

HONG KONG RAINFALL AND LANDSLIDES IN 1989

GEO REPORT No. 6

K.L. Siu

**GEOTECHNICAL ENGINEERING OFFICE
CIVIL ENGINEERING DEPARTMENT
HONG KONG**

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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.

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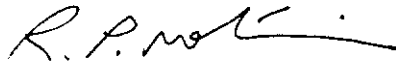
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A handwritten signature in black ink, appearing to read 'A. W. Malone', with a stylized flourish at the end.

A. W. Malone
Principal Government Geotechnical Engineer
April 1995

FOREWORD

This report presents a general review of rainfall and landslides in Hong Kong in 1989. Geotechnical Engineers from the Geotechnical Control Office District Divisions provided details of the notable landslides. Supplementary landslide data were provided by the Agriculture and Fisheries Department, Architectural Services Department, Civil Engineering Office, Fire Services Department, Highways Department, Housing Department and Water Supplies Department. The Royal Observatory provided rainfall information. All contributions are gratefully acknowledged.



(R.P. Martin)
Ag Chief Geotechnical Engineer/Special Projects

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1. INTRODUCTION

This report reviews rainfall and landslide occurrence in Hong Kong throughout 1989. Rainfall information has been obtained from the Geotechnical Control Office (GCO) automatic raingauge system and from the Royal Observatory (RO). Most of the landslide data have been taken from the records of incidents reported to the GCO during the year. Supplementary data have been obtained from other Government departments.

In this report, a landslide is defined as the collapse of a soil or rock mass, and includes the failure of fill slopes, cut slopes, retaining structures, natural slopes and rock or boulder falls. A major landslide is defined as a failure in which the volume of the collapsed mass exceeded 50 cu m.

The GCO received a total of 620 incident reports in 1989. Of these, 553 were classified as genuine landslides and 56 of them were major. The remaining incidents were minor ground or structural movements. It is notable that 114 and 338 incidents out of the whole year's total occurred during two severe rainstorms on 1-2 May and 20-21 May respectively. This report will emphasize the cases of landslides reported to the GCO, since these were inspected by the GCO's Geotechnical Engineers and detailed information is available.

The arrangement of this report is similar to the previous annual rainfall-landslides reports (Premchitt, 1985-1989). The report reviews rainfall and landslide occurrence throughout the whole one-year period rather than emphasizing any one specific rainstorm. Information has been compiled from many sources throughout the government and the report fully documents the work done by GCO in dealing with the landslide incidents.

2. RAINFALL

2.1 The Raingauge System

In the rugged terrain of Hong Kong, rainfall distribution over different geographical areas, as well as over different time periods, can vary dramatically during a rainstorm. The Royal Observatory has installed 122 raingauges at 91 locations around the Territory in order to provide sufficient coverage for a meaningful analysis of rainfall distribution. These raingauges range from a detailed automatic and instantaneous rate-of-rainfall recorder to raingauges which are read manually once a month. The "principal" gauge is located at the Royal Observatory's headquarters in Tsim Sha Tsui, and a continuous rainfall record has been made at this location since 1884. Weather summaries and rainfall statistics are normally based on the measurements made at this principal location.

Since 1978, the GCO, in co-operation with the RO, has installed a number of automatic raingauges which transmit the current rainfall data via telephone lines to the GCO's Emergency Control headquarters. Improvements have been made regularly and at present there are 46 GCO gauges and 21 RO gauges in this system, which provide up-to-date rainfall data every five minutes to the operation rooms of the GCO and RO. These data are also stored on computer tape and diskettes for future reference. The locations of these automatic raingauges (Figure 1) were selected to supplement the network of other types of raingauge and to provide specific information in areas of particular

geotechnical interest. A major upgrading of this system was completed in January 1989.

In this report, where a comparison is being made for "daily" rainfalls, the 24-hour maximum rainfall will be used instead of daily rainfall, since the latter is based on an arbitrary fixed period of midnight to midnight which does not necessarily represent the true rainstorm intensity. In addition, when a rainfall amount is quoted without reference to the location of measurement, this will be the amount measured at the RO headquarters.

2.2 Royal Observatory Records

The year's weather for 1989 was summarised by the Royal Observatory in the Monthly Weather Summary for December 1989. Their comments are as follows:

In 1989 altogether eleven tropical cyclones traversed the South China Sea. Seven of them required the hoisting of tropical cyclone warning signals in Hong Kong. Contributing 439.4 millimetres of rainfall in May, Typhoon Brenda ranked as the tenth wettest storm on record. Although the rainfall associated with tropical cyclones amounted to 646.4 millimetres which was 14 per cent above average, the annual rainfall in 1989 was only 1944.6 millimetres, 13 per cent below the normal of 2224.7 millimetres.....

With only seven days in the month without rain, the total duration of bright sunshine in April was only 71.1 hours which is the ninth lowest on record for April. A trough of low pressure reached the south China coast during the evening of 22 April, bringing showers and thunderstorms to the territory. Rainfall was especially heavy in the New Territories where 25 cases of flooding were reported.

May was a very eventful month in terms of the weather in Hong Kong. Rainfall was much above normal and tropical cyclone warning signals were hoisted for the first time in the year. The approach of Typhoon Brenda necessitated the hoisting of the No. 8 Gale or Storm Signal which had not been raised since August 1986. The monthly total rainfall of 771.9 millimetres, was the fourth highest on record for May. Most of the rain in the month was associated with an active trough of low pressure at the beginning of the month and with Typhoon Brenda which affected the south China coastal areas from 19 to 21 May. On 2 May, 104.8 millimetres of rain fell between noon and 1 p.m. This amount was the highest hourly rainfall ever recorded for May. The heavy rain resulted in widespread flooding and landslips over the territory, bringing severe disruptions to road, rail and air transport. A man was reported to have been killed by lightning while two other people were drowned. The daily total rainfall of 322.8 millimetres on 20 May associated with Typhoon Brenda was the second highest daily rainfall on record for May. During the passage of Brenda a total of six people was killed [from all causes] one reported missing, 62 injured and 50 people made homeless. In addition, torrential rain associated with Brenda resulted in 100 cases of landslips and 118 cases of flooding. At the airport, more than 100 flights were diverted, delayed or cancelled. Bus, tram and ferry services were all suspended.

In sharp contrast with the previous month, June was exceptionally dry. Only a total of 137.5 millimetres of rainfall was recorded against a normal amount of 431.8 mm. This was the eighth lowest on record for June

Although two tropical cyclones affected Hong Kong in July, the monthly rainfall amounted to only 237.9 millimetres, equivalent to about three quarters of the normal figure of 316.8 millimetres. The approach of Typhoon Gordon necessitated the hoisting of the No. 8 Gale or Storm Signal between 17 and 18 July. The typhoon brought squally showers and abnormally high tides to the territory causing thirteen cases of flooding, mostly in the outlying islands and the New Territories. The more severe ones occurred in Tai O where water level rose by more than one metre, and at Ping Ha Road in Yuen Long. An old woman was found dead in her flooded squatter hut at Tai O. In the same village nine senior residents had to be evacuated. During the passage of Gordon, local ferries, buses, trams and ferry services to China and Macau were suspended. At the international airport, 40 flights were delayed, 19 flights diverted to other places, and 13 flights cancelled.....

August was warmer and drier than usual. The mean temperature of the month of 28.9 degrees was the sixth highest on record for August. Although eight tropical cyclones occurred in the western North Pacific in August, none of them affected Hong Kong. The monthly rainfall amounted to only 218.0 millimetres which was about half of the normal figure of 413.4 millimetres....

On the whole September was rather warm with the month's mean temperature of 28.1 degrees being the fourth highest on record for September and the mean minimum temperature, 26.0 degrees, being the fifth highest.

October was rather windy with the Strong Wind Signal No. 3 hoisted on three occasions and the Strong Monsoon Signal hoisted on four other occasions. There were altogether four typhoons traversing the northern part of the South China Sea during the month. However, they all passed westwards, to the south of Hong Kong with their major rainbands stopping short of the south China coastal areas. As a result, the total rainfall for the month amounted to only 15.2 millimetres, a small fraction of the normal figure of 121.2 millimetres....

A summary of heavy rainstorms in 1989 is given in Table 1. This table shows all periods (mutually exclusive) in which 24-hour rainfall at the RO exceeded 50 mm. It also shows the fifteen-day antecedent rainfalls which occurred prior to the 24-hour periods. The highest 24-hour rainfall was 388 mm on 20-21 May. Other detailed information in Table 1 will be discussed in subsequent sections.

The rainfall data as recorded at the RO, Tsim Sha Tsui, are presented in Figures 2 to 5. Cumulative rainfall since 1st January is shown in Figure 2. Daily and monthly rainfalls are shown in Figures 3 and 4 respectively. Figure 5 shows the hourly rainfall for the highest 24-hour rainfall of 1989.

2.3 Geotechnical Control Office Records

Rainfall data are available from the GCO's 46 automatic raingauges. Current rainfall data can be found in the GCO's Rainfall Data Acquisition Centre and past data are kept in the Civil Engineering Library. A location map of the gauges is given in Figure 1.

In addition to the general RO rainstorm summary, data from some of the GCO raingauges are also given for the rainfall events in Table 1. The maximum rainfall recorded anywhere in the Territory on these occasions are given for three arbitrary durations of 24 hours, five hours and one hour.

The maximum 24-hour and one-hour rainfalls within the Territory during the year were 388 mm on 20-21 May and 105 mm on 2 May respectively.

Appendix B shows hourly rainfall data obtained from the GCO's raingauges for the heaviest 24-hour rainstorm ending on 21 May.

2.4 Rainfall Distribution

Rainfall maps, for 24-hour durations taken from RO records, are shown in Figures 6 and 7 for the two heaviest rainstorms of the year. These two rainstorms were discussed in the annual RO weather summary quoted in Section 2.2. In the storm of 1-2 May, the heaviest concentration of rainfall was in the East Kowloon area (>300mm) while less than 100 mm was recorded over much of the northern New Territories and western Lantau (Figure 6). Rainfall was more evenly spread over the Territory during the storm of 20-21 May, but there were concentrations of greater than 400 mm in the central New Territories and the Clearwater Bay Peninsula (Figure 7). The distribution of rainfall had a significant effect on the occurrence of landslides, as discussed further in Section 3.4.

2.5 Warnings Issued by the Royal Observatory

Relevant warnings issued by the RO, and the Landslip Warning jointly issued by the GCO and the RO, are summarised in Table 2.

In 1989, there were 72 Thunderstorm Warnings, 13 Flood Warnings, 3 Landslip Warnings and 7 Tropical Storm Warnings. The highest Tropical Storm Warning signal number raised during the year was No. 8, which was issued on two occasions in May and July respectively. All tropical storm warnings were issued in the period from May to October.

Three Landslip Warnings were issued after consultation between the GCO and the RO on the basis of predetermined rainfall criteria. A comparison of rainstorm damage in these events with those on all other notable rainfall-landslide days is shown in Table 1. 340 incidents are known to have occurred during 20-21 May and 120 incidents during 1-2 May, while there were less than eight incidents on any one day for the rest of the year. In the event on 2 May, of the total reported incidents for which the time of landslide occurrence is known to within one hour, 27 occurred after the warning was issued, and 29 occurred before the warning was issued. In comparison, on 20-21 May, 67 landslides occurred after the warning was issued and six occurred before the warning was issued. In the third event when the warning was issued (18-19 July), nine landslides were reported to the GCO after the warning was

issued and none before. Those events not shown in Table 1 had rainfall of less than 50 mm in 24 hours and less than five landslides on any one day.

2.6 Comparison with Past Rainstorms

Maximum rainfall amounts of various durations recorded at the GCO and RO raingauges for heavy rainstorms in 1989 are shown in comparison with the three recent major rainstorms of May and August 1982 and June 1983 in Table 1. The highest 24-hour rainfall recorded at the RO in 1989 was almost the same as that for the May 1982 rainstorm. The highest one-hour rainfall recorded anywhere in 1989 was 105 mm, which is also the highest ever recorded for May.

The return periods of heavy rainstorms in 1989 were estimated, and are shown in Table 3, for rainfall durations of one hour to fifteen days. The estimated return period for the 1 hour rainfall (105 mm) was 50 years, which is exceptionally long. The return periods for the 5 hour to 2 day rainfall were of the order of 10 years, which are also notable. In general, the intensities of the major rainfalls in 1989 were comparable to those in 1982 and 1983, as shown in Table 1.

In Figure 2, cumulative rainfall for 1989 is shown in comparison with the average (1951-1980), the wettest year (1982) and the driest year (1963) since records began in 1884. The annual cumulative rainfall was 1945 mm, which is comparable with the average amount of 2225 mm. Figure 4 shows monthly rainfalls in 1989 in comparison with the recorded maximum (since 1884) and mean (1951-1980) monthly rainfalls. In April and May, the monthly rainfall was generally above the mean value. After May, the monthly rainfall was generally well below the mean. A summary of the daily rainfall recorded at the Royal Observatory is shown in Appendix C.

3. LANDSLIDES

3.1 Landslide Occurrence in 1989

The numbers of incidents reported to various Government departments during 1989 are shown in Table 4. The numbers of incidents affecting various types of area (building, road etc.) in Hong Kong, Kowloon and the New Territories are shown in Table 5. The number of major failures are also given in this table. There were 56 major landslides in 1989.

A list containing details of all 620 incidents reported to the GCO is provided in Appendix A. A location map for all these incidents is shown in Drawing No. GCSP 25/1. Selected incidents are illustrated in Plates 1 to 14. More details of these incidents are contained in the incident files of the GCO District Divisions and the 1:5 000 incident location maps housed in the Civil Engineering Library.

Wherever possible, the dates and times of the landslides were ascertained by the Geotechnical Engineers during site inspection. Some incidents were not reported for several days or weeks, particularly those which occurred in the New Territories. Therefore, it was difficult to determine the exact times of occurrence for these incidents. Out of 620 incidents, times of occurrence were known to within one day for 532 incidents. The daily numbers of these incidents are plotted in Figure 3. Of these 532 incidents, times of occurrence were determined to within one hour for 116 incidents.

The highest number of incidents in a rainstorm was 340 on 20-21 May and the next highest was 120 on 1-2 May. These occasions are included in Table 1, where the number of incidents reported in the newspapers and by the Fire Services Department are also shown for comparison. For those events not shown in Table 1, there were less than five incidents on any one day of the year.

It is likely that there were other failures which were not known to the GCO, including minor failures of no consequence, such as failures in remote areas, open spaces and construction sites. This should be borne in mind in reading the following landslide statistics.

3.2 Areas Affected by Incidents

The numbers of incidents, as reported to Government departments, which affected various categories of areas are given in Table 5. It should be noted that one incident may affect more than one area category. Landslide consequences, classified according to the type of failure, are shown in Table 6.

3.2.1 Squatter Areas

A total of 227 incidents affected squatter areas. Of these, 14 occurred on Hong Kong Island, 100 occurred in Kowloon and 113 in the New Territories. Most of those occurring in Kowloon were in the Kowloon East region, and the majority of those occurring in the New Territories were in Tsuen Wan, Sha Tin, Tuen Mun and Sai Kung.

Fourteen major failures affected squatter areas and two of these were notable. Incident K 89/5/90 (Section 4.13) damaged two huts and killed two people. Incident MW 89/5/102 (Section 4.8) resulted in permanent evacuation of 13 huts.

Incidents in squatter areas required permanent evacuation of 344 huts and temporary evacuation of 130 huts. Most of these evacuations resulted from failures of soil slopes (Table 6).

3.2.2 Buildings

There were 77 incidents affecting buildings of which seven were major failures. Incident ME 89/5/6 (Section 4.4) in Sai Kung affected buildings located 10 m away from the failure. Incident ME 89/5/8 (Section 4.5) which led to the closure of a village house, was a subject of litigation. Incident HK 89/5/14 (Section 4.12) resulted in the temporary closure of a school building.

3.2.3 Roads and Access

A total of 217 incidents affected roads and access, of which 27 were major failures. 121 sections of roads were blocked and temporarily closed to traffic after the failures. These included parts of the Tuen Mun Highway, Route Twisk, Hiram's Highway, Sau Mau Ping Road, Princess Margaret Road and Waterloo Road. Examples of slope failures along the Tuen Mun Highway are shown in Plates 28 and 29. Two typical failures (K 89/5/3 and K 89/5/98) are discussed in Sections 4.2 and 4.7.

3.2.4 Construction Sites

There were three incidents affecting construction sites. A typical one is shown in Plates 38 and 39.

3.2.5 Catchwaters and Reservoirs

There were 23 reported incidents affecting catchwaters and reservoirs, of which one was major. This was incident MW 89/7/18, which occurred on the Maclehose Trail near Tuen Mun and involved the blocking of a catchwater by failure of a soil cut slope (about 80 cu m) during Typhoon Brenda.

3.2.6 Country Parks and Open Areas

A total of 82 incidents were reported in country parks. Typical examples are shown in Plates 27, 36 and 37.

3.3 Types of Incidents

The incidents inspected by the GCO have been classified into six types of failure and the number in each type is shown in Table 7. Damage resulting from these types of failure is shown in Table 6.

3.3.1 Fill Slopes

There were 22 fill slope failures, forming 3.5% of all incidents reported, as compared with 10% in 1988 (Premchitt, 1989). A typical example is incident K 89/5/25 (Plates 2 & 3). The failure surface was circular in shape and the slide debris was very mobile. The failure was considered to be due to infiltration of rainwater into slope. Another failure of fill on a natural/cut slope is shown in Plate 4.

3.3.2 Cut Slopes

There were 435 cut slope failures, forming 70% of all incidents reported. Of these, 66% were in soil, 2.5% in soil/rock and 1.5% in rock.

One of the biggest failures in a soil cut slope was incident MW 89/5/96 (more than 1000 cu m), although the consequence of failure was minor (Section 4.9, Plate 22). Other typical failures are shown in Plates 15 and 16.

Sixteen failures in soil/rock slopes were reported. Typical failures are shown in Plates 19 and 25 (incidents HK 89/5/43 and HK 89/5/18). Failures of this type were seldom along a curved surface, in contrast to those failures in fill.

There were 10 rock cut failures. A typical one is shown in Plate 23 (incident HK 89/6/3). The failure was due to groundwater and infiltration of rainfall into numerous joints in the volcanic rock.

3.3.3 Retaining Walls

There were 30 retaining wall failures, forming 5% of all incidents reported. Two failures were major (incidents ME 89/5/6 and ME 89/5/8). These are shown in Plates 10, 11 and 12 and are discussed in Sections 4.4 and 4.5 respectively. An unusual failure of a wall by the impact force due to a traffic accident is shown in Plate 1.

3.3.4 Natural Slopes

Forty-one natural slope failures were reported, forming 6.5% of the total. Nine of these were major. One interesting case is discussed in Section 4.14 (Plates 36 & 37).

3.3.5 Rock and Boulder Falls

There were 25 cases of rock and boulder falls, forming 4% of all incidents reported. One of these was major (incident K 89/5/102, Plate 26).

3.3.6 Other Failures

Other failures are incidents which cannot be classified according to the above categories. These included cases of collapse of excavations, ground settlement, collapse of huts and debris washout. There were 67 failures of this type, forming 11% of all incidents reported. None of these was major.

3.4 Rainfall-Landslide Relationships

The primary cause of the large majority of all failures was rainfall. Other failures were mostly isolated incidents caused by such factors as construction work, leakage of services and indiscriminate activities relating to earthworks and drainage alterations in squatter areas.

A simple relationship between rainfall and landslides is demonstrated by the plot of daily rainfall and daily number of landslide occurrences throughout 1989 in Figure 3. The great majority of the landslides recorded occurred at times of heavy rainfall, in particular during the rainstorm on 19-21 May during Typhoon Brenda. The geographical distribution of rainfall in the heavy storms also had a considerable influence on the occurrence of landslides in various areas. Figures 6 and 7 show the location of landslides for which dates of occurrence are known (see Section 3.1), imposed on the 24-hour rainfall maps for the corresponding time period for the events on 1-2 May and 19-21 May. These Figures indicate that most of the landslides occurred in squatter areas (particularly East Kowloon) and those areas which had the highest concentration of rainfall.

More detailed and comprehensive discussions on rainfall-landslide relationships and failure mechanisms can be found in Brand et al (1984) and Premchitt et al (1985), where extensive data from the past twenty years have been analyzed.

4. NOTABLE INCIDENTS

4.1 Introduction

Thirteen out of the 620 incidents are discussed in more detail in this section. These are presented in chronological order. The nature of the incident is referenced under the caption for each incident. These incidents have been selected mainly on the basis of size and consequence. For brevity and convenience, not all major failures (i.e. greater than 50 cu m) are included in this section. The cases chosen are considered to be representative of the landslides discussed in Section 3.

4.2 Incident K 89/5/3, Sau Mau Ping Road, Opposite Block 35, Sau Mau Ping Estate

(Date : 2nd May. Failure of soil and rock cut slope affecting road, Plate 5)

The failure occurred during heavy rain. About 300 to 400 cu m of soil and rock fell down from the upper part of a 45° soil/rock cut slope. The debris comprised boulders of different sizes (up to 3 m x 3 m x 3 m) and some soil. The original slope was composed of a thin layer of colluvium overlying insitu boulders embedded in residual soil, with granitic bedrock below. The colluvium may also have contained some large transported boulders. It is considered that the failure was partly due to a high ground-water table which exerted a high seepage pressure on the boulders and the soils, and partly due to poor surface drainage and leakage of water mains. After failure, the slope was subject to Landslip Preventive Measures (LPM) work undertaken by the GCO.

4.3 Incident ME 89/5/2, Lot 1130 in DD 253, Pak Shek Wo, Sai Kung

(Date 2nd May. Failure of natural slope affecting garden, Plates 8 & 9)

This 45° steep natural slope below a garden platform was covered with vegetation and trees. The toe of the slope was near a natural stream course. During heavy rain on 2 May, the slope failed, which involved 500 cu m of soil. The failure scar was about 20 m wide at the crest, 15 m long down the slope and 4 m deep. The failure was considered to be due to infiltration of rainwater into the slope either directly or through the garden platform. The house was temporarily evacuated after the failure.

4.4 Incident ME 89/5/6, Lots 1169 and 1173 in DD 253, Pak Shek Wo, Sai Kung

(Date : 2nd May. Failure of wall, fill and cut slope affecting garden platform, access and adjacent houses, Plates 10 & 11)

The original slope appeared to be a cut slope. To construct a garden platform, a substandard 4.5 m high wall was constructed at the mid slope location to retain fill material. This left a small cut slope located in front of the retaining wall. During heavy rain, the fill mass, wall and the small cut slope failed. The failure was believed to be due to infiltration. The 240 cu m of slide debris, which consisted of soil and rock fragments of different sizes, was quite mobile. It spread over the access road and the ground floors of nearby houses. A total of 15 houses were temporarily evacuated subsequent to the failure.

- 4.5 Incident ME 89/5/8, Lots 852 and 853 in DD 226, Denon Terrace, Sai Kung
(Date : 2nd May. Failure of small walls and soil slope leading to the closure of a village house, Plate 12)

The slope was located below a platform at the front of a 3-storey village house. The platform was supported by a 1 m high retaining wall. Another 1.8 m high retaining wall was located at the middle part of slope to support the terraced ground. The walls were not built to currently-accepted standards. During heavy rain, the two retaining walls and the supporting slope failed. The failure surface passed underneath the walls, which overturned and slid downslope for a distance of 5 to 10 m. The failure resulted in a 60° steep slip scar of maximum height up to 10 m. Inspection showed that the failure debris comprised fill and insitu soil. After failure, temporary remedial measures were undertaken by the Highways Department. A closure order for the house and a Dangerous Slope 'D' Notice were served to the owner(s) of the house. At the time of writing, no major remedial work has been carried out however since the case has been pursued through litigation by the owner(s).

- 4.6 Incident ME 89/5/18, No. 20, Lung Wo Tsuen, Sai Kung
(Date : 2nd May. Failure of soil cut slope affecting a factory, Plates 13 & 14)

The slope was 60° to 70° steep and 15 m high. It failed during heavy rain. Some 600 cu m soil debris piled up on the open space (6 m wide) at the rear of a factory and buried two lorries parked there. The flow debris pushed one lorry through the factory partition brick wall. The failure was considered to be due to the steepness of the cutting and infiltration. Immediate remedial work including trimming of loose soil and shotcreting of the slip scar was carried out by the Highways Department. A 'D' Notice was served to the owner of the factory.

