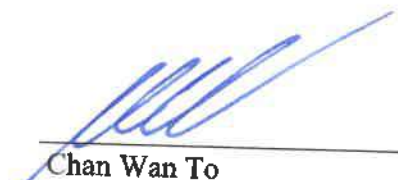


**GEOTECHNICAL PLANNING REVIEW REPORT
FOR PLANNING APPLICATION
FOR
PROPOSED TEMPORARY INSTITUTIONAL USE :
OFFICE OF NON-PROFIT MAKING ORGANIZATIONS
FOR A PERIOD OF 6 YEARS
AT LOT NO. 393 (PART) AND 394RP (PART) IN D.D.182
TAI WAI, SHA TIN, N.T.**



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Prepared by : Ratio Architecture & Construction Limited

Date : July 2026

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1. INTRODUCTION

This Geotechnical Planning Review Report (GPRR) has been prepared in support of the proposed planning application for the temporary institutional use of Lot No. 393 (Part) and Lot No. 394RP (Part) in D.D.182, Tai Wai, Sha Tin, New Territories.

The proposed development comprises the construction of a two-storey office building for non-profit-making organizations together with the associated site formation works.

The purpose of this report is to review the existing geotechnical conditions of the site, assess the geotechnical implications of the proposed development, and demonstrate the preliminary geotechnical feasibility of the planning application. The report also identifies the geotechnical studies, assessments and mitigation measures that may be required during the detailed design stage.

The scope of this Geotechnical Planning Review Report includes the following:

1. A desk study and review of the available information on the existing site conditions, surrounding structures and geotechnical features;
2. A review of the site conditions and available ground investigation information;
3. A preliminary assessment of the geotechnical feasibility of the proposed development;
4. Identification of the required extent of the Natural Terrain Hazard Study (NTHS); and
5. A preliminary appraisal of the proposed site formation works and any geotechnical mitigation measures that may be required in connection with the proposed development.

2. THE SITE

2.1 Site Description

The application site is generally trapezoidal in shape and comprises a relatively level platform that is accessible via the existing access road along its western boundary. The site is currently occupied by a temporary structure founded on a platform at approximately +25.45mPD.

Along the northwestern site boundary, an unregistered masonry retaining wall, designated as "**Unregistered Retaining Wall A**", approximately 2.7m in height, supports the existing site platform. Another unregistered masonry retaining wall, designated as "**Unregistered Retaining Wall B**", approximately 3.75m high, is located along the southeastern and southwestern boundaries to retain the adjoining ground.

The surrounding geotechnical features include registered Feature No. 7SW-D/R349, which is situated immediately beyond the eastern site boundary. Registered Feature No. 7SW-D/C462, a cut slope, is located approximately 2.5m southwest of the site, while registered Feature No. 7SW-D/CR1016 is located approximately 10m northwest of the site.

To the south of the site, a series of unregistered terrain retaining walls is located at a distance of approximately 13m. An extensive natural hillside, approximately 103m in height and comprising Features 7SW-D/C1075 and 7SW-D/FR45 is located approximately 25m southeast of the site.

The locations of the site and the surrounding geotechnical features are illustrated in Figure 1.

2.3 Existing Geotechnical Features

A brief description of the existing registered and unregistered geotechnical features in the vicinity of the application site is provided below.

Feature No. 7SW-D/R349

Feature No. 7SW-D/R349 comprises a masonry retaining wall approximately 3.75m high and 20m long located immediately to the east of the application site. According to the Hong Kong Slope Safety (HKSS) website, no surface drainage provisions are associated with this feature. The feature is classified as Consequence-to-Life Category 3, and the maintenance responsibility rests with the Lands Department.

Feature No. 7SW-D/C462

Feature No. 7SW-D/C462 comprises a soil cut slope approximately 1.0m high and 32m long located to the southwest of the application site. According to the HKSS website, no surface drainage provisions are associated with this feature. The feature is classified as Consequence-to-Life Category 3, and the maintenance responsibility rests jointly with the Lands Department and Lot 401 in D.D.182.

Feature No. 7SW-D/CR1016

Feature No. 7SW-D/CR1016 comprises a soil cut slope with a maximum height of approximately 5.6m, together with an adjoining retaining wall approximately 5m high, located to the northwest of the application site. According to the HKSS website, the feature is classified as Consequence-to-Life Category 1. The maintenance responsibility rests with Lots 394S.A, 395, 396 and 397 in D.D.182.

Feature No. 7SW-D/C1075

Feature No. 7SW-D/C1075 comprises a soil cut slope approximately 8.0m high and 30m long located to the south of the application site. According to the HKSS website, no surface drainage provisions are associated with this feature. The feature is classified as Consequence-to-Life Category 3, and the maintenance responsibility rests with the Lands Department.

Feature No. 7SW-D/FR45

Feature No. 7SW-D/FR45 comprises a soil cut slope with a maximum height of approximately 4.5m, together with an adjoining retaining wall approximately 2.5m high, located to the south of the application site. According to the HKSS website, the feature is classified as Consequence-to-Life Category 1. The maintenance responsibility rests with the Highways Department.

Unregistered Retaining Wall A

"Unregistered Retaining Wall A" comprises a masonry retaining wall approximately 41m long and 2.7m high located along the northwestern boundary of the application site. The wall provides support to the existing site platform.

Unregistered Retaining Wall B

"**Unregistered Retaining Wall B**" comprises a masonry retaining wall approximately 29m long and 3.75m high located along the southeastern and southwestern boundaries of the application site. The wall retains the adjacent ground outside the application site.

Unregistered Terrain Walls

A series of unregistered masonry terrain walls, approximately 2.3m, 1.8m, 1.2m and 4.0m high, are located to the south of the application site.

For ease of reference, the available information on the registered geotechnical features obtained from the Geotechnical Engineering Office (GEO) is presented in **Appendix A**.

3. DESK STUDY AND BACKGROUND INFORMATION SEARCH

3.1 Buildings Department

A search of the available records held by the Buildings Department (BD) indicates that no approved building plans, structural plans or site formation plans are available for the application site.

3.2 Geotechnical Engineering Office

A Stage 2 Study Report (S2R137/2007) for Feature No. 7SW-D/CR1016 was prepared by Maunsell Geotechnical Services Ltd. in May 2007. The stability assessment concluded that the feature satisfies the requirement for issuing a Dangerous Hillside (DH) Order. A copy of the report is included in **Appendix B**.

4. GEOTECHNICAL INVESTIGATION WORKS

4.1 Outline of Site Geology

According to the Hong Kong Geological Survey Map, Sheet 7 (1:20,000), Solid and Superficial Geology of Sha Tin, published by the Geotechnical Engineering Office (GEO), the application site is underlain by coarse-grained granite of Jurassic to Cretaceous age (Mesozoic Era).

4.2 Review of Existing Ground Investigation Information

Existing ground investigation records for the application site and the surrounding area were obtained from the Ground Investigation Unit (GIU) of the Geotechnical Engineering Office (GEO). The available information is summarised below.

Ground Investigation Records

Three boreholes, designated DH1 to DH3, were drilled approximately 70m west of the application site by Lam Geotechnics Limited in March 1988. The corresponding Ground Investigation Report is included in **Appendix E**.

The borehole records indicate that the subsurface profile generally comprises approximately 3.5m of colluvium overlying Completely Decomposed Granite (CDG). Piezometers were installed in Boreholes DH1 to DH3 for groundwater monitoring.

4.3 Groundwater Conditions

Groundwater monitoring records from Boreholes DH1 to DH3 indicate that dry conditions were recorded in DH1 and DH2 throughout the monitoring period. The highest recorded groundwater level was approximately +13.1mPD in DH3 in April 1988.

5. GEOTECHNICAL WORKS

The preliminary geotechnical works associated with the proposed development are discussed below.

5.1 Proposed Site Formation Works

The proposed two-storey office building will be founded on the existing site platform at approximately +25.45mPD.

(i) Unregistered Retaining Wall A and Feature No. 7SW-D/CR1016

As “**Unregistered Retaining Wall A**” and Feature No. 7SW-D/CR1016 are located in close proximity to the application site, a detailed geotechnical assessment should be carried out during the detailed design stage to evaluate the effects of the proposed development, including the surcharge imposed by the proposed building, on the stability of these features.

While the assessment indicate that the stability of the affected geotechnical features does not satisfy the current geotechnical standards, appropriate stabilization measures, such as soil nailing works will be incorporated into the detailed site formation and/or slope upgrading design.

(ii) Unregistered Retaining Wall B, Feature Nos. 7SW-D/R349 and 7SW-D/C462, 7SW-D/C1075, 7SW-D/FR454 and unregistered Terrain Walls

The proposed development will be located at the toe of “**Unregistered Retaining Wall B**”, Feature Nos. 7SW-D/R349 and 7SW-D/C462, 7SW-D/C1075, 7SW-D/FR454 as well as the adjacent unregistered terrain walls. It is considered that the proposed development will not induce any additional adverse effect on these geotechnical features.

Nevertheless, detailed geotechnical assessments of these features will be undertaken during the detailed design stage. Where necessary, appropriate stabilization measures, including soil nailing works will be incorporated into the detailed design to ensure compliance with the current geotechnical standards.

According to the information obtained from HSS, Feature 7SW-D/FR45 was upgraded under a non-prescriptive design on 1 November 2023. Based on the available information, the captioned feature is considered to be in a stable condition.

The preliminary layout of the proposed site formation and slope upgrading works is presented in **Appendix C**.

5.2 Natural Terrain Hazard Study (NTHS) and Associated Mitigation Measures

The application site is situated below a natural hillside and may therefore be affected by natural terrain hazards originating from the uphill catchment. Based on the preliminary review, the natural hillside satisfies the alert criteria for undertaking a Natural Terrain Hazard Study (NTHS).

Potential hazards that may require detailed assessment include open hillside landslides, channelised debris flows, debris floods, boulder falls and shallow washouts. The proposed extent of the NTHS is shown in **Appendix D**.

Subject to the findings of the NTHS, appropriate mitigation measures may be required. These may include debris-resisting barriers, rockfall barriers, boulder fences, boulder stabilization works and/or the removal of unstable boulders, as appropriate.

6. CONCLUSION

Based on the findings of this Geotechnical Planning Review, the following conclusions are drawn:

1. The proposed development is considered to be geotechnically feasible. The potential effects of the proposed two-storey office building and the associated site formation works on the surrounding ground and adjacent geotechnical features will be assessed in detail during the detailed design stage.
2. Detailed stability assessments of all existing slopes and retaining walls within and adjacent to the application site will be undertaken to demonstrate compliance with the current geotechnical standards. Where necessary, appropriate stabilization and preventive works will be designed and implemented to the satisfaction of the Buildings Department and the Geotechnical Engineering Office.
3. A Natural Terrain Hazard Study (NTHS) will be undertaken, where required, and any necessary mitigation measures identified by the study will be incorporated into the proposed development for the approval of the Buildings Department and the Geotechnical Engineering Office.

Appendix A

Slope Information Record of Feature 7SW-D/C462,
7SW-D/R349, 7SW-D/CR1016, 7SW-D/C1075 And 7SW-D/FR45

BASIC INFORMATION

Location: Southeast of No.5, Kak Tin Village, Sha Tin
Registration Date: 19-11-1997
Ranking Score (NPRS): 0 (EI)
Date of Formation: pre-1977
Date of Construction/ Modification:
Data Source: EI
Approximate Coordinates: Easting : 837186 Northing : 825355

CONSEQUENCE-TO-LIFE CATEGORY

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

SLOPE PART

(1) Max. Height (m): 3.5 Length (m): 30 Average Angle (deg): 60

WALL PART

N/A

MAINTENANCE RESPONSIBILITY

(1) Sub Div.: 1 Mixed Feature Party: DD182 Lot401 Agent: N/A Land Cat.: 1,5b(vi),7 Reason Code: 1 MR Endorsement Date: 04-08-1998
(2) Sub Div.: 2 Mixed Feature Party: Lands D Agent: Lands D Land Cat.: 1,5b(vi),7 Reason Code: 62 MR Endorsement Date: 04-08-1998

DETAILS OF SLOPE / RETAINING WALL

Date of Inspection: 18-02-2002
Data Source: EI
Slope Part Drainage: N/A
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: Other geology
Berm: No. of Berms: N/A Min. Berm Width (m): N/A
Weepholes: Size (mm): N/A Spacing (m): N/A

WALL PART

N/A

SERVICES

N/A

CHECKING STATUS INFORMATION

N/A

BACKGROUND INFORMATION

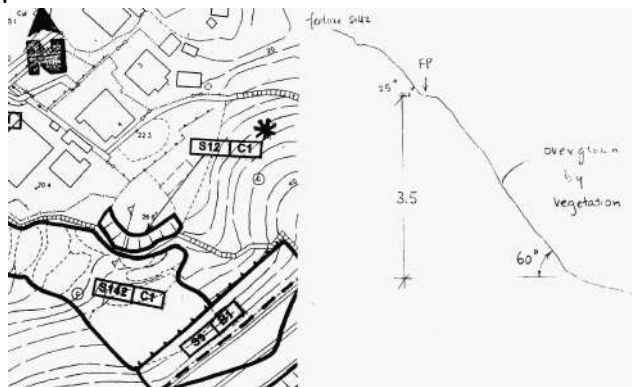
GIU Cell Ref.: 7SW20D8
Map Sheet Reference (1:1000): 7SW-20D
Aerial Photos: 8324 (1974), 8325 (1974)
Nearest Rainguage Station (Station Number): R/F, Wing Wai House, Sun Tin Wai Estate(N42)
Data Collected On: 18-02-2002
Date of Construction, Subsequent Modification and Demolition: Modification: Constructed Before: 1978 After: N/A
Related Reports/Files or Documents: File/Report: DLC/BC Ref. No.: GCMd 2/B3/19
File/Report: DLC/BC Ref. No.: GCMd 2/B3/56
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: 21/11/2025)

