REPORT ON THE RAINSTORM OF MAY 1982

GEO REPORT No. 25

M.C. Tang

GEOTECHNICAL ENGINEERING OFFICE
CIVIL ENGINEERING DEPARTMENT
HONG KONG

REPORT ON THE RAINSTORM OF MAY 1982

GEO REPORT No. 25

M.C. Tang

This report was originally produced in December 1982
as GCO Report No. 6/82

First published, August 1993
First Reprint, April 1995

Prepared by:

Geotechnical Engineering Office,
Civil Engineering Department,
Civil Engineering Building,
101 Princess Margaret Road,
Homantin, Kowloon,
Hong Kong.

This publication is available from:

Government Publications Centre,
Ground Floor, Low Block,
Queensway Government Offices,
66 Queensway,
Hong Kong.

Overseas orders should be placed with:

Publications (Sales) Office,
Information Services Department,
28th Floor, Siu On Centre,
188 Lockhart Road, Wan Chai,
Hong Kong.

Price in Hong Kong: HK$135
Price overseas: US$21 (including surface postage)

An additional bank charge of **HK$50** or **US$6.50** is required per cheque made in currencies other than Hong Kong dollars.

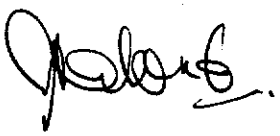
Cheques, bank drafts or money orders
must be made payable to **HONG KONG GOVERNMENT**

PREFACE

In keeping with our policy of releasing information of general technical interest, we make available some of our internal reports in a series of publications termed the GEO Report series. The reports in this series, of which this is one, are selected from a wide range of reports produced by the staff of the Office and our consultants.

Copies of GEO Reports have previously been made available free of charge in limited numbers. The demand for the reports in this series has increased greatly, necessitating new arrangements for supply. In future a charge will be made to cover the cost of printing.

The Geotechnical Engineering Office also publishes guidance documents and presents the results of research work of general interest in GEO Publications. These publications and the GEO Reports are disseminated through the Government's Information Services Department. Information on how to purchase them is given on the last page of this report.



A. W. Malone
Principal Government Geotechnical Engineer
April 1995

FOREWORD

This report was produced in 1982 as a permanent record of the effects of the rainstorms that occurred in the period of 28th to 31st of May 1982 with particular emphasis on the location, type and size of the more serious landslide incidents. It is a factual report and, apart from acknowledging that the landslides were caused by intense rainfall, does not attempt to explain the mechanisms and causes of failure. The report was the first of this kind that has been produced by the Geotechnical Engineering Office.

The report was prepared by Mr M C Tang under the supervision of Mr H B Phillipson, with input from various staff in the then Existing Slopes Division of the former Geotechnical Control Office. Supplementary landslide data were provided by the Agricultural and Fisheries Department, Architectural Services Department, Civil Engineering Office, Fire Services Department, the former Highways Office, Housing Department and Water Supplies Department. The Royal Observatory provided rainfall information. All contributions are gratefully acknowledged.

(Y.C. Chan)
Chief Geotechnical Engineer/Special Projects
August 1993

CONTENTS

CHAPTER 1

INTRODUCTION

The May 1982 rainstorm caused greater damage and disruption than any other in the last ten years. More than 650 mm of rain fell on the four days between 28th and 31st May, and intensities as high as 110 mm per hour were recorded in parts of the Territory. 28 people were killed, 120 injured and 8 000 made homeless. 1 400 hectares of vegetable crop were flooded and 500 000 pigs and poultry lost. The cost of clearance and repair work associated with landslips alone has been estimated to be approximately HK$40m.

The last time such extensive damage was caused by a rainstorm was in June 1972 when 147 people were killed and 102 injured. Since then, the only significant rainstorm was in August 1976 when a fill slope failed in a Sau Mau Ping Estate, burying the ground floor of a housing block and killing 18 people. It was because of this failure that His Excellency the Governor established an Organisation within the PWD to ensure that proper standards of geotechnical engineering were maintained in Hong Kong. The initial duties of the Organisation centred on the stability of slopes, which was considered to be that aspect of geotechnical engineering requiring the most urgent attention.

The Organisation was set up in two parts because of the different procedures required to exercise control over slopes in private lots and on crown land. These two parts are :

- the Geotechnical Control Office (GCO), which is responsible for the stability of all natural and man-made slopes, boulders and retaining structures on crown land (squatter areas, public roads, catchwaters, etc.), and
- the Geotechnical Control Branch (GCB), which is responsible for Government control of all slopes and retaining structures within private lots or adjacent to public buildings (private residential property, public schools, hospitals, etc.)

The principle concern of the Geotechnical Control Organisation during heavy rainstorms is the increased risk of landslips, where <u>landslip</u> is the collective term used to describe :

- a failure of a natural or man-made slope,
- a boulder fall,
- a rock fall, or
- a failure of a retaining structure.

It has been estimated from aerial photographs, newspaper reports and records from other Government Departments that over 1 500 distinct landslips occurred as a result of the May 1982 rainstorm. Approximately 950 of these were in natural hillsides in remote parts of the Territory and did not result in human casualties or damage property. The remaining 550 were more serious, causing death at one end of the scale and disruption at the other.

It was the 550 more serious incidents that were referred to the Geotechnical Control Organisation for :

- a decision on whether to evacuate residents,
- advice on immediate repair and support works, and
- advice on long term stabilisation measures.

This report was prepared in the Existing Slopes Division of the Geotechnical Control Office. It has been produced as a permanent record of the effects of the May rainstorm with particular emphasis on the location, type and magnitude of the more serious landslip incidents. It is a factual report and, apart from acknowledging that the landslips were caused by intense rainfall, does not attempt to explain the mechanisms of failure, or whether individual landslips could have been predicted. It is intended, however, that the factual data included in this report be analysed in detail so that our understanding of rain-induced landslips is improved.

CHAPTER 2

SUMMARY FACTS AND FIGURES

This Chapter of the report summarises the factual information included in later Chapters. In order to make each summary as succinct as possible, most of the information has been presented in tabular form.

Throughout the report there are references to various numbers of landslips and numbers of incidents. In order to avoid any confusion, the table below gives a brief explanation of the total numbers involved.

1500	The total number of landslips caused by the May 1982 rainstorm. This number has been estimated from various sources, including aerial photographs, newspaper reports and the records of other Government Departments.
1105	The number of landslips known to have occurred. Basic information on these landslips has been passed to the Geotechnical Control Organisation.
551	The number of landslips referred to the Geotechnical Control Organisation for specific advice on immediate or long term action.
536	The number of landslips referred to the Geotechnical Control Organisation which involved the collapse of soil or rock. (A number of the referrals involved flooding or other non-geotechnical causes.)
524	The number of landslips inspected by geotechnical engineers from the GCO or GCB.

Landslips referred to the Geotechnical Control Organisation have been called incidents, to distinguish them from landslips on which the Organisation has no reliable information.

Whilst this report attempts to give a broad picture of the effects of the May rainstorm, the emphasis is understandably on the 524 incidents inspected by staff of the Geotechnical Control Organisation.

The fatalities caused by the rainstorm warrant a particular mention. Not all landslips involving fatalities were referred to the GCO. However, a search through the records of the Coroner's Court, the Fire Services Department, the Housing Department and the Royal Hong Kong Police Force, indicate that 28 people were killed. Of these, 22 were buried in landslip debris, 3 were electrocuted and 3 drowned. The Table below gives the Territorial distribution of the 22 deaths caused by landslips .

Number and distribution of deaths caused by landslips in the May 1982 rainstorm				
LOCATION		Hong Kong	Kowloon	New Territories
Squatter Areas		3	15	-
Permanent Buildings	Housing Estates	-	-	-
	Cottage Areas	-	-	4
	Other Buildings	-	-	-
Roads		-	-	-
Construction Sites		-	-	-
Catchwaters		-	-	-
Country Parks		-	-	-

The majority of the deaths in squatter areas were caused by the failure of steep natural hillsides into which crude platforms had been cut.

2.1 RAINFALL

May 1982 was the wettest May since 1957. Rainfall recorded at the Royal Observatory in Tsim Sha Tsui during the four days between the 28th and 31st May was the second highest for the month of May since records began 98 years ago. The actual figures were :

The rainstorm of May 1982 (R.O. gauge at Tsim Sha Tsui)	
Rainfall	Day and Date
179.0 mm	Friday 28 May
258.4 mm	Saturday 29 May
11.0 mm	Sunday 30 May
205.5 mm	Monday 31 May

The Table below compares the rainfall during the May 1982 rainstorm with the rainfall recorded during past rainstorms. This comparison has been made using the Royal Observatory's 'principal' gauge in Tsim Sha Tsui which has records that date back to 1884.

The May 1982 rainstorm compared to other rainstorms since 1884		
Period	May 1982 rainstorm figures	Ranking of May 1982 rainstorm
4-day	653.9 mm (28th to 31st)	5th highest (Highest = 870.6 mm)
3-day	474.9 mm (29th to 31st)	9th highest (Highest = 854.9 mm)
2-day	437.4 mm (28th to 29th)	9th highest (Highest = 841.2 mm)
1-day	258.4 mm (29th)	5th highest (Highest = 534.0 mm)
24 hours	394.3 mm (10 a.m. on 28th to 10 a.m. on 29th)	6th highest (Highest = 697.1 mm)

The above figures suggest that the May 1982 rainstorm was an event which could be expected to occur only once in every 15 years.

There were considerable differences in rainfall across the Territory. Areas at similar elevations and only 3 kms apart experienced differences in rainfall of over 200 mm in a 24 hour period. The populated areas that experienced the heaviest rainfall were Rennie's Mill, the eastern part of Kowloon and the north eastern side of Hong Kong Island.

There was also a considerable variation in the intensity of rainfall. A maximum of 110.5 mm per hour was recorded by the GCO's automatic gauge in Yau Tong, East Kowloon. Such a high, local intensity would only be expected once every 70 years. At one of the GCO's gauges in North Point, 90 mm was recorded in one hour followed by only 16 mm during the next, and in the Mid-levels, two successive periods of 15 minutes produced rainfall of 31 mm and 1 mm respectively.

Such dramatic variations in distribution and intensity have significant effects on the stability of slopes, boulders and retaining walls.

2.2 LANDSLIPS

The Geotechnical Control Organisation has details of 1105 landslips caused by the May 1982 rainstorm. The Table below gives the Territorial distribution of these 1105 landslips.

Number and distribution of landslips known to the Geotechnical Control Organisation				
LOCATION		Hong Kong	Kowloon	New Territories
Squatter Areas		31	130	105
Permanent Buildings	**Housing Estates**	2	19	17
	Cottage Areas	5	1	79
	Other Buildings	20	3	90
Roads		47	8	81
Construction Sites		2	-	1
Catchwaters		2	-	158
Country Parks		3	-	301

It should be emphasized that the figures in this Table are not exhaustive. They have been compiled from information passed to the Geotechnical Control Organisation and inevitably exclude many small or remote landslips. The GCO does not have information on :

- minor landslips in construction sites,
- landslips in remote areas, or
- minor landslips adjacent to roads.

A total of 551 landslips were referred direct to the Geotechnical Control Organisation. Of these, 536 were genuine landslips, and the other 15 were cases where damage and disruption were caused by non-geotechnical factors (e.g. flooding).

The 536 landslips can be classified into five principal types under the broad headings of man-made or natural features.

- Man-made features : Fill slopes
  Cut slopes
  Retaining walls
- Natural features : Natural slopes
  Boulders

The Table below shows the breakdown of the 536 landslips and the deaths caused by each type.

Number, type and fatal consequence of the landslips referred to the Geotechnical Control Organisation

Type of landslip		Total number of each type	Percentage of classified landslips	Consequence: number of deaths
Fill slope failure		30	7%	1
Cut slope failure	Soil	183	43%	6
	Soil/Rock	35	8%	-
	Rock	16	4%	-
Retaining wall failure		49	12%	-
Natural slope failure		84	20%	11
Rock or boulder fall		24	6%	-
Unclassified failures		115	-	-

The 115 unclassified failures are those that could not be satisfactorily identified as one of the five principal landslip types. The majority of these failures occurred in squatter areas where it was difficult to establish the original geometry and mechanism of failure. It has been estimated that 80% of these unclassified landslips in squatter areas were in steep natural slopes where failure was initiated by the collapse of small, unprotected cuttings. In cases where there was an element of uncertainty, landslips have not been classified.

Of the 536 referred incidents, staff from the Geotechnical Control Organisation inspected 524. The other 12 were incidents that did not require geotechnical advice and could be referred direct to the appropriate Government Department.

The Table below shows the distribution of the 524 incidents inspected by the staff of the Geotechnical Control Organisation.

Number and distribution of incidents inspected by the Geotechnical Control Organisation

LOCATION		Hong Kong	Kowloon	New Territories
Squatter Areas		31	130	105
Permanent Buildings	Housing Estates	-	-	-
	Cottage Areas	-	-	-
	Other Buildings	20	3	90
Roads		47	8	76
Construction Sites		2	-	1
Catchwaters		-	-	11
Country Parks		-	-	-

It can be seen that the bulk of the landslips inspected by the GCO were in squatter areas, adjacent to buildings, other than those in housing estates or cottage areas, and adjacent to roads.

The Housing Department inspected all landslips within housing estates and cottage areas and Water Supplies Department only asked for GCO advice on the 11 largest landslips affecting catchwaters.

Landslips are classified as either major or minor depending on the volume of soil and rock in the failed mass. This is a classification based on magnitude alone and does not relate to consequence. In general, during the May 1982 rainstorm, the greatest damage was caused by the largest landslips. There were, however, a few cases where fatalities resulted from smaller failures.

- A major landslip is : a landslip in which the volume of displaced soil or rock is greater than 50 cubic metres.

The following two Tables show the number and distribution of major landslips that took place in man-made and natural features respectively.

Number and distribution of major landslips in man-made features

LOCATION		Cut slope failures	Fill slope failures	Retaining wall failures
Squatter Areas		6	1	-
Permanent Buildings	Housing Estates	5	-	-
	Cottage Areas	5	2	-
	Other Buildings	9	1	6
Roads		12	2	1
Construction Sites		2	1	-
Catchwaters		9	-	-
Country Parks		-	-	-

Number and distribution of major landslips in natural features

LOCATION		Natural slope failures	Rock and boulder falls	Unclassified failures
Squatter Areas		8	1	-
Permanent Buildings	Housing Estates	5	1	-
	Cottage Areas	3	-	-
	Other Buildings	4	1	-
Roads		7	1	1*
Construction Sites		-	-	-
Catchwaters		2	-	-
Country Parks		1	-	-

* This case was severe erosion of a road formation and cannot be sensibly classified as a failure of a natural or man-made slope.

The Tables that have been presented in this Section are summaries only. Specific details can be obtained from information in the later Chapters of this report and, in particular, from Appendix 1, the comprehensive list of incidents reported to the Geotechnical Control Organisation.

2.3 FLOODING

The Engineering Development Department received a total of 1700 individual reports of flooding as a result of the May 1982 rainstorm. Of these, 675 related to incidents on Hong Kong Island, 851 in Kowloon and 174 in the New Territories. Despite the smaller number of reports made, the most extensive flooding was in the flatter areas of Tai Po and Yuen Long.

The Table below gives the distribution of the 8 incidents involving flooding that were referred direct to the Geotechnical Control Organisation.

Number and distribution of flooding incidents referred direct to the GCO, following the August 1982 rainstorm

LOCATION		Hong Kong	Kowloon	New Territories
Squatter Areas		1	2	2
Permanent Buildings	Housing Estates	-	-	-
	Cottage Areas	-	-	-
	Other Buildings	-	-	3
Roads		-	-	-
Construction Sites		-	-	-
Catchwaters		-	-	-
Country Parks		-	-	-

CHAPTER 3

RAINFALL DATA

In Hong Kong, the distribution of rainfall can vary dramatically during a rainstorm event. In the May rainstorm, for example, one area received 230 mm more rainfall in a 24 hour period than an area, at a similar elevation, only 3 km away.

In order to quantify this widely varying rainfall pattern, the Royal Observatory has 165 raingauges at strategic locations around the Territory. The 'principal' gauge is outside the Royal Observatory's old headquarters in Tsim Sha Tsui, and readings have been taken from this gauge since January 1884. Weather summaries and rainfall statistics are usually based on the measurements made at this 'principal' gauge.

A few years ago, the GCO, in co-operation with the Royal Observatory, installed 20 additional raingauges. These are able to record rainfall every 15 minutes and are connected by telephone lines to an automatic recorder in the Emergency control room of the GCO. The locations of these additional gauges were selected to supplement information available from the existing Royal Observatory gauges and to provide specific information in areas where slopes were under observation.

3.1 ROYAL OBSERVATORY RECORDS

The following three paragraphs relating to the May rainstorm have been extracted from the Royal Observatory's Monthly Weather Summary :

> " May 1982 is the wettest May since 1957. The total rainfall during the month amounted to 767.4 mm, which ranks the fourth highest on record. The accumulated rainfall from 1 January until 31 May, 1 147.1 mm, was double the normal figure and is the third highest for the five months since records began in 1884. Violent thunderstorms and heavy rain during the last four days of the month caused the worst landslips since 1976.....
> 653.9 mm of rainfall were recorded at the Royal Observatory between 28-31 May. This amount of rainfall over a four-day period is the second highest on record for May and is the fifth highest for any month.
>
> The weather was fine and hot between 16-26 May apart from some coastal fog on 17 and 18 May and isolated thunderstorms on the night of 19 May ..... There were some slight showers on 27 May. An active southwest monsoon coupled with upper-air disturbances caused widespread thunderstorms and heavy rain on 28 May. Rapid developments of rain-bearing clouds took place close to Hong Kong early on 29 May and violent

thunderstorms and heavy downpours occurred within a few hours, resulting in many landslips and extensive flooding. 394.3 mm of rainfall were recorded at the Royal Observatory during the 24-hour period ending at 10.00 a.m. on 29 May. This amount of rainfall is the sixth highest on record.

The weather improved slightly on 30 May with some scattered thunderstorms in the morning. However, violent thunderstorms occurred again early on 31 May. Thunderstorms and heavy rain persisted during the day and a total of 205.5 mm of rainfall was recorded at the Royal Observatory on 31 May. Thunderstorm Warnings were in effect on 28, 29, 39 and 31 May while Thunderstorm and Heavy Rain Warnings were in effect on 29 and 30 May. No Fire Danger Warnings were issued and no Strong Monsoon nor Tropical Cyclone Warning Signals were hoisted."

The following daily rainfalls were recorded at the Royal Observatory at Tsim Sha Tsui from Friday 28 May to Wednesday 2 June 1982 :

Rainfall	Day and Date	
179.0 mm	Friday	28 May
258.4 mm	Saturday	29 May
11.0 mm	Sunday	30 May
205.5 mm	Monday	31 May
1.3 mm	Tuesday	1 June
22.1 mm	Wednesday	2 June

3.2 GEOTECHNICAL CONTROL OFFICE RECORDS

Rainfall records are also available from the twenty automatic GCO gauges.

The maximum 4-day, 3-day, 2-day, 1-day and 24-hour rainfalls were all recorded at raingauge K05 in Yau Tong, east Kowloon. The actual figures were :

Rainstorm of May 1982
[GCO gauge at Yau Tong]

Rainfall	Day and Date	
135.5 mm	Friday	28 May
358.0 mm	Saturday	29 May
9.0 mm	Sunday	30 May
186.5 mm	Monday	31 May
1.0 mm	Tuesday	1 June
24.5 mm	Wednesday	2 June

The most intense rainfall was recorded at the same location. Figure 3 shows the rainfall recorded every 15 minutes on the 28th and 29th May. It may be seen that the heaviest rain fell between 0100 and 0400 hours on the 29th with a peak of 110.5 mm between 0200 and 0300 hours.

3.3 GEOGRAPHICAL VARIATION

The intensity of rainfall varied with time and location.

Figures 3 and 4 illustrate the variation of rainfall with time as recorded by GCO raingauges K05 at Yau Tong and H09 at Kiangsu-Chekiang College, North Point on 28 and 29 May.

Figure 5 shows the 15-minute rainfall records for the twenty GCO raingauges between 0100 and 0400 hours on 29 May. This data demonstrates the significant geographical variation in rainfall. Maximum intensities varied from 110.5 mm at Yau Tong to 12.5 mm at Sha Tin racecourse.

Over the whole Territory, the rainfall distribution for the 24-hour period from 3 p.m. on 28 May to 3 p.m. on 29 May is shown in Figure 2. It is apparent that rainfall was heaviest in east Kowloon, Rennie's Mill and on the north eastern side of Hong Kong Island.

3.4 COMPARISON WITH PAST RAINSTORMS

The heavy rain of 28 May to 31 May 1982 recorded by Royal Observatory at Tsim Sha Tsui may be compared with previous rainfall records as follow :

(a) 4-day Total

Rank	Period	Amount
1	27-30 May 1889	870.6 mm
2	12-15 Jun 1959	724.6 mm
3	15-18 Jun 1972	677.2 mm
4	19-22 Jul 1926	656.8 mm
[5]	28-31 May 1982	653.9 mm

Note: 689.0 mm of rainfall was recorded by GCO Raingauge K05

(b) 3-day Total

Rank	Period	Amount
1	28-30 May 1889	854.9 mm
2	16-18 Jun 1972	652.3 mm
3	13-15 Jun 1959	627.5 mm
4	18-20 Jul 1926	587.0 mm
5	31 May-2 Jun 1916	537.9 mm
6	10-12 Jun 1966	518.4 mm
7	24-26 Aug 1976	516.1 mm
8	16-18 Jun 1892	481.6 mm
[9]	29-31 May 1982	474.9 mm

Note: 553.5 mm of rainfall was recorded by GCO Raingauge K05 from 29 to 31 May 82

(c) 2-day Total

Rank	Period	Amount
1	29-30 May 1889	841.2 mm
2	19-20 Jul 1926	561.2 mm
3	24-25 Aug 1976	511.6 mm
4	11-12 Jun 1966	460.4 mm
5	14-15 Jun 1959	452.0 mm
6	17-18 Jun 1972	446.4 mm
7	11-12 Jun 1885	444.6 mm
8	1-2 Jun 1916	444.4 mm
[9]	28-29 May 1982	437.4 mm

Note: 493.5 mm of rainfall was recorded by GCO Raingauge K05 from 28 to 29 May 82

(d) 1-day Total

The daily rainfall of 258.4 mm for 29 May 1982 ranks 19th highest on record, the highest being 534.0 mm recorded on 19 July 1926. For the month of May, the figures are as below :

Rank/May	Date	Amount
1	30 May 1889	520.6 mm
2	29 May 1889	320.6 mm
3	13 May 1970	265.1 mm
4	14 May 1891	264.3 mm
[5]	29 May 1982	258.4 mm

Note: 358.0 mm of rainfall was recorded by GCO Raingauge K05 on 29 May 82

(e) 24-hour Total

Rank	Ending hour of 24-hour period	Amount
1	6 a.m. 30 May 1889	697.1 mm
2	3 p.m. 19 Jul 1926	552.2 mm
3	11 a.m. 25 Aug 1976	416.2 mm
4	9 a.m. 31 Oct 1923	408.8 mm
5	12 noon 12 Jun 1966	401.2 mm
[6]	10 a.m. 29 May 1982	394.3 mm

Note: 440.0 mm of rainfall was recorded by GCO Raingauge K05 in 24-hour period ending 10 a.m. 29 May 82

The cumulative record of the May 1982 rainstorm may be compared with the maximum records for the rainstorms of June 1966, June 1972 and August 1976 which caused many landslips and much disruption (Figure 7). The extreme rainfalls for various durations of event and return periods are shown in Figure 6 as an overlay to Figure 7.

CHAPTER 4

LANDSLIPS

Between 28 May and 30 September 1982, the Geotechnical Control Organization received a total of 576 landslip and related incident reports (see Table 1). The daily/monthly totals of incidents reported are shown in Table 2. From 28 May to 3 June, the first week after the start of the rainstorm, 354 incident reports were received. From 4 June to 30 June, yet another 197 incidents were reported. Between 1 July and 30 September, 25 more incident reports were received relating to the May rainstorm.

A master list containing details of all incidents reported to the Geotechnical Control Organization is enclosed in Appendix 1.

It was discovered that some of incidents were reported to both GCO and GCB, while some were reported separately by various offices and departments. Furthermore, there were some incidents which were first reported to and inspected by GCO but subsequently referred to GCB for follow up action and vice versa.

The Geotechnical Control Organisation has dealt with 551 distinct incidents viz. 497 cases by GCO and 54 by GCB.

Wherever possible, the dates on which individual landslips occurred were ascertained by the geotechnical engineers during site inspection. These are shown in Table 4. The dates of landslips are known for about 50% of the cases, and of these, the majority (about 90%) occurred on 29 May 1982.

As shown in Table 1, of the 551 incidents reported to the Geotechnical Control Organization, 103 incidents originated on Hong Kong Island, 149 in the Kowloon urban area and 299 in the New Territories.

266 incidents occurred in squatter areas, 113 incidents concerned permanent buildings and 136 cases related to roads. The remainder affected others, e.g. reservoirs, cemetries etc. Some landslips affected more than one type of locality, e.g. a squatter area and a road.

