Appendix 3

Geotechnical Planning Review Report

Project:

Proposed Access (Inclined Lift) for the Existing Residential Development in "Green Belt" at 17 Bowen Road, Mid-Levels, HK

S16 Planning Application

Geotechnical Planning Review Report

Revision:

Date: 11/ 2025

Project no.:	25047
Designed by:	NC
Check / Approved By:	Eddy Kwok

So Chi Wai

Registered Geotechnical Engineer

(RGE No.: 89/ 00)

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Table of Content

1 Introduction

1.1 Background

Green Engineering Consultant Company Limited (GEC) is commissioned as the geotechnical engineering consultant to support the application of Section 16 for the site at No. 17 Bowen Road, Mid-Levels, Hong Kong. The Development site (the "Site") is located in "Green Belt" and "Residential (Group C) 1" Zones at North side of No. 17 Bowen Road, Hong Kong. The total area of the Development Site is about 89.6m^2, of which approx. 69.7m^2 falls within the Application Site.

2 Site Information

2.1 General

The Site is on a sloping ground with site ground level 146 mPD at Lot IL 2460 to 127.6 mPD at the existing stairway at North. There is an existing natural stream on the West side and 1 m wide stairway on the East side. The average gradient of the slope is about 1:2 (i.e. 26 degree) along the site.

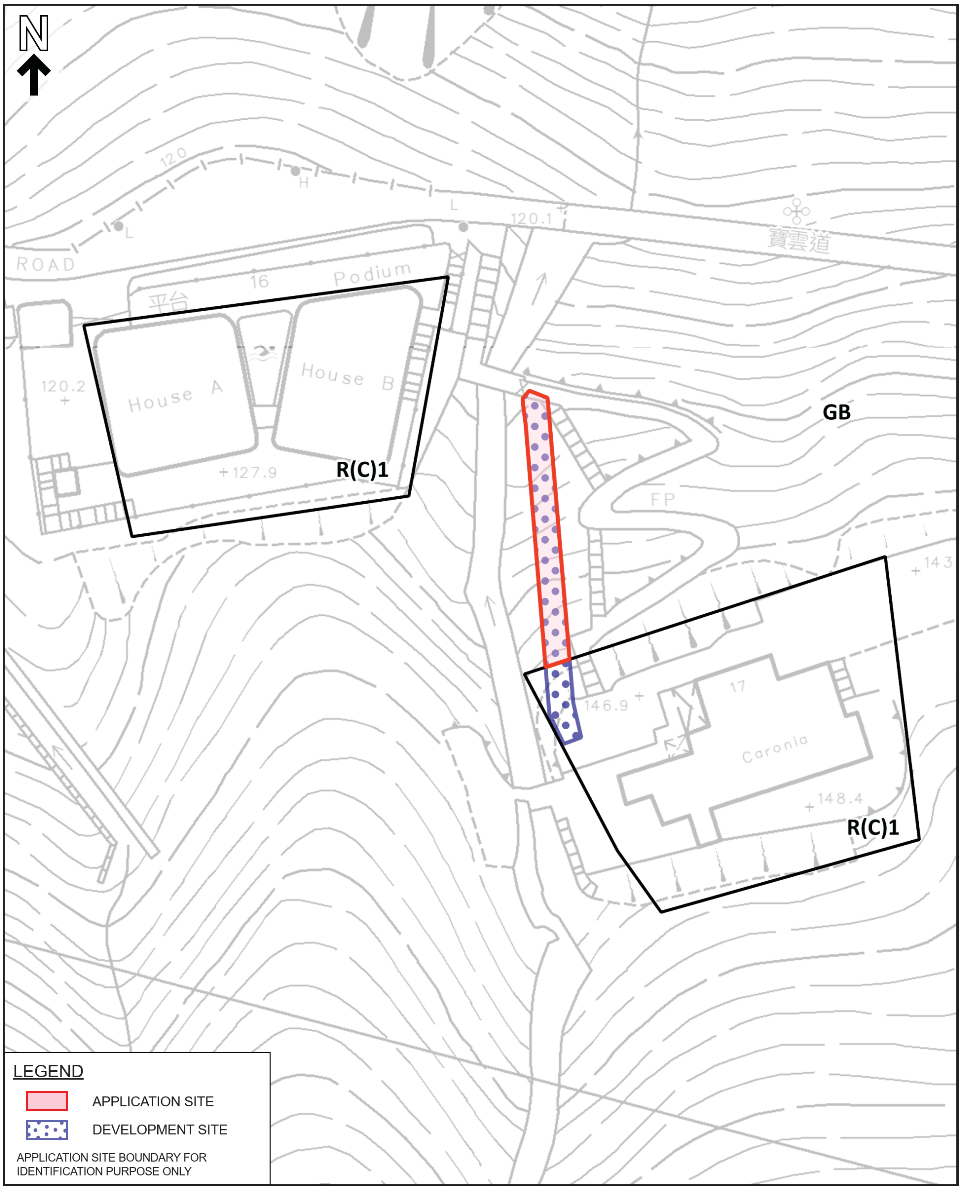


Figure 1: Site Plan

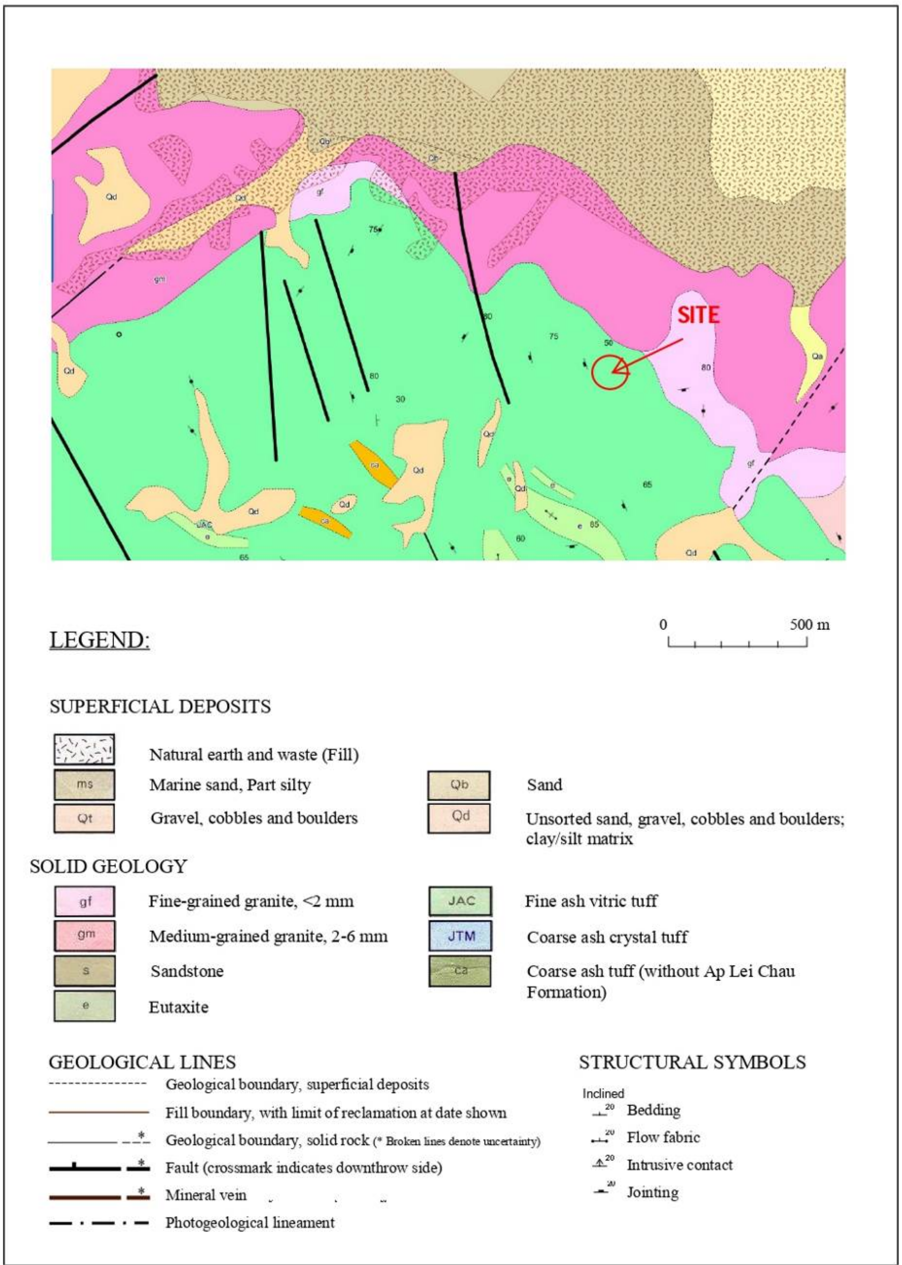
2.2 Site Geology

To reveal the geological information for the site, the following information was reviewed and collected:-

- The Hong Kong Geological Map Sheet (Edition II-2012)
- Geotechnical Area Studies Programme (GASP)
- Enhanced Natural Terrain Landslide Inventory (ENTLI)
- Existing Ground Investigation Record

2.2.1 Geological Map

The Hong Kong Geological Map Sheet (Edition II – 2012) No. 11 (Scale 1:20,000) on Solid Geology published by the Geotechnical Engineering Offices indicates that the Site is underlain by bedrock of fine ash tuff of Upper Jurassic Mesozoic. The part of the geological map is shown in Figure 2 below.



Note: Extracted from Hong Kong Geological Survey, Map Series HGM20, Sheet No. 11, 1:20 000 scale (GCO, 1986).

Figure 2: The Geological Map of Hong Kong (Sheet 11: HGM20 Series : Edition II-2012)

2.2.2 Geotechnical Area Studies Programme (GASP)

According to Geotechnical Area Studies Programme (GASP), Geotechnical Land Use map GASP/20/1/1, the Site is classified as Class III with high geotechnical limitations. It may require intensive geotechnical investigation.

High engineering cost and normal site investigation works envisaged. Engineering Geology Map GASP/20/1/2 indicated the site geology is dominantly granophyric rocks that weathers to produce clayey silty sand with corestones. Physical Constraints Mapsheet GASP/20/1/6 indicates the Site is within zone of general instability associated with predominate in-situ terrain.

2.2.3 Natural Terrain Hazards

There is no landslide record at the site area. ENTLI records that there are two past slope failure at about 80 m East of the Site. They are:-

ENTLI No.	Type of Slides	Width of Main Scarp (m)	Length of Landslide Source (m)	Year of Landslide Observed
11SWD0602E	Relict	33	40.5	1963
11SWB0008E	Recent open hillside	25	20	1982
11SWD0729E	Recent open hillside	15	30	2008

Table 1: Record of Slope Failure Nearby

Detail information of the record is appended in Appendix 04. All the affected slope features shall be checked and upgraded to achieve current standard as necessary.

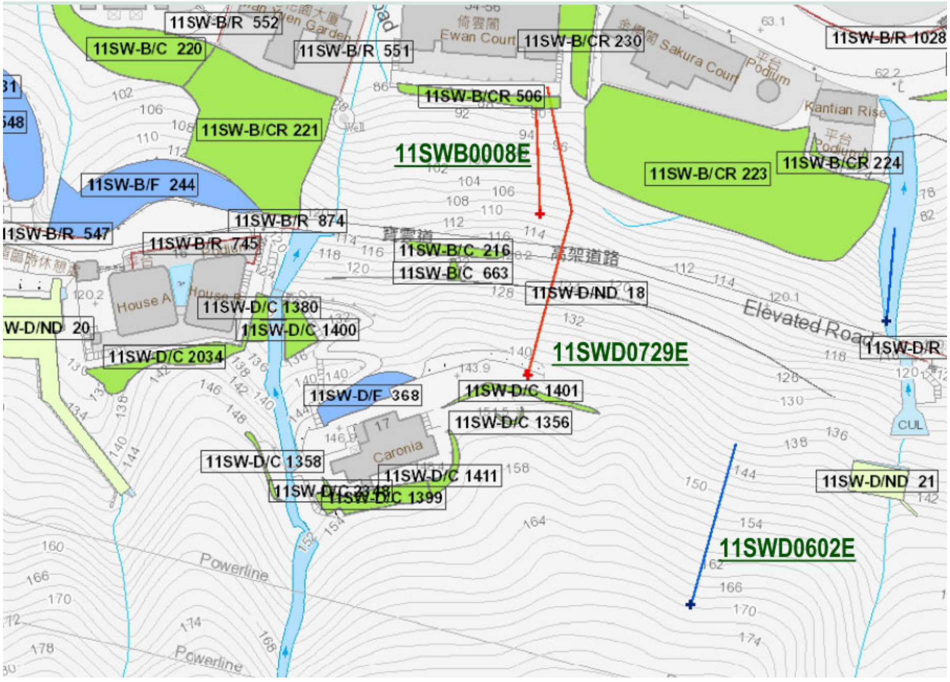


Figure 3: Location Plan of Past Slope Failure Record

2.2.4 Pervious Ground Investigation Records

There is no recorded borehole information within the Site. However, the most nearby ground investigation record is the ground investigation work conducted by Driltech in 2010 that includes three trial pits and two slope stripping at the existing feature no.: 11SW-D/C 1411 at the South-east of the Site.

The inferred geological profile by recorded ground investigation information indicates that the top soil is 0.6 m thick colluvium with grade V CDT below.

Copy of the ground investigation report is appended in Appendix 06.

2.2.5 Groundwater

No ground water monitoring records were available.

2.3 Adjoining Structures

There is an existing two storey residential building, Caronia (IL 2460), suit at the South side of the proposed Site.

2.4 Existing Features Within and Adjacent to the Site Area

Major geotechnical features in the vicinity and their Slope Information System (SIS) together with proposed actions are summarized as below:-

Feature No.	Type of Feature	Slope Dimension (Max. H X L (m))	Angle (Degree)	Maintenance Responsibility
11SW-D/C 138	Soil Cut Slope	6.5 (H) x 15 (L)	45	CEDD
11SW-D/C 1400	Soil Cut Slope	8.5 (H) x 16 (L)	50	IL 2460
11SW-D/F 368	Soil Cut Slope	5 (H) x 23 (L)	35	IL 2460

Copy of the slope information is appended in Appendix 05.

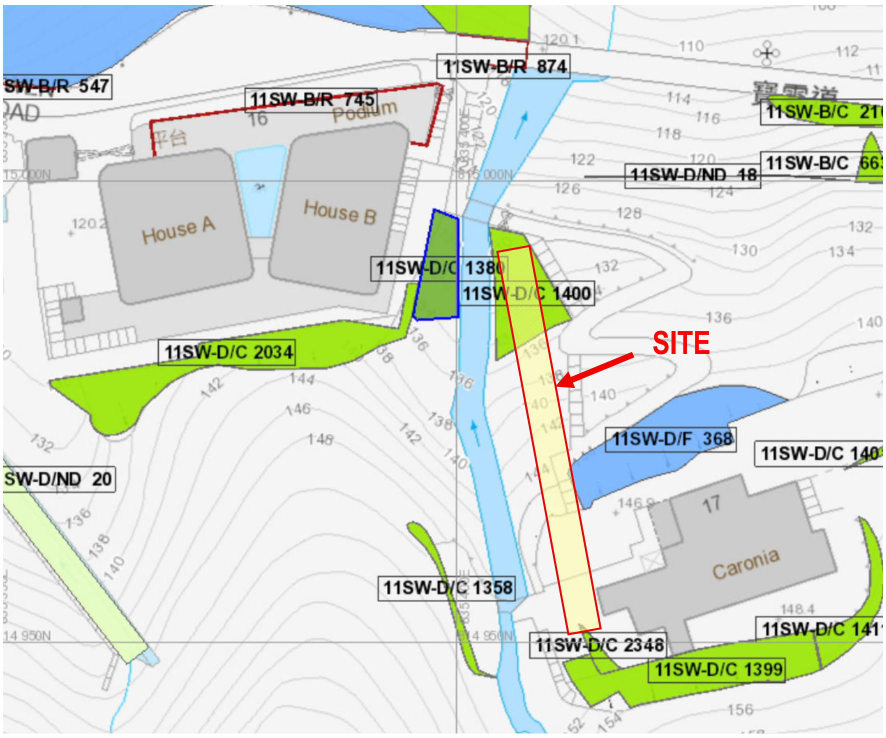


Figure 4: Existing Feature Layout Plan

3 Proposed Development

It is proposed to construct a inclined lift from the flat platform with level 146 mPD at IL 2460, Caronia, to the stair platform at level about 127.6 mPD. A new R C trough will be constructed to support the lift. Critical section along the proposed lift is provided in Figure 6.

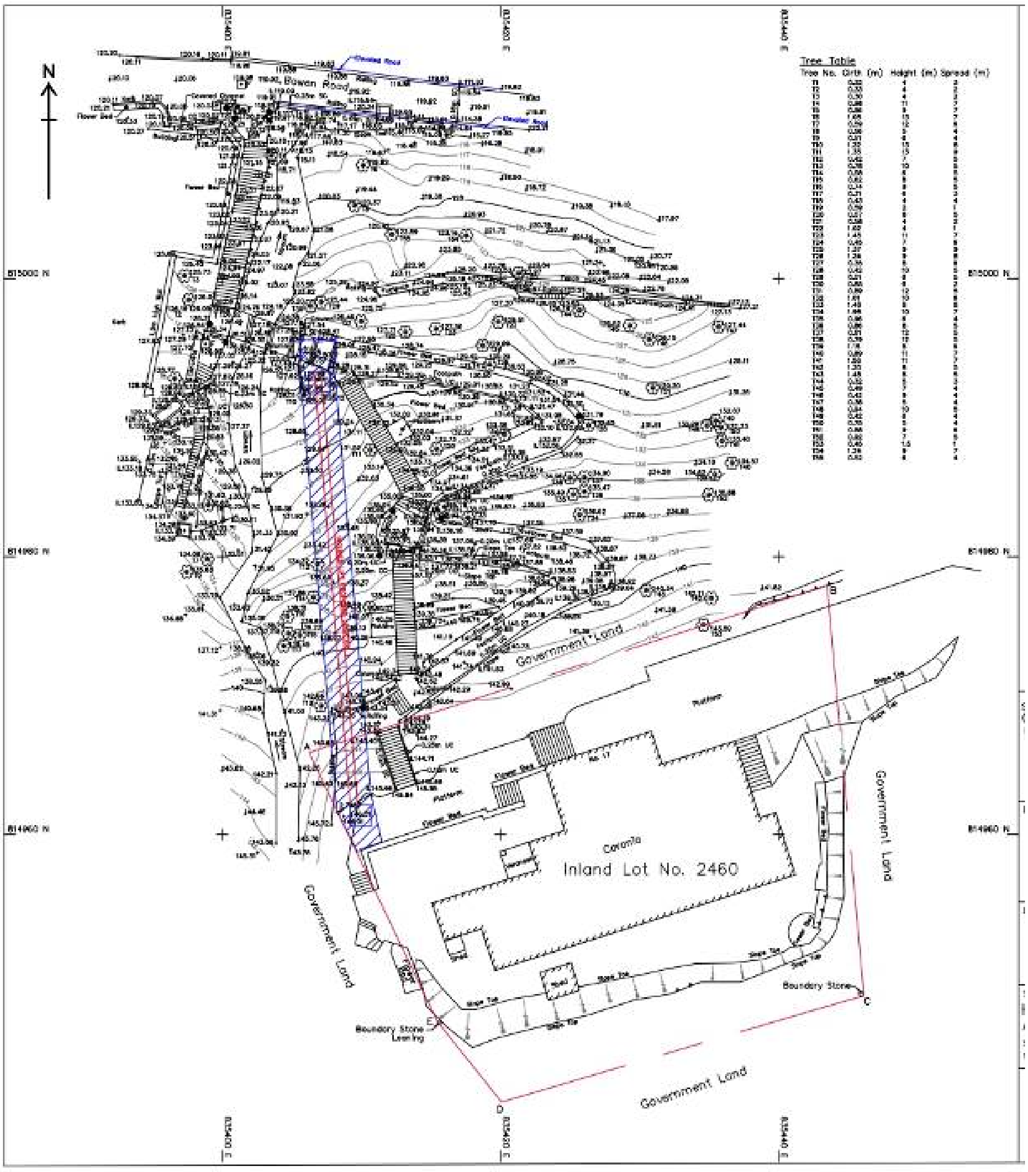


Figure 5: Proposed Layout of the Site

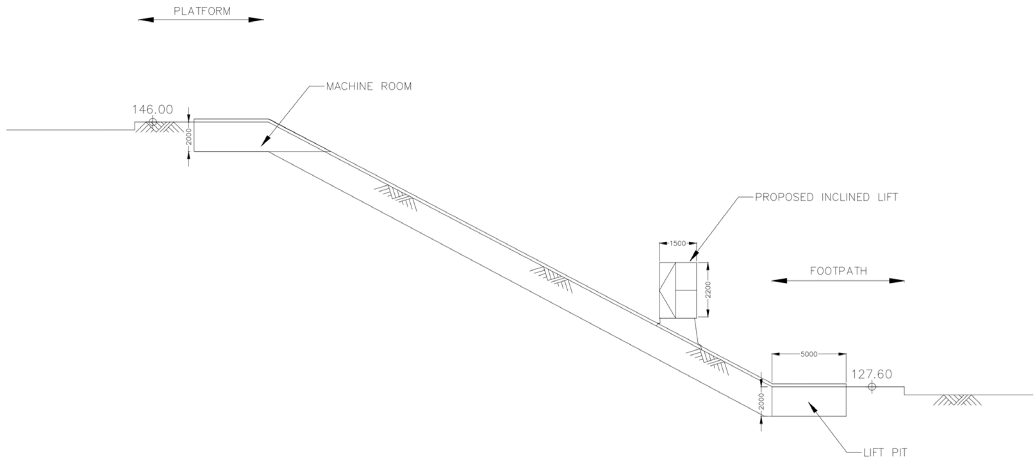


Figure 6: Section along the Proposed Inclined Lift

3.1 Proposed Site Formation Works

The natural hillside is about 26 degree that is not steep. There is no sign of distress apparent. Extensive geotechnical work shall be avoided to destroy its natural stability. The portion of natural slope measured 10 m on plan from the site boundary is proposed to undertake further study. Ground investigation works including vertical bored holes and trial pits shall be carried out to determine the soil design parameters for its stabilities checking. The affected area shall be upgraded as necessary to current safety standard. We consider that the subjected slope can be upgraded to sufficient factor of safety by installation of new soil nails and/ or rock dowel subjected to the detail design. Proper surface drainage will be provided to collect the surface water to the natural stream beside.

We consider that the natural terrain hazard study is not necessary because:-

(1) The proposed facilities are group 4 only (i.e. road with low vehicle or pedestrian traffic density) as per Table 2.2 of GEO Report No. 138.

(2) There is no past failure record at the subjected Site.

(3) The uphill side of the Site is protected by the existing platform of building, Caronia.

3.2 Proposed Foundation Works

The existing soil profile will be trimmed locally to provide a branched flat platform for strip footing of the R C trough. Soil nails will be installed to the affected slopes as necessary.

3.3 Proposed ELS Works

Temporary sheet pile / pipe pile with temporary open cut slope along both sides of the Site may be adopted for temporary excavation works of the proposed development.

3.4 Proposed Access during Construction Works

There is no accessible road directly to the subjected Site at this moment. We propose that all material and plants shall be transported from the adjoining Lot IL 2304 that owned by the applicant. The proposed development involves only soil nail, concrete work and backfilling that can be transported to the Site easily.

4 Effect on Adjacent Ground

There are no nearby buildings or sensitive utilities that could adversely affect or be affected by the proposed development. The affected features will be checked and slope upgrading works will be provided as necessary.

5 Conclusion

The proposed development only involves slope stability enhancement and on-grade R C trough. It is considered geotechnical feasible based on its relatively small construction scale. Its surrounding natural sloping ground is not steep. We consider that no natural terrain hazard study is required. However, geotechnical assessment report, detailed design and works proposal of associated works shall be submitted for approval.

Appendix 01

Topographic Survey Plan

Tree Table

Tree No.	Girth (m)	Height (m)	Spread (m)
T1	0.32	4	3
T2	0.33	4	2
T3	0.30	4	2
T4	0.98	11	7
T5	0.96	9	7
T6	1.08	13	7
T7	0.59	12	6
T8	0.56	5	4
T9	0.51	6	4
T10	1.32	13	8
T11	1.35	13	9
T12	0.42	7	5
T13	0.78	10	5
T14	0.58	6	5
T15	0.62	8	5
T16	0.74	9	5
T17	0.31	6	3
T18	0.43	4	4
T19	0.59	2	1
T20	0.57	8	5
T21	0.58	4	2
T22	1.02	4	1
T23	1.45	11	7
T24	0.45	7	6
T25	1.37	9	9
T26	1.34	9	8
T27	0.35	8	6
T28	0.42	10	5
T29	0.51	6	5
T30	0.85	6	2
T31	0.89	12	5
T32	1.01	10	6
T33	1.48	8	8
T34	1.98	10	7
T35	0.96	6	4
T36	0.86	8	5
T37	0.81	12	5
T38	0.79	12	5
T39	1.15	8	6
T40	0.89	11	7
T41	1.56	11	7
T42	1.35	8	5
T43	1.48	8	5
T44	0.32	5	3
T45	0.49	7	4
T46	0.42	9	4
T47	0.38	5	4
T48	0.94	10	5
T49	0.42	6	4
T50	0.75	5	4
T51	0.88	9	6
T52	0.92	7	5
T53	0.45	1.5	1
T54	1.24	9	7
T55	0.52	6	4

Notes:

1. All levels are in metres above HK Principal Datum
2. Grid lines are in H.K. Metric Grid 1980.
3. Elevations of kerb are referred to the bottom of kerb.

Legend:

- F Foul Water Manhole
- MH Manhole
- 0.30m UC IL45.20 U-Channel and Invert Level
- 0.30m SC IL45.20 Stepped Channel and Invert Level
- Catch Pit
- T Telecom Manhole
- P Pit
- Bore Hole
- T1 Tree & Tree Number
- L Lamp Post
- S Sign Pole
- T Telephone Pole
- W Valve Water
- Gate
- Slope
- Fence/Railing
- Retaining Wall Top
- Retaining Wall toe
- Lot Boundary

SUBJECT INLAND LOT NO.– 2460
(Area =964.0 sq. m. (about))

Point	Bearing	Distance	N	E
A			814 965.905	835 406.233
B	72°07'45"	39.141	814 977.916	835 443.485
C	174°51'48"	29.616	814 948.419	835 446.137
D	253°36'52"	27.153	814 940.759	835 420.087
E	321°22'48"	7.417	814 946.554	835 415.458
A	334°30'39"	21.438	814 965.905	835 406.233

Drawing title:

Topographical Survey Plan of Inland Lot No. 2460, 17 Bowen Road, Hong Kong.

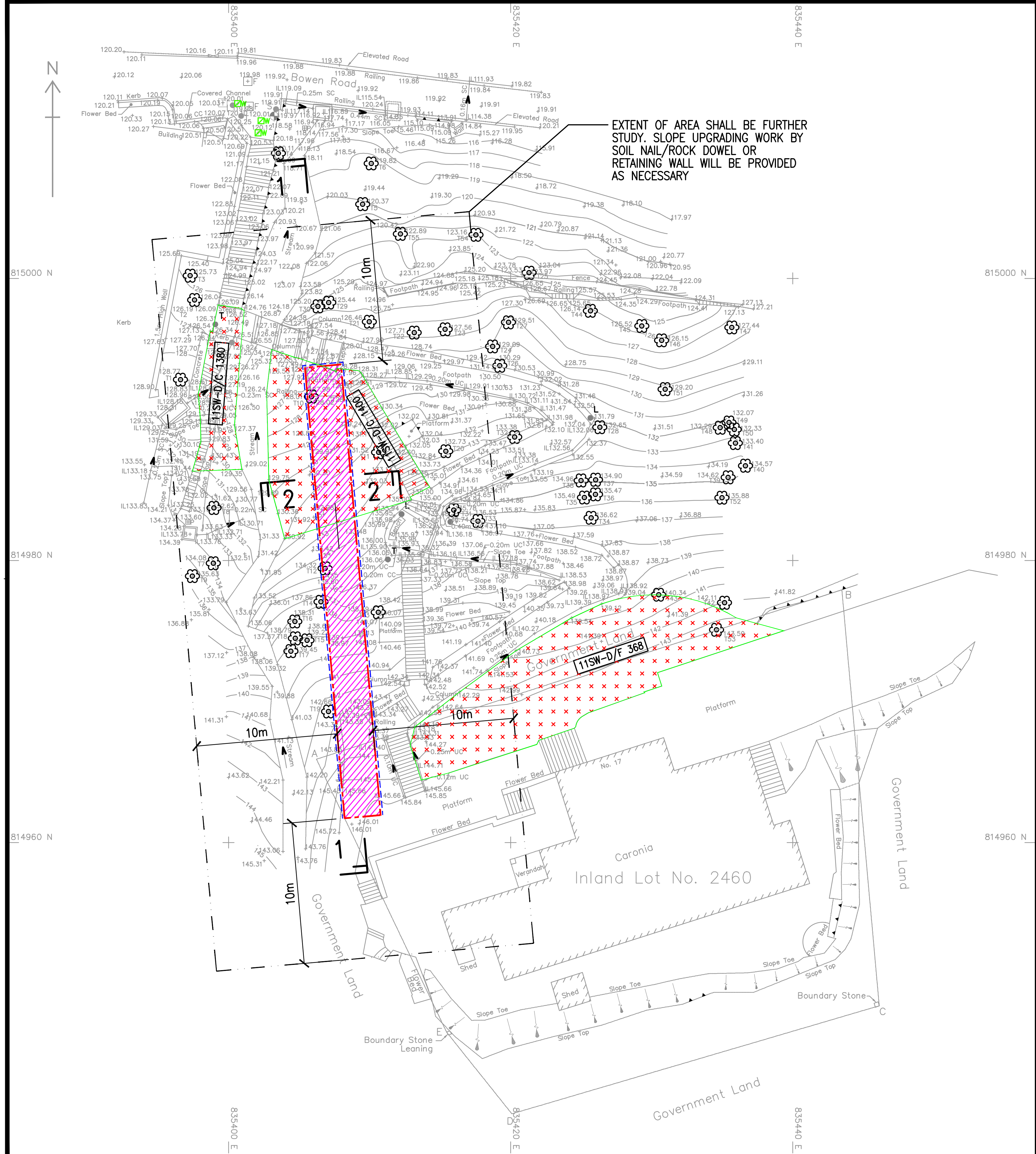
Drawing No.:	Date:	Scale:
HC–16208/01	23/04/2025	1 : 200 (A2)
	Checked by:	Drawn by:
	H. So	H.Y. Poon

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

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

Appendix 02

Proposed Geotechnical Works Layout Plan & Section



B.D. Ref. No. –

LEGENDS : –

WORKING AREA

PROPOSED TEMPORARY SHEET PILE OR PIPE PILE

REV.	DATE	DESCRIPTION
–	NOV. 2025	1st BD SUBMISSION

DRAWN BY:	TTT	SCALE:	A3 1:300
APPROVED BY:	EK	DATE:	NOV., 2025

CONSULTING ENGINEER:

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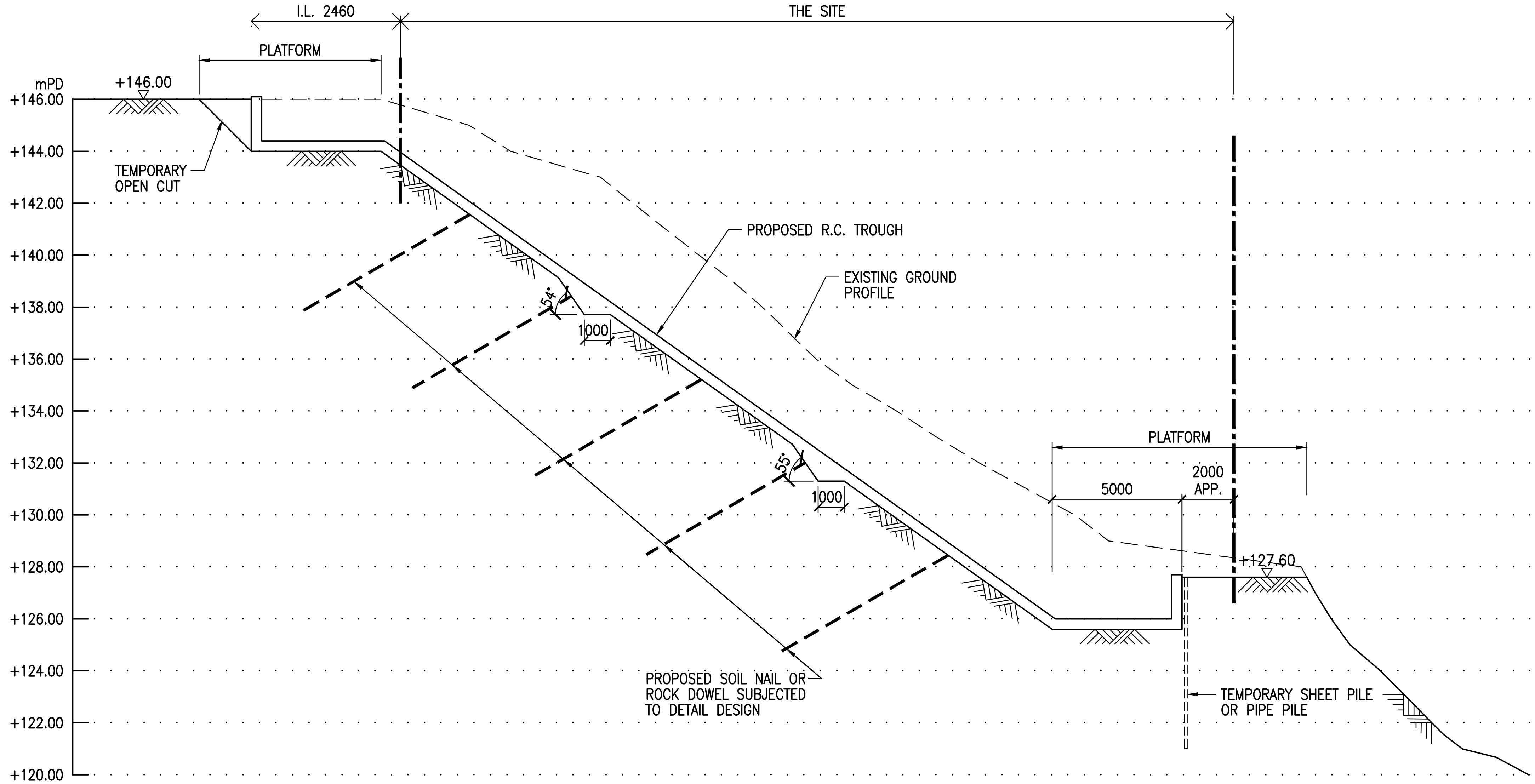
PROJECT:
PROPOSED ACCESS (INCLINED LIFT) FOR THE EXISTING RESIDENTIAL DEVELOPMENT IN "GREEN BELT" AND "RESIDENTIAL (GROUP C) 1" ZONES AT 17 BOWEN ROAD, MID-LEVELS, HK S16 PLANNING APPLICATION

DRAWING TITLE:
PROPOSED GEOTECHNICAL WORK LAYOUT PLAN

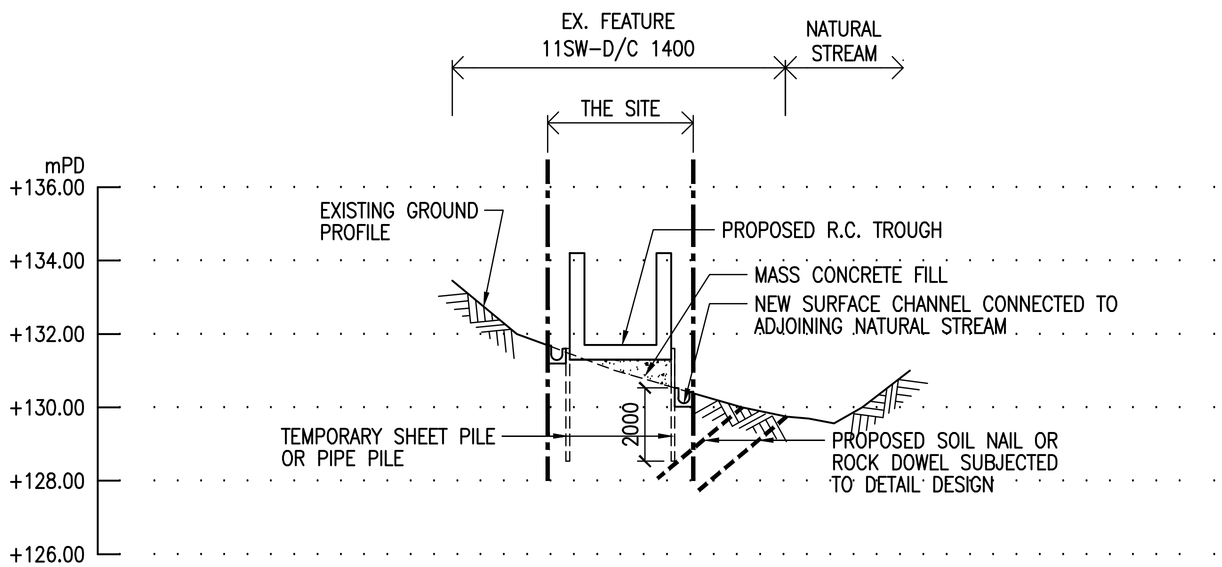
DRAWING No.:	PROJECT No.:
25047_SK-001	25047

Cad Ref. 25047_SK001.dwg

B.D. Ref. No. –



1 – 1 1:200



2 – 2 1:200

REV.	DATE	DESCRIPTION
–	NOV. 2025	1st BD SUBMISSION

DRAWN BY:	TTT	SCALE:	AS SHOWN
APPROVED BY:	EK	DATE:	NOV., 2025

CONSULTING ENGINEER:

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PROJECT:
PROPOSED ACCESS (INCLINED LIFT) FOR THE EXISTING RESIDENTIAL DEVELOPMENT IN "GREEN BELT" AND "RESIDENTIAL (GROUP C) 1" ZONES AT 17 BOWEN ROAD, MID-LEVELS, HK S16 PLANNING APPLICATION

DRAWING TITLE:

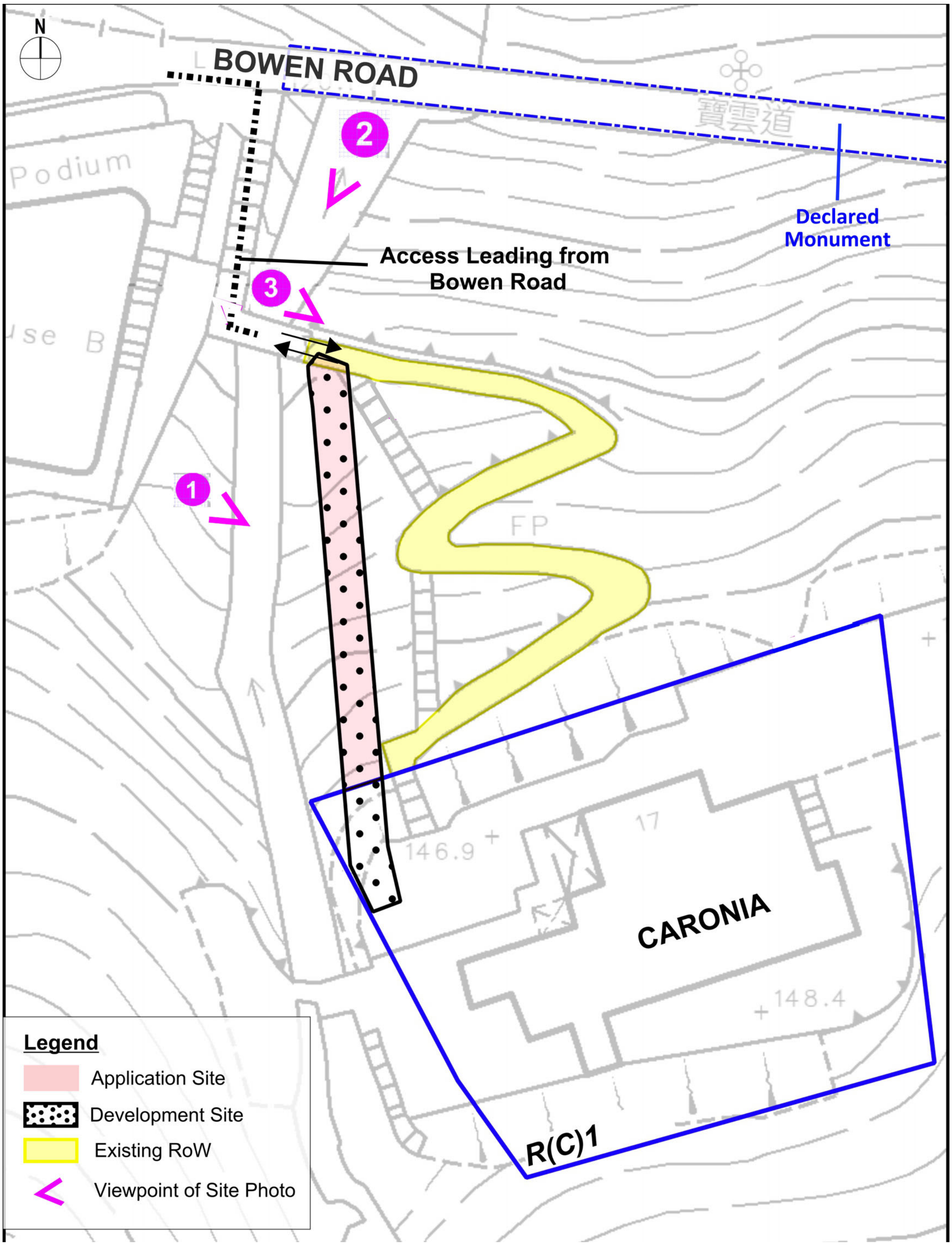
SECTIONS

DRAWING No.:	PROJECT No.:
25047_SK-002	25047

Cad Ref. 25047_SK002.dwg

Appendix 03

Record Photos for Existing Site Condition



Site Location Plan

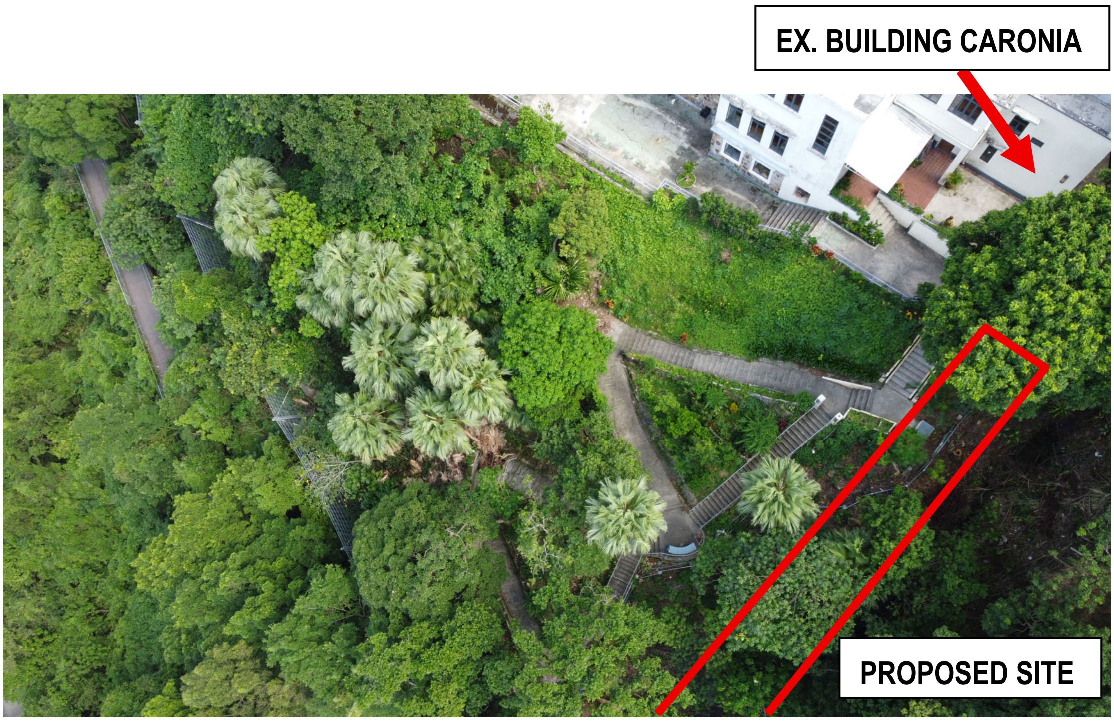


Plate 1: Aerial View of the Site (View 1)

Plate 2: Aerial View of the Site (View 2)

EX. FEATURE
11SW-D/C 1400

Plate 3: Existing Feature 11 SW-D/C 1400

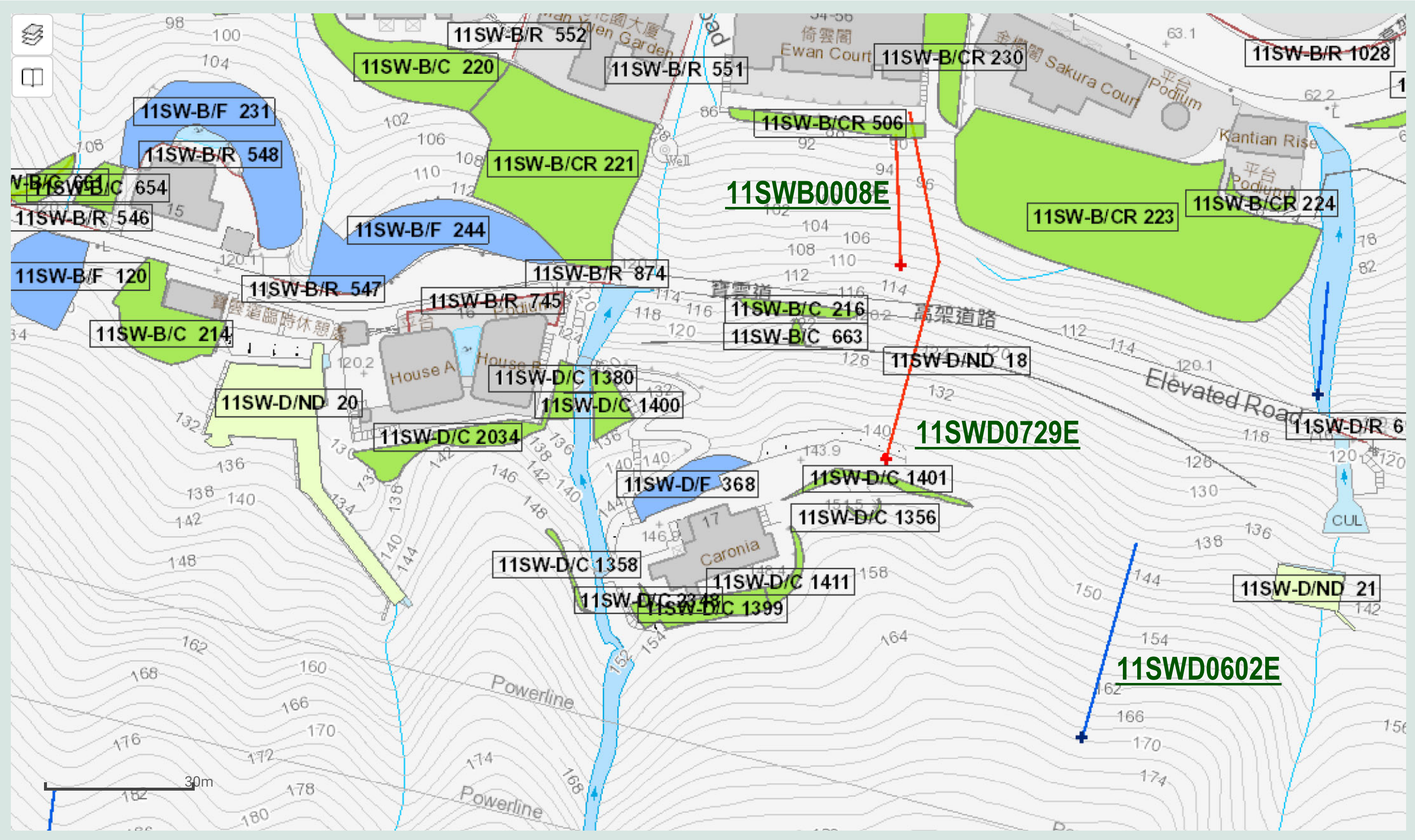
Appendix 04

Abstract of Natural Terrain Hazard Map and Records

Facts and Figures

Slope Information System

Search By: Building / Street Street / Road / Building: 17 bowen road **Search**



User Manual

[Application for information from the Catalogue of Slopes](#)

[Disclaimer](#)

Sitemap

Facts and Figures

Slope Information System

	Back
ENTLI No.	11SWB0008E
Type of slides	Recent open hillside
Width of main scarp	25
Length of landslide source	20
Slope	48
Vegetation cover	Totally bare
Year landslide first observed	1982
Elevation of landslide crown	109
Elevation of landslide toe	88
Elevation difference of landslide trail	21
Gully	N
Relict class	-
Easting	835465.803162
Northing	815016.049334

Facts and Figures

Slope Information System

	Back
ENTLI No.	11SWD0602E
Type of slides	Relict
Width of main scarp	33
Length of landslide source	40.5
Slope	25.5
Vegetation cover	Completely in grass
Year landslide first observed	1963
Elevation of landslide crown	169
Elevation of landslide toe	138
Elevation difference of landslide trail	31
Gully	N
Relict class	Broad depression (10% certain)
Easting	835502.171148
Northing	814921.15072

Facts and Figures

Slope Information System

	Back
ENTLI No.	11SWD0729E
Type of slides	Recent open hillside
Width of main scarp	15
Length of landslide source	30
Slope	19.5
Vegetation cover	Totally bare
Year landslide first observed	2008
Elevation of landslide crown	144
Elevation of landslide toe	84
Elevation difference of landslide trail	60
Gully	N
Relict class	-
Easting	835462.808375
Northing	814977.042947

Appendix 05

Abstract of Slope Registration Record

BASIC INFORMATION

Location:	NW of Caronia, 17 Bowen Road
Date of Formation:	pre-1977
Date of Construction/ Modification:	N/A
Approximate Coordinates:	Easting : 835398 Northing : 814988

CONSEQUENCE-TO-LIFE CATEGORY

Facility at Crest:	Undeveloped green belt
Distance of Facility from Crest (m):	0
Facility at Toe:	Road/footpath with low traffic density
Distance of Facility from Toe (m):	0
Consequence-to-life Category:	3
Remarks:	N/A

SLOPE PART

(1) Max. Height (m): 6.5 Length (m): 15 Average Angle (deg): 45

WALL PART

N/A

MAINTENANCE RESPONSIBILITY

Maintenance Type: Government Party: Lands D Agent: Lands D
Maintenance Type: Government Party: CEDD Agent: CEDD

DETAILS OF SLOPE / RETAINING WALL

Date of Inspection:	19-09-2000
Data Source:	EI
Slope Part Drainage:	(1) Position: Crest Size(mm): 151
Wall Part Drainage:	N/A

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): 65 Spacing (m): 1.2

WALL PART

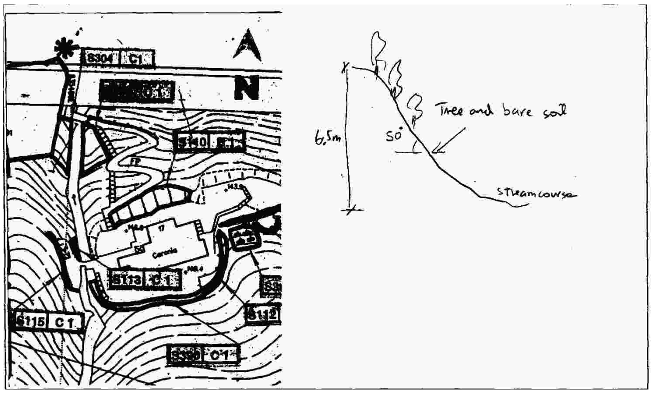
N/A

SERVICES

(1) Utilities Type: Water Main Size (mm): 35 Location: On crest Remark: N/A
(2) Utilities Type: Water Main Size (mm): 35 Location: On slope Remark: N/A

STAGE 1 STUDY REPORT

Inspected On:	13-12-1996
Weather:	Mainly Fine
District:	I



Section No:	1-1
Height (m):	N/A
Type of Toe Facility:	Road/footpath with low traffic density
Distance from Toe (m):	0
Type of Crest Facility:	Undeveloped green belt
Distance from Crest (m):	0
Consequence Category:	1
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:	1
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):	1
Observations:	N/A
Emergency Action Required:	N
Action By:	N/A

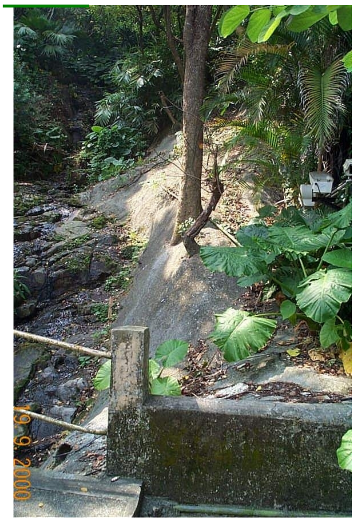
ACTION TO INITIATE PREVENTIVE WORKS

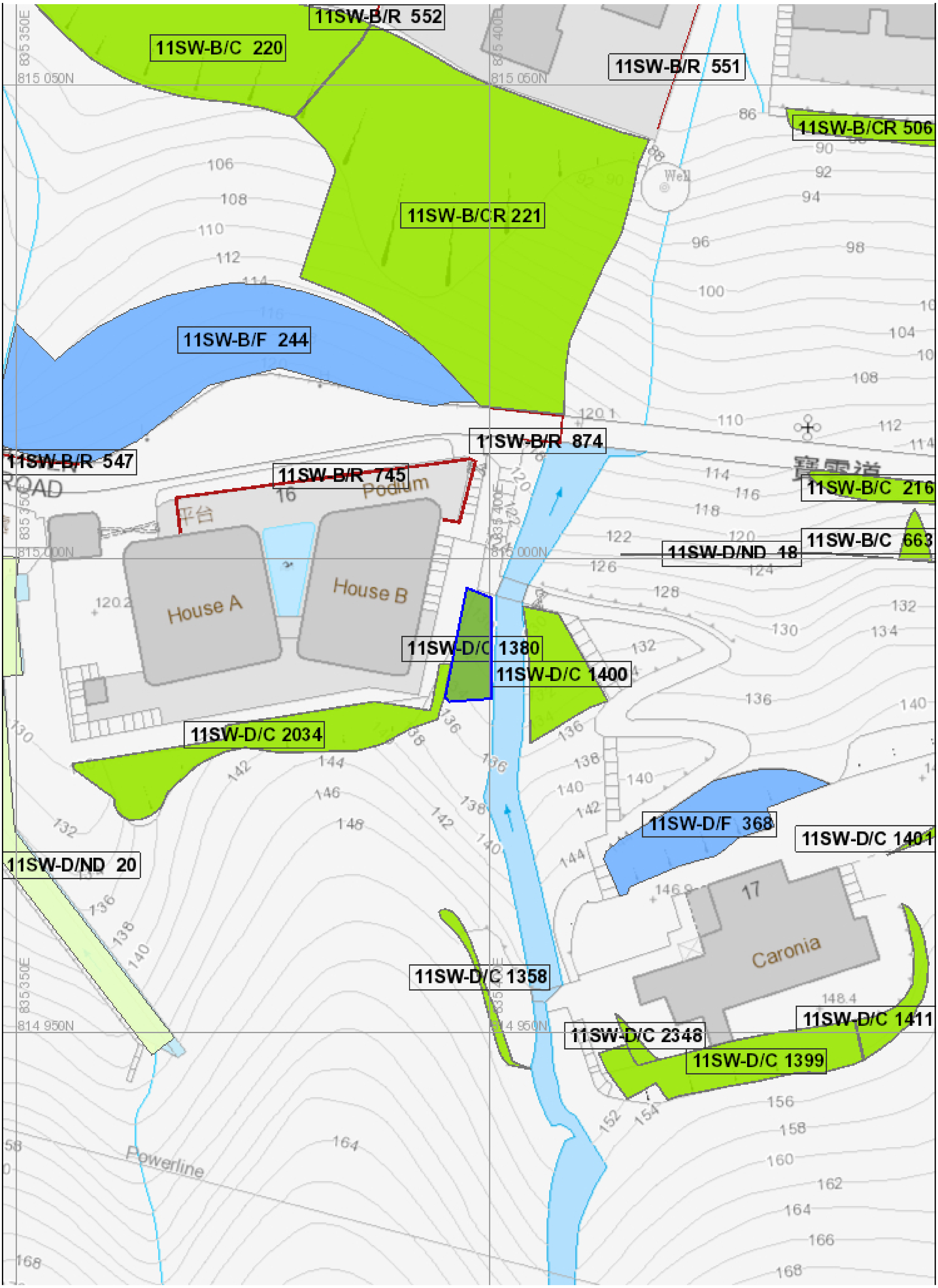
Criterion A / Criterion D:	N/A
Action By:	N/A
Further Study:	Y
Action By:	Mixed

OTHER EXTERNAL ACTION

Check / repair Services:	N
Action By:	N/A
Non-routine Maintenance:	N
Action By:	N/A

PHOTO




11SW-B/R 552
11SW-B/C 220
11SW-B/R 551
11SW-B/CR 506
11SW-B/CR 221
11SW-B/F 244
11SW-B/R 874
11SW-B/R 547
11SW-B/R 745
11SW-B/C 216
11SW-B/C 663
11SW-D/ND 18
House A
House B
Podium
平台
11SW-D/C 1380
11SW-D/C 1400
11SW-D/C 2034
11SW-D/F 368
11SW-D/C 1401
11SW-D/ND 20
Caronia
11SW-D/C 1358
11SW-D/C 2348
11SW-D/C 1399
11SW-D/C 1411
Powerline
Well
815 050N
815 000N
814 950N
835 350E
835 400E

BASIC INFORMATION

Location:	E OF CAONIA, 17 BOWEN ROAD
Date of Formation:	pre-1977
Date of Construction/ Modification:	N/A
Approximate Coordinates:	Easting : 835407 Northing : 814988

CONSEQUENCE-TO-LIFE CATEGORY

Facility at Crest:	Densely-used playground
Distance of Facility from Crest (m):	0
Facility at Toe:	Residential building
Distance of Facility from Toe (m):	0
Consequence-to-life Category:	1
Remarks:	N/A

SLOPE PART

(1) Max. Height (m): 8.5 Length (m): 16 Average Angle (deg): 50

WALL PART

N/A

MAINTENANCE RESPONSIBILITY

Maintenance Type: Private Party: IL2460 Agent: N/A

DETAILS OF SLOPE / RETAINING WALL

Date of Inspection:	13-12-1996
Data Source:	SIRST
Slope Part Drainage:	N/A
Wall Part Drainage:	N/A

SLOPE PART

Slope Part (1)

Surface Protection (%):	Bare: 50	Vegetated: 50	Chunam: 0	Shotcrete: 0	Other Cover: 0
Material Description:	Material type: Soil	Geology: Decomposed volcanic			
Berm:	No. of Berms: N/A	Min. Berm Width (m): N/A			
Weepholes:	Size (mm): N/A	Spacing (m): N/A			

WALL PART

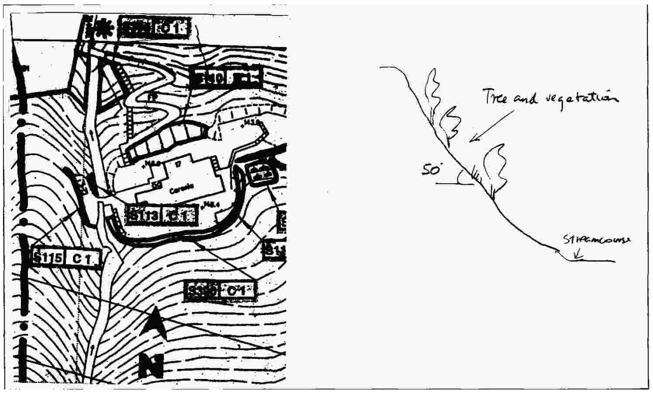
N/A

SERVICES

(1) Utilities Type: Electricity Size (mm): 0 Location: On crest Remark: Size cannot be determined

STAGE 1 STUDY REPORT

Inspected On:	13-12-1996
Weather:	Mainly Fine
District:	I



Section No:	1-1
Height (m):	N/A
Type of Toe Facility:	Residential building
Distance from Toe (m):	0
Type of Crest Facility:	Densely-used playground
Distance from Crest (m):	0
Consequence Category:	1
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:	1
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):	1
Observations:	N/A
Emergency Action Required:	N
Action By:	N/A

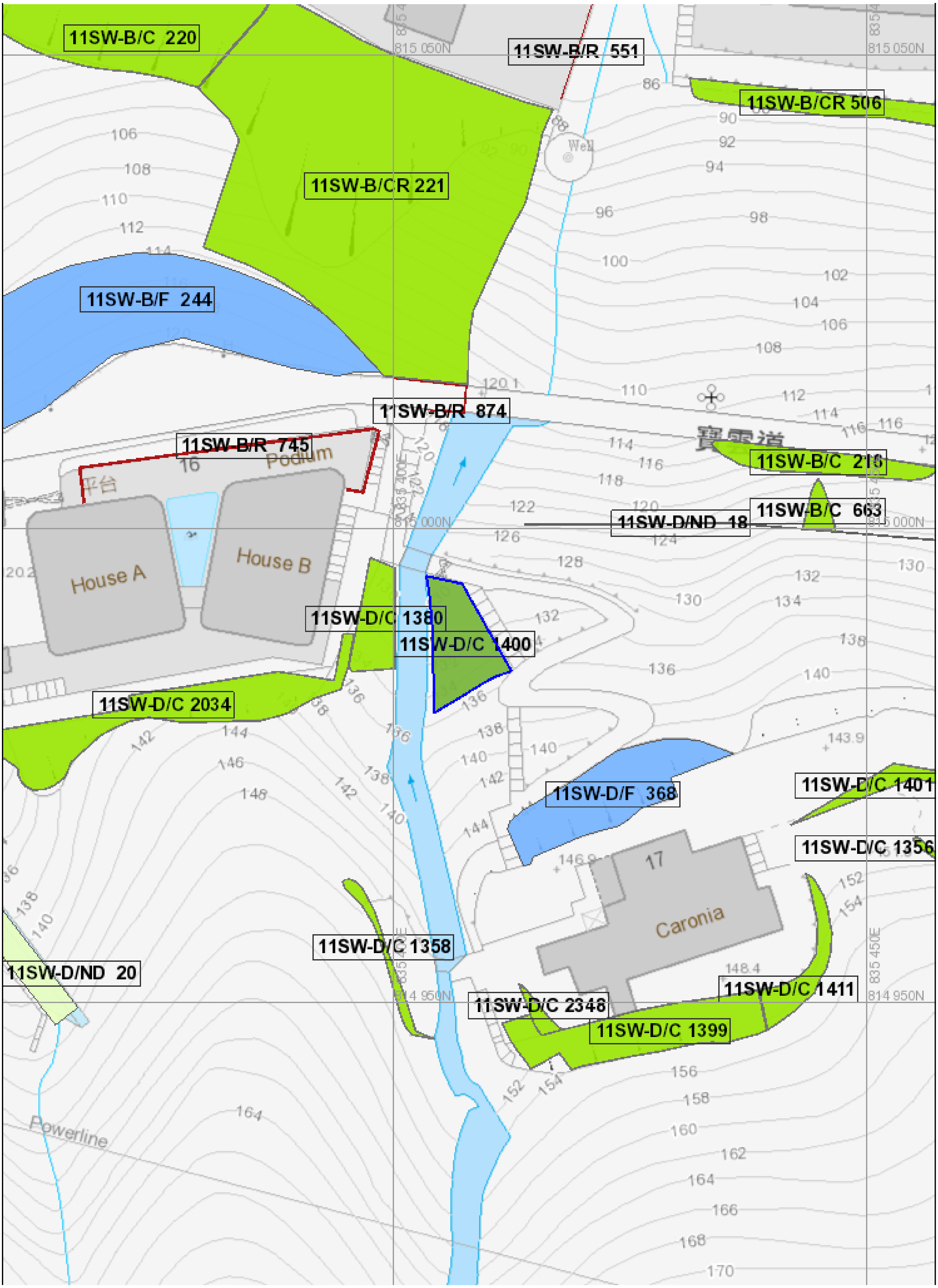
ACTION TO INITIATE PREVENTIVE WORKS

Criterion A / Criterion D:	N/A
Action By:	N/A
Further Study:	Y
Action By:	Mixed

OTHER EXTERNAL ACTION

Check / repair Services:	N
Action By:	N/A
Non-routine Maintenance:	N
Action By:	N/A

PHOTO


11SW-B/C 220
11SW-B/R 551
11SW-B/CR 506
11SW-B/CR 221
11SW-B/F 244
11SW-B/R 874
11SW-B/R 745
Podium
平台
House A
House B
11SW-B/C 216
11SW-B/C 663
11SW-D/ND 18
寶雲道
11SW-D/C 1380
11SW-D/C 1400
11SW-D/C 2034
11SW-D/F 368
11SW-D/C 1401
11SW-D/C 1356
Caronia
11SW-D/C 1358
11SW-D/ND 20
11SW-D/C 2348
11SW-D/C 1411
11SW-D/C 1399
Powerline
Well
815 050N
815 000N
814 950N
835 450E

BASIC INFORMATION

Location:	IN FRONT OF 17 BOWEN ROAD
Registration Date:	16-03-1998
Ranking Score (NPRS):	0 (LPMit)
Date of Formation:	pre-1977
Date of Construction/ Modification:	
Data Source:	SIRST
Approximate Coordinates:	Easting : 835421 Northing : 814971