STAGE 1 STUDY REPORT

Inspected On: 07-06-1996
Weather: Mainly Fine
District: MW



Section No: 1-1
Height(m): H1 : 4 , H2 : 0
Type of Toe Facility: Undeveloped green belt
Distance from Toe(m): 0
Type of Crest Facility: Road/footpath with very low traffic density
Distance from Crest(m): 0
Consequence Category: 3
Engineering Judgement: P
Section No: 2-2
Type of Toe Facility: N/A
Distance from Toe(m): 0
Type of Crest Facility: N/A
Distance from Crest(m): 0
Consequence Category: 3
Engineering Judgement: P
Sign of Seepage: Slope : No signs of seepage
Wall : N/A
Criterion A satisfied: N
Sign of Distress: Slope : N/A
Wall : N/A
Criterion D satisfied: N
Non-routine maintenance required: N
Note: N/A
Masonry wall/Masonry facing: N
Note: N/A
Consequence category (for critical section): 3



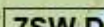
Observations:	N/A
Emergency Action Required:	N
Action By:	N/A

ACTION TO INITIATE PREVENTIVE WORKS

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

OTHER EXTERNAL ACTION

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



BASIC INFORMATION

Location: Adjacent to DD182 Lot 393, Kak Tin Village, Sha Tin
Registration Date: 07-11-2019
Ranking Score (NPRS): 0 (Notional)
Date of Formation: N/A
Date of Construction/ Modification:
Data Source: Districts
Approximate Coordinates: Easting : 837213 Northing : 825380

CONSEQUENCE-TO-LIFE CATEGORY

Facility at Crest: Lightly-used open area/facilities
Distance of Facility from Crest (m): 0
Facility at Toe: Lightly-used open area/facilities
Distance of Facility from Toe (m): 0
Consequence-to-life Category: 3
Remarks: N/A

SLOPE PART

N/A

WALL PART

(1) Max. Height (m): 3 Length (m): 20 Face Angle (deg): 90

MAINTENANCE RESPONSIBILITY

(1) Sub Div.: 0 Government Feature Party: Lands D Agent: Lands D Land Cat.: 5b(vi) Reason Code: 62 MR Endorsement Date: 30-07-2021

DETAILS OF SLOPE / RETAINING WALL

Date of Inspection: 08-10-2019
Data Source: Districts
Slope Part Drainage: N/A
Wall Part Drainage: N/A

SLOPE PART

N/A

WALL PART



Wall Part (1)
Type of Wall: Wall Material: Others Wall Location: Wall at toe
Berm: No. of Berms: N/A Min. Berm Width (m): N/A
Weepholes: Size (mm): N/A Spacing (m): N/A

SERVICES

N/A

CHECKING STATUS INFORMATION

N/A

BACKGROUND INFORMATION

GIU Cell Ref.:

Map Sheet Reference (1:1000):

Aerial Photos:

Nearest Rainguage Station (Station Number):

Data Collected On: 08-10-2019

Date of Construction, Subsequent Modification and Demolition: N/A

Related Reports/Files or Documents: N/A

Remarks:

Follow Up Actions:

DH-Order (To Be Confirmed with Buildings Department): None

Advisory Letter (To Be Confirmed with Buildings Department): None

LPMIS: None

ENHANCED MAINTENANCE INFORMATION

STAGE 1 STUDY REPORT

Inspected On:

Weather:

District:

Section No: 1-1

Height(m):

Type of Toe Facility: Lightly-used open area/facilities

Distance from Toe(m): 0

Type of Crest Facility: Lightly-used open area/facilities

Distance from Crest(m): 0

Consequence Category:

Engineering Judgement:

Section No: 2-2

Type of Toe Facility:

Distance from Toe(m):

Type of Crest Facility:

Distance from Crest(m):

Consequence Category:

Engineering Judgement:

Sign of Seepage:

Criterion A satisfied:

Sign of Distress:

Criterion D satisfied:

Non-routine maintenance required:

Note:

Masonry wall/Masonry facing:

Note:

Consequence category (for critical section):

Observations: N/A

Emergency Action Required:

Action By: N/A

ACTION TO INITIATE PREVENTIVE WORKS

Criterion A/Criterion D: N/A

Action By: N/A

Further Study:

Action By: N/A

OTHER EXTERNAL ACTION

Check / repair Services:

Action By: N/A

Non-routine Maintenance:



Action By: N/A



BASIC INFORMATION

Location: Kak Tin Village, Shatin, New Territories, Lot No. 394, 395, 396 & 397 in DD182
Registration Date: 07-07-2009
Ranking Score (NPRS): 2 (LPMit)
Date of Formation: pre-1977
Date of Construction/ Modification: 08-12-2021
Data Source: AP
Approximate Coordinates: Easting : 837160 Northing : 825369

CONSEQUENCE-TO-LIFE CATEGORY

Facility at Crest: Cottage, licensed and squatter area
Distance of Facility from Crest (m): 0
Facility at Toe: Monastery
Distance of Facility from Toe (m): 0
Consequence-to-life Category: 1
Remarks: N/A

SLOPE PART

(1)	Max. Height (m): 3.4	Length (m): 2.5	Average Angle (deg): 80
(1)	Max. Height (m): 5.6	Length (m): 8.5	Average Angle (deg): 80
(1)	Max. Height (m): 5.2	Length (m): 7	Average Angle (deg): 80

WALL PART

(1)	Max. Height (m): 4.8	Length (m): 12	Face Angle (deg): 70
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MAINTENANCE RESPONSIBILITY

(1) Sub Div.: 1	Private Feature	Party: DD182 LOT 394 S.A	Agent: N/A	Land Cat.: 1	Reason Code: 1	MR Endorsement Date: 31-08-2023
(2) Sub Div.: 2	Private Feature	Party: DD182 LOT 397	Agent: N/A	Land Cat.: 1	Reason Code: 1	MR Endorsement Date: 31-08-2023
(3) Sub Div.: 3	Private Feature	Party: DD182 LOT 396	Agent: N/A	Land Cat.: 1	Reason Code: 1	MR Endorsement Date: 31-08-2023
(4) Sub Div.: 4	Private Feature	Party: DD182 LOT 395	Agent: N/A	Land Cat.: 1	Reason Code: 1	MR Endorsement Date: 31-08-2023

DETAILS OF SLOPE / RETAINING WALL

Date of Inspection: 08-12-2021
Data Source: AP
Slope Part Drainage: (1) Position: Crest Size(mm): 225
Wall Part Drainage: (1) Position: Crest Size(mm): 225
(2) Position: Downpipe Size(mm): 250
(3) Position: Toe Size(mm): 225

SLOPE PART

Slope Part (1)

Surface Protection (%): Bare: 0 Vegetated: 0 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): 50 Spacing (m): 1.5

Slope Part (2)

Surface Protection (%): Bare: 0 Vegetated: 0 Chunam: 0 Shotcrete: 0 Other Cover: 0
Material Description: Material type: Soil Geology: N/A
Berm: No. of Berms: 1 Min. Berm Width (m): 1.2
Weepholes: Size (mm): 50 Spacing (m): 1.5

Slope Part (3)

Surface Protection (%): Bare: 0 Vegetated: 0 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): 50 Spacing (m): 1.5

WALL PART

Wall Part (1)

Type of Wall: Wall Material: Concrete Wall Location: Wall at toe
Berm: No. of Berms: N/A Min. Berm Width (m): N/A
Weepholes: Size (mm): 50 Spacing (m): 1.5

SERVICES

N/A

CHECKING STATUS INFORMATION

Tagmark: SCS_19973 Part: 0 Checking Status: Feature modified/upgraded to current standard Checking Certificate No.: N/A

BACKGROUND INFORMATION

GIU Cell Ref.: N/A
Map Sheet Reference (1:1000): N/A
Aerial Photos: N/A
Nearest Rainguage Station (Station Number): ()
Data Collected On: 08-12-2021
Date of Construction, Subsequent Modification and Demolition: N/A

Related Reports/Files or Documents: N/A

Remarks: N/A

Follow Up Actions: N/A

DH-Order (To Be Confirmed with Buildings Department):
Date of Recommendation to BD: 17/12/2009 File Reference: DH/0071/09/NT
Date Served by BD: 31/05/2010 Notice No.: DH0069/NT/10/C
Date of Recommendation to BD: 17/12/2009 File Reference: DH/0072/09/NT
Date Served by BD: 31/05/2010 Notice No.: DH0070/NT/10/C
Date of Recommendation to BD: 17/12/2009 File Reference: DH/0073/09/NT
Date Served by BD: 31/05/2010 Notice No.: DH0071/NT/10/C
Date of Recommendation to BD: 17/12/2009 File Reference: DH/0074/09/NT
Date Served by BD: 31/05/2010 Notice No.: DH0072/NT/10/C

Advisory Letter (To Be Confirmed with Buildings Department): None

LPMIS: Agreement No.: CE33/2004 Report No.: S2R137/2007

ENHANCED MAINTENANCE INFORMATION

From Maintenance Department: (Last Updated Date: 21/11/2025)

STAGE 1 STUDY REPORT

Inspected On:

Weather:

District: N/A

Section No: 1-1

Height(m):

Type of Toe Facility: Monastery

Distance from Toe(m): 0

Type of Crest Facility: Cottage, licensed and squatter area

Distance from Crest(m): 0

Consequence Category:

Engineering Judgement:

Section No: 2-2

Type of Toe Facility:

Distance from Toe(m):

Type of Crest Facility:

Distance from Crest(m):

Consequence Category:

Engineering Judgement:

Sign of Seepage:

Criterion A satisfied:

Sign of Distress:

Criterion D satisfied:

Non-routine maintenance required:

Note:

Masonry wall/Masonry facing:

Note:

Consequence category (for critical section):

Observations: N/A

Emergency Action Required:

Action By: N/A

ACTION TO INITIATE PREVENTIVE WORKS

Criterion A/Criterion D: N/A

Action By: N/A

Further Study:

Action By: N/A

OTHER EXTERNAL ACTION

Check / repair Services:

Action By: N/A

Non-routine Maintenance:

Action By: N/A

eLPMIS

LPM/LPMit Details Report

LPM Study Feature No.:	7SW-D/R 267
Location:	70M EAST OF KAK TIN STREET, KAK TIN, TAI WAI
District Council:	Sha Tin
Maintenance Responsibility (At the Time of Selection):	Private
Responsible Party for Maintenance of Government Portion:	N/A
Private Lot No.:	DD182 Lot394, Lot395, Lot396, Lot397

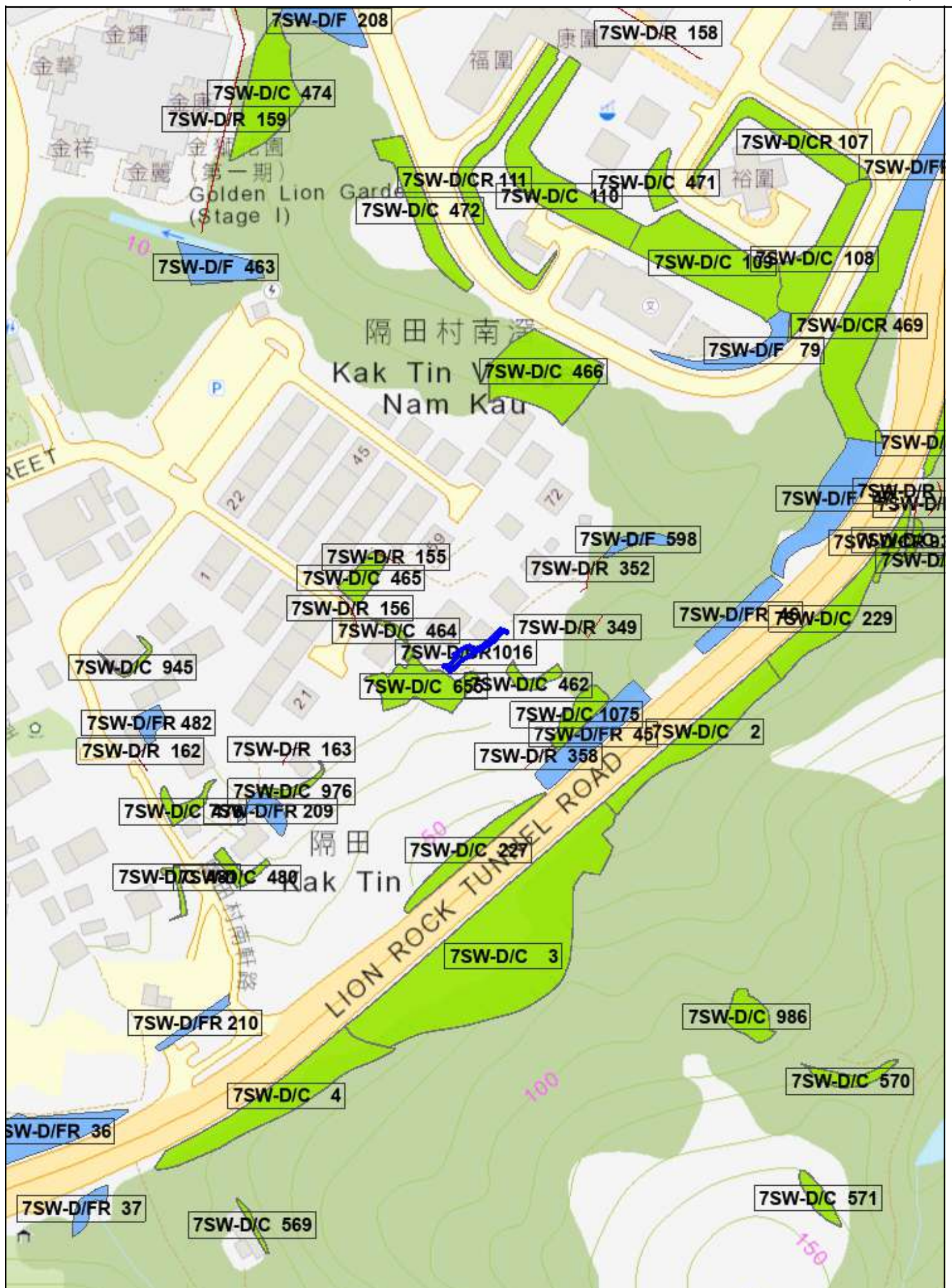
LPM/LPMit Study

Agreement No.:	CE33/2004
Study Type:	Stage 2 Study
Consultant:	Maunsell Geotechnical Services Ltd.
GEO Managing Section / Engineer:	SS / SS1
Study Status:	Study completed
Design Approach:	N/A
Option Assessment Accepted:	N/A
Study Report No.:	S2R137/2007
Programme / Actual Commencement:	03-05-2007

Programme / Actual Completion:	31-03-2008
Report Recommendation (For Stage 2 Study):	DH Order
District Check Status:	Checked
Checking Certificate No.:	N/A
GEO Engineer's Remarks:	N/A