A location plan of all those incidents inspected is enclosed in Appendix 2.

Based on the information collected during the incident inspections up to 30 September 1982, statistics of various types of landslips have been compiled and shown in Table 5. It should be noted that at certain incident locations, failures involved a combination of several failure types, e.g. the failure of a fill slope and retaining wall, and they have been catalogued separately. A large number of the failures which took place in squatter areas have been classified as landslips only. However, after discussion with the engineers concerned, it appears the majority were failures of natural slopes instigated by small cuttings.

To provide a complete picture of the occurrence and distribution of landslips, various Offices/Departments were approached for reports on landslips. Housing Department have provided a list and location plan of the landslips dealt with by them in housing estates and cottage areas. Water Supplies Department reported failures on the 120 km of catchwater under their maintenance. Agricultural and Fisheries Department have mapped the locations of the landslips that occurred in the country park areas. Furthermore, observations were made by GCO staff during several helicopter flights soon after the rainstorm.

The locations of the reported and observed landslips are plotted on Figure 1. It should be noted that it is not exhaustive in showing the location of all the landslips arising from the May rainstorm because many landslips in remote parts of the Territory remain unrecorded.

However, based on the information collected to date, it is roughly estimated that over 1500 landslips were caused by the rainstorm of May 1982. The Geotechnical Control Organization have inspected 524 of these.

Broadly speaking, as shown in Figure 1, the landslips clustered around the Rennies' Mill, east Kowloon, northeastern Hong Kong Island, Sham Tseng, Tsuen Wan and southwestern part of Lantau Island. These areas were subjected to intense rainfall on 28 and 29 May (see Figure 2).

4.1 CUT SLOPE FAILURES

Referring to Table 5, cut slope failures account for about 55% of all known types of landslip. This class is further divided into soil cuts, soil/rock cuts and rock cuts.

4.1.1 Soil Cut Slopes

A total of 181 incidents reported were classified as failures in soil cut slopes. It ranked highest in terms of number of known types of failure. (see Table 5). These failures resulted in six deaths (all in squatter areas) and were responsible for most of the recommendations for the permanent evacuation of squatter huts.

As previously explained, there may well be a number of other soil cut slope failures which were registered as landslip without distinction of failure types. Hence, the actual figure and consequence of failures would be higher.

In comparison with other types of failure discussed elsewhere in the report, the following points are worth noting concerning soil cut landslips :

- They were the most common form of failure reported during the rainstorm.
- About 60% of failures were in squatter areas.

- The majority of the failures were minor (i.e. volume of landslide debris less than 50 m^3) particularly in squatter areas.

It should be noted that the number of soil cut failures reported as incidents represents only a proportion of the total number which occurred in the rainstorm. Many other failures are known to have occurred, including more than one hundred cut slopes on catchwaters. Two notable incidents of soil cut slope failures occurred at Tsin Tsui Ma Tau Village in Shau Kei Wan (Incident No. HK 2) and Yuen Mo Village, Junk Bay Road in Lam Tin (see Section 5.1).

4.1.2 Soil/Rock Cut Slopes

Soil/rock cuts slope failure involved failure in both weak soil and stronger rock materials. They were far less numerous than failures occurring wholly within the soil part of cut slopes. A total of 35 incidents in this category were reported, of which the majority (23) were located on Hong Kong Island (see Table 5). The main areas affected were roads. Despite the fact that nearly one third of the failures were classified as major, in that the volume of debris exceeded 50 m^3, no causalties were reported in any of these incidents.

The soil/rock cut slope failures adjacent to roads are described below in order to illustrate the variation in the size of these features and the problems they caused.

(a) Hong Ning Road, Kwun Tong, Kowloon
(Incident No. K28, Plate 35)

This small failure occurred in a cut slope on Hong Ning Road, Kwun Tong on the evening of 31 May and is shown in Plate 35. The material involved in the failure was highly to completely decomposed granite containing large core-stones of stronger rock (grades III - IV) up to 1.5 m diameter. The lower part of the failure plane was covered by debris but appeared to be a well-defined joint, dipping directly out of the slope. No casualties were reported and the slip blocked the pavement only.

(b) CH10050 Tuen Mun Highway
(Incident No. NT 8, Plates 37 and 38)

In contrast to (a) above, the soil/rock cut slope failure at CH10050 on the Tuen Mun Highway was one of the biggest failures to be reported. Aerial and ground views of this failure are shown in Plates 37 and 38. The failure was approximately 20 m wide x 30 m long and involved the removal of a 1 to 3 m thick layer of highly to completely decomposed granite in the upper part of the slope and several large blocks of stronger rock, up to 2 m diameter, lower down near the top of the rock face forming the bottom part of the slope. On the right hand edge of the scar (looking upslope) the failure plane occurred on a persistent sheeting joint dipping obliquely out of the slope face. In the main body

of the scar, failure occurred through the decomposed granite matrix. During the site inspections, water seepage was observed at several points in the rock face, in the lowest 10 m of the failure scar and adjacent to the old access track some 20 m above the scar on the natural slope (see Plate 37).

The failure did not result in any casualties but blocked the Tuen Mun Highway. One lane of the road was closed for a period of approximately 2 months after the failure in order to complete the remedial work.

4.1.3 Rock Cut Slopes

All 16 rock cut slope failures that occurred are classed as minor, i.e. less that 50 m^3 of material involved in the failure. The 4 failures in Hong Kong were all on the Northern side of the Island and all directly affected roads (Incident Nos. HK 23, 46, 77, 84). Of the 4 incidents in Kowloon one affected a road (Incident No. K 17) and other 3 incidents were in a squatter village (Incident No. K65). There were 8 incidents in the New Territories, 3 affecting roads (Incident Nos. NT 59, 230 & 262), 2 affecting squatters (Incident Nos. NT 103 & 268), and 3 affecting buildings (Incident Nos. NT 17, 109, 157).

Wedge and planar failures were most common on steeply dipping joint planes (in the range 60° to 80°). One case of toppling failure has been recorded (Kings Road, Incident No. HK 77).

The incident at the Junction of May Road and Magazine Gap Road in Northern H.K. Island (Incident No. HK 84, Plate 22) is typical. Plane failure took place on a joint plane dipping out of the rock face at an angle of between 65° and 70°. Three large blocks 0.8 m^3 to 1.0 m^3 had fallen from a scar 2 m to 5 m above the road surface onto the road. Numerous small blocks were also associated with the failure. Most of the debris fell within the inner (slope side) carriageway. The road surface did not sustain any damage but a lamp post was destroyed. The road was closed for removal of the debris and then reopened.

4.2 FILL SLOPE FAILURES

In the May rainstorm, only 30 out of 536 landslips handled by the Geotechnical Control Organization were identified as fill slope failures (see Table 5). Of these, 6 were classified as major (i.e. volume of debris exceeds 50 cu.m.). In terms of consequence, 1 person was killed, some 30 squatter huts were recommended for permanent evacuation, against some 1 100 huts recommended for clearance due to other types of failures. As previously discussed, there may well be a number of other fill slope failures which were registered as landslip without distinction of failure type.

13 out of the 30 failures were found to affect squatter areas, and all of them were minor incidents except the one at Yuen King Village opposite Shun Lee Tsuen Resite Area (Incident No. K 45), which caused the only death due to the failure of a fill slope. The incident at Yuen King Village is described in Section 5.1 (case (h) refers).

10 failures affected roads, 3 of which were classified as major. All 3 major incidents occurred along Castle Peak Road, two at 13¾ ms (Incident No. NT 7 and GCB 12; Plate 33) and one at 17½ ms (Incident No. NT 86, Plate 34). These 3 incidents together with some other minor cases, led to the closure of the road from 29 May to 10 June.

The remainder affected village type houses, private buildings or farmland, etc.

Of the 30 incidents none involved fill slopes in Urban Areas overlooking schools, hospitals or housing estates.

4.3 RETAINING WALL FAILURES

Out of 536 landslips handled by GCO and GCB, a total of 49 involved retaining walls. Of these, 40 were dealt with by GCO, 9 were dealt with by GCB. Table 8 shows the geographic distribution of the incidents affecting retaining walls. The majority of the wall failures occurred in the New Territories, and it is significant that a higher proportion of the NT incidents were classified as major. (i.e. volume of failure debris exceeded 50 m^3).

Not all the incidents resulted in failure, and in fact 15 of the incidents reported related to walls showing signs of severe distress. Table 8 also shows the distribution of incidents subdivided into actual failures and those cases of walls showing signs of severe distress.

The Table shows that 50% of the incidents involved walls under 3 m, and about 25% of incidents related to walls higher than 3 m. The original height of the remaining 25% is unknown.

No deaths or injuries were reported but there were clearly several narrow escapes.

The walls inspected may be divided into two categories : skin walls (i.e. very thin retaining walls) and walls of substantial cross section.

(a) Skin Walls

Skin walls are defined as those for which the height to width ratio is large - typically in excess of 10:1. There were several such incidents noted, all in the New Territories. In all cases the wall was 2 to 2.5 m high. The case at Tit Mei Tsai, Tai Po (Incident No. NT 136) is notable. In this case, a retaining wall 0.15 m thick and 2.5 m high formed one wall of a squatter hut. The length of the wall was 4 m, over which distance it was not buttressed by partition

walls. The ground immediately behind was flat, forming part of a terrace, and was completely open to infiltration. Being a wall of the house, there were of course no weep holes. It is this type of retaining wall that is of most concern as it is much more likely to cause injury in the event of failure than one which is separated from the house by a passage way.

(b) Walls of Substantial Cross-Section

This group includes those walls which had height to breadth ratios of about 3:1. Typical examples are Incident No. NT 29 behind 81 - 87A Kam Shan Terrace, Tai Po, Incident No. NT 18 behind 83 - 89 Sun On Tsuen, Sai Kung, and behind the Village Hall at Ho Chung, Sai Kung.

The retaining wall behind 81 - 87A Kam Shan Terrace was of squared and dressed masonry block construction. It was 3.6 m high 1.2 m wide at its base. The wall was 60 m long and it failed in two separate sections - one about 10 m long, and the other about 15 m long. There was an intact section about 15 m long which remained standing between these two failures. The ground behind sloped upwards at about 25° to 30°, and it appeared that there were slight depressions behind the two failures. It is interesting to note that the central section of wall between the two depressions did not fail.

At 83 - 89 Sun On Tsuen, a retaining wall 4.5 m high had a 3:1 height : breadth ratio and few weepholes. The collection of water above the crest arising from totally inadequate drainage on the footpath above was clearly the major contributing factor in the failure.

It is often difficult with masonry walls to ascertain whether the wall failed by sliding or toppling. Two cases where toppling was clearly the mode of failure are incident Nos. NT 18 and NT 29 reported above. There are, however, walls which have clearly failed as a result of a bearing capacity failure and those which have failed as part of a general slope failure. In addition, there are those walls that did not result in complete failure but showed signs of severe distress.

There were few failures of the bearing capacity type, and a complete failure was noted in only one case. In all cases, the walls were at the top of extensive slopes at angles greater than 35°, and partial erosion near the toe of the wall caused rotation of the wall.

General slope failures were common in the Tai Po/Sai Kung regions but constituted only about one third of all reported cases. Typically, a relatively small retaining wall was backed by a cut slope, often steeper than 60°. Alternatively, an equally steep toe slope was present in addition to a crest slope. Such incidents often occurred between two houses and were always on a narrow strip of Crown Land.

A typical example in this category is Incident No. NT 62 at Man Sau Sun Tsuen (Sun On Tsuen), Sai Kung (see Plate 51). The slope profile

varied behind each of the houses, but behind No. 26, a 2 m high 75° cut slope was topped by a 2 m high retaining wall, on the crest of which there was a horizontal section about 1 m wide followed by a further 2 m high 75° degree cut slope. Above the upper cut slope was a 1.5 m wide berm, and behind that a 3 m high retaining wall. Thus, a total height difference of 9 m was achieved in about 3 m horizontal distance, representing an effective slope angle of 70°. Failure took place in the lower three sections of this slope, undercutting the 2nd berm and thereby threatening the upper retaining wall. In adjoining sections where there was a retaining wall of moderate proportions at the toe, no failure took place.

Details of walls showing signs of severe distress are given here. One 2.5 m wall (Incident No. NT 49) remained standing despite the fact that the top had rotated outwards by over 0.6 m. It is interesting to note in this case that a gap opened up between the in-situ soil and the wall. Clearly excessive pore water pressures developed behind the wall, and these alone, and not the earth pressure were responsible for the distortion to the wall. In another incident (Incident No. NT 99), the 2 m high wall was bulging, and a block of the random rubble wall actually fell out at the time of inspection. Both walls (i.e. Incident Nos. NT 99 and NT49) were still standing 6 weeks after the rainstorm.

There were 10 incidents involving concrete walls and 10 involving random rubble walls, while a squared rubble construction had been used for 7 walls. Most of the concrete walls came in the 'severe distress' category, with steel reinforcement preventing a complete collapse of the wall.

Many incidents were associated with a high water table and/or a high infiltration potential. In some cases, blocked drains and gullys caused flooding of the crest platform by up to 300 mm of water. Few of the retaining walls involved in incidents had crest platforms which were well sealed against infiltration.

Several walls had an inadequate number of weepholes and a number had no weepholes (e.g. Incident NT 29). In other walls, the effectiveness of the weepholes must be questioned, as many were blocked (e.g. Incident No. NT 49).

Most incidents involved slender walls (i.e. high height/breadth ratio) although there were cases of failures in walls which had a H/B ratio as low as 3:1. For such walls, other factors contributed to the failure (e.g. significant crest slope or lack of weepholes). No walls of thicker section failed.

4.4 NATURAL SLOPE FAILURES

The natural slope failures ranked after soil cut slopes in terms of number of incidents reported to the Geotechnical Control Organization. There were 84 incidents reported, 18 on Hong Kong Island, 5 in Kowloon and 61 in the New Territories (see Table 5). 20 out of the 25 cases which were classified as major (i.e. volume of debris exceeded 50 m^3) occurred in the New Territories. From these figures alone, it is readily seen that most natural slope failures occurred in the New Territories.

In fact, it was estimated from by observations made by GCO staff during several helicopter flights soon after the rainstorms and from records provided by the Agriculture and Fisheries Department that on a territory wide basis approximately 800-1000 landslips occurred on natural terrain (typical examples shown on Plate 59).

There were definite areas where the intensity of natural slope failures was very high. These areas, as could be expected, correspond to the areas of peak rainfall. Examination of the rainfall distribution map for the 24 hours from 3 p.m. 28 May 1982 reveals that three areas in particular were subjected to extraordinarily high precipitation rates. From general observation, these areas had a very high incidence of failure. These are :

- the steep volcanic and acid intrusive terrain adjacent to Route Twisk in the Shek Kong Valley and also in Lam Tsuen Valley,
- the fine grained porphyritic phase of the Needle Hill Granite near Sham Tseng, and
- the steep terrain associated with the Repulse Bay Formation on Lantau Island.

Most of the natural slope failures did not pose a direct threat to life and property, as they took place remote from populated areas. Three cases are presented below to illustrate the effect of the failures.

(a) Kowloon Textile Quarters, Sham Tseng, N.T.
(Incident No. NT 10, Plates 55 & 56)

A failure about 20 m across, 4-5 m deep occurred on a natural hill about 60 m above and approximately 120 m horizontally behind the Kowloon Textile Quarters in Sham Tseng, N.T., in the early morning of 29 May. The failure debris washed down from the hillside into a natural stream course scouring and tearing away soil/rock and boulder along the stream course. Large scars were visible all along the course (Plate 55).

The debris and boulders completely blocked a 1.5 m box culvert underneath 3 rows of 2 to 3 storey buildings which were constructed across the stream channel. As a result, all debris piled up against the first row of buildings, with boulders breaking through the windows of some of the units. Mud, sand and water flowed into these units causing severe damage to furniture and appliances (Plate 56). Consequently, fourteen units on the first row which suffered damage were considered dangerous and were permanently evacuated.

(b) DD 390, Lot 207, Sham Tseng, Tsuen Wan
(Incident No. NT 198, Plate 60)

The slip occurred on natural slope just below a 3-storey building on DD 390, Lot 207, Sham Tseng (Plate 60). The failure debris, greater than 50 m^3 in volume, moved downhill over a distance of more than 100 m onto and across the Castle Peak Road at around the 9¼ ms. The

nature of the slip indicated that its main cause of erosion was due to the large amount of surface runoff. Subsequently, a closure order was served on the premises.

(c) Nam Long Shan Road, H.K.
(Incident No. GCB 2, Plates 57 & 58)

In Wong Chuk Hang, a major natural slope failure occurred above the Nam Long Shan Road, at the access to the Ocean Theatre. This resulted in the blockage of the access road (Plates 57 and 58).

4.5 ROCK AND BOULDER FALLS

Among the landslip incidents reported to GCO and GCB, there were 24 incidents involving boulders, 5 of which have been classified as major (i.e. volume of failure exceeds 50 m^3). Hong Kong Island had 9 incidents; 6 affecting roads or footpaths (Incident Nos. HK 5, 17, 20, 22, 38, 52), and 3 affecting squatter areas (Incident Nos. HK 3, 14, 48). There were no reports of boulder incidents in Kowloon. The New Territories had 15 incidents; 5 affecting roads of footpaths (Incident Nos. NT 9, 85, 147, 229, 256); 5 affecting squatters areas (Incident Nos. NT 36, 83, 184, 238, 254); 3 affecting houses (Incident Nos. NT 1, 159, 216), and 2 affecting catchwaters (Incident Nos. NT 243, 245). All 5 major incidents were recorded in the New Territories.

The failure mechanisms for boulders were one of, or a combination of, the following :

- surface washout of soil supporting the boulders causing undermining,
- shallow failure of the underlying soil causing movement of boulders with the soil failure, or
- deep seated soil failure causing release of a previously buried boulder.

Three notable boulder falls are described here.

(a) Kam Shan Village, Tai Po
(Incident No. 159, Plate 41)

The major incident at Kam Shan Village, Tai Po resulted in three 1 m^3 boulders destroying rooms in the ground floor of a house. The stability of 18 other boulders were also impaired. The incident was triggered by a minor soil slope failure at the top of a 33 m high colluvial slope which released buried and partially buried boulders which then rolled down the slope a distance of 65 m. The subspherical shape of the boulders contributed towards the distance travelled. The slope angle varied from 60° (failed soil slope) to 18° (point of rest of farthest boulder travel).

(b) Caroline Hill Road, H.K.
(Incident No. HK 38, Plate 42)

The minor incident affected a footpath at Caroline Hill Road. The plate shows the boulder after splitting, prior to being removed. Failure was due to surface erosion and scouring causing undermining of the boulder.

(c) Peak Road, H.K.
(Incident No. HK 22, Plate 43)

The minor incident resulted in closure of one half of Peak Road at this point. Shallow failure of the clay soil underlying this exposed boulder had occurred and the boulder had slid 20 m down a 45^{o} slope on a thin 'blanket' of soil. The blanket of soil had prevented the initiation of rolling and protected the road surface from impact damage.

4.6 UNCLASSIFIED FAILURES

Sections 4.1 to 4.5 of this Chapter have described the five principal landslip categories.

A number of the incidents inspected by staff from the Geotechnical Control Organisation could not be appropriately classified into one of these 5 categories.

The majority of these unclassified incidents were minor and occurred in squatter areas. In these congested areas, it is often difficult to assess the pre-failure geometry and to establish the cause of failure. It was considered, however, that the majority of landslips in squatter areas were in steep natural slopes and were initiated by the collapse of small, unprotected cuttings. However, because of the element of uncertainty, this type of landslip has been described as unclassified.

A few other incidents have also been described as unclassified. The majority of these concern erosion which, in spite of the movement of soil and rock, cannot satisfactorily be described as slope or boulder failures. Erosion gullys were most often caused by the blockage and overflow of natural streams or man-made drainage channels. The subsequent washout of soil and rock caused nuisance and disruption rather than a threat to human life.

In one notable, unclassified failure, a water main burst causing the erosion of 450 m of road pavement. (Incident No. NT 139, Po Toi O Village Road, Clearwater Bay).

CHAPTER 5

NOTABLE INCIDENTS

The landslips referred to the Geotechnical Control Organisation have been grouped into one of six categories depending on who or what was most affected.

This Chapter describes some of the more significant incidents in each of the six categories and presents photographs where these are available.

5.1 SQUATTER AREAS

Out of a total of 22 deaths caused by landslips, 18 took place in squatter areas (see Table 3). These squatters were all located on dangerous natural slopes with slope angles in excess of 30°.

264 landslips were involved in the incidents reported to the Geotechnical Control Organization (see Table 6). 162 occurred in the urban area and 102 in the New Territories. The worst areas were in Sau Mau Ping and Lam Tin, where the recent boom in hut erections has produced many poorly constructed huts, a large number of which did not stand their first major rainfall incident.

Of the 264 failures, it was identified that there were 13 fill slope failures, 67 soil cut slope failures, 5 rock cut slope failures, 6 soil/rock cut slope failures, 38 natural slope failures, 9 boulder falls and 15 retaining wall failures. 111 were unclassified landslips (see Table 6).

As a result of these slope failures, GCO has recommended permanent evacuation of more than 1 100 squatter huts (see Table 1).

Some individual incidents are described below. The first 8 cover sites where there were fatalities, and the remainder are for sites where over fifty huts were evacuated.

(a) Lam Tin Third Village, Section 1
(Incident No. K30)

This failure caused a slip approximately 20 m high, 20 m wide and 1 to 2 m deep representing approximately 600 m^3 of material. The failure caused the collapse of a masonry wall of a squatter hut, resulting in one death. At the crest of the slope was a 2 m deep natural drainage channel running parallel to part of the crest. In the remainder of the area at the crest, recent terracing had been undertaken for further squatter huts.

(b) Lam Tin Third Village, Section ?
(Incident No. K31, Plate 4)

Three separate landslips affected this village in a small (50 m x 50 m) area. All three caused the partial or complete collapse of the rear wall of a group of huts. The height of the slope which failed was about 8 - 10 m in each case. 3 deaths occurred in one of the incidents and a further 2 occurred in a second incident. In the third incident, which was very similar in terms of the damage caused and the material involved, it was fortunate that no deaths or injuries were caused. In the first and third incidents, there were newly formed terraces at the crest of the slope. In the second incident, there was evidence of erosion of the toe of the slope by an unchannelled stream, together with water run-off from a footpath at the crest.

(c) Lam Tin 1st Village
(Incident No. K14, Plate 3)

A squatter hut which was founded over a rock outcrop was demolished when a slip from a cut slope behind occurred. The hut fell 5 m and crashed into a hut in front. 2 deaths were caused. At the same time a small slip was noted at the toe of the slope, and consequently all huts on that slope below the slip were evacuated permanently, as were four newly constructed huts which were at the crest. Some broken drainage pipes may be indicative of the method of water ingress to the slope. In addition, the flat area at the crest was destroyed by fire in 1981 leaving large areas open to infiltration.

(d) Yuen Mo Village, Junk Bay Road
(Incident No. K13, Plates 1 and 2)

This village was affected in 1981 by a fire which destroyed a significant number of huts leaving approximately 40 in two isolated groups. The flat areas on the upper slopes were thus exposed and significant ponding of water was noted during the site inspection on 29 May 1982. Several small failures on the 40 m high natural slope were noted above the main one which caused the complete collapse of a number of structures and 3 deaths.

(e) Landslip at Chung Luen Tsuen, N.W. Kowloon
(Incident No. K60)

The hut was constructed on a wooden platform across an east-west running boulder strewn gully/minor stream. The side slopes of the gully are steep (greater than 45°) and composed of loose boulderly colluvium. The north bank of the gully immediately abutting the hut had been locally steepened. A section of this slope failed in the morning of 29 May leaving a 9 m x 4 m scar on the slope. The debris crushed the hut, killed 3 people and injured another. The front part of the hut was pushed over the platform onto the gully bed below. The slip was most likely caused by infiltration, encouraged by water flow along the gully.

(f) Below Mt. Parker Road, off Quarry Bay Street
(Incident No. HK82, Plates 7 and 8)

The steep natural slope below Mt. Parker failed, together with a 1 m high rubble retaining wall which supported a small portion of Mt. Parker Road. A single squatter hut at the toe was demolished by the impact of the slide debris. The failure scar had a maximum height of 20 metres. It is possible that due to heavy rainfall, surface runoff overflowed from Mt. Parker Road onto the steep natural slope and this, together with infiltration, was responsible for this failure. Two children died later in hospital as a result of injuries received when the hut was destroyed.

(g) Tsin Shui Ma Tau Village, Shau Kei Wan
(Incident No. HK2, Plates 5 and 6)

In this incident, the top part of a 15 m high cut slope collapsed, undermining and partly destroying a line of 4 huts at the slope crest. One person, asleep at the time, fell to his death when the floor of his hut was undermined by the failure. Inspection of the site revealed that infiltration into small platforms cut on the sides and above the slope was probably responsible for failure. Several signs of minor movement were observed adjacent to the failure, and it was recommended that a total of 40 huts should be temporarily evacuated over an area within 15 - 20 m of the failure. 16 huts had been recommended by GCO for permanent evacuation in a subsequent visit.