CONSEQUENCE-TO-LIFE CATEGORY

Facility at Crest:	Residential building
Distance of Facility from Crest (m):	3
Facility at Toe:	Road/footpath with low traffic density
Distance of Facility from Toe (m):	0
Consequence-to-life Category:	1
Remarks:	N/A

SLOPE PART

(1) Max. Height (m): 5 Length (m): 23 Average Angle (deg): 35

WALL PART

N/A

MAINTENANCE RESPONSIBILITY

(1) Sub Div.: 0 Private Feature Party: IL2460 Agent: N/A Land Cat.: 1,5a,7 Reason Code: 44 MR Endorsement Date: 01-12-1998

DETAILS OF SLOPE / RETAINING WALL

Date of Inspection:	11-12-1996
Data Source:	SIRST
Slope Part Drainage:	N/A
Wall Part Drainage:	N/A

SLOPE PART

Slope Part (1)

Surface Protection (%):	Bare: 70	Vegetated: 30	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

(1) Utilities Type: Electricity Size(mm): 0 Location: On crest Remark: Size cannot be determined
(2) Utilities Type: Sewer/Drain Size(mm): 0 Location: On crest Remark: Size cannot be determined
(3) Utilities Type: Water Main Size(mm): 0 Location: On crest Remark: Size cannot be determined

CHECKING STATUS INFORMATION

Tagmark: SCS_10567 Part: 0 Checking Status: Others (See remarks) Checking Certificate No.: N/A

BACKGROUND INFORMATION

GIU Cell Ref.:	11SW14D1
Map Sheet Reference (1:1000):	11SW-14D
Aerial Photos:	7053/4 (1963),
Nearest Rainguage Station (Station Number):	25 Borrett Road(H17)
Data Collected On:	11-12-1996
Date of Construction, Subsequent Modification and Demolition:	Modification: Constructed Before: 1949 After: N/A
Related Reports/Files or Documents:	File/Report: Development Ref. No.: GCI 2/B7/113 File/Report: Development Ref. No.: GCI 2/B7/113
Remarks:	N/A
Follow Up Actions:	N/A
DH-Order (To Be Confirmed with Buildings Department):	None
Advisory Letter (To Be Confirmed with Buildings Department):	None
LPMIS:	None

ENHANCED MAINTENANCE INFORMATION

From Maintenance Department: (Last Updated Date: 25/09/2025)

STAGE 1 STUDY REPORT

Inspected On:	
Weather:	
District:	I
Section No:	1-1
Height(m):	
Type of Toe Facility:	Road/footpath with low traffic density
Distance from Toe(m):	0
Type of Crest Facility:	Residential building
Distance from Crest(m):	3
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

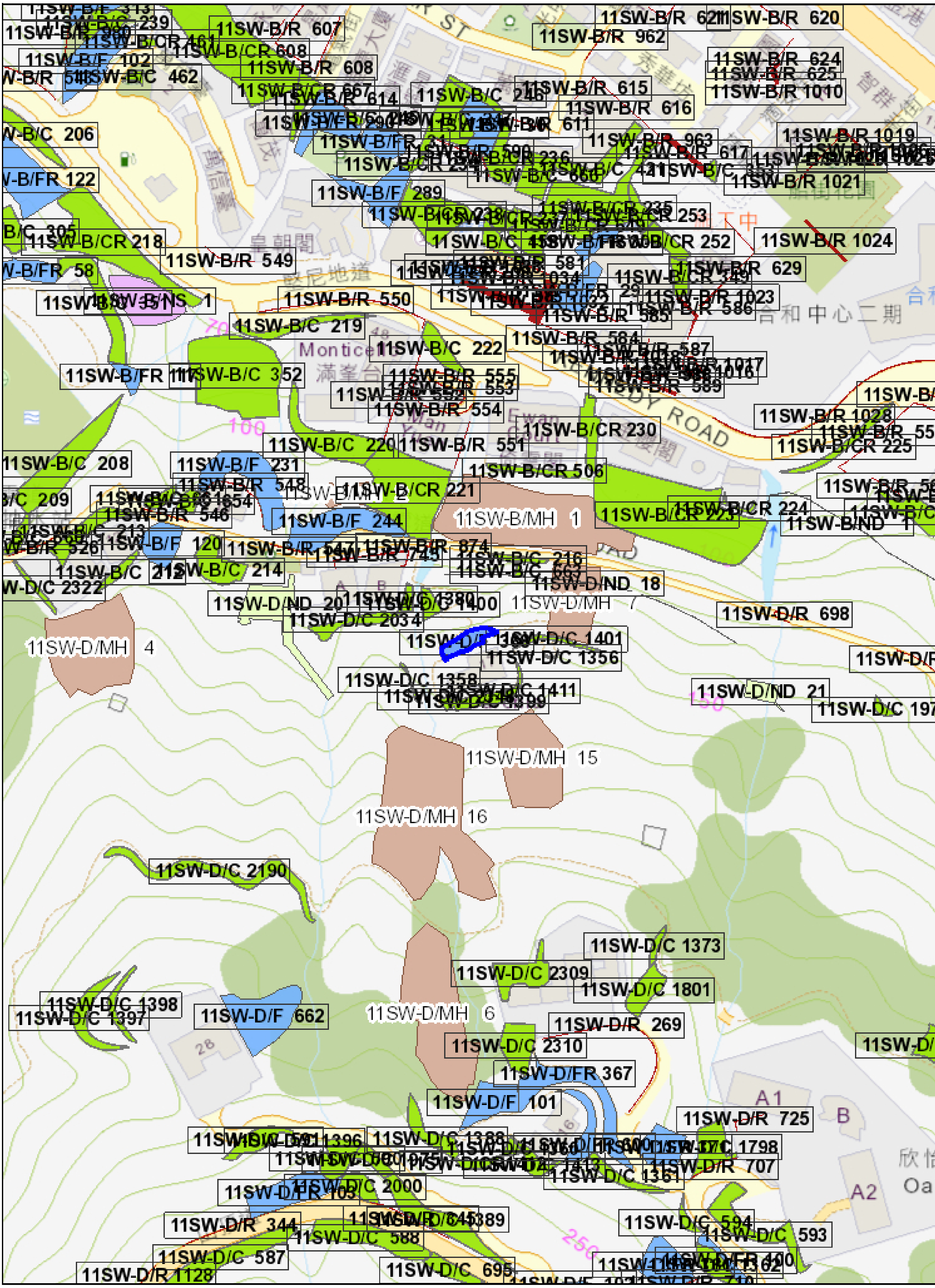
OTHER EXTERNAL ACTION

Check / repair Services:	
Action By:	N/A

Non-routine Maintenance:

Action By: N/A

PHOTO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11SW-B/CR 608
11SW-B/R 608
11SW-B/R 962
11SW-B/R 620
11SW-B/R 624
11SW-B/R 625
11SW-B/R 1010
11SW-B/R 615
11SW-B/R 616
11SW-B/C 462
11SW-B/C 206
11SW-B/FR 122
11SW-B/F 289
11SW-B/R 963
11SW-B/R 1019
11SW-B/R 1021
11SW-B/CR 218
11SW-B/R 549
11SW-B/R 1024
11SW-B/CR 252
11SW-B/R 629
11SW-B/R 550
11SW-B/C 219
11SW-B/R 1023
11SW-B/R 585
11SW-B/R 586
11SW-B/C 222
11SW-B/R 584
11SW-B/R 587
11SW-B/FR
11SW-B/C 352
11SW-B/R 555
11SW-B/R 553
11SW-B/R 554
11SW-B/R 589
11SW-B/R 1028
11SW-B/CR 225
11SW-B/CR 230
11SW-B/C 220
11SW-B/R 551
11SW-B/C 208
11SW-B/F 231
11SW-B/CR 506
11SW-B/CR 221
11SW-B/R 546
11SW-B/F 244
11SW-B/MH 1
11SW-B/CR 223
11SW-B/CR 224
11SW-B/ND 1
11SW-B/F 120
11SW-B/R 874
11SW-B/R 743
11SW-B/C 216
11SW-B/C 214
11SW-B/C 212
11SW-D/C 2322
11SW-D/ND 18
11SW-D/ND 20
11SW-D/C 1400
11SW-D/MH 7
11SW-D/R 698
11SW-D/C 2034
11SW-D/MH 4
11SW-D/C 1401
11SW-D/C 1356
11SW-D/C 1358
11SW-D/C 1411
11SW-D/ND 21
11SW-D/MH 15
11SW-D/MH 16
11SW-D/C 2190
11SW-D/C 1373
11SW-D/C 2309
11SW-D/C 1801
11SW-D/C 1398
11SW-D/C 1397
11SW-D/F 662
11SW-D/MH 6
11SW-D/R 269
11SW-D/C 2310
11SW-D/FR 367
11SW-D/F 101
11SW-D/R 725
11SW-D/C 1798
11SW-D/R 707
11SW-D/C 1361
11SW-D/C 2000
11SW-D/R 344
11SW-D/C 588
11SW-D/C 594
11SW-D/C 593
11SW-D/C 587
11SW-D/R 1128
11SW-D/C 695
ROAD
Montice
滿峯台
皇朝閣
合和中心二期
A1
A2
B

Appendix 06

Abstract of Record Ground Investigation Report

DRiLTECH

CONTRACT NO. GE/2009/03
GROUND INVESTIGATION – URBAN
(TERM CONTRACT)

WORKS ORDER NO. GE/2009/03.221
Agreement No. CE15/2009(GE)
Landslip Prevention and Mitigation Programme 2009, Package A, Landslip Preventive Works on Government Slopes and Retaining Walls Hong Kong Island – Investigation, Design and Construction
Feature No. 11SW-D/C1411 (Behind No. 17 Bowen Road)

Ground Investigation

FINAL FIELD WORK REPORT

Certified as Checked

Clement Lun
Geotechnical Engineer

Certified as Completed by

K C Sung
Contractor's Representative

CONTRACTOR
DRiLTECH Ground Engineering Ltd.
Blk A & B, 9/F., Hong Kong Spinners Industrial Bldg.
Phase VI,
481 – 483 Castle Peak Road,
Kowloon.

September 2010

DRiLTECH

DrilTech Ground Engineering Ltd.

BLK A & B, 9/F, HONG KONG SPINNERS IND. BLDG, PHASE VI,481-483 CASTLE PEAK RD, KLN, HONG KONG
TEL: 2371 0008 FAX: 2744 1037 E-Mail: driltech@driltech.com.hk WEBSITE: driltech.com.hk

CONTRACT DATA SUMMARY

Project Name & No. *Ground Investigation Urban (Term Contract)*	**Site Name** *Works Order No. GE/2009/03.221* *Agreement No. CE15/2009(GE), Landslip Prevention and Mitigation Programme 2009, Package A, Landslip Preventive Works on Government Slopes and Retaining Walls Hong Kong Island - Investigation, Design and Construction, Feature No. 11SW-D/C1411 (Behind No. 17 Bowen Road)*	**Date:** *31-Jul-10* to *24-Sep-10* **Official Only** **G.E.O. Data Bank No.**
G.I. Contractor *DrilTech Ground Engineering Ltd.*	**Client** *Geotechnical Engineering Office* *Civil Engineering and Development Department*	
Contract No. *GE/2009/03*	**Consulting Engineer** *AECOM*	**File Ref.**

FIELD WORK SUMMARY

Drillholes:	No.	*Nil*	**Method:**		*Nil*	**Date:**	*13-Aug-10* to	*2-Sep-10*
Trial Pits / I.P.	No.	*3 / ---*	**Trial Trenches:**	No.	*Nil*			
Coreholes:	No.	*Nil*	**Strippings:**	No.	*2*	**Probes:**	No.	*Nil*
Piezometers:	No.	*Nil*	**Standpipes:**	No.	*Nil*	**Piezometer Buckets:**	No.	*Nil*
Insitu Tests:	No.	*Nil*	**Types:**		*Nil*			
Geophysics:	No.	*Nil*	**Types:**		*Nil*			

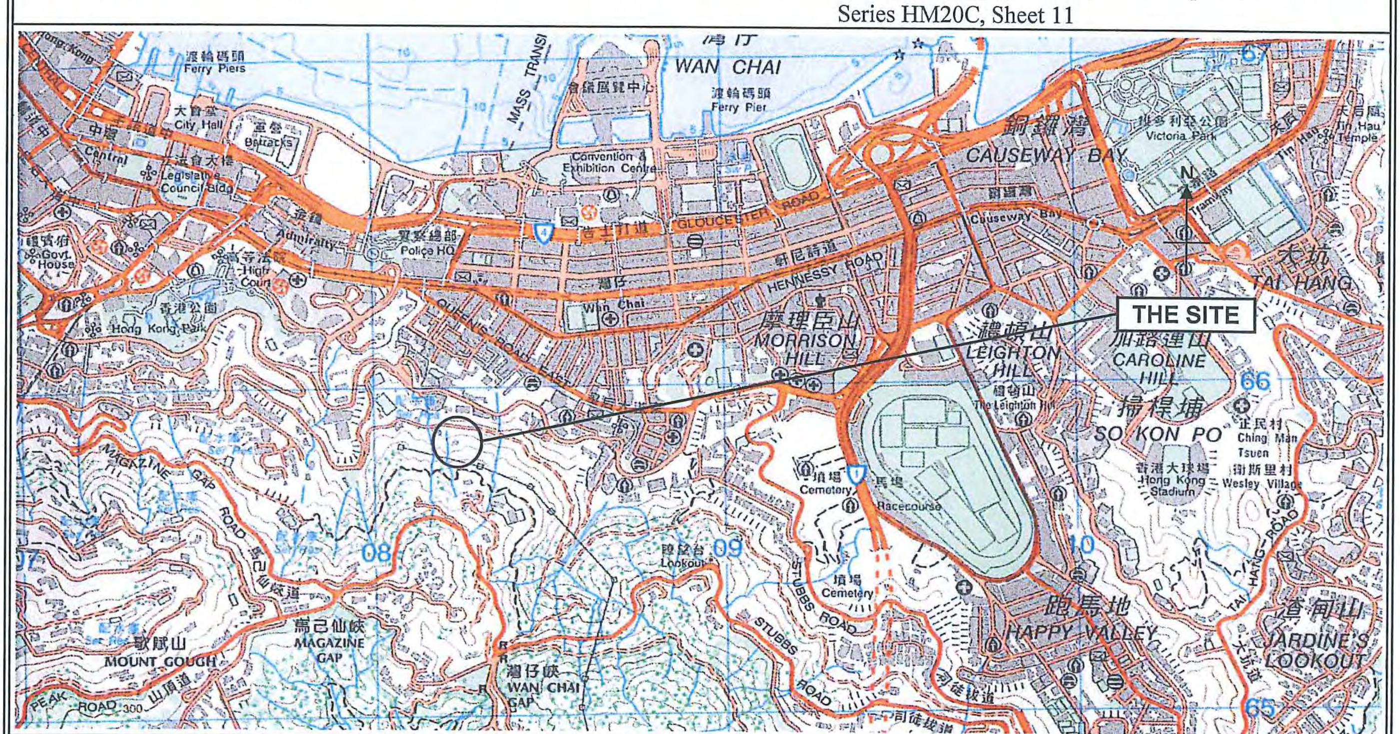
LABORATORY TESTING SUMMARY

No. of each type of test: Date: to

NOT APPLICABLE

SOIL	Physical Properties	LL	PL	PSD	MC
		SG			
	Strength Tests	Cum			Shear Box
	Compaction & CBR Tests	Stand		r	CBR
	Oedometer & Perm. Tests	Cv	k		
	Others	Split Mazier			
ROCK		Pt Load	UC	Shear Box	US Vel.

LOCATION PLAN Scale 1 : 20, 000 Derived from : Survey & Mapping Office, Lands Department Series HM20C, Sheet 11



	G.I.	Laboratory	Geotechnical Engineering Office
Contractor	*DrilTech Ground Engineering Ltd.*	---	CEDD CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT
Works Order No.	*GE/2009/03.221*	---	

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WORKS ORDER NO. GE/2009/03.221

Agreement No. CE15/2009(GE)
Landslip Prevention and Mitigation Programme 2009, Package A, Landslip Preventive Works on Government Slopes and Retaining Walls Hong Kong Island – Investigation, Design and Construction
Feature No. 11SW-D/C1411 (Behind No. 17 Bowen Road)

Ground Investigation

FINAL FIELD WORK REPORT

CONTENTS

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CONTRACT NO. GE/2009/03
GROUND INVESTIGATION - URBAN
(TERM CONTRACT)

WORKS ORDER NO. GE/2009/03.221
Agreement No. CE15/2009(GE)
Landslip Prevention and Mitigation Programme 2009,
Package A, Landslip Preventive Works on Government
Slopes and Retaining Walls Hong Kong Island –
Investigation, Design and Construction
Feature No. 11SW-D/C1411 (Behind No. 17 Bowen Road)

Ground Investigation

FINAL FIELD WORK REPORT

1. Introduction

DRiLTECH Ground Engineering Ltd. was awarded a 2-year Term Contract from the Geotechnical Engineering Office, Civil Engineering and Development Department of the Government of Hong Kong Special Administrative Region in March 2009 to carry out ground investigation works in any locations in Hong Kong Island, Ap Lei Chau, Kowloon and may cover other areas in the territory of Hong Kong including outlying islands.

This report presents the results of ground investigation for Feature No. 11SW-D/C1411 (Behind No. 17 Bowen Road), under the Works Order GE/2009/03.221. The fieldwork was carried out in the period between 13th August 2010 and 2nd September 2010, under the supervision of AECOM.

2. Site Location

The site is located at Feature No. 11SW-D/C1411 (Behind No. 17 Bowen Road), Hong Kong, bounded within the following co-ordinates.

835 442E	814 962N
835 456E	814 962N
835 456E	814 940N
835 442E	814 940N

The locations of the investigation stations are shown in Ground Investigation Plan No. D419/03.221/GI/D001 and survey records of the stations are shown in Table 1.

3. Geology

According to the 1:20,000 scale, Sheet 11 of HGM20 Series Solid and Superficial Geology Map published by the Geotechnical Control Office, the site may be underlain by bedrock of fine ash Tuff of Upper Jurassic, Mesozoic.

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3. Geology (Cont'd)

The results of investigation reveal that the site is composed of Superficial Deposit (Top Soil and Colluvium), Saprolite and Bedrock (Corestone ?) of fine ash Tuff.

Superficial Deposits

The Top Soil layer is encountered in all trial pits with approximately thickness of 0.30m, which is composed mainly of sandy clayey silt with some subangular gravel of rock fragments materials.

The Colluvium layer was found in all trial pits with maximum thickness of 0.60m, which is composed mainly of sandy clayey silt with subangular gravel, locally with cobbles and boulders of rock fragments materials.

Saprolite

The highly decomposed material is found in trial pit TP3 only with approximately thickness of 0.80m, which is composed mainly of sandy clayey silty cobbles with some gravel of rock fragments materials.

Bedrock (Corestone ?)

The rock type that encountered in the investigation is fine ash Tuff, bedrock or corestone was found at the base of each trial pit.

4. Field Works

Field works included sampling and field testing in three (3) trial pits (TP1 to TP3) and two (2) slope strips (S1 and S2) were carried out at locations as shown in the Ground Investigation Plan No. D419/03.221/GI/D001 as specified in the Works Order.

4.1 Field Tests

4.1.1 Dynamic Probing (GCO Probe) Tests

Dynamic probing tests were carried out using a GCO Probe on the trial pits before excavation and after backfilling. The features of the Probe are given in the Figure 36 of Geoguide 2.

A rod with diameter of approximately 12mm was driven into the ground by a hammer of 10kg in weight dropping freely from a height of 300mm. The rod was equipped at its lower end with a driving point, which was 25mm in diameter with a cylindrical portion of about 25mm long and a conical tip with an apex angle of approximately 45°. The numbers of blows required for the hammer to drive the rod into the ground for each 100mm were recorded. The tests were carried out to specified depths or where refusal was encountered.

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4.1.1 Dynamic Probing (GCO Probe) Tests (Cont'd)

The results of the pre-excavation probing tests are presented in Appendix E.

4.2 Trial Pits

Trial pits were excavated manually using hand tools.

The trial pits were excavated to expose the underground materials for inspection and sampling. Undisturbed block and U76 and large disturbed samples were taken at specified locations and depths. Small disturbed samples were taken at 0.50m intervals starting from the ground level.

The trial pits were inspected and logged and the results are reported in the Trial Pit Records in Appendix C. Record photographs taken on each side of the trial pits are presented in Appendix D.

The trial pits were subsequently backfilled with excavated materials and were compacted using portable tools.

4.3 Slope Surface Protection Stripping

Slope surface of about 500mm wide, generally 100mm thick at locations S1 and S2 were stripped off using manual tools to expose the geological profile of the slope. Temporary steel access ladders were erected to facilitate the inspection and logging. The stripped surfaces were reinstated upon completion of field works.

The results of investigation are presented in the Slope Stripping Records in Appendix C.

5. Soil and Rock Descriptions

The soils and rocks encountered in the investigation have generally been described according to the Geoguide 3, Guide to Rock and Soil Descriptions, except for the following terms, which are used for the secondary constituents other than clay, silt and sand, in composition of common ground:

"with occasional" for less than 5%, and
"with some" for between 5% and 20%; and
"with much or many" for greater than 20%

The classification and definitions of the descriptive terms are presented in Appendix A.

5. Soil and Rock Descriptions (Cont'd)

The delineation of various strata was primary based on examination the exposed faces of the trial pits and slope strips. The results are presented in Appendix C in form of Trial Pit and Slope Strip Records, which have been finalized by incorporating comments provided by AECOM.

The legends used in these records are summarized in Appendix B.

6. Surveying

The locations of investigation stations were surveyed using theodolite and the results are related to the Hong Kong Grid System. The co-ordinates and levels of these investigation stations are presented on the relevant records and are summarized in Table 1.

7. Digital Data Record

The data of the ground investigation works are also provided in an electronic format. The format complies with the 3rd edition of the Association of Geotechnical and Geoenvironmental Specialists (AGS) Publication 'Electronic Transfer of Geotechnical and Geoenvironmental Data'.

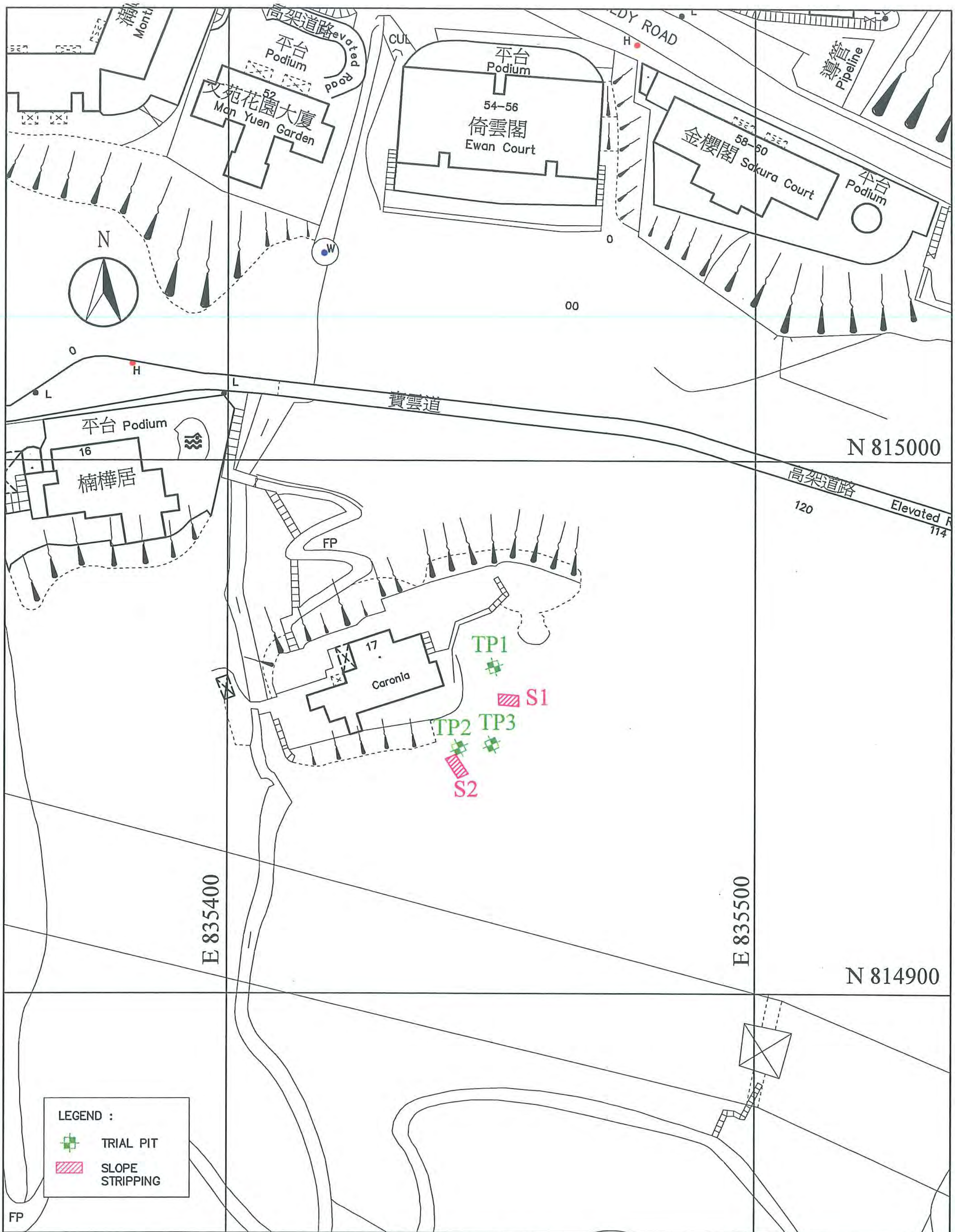
The Final Fieldwork Report and Individual Investigation Stations Record Folders were also created in Acrobat format and stored together with AGS on a CD-ROM.

All digital records are included in Appendix F.

8. References

1. Geotechnical Control Office, Geological Map of Hong Kong HGM20, Sheet 11, (1:20,000)
2. Geotechnical Engineering Office (2nd Reprint, 1994), Guide to Rock and Soil Descriptions (Geoguide 3)
3. Geotechnical Engineering Office (4th Reprint, 2000), Guide to Site Investigation (Geoguide 2)
4. Association of Geotechnical & Geoenvironmental Specialists (1999), Electronic Transfer of Geotechnical and Geoenvironmental Data, 3rd Edition
5. BS 5930: 1981, the "Code of Practice for Site Investigation"

Ground Investigation Plan
(No. D419/03.221/GI/D001)



Location Plan

Contract No. GE/2009/03
Ground Investigation - Urban (Term Contract)
Works Order No. GE/2009/03.221
Ground Investigation - Urban (Term Contract), Agreement No. CE 15/2009(GE), Landslip Prevention and Mitigation Programme 2009, Package A, Landslip Preventive Works on Government Slopes and Retaining Walls, Hong Kong Island - Investigation, Design and Construction. Feature No. 11SW-D/C1411 (Behind No. 17, Bowen Road)

Drawing No. : D419/03.221/GI/D001

Date : September 2010

Scale 1 : 1000

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Table 1

DRiLTECH

Contract No. GE/2009/03
Ground Investigation - Urban (Term Contract)

Works Order No. GE/2009/03.221
Agreement No. CE15/2009(GE)
Landslip Prevention and Mitigation Programme 2009,
Package A, Landslip Preventive Works on Government
Slopes and Retaining Walls Hong Kong Island -
Investigation, Design and Construction
Feature No. 11SW-D/C1411 (Behind No. 17, Bowen Road)

Final Field Work Report

Table 1 - Survey Records

Station No.	Ground Level/ Reference Level (mPD)	Easting	Northing	Remark
TP1	+152.78	835450.50	814961.35	
TP2	+155.72	835443.99	814946.13	
TP3	+158.05	835450.14	814946.77	
S1 (Crest)	+156.74	835455.27	814954.92	
S1 (Toe)	+155.89	835451.48	814955.19	
S2 (Crest)	+156.66	835444.84	814940.81	
S2 (Toe)	+155.97	835442.51	814944.42	

CHECKLIST FOR SOIL DESCRIPTION

GEOTECHNICAL ENGINEERING OFFICE, HKSAR

1. STRENGTH (Compactness & Consistency)

Soil Type	Term	Identification
Very Coarse (COBBLES & BOULDERS)	Loose Dense	By inspection of voids and particle packing in the field.
Coarse (SANDS & GRAVELS)	Very loose	SPT 'N' value 0-4.
	Loose	SPT 4-10; can be excavated with spade; 50 mm peg easily driven.
	Medium dense	SPT 10-30.
	Dense	SPT 30-50; requires pick for excavation; 50 mm peg hard to drive.
	Very dense	SPT > 50.
Fine (CLAYS & SILTS)	Very soft	Undrained shear strength (USS) < 20 kPa; exudes between fingers when squeezed in hand.
	Soft	USS 20-40 kPa; moulded by light finger pressure.
	Firm	USS 40-75 kPa; can be moulded by strong finger pressure.
	Stiff	USS 75-150 kPa; cannot be moulded by fingers; can be indented by thumb.
	Very stiff or hard	USS > 150 kPa; can be indented by thumbnail.
Organic (ORGANIC CLAYS, SILTS SANDS & PEATS)	Compact	Fibres already compressed together.
	Spongy	Very compressible and open structure.
	Plastic	Can be moulded in hand and smears fingers.

Terms applicable only to transported soils. For soils derived from insitu rock weathering, record actual values of quantitative tests (e.g. SPT 'N' value) as part of the description, where appropriate.

2. COLOUR

Parameter	Terms
Value	Light, Dark
Chroma	Pinkish, Reddish, Yellowish, Orangish, Brownish, Greenish, Bluish, Purplish, Greyish
Hue	Pink, Red, Yellow, Orange, Brown, Green, Blue, Purple, White, Grey, Black

For uniform colour distribution, choose a hue, supplemented by a value and/or chroma if necessary.

For non-uniform distribution, repeat this procedure using one of the following descriptors: spotted, mottled, dappled, streaked, striped (e.g. light yellowish brown mottled with red).

State whether sample was wet or dry when described.

3. PARTICLE SHAPE & COMPOSITION

Characteristic	Terms
Form	Equidimensional, Flat, Elongate, Flat & Elongate
Angularity	Angular, Subangular, Subrounded, Rounded
Surface Texture	Smooth, Rough, Glassy, Honeycombed, Pitted, Striated

Describe composition of coarse particles where appropriate. Gravel and larger particles are usually rock fragments (e.g. granite, tuff); sand particles are usually individual minerals (e.g. quartz, feldspar).

4. STRUCTURE

Soil Type	Term	Identification
Coarse & Fine	Homogenous	Deposit consists essentially of one type.
	Interstratified (Interbedded or Interlaminated)	Alternating layers of varying types or with bands or lenses of other materials.
Coarse	Heterogenous	A mixture of types.
Fine	Fissured	Breaks into polyhedral fragments along fissures.
	Intact	No fissures.
Organic	Fibrous	Plant remains recognizable & retain some strength.
	Amorphous	No recognizable plant remains.

Describe spacing of bedding planes, fissures, shell bands, etc using the spacing terms given in items 6 & 7 for rock description (see other side).

Above terms applicable only to transported soils. For soils derived from insitu rock weathering, describe relict structures in accordance with item 6 of rock description (see other side).

5. WEATHERING

Soils Derived from Insitu Weathering of Rocks
There are two main types: saprolites (rock texture/structure retained) and residual soils (rock texture/structure completely destroyed). Describe state of weathering in accordance with items 4 & 8 for rock description (see other side).

Sedimentary (Transported) Soils
Coarse soils: Describe overall discolouration of soil and degree of decomposition of gravel and larger particles (see item 4, other side). Also note any signs of disintegration of large particles where apparent.

Fine Soils: Describe overall discolouration of soil where apparent.

6. SOIL NAME

A. Basic Soil Types

Soil Type		Particle Sizes (mm)	Identification
BOULDERS	—	> 200	Only seen complete in pits or exposures.
COBBLES	—	60 - 200	Often difficult to recover from boreholes.
GRAVELS	Coarse	20 - 60	Easily visible to naked eye; particle shape and grading can be described.
	Medium	6 - 20	Well-graded: wide range of grain sizes.
	Fine	2 - 6	Poorly-graded: not well-graded (split further into uniform or gap-graded).
SANDS	Coarse	0.6 - 2	Visible to naked eye; very little or no cohesion; grading can be described.
	Medium	0.2 - 0.6	May be well-graded or poorly-graded (uniform or gap-graded) as for gravel.
	Fine	0.06 - 0.2	
SILTS	Coarse	0.02 - 0.06	Only coarse silt barely visible to naked eye; exhibits little plasticity and marked dilatancy; slightly granular or silky to the touch. Disintegrates in water; lumps dry quickly; possesses cohesion but can be powdered easily between fingers.
	Medium	0.006 - 0.02	
	Fine	0.002 - 0.006	
CLAYS	—	< 0.002	Dry lumps can be broken by hand but not powdered between the fingers. Disintegrates in water more slowly than silt; smooth to the touch; exhibits plasticity but no dilatancy; sticks to the fingers and dries slowly; shrinks appreciably on drying, usually showing cracks. These properties more noticeable with increasing plasticity.
ORGANIC CLAYS, SILTS OR SANDS	—	varies	Contains much organic vegetable matter; often has a noticeable smell and changes colour on oxidation.
PEATS	—	varies	Predominantly plant remains; usually dark brown or black in colour, often with distinctive smell; low bulk density.

B. Composite Soil Types (Mixtures of Basic Types)

Principal Soil Type	Terminology Sequence	Term for Secondary Constituent	% of Secondary Constituent
Very coarse (BOULDERS & COBBLES) (> 50% of soil > 60 mm)	Secondary constituents (finer material) ▲ after principal	With a little	< 5
		With some	5 - 20
		With much	20 - 50
Coarse (GRAVELS & SANDS) (> 65% gravel & sand sizes)	Secondary constituents before principal (excluding cobbles & boulders) +	Slightly (silty, clayey or silty/clayey) ✻	< 5
		- (silty, clayey or silty/clayey) ✻	5 - 15
		Very (silty, clayey or silty/clayey) ✻	15 - 35
		AND/OR	
		Slightly (gravelly or sandy) ✻	< 5
		- (gravelly or sandy) ✻	5 - 20
		Very (gravelly or sandy) ✻	20 - 50
Fine (SILTS & CLAYS) (> 35% silt & clay sizes)	Secondary constituents before principal (excluding cobbles & boulders) +	Slightly (gravelly or sandy or both) ✻	< 35
		- (gravelly or sandy) ✻	35 - 65

▲ Full name of finer material should be given (see examples below).

✻ Secondary soil type as appropriate; use 'silty/clayey' when a distinction cannot be made between the two.

\+ If cobbles or boulders are also present in a coarse or fine soil, this can be indicated by using one of the following terms relating to the very coarse fraction after the principal: 'with occasional' (< 5), 'with some' (5-20), 'with many' (20-50), where figures in brackets are % very coarse material expressed as a fraction of the whole soil (see examples below).

Examples: Slightly silty/clayey, sandy GRAVEL. Slightly gravelly, sandy SILT. Very gravelly SAND. Sandy GRAVEL with occasional boulders. BOULDERS with much finer material (silty/clayey, very sandy gravel).

For fine soils, plasticity terms should also be described where possible, viz: 'non-plastic' (generally silts), 'intermediate plasticity' (lean clays), 'high plasticity' (fat clays).

7. DISCONTINUITIES

Full description of discontinuities, where necessary, should be made using the methods and terms given in item 7 for rock description (see other side).

8. ADDITIONAL GEOLOGICAL INFORMATION

Record geological name which indicates geological origin or soil type (e.g. Alluvium, Colluvium, Marine sand etc.). Refer to HKGS maps & memoirs for further information.

NOTES:

1. Mass characteristics of soils (i.e. structure, weathering, discontinuities) can only be described satisfactorily in undisturbed field exposures or large undisturbed samples.
2. For full descriptions of soils derived from insitu rock weathering:
   (a) saprolites - describe as rocks, supplemented by soil strength and soil name terms in brackets,
   (b) residual soils - describe as soils, supplemented by name of parent rock where apparent from field evidence.

CHECKLIST FOR ROCK DESCRIPTION

1. STRENGTH

Term	Identification
Extremely weak	Easily crumbled by hand; indented deeply by thumbnail.
Very weak	Crumbled with difficulty; scratched easily by thumbnail; peeled easily by pocket knife.
Weak	Broken into pieces by hand; scratched by thumbnail; peeled by pocket knife; deep indentations (to 5 mm) by point of geological pick; hand-held specimen easily broken by single light hammer blow.
Moderately weak	Broken with difficulty in two hands; scratched with difficulty by thumbnail; difficult to peel but easily scratched by pocket knife; shallow indentations easily made by point of pick; hand-held specimen usually broken by single light hammer blow.
Moderately strong	Scratched by pocket knife; shallow indentations made by firm blow with point of pick; hand-held specimen usually broken by single firm hammer blow. Point load strength (PLS) 0.5 - 2 MPa.
Strong	Firm blows with point of pick cause only superficial surface damage; hand-held specimen requires more than one firm hammer blow to break. PLS 2 - 4 MPa.
Very strong	Many hammer blows required to break specimen. PLS 4 - 8 MPa.
Extremely strong	Specimen only chipped by hammer blows. PLS > 8 MPa.

2. COLOUR

Parameter	Terms
Value	Light, Dark
Chroma	Pinkish, Reddish, Yellowish, Orangish, Brownish, Greenish, Bluish, Purplish, Greyish
Hue	Pink, Red, Yellow, Orange, Brown, Green, Blue, Purple, White, Grey, Black

For uniform colour distribution, choose a hue, supplemented by a value and/or chroma if necessary.

For non-uniform distribution, repeat this procedure using one of the following descriptors: spotted, mottled, dappled, streaked, striped (e.g. light pinkish grey spotted with black).

State whether sample was wet or dry when described.

3. TEXTURE/FABRIC

Texture Terms (Applicable Mainly to Igneous Rocks)
Equigranular, Inequigranular, Megacrystic, Porphyritic, Crystalline, Cryptocrystalline, Aphanitic

Fabric
Describe preferred orientation of grains/crystals where apparent.

Describe intensity, spacing, continuity and any preferred orientation of microfractures where apparent.

4. MATERIAL WEATHERING/ALTERATION

Decomposition Term	Grade Symbol	Typical Characteristics
Residual Soil	VI	Original rock texture completely destroyed; can be crumbled by hand and finger pressure into constituent grains.
Completely Decomposed	V	Original rock texture preserved; can be crumbled by hand and finger pressure into constituent grains; easily indented by point of geological pick; slakes in water; completely discoloured compared with fresh rock.
Highly Decomposed	IV	Can be broken by hand into smaller pieces; makes a dull sound when struck by hammer; not easily indented by point of pick; does not slake in water; completely discoloured compared with fresh rock.
Moderately Decomposed	III	Cannot usually be broken by hand; easily broken by hammer; makes a dull or slight ringing sound when struck by hammer; completely stained throughout.
Slightly Decomposed	II	Not broken easily by hammer; makes a ringing sound when struck by hammer; fresh rock colours generally retained but stained near joint surfaces.
Fresh Rock	I	Not broken easily by hammer; makes a ringing sound when struck by hammer; no visible signs of decomposition (i.e. no discolouration).

This classification is applicable to igneous and volcanic rocks and other rocks of equivalent strength in fresh state.

Disintegration
Describe small-scale cracking and fracturing caused by mechanical weathering, where apparent.

Alteration
Describe state of alteration (e.g. mineralised, kaolinised) where apparent.

5. ROCK NAME (Including Grain Size)

Igneous	: Coarse- (6-20 mm), Medium- (2-6 mm) & Fine- (0.06-2 mm) grained GRANITE; GRANODIORITE. Very Fine-grained (< 0.06 mm) RHYOLITE; BASALT. (Common types only, see Geoguide 3 for others).
Pyroclastic	: PYROCLASTIC BRECCIA (> 60 mm), Lapilli TUFF (2-60 mm), Coarse ash TUFF (0.06-2 mm), Fine ash TUFF (< 0.06 mm).
Metamorphic	: Foliated - SCHIST (> 0.06 mm), PHYLLITE (< 0.06 mm). Non-foliated - MARBLE, QUARTZITE, FAULT BRECCIA.
Sedimentary	: CONGLOMERATE, BRECCIA (> 2 mm), SANDSTONE (0.06-2 mm), MUDSTONE (< 0.06 mm) = SILTSTONE (0.002-0.06 mm) + CLAYSTONE (< 0.002 mm). (Common types only).

If rock name cannot be identified, describe grain size quantitatively, including textural term where appropriate.

6. STRUCTURE

Structural Term	Rock Type
Bedded, Laminated, Massive	Sedimentary
Massive, Flow-banded	Igneous, Pyroclastic
Foliated, Banded, Cleaved	Metamorphic

Spacing of Planar Structures
Very thick (> 2 m), Thick (0.6-2 m), Medium (200-600 mm),
Thin (60-200 mm), Very thin (20-60 mm),
Thickly-laminated (Sedimentary) (6-20 mm) or Narrow (Igneous, Metamorphic) (6-20 mm),
Thinly-laminated (Sedimentary) (< 6 mm) or Very narrow (Igneous, Metamorphic) (< 6 mm).

Examples: Thickly-bedded SANDSTONE. Narrowly flow-banded RHYOLITE.

7. DISCONTINUITIES

Nature (Type of Discontinuity)

Fault zone	Cleavage	Fissure	Bedding
Fault	Schistocity	Tension crack	
Joint	Shear plane	Foliation	

Location and Orientation
Record location as co-ordinates or relative position along datum line, preferably on map or plan.

Record orientation as dip direction/dip in degrees (e.g. 032/55).

Spacing
Extremely widely-spaced (> 6 m), Very widely-spaced (2-6 m),
Widely-spaced (0.6-2 m), Medium-spaced (200-600 mm),
Closely-spaced (60-200 mm), Very closely-spaced (20-60 mm),
Extremely closely-spaced (< 20 mm).

In exposures, supplement spacing with description of rock block shape where possible. Descriptors: Blocky, Tabular, Columnar, Polyhedral.

Persistence (Areal extent or size of a discontinuity within a plane)
Measured maximum persistence dimension should be used where possible (e.g. the discontinuity trace length on the surfaces of rock exposures). For general descriptions of different discontinuity sets, relative terms should be used.

Roughness
Waviness (large-scale): Estimate/measure wavelength and amplitude in metres.
Unevenness (small-scale), use one term from the following:

Rough stepped	Smooth stepped	Slickensided stepped
Rough undulating	Smooth undulating	Slickensided undulating
Rough planar	Smooth planar	Slickensided planar

Aperture Size
Wide (> 200 mm), Moderately wide (60-200 mm), Moderately narrow (20-60 mm), Narrow (6-20 m), Very narrow (2-6 mm), Extremely narrow (> 0-2 mm), Tight (zero).

Infilling (Nature)

Clean	Surface staining	Decomposed/ disintegrated rock
Non-cohesive soil	Cohesive soil	
Calcite	Manganese	Quartz
Other (Specify)		Kaolin

Give full description of infill materials/minerals where appropriate.

Seepage
Dry   Damp/wet   Seepage present (estimate quantity in 1/sec or 1/min)

Fracture State
In borehole cores, measure the following: Total Core Recovery (TCR), Solid Core Recovery (SCR), Rock Quality Designation (RQD), Fracture Index (FI). See Geoguide 3 for definitions.

8. MASS WEATHERING

Term	Zone Symbol	Typical Characteristics
Residual Soil	RS	**Residual soil derived from insitu weathering; mass structure and material texture/fabric completely destroyed: 100% soil**
Partially Weathered Rock	PW 0/30	**Less than 30% rock** **Soil retains original mass structure and material texture/fabric (i.e. saprolite)** Rock content does not affect shear behaviour of mass, but relict discontinuities in soil may do so.
	PW 30/50	**30% to 50% rock** Rock content may be significant for investigation and construction. Both rock content and relict discontinuities may affect shear behaviour of mass.
	PW 50/90	**50% to 90% rock** Interlocked structure.
	PW 90/100	**Greater than 90% rock** Small amount of the material converted to soil along discontinuities.
Unweathered Rock	UW	**100% rock.** May show slight discolouration along discontinuities.

9. ADDITIONAL GEOLOGICAL INFORMATION

Record geological formation name if known. Avoid conjecture. Refer to HKGS maps & memoirs for further information.

NOTES:

1. Rock material description normally includes: strength, colour, texture/fabric, material weathering/alteration and ROCK NAME.
2. Rock mass description normally includes: strength, colour, structure, mass weathering, ROCK NAME, discontinuities and additional geological information. Can be supplemented with more detailed information on texture/fabric and material weathering/alteration of different materials within the mass where necessary.

Appendix A

Checklists for Soil and Rock Descriptions

Material: c:\documents and settings\joycelo\桌面\lib-2004-r12xp.glb

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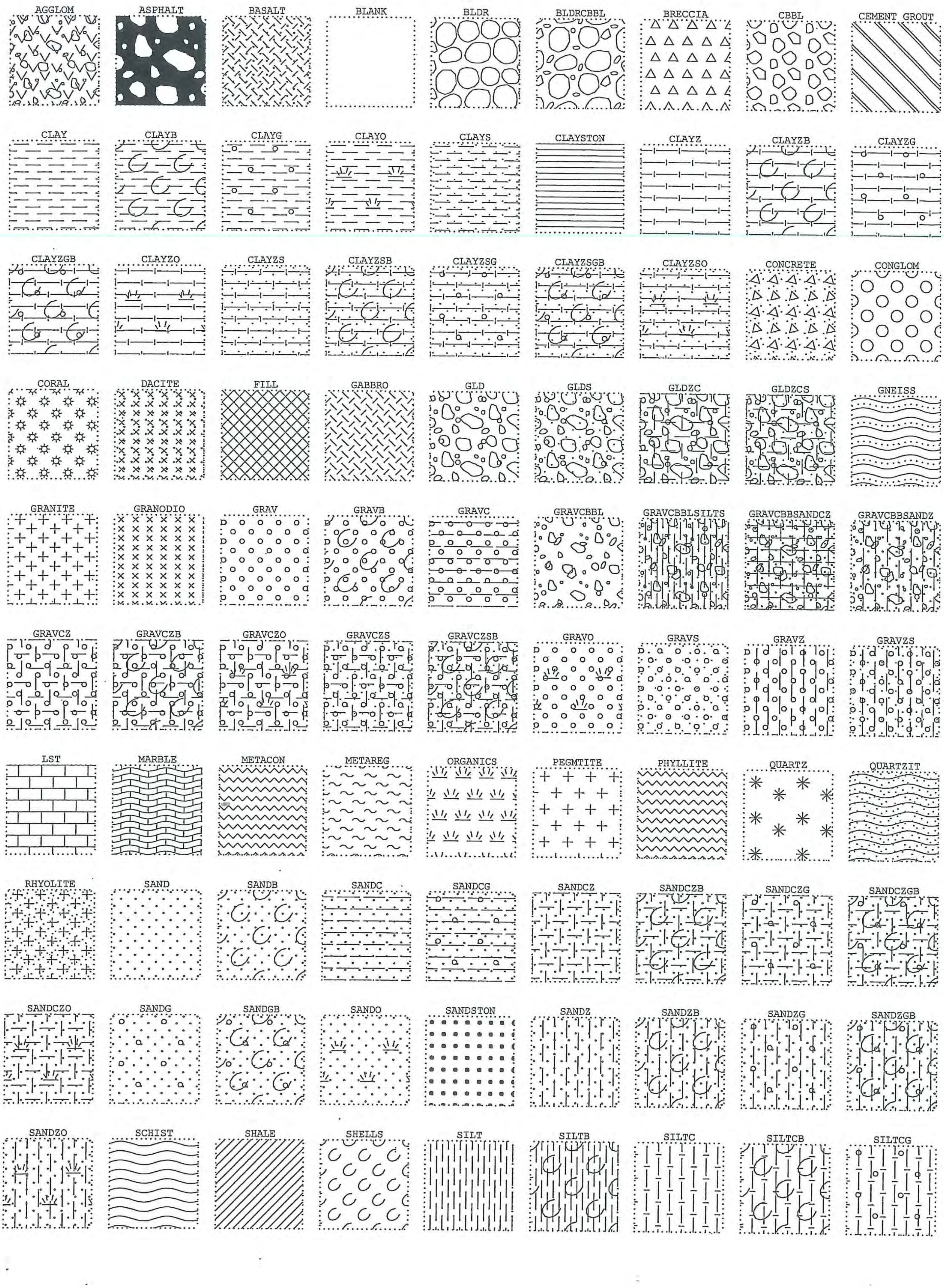
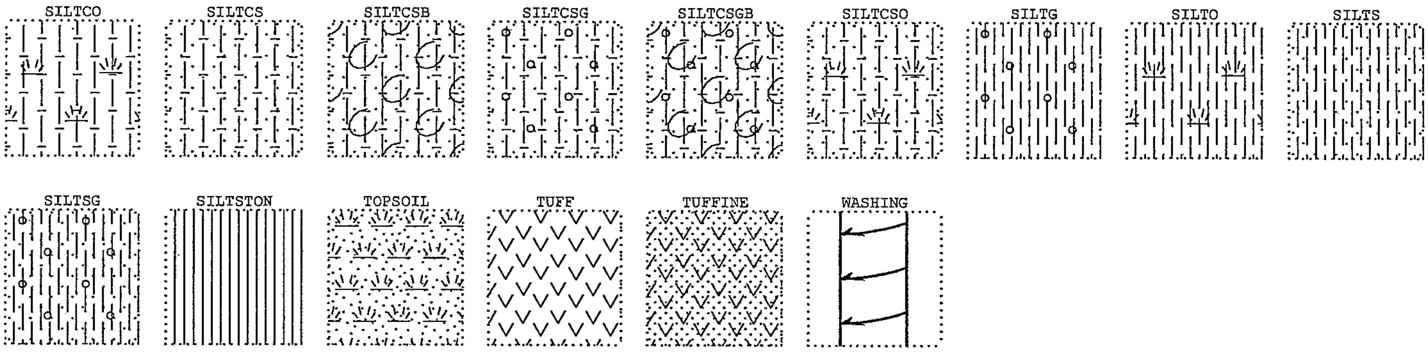



SILTCO
SILTCS
SILTCSB
SILTCSG
SILTCSGB
SILTCSO
SILTG
SILTO
SILTS
SILTSG
SILTSTON
TOPSOIL
TUFF
TUFFINE
WASHING

Appendix B

Legends for Use on Trial Pit and Slope Stripping Records

SYMBOLS - Material: c:\progra~1\gintw\vw221201.glb

Name	Description
AGGLOM	PYROCLASTIC BRECCIA
ASPHALT	ASPHALT
BASALT	BASALT
BLANK	NO RECOVERY
BLDR	BOULDERS
BLDRCBBL	BOULDERS and COBBLES
BRECCIA	SEDIMENTARY BRECCIA
CBBL	COBBLE
CEMENT GROUT	Cement Grout
CLAY	CLAY
CLAYB	CLAY with shell fragments
CLAYG	Gravelly CLAY
CLAYO	CLAY with Peats
CLAYS	Sandy CLAY
CLAYSTON	CLAYSTONE / MUDSTONE
CLAYZ	Silty CLAY
CLAYZB	Silty CLAY with shells
CLAYZG	Silty CLAY with gravel
CLAYZGB	Silty CLAY with gravel and shell fragments
CLAYZO	Silty CLAY with peats
CLAYZS	Sandy silty CLAY
CLAYZSB	Sandy silty CLAY with shells
CLAYZSG	Sandy silty CLAY with gravel
CLAYZSGB	Sandy silty CLAY with gravel and shells
CLAYZSO	Sandy silty CLAY with peats
CONCRETE	CONCRETE
CONGLOM	CONGLOMERATE
CORAL	CORAL. NOT USED
DACITE	DACITE / LATITE / ANDESITE / TRACHYTE / TRACHYANDESITE
FILL	FILL (made ground)
GABBRO	GABBRO / LAMPROPHYRE
GLD	GRAVEL, COBBLES and BOULDERS
GLDS	GRAVEL, COBBLES and BOULDERS with sand
GLDZC	GRAVEL, COBBLES and BOULDERS with silt and clay
GLDZCS	GRAVEL, COBBLES and BOULDERS with sand, silt and clay
GNEISS	GNEISS
GRANITE	GRANITE
GRANODIO	GRANODIORITE / SYENITE / MONZONITE
GRAV	GRAVEL
GRAVB	GRAVEL with shell fragments
GRAVC	Clayey GRAVEL
GRAVCBBL	GRAVEL and COBBLES
GRAVCBBLSILTS	gravels & cobbles in sandy silt
GRAVCBBSANDCZ	gravel & cobble in silty sand
GRAVCBBSANDZ	gravel & cobble in silty sand
GRAVCZ	Silty clayey GRAVEL
GRAVCZB	Silty clayey GRAVEL with shell fragments
GRAVCZO	Silty clayey GRAVEL with peats
GRAVCZS	Sandy silty clayey GRAVEL
GRAVCZSB	Sandy silty clayey GRAVEL with shell fragments
GRAVO	GRAVEL with peats
GRAVS	Sandy GRAVEL
GRAVZ	Silty GRAVEL
GRAVZS	Sandy silty GRAVEL
LST	LIMESTONE

SYMBOLS - Material: c:\progra~1\gintw\vw221201.glb

Name	Description
MARBLE	MARBLE
METACON	Metamorphic Rocks - Contact
METAREG	Metamorphic Rocks - Regional
ORGANICS	PEAT
PEGMTITE	PEGMATITE, Coarse-grained GRANITE
PHYLLITE	PHYLLITE / MYLONITE
QUARTZ	Quartz
QUARTZIT	QUARTZITE
RHYOLITE	RHYOLITE
SAND	SAND
SANDB	SAND with shell fragments
SANDC	Clayey SAND
SANDCG	Clayey SAND with gravel
SANDCZ	Silty, clayey SAND
SANDCZB	Silty, clayey SAND with shells
SANDCZG	Silty, clayey SAND with gravel
SANDCZGB	Silty, clayey SAND with gravel and shells
SANDCZO	Silty, clayey SAND with peats
SANDG	Gravelly SAND
SANDGB	Gravelly SAND wth shell fragments
SANDO	SAND with Peat
SANDSTON	SANDSTONE
SANDZ	Silty SAND
SANDZB	Silty SAND with shell fragments
SANDZG	Silty SAND with gravels
SANDZGB	Silty SAND with gravels and shells
SANDZO	Silty SAND with peats
SCHIST	SCHIST
SHALE	SHALE
SHELLS	Shells
SILT	SILT
SILTB	SILT with shell fragments
SILTC	Clayey SILT
SILTCB	Clayey SILT wth shells
SILTCG	Clayey SILT wth gravel
SILTCO	Clayey SILT wth peat
SILTCS	Sandy Clayey SILT
SILTCSB	Sandy Clayey SILT with shells
SILTCSG	Sandy Clayey SILT with gravel
SILTCSGB	Sandy Clayey SILT with gravel and shells
SILTCSO	Sandy Clayey SILT with peat
SILTG	Gravelly SILT
SILTO	SILT with peat
SILTS	Sandy SILT
SILTSG	Gravelly sandy SILT
SILTSTON	SILTSTONE
TOPSOIL	Topsoil
TUFF	Coarse Ash TUFF, Lapilli Tuff
TUFFINE	Fine Ash TUFF
WASHING	Wash Boring

Appendix C

Trial Pit and Slope Stripping Records

TRIAL PIT RECORD

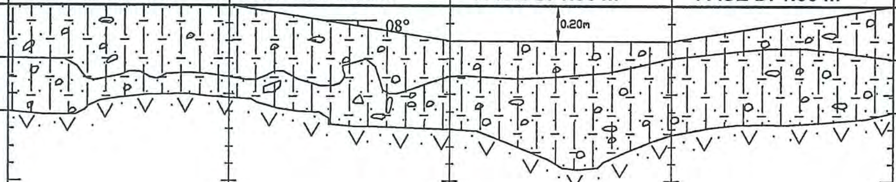
CONTRACT NO. GE/2009/03
FEATURE NO. 11SW-D/C1411

DRILTECH

TRIAL PIT NO. TP 1
SHEET 1 of 1

PROJECT	Ground Investigation - Urban (Term Contract), Agreement No. CE15/2009 (GE), Landslip Prevention and Mitigation Programme 2009, Package A, Landslip Preventive Works on Government Slopes and Retaining Walls Hong Kong Island - Investigation, Design and Construction. Feature No. 11SW-D/C1411 (Behind No. 17, Bowen Road)
WORKS ORDER NO.	GE/2009/03.221
CO-ORDINATES	E 835450.50 N 814961.35
GROUND LEVEL:	+152.78 mPD
LOGGED	L. Zhang
DATE	24.08.2010
CHECKED	C. Lun
DATE	25.08.2010
EXCAVATION DATES:	16.08.2010 to 19.08.2010
BACKFILL DATES:	02.09.2010 to 02.09.2010

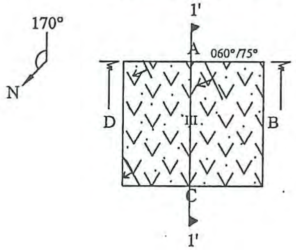
SAMPLES and TESTS	DEPTH (m)	SKETCH	DEPTH (m)	LEGEND	GRADE	DESCRIPTION
	0.00	FACE A: 1.50 m / FACE B: 1.50 m / FACE C: 1.50 m / FACE D: 1.50 m	0.00			Soft, moist, dark greyish brown (10YR4/2), sandy clayey SILT with some subangular fine to coarse gravel of weak to moderately strong tuff fragments and rootlets. (TOP SOIL)
3, 2, 1	0.30		0.30			Soft, moist, reddish yellow (5YR6/8) to light yellowish brown (10YR5/6), sandy clayey SILT with some subangular fine to coarse gravel and cobbles occasional boulders of weak to moderately strong tuff fragments and rootlets. (COLLUVIUM)
5, 4	0.45 0.50 0.60		0.60			Bottom: Moderately strong, very pale brown mottled strong brown, moderately decomposed fine ash TUFF with closely spaced, rough planar, extremely narrow to very narrow, manganese oxide stained and greyish brown soil coated joints.
						End of trial pit at maximum depth of 0.60 m.



1
2
3
4
5

- SMALL DISTURBED SAMPLE
- LARGE DISTURBED SAMPLE
- U76 SAMPLE (VERTICAL / HORIZONTAL)
- U100 SAMPLE (VERTICAL / HORIZONTAL)
- BLOCK SAMPLE
- IN-SITU DENSITY TEST
- WATER SAMPLE
- WATER SEEPAGE
- N-SCHMIDT HAMMER TEST

PLAN (not to scale)



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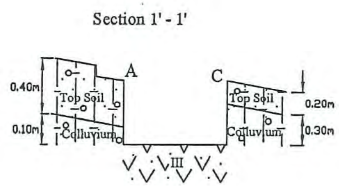


REMARKS

Maximum Depth: 0.60 m
Shoring: NO
Water Seepage: NO
Average Depth: 0.50 m
Stability: STABLE

1. Small disturbed sample was taken at 0.50m.
2. Large disturbed sample was taken at 0.50m.
3. Block sample was taken at 0.30m.
4. U76 (Horizontal) sample was taken at 0.30m on Face D.

TRIAL PIT RECORD

CONTRACT NO. GE/2009/03
FEATURE NO. 11SW-D/C1411

TRIAL PIT NO. TP 2

SHEET 1 of 1

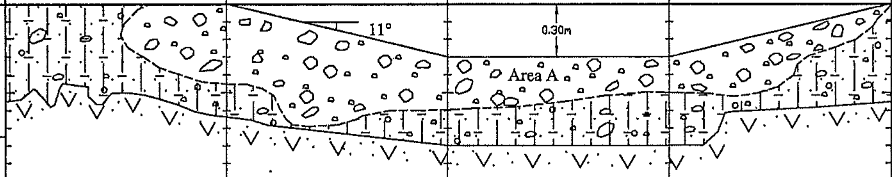
DRiLTECH

PROJECT: Ground Investigation - Urban (Term Contract), Agreement No. CE15/2009 (GE), Landslip Prevention and Mitigation Programme 2009, Package A, Landslip Preventive Works on Government Slopes and Retaining Walls Hong Kong Island - Investigation, Design and Construction. Feature No. 11SW-D/C1411 (Behind No. 17, Bowen Road)

WORKS ORDER NO. GE/2009/03.221

CO-ORDINATES	GROUND LEVEL:	LOGGED	CHECKED	EXCAVATION DATES:	BACKFILL DATES:
E 835443.99 N 814946.13	+155.72 mPD	L. Zhang, DATE 24.08.2010	C. Lun, DATE 25.08.2010	19.08.2010 to 19.08.2010	02.09.2010 to 02.09.2010

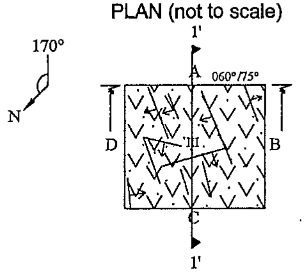
SAMPLES and TESTS	DEPTH (m)	SKETCH	DEPTH (m)	LEGEND	GRADE	DESCRIPTION
3, 2, 1, 4, 5	0.00 / 0.30 / 0.45 / 0.50 / 0.75	FACE A: 1.50 m; FACE B: 1.50 m; FACE C: 1.50 m; FACE D: 1.50 m	0.00			Soft, moist, dark greyish brown (10YR4/2), sandy clayey SILT with many subangular cobbles and fine to coarse gravel of moderately weak to moderately strong tuff fragments and rootlets. (TOP SOIL)
						Area A: Loose, moist, dark greyish brown (10YR4/2) to pale brown (10YR6/3), sandy silty clayey subangular COBBLES with some fine to coarse gravel of moderately strong rock fragments and many rootlets (100mm). (COLLUVIUM)
			0.75			Bottom: Moderately strong, very dark grey, moderately decomposed fine ash TUFF with closely spaced, rough planar, extremely narrow to very narrow, iron and manganese oxide stained and grey soil infilled joints measured as following: J1: 065°/75°, J2: 240°/82°, J3: 350°/70°, J4: 347°/80°, J5: 245°/65°
						End of trial pit at maximum depth of 0.75 m.



1
2
3
4
5

↥ SMALL DISTURBED SAMPLE
↥ LARGE DISTURBED SAMPLE
U76 SAMPLE (VERTICAL / HORIZONTAL)
U100 SAMPLE (VERTICAL / HORIZONTAL)
BLOCK SAMPLE
IN-SITU DENSITY TEST
WATER SAMPLE
WATER SEEPAGE
N-SCHMIDT HAMMER TEST

PLAN (not to scale)



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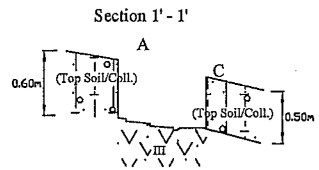


REMARKS

Maximum Depth: 0.75 m
Average Depth: 0.50 m
Shoring: NO
Stability: STABLE
Water Seepage: NO

1. Small disturbed sample was taken at 0.50m.
2. Large disturbed sample was taken at 0.50m.
3. Block sample was taken at 0.30m.
4. U76 (Horizontal) sample was taken at 0.30m on Face A.

TRIAL PIT RECORD

DRiLTECH

CONTRACT NO. GE/2009/03
FEATURE NO. 11SW-D/C1411

TRIAL PIT NO. TP 3

SHEET 1 of 1

PROJECT: Ground Investigation - Urban (Term Contract), Agreement No. CE15/2009 (GE), Landslip Prevention and Mitigation Programme 2009, Package A, Landslip Preventive Works on Government Slopes and Retaining Walls Hong Kong Island - Investigation, Design and Construction. Feature No. 11SW-D/C1411 (Behind No. 17, Bowen Road)

WORKS ORDER NO. GE/2009/03.221

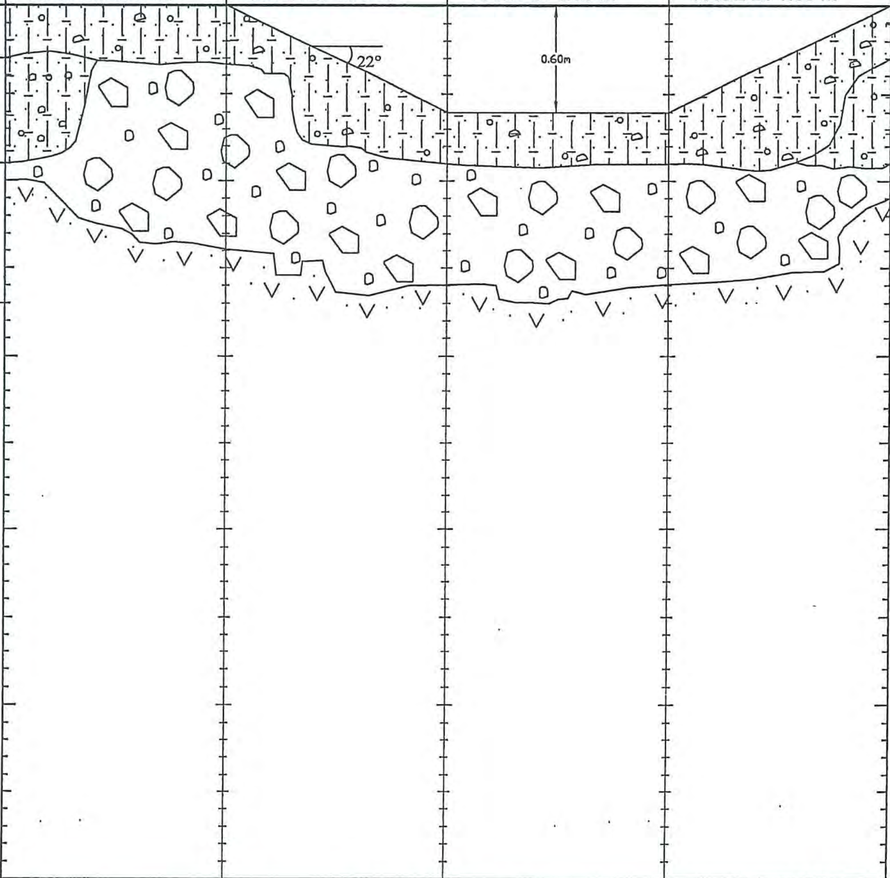
CO-ORDINATES	E 835450.14	N 814946.77	GROUND LEVEL: +158.05 mPD	LOGGED L. Zhang	CHECKED C. Lun	EXCAVATION DATES: 17.08.2010 to 19.08.2010
				DATE 24.08.2010	DATE 25.08.2010	BACKFILL DATES: 02.09.2010 to 02.09.2010

SAMPLES and TESTS / DEPTH (m): 0.00, 0.30, 0.40, 0.45, 0.50, 0.90, 0.95, 1.00, 1.70

Samples: 4, 5, 3, 1, 2 (0.40–0.50 m); 8, 6, 9, 7 (0.90–1.00 m)

SKETCH

FACE A: 1.50 m | FACE B: 1.50 m | FACE C: 1.50 m | FACE D: 1.50 m

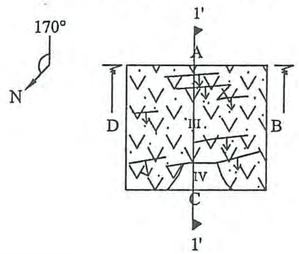


DEPTH (m)	LEGEND	GRADE	DESCRIPTION
0.00–0.30			Soft, moist, dark greyish brown (10YR4/4), sandy clayey SILT with some subangular fine to coarse gravel of cobbles of weak to moderately strong tuff fragments and rootlets. (TOP SOIL)
0.30–0.90			Firm, moist, pale brown (10YR6/3), slightly sandy clayey SILT with some subangular fine to coarse gravel of moderately weak to moderately strong tuff fragments. (COLLUVIUM)
0.90–1.70		IV	Weak to locally moderately weak, very pale brown, highly decomposed fine ash TUFF with closely spaced, smooth and rough planar, extremely narrow to very narrow, iron oxide stained and pale brown soil (clayey silty) infilled joints. (Sandy clayey silty COBBLES with some fine to coarse gravel)
1.70			Bottom: Moderately strong, brownish yellow to olive grey, moderately decomposed fine ash TUFF with closely spaced, rough planar, extremely narrow to very narrow, iron and manganese oxide stained and pale brown, soil (clay/ silt) infilled joints measured as 340°/80°.
			End of trial pit at maximum depth of 1.70 m.