- 4.7 Incident K 89/5/98, Slope at Princess Margaret Road
(Date : 20th May. Failure of slope affecting road and adjacent building, Plates 17 & 18)

The failed slope is located to the east of No. 9, Ho Man Tin Hill, Kowloon. The slope was about 50° steep and 14 m high, covered with trees and vegetation and with a 5 storey residential building at the crest. It was cut in decomposed granite for the widening of Princess Margaret Road. During Typhoon Brenda, about 220 cu m of soil slipped down to the pavement, spreading over three traffic lanes of the north-bound carriageway of Princess Margaret Road. The cause of failure was considered to be erosion and infiltration, as well as loading transmitted onto the slope from the trees under wind forces. Subsequent to the failure, the surface of slope was covered with no-fines concrete as a temporary remedial measure, as there was no room for trimming back.

- 4.8 Incident MW 89/5/102, Nos. 52A and 53A Tseng Tau Chung Tsuen, Tuen Mun
(Date : 20th May. Major soil cut and fill slope failure affecting squatter huts located at the crest and toe of slope, Plates 20 & 21)

This failure, involving slide debris of about 1000 cu m, was one of the largest failures that occurred in squatter areas in 1989 and one of the

largest recorded anywhere in the Territory. The original slope was 16 m high and had an angle of about 60°, formed by both cutting and filling. A stream course was located at the toe of the slope. During Typhoon Brenda, a mass of soil 14 m high and 50 m wide failed. The maximum thickness of the debris was about 4 m and it was wet at the time of inspection 5 days after the failure. The failure was considered to be due to infiltration of rainwater. 13 squatter huts were permanently evacuated as a result of this failure.

4.9 Incident MW 89/5/96, Yiu Kee Farm, Lots 146 and 147, Ta Shek Wu Tsuen, Pat Heung

(Date : 20th May. Failure of soil slope affecting pigsties and a farm house, Plate 22)

This failure was one of the largest (more than 1000 cu m) that occurred in 1989. The failed area was about 35 m wide and 40 m long. The failure depth was however only 2 to 3 m. This is a typical example of a shallow slope failure, and was probably due to infiltration and surface sheet flow. Pigsties and farm houses were damaged by the failure.

4.10 Incident ME 89/5/39 No. 35-38, Tai Lam Liu Village, Sha Tin

(Date : 21st May. Failure of soil cut slope affecting houses, Plate 24)

The slope was 40° to 50° steep and 12 to 15 m high, with a retaining wall at the base. Based on the GCO's assessment, the slope was not engineered to the required standard and improvement was needed. Despite GCO's repeated advice, no improvement work was carried out. During Typhoon Brenda, the slope failed. More than 200 cu m of soil fell down and piled up at the rear of the houses up to the window level. The failure was considered to be due to the steep cut and high groundwater table, as persistent seepage was noted on the slope face preceding the failure. After failure, a closure order was served to the ground floors of house 37A and 38B. This case provides an example of the failure of substandard works formed during New Territories Exempted House (NTEH) development prior to the enactment of the Buildings Ordinance (Application to the New Territories) Ordinance - Chapter 121.

4.11 Incident MW 89/5/9, Route Twisk, North Bound (South of Shek Kong Barracks)

(Date : 21st May. Soil cut slope failure affecting road, Plates 23 & 24)

This incident involved two slips in a road cut about 80 m apart. The volumes of soil debris were about 800 cu m and 500 cu m respectively. The road cut was about 60° steep and 15 m to 20 m high. The surface was covered with heavy vegetation. During Typhoon Brenda, two parts of the slope failed. The failures were of similar mode, and were probably due to seepage of ground water and infiltration of rainwater into the natural slope above. As a result of these two failures, the entire road was blocked and closed to traffic for almost one day.

4.12 Incident HK 89/5/14, Wah Yan College, Kennedy Road

(Date : 21st May. Failure of slope affecting the school and Kennedy Road, Plates 25 & 26)

The slope was 35° to 42° steep and 12 m high, with a retaining wall at its toe. During Typhoon Brenda, 500 cu m of soil, mostly loose fill, slipped down, leaving a 20 m wide steep scarp. Aerial photographic interpretation indicated that the slope and adjacent areas have a history of instability and maintenance work, which can be dated back to as early as 1952 when the school was under construction. In 1967, failures were reported during the improvement of Kennedy Road. Further inspections in 1979, 1981 and 1987, revealed defects in the slope and the adjoining areas. A GCO Stage 1 study was carried out in 1987 and showed that the slope did not have an adequate factor of safety. A Stage 2 study was then carried out and the slope failed during the site investigation works for the study. Immediate remedial works comprising installation of 94 soil nails were designed by the GCO and constructed by the Highways Department. A part of the school building was temporarily closed as a result of this failure.

4.13 Incident K 89/5/90, Lion Rock Lower Village, Sha Tin

(Date : 21st May. Natural soil slope failure causing casualties and hut damage, Plates 34 & 35)

This colluvial slope is located at the rear of Lion Rock Lower Village. It was covered with vegetation and trees. The slip scar was about 35 m high and had a slope angle of 50°. The incident occurred in the early morning during heavy rain. It involved 400 cu m of soil falling from a steep section of the slope. The failure was possibly caused by a concentration of surface water flow in a valley area, accompanied by infiltration of rainwater into the slope. The failure damaged two huts and killed two people. Sixteen huts were permanently evacuated subsequently on geotechnical grounds.

4.14 Incident HK 89/5/28, Slope between Governor's Walk and Harlech Road

(Date : 20/21st May (?). Failure of natural slope in decomposed volcanic rock affecting road and storm water drain, Plates 36 & 37)

The consequence of this failure was relatively minor, since only a small access road and a storm water drain were affected. However, the failure mechanism is interesting. The natural slope can be regarded as an infinite slope with an slope angle of 30° to 40°. The slope is covered with heavy a growth of trees. The report of the incident was received by the GCO on 22.5.89 but the exact date and time of the failure was however unknown. The GCO inspection indicated that the failure was about 40 m long, 15 m wide and 2 to 7 m deep. The slide debris was very mobile and travelled a long distance though dense vegetation before it reached Harlech Road, some 30 m away. The mobility of the slide was also demonstrated by the fact that the spaces between branches of fallen trees were entirely filled up with debris. Inspection showed that rock was exposed near the scarp, indicating that the bedrock surface/hard stratum was quite shallow. The cause of failure was probably a temporary build up of pore water pressure within the thin layer of looser material (decomposed volcanics and colluvium) due to the infiltration of rainwater.

5. CONCLUSIONS

In general, rainfall during 1989 can be considered as quite exceptional. Although the annual total of 1945 mm was broadly comparable with the average amount of 2225 mm, much more than the average rain fell in April and May, while the monthly totals from June to December were all lower than average. The rainfall in May was particularly notable. The monthly total was the fourth highest on record for May and the maximum hourly rainfall on 2 May was the highest ever recorded for May.

Over the whole year, three Landslide Warnings were issued. 620 landslides and related incidents were reported to the GCO District Divisions and the damage resulting from these incidents may be summarized as follows : two persons were killed and eight injured, 344 huts were evacuated, 17 buildings were partially closed and 121 sections of road/access were blocked. Most of these incidents occurred during the two heaviest storms of the year on 1-2 May and 20-21 May and Landslide Warnings were issued on both occasions.

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Table 1 - Rainfall-Landslide Events in 1989 with 24-hour Rainfall Greater than 50mm

Date	Maximum Rainfall (mm)								Landslide Consequences				
	Royal Observatory					GCO Raingauges			Number of Landslides			Persons Killed or Injured	Number Huts Evacuated Permanently
	24-hr	5-hr	1-hr	Antecedent		24-hr	5-hr	1-hr	GCO	Newspaper	FSD		
				4-day	15-day								
20-21/5/89 *	388	149	37	421	429	552	224	51	340	100	3	2 death 3 injured	199
1-2/5/89 *	239	193	105	239	274	226	160	56	120	16	1	—	104
18/7/89 *	120	60	17	131	162	203	77	20	7	—	—	—	—
22-23/8/89	119	80	47	131	151	138	111	40	1	—	—	—	—
7-8/4/89	82	43	17	107	110	95	39	19	7	—	—	—	1
6-7/9/89	77	43	26	92	140	158	89	42	1	—	—	—	—
16-17/9/89	71	32	15	72	165	64	32	13	—	—	—	—	—
28-29/7/89	67	19	8	68	205	87	37	16	—	—	—	—	—
21-22/6/89	65	52	26	69	87	86	70	25	2	—	—	—	1
Recent Major Rainstorms (For Comparison Only)													
29/5/82	394	153	44	1	11	430	237	111	551	498	15	48	1153
16/8/82	362	159	68	0	346	370	290	95	138	62	6	9	200
17/6/83	347	274	69	2	77	460	303	101	155	114	5	2	149
Notes : (1) The events are arranged in order of magnitude of 24-hour rainfall at the Royal Observatory, Tsim Sha Tsui. (2) For the rest of 1989, there were less than 5 landslips reported to GCO on any one day. (3) Newspapers searched are South China Morning Post and Hong Kong Standard. (4) * Landslip warning issued.													
Abbreviation : GCO = Geotechnical Control Office ; FSD = Fire Services Department ; RO = Royal Observatory													

Table 2 - Type and Date of Warnings Issued by the Royal Observatory in 1989

Month	Monthly Rainfall (mm)	Dates of Warnings			
		Thunderstorm	Flood	* Landslip	Tropical Storm
January	23.9	-	-	-	-
February	2.7	-	-	-	-
March	47.8	25	-	-	-
April	201.1	4-9, 15-17, 22-23, 26	22-23	-	-
May	771.9	1-3, 13, 17, 24, 30	2-3, 20-21	2 (12.35) to (22.45) 20 (15.01) to 21 (13.45)	19-21 (No. 1-8 signals, Brenda)
June	137.5	6, 10-12, 20, 23, 26-28	-	-	8-10 (No. 1-3 signals, Dot)
July	237.9	5, 23-24, 28-29	18-19	18 (22.45) to 19 (07.30)	9-10 (No. 1 signal, Faye) 16-18 (No. 1-8 signals, Gordon)
August	218.0	2, 5, 14-18, 20-29	21-24, 29	-	-
September	228.1	6-8, 17, 19-24, 28-30	7	-	30 (No. 1 signal, Brian)
October	15.2	16	-	-	1-2 (No. 1-3 signals, Brian) 6-9 (No. 1-3 signals, Angela) 11-13 (No. 1-3 signals, Dan)
November	20.3	-	-	-	-
December	40.2	-	-	-	-
TOTAL NUMBER	1944.6	72	13	3	7
<p>Legend :</p> <p>* Landslip warnings were issued after consultation between GCO & RO</p>					
<p>Note : The daily total rainfall of 322.8mm on 20 May associated with Typhoon Brenda is the second highest daily rainfall on record for May and the eighth highest for all months.</p>					

Table 3 - Maximum Rainfalls During 1989 and Estimated Return Periods

Duration	* Rainfall (mm)	Ending Time		† Estimated Return Period (Year)
		Date	Hours	
1 hour	104.8	2/5	1300	50
5 hours	202.1	2/5	1400	10
12 hours	288.0	21/5	0100	10
24 hours	387.8	21/5	0500	10
2 days	432.2	21/5	0900	< 10
4 days	433.1	22/5	2400	< 5
7 days	460.8	24/5	0900	4
15 days	480.9	27/5	2400	< 2
Legend : * Rainfall at Royal Observatory, Tsim Sha Tsui † Gumbel equation, Peterson & Kwong (1981)				

Table 4 - Number of Incidents Reported to Various Offices/Departments During 1989

Office / Department	Total Number	Types of Incident		
		Landslide	Flooding	Others
Agriculture & Fisheries Department	25	25	-	-
Architectural Services Department	30	20	4	6
Drainage Services Department	331	-	331	-
Fire Services Department	30	6	24	-
Geotechnical Control Office, CESD	620	575	-	45
Highways Department	337	260 *	10	67
Housing Department	5	4	1	-
Water Supplies Department	23	22	-	1
Legend:- * Landslides reported to HyD were referred to GCO and are included in the GCO incidents.				

Table 5 - Number of Incidents Affecting Different Areas in 1989

Affected Area	Hong Kong	Kowloon	New Territories	All Districts
Squatters	14	100 (1)	113 (13)	227 (14)
Buildings	14 (1)	7 (1)	46 (5)	67 (7)
Roads	40 (3)	42 (5)	135 (19)	217 (27)
Construction Sites	3	—	1	4
Catchwaters	5	—	18 (2)	23 (2)
Country Parks / Open Areas	16 (3)	46 (2)	20 (1)	82 (6)
Legend : () Number of major failures				
Note : One incident may affect more than one type of area .				

Table 6 - Consequence Related to Type of Failure in 1989

Type of Failure		No. of Huts Evacuated		Closure of Part of Building	Road/ Access Blocked	Injury
		Permanent	Temporary			
Fill Slope		7	1	0	4	0
Cut Slope	Soil	245	53	14	89	2 injured
	Soil/Rock	4	0	0	8	1
	Rock	0	0	2	1	0
Natural Slope		48	12	0	6	2 died 3 injured
Retaining Wall		10	3	1	5	0
Rock/ Boulder Fall		4	0	0	4	0
Others		26	61	1	4	0
TOTAL		344	130	17	121	8

Table 7 - Number of Incidents Reported to GCO during 1989 Classified by Type of Failure

Type of Failure		Number	Percentage
Fill Slope		22 (5)	3.5 %
Cut Slope	Soil	409 (38)	66 %
	Soil/Rock	16 (1)	2.5 %
	Rock	10	1.5 %
Natural Slope		41 (9)	6.5 %
Rock/Boulder Fall		25 (1)	4 %
Retaining Wall		30 (2)	5 %
Others (Collapse, debris washout, etc)		67	11 %
TOTAL		620	100 %
Legend : () Number of major failures			

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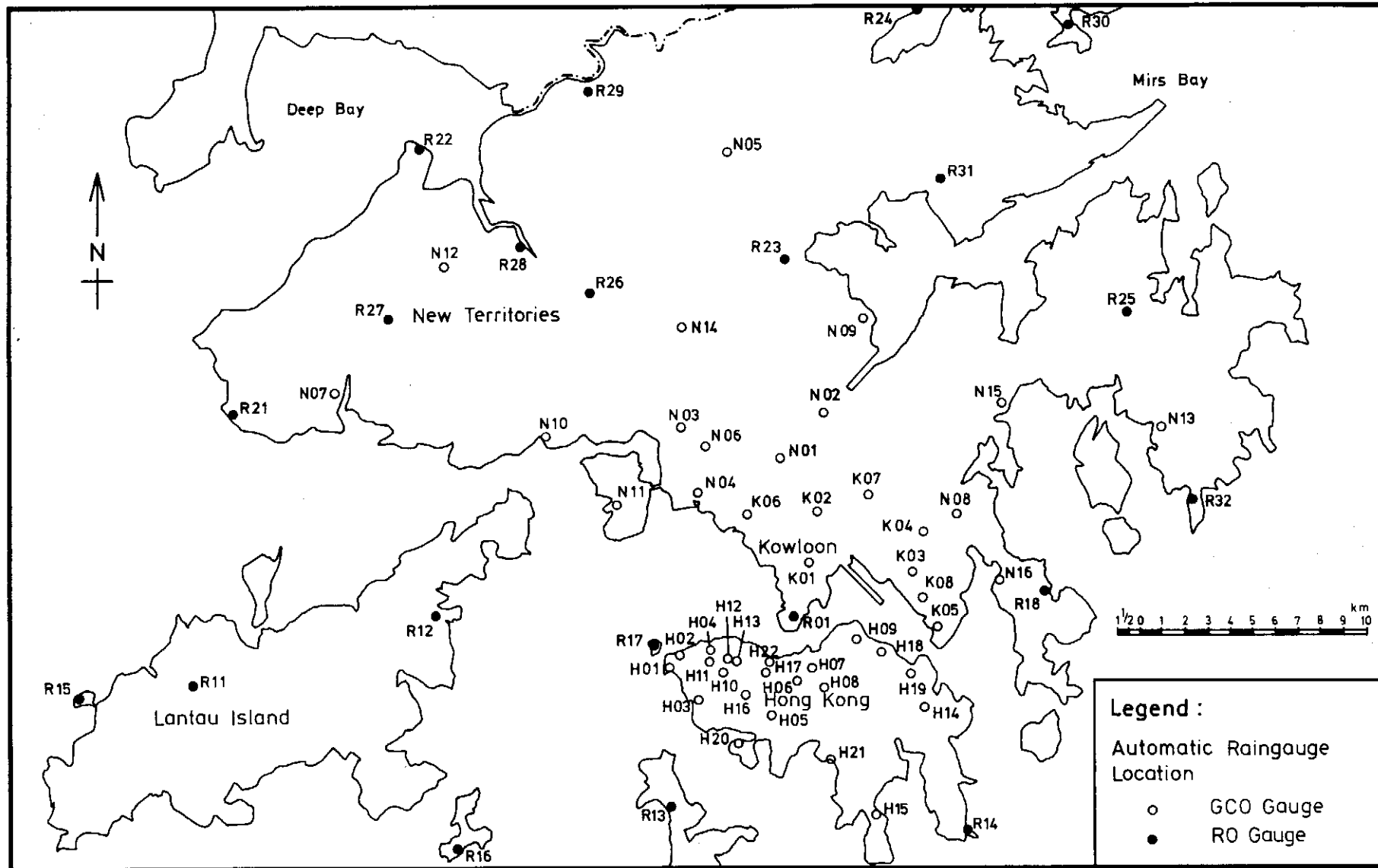


Figure 1 - Location of GCO and RO Automatic Raingauges

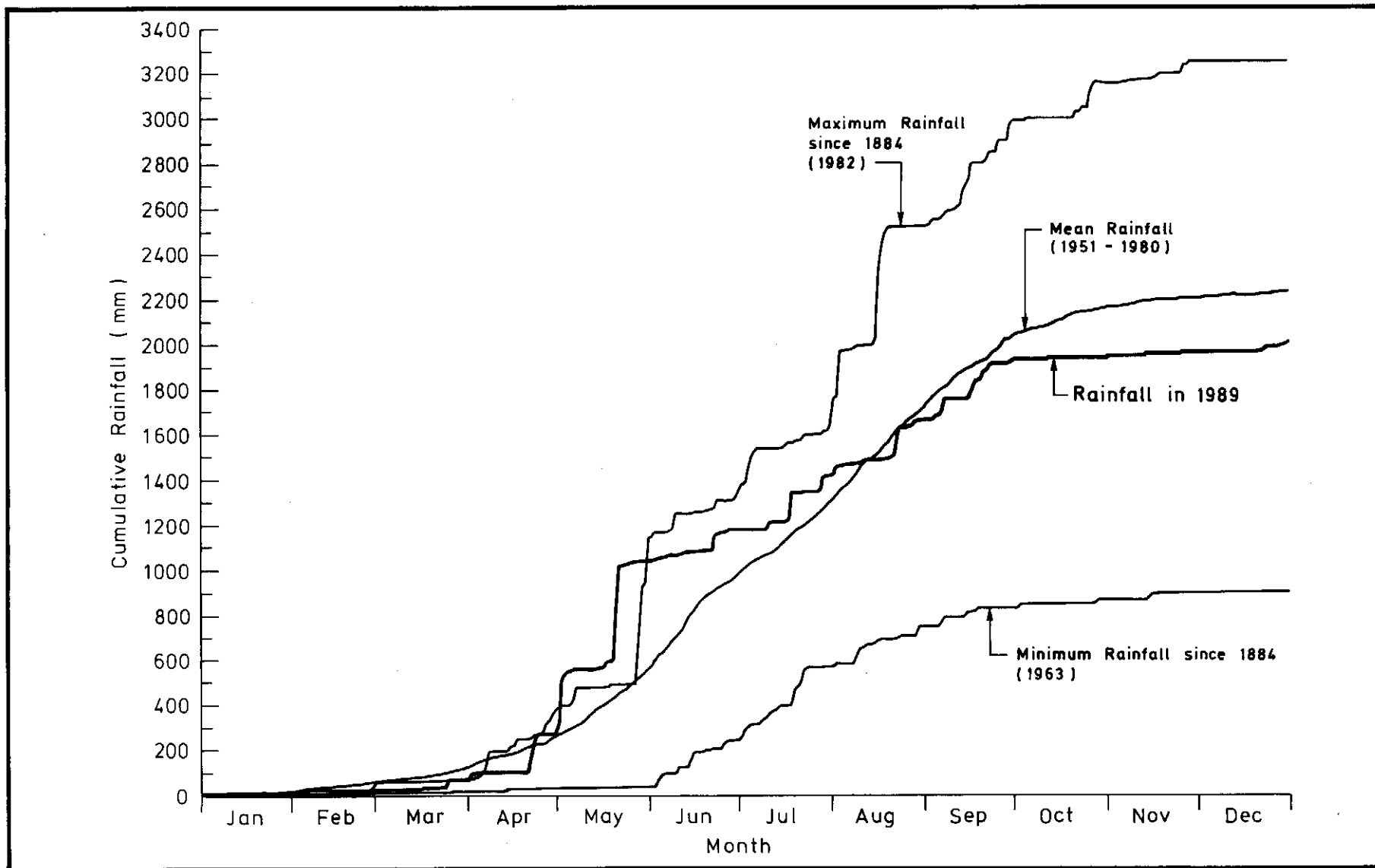


Figure 2 - Cumulative Rainfall for 1989 and the Recorded Maximum, Mean and Minimum Cumulative Rainfalls