(h) Yuen King Village, opposite Shun Lee Tsuen Resite Area
(Incident No. K45)

Here, a small area of fill adjacent to the New Clearwater Bay Road which was used as a storage area for 1 m diameter drainage pipes failed, presumably because the surface of the fill was level, loose and uncovered, and because of the surcharge. The fill, the drainage pipes and the natural slope below the fill failed spilled down into an isolated group of huts causing 1 death.

(i) Tai Shing (On Lok) Village
(Incident No. 42)

53 huts were damaged and subsequently permanently evacuated after a major nullah overflowed down a steep natural slope after being blocked by a rockfall. The water demolished a group of structures approximately 10 m by 15 m until its force was dissipated when it reached the bottom of a small valley and found a new flow path.

(j) Cheung Leung Tin Village
(Incident No. 36)

52 huts were permanently evacuated when a group of huts inadequately founded on a very steep hillside collapsed together. The initial collapse of one or two triggered the failure.

(k) On Lok Village, Sau Mau Ping Road
(Incident No. 8)

75 huts were permanently evacuated when a group of huts collapsed due to inadequate foundations on a steep hillside with a shallow soil/rock interface. Again, this incident was triggered by the initial failure of one or two individual huts.

Most of the incidents were the usual type of failure caused by the failure of cut, natural, or fill slopes within squatter areas where the activities of the squatters were heavily responsible for the failures. An estimated 5% or less of failures were thought to the due to factors other than the squatters. However, three out of eight of the GCO inspected failures which caused deaths were primarily due to causes not connected with squatters. These were at Lam Tin Third Village Section 1, Yuen King Village, and Mt. Parker Road. At the first, a natural slope above a squatter area failed possibly due to an unlined erosion gully at the crest or some undercutting by squatters at the toe. At the second, a small area of unidentified fill failed with heavy infiltration and a surcharge from the storage of drainage pipes. At the third, a steep natural slope failed due to heavy infiltration, and possibly the channelling of surface run off by a road at the immediate crest of the failure.

Within the squatter areas, all of the usual factors were present as causes, e.g. uncontrolled or blocked drainage, unprotected cut slopes, fill platforms formed with rotten sand bags, plywood retaining walls. There were three additional factors. The first was the effect of very high flow in drainage nullah or natural stream courses, which affected the huts built across them, either flooding through them, or undermining the supports set in the drainage paths. The second factor was the increasing percentage of squatter areas open to infiltration. This was primarily caused by the large fires of 1981 which left many hectares of squatter area open to the rain. A third but minor factor was found at those sites where huts have been evacuated and demolished leaving small but damaging openings in the general waterproofing of the hillsides.

5.2 PERMANENT BUILDINGS

Permanent buildings affected by landslips are one of three categories:

- buildings in housing estates,
- buildings in cottage areas, and
- all other buildings

The GCO has first hand knowledge of those landslips affecting the third category (other buildings). Some information, however, has been passed to the GCO from the Housing Department who inspected landslips within housing estates and cottage areas.

5.2.1 Housing Estates

A total of 38 landslips occurred in housing estates, according to information passed to the GCO. Of these, 14 were failures in soil cut slopes, 2 in rock cuts, 1 in a fill slope and 21 in natural slopes.

The majority of these were minor (i.e. less than 50 m^3 of debris). The most extensive failure was that of a natural slope at Sau Mau Path in the Sau Mau Ping Estate.

The one fill slope that failed was in the Tsz On Estate. In this incident, 12 m^3 of sand and mud were washed down from the slope surface.

5.2.2 Cottage Areas

Reports from Housing Department indicated that there were 79 landslips in Rennie's Mill cottage area resulting in 4 fatalities.

Rennie's Mill lies within the area of heaviest rainfall during the May rainstorm (see Figure 2). The fatalities were due to natural slope failures above cut slopes.

There were very few failures in other cottage areas. Only 7 natural slope failures were recorded in 5 other cottage areas.

(a) Rennie's Mill Section 4, Cottage 16

3 deaths occurred at this site.

The failure scar shows a shallow circular slip with decomposed granite soil and possibly colluvium, sliding on in-situ weathered rock of grade III, which was exposed in the base of the slip scar.

The failure occurred in an upper natural slope which had been cut and chunammed in its lower part. A 500 mm U-channel is located at the base of the cut portion of the slope. Below the U-channel, the slope continues for a short distance before being cut to form the terrace on which Cottage 4/16 is located.

During inspection, a 200 mm U-channel was discovered which ended just above the slip scar (upper right hand side when viewed from below). This U-channel was discharging water on to the natural slope, apparently from the road above.

Subsequent examination of the slide showed an area of natural groundwater seepage in the back scar of the slide which would also have been contributing to the saturation of the soil mass.

(b) Rennie's Mill Section 10, Cottage 174

1 death occurred at this site.

A shallow circular slip occurred in the upper portion of a chunammed cut slope behind Cottage 10/174 and included part of the natural slope above. The slipped material included decomposed granite and colluvium. Decomposed granite of grade IV and grade III was exposed in the base of the slip scar. A U-channel which apparently crossed the central part of the slip was broken by the failure. A subsequent inspection showed the U-channel to fall away in both directions from the slip area.

5.2.3 Other Buildings

Of the toal 551 landslip incidents handled by the Geotechnical Control Organisation, 113 affected permanent buildings, including N.T. exempted houses. Of these, 90 were in the New Territories, 20 on Hong Kong Island and 3 in Kowloon (see Table 1). The figures quoted above include landslips affecting the spacesadjacent to permanent buildings, including rear yards, playgrounds and building carparks, irrespective whether the landslips have originated within the lots or outside the lots.

For the 35 incidents affecting private or public buildings which were handled by GCB, 14 cases were considered as major failures in that the debris volume exceeded 50 m^3. Up to 15 July 1982, a total of 10 Closure Orders, 20 Dangerous Building/Slope Notices and 3 Advisory Letters were recommended. There were no building collapses, and in no case was the main structure of the building impaired except for three landslips in the N.T. where the walls of old masonry buildings were demolished. It was noted that in these cases, debris was only 1.5 to 2 m high against the wall.

(a) 88 - 90 Kennedy Road, H.K.
(Incident No. HK10/GCB6 & 34, Plate 13)

The major failure occurred in the afternoon of 31 May 1982 and was preceded by a minor one on 29 May 1982. It was a soil/rock cutslope failure. The soil portion of the slope, which stood at an angle of about 60° to horizontal, is about 12 m in height with the surface chunammed. Below the soil slope is an 80° rock cutting. The slip on 29 May 1982 was a shallow one within the soil portion of the existing cutting, and the debris fell down to the ground floor elevated platform which was used as carpark. Several steel sheds beneath the slip were damaged and partly buried, thus causing damage to the cars parked there. On 31 May 1982, part of the slope immediately adjacent to the previous slip failed. The debris buried two of the supporting columns of Block B of 88 - 90 Kennedy Road. Seepage was observed coming out from the soil/rock interface even during the subsequent visit on 1 June 1982. A Closure Order and a Dangerous Slope Notice were served on the owners of 88 - 90 Kennedy Road.

(b) 54 - 56, Kennedy Road
(Incident No. GCB1 & 7)

The landslip occurred on 29 May 1982 and was a failure of a natural slope between the building and Bowen Road. The natural slope was inclined at angle of 38° to the horizontal. The slip was about 1.5 m deep and 35 m long, with the crest of the failing zone extending to about 3 m below Bowen Road level. The debris was partly stopped by a wall at the back of the building, and the rear yard was partially blocked. Active seepage was noticed at the upper part of the scar. A Dangerous Slope Notice was recommended by GCB for issue to the owners.

(c) Lai Shum Villa, 13¼ ms Castle Peak Road
(Incident No. GCB12, Plate 33)

In the New Territories, one of the most significant failures occurred at Lai Shum Villa, 13¼ ms Castle Peak Road. The lower part was a suspected natural slope about 5 m high just adjacent to Castle Peak Road. On top of it a masonry retaining wall of 4 m high was built to retain a sloping fillslope of about 4 m in height. Lai Shum Villa is situated on the crest platform some 3 m from the crest of the slip. The incident was mainly a fill slope failure which also caused severe cracking of the masonry wall and minor slip in the slope beneath it. The debris came down and blocked part of the road. A Dangerous Slope Notice and a Closure Order have been served on the owner of Lai Shum Villa.

(d) Wan On Terrace, Tsuen Wan
(Incident No. NT23, Plates 15 & 16)

This is another major failure which affected a building in the New Territories. The failure which occurred on 30 May was a complex one consisting of retaining walls and cut slopes lying in between two platforms with about 10 m difference in level.

(e) Greenwich Garden, Kam Shan Village, Tai Po
(Incident No. 159)

One of the largest failuresaffecting buildings was the incident behind Greewich Garden, Tai Po, where a 33 m high natural slope failed creating a wash of soil up to 1 m deep which flowed down to the houses. In addition, three approximately 10 tonne boulders were released, each of which narrowly missed the houses. A further approximately 18 boulders ranging in size from 1 tonne upwards were also released, but most remained in a metastable position near the top of the slope.

5.3 ROADS

47 incidents were reported affecting roads and footpaths on Hong Kong Island. Three have been classified as major (i.e. volume of debris exceeded 50 m^3) : Chai Wan Road near Lok Man Road (Incident No. HK24; Plates 27 and 28), Mt. Parker Road (Incident No. 82, Plate 8) and Tong Bin Lane (Incident No. HK83, Plate 24). The majority of the incidents affected only one carriageway. Total road closures occurred on Borrett Road (Incident No. HK27), Bowen Road (Incident No. HK28), Plantation Road (Incident No. HK73), and May Road (Incident No. HK83; Plate 22).

There were quite a number of cases in which the landslip/rock or boulder fall affected the footpath only, but as a precautionary measure, the adjacent lane was temporarily closed pending removal of the debris by the H/HK, in the minor case, or inspection by GCO for safety use of the road. One lane of Ka Wai Man Road was closed for approximately two weeks. Plantation Road (Incident No. HK73) remained closed until 29 June, as remedial works involved the design and construction of the concrete retaining wall to support the narrow road, most of which had failed. The Chai Wan Road (Incident No. HK24) was still partially closed up to 15 July 1982.

Roads and footpaths in Kowloon were affected by 8 incidents. One has been classified as major - Junk Bay Road (Incident No. K18; Plates 29, 30). The minor incidents at worst only involved closure of one lane of the carriage-way and the roads were usually fully open again the day of or the day after the incident.

Remedial works to Junk Bay Road slope had been completed and the closed carriageway (2 lanes) reopened to traffic on 5 October, 1982.

Disruption to traffic flow occurred in the New Territories, where for the period 29 May to 31 May Tuen Mun was virtually isolated due to Castle Peak Road being closed and only one lane being open on the Tuen Mun Highway.

76 incidents affecting roads in the New Territories were reported to the GCO, 18 of which were classified as major. Many minor roads were closed or partially closed for short periods (one to two days). The major roads affected were Castle Peak Road and the Tuen Mun Highway.

(a) Tuen Mun Highway
(Four Incidents, Plates 36 to 40 and 44)

Four separate incidents on the Tuen Mun Highway at Chainages 3500 near Ting Kau (Incident No. NT78), 6750 near Sham Tseng (Incident No. NT79; Plate 36), 10050 (Incident No. NT8; Plates 37, 38), and 10350 near Tai Lam Kok (Incident No. NT70; Plates 39, 40, 44) seriously disrupted traffic. Lane closures were in operation for some time at CH 6750, 10050, and 10350 to allow remedial works to continue.

At CH 10050 near Tai Lam Kok (Incident No. NT8) from 29 May until 31 May, the Tuen Mun Highway was restricted to one lane controlled by traffic lights. Traffic delays which extended the journey from Tsuen Wan to Tuen Mun to 3 hours were not uncommon.

At CH 10350 near Tai Lam Kok, although the incident was classified as minor with only 5 to 10 m^3 of material deposited on the road, a deep seated movement had occurred. Blasting of a major boulder on 7 June reduced the risk of further failure. Investigation of the mode of failure during June resulted in further blasting and major earthworks.

To enable extensive remedial works to be carried out whilst maintaining traffic flow on a minimum of two lanes, temporary protective fences were erected at Chainages 6750, 10050 and 10350 (Plates 36, 37, 40).

(b) Castle Peak Road
(Five Incidents, Plates 25 and 31 to 34)

Five incidents were reported to GCO, at milestones 9½, 13¼, 13½, 14 and 17½ (Incident Nos. NT125, 7, 108, 9, 86). Three of these were classified as major (Incident Nos. NT125, 7, 86).

The incident at 13¼ ms (Incident No. NT7; Plate 33), where a major fill slope failure caused subsidence of the road into the sea, completely closed Castle Peak Road at this point from 29 May until 10 June.

Two other fill slope failures, at 13½ ms (Incident No. NT108; Plates 31, 32), and at 17½ ms (Incident No. NT86; Plate 34) resulted in prolonged lane closures.

Additionally, 42 other minor incidents involving lane closures for short periods affected Castle Peak Road; an example is shown in Plate 25. These were dealt with directly by Highways Office.

5.4 CONSTRUCTION SITES

Quite a number of landslips took place on slopes that were recently constructed or under construction. A selection of cases are quoted here.

(a) Chai Wan Road near junction with Lok Man Road
(Incident No. HK24, Plates 27 and 28)

Slope fell within active construction site of Housing Department.

(b) South Bay Close, RBL 1044
(Incident No. HK33/GCB21, Plate 45)

Cut slope was newly completed within construction site.

(c) Borrow area at Kwun Yam Shan, near Kadoorie Farm, N.T.
(No Incident Number, Plate 46)

Cut slopes were recently constructed.

(d) Sha Tin Areas 11 and 51 and Borrow Area 64

Numerous cut and fill slope failures occurred on newly completed works.

5.5 CATCHWATERS

Water Supplies Department reported a total of 160 failures on the 120 km of catchwaters, of which 19 were classified as causing major blockage. The latter all occurred on Tai Lam Chung and Shing Mun Catchwaters in south west New Territories. The highest number of failures reported were the Tai Lam Chung and Shek Pik Catchwaters.

GCO inspected approximately 12 km of catchwater channel in south New Territories and recorded details of 9 major and about 20 minor failures. Most of these incidents involved minor soil or soil/rock cut slope failures on the upslope side of the catchwater channel (Plate 53).

Occasional larger failures resulted in complete blockage of the catchwater channel, which caused water to pond behind the slip debris and overflow down the natural slopes on the upstream side of the blockage. Large erosion scars have been caused by these over-topping flows, but the majority of these incidents occurred in remote areas, and damage has been restricted to local wash-outs of the catchwater tracks and waterworks access roads.

A soil cut slope failure on the Tai Lam Chung catchwater section "O" (Incident No. NT24) is shown in Plate 54. This occurred on 29 May behind a recently constructed block of high-rise flats (Allway Gardens) on the northwest edge of Tsuen Wan. The failure was approximately 7 m high by 10 m wide in completely decomposed volcanic rock containing some large corestones of highly decomposed material. Infiltration into the natural slope above the cut slope is thought to have been the cause of the failure. As shown in Plate 54, the slip debris completely blocked the catchwater channel and caused overtopping water to flow down a 30 m high cut slope at the rear of the Allway Gardens Estate. In this case, the flow was limited because the ponded water was discharged over an overflow wier some 50 m upstream of the failure site. This restricted the damage on the large cut slope below to minor erosion of the chunam cover.

5.6 COUNTRY PARKS

The Agriculture and Fisheries Department has reported to GCO landslips that have occurred in Country Park areas as a result of the May rainstorm. Typical failures are shown in Plate 59. It is estimated from the location plans prepared by the A and FD that well over 300 landslips, mostly in natural slopes, have taken place. The majority of the failures were in the Tai Lam/Tai Mo Shan/Shing Mun and Tai Po Kau Parks (see Table 7).

TABLES

LIST OF TABLES

TABLE 1 : SUMMARY OF INCIDENTS REPORTED TO THE GEOTECHNICAL CONTROL ORGANISATION AND RECOMMENDATIONS MADE

	GCO				GCB				GCO + GCB				REMARKS
	HK	K	NT	SUB-TOTAL	HK	K	NT	SUB-TOTAL	HK	K	NT	TOTAL	
No. of Incidents Reported	88	147	282	517	27	3	29	59	115	150	311	576	Some cases were reported to both GCO and GCB.
No. of Incidents Handled	78	146	273	497	25	3	26	54	103	149	299	551	Responsibility of GCO and GCB sorted out.
No. of Incidents Inspected	75	140	257	472	24	2	26	52	99	142	283	524	Some cases did not require inspection by GCO or GCB. Some incidents were inspected by both GCO and GCB.
No. of Incidents Affecting Squatters	28	129	104	261	3	1	1	5	31	130	105	266	
No. of Incidents Affecting Buildings	7	1	70	78	13	2	20	35	20	3	90	113	"Buildings" include rear yard space, car park, etc. of buildings and NT exempted houses
No. of Incidents Affecting Roads	42	8	77	127	5	0	4	9	47	8	81	136	"Roads" include footpaths adjoining carriageway
No. of Squatter Huts Recommended for Permanent Evacuation	145	720	288	1153	0	0	0	0	145	720	288	1153	
No. of Closure Orders Recommended	-	-	1	1	2	0	7	9	2	0	8	10	Closure Orders under Buildings Ordinance
No. of D' Notices Recommended	-	-	-	-	9	1	10	20	9	1	10	20	Dangerous Buildings/Slopes Notices under Buildings Ordinance
No. of Advisory Letters Recommended	-	-	-	-	3	0	0	3	3	0	0	3	Served on Private Owners

TABLE 2 : DAILY AND MONTHLY TOTALS OF INCIDENTS REPORTED TO THE GEOTECHNICAL CONTROL ORGANISATION

Office / Date	GCO				GCB				GCO + GCB				
	HK	K	NT	SUB-TOTAL	HK	K	NT	SUB-TOTAL	HK	K	NT	TOTAL	ACCUMU. TOTAL
28/5	1	1	1	3	-	-	-	-	1	1	1	3	3
29/5	30	18	27	75	8	1	8	17	38	19	35	92	95
30/5	4	-	1	5	-	-	-	-	4	-	1	5	100
31/5	25	26	27	78	14	2	7	23	39	28	34	101	201
1/6	16	16	8	40	2	-	8	10	18	16	16	50	251
2/6	3	9	28	40	-	-	3	3	3	9	31	43	294
3/6	4	5	47	56	1	-	3	4	5	5	50	60	354
4/6	-	11	5	16	1	-	-	1	1	11	5	17	371
5/6	-	1	1	2	1	-	-	1	1	1	1	3	374
6/6	-	-	-	-	-	-	-	-	-	-	-	-	374
7/6	1	-	8	9	-	-	-	-	1	-	8	9	383
8/6	-	35	3	38	-	-	-	-	-	35	3	38	421
9/6	3	1	17	21	-	-	-	-	3	1	17	21	442
10/6	-	13	5	18	-	-	-	-	-	13	5	18	460
11/6	-	10	27	37	-	-	-	-	-	10	27	37	497
12/6	1	-	-	1	-	-	-	-	1	-	-	1	498
13/6	-	-	-	-	-	-	-	-	-	-	-	-	498
14/6	-	1	6	7	-	-	-	-	-	1	6	7	505
15/6	-	-	5	5	-	-	-	-	-	-	5	5	510
16/6	-	-	8	8	-	-	-	-	-	-	8	8	518
17/6	-	-	4	4	-	-	-	-	-	-	4	4	522
18/6	-	-	4	4	-	-	-	-	-	-	4	4	526
19/6	-	-	-	-	-	-	-	-	-	-	-	-	526
20/6	-	-	-	-	-	-	-	-	-	-	-	-	526
21/6	-	-	9	9	-	-	-	-	-	-	9	9	535
22/6	-	-	2	2	-	-	-	-	-	-	2	2	537
23/6	-	-	6	6	-	-	-	-	-	-	6	6	543
24/6	-	-	4	4	-	-	-	-	-	-	4	4	547
25/6	-	-	-	-	-	-	-	-	-	-	-	-	547
26/6	-	-	-	-	-	-	-	-	-	-	-	-	547
27/6	-	-	-	-	-	-	-	-	-	-	-	-	547
28/6	-	-	2	2	-	-	-	-	-	-	2	2	549
29/6	-	-	2	2	-	-	-	-	-	-	2	2	551
30/6	-	-	-	-	-	-	-	-	-	-	-	-	551
1/6 - 30/6	28	102	201	331	5	-	14	19	33	102	215	350	551
1/7 - 31/8	-	-	7	7	-	-	-	-	-	-	7	7	558
1/8 - 31/8	-	-	18	18	-	-	-	-	-	-	18	18	576
Total	88	147	282	517	27	3	29	59	115	150	311	576	
										GRAND TOTAL		576	

TABLE 3 : DEATH TOLL

Location	No. of Victims	Cause of Death	Remarks
Tsin Shui Ma Tau Village, Shau Kei Wan, H.K.	1	Soil cut slope failure	Inspected by JP/GCO
Mt. Parker Road, Shau Kei Wan, H.K.	2	Natural slope failure	Inspected by WH/GCO
Yuen Mo Village, Junk Bay Road, Kowloon	3	Natural slope failure	Inspected by NKT/GCO
Lam Tin First Village, Kowloon	2	Soil cut slope failure	Inspected by NKT/GCO
Lam Tin Third Village, Section 1, Kowloon	1	Natural slope failure	Inspected by NKT/GCO
Lam Tin Third Village, Section 2, Kowloon	3	Soil cut slope failure	Inspected by NKT/GCO
	2	Natural slope failure	
Yuen King Village, opp. Shun Lee Tsuen Resite Area, Kowloon	1	Fill slope failure	Inspected by GWB/GCO
Chung Luen Village, north of So Uk, Kowloon	3	Natural slope failure	Inspected by YCC/GCO
Rennie's Mill Section 4, N.T.	3	Natural slope failure	Inspected by HD
Rennie's Mill Section 10, N.T.	1	Soil cut slope failure	Inspected by HD
Hillside opposite Tsui Ping Estate, Kowloon	3	Electrocution	-
Yuen Long, N.T.	3	Drowning	-

Summary :	Death Caused by			Sub-total
	landslip	electrocution	drowning	
Hong Kong	3	-	-	3
Kowloon	15	3	-	18
New Territories	4	-	3	7
Sub-total	22	3	3	-
			Grand total :	28

Note : Figures shown in above table are based on records of the Coroner's Court, Fire Services Department, Housing Department and Royal Hong Kong Police Force.

TABLE 4 : STATISTICS ON DATES OF LANDSLIPS

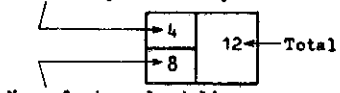
Date	No. of Landslips Known to Have Occurred on Given Date
28/5	4
29/5	234
30/5	6
31/5	11
1/6	2
2/6	1
3/6	2
4/6	1
5/6	0
6/6	0
7/6	1
Unknown	274
TOTAL	536

Note : Only incidents involving the collapse of soil and rock are included in this Table.

TABLE 5 : STATISTICS ON TYPES OF LANDSLIPS

TYPE OF LANDSLIPS	GCO								GCB								GCO + GCB									
	HK		K		NT		SUB-TOTAL		HK		K		NT		SUB-TOTAL		HK		K		NT		TOTAL		PERCENTAGE	
FILL SLOPE	0 / 5	5	1 / 5	6	2 / 13	15	3 / 23	26	0 / 0	0	0 / 0	0	3 / 1	4	3 / 1	4	0 / 5	5	1 / 5	6	5 / 14	19	6 / 24	30	1.4 / 5.7	7.1
SOIL CUT SLOPE	3 / 24	27	1 / 7	8	20 / 107	127	24 / 138	162	3 / 4	7	0 / 1	1	8 / 5	13	11 / 10	21	6 / 28	34	1 / 8	9	28 / 112	140	35 / 148	183	8.3 / 35.1	43.4
ROCK CUT SLOPE	0 / 4	4	0 / 4	4	0 / 8	8	0 / 16	16	0 / 0	0	0 / 0	0	0 / 0	0	0 / 0	0	0 / 4	4	0 / 4	4	0 / 8	8	0 / 16	16	0.0 / 3.8	3.8
SOIL/ROCK CUT SLOPE	3 / 13	16	0 / 3	3	4 / 5	9	7 / 21	28	4 / 3	7	0 / 0	0	0 / 0	0	4 / 3	7	7 / 16	23	0 / 3	3	4 / 5	9	11 / 24	35	2.6 / 5.7	8.3
NATURAL SLOPE	1 / 12	13	2 / 3	5	20 / 38	58	23 / 53	76	3 / 2	5	0 / 0	0	0 / 3	3	3 / 5	8	4 / 14	18	2 / 3	5	20 / 41	61	26 / 58	84	6.1 / 14.0	20.1
BOULDER FALL	0 / 8	8	0 / 0	0	5 / 10	15	5 / 18	23	0 / 1	1	0 / 0	0	0 / 0	0	0 / 1	1	0 / 9	9	0 / 0	0	5 / 10	15	5 / 19	24	1.2 / 4.5	5.7
RETAINING WALL	0 / 4	4	0 / 2	2	6 / 28	34	6 / 34	40	1 / 3	4	0 / 0	0	4 / 1	5	5 / 4	9	1 / 7	8	0 / 2	2	10 / 29	39	11 / 38	49	2.6 / 9.0	11.6
UNCLASSIFIED	0 / 0	0	0 / 112	112	0 / 3	3	0 / 115	115	0 / 0	0	0 / 0	0	0 / 0	0	0 / 0	0	0 / 0	0	0 / 112	112	0 / 3	3	0 / 115	115	Total : 100%	

LEGEND : No. of major landslip



No. of minor landslip

Remark : (1) Landslip is classified as major if volume of landslip debris exceeds 50 m³, and minor if volume is less than 50 m³.