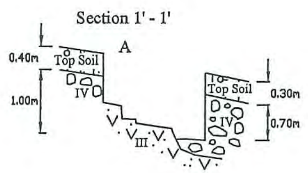
Depth scale: 1, 2, 3, 4, 5

- SMALL DISTURBED SAMPLE
- LARGE DISTURBED SAMPLE
- U76 SAMPLE (VERTICAL / HORIZONTAL)
- U100 SAMPLE (VERTICAL / HORIZONTAL)
- BLOCK SAMPLE
- IN-SITU DENSITY TEST
- WATER SAMPLE
- WATER SEEPAGE
- N-SCHMIDT HAMMER TEST

PLAN (not to scale)



SECTION (not to scale)



REMARKS

Maximum Depth: 1.70 m　　Average Depth: 1.00 m
Shoring: YES　　Stability: STABLE
Water Seepage: NO

1. Small disturbed samples were taken at 0.50m and 1.00m.
2. Large disturbed samples were taken at 0.50m and 1.00m.
3. Block sample was taken at 0.40m.
4. U76 (Horizontal) samples were taken at 0.50m and 0.90m on Face A.

DRiLTECH	**SLOPE STRIPPING RECORD** CONTRACT NO. GE/2009/03 FEATURE NO. 11SW-D/C1411	STRIP NO. **S 1** FEATURE NO. **11SW-D/C1411** SHEET 1 of 1

PROJECT Ground Investigation - Urban (Term Contract), Agreement No. CE15/2009 (GE), Landslip Prevention and Mitigation Programme 2009, Package A, Landslip Preventive Works on Government Slopes and Retaining Walls Hong Kong Island - Investigation, Design and Construction. Feature No. 11SW-D/C1411 (Behind No. 17, Bowen Road)

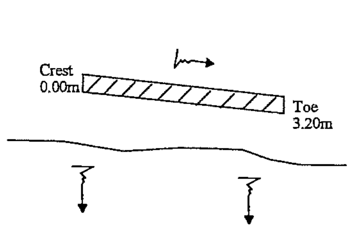
LOGGED L. Zhang DATE 24.08.2010 CHECKED C. Lun DATE 25.08.2010	DATUM (CREST) CO-ORDINATES E 835455.27 N 814954.92 LEVEL +156.74 mPD	DATUM (TOE) CO-ORDINATES E 835451.48 N 814955.19 LEVEL +155.89 mPD	WORKS ORDER NO. GE/2009/03.221 DATE 20.08.2010 to 20.08.2010 DATE REINSTATED 01.09.2010

Distance from Datum (m)	Slope Angle	Reduced Level (mPD)	Samples and Tests	Description	Legend	Grade	Discontinuities: Dip Direction / Dip	Discontinuities: Nature & Infilling
0.00 0.45 0.50 0.95 1.45 1.95 2.45 2.60 2.95 3.05 3.20 3.15	00° (0.00–1.20) 25° (1.20–3.20)	+156.74 +155.89	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11	Soft to firm, moist, very pale brown (10YR7/4) mottled red and very pale brown, slightly sandy CLAY/ SILT with some subangular fine to coarse gravel and cobbles, occasional boulders of moderately weak to moderately strong tuff fragments. (COLLUVIUM) Overlain by 150mm thick TOP SOIL of soft, moist, dark greyish brown (10YR4/2), sandy clayey SILT with some subangular fine to coarse gravel and rootlets.				
				End of stripping at 3.20 m.				

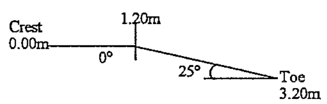
REMARKS 1. Surface: Natural Ground.
2. U76 (Vertical) samples were taken at 0.50m and 2.60m.

SMALL DISTURBED SAMPLE
U76 SAMPLE (VER / HOR)
U100 SAMPLE (VER / HOR)
LARGE DISTURBED SAMPLE
BLOCK SAMPLE
IN-SITU DENSITY TEST
WATER SAMPLE
WATER SEEPAGE
N-SCHMIDT HAMMER TEST

PLAN (not to scale)



SECTION (not to scale)



DRiLTECH

SLOPE STRIPPING RECORD

CONTRACT NO. GE/2009/03

FEATURE NO. 11SW-D/C1411

STRIP NO.	S 2
FEATURE NO.	11SW-D/C1411
SHEET	1 of 1

PROJECT: Ground Investigation - Urban (Term Contract), Agreement No. CE15/2009 (GE), Landslip Prevention and Mitigation Programme 2009, Package A, Landslip Preventive Works on Government Slopes and Retaining Walls Hong Kong Island - Investigation, Design and Construction. Feature No. 11SW-D/C1411 (Behind No. 17, Bowen Road)

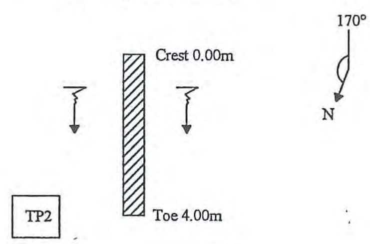
LOGGED: L. Zhang	DATE: 24.08.2010	DATUM (CREST) CO-ORDINATES E 835444.84 N 814940.81 LEVEL +156.66 mPD	DATUM (TOE) CO-ORDINATES E 835442.51 N 814944.42 LEVEL +155.97 mPD	WORKS ORDER NO. GE/2009/03.221
CHECKED: C. Lun	DATE: 25.08.2010			DATE 20.08.2010 to 20.08.2010
				DATE REINSTATED 01.09.2010

Distance from Datum (m)	Slope Angle	Reduced Level (mPD)	Samples and Tests	Description	Legend	Grade	Discontinuities: Dip Direction / Dip	Discontinuities: Nature & Infilling
0.00		+156.66		Firm, moist, pale brown (10YR6/3) mottled very pale brown and red, slightly sandy clayey SILT with some subangular fine to coarse gravel, cobbles and boulders of moderately strong tuff fragments. (COLLUVIUM)				
0.45			1					
0.50			2					
0.95			3, 4					
1.45			5	Overlain by 200mm thick TOP SOIL of soft, dark greyish brown (10YR4/2), sandy clayey SILT with some subangular fine to coarse gravel and cobbles of moderately strong tuff fragments and rootlets.				
1.95	15°		6					
2.45			7					
2.95			8					
3.45			11					
3.50			9					
3.95			10, 12					
4.00		+155.97		End of stripping at 4.00 m.				

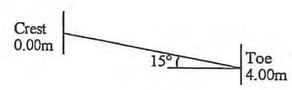
REMARKS
1. Surface: Natural Ground.
2. U76 (Vertical) samples were taken at 0.50m and 3.50m.

KEY: SMALL DISTURBED SAMPLE; U76 SAMPLE (VER / HOR); U100 SAMPLE (VER / HOR); LARGE DISTURBED SAMPLE; BLOCK SAMPLE; IN-SITU DENSITY TEST; WATER SAMPLE; WATER SEEPAGE; N-SCHMIDT HAMMER TEST

PLAN (not to scale)



SECTION (not to scale)



Appendix D

Photographs of Trial Pits

CEDD Contract No.: GE/2009/03
Ground Investigation - Urban
(Term Contract)
DRiLTECH
WORKS ORDER NO.: GE/2009/03.221
JOB TITLE: Agreement No. CE15/2009(GE). Landslip Prevention and Mitigation Programme 2009, Package A, Landslip Preventive Works on Government Slopes and Retaining Walls, Hong Kong Island - Investigation, Design and Construction. Feature No. 11SW-D/C1411 (Behind No.17, Bowen Road)
PHOTO DATE : 20 - 08 - 2010
STATION NO. : TP 1
FACE : A
0m
0.40m

DrilTech Ground Engineering Ltd.
BLK A & B, 9/F, HONG KONG SPINNERS IND. BLDG, PHASE VI, 481-483 CASTLE PEAK RD, KLN, HONG KONG
TEL: 2371 0008 FAX: 2744 1037 E-Mail: driltech@driltech.com.hk WEBSITE: driltech.com.hk

DRiLTECH DrilTech Ground Engineering Ltd.
BLK A & B, 9/F, HONG KONG SPINNERS IND. BLDG, PHASE VI, 481-483 CASTLE PEAK RD, KLN, HONG KONG
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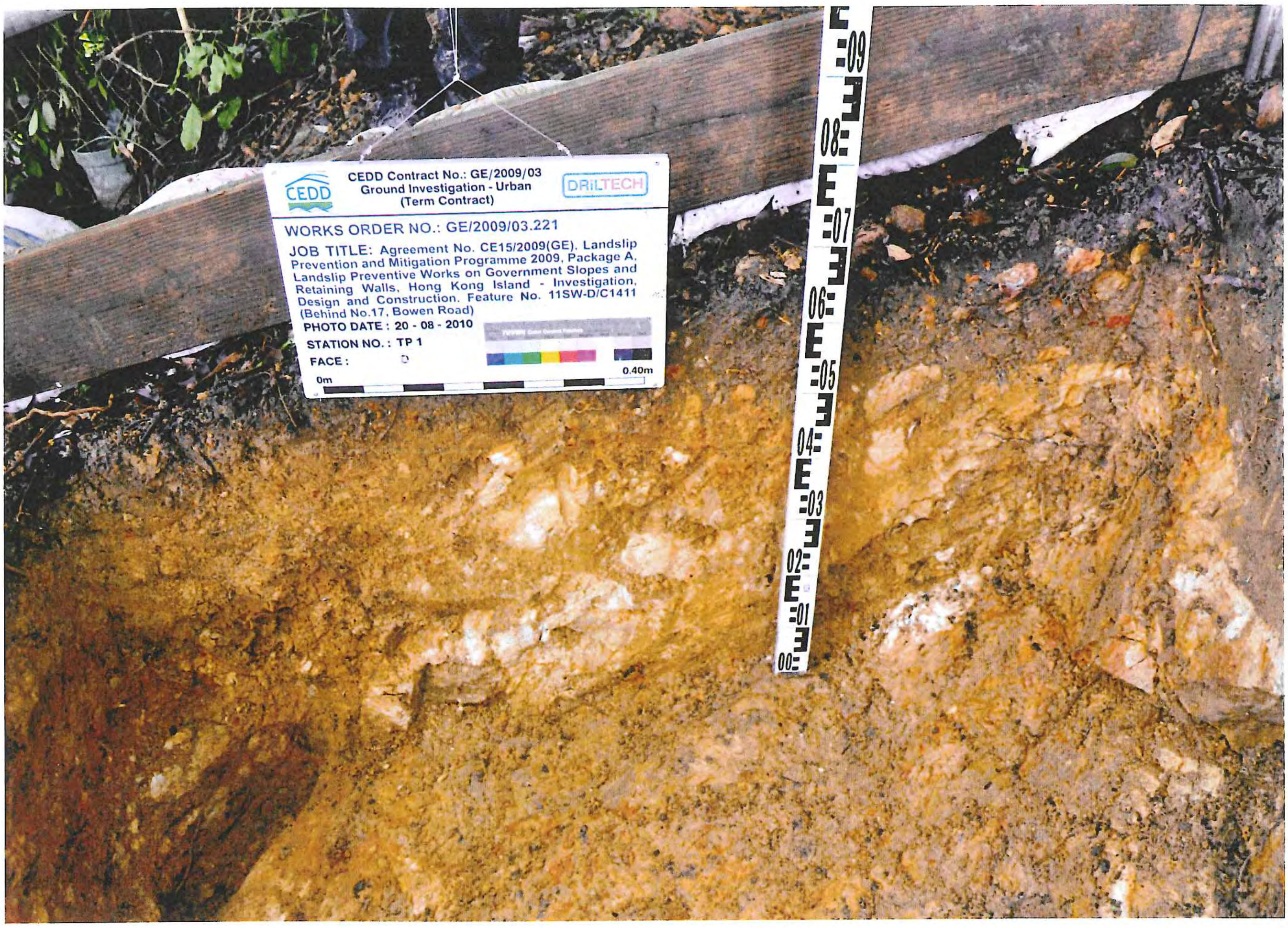

DRiLTECH

DrilTech Ground Engineering Ltd.

BLK A & B, 9/F, HONG KONG SPINNERS IND. BLDG, PHASE VI, 481-483 CASTLE PEAK RD, KLN, HONG KONG
TEL: 2371 0008 FAX: 2744 1037 E-Mail: driltech@driltech.com.hk WEBSITE: driltech.com.hk


CEDD Contract No.: GE 2009 03
Ground Investigation - Urban
(Term Contract)
CEDD
WORKS ORDER NO.: GE/2009/03.221
JOB TITLE: 'Agreement No. CE15 2009(GE). Landslip Prevention and Mitigation Programme 2009. Package A Landslip Preventive Works on Government Slopes and Retaining Walls. Hong Kong Island - Investigation Design and Construction. Feature No. 11SW-D'C1411 (Behind No.17. Bowen Road)
PHOTO DATE : 20 - 08 - 2010
STATION NO. : TP 2
FACE : A
0m
0.40m


CEDD
CEDD Contract No.: GE/2009/03
Ground Investigation - Urban
(Term Contract)
DRiLTECH
WORKS ORDER NO.: GE/2009/03.221
JOB TITLE: Agreement No. CE15/2009(GE), Landslip Prevention and Mitigation Programme 2009, Package A, Landslip Preventive Works on Government Slopes and Retaining Walls, Hong Kong Island - Investigation, Design and Construction. Feature No. 11SW-D/C1411 (Behind No.17, Bowen Road)
PHOTO DATE : 20 - 08 - 2010
STATION NO. : TP 2
FACE : B
0m
0.40m


CEDD
CEDD Contract No.: GE/2009/03
Ground Investigation - Urban
(Term Contract)
DRiLTECH
WORKS ORDER NO.: GE/2009/03.221
JOB TITLE: Agreement No. CE15/2009(GE), Landslip Prevention and Mitigation Programme 2009, Package A, Landslip Preventive Works on Government Slopes and Retaining Walls, Hong Kong Island - Investigation, Design and Construction, Feature No. 11SW-D/C1411 (Behind No.17, Bowen Road)
PHOTO DATE : 20 - 08 - 2010
STATION NO. : TP 2
FACE : C
0m
0.40m


CEDD
CEDD Contract No.: GE/2009/03
Ground Investigation - Urban
(Term Contract)
DRiLTECH
WORKS ORDER NO.: GE/2009/03.221
JOB TITLE: Agreement No. CE15/2009(GE), Landslip Prevention and Mitigation Programme 2009, Package A, Landslip Preventive Works on Government Slopes and Retaining Walls, Hong Kong Island - Investigation, Design and Construction, Feature No. 11SW-D/C1411 (Behind No.17, Bowen Road)
PHOTO DATE : 20 - 08 - 2010
STATION NO. : TP 2
FACE : D
0m
0.40m

CEDD
Ground Investigation
(Term Contract)
WORKS ORDER NO
JOB TITLE:
(Behind No 17 Bowen Road)
PHOTO DATE : 20 - 08 - 2010
STATION NO TP 2
FACE : BOTTOM
0m

CEDD
CEDD Contract No : GE 2009 03
Ground Investigation - Urban
(Term Contract)
DRiLTECH
WORKS ORDER NO.: GE/2009/03.221
JOB TITLE: Agreement No CE15/2009(GE) Landslip Prevention and Mitigation Programme 2009 Package A Landslip Preventive Works on Government Slopes and Retaining Walls, Hong Kong Island - Investigation Design and Construction Feature No 11SW-D C1411 (Behind No 17, Bowen Road)
PHOTO DATE : 20 - 08 - 2010
STATION NO. : TP 3
FACE : A
0m
0.40m


CEDD
CEDD Contract No.: GE/2009/03
Ground Investigation - Urban
(Term Contract)
DRiLTECH
WORKS ORDER NO.: GE/2009/03.221
JOB TITLE: Agreement No. CE15/2009(GE), Landslip Prevention and Mitigation Programme 2009, Package A, Landslip Preventive Works on Government Slopes and Retaining Walls, Hong Kong Island - Investigation, Design and Construction, Feature No. 11SW-D/C1411 (Behind No.17, Bowen Road)
PHOTO DATE : 20 - 08 - 2010
STATION NO. : TP 3
FACE : B
0m
0.40m


CEDD
CEDD Contract No.: GE/2009/03
Ground Investigation - Urban
(Term Contract)
DRiLTECH
WORKS ORDER NO.: GE/2009/03.221
JOB TITLE: Agreement No. CE15/2009(GE), Landslip Prevention and Mitigation Programme 2009, Package A, Landslip Preventive Works on Government Slopes and Retaining Walls, Hong Kong Island - Investigation, Design and Construction, Feature No. 11SW-D/C1411 (Behind No.17, Bowen Road)
PHOTO DATE : 20 - 08 - 2010
STATION NO. : TP 3
FACE : C
0m
0.40m


CEDD Contract No.: GE/2009/03
Ground Investigation - Urban
(Term Contract)
CEDD
DRiLTECH
WORKS ORDER NO.: GE/2009/03.221
JOB TITLE: Agreement No. CE15/2009(GE), Landslip Prevention and Mitigation Programme 2009, Package A, Landslip Preventive Works on Government Slopes and Retaining Walls, Hong Kong Island - Investigation, Design and Construction, Feature No. 11SW-D/C1411 (Behind No.17, Bowen Road)
PHOTO DATE : 20 - 08 - 2010
STATION NO. : TP 3
FACE : D
0m
0.40m

DRiLTECH

DrilTech Ground Engineering Ltd.
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TEL: 2371 0008 FAX: 2744 1037 E-Mail: driltech@driltech.com.hk WEBSITE: driltech.com.hk

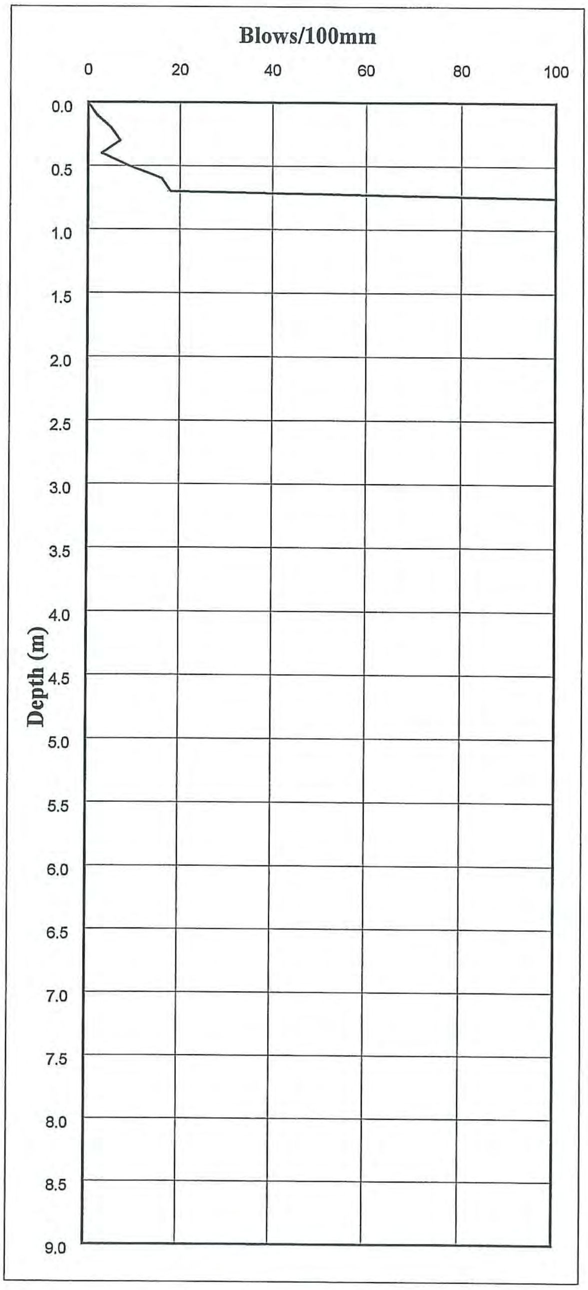
Appendix E

Dynamic Probing (GCO Probe) Test Results

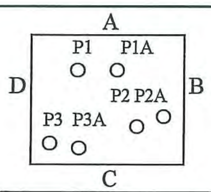
DRiLTECH	DYNAMIC PROBING TEST RECORD	Trial Pit No.: TP1
		Probe No.: P1

Contract No. :	GE/2009/03	Date of Test:	13-Aug-10
Works Order No. :	GE/2009/03.221	Ground Level:	+152.78 mPD
Project :	Ground Investigation - Urban (Term Contract), Agreement No. CE15/2009(GE), Landslip Prevention and Mitigation Programme 2009, Package A, Landslip Preventive Works on Government Slopes and Retaining Walls Hong Kong Island - Investigation, Design and Construction. Feature No. 11SW-D/C1411 (Behind No.17, Bowen Road)	Co-ordinates: (Trial Pit)	E: 835450.50 N: 814961.35
Tested by:	S. W. Wong		
Supervised by:	Y. P. Leung		

Depth (m) (below G.L.)	blows /100mm	Depth (m) (below G.L.)	blows /100mm	Depth (m) (below G.L.)	blows /100mm
0.10	2	3.10		6.10	
0.20	5	3.20		6.20	
0.30	7	3.30		6.30	
0.40	3	3.40		6.40	
0.50	9	3.50		6.50	
0.60	16	3.60		6.60	
0.70	18	3.70		6.70	
0.75	100	3.80		6.80	
0.90		3.90		6.90	
1.00		4.00		7.00	
1.10		4.10		7.10	
1.20		4.20		7.20	
1.30		4.30		7.30	
1.40		4.40		7.40	
1.50		4.50		7.50	
1.60		4.60		7.60	
1.70		4.70		7.70	
1.80		4.80		7.80	
1.90		4.90		7.90	
2.00		5.00		8.00	
2.10		5.10		8.10	
2.20		5.20		8.20	
2.30		5.30		8.30	
2.40		5.40		8.40	
2.50		5.50		8.50	
2.60		5.60		8.60	
2.70		5.70		8.70	
2.80		5.80		8.80	
2.90		5.90		8.90	
3.00		6.00		9.00	



Probe Location Plan



Remarks: Pre-excavation GCO Probe

P1 terminated on refusal

Checked by: C. Lun

Date: 13-Aug-10

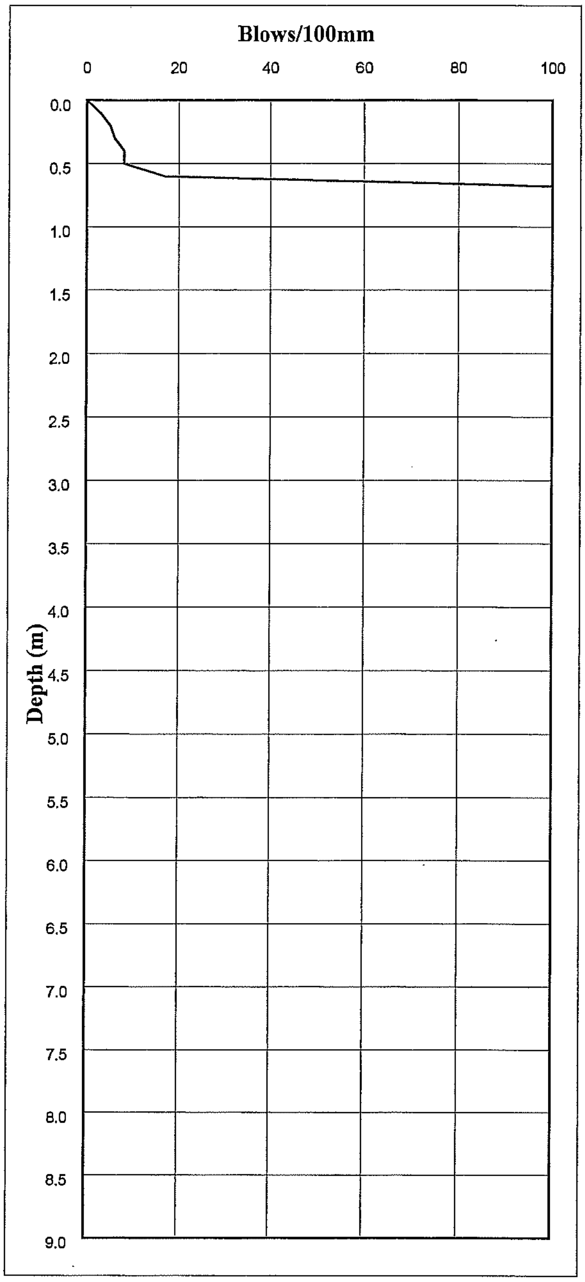
DGEL\Site-F10 03/02 STD

Pre GCOP

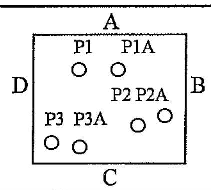
DRiLTECH	DYNAMIC PROBING TEST RECORD	Trial Pit No.: TP1
		Probe No.: P1A

Contract No. :	GE/2009/03	**Date of Test:**	13-Aug-10
Works Order No. :	GE/2009/03.221	**Ground Level:**	+152.78 mPD
Project :	Ground Investigation - Urban (Term Contract), Agreement No. CE15/2009(GE), Landslip Prevention and Mitigation Programme 2009, Package A, Landslip Preventive Works on Government Slopes and Retaining Walls Hong Kong Island - Investigation, Design and Construction Feature No. 11SW-D/C1411 (Behind No.17, Bowen Road)	**Co-ordinates:** (Trial Pit)	E: 835450.50 N: 814961.35
Tested by:	S. W. Wong		
Supervised by:	Y. P. Leung		

Depth (m) (below G.L.)	blows /100mm	Depth (m) (below G.L.)	blows /100mm	Depth (m) (below G.L.)	blows /100mm
0.10	3	3.10		6.10	
0.20	5	3.20		6.20	
0.30	6	3.30		6.30	
0.40	8	3.40		6.40	
0.50	8	3.50		6.50	
0.60	17	3.60		6.60	
0.68	100	3.70		6.70	
0.80		3.80		6.80	
0.90		3.90		6.90	
1.00		4.00		7.00	
1.10		4.10		7.10	
1.20		4.20		7.20	
1.30		4.30		7.30	
1.40		4.40		7.40	
1.50		4.50		7.50	
1.60		4.60		7.60	
1.70		4.70		7.70	
1.80		4.80		7.80	
1.90		4.90		7.90	
2.00		5.00		8.00	
2.10		5.10		8.10	
2.20		5.20		8.20	
2.30		5.30		8.30	
2.40		5.40		8.40	
2.50		5.50		8.50	
2.60		5.60		8.60	
2.70		5.70		8.70	
2.80		5.80		8.80	
2.90		5.90		8.90	
3.00		6.00		9.00	



Probe Location Plan



Remarks: Pre-excavation GCO Probe

2nd attempt due to P1 terminated on refusal

Checked by: C. Lun

Date: 13-Aug-10

DGEL\Site-F10 03/02 STD

Pre GCOP

DRiLTECH

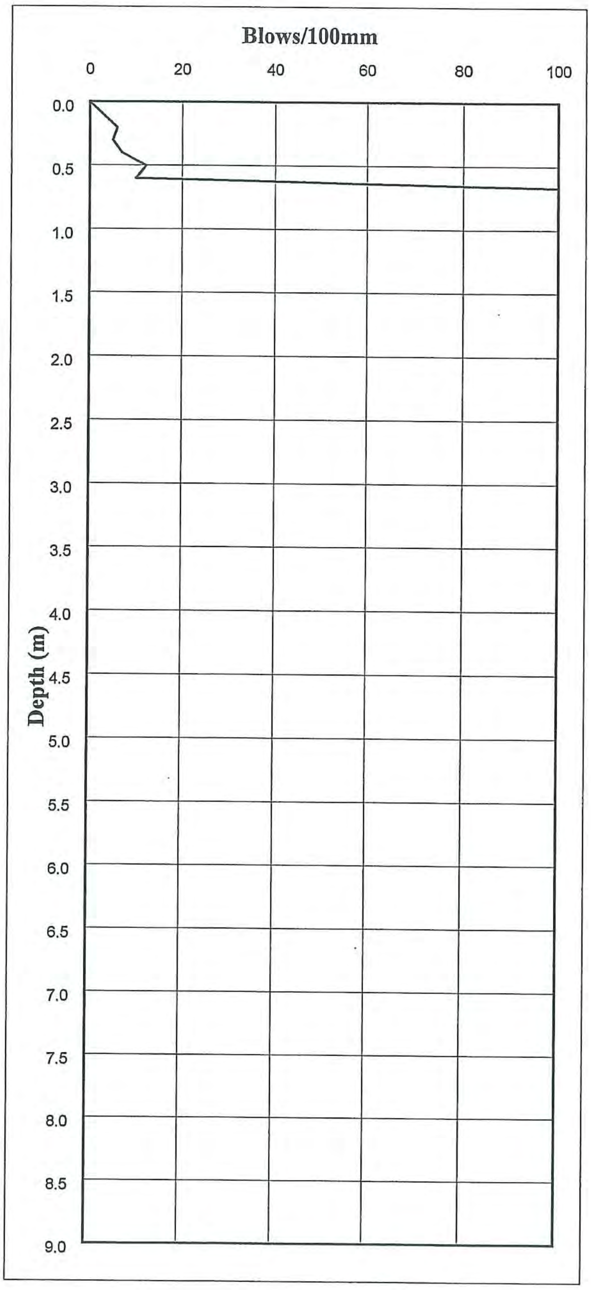
DYNAMIC PROBING TEST RECORD

Trial Pit No.: TP1

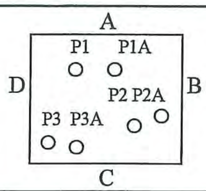
Probe No.: P2

Contract No. :	GE/2009/03	Date of Test:	13-Aug-10
Works Order No. :	GE/2009/03.221	Ground Level:	+152.78 mPD
Project :	Ground Investigation - Urban (Term Contract), Agreement No. CE15/2009(GE), Landslip Prevention and Mitigation Programme 2009, Package A, Landslip Preventive Works on Government Slopes and Retaining Walls Hong Kong Island - Investigation, Design and Construction Feature No. 11SW-D/C1411 (Behind No.17, Bowen Road)	Co-ordinates: (Trial Pit)	E: 835450.50 N: 814961.35
Tested by:	S. W. Wong		
Supervised by:	Y. P. Leung		

Depth (m) (below G.L.)	blows /100mm	Depth (m) (below G.L.)	blows /100mm	Depth (m) (below G.L.)	blows /100mm
0.10	3	3.10		6.10	
0.20	6	3.20		6.20	
0.30	5	3.30		6.30	
0.40	7	3.40		6.40	
0.50	12	3.50		6.50	
0.60	10	3.60		6.60	
0.67	100	3.70		6.70	
0.80		3.80		6.80	
0.90		3.90		6.90	
1.00		4.00		7.00	
1.10		4.10		7.10	
1.20		4.20		7.20	
1.30		4.30		7.30	
1.40		4.40		7.40	
1.50		4.50		7.50	
1.60		4.60		7.60	
1.70		4.70		7.70	
1.80		4.80		7.80	
1.90		4.90		7.90	
2.00		5.00		8.00	
2.10		5.10		8.10	
2.20		5.20		8.20	
2.30		5.30		8.30	
2.40		5.40		8.40	
2.50		5.50		8.50	
2.60		5.60		8.60	
2.70		5.70		8.70	
2.80		5.80		8.80	
2.90		5.90		8.90	
3.00		6.00		9.00	



Probe Location Plan



Remarks: Pre-excavation GCO Probe

P2 terminated on refusal

Checked by: C. Lun

Date: 13-Aug-10

DGEL\Site-F10 03/02 STD

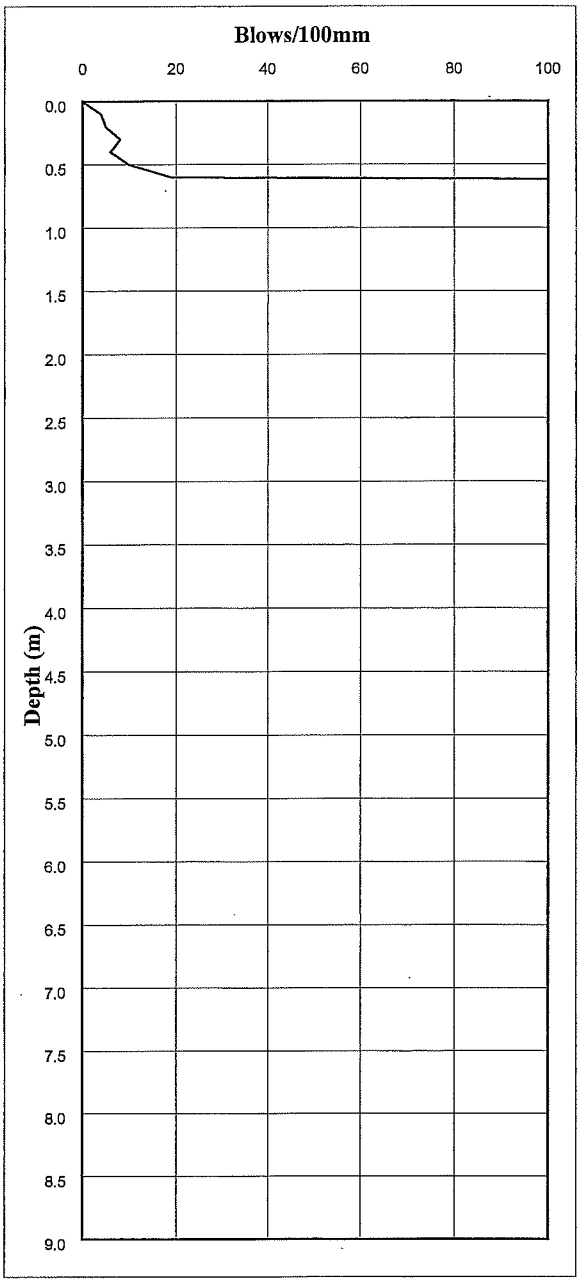
Pre GCOP

DRiLTECH	**DYNAMIC PROBING TEST RECORD**	**Trial Pit No.:** TP1
		Probe No.: P2A

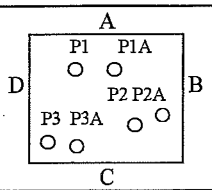
Contract No. :	GE/2009/03
Works Order No. :	GE/2009/03.221
Project :	Ground Investigation - Urban (Term Contract), Agreement No. CE15/2009(GE), Landslip Prevention and Mitigation Programme 2009, Package A, Landslip Preventive Works on Government Slopes and Retaining Walls Hong Kong Island - Investigation, Design and Construction Feature No. 11SW-D/C1411 (Behind No.17, Bowen Road)
Tested by:	S. W. Wong
Supervised by:	Y. P. Leung

Date of Test:	13-Aug-10
Ground Level:	+152.78 mPD
Co-ordinates: (Trial Pit)	E: 835450.50 N: 814961.35

Depth (m) (below G.L.)	blows /100mm	Depth (m) (below G.L.)	blows /100mm	Depth (m) (below G.L.)	blows /100mm
0.10	4	3.10		6.10	
0.20	5	3.20		6.20	
0.30	8	3.30		6.30	
0.40	6	3.40		6.40	
0.50	10	3.50		6.50	
0.60	19	3.60		6.60	
0.62	100	3.70		6.70	
0.80		3.80		6.80	
0.90		3.90		6.90	
1.00		4.00		7.00	
1.10		4.10		7.10	
1.20		4.20		7.20	
1.30		4.30		7.30	
1.40		4.40		7.40	
1.50		4.50		7.50	
1.60		4.60		7.60	
1.70		4.70		7.70	
1.80		4.80		7.80	
1.90		4.90		7.90	
2.00		5.00		8.00	
2.10		5.10		8.10	
2.20		5.20		8.20	
2.30		5.30		8.30	
2.40		5.40		8.40	
2.50		5.50		8.50	
2.60		5.60		8.60	
2.70		5.70		8.70	
2.80		5.80		8.80	
2.90		5.90		8.90	
3.00		6.00		9.00	



Probe Location Plan



Remarks: Pre-excavation GCO Probe

2nd attempt due to P2 terminated on refusal

Checked by: C. Lun W

Date: 13-Aug-10

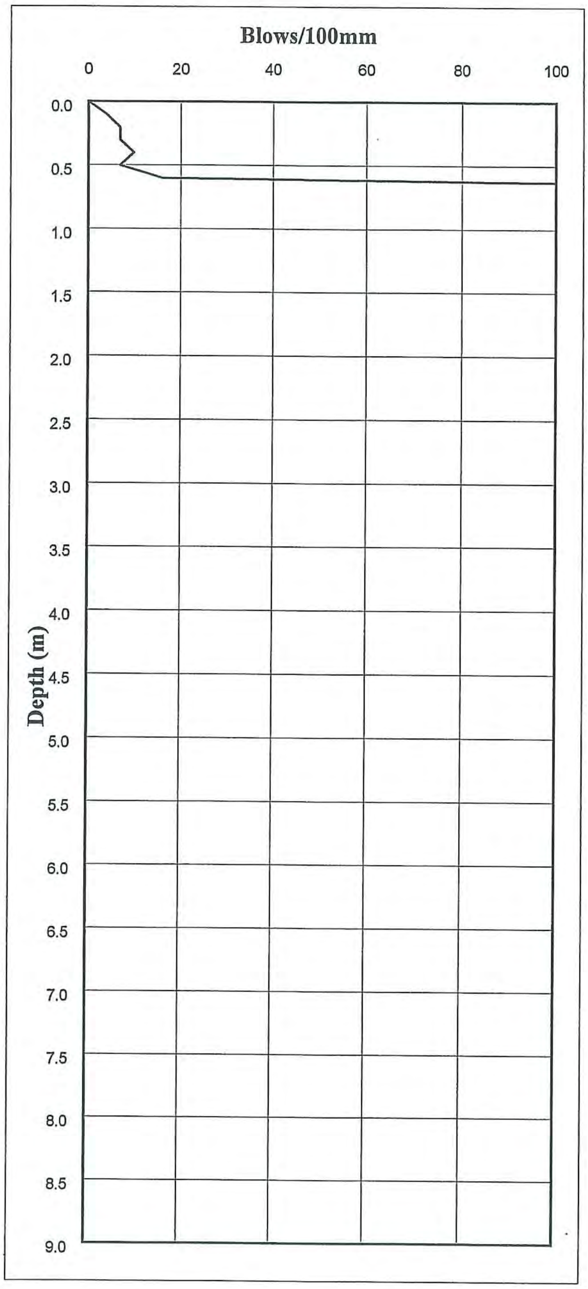
DGEL\Site-F10 03/02 STD

Pre GCOP

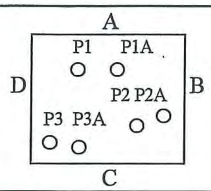
DRiLTECH	DYNAMIC PROBING TEST RECORD	Trial Pit No.: TP1
		Probe No.: P3

Contract No. :	GE/2009/03	Date of Test:	13-Aug-10
Works Order No. :	GE/2009/03.221	Ground Level:	+152.78 mPD
Project :	Ground Investigation - Urban (Term Contract), Agreement No. CE15/2009(GE), Landslip Prevention and Mitigation Programme 2009, Package A, Landslip Preventive Works on Government Slopes and Retaining Walls Hong Kong Island - Investigation, Design and Construction Feature No. 11SW-D/C1411 (Behind No.17, Bowen Road)	Co-ordinates: (Trial Pit)	E: 835450.50 N: 814961.35
Tested by:	S. W. Wong		
Supervised by:	Y. P. Leung		

Depth (m) (below G.L.)	blows /100mm	Depth (m) (below G.L.)	blows /100mm	Depth (m) (below G.L.)	blows /100mm
0.10	4	3.10		6.10	
0.20	7	3.20		6.20	
0.30	7	3.30		6.30	
0.40	10	3.40		6.40	
0.50	7	3.50		6.50	
0.60	16	3.60		6.60	
0.63	100	3.70		6.70	
0.80		3.80		6.80	
0.90		3.90		6.90	
1.00		4.00		7.00	
1.10		4.10		7.10	
1.20		4.20		7.20	
1.30		4.30		7.30	
1.40		4.40		7.40	
1.50		4.50		7.50	
1.60		4.60		7.60	
1.70		4.70		7.70	
1.80		4.80		7.80	
1.90		4.90		7.90	
2.00		5.00		8.00	
2.10		5.10		8.10	
2.20		5.20		8.20	
2.30		5.30		8.30	
2.40		5.40		8.40	
2.50		5.50		8.50	
2.60		5.60		8.60	
2.70		5.70		8.70	
2.80		5.80		8.80	
2.90		5.90		8.90	
3.00		6.00		9.00	



Probe Location Plan



Remarks:	Pre-excavation GCO Probe	Checked by:	C. Lun
	P3 terminated on refusal	Date:	13-Aug-10

DGEL\Site-F10 03/02 STD

Pre GCOP

DRiLTECH

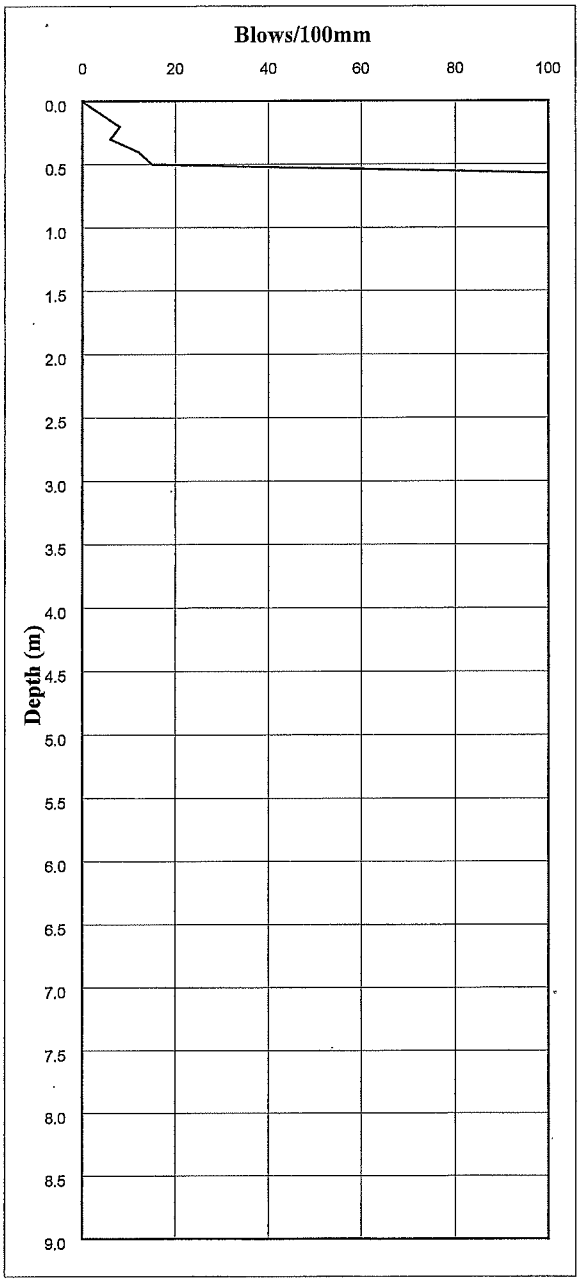
DYNAMIC PROBING TEST RECORD

Trial Pit No.: TP1

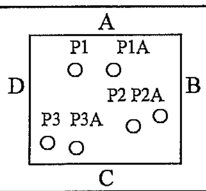
Probe No.: P3A

Contract No. :	GE/2009/03	**Date of Test:**	13-Aug-10
Works Order No. :	GE/2009/03.221	**Ground Level:**	+152.78 mPD
Project :	Ground Investigation - Urban (Term Contract), Agreement No. CE15/2009(GE), Landslip Prevention and Mitigation Programme 2009, Package A, Landslip Preventive Works on Government Slopes and Retaining Walls Hong Kong Island - Investigation, Design and Construction Feature No. 11SW-D/C1411 (Behind No.17, Bowen Road)	**Co-ordinates:** (Trial Pit)	E: 835450.50 N: 814961.35
Tested by:	S. W. Wong		
Supervised by:	Y. P. Leung		

Depth (m) (below G.L.)	blows /100mm	Depth (m) (below G.L.)	blows /100mm	Depth (m) (below G.L.)	blows /100mm
0.10	4	3.10		6.10	
0.20	8	3.20		6.20	
0.30	6	3.30		6.30	
0.40	12	3.40		6.40	
0.50	15	3.50		6.50	
0.57	100	3.60		6.60	
0.70		3.70		6.70	
0.80		3.80		6.80	
0.90		3.90		6.90	
1.00		4.00		7.00	
1.10		4.10		7.10	
1.20		4.20		7.20	
1.30		4.30		7.30	
1.40		4.40		7.40	
1.50		4.50		7.50	
1.60		4.60		7.60	
1.70		4.70		7.70	
1.80		4.80		7.80	
1.90		4.90		7.90	
2.00		5.00		8.00	
2.10		5.10		8.10	
2.20		5.20		8.20	
2.30		5.30		8.30	
2.40		5.40		8.40	
2.50		5.50		8.50	
2.60		5.60		8.60	
2.70		5.70		8.70	
2.80		5.80		8.80	
2.90		5.90		8.90	
3.00		6.00		9.00	



Probe Location Plan



Remarks: Pre-excavation GCO Probe

2nd attempt due to P3 terminated on refusal

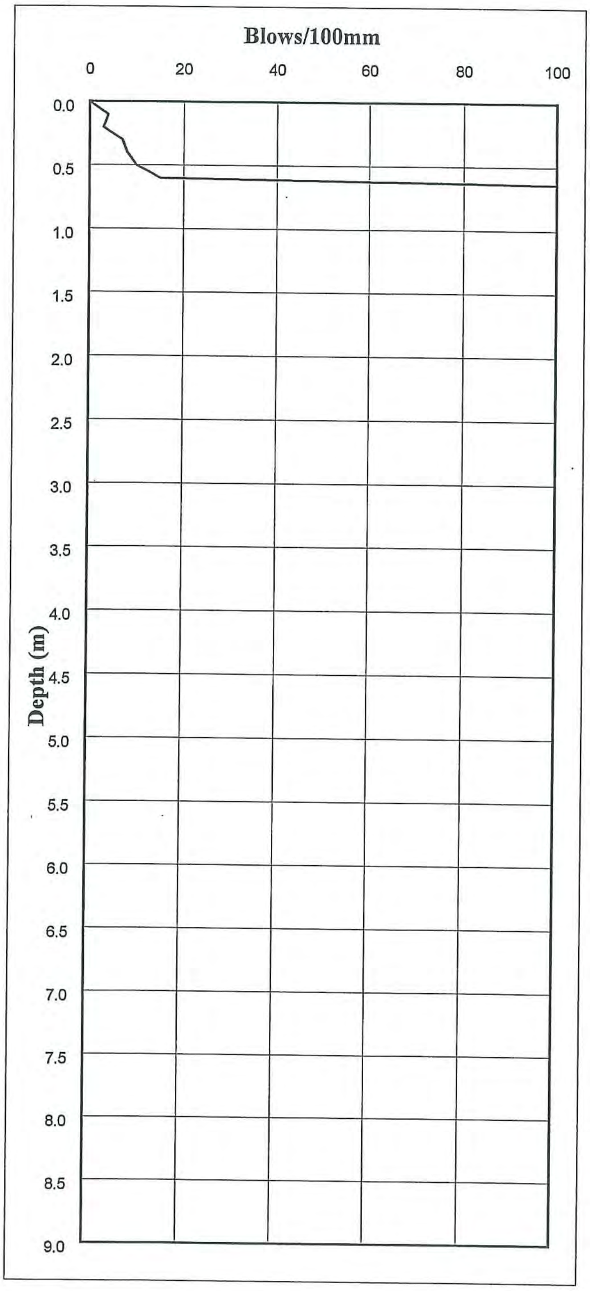
Checked by: C. Lun W

Date: 13-Aug-10

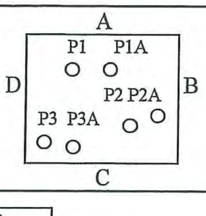
DRiLTECH	DYNAMIC PROBING TEST RECORD	Trial Pit No.: TP2
		Probe No.: P1

Contract No. :	GE/2009/03	**Date of Test:**	13-Aug-10
Works Order No. :	GE/2009/03.221	**Ground Level:**	+155.72 mPD
Project :	Ground Investigation - Urban (Term Contract), Agreement No. CE15/2009(GE), Landslip Prevention and Mitigation Programme 2009, Package A, Landslip Preventive Works on Government Slopes and Retaining Walls Hong Kong Island - Investigation, Design and Construction Feature No. 11SW-D/C1411 (Behind No.17, Bowen Road)	**Co-ordinates:** (Trial Pit)	E: 835443.99 N: 814946.13
Tested by:	S. W. Wong		
Supervised by:	Y. P. Leung		

Depth (m) (below G.L.)	blows /100mm	Depth (m) (below G.L.)	blows /100mm	Depth (m) (below G.L.)	blows /100mm
0.10	4	3.10		6.10	
0.20	3	3.20		6.20	
0.30	7	3.30		6.30	
0.40	8	3.40		6.40	
0.50	10	3.50		6.50	
0.60	15	3.60		6.60	
0.64	100	3.70		6.70	
0.80		3.80		6.80	
0.90		3.90		6.90	
1.00		4.00		7.00	
1.10		4.10		7.10	
1.20		4.20		7.20	
1.30		4.30		7.30	
1.40		4.40		7.40	
1.50		4.50		7.50	
1.60		4.60		7.60	
1.70		4.70		7.70	
1.80		4.80		7.80	
1.90		4.90		7.90	
2.00		5.00		8.00	
2.10		5.10		8.10	
2.20		5.20		8.20	
2.30		5.30		8.30	
2.40		5.40		8.40	
2.50		5.50		8.50	
2.60		5.60		8.60	
2.70		5.70		8.70	
2.80		5.80		8.80	
2.90		5.90		8.90	
3.00		6.00		9.00	



Probe Location Plan



Remarks: Pre-excavation GCO Probe

P1 terminated on refusal

Checked by: C. Lun

Date: 13-Aug-10

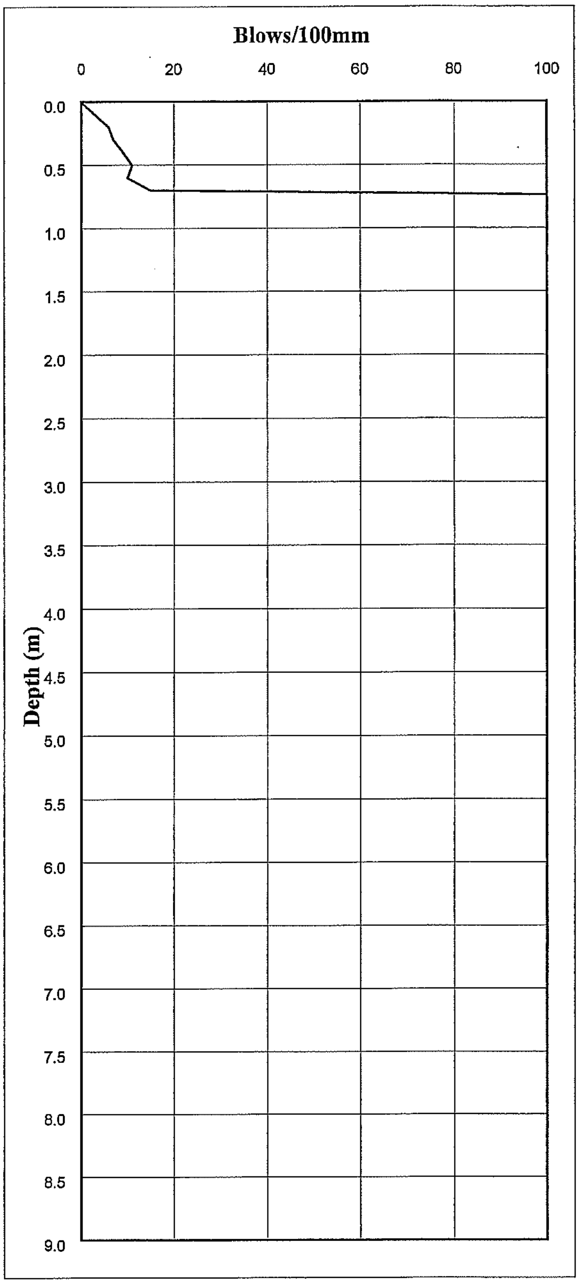
DGEL\Site-F10 03/02 STD

Pre GCOP

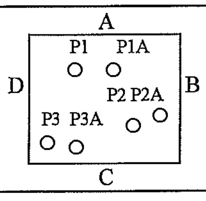
DRiLTECH	DYNAMIC PROBING TEST RECORD	Trial Pit No.: TP2
		Probe No.: P1A

Contract No. :	GE/2009/03	Date of Test:	13-Aug-10
Works Order No. :	GE/2009/03.221	Ground Level:	+155.72 mPD
Project :	Ground Investigation - Urban (Term Contract), Agreement No. CE15/2009(GE), Landslip Prevention and Mitigation Programme 2009, Package A, Landslip Preventive Works on Government Slopes and Retaining Walls Hong Kong Island - Investigation, Design and Construction Feature No. 11SW-D/C1411 (Behind No.17, Bowen Road)	Co-ordinates: (Trial Pit)	E: 835443.99 N: 814946.13
Tested by:	S. W. Wong		
Supervised by:	Y. P. Leung		

Depth (m) (below G.L.)	blows /100mm	Depth (m) (below G.L.)	blows /100mm	Depth (m) (below G.L.)	blows /100mm
0.10	3	3.10		6.10	
0.20	6	3.20		6.20	
0.30	7	3.30		6.30	
0.40	9	3.40		6.40	
0.50	11	3.50		6.50	
0.60	10	3.60		6.60	
0.70	15	3.70		6.70	
0.74	100	3.80		6.80	
0.90		3.90		6.90	
1.00		4.00		7.00	
1.10		4.10		7.10	
1.20		4.20		7.20	
1.30		4.30		7.30	
1.40		4.40		7.40	
1.50		4.50		7.50	
1.60		4.60		7.60	
1.70		4.70		7.70	
1.80		4.80		7.80	
1.90		4.90		7.90	
2.00		5.00		8.00	
2.10		5.10		8.10	
2.20		5.20		8.20	
2.30		5.30		8.30	
2.40		5.40		8.40	
2.50		5.50		8.50	
2.60		5.60		8.60	
2.70		5.70		8.70	
2.80		5.80		8.80	
2.90		5.90		8.90	
3.00		6.00		9.00	



Probe Location Plan



Remarks: Pre-excavation GCO Probe

2nd attempt due to P1 terminated on refusal

Checked by: C. Lun

Date: 13-Aug-10

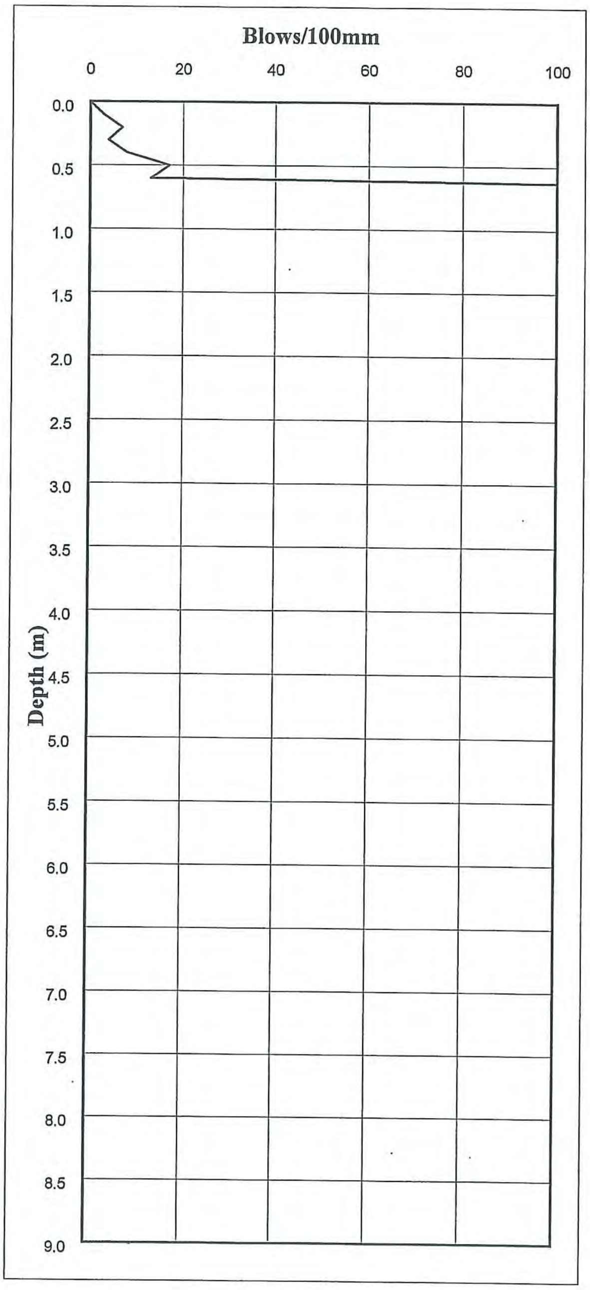
DGEL\Site-F10 03/02 STD

Pre GCOP

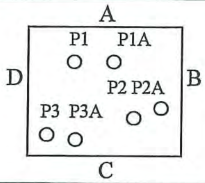
DRiLTECH	DYNAMIC PROBING TEST RECORD	Trial Pit No.: TP2
		Probe No.: P2

Contract No. :	GE/2009/03	Date of Test:	13-Aug-10
Works Order No. :	GE/2009/03.221	Ground Level:	+155.72 mPD
Project :	Ground Investigation - Urban (Term Contract), Agreement No. CE15/2009(GE), Landslip Prevention and Mitigation Programme 2009, Package A, Landslip Preventive Works on Government Slopes and Retaining Walls Hong Kong Island - Investigation, Design and Construction Feature No. 11SW-D/C1411 (Behind No.17, Bowen Road)	Co-ordinates: (Trial Pit)	E: 835443.99 N: 814946.13
Tested by:	S. W. Wong		
Supervised by:	Y. P. Leung		

Depth (m) (below G.L.)	blows /100mm	Depth (m) (below G.L.)	blows /100mm	Depth (m) (below G.L.)	blows /100mm
0.10	3	3.10		6.10	
0.20	7	3.20		6.20	
0.30	4	3.30		6.30	
0.40	8	3.40		6.40	
0.50	17	3.50		6.50	
0.60	13	3.60		6.60	
0.63	100	3.70		6.70	
0.80		3.80		6.80	
0.90		3.90		6.90	
1.00		4.00		7.00	
1.10		4.10		7.10	
1.20		4.20		7.20	
1.30		4.30		7.30	
1.40		4.40		7.40	
1.50		4.50		7.50	
1.60		4.60		7.60	
1.70		4.70		7.70	
1.80		4.80		7.80	
1.90		4.90		7.90	
2.00		5.00		8.00	
2.10		5.10		8.10	
2.20		5.20		8.20	
2.30		5.30		8.30	
2.40		5.40		8.40	
2.50		5.50		8.50	
2.60		5.60		8.60	
2.70		5.70		8.70	
2.80		5.80		8.80	
2.90		5.90		8.90	
3.00		6.00		9.00	



Probe Location Plan



Remarks: Pre-excavation GCO Probe

P2 terminated on refusal

Checked by: C. Lun

Date: 13-Aug-10

DGEL\Site-F10 03/02 STD

Pre GCOP

DRiLTECH

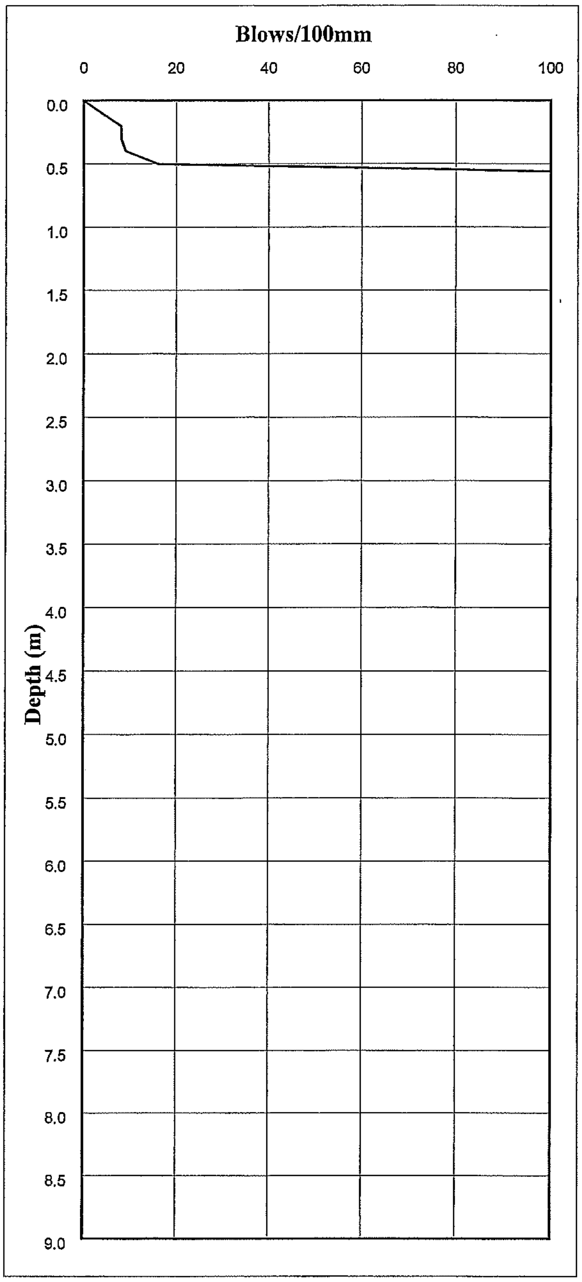
DYNAMIC PROBING TEST RECORD

Trial Pit No.: TP2

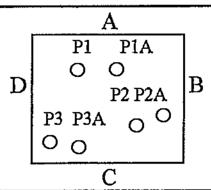
Probe No.: P2A

Contract No. :	GE/2009/03	**Date of Test:**	13-Aug-10
Works Order No. :	GE/2009/03.221	**Ground Level:**	+155.72 mPD
Project :	Ground Investigation - Urban (Term Contract), Agreement No. CE15/2009(GE), Landslip Prevention and Mitigation Programme 2009, Package A, Landslip Preventive Works on Government Slopes and Retaining Walls Hong Kong Island - Investigation, Design and Construction Feature No. 11SW-D/C1411 (Behind No.17, Bowen Road)	**Co-ordinates:** (Trial Pit)	E: 835443.99 N: 814946.13
Tested by:	S. W. Wong		
Supervised by:	Y. P. Leung		

Depth (m) (below G.L.)	blows /100mm	Depth (m) (below G.L.)	blows /100mm	Depth (m) (below G.L.)	blows /100mm
0.10	4	3.10		6.10	
0.20	8	3.20		6.20	
0.30	8	3.30		6.30	
0.40	9	3.40		6.40	
0.50	16	3.50		6.50	
0.56	100	3.60		6.60	
0.70		3.70		6.70	
0.80		3.80		6.80	
0.90		3.90		6.90	
1.00		4.00		7.00	
1.10		4.10		7.10	
1.20		4.20		7.20	
1.30		4.30		7.30	
1.40		4.40		7.40	
1.50		4.50		7.50	
1.60		4.60		7.60	
1.70		4.70		7.70	
1.80		4.80		7.80	
1.90		4.90		7.90	
2.00		5.00		8.00	
2.10		5.10		8.10	
2.20		5.20		8.20	
2.30		5.30		8.30	
2.40		5.40		8.40	
2.50		5.50		8.50	
2.60		5.60		8.60	
2.70		5.70		8.70	
2.80		5.80		8.80	
2.90		5.90		8.90	
3.00		6.00		9.00	