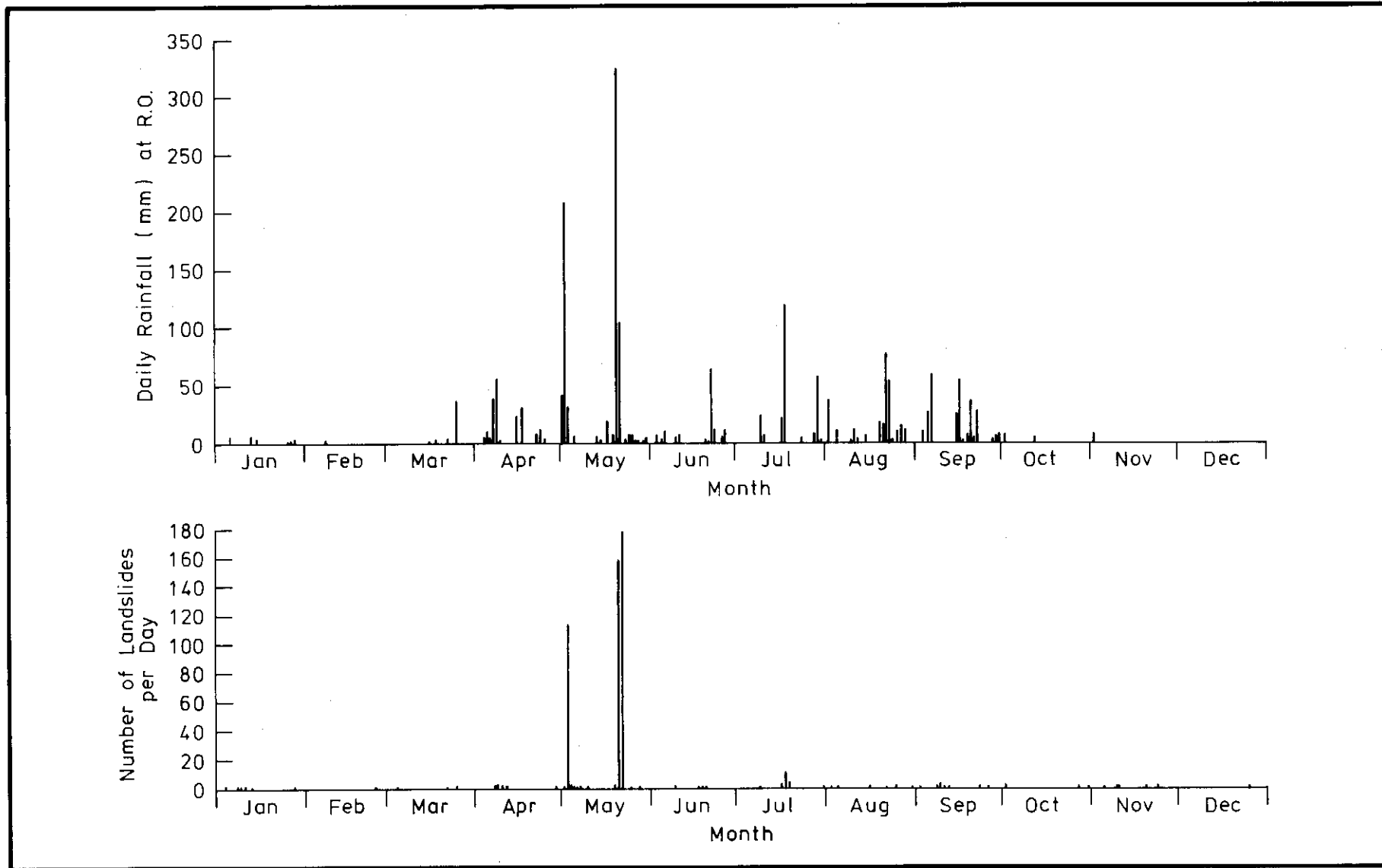


Figure 3 - Daily Rainfall and Distribution of Number of Landslides During 1989

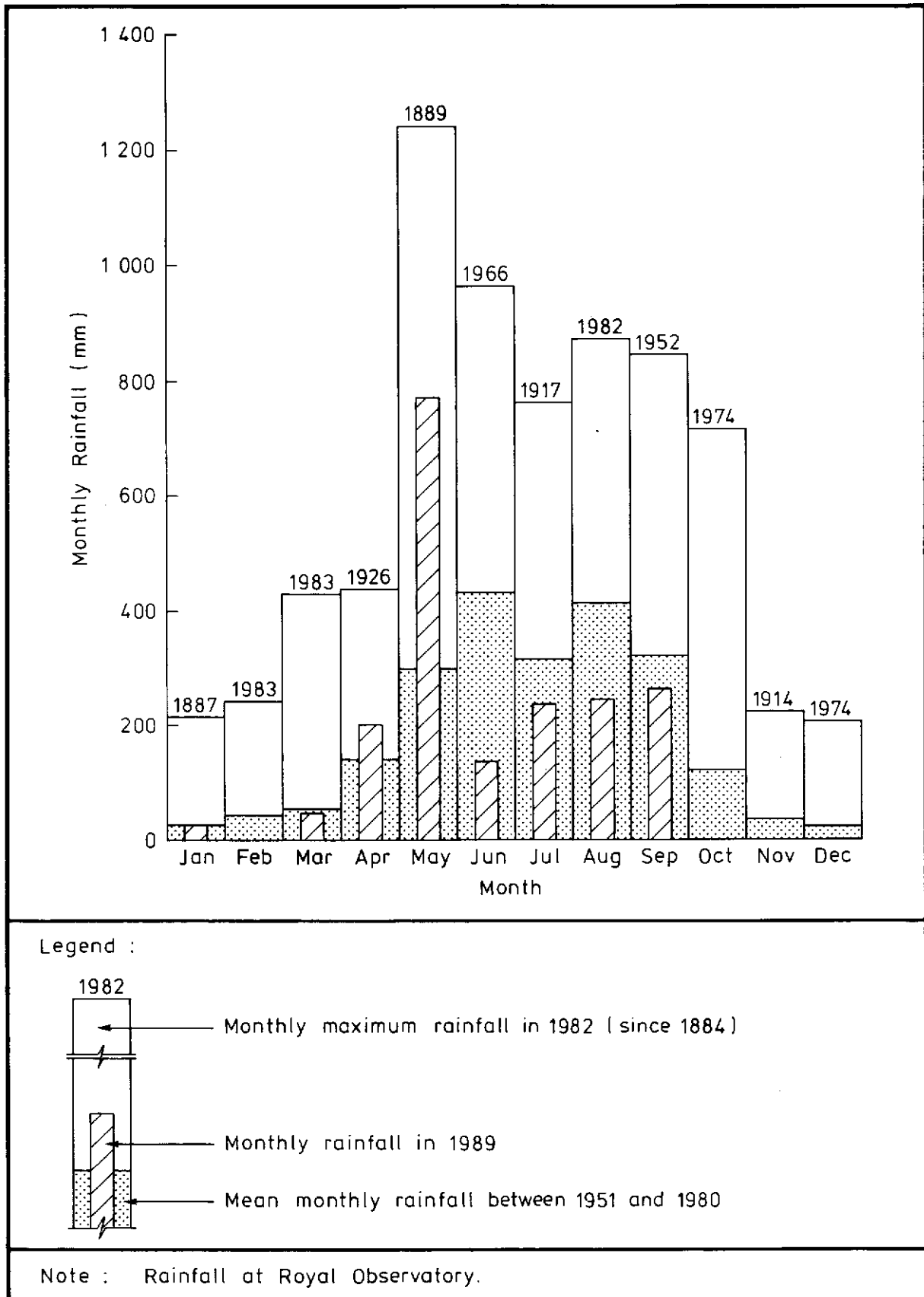


Figure 4 - Monthly Rainfalls in 1989 in Comparison with Recorded Maximum and Mean Monthly Rainfalls

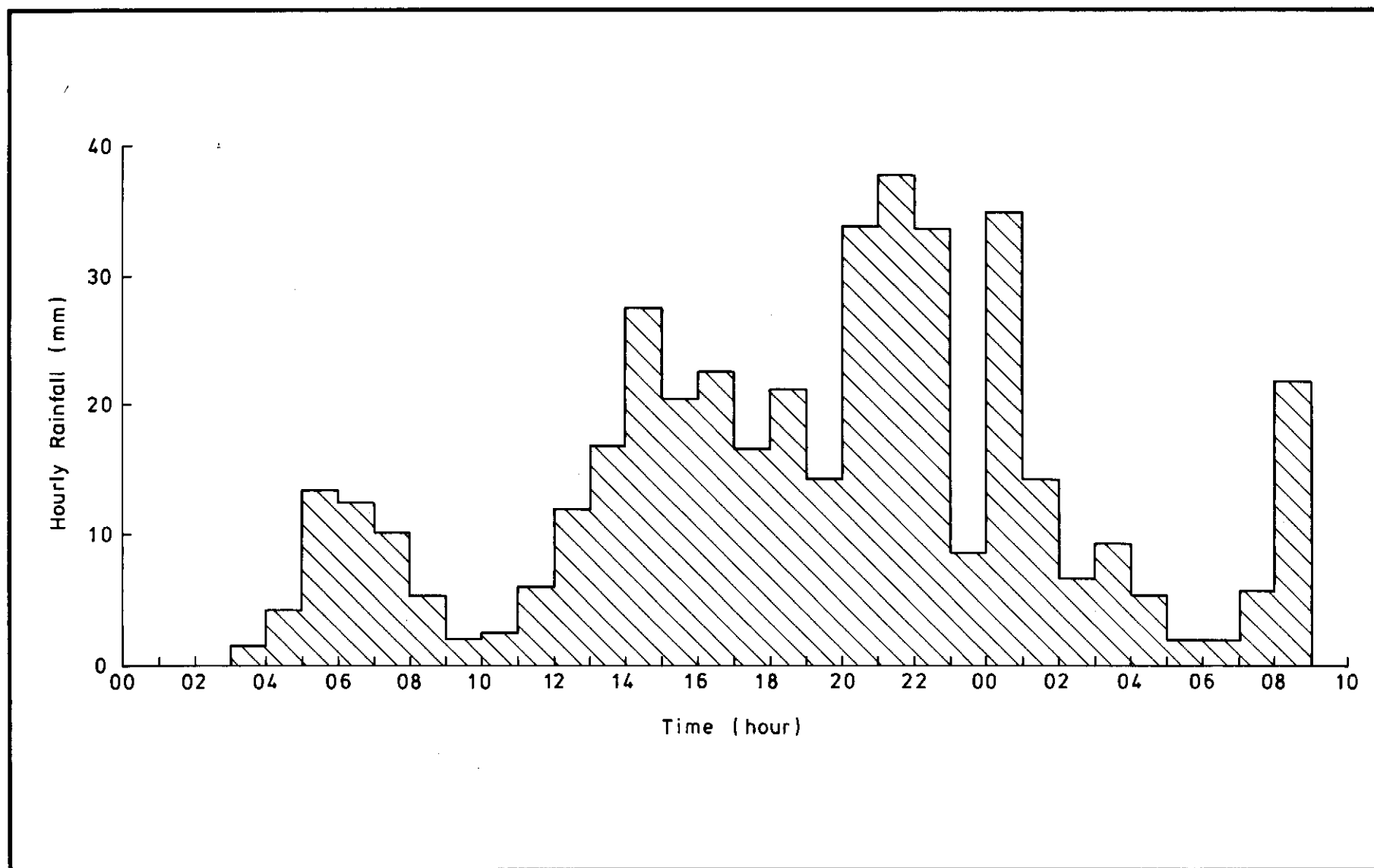


Figure 5 - Histograms of Hourly Rainfall at the Royal Observatory on 20th May 89

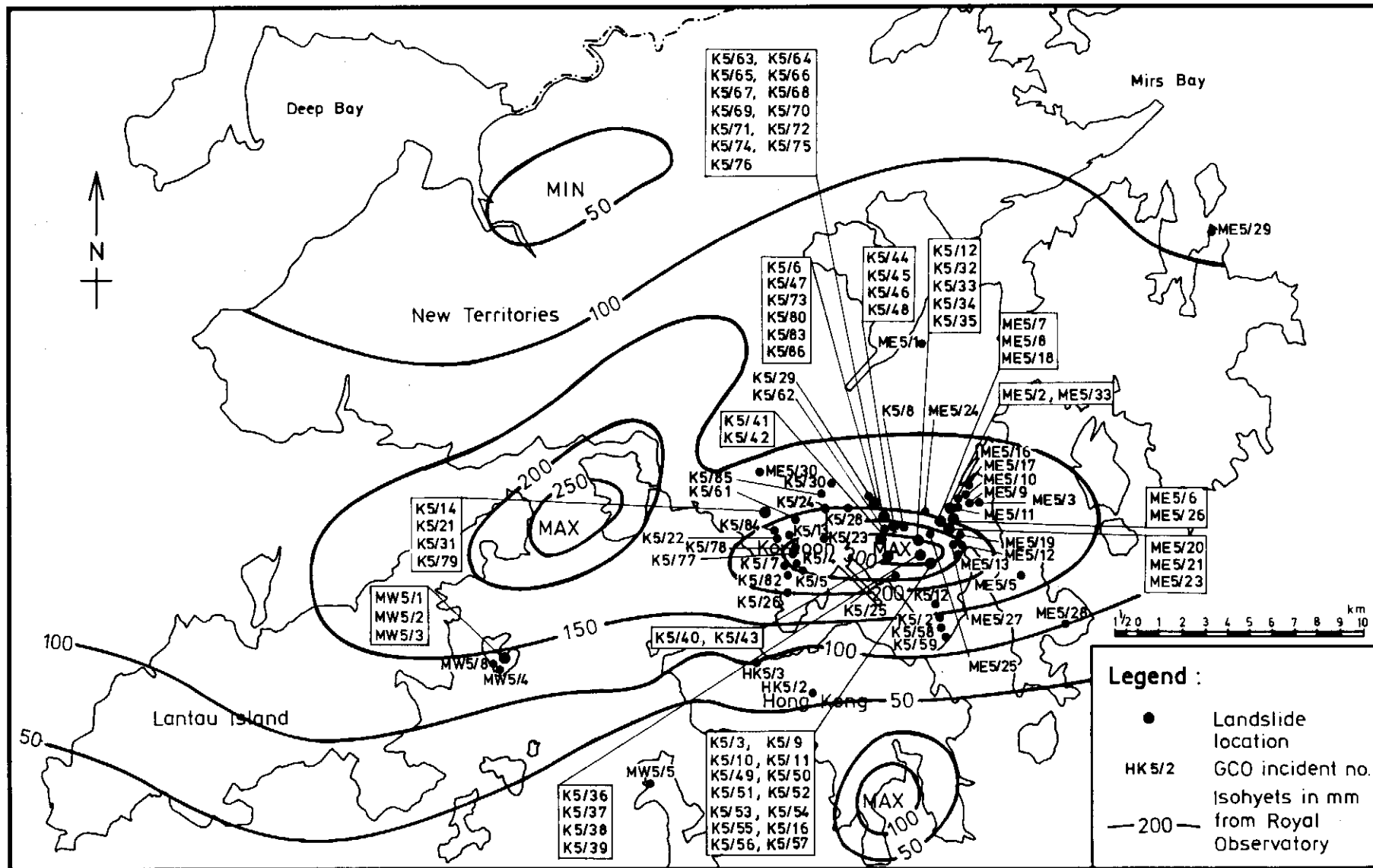


Figure 6 - 24-hour Rainfall Distribution Ending at 1pm on 2nd May 1989 and Locations of GCO Incidents

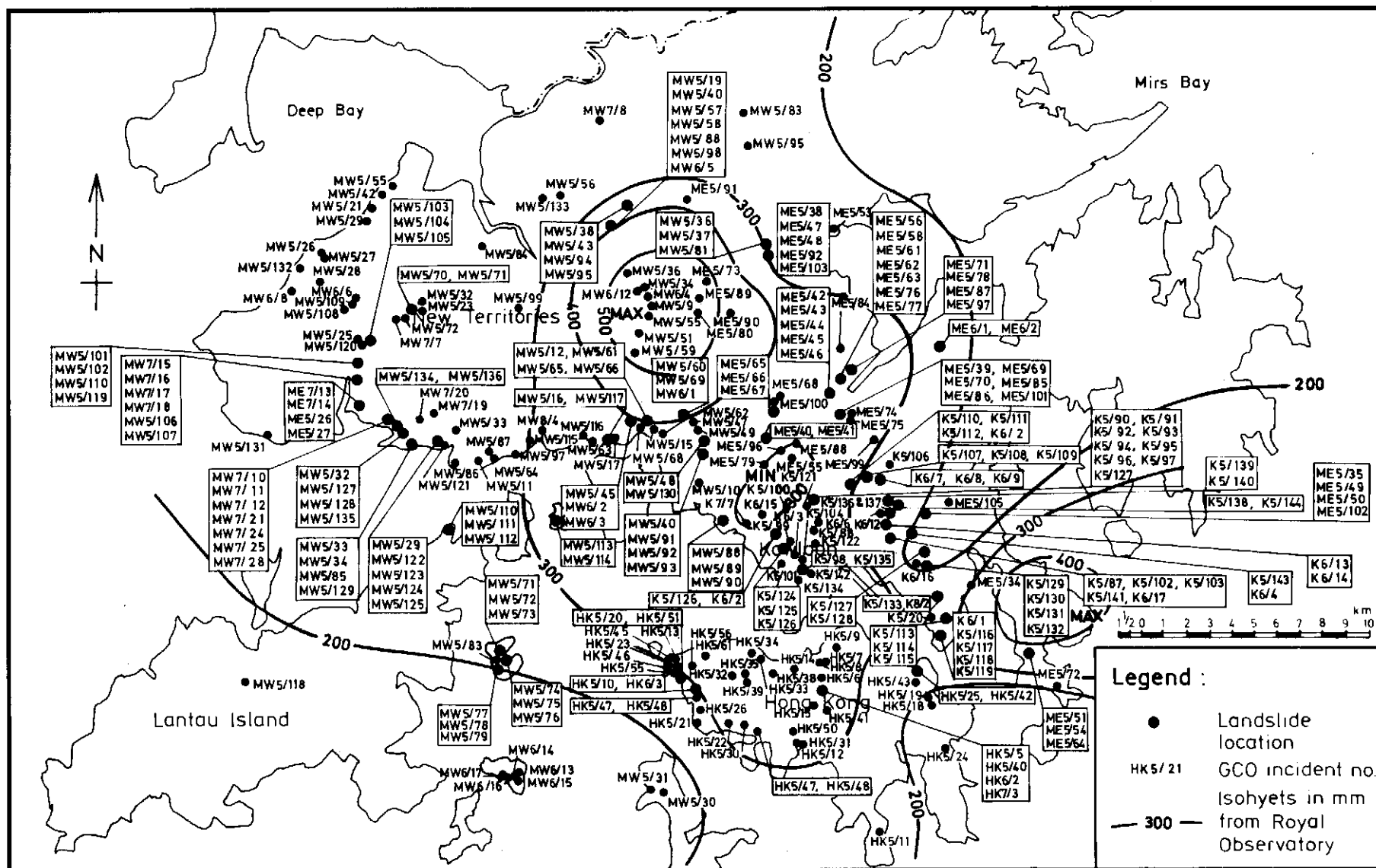


Figure 7 - 24-hour Rainfall Distribution Ending at 5am on 21st May 1989 and Location of GCO Incidents

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Plate 1 : Negative No. IW 8900407 & 08

Date : 9-1-89

Description : Retaining wall damaged on 9 Jan 89 by impact forces on the parapet due to traffic accident.

Plate 1 - Junction of Castle Peak Road and Caine Road (Incident No. HK 89/1/1)



Plate 2 : Negative No. ME 8913214 Date : 4-5-89



Plate 3 : Negative No. ME 8913222 Date : 4-5-89

Description: Failure of fill slope (about 200 cu m) on 2 May 89 causing flooding of school playground and siltation of culvert.

Plates 2 & 3 - Kung Lok Road, Ngau Tau Kok (Incident No. K 89/5/25)



Plate 4 : Negative No. ME 8912315 Date : 5-5-89

Description : Failure of thin layer of fill rested on natural/cut slope (about 200 cu m) on 2 May 89 causing three lanes of road to be blocked.

Plate 4 - Kowloon Wah Yan College, Waterloo Road (Incident No. K 89/5/7)



Plate 5 : Negative No. ME 8912601 Date: 2-5-89

Description: Failure of soil and rock (about 300 to 400 cu m)
on 2 May 89 blocking the road.

Plate 5 - Sau Mau Ping Road Opposite to Block 35, Sau Mau Ping Estate
(Incident No. K 89/5/3)



Plate 6 :

Negative No.
ME 8912221

Date : 2-5-89



Plate 7 :

Negative No. ME 8913502

Date : 4-5-89

Description : Failure of natural and cut slope (200 cu m) on 2 May 89.
Squatter huts near the failure were temporarily evacuated.

Plates 6 & 7 - Sau Mau Ping Road Opposite to Block 32, Sau Mau Ping
Estate (Incident No. K 89/5/9)



Plate 8 : Negative No. ME 8911901 Date : 2-5-89



Plate 9 : Negative No. ME 8911906 Date : 2-5-89

Description : Failure of natural slope (500 cu m) on 2 May 89 affecting garden platform adjacent to building.

Plates 8 & 9 - Lot 1130, Pak Shek Wo, Sai Kung (Incident No. ME 89/5/2)



Plate 10 : Negative No. ME 8911918 Date : 2-5-89



Plate 11 : Negative No. ME 8911920 Date : 2-5-89

Description : Failure of wall, backfill and cut slope (240 cu m)
on 2 May 89 damaging garden platform, adjacent buildings,
access and cars.

Plates 10 & 11 - Lot 1169 & 1173, Pak Shek Wo, Sai Kung
(Incident No. ME 89/5/6)



Plate 12 :
 Negative No. SP9006800 & 01
 Date : 24-5-89

Description : Failure of soil slope and small walls on 2 May 89 leading to the closure of a village house.

Plate 12 - Lots 852 & 853, Denon Terrace, Sai Kung (Incident No. ME 89/5/8)



Plate 13 : Negative No. ME 8914005 Date : 5-5-89



Plate 14 : Negative No. SP 9006804 Date : 6-5-89

Description : Failure of soil cut slope (600 cu m) on 2 May 89 causing two lorries to be buried and the partition wall to be broken.

Plates 13 & 14 - No. 20 Lung Wo Tsuen, Clear Water Bay Road, Sai Kung
(Incident No. ME 89/5/18)



Plate 15 :

Negative No.
IW 8975B11

Date : 22-5-89



Plate 16 :

Negative No. IW 8908517

Date : 30-5-89

Description : Failure of 18m high soil cut slope (180 cu m) on 20 May 89 damaging the Museum backyard at the crest and the platform at the toe.

Plates 15 & 16 - Backyard of Museum of Teaware, Queensway
(Incident No. HK 89/5/33)



Plate 17 :

Negative No. ME 891722A

Date : 22-5-89



Plate 18 :

Negative No.

ME 8923500

Date : 21-6-89

Description : Failure of soil slope (220 cu m) on 20 May 89. The slope surface was benched and covered with no-fines concrete as a temporary measure.

Plates 17 & 18 - Princess Margaret Road near Ho Man Tin
(Incident No. K 89/5/98)



Plate 19 : Negative No. IE8912208 Date : 23-5-89

Description : Failure of soil/rock (20 cu m) on 20 May 89 affecting building. Failure along joint planes.

Plate 19 - Shau Ki Wan Fire Station, 34 Chai Wan Road
(Incident No. HK 89/5/43)



Plate 20: Negative No. MW 8913117 Date: 25-5-89



Plate 21: Negative No. MW 8913109 Date: 25-5-89

Description: Failure of soil cut/fill slope (1000 cu m) on 20 May 89.
Twelve squatter huts were permanently evacuated.

Plates 20 & 21 - 52A to 53A, Tseng Tau Chung Tsuen, Tuen Mun
(Incident No. MW 89/5/102)



Plate 22 : Negative No. MW 8913324 Date : 26-5-89

Description : Failure of soil slope (more than 1000 cu m) on 20 May 89 affecting farm houses.

Plate 22 - Yiu Kee Farm, Ta Shek Wu Tsuen, Pat Heung
(Incident No. MW 89/5/96)



Plate 23 : Negative No.IW8909312 & 13 Date : 6-6-89

Description : Failure of 8m high slope in jointed volcanic rock
(about 70 cu m) on 20 May 89 blocking a nullah.

Plate 23 - Telegraph Bay Village, Pokfulam (Incident No. HK 89/6/3)



Plate 24 : Negative No. ME 8918121, 22 & 23

Date: 21-5-89

Description : Failure of soil cut slope (more than 200 cu m) on 21 May 89 with debris piled up to windows.

Plate 24 - No. 35-38, Tai Lam Liu Village, Shatin (Incident No. ME 89/5/39)

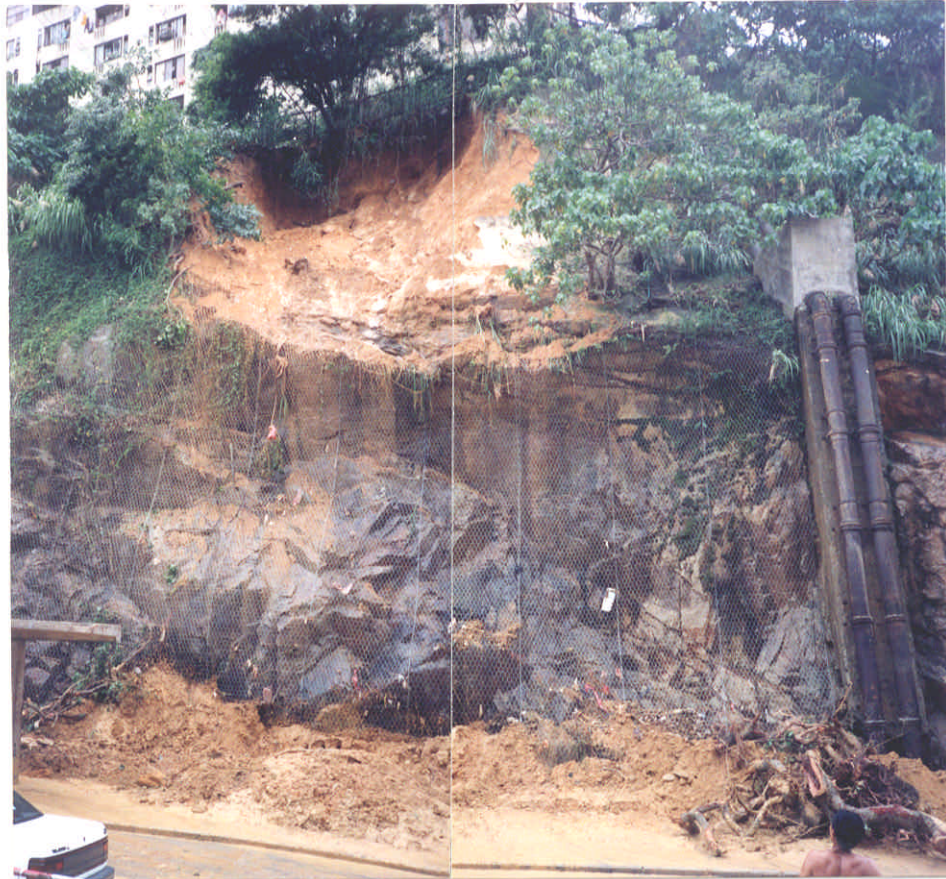


Plate 25 : Negative No. IE 8911807 & 08 Date : 21-5-89

Description : Failure of soil slope (100 cu m) along rock surface on 21 May 89 affecting road.