LPM/LPMit Works

Works Contract No.:	N/A
GEO Managing Section / Engineer:	N/A / N/A
Contractor:	N/A
Progress Status:	N/A
Reason of Study Termination / Works Deletion (If Necessary):	N/A
Forecast Commencement Date:	N/A
Forecast Completion Date:	N/A
Completion Cert. Issued:	N/A
Site Handed Over to Maintenance Department on:	N/A
Estimated Cost for Upgrading (HK\$M):	N/A
Maintenance Manual No.:	N/A
Actual Works:	N/A
No. of Tree Felled:	N/A
No. of Tree Planted (Incl. Transplant):	N/A
% Bare of Slope Surfacing:	N/A
% Vegetated of Slope Surfacing:	N/A
% Shotcrete of Slope Surfacing:	N/A
Other Hard Surface of Slope Surfacing:	N/A



BASIC INFORMATION

Location: Southeast of No. 6-7, Kak Tin Village, Sha Tin
Registration Date: 20-10-2020
Ranking Score (NPRS): 0 (Notional)
Date of Formation: post-1977
Date of Construction/ Modification:
Data Source: Project Office
Approximate Coordinates: Easting : 837206 Northing : 825343

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): 8 Length (m): 30 Average Angle (deg): 40

WALL PART

N/A

MAINTENANCE RESPONSIBILITY

(1) Sub Div.: 0 Government Feature Party: Lands D Agent: Lands D Land Cat.: 5b(vi) Reason Code: 62 MR Endorsement Date: 02-10-2025

DETAILS OF SLOPE / RETAINING WALL

Date of Inspection: 24-08-2020
Data Source: Project Office
Slope Part Drainage: N/A
Wall Part Drainage: N/A

SLOPE PART

Slope Part (1)
Surface Protection (%): Bare: 0 Vegetated: 0 Chunam: 0 Shotcrete: 100 Other Cover: 0
Material Description: Material type: Soil Geology: N/A
Berm: No. of Berms: N/A Min. Berm Width (m): N/A
Weepholes: Size (mm): 75 Spacing (m): 1.5



WALL PART

N/A

SERVICES

N/A

CHECKING STATUS INFORMATION

N/A

BACKGROUND INFORMATION

GIU Cell Ref.:

Map Sheet Reference (1:1000):

Aerial Photos:

Nearest Rainguage Station (Station Number):

Data Collected On: 24-08-2020

Date of Construction, Subsequent Modification and Demolition: N/A

Related Reports/Files or Documents: N/A

Remarks:

Follow Up Actions:

DH-Order (To Be Confirmed with Buildings Department): None

Advisory Letter (To Be Confirmed with Buildings Department): None

LPMIS: None

ENHANCED MAINTENANCE INFORMATION

STAGE 1 STUDY REPORT

Inspected On:

Weather:

District:

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: Undeveloped green belt

Distance from Crest(m): 0

Consequence Category:

Engineering Judgement:

Section No: 2-2

Type of Toe Facility:

Distance from Toe(m):

Type of Crest Facility:

Distance from Crest(m):

Consequence Category:

Engineering Judgement:

Sign of Seepage:

Criterion A satisfied:

Sign of Distress:

Criterion D satisfied:

Non-routine maintenance required:

Note:

Masonry wall/Masonry facing:

Note:

Consequence category (for critical section):

Observations: N/A

Emergency Action Required:

Action By: N/A

ACTION TO INITIATE PREVENTIVE WORKS

Criterion A/Criterion D: N/A

Action By: N/A

Further Study:

Action By: N/A

OTHER EXTERNAL ACTION

Check / repair Services:

Action By: N/A

Non-routine Maintenance:



Action By:

N/A



BASIC INFORMATION

Location: LION ROCK TUNNEL ROAD, HSR
Registration Date: 19-11-1997
Ranking Score (NPRS): 29 (EI)
Date of Formation: pre-1977
Date of Construction/ Modification: 01-01-1963
Data Source: LPM
Approximate Coordinates: Easting : 837211 Northing : 825332

CONSEQUENCE-TO-LIFE CATEGORY

Facility at Crest: Road/footpath with very heavy traffic density
Distance of Facility from Crest (m): 2.2
Facility at Toe: Cemetery
Distance of Facility from Toe (m): 0
Consequence-to-life Category: 1
Remarks: N/A

SLOPE PART

(1) Max. Height (m): 4.5 Length (m): 58 Average Angle (deg): 43

WALL PART

(1) Max. Height (m): 2.5 Length (m): 58 Face Angle (deg): 90

MAINTENANCE RESPONSIBILITY

(1) Sub Div.: 0 Government Feature Party: HyD Agent: HyD Land Cat.: 5b(iii) Reason Code: 56 MR Endorsement Date: 05-08-1997

DETAILS OF SLOPE / RETAINING WALL

Date of Inspection: 02-12-2016
Data Source: LPM
Slope Part Drainage: (1) Position: On slope Size(mm): 300
Wall Part Drainage: (1) Position: Crest Size(mm): 300

SLOPE PART

Slope Part (1)
Surface Protection (%): Bare: 20 Vegetated: 80 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

Wall Part (1)

Type of Wall:	Wall Material: Concrete	Wall Location: Wall at crest
Berm:	No. of Berms: N/A	Min. Berm Width (m): N/A
Weepholes:	Size (mm): 60	Spacing (m): 1.5

SERVICES

N/A

CHECKING STATUS INFORMATION

Tagmark: SCS_21310 Part: 0 Checking Status: Feature modified/upgraded to current standard Checking Certificate No.: GEO/MW 145/2024

BACKGROUND INFORMATION

GIU Cell Ref.:	7SW20D8
Map Sheet Reference (1:1000):	7SW-20D
Aerial Photos:	Y15473-4 (1969),
Nearest Rainguage Station (Station Number):	R/F, Wing Wai House, Sun Tin Wai Estate(N42)
Data Collected On:	02-12-2016
Date of Construction, Subsequent Modification and Demolition:	Modification: Constructed Before: 1969 After: 1963
Related Reports/Files or Documents:	File/Report: BP Reports Ref. No.: B & P's Landslide study Phase IIA/IIB/IIC File/Report: BP Reports Ref. No.: Mid Levels study report File/Report: Development Ref. No.: GCHW 2/B3/19
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: 21/11/2025)

Upgraded by:

Prescriptive Design Using GEO Report No. 56: N/A

Non-prescriptive Design Including Conventional Design: Yes

Improved by:

Type 1 / Type 2 Prescriptive Measures: N/A

Type 3 Prescriptive Measures (not up to upgrading standard): N/A

Actual Completion Date: 01-11-2023

STAGE 1 STUDY REPORT

Inspected On:

Weather:

District: MW

Section No: 1-1

Height(m):

Type of Toe Facility: Cemetery

Distance from Toe(m): 0

Type of Crest Facility: Road/footpath with very heavy traffic density

Distance from Crest(m): 2.2

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



Appendix B

Stage 2 Study Report (S2R137/2007)

1 INTRODUCTION

1.1 Background

This report presents a Stage 2 Study on Feature No. **7SW-D/CR1016** (also termed Study Feature in this report) located at 10m to the southeast of No. 5, Kak Tin Village Nam Kau, Sha Tin. The Study Feature lies partly within Lot Nos. DD182 Lot394, Lot395, Lot396 and Lot397. There is no other feature located partly or wholly within Lot Nos. DD182 Lot394, Lot395, Lot396 and Lot397. The study status and location of the feature in Hong Kong Metric Grid Reference, is listed as follows:

Feature No.	Included in this Safety Screening Study	Hong Kong Metric Grid Co-ordinates
7SW-D/CR1016	Yes	837165E, 825365N

The location of the Study Feature is shown in Figure 1. The boundary of the feature has been determined from the Slope Information System (SIS) plan obtained from the Geotechnical Engineering Office (GEO), SIMAR Report obtained from Lands Department and observations made during the site inspection. A topographical/boundary survey was carried out in December 2007 to ascertain the location of the feature in relation to the study lots (Appendix A1).

The Stage 2 Study commenced in June 2007. The scope of the Study includes desk study, site inspection, aerial photograph interpretation and stability analysis. No ground investigation work was undertaken for the Study.

1.2 Site Description

The Study Feature is located at 10m to the southeast of No. 5, Kak Tin Village Nam Kau, Shatin, which lies partly within Lot Nos. DD182 Lot394, Lot395, Lot396 and Lot397. The total length of the feature is 34m. It comprises a 21m long cut slope with maximum height of 4.42m and maximum gradient of 66°; a 12m long, maximum 2m high masonry wall with maximum face angle of 85° located at the upper portion; and a 9m long, maximum 2.25m high concrete wall with face angle of 90° located at the lower portion. Undeveloped green belt and a cottage are situated immediately at the crest and the toe of the feature respectively. Details of the feature are described in Section 2.2.

1.3 Maintenance Responsibility

According to the relevant SIMAR reports (Appendix A), the maintenance responsibility of the Study Feature rests with the owners of Lot Nos. DD182 Lot394, Lot395, Lot396 and Lot397. The maintenance responsibilities of the feature are listed as follows:

Feature No.	Sub-division No. stated in SIMAR report	Maintenance Responsibility
7SW-D/CR1016	1	DD182 Lot394
	2	DD182 Lot397
	3	DD182 Lot396
	4	DD182 Lot395

2 GEOTECHNICAL INVESTIGATION

2.1 Background/Desk Study

2.1.1 Aerial Photograph Interpretation (API)

Aerial photographs taken between 1963 and 2004 were examined. Based on the API report (Appendix B), the Study Feature and the cottages at its toe had been formed before 1963. No evidence of the presence of fill, colluvium, boulders or natural drainage path affecting the Study Feature could be identified. No evidence of the past instability was noted from the available aerial photographs.

2.1.2 Geotechnical Engineering Office (GEO)

2.1.2.1 Previous Studies

Phase 2 Systematic Inspection of Features in the Territory (SIFT) Study was carried out on Feature No. 7SW-D/CR1016 by the SIFT Consultant in 1996. The report (SIFT No. 7SW-20D/S143) was enclosed in Appendix C.

The Slope Information System (SIS) records are enclosed in Appendix D. No sign of seepage or sign of distress was reported.

A site investigation (SI) report (GIU Ref. No. 10932) for 'Village Extension in Kak Tin (Area 24C) Natural Slope Adjacent to Kak Tin Village' was viewed. Two boreholes logs (DH2 and DH3) were extracted from the reports and their locations are shown in Figure 2. The SI works were carried out by Lam Geotechnics Limited in 1988. As revealed from DH2 and DH3, the site area was underlain by colluvium/alluvium overlying decomposed granite. Extracts of the SI report were enclosed in Appendix E.

Laboratory tests on the samples obtained from the above mentioned site investigation works were carried out by Geotechnics & Concrete Engineering (Hong Kong) Limited. The extracts of the laboratory test results were enclosed in Appendix F.

2.1.3 Buildings Department (BD)

No relevant information to the Study Feature could be retrieved.

2.1.4 Existing Services

Drainage Services Department (DSD) and Water Supplies Department (WSD) were requested to provide information on existing utilities/services located within or in the vicinity of the Study Feature. With reference to the DSD record plan, no record of storm water drain or foul sewer located within or in the vicinity of the Study Feature. With reference to the WSD record plan, no fresh water main or salt water main was present in the vicinity of the Study Feature. The existing services plans are enclosed in Appendix G.

2.1.5 Geological Survey

Based on the 1:20 000 Geological Map of Hong Kong Sheet No. 7 (Sha Tin) published by the Hong Kong Government (Appendix H), the concerned area is underlain by unsorted sand, gravel, cobbles and boulders; clay/silt matrix of Debris flow deposits (Qd).

2.1.6 Past Instability

No record of past instability related to the Study Feature was identified from the available documents or files maintained by BD/GEO.

2.2 Visual Inspection

Visual inspections were carried out on Feature No. 7SW-D/CR1016 in June 2007 and September 2009. The total length of the feature was 34m. It comprised a 21m long cut slope with maximum height of 4.42m and maximum gradient of 66°; a 12m long, maximum 2m high masonry wall with maximum face angle of 85° located at the upper portion; and a 9m long, maximum 2.25m high concrete wall with face angle of 90° located at the lower portion. Undeveloped green belt and cottages were located immediately at the feature crest and toe respectively. The slope surface was generally covered by chunam. No signs of seepage or leakage of water-carrying services were observed on the feature during the site inspections.

Sub-division No. 1 of the feature consisted of a 2.2m long and 1.44m high masonry wall with face angle of 85°. An almost levelled berm of 1m width was located at the toe of the masonry wall. The general view was shown in Plate No. 1. Some missing masonry blocks were observed on the wall face. A platform and the cottage were located immediately at the slope crest and toe respectively.

Sub-division 2 of the feature consisted of a cut slope, a masonry wall and a concrete wall. The cut slope was about 25m long, 4.42m high with a slope angle of 66° (Plate 2). The slope surface was generally covered by chunam. Two rows of 25mm in diameter weepholes were observed in a horizontal spacing of 1m on the chunam surface. Most of the weepholes were blocked by debris. A single-storey cottage was located at the toe of the eastern end of Sub-division No. 2. A concrete wall was formed as a part of the cottage but no access was available to inspect this portion during the site inspection. Based on the topographical survey results, the concrete wall was 1.57m high with a face angle of 90°. A masonry wall was located

was measured to be 300mm at the wall top during the site inspection (Plate 3). It was maximum 2m high and the face angle was 85°. An incinerator was observed near the western end of the feature (Plate 4).

Sub-division No. 3 of the feature was bounded by Sub-division Nos. 1 and 2 (Plate 5). Its geometry was similar to that of Sub-division No. 1. A 1.5m long, 1.92m high and 80° masonry wall was located at the upper portion. A cottage was located immediately at the toe with a 90° concrete wall of 1.57m in height. A 10° berm was located between the masonry wall and the concrete wall.

Sub-division No. 4 of the feature was located at the eastern end of the Study Feature. It was the extension of Sub-division No. 1. Its geometry was similar to that of Sub-division No. 1. A 3.3m long, 0.93m high and 80° masonry wall was located at the upper portion. A cottage was located immediately at the toe with a 90° concrete wall of 2.25m in height. A 1m wide berm was located between the masonry wall and the concrete wall. The general view of Sub-division No. 4 was shown in Plate 6. A water tank was located at the crest and a stairway was built for access to the crest of the feature (Plate 7).