Probe Location Plan



Remarks: Pre-excavation GCO Probe

2nd attempt due to P2 terminated on refusal

Checked by: C. Lun

Date: 13-Aug-10

DGEL\Site-F10 03/02 STD

Pre GCOP

DRiLTECH

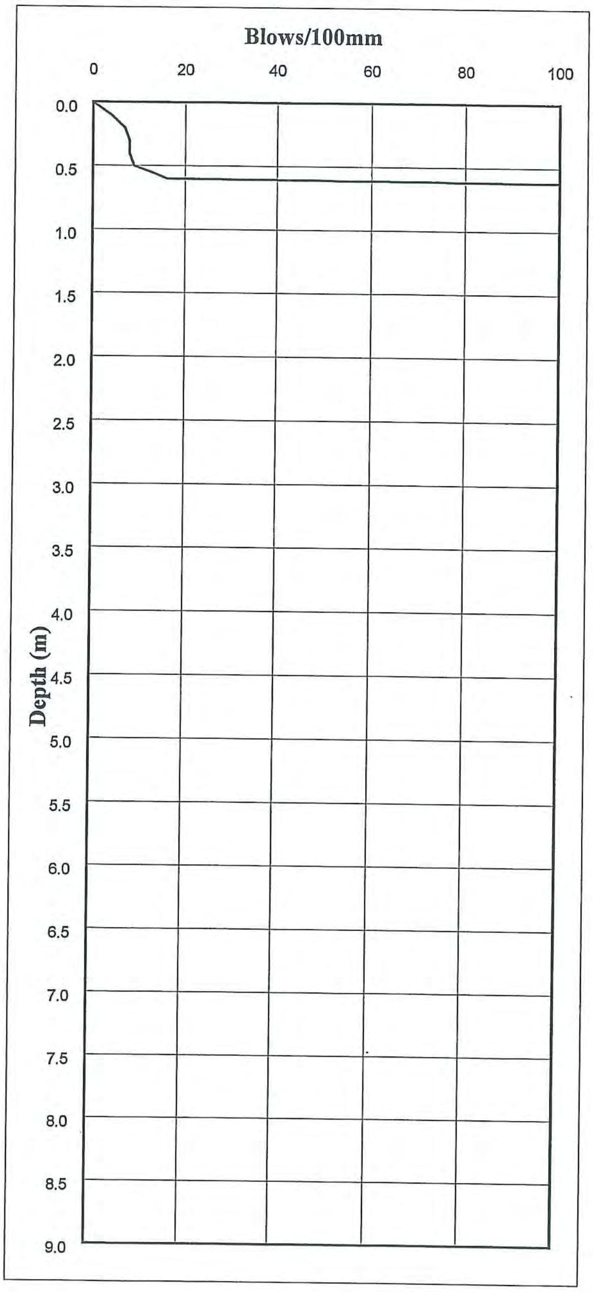
DYNAMIC PROBING TEST RECORD

Trial Pit No.: TP2

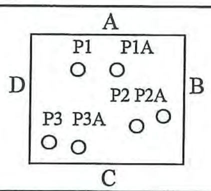
Probe No.: P3

Contract No. :	GE/2009/03	Date of Test:	13-Aug-10
Works Order No. :	GE/2009/03.221	Ground Level:	+155.72 mPD
Project :	Ground Investigation - Urban (Term Contract), Agreement No. CE15/2009(GE), Landslip Prevention and Mitigation Programme 2009, Package A, Landslip Preventive Works on Government Slopes and Retaining Walls Hong Kong Island - Investigation, Design and Construction Feature No. 11SW-D/C1411 (Behind No.17, Bowen Road)	Co-ordinates: (Trial Pit)	E: 835443.99 N: 814946.13
Tested by:	S. W. Wong		
Supervised by:	Y. P. Leung		

Depth (m) (below G.L.)	blows /100mm	Depth (m) (below G.L.)	blows /100mm	Depth (m) (below G.L.)	blows /100mm
0.10	4	3.10		6.10	
0.20	7	3.20		6.20	
0.30	8	3.30		6.30	
0.40	8	3.40		6.40	
0.50	9	3.50		6.50	
0.60	16	3.60		6.60	
0.62	100	3.70		6.70	
0.80		3.80		6.80	
0.90		3.90		6.90	
1.00		4.00		7.00	
1.10		4.10		7.10	
1.20		4.20		7.20	
1.30		4.30		7.30	
1.40		4.40		7.40	
1.50		4.50		7.50	
1.60		4.60		7.60	
1.70		4.70		7.70	
1.80		4.80		7.80	
1.90		4.90		7.90	
2.00		5.00		8.00	
2.10		5.10		8.10	
2.20		5.20		8.20	
2.30		5.30		8.30	
2.40		5.40		8.40	
2.50		5.50		8.50	
2.60		5.60		8.60	
2.70		5.70		8.70	
2.80		5.80		8.80	
2.90		5.90		8.90	
3.00		6.00		9.00	



Probe Location Plan



Remarks: Pre-excavation GCO Probe

P3 terminated on refusal

Checked by: C. Lun

Date: 13-Aug-10

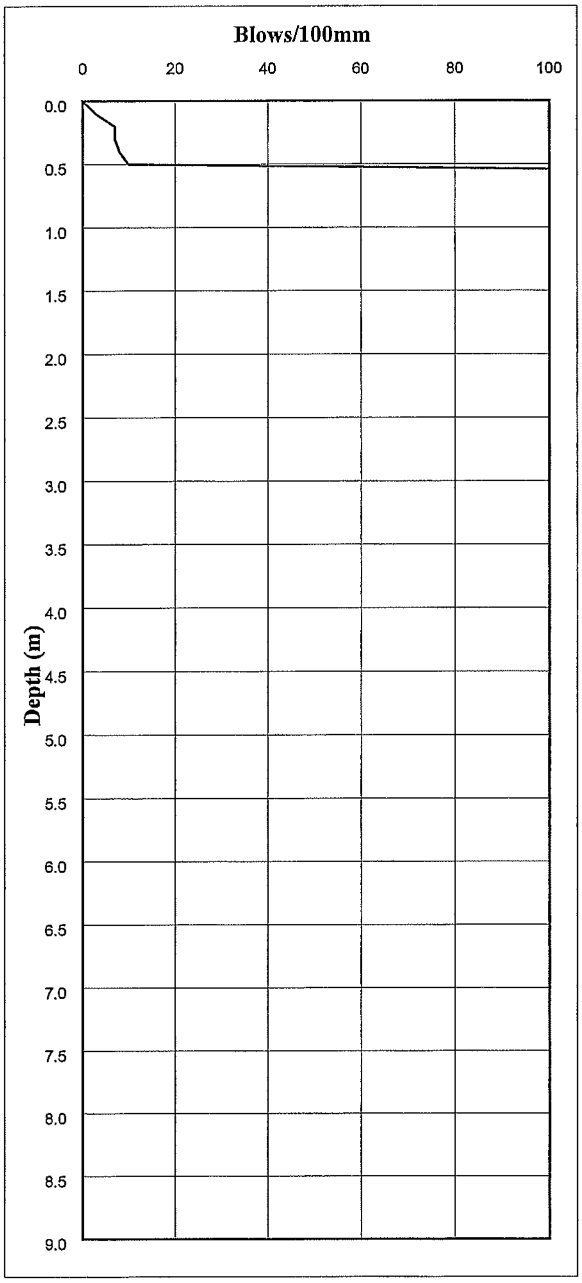
DGEL\Site-F10 03/02 STD

Pre GCOP

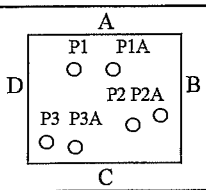
DRiLTECH	DYNAMIC PROBING TEST RECORD	Trial Pit No.: TP2 Probe No.: P3A

Contract No. :	GE/2009/03	**Date of Test:**	13-Aug-10
Works Order No. :	GE/2009/03.221	**Ground Level:**	+155.72 mPD
Project :	Ground Investigation - Urban (Term Contract), Agreement No. CE15/2009(GE), Landslip Prevention and Mitigation Programme 2009, Package A, Landslip Preventive Works on Government Slopes and Retaining Walls Hong Kong Island - Investigation, Design and Construction Feature No. 11SW-D/C1411 (Behind No.17, Bowen Road)	**Co-ordinates:** **(Trial Pit)**	E: 835443.99 N: 814946.13
Tested by:	S. W. Wong		
Supervised by:	Y. P. Leung		

Depth (m) (below G.L.)	blows /100mm	Depth (m) (below G.L.)	blows /100mm	Depth (m) (below G.L.)	blows /100mm
0.10	3	3.10		6.10	
0.20	7	3.20		6.20	
0.30	7	3.30		6.30	
0.40	8	3.40		6.40	
0.50	10	3.50		6.50	
0.54	100	3.60		6.60	
0.70		3.70		6.70	
0.80		3.80		6.80	
0.90		3.90		6.90	
1.00		4.00		7.00	
1.10		4.10		7.10	
1.20		4.20		7.20	
1.30		4.30		7.30	
1.40		4.40		7.40	
1.50		4.50		7.50	
1.60		4.60		7.60	
1.70		4.70		7.70	
1.80		4.80		7.80	
1.90		4.90		7.90	
2.00		5.00		8.00	
2.10		5.10		8.10	
2.20		5.20		8.20	
2.30		5.30		8.30	
2.40		5.40		8.40	
2.50		5.50		8.50	
2.60		5.60		8.60	
2.70		5.70		8.70	
2.80		5.80		8.80	
2.90		5.90		8.90	
3.00		6.00		9.00	



Probe Location Plan



Remarks: Pre-excavation GCO Probe

2nd attempt due to P3 terminated on refusal

Checked by: C. Lun

Date: 13-Aug-10

DGEL\Site-F10 03/02 STD

Pre GCOP

DRiLTECH

DYNAMIC PROBING TEST RECORD

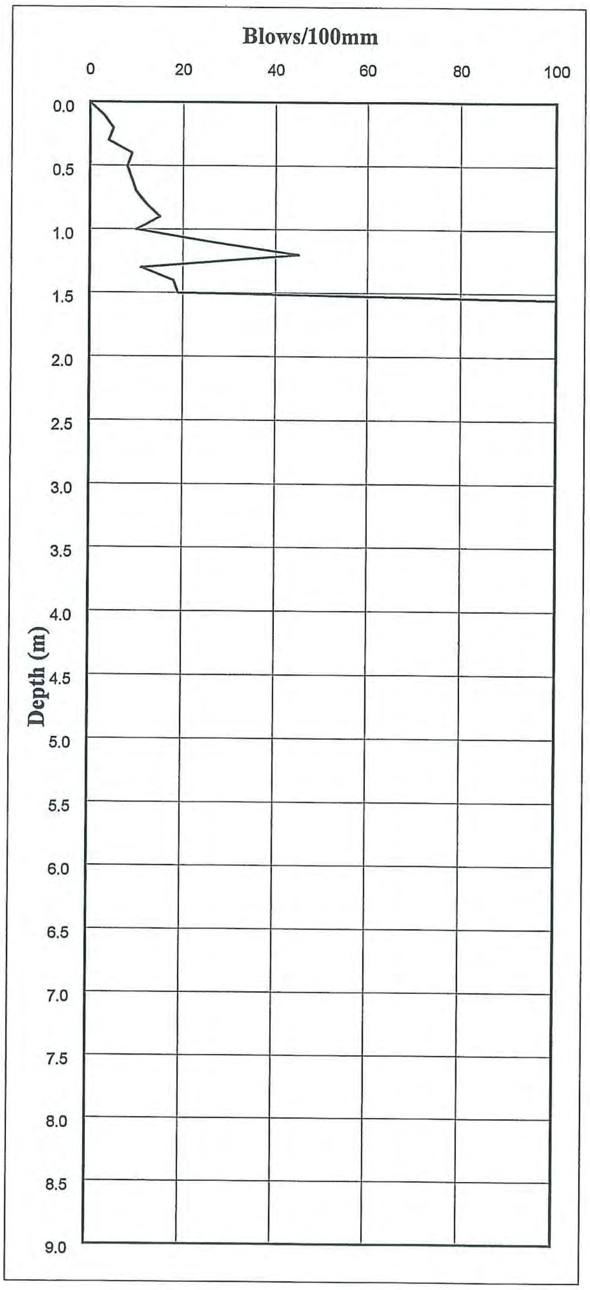
Trial Pit No.: TP3

Probe No.: P1

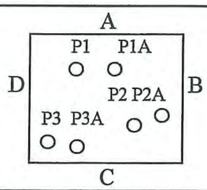
Contract No. :	GE/2009/03
Works Order No. :	GE/2009/03.221
Project :	Ground Investigation - Urban (Term Contract), Agreement No. CE15/2009(GE), Landslip Prevention and Mitigation Programme 2009, Package A, Landslip Preventive Works on Government Slopes and Retaining Walls Hong Kong Island - Investigation, Design and Construction Feature No. 11SW-D/C1411 (Behind No.17, Bowen Road)
Tested by:	S. W. Wong
Supervised by:	Y. P. Leung

Date of Test:	16-Aug-10
Ground Level:	+158.05 mPD
Co-ordinates: (Trial Pit)	E: 835450.14 N: 814946.77

Depth (m) (below G.L.)	blows /100mm	Depth (m) (below G.L.)	blows /100mm	Depth (m) (below G.L.)	blows /100mm
0.10	3	3.10		6.10	
0.20	5	3.20		6.20	
0.30	4	3.30		6.30	
0.40	9	3.40		6.40	
0.50	8	3.50		6.50	
0.60	9	3.60		6.60	
0.70	10	3.70		6.70	
0.80	12	3.80		6.80	
0.90	15	3.90		6.90	
1.00	10	4.00		7.00	
1.10	26	4.10		7.10	
1.20	45	4.20		7.20	
1.30	11	4.30		7.30	
1.40	18	4.40		7.40	
1.50	19	4.50		7.50	
1.55	100	4.60		7.60	
1.70		4.70		7.70	
1.80		4.80		7.80	
1.90		4.90		7.90	
2.00		5.00		8.00	
2.10		5.10		8.10	
2.20		5.20		8.20	
2.30		5.30		8.30	
2.40		5.40		8.40	
2.50		5.50		8.50	
2.60		5.60		8.60	
2.70		5.70		8.70	
2.80		5.80		8.80	
2.90		5.90		8.90	
3.00		6.00		9.00	



Probe Location Plan



Remarks: Pre-excavation GCO Probe

P1 terminated on refusal

Checked by: C. Lun

Date: 16-Aug-10

DGEL\Site-F10 03/02 STD

Pre GCOP

DRiLTECH

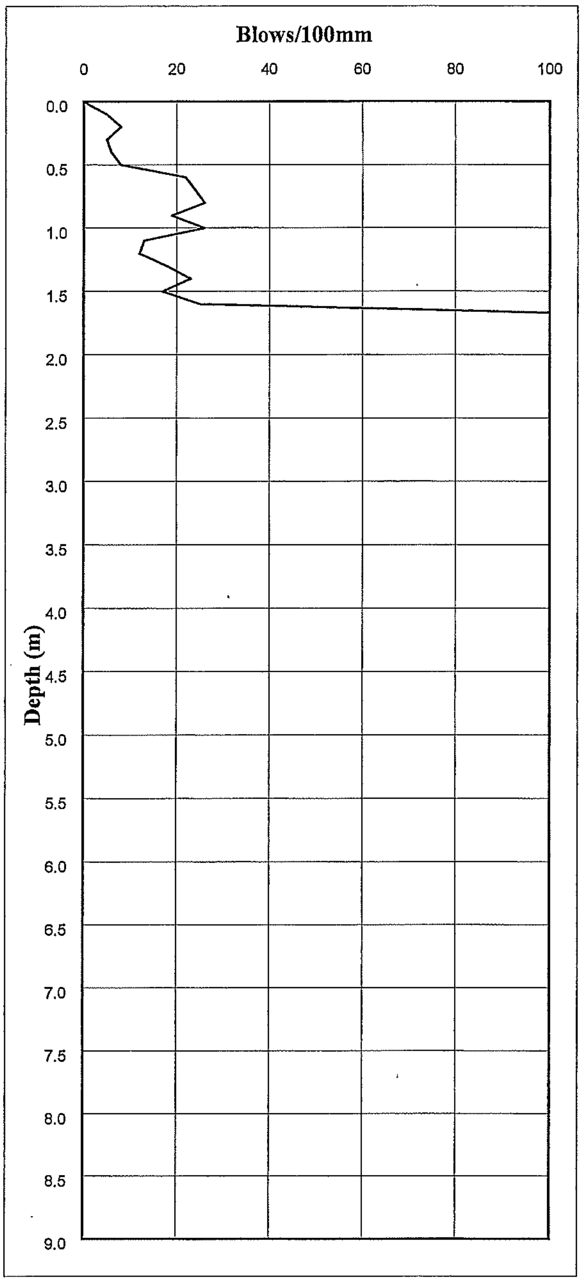
DYNAMIC PROBING TEST RECORD

Trial Pit No.: TP3

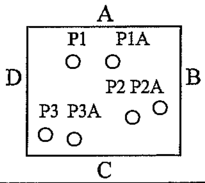
Probe No.: P1A

Contract No. :	GE/2009/03	**Date of Test:**	16-Aug-10
Works Order No. :	GE/2009/03.221	**Ground Level:**	+158.05 mPD
Project :	Ground Investigation - Urban (Term Contract), Agreement No. CE15/2009(GE), Landslip Prevention and Mitigation Programme 2009, Package A, Landslip Preventive Works on Government Slopes and Retaining Walls Hong Kong Island - Investigation, Design and Construction Feature No. 11SW-D/C1411 (Behind No.17, Bowen Road)	**Co-ordinates:** (Trial Pit)	E: 835450.14 N: 814946.77
Tested by:	S. W. Wong		
Supervised by:	Y. P. Leung		

Depth (m) (below G.L.)	blows /100mm	Depth (m) (below G.L.)	blows /100mm	Depth (m) (below G.L.)	blows /100mm
0.10	5	3.10		6.10	
0.20	8	3.20		6.20	
0.30	5	3.30		6.30	
0.40	6	3.40		6.40	
0.50	8	3.50		6.50	
0.60	22	3.60		6.60	
0.70	24	3.70		6.70	
0.80	26	3.80		6.80	
0.90	19	3.90		6.90	
1.00	26	4.00		7.00	
1.10	13	4.10		7.10	
1.20	12	4.20		7.20	
1.30	18	4.30		7.30	
1.40	23	4.40		7.40	
1.50	17	4.50		7.50	
1.60	25	4.60		7.60	
1.67	100	4.70		7.70	
1.80		4.80		7.80	
1.90		4.90		7.90	
2.00		5.00		8.00	
2.10		5.10		8.10	
2.20		5.20		8.20	
2.30		5.30		8.30	
2.40		5.40		8.40	
2.50		5.50		8.50	
2.60		5.60		8.60	
2.70		5.70		8.70	
2.80		5.80		8.80	
2.90		5.90		8.90	
3.00		6.00		9.00	



Probe Location Plan



Remarks: Pre-excavation GCO Probe

2nd attempt due to P1 terminated on refusal

Checked by: C. Lun

Date: 16-Aug-10

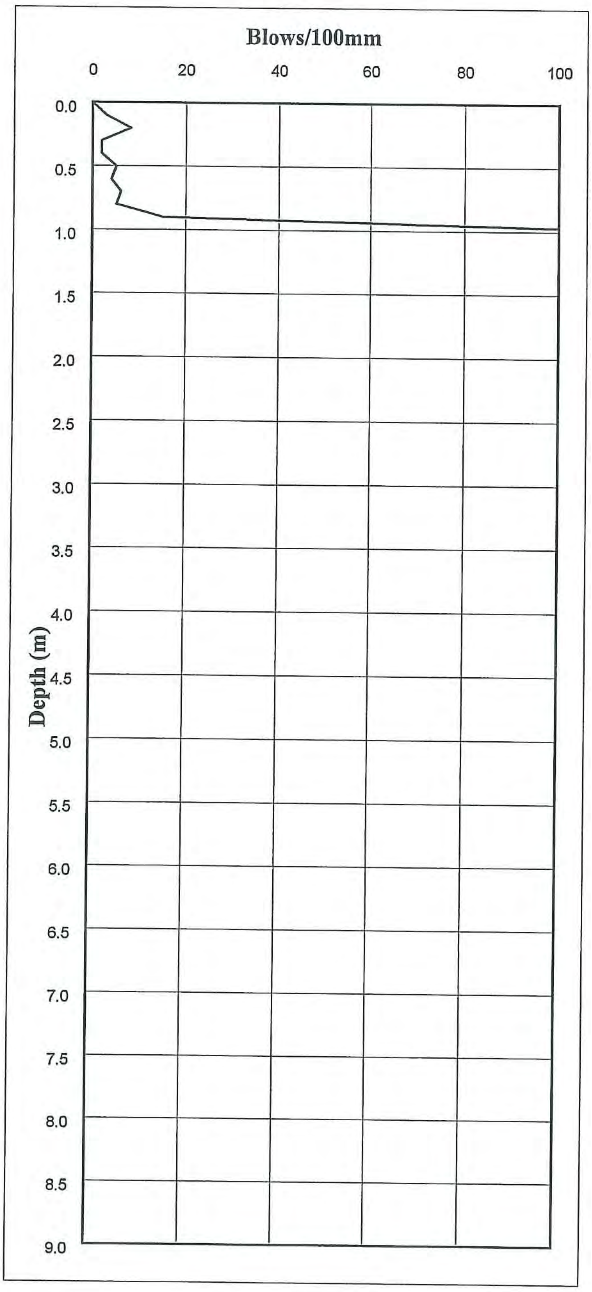
DGEL\Site-F10 03/02 STD

Pre GCOP

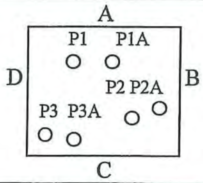
DRiLTECH	DYNAMIC PROBING TEST RECORD	Trial Pit No.: TP3
		Probe No.: P2

Contract No. :	GE/2009/03	Date of Test:	16-Aug-10
Works Order No. :	GE/2009/03.221	Ground Level:	+158.05 mPD
Project :	Ground Investigation - Urban (Term Contract), Agreement No. CE15/2009(GE), Landslip Prevention and Mitigation Programme 2009, Package A, Landslip Preventive Works on Government Slopes and Retaining Walls Hong Kong Island - Investigation, Design and Construction Feature No. 11SW-D/C1411 (Behind No.17, Bowen Road)	Co-ordinates: (Trial Pit)	E: 835450.14 N: 814946.77
Tested by:	S. W. Wong		
Supervised by:	Y. P. Leung		

Depth (m) (below G.L.)	blows /100mm	Depth (m) (below G.L.)	blows /100mm	Depth (m) (below G.L.)	blows /100mm
0.10	3	3.10		6.10	
0.20	8	3.20		6.20	
0.30	2	3.30		6.30	
0.40	2	3.40		6.40	
0.50	5	3.50		6.50	
0.60	4	3.60		6.60	
0.70	6	3.70		6.70	
0.80	5	3.80		6.80	
0.90	15	3.90		6.90	
0.97	100	4.00		7.00	
1.10		4.10		7.10	
1.20		4.20		7.20	
1.30		4.30		7.30	
1.40		4.40		7.40	
1.50		4.50		7.50	
1.60		4.60		7.60	
1.70		4.70		7.70	
1.80		4.80		7.80	
1.90		4.90		7.90	
2.00		5.00		8.00	
2.10		5.10		8.10	
2.20		5.20		8.20	
2.30		5.30		8.30	
2.40		5.40		8.40	
2.50		5.50		8.50	
2.60		5.60		8.60	
2.70		5.70		8.70	
2.80		5.80		8.80	
2.90		5.90		8.90	
3.00		6.00		9.00	



Probe Location Plan



Remarks: Pre-excavation GCO Probe

P2 terminated on refusal

Checked by: C. Lun

Date: 16-Aug-10

DGEL\Site-F10 03/02 STD

Pre GCOP

DRiLTECH

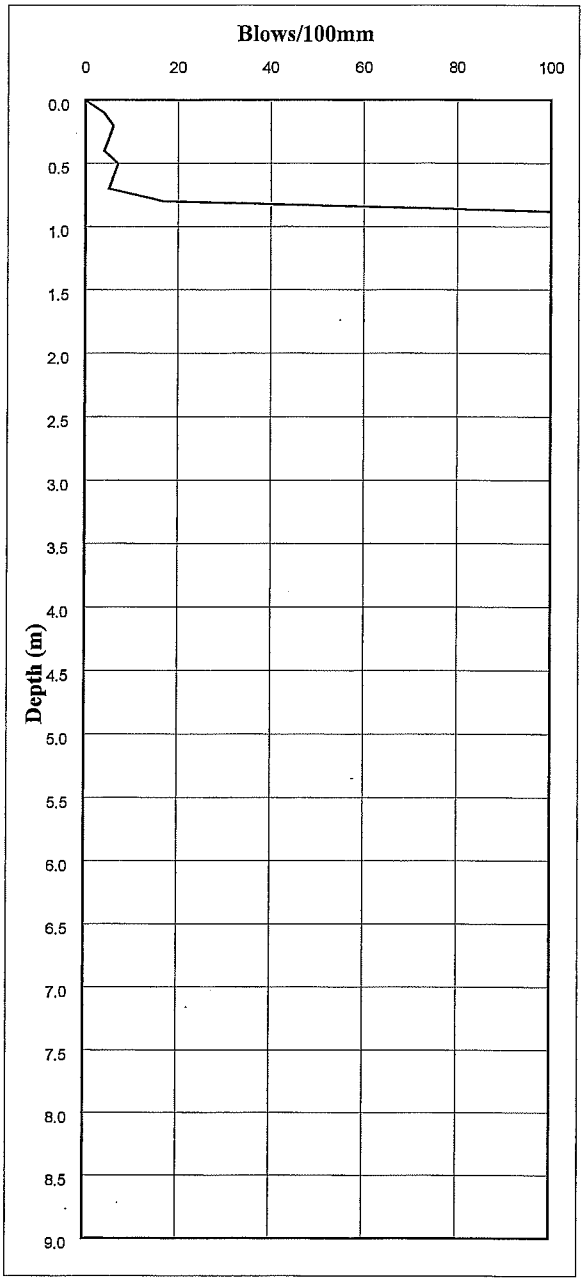
DYNAMIC PROBING TEST RECORD

Trial Pit No.: TP3

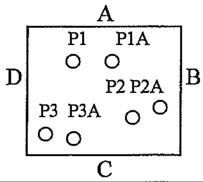
Probe No.: P2A

Contract No. :	GE/2009/03	**Date of Test:**	16-Aug-10
Works Order No. :	GE/2009/03.221	**Ground Level:**	+158.05 mPD
Project :	Ground Investigation - Urban (Term Contract), Agreement No. CE15/2009(GE), Landslip Prevention and Mitigation Programme 2009, Package A, Landslip Preventive Works on Government Slopes and Retaining Walls Hong Kong Island - Investigation, Design and Construction Feature No. 11SW-D/C1411 (Behind No.17, Bowen Road)	**Co-ordinates:** (Trial Pit)	E: 835450.14 N: 814946.77
Tested by:	S. W. Wong		
Supervised by:	Y. P. Leung		

Depth (m) (below G.L.)	blows /100mm	Depth (m) (below G.L.)	blows /100mm	Depth (m) (below G.L.)	blows /100mm
0.10	4	3.10		6.10	
0.20	6	3.20		6.20	
0.30	5	3.30		6.30	
0.40	4	3.40		6.40	
0.50	7	3.50		6.50	
0.60	6	3.60		6.60	
0.70	5	3.70		6.70	
0.80	17	3.80		6.80	
0.88	100	3.90		6.90	
1.00		4.00		7.00	
1.10		4.10		7.10	
1.20		4.20		7.20	
1.30		4.30		7.30	
1.40		4.40		7.40	
1.50		4.50		7.50	
1.60		4.60		7.60	
1.70		4.70		7.70	
1.80		4.80		7.80	
1.90		4.90		7.90	
2.00		5.00		8.00	
2.10		5.10		8.10	
2.20		5.20		8.20	
2.30		5.30		8.30	
2.40		5.40		8.40	
2.50		5.50		8.50	
2.60		5.60		8.60	
2.70		5.70		8.70	
2.80		5.80		8.80	
2.90		5.90		8.90	
3.00		6.00		9.00	



Probe Location Plan



Remarks: Pre-excavation GCO Probe

2nd attempt due to P2 terminated on refusal

Checked by: C. Lun

Date: 16-Aug-10

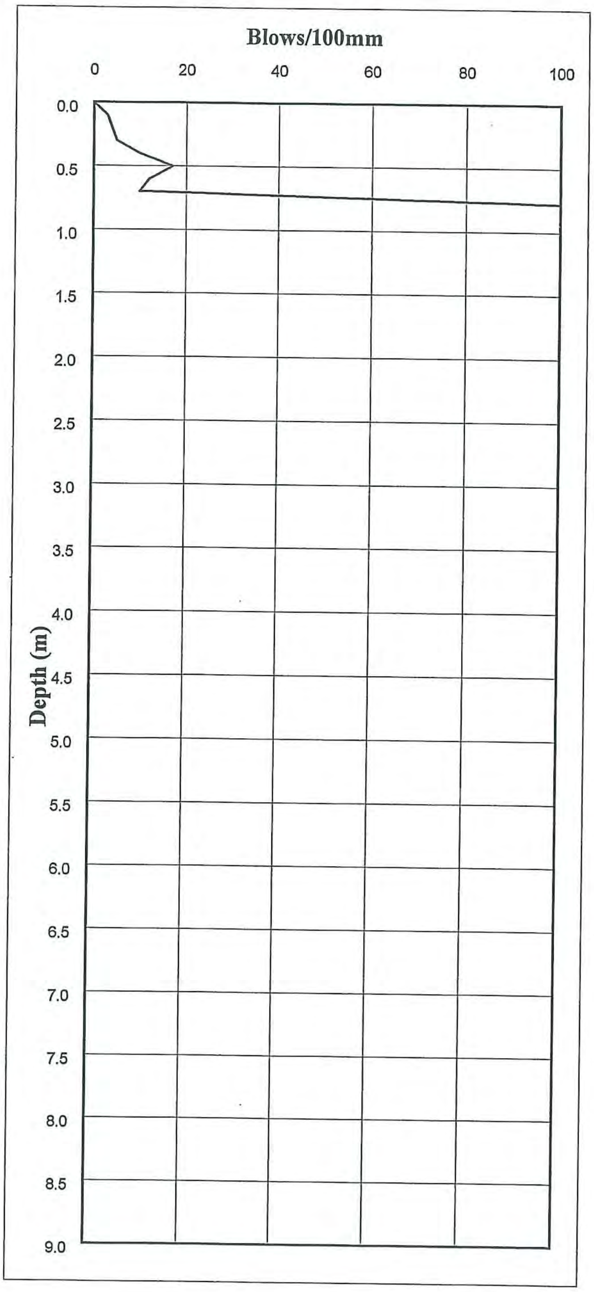
DGEL\Site-F10 03/02 STD

Pre GCOP

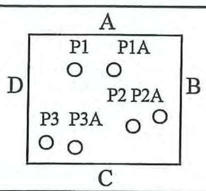
DRiLTECH	DYNAMIC PROBING TEST RECORD	Trial Pit No.: TP3
		Probe No.: P3

Contract No. :	GE/2009/03	Date of Test:	16-Aug-10
Works Order No. :	GE/2009/03.221	Ground Level:	+158.05 mPD
Project :	Ground Investigation - Urban (Term Contract), Agreement No. CE15/2009(GE), Landslip Prevention and Mitigation Programme 2009, Package A, Landslip Preventive Works on Government Slopes and Retaining Walls Hong Kong Island - Investigation, Design and Construction Feature No. 11SW-D/C1411 (Behind No.17, Bowen Road)	Co-ordinates: (Trial Pit)	E: 835450.14 N: 814946.77
Tested by:	S. W. Wong		
Supervised by:	Y. P. Leung		

Depth (m) (below G.L.)	blows /100mm	Depth (m) (below G.L.)	blows /100mm	Depth (m) (below G.L.)	blows /100mm
0.10	3	3.10		6.10	
0.20	4	3.20		6.20	
0.30	5	3.30		6.30	
0.40	10	3.40		6.40	
0.50	17	3.50		6.50	
0.60	12	3.60		6.60	
0.70	10	3.70		6.70	
0.78	100	3.80		6.80	
0.90		3.90		6.90	
1.00		4.00		7.00	
1.10		4.10		7.10	
1.20		4.20		7.20	
1.30		4.30		7.30	
1.40		4.40		7.40	
1.50		4.50		7.50	
1.60		4.60		7.60	
1.70		4.70		7.70	
1.80		4.80		7.80	
1.90		4.90		7.90	
2.00		5.00		8.00	
2.10		5.10		8.10	
2.20		5.20		8.20	
2.30		5.30		8.30	
2.40		5.40		8.40	
2.50		5.50		8.50	
2.60		5.60		8.60	
2.70		5.70		8.70	
2.80		5.80		8.80	
2.90		5.90		8.90	
3.00		6.00		9.00	



Probe Location Plan



Remarks: Pre-excavation GCO Probe

P3 terminated on refusal

Checked by: C. Lun

Date: 16-Aug-10

DGEL\Site-F10 03/02 STD

Pre GCOP

DRiLTECH

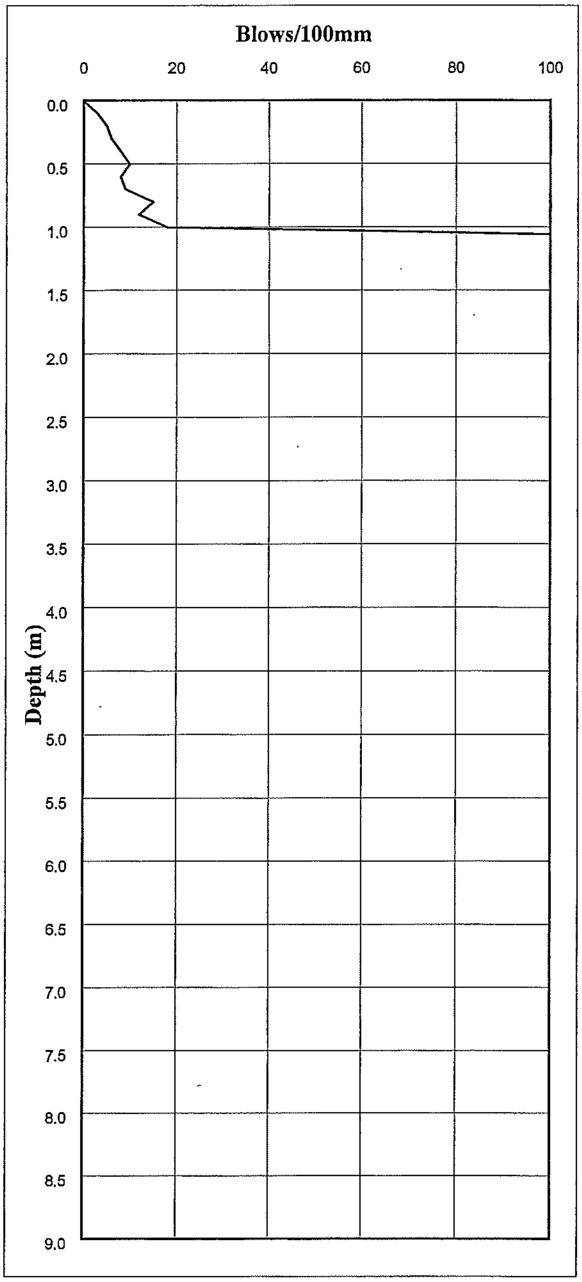
DYNAMIC PROBING TEST RECORD

Trial Pit No.: TP3

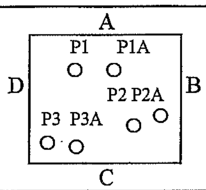
Probe No.: P3A

Contract No. :	GE/2009/03	**Date of Test:**	16-Aug-10
Works Order No. :	GE/2009/03.221	**Ground Level:**	+158.05 mPD
Project :	Ground Investigation - Urban (Term Contract), Agreement No. CE15/2009(GE), Landslip Prevention and Mitigation Programme 2009, Package A, Landslip Preventive Works on Government Slopes and Retaining Walls Hong Kong Island - Investigation, Design and Construction Feature No. 11SW-D/C1411 (Behind No.17, Bowen Road)	**Co-ordinates:** (Trial Pit)	E: 835450.14 N: 814946.77
Tested by:	S. W. Wong		
Supervised by:	Y. P. Leung		

Depth (m) (below G.L.)	blows /100mm	Depth (m) (below G.L.)	blows /100mm	Depth (m) (below G.L.)	blows /100mm
0.10	3	3.10		6.10	
0.20	5	3.20		6.20	
0.30	6	3.30		6.30	
0.40	8	3.40		6.40	
0.50	10	3.50		6.50	
0.60	8	3.60		6.60	
0.70	9	3.70		6.70	
0.80	15	3.80		6.80	
0.90	12	3.90		6.90	
1.00	18	4.00		7.00	
1.06	100	4.10		7.10	
1.20		4.20		7.20	
1.30		4.30		7.30	
1.40		4.40		7.40	
1.50		4.50		7.50	
1.60		4.60		7.60	
1.70		4.70		7.70	
1.80		4.80		7.80	
1.90		4.90		7.90	
2.00		5.00		8.00	
2.10		5.10		8.10	
2.20		5.20		8.20	
2.30		5.30		8.30	
2.40		5.40		8.40	
2.50		5.50		8.50	
2.60		5.60		8.60	
2.70		5.70		8.70	
2.80		5.80		8.80	
2.90		5.90		8.90	
3.00		6.00		9.00	



Probe Location Plan



Remarks: Pre-excavation GCO Probe

2nd attempt due to P3 terminated on refusal

Checked by: C. Lun

Date: 16-Aug-10

DGEL\Site-F10 03/02 STD

Pre GCOP

Appendix F

Digital Data Record
(AGS and PDF in CD-ROM)

DRiLTECH

Media Index Record

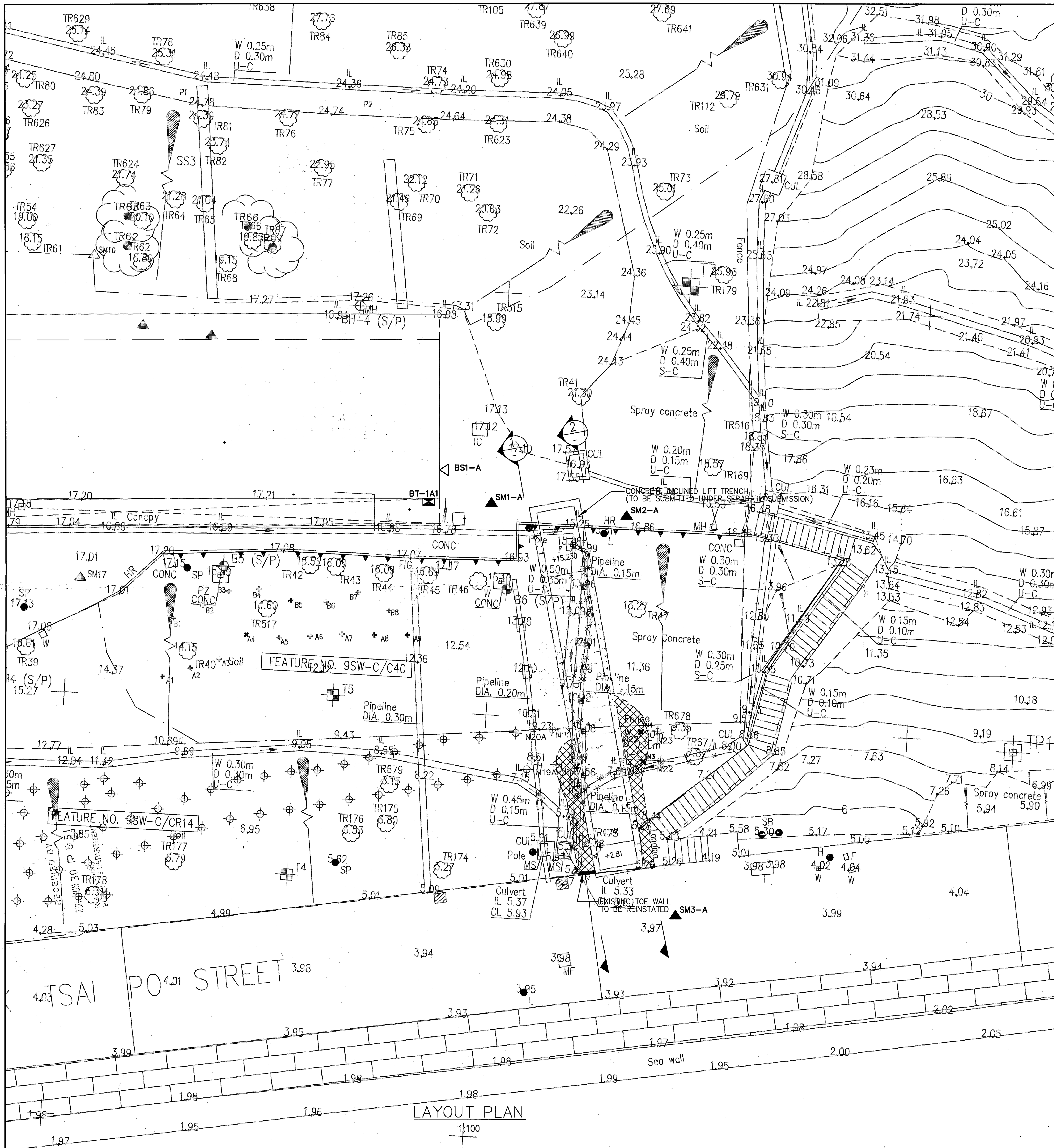
Project Identification	**D-419**
Project Name	**Ground Investigation - Urban (Term Contract) Agreement No. CE 15/2009(GE), Landslip Prevention and Mitigation Programme 2009, Package A, Landslip Preventive Works on Government Slopes and Retaining Walls, Hong Kong Island - Investigation, Design and Construction. Feature No. 11SW-D/C1411 (Behind No. 17, Bowen Road)**
Works Order No.	**GE/2009/03.221**
Location	Bowen Road
Client	**Geotechnical Engineering Office, Civil Engineering and Development Department**
From	**DrilTech Ground Engineering Ltd.**

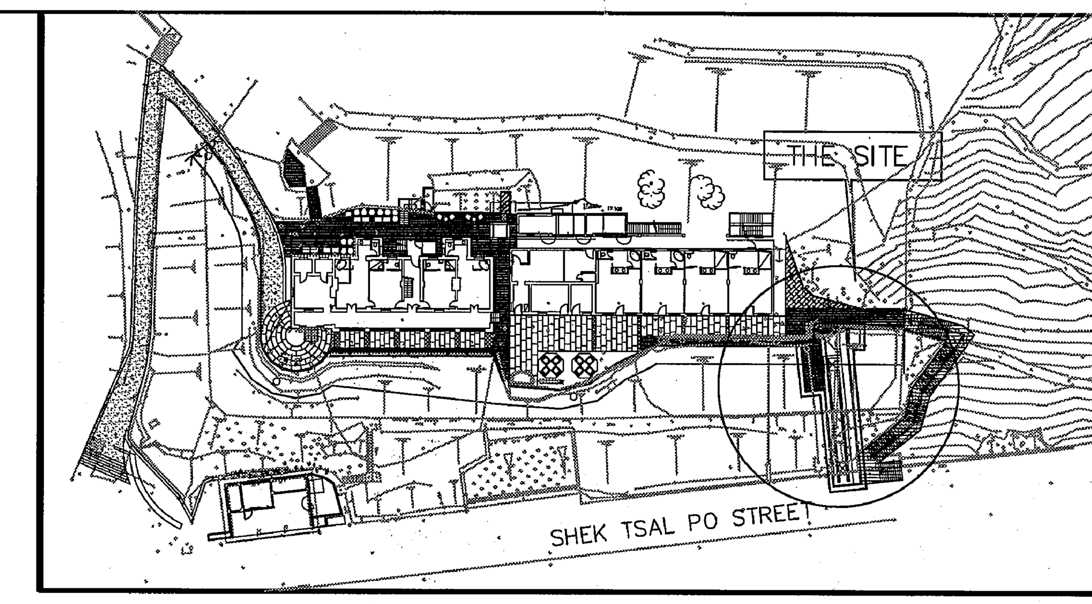
Issue Sequence Number	**Date of Issue**	**Issued To**		**General Notes**
D419_GE200903.221.00	22-Sep-10	Geotechnical Engineering Office, Civil Engineering and Development Department		
File Name	**Creation Date**	**Creation Time**	**File Size in Bytes**	**General Description of Data Transferred**
GE200903.221.ags	21-Sep-10	18:12	11KB	Digital Data in AGS Format for Final Factual Fieldwork Report
GE200903.221.pdf	22-Sep-10	9:47	21,784KB	Digital Data in PDF Format for Final Factual Fieldwork Report
Photographs_03.221.jpg	22-Sep-10	9:43	47MB	Digital Data in JPG Format for Final Factual Fieldwork Report
Individual Investigation Stations.pdf	22-Sep-10	9:59	8MB	Digital Data in PDF Format for Final Factual Fieldwork Report

Appendix 07

Reference Drawings for Similar Development

(Tai O Heritage Hotel)





LOCATION PLAN

N.T.S.

SOIL NAIL PULL OUT TEST SCHEDULE

FEATURE NO.	TEST NAIL NO.	NAILS DIAMETER (mm)	LEVEL (mPD)	DRILLHOLE DIAMETER (mm)	TOTAL LENGTH (m)	GROUT LENGTH (m)	DIPPINC ANGLE (DEGREES)	Ta (kN)	TDL1 (kN)	TDL2 (kN)	Tp (kN)
9SW-C/CR14	TN3	25	+7.5	100	10.0	2.0	15	4	19	38	76
	TN4	25	+9.0	100	10.0	2.0	15	4	20	40	80

SOIL NAIL SCHEDULE

FEATURE NO.	SOIL NAIL NO.	NAILS DIAMETER (mm)	TENTATIVE LEVEL (mPD)	TENTATIVE NOS. OF NAILS	TOTAL LENGTH (m)	DIPPING ANGLE (DEGREES)		DRILLHOLE DIAMETER (mm)	ALLOWABLE STABILIZING FORCE (kN m)	NAIL HEAD SIZE (mmXmm)
9SW-C/CR14	M19A	25	+7.5	2	10.0	15		150	45	600X600X250
	M21	25	+7.5	2	10.0	15		150	45	
	N20A	25	+9.0	2	10.0	15		150	45	
	N22	25	+9.0	2	10.0	15		150	45	

HORIZONTAL SPACING BETWEEN PROPOSED & EXISTING SOIL NAILS SHALL BE NOT GREATER THAN 1.5m.

BD Reference No. :

LEGEND:

- SITE BOUNDARY
- SLOPE FEATURE BOUNDARY
- BH-1 EXISTING BOREHOLES (BY LAMS GEOTECHNICS LTD. 1984)
- DH/14/1 EXISTING BOREHOLES (BY LAMS GEOTECHNICS LTD. 2001)
- B1 EXISTING BOREHOLES (BY TYSAN FOUNDATION LTD. 2008)
- T1 EXISTING TRIAL PITS (BY TYSAN FOUNDATION LTD. 2008)
- SS1 EXISTING SLOPE STRIPPING (BY LAMS GEOTECHNICS LTD. 1985)
- SS1/14/1 EXISTING SLOPE STRIPPING (BY LAMS GEOTECHNICS LTD. 2001)
- AS-BUILT SOIL NAIL
- SOIL NAIL TO BE CONSTRUCTED UNDER ARCH.S.D. AGREEMENT NO. ASD/PSB/PM1/PM3/03/08
- TO BE BACKFILL WITH NO-FINE CONCRETE
- SM1 SETTLEMENT MARKERS
- BT1 TILTING MARKER
- BS1 BUILDING SETTLEMENT MARKER
- TN3 PROPOSED PULL-OUT TEST NAILS (TN3, TN4)
- N22 PROPOSED SOIL NAIL (N20A, N22, M19A, M21)
- EXISTING TOE WALL TO BE REINSTATED

Plan Approved

CHAN Yuen-ming, Mary

Senior Building Surveyor for BUILDING AUTHORITY

2 5 AUG 2011

Yung Hun Tat, Arthur

Registered Structural Engineer

CHAN Henry

Registered Geotechnical Engineer

RGE 12/05

Rev.	Stat.	Description	Date	By	Chk.	Ver'd
B	IFS	BD SUBMISSION	06/11	RC	ML	MN
A	IFT	GENERAL REVISION	03/11	ML	MN	MN
–	IFT	TENDER DRAWING	10/10	ML	MN	MN

Revisions

ESA CONSULTING ENGINEERS LTD

Civil . Structural . Geotechnical . Environmental

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Authorized Person / Registered Structural Engineer :

MAK CHI CHEUNG, PETER

BArch., BAAS, FHKIA, RIBA, ARAIA

REGISTERED ARCHITECT, AP(List 1)

Project :

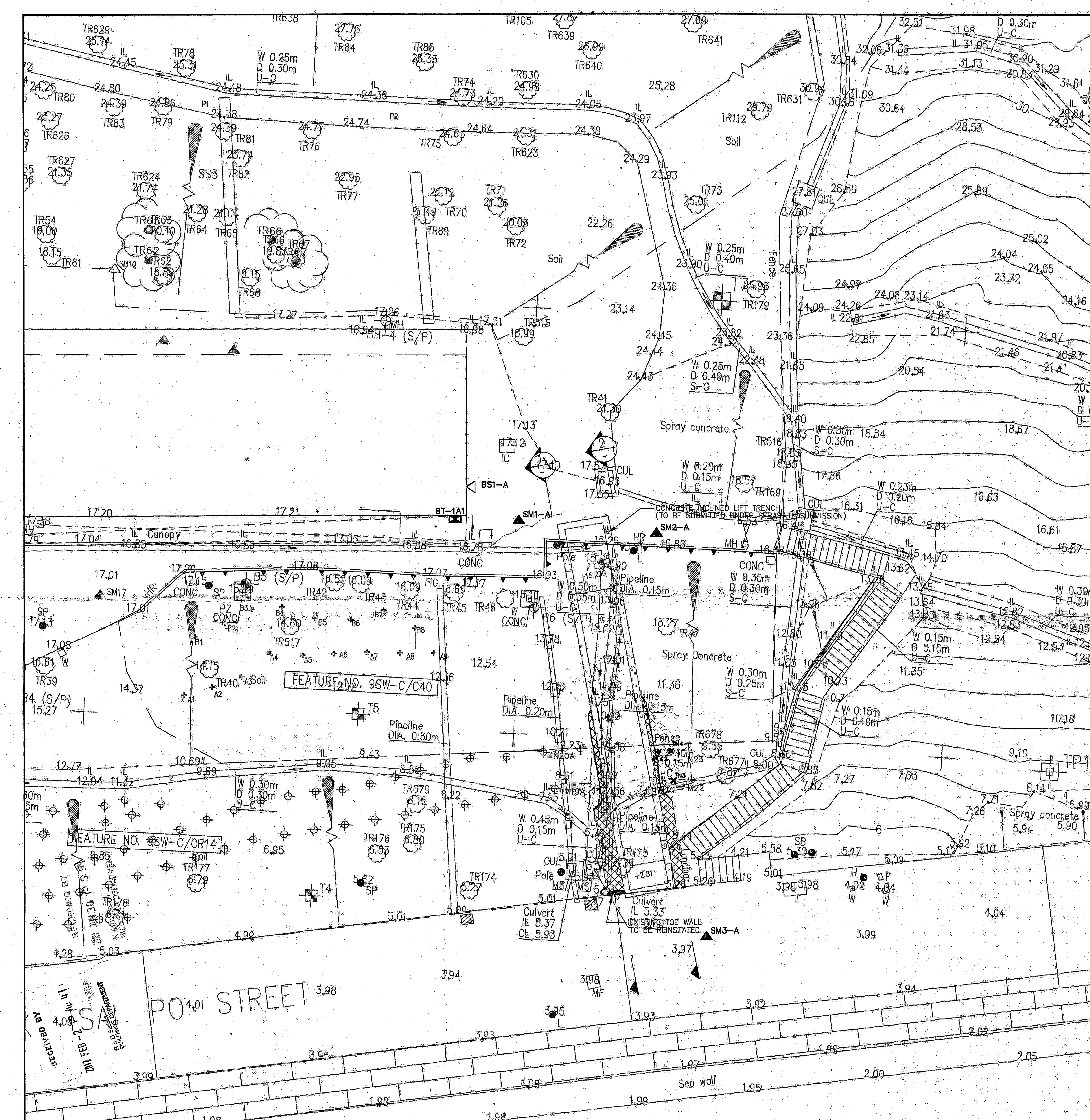
REVITALISATION SCHEME CONVERSION OF OLD TAI O POLICE STATION INTO TAI O HERITAGE HOTEL

Drawing Title :

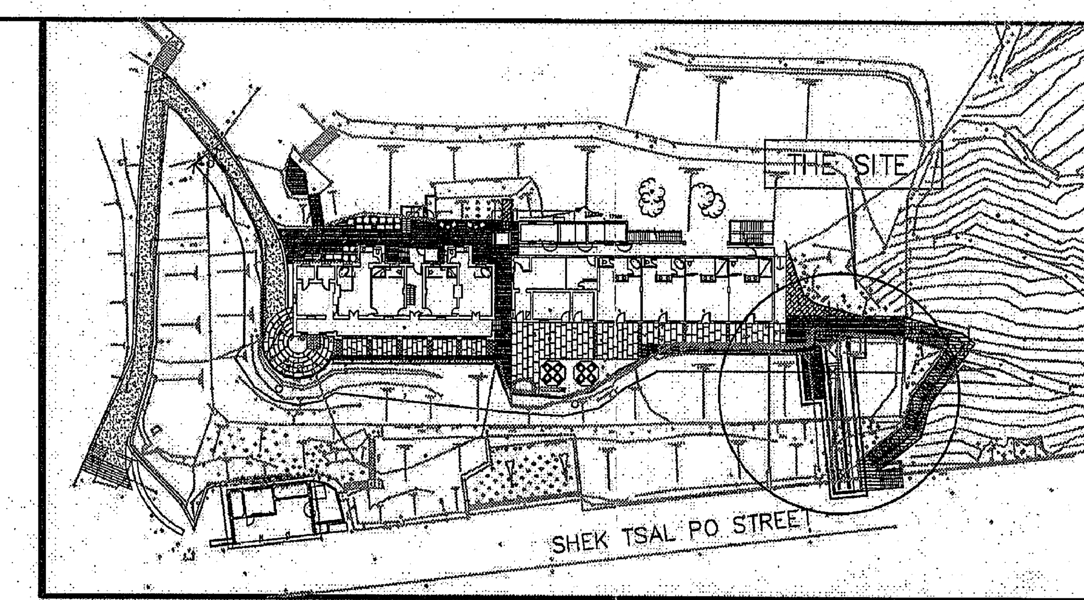
SITE FORMATION LAYOUT PLAN (INCLINED LIFT)

Drawn :	LC	Date :	10/10	Job No. :	091427
Checked :	ML	Date :	10/10	Cad File :	091427_SF01B
Approved :	MN	Date :	10/10	Scale :	AS SHOWN

Drawing No. : 091427/SF01 Rev. B



LAYOUT PLAN
1:100



LOCATION PLAN
N.T.S.

SOIL NAIL PULL OUT TEST SCHEDULE

FEATURE NO.	TEST NAIL NO.	NAILS DIAMETER (mm)	LEVEL (mPD)	DRILLHOLE DIAMETER (mm)	~~TOTAL~~ LENGTH (m)	GROUT LENGTH (m)	DIPPING ANGLE (DEGREES)	Ta (kN)	TDL1 (kN)	TDL2 (kN)	Tp (kN)
9SW-C/CR14	TN3	25	+7.5	100	10.0	2.0	15	4	19	38	76
	TN4	25	+9.0	100	10.0	2.0	15	4	20	40	80

SOIL NAIL SCHEDULE

FEATURE NO.	SOIL NAIL NO.	NAILS DIAMETER (mm)	TENTATIVE LEVEL (mPD)	TENTATIVE NOS. OF NAILS	~~TOTAL~~ LENGTH (m)	DIPPING ANGLE (DEGREES)		DRILLHOLE DIAMETER (mm)	ALLOWABLE STABILIZING FORCE (kN)	NAIL HEAD SIZE (mmXmm)
9SW-C/CR14	M19A	25	+7.5	2	10.0	15		150	45	600X600X250
	M21	25	+7.5	2	10.0	15		150	45	
	N20A	25	+9.0	2	10.0	15		150	45	
	N22	25	+9.0	2	10.0	15		150	45	

HORIZONTAL SPACING BETWEEN PROPOSED & EXISTING SOIL NAILS SHALL BE NOT GREATER THAN 1.5m.

Yung Hun Tat, Arthur
BSc MSc DIC FIStructE FHKIE FICE
Registered Structural Engineer

Plan Approved
CHAN Yuen-ming, Mary
Senior Building Surveyor
for BUILDING AUTHORITY
2 5 AUG 2011

Yung Hun Tat, Arthur
BSc MSc DIC FIStructE FHKIE FICE
Registered Structural Engineer

CHAN Henry
Registered Geotechnical Engineer
RGE 12/05

CHAN Henry
Registered Geotechnical Engineer
RGE 12/05

BD Reference No. :

LEGEND:

SITE BOUNDARY
SLOPE FEATURE BOUNDARY
BH-1 EXISTING BOREHOLES (BY LAMS GEOTECHNICS LTD. 1984)
DH/14/1 EXISTING BOREHOLES (BY LAMS GEOTECHNICS LTD. 2001)
B1 EXISTING BOREHOLES (BY TYSAN FOUNDATION LTD. 2008)
T1 EXISTING TRIAL PITS (BY TYSAN FOUNDATION LTD. 2008)
SS1 EXISTING SLOPE STRIPPING (BY LAMS GEOTECHNICS LTD. 1985)
SS1/14/1 EXISTING SLOPE STRIPPING (BY LAMS GEOTECHNICS LTD. 2001)
AS-BUILT SOIL NAIL
SOIL NAIL TO BE CONSTRUCTED UNDER ARCH.S.D. AGREEMENT NO. ASD/PSB/PM1/PM3/03/08
TO BE BACKFILL WITH NO-FINE CONCRETE
SM1 SETTLEMENT MARKERS
BT1 TILTING MARKER
BS1 BUILDING SETTLEMENT MARKER
TN3 PROPOSED PULL-OUT TEST NAILS (TN3, TN4)
N22 PROPOSED SOIL NAIL (N20A, N22, M19A, M21)
EXISTING TOE WALL TO BE REINSTATED

MAK CHI CHEUNG, PETER
BArch., BAAS, FHKIA, RIBA, ARAIA
REGISTERED ARCHITECT, AP(List 1)

Plan Approved
Senior Building Surveyor
for BUILDING AUTHORITY
AUG 2011
CANCELLED

AS-BUILT RECORD PLAN

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Authorized Person / Registered Structural Engineer :

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REGISTERED ARCHITECT, AP(List 1)

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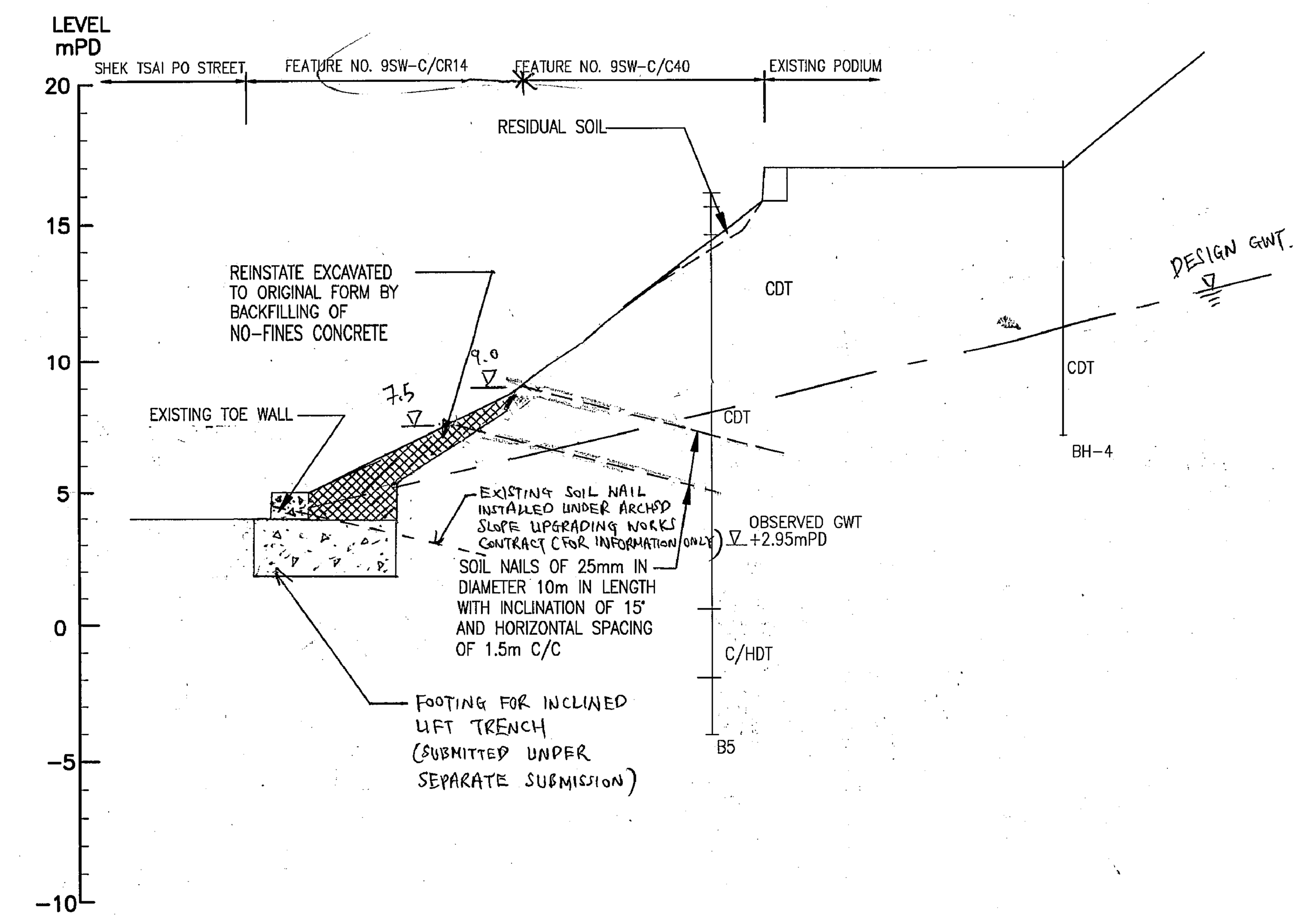

SECTION 1-1
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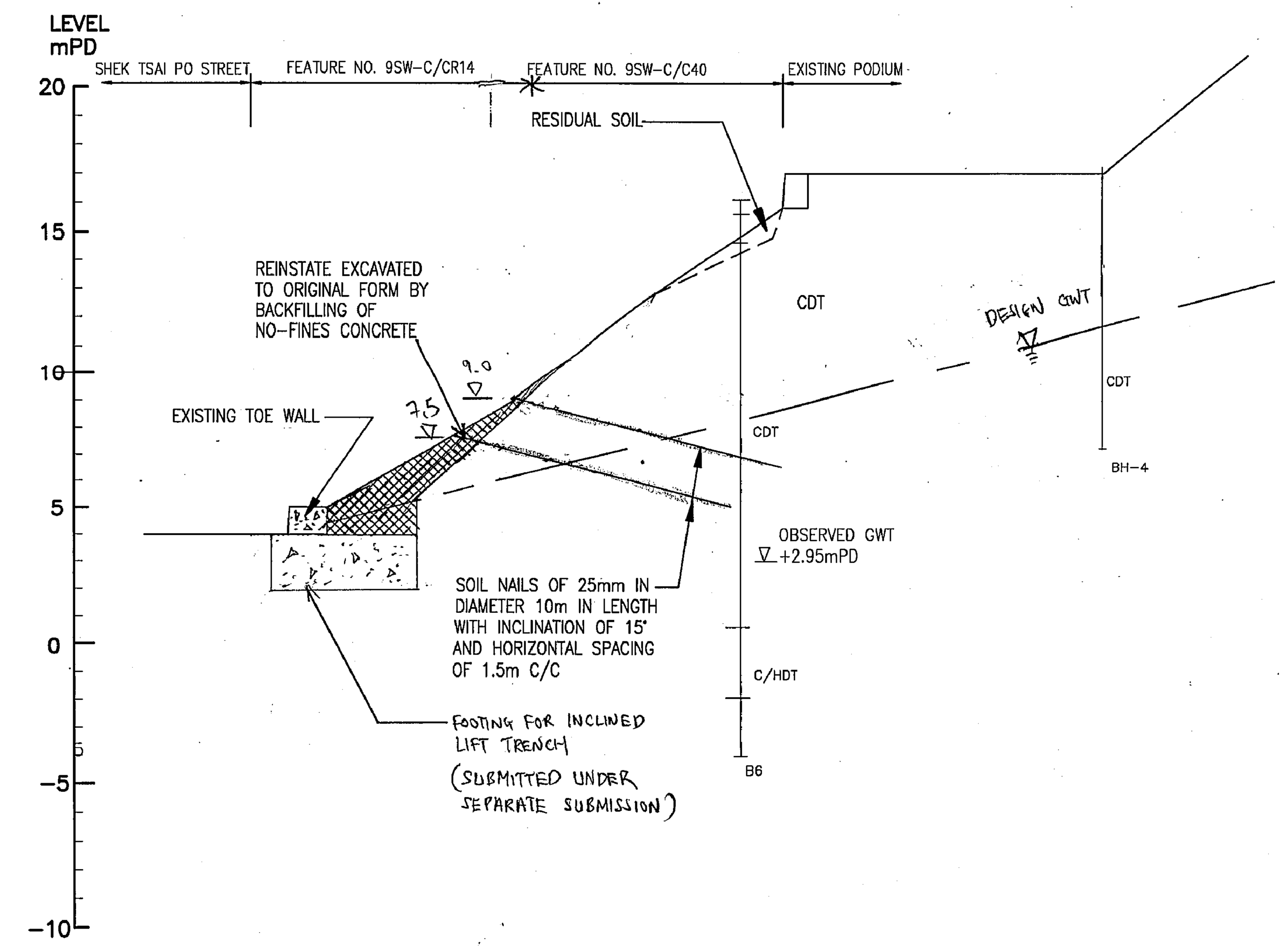


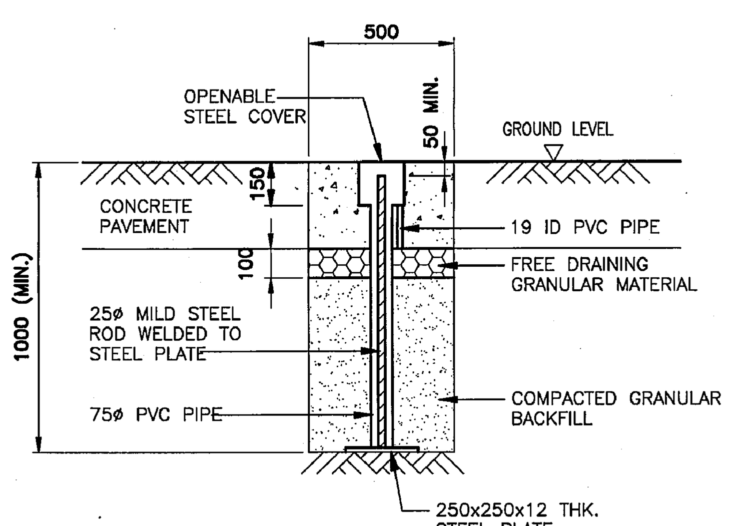
SECTION 2-2
1:200

LEGEND:

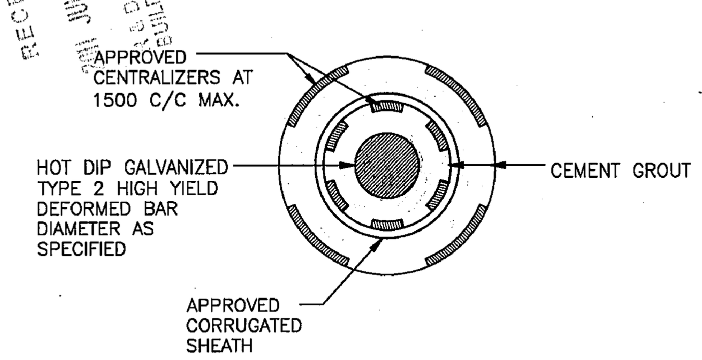
——— SOIL NAIL

– – – SOIL NAIL LOCATION (REFER DRAWING NO. 091427/SF01 FOR LOCATION OF SOIL NAILS).