Plate 25 - Hing Wah Estate, Opposite to King Hing House, Chai Wan
(Incident No. HK 89/5/18)



Plate 26: Negative No. ME 8918111 Date : 21-5-89

Description : Failure of rock block (about 100 cu m) on 21 May 89 in slope 11NE-A/C35, Kwun Tong Road, Kowloon (Incident No. K 89/5/102)



Plate 27 : Negative No. ME 8917807 & 08 Date : 23-5-89

Description : Boulder fall (about 10 cu m) in Jats Incline, Ngau Chi Wan, on 20 May 89 due to rainfall (Incident No. K 89/5/105)

Plates 26 & 27 - Typical Examples of Rock and Boulder Falls



Plate 28 : Negative No. MW 8911318

Date: 22-5-89

Description : Failure of fill slope (200 cu m) at ch.21400 on 21 May 89 due to rainwater infiltration. Lanes of road blocked (Incident No. MW 89/5/86)



Plate 29 : Negative No. MW 8911309, 10 & 11 Date: 21-5-89

Description : Failure of CDG cut slope (120 cu m) at ch.26500 on 21 May 89 due to rainwater infiltration (Incident No. MW 89/5/28)

Plates 28 & 29 - Typical Examples of Slope Failures at Tuen Mun Road



Plate 30 :

Negative No.

MW 8911021

Date : 22-5-89



Plate 31 :

Negative No. MW 8911013&14

Date : 22-5-89

Description : Two failures in road cut on 21 May 89. The volumes of slide debris were about 800 & 500 cu m for sites A and B respectively. The road was close to traffic for one day.

Plates 30 & 31 - Route Twisk (North Bound), South of Shek Kong Barrack
(Incident No. MW 89/5/9)



Plate 32 : Negative No. IE 8911901 Date : 22-5-89



Plate 33 : Negative No. IE 8919918 Date : 18-7-89

Description : Failure of slope (500 cu m) on 21 May 89 affecting school and footpath. The slope has a history of instability and maintenance.

Plates 32 & 33 - Wah Yan College, Kennedy Road (Incident No. HK 89/5/14)



Plate 34: Negative No. ME 8917413 Date : 22-5-89



Plate 35: Negative No. ME 8917400 Date : 22-5-89

Description : Failure of colluvial slope on 21 May 89 destroying two huts and killing two people. Sixteen huts were permanently evacuated.

Plates 34 & 35 - Lion Rock Lower Village, Shatin (Incident No. K 89/5/90)



Plate 36 :

Negative No.
IW 8909705

Date : 13-6-89



Plate 37 :

Negative No. IW 8909707

Date : 13-6-89

Description : Failure of natural slope (more than 1500 cu m)
on 20/21 May 89 (?) affecting road storm water drain.

Plates 36 & 37 - Slope between Governor's Walk and Harlech Road
(Incident No. HK 89/5/28)



Plate 38 : Negative No. MW 8920903 Date : 31-7-89



Plate 39 : Negative No. MW 8920913 Date : 31-7-89

Description : Failure of slope (50 cu m) at construction site on 31 July 89 due to rupture of water main. 1 person injured.

Plates 38 & 39 - Kwai Fuk Road, Kwai Chun (Incident No. MW 89/7/32)

APPENDIX A
LIST OF INCIDENTS

APPENDIX A

LIST OF TABLES

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Table A1 - List of Incidents on Hong Kong Island Reported to GCO in 1989 (Sheet 1 of 6)

Incident No.	Location	Call Received		Failure			Area Affected	Consequence	Remarks
		Date	From	Date (Time)	Type	Scale			
HK 1/1	J/O Castle Road/Caine Road	9/1	Police	9/1 (am)	Retaining wall	Minor	Road	Lane of road blocked	Water main undermined
HK 1/2	50 Hollywood Road	11/1	BOO	11/1 (3am)	Retaining wall	Minor	Building lot	Kitchen affected	
HK 1/3	Wong Chuk Hang Path	30/1	HyD	Summer 1988	Soil/rock cut slope	Minor	Stream course	Stream course blocked	
HK 3/1	Turtle Bay Beach below Tai Tam Road	4/3	HyD	4/3 (10am)	Natural slope	Minor	Beach	Portion of beach blocked	
HK 3/2	Peel Rise above Island Road Government School	22/3	GCO	22/3 (2pm)	Soil cut slope	Minor	Road	Lane of road blocked	
HK 3/3	7 Star Street	31/3	Public	March	Soil cut slope	Minor	Access		
HK 4/1	Tai Tam Road	12/4	HyD	12/4 (1am)	Natural slope	Major	Open space		
HK 4/2	Behind Hut No. 139 at Upper Kai Lung Wan Village	10/4	DO	7/4 (5am)	Fallen trees	Minor	Squatters		
HK 5/1	Tai Hang Road/Blue Pool Road	2/5	HyD		Natural slope	Minor	Road	Lane of road blocked	
HK 5/2	Hawthorn Road, Happy Valley (Slope ref. 11SW-D/C209)	2/5	HyD	2/5 (2pm)	Soil cut slope	Minor	Road, building lot	Lane of road blocked	
HK 5/3	Behind 56-58 MacDonnell Road	2/5	HyD	2/5 (12am)	Soil cut slope	Minor	Building lot		
HK 5/4	A Kung Ngam Village, Squatter area near retaining wall 11SE-B/R14	4/5	HyD		No failure				
HK 5/5	Near J/O Broadwood Road/Tai Hang Road	20/5	HyD	20/5 (10pm)	Soil/rock cut slope	Minor	Road	Lane of road blocked	
HK 5/6	Below Tai Hang Road near Wesley Village	22/5	HyD	20/5	Natural slope	Minor	Stream course		
HK 5/7	Wun Sha Street, Tai Hang	21/5		20/5 (4pm)	Retaining wall	Minor	Squatters	1 hut temporarily evacuated	
HK 5/8	Ka Ning Path sitting out area	22/5	ASD	20/5	Rock/boulder fall	Minor	Sitting out area		
HK 5/9	Ma Shan Tsuen, above Yee King Road	21/5		20/5 (10pm)	Soil cut slope	Minor	Squatters	1 hut temporarily evacuated	

Table A1 - List of Incidents on Hong Kong Island Reported to GCO in 1989 (Sheet 2 of 6)

Incident No.	Location	Call Received		Failure			Area Affected	Consequence	Remarks
		Date	From	Date (Time)	Type	Scale			
HK 5/10	82 Telegraph Bay Village	21/5	GCO	21/5 (3am)	Natural slope	Minor	Squatters	1 hut permanently evacuated	
HK 5/11	Wong Ma Kok Road	22/5	HyD	21/5 (2am)	Soil cut slope	Minor	Road	1 lane of road blocked	
HK 5/12	41 Shouson Hill Road (main entrance)	22/5	HyD	20/5 (9am)	Natural slope	Minor	Access		A lamp post fell
HK 5/13	Kung Man Village (slope below huts 138 & 139)	22/5	BOO	20/5	Fill slope	Minor	Squatters		
HK 5/14	Below Wah Yan College Kenndy Road (11SW-B/CR29)	22/5	HyD	21/5 (am)	Soil cut slope	Major	Building lot, footpath	Part of school building closed temporarily	Under Stage 2 Study before failure, temporary remedial work completed by GCO after failure
HK 5/15	69 Blue Pool Road	20/5	Police	20/5 (10pm)	Soil/rock cut slope	Minor	Building lot	Part of car park affected	
HK 5/16	39A Conduit Road, LPM site	20/5	BOO		Wash out		Construction site		Slope degradation
HK 5/17	18 Cloud View Road	22/5	BOO		Wash out	Minor	Building lot	Playground fenced off	
HK 5/18	Hing Wah Estate, opposite King Hing House, below On Hing House, Wan Tsui Road	21/5	FSD	21/5 (1am)	Soil cut slope	Major	Road	2 lanes of road blocked	
HK 5/19	Slope below star of the Sea Church, Chai Wan	22/5	HyD	20/5 (pm)	Soil cut slope	Minor	Footpath, open space	Parapet wall of garden affected	
HK 5/20	Slope above Bisney Road near Pokfulam Road	22/5	HyD	20/5	Soil cut slope	Minor	Road	Lane of road blocked	
HK 5/21	Victoria Road near Pokfulam Road	22/5	HyD	20/5	Soil cut slope	Minor	Road	Lane of road partly blocked	
HK 5/22	Tin Wan Hill Road near Shek Pai Wan Road	22/5	HyD	21/5 (10am)	Soil cut slope	Minor	Road		
HK 5/23	Access road to Youth Hostel at Mt. Davis (Mt. Davis Path) 4 areas	22/5	HyD	21/5	Soil cut slope, retaining wall	Major	Road	Lane of road blocked	
HK 5/24	2C, Tai Long Wan Village, Tai Long Wan	22/5	BOO	20/5 (am)	Soil cut slope	Minor	Squatters		

Table A1 - List of Incidents on Hong Kong Island Reported to GCO in 1989 (Sheet 3 of 6)

Incident No.	Location	Call Received		Failure			Area Affected	Consequence	Remarks
		Date	From	Date (Time)	Type	Scale			
HK 5/25	A Kung Ngam Road opposite Shaueiwan Government School	22/5	HyD	20/5	Soil cut slope	Minor	Squatters, footpath	1 hut permanently evacuated, close pedestrian pavement	
HK 5/26	Upper Baguio Villa	22/5	Public	21/5	Natural slope	Minor	Access		Fence at the top of a retaining wall damaged
HK 5/27	Backyard of 56 Peak Road above Shell Petrol Station	21/5	Police	22/5 (3pm)	Soil cut slope	Minor	Building lot		
HK 5/28	Natural slope above Harlech Road (below Governor's Walk near lamp posts 24250-24351)	22/5 (?)	HyD		Natural slope	Major	Road	Lane of road blocked	Exact date of failure is unknown
HK 5/29	Rock slope opposite 25 Shouson Hill Road	22/5	HyD	22/5 (8am)	Rock cut slope	Minor	Footpath		
HK 5/30	St. Peter's School, Peel Rise	22/5	Public	21/5 (6am)	Rock cut slope	Minor	Building lot	Car park of school partially closed	
HK 5/31	Flat 41D, 41 Shouson Hill Road	22/5	Public	21/5 (10am)	Fallen trees		Building lot		
HK 5/32	Eastern Slope No. 26 Lugard Road	22/5	HyD	21/5 (12am)	Soil cut slope	Minor	Road	Lane of road blocked	
HK 5/33	Backyard of Museum of Tea Ware, Cotton Tree Drive, Queensway	22/5	AO	20/5 (pm)	Soil cut slope, retaining wall	Major	Building lot	Backyard of Museum closed	
HK 5/34	East of Central Hospital, Lower Albert Road between lighting post 22317/22316	22/5	HyD	20/5 (pm)	Soil cut slope	Minor	Road	Part of road blocked	
HK 5/35	Near No. 7 May Road, May Tower	22/5	HyD	20/5 (7pm)	Soil cut slope	Minor	Road	Part of road blocked	
HK 5/36	Opposite to German Swiss International School, No. 11 Guildford Road	21/5	HyD		Wash out	Minor	Footpath		
HK 5/37	Uphill slope of near No. 17 Magazine Gap Road	21/5	HyD		Soil cut slope	Minor	Road	Lane of road blocked	
HK 5/38	Slope at east of No. 44 Kennedy Road (Electric House)	21/5	HyD	21/5 (1am)	Soil cut slope	Major	Road	Lane of road blocked	
HK 5/39	3 Severn Road, the Peak	21/5	Public	20/5 (9am)	Soil cut slope	Minor	Building lot		

Table A1 - List of Incidents on Hong Kong Island Reported to GCO in 1989 (Sheet 4 of 6)

Incident No.	Location	Call Received		Failure			Area Affected	Consequence	Remarks
		Date	From	Date (Time)	Type	Scale			
HK 5/40	Tai Hang Road near catchpit 24	22/5	HyD	20/5	Soil cut slope	Minor	Road		
HK 5/41	Tai Hang Road near catchpit 12	22/5	HyD	20/5	Soil cut slope	Minor	Road		
HK 5/42	Shaukiwan Government Primary School, Shaukiwan Main Street East	23/5	ASD	20/5 (9pm)	Rock/boulder fall	Minor	Building lot		
HK 5/43	Behind Shaukiwan Fire Station, 34 Chai Wan Road (Slope ref. 11SE-D/C72)	22/5	GCO	20/5 (11pm)	Soil/rock cut slope	Minor	Open space		Partially damage of stell mesh protective cover
HK 5/44	Borrett Road	20/5	GCO		Soil cut slope	Minor	Road	Lane of road blocked	
HK 5/45	410 Victoria Road near former Hoi Pong Village	22/5	HyD	21/5	Soil cut slope	Minor	Road		
HK 5/46	Victoria Road near Mount Davis Road	22/5	HyD	21/5	Soil cut slope	Minor	Road	Lane of road blocked	
HK 5/47	Tai Shui Heng Tsuen	23/5	DO	21/5 (7am)	Retaining wall	Minor	Squatters	1 hut temporarily evacuated	
HK 5/48	Tai Shui Heng Tsuen near Staircase	23/5	DO	21/5 (7am)	Rock/boulder fall	Minor	Footpath		
HK 5/49	Access road to No. 1 Peak Road	22/5	HyD		Soil cut slope	Minor	Road	Lane of road partly blocked	
HK 5/50	Wong Chuk Hang Path Village	23/5	DO	20/5 (3pm)	Soil cut slope	Minor	Squatters	5 huts permanently evacuated	
HK 5/51	Behind No. 21 Bisney Road (Slope ref. 11SW-C/CR169)	23/5	Public	20/5 (9pm)	Soil cut slope	Minor	Building lot		
HK 5/52	3 Tregunter Path, Branksome Tower (Slope ref. 11SW-D/CR321)	24/5	Public		Soil cut slope	Minor	Building lot		
HK 5/53	Near 98 Pokfulam Road, Foo Wai Mansion (Slope ref. 11SW-A/C311)	25/5	HyD	24/5	Soil cut slope	Minor	Footpath		
HK 5/54	Behind Shaukiwan Fire Station, Chai Wan Road	26/5	FSD	26/5 (7am)	Rock/boulder fall	Minor	Open space		
HK 5/55	Near No. 49 Mount Davis Road	23/5	HyD	20/5	Soil cut slope	Minor	Road	Lane of road partly blocked	
HK 5/56	Ho Jong Squatter Village	25/5	DO	21/5	Soil cut slope	Minor	Squatters	1 hut permanently evacuated	Huts destroyed

Table A1 - List of Incidents on Hong Kong Island Reported to GCO in 1989 (Sheet 5 of 6)

Incident No.	Location	Call Received		Failure			Area Affected	Consequence	Remarks
		Date	From	Date (Time)	Type	Scale			
HK 5/57	Kennedy Town Service Reservoir	26/5	AO		Soil cut slope	Minor	Access, service reservoir	Lavatory temporarily closed, access blocked	
HK 5/58	Cut slope below Brewin Path and above the playground at Magazine Gap Road (Slope ref. 11SW-B/C8)	26/5	HyD		Soil cut slope	Minor	Road	Lane of road blocked	
HK 5/59	Below No. 3 Middle Gap Road	26/5	HyD	22/5 (1am)	Fill slope	Minor	Building lot, stream course	Stream course partly blocked	
HK 5/60	Mount Butler Road near Henderson Road	26/5	HyD		Soil cut slope	Minor	Footpath		
HK 5/61	Natural slope above anchored cut slope to the south of Haking Wong Building, Pokfulam Road	29/5	Public	20/5	Natural slope	Minor	Road		Cut slope face and berm slightly damaged by fallen corestone
HK 5/62	Tai Wan Sun Tsuen below Pokfulam Road	26/5	HD		Soil cut slope	Minor	Squatters		
HK 5/63	Yuen Dao Ngam Village, Chai Wan	31/5	HyD		No failure				
HK 6/1	Behind 133 Wong Nai Chung Road (Slope ref. 11SW-B/CR269)	1/6	Public		Soil cut slope	Minor	Access		
HK 6/2	Broadwood Road near Tai Hang Road Junction., below 150 Tai Hang Road	2/6	HyD	21/5	Soil cut slope	Minor	Open space		
HK 6/3	Telegraph Bay Village below Victoria Road	5/6	DO	20/5	Rock cut slope	Major	Nullah	Nullah blocked	
HK 6/4	Aldrich Village, Shaukiwan	9/6	HyD	9/6 (3pm)	Retaining wall		Squatters	2 huts permanently evacuated	
HK 6/5	Catchwater above Lady Clementis Ride to the West of J/o Nam Fung Road and Deep Water Bay Road	13/6	WSD		Rock/boulder fall	Minor	Catchwater, footpath	Catchwater partly blocked	Box culvert partly damaged
HK 6/6	Natural slope behind Salesian School	20/6	HyD	17/6 (pm)	Natural slope	Minor	Building lot	Playground of school affected	
HK 6/7	Slope between Victoria Road and Chinese Christian Cemetery	10/6	HyD		Soil cut slope	Minor	Cemetery		
HK 6/8	Ma Hang Village, Stanley	26/6	DO		Wash out	Minor	Footpath		

Table A1 - List of Incidents on Hong Kong Island Reported to GCO in 1989 (Sheet 6 of 6)

Incident No.	Location	Call Received		Failure			Area Affected	Consequence	Remarks
		Date	From	Date (Time)	Type	Scale			
HK 7/1	Tai Tam Road near Turtle Cove Beach	8/7	Police	7/7 (9pm)	Opening of road surface	Minor	Road	Lane of road blocked	
HK 7/2	Wong Chuk Hang Path Village	12/7	BOO		Tilting of platform & kitchen		Squatters	3 huts permanently evacuated	
HK 7/3	At rear of Nos. 27-31, Blue Pool Road	11/7	BOO	20/5	Rock/boulder fall	Minor	Construction site		
HK 8/1	2 Tai Hang Road	7/8	GCO	5/8 (am)	Soil cut slope	Minor	Building lot		
HK 8/2	19-25 Village Terrace	31/8	BOO	31/8 (1pm)	Rock/boulder fall	Minor	Building lot	Backyard blocked	
HK 9/1	Wan Tsui Road, Chai Wan (Slope ref. 11SE-D/C49)	1/9	HyD	1/9 (am)	Fill slope	Minor	Road		
HK 9/2	Wong Chuk Hang Path Village	25/9	DO	25/9	Partial collapse of floor		Squatters		
HK 10/1	Shek Pai Wan Road (Slope ref. 11SW-C/C4)	4/10	HyD	2/10	Rock cut slope	Minor	Footpath		
HK 11/1	6 Tai Hang Road	1/11	HyD	28/10 (am)	Soil/rock cut slope	Minor	Building lot	Car park affected	
HK 11/2	Hong Kong Cemetery	20/11	Public	10/11 (am)	Soil cut slope	Minor	Cemetery		
HK 11/3	St. Stephen Girl's College	22/11	Public	20/11 (am)	No failure		Building lot		
HK 11/4	Below 67-71 Bisney Road	24/11	Police	24/11 (1pm)	Soil cut slope	Major	Construction site		2 workers injured
HK 12/1	62 Tin Hau Temple Road, Behind Building Contractor's Association School	27/12	Public	25/12 (12pm)	Soil cut slope	Minor	Building lot		Part of playground covered by slip debris

Table A2 - List of Incidents in Kowloon Reported to GCO in 1989 (Sheet 1 of 13)

Incident No.	Location	Call Received		Failure			Area Affected	Consequence	Remarks
		Date	From	Date (Time)	Type	Scale			
K 1/1	Ngau Chi Wan Village	9/1	HyD		Fill platform	Minor	Squatters	2 huts permanently evacuated	
K 1/2	Ngau Chi Wan Village	9/1	BOO	8/1	Soil cut slope, fill slope	Minor	Squatters		
K 3/1	Ling Nam San Village (Lower)	22/3	DO	22/3 (11am)	Concrete debris fall	Minor	Squatters, footpath		
K 3/2	Cha Kwo Ling Village	28/3	DO	25/3	Rock/boulder fall	Minor	Squatters		
K 4/1	Ngau Tse Wan East Village, No. 276	8/4	BOO	8/4 (am)	Fill slope	Minor	Squatters	1 hut permanently evacuated	
K 4/2	Chung Luen Tsuen, Lung Cheung Road	11/4	HD	10/4 (3pm)	Soil cut slope	Minor	Squatters	Open yard affected	
K 4/3	Chung Luen Tsuen, Lung Cheung Road	11/4	HD	10/4 (4pm)	Subsidence	Minor	Squatters, access		
K 4/4	Ngau Chi Wan West Village	14/4	DO	7/4	Fallen trees	Minor	Slope		
K 4/5	Behind 57A On Lei Sai Tsuen, Lei Yue Mun	7/4	HyD	7/4 (am)	Soil cut slope, wash out	Minor	Squatters	3 huts temporarily evacuated	
K 4/6	Tak Mei New Village, Lok Fui	22/4	DO	22/4	Soil cut slope	Minor	Squatters		
K 4/7	Ngau Chi Wan East Village, No. 276	8/4	BOO	8/4 (am)		Minor	Squatters	1 hut permanently evacuated	Huts destroyed
K 5/1	Ngau Chi Wan Village	2/5	DO	1/5 (pm)	Wash out	Minor	Squatters	4 huts temporarily evacuated	
K 5/2	St. Anthonius Girls' College	2/5	BOO	2/5 (9am)	Wash out	Minor	Building lot, footpath	School temporarily evacuated, pedestrian pavement blocked	School playground flooded with mud
K 5/3	Sau Mau Ping Road between Sau Mau Pass and Sau Ming Road	2/5	HyD	2/5 (2pm)	Soil/rock cut slope, boulders fall	Major	Road	Lane of road blocked, all lanes of road closed	LPM work in progress
K 5/4	12 Ho Man Tin Hill Road	2/5	Public	2/5 (am)	Fill slope, wash out	Minor	Building lot, access		Pedestrian pavement silted
K 5/5	Carmel School, Carmel Village Street, Ho Man Tin	2/5	BOO	2/5	Soil cut slope	Minor	Open space		Open space flooded
K 5/6	Diamond Hill New Village, KCT/4B/E/5/32-39	2/5	DO	2/5 (12am)	Wash out, flooding		Squatters	5 huts temporarily evacuated	

Table A2 - List of Incidents in Kowloon Reported to GCO in 1989 (Sheet 2 of 13)

Incident No.	Location	Call Received		Failure			Area Affected	Consequence	Remarks
		Date	From	Date (Time)	Type	Scale			
K 5/7	Kowloon Wah Yan College, Waterloo Road, Kowloon	2/5	Police	2/5 (1pm)	Fill slope	Major	Road	3 lanes of road & pavement blocked	2 cars & 1 bus stop damaged
K 5/8	Good Hope School, Clearwater Bay Road	3/5	HyD	2/5	Soil cut slope	Minor	Access		
K 5/9	Sau Mau Ping Road, opposite to Block 32, Sau Mau Ping	2/5	HyD	2/5 (2pm)	Soil cut slope	Major	Road, squatters	4 huts temporarily evacuated, close all lane of road	4 vehicles damaged
K 5/10	Tai Shing Village, XKE/9B/6/72	2/5	HyD	2/5 (11am)	Soil cut slope	Minor	Squatters	4 huts temporarily evacuated	
K 5/11	Tai Shing Village, XKE/9B/6/697 etc	2/5	HyD	2/5 (12am)	Soil cut slope, wash out	Minor	Squatters	18 huts permanently evacuated	
K 5/12	Junction of Lee On Road and Shun King Street opposite Lee Foo House	2/5	HyD	2/5 (3pm)	Soil/rock cut slope, wash out	Minor	Road	Lane of road blocked, all lanes of road closed	
K 5/13	Behind House No. RK/15B/117, Chu Koo Chai Village, Tai Hang Tung	2/5	DO	2/5 (4pm)	Soil cut slope	Minor	Squatters	2 huts permanently evacuated	
K 5/14	Chung Luen Village, Tai Po Road, Slope adjacent to Hut No. RK/16B/54	2/5	CNTA	2/5 (12am)	Natural slope	Minor	Squatters, open space		
K 5/15	Fat Kwong Street, USD Carpark	3/5	USD	2/5	Soil cut slope	Minor	Footpath		
K 5/16	Tai Shing Village	2/5	HyD	2/5 (12am)	Soil cut slope, retaining wall	Minor	Squatters	13 huts permanently evacuated	
K 5/17	Sau On Village, Shun On Road		HyD	2/5	Rock/boulder fall	Minor	Road	Lane of road blocked, close all lane of Shun On Road	
K 5/18									Deleted
K 5/19									Deleted
K 5/20									Deleted
K 5/21	Chung Luen Tsuen, Lung Cheung Road, platform adjacent to Hut No. RK/16B/44	3/5	HD	2/5	Retaining wall	Minor	Access		
K 5/22	South of Block 29, Lower Shek Kip Mei Estate	3/5	DO	2/5 (3pm)	Natural slope	Minor	Garden		Garden flooded