3 GEOTECHNICAL ASSESSMENT

3.1 Topography

Four critical Sections A-A, B-B, C-C and D-D were selected for stability analysis based on the site observation and measurements with respect to the maintenance responsibility. The profile of the section was referenced to the results of the topographical survey carried out on site. Locations of these sections are shown in Figure 2A.

Section A-A represents the critical section of the portion maintained by the owners of Lot No. DD182 Lot394 (Sub-division No. 1). This section is a masonry wall of 1.44m in height, 0.3m in thickness with a face angle of 85° (refer to Figure 3).

Section B-B represents the critical section of the portion maintained by the owners of Lot No. DD182 Lot397 (Sub-division No. 2). This section is a cut slope of 4.26m in height with the slope angle of 65° (refer to Figure 4). In addition, another critical section consisted of a masonry wall and a concrete wall which was similar to the geometry in Section C-C (refer to Figure 5).

Section C-C represents the critical section of the portion maintained by the owners of Lot No. DD182 Lot396 (Sub-division No. 3). This section consists of a masonry wall of 1.91m in height, 0.3m in thickness with a face angle of 80° and a concrete wall of 1.57m high with face angle of 90°. A 10° berm was located between the masonry wall and the concrete wall (refer to Figure 5).

Section D-D represents the critical section of the portion maintained by the owners of Lot No. DD182 Lot395 (Sub-division No. 4). This section consists of a masonry wall of 0.95m in height, 0.3m in thickness with a face angle of 80° and a concrete wall of 2.25m high with face angle of 90°. A 1m wide berm was located between the masonry wall and the concrete wall. A water tank is located at the crest (refer to Figure 6).

3.2 Geology and Geological Model

Based on the 1:20 000 Geological Map of Hong Kong Sheet No. 7 (Sha Tin) published by the Hong Kong Government (Appendix H), the concerned area is underlain by unsorted sand, gravel, cobbles and boulders; clay/silt matrix of debris flow deposits (Qd).

The inferred geological model for Sections A-A, B-B, C-C and D-D are shown in Figures 3, 4, 5 and 6 respectively.

3.3 Groundwater Condition

In the absence of any relevant groundwater monitoring record, a groundwater table was assumed at one-third of the total feature height to account for possible rises occurring during 1 in 10 years return period of rainfall.

3.4 Parameters for Analysis

No ground investigation record for the Study Feature is available from relevant government departments. The Study Feature was confirmed to be composed of debris flow deposits based on the 1:20 000 geological survey map. According to the Site Investigation report (Appendix E) prepared by Lam Geotechnics Limited for 'Village Extension in Kak Tin (Area 24C) Natural Slope Adjacent to Kak Tin Village', the site area is underlain by colluvium/alluvium overlying decomposed granite. The slope material was inspected on site with a geological hammer and which was found to be colluvium of medium dense, reddish brown, with moderately decomposed rootlets which generally tallied with the description for colluvium in the Site Investigation report. Since no laboratory test has been carried out for the colluvium in the nearby borehole (DH 2 & DH3), the typical shear strength parameters for colluvium suggested in Table 8 of Geoguide 1 was adopted in this stability analysis. The adopted parameters are summarised below:

Soil Material	Shear Strength Parameters		Bulk Unit Weight	Remark
	c' (kPa)	ϕ' (°)	γ (kN/m ³)	
Colluvium	4	34	19	Adopted

3.5 Stability Analysis

3.5.1 Wall Stability

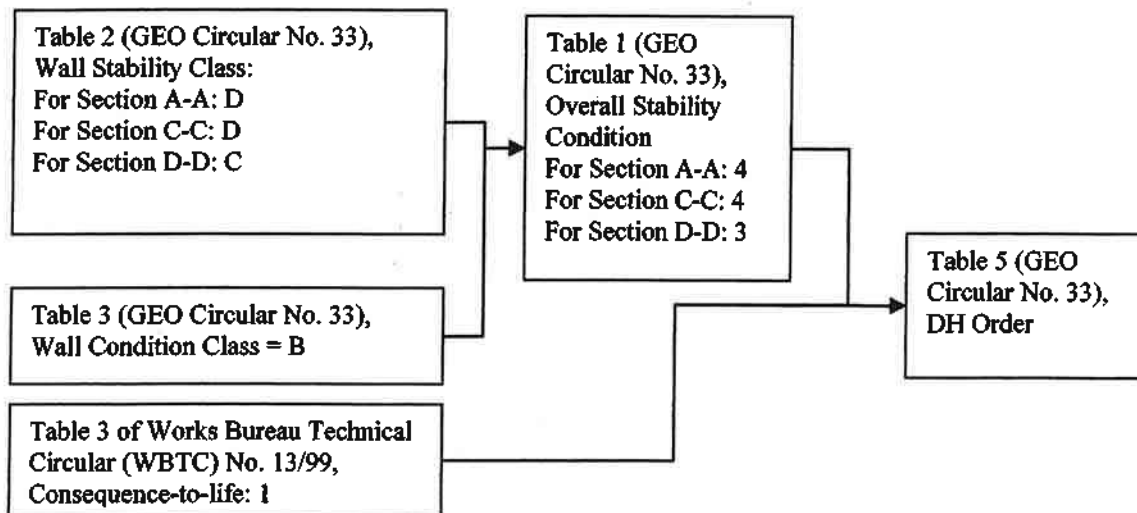
With the masonry wall geometry for the critical Sections A-A, C-C and D-D, outlined in Section 3.1 and according to GEO Circular No. 33, the calculated slenderness ratios of the masonry walls are as follows:

For Section A-A, the calculated slenderness ratio is 5.68. As a result, the Wall Stability Class is assessed to be D. For Section C-C, the calculated slenderness ratio is 7.24. As a result, the Wall Stability Class is assessed to be D. For Section D-D, the calculated slenderness ratio is

3.98. As a result, the Wall Stability Class is assessed to be C. The calculations are enclosed in Appendix I.

During the visual inspection, some missing blocks were observed on the masonry wall face. Therefore, the Wall Condition Class is assessed to be Class B with reference to Table 3 of GEO Circular No. 33. Further to the above Wall Stability Class and Wall Condition Class, it rendered the Overall Stability Condition of Wall to be 4, 4 and 3 for Sections A-A, C-C and D-D respectively based on Table 1 of GEO Circular No. 33. Therefore, a DH Order is recommended for Sections A-A, C-C and D-D as suggested by Table 5 in GEO Circular 33 under significant Consequence-to-life Category.

The analysis process is summarized in the following flow-chart,



3.5.2 Overall Stability

The slope stability of the Study Feature had been checked using the Morgenstern-Price Method in the computer program SLOPE/W (BD approval No. G0138, Version 6.20) copyrighted by GEO-SLOPE International Ltd., Canada. A groundwater table was assumed at one-third of the total height in the stability analysis. The calculated Factors of Safety (FOS) of Section A-A to D-D are tabulated below.

Section A-A

Slip Surface No.	FOS
1	1.303
2	1.260
3	1.142
4	1.066
5	1.036*
6	1.065
7	1.513

Section B-B

Slip Surface No.	FOS
1	1.187
2	1.101
3	0.972
4	0.867*
5	0.886

Section C-C

Slip Surface No.	FOS
1	1.372
2	1.092
3	0.921
4	0.865
5	0.847
6	0.831*
7	0.874
8	0.969
9	0.980

Section D-D

Slip Surface No.	FOS
1	1.072
2	0.943
3	0.870
4	0.799
5	0.779
6	0.754
7	0.704
8	0.682*

*denotes the minimum calculated FOS

The computer outputs of the stability analysis are enclosed in Appendix J. The results of the analysis for Sections A-A, B-B, C-C and D-D are summarized in Figures 3, 4, 5 and 6 respectively.

3.6 Consequence-to-life

The consequence-to-life in the event of failure has been assessed in accordance with Table 3 of Works Bureau Technical Circular (WBTC) No. 13/99. Feature No. 7SW-D/CR1016 has been assessed as Category 1 as failure of the feature would affect the cottage at the feature toe.

4 DISCUSSION OF CALCULATED FACTOR OF SAFETY

4.1 Portion maintained by Lot No. DD182 Lot394 (Sub-division No. 1)

In accordance with Criterion F of GEO Circular No. 24, the FOS calculated from a stability assessment without site-specific ground investigation for slopes having significant Consequence-to-life in the event of failure should not be less than 1.20. Also, with reference to Criterion C of GEO Circular No. 24, an old masonry retaining wall should be assessed according to GEO Circular No. 33.

Based on the result of stability analysis of the critical Section A-A for the adopted set of parameters, the calculated minimum FOS is 1.036, which is below the required value of 1.2.

4.2 Portion maintained by Lot No. DD182 Lot397 (Sub-division No. 2)

In accordance with Criterion F of GEO Circular No. 24, the FOS calculated from a stability assessment without site-specific ground investigation for slopes having significant Consequence-to-life in the event of failure should not be less than 1.20.

Based on the result of stability analysis of the critical Sections B-B for the adopted set of parameters, the calculated minimum FOS is 0.867, which is below the required value of 1.2.

4.3 Portion maintained by Lot No. DD182 Lot396 (Sub-division No. 3)

In accordance with Criterion F of GEO Circular No. 24, the FOS calculated from a stability assessment without site-specific ground investigation for slopes having significant Consequence-to-life in the event of failure should not be less than 1.20. Also, with reference to Criterion C of GEO Circular No. 24, an old masonry retaining wall should be assessed according to GEO Circular No. 33.

Based on the result of the stability analysis of critical Section C-C for the adopted set of parameters, the calculated minimum FOS is 0.831, which is below the required value of 1.2.

4.4 Portion maintained by Lot No. DD182 Lot395 (Sub-division No. 4)

In accordance with Criterion F of GEO Circular No. 24, the FOS calculated from a stability assessment without site-specific ground investigation for slopes having significant Consequence-to-life in the event of failure should not be less than 1.20. Also, with reference to Criterion C of GEO Circular No. 24, an old masonry retaining wall should be assessed according to GEO Circular No. 33.

Based on the result of the stability analysis of critical Section D-D for the adopted set of parameters, the calculated minimum FOS is 0.682, which is below the required value of 1.2.

5 CONCLUSIONS AND RECOMMENDATIONS

5.1 Portion maintained by Lot No. DD182 Lot394 (Sub-division No. 1)

Sub-division No. 1 of the feature possesses Factors of Safety (FOS) which satisfy the requirements for the service of a Dangerous Hillside (DH) Order according to Criterion C and Criterion F of GEO Circular No. 24. Therefore a DH Order is recommended to be served on the owners of Lot No. DD182 Lot394 with respect to Sub-division No. 1 of the feature.

5.2 Portion maintained by Lot No. DD182 Lot397 (Sub-division No. 2)

Sub-division No. 2 of the feature possesses Factors of Safety (FOS) which satisfy the requirements for the service of a Dangerous Hillside (DH) Order according to Criterion F of GEO Circular No. 24. Therefore a DH Order is recommended to be served on the owners of Lot No. DD182 Lot397 with respect to Sub-division No. 2 of the feature.

5.3 Portion maintained by Lot No. DD182 Lot396 (Sub-division No. 3)

Sub-division No. 3 of the feature possesses Factors of Safety (FOS) which satisfy the requirements for the service of a Dangerous Hillside (DH) Order according to Criterion C and Criterion F of GEO Circular No. 24. Therefore a DH Order is recommended to be served on the owners of Lot No. DD182 Lot396 with respect to Sub-division No. 3 of the feature.

5.4 Portion maintained by Lot No. DD182 Lot395 (Sub-division No. 4)

Sub-division No. 4 of the feature possesses Factors of Safety (FOS) which satisfy the requirements for the service of a Dangerous Hillside (DH) Order according to Criterion C and Criterion F of GEO Circular No. 24. Therefore a DH Order is recommended to be served on the owners of Lot No. DD182 Lot395 with respect to Sub-division No. 4 of the feature.

6 REFERENCES

- Geotechnical Engineering Office (1984). Geotechnical Manual for Slopes (Second Edition).
- Geotechnical Engineering Office (1993). Geoguide 1: Guide to Retaining Wall Design
- Geotechnical Engineering Office (2003). Geoguide 5: Guide to Slope Maintenance, 3rd Edition.
- GEO Circular No. 24 (2001). Dangerous Hillside Orders and Advisory Letters.
- GEO Circular No. 30 (2004). Stage 1 and Stage 2 Geotechnical Studies of Slopes and Retaining Walls.
- GEO Circular No. 33 (2004). Guidelines for Assessment of Old Masonry Retaining Walls in Geotechnical Studies and for Action to be Taken on Private Walls

Works Branch (1996). Code of Practice on Inspection and Maintenance of Water Carrying Services Affecting Slopes.

WBTC Circular No.13/99 (1999). Geotechnical Manual for Slopes – Guidance on Interpretation and Updating.