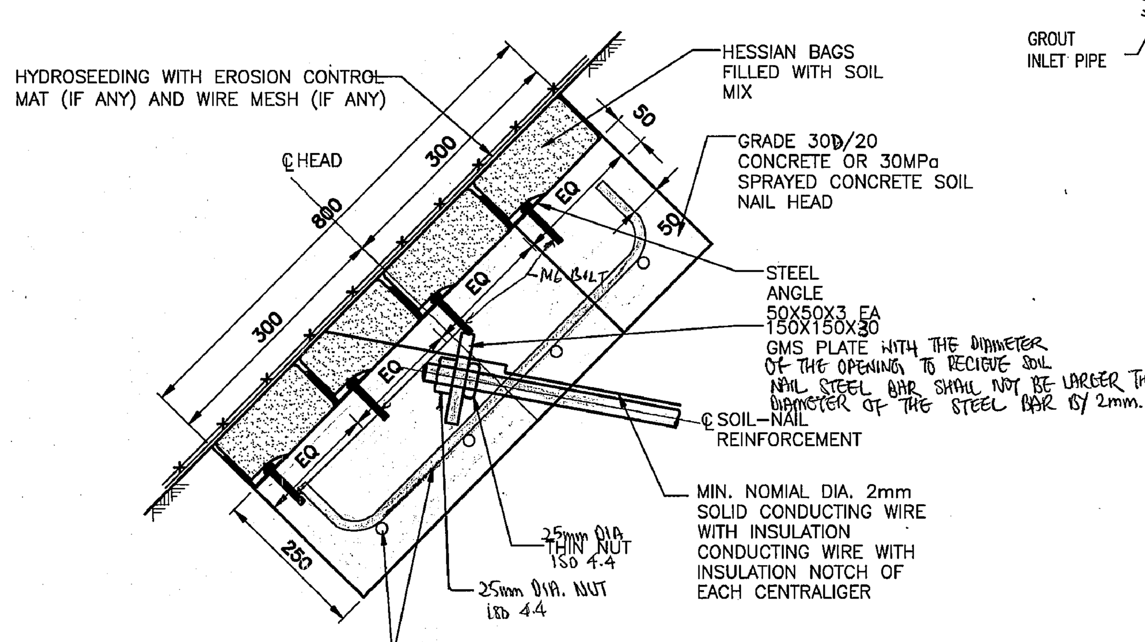
Plan Approved
CHAN Yuen-ming, Mary
Senior Building Surveyor
for BUILDING AUTHORITY
25 AUG 2011



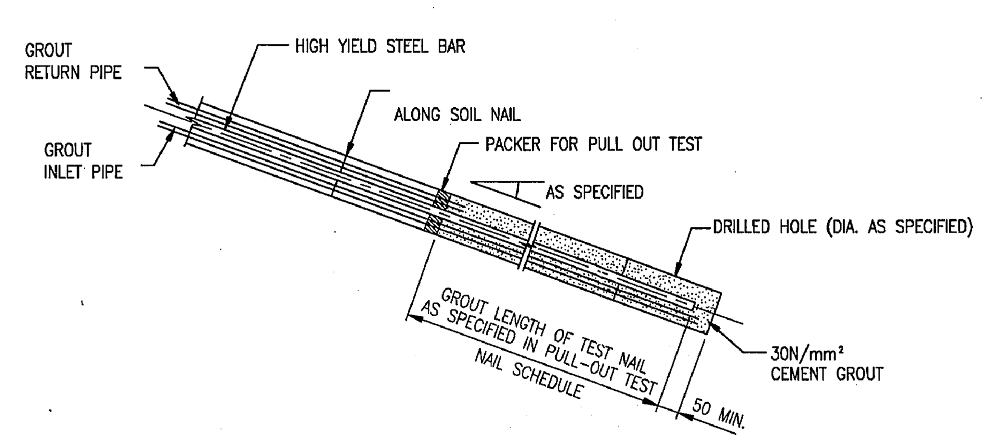
GROUND SETTLEMENT POINT
N.T.S.



SECTION A
NTS



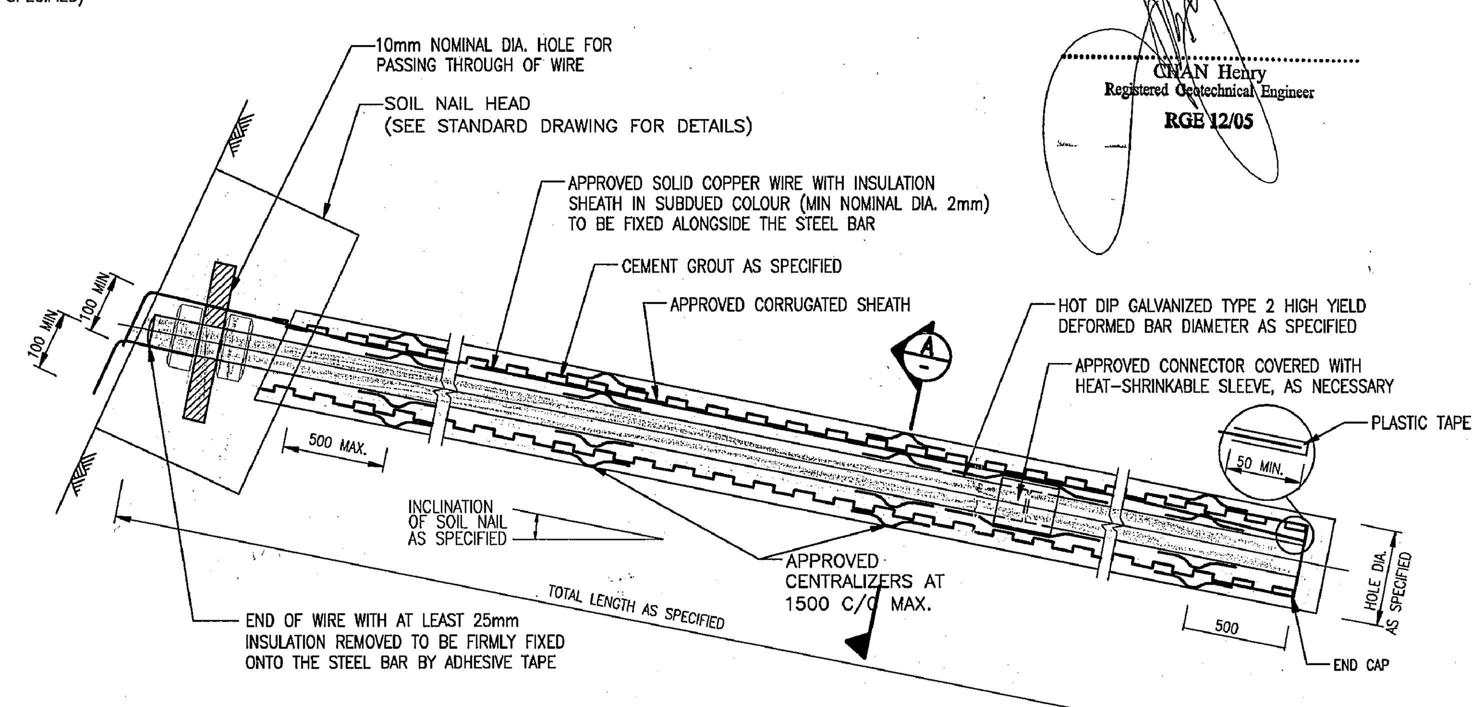
DETAIL OF SOIL NAIL HEAD FOR HYDROSEEDING SURFACE FOR ROW M & N (PROVISIONAL)
N.T.S.



TYPICAL ARRANGEMENT FOR PULL-OUT TEST
NTS

Yung Hun Tat, Arthur
Registered Structural Engineer

CHAN Henry
Registered Geotechnical Engineer
RGE 12/05



TYPICAL DETAILS OF SOIL NAIL
N.T.S.

BD Reference No. :

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Authorized Person / Registered Structural Engineer :

Project :
REVITALISATION SCHEME CONVERSION OF OLD TAI O POLICE STATION INTO TAI O HERITAGE HOTEL

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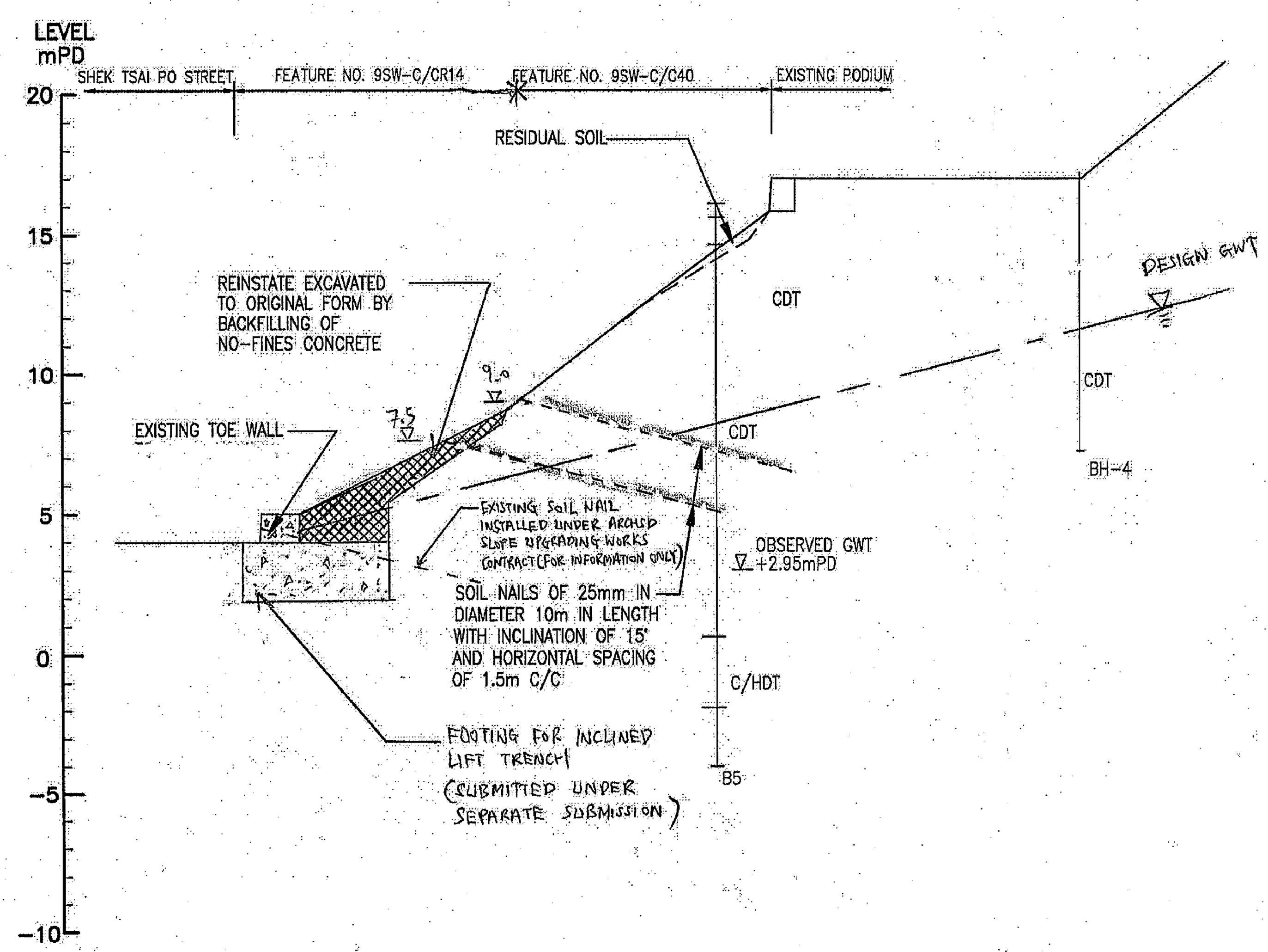
Drawing No. : 091427/SF02 Rev. B

BD Reference No. :



SECTION 1-1
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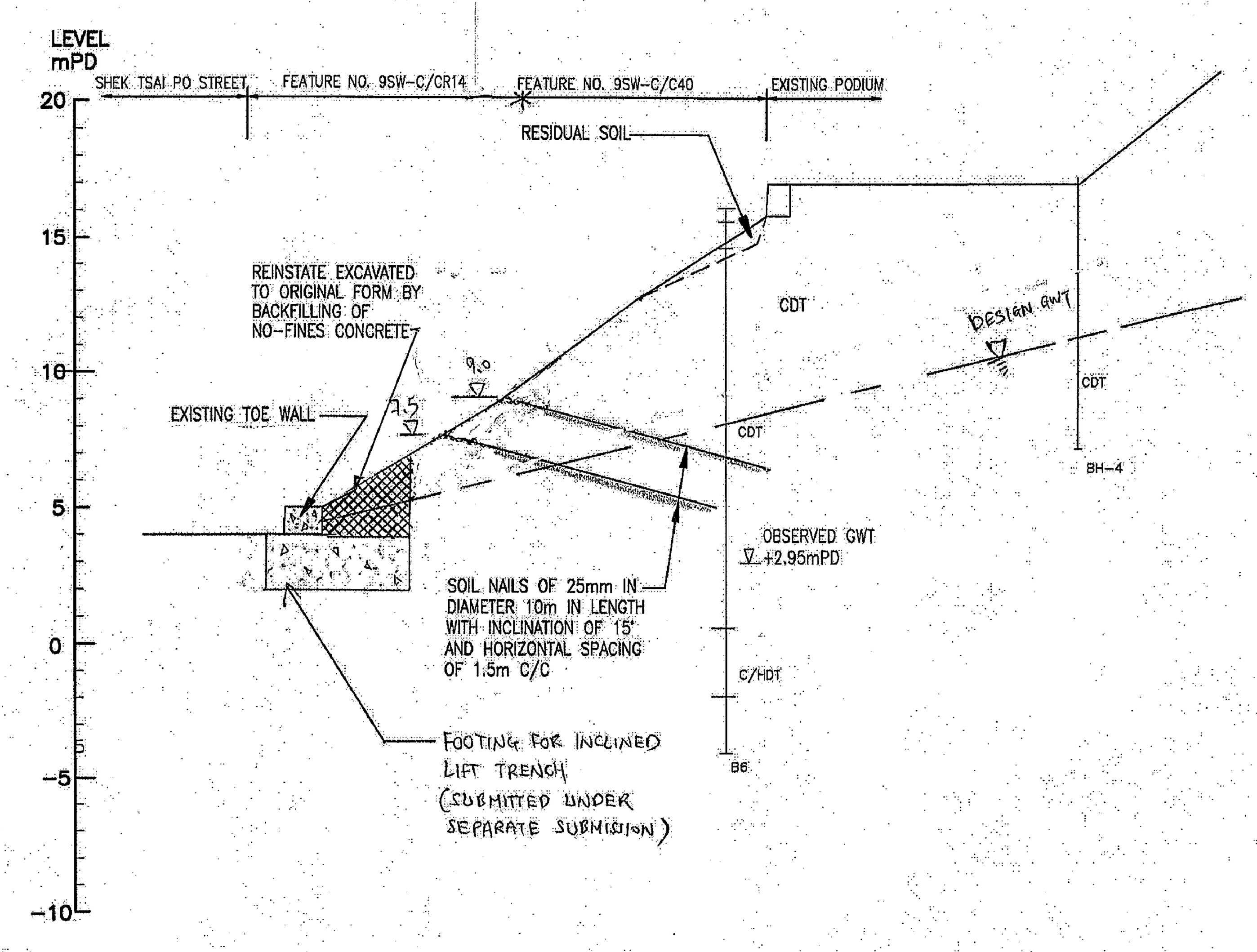
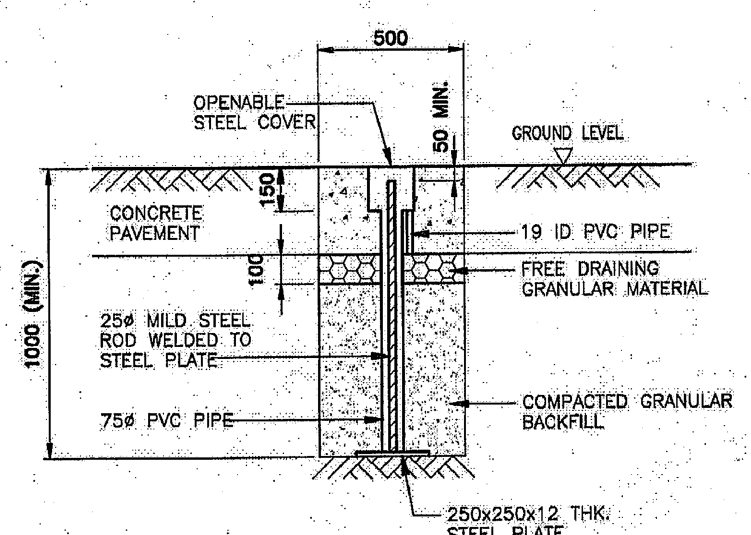


SECTION 2-2
1:200

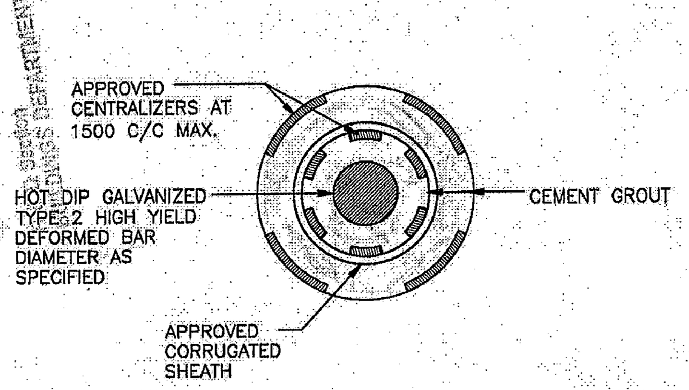
LEGEND :

—— SOIL NAIL

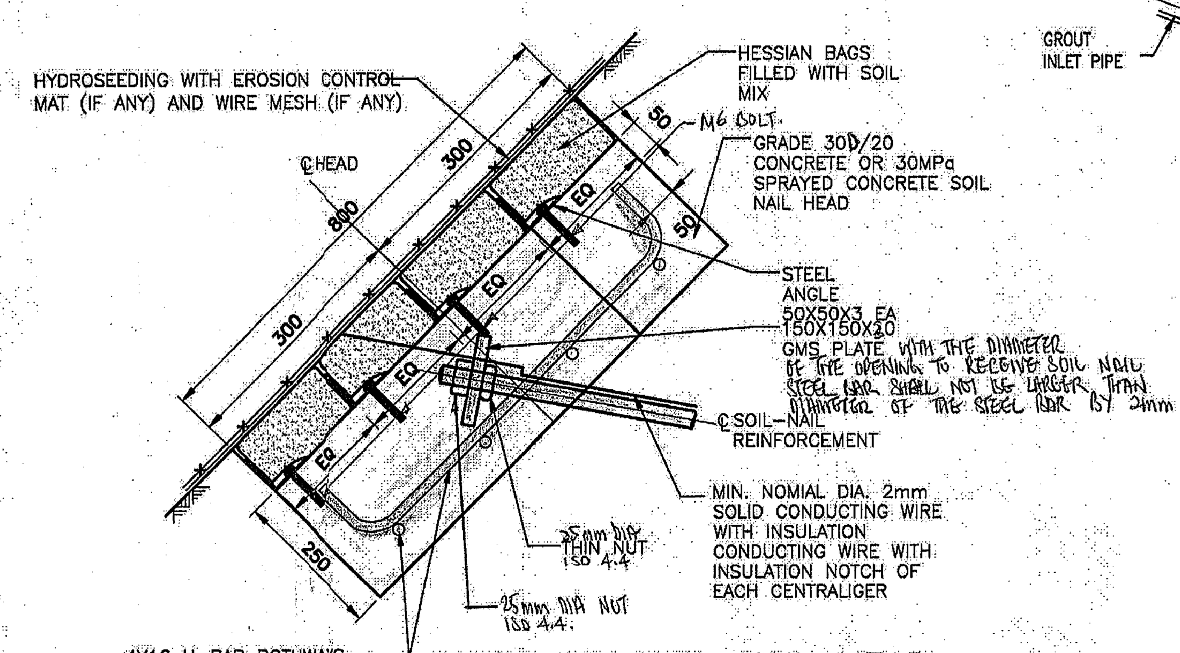
– – – SOIL NAIL LOCATION (REFER DRAWING NO. 091427/SF01 FOR LOCATION OF SOIL NAILS).



GROUND SETTLEMENT POINT
N.T.S.



SECTION A
NTS



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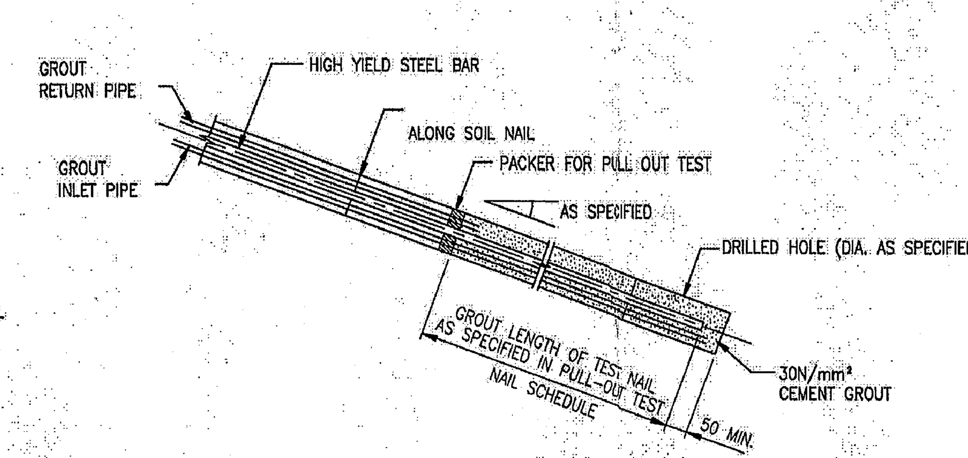
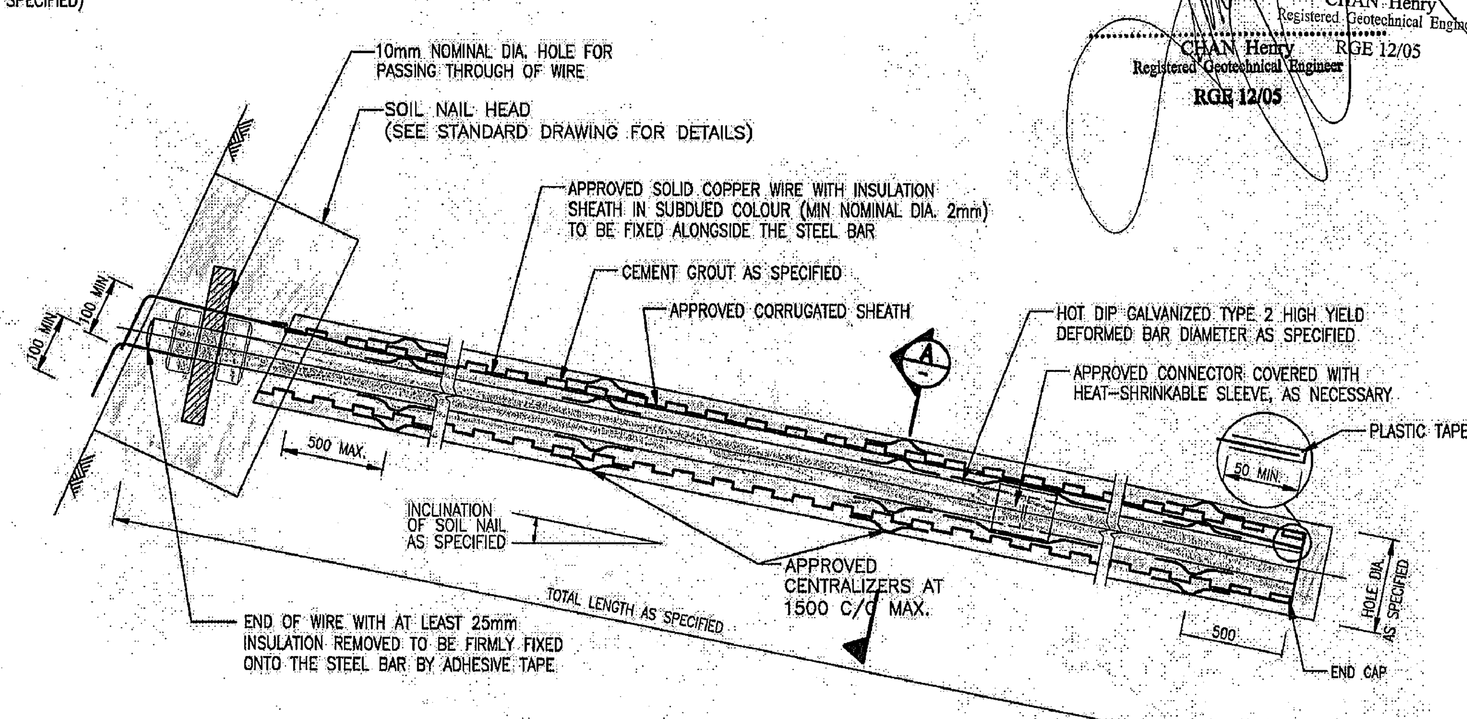


TYPICAL ARRANGEMENT FOR PULL-OUT TEST
NTS



TYPICAL DETAILS OF SOIL NAIL
N.T.S.

RECEIVED BY BUILDINGS DEPARTMENT 2011 JUN 30 P 5:51

MAK CHI CHEUNG, PETER
BArch, BAAS, FHKIA, RIBA, ARAIA
REGISTERED ARCHITECT, AP(List 1)

Plan Approved
CHAN Yee-ming, Mary
Senior Building Surveyor
for BUILDING AUTHORITY
25 AUG 2011

Yung Hun Tat, Arthur
Registered Structural Engineer

Yung Hun Tat, Arthur
Registered Structural Engineer

CHAN Henry
Registered Geotechnical Engineer
RGE 12/05

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Project :

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GENERAL NOTES

1. DO NOT SCALE DRAWINGS.
2. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE SPECIFIED.
3. ALL LEVELS ARE IN METRES ABOVE PRINCIPLE DATUM (mPD) UNLESS OTHERWISE SPECIFIED.
4. ALL DRAWINGS ARE TO BE READ IN CONJUNCTION WITH ALL RELEVANT DRAWINGS AND SPECIFICATIONS ISSUED UNDER THE CONTRACT. THE CONTRACTOR SHALL INFORM THE AP FOR ANY DISCREPANCIES WHICH MAY BE FOUND AMONG THESE DRAWINGS.
5. THE CONTRACTOR SHALL INSPECT THE CONDITIONS OF ADJOINING AREAS AND RECORD THE EXISTING STRUCTURES, UTILITIES, ROADS, PAVEMENTS, AND THE LIKE PRIOR TO THE COMMENCEMENT AND AFTER COMPLETION OF THE WORKS. THE CONTRACTOR SHALL SUBMIT THE CONDITION SURVEY REPORT TO THE AP FOR RECORD BEFORE CONSTRUCTION.
6. THE CONTRACTOR SHALL BE RESPONSIBLE FOR AND REPAIR ANY DAMAGES TO ADJOINING AREAS, STRUCTURES, UTILITIES, ROADS, PAVEMENT AND THE LIKE ARISING DIRECTLY FROM THE WORKS AT NO EXTRA COST AND NO EXTENSION OF TIME.
7. ALL WORKS SHALL COMPLY WITH THE GENERAL SPECIFICATION FOR CIVIL ENGINEERING 2006, HONG KONG BUILDING (CONSTRUCTION) REGULATIONS 1990, RELEVANT PRACTICE NOTES FOR AUTHORIZED PERSONS AND REGISTERED STRUCTURAL ENGINEERS AND PRACTICE NOTES FOR REGISTERED CONTRACTORS. ALL EXCAVATION WORKS SHALL BE CARRIED OUT ACCORDING TO SECTION 6 OF THE GENERAL SPECIFICATION. ALL DESIGN AND WORKS OF STRUCTURAL STEEL SHALL COMPLY WITH CODE OF PRACTICE FOR THE STRUCTURAL USE OF STEEL 2005. ALL DESIGN AND WORKS FOR REINFORCED CONCRETE SHALL COMPLY WITH CODE OF STRUCTURAL USE OF CONCRETE 2004.
8. ALL UTILITIES LOCATED IN THE WORK AREA SHALL BE IDENTIFIED BY THE THE CONTRACTOR PRIOR TO THE COMMENCEMENT OF THE WORKS. IF NECESSARY, THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE TEMPORARY UTILITY DIVERSION AND REINSTATEMENT AND ALL COORDINATION WORKS WITH THE UTILITY COMPANIES.
9. THE EXACT BOUNDARY OF THE WORKS SITE AND THE WORKS AREA SHALL BE CONFIRMED BY THE ENGINEER ON SITE.
10. ALL MONITORING WORKS REQUIRED FOR THE PROPOSED WORKS SHALL REFER TO DRAWING NO. 091427/SF01.
11. THE REQUIREMENT FOR SITE SUPERVISION SHALL FOLLOW THAT STIPULATED IN THE CODE OF PRACTICE FOR SITE SUPERVISION 2009.
12. SOIL PROPERTIES

MATERIALS	COHESION C'(kPa)	FRICTION ANGLE Ø'(°)	UNIT WEIGHT (kN/m)³
CDT	4	36	17
EXISTING FILL	0	32	19

~~13. ALL STRUCTURAL STEEL TO BE GRADE S275 TO BS EN 10025.~~
13. TOE WALL TO BE REINSTATED SHALL BE GRADE 30/20D AND A252 WIRE MESH SHALL BE PLACED CENTRALLY.

NOTES ON TEMPORARY DRAINAGE

1. SUMP PUMP AND SUMP PIT SHALL BE PROVIDED FOR THE TEMPORARY DRAINAGE PURPOSE IF NECESSARY. ADEQUATE FILTERS SHALL BE PROVIDED TO PREVENT LOSS OF GROUND AS A RESULT OF PUMPING.
2. ALL TEMPORARY U-CHANNEL SHALL BE 1 IN 100 IN GRADIENT UNLESS OTHERWISE STATED.
3. SUMP PUMPING WITH SUFFICIENT CAPACITY SHALL BE PROVIDED AS DRAINAGE FOR THE TEMPORARY EXCAVATION.
4. LOCATION, NUMBERS AND METHOD OF INSTALLATION OF SUMP PUMPS SHALL BE PROPOSED BY THE CONTRACTOR AGREED WITH THE AP/RGE ON SITE.
5. WATER DISCHARGED FROM SUMP PUMPS SHALL BE DIRECTED TO SAND TRAP AND THEN GOVERNMENTS STORM WATER DRAINS. PERMITS FROM STATUTORY AUTHORITIES SHALL BE OBTAINED FOR WATER DISCHARGING.
6. A REGULAR MAINTENANCE OF SAND TRAP SHALL BE PROVIDED TO ENSURE NO LIKELIHOOD OF FLOODING OCCURING FROM THE SITE ONTO THE ADJACENT AREAS.
7. ALL SURFACE WATER SHALL BE DIVERTED AND COLLECTED WITHIN THE EXCAVATION AREA AND SHALL BE DISCHARGED BY SUMP PUMPS.

NOTES ON EXCAVATION

1. ALL TEMPORARY SOIL CUT SURFACE/SLOPE EXPOSED FOR LESS THAN A WEEK SHALL BE PROTECTED WITH NYLON SHEETS SECURED AGAINST WIND.
2. ~~ALL TEMPORARY SOIL CUT SURFACE FORMED BY TEMPORARY PIPE PILE WALL, THAT IS EXPOSED FOR A WEEK OR MORE SHALL BE PROTECTED BY 5mm GRADE S275 STEEL PLATE AS DETAIL SHOWN ON DRAWING NO. 091427/GL02.~~
3. MATERIAL THAT MAY CAUSE A LANDSLIDE OF THE TEMPORARY CUT SLOPE SHALL NOT BE STOCKPILED BEHIND THE CREST OF OR ON THE TEMPORARY CUT SLOPE.
4. OVER EXCAVATION IF ANY BELOW THE FINAL FORMATION LEVEL SHALL BE BACKFILLED WITH NO-FINES CONCRETE.
5. EXCAVATION OF SOIL SLOPES SHALL BE CARRIED OUT IN SUCH A MANNER THAT SOIL IS REMOVED FROM THE SLOPE FACE WITHOUT AFFECTING THE STABILITY AND INTEGRITY OF THE SLOPE. MEASURES SHALL BE TAKEN TO PREVENT UNCONTROLLED FALLS OF DEBRIS.
6. EXCAVATION OF SOIL SLOPES SHALL BE CARRIED OUT USING HAND-HELD TOOLS. ALL MATERIAL REMOVED OR EXCAVATED BY TRIMMING AND LOOSE FRAGMENTS OF SOIL AND ROCK SHALL BE REMOVED FROM THE SLOPE.
7. THE EXACT LOCATION FOR CARRYING OUT EXCAVATION TO THE SLOPE SHALL BE VERIFIED BY ENGINEER ON SITE.
8. TAKE NECESSARY PRECAUTION TO PREVENT DAMAGE TO EXISTING DRAINS AND SERVICES ENCOUNTERED IN AND AROUND THE EXCAVATION AREA. WHERE NECESSARY, TEMPORARILY DIVERT DRAINS AND SERVICES IN THE EXCAVATION AREA AND SUBSEQUENTLY REINSTATE.
9. EXCAVATED MATERIAL SHALL BE DISPOSED OF BY THE CONTRACTOR UNLESS OTHERWISE STATED IN THE CONTRACT.

~~NOTES ON STEELWORK~~

1. ALL STEELWORK INCLUDING UNIVERSAL COLUMNS, STEEL PLATE SHALL BE GRADE S275 TO BS EN 10025, AND HOLLOW CIRCULAR SECTIONS SHALL BE GRADE S275 TO BS EN 10210 1:1994. ALL STEELWORKS SHALL BE CLASS 1.
2. THE FABRICATION, ERECTION AND WELDING OF STRUCTURAL STEEL SHALL CONFORM TO THE HONG KONG BUILDING (CONSTRUCTION) REGULATIONS 1990 AND CODE OF PRACTICE FOR STRUCTURAL USE OF STEEL 2005.
3. CERTIFICATE OF ORIGIN AND CHEMICAL COMPOSITION OF THE STRUCTURAL STEEL TO BE USED SHALL BE SUBMITTED REGISTERED STRUCTURAL ENGINEER PRIOR TO THE COMMENCEMENT OF FABRICATION WORK.

DELETE

NOTES ON GROUNDWATER TABLE

1. THE DESIGN GROUNDWATER TABLE IS ASSUMED TO BE ONE-THIRD OF SLOPE HEIGHT

NOTES ON EXCAVATION AND LATERAL SUPPORT (ELS) WORKS

1. THE CONTRACTOR SHALL TAKE FULL RESPONSIBILITY FOR THE ERECTION, MAINTENANCE AND REMOVAL OF ALL TEMPORARY WORKS DURING CONSTRUCTION.
2. NECESSARY PRECAUTIONS SHALL BE TAKEN TO PREVENT DAMAGE TO EXISTING FOUNDATIONS, DRAINS, PAVEMENTS, FEATURES, SERVICES, ETC. SHOULD ANY DAMAGE OCCUR, NOTIFY THE ENGINEER ON SITE AND RELEVANT AUTHORITIES CONCERNED IMMEDIATELY.
3. ALL TEMPORARY WORKS INCLUDING ELS WORKS SHALL BE WITHIN SITE BOUNDARY.

DELETE

PROTECTION OF EARTHWORKS

1. ALL EARTHWORKS SHALL BE GRADED AND SEALED TO ENSURE RUN-OFF AND TO AVOID PONDING.
2. A METHOD OF WORKING SHALL BE ADOPTED IN WHICH THE MINIMUM OF BARE SOIL IS EXPOSED AT ANY TIME. EARTHWORK TO FORM THE FINAL FACE SHALL BE FOLLOWED UP IMMEDIATELY WITH SURFACE PROTECTION.
3. WHERE TEMPORARY BARE SLOPE FACES ARE UNAVOIDABLE, THEY SHALL BE PROTECTED WITH SHEETING SECURED AGAINST THE WIND. WHERE SLOPE FACES ARE TO BE TEMPORARY EXPOSED FOR MORE THAN TWO WEEKS, TEMPORARY HARD SURFACING SHALL BE PROVIDED AND TEMPORARY DRAINS SHALL BE INSTALLED.
4. IF TRENCHES ON OR ADJACENT TO SLOPE HAVE TO BE EXCAVATED DURING THE WET SEASON, THIS SHALL BE DONE WITH EXTREME CARE IN SHORT SECTIONS AT A TIME. PRECAUTION SHALL BE TAKEN TO PREVENT WATER ENTERING AND ACCUMULATING IN THE TRENCH.
5. EARTHWORKS SHALL BE SEALED TO THE SATISFACTION OF THE SUPERVISING ENGINEER TO PREVENT INFILTRATION AND EROSION.
6. EXCAVATION WORKS FOR ANY SECTION OF A TRENCH FOR TEMPORARY/PERMANENT DRAINAGE WORKS SHALL NOT COMMENCE UNTIL THE NATURE, LOCATION AND SIZE OF EXISTING UTILITIES WHICH MAY BE AFFECTED BY THE EXCAVATION HAVE BEEN ASCERTAINED AND THE SETTING OUT DETAILS HAVE BEEN APPROVED BY THE SUPERVISING ENGINEER.
7. THE CONTRACTOR SHALL ALLOW THE SUPERVISING ENGINEER TO INSPECT TRENCHES, BEDDING, PIPES, JOINTS, FITTINGS AND VALVES BEFORE DRAINAGE WORKS STARTS. THE CONTRACTOR SHALL INFORM THE SUPERVISING ENGINEER 24 HOURS OR SUCH SHORTER PERIOD AGREED BY THE SUPERVISING ENGINEER, BEFORE TEMPORARY/PERMANENT DRAINAGE WORKS STARTS IN ANY PART OF THE WORKS.
8. NEITHER STOCK PILING ON THE SLOPE NOR THE CEMENT IS PERMITTED WITHOUT APPROVAL FROM THE ARCHITECT.

NOTES ON SITE SUPERVISION

1. THE TCP SUPERVISION PERSONNEL UNDER THE RGE'S STREAM SHALL SUBMIT REGULAR REPORTS OF HIS/HER FINDINGS AND RECOMMENDATIONS TO RGE. THE RGE SHALL FORMALLY SUBMIT THESE REPORTS TO THE BD AND PROVIDE A COPY TO THE GEO AT MONTHLY INTERVALS OR MORE FREQUENTLY AS NECESSARY.
2. TYPICAL CONTENTS OF THE REGULAR REPORTS PREPARED BY THE TCP T5 SITE SUPERVISION PERSONNEL SHALL INCLUDE THE FOLLOWING:
   (A) PROGRESS OF THE WORKS
   (B) RESULTS OF MONITORING DURING CONSTRUCTION
   (C) SITE OBSERVATIONS
   (D) INSPECTION RECORDS
   (E) REVIEW

NOTES ON STRUCTURAL STEELWORK

1. ALL STEELWORK INCLUDING RHS STEEL PLATE SHALL BE GRADE S275 J0 TO BS EN 10025. ALL STEEL SHALL BE CLASS 1.
2. DESIGN STRENGTH FOR STEEL = 275 MPa.
3. THE FABRICATION, ERECTION AND WELDING OF STRUCTURAL STEEL SHALL CONFORM TO THE HONG KONG BUILDING (CONSTRUCTION) REGULATION 1990. AND CODE OF PRACTICE FOR STRUCTURAL USE OF STEEL 2005.
4. CERTIFICATION OF ORIGIN AND CHEMICAL COMPOSITION OF STRUCTURAL STEEL TO BE USED SHALL BE SUBMITTED TO REGISTERED STRUCTURAL ENGINEER PRIOR TO THE COMMENCEMENT OF WORK.
5. ALL BOLT AND NUTS SHALL BE OF GRADE ISO 4.4.

NOTES ON MONITORING

1. ALL THE CHECK POINTS SHALL BE INSTALLED PRIOR TO THE COMMENCEMENT OF SITE FORMATION & ELS WORKS. THE INITIAL READINGS SHALL BE TAKEN AND SUBMITTED TO THE BUILDINGS DEPARTMENT AND THE AP/RGE/RSE PRIOR TO THE COMMENCEMENT OF ELS WORKS. DURING THE PROCESSES OF SITE FORMATION ~~& ELS~~ WORKS, THE CHECK POINTS AND PIEZOMETERS SHALL BE MONITORED DAILY. ALL READINGS SHALL BE KEPT ON SITE AND SUBMITTED TO THE ENGINEER AND BUILDINGS DEPARTMENT BI-WEEKLY.

NOTES ON REACHING THE TRIGGER LEVELS

1. IF AN ALERT LEVEL IS REACHED, THE CONTRACTOR SHALL:
   (A) NOTIFY THE ENGINEER IMMEDIATELY.
   (B) WITHIN 24 HOURS OF DETECTING THAT AN ALERT LEVEL HAS BEEN REACHED, SUBMIT A BRIEF REPORT DESCRIBING THE WORKS BEING UNDERTAKEN CLOSE BY AND ANY OTHER RELEVANT OBSERVATIONS.
   (C) PROPOSE A SUITABLE PLAN OF ACTION THAT INCLUDES THE INSTALLATION OF ADDITIONAL INSTRUMENTS AND/OR INCREASING THE MONITORING FREQUENCY.
   (D) WITHIN 7 DAYS, SUBMIT A REPORT TO REVIEW THE INSTRUMENT RESPONSES, INCLUDING DIFFERENTIAL DEFORMATIONS, ASSESS THE EFFECTS ON THE MONITORED ELEMENTS IN LIGHT OF THE RELEVANT CONSTRUCTION ACTIVITIES AND PREDICT FURTHER RESPONSES AND THEIR EFFECT BASED ON THE DATA TREND TO DATE.
   (E) WITHIN 7 DAYS, SUBMIT A DETAILED PLAN OF ACTION TO THE ENGINEER AND THE ARCHITECT DESCRIBING THE MEASURE TO BE TAKEN IN THE EVENT OF AN ALARM TRIGGER LEVEL BEING REACHED. THE PLAN OF ACTION WILL BE SUBJECT TO THE APPROVAL OF THE ENGINEER.
   (F) MAKE PREPARATIONS FOR IMPLEMENTING THE ALARM TRIGGER ACTIONS, IN ACCORDANCE WITH THE AGREED DETAILED PLAN OF ACTION.
2. IF AN ALARM LEVEL IS REACHED, THE CONTRACTOR SHALL
   (A) NOTIFY THE ENGINEER AND THE ARCHITECT IMMEDIATELY.
   (B) UNDERTAKE A JOINT INSPECTION OF THE WORKS WITH THE ENGINEER.
   (C) IMPLEMENT THE ALARM TRIGGER ACTIONS, PHASED AS APPROPRIATE, SO THAT THE ACTION LEVEL IS NOT REACHED BEFORE THE PREDICTED STAGE.
   (D) IF THE ALARM LEVEL OF OBSERVATION WELL IS REACHED, WATER RECHARGING SHOULD BE CARRIED OUT ACCORDING TO NOTE (O).
   (E) WITHIN 48 HOURS OF EXCEEDING AN ALARM TRIGGER LEVEL, DEVISE AND SUBMIT AN EMERGENCY PLAN DESCRIBING THE MEASURE TO BE TAKEN IN THE EVENT OF AN ACTION TRIGGER LEVEL BEING ATTAINED.
   (F) MEET THE ENGINEER TO DISCUSS THE INSTRUMENT RESPONSE AND REVIEW THE EFFECTIVENESS OF THE TRIGGER LEVEL ACTIONS.
   (G) AS DISCUSSED AND AGREED WITH THE ENGINEER, UNDERTAKE ADDITIONAL MEASURES IN THE AFFECTED AREA TO AVOID REACHING THE ACTION LEVEL.
   (H) WITHIN 7 DAYS, SUBMIT AN UPDATED REPORT TO THE ENGINEER TO REVIEW THE INSTRUMENT RESPONSES, INCLUDING DIFFERENTIAL DEFORMATIONS, ASSESS THE CONSTRUCTION ACTIVITIES AND PREDICT FURTHER RESPONSES AND THEIR EFFECT, BASED ON THE DATA TREND TO DATE.
3. IF AN ACTION VALUE IS REACHED OR THE GROUND/BUILDING SETTLEMENT BETWEEN TWO CONSECUTIVE READING EXCEED 5mm, THE CONTRACTOR SHALL
   (A) SUSPEND ALL WORKS WITHIN SITE.
   (B) NOTIFY BD/AP/RSE/RGE IMMEDIATELY.
   (C) UNDERTAKE A JOINT INSPECTION OF THE WORKS WITH THE ENGINEER.
   (D) IMPLEMENT EMERGENCY TRIGGER ACTION(S) BASED ON THE EMERGENCY PLAN OF TRIGGER ACTIONS REVIEW WITHOUT OBJECTION BY THE ENGINEER. THESE EMERGENCY TRIGGER ACTIONS WILL INCLUDE MEASURE TO DIMINISH THE DEFORMATIONS AND GROUND RESPONSES.
   (E) WITHIN 3 DAYS, PROVIDE A COMPLETE REPORT TO EXAMINE THE CONSTRUCTION METHOD AND A DETAILED REPORT TO THE DEFORMATION AND GROUND RESPONSE HISTORY AND TRIGGER ACTIONS ADOPTED RELATED TO THE CONSTRUCTION ACTIVITIES.
   (F) COMPLETE REPORT SHOULD BE SUBMITTED TO BD FOR APPROVAL PRIOR TO RECOMMENCEMENT OF WORKS.

MONITORING POINT	ALERT LEVEL	ALARM LEVEL	ACTION LEVEL
SETTLEMENT MARKER ON GROUND (SM1-A TO SM3-A)	5mm	10mm	15mm
BUILDING SETTLEMENT MARKER (BS1-A)	5mm	10mm	15mm
BUILDING TILTING MARKER (BT-1A)	1:1000	1:750	1:500
PIEZOMETER (B6)	3m BELOW DESIGN LEVEL	2m BELOW DESIGN LEVEL	1m BELOW DESIGN LEVEL

~~MASTER CONSTRUCTION SEQUENCE~~

1. FOR CONSTRUCTION OF FOOTING FOR LOWER LANDING PLATFORM
   a) OPEN EXCAVATE THE EXISTING SLOPE TO LEVEL 5.5mPD.
   b) INSTALL PIPE PILE TO THE FOUNDING LEVEL AS SPECIFIED IN DRAWING NO. 091427/SF04.
   c) EXCAVATE TO THE LEVEL OF LEVEL 5.0mPD.
   d) INSTALL STRUT AND WALING AT LEVEL 5.0mPD.
   e) CONTINUE TO EXCAVATE TO THE FOUNDING LEVEL AS SPECIFIED IN 091427/SF04 FOR THE LOWER LANDING PLATFORM.
   f) CONSTRUCT THE FOOTING AS DETAILED IN RELEVANT STRUCTURAL DRAWINGS (UNDER SEPARATED BD SUBMISSION).
   g) BACKFILL THE SLOPE USING NO-FINE CONCRETE MATERIALS.
2. FOR CONSTRUCTION OF FOOTING FOR UPPER LANDING PLATFORM
   a) INSTALL PIPE PILE TO THE FOUNDING LEVEL AS SPECIFIED IN DRAWING NO. 091427/GL02.
   b) EXCAVATE TO THE LEVEL OF LEVEL 14.588mPD.
   c) CONSTRUCT THE FOOTING NO. 4 OF THE UPPER LANDING PLATFORM.
3. FOR CONSTRUCTION OF INCLINED LIFT TRENCH
   a) OPEN EXCAVATION WITH 45° TENPORARY CUT SLOPE FOR THE LIFT TRENCH.
   b) EXCAVATE TRENCH TO FOUNDING LEVEL AS SPECIFIED IN DRAWING NO. 091427/GL01 AND GL02.
   c) CONSTRUCT THE INCLINED LIFT TRENCH.
   d) BACKFILL SLOPE WITH NO-FINE CONCRETE.

DELETE

NOTES ON DUST CONTROL

1. THE CONTRACTOR SHALL SUBMIT FOR THE ENGINEER'S PRIOR APPROVAL AT LEAST 2 WEEKS BEFORE COMMENCEMENT OF ANY WORK; METHOD STATEMENT IDENTIFYING OPERATIONS AND PLANTS LIKELY TO CASE AIR POLLUTION OR DUST EMISSIONS FROM THE SITE. TOGETHER WITH MEASURES TO BE IMPLEMENTED TO MITIGATE AND CONTROL SUCH POLLUTION AND EMISSION.
2. DURING THE COURSE OF DRILLING WORKS THE WORKS SHALL BE TREATED WITH WATER OR SPRAYED WITH WETTING AGENT.

CONCRETE WORKS

1. ALL CONCRETE WORKS TO BE GRADE 30D/20 TO COMPLY WITH ~~CS2~~ CS1:2010. MAXIMUM AGGREGATE SIZE = 20.
2. ALL STEEL REINFORCEMENT SHALL BE HIGH YIELD BAR TYPE 2 AND COMPLY WITH CS2:1995

ALLOWABLE BEARING PRESSURE

1. ALLOWABLE BEARING PRESSURE FOR FOOTNG NO. F1 (FOR GLASS ENCLOSURE) = 85kPa
2. ALLOWABLE BEARING FOR FOOTING NO. F8 = 160kPa
3. ALL FOOTING SHALL BE FOUNDED ON COMPLETELY DECOMPOSED TUFF

DELETE

ALLOWABLE LOADING FOOTING FOR UPPER LANDING PLATFORM

1. ALLOWABLE LOADING FOR FOOTING OF UPIER LANDINF PLATFORM = 40kPa

DELETE

NOTES ON SOIL NAILS

1. THE SOIL NAILS SHALL BE INSTALLED PERPENDICULAR TO THE GENERAL SLOPE FACE UNLESS OTHERWISE NOTED OR INSTRUCTED BY THE ENGINEER.
2. THE MINIMUM DIAMETER OF THE DRILLHOLE FOR SOIL NAIL INSTALLATION SHALL BE 100mm UNLESS OTHERWISE STATED. TOLERANCE OF ANGLE SHALL BE ±2° AIR OR FOAM FLUSH MEDIUM MUST BE USED DURING DRILLING, WATER SHALL NOT BE USED FOR FLUSHING.
3. THE SOIL NAILS SHALL BE INSTALLED WITHIN 24 HOURS OF COMPLETION OF THE DRILLING UNLESS OTHERWISE AGREED BY THE ENGINEER'S REPRESENTATIVE. DRILLHOLE SHALL BE CLEARED OF ALL DEBRIS IMMEDIATELY BEFORE GROUTING.
4. STEEL BAR FOR SOIL NAILS IS TO BE 25mm DIAZ. HIGH YIELD TENSILE STEEL BAR TO CS2 : 1995 WITH A YIELD STRESS OF 460 N/mm² REINFORCEMENT TO COMPLY WITH CS2:1995.
5. CENTRALIZES SHALL BE PROVIDED AT 1500mm SPACING ALONG THE STEEL BAR TO ENSURE A MINIMUM GROUT COVER OF 30mm ALL AROUND TO THE STEEL BAR.
6. CEMENT GROUT SHALL BE A DESIGN MIX HAVING A 28 DAY CUBE STRENGTH OF 30MPa AND THE WATER CEMENT RATIO SHALL NOT EXCEED 0.45.
7. GROUT IS TO BE INJECTED UNDER MINIMUM PRESSURE TO LIMIT POTENTIAL DISTURBANCE AT THE SITE (MIN. PRESSURE IS TAKEN TO BE THE AVERAGE CONFINING PRESSURE AT THE SOIL NAIL LEVEL PLUS 10%).
8. CEMENT GROUT SHALL BE DISCHARGED FROM THE BOTTOM OF DRILLHOLE BY MEANS OF A GROUT PIPE. GROUTING SHALL PROCEED AT A SLOW STEADY RATE AND SHALL CONTINUE UNTIL INJECTED GROUT OF THE SAME COMPOSITION AND CONSISTENCY AS THAT MIXED HAS BEEN EMERGING FROM THE OUTLET FOR AT LEAST ONE MINUTE.
9. ALL SOIL NAIL AND OTHER STEEL COMPONENTS ARE TO BE HOT DIP GALVANIZED TO BS EN ISO 1461:1999. THE THICKNESS OF ZINC COATING SHALL BE A MINIMUM OF 610g/m².
10. THE EXACT LOCATION OF ALL SOIL NAILS SHALL BE AGREED WITH THE ENGINEER PRIOR TO WORK COMMENCING.
11. FOR CONTROL OF ALKALI-AGGREGATE REACTION IN CONCRETE, THE CONTRACTOR IS TO SUBMIT TO THE ENGINEER TEST RESULTS TO VERIFY THAT THE EQUIVALENT SODIUM OXIDE (Na_2O) CONTENT PER CUBIC METRES OF CONCRETE DOES NOT EXCEED 3.0kg.
12. ALL WORKING NAILS SHALL BE INSTALLED WITH PROVISIONS FOR SUBSEQUENT TIME DOMAIN REFLECTION TEST.
13. THE EXACT LOCATION OF PULL-OUT TESTING NAILS SHALL BE DETERMINED ON SITE.
14. CASING SHALL BE PROVIDED FOR DRILLING THROUGH THE FILL LAYER.
15. FOR SOIL NAILS WITH DOUBLE CORROSION PROTECTION THE ANNULAR SPACE BETWEEN THE WALL OF DRILLHOLE AND CORRUGATED SHEATHING SHALL BE GROUTED FIRST IN A CONTINUOUS OPERATION. THE ANNULAR SPACE BETWEEN CORRUGATED SHEATHING AND STEEL BARS SHALL BE GROUTED IMMEDIATELY AFTERWARDS IN A CONTINUOUS OPERATION.

SPECIFICATION FOR SOIL NAIL PULL OUT TEST

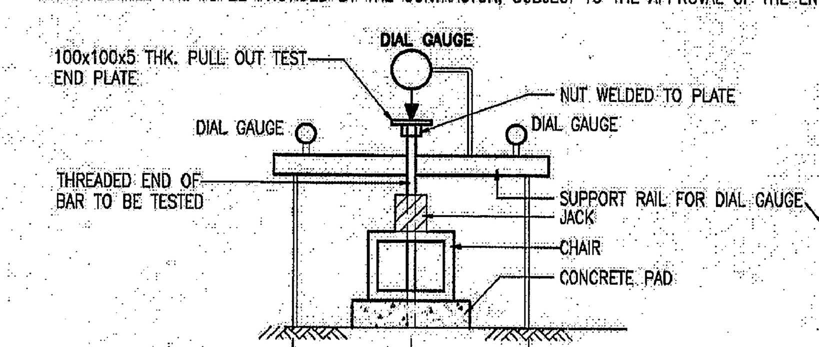
1. THE APPARATUS FOR MEASURING LOADS AND DEFORMATIONS SHALL HAVE AN ACCURACY OF 5 KN AND 0.05 MM RESPECTIVELY.
2. THE PULL-OUT TEST SHALL NOT BE CARRIED OUT UNTIL THE GROUT HAS REACHED A CUBE STRENGTH OF 21 MPa.
3. THE APPARATUS SHALL BE TESTED AND CALIBRATED BY APPROVED LABORATORIES NOT MORE THAN 6 MONTHS PRIOR TO THE DATE OF CARRYING OUT OF THE TESTS.

PULL-OUT TEST

1. SOIL NAILS SHALL BE INSTALLED FOR PULL-OUT TESTS PRIOR TO THE INSTALLATION OF PERMANENT SOIL NAILS.
2. SOIL NAILS SUBJECTED TO PULL-OUT TESTS SHALL NOT FORM PART OF THE PERMANENT WORKS.
3. THE ENTIRE FREE LENGTH OF THE STEEL BAR SHALL BE PROPERLY WRAPPED OR CAPPED TO ENSURE THAT THE TEST LOAD CAN BE DIRECTLY TRANSFERRED TO THE BONDED ZONE IN CASE OF GROUT LEAK THROUGH THE PACKER.
4. THE MAXIMUM TEST LOAD (Tp) SHALL BE ACCORDING TO THE SOIL NAIL PULL OUT TEST SCHEDULE.
5. THE TEST NAIL SHALL BE LOADED IN STAGES: FROM THE INITIAL LOAD (To) VIA, TWO INTERMEDIATE TEST LOADS (T_{DL1} AND T_{DL2}) TO THE MAXIMUM TEST LOAD.
6. DURING THE FIRST TWO LOADING CYCLES, THE INTERMEDIATE LOADS, T_{DL1} AND T_{DL2} SHALL BE MAINTAINED FOR 60 MINUTES FOR DEFORMATION MEASUREMENT. AFTER THE MEASUREMENT HAS BEEN COMPLETED, THE LOAD SHALL BE REDUCED TO To AND THE RESIDUAL DEFORMATION SHALL BE RECORDED. IN THE LAST CYCLE, THE TEST LOAD SHALL BE INCREASED GRADUALLY FROM To STRAIGHT TO MAXIMUM TEST LOAD AND THEN MAINTAINED FOR DEFORMATION MEASUREMENT.
7. THE MEASUREMENT AT EACH OF THE CYCLES SHALL BE TAKEN AT TIME INTERVALS OF 1, 3, 6, 10, 20, 30, 40, 50 AND 60 MINUTES.
8. THE TEST NAIL IS CONSIDERED TO BE ABLE TO SUSTAIN THE TEST LOAD IF THE DIFFERENCE OF NAIL MOVEMENTS AT 6 AND 60 MINUTES DOES NOT EXCEED 2mm OR 0.1% OF THE GROUT LENGTH OF THE TEST NAIL. IN THIS CASE, THE TEST SHALL PROCEED TO THE NEXT LOADING CYCLE OR BE TERMINATED IF THE TEST NAIL IS SUBJECTED TO Tp.
9. THROUGHOUT THE TEST, THE SOIL NAIL MOVEMENT AS WELL AS THE MOVEMENT OF THE BEARING PLATE VERSUS THE APPLIED LOAD SHALL BE MEASURED, RECORDED AND PLOTTED ON A GRAPH IN THE FORMAT APPROVED BY THE ENGINEER.
10. IF THE TEST SOIL NAIL FAILS TO SUSTAIN TDL1, TDL2, OR THE MAXIMUM TEST LOAD IN ANY CYCLE, THE TEST SHALL BE TERMINATED AND THE SOIL NAIL MOVEMENT AGAINST RESIDUAL LOAD WITH TIME SHALL BE RECORDED. THE MEASUREMENTS SHALL BE TAKEN AT TIME INTERVALS OF 1, 3, 6, 10 AND, EVERY 10 MINUTES THEREAFTER OVER A PERIOD FOR AT LEAST TWO HOURS. THE MEASUREMENTS SHALL BE TAKEN FOR A LONGER PERIOD WHERE CONSIDERED NECESSARY.

SOIL NAIL PULL OUT TEST ARRANGEMENT

EXACT DETAILS ARE TO BE PROVIDED BY THE CONTRACTOR, SUBJECT TO THE APPROVAL OF THE ENGINEER.



NOTES ON NON-DESTRUCTIVE TEST (NDT) FOR SOIL NAILS

1. TIME DOMAIN REFLECTOMETRY (TDR) TESTS FOR THE PERMANENT SOIL NAILS SHALL BE CARRIED OUT.
2. A CONTROL NAIL SHALL BE SELECTED BY THE ENGINEER FOR CALIBRATION OF THE TDR TEST.
3. THE EXACT LOCATIONS OF ALL TDR TESTS SHALL BE CONFIRMED BY THE ENGINEER ON SITE. A MINIMUM OF 2 NUMBERS OF TDR TESTS OR 1% OF THE TOTAL NUMBER OF SOIL NAILS, WHICHEVER IS GREATER, SHALL BE CARRIED OUT.
4. TDR TEST SHALL NOT BE CARRIED OUT WITHIN 3 DAYS AFTER COMPLETION OF GROUTING.
5. TDR TEST SHALL BE CARRIED OUT BY AN INDEPENDENT LABORATORY AND A REPORT WITH THE TEST RESULTS AND INTERPRETATIONS SHALL BE SUBMITTED TO THE ENGINEER FOR ACCEPTANCE.