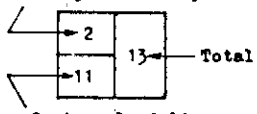
(2) Total No. of classified landslips = 421

(3) Total No. of landslips = 536

TABLE 6 : NUMBER AND TYPES OF INCIDENTS AFFECTING SQUATTER AREAS

TYPE OF INCIDENT	GCO								GCB								GCO + GCB							
	HK		K		NT		SUB-TOTAL		HK		K		NT		SUB-TOTAL		HK		K		NT		TOTAL	
FILL SLOPE FAILURE	0	4	1	4	0	4	1	12	0	0	0	0	0	1	0	1	0	4	1	4	0	5	1	13
	4		3		4		11		0		0		1		1		4		3		5		12	
SOIL CUT SLOPE FAILURE	2	13	0	5	2	48	4	66	1	1	0	0	0	0	1	1	3	14	0	5	2	48	5	67
	11		5		46		62		0		0		0		0		11		5		46		62	
ROCK CUT SLOPE FAILURE	0	0	0	3	0	2	0	5	0	0	0	0	0	0	0	0	0	0	0	3	0	2	0	5
	0		3		2		5		0		0		0		0		0		3		2		5	
SOIL/ROCK CUT SLOPE FAILURE	2	3	0	6	1	3	3	6	0	0	0	0	0	0	0	0	2	3	0	0	1	3	3	6
	1		0		2		3		0		0		0		0		1		0		2		3	
NATURAL SLOPE FAILURE	0	5	2	4	9	28	11	37	1	1	0	0	0	0	1	1	1	6	2	4	9	28	12	38
	5		2		19		26		0		0		0		0		5		2		19		26	
BOULDER FALL	0	3	0	1	1	4	1	8	0	1	0	0	0	0	0	1	0	4	0	1	1	4	1	9
	3		1		3		7		1		0		0		1		4		1		3		8	
RETAINING WALL FAILURE	0	0	0	2	1	11	1	13	0	1	0	1	0	0	0	2	0	1	0	3	1	11	1	15
	0		2		10		12		1		1		0		2		1		3		10		14	
UNCLASSIFIED LANDSLIP	0	0	0	110	0	1	0	111	0	0	0	0	0	0	0	0	0	0	0	110	0	1	0	111
	0		110		1		111		0		0		0		0		0		110		1		111	
FLOODING	1		2		3		6		0		0		0		0		1		2		3		6	
OTHERS	0		0		1		1		0		0		0		0		0		0		1		1	

LEGEND : No. of major landslip



No. of minor landslip

Remarks : (1) Landslip is classified as major if volume of landslip debris exceeds 50 m^3, and minor if volume is less than 50 m^3.

(2) Total No. of landslips excluding flooding and others = 264.

TABLE 7 : DISTRIBUTION OF LANDSLIPS IN COUNTRY PARK AREAS

Name of Country Park	Approx. No. of Landslips
Lantau	71
Sai Kung	10
H.K. Island	3
Pat Sin Range Plover Cove	44
Tai Lam/Tai Mo Shan/ Shing Mun/Tai Po Kau	176
Total	304

Note : The figures shown in above Table are based on landslip location plans prepared by the Agriculture and Fisheries Department.

TABLE 8 : STATISTICS ON RETAINING WALL INCIDENTS

Area	No. of Incidents	Scale*		Area Affected+				Deaths
		Major	Minor	Squatter	Road	Building	Others	
Hong Kong	8	1	7	1	4	3	2	0
Kowloon	2	0	2	2	0	0	0	0
New Territories	39	10	29	10	11	21	2	0
Total	49	11	38	13	15	24	4	0

Walls Showing Signs of Severe Distress

Area	No.	Height			No. of walls >3m	
		<3m	>3m	Unknown	Catalogued°	Uncatalogued
Hong Kong	4	1	2	1	0	2
Kowloon	1	0	1	0	0	1
New Territories	10	8	2	0	0	2
Total	15	9	5	1	0	5

Walls which Actually Failed

Area	No.	Height			No. of Walls >3m	
		<3m	>3m	Unknown	Catalogued°	Uncatalogued
Hong Kong	4	3	1	0	1	0
Kowloon	1	0	0	1	0	0
New Territories	29	12	7	10	1	6
Total	34	15	8	11	2	6

* Scale is major if volume of debris exceeds 50 m^3, minor if less than 50 m^3

\+ Note that some of the wall failures affected two areas (e.g. a road and a building). In such cases, both areas have been included on the table.

o Walls catalogued by GCO Consultants under Landslip Study Phase I Reappraisal

FIGURES

LIST OF FIGURES

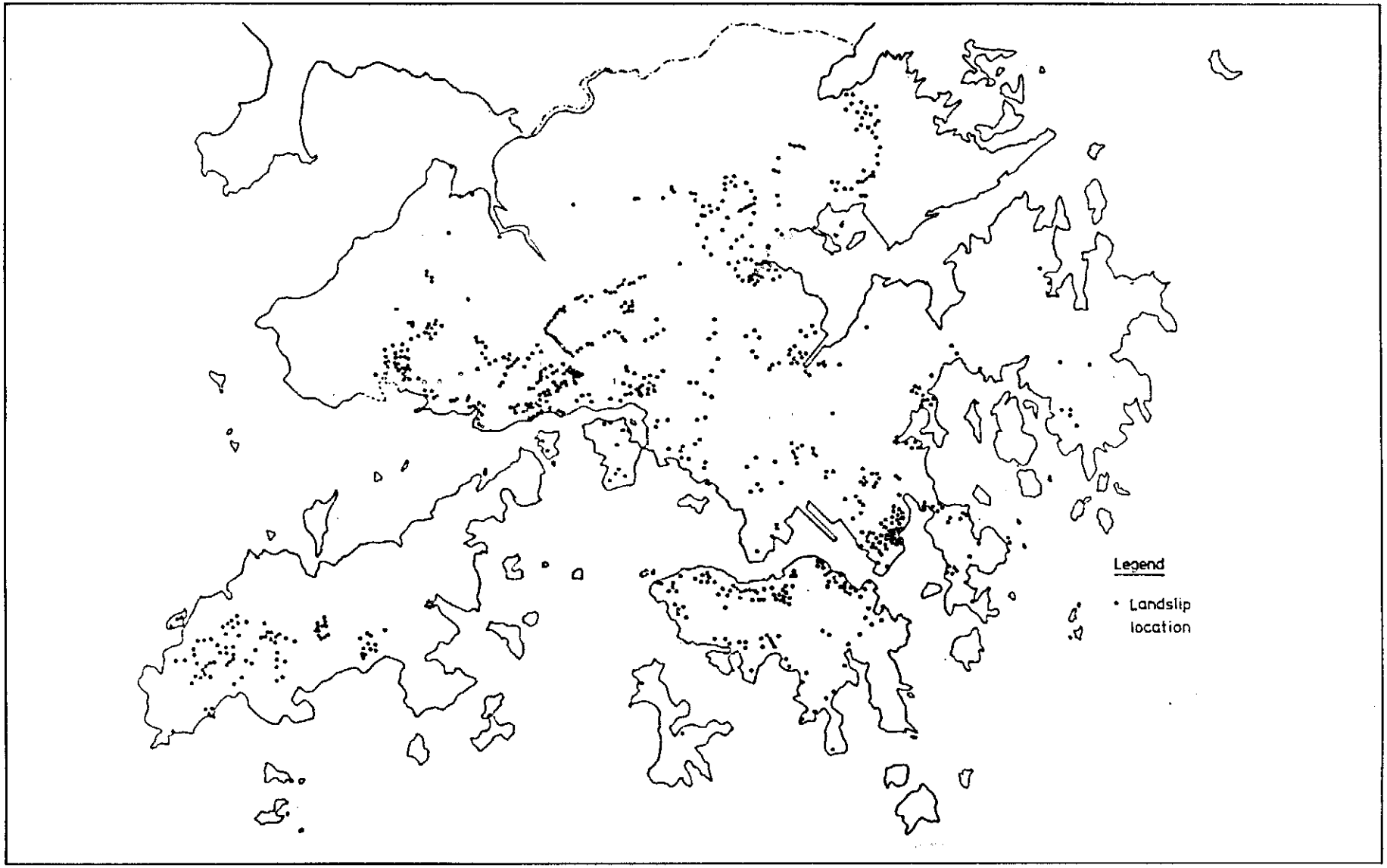


Figure 1 - Location plan of reported and observed landslips resulting from May 1982 Rainstorm

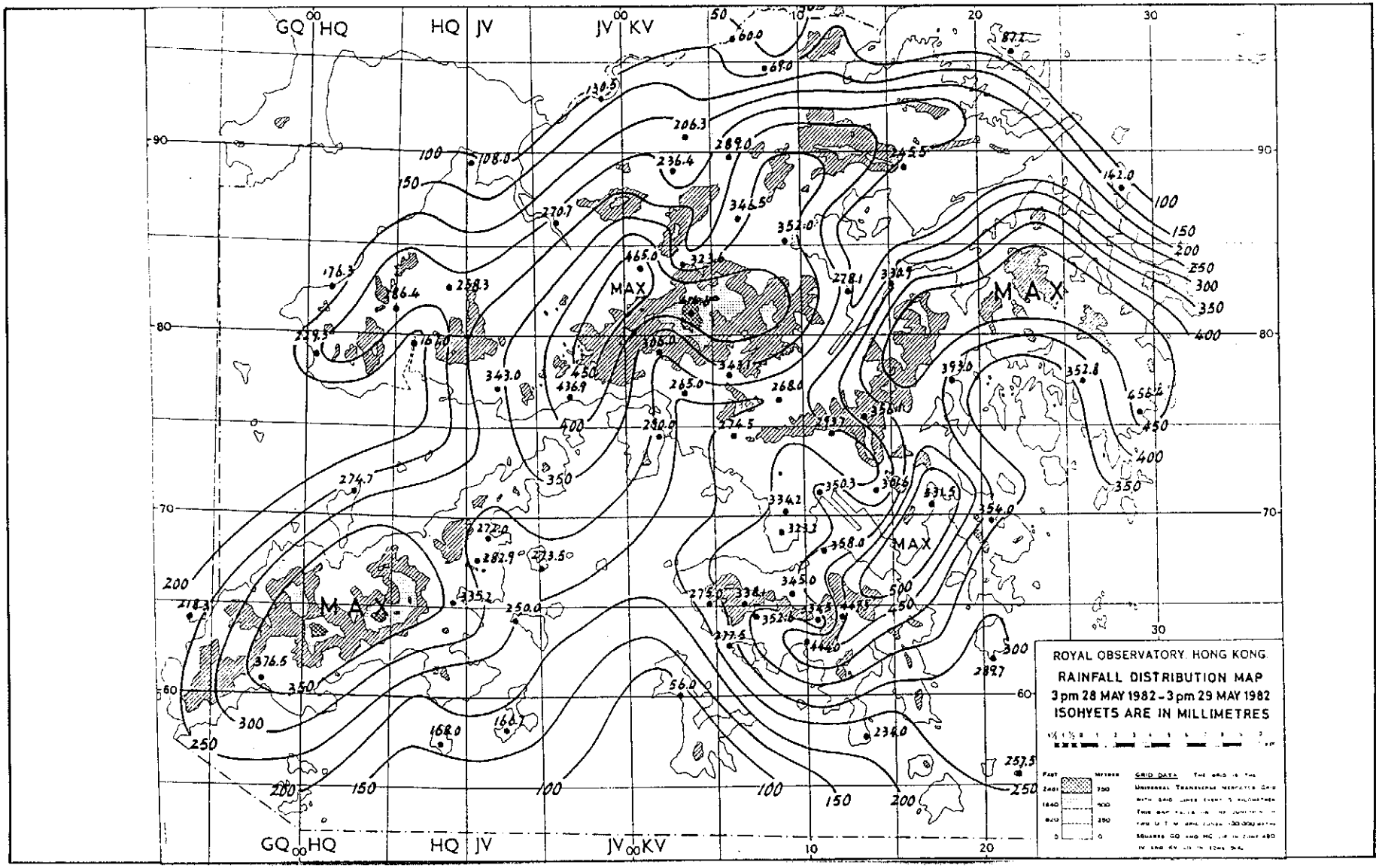


Figure 2 - Rainfall distribution for the 24-hour period from 3 p.m. on 28 May to 3 p.m. on 29 May 1982

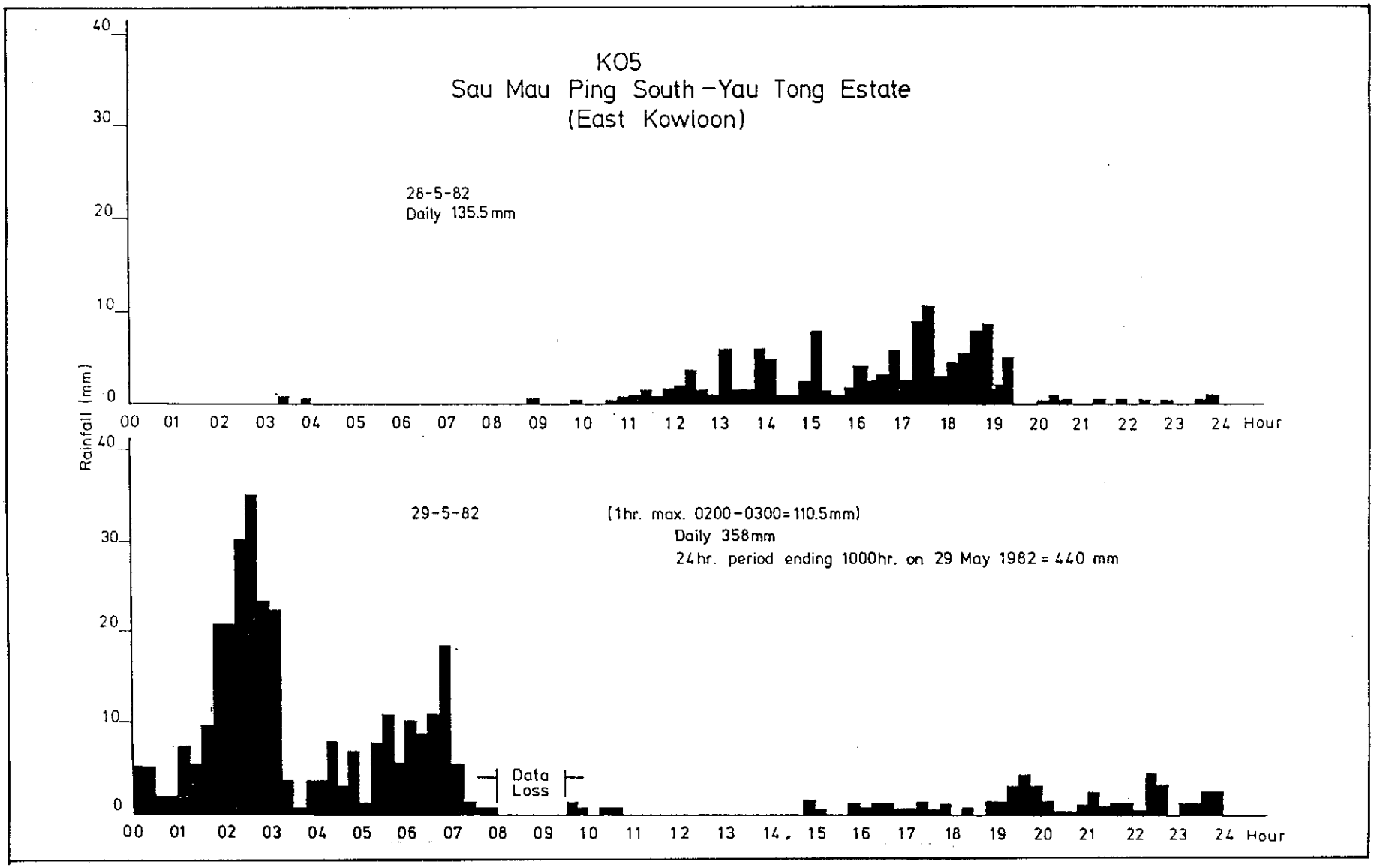


Figure 3 - 15 minute rainfall recorded by GCO Raingauge K05 at Yau Tong, east Kowloon on 28 & 29 May 1982

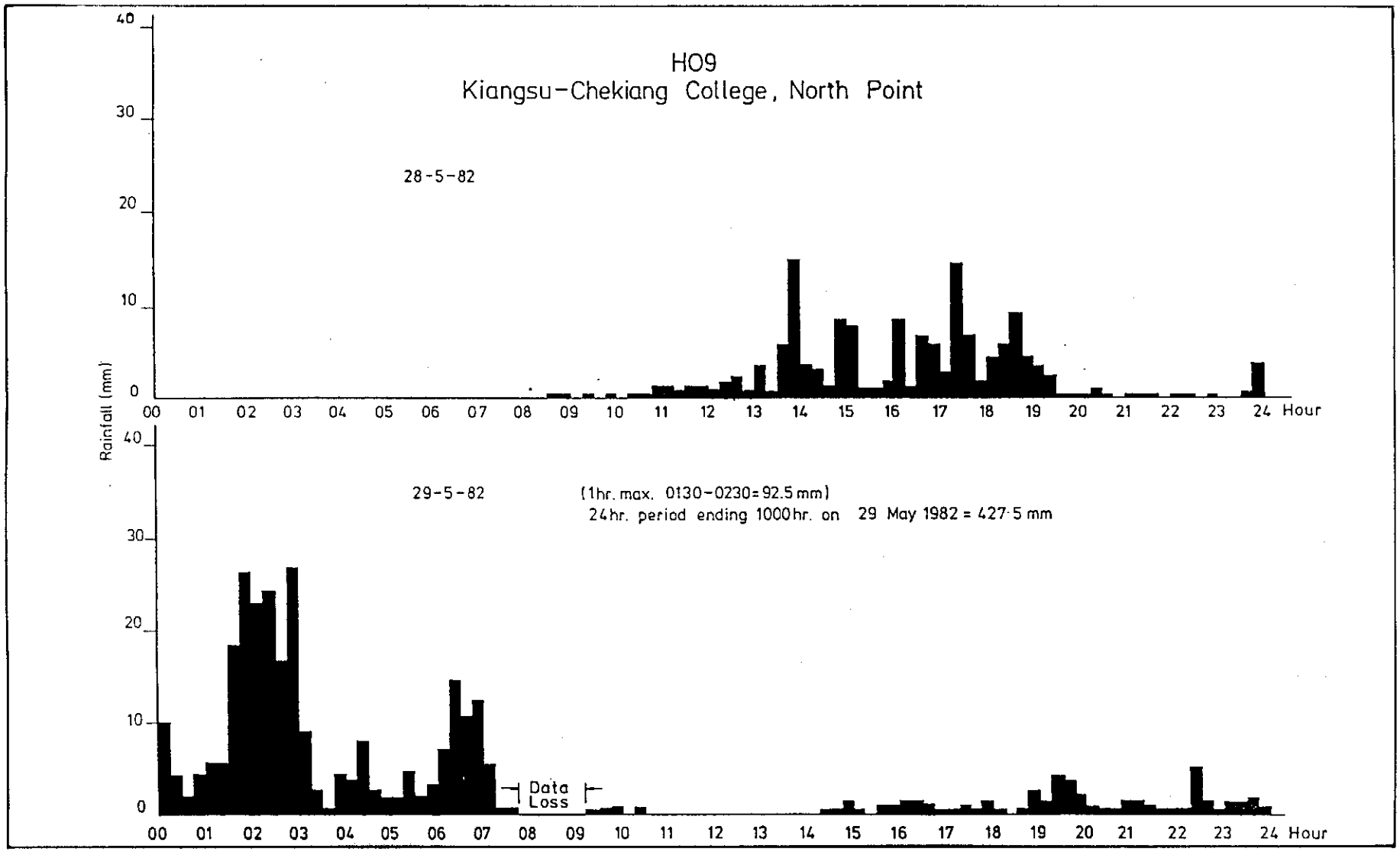


Figure 4 - 15 minute rainfall recorded by GCO Raingauge H09 at Kiangsu-Chekiang College. North Point 28 & 29 May 1982