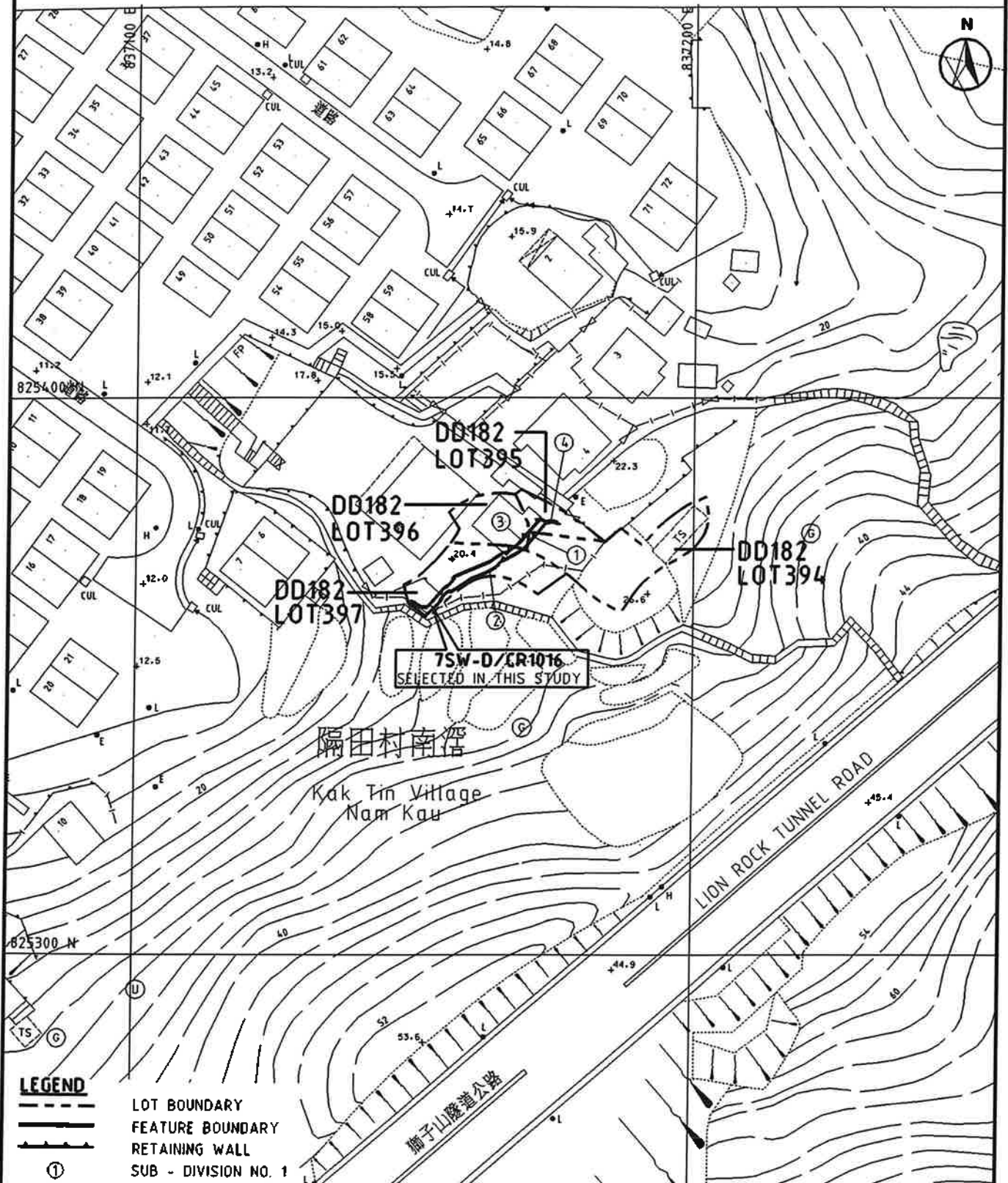
Geotechnical Engineering Office (1997). Phase 2 Systematic Inspection of Features in the Territory (SIFT) Study.

Lands Department. Systematic Identification of Maintenance Responsibility of Slopes in the Territory (SIMAR) reports.

1:20000 Geological Map of Hong Kong Sheet No. 7

LOCATION : NEAR TO NO. 5 KAK TIN VILLAGE, NAM KAU, SHATIN

LOT NO. : DD182 LOT394, LOT395, LOT396 & LOT397



GENERAL LOCATION PLAN

AECOM

AGREEMENT NO. CE 33/2004(GE)
10-YEAR EXTENDED LPM PROJECT
PHASE 6, PACKAGE C
STABILITY STUDIES OF PRIVATE
SLOPES IN NEW TERRITORIES AND
OUTLYING ISLANDS
- INVESTIGATION

Org. No. : 53805/259

FIGURE NO. : 1



**Civil Engineering and
Development Department**
Geotechnical Engineering Office

Part Print of Survey Sheet No. : 7SW-200

Drawn : WZP

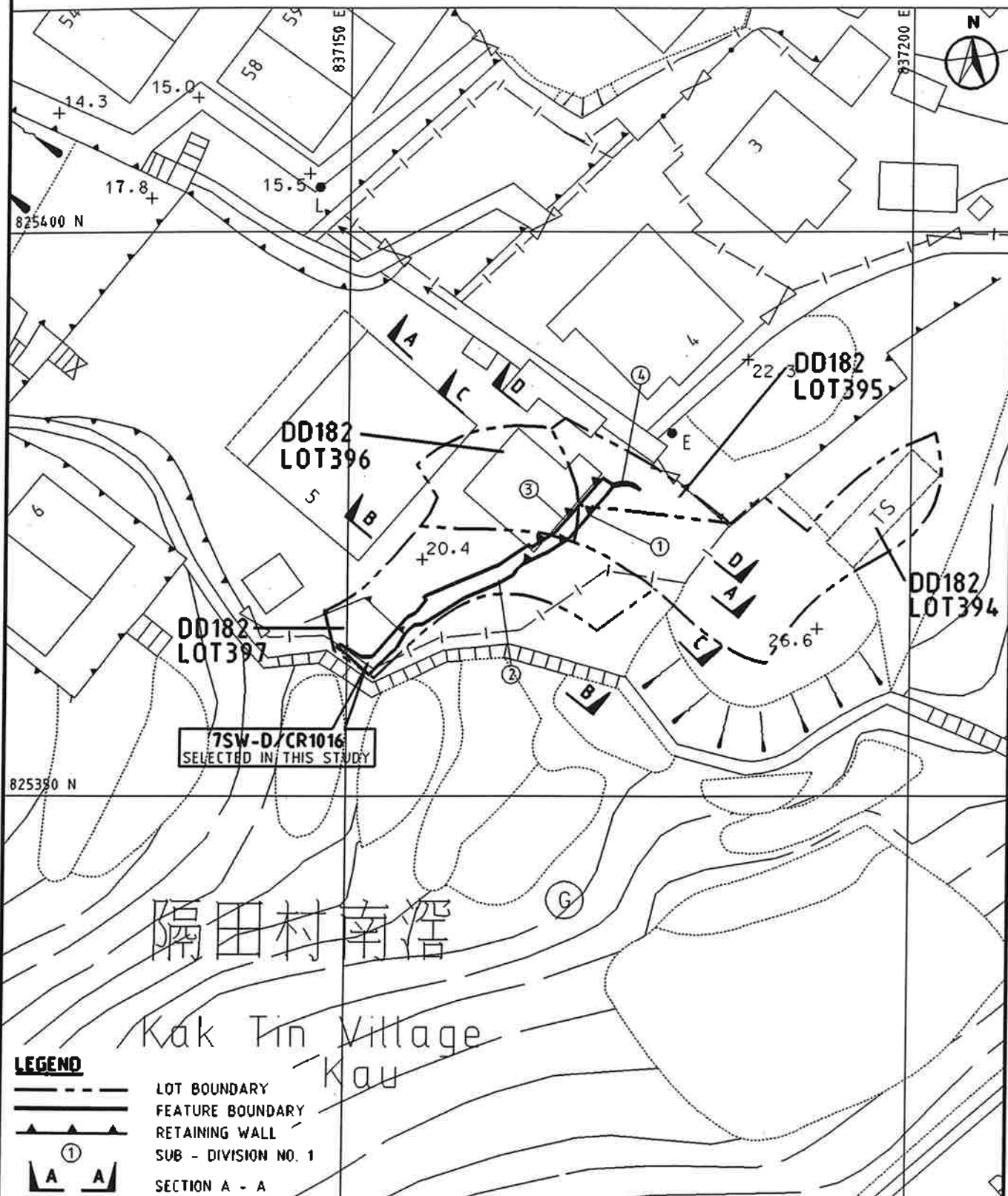
Checked : -

Scale : 1 : 1 000

Date : SEP. 2009

LOCATION : NEAR TO NO. 5 KAK TIN VILLAGE, NAM KAU, SHATIN

LOT NO. : DD182 LOT394, LOT395, LOT396 & LOT397



LOCATION PLAN OF SECTIONS

AECOM

AGREEMENT NO. CE 33/2004(GE)
10-YEAR EXTENDED LPM PROJECT
PHASE 0, PACKAGE C
STABILITY STUDIES OF PRIVATE
SLOPES IN NEW TERRITORIES AND
OUTLYING ISLANDS
- INVESTIGATION

Drg. No. : 53805/259

FIGURE NO. : 2A



**Civil Engineering and
Development Department**
Geotechnical Engineering Office

Part Print of Survey Sheet No. : 75W-200

Drawn : WZP

Checked : -

Scale : 1 : 500

Date : SEP, 2009

LEGEND :

① SLIP SURFACE NO.1 (NO.1 OF 7)

ADOPTED SOIL PARAMETERS

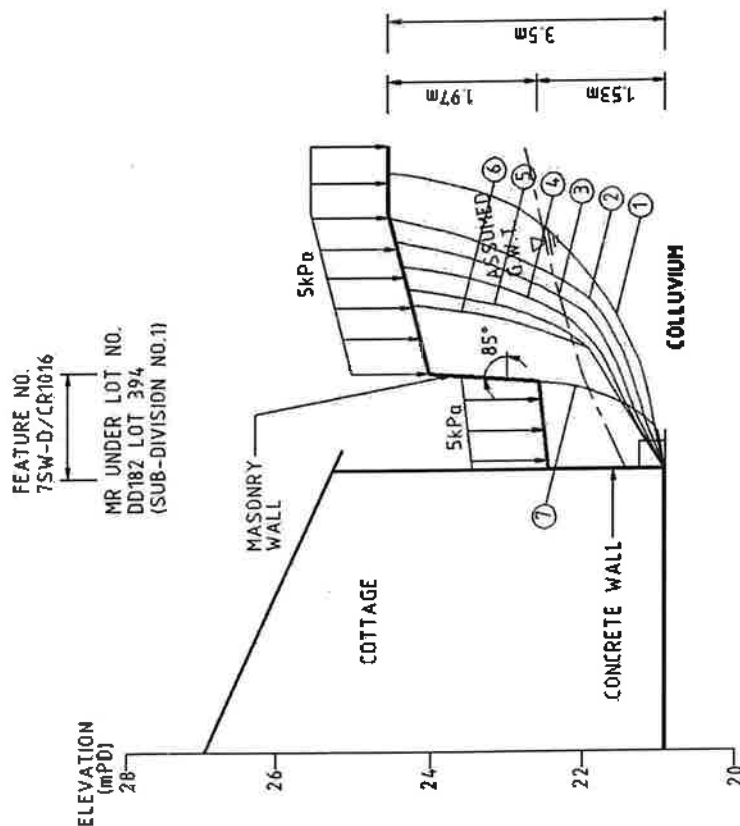
SOIL	c' (kPa)	ϕ' (°)	γ (kN/m ³)	REMARK
COLLUVIUM	4	34	19	ADOPTED

BASED ON GEO CIRCULAR NO. 33

WALL SLENDERNESS RATIO	5.68
WALL STABILITY CLASS	D
WALL CONDITION CLASS	B
WALL STABILITY CONDITION CLASS	4
CONSEQUENCE-TO-LIFE CATEGORY	1
RECOMMENDATION	DH ORDER

SLOPE STABILITY ANALYSIS RESULTS

SLIP SURFACE NO.	F.O.S.
1	1.303
2	1.260
3	1.142
4	1.066
5	1.036(MIN.)
6	1.065
7	1.613



GEOLOGICAL PROFILE AND STABILITY ANALYSIS OF SECTION A-A

AECOM AGREEMENT NO. CE 33/2004(GE) 10-YEAR EXTENDED LPM PROJECT PHASE 6, PACKAGE C STABILITY STUDIES OF PRIVATE SLOPES IN NEW TERRITORIES AND OUTLYING ISLANDS - INVESTIGATION	Drawn :	WZP	SCALE : 1 : 100	FIGURE NO. : 3
	Checked :	-	 CEDD Civil Engineering and Development Department Geotechnical Engineering Office	
	Date :	SEP. 2009		
	Drg. No. :	53805/259		FEATURE NO. : 7SW-D/CR1016

LEGEND :

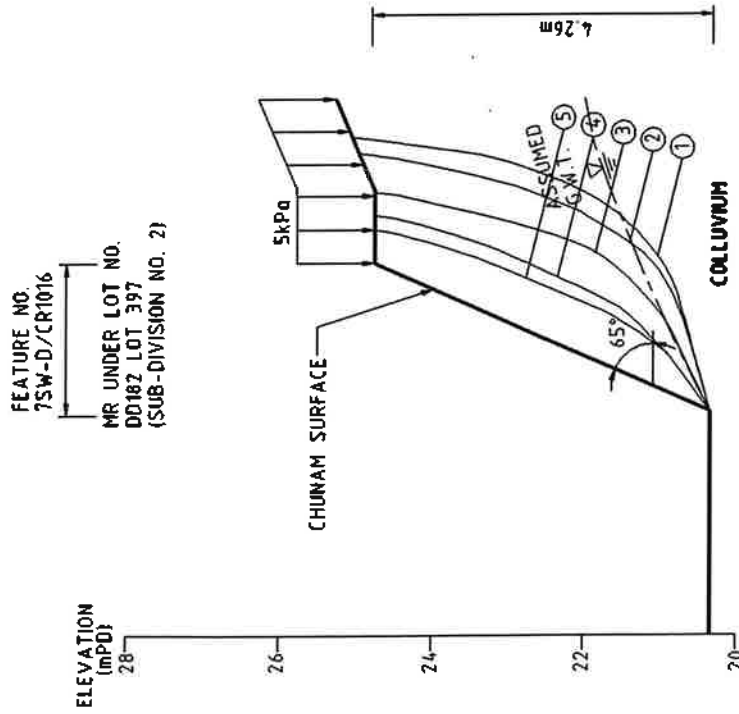
- ① SLIP SURFACE NO.1 (NO.1 OF 5)

ADOPTED SOIL PARAMETERS

SOIL	c' (kPa)	ϕ' (°)	γ (kN/m ³)	REMARK
COLLUVIUM	4	34	19	ADOPTED

SLOPE STABILITY ANALYSIS RESULTS

SLIP SURFACE NO.	F.O.S.
1	1.167
2	1.101
3	0.972
4	0.867(MIN.)
5	0.886



GEOLOGICAL PROFILE AND STABILITY ANALYSIS OF SECTION B-B

AECOM	AGREEMENT NO. CE 33/2004(GE) 10-YEAR EXTENDED LPM PROJECT PHASE 6, PACKAGE C STABILITY STUDIES OF PRIVATE SLOPES IN NEW TERRITORIES AND OUTLYING ISLANDS - INVESTIGATION		Drawn : WZP	SCALE : 1 : 100	FIGURE NO. : 4
			Checked : -	CEDD Civil Engineering and Development Department Geotechnical Engineering Office	
			Date : SEP, 2009		
			Drg. No. : 53805/259	FEATURE NO. : 7SW-D/CR1016	