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BSc MSc DIC FIStructE FHKIE FICE
Registered Structural Engineer

CHAN Henry
Registered Geotechnical Engineer
RGE 12/05

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Registered Geotechnical Engineer
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BD Reference No. :

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Plan Approved
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Senior Building Surveyor
for BUILDING AUTHORITY
2 5 AUG 2011

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AS-BUILT RECORD PLAN

Rev.	Stat.	Description	Date	By	Chk.	Ver'd
–	IFS	BD SUBMISSION	06/11	RC	ML	MN

Revisions

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Authorized Person / Registered Structural Engineer :

Project :
REVITALISATION SCHEME CONVERSION OF OLD TAI O POLICE STATION INTO TAI O HERITAGE HOTEL

Drawing Title :
NOTES FOR SITE FORMATION (INCLINED LIFT)

Drawn :	LC	Date :	04/11	Job No. :	091427
Checked :	ML	Date :	04/11	Cad File :	091427_SF05
Approved :	MN	Date :	04/11	Scale :	AS SHOWN
Drawing No. :	091427/SF03			Rev.	–

BD Reference No. :

GENERAL NOTES

1. DO NOT SCALE DRAWINGS.
2. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE SPECIFIED.
3. ALL LEVELS ARE IN METRES ABOVE PRINCIPLE DATUM (mPD) UNLESS OTHERWISE SPECIFIED.
4. ALL DRAWINGS ARE TO BE READ IN CONJUNCTION WITH ALL RELEVANT DRAWINGS AND SPECIFICATIONS ISSUED UNDER THE CONTRACT. THE CONTRACTOR SHALL INFORM THE AP FOR ANY DISCREPANCIES WHICH MAY BE FOUND AMONG THESE DRAWINGS.
5. THE CONTRACTOR SHALL INSPECT THE CONDITIONS OF ADJOINING AREAS AND RECORD THE EXISTING STRUCTURES, UTILITIES, ROADS, PAVEMENTS, AND THE LIKE PRIOR TO THE COMMENCEMENT AND AFTER COMPLETION OF THE WORKS. THE CONTRACTOR SHALL SUBMIT THE CONDITION SURVEY REPORT TO THE AP FOR RECORD BEFORE CONSTRUCTION.
6. THE CONTRACTOR SHALL BE RESPONSIBLE FOR AND REPAIR ANY DAMAGES TO ADJOINING AREAS, STRUCTURES, UTILITIES, ROADS, PAVEMENT AND THE LIKE ARISING DIRECTLY FROM THE WORKS AT NO EXTRA COST AND NO EXTENSION OF TIME.
7. ALL WORKS SHALL COMPLY WITH THE GENERAL SPECIFICATION FOR CIVIL ENGINEERING 2006, HONG KONG BUILDING (CONSTRUCTION) REGULATIONS 1990, RELEVANT PRACTICE NOTES FOR AUTHORIZED PERSONS AND REGISTERED STRUCTURAL ENGINEERS AND PRACTICE NOTES FOR REGISTERED CONTRACTORS. ALL EXCAVATION WORKS SHALL BE CARRIED OUT ACCORDING TO SECTION 6 OF THE GENERAL SPECIFICATION. ALL DESIGN AND WORKS OF STRUCTURAL STEEL SHALL COMPLY WITH CODE OF PRACTICE FOR THE STRUCTURAL USE OF STEEL 2005. ALL DESIGN AND WORKS FOR REINFORCED CONCRETE SHALL COMPLY WITH CODE OF STRUCTURAL USE OF CONCRETE 2004.
8. ALL UTILITIES LOCATED IN THE WORK AREA SHALL BE IDENTIFIED BY THE THE CONTRACTOR PRIOR TO THE COMMENCEMENT OF THE WORKS. IF NECESSARY, THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE TEMPORARY UTILITY DIVERSION AND REINSTATEMENT AND ALL COORDINATION WORKS WITH THE UTILITY COMPANIES.
9. THE EXACT BOUNDARY OF THE WORKS SITE AND THE WORKS AREA SHALL BE CONFIRMED BY THE ENGINEER ON SITE.
10. ALL MONITORING WORKS REQUIRED FOR THE PROPOSED WORKS SHALL REFER TO DRAWING NO. 091427/SF01.
11. THE REQUIREMENT FOR SITE SUPERVISION SHALL FOLLOW THAT STIPULATED IN THE CODE OF PRACTICE FOR SITE SUPERVISION 2009.
12. SOIL PROPERTIES

MATERIALS	COHESION C'(kPa)	FRICTION ANGLE Ø'(°)	UNIT WEIGHT (kN/m)³
CDT	4	36	17
EXISTING FILL	0	32	19

~~13. ALL STRUCTURAL STEEL TO BE GRADE S275 TO BS EN 10025.~~
13. TOE WALL TO BE REINSTATED SHALL BE GRADE 30/20D AND A252 WIRE MESH SHALL BE PLACED CENTRALLY.

NOTES ON TEMPORARY DRAINAGE

1. SUMP PUMP AND SUMP PIT SHALL BE PROVIDED FOR THE TEMPORARY DRAINAGE PURPOSE IF NECESSARY. ADEQUATE FILTERS SHALL BE PROVIDED TO PREVENT LOSS OF GROUND AS A RESULT OF PUMPING.
2. ALL TEMPORARY U-CHANNEL SHALL BE 1 IN 100 IN GRADIENT UNLESS OTHERWISE STATED.
3. SUMP PUMPING WITH SUFFICIENT CAPACITY SHALL BE PROVIDED AS DRAINAGE FOR THE TEMPORARY EXCAVATION.
4. LOCATION, NUMBERS AND METHOD OF INSTALLATION OF SUMP PUMPS SHALL BE PROPOSED BY THE CONTRACTOR AGREED WITH THE AP/RGE ON SITE.
5. WATER DISCHARGED FROM SUMP PUMPS SHALL BE DIRECTED TO SAND TRAP AND THEN GOVERNMENTS STORM WATER DRAINS. PERMITS FROM STATUTORY AUTHORITIES SHALL BE OBTAINED FOR WATER DISCHARGING.
6. A REGULAR MAINTENANCE OF SAND TRAP SHALL BE PROVIDED TO ENSURE NO LIKELIHOOD OF FLOODING OCCURING FROM THE SITE ONTO THE ADJACENT AREAS.
7. ALL SURFACE WATER SHALL BE DIVERTED AND COLLECTED WITHIN THE EXCAVATION AREA AND SHALL BE DISCHARGED BY SUMP PUMPS.

NOTES ON EXCAVATION

1. ALL TEMPORARY SOIL CUT SURFACE/SLOPE EXPOSED FOR LESS THAN A WEEK SHALL BE PROTECTED WITH NYLON SHEETS SECURED AGAINST WIND.
2. ~~ALL TEMPORARY SOIL CUT SURFACE FORMED BY TEMPORARY PIPE PILE WALL, THAT IS EXPOSED FOR A WEEK OR MORE SHALL BE PROTECTED BY 5mm GRADE S275 STEEL PLATE AS DETAIL SHOWN ON DRAWING NO. 091427/GL02.~~
3. MATERIAL THAT MAY CAUSE A LANDSLIDE OF THE TEMPORARY CUT SLOPE SHALL NOT BE STOCKPILED BEHIND THE CREST OF OR ON THE TEMPORARY CUT SLOPE.
4. OVER EXCAVATION IF ANY BELOW THE FINAL FORMATION LEVEL SHALL BE BACKFILLED WITH NO-FINES CONCRETE.
5. EXCAVATION OF SOIL SLOPES SHALL BE CARRIED OUT IN SUCH A MANNER THAT SOIL IS REMOVED FROM THE SLOPE FACE WITHOUT AFFECTING THE STABILITY AND INTEGRITY OF THE SLOPE. MEASURES SHALL BE TAKEN TO PREVENT UNCONTROLLED FALLS OF DEBRIS.
6. EXCAVATION OF SOIL SLOPES SHALL BE CARRIED OUT USING HAND-HELD TOOLS. ALL MATERIAL REMOVED OR EXCAVATED BY TRIMMING AND LOOSE FRAGMENTS OF SOIL AND ROCK SHALL BE REMOVED FROM THE SLOPE.
7. THE EXACT LOCATION FOR CARRYING OUT EXCAVATION TO THE SLOPE SHALL BE VERIFIED BY ENGINEER ON SITE.
8. TAKE NECESSARY PRECAUTION TO PREVENT DAMAGE TO EXISTING DRAINS AND SERVICES ENCOUNTERED IN AND AROUND THE EXCAVATION AREA. WHERE NECESSARY, TEMPORARILY DIVERT DRAINS AND SERVICES IN THE EXCAVATION AREA AND SUBSEQUENTLY REINSTATE.
9. EXCAVATED MATERIAL SHALL BE DISPOSED OF BY THE CONTRACTOR UNLESS OTHERWISE STATED IN THE CONTRACT.

~~NOTES ON STEELWORK~~

1. ALL STEELWORK INCLUDING UNIVERSAL COLUMNS, STEEL PLATE SHALL BE GRADE S275 TO BS EN 10025, AND HOLLOW CIRCULAR SECTIONS SHALL BE GRADE S275 TO BS EN 10210 1:1994. ALL STEELWORKS SHALL BE CLASS 1.
2. THE FABRICATION, ERECTION AND WELDING OF STRUCTURAL STEEL SHALL CONFORM TO THE HONG KONG BUILDING (CONSTRUCTION) REGULATIONS 1990 AND CODE OF PRACTICE FOR STRUCTURAL USE OF STEEL 2005.
3. CERTIFICATE OF ORIGIN AND CHEMICAL COMPOSITION OF THE STRUCTURAL STEEL TO BE USED SHALL BE SUBMITTED REGISTERED STRUCTURAL ENGINEER PRIOR TO THE COMMENCEMENT OF FABRICATION WORK.

DELETE

NOTES ON GROUNDWATER TABLE

1. THE DESIGN GROUNDWATER TABLE IS ASSUMED TO BE ONE-THIRD OF SLOPE HEIGHT.

~~NOTES ON EXCAVATION AND LATERAL SUPPORT (ELS) WORKS~~

1. THE CONTRACTOR SHALL TAKE FULL RESPONSIBILITY FOR THE ERECTION, MAINTENANCE AND REMOVAL OF ALL TEMPORARY WORKS DURING CONSTRUCTION.
2. NECESSARY PRECAUTIONS SHALL BE TAKEN TO PREVENT DAMAGE TO EXISTING FOUNDATIONS, DRAINS, PAVEMENTS, FEATURES, SERVICES, ETC. SHOULD ANY DAMAGE OCCUR, NOTIFY THE ENGINEER ON SITE AND RELEVANT AUTHORITIES CONCERNED IMMEDIATELY
3. ALL TEMPORARY WORKS INCLUDING ELS WORKS SHALL BE WITHIN SITE BOUNDARY.

DELETE

PROTECTION OF EARTHWORKS

1. ALL EARTHWORKS SHALL BE GRADED AND SEALED TO ENSURE RUN-OFF AND TO AVOID PONDING.
2. A METHOD OF WORKING SHALL BE ADOPTED IN WHICH THE MINIMUM OF BARE SOIL IS EXPOSED AT ANY TIME. EARTHWORK TO FORM THE FINAL FACE SHALL BE FOLLOWED UP IMMEDIATELY WITH SURFACE PROTECTION.
3. WHERE TEMPORARY BARE SLOPE FACES ARE UNAVOIDABLE, THEY SHALL BE PROTECTED WITH SHEETING SECURED AGAINST THE WIND. WHERE SLOPE FACES ARE TO BE TEMPORARY EXPOSED FOR MORE THAN TWO WEEKS, TEMPORARY HARD SURFACING SHALL BE PROVIDED AND TEMPORARY DRAINS SHALL BE INSTALLED.
4. IF TRENCHES ON OR ADJACENT TO SLOPE HAVE TO BE EXCAVATED DURING THE WET SEASON, THIS SHALL BE DONE WITH EXTREME CARE IN SHORT SECTIONS AT A TIME. PRECAUTION SHALL BE TAKEN TO PREVENT WATER ENTERING AND ACCUMULATING IN THE TRENCH.
5. EARTHWORKS SHALL BE SEALED TO THE SATISFACTION OF THE SUPERVISING ENGINEER TO PREVENT INFILTRATION AND EROSION.
6. EXCAVATION WORKS FOR ANY SECTION OF A TRENCH FOR TEMPORARY/PERMANENT DRAINAGE WORKS SHALL NOT COMMENCE UNTIL THE NATURE, LOCATION AND SIZE OF EXISTING UTILITIES WHICH MAY BE AFFECTED BY THE EXCAVATION HAVE BEEN ASCERTAINED AND THE SETTING OUT DETAILS HAVE BEEN APPROVED BY THE SUPERVISING ENGINEER.
7. THE CONTRACTOR SHALL ALLOW THE SUPERVISING ENGINEER TO INSPECT TRENCHES, BEDDING, PIPES, JOINTS, FITTINGS AND VALVES BEFORE DRAINAGE WORKS STARTS. THE CONTRACTOR SHALL INFORM THE SUPERVISING ENGINEER 24 HOURS OR SUCH SHORTER PERIOD AGREED BY THE SUPERVISING ENGINEER, BEFORE TEMPORARY/PERMANENT DRAINAGE WORKS STARTS IN ANY PART OF THE WORKS.
8. NEITHER STOCK PILING ON THE SLOPE NOR THE CEMENT IS PERMITTED WITHOUT APPROVAL FROM THE ARCHITECT.

NOTES ON SITE SUPERVISION

1. THE TCP SUPERVISION PERSONNEL UNDER THE RGE'S STREAM SHALL SUBMIT REGULAR REPORTS OF HIS/HER FINDINGS AND RECOMMENDATIONS TO RGE. THE RGE SHALL FORMALLY SUBMIT THESE REPORTS TO THE BD AND PROVIDE A COPY TO THE GEO AT MONTHLY INTERVALS OR MORE FREQUENTLY AS NECESSARY.
2. TYPICAL CONTENTS OF THE REGULAR REPORTS PREPARED BY THE TCP T5 SITE SUPERVISION PERSONNEL SHALL INCLUDE THE FOLLOWING.
   (A) PROGRESS OF THE WORKS
   (B) RESULTS OF MONITORING DURING CONSTRUCTION
   (C) SITE OBSERVATIONS
   (D) INSPECTION RECORDS
   (E) REVIEW

NOTES ON STRUCTURAL STEELWORK

1. ALL STEEL WORK INCLUDING GMS STEEL PLATE SHALL BE GRADE S275 J0 TO BS EN 10025. ALL STEEL SHALL BE CLASS 1.
2. DESIGN STRENGTH FOR STEEL = 275 MPa
3. THE FABRICATION, ERECTION AND WELDING OF STRUCTURAL STEEL SHALL CONFORM TO THE HONG KONG BUILDING (CONSTRUCTION) REGULATIONS 1990 AND CODE OF PRACTICE FOR STRUCTURAL USE OF STEEL 2005.
4. CERTIFICATION OF ORIGIN AND CHEMICAL COMPOSITION OF STRUCTURAL STEEL TO BE USED SHALL BE SUBMITTED TO REGISTERED STRUCTURAL ENGINEER PRIOR TO THE COMMENCEMENT OF WORK
5. ALL BOLT AND NUTS SHALL BE OF GRADE ISO 4.4.

NOTES ON MONITORING

1. ALL THE CHECK POINTS SHALL BE INSTALLED PRIOR TO THE COMMENCEMENT OF SITE FORMATION & ELS WORKS. THE INITIAL READINGS SHALL BE TAKEN AND SUBMITTED TO THE BUILDINGS DEPARTMENT AND THE AP/RGE/RSE PRIOR TO THE COMMENCEMENT OF ELS WORKS. DURING THE PROCESSES OF SITE FORMATION ~~& ELS~~ WORKS, THE CHECK POINTS AND PIEZOMETERS SHALL BE MONITORED DAILY. ALL READINGS SHALL BE KEPT ON SITE AND SUBMITTED TO THE ENGINEER AND BUILDINGS DEPARTMENT BI-WEEKLY.

NOTES ON REACHING THE TRIGGER LEVELS

1. IF AN ALERT LEVEL IS REACHED, THE CONTRACTOR SHALL:
   (A) NOTIFY THE ENGINEER IMMEDIATELY.
   (B) WITHIN 24 HOURS OF DETECTING THAT AN ALERT LEVEL HAS BEEN REACHED, SUBMIT A BRIEF REPORT DESCRIBING THE WORKS BEING UNDERTAKEN CLOSE BY AND ANY OTHER RELEVANT OBSERVATIONS.
   (C) PROPOSE A SUITABLE PLAN OF ACTION THAT INCLUDES THE INSTALLATION OF ADDITIONAL INSTRUMENTS AND/OR INCREASING THE MONITORING FREQUENCY.
   (D) WITHIN 7 DAYS, SUBMIT A REPORT TO REVIEW THE INSTRUMENT RESPONSES, INCLUDING DIFFERENTIAL DEFORMATIONS, ASSESS THE EFFECTS ON THE MONITORED ELEMENTS IN LIGHT OF THE RELEVANT CONSTRUCTION ACTIVITIES AND PREDICT FURTHER RESPONSES AND THEIR EFFECT BASED ON THE DATA TREND TO DATE.
   (E) WITHIN 7 DAYS, SUBMIT A DETAILED PLAN OF ACTION TO THE ENGINEER AND THE ARCHITECT DESCRIBING THE MEASURE TO BE TAKEN IN THE EVENT OF AN ALARM TRIGGER LEVEL BEING REACHED. THE PLAN OF ACTION WILL BE SUBJECT TO THE APPROVAL OF THE ENGINEER.
   (F) MAKE PREPARATIONS FOR IMPLEMENTING THE ALARM TRIGGER ACTIONS, IN ACCORDANCE WITH THE AGREED DETAILED PLAN OF ACTION.
2. IF AN ALARM LEVEL IS REACHED, THE CONTRACTOR SHALL
   (A) NOTIFY THE ENGINEER AND THE ARCHITECT IMMEDIATELY.
   (B) UNDERTAKE A JOINT INSPECTION OF THE WORKS WITH THE ENGINEER.
   (C) IMPLEMENT THE ALARM TRIGGER ACTIONS, PHASED AS APPROPRIATE, SO THAT THE ACTION LEVEL IS NOT REACHED BEFORE THE PREDICTED STAGE.
   (D) IF THE ALARM LEVEL OF OBSERVATION WELL IS REACHED, WATER RECHARGING SHOULD BE CARRIED OUT ACCORDING TO NOTE (O).
   (E) WITHIN 48 HOURS OF EXCEEDING AN ALARM TRIGGER LEVEL, DEVISE AND SUBMIT AN EMERGENCY PLAN DESCRIBING THE MEASURE TO BE TAKEN IN THE EVENT OF AN ACTION TRIGGER LEVEL BEING ATTAINED.
   (F) MEET THE ENGINEER TO DISCUSS THE INSTRUMENT RESPONSE AND REVIEW THE EFFECTIVENESS OF THE TRIGGER LEVEL ACTIONS.
   (G) AS DISCUSSED AND AGREED WITH THE ENGINEER, UNDERTAKE ADDITIONAL MEASURES IN THE AFFECTED AREA TO AVOID REACHING THE ACTION LEVEL.
   (H) WITHIN 7 DAYS, SUBMIT AN UPDATED REPORT TO THE ENGINEER TO REVIEW THE INSTRUMENT RESPONSES, INCLUDING DIFFERENTIAL DEFORMATIONS, ASSESS THE CONSTRUCTION ACTIVITIES AND PREDICT FURTHER RESPONSES AND THEIR EFFECT, BASED ON THE DATA TREND TO DATE.
3. IF AN ACTION VALUE IS REACHED OR THE GROUND/BUILDING SETTLEMENT BETWEEN TWO CONSECUTIVE READING EXCEED 5mm, THE CONTRACTOR SHALL
   (A) SUSPEND ALL WORKS WITHIN SITE.
   (B) NOTIFY BD/AP/RSE/RGE IMMEDIATELY.
   (C) UNDERTAKE A JOINT INSPECTION OF THE WORKS WITH THE ENGINEER.
   (D) IMPLEMENT EMERGENCY TRIGGER ACTION(S) BASED ON THE EMERGENCY PLAN OF TRIGGER ACTIONS REVIEW WITHOUT OBJECTION BY THE ENGINEER. THESE EMERGENCY TRIGGER ACTIONS WILL INCLUDE MEASURE TO DIMINISH THE DEFORMATIONS AND GROUND RESPONSES.
   (E) WITHIN 3 DAYS, PROVIDE A COMPLETE REPORT TO EXAMINE THE CONSTRUCTION METHOD AND A DETAILED REPORT TO THE DEFORMATION AND GROUND RESPONSE HISTORY AND TRIGGER ACTIONS ADOPTED RELATED TO THE CONSTRUCTION ACTIVITIES.
   (F) COMPLETE REPORT SHOULD BE SUBMITTED TO BD FOR APPROVAL PRIOR TO RECOMMENCEMENT OF WORKS.

MONITORING POINT	ALERT LEVEL	ALARM LEVEL	ACTION LEVEL
SETTLEMENT MARKER ON GROUND (SM1-A TO SM3-A)	5mm	10mm	15mm
BUILDING SETTLEMENT MARKER (BS1-A)	5mm	10mm	15mm
BUILDING TILTING MARKER (BT-1A)	1:1000	1:750	1:500
PIEZOMETER (B6)	3m BELOW DESIGN LEVEL	2m BELOW DESIGN LEVEL	1m BELOW DESIGN LEVEL

~~MASTER CONSTRUCTION SEQUENCE~~

1. FOR CONSTRUCTION OF FOOTING FOR LOWER LANDING PLATFORM
   a) OPEN EXCAVATE THE EXISTING SLOPE TO LEVEL 5.5mPD.
   b) INSTALL PIPE PILE TO THE FOUNDING LEVEL AS SPECIFIED IN DRAWING NO. 091427/SF04.
   c) EXCAVATE TO THE LEVEL OF LEVEL 5.0mPD.
   d) INSTALL STRUT AND WALING AT LEVEL 5.0mPD.
   e) CONTINUE TO EXCAVATE TO THE FOUNDING LEVEL AS SPECIFIED IN 091427/SF04 FOR THE LOWER LANDING PLATFORM.
   f) CONSTRUCT THE FOOTING AS DETAILED IN RELEVANT STRUCTURAL DRAWINGS (UNDER SEPARATED BD SUBMISSION).
   g) BACKFILL THE SLOPE USING NO-FINE CONCRETE MATERIALS.
2. FOR CONSTRUCTION OF FOOTING FOR UPPER LANDING PLATFORM
   a) INSTALL PIPE PILE TO THE FOUNDING LEVEL AS SPECIFIED IN DRAWING NO. 091427/GL02.
   b) EXCAVATE TO THE LEVEL OF LEVEL 14.588mPD.
   c) CONSTRUCT THE FOOTING NO. 4 OF THE UPPER LANDING PLATFORM.
3. FOR CONSTRUCTION OF INCLINED LIFT TRENCH
   a) OPEN EXCAVATION WITH 45° TEMPORARY CUT SLOPE FOR THE LIFT TRENCH.
   b) EXCAVATE TRENCH TO FOUNDING LEVEL AS SPECIFIED IN DRAWING NO. 091427/GL01 AND GL02.
   c) CONSTRUCT THE INCLINED LIFT TRENCH.
   d) BACKFILL SLOPE WITH NO-FINE CONCRETE.

DELETE

NOTES ON DUST CONTROL

1. THE CONTRACTOR SHALL SUBMIT FOR THE ENGINEER'S PRIOR APPROVAL. AT LEAST 2 WEEKS BEFORE COMMENCEMENT OF ANY WORK, METHOD STATEMENT IDENTIFYING OPERATIONS AND PLANTS LIKELY TO CASE AIR POLLUTION OR DUST EMISSIONS FROM THE SITE. TOGETHER WITH MEASURES TO BE IMPLEMENTED TO MITIGATE AND CONTROL SUCH POLLUTION AND EMISSION.
2. DURING THE COURSE OF DRILLING WORKS. THE WORKS SHALL BE TREATED WITH WATER OR SPRAYED WITH WETTING AGENT.

CONCRETE WORKS

1. ALL CONCRETE WORKS TO BE GRADE 30D/20 TO COMPLY WITH CS1:2010. MAXIMUM AGGREGATE SIZE = 20.
2. ALL STEEL REINFORCEMENT SHALL BE HIGH YIELD BAR TYPE 2 AND COMPLY WITH CS2:1995

~~ALLOWABLE BEARING PRESSURE~~

1. ~~ALLOWABLE BEARING PRESSURE FOR FOOTING NO. F1 (FOR GLASS ENCLOSURE) = 85kPa~~
2. ~~ALLOWABLE BEARING FOR FOOTING NO. F8 = 160kPa~~
3. ~~ALL FOOTING SHALL BE FOUNDED ON COMPLETELY DECOMPOSED TUFF~~

DELETE

~~ALLOWABLE LOADING FOOTING FOR UPPER LANDING PLATFORM~~

1. ~~ALLOWABLE LOADING FOR FOOTING OF UPPER LANDINF PLATFORM = 40kPa~~

DELETE

NOTES ON SOIL NAILS

1. THE SOIL NAILS SHALL BE INSTALLED PERPENDICULAR TO THE GENERAL SLOPE FACE UNLESS OTHERWISE NOTED OR INSTRUCTED BY THE ENGINEER.
2. THE MINIMUM DIAMETER OF THE DRILLHOLE FOR SOIL NAIL INSTALLATION SHALL BE 100mm UNLESS OTHERWISE STATED. TOLERANCE OF ANGLE SHALL BE ±2° AIR OR FOAM FLUSH MEDIUM MUST BE USED DURING DRILLING, WATER SHALL NOT BE USED FOR FLUSHING.
3. THE SOIL NAILS SHALL BE INSTALLED WITHIN 24 HOURS OF COMPLETION OF THE DRILLING UNLESS OTHERWISE AGREED BY THE ENGINEER'S REPRESENTATIVE. DRILLHOLE SHALL BE CLEARED OF ALL DEBRIS IMMEDIATELY BEFORE GROUTING.
4. STEEL BAR FOR ~~SOIL NAILS IS TO BE 25mm DIA~~. HIGH YIELD TENSILE STEEL BAR TO CS2 : 1995 WITH A YIELD STRENGTH OF 460 N/mm² REINFORCEMENT TO COMPLY WITH CS2:1995.
5. CENTRALIZES SHALL BE PROVIDED AT 1500mm SPACING ALONG THE STEEL BAR TO ENSURE A MINIMUM GROUT COVER OF 30mm ALL AROUND TO THE STEEL BAR.
6. CEMENT GROUT SHALL BE A DESIGN MIX HAVING A 28 DAY CUBE STRENGTH OF 30MPa AND THE WATER CEMENT RATIO SHALL NOT EXCEED 0.45.
7. GROUT IS TO BE INJECTED UNDER MINIMUM PRESSURE TO LIMIT POTENTIAL DISTURBANCE AT THE SITE (MIN. PRESSURE IS TAKEN TO BE THE AVERAGE CONFINING PRESSURE AT THE SOIL NAIL LEVEL PLUS 10%).
8. CEMENT GROUT SHALL BE DISCHARGED FROM THE BOTTOM OF DRILLHOLE BY MEANS OF A GROUT PIPE. GROUTING SHALL PROCEED AT A SLOW STEADY RATE AND SHALL CONTINUE UNTIL INJECTED GROUT OF THE SAME COMPOSITION AND CONSISTENCY AS THAT MIXED HAS BEEN EMERGING FROM THE OUTLET FOR AT LEAST ONE MINUTE.
9. ALL SOIL NAIL AND OTHER STEEL COMPONENTS ARE TO BE HOT DIP GALVANIZED TO BS EN ISO 1461:1999. THE THICKNESS OF ZINC COATING SHALL BE A MINIMUM OF 610g/m².
10. THE EXACT LOCATION OF ALL SOIL NAILS SHALL BE AGREED WITH THE ENGINEER PRIOR TO WORK COMMENCING.
11. FOR CONTROL OF ALKALI-AGGREGATE REACTION IN CONCRETE, THE CONTRACTOR IS TO SUBMIT TO THE ENGINEER TEST RESULTS TO VERIFY THAT THE EQUIVALENT SODIUM OXIDE (Na_2O) CONTENT PER CUBIC METRES OF CONCRETE DOES NOT EXCEED 3.0kg.
12. ALL WORKING NAILS SHALL BE INSTALLED WITH PROVISIONS FOR SUBSEQUENT TIME DOMAIN REFLECTION TEST.
13. THE EXACT LOCATION OF PULL-OUT TESTING NAILS SHALL BE DETERMINED ON SITE.
14. CASING SHALL BE PROVIDED FOR DRILLING THROUGH THE FILL LAYER.
15. FOR SOIL NAILS WITH DOUBLE CORROSION PROTECTION THE ANNULAR SPACE BETWEEN THE WALL OF DRILLHOLE AND CORRUGATED SHEATHING SHALL BE GROUTED FIRST IN A CONTINUOUS OPERATION. THE ANNULAR SPACE BETWEEN CORRUGATED SHEATHING AND STEEL BARS SHALL BE GROUTED IMMEDIATELY AFTERWARDS IN A CONTINUOUS OPERATION.

SPECIFICATION FOR SOIL NAIL PULL OUT TEST

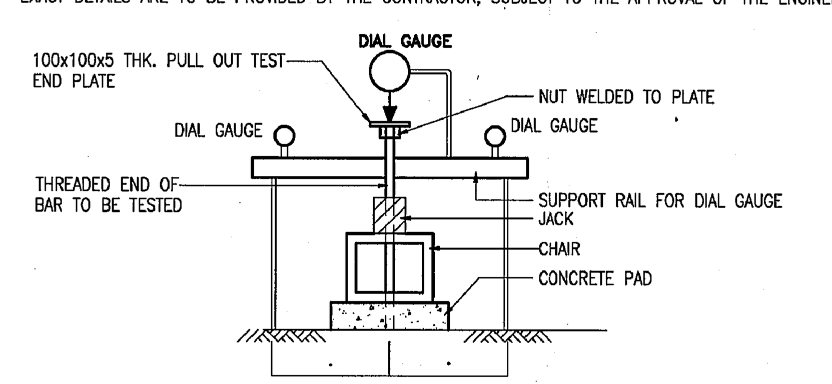
1. THE APPARATUS FOR MEASURING LOADS AND DEFORMATIONS SHALL HAVE AN ACCURACY OF 5 KN AND 0.05 MM RESPECTIVELY.
2. THE PULL-OUT TEST SHALL NOT BE CARRIED OUT UNTIL THE GROUT HAS REACHED A CUBE STRENGTH OF 21 MPa.
3. THE APPARATUS SHALL BE TESTED AND CALIBRATED BY APPROVED LABORATORIES NOT MORE THAN 6 MONTHS PRIOR TO THE DATE OF CARRYING OUT OF THE TESTS.

PULL-OUT TEST

1. SOIL NAILS SHALL BE INSTALLED FOR PULL-OUT TESTS PRIOR TO THE INSTALLATION OF PERMANENT SOIL NAILS.
2. SOIL NAILS SUBJECTED TO PULL-OUT TESTS SHALL NOT FORM PART OF THE PERMANENT WORKS.
3. THE ENTIRE FREE LENGTH OF THE STEEL BAR SHALL BE PROPERLY WRAPPED OR CAPPED TO ENSURE THAT THE TEST LOAD CAN BE DIRECTLY TRANSFERRED TO THE BONDED ZONE IN CASE OF GROUT LEAK THROUGH THE PACKER.
4. THE MAXIMUM TEST LOAD (Tp) SHALL BE ACCORDING TO THE SOIL NAIL PULL OUT TEST SCHEDULE.
5. THE TEST NAIL SHALL BE LOADED IN STAGES: FROM THE INITIAL LOAD (Ta) VIA, TWO INTERMEDIATE TEST LOADS (T_{DL1} AND T_{DL2}) TO THE MAXIMUM TEST LOAD.
6. DURING THE FIRST TWO LOADING CYCLES, THE INTERMEDIATE LOADS, T_{DL1} AND T_{DL2} SHALL BE MAINTAINED FOR 60 MINUTES FOR DEFORMATION MEASUREMENT. AFTER THE MEASUREMENT HAS BEEN COMPLETED, THE LOAD SHALL BE REDUCED TO Ta AND THE RESIDUAL DEFORMATION SHALL BE RECORDED. IN THE LAST CYCLE, THE TEST LOAD SHALL BE INCREASED GRADUALLY FROM Ta STRAIGHT TO MAXIMUM TEST LOAD AND THEN MAINTAINED FOR DEFORMATION MEASUREMENT.
7. THE MEASUREMENT AT EACH OF THE CYCLES SHALL BE TAKEN AT TIME INTERVALS OF 1, 3, 6, 10, 20, 30, 40, 50 AND 60 MINUTES.
8. THE TEST NAIL IS CONSIDERED TO BE ABLE TO SUSTAIN THE TEST LOAD IF THE DIFFERENCE OF NAIL MOVEMENTS AT 6 AND 60 MINUTES DOES NOT EXCEED 2mm OR 0.1% OF THE GROUT LENGTH OF THE TEST NAIL. IN THIS CASE, THE TEST SHALL PROCEED TO THE NEXT LOADING CYCLE OR BE TERMINATED IF THE TEST NAIL IS SUBJECTED TO Tp.
9. THROUGHOUT THE TEST, THE SOIL NAIL MOVEMENT AS WELL AS THE MOVEMENT OF THE BEARING PLATE VERSUS THE APPLIED LOAD SHALL BE MEASURED, RECORDED AND PLOTTED ON A GRAPH IN THE FORMAT APPROVED BY THE ENGINEER.
10. IF THE TEST SOIL NAIL FAILS TO SUSTAIN TDL1, TDL2, OR THE MAXIMUM TEST LOAD IN ANY CYCLE, THE TEST SHALL BE TERMINATED AND THE SOIL NAIL MOVEMENT AGAINST RESIDUAL LOAD WITH TIME SHALL BE RECORDED. THE MEASUREMENTS SHALL BE TAKEN AT TIME INTERVALS OF 1, 3, 6, 10 AND, EVERY 10 MINUTES THEREAFTER OVER A PERIOD FOR AT LEAST TWO HOURS. THE MEASUREMENTS SHALL BE TAKEN FOR A LONGER PERIOD WHERE CONSIDERED NECESSARY.

SOIL NAIL PULL OUT TEST ARRANGEMENT

EXACT DETAILS ARE TO BE PROVIDED BY THE CONTRACTOR, SUBJECT TO THE APPROVAL OF THE ENGINEER.



NOTES ON NON-DESTRUCTIVE TEST (NDT) FOR SOIL NAILS

1. TIME DOMAIN REFLECTOMETRY (TDR) TESTS FOR THE PERMANENT SOIL NAILS SHALL BE CARRIED OUT.
2. A CONTROL NAIL SHALL BE SELECTED BY THE ENGINEER FOR CALIBRATION OF THE TDR TEST.
3. THE EXACT LOCATIONS OF ALL TDR TESTS SHALL BE CONFIRMED BY THE ENGINEER ON SITE. A MINIMUM OF 2 NUMBERS OF TDR TESTS OR 1% OF THE TOTAL NUMBER OF SOIL NAILS, WHICHEVER IS GREATER, SHALL BE CARRIED OUT.
4. TDR TEST SHALL NOT BE CARRIED OUT WITHIN 3 DAYS AFTER COMPLETION OF GROUTING.
5. TDR TEST SHALL BE CARRIED OUT BY AN INDEPENDENT LABORATORY AND A REPORT WITH THE TEST RESULTS AND INTERPRETATIONS SHALL BE SUBMITTED TO THE ENGINEER FOR ACCEPTANCE.

Yung Hun Tat, Arthur
BSc MSc DIC FIStructE FHKIE FICE
Registered Structural Engineer

CHAN Henry
Registered Geotechnical Engineer
RGE 12/05

Plan Approved
Mary Chan
CHAN Yuen-ming, Mary
Senior Building Surveyor
for BUILDING AUTHORITY
25 AUG 2011

Rev.	Stat.	Description	Date	By	Chk.	Ver'd
–	IFS	BD SUBMISSION	06/11	RC	ML	MN

Revisions

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Authorized Person / Registered Structural Engineer :

Project :
REVITALISATION SCHEME CONVERSION OF OLD TAI O POLICE STATION INTO TAI O HERITAGE HOTEL

Drawing Title :
NOTES FOR SITE FORMATION (INCLINED LIFT)

Drawn :	LC	Date :	04/11	Job No. :	091427
Checked :	ML	Date :	04/11	Cad File :	091427_SF05
Approved :	MN	Date :	04/11	Scale :	AS SHOWN
Drawing No. :	091427/SF03			Rev.	–

GENERAL NOTES

1. DO NOT SCALE DRAWINGS.
2. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE SPECIFIED.
3. ALL LEVELS ARE IN METRES ABOVE PRINCIPLE DATUM (mPD) UNLESS OTHERWISE SPECIFIED.
4. ALL DRAWINGS ARE TO BE READ IN CONJUNCTION WITH ALL RELEVANT DRAWINGS AND SPECIFICATIONS ISSUED UNDER THE CONTRACT. THE CONTRACTOR SHALL INFORM THE AP FOR ANY DISCREPANCIES WHICH MAY BE FOUND AMONG THESE DRAWINGS.
5. THE CONTRACTOR SHALL INSPECT THE CONDITIONS OF ADJOINING AREAS AND RECORD THE EXISTING STRUCTURES, UTILITIES, ROADS, PAVEMENTS, AND THE LIKE PRIOR TO THE COMMENCEMENT AND AFTER COMPLETION OF THE WORKS. THE CONTRACTOR SHALL SUBMIT THE CONDITION SURVEY REPORT TO THE AP FOR RECORD BEFORE CONSTRUCTION.
6. THE CONTRACTOR SHALL BE RESPONSIBLE FOR AND REPAIR ANY DAMAGES TO ADJOINING AREAS, STRUCTURES, UTILITIES, ROADS, PAVEMENT AND THE LIKE ARISING DIRECTLY FROM THE WORKS AT NO EXTRA COST AND NO EXTENSION OF TIME.
7. ALL WORKS SHALL COMPLY WITH THE GENERAL SPECIFICATION FOR BUILDING 2006, HONG KONG BUILDING (CONSTRUCTION) REGULATIONS 1990, RELEVANT PRACTICE NOTES FOR AUTHORIZED PERSONS AND REGISTERED STRUCTURAL ENGINEERS AND PRACTICE NOTES FOR REGISTERED CONTRACTORS. ALL EXCAVATION WORKS SHALL BE CARRIED OUT ACCORDING TO SECTION 6 OF THE SPECIFICATION. ALL DESIGN AND WORKS OF STRUCTURAL STEEL SHALL COMPLY WITH CODE OF PRACTICE FOR THE STRUCTURAL USE OF STEEL 2005. ALL DESIGN AND WORKS FOR REINFORCED CONCRETE SHALL COMPLY WITH CODE OF PRACTICE FOR STRUCTURAL USE OF CONCRETE 2004.
8. ALL UTILITIES LOCATED IN THE WORK AREA SHALL BE IDENTIFIED BY THE THE CONTRACTOR PRIOR TO THE COMMENCEMENT OF THE WORKS. IF NECESSARY, THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE TEMPORARY UTILITY DIVERSION AND REINSTATEMENT AND ALL COORDINATION WORKS WITH THE UTILITY COMPANIES.
9. THE EXACT BOUNDARY OF THE WORKS SITE AND THE WORKS AREA SHALL BE CONFIRMED BY THE ENGINEER ON SITE.
10. ALL MONITORING WORKS REQUIRED FOR THE PROPOSED WORKS SHALL REFER TO DRAWING NO. P093113/ELS02.
11. THE REQUIREMENT FOR SITE SUPERVISION SHALL FOLLOW THAT STIPULATED IN THE CODE OF PRACTICE FOR SITE SUPERVISION 2005.
12. SOIL PROPERTIES

MATERIALS	COHESION C'(kPa)	FRICTION ANGLE Ø'(°)	UNIT WEIGHT (kN/m³)
FILL	0	32	19
RESIDUAL SOIL	0	32	19
COLLUVIUM	6	28	19
CDT	4	36	17

13. SLOPE AREA SHALL BE EXCAVATED UPON APPROVAL AND CONSENT OF EXCAVATION AND LATERAL SUPPORT PLAN WHICH IS UNDER SEPARATE SUBMISSION.
14. ALL STRUCTURAL STEEL TO BE GRADE S275 TO BS EN 10025.

NOTES ON TEMPORARY DRAINAGE

1. SUMP PUMP AND SUMP PIT SHALL BE PROVIDED FOR THE TEMPORARY DRAINAGE PURPOSE IF NECESSARY. ADEQUATE FILTERS SHALL BE PROVIDED TO PREVENT LOSS OF GROUND AS A RESULT OF PUMPING.
2. ALL TEMPORARY U-CHANNEL SHALL BE 1 IN 100 IN GRADIENT UNLESS OTHERWISE STATED.
3. SUMP PUMPING WITH SUFFICIENT CAPACITY SHALL BE PROVIDED AS DRAINAGE FOR THE TEMPORARY EXCAVATION.
4. LOCATION, NUMBERS AND METHOD OF INSTALLATION OF SUMP PUMPS SHALL BE PROPOSED BY THE CONTRACTOR AGREED WITH THE AP/RGE ON SITE.
5. WATER DISCHARGED FROM SUMP PUMPS SHALL BE DIRECTED TO SAND TRAP AND THEN GOVERNMENTS STORM WATER DRAINS. PERMITS FROM STATUTORY AUTHORITIES SHALL BE OBTAINED FOR WATER DISCHARGING.
6. A REGULAR MAINTENANCE OF SAND TRAP SHALL BE PROVIDED TO ENSURE NO LIKELIHOOD OF FLOODING OCCURRING FROM THE LOT ONTO THE ADJACENT PROPERTIES.
7. ALL SURFACE WATER SHALL BE DIVERTED AND COLLECTED WITHIN THE EXCAVATION AREA AND SHALL BE DISCHARGED BY SUMP PUMPS.

NOTES ON EXCAVATION

1. ALL TEMPORARY SOIL CUT SLOPES EXPOSED FOR LESS THAN A WEEK SHALL BE PROTECTED WITH NYLON SHEETS SECURED AGAINST WIND.
2. ALL TEMPORARY SOIL CUT SLOPES EXPOSED FOR A WEEK OR MORE SHALL BE PROTECTED BY 50mm THICK SPRAYED CONCRETE SURFACING OR OTHER APPROVED MATERIAL WITH WEEPHOLE. 50mm DIAMETER PVC WEEPHOLES SHALL BE BUILT IN AT 1.5m CENTRES IN EACH DIRECTION ON A STAGGERED PITCH AS THE WORK PROCEEDS.
3. MATERIAL THAT MAY CAUSE A LANDSLIDE OF THE TEMPORARY CUT SLOPE SHALL NOT BE STOCKPILED BEHIND THE CREST OF OR ON THE TEMPORARY CUT SLOPE.
4. OVER EXCAVATION IF ANY BELOW THE FINAL FORMATION LEVEL SHALL BE BACKFILLED WITH MASS CONCRETE.

NOTES ON GROUNDWATER TABLE

1. THE DESIGN GROUNDWATER TABLE IS ASSUMED TO BE ONE-THIRD OF SLOPE HEIGHT.

NOTES ON DUST CONTROL

1. THE CONTRACTOR SHALL SUBMIT FOR THE ENGINEER'S PRIOR APPROVAL. AT LEAST 2 WEEKS BEFORE COMMENCEMENT OF ANY WORK, METHOD STATEMENT IDENTIFYING OPERATIONS AND PLANTS LIKELY TO CASE AIR POLLUTION OR DUST EMISSIONS FROM THE SITE. TOGETHER WITH MEASURES TO BE IMPLEMENTED TO MITIGATE AND CONTROL SUCH POLLUTION AND EMISSION.
2. DURING THE COURSE OF DRILLING WORKS. THE WORKS SHALL BE TREATED WITH WATER OR SPRAYED WITH WETTING AGENT.

NOTES ON SITE SUPERVISION

1. THE TCP T5 SITE SUPERVISION PERSONNEL UNDER THE RGE'S STREAM SHALL SUBMIT REGULAR REPORTS OF HER/HIS FINDINGS AND RECOMMENDATIONS TO THE RGE. THE RGE SHALL FORMALLY SUBMIT THESE REPORTS TO THE BD AND PROVIDE A COPY TO THE GEO AT MONTHLY INTERVALS OR MORE FREQUENTLY AS NECESSARY.
2. TYPICAL CONTENTS OF THE REGULAR REPORTS PREPARED BY THE TCP T5 SITE SUPERVISION PERSONNEL SHALL INCLUDE THE FOLLOWING:
   (A) PROGRESS OF THE WORKS
   (B) RESULTS OF MONITORING DURING CONSTRUCTION
   (C) SITE OBSERVATIONS
   (D) INSPECTION RECORDS
   (E) REVIEW

CONCRETE WORKS

1. ALL CONCRETE WORKS TO BE GRADE 30D/20 TO COMPLY WITH CS2. MAXIMUM AGGREGATE SIZE = 20.
2. ALL STEEL REINFORCEMENT SHALL BE HIGH YIELD BAR TYPE 2 AND COMPLY WITH CS2.

PRECAUTIONS AGAINST HEAVY RAINFALL

1. PRIOR TO THE COMMENCEMENT OF WORKS, SURFACE WATER FLOWING INTO THE SITE FROM UPHILL SHALL BE INTERCEPTED AND SAFELY DISCHARGED FROM THE SITE. AT EACH INTERSECTION AND ABRUPT CHANGE IN DIRECTION OF SURFACE DRAINAGE CHANNELS AND ACCESSIBLE CATCHPIT SHALL BE PROVIDED. ALL DRAINAGE WORKS SHALL BE KEPT CLEAR OF DEBRIS.
2. WHERE PARTIALLY COMPLETED DRAINAGE WORKS DISCHARGE WITHIN THE SITE A TEMPORARY CONDUIT SHALL BE PROVIDED TO THE DISCHARGE POINT.

NOTES ON MONITORING

1. ALL THE CHECK POINTS SHALL BE INSTALLED PRIOR TO THE COMMENCEMENT OF WORKS. THE INITIAL READINGS SHALL BE TAKEN AND SUBMITTED TO THE BUILDINGS DEPARTMENT AND THE AP/RGE PRIOR TO THE COMMENCEMENT OF WORKS. DURING THE PROCESSES OF WORKS, THE CHECK POINTS, PIEZOMETERS AND INCLINOMETERS SHALL BE MONITORED DAILY. ALL READINGS SHALL BE KEPT ON SITE AND SUBMITTED TO THE ENGINEER AND BUILDINGS DEPARTMENT BI-WEEKLY.

3. MONITORING SCHEDULE FOR WORKS
   IF THE ALERT LEVEL IS EXCEEDED, THE FREQUENCY OF MONITORING SHALL BE INCREASED TO TWICE DAILY TO GAUGE FURTHER MOVEMENT AND THE AP/RGE SHOULD BE INFORMED IMMEDIATELY.
   IF THE ALARM LEVEL IS EXCEEDED, THE WORKS AT AFFECTED AREAS SHALL CEASE AND AP/RGE SHALL BE INFORMED IMMEDIATELY AND PROPOSAL FOR PRECAUTIONARY MEASURES SHALL BE SUBMITTED TO AP/RGE FOR CONSIDERATION PRIOR TO RESUMING WORKS IN THE AFFECTED AREA.
   IF THE ACTION LEVEL IS EXCEEDED, THE WORKS AT THE AFFECTED AREA SHALL CEASE AND THE AP/RGE/BD/GEO/AMD SHALL BE NOTIFIED. A REVIEW OF VALIDITY OF THE DESIGN ASSUMPTIONS AND METHOD, AND REMEDIAL PROPOSAL, SHALL BE SUBMITTED TO THE SATISFACTION OF BD. THE WORKS IN THE AFFECTED AREA SHALL NOT BE RESUMED UNTIL THE APPROVAL FOR RECOMMENCEMENT HAS BEEN GIVEN.

MONITORING POINT	LOCATION	ALERT LEVEL	ALARM LEVEL	ACTION LEVEL
SETTLEMENT MARKER ON GROUND	~~SM4 TO SM8, SM10, SM16,17,18,20, SM4 (SA), SM3 (SA)~~, SM26, SM27	5mm	10mm	15mm
PIEZOMETER	B5	11.5mPD	10.5mPD	9.5mPD
~~BUILDING SETTLEMENT MARKER~~	~~BS1 TO BS4, BS8 TO BS10~~	~~5mm~~	~~10mm~~	~~15mm~~
~~TILTING MARKER~~	~~BT1 TO BT4, BT10, BT11, BT12~~	~~1:1000~~	~~1:750~~	~~1:500~~
~~VIBRATION MONITORING~~	~~VM1 TO VM3, VM5~~	~~5.5mm/sec~~	~~6.5mm/sec~~	~~7.5mm/sec~~

SOIL NAIL PULL OUT TEST SCHEDULE

FEATURE NO.	TEST NAIL NO.	NAILS DIAMETER (mm)	LEVEL (mPD)	DRILLHOLE DIAMETER (mm)	FULL LENGTH (m)	GROUT LENGTH (m)	DIPPING ANGLE (DEGREES)	Ta (kN)	TDL1 (kN)	TDL2 (kN)	Tp (kN)
~~9SW-C/F6~~	~~TN1~~	~~25~~	~~+13.2~~	~~100~~	~~8.0~~	~~2.0~~	~~15~~	~~3~~	~~15~~	~~30~~	~~59~~
	~~TN2~~	~~25~~	~~+15.2~~	~~100~~	~~8.0~~	~~2.0~~	~~15~~	~~2~~	~~10~~	~~19~~	~~39~~
~~9SW-C/CR14~~	~~TN3~~	~~25~~	~~+7.5~~	~~100~~	~~10.0~~	~~2.0~~	~~15~~	~~4.5~~	~~33~~	~~61.5~~	~~90~~
	~~TN4~~	~~25~~	~~+9.0~~	~~100~~	~~10.0~~	~~2.0~~	~~15~~	~~45~~	~~33~~	~~61.5~~	~~90~~

SOIL NAIL SCHEDULE

SECTION	SOIL NAIL NO.	NAILS DIAMETER (mm)	TENTATIVE LEVEL (mPD)	TENTATIVE NOS. OF NAILS	MINIMUM DESIGN LENGTH (m)	DIPPING ANGLE (DEGREES)	HORIZONTAL SPACING (m)	DRILLHOLE DIAMETER (mm)	ALLOWABLE STAGGERING FORCE (kN/m)	NAIL HEAD SIZE (mmXmm)
~~SECTION A-A~~	~~A-A~~	~~25~~	~~+13.2~~	~~9~~	~~8.0~~	~~15~~	~~1.5~~	~~100~~	~~21.0~~	600X600X250
	~~B-B~~	~~25~~	~~+15.2~~	~~8~~	~~8.0~~	~~15~~	~~1.5~~	~~100~~	~~13.0~~	
~~SECTION 3-3~~	~~L17-L18~~	~~25~~	~~+14.5~~	~~2~~	~~8.0~~	~~15~~	~~1.5~~	~~100~~	~~15.0~~	~~600X600X250~~
	~~M20-M21~~	~~25~~	~~+7.5~~	~~2~~	~~10.0~~	~~15~~	~~1.5~~	~~100~~	~~30.0~~	
	~~N21-N22~~	~~25~~	~~+9.0~~	~~2~~	~~10.0~~	~~15~~	~~1.5~~	~~100~~	~~30.0~~	

ALLOWABLE BEARING PRESSURE

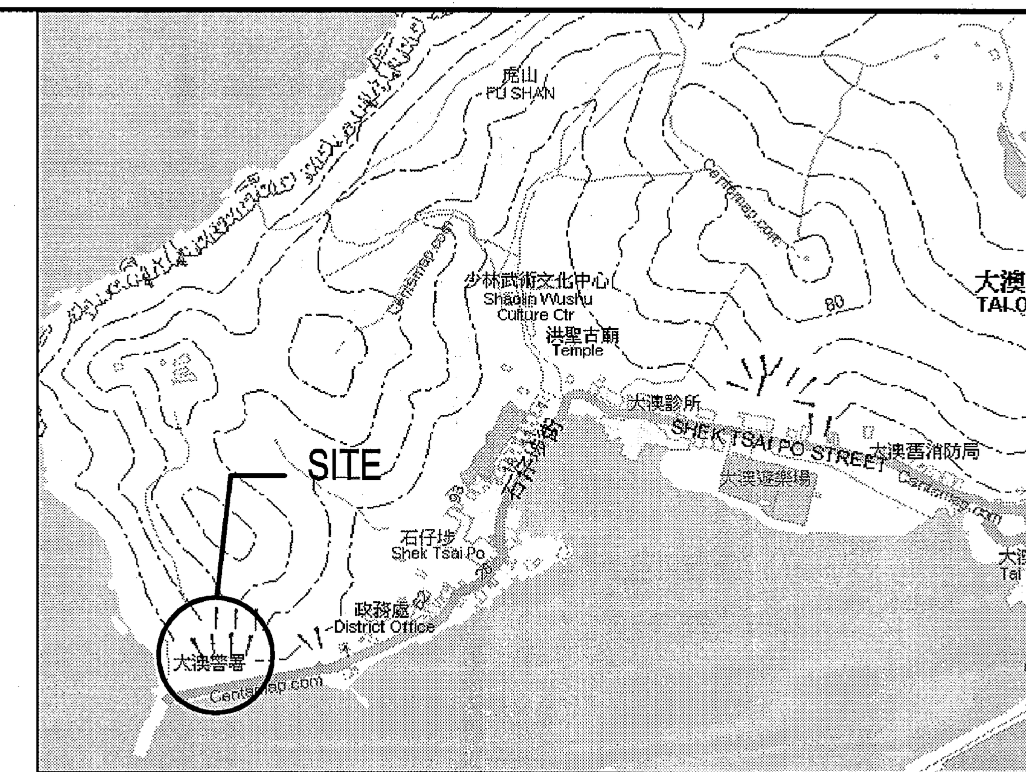
1. ALLOWABLE BEARING PRESSURE FOR FOOTING NO. F1 (FOR GLASS ENCLOSURE) = 85kPa
2. ALLOWABLE BEARING FOR FOOTING NO. F8 = 160kPa
3. ALL FOOTING SHALL BE FOUNDED ON COMPLETELY DECOMPOSED TUFF

ALLOWABLE LOADING FOR PORTABLE WATER TANK AND COOLING TOWER

1. ALLOWABLE LOADING FOR PORTABLE WATER TANK = 12kPa
2. ALLOWABLE LOADING FOR COOLING TOWER OF AIR CONDITION SYSTEM = 10kPa

NOTES ON SOIL NAILS

1. THE SOIL NAILS SHALL BE INSTALLED PERPENDICULAR TO THE GENERAL SLOPE FACE UNLESS OTHERWISE NOTED OR INSTRUCTED BY THE ENGINEER.
2. THE MINIMUM DIAMETER OF THE DRILLHOLE FOR SOIL NAIL INSTALLATION SHALL BE 100mm UNLESS OTHERWISE STATED. TOLERANCE OF ANGLE SHALL BE ±2° AIR OR FOAM FLUSH MEDIUM MUST BE USED DURING DRILLING, WATER SHALL NOT BE USED FOR FLUSHING.
3. THE SOIL NAILS SHALL BE INSTALLED WITHIN 24 HOURS OF COMPLETION OF THE DRILLING UNLESS OTHERWISE AGREED BY THE ENGINEER'S REPRESENTATIVE. DRILLHOLE SHALL BE CLEARED OF ALL DEBRIS IMMEDIATELY BEFORE GROUTING.
4. STEEL BAR FOR SOIL NAILS IS TO BE 25mm DIAZ. HIGH YIELD TENSILE STEEL BAR TO CS2 : 1995 WITH A WORKING STRESS OF 230 N/mm². ULTIMATE TENSILE STRESS SHALL BE 460 N/mm². REINFORCEMENT TO COMPLY WITH CS2:1995.
5. CENTRALIZES SHALL BE PROVIDED AT 1500mm SPACING ALONG THE STEEL BAR TO ENSURE A MINIMUM GROUT COVER OF 30mm ALL AROUND TO THE STEEL BAR.
6. CEMENT GROUT SHALL BE A DESIGN MIX HAVING A 28 DAY CUBE STRENGTH OF 30MPa AND THE WATER CEMENT RATIO SHALL NOT EXCEED 0.45.
7. GROUT IS TO BE INJECTED UNDER MINIMUM PRESSURE TO LIMIT POTENTIAL DISTURBANCE AT THE SITE (MIN. PRESSURE IS TAKEN TO BE THE AVERAGE CONFINING PRESSURE AT THE SOIL NAIL LEVEL PLUS 10%).
8. CEMENT GROUT SHALL BE DISCHARGED FROM THE BOTTOM OF DRILLHOLE BY MEANS OF A GROUT PIPE. GROUTING SHALL PROCEED AT A SLOW STEADY RATE AND SHALL CONTINUE UNTIL INJECTED GROUT OF THE SAME COMPOSITION AND CONSISTENCY AS THAT MIXED HAS BEEN EMERGING FROM THE OUTLET FOR AT LEAST ONE MINUTE.
9. ALL SOIL NAIL AND OTHER STEEL COMPONENTS ARE TO BE HOT DIP GALVANIZED TO BS EN ISO 1461:1999. THE THICKNESS OF ZINC COATING SHALL BE A MINIMUM OF 610g/m².



SITE LOCATION PLAN

N.T.S.

10. THE EXACT LOCATION OF ALL SOIL NAILS SHALL BE AGREED WITH THE ENGINEER PRIOR TO WORK COMMENCING.
11. FOR CONTROL OF ALKALI-AGGREGATE REACTION IN CONCRETE, THE CONTRACTOR IS TO SUBMIT TO THE ENGINEER TEST RESULTS TO VERIFY THAT THE EQUIVALENT SODIUM OXIDE (Na_2O) CONTENT PER CUBIC METRES OF CONCRETE DOES NOT EXCEED 3.0kg.
12. ALL WORKING NAILS SHALL BE INSTALLED WITH PROVISIONS FOR SUBSEQUENT TIME DOMAIN REFLECTION TEST.
13. THE EXACT LOCATION OF PULL-OUT TESTING NAILS SHALL BE DETERMINED ON SITE.
14. CASING SHALL BE PROVIDED FOR DRILLING THROUGH THE FILL LAYER.
15. FOR SOIL NAILS WITH DOUBLE CORROSION PROTECTION THE ANNULAR SPACE BETWEEN THE WALL OF DRILLHOLE AND CORRUGATED SHEATHING SHALL BE GROUTED FIRST IN A CONTINUOUS OPERATION. THE ANNULAR SPACE BETWEEN CORRUGATED SHEATHING AND STEEL BARS SHALL BE GROUTED IMMEDIATELY AFTERWARDS IN A CONTINUOUS OPERATION.

DELETE

SPECIFICATION FOR SOIL NAIL PULL OUT TEST

1. THE APPARATUS FOR MEASURING LOADS AND DEFORMATIONS SHALL HAVE AN ACCURACY OF 5 KN AND 0.05 MM RESPECTIVELY.
2. THE PULL-OUT TEST SHALL NOT BE CARRIED OUT UNTIL THE GROUT HAS REACHED A CUBE STRENGTH OF 21 MPa.
3. THE APPARATUS SHALL BE TESTED AND CALIBRATED BY APPROVED LABORATORIES NOT MORE THAN 6 MONTHS PRIOR TO THE DATE OF CARRYING OUT OF THE TESTS.

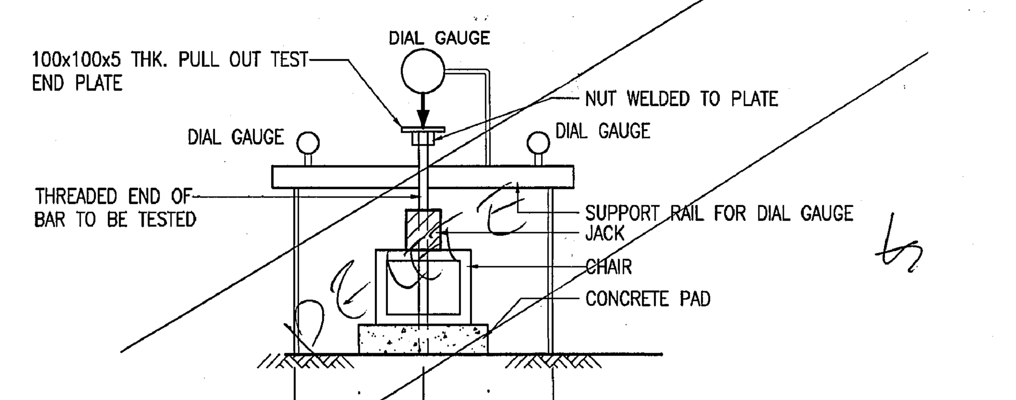
PULL-OUT TEST

1. SOIL NAILS SHALL BE INSTALLED FOR PULL-OUT TESTS PRIOR TO THE INSTALLATION OF PERMANENT SOIL NAILS.
2. SOIL NAILS SUBJECTED TO PULL-OUT TESTS SHALL NOT FORM PART OF THE PERMANENT WORKS.
3. THE ENTIRE FREE LENGTH OF THE STEEL BAR SHALL BE PROPERLY WRAPPED OR CAPPED TO ENSURE THAT THE TEST LOAD CAN BE DIRECTLY TRANSFERRED TO THE BONDED ZONE IN CASE OF GROUT LEAK THROUGH THE PACKER.
4. THE MAXIMUM TEST LOAD (Tp) SHALL BE ACCORDING TO THE SOIL NAIL PULL OUT TEST SCHEDULE.
5. THE TEST NAIL SHALL BE LOADED IN STAGES: FROM THE INITIAL LOAD (Ta) VIA, TWO INTERMEDIATE TEST LOADS (T_{DL1} AND T_{DL2}) TO THE MAXIMUM TEST LOAD.
6. DURING THE FIRST TWO LOADING CYCLES, THE INTERMEDIATE LOADS, T_{DL1} AND T_{DL2} SHALL BE MAINTAINED FOR 60 MINUTES FOR DEFORMATION MEASUREMENT. AFTER THE MEASUREMENT HAS BEEN COMPLETED, THE LOAD SHALL BE REDUCED TO Ta AND THE RESIDUAL DEFORMATION SHALL BE RECORDED. IN THE LAST CYCLE, THE TEST LOAD SHALL BE INCREASED GRADUALLY FROM Ta STRAIGHT TO MAXIMUM TEST LOAD AND THEN MAINTAINED FOR DEFORMATION MEASUREMENT.
7. THE MEASUREMENT AT EACH OF THE CYCLES SHALL BE TAKEN AT TIME INTERVALS OF 1, 3, 6, 10, 20, 30, 40, 50 AND 60 MINUTES.
8. THE TEST NAIL IS CONSIDERED TO BE ABLE TO SUSTAIN THE TEST LOAD IF THE DIFFERENCE OF NAIL MOVEMENTS AT 6 AND 60 MINUTES DOES NOT EXCEED 2mm OR 0.1% OF THE GROUT LENGTH OF THE TEST NAIL. IN THIS CASE, THE TEST SHALL PROCEED TO THE NEXT LOADING CYCLE OR BE TERMINATED IF THE TEST NAIL IS SUBJECTED TO Tp.
9. THROUGHOUT THE TEST, THE SOIL NAIL MOVEMENT AS WELL AS THE MOVEMENT OF THE BEARING PLATE VERSUS THE APPLIED LOAD SHALL BE MEASURED, RECORDED AND PLOTTED ON A GRAPH IN THE FORMAT APPROVED BY THE ENGINEER.
10. IF THE TEST SOIL NAIL FAILS TO SUSTAIN TDL1, TDL2, OR THE MAXIMUM TEST LOAD IN ANY CYCLE, THE TEST SHALL BE TERMINATED AND THE SOIL NAIL MOVEMENT AGAINST RESIDUAL LOAD WITH TIME SHALL BE RECORDED. THE MEASUREMENTS SHALL BE TAKEN AT TIME INTERVALS OF 1, 3, 6, 10 AND, EVERY 10 MINUTES THEREAFTER OVER A PERIOD FOR AT LEAST TWO HOURS. THE MEASUREMENTS SHALL BE TAKEN FOR A LONGER PERIOD WHERE CONSIDERED NECESSARY.

DELETE

SOIL NAIL PULL OUT TEST ARRANGEMENT

EXACT DETAILS ARE TO BE PROVIDED BY THE CONTRACTOR, SUBJECT TO THE APPROVAL OF THE ENGINEER.



NOTES ON NON-DESTRUCTIVE TEST (NDT) FOR SOIL NAILS

1. TIME DOMAIN REFLECTOMETRY (TDR) TESTS FOR THE PERMANENT SOIL NAILS SHALL BE CARRIED OUT.
2. A CONTROL NAIL SHALL BE SELECTED BY THE ENGINEER FOR CALIBRATION OF THE TDR TEST.
3. THE EXACT LOCATIONS OF ALL TDR TESTS SHALL BE CONFIRMED BY THE ENGINEER ON SITE. A MINIMUM OF 2 NUMBERS OF TDR TESTS OR 1% OF THE TOTAL NUMBER OF SOIL NAILS, WHICHEVER IS GREATER, SHALL BE CARRIED OUT.
4. TDR TEST SHALL NOT BE CARRIED OUT WITHIN 3 DAYS AFTER COMPLETION OF GROUTING.
5. TDR TEST SHALL BE CARRIED OUT BY AN INDEPENDENT LABORATORY AND A REPORT WITH THE TEST RESULTS AND INTERPRETATIONS SHALL BE SUBMITTED TO THE ENGINEER FOR ACCEPTANCE.