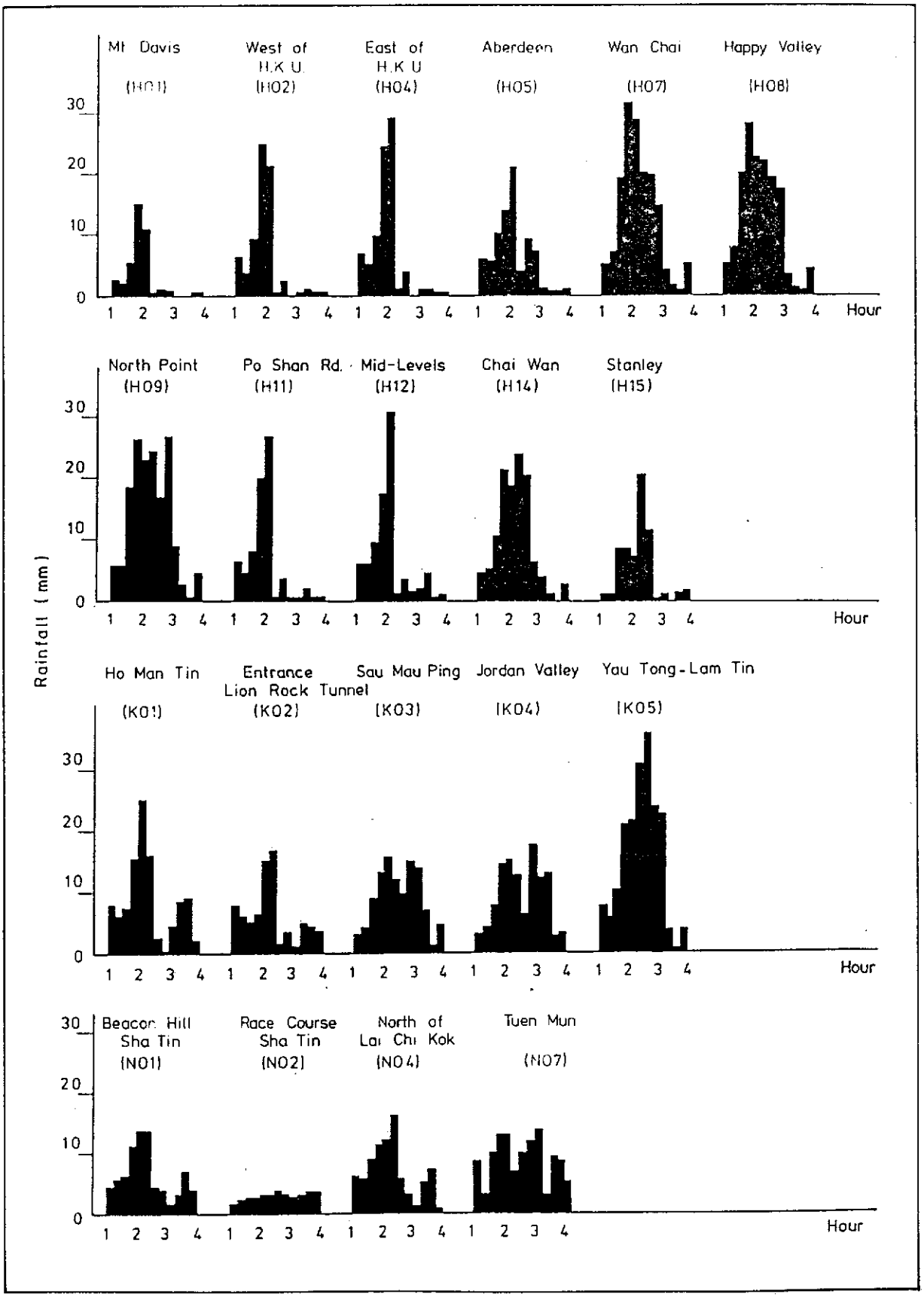
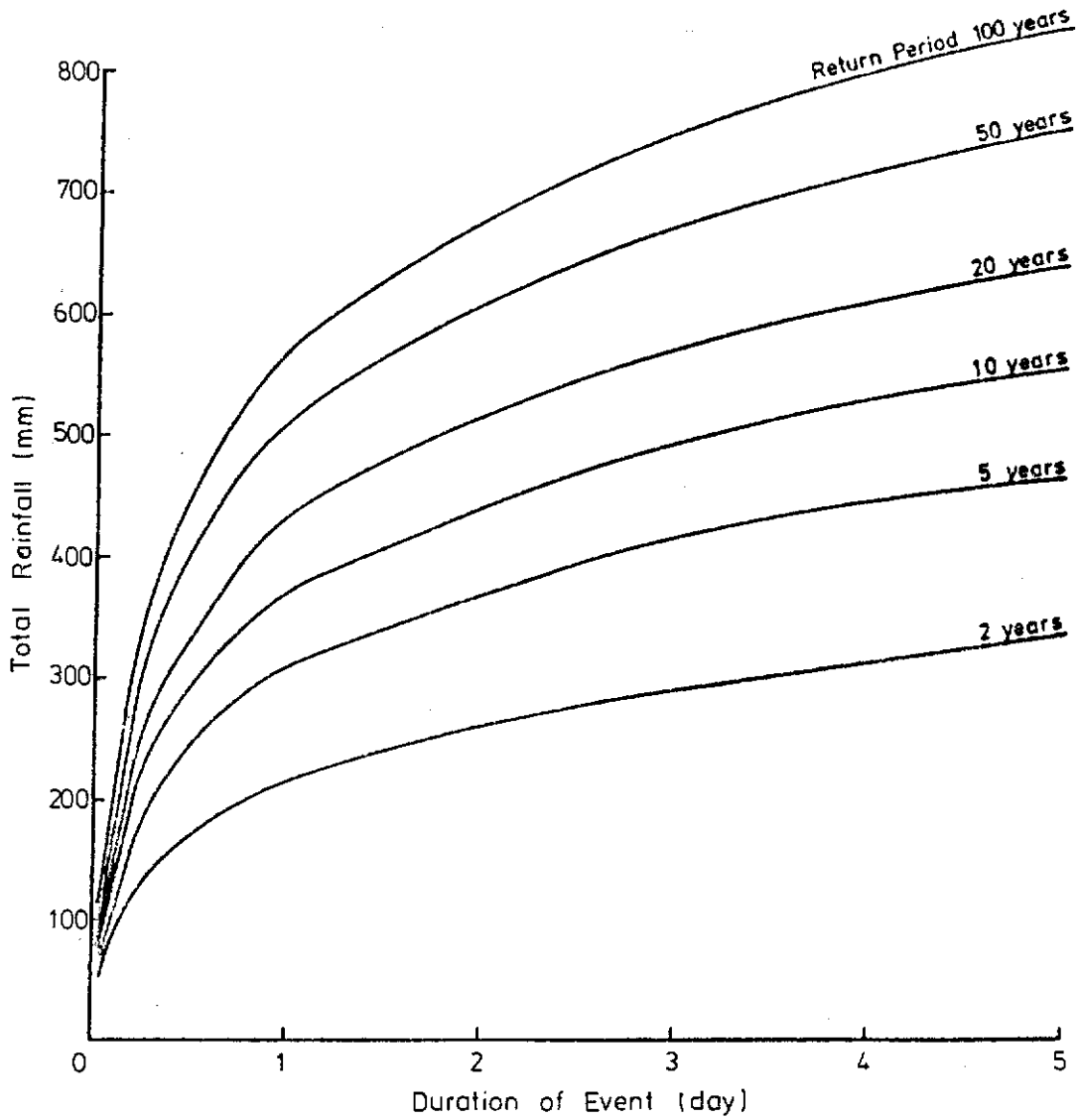
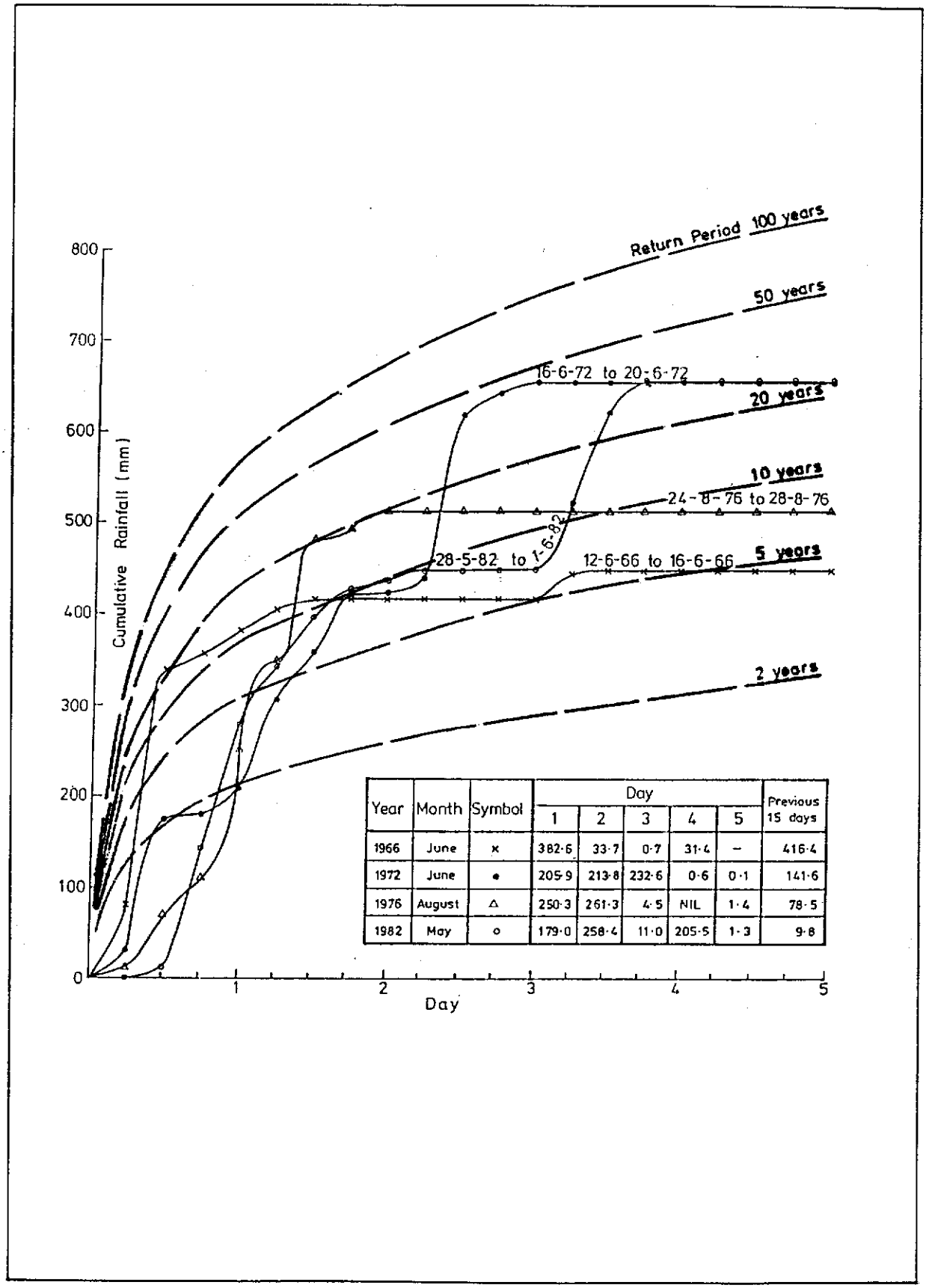


Figure 5 - 15 minute rainfall recorded by GCO Raingauges during 0100 - 0400 hr. on 29 May 1982



Note : Extreme depth of rainfall corresponding to various return periods was based on GUMBEL's Method and hourly and daily rainfall data recorded at the Royal Observatory, Tsim Sha Tsui, 1884-1939; 1947-1980

Figure 6 - Extreme rainfall for various durations of events and return periods



Year	Month	Symbol	Day 1	2	3	4	5	Previous 15 days
1966	June	×	382·6	33·7	0·7	31·4	–	416·4
1972	June	•	205·9	213·8	232·6	0·6	0·1	141·6
1976	August	△	250·3	261·3	4·5	NIL	1·4	78·5
1982	May	○	179·0	258·4	11·0	205·5	1·3	9·8

Figure 7 – Comparison of rainfall with significant past events (based on rainfall recorded by Royal Observatory at Tsim Sha Tsui)

PLATES

LIST OF PLATES

* See legend on Page 66.

LIST OF PLATES

* See legend on Page 66.

LIST OF PLATES

* See legend on Page 66.

LIST OF PLATES

* See legend on Page 66.

LIST OF PLATES

* See legend on Page 66.

LIST OF PLATES

* Legend of Source : ES/GCO = Existing Slopes Division/GCO

API/GCO = Aerial Photographs Interpretation Section/GCO

SD/LD = Reprographic Section, Survey Division, Lands Department

Plate 1

Plate 2

Plate 1 & Plate 2

Landslip at Yuen Mo Village, Lam Tin.
- 3 deaths
(Incident No. K13)

Plate 3

Landslip at Lam Tin 1st Village, Kwun Tong
- 2 deaths
(Incident No. K14)

Plate 4

Landslip at Lam Tin 3rd Village, 2nd Section
- 2 deaths at this incident
(3 deaths at incident about 30 m away)
(Incident No. K31)

Plate 5

Plate 5 & Plate 6

Soil cut slope failure at Tsin Shui Ma Tau Village, Shau Kei Wan. (Incident No. HK2)

Plate 6

Plate 7

Plate 7 & Plate 8

Natural slope failure
at Mt. Parker Road,
above Quarry Bay Street,
Shau Kei Wan.
- 2 deaths
(Incident No. HK82)

Plate 8

Plate 9

Soil/rock cut slope failure at Holy Cross Path Village, Shau Kei Wan.
(Incident No. HK74)

Plate 10

Landslips affecting squatter huts

Plate 11

Squatter area affected by the fire of 1981
(Kowloon east)

Plate 12

Scene of squatter area after rainstorm
(Kowloon east)

Plate 13

Soil/rock cut slope failure at 90, Kennedy Road (Incident No. HK10/ GCB 6 & 34)

Plate 14

Soil/rock cut slope failure behind 1, Conduit Road, Chater Hall (Incident No. HK32/GCB26)

Plate 15

Plate 16

Plate 15 & Plate 16

Soil cut slope & retaining wall failure at Wan On Terrace, Tsuen Wan (Incident No. NT23)

Plate 17

Soil cut slope & retaining wall failure at Man King Toi, 6½ m Clear Water Bay Road (Incident No. NT210)

Plate 18

Failure of the natural slope above a cut slope at 21 Ventris Terrace, Hong Kong (Incident No. HK58/GCB45)

Plate 19

Retaining wall failure at junction of
Mt. Nicholson & Stubbs Road,
No. 50, Stubbs Road.
(Incident No. HK36)

Plate 20

Retaining wall failure at
Stubbs Road, near
Lingnam College.
(Incident No. HK34)

Plate 21

soil/rock cut slope failure
at Tramway near May Road Station.
(Incident No. HK 6)

Plate 22

Rock cut slope failure at junction
of May Road & Magazine Gap Road.
(Incident No. HK 84)

Plate 23

Soil/rock cut slope failure at King's Road near Tai Koo Shing Road Junction.
(Incident No. HK61)

Plate 24

Soil/rock cut slope failure at Tong Bin Lane, behind Fire Station, Aberdeen.
(Incident No. HK83)

Plate 25

Soil/rock cut slope failure at 13ms Castle Peak Road

Plate 26

Cut slope failure at Chung Hom Kok (Incident No. HK42)

Plate 27

Plate 27 & 28

Soil cut slope failure at Chai Wan Road near junction with Lok Man Road. (Incident No. HK24)

Plate 28

Plate 29

Plate 29 & 30

Soil cut slope failure at Junk Bay Road, Lam Tin. (Incident No. K18)

Plate 30

Plate 31

Plate 31 & Plate 32

Fillslope & retaining wall failure at 13½ ms Castle Peak Road. (Incident No. NT108/GCB 12A)

Plate 32

Plate 33

Fillslope failure at 13¼ ms Castle Peak Road, opposite Lai Shum Villa.
(Incident No. NT7)

Plate 34

Fill slope failure at 17½ ms Castle Peak Road near Siu Wo Village
(Incident No. NT86)

Plate 35

Soil/rock cut slope failure at Hong Ning Road, Kwun Tong. (Incident No. K28)

Plate 36

Soil cut slope failures at CH 6750, Tuen Mun Highway. (Incident No. NT79)

Plate 37

Plate 37 & Plate 38

Soil/rock cut slope failure at CH 10050
Tuen Mun Highway.
(Incident No. NT8)

Plate 38

Plate 39

Soil/rock cut slope failure at CH 10350 Tuen Mun Highway. Failure of big boulder was imminent. (See also Plate 44 for close up view)
(Incident No. NT70)

Plate 40

Soil/rock cut slope failure at CH 10350 Tuen Mun Highway (Boulder destroyed by blasting)
(Incident No. NT70)

Plate 41

Boulder fall & natural slope failure at Greenwich Garden, Kam Shan Village, Tai Po. (Incident No. NT 159)

Plate 42

Boulder fall at Caroline Hill Road near New Method College, opposite South China Athletic Association (Boulder split) (Incident No. HK38)

Plate 43

Boulder fall & soil cut slope failure at Peak Road
(Incident No. HK22)

Plate 44

Boulder perched on soil/rock cut slope at CH 10350 Tuen Mun Highway - Boulder shown subsequently destroyed by blasting
(See also Plate 39 and Plate 40)
(Incident No. NT70)

Plate 45

Soil/rock cut slope failure at RBL 1044, South Bay Close, H.K.
(Incident No. HK33/GCB21)

Plate 46

Soil cut slope failure at Kwun Yam Shan borrow area near Kadoorie Farm, N.T.

Plate 47

Plate 47 & Plate 48

Movement has taken place on cut slope at Road TY1, South West Tsing Yi (Incident No. NT231)

Plate 48

Plate 49

Natural slope failure at Lai Chi Hang Chuen, Tai Po.
(Incident No. NT11)

Plate 50

Fillslope failure at Nam Hang Tsuen
(Incident No. NT98)

Plate 51

Soil cut slope & retaining wall failure at Nos. 26-27 Sun On Tsuen, Sai Kung. (Incident No. NT62)

Plate 52

Soil cut slope failure and boulder fall at Tai Lam Chung Catchwater Section 'K' CH 1990-2015 near Tsing Lung Tau (Incident No. NT245)

Plate 53

Several failures along Tai Lam Chung Catchwater, between CH 680 and CH 770.

Plate 54

Soil cut slope failure at Tai Lam Chung Section 'O' Catchwater above West Tsuen Wan
(Incident No. NT24)

Plate 55

Natural slope failure behind Kowloon Textiles Factory Quarters, Sham Tseng, N.T.
(Incident No. NT10)

Plate 56

Natural slope failure behind Kowloon Textiles Factory Quarters. Landslip debris blocked the nullah downslope, causing flooding problem.
(Incident No. NT10)

Plate 57

Plate 57 & Plate 58

Natural & soil/rock cut slope failure along Nam Long Shan Road, access to Ocean Theatre, H.K. (Incident No. GCB2)

Plate 58

Plate 59

Natural slope failures around Tai Lam Country Park

Plate 60

Natural slope failure at DD 390 Lot 207
Sham Tseng, Tsuen Wan
(Incident No. 198)

APPENDICES

APPENDIX 1

List of Incidents

This Appendix is a list of incidents caused by the May rainstorm and reported to the Geotechnical Control Organisation. Reports on these May rainstorm related incidents were received by the GCO up to 5 months after the event. This list includes details of those incidents reported up to the 30th September 1982.

Master List of Incidents reported to Geotechnical Control Organisation

(A) List of Incidents in Hong Kong reported to Geotechnical Control Office

Incident No.	Location	Call Received		Failure			Area Affected	Consequence	Remarks
		on	from	Date	Type	Scale			
HK 1	Aldrich Village, Shaukiwan	29-5	Police	29-5	Soil cut slope	Minor	Squatter	Permanent evacuation of 6 huts	
HK 2	Tsin Shui Ma Tau Village, Shaukiwan	29-5	Police	29-5	Soil cut slope	Major	Squatter	1 dead + Permanent evacuation of 16 huts	
HK 3	Sun Shing Street near Tel. Co., Shaukiwan	29-5	Police	29-5	Boulder	Minor	Squatter		
HK 4	Nam Fung Road/Wong Chuk Hang Road	29-5	H/HK	29-5	Soil cut slope	Minor	Squatter + road	Permanent evacuation of 49 huts	
HK 5	Along Victoria Road Lamp Post 10841-51, near Baguio Villa	29-5	H/HK	29-5	Boulder	Minor	Road	-	Dealt with by H/HK
HK 6	Tramway near May Road Station	29-5	Peak Tram	29-5	soil/ rock cut slope	Major	Tram way	Service stopped	
HK 7	Ah Kung Ngam, opposite Lamp Post 14770	29-5	Police		Soil/rock cut slope	Minor	Road	-	
HK 8	Ma Sha Village, behind North Point	1-6	H/HK		Fill slope	Minor	Squatter	-	
HK 9	Junction of Ma Shan Village & Holy Cross Path Village, Shaukiwan	29-5	Police		Soil/rock cut slope	Major	Squatter	Permanent evacuation of 14 huts	
HK10	90 Kennedy Road	29-5	Police		Soil/rock cut slope	Major	Road + building	Evacuation of a couple of floors	Referred to GCB case GCB 6 & 34
HK11	No. 62 of Kai Yuen Terrace, North Point	29-5	Public	29-5	Natural slope	Minor	Building	-	Referred to GCB
HK12	No. 7 Stubbs Road Shui Tai Terrace	29-5	Public		Soil cut slope	Minor	Building	Access to building blocked	Referred to GCB case GCB4
HK13	New Method College at 101 Caroline Hill Road	29-5	Public		Natural/soil cut slope	Minor	School building	-	Referred to GCB case GCB3
HK14	26 Wan Shan Sai Tsuen, Shau Kei Wan	29-5	Police	29-5	Natural slope + boulders	Minor	Squatters	Squatter hut destroyed	GCO involvement not required
HK15	Area 4, Hoi Pong Village, Mount Davis	29-5	CDO	29-5	Soil cut slope	Minor	Roads & squatters	Permanent evacuation of 2 huts	
HK16	Tai Wai Shan Village, Ka Wai Man Road	29-5	CDO	29-5	Soil cut slope	Major	Squatter	Permanent evacuation of 6 huts	
HK17	Wong Ma Kok Road, Stanley	28-5	H/HK	28-5	Boulder	Minor	Road	One lane closed	
HK18	Oakland Avenue	29-5	GCB		Cracks on road	Minor	Road	-	
HK19	Mansion Street, North Point	29-5	H/HK		Natural slope	Minor	Squatter	Permanent evacuation of 7 huts and school playground closed	
HK20	No. 72 Old Main Street Aberdeen	29-5	H/HK		Boulders	Minor	Access to squatter and construction site	Footpath blocked	Referred to GCB case GCB33
HK21	Yee Pak Kung Temple, King's Road opposite Tong Chong Street	29-5	H/HK	29-5	Retaining wall	Major	Squatter and school	Debris blocked Quarry Bay Junior School playground	Dealt with by GCB case GCB17

Master List of Incidents reported to Geotechnical Control Organisation

(A) List of Incidents in Hong Kong reported to Geotechnical Control Office

Incident No.	Location	Call Received		Failure			Area Affected	Consequence	Remarks
		on	from	Date	Type	Scale			
HK22	Peak Road	29-5	H/HK	29-5	Boulder + soil cut slope	Minor	Road	½ road blocked	
HK23	42 Kennedy Road	29-5	GCO		Rock cut slope	Minor	Road	1 lane closed	
HK24	Chai Wan Road at junction of Lok Man Road	30-5	H/HK	Mid-night 29-5	Soil cut slope	Major	Road + Construction site	2 lanes closed	
HK25	Wang Hang Village, Shaukiwan	30-5	Police		Soil cut slope	Minor	Squatter	Permanent evacuation of 9 huts	
HK26	45 Repulse Bay Road	30-5	GCO		Soil/rock cut slope	Minor	Road	Debris block edge of road	
HK27	21-23 Borret Road Southern End	31-5	Public		Washout	Minor	Road	Road blocked	
HK28	Bowen Road, Approx. 0.8 to 1 km East of Wanchai Gap Road Intersection	31-5	H/HK		Natural slope	Minor	Road	Road blocked	Dealt with by H/HK
HK29	Tai Hang Tong Tsuen, Chai Wan opposite hut No. 91	31-5	CDO		Soil cut slope	Minor	Squatter	6 huts temporary evacuation only	
HK30	Tai Ping Tsuen, near Chai Wan Swimming Pool, Sun Ha Street Extension	31-5	CDO	29-5	Flooding	Major	Squatter	Permanent evacuation of 4 huts Nullah blocked	
HK31	Natural Slope between Bowen Road and 7 Bowen Road	31-5	Public		Natural slope	Minor	Road	-	Referred to H/HK
HK32	Behind 1 Conduit Road (Chater Hall)	31-5	Public		Soil/rock cut slope	Minor	Building	Courtyard fenced off	Investigated by Fugro case GCB 26
HK33	Near International School South Bay Close	31-5	GCO		Soil/rock cut slope	Major	Building site	-	Referred to GCB case GCB21
HK34	Stubbs Road - near Lingnam College	31-5	H/HK		Retaining wall	Minor	Road	Footpath closed	
HK35	Bowen Road - East of Bowen Garden	31-5	H/HK					-	No GCO action
HK36	J/O Mt. Nicholson/Stubbs Road, No. 50 Stubbs Road	31-5	H/HK		Retaining wall	Minor	Stubbs Road	Footpath closed	
HK37	Chor Sheung Village, Nam Fung Road, Aberdeen	31-5	H/HK		Fill slope	Minor	Squatter	Permanent evacuation of 10 huts	
HK38	Caroline Hill Road near New Method College, opposite South China Athletic Association	31-5	H/HK	31-5	Boulder	Minor	Road	Footpath closed	
HK39	Tin Wan Hill Road/Shek Pai Wan Road	31-5	H/HK		Soil cut slope	Minor	Road/footpath	Footpath blocked	
HK40	Tai Wan Suen Chuen/Pokfulam Road behind Girl's School	29-5	H/HK		Fill slope	Minor	Squatter	Permanent evacuation of 4 huts	
HK41	Block 10, Wong Chuk Hang New Estate, Nam Long Shan Road	31-5	H/HK					-	No. GCO action

Master List of Incidents reported to Geotechnical Control Organisation

(A) List of Incidents in Hong Kong reported to Geotechnical Control Office

Incident No.	Location	Call Received		Failure			Area Affected	Consequence	Remarks
		on	from	Date	Type	Scale			
HK42	Chung Hom Kok	31-5	H/HK		Soil cut slope	Minor	Road		
HK43	137, Pok Fu Lam Road below HKU Staff, Quarter, Woodbury Court	31-5	H/HK		Soil cut slope	Minor	Road, footpath	Bus lane and footpath closed	
HK44	89-93 Tai Hang Road	evening 31-5	Public	31-5	Soil cut slope	Minor	Road & building		Refer case GCB 37
HK45	Tai Tam Road near Tai Tam Tuk	31-5	H/HK		Soil/rock cut slope	Minor	Road	Road ½ closed	
HK46	No. 1 Peak Road	1-6	H/HK	29-5	Rock cut slope	Minor	-	-	Dealt with by H/HK
HK47	Hut 318, Ma Shan Village, Shaukeiwan	29-5	CDO		Fill-platform	Minor	Squatter	-	
HK48	Ngar Choi Hang, North Point	1-6	H/HK		Boulder	Minor	Squatter	-	
HK49	Smithfield Road	29-5	BOO	29-5	Retaining wall	Minor	Building	-	Referred to GCB & BOO case GCB39
HK50	Behind 14 Belcher Street	1-6	H/HK	31-5	Soil/rock cut slope	Minor	Courtyard of building		
HK51	Mount Davis Road near Catchpit No. MD11	1-6	H/HK	30-5	Soil/rock cut slope	Minor	Road	-	
HK52	Behind 41c Conduit Road	1-6	H/HK	31-5	Boulder	Minor	Building	-	Refer GCB 32
HK53	Above Po Shan Road behind 21 Po Shan Road	1-6	GCB		Natural slope	Minor	Road	-	Referred to H/HK
HK54	Wesley Squatter Village	1-6	H/HK		Natural slope	Minor	Squatter	-	
HK55	Floodlight Stand, Behind H.K. Stadium So Kun Po	1-6	H/HK		Soil/rock cut slope	Minor	H.K. Stadium	Access blocked	
HK56	Chin Man Village, behind H.K. Govt. Stadium, So Kun Po	1-6	H/HK		Soil cut slope	Minor	Squatter	No immediate danger	
HK57	North Point Primary School, 888 King's Road	2-6	L & W Branch		Soil cut slope	Minor	School building	-	Referred to H/HK
HK58	21 Ventris Terrace	1-6	H/HK		Natural slope	Minor	Building under demolition	-	Referred to GCB case GCB45
HK59	17A Ventris Road	1-6	H/HK		-		Tennis court	-	Mud washed from 21 Ventris Tenace
HK60	147 Rear Lane, Wong Nei Chong Road, Happy Valley	1-6	H/HK		Soil cut slope	Minor	Road	Lane blocked	
HK61	King's Road near Tai Koo Shing Road Junction	30-5	H/HK	Mid-night 29-5	Soil/rock cut slope	Minor	Road	Footpath blocked	