Table A2 - List of Incidents in Kowloon Reported to GCO in 1989 (Sheet 3 of 13)

Incident No.	Location	Call Received		Failure			Area Affected	Consequence	Remarks
		Date	From	Date (Time)	Type	Scale			
K 5/23	24, La Salle Road	4/5	ASD	2/5 (12am)	Masonry fence wall failed	Minor	Building lot		
K 5/24	Lion Rock Plant Nursery	4/5	ASD	2/5 (12am)	Natural slope	Minor	Plant nursery		
K 5/25	Kung Lok Road Park	4/5	ASD	2/5 (12am)	Fill slope	Major	Building lot, park		School playground flooded, culvert silted, park affected
K 5/26	36, Gascoigne Road, South Kowloon Magistracy	4/5	ASD	2/5 (12am)	Soil cut slope	Minor	Access		
K 5/27	Diamond New Village (XKC/4B/E/5/50-55)	2/5	DO/WTs	2/5	Wash out		Squatters		
K 5/28	Sha Tin Pass Road/Wong Tai Sin Road Junction	5/5	HyD	2/5 (pm)	Fill slope	Minor	Road, carpark		
K 5/29	Tze Mei Village, Tze Wan Shan	5/5	HD	2/5 (pm)	Soil cut slope, boulders fall	Minor	Squatters	2 huts permanently evacuated	
K 5/30	Heung Yeung Village, Tze Wan Shan	5/5	HD	2/5 (pm)	Wash out, fallen trees	Minor	Squatters	3 huts temporarily evacuated	
K 5/31	Hut No. XKW/16B/26, Chung Luen Tsuen	5/5	DO	2/5 (12am)	Natural slope	Minor	Squatters	1 hut permanently evacuated	
K 5/32	Wo Ping Village, Anderson Road, Hut No. RKT/9D/121, 122	5/5	HyD	2/5 (12am)	Soil cut slope	Minor	Squatters	Permanently evacuated RKT/9D/121, and part of RKT/9D/122	
K 5/33	Wo Ping Village, XKE/9/D/G7/77, 78	5/5	HyD	2/5 (12am)	Soil cut slope	Minor	Squatters		
K 5/34	Wo Ping Village, Anderson Road, Hut No. YKC/R3/67	5/5	HyD	2/5 (12am)	Soil cut slope	Minor	Squatters	1 hut permanently evacuated	
K 5/35	Wo Ping Village, XKE/9/A/G7/74	5/5	HyD	2/5	Soil cut slope	Minor	Squatters	1 hut permanently evacuated	
K 5/36	Sau On Village, Shun On Road, Hut No. XKE/3E/G7/109 & RKT/3E/266	5/5	HyD	2/5	Rock/boulder fall	Minor	Footpath	Footpath blocked	
K 5/37	Sau On Village, XKE/3E/G7/803	5/5	HyD				Squatters		No landslide incident occurred.

Table A2 - List of Incidents in Kowloon Reported to GCO in 1989 (Sheet 4 of 13)

Incident No.	Location	Call Received		Failure			Area Affected	Consequence	Remarks
		Date	From	Date (Time)	Type	Scale			
K 5/38	Sau On Village, Hut No. XKE/3E/G7/420	5/5	HyD	2/5 (2pm)	Subsidence	Minor	Squatters	1 hut permanently evacuated	Fence wall damaged
K 5/39	Sau On Village, Hut No. XKE/3E/G7/374	5/5	HyD	2/5 (1pm)	Soil cut slope	Minor	Squatters	1 hut permanently evacuated	
K 5/40	Slope behind Tak Bo Garden	5/5	HyD	2/5	Rock/boulder fall	Minor	Building lot		
K 5/41	Fei Por Hanf Village, Choi Shek Lane	5/5	HyD	2/5 (1pm)	Natural slope	Minor	Planting yard		
K 5/42	Fei Por Hang Village, Hut No. YKE/YA/10/2	5/5	HyD	2/5 (1pm)	Natural slope	Minor	Squatters	1 hut permanently evacuated	
K 5/43	Jordan Valley Morning Trail	5/5	HyD	2/5	Natural slope	Minor	Footpath	Footpath blocked	
K 5/44	Tak Mong Village, (Structures XKC/3A/E/G1/302,303,304,325 & 326)	3/5	HyD	2/5 (12am)	Soil cut slope	Minor	Squatters	5 huts permanently evacuated	
K 5/45	Tak Mong Village, (Structure XKC/3AB/G1/267)	3/5	HyD	2/5 (12am)	Soil cut slope	Minor	Squatters	1 hut temporarily evacuated	
K 5/46	Tak Mong Village, (Structures XKC/3AB/G1/99, 100)	3/5	HyD	2/5	Soil cut slope, retaining wall	Minor	Squatters	2 huts temporarily evacuated	
K 5/47	Tung Shan Village, (Structure RKT/5B/D14)	3/5	HyD	2/5 (12am)	Soil cut slope	Minor	Squatters	1 hut permanently evacuated	
K 5/48	Tak Mong Village (Structures XKC/3AB/G1/115,116 & 120)	3/5	HyD	2/5	Flooding		Squatters		No geotechnical involvement, no slope failure or structural damage
K 5/49	Tai Sing Village, Sau Mau Ping (RKT/9C/200-202, KX/559)	5/5	HyD	2/5 (2pm)	Natural slope, retaining wall	Minor	Squatters	3 huts permanently evacuated, close pedestrian pavement	
K 5/50	Tai Sing Village, Sau Mau Ping (RKT/9C/227-240 & XKE/9/C/G1/350,366 & 373)	5/5	HyD	2/5 (2pm)	Natural slope	Minor	Squatters	17 huts permanently evacuated	
K 5/51	Tai Sing Village, Sau Mau Ping (RKT/9C/216)	5/5	HyD	2/5 (12am)	Natural slope	Minor	Squatters		
K 5/52	Tai Sing Village, Sau Mau Ping (XKE/9C/G1/17&18)	5/5	HyD	2/5 (1pm)	Rock/boulder fall	Minor	Squatters	2 huts permanently evacuated	

Table A2 - List of Incidents in Kowloon Reported to GCO in 1989 (Sheet 5 of 13)

Incident No.	Location	Call Received		Failure			Area Affected	Consequence	Remarks
		Date	From	Date (Time)	Type	Scale			
K 5/53	Tai Sing/On Lok Village, Sau Mau Ping (XKE/9B/269)	5/5	HyD	2/5	Cracked concrete platform	Minor	Squatters		
K 5/54	Tai Sing/On Lok Village, Sau Mau Ping (XKE/9/B/8/456, 460, 461 & 463)	5/5	HyD	2/5 (12pm)	Soil cut slope, natural slope		Squatters	3 huts permanently evacuated	
K 5/55	Tai Sing/On Lok Village, Sau Mau Ping (XKE/9/B/6/1172 & 1179)	5/5	HyD	2/5 (1pm)	Soil cut slope	Minor	Squatters	2 huts permanently evacuated	
K 5/56	Tai Sing/On Lok Village, Sau Mau Ping (Hut No. XKE/9/B/8/302)	5/5	HyD	2/5 (1am)	Soil cut slope, natural slope		Squatters	1 hut permanently evacuated	
K 5/57	Tai Sing/On Lok Village, Sau Mau Ping (Hut No. XKE/9/B/6/246)	5/5	HyD	2/5	Soil cut slope		Squatters		
K 5/58	Ling Nam Upper Village, Ko Chiu Road, Kowloon (Hut No. XKE/12A/N/G3/367 & 369)	5/5	HyD	2/5 (7pm)	Natural slope	Minor	Squatters		
K 5/59	Ling Nam Upper Village, Ko Chiu Road, Kowloon (Hut No. RKT/12A/N/291 & 292)	5/5	HyD	2/5 (8pm)	Soil cut slope, boulders fall	Minor	Squatters	2 huts temporarily evacuated	
K 5/60	Ling Nam Lower Village (RKT/12/C/15-21, 23-26, 35-40, XKE/12/C/G1/5,6)	5/5	HyD	3/5	Wash out, flooding	Minor	Squatters	19 huts temporarily evacuated	
K 5/61	6, Cornwall Street	8/5	Public	2/5 (12am)	Soil cut slope	Minor	Building lot	Open car park affected	
K 5/62	Slope No. 11NE-A/C63, New Clearwater Bay Road	8/5	HyD	2/5 (12pm)	Soil cut slope	Major	Road		
K 5/63	Ngau Chi Wan Village (RKT/3A/13/441 to 445)	3/5	DO	2/5	Flooding	Minor	Building lot	5 structures temporarily evacuated	
K 5/64	Ngau Chi Wan Village (RKT/3A/B/431 & 432)	3/5	DO	2/5	Flooding	Minor	Squatters	2 huts permanently evacuated	
K 5/65	Ngau Chi Wan Village (Hut No. XKC/3A/B/G1/220)	3/5	DO	2/5	Soil cut slope, fill slope		Squatters	1 hut permanently evacuated	
K 5/66	Ngau Chi Wan Village (Hut No. RKT/3A/B/446)	3/5	DO	2/5	Fill slope, wash out, flooding	Minor	Squatters	1 hut permanently evacuated	

Table A2 - List of Incidents in Kowloon Reported to GCO in 1989 (Sheet 6 of 13)

Incident No.	Location	Call Received		Failure			Area Affected	Consequence	Remarks
		Date	From	Date (Time)	Type	Scale			
K 5/67	Ngau Chi Wan Village (Hut No. XKC/3AB/G1/211)	3/5	DO	2/5	Soil cut slope, wash out	Minor	Squatters	1 hut permanently evacuated	
K 5/68	Ngau Chi Wan Village (Hut No. RKT/3A/B/210)	3/5	DO	2/5	Soil cut slope	Minor	Squatters	1 hut permanently evacuated	
K 5/69	Ngau Chi Wan Village (Hut No. XKC/3AB/G1/376-378)	3/5	DO	2/5	Soil cut slope	Minor	Squatters	3 huts permanently evacuated	
K 5/70	Ngau Chi Wan Village (Hut No. XKC/3AB/G1/431-437, 424 to 426)	3/5	DO	2/5	Wash out, flooding	Minor	Squatters	10 huts permanently evacuated	
K 5/71	Ngau Chi Wan Village (Hut No. RKT/3A/B/246)	3/5	DO	2/5	Soil cut slope, fallen tree	Minor	Squatters	1 hut temporarily evacuated	
K 5/72	Ngau Chi Wan Village (Hut No. XKC/3AB/G1/536, 537)	3/5	DO	2/5	Soil cut slope	Minor	Squatters	2 huts permanently evacuated	
K 5/73	Diamond Hill New Village	4/5	DO	2/5	Wash out, flooding	Minor	Squatters	2 huts temporarily evacuated	
K 5/74	Ngau Chi Wan Village (Hut No. XKC/3AB/G1/174, 175)	11/5	DO	2/5	Soil cut slope	Minor	Squatters	2 huts permanently evacuated	
K 5/75	Ngau Chi Wan Village (Hut No. XKC/3AB/G1/189, 190)	11/5	DO	2/5	Soil cut slope	Minor	Squatters		
K 5/76	Ngau Chi Wan Village (Hut No. XKC/3AB/G1/469)	11/5	DO	2/5	Natural slope, boulders fall	Minor	Squatters		
K 5/77	Headmaster's drive, Diocesan Boy's School	10/5	ASD	2/5 (12am)	Fill slope	Minor	Access		
K 5/78	Behind 101, Kadoorie Avenue	10/5	ASD	2/5 (12am)	Soil cut slope	Minor	Building lot		
K 5/79	Chung Luen Village, Lung Cheung Road, (Hut No. RK/16B111)	11/5	HD	2/5 (12am)	Soil cut slope	Minor	Squatters		
K 5/80	Lane 18, Sheung Yuen Leng, Diamond Hill	9/5	DO	2/5	Flooding	Minor	Open space		
K 5/81	Sau On Village, (Hut No. XKE/1/GT/408)	10/5	DO	9/5	Retaining wall	Minor	Squatters		
K 5/82	Cliff Road, South of Slope 11NW-D/CR10	5/5	CGE/D	2/5 (12am)	Soil cut slope	Minor	Open space		

Table A2 - List of Incidents in Kowloon Reported to GCO in 1989 (Sheet 7 of 13)

Incident No.	Location	Call Received		Failure			Area Affected	Consequence	Remarks
		Date	From	Date (Time)	Type	Scale			
K 5/83	Diamond Hill New Village (Hut No. RKT/4B/E/37-42)	4/5	DO	2/5 (12am)	Wash out, flooding	Minor	Squatters	6 huts temporarily evacuated	
K 5/84	Berwick Street Sitting Out Area, Shek Kip Mei	16/5	ASD	2/5 (12am)	Soil cut slope	Minor	Sitting out area		
K 5/85	Lion Rock Upper Village (Hut No. RK/6AA/150, 153)	12/5	DO	2/5	Soil cut slope, retaining wall	Minor	Footpath	1 hut temporarily evacuated	
K 5/86	Chi Lin Home for the Aged, Sheung Yuen Leng, Diamond Hill	16/5	DO	2/5	Wash out, flooding	Minor	Building lot		
K 5/87	Adjacent to Basketball Court, Detective Training School, Kwun Tong	22/5	ASD	21/5 (1)	Soil cut slope	Minor	Basketball court		
K 5/88	Hut No. WA/C/196, Model Village, J/O La Salle Road/Hereford Road	21/5	DO	21/5 (1am)	Soil cut slope	Minor	Squatters	3 huts temporarily evacuated	
K 5/89	Kun Yum Shan, lot 192	22/5	Police	22/5	Minor slope failure	Minor	Squatters		
K 5/90	Lion Rock Lower Village (RK/6AA/41, 42)	22/5	DO	20/5 (1am)	Natural slope	Major	Squatters	16 huts permanently evacuated (including 2 destroyed)	2 person died, 3 person injured, 2 huts destroyed
K 5/91	Yau Oi Village (Hut No. RK/6AB/271, 272)	22/5	DO	21/5	Flooding	Minor	Squatters	2 huts permanently evacuated by BOO	Basically no geotechnical concern.
K 5/92	Yau Oi Village (Hut No. RK/6AB/267, 268)	22/5	DO	21/5	Flooding	Minor	Squatters	2 huts permanently evacuated by BOO	Basically no geotechnical concern.
K 5/93	Lion Rock Hill Village (Hut No. RK/6AA/15-17)	22/5	DO/WTs	21/5	Part of slab collapsed		Squatters	Hut permanently evacuated by BOO	No geotechnical concern.
K 5/94	Lion Rock Hill Village	22/5	DO	21/5 (1am)	Soil cut slope	Minor	Squatters	6 huts permanently evacuated	
K 5/95	Lion Rock Hill Village (RK/6AA/112-119)	22/5	DO	20/5 (1am)	Soil cut slope, natural slope	Minor	Squatters	9 huts permanently evacuated, 3 huts temporarily evacuated	
K 5/96	Lion Rock Hill Village (Hut No. XKC/6AA/14/68, RK/6AA/81)	22/5	DO/WTs	21/5 (1am)	Soil cut slope	Minor	Squatters	2 huts permanently evacuated	
K 5/97	Lion Rock Hill Village	22/5	DO	21/5 (1am)	Soil cut slope	Minor	Squatters, road		

Table A2 - List of Incidents in Kowloon Reported to GCO in 1989 (Sheet 8 of 13)

Incident No.	Location	Call Received		Failure			Area Affected	Consequence	Remarks
		Date	From	Date (Time)	Type	Scale			
K 5/98	Princess Margaret Road near J/O Pui Ching Road	21/5	HyD	20/5 (11pm)	Soil cut slope, retaining wall	Major	Building lot, road	3 lanes of road blocked	
K 5/99	Hut No. RK/15C/361 & 405, Tung Hang Lane, Shek Kep Mei	22/5	DO	20/5 (11pm)	Soil cut slope	Minor	Squatters	1 hut temporarily evacuated	
K 5/100	Beacon Hill Radar Station Access Road	22/5	HyD	20/5	Soil cut slope	Minor	Road	Road blocked	
K 5/101	Lutheran Middle School, Waterloo Road, South end of Slope 11NW-D/C125	23/5	HyD	20/5	Soil cut slope	Minor	Footpath	Closing of staircase	
K 5/102	Slope 11NE-A/C35, Kwun Tong Road, Kowloon	21/5	H/K	21/5	Rock blocks failed	Major	Road	Close 1 lane of Kwun Tong Road, close pedestrian pavement	
K 5/103	Choi Shek Lane, Ping Shek, Kowloon	22/5	HyD	21/5 (am)	Soil cut slope	Minor	Road	Lane of road blocked	
K 5/104	Between 101 & 103, Kadoorie Avenue	21/5	HyD	21/5 (2am)	Soil cut slope	Minor	Building lot, access	Private access blocked	
K 5/105	Jet's Incline	21/5	HyD	20/5 (8pm)	Soil cut slope, boulders fall	Minor	Road	Lane of road blocked	
K 5/106	Fei Ngo Shan Road	21/5	HyD	20/5 (8pm)	Soil cut slope	Major	Road	Lane of road blocked	
K 5/107	Shatin Pass Road (I)	21/5	HyD/K	20/5 (8pm)	Soil cut slope	Minor	Road	Lane of road blocked	
K 5/108	Shatin Pass Road	21/5	HyD	20/5 (8pm)	Soil cut slope	Minor	Road	Lane of road blocked	
K 5/109	Shatin Pass Road	21/5	HyD	20/5 (8pm)	Soil cut slope	Minor	Road	Lane of road blocked	
K 5/110	Shatin Pass Road	21/5	HyD	20/5 (8pm)	Soil cut slope	Minor	Road	Lane of road blocked	
K 5/111	Shatin Pass Road	21/5	HyD	20/5 (8pm)	Soil cut slope	Minor	Road	Lane of road blocked	
K 5/112	Shatin Pass Road	21/5	HyD	20/5 (8pm)	Soil cut slope	Minor	Road	Lane of road blocked	
K 5/113	Ling Nam Upper Village (Hut No. XKE/12/N/G3/367, RKT/12A/N/291,292)	23/5	HyD	20/5 (pm)	Soil cut slope, retaining wall	Minor	Squatters	1 hut permanently evacuated, 2 huts temporarily evacuated	

Table A2 - List of Incidents in Kowloon Reported to GCO in 1989 (Sheet 9 of 13)

Incident No.	Location	Call Received		Failure			Area Affected	Consequence	Remarks
		Date	From	Date (Time)	Type	Scale			
K 5/114	Ling Nam Upper Village (Hut No. XKE/12A/N/G3/358)	23/5	HyD	21/5	Soil cut slope	Minor	Squatters	1 hut permanently evacuated	
K 5/115	Ling Nam Upper Village (Hut No. RKT/12A/295)	23/5	HyD	21/5	Subsidence of footpath	Minor	Footpath	Footpath blocked	
K 5/116	Ling Nam Lower Village (Hut No. RKT/12B/117A&B, 118 and 119)	23/5	HyD	21/5	Rock fall	Minor	Squatters		
K 5/117	On Lai Sai Tsuen (Hut No. XKE/12/C/G1/24)	23/5	HyD	21/5	Soil/rock cut slope	Minor	Squatters	1 hut permanently evacuated	
K 5/118	On Lai Sai Tsuen (Hut No. RKT/12/C/67 & 174)	23/5	HyD	21/5	Fallen trees	Minor			
K 5/119	On Lai Sai Tsuen (Hut No. XKE/12/C/G1/34&35)	23/5	HyD	20/5	Soil cut slope	Minor	Squatters	2 huts permanently evacuated	
K 5/120	Fan Wa Street Squatter Area (Hut No. RKT/1A/B/238)	23/5	HyD	20/5	Rock/boulder fall	Minor	Squatters		
K 5/121	Lung Cheung Road near Broadcast Drive	23/5	HyD	20/5	Soil cut slope	Minor	Footpath		Catchpit silted
K 5/122	Kowloon Tsai Park along Inverness Road	23/5	HyD	20/5	Soil cut slope	Minor	Park, footpath		
K 5/123	Slope 11NW-B/C48, near Tai Hang Tung Playground	24/5	HyD	20/5	Soil cut slope	Minor	Road	Half lane of road blocked	
K 5/124	Mission Hill, near Tai Hang Tung Playground	24/5	HyD	20/5	Soil cut slope	Minor	Park, footpath		Staircase undermined
K 5/125	Mission Hill near No. 7 Tong Yam Street	24/5	HyD	20/5	Soil cut slope	Minor	Park, footpath		Staircase undermined
K 5/126	Behind North Kowloon Magistracy, Tai Po Road	24/5	HyD	20/5	Soil cut slope	Minor	Footpath		
K 5/127	Sau On Village (Hut No. XKE/3E/G7/1024)	23/5	HyD	20/5	Soil cut slope	Minor	Squatters	1 hut permanently evacuated	
K 5/128	Sau On Village (Hut No. XKE/3E/G7/407 & 408)	23/5	HyD	20/5 (pm)	Rock/boulder fall	Minor	Squatters	2 huts permanently evacuated	
K 5/129	Tai Shing Village (Hut No. XKE/9C/G7/241)	23/5	HyD	20/5 (pm)	Soil cut slope	Minor	Squatters		
K 5/130	Tai Shing Village (Hut No. XKE/9/B/1124)	23/5	HyD	20/5 (pm)	Soil cut slope	Minor	Squatters		

Table A2 - List of Incidents in Kowloon Reported to GCO in 1989 (Sheet 10 of 13)

Incident No.	Location	Call Received		Failure			Area Affected	Consequence	Remarks
		Date	From	Date (Time)	Type	Scale			
K 5/131	Tai Shing Village (Hut No. XKE/9B/6/1118-1121)	23/5	HyD	20/5 (pm)	Soil cut slope	Minor	Squatters	4 huts permanently evacuated	
K 5/132	Tai Shing Village (Hut No. XKE/9B/6/1206)	23/5	HyD	20/5 (pm)	Soil cut slope	Minor	Squatters		
K 5/133	Ma Yau Tong Village (Hut No. RKT/9/A/135 & 136)	23/5	HyD	21/5 (am)	Soil cut slope	Minor	Squatters	2 huts permanently evacuated	
K 5/134	Behind 80, Princess Margaret Road	25/6	DO	2/5 (pm)	Soil cut slope	Minor	Squatters	2 huts permanently evacuated	
K 5/135	Kowloon Wah Yan Collage - Slope below King's Park Flats Government Quarters	25/6	Public	20/5 (pm)	Natural slope, wash out	Minor	Building lot		Soil debris disposed on open space
K 5/136	Diamond Hill Cementary	24/5	ASD	20/5	Natural slope	Major	Footpath		
K 5/137	Diamond Hill Cementary Area	24/5	ASD	20/5	Natural slope	Major	Squatters, cemetery		
K 5/138	Diamond Hill Cementary Area	24/5	ASD	20/5	Natural slope	Minor	Footpath		
K 5/139	Diamond Hill Cementary Area	24/5	ASD	20/5	Natural slope	Minor	Cemetery		Graves destroyed
K 5/140	Diamond Hill Cementary Area	24/5	ASD	20/5	Natural slope	Minor	Cemetery		Urns destroyed
K 5/141	Slope No. 11NE-A/C130, 51, Kwun Tong Road, Kowloon	22/5	ASD	21/5 (am)	Soil cut slope	Minor	Building lot		
K 5/142	Ko Shan Road Park	24/5	ASD	20/5	Natural slope	Minor	Park		Drainage channel silted
K 5/143	Clear Water Bay Road (near Fei Ngo Shan Road)	26/5	HyD	21/5 (am)	Soil cut slope	Minor	Road	Lane of road blocked	
K 5/144	Nam Shan New Village	30/5	DO	21/5 (am)	Soil cut slope, natural slope	Minor	Access	Pedestrian pavement closed	
K 5/145	Chi Lin Home for the Aged	24/5	DO	20/5 (pm)	Soil cut slope	Minor	Building lot		
K 6/1	Ling Nam Lower Village, Cha Kwo Ling Road, Kwun Tong	30/5	HyD	21/5	Natural slope	Minor	Squatters	1 hut permanently evacuated	
K 6/2	Sheun Li Uk Garden, Sham Shui Po	30/5	ASD	20/5	Soil cut slope	Minor	Park		
K 6/3	Fan Hui Garden	30/5	ASD	20/5	Soil cut slope, fill slope	Minor	Park		