BD Reference No. : BD 22-3/3022/09 (HU) (SF)

Plan Approved
YU Po-mei, Clarice
Senior Building Surveyor
for BUILDING AUTHORITY
- 1 MAR 2011

CHAN Henry
Registered Geotechnical Engineer
RGE 12/05

~~"The works shown on these plans are Type II works (Site Formation Works) in respect of which consent is applied for the purpose of Fast Track consent application under regulation 33 of the Building (Administration) Regulations."~~

Rev.	Stat.	Description	Date	By	Chk.	Ver'd
E	IFS	BD SUBMISSION (AMENDMENT NO. 2)	01/11	LC	ML	MN
D	IFS	BD APPROVAL	15/04/10			
C	IFS	BD SUBMISSION (AMENDMENT NO. 1)	03/10	LC	ML	MN
B	IFS	AMENDMENT NO.1	01/10	LC	ML	MN
A	IFA	DRAWING	11/09	LC	ML	MN
-	IFS	BD SUBMISSION	09/09	LC	ML	MN

Revisions

ESA 工程顧問有限公司
CONSULTING ENGINEERS LTD
Civil . Structural . Geotechnical . Environmental
10 / F., Greatmany Centre, 109 - 115 Queen's Road East, Wanchai, Hong Kong. Tel : 2528 6217 Fax : 2865 2657

Authorized Person / Registered Structural Engineer :

Project :
REVITALISATION SCHEME CONVERSION OF OLD TAI O POLICE STATION INTO TAI O HERITAGE HOTEL

Drawing Title :
GENERAL NOTES AND DETAILS

Drawn :	LC	Date :	12/09	Job No. :	091427
Checked :	ML	Date :	12/09	Cad File :	P093113_ELS01D
Approved :	MN	Date :	12/09	Scale :	1:200
Drawing No. :	P093113/ELS01			Rev.	E

GENERAL NOTES

1. DO NOT SCALE DRAWINGS.
2. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE SPECIFIED.
3. ALL LEVELS ARE IN METRES ABOVE PRINCIPLE DATUM (mPD) UNLESS OTHERWISE SPECIFIED.
4. ALL DRAWINGS ARE TO BE READ IN CONJUNCTION WITH ALL RELEVANT DRAWINGS AND SPECIFICATIONS ISSUED UNDER THE CONTRACT. THE CONTRACTOR SHALL INFORM THE AP FOR ANY DISCREPANCIES WHICH MAY BE FOUND AMONG THESE DRAWINGS.
5. THE CONTRACTOR SHALL INSPECT THE CONDITIONS OF ADJOINING AREAS AND RECORD THE EXISTING STRUCTURES, UTILITIES, ROADS, PAVEMENTS, AND THE LIKE PRIOR TO THE COMMENCEMENT AND AFTER COMPLETION OF THE WORKS. THE CONTRACTOR SHALL SUBMIT THE CONDITION SURVEY REPORT TO THE AP FOR RECORD BEFORE CONSTRUCTION.
6. THE CONTRACTOR SHALL BE RESPONSIBLE FOR AND REPAIR ANY DAMAGES TO ADJOINING AREAS, STRUCTURES, UTILITIES, ROADS, PAVEMENT AND THE LIKE ARISING DIRECTLY FROM THE WORKS AT NO EXTRA COST AND NO EXTENSION OF TIME.
7. ALL WORKS SHALL COMPLY WITH THE GENERAL SPECIFICATION FOR BUILDING 2006, HONG KONG BUILDING (CONSTRUCTION) REGULATIONS 1990, RELEVANT PRACTICE NOTES FOR AUTHORIZED PERSONS AND REGISTERED STRUCTURAL ENGINEERS AND PRACTICE NOTES FOR REGISTERED CONTRACTORS. ALL EXCAVATION WORKS SHALL BE CARRIED OUT ACCORDING TO SECTION 6 OF THE SPECIFICATION. ALL DESIGN AND WORKS OF STRUCTURAL STEEL SHALL COMPLY WITH CODE OF PRACTICE FOR THE STRUCTURAL USE OF STEEL 2005. ALL DESIGN AND WORKS FOR REINFORCED CONCRETE SHALL COMPLY WITH CODE OF PRACTICE FOR STRUCTURAL USE OF CONCRETE 2004.
8. ALL UTILITIES LOCATED IN THE WORK AREA SHALL BE IDENTIFIED BY THE THE CONTRACTOR PRIOR TO THE COMMENCEMENT OF THE WORKS. IF NECESSARY, THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE TEMPORARY UTILITY DIVERSION AND REINSTATEMENT AND ALL COORDINATION WORKS WITH THE UTILITY COMPANIES.
9. THE EXACT BOUNDARY OF THE WORKS SITE AND THE WORKS AREA SHALL BE CONFIRMED BY THE ENGINEER ON SITE.
10. ALL MONITORING WORKS REQUIRED FOR THE PROPOSED WORKS SHALL REFER TO DRAWING NO. P093113/ELS02.
11. THE REQUIREMENT FOR SITE SUPERVISION SHALL FOLLOW THAT STIPULATED IN THE CODE OF PRACTICE FOR SITE SUPERVISION 2005.
12. SOIL PROPERTIES

MATERIALS	COHESION C'(kPa)	FRICTION ANGLE Ø'(°)	UNIT WEIGHT (kN/m³)
FILL	0	32	19
RESIDUAL SOIL	0	32	19
COLLUVIUM	6	28	19
CDT	4	36	17

13. SLOPE AREA SHALL BE EXCAVATED UPON APPROVAL AND CONSENT OF EXCAVATION AND LATERAL SUPPORT PLAN WHICH IS UNDER SEPARATE SUBMISSION.
14. ALL STRUCTURAL STEEL TO BE GRADE S275 TO BS EN 10025.

NOTES ON TEMPORARY DRAINAGE

1. SUMP PUMP AND SUMP PIT SHALL BE PROVIDED FOR THE TEMPORARY DRAINAGE PURPOSE IF NECESSARY. ADEQUATE FILTERS SHALL BE PROVIDED TO PREVENT LOSS OF GROUND AS A RESULT OF PUMPING.
2. ALL TEMPORARY U-CHANNEL SHALL BE 1 IN 100 IN GRADIENT UNLESS OTHERWISE STATED.
3. SUMP PUMPING WITH SUFFICIENT CAPACITY SHALL BE PROVIDED AS DRAINAGE FOR THE TEMPORARY EXCAVATION.
4. LOCATION, NUMBERS AND METHOD OF INSTALLATION OF SUMP PUMPS SHALL BE PROPOSED BY THE CONTRACTOR AGREED WITH THE AP/RGE ON SITE.
5. WATER DISCHARGED FROM SUMP PUMPS SHALL BE DIRECTED TO SAND TRAP AND THEN GOVERNMENTS STORM WATER DRAINS. PERMITS FROM STATUTORY AUTHORITIES SHALL BE OBTAINED FOR WATER DISCHARGING.
6. A REGULAR MAINTENANCE OF SAND TRAP SHALL BE PROVIDED TO ENSURE NO LIKELIHOOD OF FLOODING OCCURRING FROM THE LOT ONTO THE ADJACENT PROPERTIES.
7. ALL SURFACE WATER SHALL BE DIVERTED AND COLLECTED WITHIN THE EXCAVATION AREA AND SHALL BE DISCHARGED BY SUMP PUMPS.

NOTES ON EXCAVATION

1. ALL TEMPORARY SOIL CUT SLOPES EXPOSED FOR LESS THAN A WEEK SHALL BE PROTECTED WITH NYLON SHEETS SECURED AGAINST WIND.
2. ALL TEMPORARY SOIL CUT SLOPES EXPOSED FOR A WEEK OR MORE SHALL BE PROTECTED BY 50mm THICK SPRAYED CONCRETE SURFACING OR OTHER APPROVED MATERIAL WITH WEEPHOLE. 50mm DIAMETER PVC WEEPHOLES SHALL BE BUILT IN AT 1.5m CENTRES IN EACH DIRECTION ON A STAGGERED PITCH AS THE WORK PROCEEDS.
3. MATERIAL THAT MAY CAUSE A LANDSLIDE OF THE TEMPORARY CUT SLOPE SHALL NOT BE STOCKPILED BEHIND THE CREST OF OR ON THE TEMPORARY CUT SLOPE.
4. OVER EXCAVATION IF ANY BELOW THE FINAL FORMATION LEVEL SHALL BE BACKFILLED WITH MASS CONCRETE.

NOTES ON GROUNDWATER TABLE

1. THE DESIGN GROUNDWATER TABLE IS ASSUMED TO BE ONE-THIRD OF SLOPE HEIGHT.

NOTES ON DUST CONTROL

1. THE CONTRACTOR SHALL SUBMIT FOR THE ENGINEER'S PRIOR APPROVAL AT LEAST 2 WEEKS BEFORE COMMENCEMENT OF ANY WORK, METHOD STATEMENT IDENTIFYING OPERATIONS AND PLANTS LIKELY TO CASE AIR POLLUTION OR DUST EMISSIONS FROM THE SITE, TOGETHER WITH MEASURES TO BE IMPLEMENTED TO MITIGATE AND CONTROL SUCH POLLUTION AND EMISSION.
2. DURING THE COURSE OF DRILLING WORKS, THE WORKS SHALL BE TREATED WITH WATER OR SPRAYED WITH WETTING AGENT.

NOTES ON SITE SUPERVISION

1. THE TCP T5 SITE SUPERVISION PERSONNEL UNDER THE RGE'S STREAM SHALL SUBMIT REGULAR REPORTS OF HER/HIS FINDINGS AND RECOMMENDATIONS TO THE RGE. THE RGE SHALL FORMALLY SUBMIT THESE REPORTS TO THE BD AND PROVIDE A COPY TO THE GEO AT MONTHLY INTERVALS OR MORE FREQUENTLY AS NECESSARY.
2. TYPICAL CONTENTS OF THE REGULAR REPORTS PREPARED BY THE TCP T5 SITE SUPERVISION PERSONNEL SHALL INCLUDE THE FOLLOWING:
   (A) PROGRESS OF THE WORKS
   (B) RESULTS OF MONITORING DURING CONSTRUCTION
   (C) SITE OBSERVATIONS
   (D) INSPECTION RECORDS
   (E) REVIEW

CONCRETE WORKS

1. ALL CONCRETE WORKS TO BE GRADE 300/20 TO COMPLY WITH CS2, MAXIMUM AGGREGATE SIZE = 20.
2. ALL STEEL REINFORCEMENT SHALL BE HIGH YIELD BAR TYPE 2 AND COMPLY WITH CS2.

PRECAUTIONS AGAINST HEAVY RAINFALL

1. PRIOR TO THE COMMENCEMENT OF WORKS, SURFACE WATER FLOWING INTO THE SITE FROM UPHILL SHALL BE INTERCEPTED AND SAFELY DISCHARGED FROM THE SITE. AT EACH INTERSECTION AND ABRUPT CHANGE IN DIRECTION OF SURFACE DRAINAGE CHANNELS AND ACCESSIBLE CATCHPIT SHALL BE PROVIDED. ALL DRAINAGE WORKS SHALL BE KEPT CLEAR OF DEBRIS.
2. WHERE PARTIALLY COMPLETED DRAINAGE WORKS DISCHARGE WITHIN THE SITE A TEMPORARY CONDUIT SHALL BE PROVIDED TO THE DISCHARGE POINT.

NOTES ON MONITORING

1. ALL THE CHECK POINTS SHALL BE INSTALLED PRIOR TO THE COMMENCEMENT OF WORKS. THE INITIAL READINGS SHALL BE TAKEN AND SUBMITTED TO THE BUILDINGS DEPARTMENT AND THE AP/RGE PRIOR TO THE COMMENCEMENT OF WORKS. DURING THE PROCESSES OF WORKS, THE CHECK POINTS, PIEZOMETERS AND INCLINOMETERS SHALL BE MONITORED DAILY. ALL READINGS SHALL BE KEPT ON SITE AND SUBMITTED TO THE ENGINEER AND BUILDINGS DEPARTMENT BI-WEEKLY.

3. MONITORING SCHEDULE FOR WORKS:
IF THE ALERT LEVEL IS EXCEEDED, THE FREQUENCY OF MONITORING SHALL BE INCREASED TO TWICE DAILY TO GAUGE FURTHER MOVEMENT AND THE AP/RGE SHOULD BE INFORMED IMMEDIATELY.
IF THE ALARM LEVEL IS EXCEEDED, THE WORKS AT AFFECTED AREAS SHALL CEASE AND AP/RGE SHALL BE INFORMED IMMEDIATELY AND PROPOSAL FOR PRECAUTIONARY MEASURES SHALL BE SUBMITTED TO AP/RGE FOR CONSIDERATION PRIOR TO RESUMING WORKS IN THE AFFECTED AREA.
IF THE ACTION LEVEL IS EXCEEDED, THE WORKS AT THE AFFECTED AREA SHALL CEASE AND THE AP/RGE/BD/GEO/AMD SHALL BE NOTIFIED. A REVIEW OF VALIDITY OF THE DESIGN ASSUMPTIONS AND METHOD, AND REMEDIAL PROPOSAL, SHALL BE SUBMITTED TO THE SATISFACTION OF BD. THE WORKS IN THE AFFECTED AREA SHALL NOT BE RESUMED UNTIL THE APPROVAL FOR RECOMMENCEMENT HAS BEEN GIVEN.

MONITORING POINT	LOCATION	ALERT LEVEL	ALARM LEVEL	ACTION LEVEL
SETTLEMENT MARKER ON GROUND	~~SM1 TO SM8, SM10, SM16,17,18,20,~~ ~~SM4-(5A), SM5-(5A)~~, Sm24, Sm21	5mm	10mm	15mm
PIEZOMETER	B5	11.5mPD	10.5mPD	9.5mPD
~~BUILDING SETTLEMENT MARKER~~	~~BS1 TO BS4, BS8 TO BS10~~	~~5mm~~	~~10mm~~	~~15mm~~
~~TILTING MARKER~~	~~BT1 TO BT4, BT10, BT11, BT12~~	~~1:1000~~	~~1:750~~	~~1:500~~
~~VIBRATION MONITORING~~	~~VM1 TO VM3, VM5~~	~~5.5mm/sec~~	~~6.5mm/sec~~	~~7.5mm/sec~~

SOIL NAIL PULL OUT TEST SCHEDULE

FEATURE NO.	TEST NAIL NO.	NAILS DIAMETER (mm)	LEVEL (mPD)	DRILLHOLE DIAMETER (mm)	FULL LENGTH (m)	GROUT LENGTH (m)	DIPPING ANGLE (DEGREES)	To (kN)	TDL1 (kN)	TDL2 (kN)	Tp (kN)
~~9SW-C/F6~~	~~TN1~~	~~25~~	~~+13.2~~	~~100~~	~~8.0~~	~~2.0~~	~~15~~	~~3~~	~~15~~	~~30~~	50
	~~TN2~~	~~25~~	~~+15.2~~	~~100~~	~~8.0~~	~~2.0~~	~~15~~	~~2~~	~~10~~	~~19~~	39
~~9SW-C/CR14~~	~~TN3~~	~~25~~	~~+17.5~~	~~100~~	~~10.0~~	~~2.0~~	~~15~~	~~4.5~~	~~33~~	~~61.5~~	~~90~~
	~~TN4~~	~~25~~	~~+19.0~~	~~100~~	~~10.0~~	~~2.0~~	~~15~~	~~45~~	~~33~~	~~61.5~~	~~90~~

SOIL NAIL SCHEDULE

SECTION	SOIL NAIL NO.	NAILS DIAMETER (mm)	TENTATIVE LEVEL (mPD)	TENTATIVE NOS. OF NAILS	MINIMUM DESIGN LENGTH (m)	DIPPING ANGLE (DEGREES)	HORIZONTAL SPACING (m)	DRILLHOLE DIAMETER (mm)	ALLOWABLE STAGGERING FORCE (kN/m)	NAIL HEAD SIZE (mmXmm)
~~SECTION A-A~~	~~A-A~~	~~25~~	~~+13.2~~	~~9~~	~~8.0~~	~~15~~	~~1.5~~	~~100~~	~~21.0~~	~~600X600X250~~
	~~B-B~~	~~25~~	~~+15.2~~	~~8~~	~~8.0~~	~~15~~	~~1.5~~	~~100~~	~~13.0~~	
~~SECTION 3-3~~	~~L17-L18~~	~~25~~	~~+14.5~~	~~2~~	~~8.0~~	~~15~~	~~1.5~~	~~100~~	~~15.0~~	600X600X250
	~~M19-M21~~	~~25~~	~~+7.5~~	~~2~~	10.0	15	1.5	100	~~30.0~~	
	~~N21-N22~~	~~25~~	~~+9.0~~	~~2~~	~~10.0~~	~~15~~	~~1.5~~	~~100~~	~~30.0~~	

ALLOWABLE BEARING PRESSURE

1. ALLOWABLE BEARING PRESSURE FOR FOOTING NO. F1 (FOR GLASS ENCLOSURE) = 85kPa
2. ALLOWABLE BEARING FOR FOOTING NO. FB = 150kPa
3. ALL FOOTING SHALL BE FOUNDED ON COMPLETELY DECOMPOSED TUFF

ALLOWABLE LOADING FOR PORTABLE WATER TANK AND COALING TOWER

1. ALLOWABLE LOADING FOR PORTABLE WATER TANK = 12kPa
2. ALLOWABLE LOADING FOR COOLING TOWER OF AIR CONDITION SYSTEM = 10kPa

NOTES ON SOIL NAILS

1. THE SOIL NAILS SHALL BE INSTALLED PERPENDICULAR TO THE GENERAL SLOPE FACE UNLESS OTHERWISE NOTED OR INSTRUCTED BY THE ENGINEER.
2. THE MINIMUM DIAMETER OF THE DRILLHOLE FOR SOIL NAIL INSTALLATION SHALL BE 100mm UNLESS OTHERWISE STATED. TOLERANCE OF ANGLE SHALL BE ±2°. AIR OR FOAM FLUSH MEDIUM MUST BE USED DURING DRILLING. WATER SHALL NOT BE USED FOR FLUSHING.
3. THE SOIL NAILS SHALL BE INSTALLED WITHIN 24 HOURS OF COMPLETION OF THE DRILLING UNLESS OTHERWISE AGREED BY THE ENGINEER'S REPRESENTATIVE. DRILLHOLE SHALL BE CLEARED OF ALL DEBRIS IMMEDIATELY BEFORE GROUTING.
4. STEEL BAR FOR SOIL NAILS IS TO BE 25mm DIA. HIGH YIELD TENSILE STEEL BAR TO CS2 : 1995 WITH A WORKING STRESS OF 230 N/mm², ULTIMATE TENSILE STRESS SHALL BE 460 N/mm². REINFORCEMENT TO COMPLY WITH CS2:1995.
5. CENTRALIZES SHALL BE PROVIDED AT 1500mm SPACING ALONG THE STEEL BAR TO ENSURE A MINIMUM GROUT COVER OF 35mm ALL AROUND TO THE STEEL BAR.
6. CEMENT GROUT SHALL BE A DESIGN MIX HAVING A 28 DAY CUBE STRENGTH OF 30MPa AND THE WATER CEMENT RATIO SHALL NOT EXCEED 0.45.
7. GROUT IS TO BE INJECTED UNDER MINIMUM PRESSURE TO LIMIT POTENTIAL DISTURBANCE AT THE SITE (MIN. PRESSURE IS TAKEN TO BE THE AVERAGE CONFINING PRESSURE AT THE SOIL NAIL LEVEL PLUS 10%).
8. CEMENT GROUT SHALL BE DISCHARGED FROM THE BOTTOM OF DRILLHOLE BY MEANS OF A GROUT PIPE. GROUTING SHALL PROCEED AT A SLOW STEADY RATE AND SHALL CONTINUE UNTIL INJECTED GROUT OF THE SAME COMPOSITION AND CONSISTENCY AS THAT MIXED HAS BEEN EMERGING FROM THE OUTLET FOR AT LEAST ONE MINUTE.
9. ALL SOIL NAIL AND OTHER STEEL COMPONENTS ARE TO BE HOT DIP GALVANIZED TO BS EN ISO 1461:1999. THE THICKNESS OF ZINC COATING SHALL BE A MINIMUM OF 610g/m².
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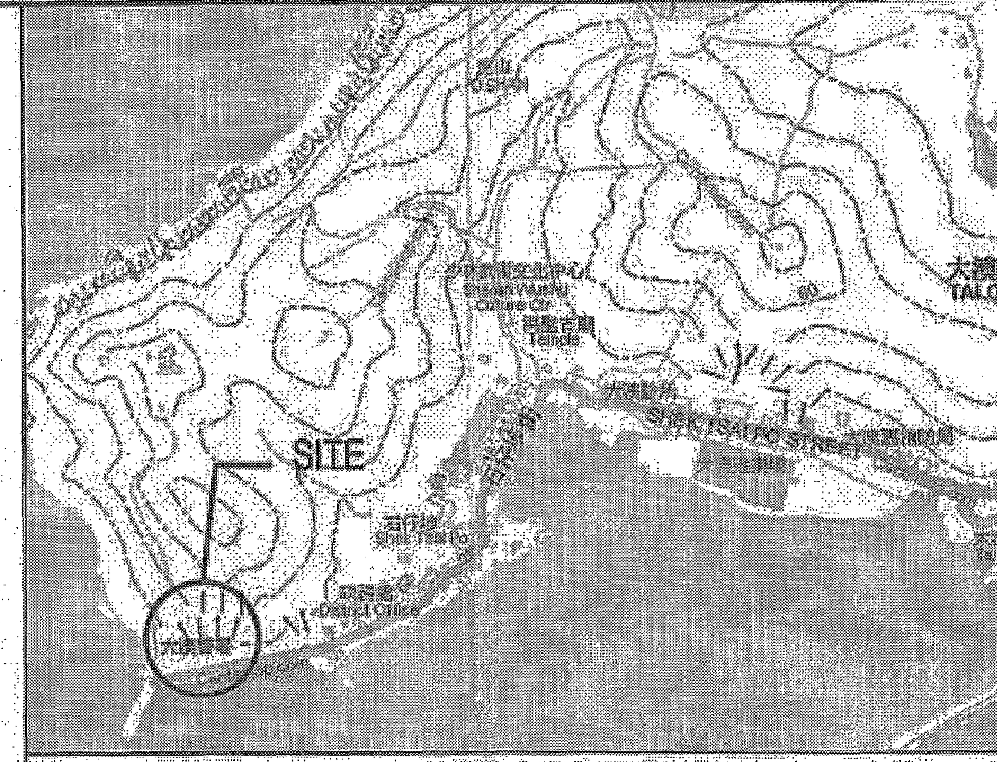
12. ALL WORKING NAILS SHALL BE INSTALLED WITH PROVISIONS FOR SUBSEQUENT TIME DOMAIN REFLECTION TEST.
13. THE EXACT LOCATION OF PULL-OUT TESTING NAILS SHALL BE DETERMINED ON SITE.
14. CASING SHALL BE PROVIDED FOR DRILLING THROUGH THE FILL LAYER.
15. FOR SOIL NAILS WITH DOUBLE CORROSION PROTECTION THE ANNULAR SPACE BETWEEN THE WALL OF DRILLHOLE AND CORRUGATED SHEATHING SHALL BE GROUTED FIRST IN A CONTINUOUS OPERATION. THE ANNULAR SPACE BETWEEN CORRUGATED SHEATHING AND STEEL BARS SHALL BE GROUTED IMMEDIATELY AFTERWARDS IN A CONTINUOUS OPERATION.



SITE LOCATION PLAN

N.T.S.

SPECIFICATION FOR SOIL NAIL PULL OUT TEST

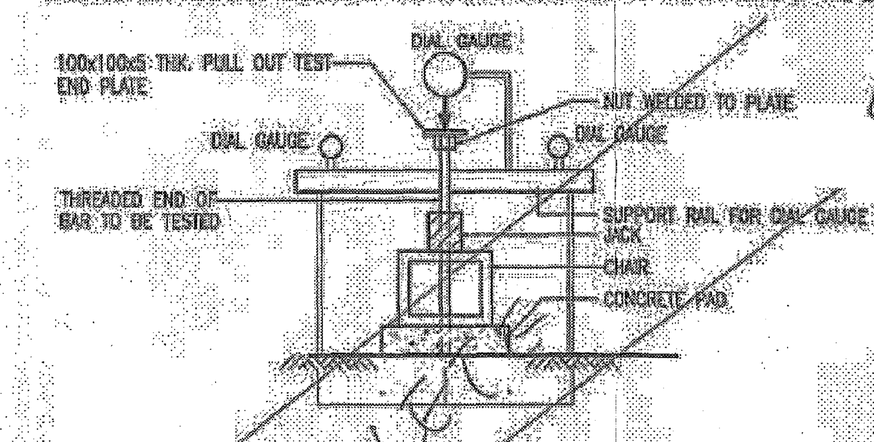
1. THE APPARATUS FOR MEASURING LOADS AND DEFORMATIONS SHALL HAVE AN ACCURACY OF 5 KN AND 0.05 MM RESPECTIVELY.
2. THE PULL-OUT TEST SHALL NOT BE CARRIED OUT UNTIL THE GROUT HAS REACHED A CUBE STRENGTH OF 21 MPa.
3. THE APPARATUS SHALL BE TESTED AND CALIBRATED BY APPROVED LABORATORIES NOT MORE THAN 6 MONTHS PRIOR TO THE DATE OF CARRYING OUT OF THE TESTS.

PULL-OUT TEST

1. SOIL NAILS SHALL BE INSTALLED FOR PULL-OUT TESTS PRIOR TO THE INSTALLATION OF PERMANENT SOIL NAILS.
2. SOIL NAILS SUBJECTED TO PULL-OUT TESTS SHALL NOT FORM PART OF THE PERMANENT WORKS.
3. THE ENTIRE FREE LENGTH OF THE STEEL BAR SHALL BE PROPERLY WRAPPED OR CAPPED TO ENSURE THAT THE TEST LOAD CAN BE DIRECTLY TRANSFERRED TO THE BONDED ZONE IN CASE OF GROUT LEAK THROUGH THE PACKER.
4. THE MAXIMUM TEST LOAD (Tp) SHALL BE ACCORDING TO THE SOIL NAIL PULL OUT TEST SCHEDULE.
5. THE TEST NAIL SHALL BE LOADED IN STAGES FROM THE INITIAL LOAD (To) VIA TWO INTERMEDIATE TEST LOADS (T_{D1} AND T_{D2}) TO THE MAXIMUM TEST LOAD.
6. DURING THE FIRST TWO LOADING CYCLES, THE INTERMEDIATE LOADS, T_{D1} AND T_{D2} SHALL BE MAINTAINED FOR 60 MINUTES FOR DEFORMATION MEASUREMENT. AFTER THE MEASUREMENT HAS BEEN COMPLETED, THE LOAD SHALL BE REDUCED TO To AND THE RESIDUAL DEFORMATION SHALL BE RECORDED. IN THE LAST CYCLE, THE TEST LOAD SHALL BE INCREASED GRADUALLY FROM To STRAIGHT TO MAXIMUM TEST LOAD AND THEN MAINTAINED FOR DEFORMATION MEASUREMENT.
7. THE MEASUREMENT AT EACH OF THE CYCLES SHALL BE TAKEN AT TIME INTERVALS OF 1, 3, 6, 10, 20, 30, 40, 50 AND 60 MINUTES.
8. THE TEST NAIL IS CONSIDERED TO BE ABLE TO SUSTAIN THE TEST LOAD IF THE DIFFERENCE OF NAIL MOVEMENTS AT 6 AND 60 MINUTES DOES NOT EXCEED 2mm OR 0.1% OF THE GROUT LENGTH OF THE TEST NAIL. IN THIS CASE, THE TEST SHALL PROCEED TO THE NEXT LOADING CYCLE OR BE TERMINATED IF THE TEST NAIL IS SUBJECTED TO Tp.
9. THROUGHOUT THE TEST, THE SOIL NAIL MOVEMENT AS WELL AS THE MOVEMENT OF THE BEARING PLATE VERSUS THE APPLIED LOAD SHALL BE MEASURED, RECORDED AND PLOTTED ON A GRAPH IN THE FORMAT APPROVED BY THE ENGINEER.
10. IF THE TEST SOIL NAIL FAILS TO SUSTAIN TDL1, TDL2, OR THE MAXIMUM TEST LOAD IN ANY CYCLE, THE TEST SHALL BE TERMINATED AND THE SOIL NAIL MOVEMENT AGAINST RESIDUAL LOAD WITH TIME SHALL BE RECORDED. THE MEASUREMENTS SHALL BE TAKEN AT TIME INTERVALS OF 1, 3, 6, 10 AND, EVERY 10 MINUTES THEREAFTER OVER A PERIOD FOR AT LEAST TWO HOURS. THE MEASUREMENTS SHALL BE TAKEN FOR A LONGER PERIOD WHERE CONSIDERED NECESSARY.

SOIL NAIL PULL OUT TEST ARRANGEMENT

EXACT DETAILS ARE TO BE PROVIDED BY THE CONTRACTOR, SUBJECT TO THE APPROVAL OF THE ENGINEER.



NOTES ON NON-DESTRUCTIVE TEST (NDT) FOR SOIL NAILS

1. TIME DOMAIN REFLECTOMETRY (TDR) TESTS FOR THE PERMANENT SOIL NAILS SHALL BE CARRIED OUT.
2. A CONTROL NAIL SHALL BE SELECTED BY THE ENGINEER FOR CALIBRATION OF THE TDR TEST.
3. THE EXACT LOCATIONS OF ALL TDR TESTS SHALL BE CONFIRMED BY THE ENGINEER ON SITE. A MINIMUM OF 2 NUMBERS OF TDR TESTS OR 1% OF THE TOTAL NUMBER OF SOIL NAILS, WHICHEVER IS GREATER, SHALL BE CARRIED OUT.
4. TDR TEST SHALL NOT BE CARRIED OUT WITHIN 3 DAYS AFTER COMPLETION OF GROUTING.
5. TDR TEST SHALL BE CARRIED OUT BY AN INDEPENDENT LABORATORY AND A REPORT WITH THE TEST RESULTS AND INTERPRETATIONS SHALL BE SUBMITTED TO THE ENGINEER FOR ACCEPTANCE.

BD Reference No. : BD 22-3/3022/09 (HU) (SF)

CHAN Henry
Registered Geotechnical Engineer
RGE 12/05

Plan Approved
YU Po-mei, Clarice
Senior Building Surveyor
for BUILDING AUTHORITY
- 1 MAR 2011

CHAN Henry
Registered Geotechnical Engineer
RGE 12/05

"The works shown on these plans are Type II works (Site Formation Works) in respect of which consent is applied for the purpose of Fast Track consent application under regulation 33 of the Building (Administration) Regulations."

RECORD PLAN

Rev	Stat	Description	Date	By	Chk	Ver'd
E	IFS	BD SUBMISSION (AMENDMENT NO. 2)	01/11	LC	ML	MN
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A	IFA	DRAWING	11/09	LC	ML	MN
-	IFS	BD SUBMISSION	08/09	LC	ML	MN

Revisions

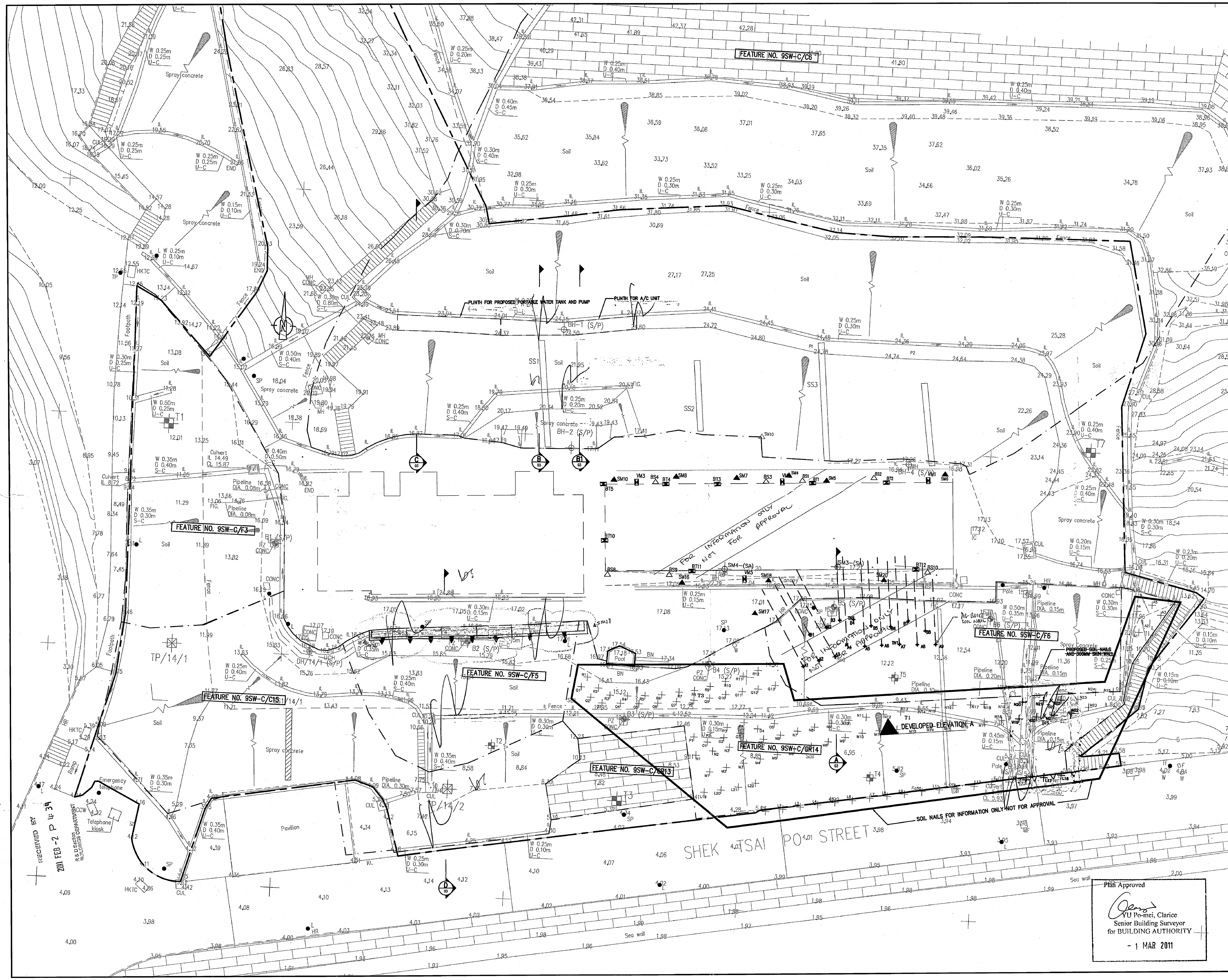
ESA 工程顧問有限公司
CONSULTING ENGINEERS LTD
Civil Structural Geotechnical Environmental
10 / F., Gracimony Centre, 109 - 115 Queen's Road East, Wanchai, Hong Kong. Tel : 2528 6217 Fax : 2865 2057

Authorized Person / Registered Structural Engineer :

Project :
REVITALISATION SCHEME CONVERSION OF OLD TAI O POLICE STATION INTO TAI O HERITAGE HOTEL

Drawing Title :
GENERAL NOTES AND DETAILS

Drawn :	LC	Date :	12/09	Job No. :	091427
Checked :	ML	Date :	12/09	Cad File :	P093113_ELS01D
Approved :	MN	Date :	12/09	Scale :	1:200
Drawing No. :	P093113/ELS01			Rev.	E



BD Reference No. : BD 22-3/3022/09 (HU) (SF)

LEGEND:

- SITE BOUNDARY
- SLOPE FEATURE BOUNDARY
- BH-1 EXISTING BOREHOLES (BY LAMS GEOTECHNICS LTD. 1984)
- DH/14/1 EXISTING BOREHOLES (BY LAMS GEOTECHNICS LTD. 2001)
- B1 EXISTING BOREHOLES (BY TYSAN FOUNDATION LTD. 2008)
- T1 EXISTING TRIAL PITS (BY TYSAN FOUNDATION LTD. 2008)
- SS1 EXISTING SLOPE STRIPPING (BY LAMS GEOTECHNICS LTD. 1985)
- SS1/14/1 EXISTING SLOPE STRIPPING (BY LAMS GEOTECHNICS LTD. 2001)
- AS-BUILT SOIL NAIL
- TN1 AS-BUILT PULL-OUT TEST NAILS (TN1 TO TN8)
- R1 SOIL NAIL TO BE CONSTRUCTED UNDER ARCH.S.D. AGREEMENT NO. ASD/PSB/PM1 /PM3/03/08
- SM7 SETTLEMENT MARKERS
- BT3 AS-BUILT TILTING MARKER
- BS3 AS-BUILT BUILDING SETTLEMENT MARKER
- VM1 AS-BUILT VIBRATION MONITORING POINT
- SM1-(SA) SETTLEMENT MARKER (INSTALLED DURING STRUCTURAL ASSESSMENT STAGE)
- PROPOSED PLANTER Box
- PROPOSED TOE WALL

CHAN (Henry)
Registered Geotechnical Engineer
RGE 12/05

~~"The works shown on these plans are Type II works (Site Formation Works) in respect of which consent is applied for the purpose of Fast Track consent application under regulation 33 of the Building (Administration) Regulations."~~

MAK CHI CHEUNG, PETER
BArch., BAAS, FHKIA, RIBA, ARAIA
REGISTERED ARCHITECT, AP(List 1)

Rev.	Stat.	Description	Date	By	Chk.	Ver'd
E	IFS	BD SUBMISSION (AMENDMENT NO. 2)	01/11	LC	ML	MN
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A	IFT	BD APPROVED DRAWING	11/09	LC	ML	MN
–	IFS	BD SUBMISSION	09/09	LC	ML	MN

Revisions

ESA 工程顧問有限公司
CONSULTING ENGINEERS LTD
Civil . Structural . Geotechnical . Environmental
10 / F., Greatmany Centre, 109 – 115 Queen's Road East, Wanchai, Hong Kong. Tel : 2528 6217 Fax : 2865 2657

Authorized Person / Registered Structural Engineer :

Project :

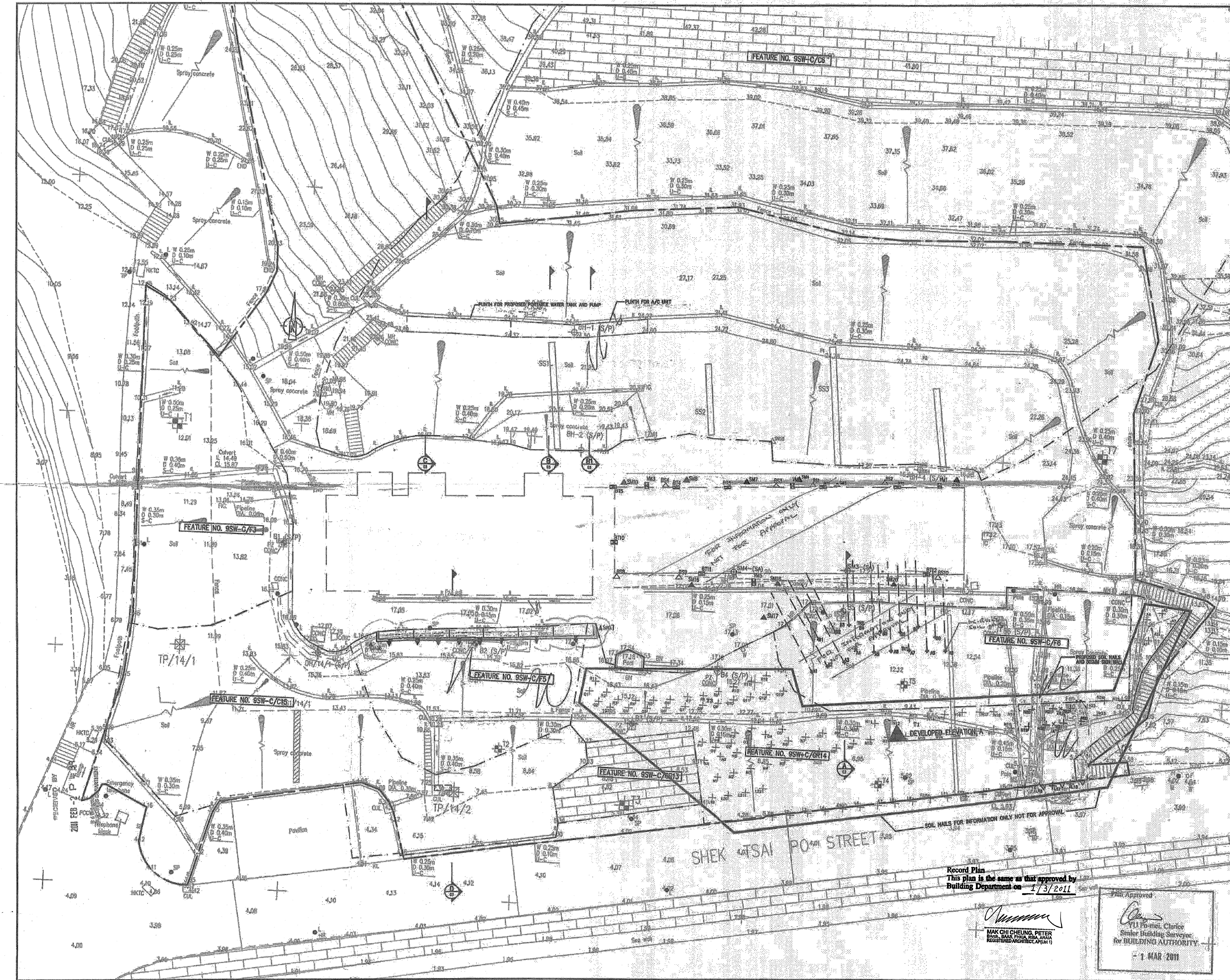
REVITALISATION SCHEME CONVERSION OF OLD TAI O POLICE STATION INTO TAI O HERITAGE HOTEL

Drawing Title :

SITE FORMATION PLAN

Drawn :	LC	Date :	12/09	Job No. :	091427
Checked :	ML	Date :	12/09	Cad File :	P093113_ELS02E
Approved :	MN	Date :	12/09	Scale :	1:150

Drawing No. : P093113/ELS02 Rev. E



Record Plan
This plan is the same as that approved by
Building Department on 1/3/2011

MAK CHI CHEUNG, PETER
BArch., BAAS, FHKIA, RIBA, ARAIA
REGISTERED ARCHITECT, AP(List 1)

Plan Approved
YU Po-mei, Clarice
Senior Building Surveyor
for BUILDING AUTHORITY
- 1 MAR 2011

BD Reference No. : BD 22-3/3022/09 (HU) (SF)

LEGEND:

- SITE BOUNDARY
- SLOPE FEATURE BOUNDARY
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- TN1 AS-BUILT PULL-OUT TEST NAILS (TN1 TO TN4)
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- SM1-(SA) SETTLEMENT MARKER (INSTALLED DURING STRUCTURAL ASSESSMENT STAGE)
- PROPOSED PLANTER BOX
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CHAN Henry
Registered Geotechnical Engineer
RGE 12/05

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Registered Geotechnical Engineer
RGE 12/05

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MAK CHI CHEUNG, PETER
BArch., BAAS, FHKIA, RIBA, ARAIA
REGISTERED ARCHITECT, AP(List 1)

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Revisions

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Civil Structural Geotechnical Environmental
10/F., Greatmany Centre, 109 - 115 Queen's Road East, Wanchai, Hong Kong. Tel : 2528 6217 Fax : 2865 2657

Authorized Person / Registered Structural Engineer :

Project :
REVITALISATION SCHEME CONVERSION OF OLD TAI O POLICE STATION INTO TAI O HERITAGE HOTEL

Drawing Title :
SITE FORMATION PLAN

Drawn :	LC	Date :	12/09	Job No. :	091427
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Drawing No. :	P093113/ELS02			Rev.	E

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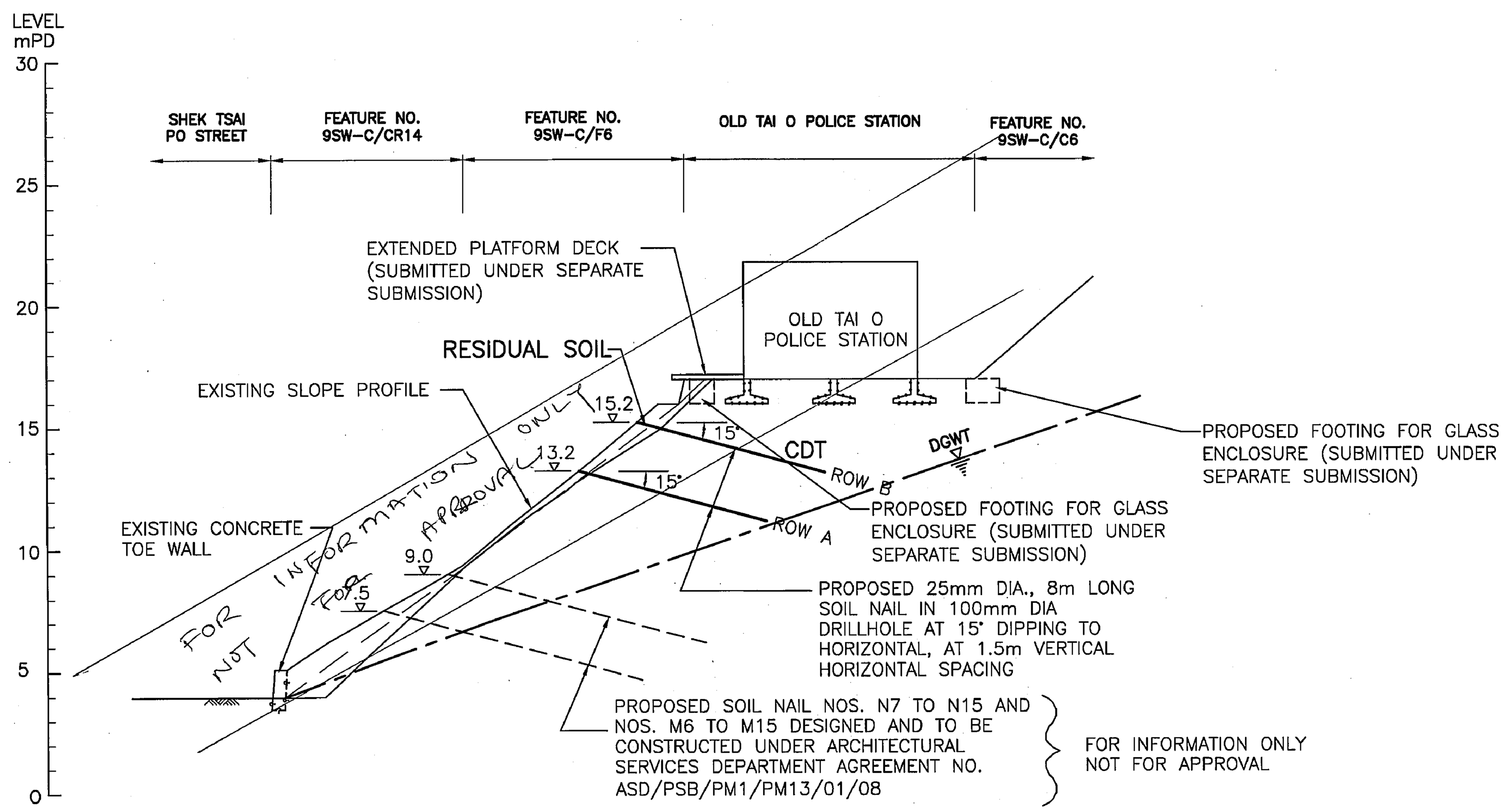

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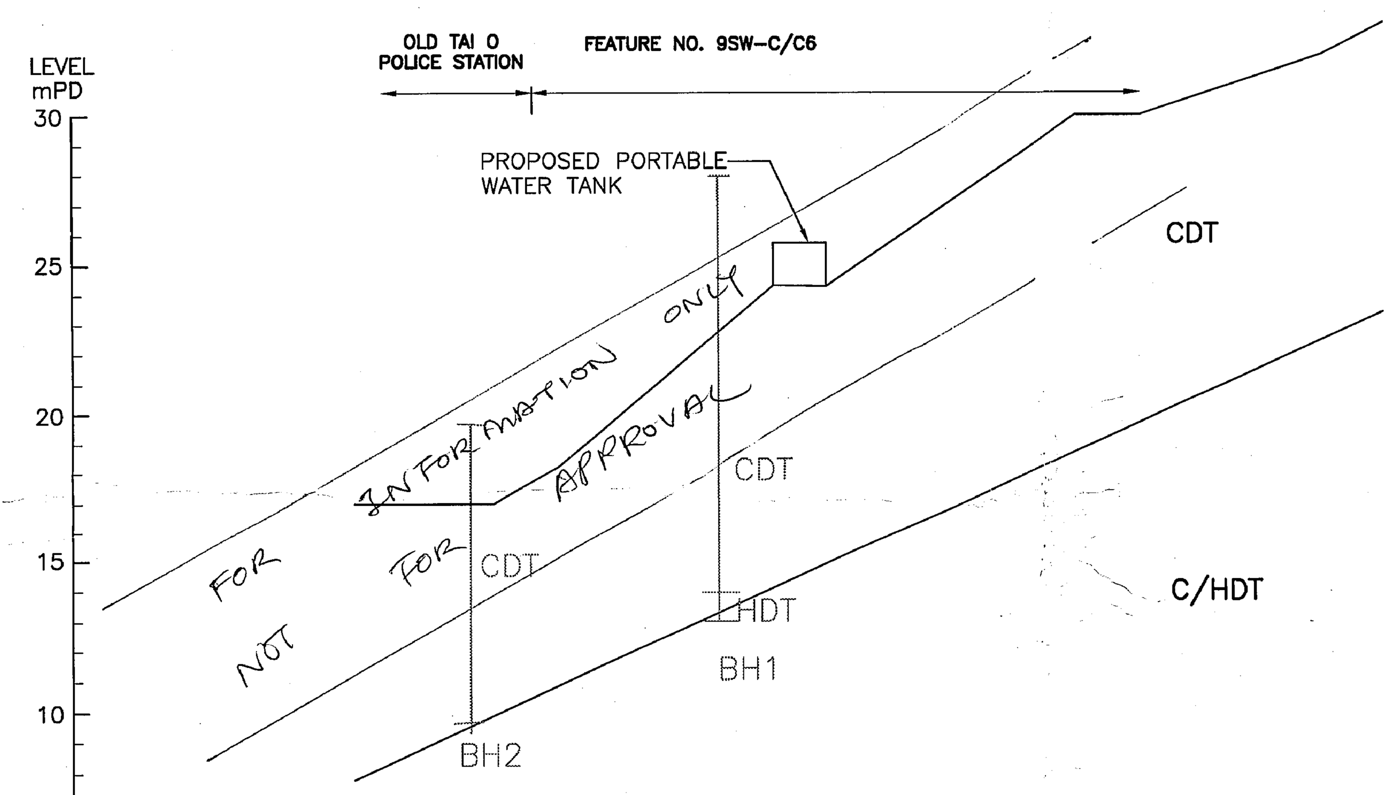

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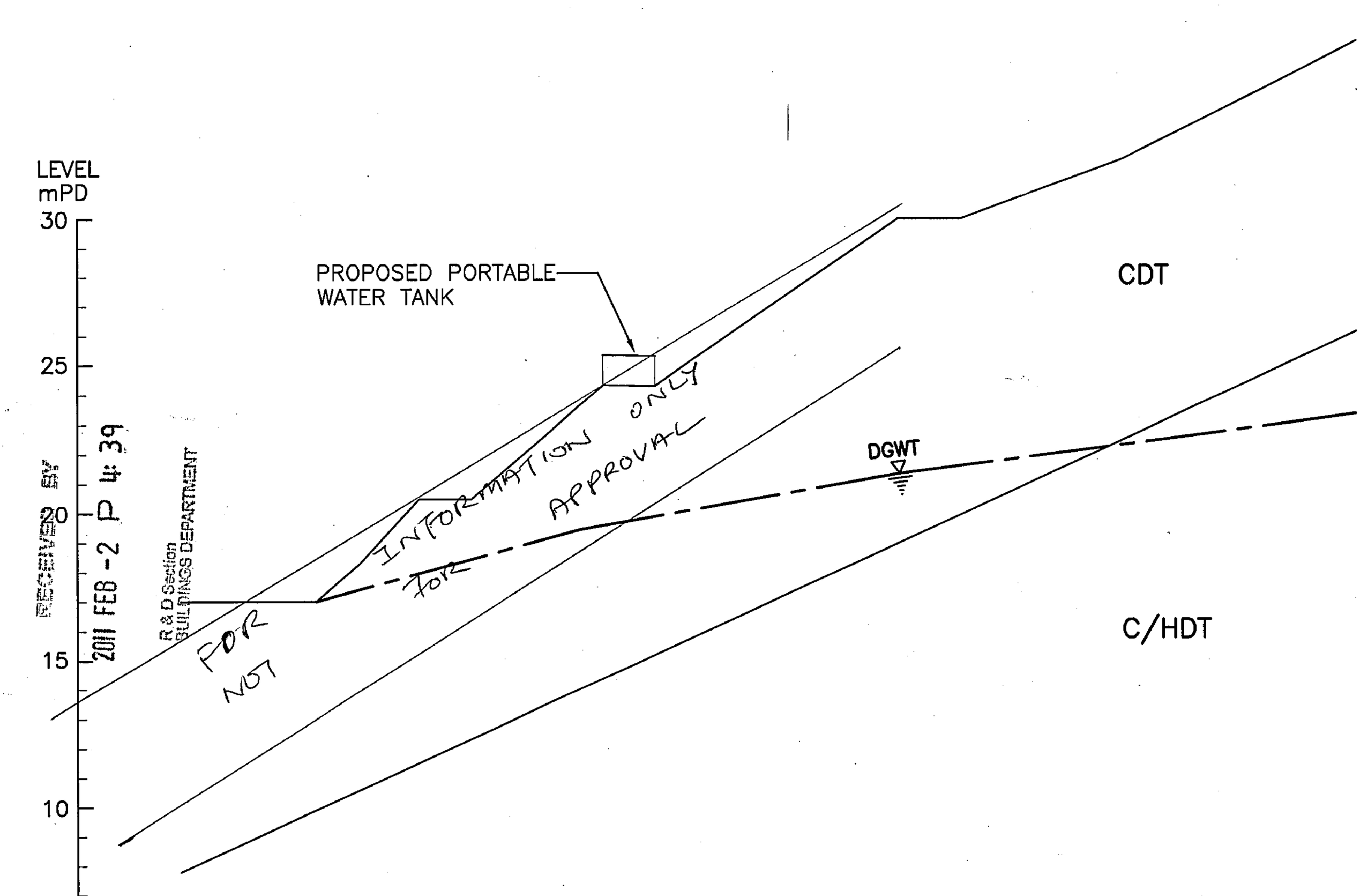

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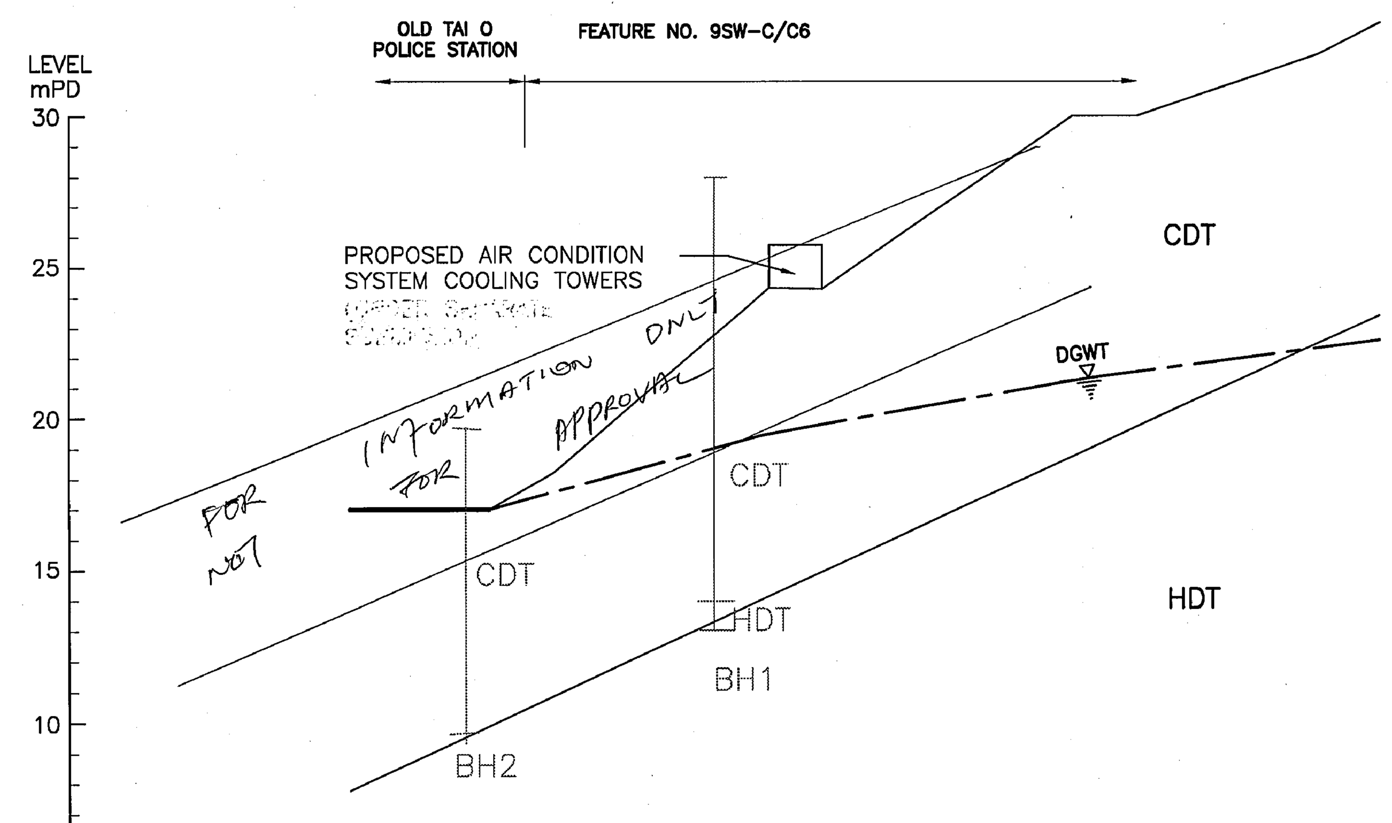

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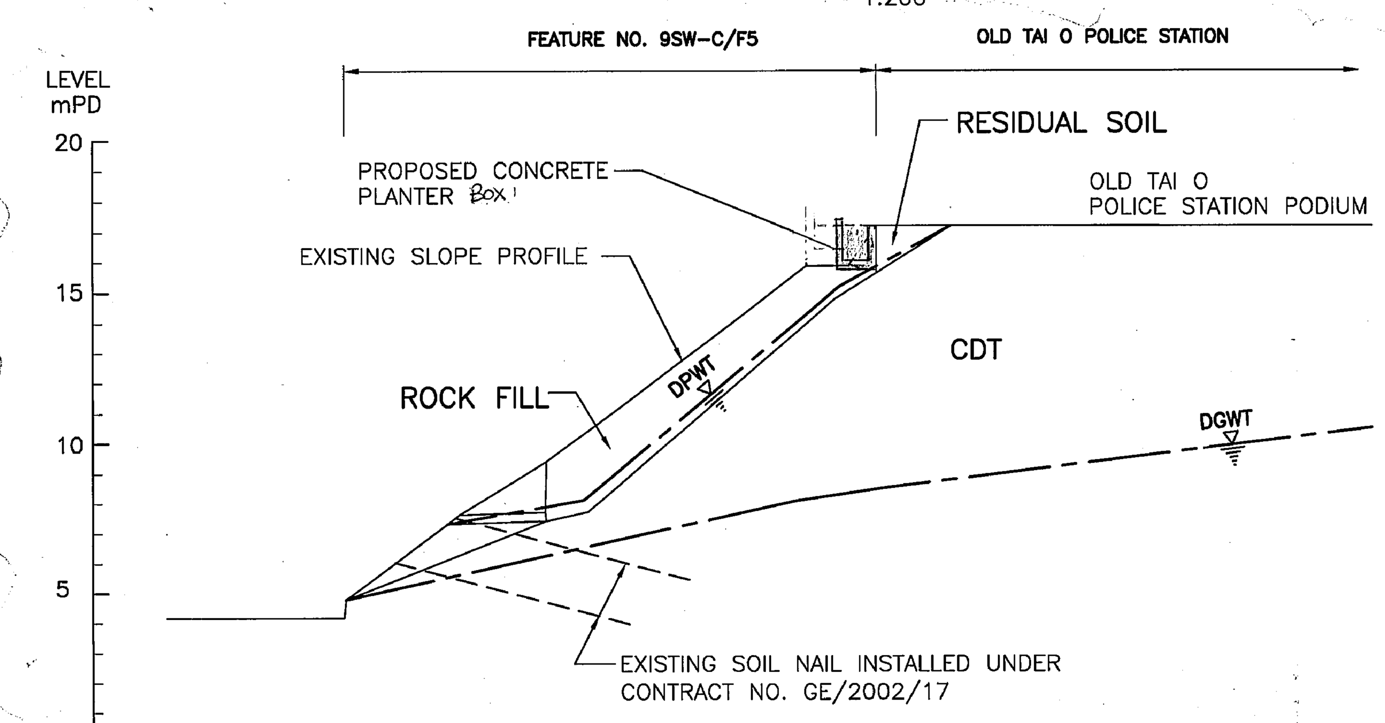

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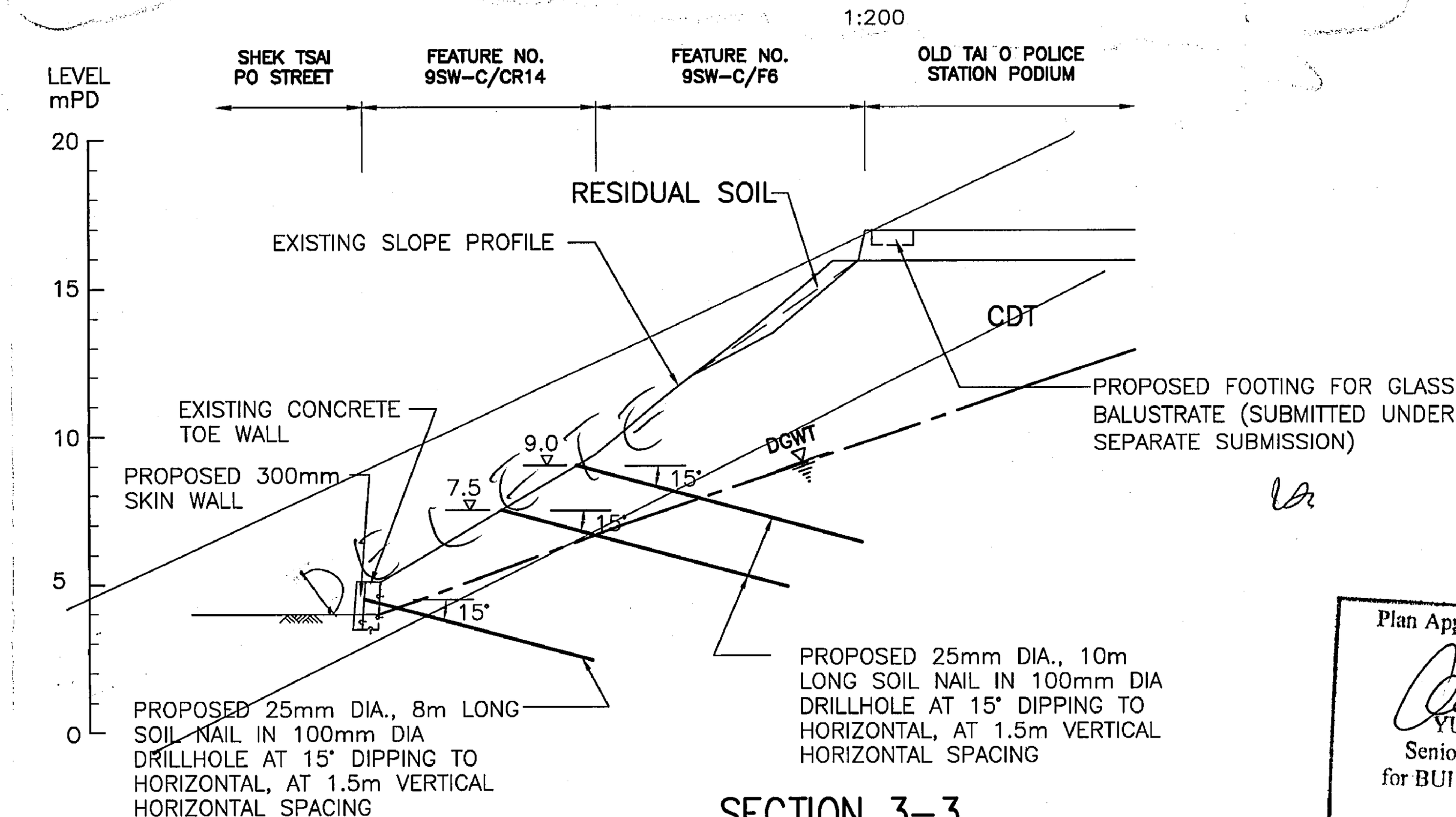

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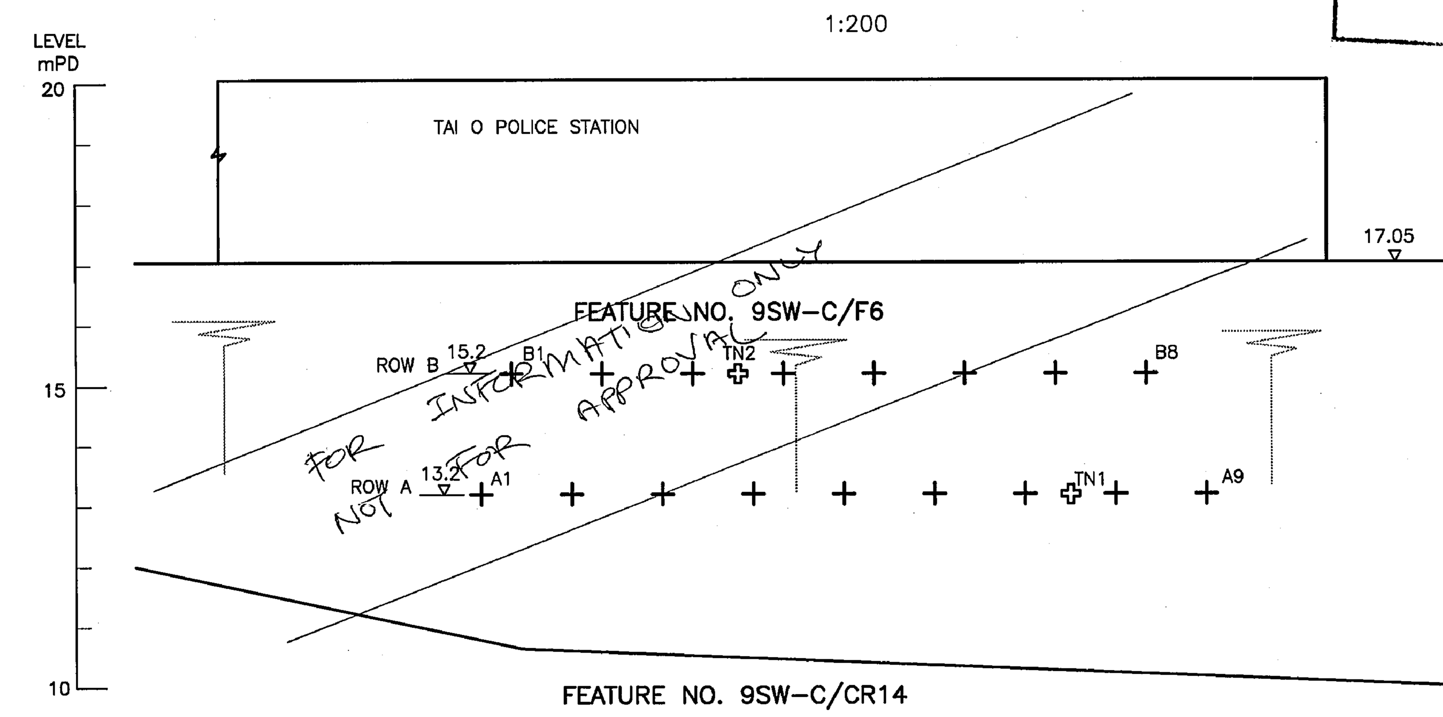

DEVELOPED ELEVATION A
1:100

LEGENDS
- + PROPOSED SOIL NAILS
- ✥ PROPOSED PULL-OUT TEST NAIL LOCATION
- T EXISTING SLOPE

Plan Approved
YU Po-mei, Clarice
Senior Building Surveyor
for BUILDING AUTHORITY
- 1 MAR 2011

CHAN Henry
Registered Geotechnical Engineer
RGE 12/05

"The works shown on these plans are Type II works (Site Formation Works) in respect of which consent is applied for the purpose of Fast Track consent application under regulation 33 of the Building (Administration) Regulations."