Master List of Incidents reported to Geotechnical Control Organisation

(A) List of Incidents in Hong Kong reported to Geotechnical Control Office

Incident No.	Location	Call Received		Failure			Area Affected	Consequence	Remarks
		on	from	Date	Type	Scale			
HK62	Sai Wan Chai Village, Stanley	1-6	H/HK		Natual slope	Minor	Squatter	Permanent evacuation of 3 huts	
HK63	North of Wong Chuk Hang Transit Centre	2-6	H/HK		Soil cut slope	Minor	Squatter, road	Permanent evacuation of 1 hut	
HK64	Cape Collinson Road	7-6	Public		Fill embankment	Minor	Road	1 lane blocked	
HK65	2-10 Aberdeen Main Street	31-5	H/HK		Soil cut slope	Minor	Factory building	Rear portion of factory blocked	
HK66	41 Sassoon Road	31-5	H/HK		Natural slope	Minor	Building		
HK67	Upper Right Village, Nam Fung Road	31-5	H/HK		Natural slope	Minor	Squatter	Permanent evacuation of 1 hut	
HK68	54 Kennedy Road	29-5	H/HK		Natural slope	Major	Building	-	Dealt with by GCB case case GCB 1 & 7
HK69	Stanley Gap Road between Catchpit SG 9 & 10	31-5	H/HK		Soil cut slope	Minor	Road	Road edge blocked	
HK70	Shau Kei Wan Main Strret behind No. 11	3-6	H/HK		Soil cut slope	Minor	Squatter	Permanent evacuation of 1 hut	
HK71	Fu Tau Wat Village, Shaukiwan	3-6	H/HK		Soil cut slope	Minor	Squatter	Permanent evacuation of 4 huts	
HK72	O' Pui Loong Village	9-6	H/HK		Soil cut slope	Minor	Footpath	Footpath collapsed	
HK73	Plantation Road - Barker Road	29-5	H/HK	29-5	Retaining wall	Minor	Road	Road closed	
HK74	Holy Cross Path Village	29-5	CDO	29-5	Soil/rock cut slope	Minor	Squatters	8 huts permanently evacuated	
HK75	Tai Tam Reservoir Road below 1 Repulse Bay Road	1-6	H/HK		Soil/rock cut slope	Minor	Road	Partial road closure	
HK76	Holy Cross Village, Shaukiwan	9-6	H/HK		Soil cut slope	Minor	Squatter	Rear portion of hut blocked	
HK77	King's Road	3-6	H/HK		Rock cut slope	Minor	Road	Footpath blocked	
HK78	Bell View Drive, Repulse Bay	1-6	H/HK		Soil/rock cut slope	Minor	Road	1 lane closed	
HK79	Shek O Road, east of Cape Collinson Road	12-6	H/HK	between 29-5 &-1-6	Soil/rock cut slope	Minor	Road	1 lane partially blocked	
HK80	5 Ma Shan - 7 Holy Cross Path Village	9-6	H/HK		Soil cut slope	Minor	Squatter		
HK81	Lugard Road (a number of failures)	29-5	H/HK	29-5	Soil cut slope	Minor	Road		
HK82	Mt. Parker Road (above Quarry Bay Street) (2 incidents)	3-6	H/HK	29-5	Natural slopes "	i) Major ii)Minor	Road	Road closed 2 dead	
HK83	Tong Bin Lane, Behind Fire Station, Aberdeen	29-5	H/HK	29-5	Soil/rock cut slope	Major	Road, squatter	Partial road closure Kiosk and pigsty destroyed	
HK84	May Road & Magazine Gap Road	29-5	H/HK	31.5	Rock cut slope	Minor	Road	Road closed	

Master List of Incidents reported to Geotechnical Control Organisation

(A) List of Incidents in Hong Kong reported to Geotechnical Control Office

Incident No.	Location	Call Received		Failure			Area Affected	Consequence	Remarks
		on	from	Date	Type	Scale			
HK85	Cloud View Road near Islam School	31-5	Police	29-5	Soil cut slope	Minor	Road	1 lane of road closed	
HK86	Yee King Road, Causeway Bay	31-5	Police	29-5	Soil/rock cut slope	Minor	Road	Vehicle damaged, 1 lane blocked	
HK87	Deep Water Bay Road (opposite Water Work Office)	2-6	H/HK	1-6	Retaining Wall	Minor	Road, footpath	Footpath closed	
HK88	Tong Bin Lane, Aberdeen	31-5	H/HK		Soil/rock cut slope	Minor	Road and footpath	Car damaged Closure of footpath	

Master List of Incidents reported to Geotechnical Control Organisation

(B) List of Incidents in Kowloon reported to Geotechnical Control Office

Incident No.	Location	Call Received		Failure			Area Affected	Consequence	Remarks
		on	from	Date	Type	Scale			
K1	Wang Tau Hom (Lung Yin Hong Village)	29-5	CDO	29-5	Soil cut slope	Minor	Squatters	1 injured 4 huts permanently evacuated	
K2	Kau Wah Keng Upper Village	31-5	DO, TW	-	-	-	-	-	No GCO action
K3	Tsz Wan Shan	31-5	Police	-	-	-	-	-	No GCO action
K4	O Pui Shan Boys Home	31-5	DO, TW	-	-	-	-	-	No GCO action
K5	Playground at Sau Mau Ping	29-5	MHA	-	Suspected failure	-	-	-	No GCO action
K6	Lam Tin 3rd Village	9-6	HD	-	Landslip	Minor	Squatters	3 huts permanently evacuated	
K7	Tsui Lam Tung Village, Wong Tai Sin	29-5	Police	29-5	Landslip & Downslope erosion	Minor	"	15 huts permanently evacuated	
K8	Tai Shing Village, Kwun Tong (3 incidents)	8-6	HD	-	Landslip	"	"	75 huts permanently evacuated	
K9	Jordan Valley (Fuk Tak Sun Chuen) (Kam Kuk) (7 incidents)	29-5	Police	27-5 to 31-5	"	"	Squatters	Permanent evacuation of 21 huts	
K10	Lei Yue Mun Resettlement Estate, Kwun Tong	29-5	HD	-	Soil/Rock cut slope	"	Temple	Permanent evacuation of temple	
K11	Lau Sui Hang, Lei Yue Mun	1-6	DO	-	-	-	-	-	No GCO action
K12	Nam Shan a) Chui Yuen Wan Shan Village b) Chu Koo Chai Village (2 incidents)	31-5 1-6	H/K CDO	-	(a) Wall collapse (b) Soil cut slope	Minor Minor	a) Squatters b) Squatters	a) 5 huts permanently evacuated 13 huts re-occupied but evacuation needed during rainstorm b) 2 huts re-occupied with maintenance	Refer case GCB 31/35
K13	Yuen Mo Village (Lam Tin)	29-5	CDO	29-5	Natural slope	Minor	Squatters	3 dead All huts on hillside permanently evacuated (about 36 huts)	
K14	Lam Tin 1st Village, Kwun Tong	29-5	H/K	29-5	Soil cut slope	Minor	Squatters	2 dead 22 huts permanently evacuated	
K15	Yeung Mui Hang, Tai Wo Ping	1-6	H/K	29-5	Fill slope	Minor	Squatters	1 hut permanently evacuated	
K16	Tsz Wan Shan Squatter Area Tsz Mei Village (5 incidents)	1-6	Police	29-5	a) Landslip b) Possible rock-fall by erosion c) Landslip d) Landslip e) Landslip	Minor " " " "	Squatters " " "	a) 2 huts permanently evacuated c) 1 hut permanently evacuated e) 2 huts permanently evacuated	
K17	Yau Tong Road, Kwun Tong	2-6	H/K	-	Rock cut slope	Minor	Road	-	
K18	Junk Bay Road, Kwun Tong	31-5	H/K	-	Soil cut slope	Major	Road	½ Carriageway remained closed until remedial works were completed.	

Master List of Incidents reported to Geotechnical Control Organisation

(B) List of Incidents in Kowloon reported to Geotechnical Control Office

Incident No.	Location	Call Received		Failure			Area Affected	Consequence	Remarks
		on	from	Date	Type	Scale			
K19	Sau On Village	8-6	H.D.	-	Landslip	Minor	Squatters	3 huts permanently evacuated.	
K20	Tsui Ping Tsuen opposite junction of Junk Bay Road/Kai Tin Road	1-6	C.E.O.	-	Landslip	Minor	Squatters	8 huts permanently evacuated.	
K21	Ma Yau Tong Tip, Junk Bay Road	1-6	C.E.O.	-	Natural slope	Minor	Possibly bus terminus and box culvert	no immediate danger.	
K22	Kan Shek, Lam Tin	2-6	C.D.O.	-	Landslip	Minor	Squatters	one hut permanently evacuated. 2 huts temporarily evacuated.	
K23	Cheung Lung Tin, Lei Yue Mun	2-6	C.D.O.	-	Landslip/erosion	Minor	Squatters	4 huts temporarily evacuated until slopes are cut back and chunamed and services re-connected.	
K24	Kan Shek Lane, Kwun Tong	2-6	C.D.O.	1-6	Fill slope	Minor	Squatters	3 huts permanently evacuated.	
K25	Sun Tin Village, Lei Yue Mun Road	2-6	C.D.O.	-	Landslip	Minor	Squatters	-	
K26	Kai Tin/Junk Bay Road	2-6	H/K	-	Pavement drainage blockage Fillslope erosion	Minor	Road	-	
K27	Sau Mau Ping Road, Anderson Road	2-6	H/K	31-5	Soil/rock cut slope	Minor	Road	Footpath blocked	
K28	Hong Ning Road, Kwun Tong	2-6	H/K	31-5	"	Minor	Road	Footpath blocked	
K29	Hip Wo Street, Kwun Tong, near United Christian Hospital	28-5	H/K Police	28-5	Soil cut slope	Minor	Road	Fence off one half the road	
K30	Lam Tin 3rd Village, 1st Section	29-5	H/K	29-5	Natural slope	Major	Squatters	1 dead 15 huts permanently evacuated.	
K31	Lam Tin 3rd Village, 2nd Section	29-5	C.D.O.	29-5	Soil cut slope Natural slope	Minor Minor	Squatters	5 dead 40 huts permanently evacuated.	3 killed by cut slope 2 killed by natural slope
K32	Ling Nam Sun Chuen	8-6	H.D.	-	Landslip	Minor	Squatters	4 huts permanently evacuated.	
K33	Ping Shek Estate, Clear Water Bay Road	2-6	H/K	-	Landslip	Minor	Buildings (possible threat)	Playground fenced off.	
K34	On Lok Village, Kwun Tong (2 incidents)	8-6	H.D.	-	Landslip	Minor	Squatters	4 huts permanently evacuated.	

Master List of Incidents reported to Geotechnical Control Organisation

(B) List of Incidents in Kowloon reported to Geotechnical Control Office

Incident No.	Location	Call Received		Failure			Area Affected	Consequence	Remarks
		on	from	Date	Type	Scale			
K35	Ling Nam New Village, Lei Yue Mun	1-6	H/K	-	Flooding	Minor	Squatter	Permanent evacuation of 4 huts	
K36	Cheung Lung Tin Village, Lei Yue Mun (4 incidents)	1-6	H/K	-	Landslip	Minor	Squatter	Permanent evacuation of 55 huts	
K37	Yau Tong Lower Village, Lei Yue Mun	1-6	H/K	-	Landslip	Minor	Squatter	Permanent evacuation of 1 hut	
K38	Sau Ming Village, Sau Mau Ping	8-6	H.D.	-	Landslip	Minor	Squatter	Permanent evacuation of 2 huts	
K39	Tsui Ping Village, Kai Liu Village (5 incidents)	8-6	H.D.	-	Retaining wall Landslip	Minor	Squatter	7 huts permanently evacuated	
K40	Ho Man Tin Hill Road	3-6	H/K	-	Soil cut slope	Minor	Road	Close one lane	
K41	Lam Tin 1st, 2nd, 3rd Village (10 incidents)	31-5	C.D.O.	-	Landslip	Minor	Squatter	Permanent evacuation of 33 huts	
K42	Sai Yuen Village (Tai Shing Village) (6 incidents)	31-5	H/K	-	Nullah blocked Landslips	Minor	Squatter	Permanent evacuation of 67 huts Nullah blocked	
K43	Kwun Yam Temple, Tsz Wan Shan	31-5	S.W.K.P.	-	Suspected natural slope failure		-	-	No GCO action, referred to GCB case GCB 36
K44	Sau Ming Village (4 incidents)	31-5	C.D.O.	29-5	Landslips	Minor	Squatter	4 persons were injured Permanent evacuation of 47 huts	
K45	Yuen King Village, opposite Shun Lee Tsuen Resite Area	29-5	B.O.O.	29-5	Unnumbered fillslope & natural slope	Major	Squatter	1 dead permanent evacuation of 9 huts	
K46	On Lok Village, Sau Mau Ping (4 incidents)	8-6	H.D.	-	Landslip	Minor	Squatter	Permanent evacuation of 69 huts	
K47	Tai Shing Village, Sau Mau Ping (2 incidents)	8-6	H.D.	-	Landslip	Minor	Squatter	Permanent evacuation of 4 huts	
K48	Lam Tin 1st Village, Lam Tin	8-6	H.D.	7-6	Landslip	Minor	Squatter	Permanent evacuation of 1 hut	
K49	Lam Tin 1st Village, Lam Tin (3 incidents)	10-6	H.D.	29-5	Landslip	Minor	Squatter	Permanent evacuation of 6 huts	
K50	Lam Tin 2nd Village, Lam Tin (4 incidents)	10-6	H.D.	29-5	Landslip	Minor	Squatter	Permanent evacuation of 10 huts	
K51	Lam Tin 3rd Village, Lam Tin (6 incidents)	10-6	H.D.	29-5	Landslip	Minor	Squatter	Permanent evacuation of 21 huts	
K52	Ngau Chi Wan East Village, Wong Tai Sin	3-6	H/K	29-5	Soil cut slope	Minor	Squatter	Permanent evacuation of 5 huts	
K53	Tsui Lam Tung, Wong Tai Sin (5 incidents)	4-6	H/K	29-5	Landslip	Minor	Squatter	Permanent evacuation of 1 hut	

Master List of Incidents reported to Geotechnical Control Organisation

(B) List of Incidents in Kowloon reported to Geotechnical Control Office

Incident No.	Location	Call Received		Failure			Area Affected	Consequence	Remarks
		on	from	Date	Type	Scale			
K54	Chung Shan Village, Wong Tai Sin	4-6	H/K	29-5	Landslip and flooding	Minor	Squatter	Permanent evacuation of 1 hut	
K55	Ngau Chi Wan East Village, Wong Tai Sin	3-6	H/K	29-5	Landslip	Minor	Squatter	Permanent evacuation of 6 huts	
K56	Heung Yeung Village, Tsz Wan Shan	4-6	H/K	29-5	Fillslope	Minor	Squatter	Permanent evacuation of 2 huts	
K57	Tung Yeung Village, Tsz Wan Shan (4 incidents)	4-6	H/K	29-5	Landslip	Minor	Squatter	Permanent evacuation of 3 huts	
K58	Ngau Chi Wan East Village, Wong Tai Sin	3-6	H/K	29-5	Landslip	Minor	Squatter	Permanent evacuation of 1 hut	
K59	Tung Shan Village, Hammer Hill	3-6	H/K	-	Landslip	Minor	Squatter	Permanent evacuation of 1 hut	
K60	Chung Luen Tsuen, north of Sa Uk	29-5	H/K	29-5	Natural slope	Minor	Squatter	3 dead 1 injured Permanent evacuation of 3 huts	
K61	Tung Sum Yuen, Sha Tin Pass Road, Wong Tai Sin	29-5	Police		Landslip	Minor	Squatter	Permanent evacuation of 23 huts	
K62	Sau Ming Village, Kwun Tong (6 incidents)	8-6	H.D.	-	Landslip	Minor	Squatter	Permanent evacuation of 39 huts	
K63	Cheung Lung Tin Village, Kwun Tong (6 incidents)	11-6	H.D.	-	Landslip	Minor	Squatter	Permanent evacuation of 13 huts	
K64	Mau Tung Village, Kwun Tong (3 incidents)	8-6	H.D.	-	Landslip	Minor	Squatter	Permanent evacuation of 2 huts	
K65	Cha Kwo Ling (3 incidents)	11-6	H.D.	-	Rock cut slope	Minor	Squatter	Warn occupants of possible rock fall	
K66	Cheung Lung Tin	11-6	H.D.	-	Landslip	Minor	Squatter		
K67	Opposite Blocks 30 & 32, Sau Mau Ping (5 incidents)	8-6	H.D.	-	Landslip	Minor	Squatter	Permanent evacuation of 15 huts	
K68	Wo Ping Village, Kwun Tong	8-6	H.D.	-	Landslip	Minor	Squatter	Permanent evacuation of 5 huts	
K69	Tsim Sha Tsui District, Kai Fong Welfare Asso.	5-6	Public	-	Landslip	Minor		-	No GCO action, referred to GCB
K70	Hau Man Street, near Carmel Village Street	14-6	H/K	-	Old fill on cut slope	Minor	Road	-	

Master List of Incidents reported to Geotechnical Control Organisation

(C) List of Incidents in N.T. reported to Geotechnical Control Office

Incident No.	Location	Call Received		Failure			Area Affected	Consequence	Remarks
		on	from	Date	Type	Scale			
NT 1	Tuen Mun Castle Road	29-5	Public	29-5	Boulders	Complaint only	Stone building		
NT 2	Rennie's Mill (5 separate incidents?)	29-5	H.D.				Cottage	4 dead	Action by Housing Department
NT 3	Shek Lei Estate	29-5	Police	29-5	fillslope & soil cutslope	Minor	Squatter		
NT 4	6½ ms Castle Peak Road (near Shek Lei) Tsuen Wan	29-5	Police	29-5					No GCO action
NT 5	Cheung Hang (Off Castle Peak Road)	29-5	D.O.	29-5					No GCO action
NT 6	65 to 71 Pan Long Wan, Clear Water Bay	2-6	Public		Soil cutslope	Minor			
NT 7	13¼ ms Castle Peak (opp. Lai Shum Villa)	29-5	H/NT	29-5	Fillslope	Major	Road	One lane collapse and road blocked	
NT 8	Ch : 10050 Tuen Mun Highway	29-5	H/NT	29-5	Soil/rock cut	Major	Road	Road blocked	
NT 9	14 ms Castle Peak Road	28-5	H/NT	28-5	Natural slope, boulder	Minor	Road	Road Blocked (one lane)	
NT 10	Kowloon Textiles Factory, Sham Tseng	29-5	D.O.	29-5	Natural slope	Major	Building (Private) and Brick House	Nullah Blocked	
NT 11	Lai Chi Hang Tsuen, Tai Po	29-5	Police	29-5	Natural slope	Major	Squatters and footpath	Footpath blocked, some huts damaged. Permanent evacuation of 13 huts	
NT 12	Fei Ngo Shan Road	29-5	H/NT	29-5	Soil cutslope	Major	Road	Road blocked	Private cutslope
NT 13	Pak Sha, Yuen Long	29-5	H/NT						Refer back to H/NT
NT 14	Hon Ka Road, Tai Po (3 incidents)	29-5	H/NT	29-5	3 soil cutslopes	a) Minor b) Minor c) Minor	Road	Road blocked, drainage channels broken	
NT 15	Ping Shan, Yuen Long	29-5	H/NT						Refer back to H/NT
NT 16	Yung Kung Village, Clear Water Bay	29-5	H/NT						Location cannot be found
NT 17	50, Sai Kung Road, Sai Kung	29-5	H/NT	29-5	Rockcut slope	Minor	2-storey building	House threatened, evacuate one room	
NT 18	83-89, Sun On Village, Sai Kung	29-5	H/NT		Retaining wall	Minor	Buildings	7 buildings evacuated	
NT 19	Mui Tsuen, Shek Lei Estate (opposite to Block 9)	29-5							Same as case NT3

Master List of Incidents reported to Geotechnical Control Organisation

(C) List of Incidents in N.T. reported to Geotechnical Control Office

Incident No.	Location	Call Received		Failure			Area Affected	Consequence	Remarks
		on	from	Date	Type	Scale			
NT 20	Pan Long Wan, No. 59-61, Clearwater Bay	29-5	H/NT	29-5	Soil-cutslope	Minor	Building	Temporary evacuation of building	Refer case GCB 16
NT 21	Pan Long Wan, Clearwater Bay	29-5	D.O.		Natural slope	Minor	Erosion by runoff	Road undercut	
NT 22	Clearwater Bay Road, 6½ mile	29-5	D.O.						G.C.B. involvement Refer case GCB 22A
NT 23	Wan On Terrace, Tsuen Wan	30-5	D.O.	30-5	Soil cutslope & retaining wall	Major	3 storeys building	Temporary evacuation of building.	
NT 24	Tsuen Wan Catchwater above West Tsuen Wan	31-5	W.S.D.	29-5	Soil cutslope	Major	28 storey flat & catchwater	Catchwater blocked, water overflow	
NT 25	Kew Tei Resite Area, Kwai Tei Sun Tsuen Road, Shatin	31-5	D.O.	29-5	Fillslope	Minor	Resite area		
NT 26	Squatter behind Ku Nga	31-5	D.O.						Same as NT 27
NT 27	Shatin Tau Section 2, New Village	31-5	H.D.	29-5	Soil cutslope	Minor	Squatter	Permanent evacuation of 1 hut	
NT 28	Pak Tin Village, Section 2, Shatin (2 incidents)	31-5	H.D.	29-5	a) flooding b) Soil cutslope	a) Minor b) Minor	Squatter	Permanent evacuation of 8 huts	
NT 29	81-87A Kam Shan Terrace, Tai Po	29-5	Public	29-5	Retaining wall	Major	Building		G.C.B. involvement Refer case GCB 14/15
NT 30	San Fuk Village, Tsing Yi	31-5	D.O.	29-5	Soil cutslope	Minor	Squatter	1 hut destroyed, 4 damaged. Permanent evacuation of 5 huts	
NT 31	Route Twisk near Army Quarters	31-5	H/NT						No request for assistance from H/NT
NT 32	Fo Tan, Shatin	31-5	Police						No request for assistance from H/NT
NT 33	Luk Wo Tsuen, Lantau	31-5	H/NT	29-5	Soil cutslope	Minor	Temple building	No damage to building	
NT 34	Ta Shek Wu Village Pat Heung, Yuen Long	31-5	DO, YL	29-5	Natural soil slope (class 3 colluvium)	Major	Public lot & squatter		
NT 35	Tui Hoi Tsuen	31-5	H.D.	29-5	Soil cutslope	Minor	Building	Temporary evacuation of 1 house	
NT 36	Pai Tau Tsuen, Shatin	31-5	Police	29-5	Boulders (complaint)	Minor	Squatter		
NT 37	Lam Tsuen, Tai Po	31-5	H/NT	29-5	Natural slope (river bank)	Minor	Road	Road undercut	

Master List of Incidents reported to Geotechnical Control Organisation

(C) List of Incidents in N.T. reported to Geotechnical Control Office

Incident No.	Location	Call Received		Failure			Area Affected	Consequence	Remarks
		on	from	Date	Type	Scale			
NT 38	St Paul Village, Tsing Yi	31-5	D.O.	-	Chunam crack (soil cutslope)	Minor	Building	-	
NT 39	Pai Tau Village, Shatin	31-5	H.D.	29-5	Soil cutslope	Minor	Squatter	Permanent evacuation of 8 huts	
NT 40	Keung Shan Road, Tai O, Lantao	31-5	H/NT	29-5	Soil/rock cutslope	Minor	Road	Road blockage	
NT 41	Ha Wo Che, Shatin	31-5	H.D.	29-5	Soil cutslope	Minor	Squatter	2 destroyed, 4 damaged. Permanent evacuation of 4 huts	
NT 42	Tuen Mun Sam Sing Hui Area (A)	31-5	D.O.	29-5	Soil cutslope	Major	Squatter	6 huts collapsed. Permanent evacuation of 7 huts	
NT 43	Pai Tau Village, Shatin	31-5	D.O.						Same as case NT 39
NT 44	Siu Tao Fung, Shatin	31-5	D.O.	29-5	Natural slope	Minor	Squatter	1 hut destroyed, 4 huts damaged. Permanent evacuation of 7 huts	
NT 45	Cheung Hang Village, No. 29B Tsuen Wan	8-6	D.O.						Same as case NT 89
NT 46	25, Ho Chung, Sai Kung	31-5	D.O.	29-5	Rock/soil cut slope	Minor	Squatters	Buried several L.P.G. cylinders. Permanent evacuation of 1 squatter hut	
NT 47	Tai Lin Pai, Castle Peak Road, Tsuen Wan	31-5	H.D.						Referred to GCB Refer case GCB 40
NT 48	Po Wah Yuen, Yuen She Wan, Lamma	31-5	D.O.						Refer case GCB 38
NT 49	Po Lam Road, Sai Kung	31-5	H/NT	29-5	Retaining wall	Minor	Building	Retaining wall badly distorted. Temporary evacuation of 1 building	Refer case GCB 41
NT 50	She On Terrace, Sham Tseng	31-5	D.O.	31-5	Fillslope	Minor		Platform & staircase undermined	Refer case GCB 42
NT 51	Liu To Village, Tsing Yi	1-6	D.O.	29-5	Soil cutslope	Minor	Squatter	1 hut destroyed, 4 huts damaged Permanent evacuation of 7 huts	
NT 52	Kam To Village, Shatin	1-6	D.O.	29-5	Soil cutslope	Minor	2 storey building	Minor damage to building. Temporary evacuation of a 2 storey house	Refer case GCB 46