Table A2 - List of Incidents in Kowloon Reported to GCO in 1989 (Sheet 11 of 13)

Incident No.	Location	Call Received		Failure			Area Affected	Consequence	Remarks
		Date	From	Date (Time)	Type	Scale			
K 6/4	Near Good Hope School, New Clearwater Bay Road, Kowloon	30/5	HyD	21/5	Soil cut slope	Minor	Footpath		
K 6/5	Tung Hang Lane	6/6	DO	20/5	Soil cut slope	Minor	Squatters	2 huts permanently evacuated	
K 6/6	Junction of Fu Wan Street and Fu Cheng Street	31/5	HyD	20/5	Soil cut slope	Minor	Road	Lane of road blocked	
K 6/7	Near Tsz Mei Estate, Tsz Wan Shan (Hut No. XKC/5B/N/2/63)	31/5	DO	21/5 (am)	Soil cut slope	Minor	Squatters	1 hut permanently evacuated	
K 6/8	Near Tsz Mei Estate, Tsz Wan Shan (Huts No. XKC/5B/N/2/106-108)	31/5	HyD	20/5	Soil cut slope	Minor	Squatters	3 huts permanently evacuated	
K 6/9	Tung Yeung Village, Tsz Wan Shan (Hut No. XKC/54/10/443)	31/5	DO	21/5	Soil cut slope	Minor	Squatters	1 hut permanently evacuated	
K 6/10	Heung Yeung Village, Tsz Wan Shan, (Hut No. RKT/5B/248-250)	31/5	DO	25/5	Soil cut slope	Minor	Squatters	3 huts permanently evacuated	
K 6/11	Heung Yeung Village, Tsz Wan Shan (Hut No. RKT/5/B/58)	31/5	DO	21/5 (9am)	Footpath	Minor	Footpath		
K 6/12	Diamond Hill Village (Hut No. RKT/4/D/736)	2/6	DO	20/5 (pm)	Hole on slab found	Minor	Squatters		
K 6/13	Ngau Chi Wan Village (Hut No. XKC/3AB/G1/125-128)	22/5	DO	20/5 (pm)	Soil cut slope	Minor	Squatters	4 huts temporarily evacuated	
K 6/14	Ngau Chi Wan Village (Hut No. XKC/3AB/G1/472-474)	22/5	DO	20/5 (pm)	Soil cut slope, boulders fall	Minor	Squatters	3 huts permanently evacuated	
K 6/15	Chung Luen Village, Lung Cheung Road (Hut No. XKW/16B/16)	12/6	HD	20/5	Fallen trees	Minor	Squatters	1 hut permanently evacuated	
K 6/16	Slope 11NE-D/C33 J/O Hip Wo Street and Hong Ning Road, Kwun Tong	22/5	HyD	21/5	Soil cut slope	Minor	Footpath		
K 6/17	Behind MTR Ventilation Shaft, Choi Shek Lane, Kowloon	6/6	MTRC	21/5	Soil cut slope	Minor	Area adjacent to MTR ventilation shaft		Ventilation shaft area affected
K 6/18	Chi Lin Siu Hong, Diamond Hill Village		DO	2/5	Drainage problem		Squatters		

Table A2 - List of Incidents in Kowloon Reported to GCO in 1989 (Sheet 12 of 13)

Incident No.	Location	Call Received		Failure			Area Affected	Consequence	Remarks
		Date	From	Date (Time)	Type	Scale			
K 6/19	Heung Yeung Village (beside Hut No. RKT/5/16)		DO		No failure				
K 6/20	Sau On Village (XKE/3E/G7/512,513)	22/6	DO		Soil cut slope	Minor	Squatters	2 huts permanently evacuated	
K 6/21	Tai Shing Village opposite Blk 32 of Sau Mau Ping Estate	18/6	Police	18/6	Fill slope, wash out	Minor	Squatters	1 hut permanently evacuated	
K 7/1	Shun Chi Court		HD	May	Flooding	Minor	Building lot		
K 7/2	Wah Ching Road, No. 39, Diamond Hill Village	10/7	DO	July	Structural defection		Squatters		
K 7/3	Diamond Hill Village (Hut No. RKT/4/D/736)	10/7	DO	2/5	Flooding, spalling of chunam	Minor	Squatters		
K 7/4	Diamond Hill New Village (Hut No. XKC/4B-E/5/49)	10/7	DO	2/5	Flooding		Squatters		
K 7/5	Anderson Road (opposite Leighton Pavilion 1942-1943)		HyD	May	Soil cut slope	Minor	Road	Lane of road and pedestrian pavement fenced off	
K 7/6	Tai Shing Village (Hut No. XKE/9C/G7/121)	19/7	HyD	18/7	Soil cut slope	Minor	Squatters	1 hut permanently evacuated	
K 7/7	Lai Chi Kok Reception Centre, Butterfly Valley Road	20/7	HyD	20/5	Soil cut slope	Minor	Open space		
K 8/1	Tai Shing Village	7/8	DLO	July	Soil slope	Minor	Squatters	3 huts permanently evacuated	
K 8/2	Sau Mau Ping Road near Junk Bay Road (11NE-D/C13)	24/8	HyD	21/5	Soil/rock cut slope	Minor	Road		
K 8/3	St. Joseph Home for the Aged, Ngau Chi Wan	24/8	DO	2/5 (pm)	Wash out	Minor	Open space		
K 9/1	Tin Liu Village, Tze Wan Shan	5/9	HD	Sept.	Wash out	Minor	Squatters, footpath		
K 9/2	Tak Mong Village	9/9	BOO	8/9 (pm)	Natural slope	Minor	Squatters	3 huts permanently evacuated	Collapse of platform in front of the hut
K 9/3	Ngau Chi Wan West Village (Hut No. XKC/3A-B/G1/506)	11/9	DO	9/9 (pm)	Natural slope	Minor	Squatters	1 hut permanently evacuated	Huts slab cracked and inclined
K 9/4	Fan Wa Street, Lei Yue Mun	31/9	Public (letter)	8/9	Soil/rock cut slope	Minor	Squatters		

Table A2 - List of Incidents in Kowloon Reported to GCO in 1989 (Sheet 13 of 13)

Incident No.	Location	Call Received		Failure			Area Affected	Consequence	Remarks
		Date	From	Date (Time)	Type	Scale			
K 9/5	Sau On Village (Hut No. XKE/3E/G7/621 & 622)	13/9	HyD	7/9	Soil cut slope	Minor	Footpath		
K 10/1	On Lok Village (Hut No. XKE/9/B/6/1103 & 1104)	2/10	HyD	2/10 (10am)	Fill slope	Minor	Squatters	2 huts permanently evacuated	
K 11/1	Heung Yeung Village	5/11	Police	5/11	Soil cut slope	Minor	Squatters	1 hut permanently evacuated	
K 11/2	Staff Quarters of Housing Department at Junk Bay Road	11/11	HD	11/10 ()	Rock cut slope	Minor	Carpark	One car park space closed	
K 11/3	Slope behind Sitting Out Area at Wylie Road adjacent to Lim Por Yen Centre	11/11	USD	Sept.	Soil cut slope	Minor	Sitting out area, footpath		
K 11/4	Slope facing side lane of 78C Waterloo Road	22/9	USD (memo)	Unknown	Soil cut slope	Minor	Access		
K 12/1	Chung Luen Village, Tai Po Road (Hut No. RK/16B/122)	21/12	HD	Unknown	Rubble foundation	Minor	Squatters	1 hut permanently evacuated	

Table A3 - List of Incidents in Eastern New Territories Reported to GCO in 1989 (Sheet 1 of 9)

Incident No.	Location	Call Received		Failure			Area Affected	Consequence	Remarks
		Date	From	Date (Time)	Type	Scale			
ME 1/1	Tai Chung Hau Village, House 105, Pak Kong, Sai Kung	3/1	BOO	3/1 (am)	Retaining wall	Minor	Footpath		
ME 1/2	Sha Tin Tau Village	13/1	DO	13/1	Soil cut slope	Minor	Footpath		
ME 1/3	26 Second Street, Heung Fan Liu, Tai Wai, N.T.		DO	28/1	Ground subsidence	Minor	Squatters, footpath		
ME 1/4	Southern-east of Poiver-Cove Reservoir	20/1	WSD	1988	Rock cut slope	Major	Reservoir		
ME 3/1	Hang Hau Road near Hang Hau Town, Sai Kung	26/3	HyD	25/3 (pm)	Rock cut slope	Minor	Road	Pedestrian pavement closed, area in danger fenced off	
ME 3/2	Huts No. 40 & 41 at Ko Lau Wan, Sai Kung (North)	7/4	DO	March	Soil cut slope	Minor	Open space		
ME 3/3	Huts No. 54 & 55 and adjacent to hut No. 56 at Ko Lau Wan, Sai Kung (North)	7/4	DO	March	Wash out	Minor	Footpath		
ME 5/1	Access road to Ma On Shan Village	1/5	DO	1/5	Natural slope	Minor	Road		
ME 5/2	Lot 1130, Pak Shek Wo, Sai Kung	2/5	Public	2/5	Natural slope	Major	Building lot		Fence wall collapsed and part of garden subsided
ME 5/3	No. 33 Pik Shui San Tsuen, Sai Kung	2/5	DO	2/5	Retaining wall	Minor	Access	Lane of house blocked	
ME 5/4	Luk Hop Village, Sha Tin								Deleted
ME 5/5	No.1, Mong Kung Uk	2/5	HyD	3/5	Wash out	Minor	Building lot		
ME 5/6	Lot 1169 and 1173, Pak Shek Wo, Sai Kung	2/5	Police	2/5	Retaining wall, soil cut slope	Major	Building lot, access	15 houses temporarily evacuated, access road blocked	
ME 5/7	No. 28 Tseng Lan Shue, Sai Kung	2/5	DO	2/5	Soil cut slope	Minor	Access		Rear lane piled with slip debris
ME 5/8	Lot 852, 853 Denon Terrace, Sai Kung	2/5	Public	2/5	Soil cut slope, fill slope, retaining wall	Major	Building lot	2 houses temporarily evacuated	
ME 5/9	Clearwater Bay Road, Kowloon bound, near Ta Ku Ling New Village, Sai Kung	2/5	HyD	2/5	Soil cut slope	Minor	Road	Half lane of road blocked	

Table A3 - List of Incidents in Eastern New Territories Reported to GCO in 1989 (Sheet 2 of 9)

Incident No.	Location	Call Received		Failure			Area Affected	Consequence	Remarks
		Date	From	Date (Time)	Type	Scale			
ME 5/10	Hiram's Highways, near Nam Wai, Sai Kung	2/5	DO	2/5	Soil cut slope	Minor	Road		
ME 5/11	Clearwater Bay Road near Hiram's Highway, opposite to Air House, Sai Kung	2/5	HyD	2/5	Soil cut slope	Minor	Road	Lane of road partly blocked	
ME 5/12	Sunnyside School, Ma Yau Tong, Junk Bay	2/5	ASD	2/5	Retaining wall	Minor	Access		
ME 5/13	No. 3A Mau Wu Tsai, Po Lam Road	2/5	Public	2/5	Soil cut slope	Minor	Access		Rear lane of small house covered with small amount of debris
ME 5/14	No. 6 Pak Shek Wo San Tsuen	2/5	DO	3/5	Soil cut slope	Minor	Building lot	Rear lane of house No. 6 blocked	
ME 5/15	Lot 849 in DD 26, Man King Terrace, Sai Kung	4/5	DLO	4/5	Soil cut slope	Minor	Building lot	Carpark partly blocked	
ME 5/16	No. 39, Wo Mei Tsuen, Sai Kung	2/5	Police	2/5	Retaining wall	Minor	Access		
ME 5/17	No. 26, 25, Nam Wai, Sai Kung	3/5	Public	2/5	Rubble facing	Minor	Access	Service lane behind building blocked	
ME 5/18	No. 20 Lung Wo Tsuen, Sai Kung	4/5	DLO	2/5	Soil cut slope	Major	Building lot	Rear portion of the factory temporarily evacuated	Two lorries buried at the open space behind the building
ME 5/19	Junk Bay Area 6A, Tsui Lam Estate	3/5	HD	2/5	Soil/rock cut slope	Minor	Sitting out area		Sitting out area covered with a thin layer of wash out debris
ME 5/20	8B, Sam Long Tsuen, Tseng Lan Shue, Sai Kung	3/5	DLO	2/5	Soil cut slope, natural slope	Minor	Footpath	Pedestrian pavement blocked	
ME 5/21	No. 71 & 74, Tseng Lan Shue Lower Village, Sai Kung	4/5	DLO	2/5	Soil cut slope	Minor	Building lot	No. 71-74 temporarily evacuated	
ME 5/22	4th Street, Heung Fan Liu, Shatin	3/5	DO	5/5	Soil cut slope	Minor	Squatters		
ME 5/23	San Tei Tsuen, Tseng Lan Shue, Sai Kung	4/5	DO	2/5	Soil cut slope	Minor	Footpath		
ME 5/24	Fei Ngo Shan Road, Hong Kong Bank Staff Quarter	4/5	Police	2/5	Soil cut slope	Minor	Road	Lane of road blocked	

Table A3 - List of Incidents in Eastern New Territories Reported to GCO in 1989 (Sheet 3 of 9)

Incident No.	Location	Call Received		Failure			Area Affected	Consequence	Remarks
		Date	From	Date (Time)	Type	Scale			
ME 5/25	Anderson Road near Ka Wah Quarry	3/5	HyD	2/5	Soil cut slope	Minor	Road, squatters	2 huts permanently evacuated	Lane of road undermined
ME 5/26	Pak Shek Wo access road	4/5	HyD	2/5	Wash out	Minor	Road		
ME 5/27	Ma Yau Tong Village	4/5	Police	2/5	Soil cut slope, natural slope	Minor	Building lot	1 house permanently evacuated	
ME 5/28	Clearwater Bay Road near Tai Au Mun	3/5	HyD	2/5	Soil cut slope	Minor	Road	Half lane of road blocked	
ME 5/29	Rock fall behind hut No.34 at Ko Lau Wan, Sai Kung	9/5	DO	2/5	Rock/boulder fall	Minor	Building lot		Part of footpath collapsed
ME 5/30	5½ Ms, Tai Po Road, Tatiara	/	HyD	2/5	Fill slope	Minor	Building lot		
ME 5/31	No. 6A Sam Long Tsuen, Sai Kung	10/5	DO	3/5	Soil cut slope	Minor	Squatters		Lane behind building lot endangered
ME 5/32	Lot 1143, Pak Shek Wo	3/5	Police	3/5	Retaining wall	Minor	Access		
ME 5/33	Pak Shek Wo New Village, adjacent to Mutual-Aid Committee	3/5	Site inspection	2/5	Soil cut slope	Minor	Footpath		Footpath endangered
ME 5/34	No. 16, Area 2, Rennie's Mill	21/5	BOO	20/5	Natural slope	Minor	Road	Lane of Road blocked	
ME 5/35	Slope below hut ARC44 & XAND/11, Anderson Road	22/5	HyD	20/5	Soil cut slope	Minor	Road	Road partly blocked	
ME 5/36	No. 19 Chuk Hang Tsuen, Tai Po	22/5	Incident report	20/5	Soil cut slope	Minor	Building lot		
ME 5/37	Huts No. RPT/CH/385-389, Chuk Hang Village, Tai Po	23/5	Public	20/5	Natural slope	Minor	Squatters	5 huts temporarily evacuated	
ME 5/38	No. 81 Kam Shan Village (RTP/KSB/11)	22/5	Public	20/5	Soil cut slope	Minor	Building lot	Hut No. 81 temporarily evacuated	
ME 5/39	Tai Lam Liu Village, No.35-38	21/5	Police	21/5 (pm)	Soil cut slope	Major	Village houses	G/F of 37A & 38A evacuated	
ME 5/40	Vona Building, Shatin Height Road	21/5	DO	20/5	Soil cut slope	Minor	Road		

Table A3 - List of Incidents in Eastern New Territories Reported to GCO in 1989 (Sheet 4 of 9)

Incident No.	Location	Call Received		Failure			Area Affected	Consequence	Remarks
		Date	From	Date (Time)	Type	Scale			
ME 5/41	VOPD 33, Shatin Height Road	21/5	DO	20/5	Soil cut slope	Minor	Squatters	2 huts permanently evacuated	Service lane blocked
ME 5/42	23A Yau Oi Village, Shatin	21/5	DO	20/5	Soil cut slope	Minor	Squatters, footpath	1 hut permanently evacuated	
ME 5/43	Tung Lo Wan, Siu Chuk, 12B, Tung Lo Wan Village, On Ting Terrace	21/5	DO	20/5	Soil cut slope	Minor	Building lot	Close the rear 2 warns	
ME 5/44	No. 88/89 Tung Lo Wan Village	21/5	DO	20/5	Soil cut slope	Minor	Building lot		
ME 5/45	Tung Lo Wan Hill Road (Roadside)	23/5	DO	20/5	Soil cut slope	Minor	Road		
ME 5/46	49, 51 Tung Lo Wan Hill Road	23/5	DO	20/5	Soil cut slope	Minor	Open space		
ME 5/47	811 Kam Shan Village, Tai Po (RTP/KSB/180, 182)	23/5	HD	20/5	Soil cut slope, retaining wall	Minor	Squatters	2 huts temporarily evacuated	
ME 5/48	Hut No. RTP/KSB/144, Kam Shan	23/5	HD	20/5	Soil cut slope	Minor	Squatters	1 hut temporarily evacuated	
ME 5/49	43A, Tseng Lan Shue, Sai Kung	21/5	DLO	20/5 (1pm)	Soil cut slope	Minor	Building lot		
ME 5/50	No. 42 Tseng Lan Shue, Sai Kung	24/5	DLO	20/5	Soil cut slope	Minor			
ME 5/51	35A, Tin Ha Wan, Sai Kung	21/5	DO	20/5 (11am)	Soil cut slope	Minor	Footpath		
ME 5/52	Ha Hang Village, Tai Po	2/5	DO		Soil cut slope	Minor	Footpath		
ME 5/53	No. 37, Yue Kok Village	24/5	DO	20/5	Soil cut slope	Minor	Building lot		
ME 5/54	32, Tin Ha Wan, Sai Kung	21/5	DO	20/5 (5pm)	Soil cut slope, retaining wall	Minor	Access		
ME 5/55	Lion Rock Tunnel Road, CH15.45, Slope No.7SW-D/C46	22/5	HyD	20/5	Soil cut slope	Minor	Road		
ME 5/56	Behind House No. 224, Pai Tau Village, Shatin	21/5	Police	20/5	Soil cut slope	Minor	Building lot	1 bedroom at 224 & 1 kitchen at 225 temporarily evacuated	
ME 5/57	Behind house No.230 & 231, Pai Tau Village, Shatin	21/5	DO		Soil cut slope	Minor	Building lot	Half-width of footpath closed	

Table A3 - List of Incidents in Eastern New Territories Reported to GCO in 1989 (Sheet 5 of 9)

Incident No.	Location	Call Received		Failure			Area Affected	Consequence	Remarks
		Date	From	Date (Time)	Type	Scale			
ME 5/58	Below house No.350, Pai Tau Village, Shatin	21/5	DO	21/5	Soil cut slope	Minor	Squatters, building lot	6 huts permanently evacuated, 1 hut and 1 storeroom temporarily evacuated	
ME 5/59	Behind House No. 292, Pai Tau Village, Shatin	24/5	DO		Soil cut slope	Minor	Squatters	1 hut permanently evacuated, 1 hut temporarily evacuated	
ME 5/60	Below house No. 91, Pai Tau Village, Shatin	24/5	DO		Soil cut slope	Minor	Building lot		
ME 5/61	Behind House No. 100, Pai Tau Village, Shatin	21/5	DO	21/5	Soil cut slope	Minor	Footpath		
ME 5/62	Below House No. 152, Pai Tau Village, Shatin	24/5	DO	21/5	Soil cut slope	Minor	Building lot, squatters	1 hut temporarily evacuated	
ME 5/63	Behind House No. 87, Pai Tau Village, Shatin	21/5	DO	21/5	Soil cut slope	Minor	Squatters, stream course		
ME 5/64	31, Tin Ha Wan, Sai Kung	21/5	DO	20/5 (5pm)	Soil cut slope	Minor	Access		
ME 5/65	Pak Tin Village, 5th District, (RPAK/C/172 etc)	24/5	DO	20/5	Soil cut slope	Minor	Squatters	4 huts permanently evacuated	
ME 5/66	Pak Tin Village, 5th District (RPAK/C/210)	24/5	DO	20/5	Soil cut slope	Minor	Squatters	Kitchen of hut temporarily evacuated	
ME 5/67	Pak Tin Village, 5th District (RPAK/C/218)	24/5	DO	20/5	Soil cut slope	Minor	Squatters		
ME 5/68	Pak Tin Village, 5th District (RPAK/C/100)	24/5	DO	20/5	Soil cut slope	Minor	Squatters		
ME 5/69	Heung Fan Liu, No. 3, 3rd Street, (RPAK/B/883)	21/5	DO	20/5	Soil cut slope	Minor	Open space		
ME 5/70	Heung Fan Liu, 4th Street, No.1	24/5	DO	20/5	Soil cut slope	Minor	Open space		
ME 5/71	Behind Hut No. RHC/413 (local No.165) Ha Wo Che Village, Shatin	25/5	DO	21/5	Soil and rock blocks slipped	Minor	Squatters	Hut at crest & rear portion of Hut No. RHC/413 permanently evacuated	1 hut damaged

Table A3 - List of Incidents in Eastern New Territories Reported to GCO in 1989 (Sheet 6 of 9)

Incident No.	Location	Call Received		Failure			Area Affected	Consequence	Remarks
		Date	From	Date (Time)	Type	Scale			
ME 5/72	Po Toi O, Sai Kung	25/5	DO	20/5	Soil cut slope	Minor	Road	A small portion of the lane of road blocked	Flooding affecting huts and farm land
ME 5/73	No. 11, Pak Tin Kong, Tai Po	20/5	DO	20/5	Natural slope	Minor	Stream crouse		
ME 5/74	Shatin Tau Village (In front of hut RSTT6/209 & Lamp Post L.P.12)	25/5	HD	20/5	Soil cut slope	Minor	Squatters, access		
ME 5/75	Shatin Tau Village (in front of huts RSTT6/276-277)	26/5	HD	21/5	Soil cut slope	Minor	Squatters		
ME 5/76	Behind House No. 56, Poi Tau Village, Shatin	22/5	Public	20/5	Soil cut slope	Minor	Building lot		
ME 5/77	Footpath leading to 10000 Buddah Monastery, Pai Tau Village, Shatin	26/5	DO	21/5	Retaining wall	Minor	Footpath	Footpath blocked	
ME 5/78	Behind House No. 141 Ha Wo Che Village, Shatin	26/5	DO	21/5	Soil cut slope	Minor	Building lot		
ME 5/79	Ch. 1300, Beacon Hill Catchwater (off Tai Po Road), Shatin	23/5	WSD	21/5	Natural slope	Major	Road		
ME 5/80	Ng Tung Chai, Tai Po	26/5	DLO	20/5	Soil cut slope, natural slope	Minor	Road, building lot		
ME 5/81	No. 10A, Chuk Hang Village, San Wai Tsui, Tai Po	23/5	DO	21/5	Retaining wall	Minor	Building lot, footpath		
ME 5/82	Shung Him Tong, Fan Ling South	26/5	DO	20/5	Natural slope	Minor	Footpath		
ME 5/83	Kam Shan Normal Memorial School	29/5	ASD	20/5	Soil cut slope	Minor	Building lot		
ME 5/84	Kwei Tei San Tsuen Road, (opposite House No. 33), Fo Tan	31/5	DO	21/5	Soil cut slope, natural slope	Minor	Road		
ME 5/85	Behind House No. 104, Sha Tin Tau Old Village, Sha Tin	21/5	Police	20/5	Soil cut slope	Minor	Squatters	Kitchen shed temporarily evacuated	
ME 5/86	Behind Hut RSTT/245, Sha Tin Tau San Tsuen Area 2, No. 18	21/5	Police	21/5 (am)	Soil cut slope	Minor	Squatters	1 hut temporarily evacuated	