① SLIP SURFACE NO.1 (NO.1 OF 9)

FEATURE NO.
75W-D/CR1016

MR UNDER LOT NO.
DD182 LOT 396
(SUB-DIVISION NO. 3)

SOIL	c' (kPa)	ϕ' (°)	γ (kN/m ³)	REMARK
COLLUVIUM	4	34	19	ADOPTED

[illegible]

WALL SLENDERNESS RATIO	7.24
WALL STABILITY CLASS	D
WALL CONDITION CLASS	B
WALL STABILITY CONDITION CLASS	4
CONSEQUENCE-TO-LIFE CATEGORY	1
RECOMMENDATION	DN ORDER

SLIP SURFACE NO.	F.O.S.
1	1.372
2	1.092
3	0.921
4	0.865
5	0.847
6	0.831 (MIN.)
7	0.874
8	0.969
9	0.980

AGREEMENT NO. CB 33/2004(GE)
10-YEAR EXTENDED LPW PROJECT
PHASE 6, PACKAGE C
STABILITY STUDIES OF PRIVATE
SLOPES IN NEW TERRITORIES AND
OUTLYING ISLANDS
- INVESTIGATION

AECOM

Drawn :	Checked	Date :	Org. No.
---------	---------	--------	----------

FIGURE NO. : 5

**CEDD Civil Engineering and
Development Department
Geotechnical Engineering Office**

FEATURE NO. : 7SW-D/CR1016

LEGEND :

① SLIP SURFACE NO.1 (NO.1 OF 8)

ADOPTED SOIL PARAMETERS

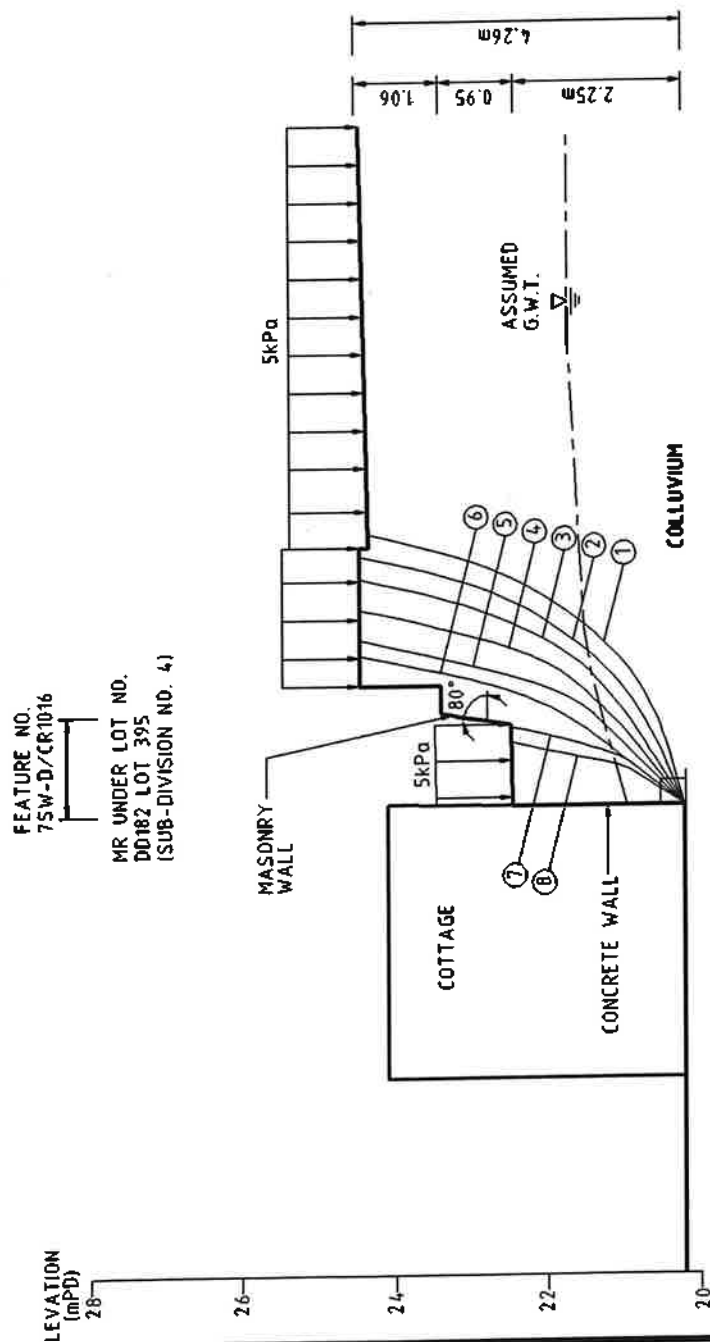
SOIL	c' (kPa)	ϕ' (°)	γ (kN/m ³)	REMARK
COLLUVIUM	4	34	19	ADOPTED

BASED ON GEO CIRCULAR NO. 33

WALL SLENDERNESS RATIO	3.98
WALL STABILITY CLASS	C
WALL CONDITION CLASS	B
WALL STABILITY CONDITION CLASS	3
CONSEQUENCE-TO-LIFE CATEGORY	1
RECOMMENDATION	DH ORDER

SLOPE STABILITY ANALYSIS RESULTS

SLIP SURFACE NO.	F.O.S.
1	1.072
2	0.943
3	0.870
4	0.799
5	0.779
6	0.754
7	0.704
8	0.682(MIN.)

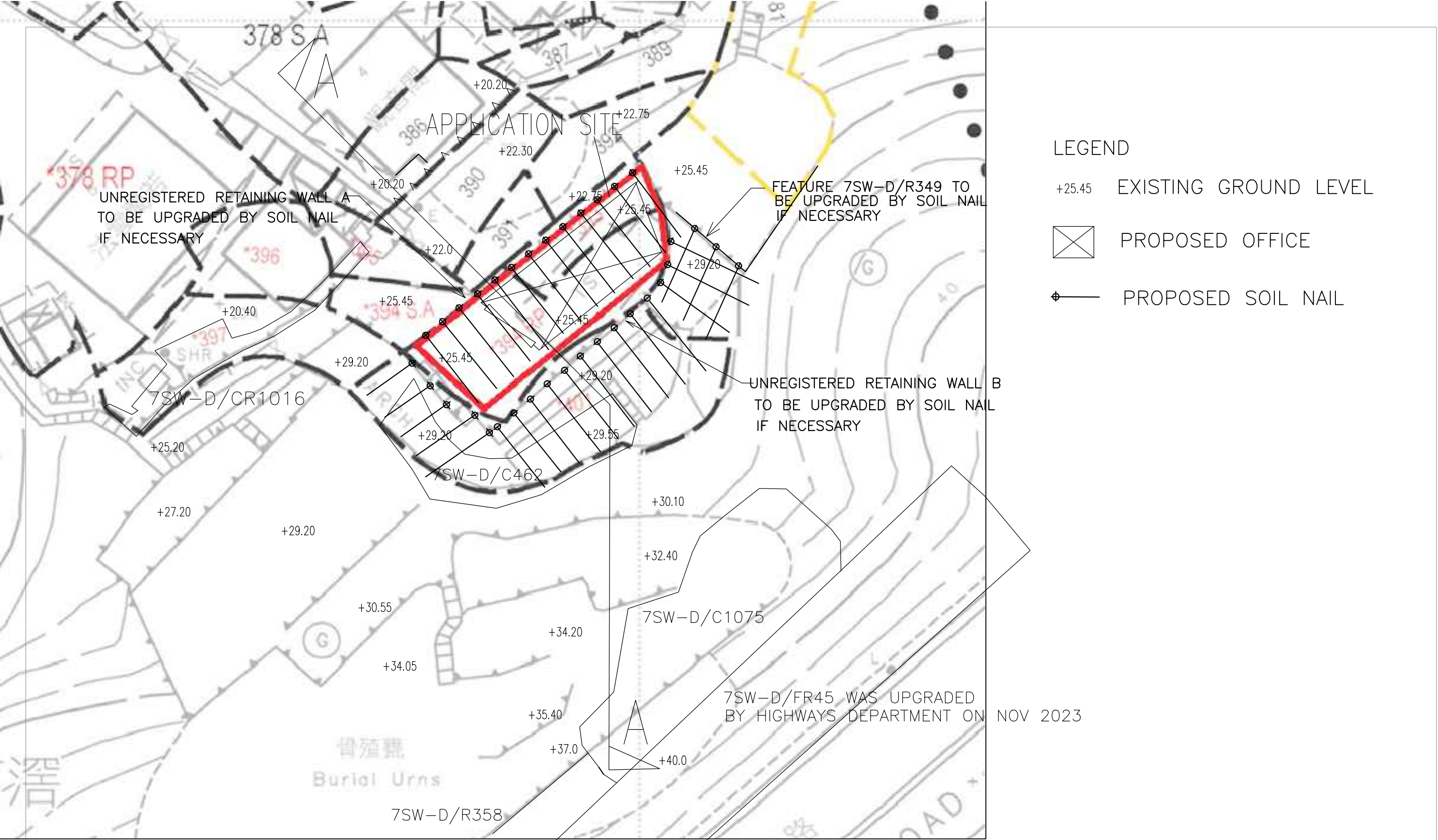


GEOLOGICAL PROFILE AND STABILITY ANALYSIS OF SECTION D-D

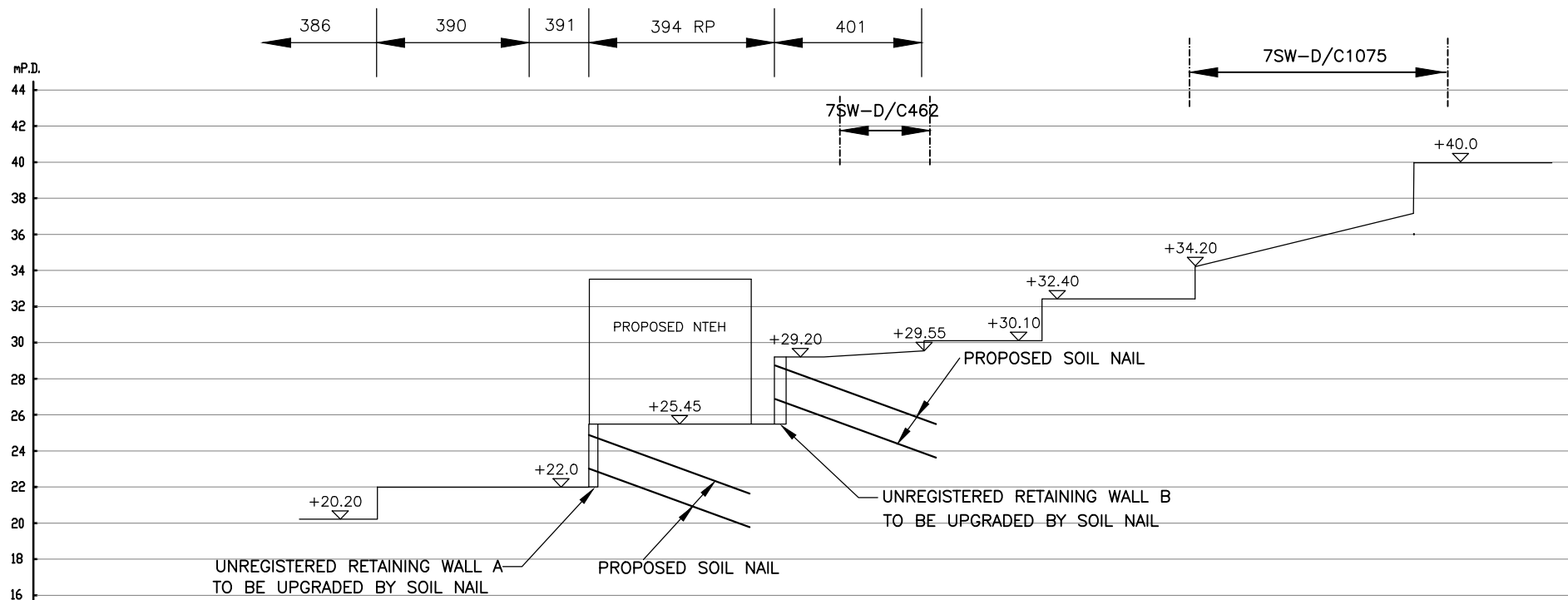
AECOM	AGREEMENT NO. CR 33/2004(GE) 10-YEAR EXTENDED LPM PROJECT PHASE 6, PACKAGE C STABILITY STUDIES OF PRIVATE SLOPES IN NEW TERRITORIES AND OUTLYING ISLANDS - INVESTIGATION	Drawn :	WZP	SCALE : 1 : 100	FIGURE NO. : 6
		Checked :	-		
		Date :	SEP, 2009	CEDD Civil Engineering and Development Department Geotechnical Engineering Office	
		Drg. No. :	53805/259		
		FEATURE NO. : 75W-D/CR1016			

Appendix C

Preliminary Site Formation Works Plan



RATIO ARCHITECTURE & PLANNING	Project Title	PRELIMINARY SITE FORMATION WORKS AT LOT 349 RP IN D.D. 182, TAI WAI, N.T.	Scale	Figure No.
	Figure Title	PRELIMINARY SITE FORMATION PLAN	1 : 350 (A3)	A
			Date	Revision
			16-07-2025	--