Master List of Incidents reported to Geotechnical Control Organisation

(C) List of Incidents in N.T. reported to Geotechnical Control Office

Incident No.	Location	Call Received		Failure			Area Affected	Consequence	Remarks
		on	from	Date	Type	Scale			
NT 53	Kau Wah Keng, Tsuen Wan	1-6	D.O.	29-5	Soil cutslope	Minor	Squatter	2 hut destroyed. Permanent evacuation of 8 huts	
NT 54	Kwong Pan Tin, Tsuen Wan	1-6	D.O.	29-5	Soil cutslope	Minor	Squatter	Permanent evacuation of 1 hut, temporary evacuation of 1 hut	
NT 55	Fu Yung Shan, Tsuen Wan	1-6	D.O.	29-5	Soil cutslope	Minor	Squatter	Permanent evacuation of 1 hut, temporary evacuation of 3 huts	
NT 56	Pak Tin Village, Shatin (Section 6)	1-6	D.O.	29-5	Soil cutslope	Minor	Squatter	Huts damaged. Permanent evacuation of 5 huts	
NT 57	Tin Siu Wei, Yuen Long	1-6	D.O.		Natural slope (moderately decomposed metamorphic)	Minor	Road	Road blocked for a short period of time	
NT 58	Tai Kwong Middle School, Kam Shan Village, Tai Po	3-6	G.C.B.	29-5	Soil cutslope	Minor	School building		G.C.B. involvement Refer case GCB 24
NT 59	Kwai Shing Circuit, Kwai Chung	1-6	H/NT	29-5	Rock cut slop	Minor	Road		
NT 60	Shatin Wai, Shatin	2-6	D.O.	29-5	Soil cutslope	Minor	Road	Half lane of the road closed	
NT 61	Ting Kau Upper Village, Tsuen Wan	2-6	D.O.	30-5	Soil cutslope + natural slope	Minor	Squatters	1 hut destroyed, 3 huts damaged. Permanent evacuation of 7 huts	
NT 62	Nos 26-27, Sun On Tsuen, Sai Kung	2-6	B.O.O.	29-5	Soil cutslope retaining wall	Major	2 houses	Temporary closure of No. 27, No. 26	
NT 63	Shan Pui Tsuen, Yuen Long	2-6	D.O.	2-6	Masonry retaining wall	Minor	Road	Road partly closed	
NT 64	88 Kowloon Hang, Fanling	2-6	G.C.B.		Retaining wall & soil cutslope	Minor	2 houses	Close kitchen at one building	
NT 65	49D Chuk Hang, Tai Po	Before 2-6	D.O.	29-5	Soil cutslope	Minor	Squatter	House wall buckled. Permanent evacuation of 1 hut	
NT 66	19A Chung Shun, Tai Po	2-6	D.O.		Retaining wall	Minor	Squatter & road	Road partly blocked	
NT 67	43 Mui Shue, Tai Po	2-6	D.O.		Natural slope	Major	Squatter & village house	Stream blocked footpaths & buildings undercut. Permanent evacuation of 2 huts and 1 masonry structure	
NT 68	58A Na Wo, Tai Po	2-6	D.O.		Soil cutslope	Minor	Squatter	Temporary evacuation of 1 hut	

(C) List of Incidents in N.T. reported to Geotechnical Control Office

Incident No.	Location	Call Received		Failure			Area Affected	Consequence	Remarks
		on	from	Date	Type	Scale			
NT 69	Ap Tsai Wan, Hang Hau, Sai Kung	2-6	H.D.	-	Flooding	-	Squatter	Permanent evacuation of 11 huts	
NT 70	Ch: 10350 m Tuen Mun Highway	31-5	H/NT	29-5	Soil/rockcut	Minor	Road	Traffic delays	
NT 71	6-NWC/F3, Tan Kwai Tsuen, Yuen Long	2-6	H.D.		Natural slope (suspected failure)	N.A.	Squatter	-	
NT 72	82 Sun On Village, Sai Kung	2-6	D.O.	29-5	Soil cutslope	Minor	Building	-	
NT 73	Mang Kung Uk, Sai Kung	2-6	D.O.	29-5	Soil cutslope	Minor	Village huts	Huts threatened, temporary evacuation	
NT 74	12 Yu Uk Village	2-6	D.O.	29-5	Natural slope	Minor	Footpath	-	
NT 75	Hang Kau Road, Sai Kung	2-6	D.O.	29-5	Soil cutslope	Minor	Recreational building	-	
NT 76	42 Nam Wai Village, Sai Kung	2-6	D.O.		Soil cutslope	Minor	Village huts	Temporary evacuation	
NT 77	Pai Tau Village, No. 26, Shatin	2-6	D.O.	29-5	Soil/rock cut slope	Minor	Footpath		
NT 78	Ch: 3500 Tuen Mun Highway	2-6	H/NT	29-5	Soil cutslope	Major	Road	One lane of T.M. Highway closed	
NT 79	Ch: 6750, Tuen Mun Highway	2-6	H/NT	29-5	Soil cutslope	Major	Road	Blocked one lane	
NT 80	14 Nam Wai Tsuen, Sai Kung	2-6	H/NT		Soil cutslope	Minor	Masonry building	Rear wall damaged, temporary evacuation of building	
NT 81	Ting Kau, Tsuen Wan	3-6	D.O.	29-5	Soil cut/ natural slope	Minor	Squatters	1 hut destroyed, 4 damaged. Permanent evacuation of 6 huts	
NT 82	Hon Man Tsuen, Tsuen Wan	3-6	D.O.	29-5	Soil cutslope	Minor	Squatter	1 hut damaged. Permanent evacuation of 1 hut	
NT 83	Kin Yip Sun Tsuen, Tsuen Wan	3-6	D.O.	29-5	Boulder fall	Minor	Squatters		
NT 84	Route Twisk, Tsuen Wan	3-6	D.O.	29-5	Soil cutslope	Minor	Squatters	1 hut destroyed. Permanent evacuation of 2 huts	

Master List of Incidents reported to Geotechnical Control Organisation

(C) List of Incidents in N.T. reported to Geotechnical Control Office

Incident No.	Location	Call Received		Failure			Area Affected	Consequence	Remarks
		on	from	Date	Type	Scale			
NT 85	Yau Kam Tau Village, Tsing Yi	2-6	D.O.	29-5	Boulders	Minor	Walkways	-	
NT 86	17½ ms Castle Peak Road	3-6	H/NT		Fillslope	Major	Road & farmland	One lane closed	
NT 87	39 Tui Hoi Village, Sai Kung	3-6	D.O.	29-5	Soil cutslope	Minor	Village houses	Debris threatened ground floor. Temporary closure of ground floor	
NT 88	Kau Wah Keng, Tsuen Wan	3-6	D.O.	29-5	Natural slope	Minor	Squatters	Toilet damaged	
NT 89	Chung Hing Village, Tsuen Wan	2-6	D.O.	29-5	Fillslope	Minor	Squatters	Pigsty damaged	
NT 90	Squatter, Yau Kam Tau Village, Tsing Yi	2-6	D.O.	29-5	Natural slope	Minor	Squatters	3 huts damaged. Permanent evacuation of 9 huts	
NT 91	Mui Cheun Village, Tsuen Wan	2-6	D.O.	29-5	Natural slope	Minor	Squatters	3 huts damaged. Permanent evacuation of 3 huts	
NT 92	Sha Tin Wai D.D. 281	2-6	D.O.	29-5	Soil cutslope	Minor	Minor road	-	
NT 93	Tso Kong Tam Village, Tsuen Wan	2-6	D.O.	29-5	Soil cutslope	Minor	Squatters	4 huts damaged. Permanent evacuation of 10 huts	
NT 94	Chai Wan Kwok, Tsuen Wan	2-6	D.O.	29-5	Soil cutslope	Minor	Squatter	1 hut damaged. Permanent evacuation of 1 hut	
NT 95	Chung Hau Village, Mui Wo	3-6	D.O.	29-5	Soil cutslope	Minor	Squatter	Permanent evacuation of 14 huts	
NT 96	Ma Wo No. 20 Tai Po	3-6	D.O.	29-5	Soil cutslope	Minor	Squatter	1 hut collapse. Permanent evacuation of 1 hut	
NT 97	Ma Wo Tsuen	3-6	D.O.	29-5	Natural slope	Major	Squatter/footpath	Permanent evacuation of 1 hut	
NT 98	Nam Hang Tsuen	3-6	D.O.	29-5	Fillslope	Minor	Squatters, village house, footpath	Footpath undercut. Evacuation of houses	
NT 99	No. 7 Sun On Tsuen, Sai Kung	4-6	B.O.O.	29-5	Retaining wall Soil cutslope	Minor	Village house	Temporary evacuation of No. 7	
NT 100	Above incident 58, Tai Kwong School, Tai Po	3-6	G.C.B.	29-5	Natural slope	Major	Minor road	Road blocked School threatened	

Master List of Incidents reported to Geotechnical Control Organisation

(C) List of Incidents in N.T. reported to Geotechnical Control Office

Incident No.	Location	Call Received		Failure			Area Affected	Consequence	Remarks
		on	from	Date	Type	Scale			
NT 101	99-101, and 184-185 Mui Shue Hang	3-6	H.D.	29-5	Soil cutslope	Minor	Buildings	Temporary evacuation of 3 houses	
NT 102	Wai Tau Tsuen	3-6	H.D.	29-5	Soil cutslope & wall	Minor	Squatters	1 house permanently evacuated 2 houses temporarily evacuated	
NT 103	RTP/KLH/1775 Kowloon Hang, Tai Po	3-6	H.D.	29-5	Rock cut slope	Minor	Squatters		
NT 104	5B Chuk Hang Village, Tai Po	3-6	H.D.		Natural slope + retaining wall	Major	Village house and squatters	Dangerous retaining wall. Permanent evacuation of 3 huts. Temporary evacuation of a 2 storey building	
NT 105	36B Chuk Hang Village, Tai Po	3-6	H.D.		Soil cutslope	Minor	Squatters	Permanent evacuation of 1 hut	
NT 106	33-36, Chuk Hang, Tai Po	3-6	H.D.		Soil cutslope	Minor	Squatters & private building	Partial collapse of wall. Permanent evacuation of 1 hut. GCB involved about closure of building	
NT 107	No. 8B Toi Min Hui, Sai Kung	7-6	H.D.		Soil cutslope	Minor	2 storey stone house	Rear wall damaged. Temporary evacuation of 1 house	Refer case GCB 23B
NT 108	13½ ms Castle Peak Road	4-6	G.C.O.		Fillslope, retaining wall	Minor	Road and beach	Pavement subsided	Refer GCB case GCB 12A
NT 109	38 Toi Min Hui, Sai Kung	4-6	D.O.		Rock cut slope	Minor	Village house	Temporary closure of 1 village house	
NT 110	3 Nan Ying Terrace, Toi Min Hui, Sai Kung	4-6	D.O.		Soil cutslope	Minor	Building	Path undercut	
NT 111	Kai Lung Mun Ma Wan Lot 290/ Lot 288	7-6	D.O./ Owner		Soil cutslope	Minor	2 Buildings		Responsibility of B.O.O.
NT 112	Fisherman Corporation, Ma Wan	7-6	D.O.		Fillslope	Minor	1 Building	Temporary closure until remedial work complete	
NT 113	55, Kap Bin Long Village, Sai Kung	7-6	Public		Soil cutslope	Minor	Village house		
NT 114	61, Shing Mun Road, Wo Yi Hop, Tsuen Wan	7-6	D.O.						Same as NT 219
NT 115	Fu Yung Shan RTW/4B/307 Tsuen Wan	7-6	D.O.						Same as case NT 55

Master List of Incidents reported to Geotechnical Control Organisation

(C) List of Incidents in N.T. reported to Geotechnical Control Office

Incident No.	Location	Call Received		Failure			Area Affected	Consequence	Remarks
		on	from	Date	Type	Scale			
NT 116	Evergreen Villa, Toi Mang Sai, Sai Kung	7-6	H/NT		Natural slope	Minor	Carpark of house		
NT 117	The Village Hall & 15/17 Ho Chung, Sai Kung	7-6	H/NT		Retaining wall	Minor	Buildings	Temporary evacuation of No 15-17	
NT 118	5CAA, Ping Long Village, Lam Tsuen, Tai Po	8-6	Public		Soil cutslope	Minor	Squatter hut		
NT 119	Po Toi - O Road (A)	8-6	D.O.		Fillslope	Very minor	Licenseland		
NT 120	Route Twisk about 9 ms	4-6	H/NT	29-5	Retaining wall, fillslope	Minor	Roads	Footpath closed	
NT 121	Chung Wong Toi Resite Area, Tuen Mun	3-6	H.D.		Soil cutslope	Major	Resite area	Road blocked temporary	
NT 122	To Yuen Wai (near PM/LT/550) Tuen Mun	3-6	H.D.		(Natural alluvial bank) Natural slope	Minor	Squatter	Partial collapse of squatter Permanent evacuation of 7 huts	
NT 123	To Yuen Wai (Stream Bank) Tuen Mun	3-6	H.D.		(Natural alluvial bank) Natural slope	Minor	Squatter	1 brick building slightly damaged	
NT 124	Tan Kwai Tsuen (near No. 72) Yuen Long	3-6	H.D.		Natural slope (alluvial bank)	Minor	Squatter	6 huts were damaged. Permanent evacuation of 6 huts	
NT 125	9½ ms Castle Peak Road	10-6	H/NT		Retaining wall	Major	Road and building platform		
NT 126	To Tse Kin, Tai Po	9-6	H.D.	29-5	Natural slope +retaining wall	Minor	Squatter & factory	Retaining wall undercut Permanent evacuation of about 7 huts	
NT 127	Lai Chi Shan, Tai Po	9-6	H.D.		Soil cutslope	Minor	Squatter	Temporary evacuation of 1 hut	
NT 128	Lai Chi Shan, Tai Po	9-6	H.D.	29-5	non-geotechnical problem (collapsing wall)	-	Squatters	Temporary evacuation of 2 huts	
NT 129	To Yuen Tung	9-6	H.D.		Soil cutslope	Minor	Village houses		
NT 130	14A3 Sui Wai, Tai Po Kau	9-6	H.D.	29-5	Retaining wall	Minor	Village house		
NT 131	Ma Wo Tsuen	9-6	H.D.	29-5	Natural slope	Minor	Footpath	Footpath undercut	
NT 132	Tuen Pui Lung, Tai Po	9-6	H.D.		Landslip	Minor	Squatters	Hut undercut, floor collapse. Permanent evacuation of 8 huts	Not possible to investigate at night

(C) List of Incidents in N.T. reported to Geotechnical Control Office

Incident No.	Location	Call Received		Failure			Area Affected	Consequence	Remarks
		on	from	Date	Type	Scale			
NT 133	Nam Wah Po	9-6	H.D.	-	-	-	Squatters	Permanent evacuation of 3 huts	No failure but failure thought imminent in new cutslope
NT 134	Nam Wah Po, Tai Po	9-6	H.D.	29-5	Soil cutslope	Minor	Squatters	Huts threatened. Permanent evacuation of 7 huts	
NT 135	Kau Lung Hang, Tai Po	9-6	H.D.		Flooding	Minor	Squatters	Floor collapsed. Permanent evacuation of 1 hut	
NT 136	Tit Mei Tsai, Tai Po	9-6	H.D.	29-5	Retaining wall collapsed	Minor	Squatters	2 men injured. Permanent evacuation of 3 huts	
NT 137	95 Tung Lo Wan Village, Shatin	9-6	D.O.	29-5	Soil cutslope	Minor	Building	-	
NT 138	186 Sha Tin Tau Village Section 2, Shatin	9-6	D.O.	29-5	Soil cutslope	Minor	Houses	Hut damaged. Permanent evacuation of 3 structures	
NT 139	Po Toi O Tsuen Road, Clearwater Bay	5-6	D.O.		Pavement failure	Major	Road	450 m road surface damaged	
NT 140	Tseng Lam Shue, (Sai Kung)	18-6	D.O.		Soil cutslope	Minor	Squatter		
NT 141	Chim Uk Tsuen, Tai Po	9-6	D.O.		Soil cutslope	Major	Houses	Kitchens threatened	
NT 142	Sha Lo Tung, Tai Po	9-6	D.O.		Soil cutslope	Major	Houses	Wall collapsed	
NT 143	Ha Hang, Tai Po	9-6	D.O.		Soil cutslope	Minor	House		
NT 144	Sha Lo Tung Road (A), Tai Po	14-6	D.O.		Natural & fillslope	Minor	Road	Road undercut by 1 m	
NT 145	Tuen Pui Long, Tai Po	14-6	H.D.		Natural slope	Minor	2 pigstys	Immediate permanent evacuation of pigstys	
NT 146	Tai Po Kau, Tai Po	14-6	H.D.		Soil cutslope	Minor	1 (masonry) squatter hut & pigsty	Buildings threatened by debris	
NT 147	Tsing Yi Road, Tsing Yi	10-6	H/NT	29-5	Boulder	Major	Road		
NT 148	Ngong Ping Road, Lan Tau	11-6	D.O.	29-5	Landslip	Minor	Road	Road blocked	
NT 149	Yiu Hing Monastery, Lan Tau	11-6	D.O.	29-5	Soil cutslope	Minor	Road	Road blocked	

(C) List of Incidents in N.T. reported to Geotechnical Control Office

Incident No.	Location	Call Received		Failure			Area Affected	Consequence	Remarks
		on	from	Date	Type	Scale			
NT 150	143-147 Wai Sau Yuen, Luk Wu, Lantau	11-6	D.O.	29-5	Soil cutslope	Minor	House	No damage	
NT 151	Upper Keung Shan Village, Lan Tau	11-6	D.O.	29-5	Soil cutslope	Minor	Squatters	Minor 1 hut damaged	
NT 152	Shek Tsai Po Village, Lan Tau	11-6	D.O.	29-5	Soil cutslope	Minor	Pigsty	1 hut damaged	
NT 153	Tai O Police Station, Lan Tau	11-6	H/NT	29-5	Soil cutslope	Minor	Road/Police Station	Road blocked	
NT 154	Tai O Road M.S. 13, Lan Tau	11-6	H/NT	29-5	Natural/soil cutslope	Minor	Road	Flooding and road blocked	
NT 155	Ling Yau Monastery, Lan Tau	11-6	D.O.	29-5	Soil cutslope	Minor	Road	Road blocked	
NT 156	Kwun Yum Monastery, Lan Tau	11-6	D.O.	29-5	Soil cutslope	Minor	Road	Road blocked	
NT 157	Nam Wai School, No. 40 Nam Wai, Sai Kung	11-6	D.O.		Rock cut slope	Minor at present	School	School temporarily closed	
NT 158	No. 44 Nam Wai Tsuen, Sai Kung	11-6	D.O.		Landslip	Minor	Village houses		
NT 159	Kam Shan Village, Tai Po	11-6	D.O.		Natural slope & several boulders	Major	Houses	Boulders threatening houses	
NT 160	Sha Kiu/Tsim Pei Tsui	22-6	D.O.		Natural slope	Minor	Squatter	Permanent evacuation of 6 huts	
NT 161	Ng Uk Tsuen, Wang Chau	22-6	D.O.	29-5	Natural slope	Major	Road and village	Road blocked 1 hut collapsed	
NT 162	Chung Wong To Resite Area, Tuen Mun								Same as case NT 121
NT 163	Tan Kwai Tsuen, Yuen Long								Same as case NT 124
NT 164	Ho Fu Tong College, Tuen Mun	3-6	H.D.		Soil cutslope	Minor	Building	Drainage blocked	
NT 165	St.Simon College, Tuen Mun	3-6	H.D.		Soil cutslope	Minor	School building	Drainage blocked	
NT 166	Kon Shan, Tuen Mun	3-6	H.D.		Soil cut slope	Minor	Squatter	1 hut destroyed 1 hut damaged Permanent evacuation of 6 huts	

Master List of Incidents reported to Geotechnical Control Organisation

(C) List of Incidents in N.T. reported to Geotechnical Control Office

Incident No.	Location	Call Received		Failure			Area Affected	Consequence	Remarks
		on	from	Date	Type	Scale			
NT 167	142, Tseng Tau Tsuen, Tuen Mun	3-6	H.D.		Soil cut slope Natural slope	Minor	Squatter		
NT 168	Tseng Tau Tsuen, Tuen Mun	3-6	H.D.		Retaining wall	Minor	Squatter	1 hut collapsed Permanent evacuation of 1 hut Temporary evacuation of 9 huts	
NT 169	170, Tseng Tau Tsuen, Tuen Mun	3-6	H.D.		Soil cut slope Natural slope	Minor	Squatter	Undermine a platform, path blocked, temporary evacuation of 5 huts	
NT 170	74A, Tseng Tau Tsuen, Tuen Mun	3-6	H.D.		Soil cut slope	Minor	Squatter	Permanent evacuation of 10 huts	
NT 171	34, Tseng Tau Tsuen, Tuen Mun	3-6	H.D.		Natural slope	Minor	Squatter	Drains blocked	
NT 172	52, Tseng Tau Tsuen, Tuen Mun	3-6	H.D.		Natural slope	Major	Squatter	Drains blocked	
NT 173	Siu Lung Tsuen B1 Yuen, Tuen Mun	3-6	H.D.		Soil cut slope	Minor	Squatter		
NT 174	Siu Lung Tsuen, Tuen Mun	3-6	H.D.		Soil cut slope	Minor	Squatter		
NT 175	Ching Wan Lei (A), Tuen Mun	3-6	H.D.		Natural slope	Minor	Squatter	1 hut damaged, 2 affected Permanent evacuation of 3 huts	
NT 176	Ching Wan Lei (B), Tuen Mun	3-6	H.D.		Soil cut slope	Minor	Squatter	1 hut damaged, drainage blocked, Permanent evacuation of 12 huts	
NT 177	50, Ching Wah Lei, Tuen Mun	3-6	H.D.		Natural slope	Minor	Squatter	1 hut damaged, channels blocked Permanent evacuation of 8 huts	
NT 178	Coffee Bay Beach, Tuen Mun	3-6	H.D.		Natural slope	Major	Squatter	2 huts collapsed Temporary evacuation of 4 huts	
NT 179	So Kwun Wat (A), Tuen Mun	11-6	H.D.		Natural slope	Minor	Road		
NT 180	So Kwun Wat (B), Tuen Mun	11-6	H.D.		Fillslope	Minor	Cultivated field		
NT 181	So Kwun Wat (C), Tuen Mun	3-6	H.D.		Soil cutslope	Minor	Squatter	Rear wall damaged Temporary evacuation of 2 huts	
NT 182	Tai Lam, Wu Uk Tsuen	3-6	H.D.		Natural slope	Major	Squatter	Damages of 1 chicken farm	

Master List of Incidents reported to Geotechnical Control Organisation

(C) List of Incidents in N.T. reported to Geotechnical Control Office

Incident No.	Location	Call Received		Failure			Area Affected	Consequence	Remarks
		on	from	Date	Type	Scale			
NT 183	Sha Lo Tung Road (B), Tai Po	14-6	D.O.	29-5	Several soil cutslope	Minor	Road	Road blocked	
NT 184	Man Hant Village, Sha Tin	15-6	D.O.	29-5	Boulder fall	Minor	Squatters, houses		
NT 185	Ngau Pei Sha, Sha Tin	15-6	D.O.	29-5	Chunam fall off (soil cutslope)	Very minor	Squatters		
NT 186	Chung Choi Yau, Sha Tin	15-6	D.O.	29-5	Soil cutslope	Minor	Walkway		
NT 187	Pak Tin Village Section 1	15-6	D.O.	29-5	Natural slope	Minor	Walkway	Walkway blocked	
NT 188	19, So Kwan Wat	3-6	H.D.		Masonry wall	Major	Village houses	Platform collapsed Temporary evacuation of 2 huts	
NT 189	Siu So	3-6	H.D.		Soil cut slope	Minor	Village houses	Damage of pigsty	
NT 190	Siu Lam	3-6	H.D.		Natural soil slope (2m cutslope at toe)	Major	Road	Access road blocked	
NT 191	Siu Lam, in front of the Staff Quarter for Siu Lam Mental Hospital	11-6	H.D.		Soil cut	Minor	Road		
NT 192	Tseng Tau Chung Tsuen A	11-6	H.D.		Soil cut	Minor	Squatter	Minor drains blocked	
NT 193	Tseng Tau Chung Tsuen B	11-6	H.D.		Masonry wall	Minor	Squatter	Undermining of platform Permanent evacuation of 3 huts	
NT 194	Tseng Tau Chung Tsuen C	11-6	H.D.		Natural slope (2m high cut slope at toe)	Minor	Squatter		
NT 195	Tseng Tau Chung Tsuen D	11-6	H.D.		Retaining wall	Minor	Squatter		
NT 196	Tseng Tau Chung Tsuen E	11-6	H.D.		Crude masonry wall	Minor	Squatter	Ground settled	
NT 197									
NT 198	DD 390 Lot 207, Sham Tseng, Tsuen Wan	17-6	D.O.	29-5	Natural slope	Major	House on top and road below	Road blocked Permanent evacuation of 1 house, closure order served on 1-7	Followed up by BOO & GCB