Table A3 - List of Incidents in Eastern New Territories Reported to GCO in 1989 (Sheet 7 of 9)

Incident No.	Location	Call Received		Failure			Area Affected	Consequence	Remarks
		Date	From	Date (Time)	Type	Scale			
ME 5/87	Behind House No. 50A, Pak Shek Village, Sha Tin	21/5	Police	20/5 (11pm)	Soil cut slope	Major	Squatters	Kitchen hut permanently evacuated	
ME 5/88	Slope below Begonia Court, Worldwide Garden, Lung Pak Street, Shatin	22/5	Public	21/5	Soil cut slope	Minor	Stream course		
ME 5/89	Shui Wo, Tai Po	7/6	DO	20/5	Natural slope	Minor	Footpath		
ME 5/90	Lin Au Village, Tai Po	24/5	DO	20/5 (pm)	Soil cut slope	Minor	Building lot		
ME 5/91	Ying Pan, Tai Po	29/5	Public	20/5	Cut/fill platform	Minor	Footpath		
ME 5/92	Kam Shan Village, Hon Ka Road	2/6	DO	21/5	Soil cut slope	Minor	Road		
ME 5/93	Kin Tak Public School, Lin Tong Mei, Sheun Shui	2/6	ASD	Unknown	Soil cut slope	Minor	Building lot	Classroom affected	
ME 5/94	Clearwater Bay Golf & Country Club, Sai Kung	25/5	GCO	Unknown	Soil cut slope	Minor	Road	Lane of part of road blocked	
ME 5/95	No. 105B, 105C, Ho Ka Yuen, Fanling	23/5	Public	20/5 (am)	Soil cut slope	Minor	Squatters		
ME 5/96	Near No. 1, Hin Tin Village, Sha Tin	21/5	Police	21/5	Soil cut slope	Minor	Building lot		
ME 5/97	House No. 46, Sheung Wo Che Tsuen, Sha Tin	21/5	Public	21/5	Soil cut slope	Minor	Village house	Rear portion of hut temporarily evacuated	
ME 5/98	Tsuk Pak Hang Village	26/5	DO	26/5	Soil cut slope	Minor	Road		
ME 5/99	Kwun Yim Shan Village (RKTG/A/51, 52, 54)	26/5	DO	21/5	Soil cut slope	Minor	Squatters	1 hut permanently evacuated	
ME 5/100	110B Pak Tin Area 2	26/5	DO	21/5	Soil cut slope	Minor	Squatters	1 hut permanently evacuated	
ME 5/101	Ping Ling Public School, Shatin	26/5	DO	21/5	Soil cut slope	Minor	Open space		
ME 5/102	No. 21, Sam Long Tsuen, Tseng Lan Shue	25/5	DO	20/5	Natural slope	Minor	Slope on which a building platform affected		

Table A3 - List of Incidents in Eastern New Territories Reported to GCO in 1989 (Sheet 8 of 9)

Incident No.	Location	Call Received		Failure			Area Affected	Consequence	Remarks
		Date	From	Date (Time)	Type	Scale			
ME 5/103	81C Kam Shan Village, Tai Po	22/5	Public	20/5	Soil cut slope	Minor	Squatters	3 huts permanently evacuated	
ME 5/104	81M Kam Shan Village	7/6	BOO	Unknown	Natural slope	Minor	Footpath		
ME 5/105	Footpath leading to Pak Shek Wo New Village, Sai Kung	15/6	DO	2/5	Soil cut slope, retaining wall	Minor	Footpath	Close pedestrian pavement	
ME 5/106	Near Junction of Lan Shui Heung Road and Hok Tau Road, Fanling	7/5	HyD	May	Soil cut slope	Minor	Road		
ME 5/107	Landslip below footpath at Ma Yau Tong, Sai Kung	26/6	Public	May	Soil cut slope	Minor	Footpath		Footpath undermined
ME 5/108	No. 71C, Tseng Lan Shue Lower Village, Sai Kung	20/7	DO	May	Soil cut slope	Minor	Access		
ME 6/1	Ma On Shan Village RMOS/B/41	15/6	DO	21/5	Soil cut slope	Minor	Squatters	1 hut permanently evacuated	
ME 6/2	Ma On Shan Village RMOS/B/32	15/6	DO	21/5	Soil cut slope	Minor	Squatters		
ME 7/1	Slope 7NE-C/C95, Lai Ping Road, Sha Tin	13/7	DLO	May	Soil cut slope	Major	Road		
ME 7/2	Landslide in Tung Lung Chau, Sai Kung	8/7	DO	July	Natural slope	Minor	Footpath		
ME 7/3	Road leading to Nga Liu, near Greenfield Villa, Sai Kung	19/7	DO	18/7	Soil cut slope	Minor	Road		Access road threatened
ME 7/4	No. 48, Ko Lau Wan, Sai Kung North	20/7	DO	18/7	Soil cut slope	Minor	Squatters		
ME 7/5	No. 46&47, Ko Lau Wan, Sai Kung North	20/7	DO	18/7	Soil cut slope	Minor	Squatters		
ME 7/6	No. 38&39, Ko Lau Wan, Sai Kung North	20/7	DO	18/7	Soil cut slope	Minor	Squatters		
ME 7/7	No. 44&45, Ko Lau Wan, Sai Kung North	20/7	DO	18/7	Soil cut slope	Minor	Squatters		
ME 7/8	Lot 794 in DD 226, Tseng Lan Shue	1/8	Public	18/7	Soil cut slope	Minor	Building lot		
ME 7/9	Access Road to Tit Hang Village, Ma Tso Lung	2/10	DO	July	Soil cut slope	Minor	Road		

Table A3 - List of Incidents in Eastern New Territories Reported to GCO in 1989 (Sheet 9 of 9)

Incident No.	Location	Call Received		Failure			Area Affected	Consequence	Remarks
		Date	From	Date (Time)	Type	Scale			
ME 9/1	Retaining wall in front of Hut No. RTP/KS/186. Kam Shan Village, Tai Po	19/9	HD	Unknown	Retaining wall	Minor	Squatters	Partial blockage of footpath	
ME 10/1	No. 56, Ko Lau Wan Village, Ko Lau Wan	4/10	Public	Unknown	Rock/boulder fall	Minor	Building lot		
ME 10/2	Slope behind lavatory of Ko Lau Wan Primary School	6/9	DO	Unknown	Soil cut slope	Minor	Building lot		
ME 10/3	No. 36, 37 of Ko Lau Wan Village, Ko Lau Wan	4/10	Public	Unknown	Soil cut slope	Minor	Building lot		
ME 11/1	Footpath leading to Squatter Hut No. RSTT/D/1,2,3 & 4, Sha Tin Tau Village Area 2	30/10	HD	Unknown	Soil cut slope	Minor	Footpath		
ME 11/2	Slope behind No.13, Yung Shue Tsuen, Tap Mun	17/10	DLO	Unknown	Soil cut slope	Minor	Building lot		
ME 11/3	Slope behind No. 8 & 36, Yung Shue Tsuen, Tap Mun	17/10	DLO	Unknown	Soil cut slope	Minor	Building lot		
ME 11/4	Below concrete path leading to House No.54, Pai Tau Village, Sha Tin	15/11	DO	Unknown	Soil cut slope	Minor	Footpath		

Table A4 - List of Incidents in Western New Territories Reported to GCO in 1989 (Sheet 1 of 13)

Incident No.	Location	Call Received		Failure			Area Affected	Consequence	Remarks
		Date	From	Date (Time)	Type	Scale			
MW 3/1	Slope at No. 109 Pak She San Tsuen, Cheung Chau	13/1	DO	25/3	Soil cut slope	Minor	Footpath		Blockage of 225mm channel
MW 4/1	Slope behind No. 51 Shek Lei Hang Village, Kwai Chung	10/4	HD	8/4	Soil cut slope	Minor	Squatters	1 hut permanently evacuated	
MW 4/2	Tseng Tau Tsuen Chung Tsuen, Tuen Mun	11/4	HyD	8/4	Fill slope, retaining wall	Minor	Footpath		
MW 5/1	No. 40, Shing Ka Road, Peng Chau	2/5	BOO	2/5	Soil cut slope	Minor	Road, building lot	Temporarily closure of pedestrian access	
MW 5/2	6 Wai Tsai Sixth Street, Peng Chau	3/5	Police	2/5	Soil cut slope	Minor	Building lot		
MW 5/3	8 Wai Tsai Street, Peng Chau	3/5	Police	2/5	Soil cut slope	Minor	Squatters	1 hut temporarily evacuated	
MW 5/4	Nam Shan Road, Peng Chau	3/5	Police	2/5	Soil cut slope	Minor	Road	Temporarily closure of road	
MW 5/5	72 Bo Wah Yuen, Lamma Island	3/5	HyD	2/5	Soil cut slope	Minor	Building lot		
MW 5/6	CH1200, Kwong Pan Tin Tsuen, Route Twisk	8/5	HyD	6/5	Natural slope	Minor	Footpath		
MW 5/7	Tseung Tau Chung Tsuen, Tuen Mun	5/5	HyD	29/4	Natural slope	Minor	Squatters	1 hut temporarily evacuated	
MW 5/8	No. 62 Nam Wan Road, Peng Chau	16/5	HyD	2/5	Soil cut slope	Minor	Building lot		Back lane blocked
MW 5/9	Route Twisk (North Point), South of Sek Kong Barrack, N.T.	21/5	FSD	21/5	Soil cut slope	Major	Road	Road blocked, all lane and pedestrian pavement closed	
MW 5/10	Near MS6, Castle Peak Road	20/5	HyD	20/5	Soil cut slope	Minor	Road	Lane of road blocked	
MW 5/11	MS14, Castle Peak Road	21/5	HyD	21/5	Soil cut slope	Major	Road	Road blocked, 1 lane closed	
MW 5/12	Tai Wo Tsuen, Tsuen Wan	21/5	BOO	21/5	Natural slope	Minor	Squatters	1 hut temporarily evacuated	
MW 5/13	No. 4-8, Upper Kwai Chung, Da Chuen Ping Village								Deleted (same as MW/5/44)
MW 5/14	Shing Mun Road, Tsuen Wan								Deleted (same as MW/5/15)
MW 5/15	Shing Mun Road near Texaco Road, Tsuen Wan	21/5	HyD	20/5	Fill slope	Minor	Road	Close half of the lane of road	

Table A4 - List of Incidents in Western New Territories Reported to GCO in 1989 (Sheet 2 of 13)

Incident No.	Location	Call Received		Failure			Area Affected	Consequence	Remarks
		Date	From	Date (Time)	Type	Scale			
MW 5/16	MS10, Castle Peak Road	21/5	HyD	21/5	Soil cut slope	Major	Road	Lane of road blocked, 1 lane of road closed	
MW 5/17	T.W. Buddhist Secondary School, Fat Yip Lane, T.W.	21/5	HyD	21/5	Rock/boulder fall	Minor	Road	Half of road blocked	
MW 5/18	107, Pak She San Tsuen, Cheung Chau	22/5	Police						Deleted (refer to HyD/NT)
MW 5/19	Fan Kam Road, N.T.	21/5	HyD	21/5	Soil cut slope	Minor	Road	Lane of road blocked, pedestrian pavement closed	
MW 5/20	Kam Sheung Road, near Sheung Tsuen	20/5	DO	20/5	Soil cut slope				Deleted
MW 5/21	Lau Fau Shan Police Station	22/5	Police	21/5	Soil cut slope	Minor	Carpark	2 carparks closed	Carpark shelter damaged
MW 5/22	Yuen Long Ping Shan near Lau Shan & Ngau	20/5	Police						Deleted
MW 5/23	No. 668, Tan Kwai Tsuen, Yuen Long, Spot "C"	21/5	Police	21/5	Soil cut slope	Minor	Squatters	1 hut permanently evacuated	
MW 5/24	Pak Sha Tsuen Nursery, Yuen Long	21/5	DO						Deleted (refer to HyD/NT)
MW 5/25	Behind Wai King Garden, Tuen Mun	22/5	Police	21/5	Soil cut slope	Minor			
MW 5/26	Siu Lam Village	21/5	Police						Deleted (refer to BOO)
MW 5/27	Sam Shing Estate, Tuen Mun	21/5	HyD	21/5	Soil/rock cut slope	Major	Squatters, road	Two lanes of road blocked	1 hut permanently evacuated, 1 lane closed
MW 5/28	CH2580 and CH2650, Tuen Mun Highway, So Kwun Wat	21/5	HyD	21/5	Soil cut slope	Major	Road	1 lane closed	Drainage damaged
MW 5/29	Siu Lam Chuen, near Yuk Fai Terrace	21/5	Public	21/5	Soil cut slope	Major	Road	Lane of road blocked, stream course partially blocked	
MW 5/30	No. 9, Tai Wan To Tsuen, Lamma Island	22/5	Police	21/5	Retaining wall	Minor	Squatters, footpath	1 hut temporarily evacuated	

Table A4 - List of Incidents in Western New Territories Reported to GCO in 1989 (Sheet 3 of 13)

Incident No.	Location	Call Received		Failure			Area Affected	Consequence	Remarks
		Date	From	Date (Time)	Type	Scale			
MW 5/31	No. 7, San Pin Road, Yung Shue Wan, Lamma Island	22/5	Police	20/5	Rock/boulder fall	Minor	Building lot		Store room damaged
MW 5/32	No. 362, Tan Kwai Tsuen, Yuen Long.	22/5	Public	20/5	Factory building damaged	Minor	Building lot		
MW 5/33	Tai Lam Centre for Women	21/5	BOO	21/5	Soil cut slope, fill slope	Major	Road, building lot	Lane of road blocked, half lane closed	
MW 5/34	Lam Kam Road, West of Kadoorie Farm	21/5	HyD	20/5	Soil/rock cut slope	Minor	Road	2 lanes of road blocked	
MW 5/35	Pak Heung	21/5	Police						Deleted (refer to BOO and HyD)
MW 5/36	Wong Chuk Yuen, Pak Heung, Yuen Long	26/5	DO	20/5	Soil cut slope	Major	Squatters		
MW 5/37	Lam Kam Road near LPN522(65) & LPN5312(3)	21/5	Police						Deleted (refer to HyD)
MW 5/38	Ta Shek WU Kiu Tau	22/5	Public	20/5	Soil cut slope	Major	Footpath	Footpath blocked	
MW 5/39	MA On Kong, Pak Heung	22/5	DO	20/5	Wall of hut collapsed				Deleted (No geotechnical concern)
MW 5/40	No. 36, Ta Shek Tong, Pak Heung	22/5	HyD	20/5 (pm)	Soil cut slope	Major	Squatters	5 huts permanently evacuated, 1 hut temporarily evacuated	
MW 5/41	Fan Kam Road, Ta Shek Wu	21/5	Police						Deleted
MW 5/42	Tsim Bei Tsui, Yuen Long	22/5	DLO	21/5	Soil cut slope	Minor	Road	Lane of road blocked	
MW 5/43	No. 30, Tai Shek Wu, along Fan Kam Road, Pat Heung	21/5	DLO	20/5	Soil cut slope	Major	Road	Road blocked, all private access closed	
MW 5/44	No. 4-6, Shing Mun Road, Da Chuen Ping Village	21/5	Police		Soil cut slope	Minor	Building lot	Temporarily evacuate No. 7-13, kitchen of No. 7-13 to be demolished (same as MW 89/5/13)	
MW 5/45	Pak Tin Pa San Tsuen	21/5	Police	21/5	Soil cut slope	Minor	Squatters	5 huts permanently evacuated	(same as MW 89/5/67)

Table A4 - List of Incidents in Western New Territories Reported to GCO in 1989 (Sheet 4 of 13)

Incident No.	Location	Call Received		Failure			Area Affected	Consequence	Remarks
		Date	From	Date (Time)	Type	Scale			
MW 5/46	Kam Shan Village, Lei Muk Shu, Tuen Wan	21/5	BOO	21/5	Soil cut slope	Minor	Squatters	Huts temporarily evacuated	
MW 5/47	No. 16, Shing Mun Reservoir, Shing Mun Ha Tsuen	21/5	BOO	21/5	Subsidence wash out		Squatters	7 huts permanently evacuated	
MW 5/48	Shek Lei Village, On Chit Street	21/5	Police	21/5			Squatters	3 huts temporarily evacuated, 1 hut permanently evacuated	
MW 5/49	MS64, Sheung Yat Towe, No. 13, Castle Peak Road	21/5	BOO	21/5	Soil cut slope	Minor	Building lot, squatters	1 hut permanently evacuated	
MW 5/50	Near MS13, Route Twisk	21/5	Police	21/5	Soil cut slope	Major	Road	Road blocked	
MW 5/51	Near MS13, Route Twisk	21/5	Police	21/5	Soil cut slope	Major	Road	Road blocked	
MW 5/52	MS174, Tuen Mun, Castle Peak Road, No. 31, Siu San Tsuen	22/5	Public	21/5	Soil cut slope	Minor	Squatters	Temporarily evacuated and permanently evacuated squatter huts	
MW 5/53	No. 1A, Ling Wan Tse, Lam Kam Road	22/5	Police						Deleted (same as MW 89/6/4)
MW 5/54	So Kwun Wat	22/5	HyD		Soil cut slope	Minor	Squatters	1 hut permanently evacuated	
MW 5/55	Deep Bay Road, Lau Fau Shan	22/5	HyD	21/5	Soil cut slope	Minor	Road	Lane of road blocked	
MW 5/56	San Tin, near Ngau Tam Mei	24/5	DLO	20/5	Soil cut slope	Major	Squatters	10 huts permanently evacuated	Hut destroyed
MW 5/57	No. 44, Da Shek Wu Chuen	23/5	DO	20/5	Soil cut slope	Major	Squatters	1 hut temporarily evacuated	
MW 5/58	No. 34, Da Shek Wu Shek Tong, Pak Heung	23/5	DO	20/5	Soil cut slope	Minor	Village house	1 house temporarily evacuated	
MW 5/59	CH4850, Route Twisk, Tsuen Wan	22/5	HyD	20/5	Soil cut slope	Minor	Road	Lane of road blocked	
MW 5/60	Behind No. 67, Wo Yi Hop Village, Tsuen Wan	22/5	HyD	21/5	Soil cut slope	Minor	Footpath	Pedestrian Pavement affected	
MW 5/61	Fu Yung Shan Road, Tsuen Wan	22/5	HyD	21/5	Soil cut slope	Minor	Road	Lane of road blocked	
MW 5/62	Shing Mun Road, Kwu Hang, Kwai Chung	24/5	HD	20/5	Soil cut slope	Minor	Squatters	3 huts permanently evacuated	

Table A4 - List of Incidents in Western New Territories Reported to GCO in 1989 (Sheet 5 of 13)

Incident No.	Location	Call Received		Failure			Area Affected	Consequence	Remarks
		Date	From	Date (Time)	Type	Scale			
MW 5/63	MS10½-11, Castle Peak Road, Ting Kau	22/5	HyD	21/5	Soil cut slope	Minor	Footpath		
MW 5/64	MS14½ Castle Peak Road, Tsing Lung Tau	22/5	HyD	21/5	Soil cut slope	Minor	Road	Lane of road blocked	
MW 5/65	Fu Yung Shan, Tai Wor Tsuen	23/5	HyD	21/5	Soil cut slope	Minor	Squatters	2 huts permanently evacuated	
MW 5/66	Fu Yung Shan	23/5	HyD	21/5	Soil cut slope	Minor	Squatters	1 hut permanently evacuated	
MW 5/67	Pak Tin Pa San Tsuen								Deleted (same as MW 89/5/45)
MW 5/68	Pak Tin Pa	23/5	HyD	21/5	Retaining wall		Squatters	1 hut permanently evacuated	
MW 5/69	Shing Mun Road, Wo Yi Hop	22/5	HyD	21/5	Soil cut slope	Minor	Road	Half lane of road blocked	
MW 5/70	Tan Kwai Tsuen, Yuen Long, SPOT 'A'	25/5	DLO	20/5	Soil cut slope	Minor	Squatters	2 huts permanently evacuated	
MW 5/71	Tan Kwai Tsuen, Yuen Long, SPOT 'B'	25/5	DLO	21/5	Rock/boulder fall	Minor	Squatters		Huts destroyed
MW 5/72	Tan Kwai Tsuen, Yuen Long, SPOT 'D'	25/5	DLO	21/5	Soil cut slope	Minor	Squatters		
MW 5/73	No. 1A, Yan Kwong Street, Tung Wan, Peng Chau	22/5	BOO	21/5	Soil cut slope	Minor	Building lot	Flat evacuated	Foundation of the small store room undermined
MW 5/74	No. 19, Wing Lung street, Tung Wan, Peng Chau	22/5	BOO	21/5	Soil cut slope	Minor	Building lot		
MW 5/75	No. 38 Chung Tsai Tsuen, Tung Wan, Peng Chau	22/5	BOO	21/5	Soil/rock cut slope	Minor	Building lot		
MW 5/76	No. 64 & 65 Chung Tsai Mei, Tung Wan, Peng Chau	22/5	Public	21/5	Soil cut slope	Major	Squatters	1 hut permanently evacuated	
MW 5/77	No. 16, Shing Ka Road, Peng Chau	22/5	BOO	21/5	Soil cut slope	Minor	Building lot	Garden affected	
MW 5/78	No. 7 Shing Ka Road, Peng Chau	22/5	BOO	21/5	Soil cut slope	Minor	Building lot		
MW 5/79	No. 24, Nam Wan, Peng Chau	24/5	Police	21/5	Soil cut slope	Minor	Squatters		

Table A4 - List of Incidents in Western New Territories Reported to GCO in 1989 (Sheet 6 of 13)

Incident No.	Location	Call Received		Failure			Area Affected	Consequence	Remarks
		Date	From	Date (Time)	Type	Scale			
MW 5/80	No. 38, 39 Shan Ting Tsuen, Peng Chau	22/5	BOO	21/5	Natural slope	Minor	Squatters	Huts permanently evacuated	Foundation of huts undermined
MW 5/81	No. 69, Tai Lung Tsuen, Peng Chau	22/5	BOO	21/5	Soil cut slope	Minor	Squatters	1 hut permanently evacuated	
MW 5/82	No. 38, Tai Lung Tsuen, Peng Chau	22/5	BOO	21/5	Soil cut slope	Minor	Building lot, squatters	1 hut permanently evacuated	
MW 5/83	No. 101, Wing On street, Peng Chau	22/5	BOO	21/5	Soil/rock cut slope	Minor	Building lot		
MW 5/84	Yan Hing School, Shan Pui, Yuen Long	24/5	ASD	21/5	Soil cut slope	Minor	Building lot	School affected	Hut destroyed
MW 5/85	35, Siu Sau Tsuen, 17½ miles, Castle Peak Road	23/5	Public	21/5	Soil cut slope	Minor	Squatters	Temporarily evacuated and permanently evacuated squatters	
MW 5/86	Chainage 21400 Tuen Mun Highway	22/5	HyD	21/5	Fill slope	Major	Road	Lane of road blocked, 1 lane closed	
MW 5/87	Chainage 20300 Tuen Mun Highway	22/5	HyD	21/5	Soil cut slope	Minor	Cut slope		
MW 5/88	No. 45 Kau Wa Keng San Tsuen	26/5	HD	21/5 (2am)	Soil cut slope	Minor	Building lot		cut slope toe covering by debris
MW 5/89	Pump Fong Sheung Tsuen	26/5	HD	20/5	Soil cut slope	Minor	Squatters		
MW 5/90	Pump Fong Sheung Tsuen	26/5	HD	20/5 (9am)	Soil cut slope	Minor	Squatters		
MW 5/91	Shek Lei Hang Village, Kwai Chung	26/5	HD	20/5	Retaining wall	Minor	Squatters	1 hut permanently evacuated	
MW 5/92	Shek Lei Hang Village, Kwai Chung	26/5	HD	20/5 (10pm)	Soil cut slope	Minor	Squatters	3 hut permanently evacuated	Huts partly destroyed
MW 5/93	Kam Sham Tsuen, K.C.	26/5	HD	20/5 (10pm)	Soil cut slope	Minor	Squatters	1 hut permanently evacuated	Huts partly destroyed
MW 5/94	Ta Shek Wu Kiu, Tau Chuen Pat Heung	22/5	DO	20/5	Soil cut slope	Major	Access	Footpath blocked	
MW 5/95	Lot 73B2RP in DD 108, Ta Shek Wu Kiu, Tau Chuen Pat Heung	26/5	DO	20/5	Soil cut slope	Major	Access		