RATIO ARCHITECTURE & PLANNING

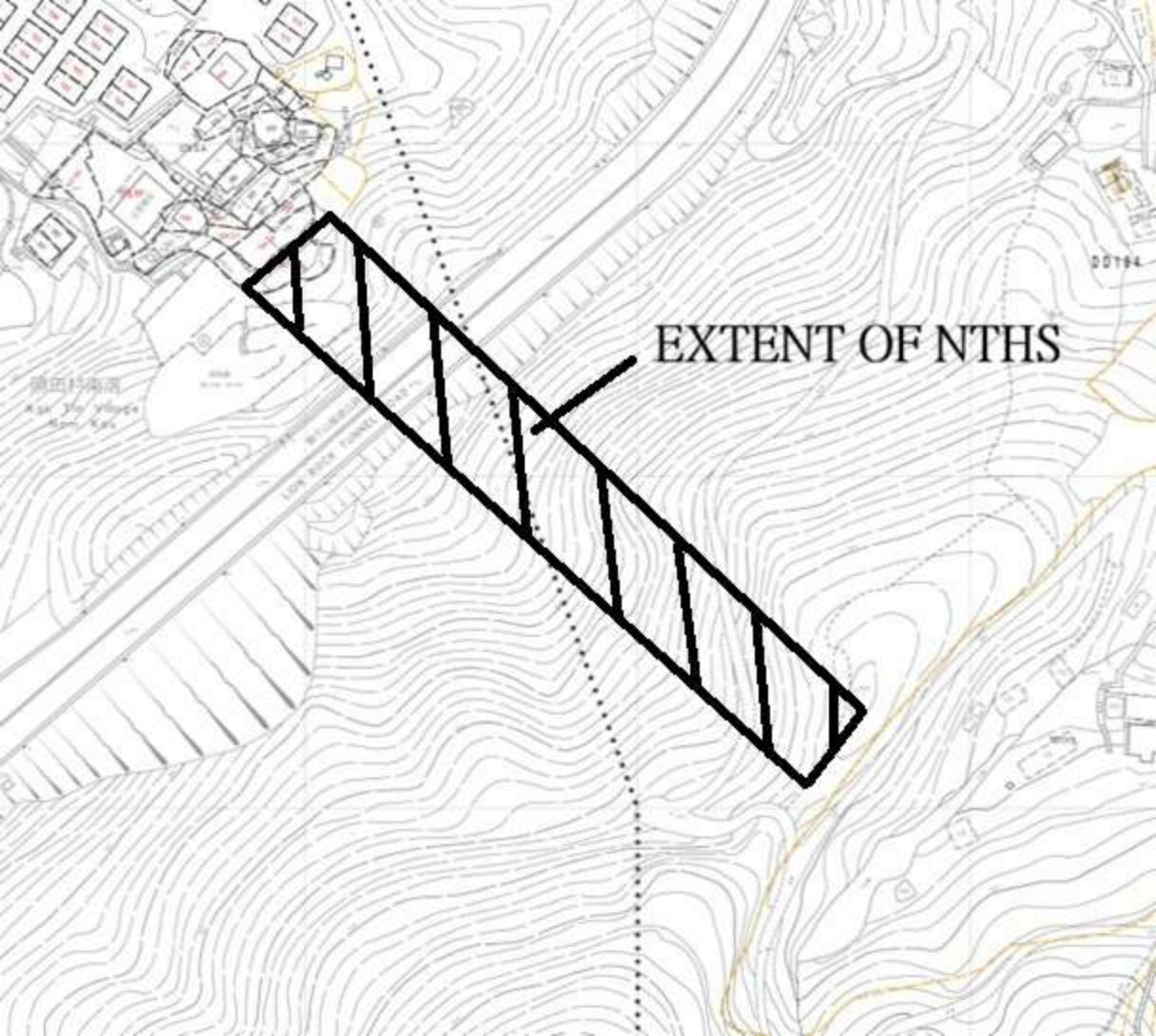
Project Title PRELIMINARY SITE FORMATION WORKS AT LOT 349 RP IN D.D. 182, TAI WAI, N.T.
Figure Title SECTION A-A

Scale 1 : 350 (A4)
Date 16-07-2025

Figure No. B
Revision --

Appendix D

Proposed Extent of Natural Terrain Hazard Study



EXTENT OF NTHS

鹽田村南港
Map 310 Village
Name 5.5%

LOW RIDGE TUNNEL

00794

Appendix E

Existing Ground Investigation Works Report

10 JUN 1988

SITE INVESTIGATION REPORT
Fieldwork Report

CESD Contract No. GC/87/05

Works Order No. PW7/2/22.41

Job Title: Village Extension in Kak Tin (Area 24C)
Natural Slope Adjacent to Kak Tin Village

Client: Geotechnical Control Office

See also 11087.

GEOTECHNICAL INFORMATION UNIT	
Report No.	10932
AREA	7SW 20D
Ref.	

Lam Geotechnics Limited

CESD CONTRACT NO. GC/87/05
TERM SITE INVESTIGATION
CONTRACT FOR NEW TERRITORIES
EAST, 1987-89
WORKS ORDER NO. PW7/2/22.41
VALLAGE EXTENSION IN KAK TIN (AREA 24C)
NATURAL SLOPE ADJACENT TO KAK TIN VILLAGE

1 Introduction

In October 1987, Lam Geotechnics Limited was awarded a term contract to carry out site investigations and associated geotechnical works in New Territories East for Civil Engineering Services Department under CESD Contract No. GC/87/05.

This particular report presents the results of site investigation for Village Extension in Kak Tin (Area 24C) Natural Slope Adjacent to Kak Tin Village. The site work was carried out during the period from 21st March 1988 to 11th April 1988, under the supervision of Maunsell Consultants Asia and Geotechnical Control Office.

2 The Site

The site is located in Kak Tin Village, Shatin, approximately between co-ordinates N825284 and N825508 in North-South direction and between E837113 and E837241 in East-West direction.

3 Geology

According to the 1:50000 scale geological map of Hong Kong (1972), the site may be expected to be underlain by Sung Kong Granite of which the geological age is Phase 2, Upper Jurassic.

4 Fieldwork

4.1 Drillholes

Seven drillholes were put down using water flush rotary drilling techniques generally employing Px (140mm diameter), Hx (114mm diameter) and Nx ((89mm diameter).

Standard penetration tests with liner sample and undisturbed U76 and mazier samples were taken in the soft materials. The bottom depth and type of the samples are presented at the relevant depths in the drillhole logs.

Lam Geotechnics Limited

4.1 Drillhole (Cont'd)

Drillholes were terminated at the depths specified. 62mm diameter rock samples were taken by using the TNW water flush double tube swivel type core barrel and were photographed and are presented after the drillhole logs.

Casagrande type piezometers were installed at the depths specified in all drillholes.

The soils and rocks encountered have been described generally in accordance with BS5930, the Code of Practice for Site Investigation.

DRILLHOLE RECORD												W.O. NO. <u>PW 7/2/22.41</u>			
												HOLE NO. <u>DH-1</u>			
CONTRACT NO. <u>GC/87/05</u>												SHEET <u>1</u> of <u>2</u>			
												DATE from <u>23.3.88</u> to <u>26.3.88</u>			
PROJECT <u>Village Extension in Kak Tin (Area 24C)</u> <u>Natural Slope Adjacent to Kak Tin Village</u>															
METHOD <u>Rotary</u>						CO-ORDINATES				ROCK COREBIT <u>T2, TNW</u>					
MACHINE & NO. <u>Long Year</u> <u>D51</u>						E <u>837146</u> N <u>825284</u>				HOLE DIA. <u>P to H to N</u> <u>140mm to 114mm to 89mm</u>					
FLUSHING MEDIUM <u>Water</u>						ORIENTATION <u>Vertical</u>				GROUND LEVEL <u>52.62 mPD</u>					
Drilling Progress	Casing depth/size	Water level/time/date	Water recovery	Total core Recovery %	Solid core Recovery %	R.O.D.	Fracture Index	Tests	Samples	Reduced Level	Depth (m.)	Legend	Grade	Zone	Description
23/3	P		80								0.00	x x x			Medium dense, yellowish brown, sandy SILT (COLLUVIUM)
								(23, 45, 37) N=21			1.00	x x x			
											2.00	x x x			
				100				37 bls			3.00	x x x			
										49.12	3.50	x x x			Medium dense, brown and reddish brown, silty fine to coarse SAND (Completely decomposed GRANITE)
								(22, 45, 46) N=19			4.00	+ + +	V		
											5.00	+ + +			
				100							6.00	+ + +			
23/3 24/3	P H	6.00m at 19:00 NIL at 7:00								46.12	6.50	+ + +			Very dense, greyish brown, silty coarse SAND with weathered rock fragments (Completely decomposed GRANITE)
								(7, 18, 10, 31, 43, 51) N=135			7.00	+ + +	V		
										44.82	7.80	+ + +			Slightly decomposed GRANITE, brownish grey with highly decomposed partly
				95	614	51	4				8.90	+ + +	II		
											9.60	+ + +			Details as sheet 2 of 2
				714	3	0	*			43.02	9.60	+ + +			
24/3	H		0	35	0	0	*				10.00	+ + +	IV / III		

• Small disturbed sample ▲ Water sample

✱ Large disturbed sample ✕ Water Level

□ SPT blow sample ↓ Standard penetration test

■ U76 undisturbed sample ⊞ Permeability test

■ U100 undisturbed sample ⊞ Piezometer tip

▨ Mazier sample ∇ In-situ vane shear test

P/S Pluton sample

LOGGED W.H.Lau

DATE 28.3.88

CHECKED S.P.Su

DATE 31.3.88

REMARKS

1. Installed a piezometer at depth 13.70m with sand pocket from 12.90m to 14.20m

Lam Geotechnics Limited

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DRILLHOLE RECORD

W.O. NO. PW 7/2/22.41
HOLE NO. DH-1
SHEET 2 of 2
DATE from 23.3.88 to 26.3.88

CONTRACT NO. GC/87/05

PROJECT Village Extension in Kak Tin (Area 24C)
Natural Slope Adjacent to Kak Tin Village

METHOD Rotary	CO-ORDINATES E 837146 N 825284	ROCK COREBIT T2, TNW
MACHINE & NO. Long Year 051		HOLE DIA. P to H to N 140mm to 114mm to 89mm
FLUSHING MEDIUM Water	ORIENTATION Vertical	GROUND LEVEL 52.62 mPD

Drilling Progress	Casing depth/size	Water level/time/date	Water Recovery %	Total core Recovery %	Solid core Recovery %	R.Q.D.	Fracture Index	Tests	Samples	Reduced Level	Depth (m.)	Legend	Grade	Zone	Description
24/3	H		0	29	0	0	*				10.00	+	IV		Highly to moderately decomposed GRANITE
				85	85	85	0			42.02	10.60	+	III		
24/3		10.10m at 19:00		100	100	100	0		T2		11.00	+			
25/3		11.30m at 7:00		100	100	100	0				11.15	+			
				100	100	100	0				11.67	+	II		Strong, light greyish brown, slightly decomposed GRANITE
				100	100	100	0				11.90	+			
				65	65	65	2			40.14	12.48	+			
		13.72 H N						(S4, 49.5, 16) H=34			13.00	+	V		Dense, silty coarse SAND with some fine gravel
				100	91	91	2			38.90	13.72	+			(Completely decomposed GRANITE)
				100	100	100	2				14.00	+			
				100	100	100	2				14.17	+			
				94	79	79	2		T2		14.60	+			
				100	100	100	3				15.00	+	II		
25/3	N	15.75 NIL at 19:00									15.13	+			
26/3		NIL at 7:00		98	81	81	2				15.75	+			
				98	72	64	5				16.00	+			
				100	67	67	7				16.75	+	III		
				100	96	96	4		TNW		17.00	+	II		Strong, grey, coarse grained, slightly decomposed GRANITE with moderately decomposed partly (16.52m-17.00m, 17.50m-17.70m), closely to moderately widely spaced joints with limonite stained, dip 30°-50° some 60°-70°
											17.60	+	III		
											17.90	+	II		
26/3		19.00 at 19:00									19.08	+			End of investigation hole at 19.08m
											20.00	+			

- Small disturbed sample
- Large disturbed sample
- SPT liner sample
- U75 undisturbed sample
- U100 undisturbed sample
- Mazier sample
- P/S Piston sample
- Water sample
- Water Level
- Standard penetration test
- Permeability test
- Piezometer tip
- In-situ vane shear test

LOGGED W.H.Lau
DATE 28.3.88
CHECKED S.P.Su
DATE 31.3.88

REMARKS
2. * Cannot be determined

Lam Geotechnics Limited

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DRILLHOLE RECORD															W.O. NO. <u>PW 7/2/22.41</u>
															HOLE NO. <u>DH-2</u>
CONTRACT NO. <u>GC/87/05</u>															SHEET <u>1</u> of <u>2</u>
															DATE from <u>30.3.88</u> to <u>31.3.88</u>
PROJECT <u>Village Extension in Kak Tin (Area 24C)</u> <u>Natural Slope Adjacent to Kak Tin Village</u>															
METHOD <u>Rotary</u>					CO-ORDINATES					ROCK COREBIT <u>T2, TNW</u>					
MACHINE & NO. <u>Long Year</u> <u>D51</u>					E <u>837125</u> N <u>825307</u>					HOLE DIA. <u>P to H to N</u> <u>140mm to 114mm to 89mm</u>					
FLUSHING MEDIUM <u>Water</u>					ORIENTATION <u>Vertical</u>					GROUND LEVEL <u>36.71 mPD</u>					
Drilling Progress	Casing depth/size	Water level/time/date	Water Recovery %	Total core Recovery %	Solid core Recovery %	R.Q.D.	Fracture Index	Tests	Samples	Reduced Level	Depth (m.)	Legend	Grade	Zone	Description
30/3	P		80								0.00	x x x x			Medium dense, brown, silty fine and medium SAND with highly decomposed rock fragments (COLLUVIUM)
											1.00	x x x x			
										34.71	2.00	x x x x			Very dense, brown, silty coarse SAND with some gravel (Completely decomposed GRANITE)
	2.60 P										34.11	2.60	+	V	
	H							215bls 0.10m			3.00	+	+	IV	Alternate weak and strong, grey coarse grained, highly and slightly decomposed GRANITE
											3.21	+	+	II	
											3.55	+	+	IV	
											4.00	+	+	II	
											4.37	+	+		
											4.97	+	+		Strong, grey, slight blue, coarse grained, slightly decomposed GRANITE, moderately widely spaced joints
											5.07	+	+		
											6.05	+	+		
											6.51	+	+	II	
											7.06	+	+		
											7.48	+	+		Reddish brown, silty fine and medium SAND (Completely to highly decomposed GRANITE)
											7.68	+	+		
											7.83	+	+	V / IV	
											9.10	+	+		Weak to moderately strong, greyish brown, coarse grained, moderately decomposed GRANITE
											9.60	+	+	III	
30/3	H		0								10.00	+	+		

* Small disturbed sample ▲ Water sample
 * Large disturbed sample x Water Level
 □ SPI 11er sample ↓ Standard penetration test
 ■ U76 undisturbed sample ⊞ Permeability test
 ■ U100 undisturbed sample ⊞ Piezometer tip
 ■ Water sample v In-situ vane shear test
 P/S Piston sample