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Revisions

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CONSULTING ENGINEERS LTD
Civil . Structural . Geotechnical . Environmental
10 / F., Greatmany Centre, 109 – 115 Queen's Road East, Wanchai, Hong Kong. Tel : 2528 6217 Fax : 2865 2657

Authorized Person / Registered Structural Engineer :

Project :

REVITALISATION SCHEME CONVERSION OF OLD TAI O POLICE STATION INTO TAI O HERITAGE HOTEL

Drawing Title :

SECTIONS FOR SITE FORMATION

Drawn :	LC	Date :	12/09	Job No. :	091427
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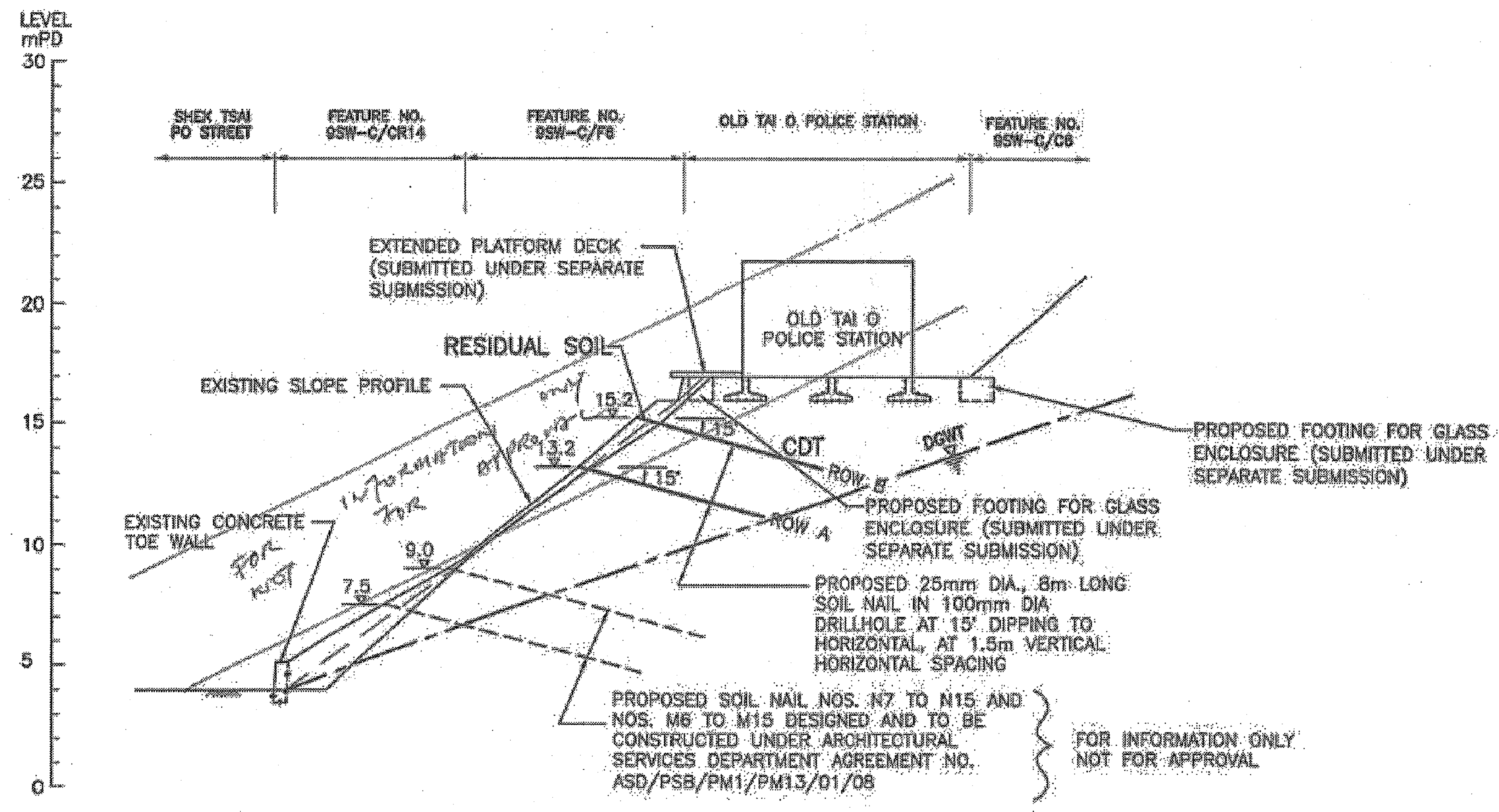
Drawing No. :	P093113/ELS03			Rev.	E

BD Reference No.: BD 22-3/3022/09 (HU) (SF)



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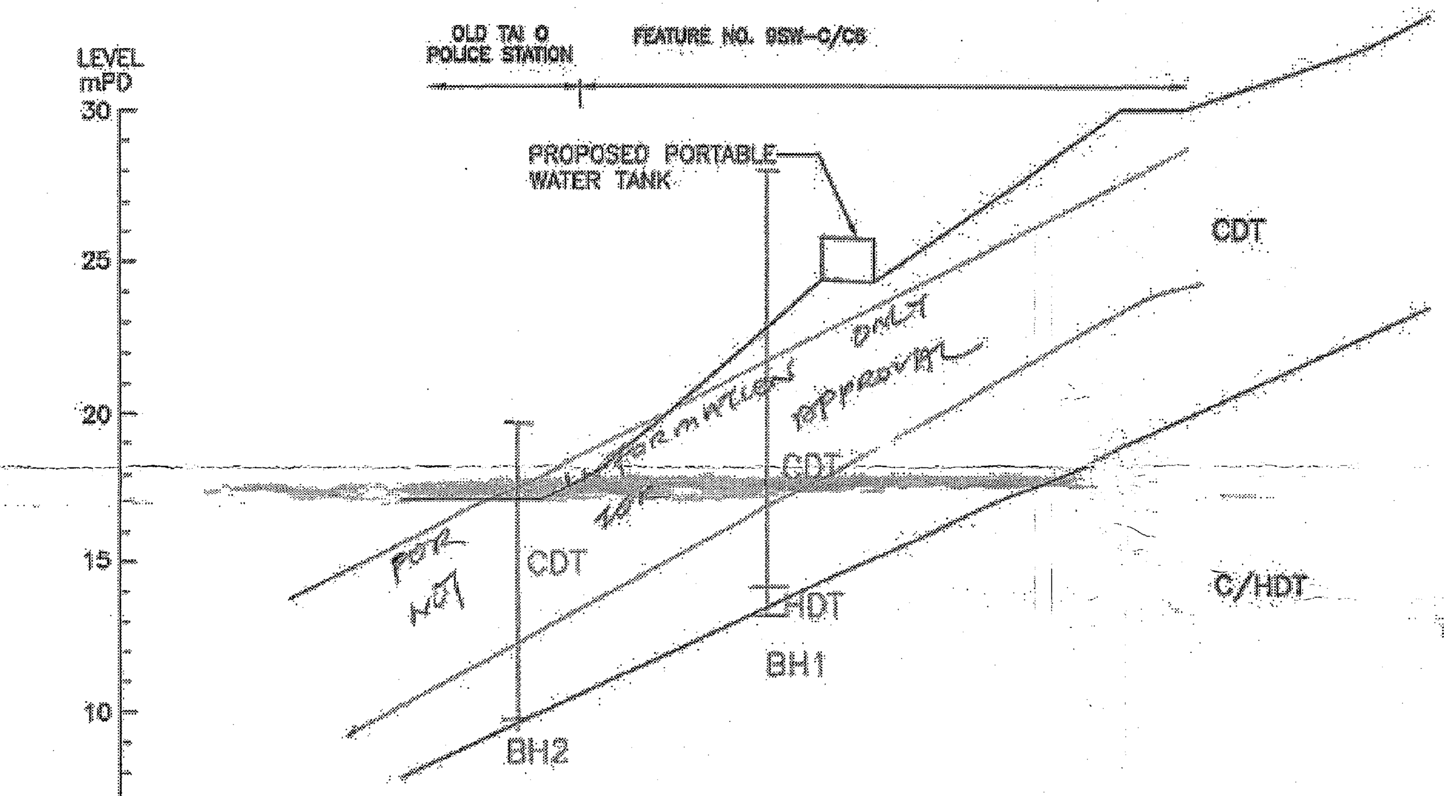

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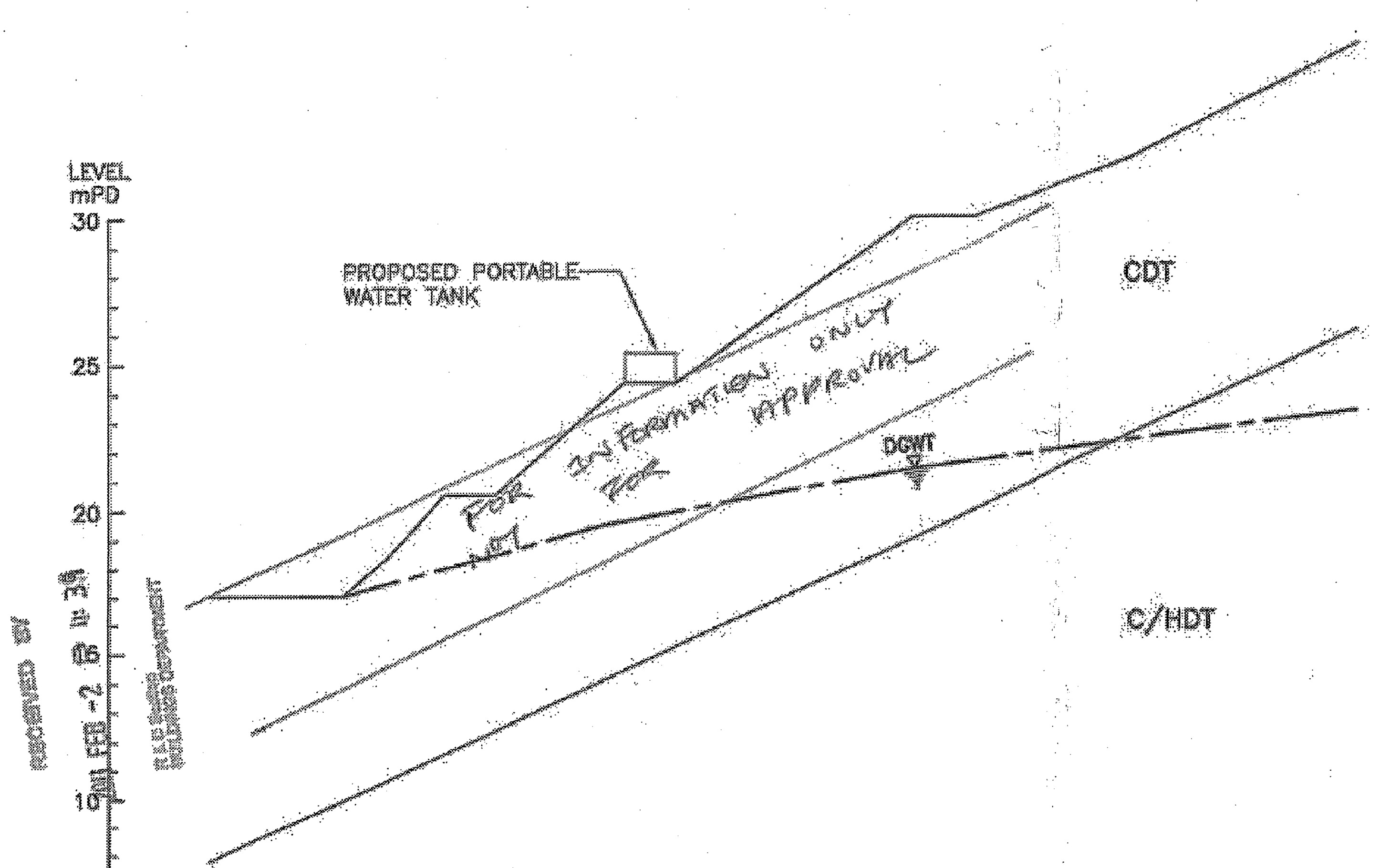

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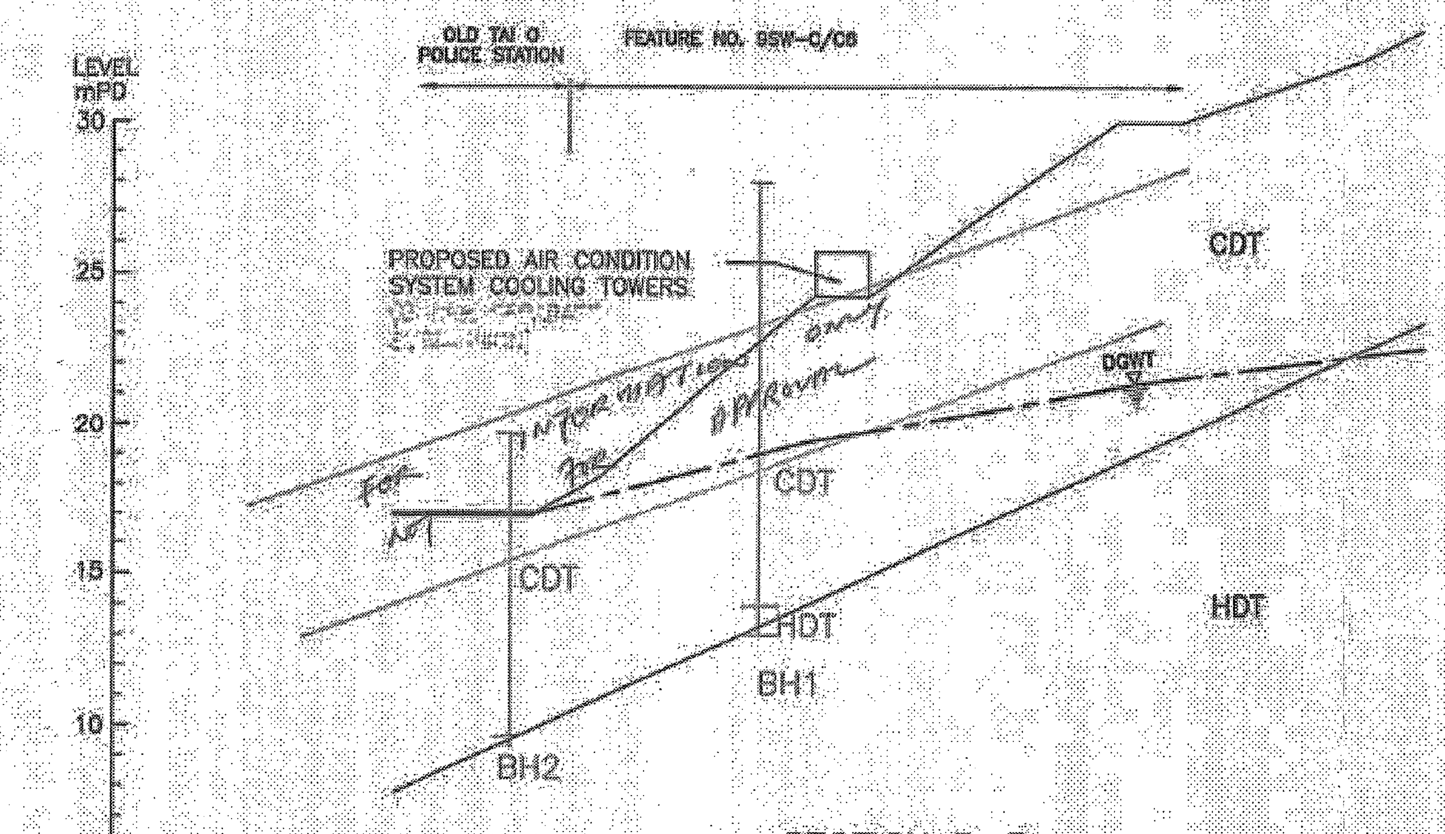

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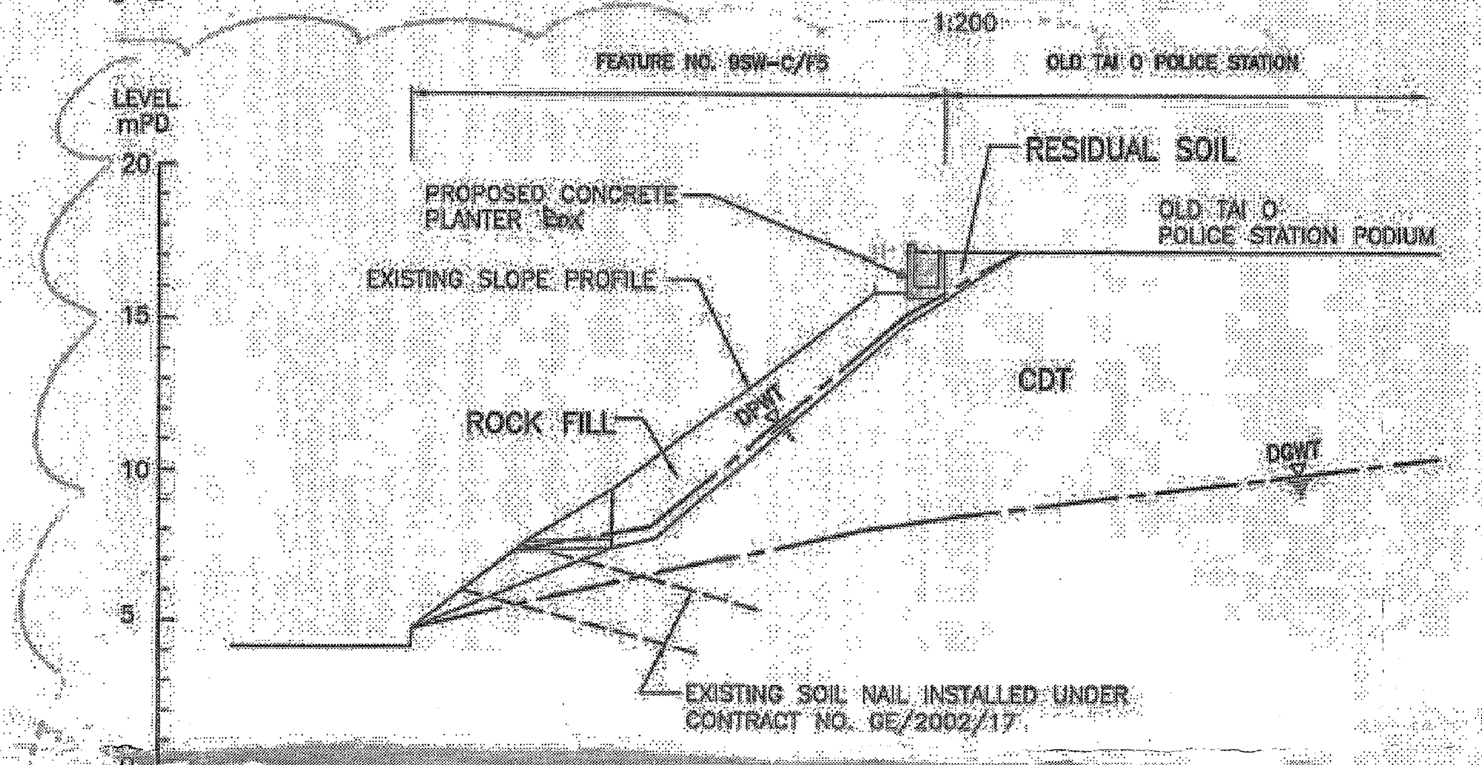

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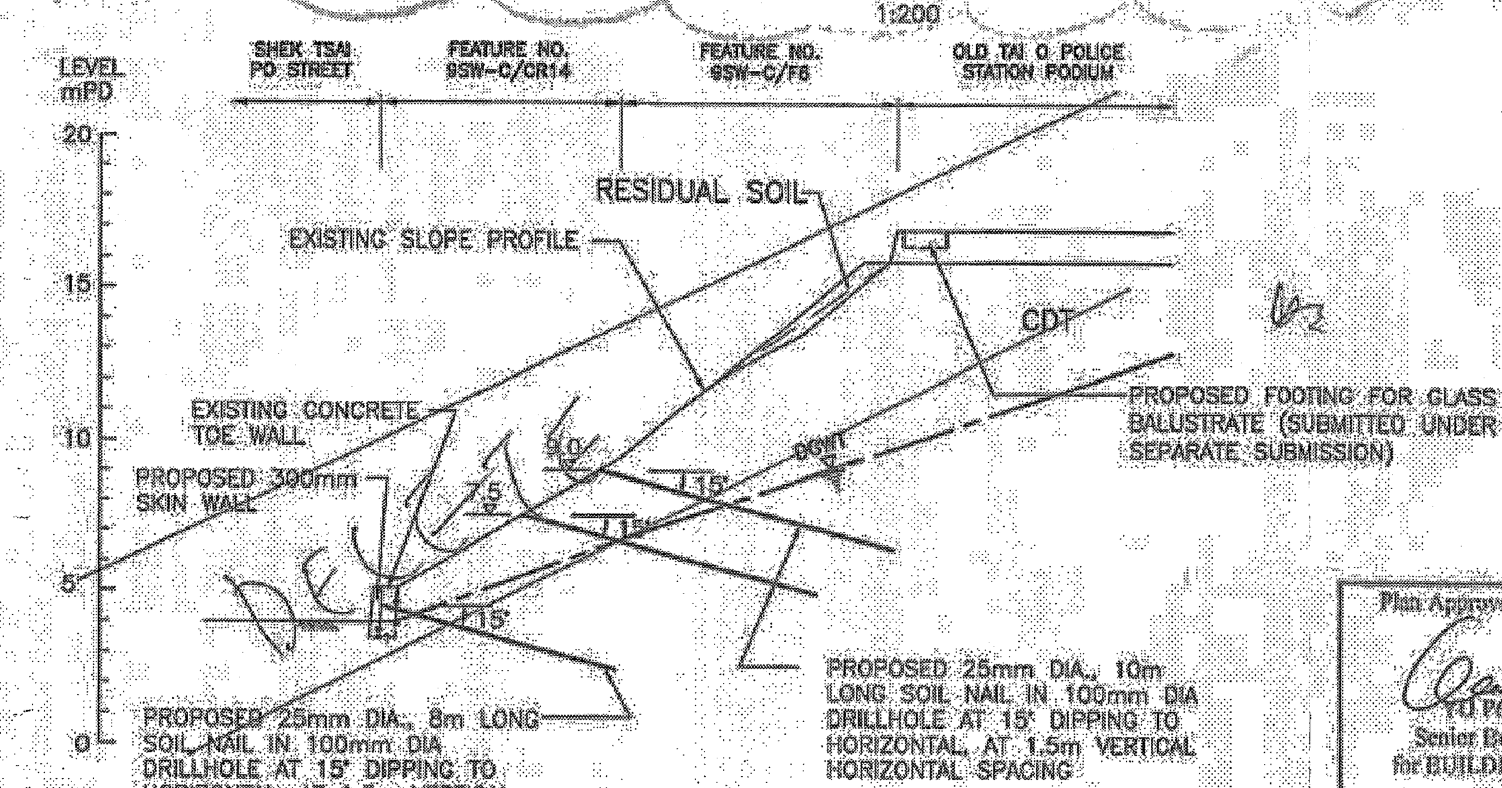

SECTION 3-3

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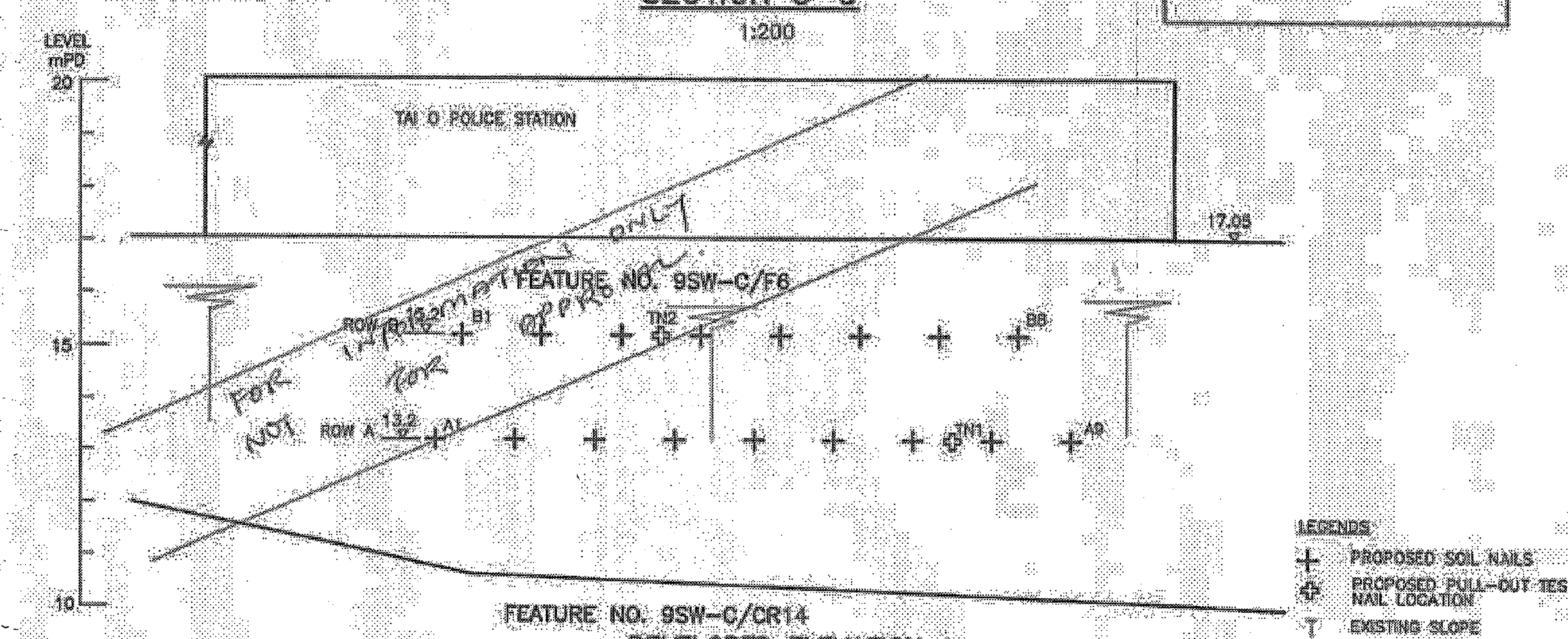
Plan Approved

YU Pernel, Clarice
Senior Building Surveyor
for BUILDING AUTHORITY

- 1 MAR 2011



DEVELOPED ELEVATION A

1:100

LEGENDS

- + PROPOSED SOIL NAILS
- PROPOSED PULL-OUT TEST NAIL LOCATION
- EXISTING SLOPE

CHAN Henry
Registered Geotechnical Engineer
RGE 12/05

"The works shown on these plans are Type II works (Site Formation Works) in respect of which consent is applied for the purpose of Fast Track consent application under regulation 33 of the Building (Administration) Regulations."

CHAN Henry
Registered Geotechnical Engineer
RGE 12/05

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BUILDINGS DEPARTMENT

RECORD PLAN

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Revisions

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Civil Structural Geotechnical Environmental
10/F., Stockmany Centre, 109 - 115 Queen's Road East, Wanchai, Hong Kong. Tel : 2528 6217 Fax : 2865 2657

Authorized Person / Registered Structural Engineer :

Project :

REVITALISATION SCHEME CONVERSION OF OLD TAI O POLICE STATION INTO TAI O HERITAGE HOTEL

Drawing Title :

SECTIONS FOR SITE FORMATION

Drawn :	LC	Date :	12/09	Job No. :	091427
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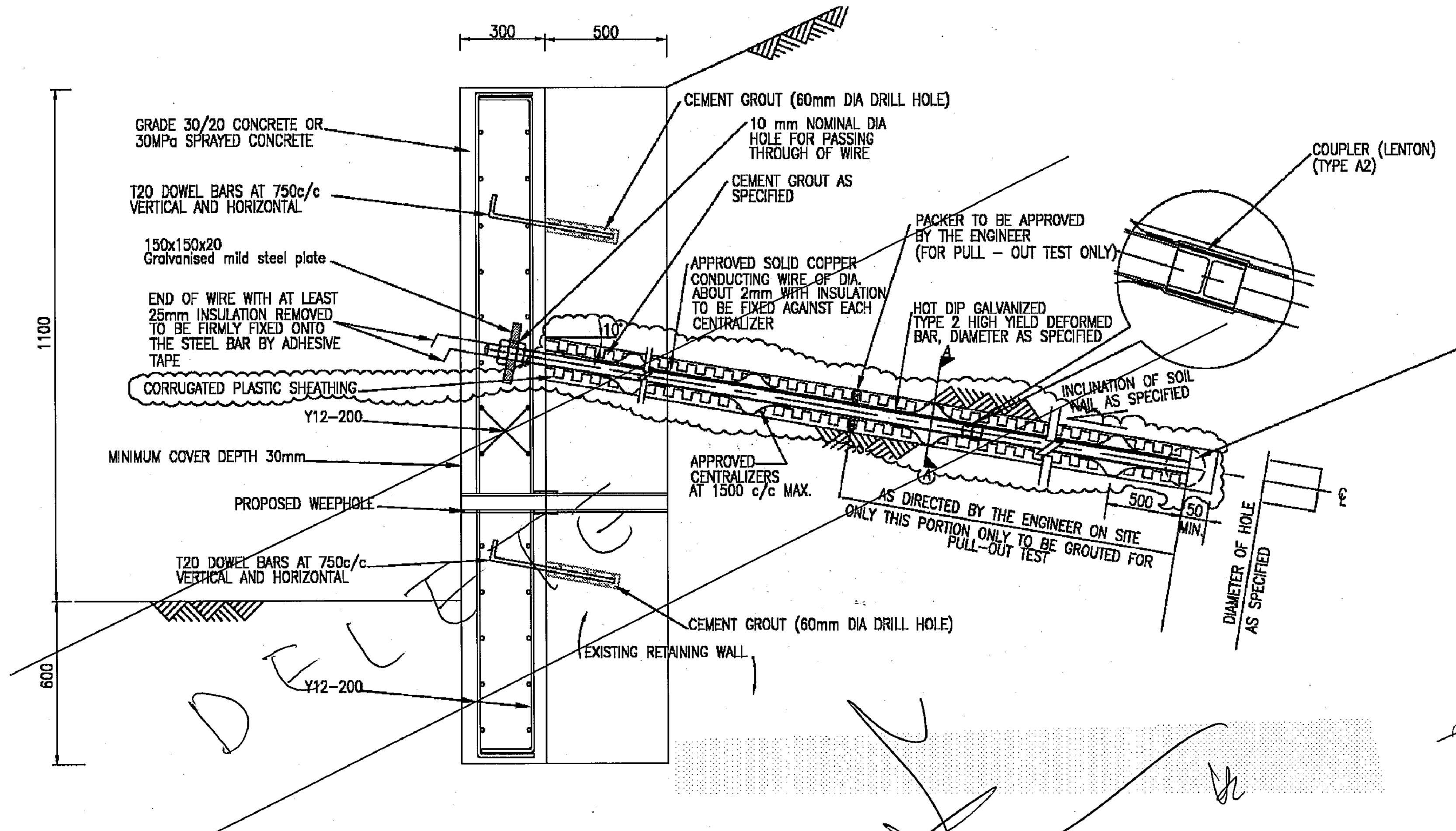
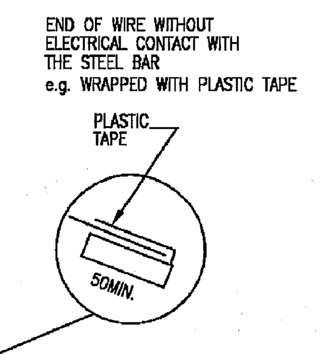
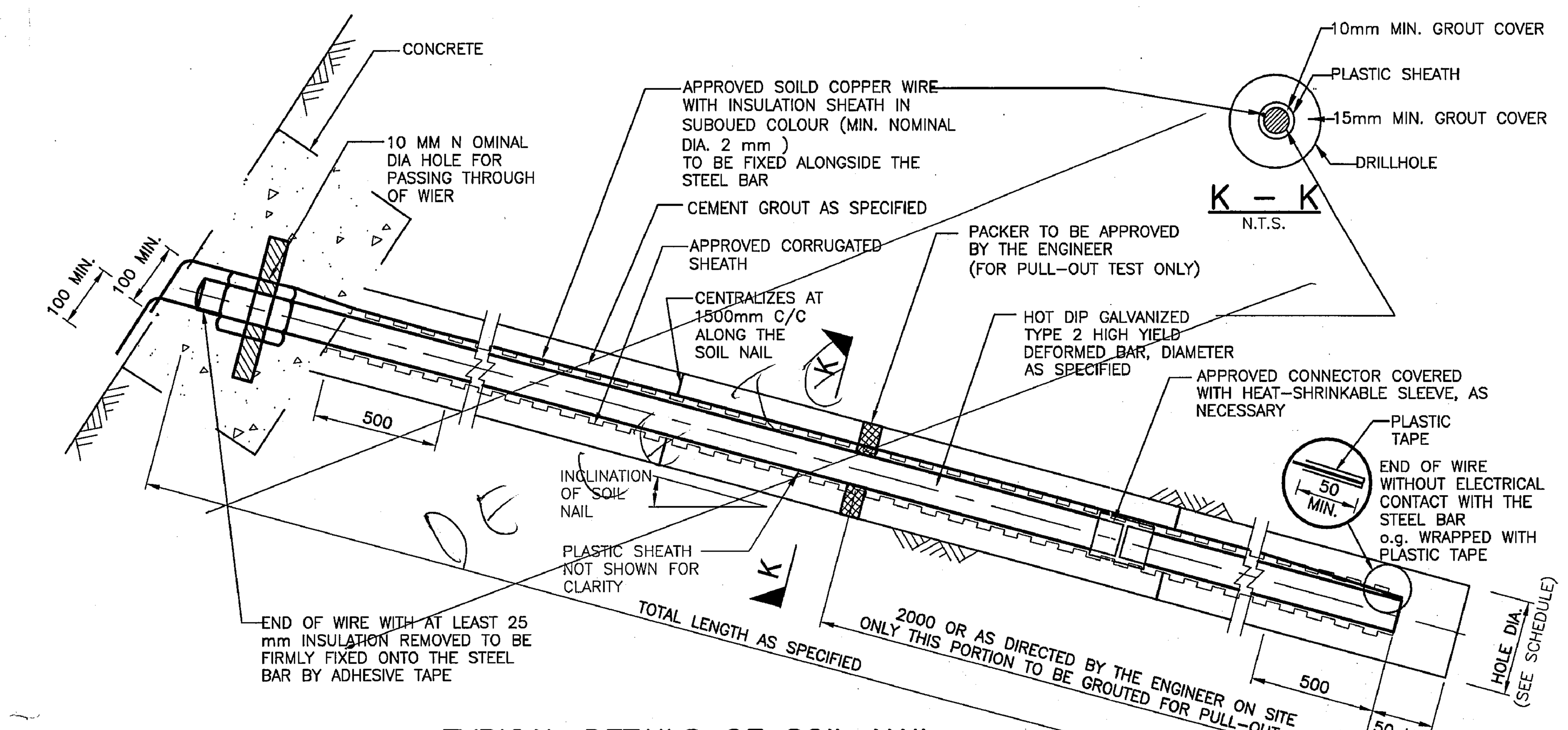
BD Reference No. : BD 22-3/3022/09 (HU) (SF)



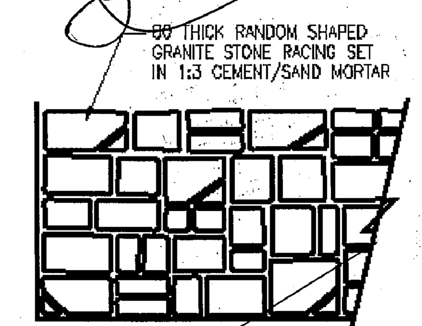
TYPICAL DETAILS OF 300mm SKIN WALL AND SOIL NAIL
N.T.S.



NOTES:
1. ALL DIMENSIONS ARE IN MILLIMETRES.
2. DRILLHOLE SHALL BE COMPLETELY FILLED WITH GROUT TO THE FINISHED SLOPE SURFACE.
3. MINIMUM GROUT COVER OF 20mm SHALL BE PROVIDED TO THE BAR.
4. PROTRUSION OF WIRE SHALL BE PROVIDED IF NAIL LENGTH CHECKING AFTER CASTING OF SOIL NAIL HEAD IS REQUIRED.
5. THE CONDUCTING WIRE AND HEAT-SHRINKABLE SLEEVE SHALL BE OMITTED FOR SOIL NAILS UNDER PULL OUT TEST.



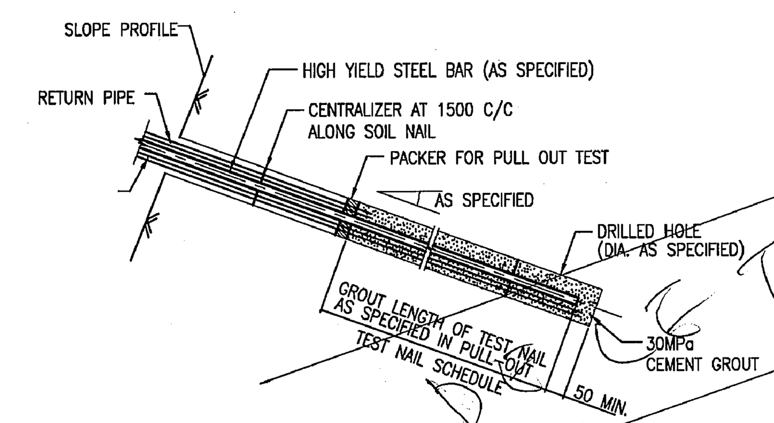
TYPICAL DETAILS OF SOIL NAIL WITH DOUBLE CORROSION PROTECTION
N.T.S.



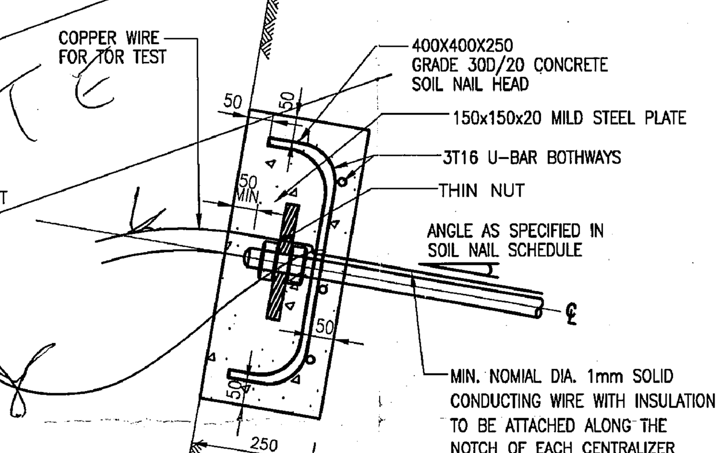
ELEVATION OF STONE FACING ON SLOPE SURFACE (RANDOM PATTERN)
N.T.S.

NOTES FOR STONE FACING TO CONCRETE SURFACES

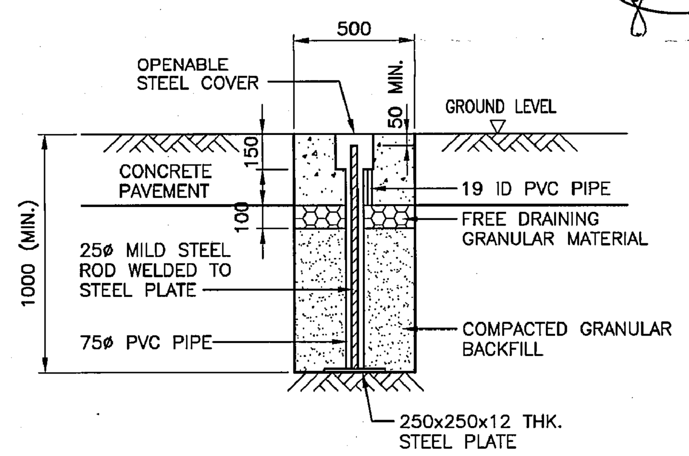
1. ALL DIMENSIONS ARE IN MILLIMETRES.
2. A TRIAL PANEL OF SIZE 1m x 1m SHALL BE PREPARED FOR ENGINEER'S APPROVAL.
3. WEEPHOLES SHALL BE PROVIDED AS 1.2m c/c HORIZONTALLY AND VERTICALLY, THEY SHALL BE CONSTRUCTED OF SINGLE CONTINUOUS PVC PIPES EXTENDED TO THE OUTER FACE OF THE ENGINEER'S AGREEMENT, WATER TIGHT SOCKETED JOINTS MAY BE PROVIDED AS AN ALTERNATIVE.
4. ALTERNATIVE TREATMENT TO CONCRETE SURFACE INCLUDES RIB FINISH, LARGE BLOCK PATTERN, APPLICATION OF PAINT AND SPRAYED GRANITE.



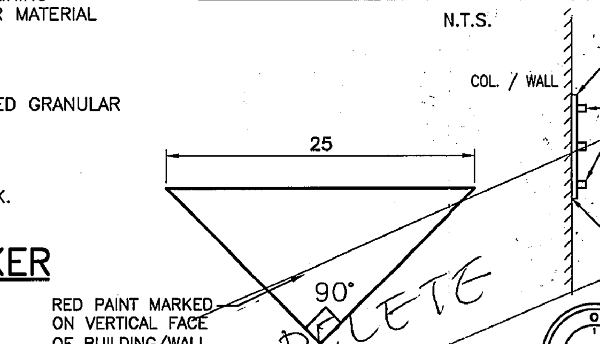
TYPICAL ARRANGEMENT FOR PULL-OUT TEST
N.T.S.



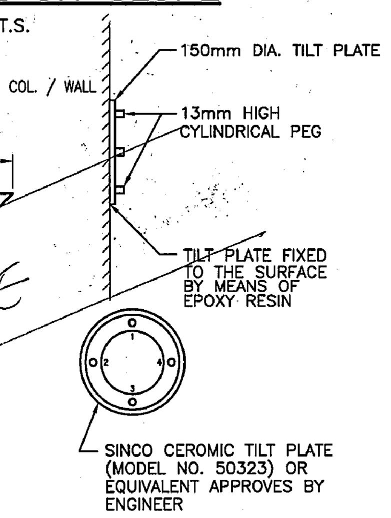
DETAIL OF SOIL NAIL HEAD FOR SOIL NAIL ON SLOPE
N.T.S.



GROUND SETTLEMENT MARKER
N.T.S.



BUILDING SETTLEMENT MARKER
N.T.S.



TILTING MARKER
N.T.S.

NOTES ON CONCRETE AND REINFORCEMENT

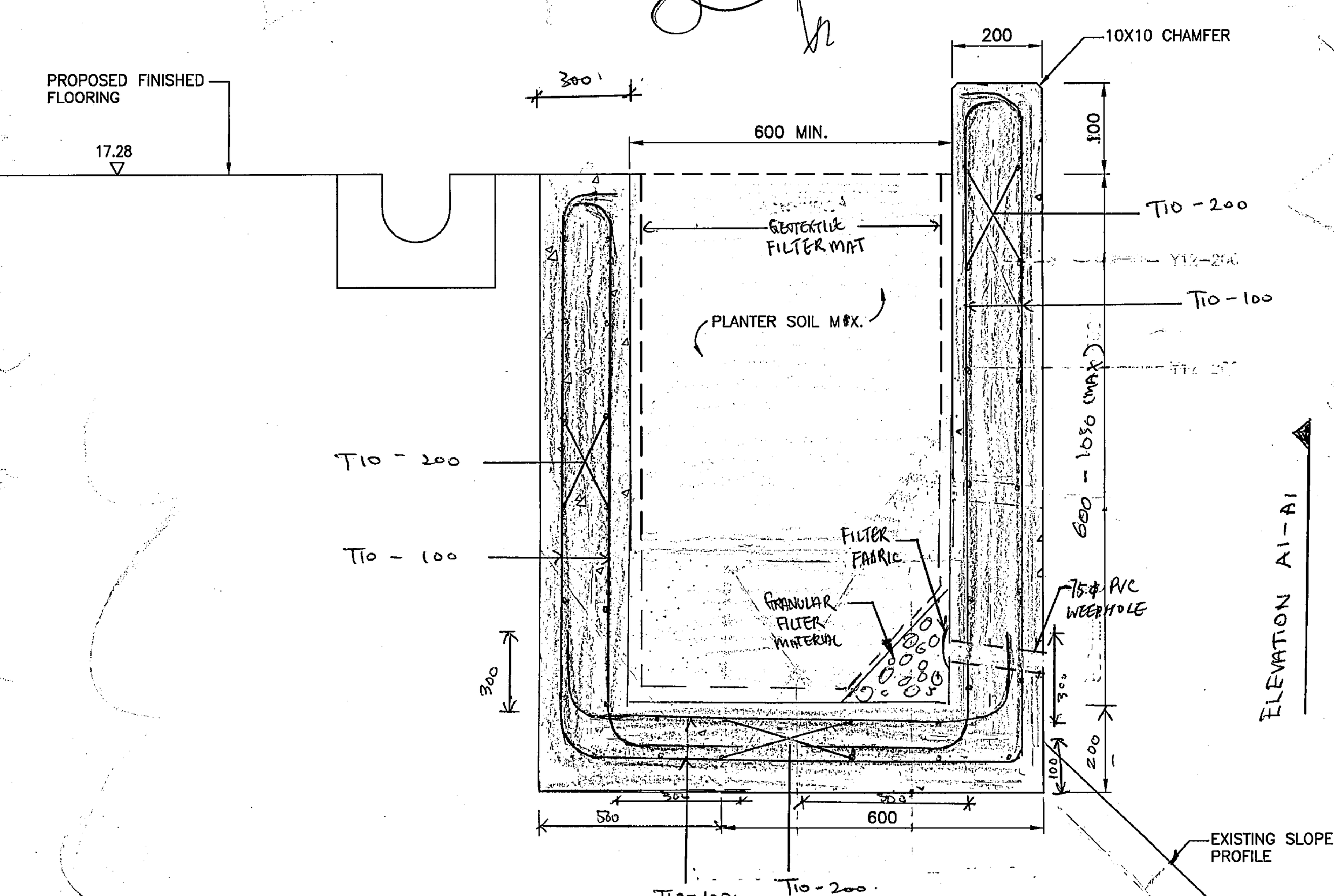
1. CONCRETE GRADE FOR ALL CONCRETE STRUCTURES SHALL BE 30D/20.
2. ALL TESTING AND SAMPLING OF CONCRETE SHALL COMPLY WITH CS1:1990 BY A LABORATORY ACCREDITAL UNDER HOKLAS.
3. MINIMUM FOR CONCRETE SHALL 50mm.
4. REINFORCEMENT SHALL COMPLY WITH CS2:1995 WITH MINIMUM YIELD STRENGTH:
   - HIGH YIELD (TYPE T) = 460MPa
   - HOT ROLLED MILD STEEL (TYPE R) = 250MPa
5. CALLING UP FOR REINFORCEMENT:

   20 T 20-150 B1 ABR

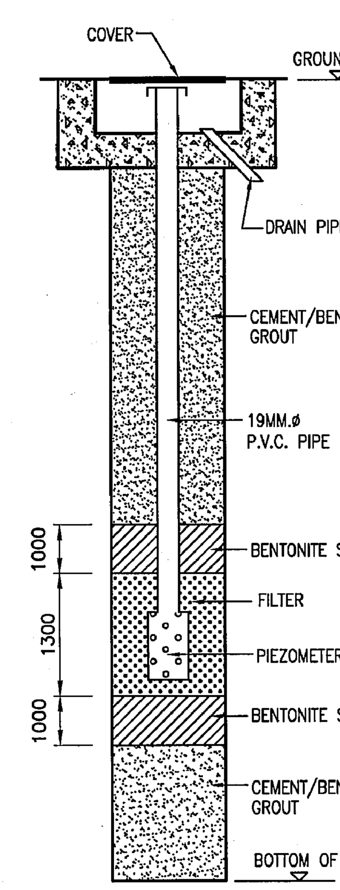
   NUMBER OF BAR — 20; TYPE OF BAR — T; BAR DIAMETER — 20; SPACING OF BARS — 150; POSITION OF BARS — B1; ADDITIONAL INFORMATION — ABR

6. BAR REINFORCEMENT FROM EACH BATCH SHOULD NOT FIXED UNTIL TESTING OF THE BATCH HAS BEEN COMPLTED IN ACCORDANCE WITH CS:1995, AND TEST CERTIFICATES SUBMITTED TO THE RSE.
7. LOOSE RUST, EXCESSIVE FLAKY RUST OR MILL-SCALE ON REINFORCEMENT MUST BE REMOVED BY WIRE BRUSHING, BADLY CORROADED, DAMAGED OR SCALING STEEL SHOULD NOT BE USED.
8. SUFFICIENT NUMBERS OF SPACERS, CHAIRS AND SUCH OTHER SUPPORTS AS MAY BE NECESSARY SHOULD BE PROVIDED TO MAINTAIN THE REINFORCEMENT IN THE CORRECT LOCATION AS SHOWN IN THE APPROVED PLANS AND TO MAINTAIN THE SPCIFIED MINIMUM COVER AT ALL POSITIONS. SPCAERS AND CHAIRS SHOULD BE PLACED AT A MAXIMUM SPACING OF 1.5m. HOWEVER, IN THE CASE PF 20mm DIAMETER OR SMALLER BARS THE SPACING FO CHAIRS AND SPACERS SHOULD BE SUITABLY REDUCED TO AVIOD SAGGING.
9. SUFFICIENT NUMBER OF INTERSECTING AND LAPPING BARS SHOULD BE TIED BY TYING WIRE, TYING DEVICES OR CLIPS TO PREVENT MOVEMENT OF THE REINFORCEMENT. THE ENDS OF TYING WIRE, TYING DEVICES AND CLIPS SHOULD NOT ENCROACH INTO THE COVER TO REINFORCEMENT.
10. LAPS AND JOINTS IN REINFORCEMENT SHOULD BE LOCATED ONLY AT THE SPECIFIED POSITION. REINFORCEMENT CONNECTORS MAY ONLY BE USED WHERE SPECIFIED OR AS OTHERWISE AGREED WITH THE RSE. THEY SHOULD BE FIXED IN ACCORDANCE WITH THE MANUFACTURERS RECOMMENDATIONS AND USING EQUIPMENT RECOMMENDED BY MANUFACTURER.
11. REINFORCEMENT WHICH IS FREE-STANDING SHOULD BE SECURED IN POSITION AND BRACED TO PREVENT MOVEMENT DUE TO WIND AND OTHER LOADS. PREFABRICATED REINFORCEMENT CAGES SHOULD BE ADEQUATELY SUPPORTED AND BRACED BEFORE LIFTING.
12. THE REGISTERED CONTRACTOR SHOULD INFORM THE REGISTERED STRUCTURAL ENGINEER TO INSPECT ALL REINFORCEMENT AFTER FIXING AND WELL IN ADVANCE OF CONCRETING TO ALLOW FOR ANY NECESSARY RECTIFICATION.
13. THE REGISTERED GENERAL BUILDING CONTRACTOR SHOULD ENSURE THAT THE FIXING OF REINFORCEMENT IS CARRIED OUT IN ACCORDANCE WITH THE APPROVED PLANS, AND THAT NO DISPLACEMENT OF REINFORCEMENT TAKES PLACE DURING PLACEMENT AND COMPACTION OF CONCRETE.
14. PFA SHALL COMPLY WITH BS 3892 PART 1 EXCEPT THAT THE CRITERION FOR MAXIMUM WATER REQUIREMENT MAY NOT APPLY. THE PERCENTAGE OF PFA SHALL NOT EXCEED 25% BY MASS OF THE CEMETTIOUS CONENT. UNLESS NOTED OTHERWISE.
15. THE REACTIVE ALKALL CONTENT OF CONCRETE EXPRESSED AS THE EQUIVALENT SODIUM OXIDE CONTENT/CUBIC METRE OF CONCRETE SHOULD NOT EXCEED 3.0kg WHEN DETERMINED IN ACCORDANCE WITH THE SPECIFICATION ITEMS GIVEN IN APPENDIX A OF PNAP NO.180.

CHAN Henry
Registered Geotechnical Engineer
RGE 12/05



TYPICAL DETAILS OF PLANTER
N.T.S.

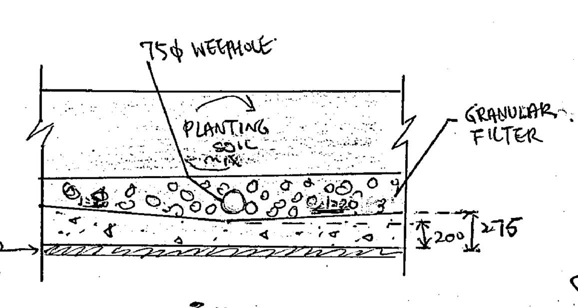


TYPICAL DETAILS OF PIEZOMETER
N.T.S.

RECEIVED BY
2011 FEB -2 P 4:39
R.& D. Section
BUILDINGS DEPARTMENT

CONSTRUCTION SEQUENCE FOR PLANTER

1. REMOVE EXISTING ROCKFALL NETTING AND EROSION CONTROL MAT ON THE BERM OF FEATURE NO. 6SW-C/FS.
2. EXCAVATE TO 175mm (MIN) BELOW THE EXISTING BERM LEVEL TO FORM THE BASE OF THE PLANTER FOR BINDING LAYER AND CONSTRUCTION OF PLANTER BASE.
3. CONSTRUCT THE PLANTER.



ELEVATION A1-A1
1:50

Plan Approved

YU Po-mei, Clarice
Senior Building Surveyor
for BUILDING AUTHORITY

- 1 MAR 2011

"The works shown on these plans are Type II works (Site Formation Works) in respect of which consent is applied for the purpose of Fast Track consent application under regulation 33 of the Building (Administration) Regulations."

Rev.	Stat.	Description	Date	By	Chk.	Ver'd
E	IFS	BD SUBMISSION (AMENDMENT NO. 2)	01/11	LC	ML	
D	IFS	BD APPROVAL	15/04/10			
C	IFS	BD SUBMISSION (AMENDMENT NO. 1)	03/10	LC	ML	MN
B	IFS	AMENDMENT NO.1	01/10	LC	ML	MN
A	IFA	BD APPROVED DRAWING	11/09	LC	ML	MN
–	IFS	BD SUBMISSION	09/09	LC	ML	MN

Revisions

ESA 工程顧問有限公司
CONSULTING ENGINEERS LTD
Civil . Structural . Geotechnical . Environmental
10 / F., Greatmany Centre, 109 - 115 Queen's Road East, Wanchai, Hong Kong. Tel : 2528 6217 Fax : 2865 2657

Authorized Person / Registered Structural Engineer :

Ir LAW Yue Kei, Ricky
Registered Structural Engineer (RSE 22/00)

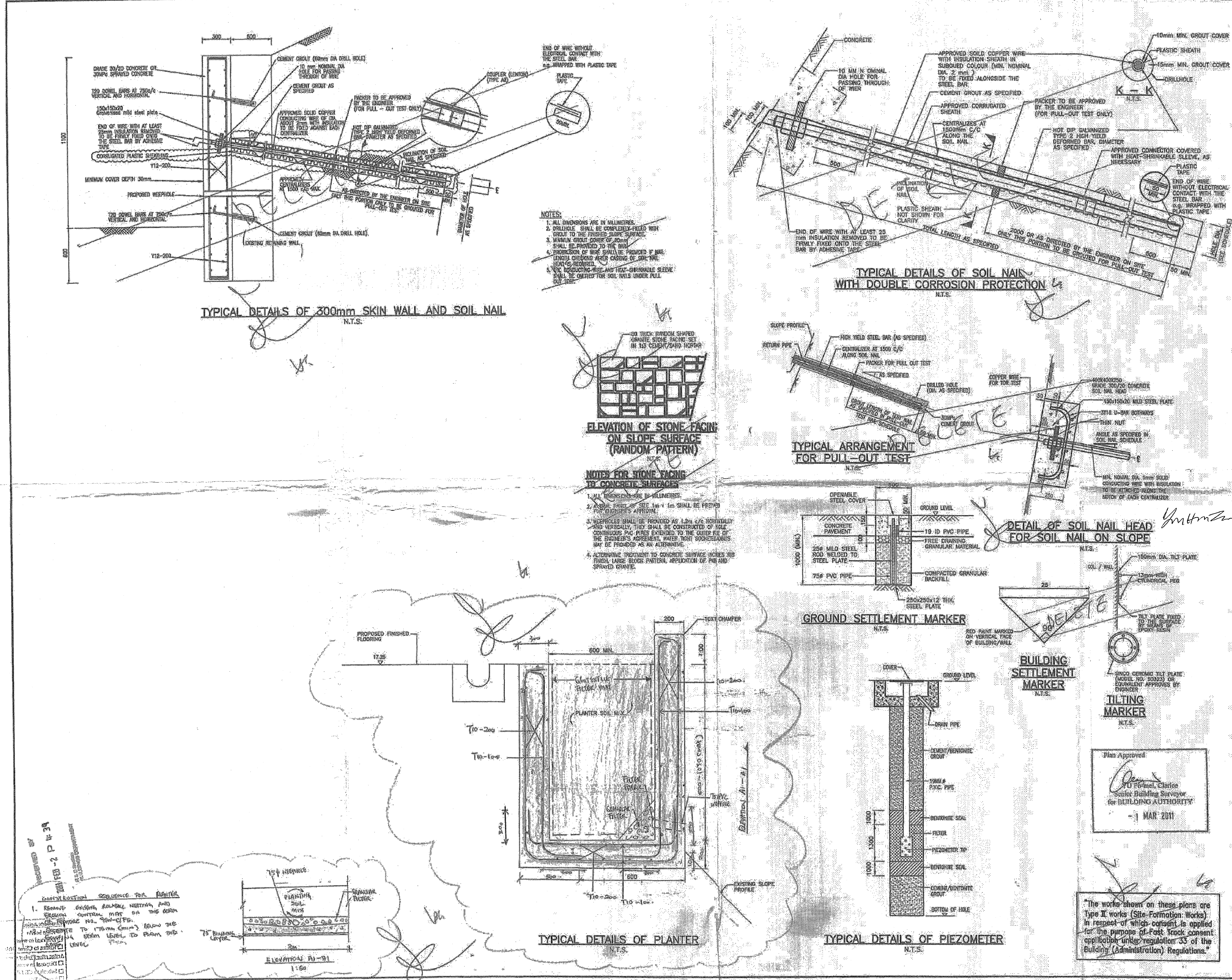
Project :

REVITALISATION SCHEME CONVERSION OF OLD TAI O POLICE STATION INTO TAI O HERITAGE HOTEL

Drawing Title :

TYPICAL DETAILS

Drawn :	LC	Date :	12/09	Job No. :	091427
Checked :	ML	Date :	12/09	Cad File :	P093113_ELS04D
Approved :	MN	Date :	12/09	Scale :	N.T.S
Drawing No. :	P093113/ELS04			Rev.	E



BD Reference No.: BD 22-3/3022/09 (HU) (SF)

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   20 T 20-150 B1 ABR

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CHAN Henry
Registered Geotechnical Engineer
RGE 12/05

RECORD PLAN

CHAN Henry
Registered Geotechnical Engineer
RGE 12/05

Rev	Stat.	Description	Date	By	Chk.	Ver'd
E	IFS	BD SUBMISSION (AMENDMENT NO. 2)	01/11	LC	ML	
D	IFS	BD APPROVAL	19/04/10			
C	IFS	BD SUBMISSION (AMENDMENT NO. 1)	03/10	LC	ML	MN
B	IFS	AMENDMENT NO.1	01/10	LC	ML	MN
A	IFA	BD APPROVED DRAWING	11/09	LC	ML	MN
—	IFS	BD SUBMISSION	09/09	LC	ML	MN

Revisions

ESA 工程顧問有限公司
CONSULTING ENGINEERS LTD
Civil . Structural . Geotechnical . Environmental

Authorized Person / Registered Structural Engineer :

Ir LAW
Registered Structural Engineer

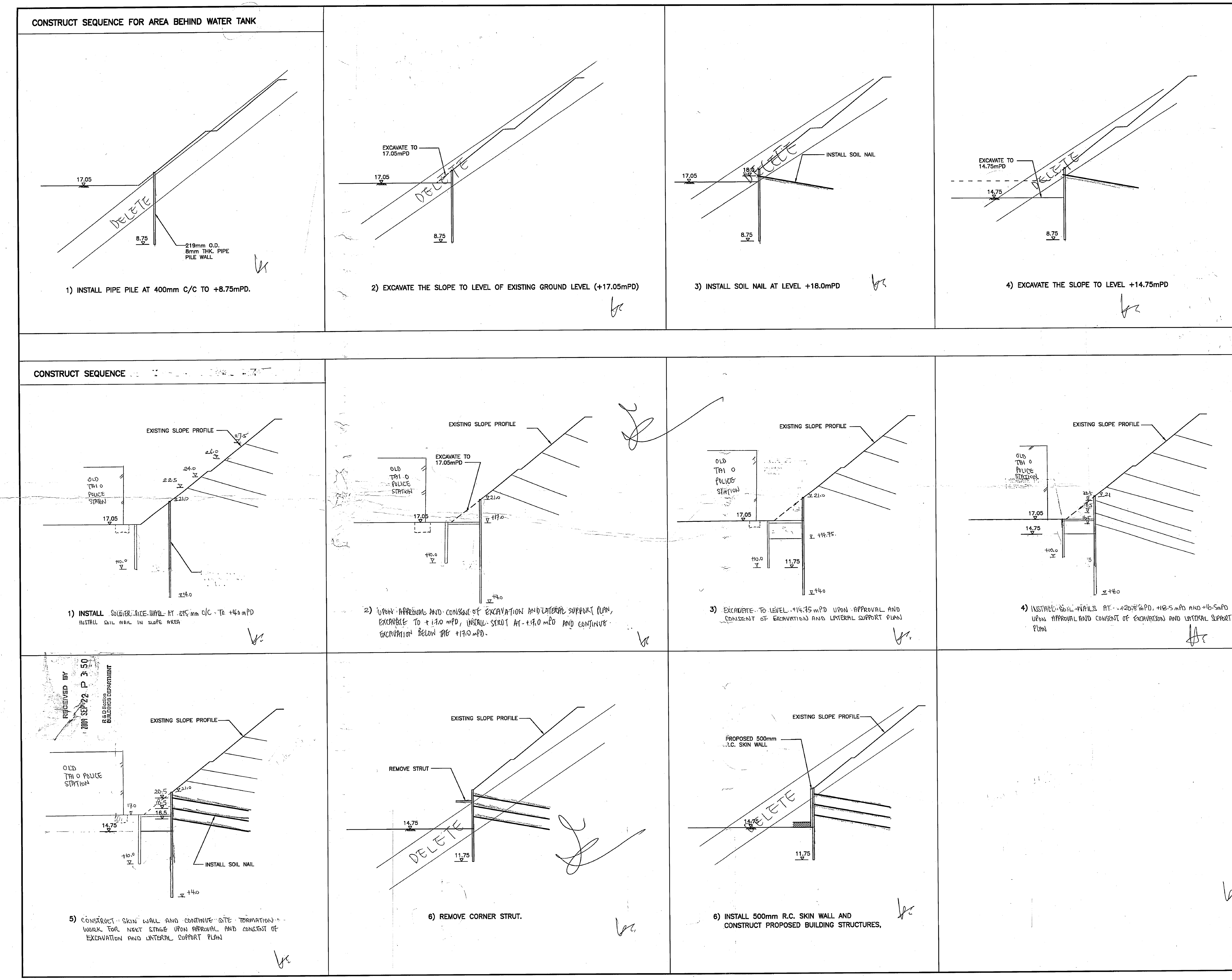
Project :

REVITALISATION SCHEME CONVERSION OF OLD TAI O POLICE STATION INTO TAI O HERITAGE HOTEL.

Drawing Title :

TYPICAL DETAILS

Drawn :	LC	Date :	12/09	Job No. :	091427
Checked :	ML	Date :	12/09	Cad File :	P093113_ELS040
Approved :	MN	Date :	12/09	Scale :	N.T.S
Drawing No. :	P093113/ELS04			Rev :	E



BD Reference No. :

Plan Approved
YU Po-mei, Clarice
Senior Building Surveyor
for BUILDING AUTHORITY
19 NOV 2009

CHAN Henry
Registered Geotechnical Engineer
RGE 12/05

Ir LAW Yue Kei, Ricky
Registered Structural Engineer (RSE 22/00)

Rev.	Stat.	Description	Date	By	Chk.	Ver'd
–	IFT	BD SUBMISSION	09/09	LC	ML	MN

Revisions

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Authorized Person / Registered Structural Engineer :

Project :
REVITALIZATION SCHEME : CONVERSION OF OLD TAI O POLICE STATION INTO TAI O HERITAGE HOTEL.

Drawing Title :
CONSTRUCTION SEQUENCE FOR SITE FORMATION

Drawn : LC	Date : 08/09	Job No. : 081401
Checked : ML	Date : 08/09	Cad File : 081401_ELS05.dwg
Approved : MN	Date : 08/09	Scale : AS SHOWN
Drawing No. : P093113/ELS05		Rev. –