Master List of Incidents reported to Geotechnical Control Organisation

(C) List of Incidents in N.T. reported to Geotechnical Control Office

Incident No.	Location	Call Received		Failure			Area Affected	Consequence	Remarks
		on	from	Date	Type	Scale			
NT 199	DD 388 Lot 98 - 100, Tsing Lung Tao, Tsuen Wan	17-6	D.O.	29-5	Wall collapse	Minor	House on top and walkway below	Walkway blocked	
NT 200	Squatters: Tsing Lung Tao New Village Tsuen Wan	17-6	D.O.	29-5	Soil cut/natural slope	Major	Squatters	2 huts destroyed 4 damaged Permanent evacuation of 6 huts	
NT 201	Squatters; Kau Wah Keng Upper Village	17-6	D.O.	29-5	Soil cut slope	Minor	Squatters	2 huts destroyed 2 damaged Permanent evacuation of 6 huts	
NT 202	Tseng Tau Hai Tsuen	11-6	H.D.		Fillslope	N.A.	Squatter	Settlement of platform	
NT 203	So Kun Wat, near Chan Uk Tsuen	11-6	H.D.		Natural slope	Major	Road	Road blocked	
NT 204	Tseng Tau Sheung Tsuen	11-6	H.D.		Soil cut slope	Minor	Road	Half width of road closed	
NT 205	Tseng Sheung Tsuen	11-6	H.D.		Natural slope (masonry wall at crest)	Major	Road	Road closed	
NT 206	Tseng Sheung Tsuen @ behind the dogs' training school	11-6	H.D.		Soil/rock cut (of loose colluvium)	Minor	Squatter	1 hut damaged Permanent evacuation of 1 hut	
NT 207	Ching Wah Lei behind Hang Tai Textile factory	11-6	H.D.		Soil/rock cut (class 1 colluvium)	Major	Squatter and textile factory	7 huts collapsed Permanent evacuation of 7 huts	
NT 208	Tseng Lam Shue	21-6	D.O.	29-5	Natural slope	Minor	Village		
NT 209	4 Sam Lung Tsuen, Tseng Lam Shue	18-6	D.O.	29-5	Bearing capacity failure of house wall	Minor	4 squatters	Collapse of kitchen wall	
NT 210	Man King Toi, Clear Water Bay Road	18-6	D.O.	29-5	Soil cutslope retaining wall	Minor	Carpark		
NT 211	Tseng Lam Shue	21-6	D.O.		Soil cut slope	Minor	Houses	Evacuation of 1 building	
NT 212	1 Sheung Wong Yi Au, Tai Po	16-6	D.O.		Cutslope	Minor	VTH	Temporary evacuation of 1 house	
NT 213	Na Wu Tsai, Sai Kung	21-6	D.O.	29-5	Soil cut slope	Minor	1 storey house		

Master List of Incidents reported to Geotechnical Control Organisation

(C) List of Incidents in N.T. reported to Geotechnical Control Office

Incident No.	Location	Call Received		Failure			Area Affected	Consequence	Remarks
		on	from	Date	Type	Scale			
NT 214	Pak She Toi, CWB Road	18-6	D.O.	29-5	Retaining wall	Minor	Garden of house		
NT 215	Hang Hau Poon Kin Tsuen	11-6	D.O.		Retaining wall	Minor	Building	Road blocked	
NT 216	Sok Kwu Wan, Lamma Island	21-6	D.O.	29-5	Boulders (complaint)	Minor	Village houses		
NT 217	Tao Fung Shan Road, Sha Tin	15-6	D.O.	29-5	Natural slope	Minor	Road	Road damaged	
NT 218	Squatters: Shing Mun Road, Tsuen Wan	23-6	D.O.	29-5	Natural slope	Minor	Squatters		
NT 219	53 Shing Mun Road, Tsuen Wan	23-6	D.O.	29-5	Natural slope	Minor	Road below and house at top		
NT 220	Chip Tak Weaving Factory, Tsuen Wan	23-6	D.O.	29-5	Soil cutslope/ natural slope	Minor	Factory building	Fence broken	
NT 221	License W 6382, Tsing Lung Tao, Tsuen Wan	23-6	D.O.	29-5	Soil cutslope	Minor	Licensed houses	1 house wall collapse 1 house damaged Permanent evacuation involving 10 structures	
NT 222	License W 6793, Tsing Lung Tao, Tsuen Wan	23-6	D.O.	29-5	Natural slope	Minor	Licensed houses	1 house damaged Permanent evacuation involving 5 structures	
NT 223	Choi Yuen Chuen, Tsing Lung Tao, Tsuen Wan	23-6	D.O.	29-5	Soil cut/natural slope/road embankment	Minor	Walkway and squatters	1 pigsty buried	
NT 224	Tai Chik Sha (A)	21-6	D.O.		Soil cutslope	Minor	Footpath		
NT 225	Tai Chik Sha (B)	21-6	D.O.		Soil cutslope & retaining wall	Minor	Footpath & building	Building temporarily closed	affect the same building as in case NT233
NT 226	Tai Chik Sha (C)	21-6	D.O.		Soil cutslope	Minor	Building		
NT 227	So Kwun Wat (D) Tuen Mun	3-6	H.D.		Masonry retaining wall	Minor	Squatter		

Master List of Incidents reported to Geotechnical Control Organisation

(C) List of Incidents in N.T. reported to Geotechnical Control Office

Incident No.	Location	Call Received		Failure			Area Affected	Consequence	Remarks
		on	from	Date	Type	Scale			
NT 228	Sam San Hui (B), Tuen Mun	3-6	H.D.	29-5	Soil cut slope	Minor	Road and squatter	Temporary evacuation of 2 huts	
NT 229	Sam San Hui (C), Tuen Mun	3-6	H.D.	29-5	Boulder	Minor	Footpath		
NT 230	Sam San Hui (D), Tuen Mun	3-6	H.D.	29-5	Rock cut slope	Minor	Road	Partial blockage of road Temporary evacuation of 2 huts	
NT 231	Tsing Yi (1 Km from CL&P)	28-6	H/NT		Soil/rock cut boulders	Major	Road		
NT 232	Tai Chik Sha (1)	21-6	D.O.		Retaining wall	Minor	Squatter	1 squatter temporarily evacuated	
NT 233	Tai Chik Sha (2)	21-6	D.O.		Retaining wall	Minor	Building	Building temporarily closed	
NT 234	Tsuen Wan 3 cases	29-6	DO/TW						same as NT 236, 237, 238
NT 235	Hung Nai Tong, Ma On Shan, Shatin	28-6	D.O. Shatin		Soil cut slope	Minor	Building (VTH)	-	
NT 236	30 Pak Tin Pa Village (CLL W0735)	24-6	DO,TW		Soil cut slope	Minor	Squatters	-	
NT 237	Lin To, Tsing Yi (RTW/10D/65 CLL.W7192)	24-6	DO,TW		Soil cut slope	Minor	Squatters	-	Some location as NT 51
NT 238	D453 Fu Yung Shan, Tsuen Wan (2 incidents)	24-6	DO,TW		a) boulder b) retaining wall	a) Minor b) Minor	Squatters, footpath, brick house	a) 1 hut permanently evacuated b) Part of brickhouse temporarily closed, footpath closed.	
NT 239	Shing Mun Catchwater CH 4210 Tsuen Wan (830255E, 826950N)	10-6	G.C.O.		Natural slope	Major	Waterworks Road	-	
NT 240	Shing Mun Catchwater CH 4352 Tsuen Wan (830160E, 826895N)	10-6	G.C.O.		Soil cut slope	Major	Catchwater	-	
NT 241	Shing Mun Catchwater CH 5050 Tsuen Wan (829790E, 827100N)	10-6	G.C.O.		Soil cut slope	Major	Catchwater	-	
NT 242	Tai Lam Chung Catchwater CH 180 Section 'K', Tsing Lung Tau. (823220E, 825625N)	16-6	G.C.O.		Soil cut slope	Major	Catchwater & Downslope	Overflow of water at CH 215 caused large downslope erosion.	
NT 243	Tai Lam Chung Catchwater CH 600 Section 'K', Tsing Lung Tau (822975E, 825410N)	16-6	G.C.O.		Soil cut slope & Boulder	Major	Catchwater	-	
NT 244	Tai Lam Chung Catchwater CH 720 Section 'K', Tsing Lung Tau (822855E, 825350N)	16-6	G.C.O.		Soil cut slope	Major	Catchwater	-	

Master List of Incidents reported to Geotechnical Control Organisation

(C) List of Incidents in N.T. reported to Geotechnical Control Office

Incident No.	Location	Call Received		Failure			Area Affected	Consequence	Remarks
		on	from	Date	Type	Scale			
NT 245	Tai Lam Chung Catchwater CH 1990 Section 'K', Tsing Lung Tau (821965E, 825000N)	16-6	G.C.O.		Soil cut slope & Boulder	Major	Catchwater	-	
NT 246	Tai Lam Chung Catchwater, CH 2195 Section 'K', Tsing Lung Tau (821820E, 824880N)	16-6	G.C.O.		Natural slope	Major	Catchwater	-	
NT 247	Tai Lam Chung Catchwater CH 9720 KV016787, Section 'O' Tsuen Wan, Route Twisk	9-6	G.C.O.		Soil cut slope	Major	Catchwater & Downslope	Overflow & erosion of downslope	
NT 248	Sha Lo Tung Road (C)	14-6	D.O.	End of May	Natural slope	Minor	Road		
NT 249	Ap Tsai Wan, Sai Kung	13-7	H.D.	"	Soil cut slope	Minor	Squatters	Permanent evacuation of 3 huts	
NT 250	Wong Yi Au Tsuen, Tai Po	13-7	D.O.	"	Soil cut slope	Minor	Houses and footpath		
NT 251	Wo Hop Shek (A)	16-6	NTSD	"	Soil cut slope	Probably Minor	Cemetery	Several graves damaged	Stone pitching failed
NT 252	Wo Hop Shek (B)	16-6	NTSD	"	Natural slope	Probably Major	Cemetery	Several graves damaged	
NT 253	Tsz Tin Tsuen, Tuen Mun	15-7	D.O.	"	Natural/stream erosion	Minor	Pigsty		
NT 254	Tsing Yi Repco Slope 1 (A)	21-7	GCO/NW	"	Boulder	Major	Squatters	Permanent evacuation of 3 huts	
NT 255	Wo Li Hang, Tsuen Wan	26-7	D.O.	"					Dealt with by H/NT.
NT 256	Tsing Yi Pepco Slope 1 (B)	28-7	H/NT	"	Boulder	Minor	Road		
NT 257	Siu Hang Tsuen, Tuen Mun	26-7	D.O.	"					Duplicate of earlier case
NT 258	CH 3555 - 3565 Shing Mun Catchwater KV034787	14-6	G.C.O.	"	Soil cut slope	Major	Catchwater		
NT 259	Hok Tau Road (A)	31-8	W.S.D.	"	Soil/rock cut slope	Major	WSD access road	Road blocked	
NT 260	Hok Tau Road (B)	31-8	W.S.D.	"	Imminent failure of pitching of cut slope	Minor	WSD access road		No failure yet
NT 261	Hok Tau Road (C)	31-8	W.S.D.	"	"	Minor	WSD access road		No failure yet
NT 262	Hok Tau Road Reservoir	31-8	W.S.D.	"	Rock cut slope	Minor	WSD access road and reservoir		
NT 263	Lau Shui Heung Road	31-8	W.S.D.	"	Soil cut slope	Minor	WSD access road	Road blocked	
NT 264	Lau Shui Heung Reservoir	31-8	W.S.D.	"	Soil cut slope	Minor	Reservoir		
NT 265	Lau Shui Heung Reservoir	31-8	W.S.D.	"	Soil cut slope	Minor	Reservoir		

Master List of Incidents reported to Geotechnical Control Organisation

(C) List of Incidents in N.T. reported to Geotechnical Control Office

Incident No.	Location	Call Received		Failure			Area Affected	Consequence	Remarks
		on	from	Date	Type	Scale			
NT 266	19-23 Ho Chung, Sai Kung	11-8	D.O.	End of May	Soil cut slope	Minor	Houses		
NT 267	Tai Hang Hau, Sai Kung	11-8	D.O.	"	Soil cut slope	Major	CL & P Substatiin	Substation damaged	
NT 268	Lei Yue Mun, Sai Kung	11-8	D.O.	"	Rock cut slope	Minor	Squatters and CLL house	Rear of house demolished Permanent evacuation of 1 CLL house	
NT 269	Tseng Lan Shue	11-8	D.O.	"	Soil cut slope	Minor	Road	Road blocked	
NT 270	Tseng Lan Shue	11-8	D.O.	"	Retaining wall	Minor	Road		Wall showing signs of distress
NT 271	Ma Yau Tong A	11-8	D.O.	"	Soil cut slope	Minor	VT House		
NT 272	Ma Yau Tong B	11-8	D.O.	"	Stream erosion		Footpath	Footpath undercut	
NT 273	Ma Yau Tong C (2 incidents)	11-8	D.O.	"	Fill slope	Minor	Road		
					Retaining wall	Minor	Road		Wall showing signs of distress
NT 274	Ma Yau Tong D	11-8	D.O.	"	Retaining wall	Minor	Road		
NT 275	Ma Yau Tong E	11-8	D.O.	"	Soil cut slope	Major	Road	Road blocked	
NT 276	Tai Po Kau	26-9	D.O.	"	Natural slope	Minor	CLL Houses	Debris in back yard of house	

Master List of Incidents reported to Geotechnical Control Organisation

(D) List of Incidents reported to Geotechnical Control Branch, Buildings Ordinance Office

Incident No.	Location	Call Received		Failure			Area Affected	Consequence	Remarks
		on	from	Date	Type	Scale			
GCB 1 & 7	54 - 56 Kennedy Road, H.K.	29-5	HO	29-5	Natural slope	Major	Rear yard of bldg.	Yard blocked	'D' notice recommended
GCB 2	Along Nam Long Shan Road - Access to Ocean Theatre H.K.	29-5	BOO	29-5	Natural slope/ Soil/rock cut slope	Major	Access road	Road blocked Dangerous notice issued	
GCB 3	101 Caroline Hill Road, H.K.	29-5	BOO	29-5	Natural slope/ Soil cut slope	Minor	Building	Dangerous notice issued	Refer case HK13
GCB 4	7, Shui Fai Terrace, H.K.	29-5	BOO	29-5	Soil cut slope	Minor	footpath to building	Access to building blocked	Refer case HK12
GCB 5	Pak Fuk Road, Bedford Terrace, H.K.	29-5	H/HK	29-5	Soil/rock cut slope	Minor	pavement	-	H/HK follow up
GCB 6 & 34	90, Kennedy Road, H.K.	31-5	BOO	29-5 31-5	Soil/rock cut slope	Major	Building & Carpark	Car mined Carpark blocked Dangerous notice issued	Refer case HK10
GCB 8	237-239, Prince Edward Road, K.	29-5	BOO	29-5	Soil cut slope	Minor	Carpark	Dangerous notice recommended	DB follow up
GCB 9	19, Tai Hang Road, H.K.	29-5	BOO	29-5	Soil cut slope	Major	Entrance blocked	Closure order issued Dangerous notice issued	
GCB 10	Sham Tseng Textile Factory, N.T.	29-5	BOO	29-5	Wing wall of culvert	Minor	Deralict building to be demolished	-	DB follow up
GCB 11	San Tsuen, Sham Tseng, N.T.	29-5	BOO	29-5	Natural slope	Minor	Brick house	Closure order issued	Dangerous notice under preparation
GCB 12	Lai Shum Villa, 13¼ ms - Castle Peak, N.T.	29-5	BOO	29-5	Soil cut slope, Fill slope and retaining wall	Minor Major Minor	Building/Public road	Closure order issued Dangerous notice issued	DB follow up
GCB 12A	Swimming Huts - Dragon Beach, N.T.	31-5	BOO	29-5	Fill slope/ retaining wall	Minor	Building (changing room)/Road	-	Refer case NT108
GCB 13	TWTL 96 - 9¼ ms Castle Peak Rd., N.T.	29-5	BOO	29-5	Soil cut slope	Minor	Unoccupied building (newly completed), Road	Public Road partially blocked	AP follow up
GCB 14	81-86, Kam Shan Terrace, Tai Po, N.T.	29-5	BOO	29-5	Soil cut slope/ Retaining wall	Major	Building yard	Evacuate part of the building Dangerous notice recommended	DB clarifying responsibility. Refer case NT29
GCB 15 & 15A	87A-87, Kam Shan Terrace, Tai Po, N.T.	29-5	BOO	29-5	Soil cut slope and Retaining wall	Major	Building yard	Evacuate part of the building Dangerous notice recommended	Refer case NT29 DB clarifying responsibility
GCB 16	Pan Lo Wan Village House Nos. 59-61, S.K. N.T.	29-5	BOO	29-5	Soil cut slope	Minor	Building		Refer case NT20
GCB 17	Quarry Bay School, H.K.	29-5	H/HK	29-5	Retaining wall	Major	Building	Playground of Quarry Bay Junior School blocked	H/HK follow up Refer case HK21

Master List of Incidents reported to Geotechnical Control Organisation

(D) List of Incidents reported to Geotechnical Control Branch, Buildings Ordinance Office

Incident No.	Location	Call Received		Failure			Area Affected	Consequence	Remarks
		on	from	Date	Type	Scale			
GCB 18	H.K. Garden, H.K.	31-5	H/HK	-	-	-	-	-	No failure
GCB 19	Off Pokfield Road, HKU, H.K. (2 incidents)	31-5	BOO	29-5	(a) Natural slope (b) Soil cut slope	a) Major b) Major	Huts and factory	Closure order issued Dangerous notice issued	
GCB 20	Behind 14 Shouson Hill Road West, H.K.	31-5	BOO	29-5	Retaining wall	Minor	Backyard of building	-	Advisory letter recommended to DB
GCB 21	RBL 1044, South Bay Close, H.K.	31-5	BOO	29-5	Soil/rock cut	Major	Construction site	-	A.P. follow up Refer case HK33
GCB 22A	No.1, Tseng Lan Shue Village Main King Terrace, 6½ ms Clearwater Bay Rd., S.K., N.T.	29-5	H/NT	29-5	Soil cut slope	Minor	Access road	-	Refer case NT22
GCB 23	Rise Park Villa, Razor Hill, Lot 1124 Sai Kung, N.T.	31-5	BOO	29-5	Fill slope	Major	Buildings	Block 10 & 11 evacuated Closure order issued	Dangerous notice issued
GCB 23A	Lots 359-459 in DD224, Silverstrand, Sai Kung, N.T.	31-5	BOO	-	Flooding	-	Building	Natural stream course blocked	
GCB 23B	Tui Mui Hui Village, N.T.	31-5	BOO	-	-	-	-	-	Referred to H/NT Refer case NT107
GCB 22	Las Rinades, Ta Ku Ling, Clearwater Bay Rd. Lots 245, 247-250 in DD223	31-5	BOO	29-5	Flooding	Minor	Building	-	
GCB 24	Tai Kwong Middle School, Tai Po, N.T.	31-5	BOO	29-5	Soil cut slope	Minor	Car park and part of school building	Closure order issued Dangerous notice recommended	Refer case NT58 Further 'D' notice to be recommended for adj. lot
GCB 25	144 Pokfulam Road - HK U, H.K.	31-5	BOO	29-5	Soil cut slope	Minor	Rear yard of building	-	Advisory letter to be recommended to BOO
GCB 26	Behind Chater Hall, H.K.	31-5	Public	31-5	Soil/rock cut	Minor	Building	Temporary evacuation of part of building	Refer case HK32
GCB 27	98A Kennedy Road, H.K.	31-5	BOO	-	-	-	-	-	H/HK follow up
GCB 28	Cheung Chau - CCL 1287, N.T.	31-5	BOO	30-5	Soil cut slope	Minor	Rear yard of building footpath	Footpath partially closed	D.O. (Island) follow up
GCB 29	23 Barker Road, H.K.	31-5	BOO	29-5	Masonry retaining wall	Minor	Car park	-	Advisory letter to be recommended to BOO
GCB 30	Tung Wah Eastern Hospital, H.K.	31-5	Public	-	Soil cut slope	Minor	Building	Drains blocked	Owner follow up/was already subject to 'D' notice
GCB 31/35	33 To Yuen Street - Heung Toi Middle School, K.	31-5	BOO	29-5	Retaining wall	Minor	Squatter huts/ school playground	Huts evacuated Playground partially closed	Refer case K12
GCB 32	41C Conduit Road, H.K.	31-5	BOO	-	Overhanging boulder	Minor	Building flats	-	Refer case HK52

(D) List of Incidents reported to Geotechnical Control Branch, Buildings Ordinance Office

Incident No.	Location	Call Received		Failure			Area Affected	Consequence	Remarks
		on	from	Date	Type	Scale			
GCB 33	Behind construction site off Aberdeen Old Main Street, H.K.	31-5	GCO	-	Boulder	Minor	Access to squatter and construction site	Footpath blocked	A.P. to be advised Refer case HK20
GCB 36	Kwun Yam Temple, Shatin Pass, K.	31-5	Police	-	Suspected failure	-	-	Residents of hut temporarily evacuated	Refer case K43
GCB 37	89-93 Tai Hang Road, H.K.	31-5	GCO	-	Soil cut slope	Minor	-	-	H/HK follow up, case HK44
GCB 38	Po Wah Yuen, Yung Shue Wan, Lamma Island, N.T.	1-6	GCO	31-5	Natural slope and fill slope	Minor	Building/footpath/ squatter hut	Hut evacuated/footpath closed	D.O. (Island) follow up Refer case NT48
GCB 39	Off Smithfield Road, H.K.	1-6	BOO	29-5	Retaining wall	Minor	Squatter huts	-	GCO follow up Refer case HK49
GCB 40	370-384 Castle Peak Road, N.T.	1-6	BOO	29-5	Soil cut slope/ retaining wall	Major	Factory structures (H.D. site)	Evacuation of affected part Dangerous Notice recommended	D.B. follow up Refer case NT47
GCB 41	Nos. 278, 28[illegible] Man Wu Tsai Village, Po Lam Road, Sai Kung, N.T.	1-6	GCO	-	Tilted retaining wall	Minor	Ground floor of houses vacated	-	Refer case NT49
GCB 42	She On Terrace, Sham Tseng, N.T.	1-6	GCO	-	Fill slope	Minor	Access staircase partially closed	-	GCO follow up Refer case NT50
GCB 43	Tsing Lung Tau, C & E Construction Equipment Ltd., N.T.	1-6	GCO	29-5	Soil cut slope	Major	Building/rear yard	Closure order issued	A.P. follow up
GCB 44	Dragon Terrace, Sham Tseng, N.T.	1-6	BOO	29-5	Soil cut slope	Major	Building/garage	Closure order issued Dangerous Notice issued	D.B. follow up
GCB 45	21 Ventris Road, H.K.	1-6	BOO	29-5	Natural slope	Minor	Building under demolition	-	A.P. follow up Refer case HK58
GCB 46	Kam To Village, N.T.	1-6	GCO	-	-	-	-	-	GCO follow up Refer case NT52
GCB 47	Siu Tat Fung, Shatin, N.T.	1-6	-	-	-	-	-	-	Referred to D.B., G.C.O.
GCB 48	Kowloon Hang, Tai Po, N.T.	3-6	BOO	29-5	Soil cut slope	Minor	Rear yard	-	D.B. clarifying responsibility
GCB 49	Lot 339 in DD224, Silver Crest Road, Silverstrand, Sai Kung, N.T.	3-6	Public	-	Flooding	-	Building	-	
GCB 50	No. 17, Tai Tam Road, H.K.	5-6	BOO	4-6	Soil/rock cut	Minor	Road	Dangerous notice issued	
GCB 51	96 Pokfulam Road, H.K.	4-6	Public	29-5	Soil/rock cut	Major	Road	Road closed Dangerous notice issued	
GCB 52	35 Shouson Hill Road, H.K.	3-6	BOO	29-5	Soil cut slope	Major	Access road	Dangerous notice issued	
GCB 53	Emmanuel Primary School, Sham Tseng, N.T.	2-6	BOO	29-5	Soil cut slope	Major	School hall/ playground	Closure order issued Dangerous notice issued	
GCB 54	Greenwich Garden, Kam Shan Terrace, Tai Po, N.T.	2-6	GCB	29-5	Soil cut slope/ Boulder	Major	Building	Building closed Dangerous notice issued	Refer case NT159

Master List of Incidents reported to Geotechnical Control Organisation

(D) List of Incidents reported to Geotechnical Control Branch, Buildings Ordinance Office

Incident No.	Location	Call Received		Failure			Area Affected	Consequence	Remarks
		on	from	Date	Type	Scale			
GCB 55	Kau To, STTL 107, Shatin, N.T.	2-6	BOO	29-5	Fill slope	Major	Active construction site	Site formation plan amended	
GCB 56	To Fung Shan Road, Shatin, N.T.	3-6	D.O., S.T.	-	Natural slope	Minor	Road		

APPENDIX 2

Location of Incidents

Drawing No.

GCE 255 Location Plan of Incidents May 1982 Rainstorm