LOGGED W.H. Lau
 DATE 6.4.88
 CHECKED S.P. Su
 DATE 7.4.88

REMARKS

- * Cannot be determined
- Installed a piezometer at depth 14.25m, sand pocket from 13.45m to 14.75m

Lam Geotechnics Limited

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DRILLHOLE RECORD

W.O. NO. PW 7/2/22.41

HOLE NO. DH-2

SHEET 2 of 2

DATE from 30.3.88 to 31.3.88

CONTRACT NO. GC/87/05

PROJECT Village Extension in Kak Tin (Area 24C)
Natural Slope Adjacent to Kak Tin Village

METHOD Rotary

CO-ORDINATES

ROCK COREBIT T2, TNW

MACHINE & NO. Long Year
D51

E 837125
N 825307

HOLE DIA. P to H to N
140mm to 114mm to 89mm

FLUSHING MEDIUM Water

ORIENTATION Vertical

GROUND LEVEL 36.71 mPD

Drilling Progress	Casing depth/size	Water level/time/date	Water Recovery %	Total core Recovery %	Solid core Recovery %	R.Q.D.	Fracture Index	Tests	Samples	Reduced Level	Depth (m.)	Legend	Grade	Zone	Description
30/3	H	10.60m at 19:00	0	100	100	90	3			26.59	10.12	+	III		Details as sheet 1 of 2
30/3				100	100	100	0				10.80	+			
31/3		10.70m at 7:00		100	100	100	0				11.00	+	II		Strong, greyish blue, coarse grained, slightly decomposed widely spaced joints, GRANITE
				93	93	93	3				11.42	+			
	12.05			0	0	0				24.93	11.72	+			
	H			97	97	97	2		T2	24.66	11.78	+	IV		Brown, silty coarse SAND (Highly decomposed GRANITE)
	N			100	100	100	0				12.05	+			
				100	100	100	0				12.65	+			
				100	100	100	2				12.82	+			
				98	48	48	6				13.00	+			
	14.27			100	100	100	2				13.47	+			
	N			100	100	100	1				14.00	+			
				100	100	100	1				14.27	+	II		Strong, grey, slight blue, coarse grained, slightly decomposed GRANITE with moderately decomposed partly (13.94m-14.27m) and rock fractured, closely to widely spaced joints with limonite stained, dip 10°-30° some 50°-70°
				100	96	96	2		TNW		15.00	+			
				100	96	96	2				15.77	+			
				100	96	96	2				16.00	+			
31/3		13.30m at 19:00	0	100	96	96	2				17.07	+			End of investigation hole at 17.07m
											18.00				
											19.00				
											20.00				

- Small disturbed sample
- Large disturbed sample
- SPT liner sample
- U76 undisturbed sample
- U100 undisturbed sample
- Mazier sample
- P/S Piston sample
- ▲ Water sample
- ✕ Water Level
- ↓ Standard penetration test
- ☒ Permeability test
- ⬆ Piezometer tip
- ∇ In-situ vane shear test

LOGGED W.H.Lau

DATE 6.4.88

CHECKED S.P.Su

DATE 7.4.88

REMARKS:

Lam Geotechnics Limited

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DRILLHOLE RECORD

W.O. NO. PW 7/2/22.41

HOLE NO. DH-3

SHEET 1 of 3

DATE from 8.4.88 to 11.4.88

CONTRACT NO. GC/87/05

PROJECT Village Extension in Kak Tin (Area 24C)
Natural Slope Adjacent to Kak Tin Village

METHOD Rotary

CO-ORDINATES

ROCK COREBIT T2, TNW

MACHINE & NO. Long Year
D51

E 837113
N 8825325

HOLE DIA. P to H to N
140mm to 114mm to 89mm

FLUSHING MEDIUM Water

ORIENTATION Vertical

GROUND LEVEL 22.65 mPD

Drilling Progress	Casing depth/size	Water level/time/date	Water Recovery %	Total core Recovery %	Solid core Recovery %	R.Q.D.	Fracture Index	Tests	Samples	Reduced Level	Depth (m.)	Legend	Grade	Zone	Description
8/4	P		80					(2L, 1124) N=12			0.00				Medium dense, yellowish brown, silty fine and medium SAND (ALLUVIUM)
										20.65	2.00				
				82				30 bls			3.00				Medium dense, brown, silty fine to coarse SAND with trace of fine gravel (Completely decomposed GRANITE)
	4.00 P H							(L2, 154.11) N=27			4.00		V		
				67				112bls			5.00				
				82	66	66	*			16.50	6.00				Grey, slightly decomposed GRANITE rock fractured from 6.15m - 6.44m
								(8.5, 226.12) N=22		15.65	7.00		II		
											8.00				Medium dense, brown, silty fine to coarse SAND with weathered rock fragments at base (Completely to highly decomposed GRANITE)
				70							9.00		V / IV		
										13.15	9.50				
8/4	H		80	98	64	64	6		T2		10.00		II		Details as sheet 2 of 3

- Small disturbed sample
- Large disturbed sample
- SPT liner sample
- U78 undisturbed sample
- U100 undisturbed sample
- Mazier sample
- P/S Platon sample
- ▲ Water sample
- ⊕ Water Level
- ↓ Standard penetration test
- ⊞ Permeability test
- ⊞ Piezometer tip
- ✓ in-situ vane shear test

LOGGED W.H.Lau
DATE 12.4.88
CHECKED S.P.Su
DATE 18.4.88

REMARKS

1. Installed a piezometer at depth 16.75m with sand pockets from 15.95m to 17.25m
2. * Cannot be determined

Lam Geotechnics Limited

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• Telex: 61840 LGEOL HX • Fax: 5-8932274 • Tels: 5-8910563, 5-734365

DRILLHOLE RECORD															W.O. NO. <u>PW 7/2/22.41</u>				
CONTRACT NO. <u>GC/87/05</u>															HOLE NO. <u>DH-3</u>				
PROJECT <u>Village Extension in Kak Tin (Area 24C)</u> <u>Natural Slope Adjacent to Kak Tin Village</u>															SHEET <u>2</u> of <u>3</u>				
METHOD <u>Rotary</u>															DATE from <u>8.4.88</u> to <u>11.4.89</u>				
MACHINE & NO. <u>Long Year D51</u>										CO-ORDINATES <u>E 837113</u> <u>N 825325</u>					ROCK COREBIT <u>T2, TNW</u>				
FLUSHING MEDIUM <u>Water</u>										ORIENTATION <u>Vertical</u>					HOLE DIA. <u>P to H to N</u> <u>140mm to 114mm to 89mm</u>				
GROUND LEVEL <u>22.65 mPD</u>																			
Drilling Progress	Coaming depth/size	Water level/time/date	Water recovery %	Total core Recovery %	Solid core Recovery %	R.Q.D.	Fracture Index	Tests	Samples	Reduced Level	Depth (m.)	Legend	Grade	Zone	Description				
8/4	N	8.30m at 19:00	80	98	64	64	6				10.00	+							
8/4		9.25m at 7:00		75	42	42	*			10.45	10.74	+	II		Alternate strong and weak, grey, coarse grained, slightly and highly decomposed GRANITE				
9/4				64	54	54	*			11.07	11.58	+	IV						
				95	57	0	12			10.56	11.95	+	II						
				92	86	86	4			10.15	12.50	+	IV						
				33	10	0	*			12.90		+							
										13.95		+	II		Strong, pinkish grey, coarse grained, slightly decomposed, closely to moderately widely spaced joints, GRANITE				
										7.75	14.90	+							
										15.05		+	IV						
										7.00	15.65	+	III		Weak to moderately strong, brown, coarse grained, highly to moderately decomposed GRANITE, rock fractured to highly fractured				
										16.00		+	IV		Very dense, brown, GRAVEL (Highly decomposed GRANITE)				
										5.90	16.75	+							
9/4		11.65m at 19:00		84	50	0	13			17.00		+	III		Moderately strong, pink and brown, fine grained becoming coarse grained, moderately decomposed GRANITE, closely spaced joints with limonite stained, dip 20°-40°				
11/4				100	67	67	5			5.15	17.45	+							
										18.00		+			moderately strong to strong, pink speckle white and green, coarse grained, moderately decomposed becoming moderately to slightly decomposed GRANITE from 19.43m-22.73m, closely to moderately widely spaced joints with calcite, chlorite infilling dip 10°-20°, 50°-70°				
										18.92		+	III / II						
11/4			80	100	88	82	4			19.96		+							

• Small disturbed sample ▲ Water sample

• Large disturbed sample ▼ Water level

□ SPT liner sample ↓ Standard penetration test

■ U78 undisturbed sample ▬ Permeability test

■ U100 undisturbed sample ▲ Piezometer tip

▨ Mazur sample V In-situ vane shear test

P/S Piston sample

LOGGED W.H. Lau

DATE 12.4.88

CHECKED S.P. Su

DATE 18.4.88

REMARKS

Lam Geotechnics Limited

• Office: 2/F., 332 Lockhart Rd., Kai Kwong Comm. Bldg., Hong Kong. • Laboratory: G/F., 218 Wan Chai Rd., Hong Kong.
 • Telex: 61840 LGEOL HX • Fax: 5-8932274 • Tels: 5-8910563, 5-734365

DRILLHOLE RECORD										W.O. NO. <u>PW 7/2/22.41</u>					
CONTRACT NO. <u>GC/87/05</u>										HOLE NO. <u>DH-3</u>					
PROJECT <u>Village Extension in Kak Tin (Area 24C)</u> <u>Natural Slope Adjacent to Kak Tin Village</u>										SHEET <u>3</u> of <u>3</u>					
METHOD <u>Rotary</u>										DATE from <u>8.4.88</u> to <u>11.4.88</u>					
MACHINE & NO. <u>Long Year</u> <u>DS1</u>					CO-ORDINATES <u>E 837113</u> <u>N 825325</u>					ROCK COREBIT <u>T2, TNW</u>					
FLUSHING MEDIUM <u>Water</u>					ORIENTATION <u>Vertical</u>					HOLE DIA. <u>P to H to N</u> <u>140mm to 114mm to 89mm</u>					
GROUND LEVEL <u>22.65 mPD</u>															
Drilling Progress	Casing depth/size	Water level/time/date	Water Recovery %	Total core Recovery %	Solid core Recovery %	R.Q.D.	Fracture Index	Tests	Samples	Reduced Level	Depth (m.)	Legend	Grade	Zone	Description
11/4			80	100	100	71	6		TNW		20.00	+			Details as sheet 2 of 3
											20.44	+			
											21.00	+			
											21.76	+			
										22.00	+				
11/4			80	100	88	88	2				22.73	+			
											23.00				End of investigation hole at 22.73m
											24.00				
											25.00				
											26.00				
											27.00				
											28.00				
											29.00				
											30.00				

- Small disturbed sample
- ▲ Large disturbed sample
- SPT liner sample
- U78 undisturbed sample
- U100 undisturbed sample
- Mazier sample
- P/S Piston sample

- ▲ Water sample
- ▼ Water Level
- ▼ Standard penetration test
- ▼ Permeability test
- ▲ Piezometer tip
- ▼ In-situ vane shear test

LOGGED W.H. Lau

DATE 12.4.88

CHECKED S.P. Su

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REMARKS

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Lam Geotechnics Limited

WATER LEVEL READING

SHEET _____

CONTRACT NO.: GC/87/05

WORKS ORDER NO.: PW7/2/22.41

JOB NAME: Village Extension in Kak Tin (Area 24C)
Natural Slope Adjacent to Kak Tin Village

Piezo-meter No.	Co-ordinates		Date Installed	Installed Depth (m)	Ground Level (m.P.D.)	Date & Water Level (m.)						
	Easting	Northing				(depth measured below ground level)						
DH1	837146	825284	26.3.88	13.70	52.62	28.3.88	29.3.88	30.3.88	31.3.88	6.4.88	7.4.88	8.4.88
						DRY	DRY	DRY	DRY	DRY	DRY	DRY
DH2	837125	825307	31.3.88	14.25	36.71	8.4.88	9.4.88	11.4.88	12.4.88	13.4.88	14.4.88	15.4.88
						DRY	DRY	DRY	DRY	DRY	DRY	DRY
DH3	837113	825325	11.4.88	16.75	22.65	12.4.88	13.4.88	14.4.88	15.4.88	16.4.88	18.4.88	19.4.88
						9.60	9.58	9.59	9.56	9.55	9.57	9.58
DH4	837208	825449	26.3.88	14.90	17.18	28.3.88	29.3.88	30.3.88	31.3.88	6.4.88	7.4.88	8.4.88
						4.47	4.42	4.36	4.39	4.38	4.37	4.35
DH5	837241	825469	23.3.88	14.90	32.27	28.3.88	29.3.88	30.3.88	31.3.88	6.4.88	7.4.88	8.4.88
						12.64	12.67	12.70	12.74	12.76	12.79	12.80
DH6	837148	825467	9.4.88	10.00	13.44	11.4.88	12.4.88	13.4.88	14.4.88	15.4.88	16.4.88	18.4.88
						2.93	2.95	2.94	2.92	2.93	2.94	2.92

WATER LEVEL READING

SHEET _____

CONTRACT NO.: GC/87/05

WORKS ORDER NO.: PW7/2/22.41

JOB NAME: Village Extension in Kak Tin (Area 24C)
Natural Slope Adjacent to Kak Tin Village

[illegible]

DRAWING



REV 修訂	DESCRIPTION 內容摘要	DATE 日期	CHECKED 審核
Territory Development Department 拓展署			
SHA TIN DEVELOPMENT OFFICE 沙田拓展處			
SHA TIN NEW TOWN, STAGE 2			
VILLAGE EXTENSION IN KAK TIN (AREA 24C)			
DRILLHOLES LOCATION PLAN			
DESIGNED 設計	 MAUNSELL CONSULTANTS ASIA LTD. 茂達工程顧問有限公司		
CHECKED 校核			
DRAWN 繪圖			
CHECKED 校核			
APPROVED FOR ISSUE 批准入	CONTRACT NO. 合約編號	DATE OF ISSUE 發售日期	
DATE 日期	FEB 88		
SCALE 比例	1: 500		
DIMENSIONS ARE IN 尺寸單位			
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6/10
10/82