Table A4 - List of Incidents in Western New Territories Reported to GCO in 1989 (Sheet 7 of 13)

Incident No.	Location	Call Received		Failure			Area Affected	Consequence	Remarks
		Date	From	Date (Time)	Type	Scale			
NW 5/96	Lot 146 and 147, Ta Shek Wu Tsuen, Pat Heung	26/5	DO	20/5	Soil cut slope	Major	Building lot		
NW 5/97	Tsing Lung Tau Village, Tsing Lung Tau	24/5	DO	21/5	Soil cut slope	Minor	Squatters		
NW 5/98	Ta Shek Wu Tsuen along Fan Kam Road, Yuen Long	26/5	DO	20/5	Soil cut slope	Major	Vegetated land		
NW 5/99	Yuen Long Shung San School, Cheung Ngau Shan, Shap Pat Heung, Yuen Long	29/5	DO	20/5	Retaining wall	Minor	Footpath		
NW 5/100	No. 87B, Tseng Tau Sheung Tsuen in DD131, Tuen Mun	23/5	DO	21/5	Soil cut slope	Minor	Squatters	3 huts permanently evacuated	
NW 5/101	29A, Tseng Tau Sheung Tsuen, Tuen Mun	23/5	DO	20/5	Soil cut slope, natural slope	Minor	Squatters	1 hut permanently evacuated, 1 hut temporarily evacuated	
NW 5/102	52A to 53A, Tseng Tau Chung Tsuen, Tuen Mun	23/5	DO	20/5	Soil cut slope, natural slope	Major	Squatters	13 huts permanently evacuated	
NW 5/103	18, Chung Wong Toi, Tuen Mun	23/5	DO	20/5	Soil cut slope	Minor	Squatters	2 huts permanently evacuated	
NW 5/104	21, 22, 25, Chung Wong Toi, Tuen Mun	23/5	DO	21/5	Soil cut slope, natural slope	Major	Squatters	2 huts permanently evacuated, 1 hut temporarily evacuated	
NW 5/105	Access Road to Chung Wong Toi & Primary Service Reservoir, Tuen Mun	23/5	DO	20/5	Soil cut slope	Minor	Road	Lane of road blocked	
NW 5/106	No. 16 Tseng Sheung Tsuen, above Fraser road, Tuen Mun	23/5	DO	20/5	Soil cut slope	Minor	Squatters	1 hut permanently evacuated	1 hut destroyed
NW 5/107	Ching Lam Siu Yuen, Tseng Sheung Tsuen, above Fraser Road, Tuen Mun	23/5	DO	20/5	Soil cut slope	Minor	Building lot	Temporarily close of the building lot	2 storey building lot affected
NW 5/108	Tze Tin Tsuen 295, Tuen Mun, next to Shau Lee Yuen	25/5	DO	21/5	Soil cut slope	Minor	Village house	Backyard blocked	
NW 5/109	10 Chung Shan, San Hing Tsuen, Tuen Mun	25/5	DO	21/5	Soil cut slope	Minor	Building lot	Backyard blocked	
NW 5/110	No. 4 Luk Keng Tsuen, Lantau Island N.E.	27/5	DO	21/5	Soil cut slope	Minor	Building lot		

Table A4 - List of Incidents in Western New Territories Reported to GCO in 1989 (Sheet 8 of 13)

Incident No.	Location	Call Received		Failure			Area Affected	Consequence	Remarks
		Date	From	Date (Time)	Type	Scale			
MW 5/111	Luk Keng Tsuen, Lantau Island N.E.	27/5	DO	21/5	Soil cut slope	Minor	Squatters	2 huts permanently evacuated	Huts destroyed
MW 5/112	Luk Keng Tsuen, Lantau Island N.E.	27/5	DO	21/5	Soil cut slope	Minor	Squatters		
MW 5/113	Lot 292, No. 6A Sport Road, Ma Wan Upslope of Staircase	31/5	DO	21/5	Soil cut slope	Minor	Footpath		
MW 5/114	Slope Road, Ma Wan downslope of staircase	31/5	DO	21/5	Soil cut slope	Minor	Footpath		
MW 5/115	Pa Min Kok Tsuen, Sham Tseng, No.4A	24/5	DO	21/5	Soil cut slope	Minor	Squatters		
MW 5/116	Ting Kau downslope of carpart, Slope No. 6SE-C/FR2, near Ting Kau Villa	31/5	DO	21/5	Fill slope	Minor	Footpath		
MW 5/117	Kin Yip San Tsuen, Yau Kom Tau	26/5	HD	21/5	Soil cut slope	Minor	Squatters	6 huts permanently evacuated	
MW 5/118	Lo Hon Monastery, Tung Chung, Lantau Island	29/5	DLO	21/5	Soil cut slope	Minor	Footpath		
MW 5/119	No. 171 Tseng Tau Chung Tsuen, Tuen Mun	2/6	DO	21/5	Soil cut slope	Minor	Squatters	2 huts temporarily evacuated	
MW 5/120	King Fung Path, Tuen Mun	20/5	Memo	21/5	Soil cut slope	Minor	Road	Access road partly blocked	
MW 5/121	Tai Lam Chung Marine Base, Tuen Mun	21/5	Police	21/5	Soil cut slope	Minor	Road	Lane of road blocked	
MW 5/122	No. 26A, Sin Lam Chuen, Tuen Mun	24/5	DO	21/5	Soil cut slope	Minor	Squatters	Pig shed permanently evacuated	
MW 5/123	No. 12, Sin Lam Chuen, Tuen Mun	24/5	DO	21/5	Retaining wall	Minor	Squatters	1 hut permanently evacuated	
MW 5/124	No. 6, Sin Lam Chuen, Tuen Mun	24/5	DO	21/5	Soil cut slope	Minor	Squatters		
MW 5/125	No. 30, Sin Lam Chuen, Tuen Mun	24/5	DO	21/5	Soil cut slope, retaining wall	Minor	Squatters	4 huts permanently evacuated	
MW 5/126	Squatter Hut No. TM/CPBH/2485 & 1486, Opposite Sam Shing Tsuen, Tuen Mun	21/5	HyD	21/5	Soil cut slope	Minor	Squatters	3 huts permanently evacuated	

Table A4 - List of Incidents in Western New Territories Reported to GCO in 1989 (Sheet 9 of 13)

Incident No.	Location	Call Received		Failure			Area Affected	Consequence	Remarks
		Date	From	Date (Time)	Type	Scale			
MW 5/127	Squatter Hut no. TM/SKW/B/607-609	24/5	DO	21/5	Soil cut slope	Minor	Building lot		
MW 5/128	Squatter Hut No. TM/SKW/B/632-635, Po Kwun Wat, Tuen Mun	25/5	DO	21/5	Soil cut slope	Major	Squatters	6 huts permanently evacuated	
MW 5/129	No. 77, Siu Sau Upper Tsuen, Tuen Mun	25/5	DO	21/5	Natural slope	Major	Squatters	2 huts permanently evacuated, 2 huts temporarily evacuated	
MW 5/130	Sheng Yat Chuen, On Chit Street, Kwai Chun, Hut No. RTW/TA/324&325	22/5	HyD	21/5	Soil cut slope	Minor	Squatters	2 huts permanently evacuated	
MW 5/131	Lung Mun Road, Sin Leng Shui, Tuen Mun	29/5	HyD	21/5	Soil/rock cut slope	Minor	Road	Footpath partially blocked	
MW 5/132	Nim Wan Road, Opposite Hut No. 277 Sheung Pai Nai Village, Lau Fau Shan, Yuen Long	31/5	HyD	21/5	Soil cut slope	Minor	Road	Lane of road blocked	
MW 5/133	Assess Road to EPD, Ngau Tam Mei, Chuk Yuen, Yuen Long	22/5	Public	20/5	Soil cut slope	Minor	Road	Lane of road blocked	
MW 5/134	510, So Kwun Wat	30/5	DO	21/5	Soil cut slope	Minor	Squatters	1 hut permanently evacuated	
MW 5/135	So Kwun Wat near Hop Wo Store	30/5	DO	21/5	Subsidence of platform	Minor	Squatters	1 hut temporarily evacuated	
MW 5/136	So Kwun Wat, Hut No. TM/SKW/A/394, 395, 396	16/6	HyD	21/5	Soil cut slope	Major	Squatters	1 hut permanently evacuated	
MW 6/1	Sheung Kok Shan, Lo Wai Chuen, Hut No. XTW/LW/2	31/5	HD	21/5	Soil cut slope, fill slope	Minor	Squatters	1 hut permanently evacuated	
MW 6/2	Tso Kung Tam, Tsuen Wan	2/6	HD	21/5	Fill slope	Minor	Footpath		
MW 6/3	Tso Kung Tam near Lat. Tsuen Wan	2/6	HD	21/5	Fill slope	Minor	Footpath		
MW 6/4	No. 1A, Sheng Tsuen, Kwun Yam Shan, Pat Heung, Yuen Long	22/5	DO	21/5	Natural slope	Major	Building lot, squatters	3 huts temporarily evacuated	(same as MW 89/5/53)
MW 6/5	Hau Fung Yuen, Lot 134 DD111 Fan Kam road, Pat Heung, Yuen Long	2/6	DO	21/5	Soil cut slope	Minor	Squatters		Hut destroyed and affected

Table A4 - List of Incidents in Western New Territories Reported to GCO in 1989 (Sheet 10 of 13)

Incident No.	Location	Call Received		Failure			Area Affected	Consequence	Remarks
		Date	From	Date (Time)	Type	Scale			
MW 6/6	Tuen Taz Wai, Tuen Mun	12/6	DO	21/5	Natural slope	Major	Squatters	3 huts permanently evacuated	Road undermined
MW 6/7	Sham Tseng San Tsuen, Sham Tseng, Hut No. RTW/1B/441	7/6	ND	21/5	Soil cut slope	Minor	Squatters	1 hut permanently evacuated	
MW 6/8	Charlton Road near Castle Peak Close Quarter, Battle Range	13/6	DO	21/5	Fill slope	Minor	Road		
MW 6/9	Cheung Hang Road near Lamp Post LA45196	1/6	HyD	19/5	Soil cut slope	Minor	Road	Lane of road partly blocked	
MW 6/10	Cheung Hang Road, Kwai Chung near Lamp Post LA45246	1/6	HyD	19/5	Soil cut slope	Minor	Road	Lane of road partly blocked	
MW 6/11	Cheung Hang Road, Kwai Chung near Lamp Post FA45338	1/6	HyD	19/5	Soil cut slope	Minor	Road	Lane of road blocked	
MW 6/12	Ling Wan Tze, Pat Heung, Yuen Long	16/6	DLO	21/5	Soil cut slope	Minor	Access	Access blocked	
MW 6/13	Hei Ling Chau, Site 'A'	16/6	ASD	21/5	Soil cut slope	Minor	Road	Lane of road blocked	
MW 6/14	Hei Ling Chau 'B'	21/5	ASD	21/5	Soil cut slope	Minor	Road	Lane of road blocked	
MW 6/15	Hei Ling Chau, Site 'C'	16/6	ASD	21/5	Soil cut slope	Major	Road	Lane of road blocked	
MW 6/16	Hei Ling Chau, Site 'D'	16/6	ASD	21/5	Soil cut slope	Minor	Road	Lane of road blocked	
MW 6/17	Hei Ling Chau, Site 'E'	16/6	ASD	21/5	Soil/rock cut slope	Minor	Road	Lane of road blocked	
MW 6/18	Squatter YSW/1PA13/947, Yung Shue Wan Village, Lamma Island	20/6	DO	19/6	Soil cut slope	Minor	Squatters		
MW 6/19	52A, Nam Wan, Peng Chau	20/6	DO		Soil cut slope	Minor	Squatters	1 hut temporarily evacuated	
MW 7/1	Tin Liu, Ma Wan	27/6	DO		Soil cut slope	Minor	Building lot		Road partially failed
MW 7/2	Sham Tseng San Tsuen	1/7	DO		Soil cut slope	Minor	Building lot		
MW 7/3	No. 1A - Siu Sau Tsuen, 17½ Miles, Castle Peak Road, Tuen Mun	12/7	Public	21/5	Soil cut slope	Minor	Footpath	Footpath blocked	
MW 7/4	Access Road to Siu Lam Chuen	11/7	DO		Natural slope	Minor	Road	1/3 lane closed	
MW 7/5	Access road to TM/CL/642-643, Siu Lam Chuen	11/7	DO		Natural slope	Minor	Access	Access blocked	

Table A4 - List of Incidents in Western New Territories Reported to GCO in 1989 (Sheet 11 of 13)

Incident No.	Location	Call Received		Failure			Area Affected	Consequence	Remarks
		Date	From	Date (Time)	Type	Scale			
MW 7/6	Tuen Mun Highway near Siu Lam Chuen	12/7	HyD		Soil cut slope	Minor	Road		
MW 7/7	No. 202 and 204, Tan Kwai Tsuen, Yuen Long	14/7	L&W	21/5	Natural slope	Major	Squatters		Footpath subsides
MW 7/8	Hung To Road, San Tin, Yuen Long	6/7	DO	21/5	Soil cut slope	Minor	Road	Road blocked	
MW 7/9	Sze Tin Tsuen, Tuen Mun	12/7	DO		Soil cut slope	Minor	Footpath		Footpath damaged
MW 7/10	Catchwater above Maclehose Trail at Tuen Mun, Site '1'	20/7	Site inspection	21/5	Soil cut slope	Minor	Catchwater		Wall of catchwater affected
MW 7/11	Catchwater above Maclehose Trail at Tuen Mun, Site '2'	10/7	Site inspection	21/5	Soil cut slope	Minor	Catchwater		Wall of catchwater affected
MW 7/12	Catchwater above Maclehose Trail at Tuen Mun, Site '3'	10/7	Site inspection	21/5	Soil cut slope	Minor	Catchwater		Wall of catchwater affected
MW 7/13	Catchwater above Maclehose Trail at Tuen Mun, Site '4'	10/7	Site inspection	21/5	Soil cut slope	Minor	Catchwater		Wall of catchwater affected
MW 7/14	Catchwater above Maclehose Trail at Tuen Mun, Site '5'	10/7	Site inspection	21/5	Soil cut slope	Minor	Catchwater		Wall of catchwater affected
MW 7/15	Catchwater above Maclehose Trail at Tuen Mun, Site '6'	10/7	Site inspection	21/5	Soil cut slope	Minor	Catchwater	Catchwater blocked	
MW 7/16	Catchwater above Maclehose Trail at Tuen Mun Site '7'	10/7	Site inspection	21/5	Soil cut slope	Minor	Catchwater	Catchwater blocked	
MW 7/17	Catchwater above Maclehose Trail at Tuen Mun Site '8'	10/7	Site inspection	21/5	Soil cut slope	Minor	Catchwater	Catchwater blocked	
MW 7/18	Catchwater above Maclehose Trail at Tuen Mun Site '9'	10/7	Site inspection	21/5	Soil cut slope	Major	Catchwater	Catchwater blocked	
MW 7/19	Catchwater above Maclehose Trail at Tuen Mun Site '10'	10/7	Site inspection	21/5	Soil cut slope	Minor	Catchwater	Catchwater blocked	
MW 7/20	Catchwater above Maclehose Trail at Tuen Mun Site '11'	17/7	Site inspection	21/5	Soil cut slope	Minor	Catchwater	Catchwater blocked	
MW 7/21	Catchwater above Maclehose Trail at Tuen Mun Site '12'	17/7	Site inspection	21/5	Soil cut slope	Minor	Catchwater	Catchwater blocked	
MW 7/22	Sheung Kwai Chung Kam Shan Village	19/7	Police	19/7	Fill slope	Minor	Squatters	1 hut temporarily evacuated	

Table A4 - List of Incidents in Western New Territories Reported to GCO in 1989 (Sheet 12 of 13)

Incident No.	Location	Call Received		Failure			Area Affected	Consequence	Remarks
		Date	From	Date (Time)	Type	Scale			
MW 7/23	Kwu Hang Village, Tsuen Wan	19/7	HD	18/7	Retaining wall	Minor	Squatters	1 hut permanently evacuated	
MW 7/24	Perowne Barracks behind GMQ/2, Castle Peak Road	24/6	ASD	21/5	Soil cut slope	Minor	Building lot		
MW 7/25	Perowne Barracks beside Perowne Height (Facing Building 45), Castle Peak Road	29/6	ASD	21/5	Natural slope	Major	Water mains		water mains threatened
MW 7/26	Castle Peak Range, Pat Nai, Site 'A'	13/7	ASD	21/5	Natural slope	Minor	Road		Road undermined
MW 7/27	Castle Peak Range, Pat Nai, Site 'B'	13/7	ASD	21/5	Soil cut slope	Minor	Road	Road blocked	
MW 7/28	Castle Peak Range, Pat Nai, Site 'C'	13/7	ASD	21/5	Soil cut slope	Minor	Road	Road blocked	
MW 7/29	Sitting Out Area at Hang Hau, Lau Fau Shan	12/7	DO	21/5	Soil cut slope	Minor	Sitting out area		
MW 7/30	Squatter Hut no. TM/MLS/418 above Road D4, Tuen Mun	25/7	CRE/TM	17/7	Soil cut slope	Minor	Squatters		
MW 7/31	Squatter Hut No. TM/MLS/437, 438, 440, 441, 442 & 445 above Road D4, Tuen Mun	25/7	CRE/TM	17/7	Soil cut slope	Minor	Squatters, access		
MW 7/32	Construction site at KCTL 418, Kwai Fuk Road, Kwai Chung	31/7	BOO	31/7	Soil/rock cut slope	Major	Road	Lane blocked, 1 lane closed	1 person injured
MW 7/33	No. 72, Siu Sau Tsuen, Castle Peak Road, Tuen Mun	28/7	HD	21/5	Retaining wall	Minor	Access, stream course		
MW 7/34	Squatter Hut no. TM/SDW/X/6/65, Siu Sau Tsuen, Castle Peak Road, Tuen Mun	28/7	HD	21/5	Soil cut slope	Minor	Squatters	1 hut permanently evacuated	
MW 8/1	Castle Peak Road, Sunny Villa, DD354, TWTL 269	3/8	BOO	3/8	Rock/boulder fall	Minor	Road		
MW 8/2	No. 18B4, Shek Tong Tsuen, Au Tau Shap, Pat Heung, Yuen Long	17/8	HyD	16/8 (9pm)	Retaining wall	Minor	Road		Access road damaged
MW 8/3	Wo Ye Hop Chuen	14/8	HD	Unknown	Retaining wall	Minor	Squatters	1 hut permanently evacuated	
MW 8/4	Sham Tseng San Tsuen	24/8	HD	22/8 (4pm)	Retaining wall	Minor	Squatters, footpath		Pedestrian pavement undermined

Table A4 - List of Incidents in Western New Territories Reported to GCO in 1989 (Sheet 13 of 13)

Incident No.	Location	Call Received		Failure			Area Affected	Consequence	Remarks
		Date	From	Date (Time)	Type	Scale			
MW 8/5	Shing Mun Ha Chuen, Kwai Chung	29/8	HD	25/8 (10pm)	Soil cut slope	Minor	Squatters	2 huts permanently evacuated	
MW 9/1	Au Tau Sewage Treatment Works	11/9	WSD	11/9	Soil cut slope	Minor	Construction site		
MW 9/2	No. 28 & 28A, Lung Tsai Tsuen, Cheung Chau	22/9	BOO	21/9 (9pm)	Retaining wall	Minor	Buildings lot	Rear portion of 28C ground floor temporarily evacuated	
MW 11/1	6½ miles Village, Castle Peak Road	15/1	HD	Unknown	Subsidence of squatter hut		Squatters	1 hut permanently evacuated	

APPENDIX B
RECORDS FROM GCO RAINGAUGES

APPENDIX B

LIST OF FIGURES

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B1	Histograms of Hourly Rainfall Recorded by GCO Raingauges on 20th to 21st May 1989	107

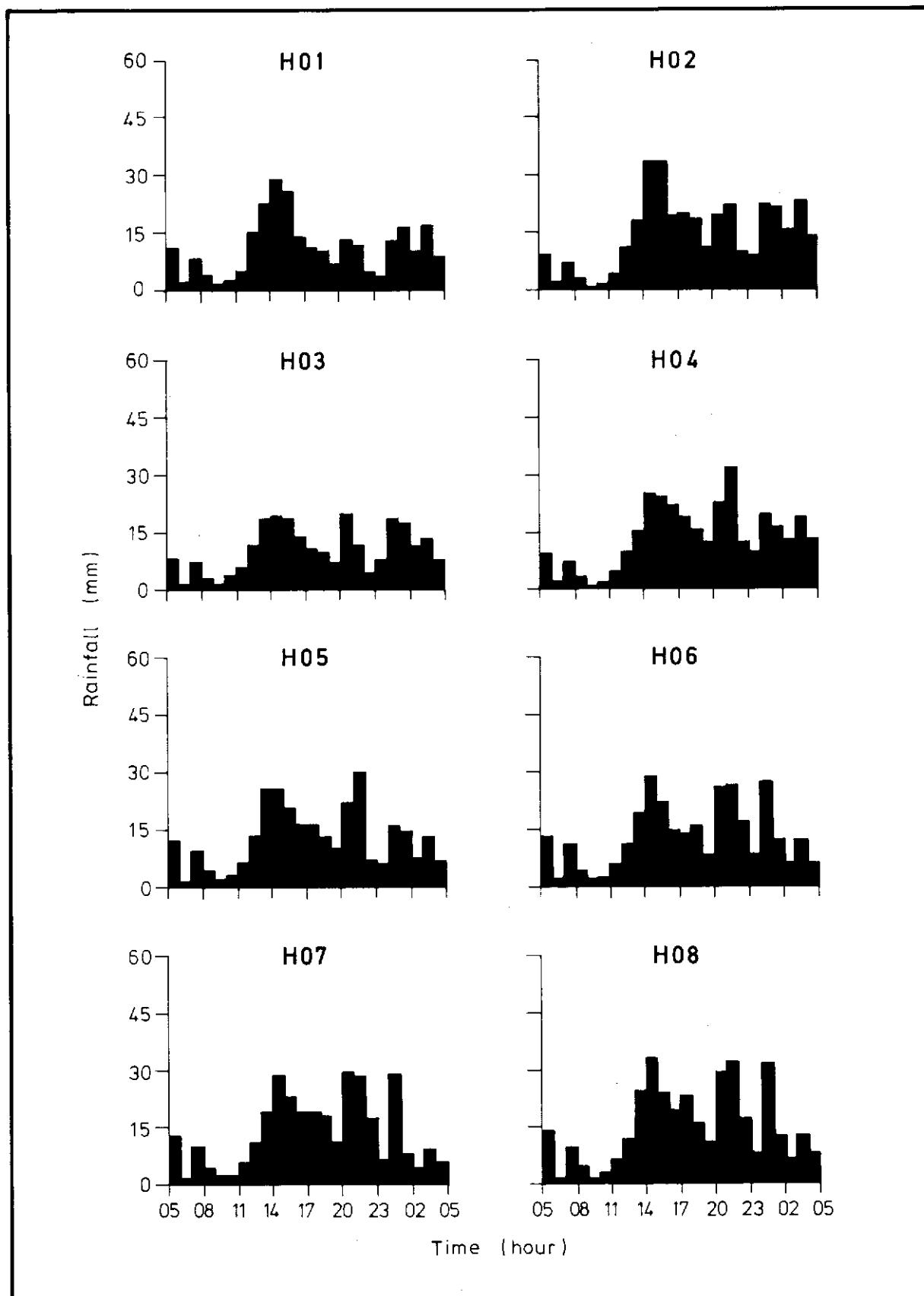


Figure B1 - Histograms of Hourly Rainfall Recorded by GCO Raingauges on 20th to 21st May 1989 (Sheet 1 of 4)

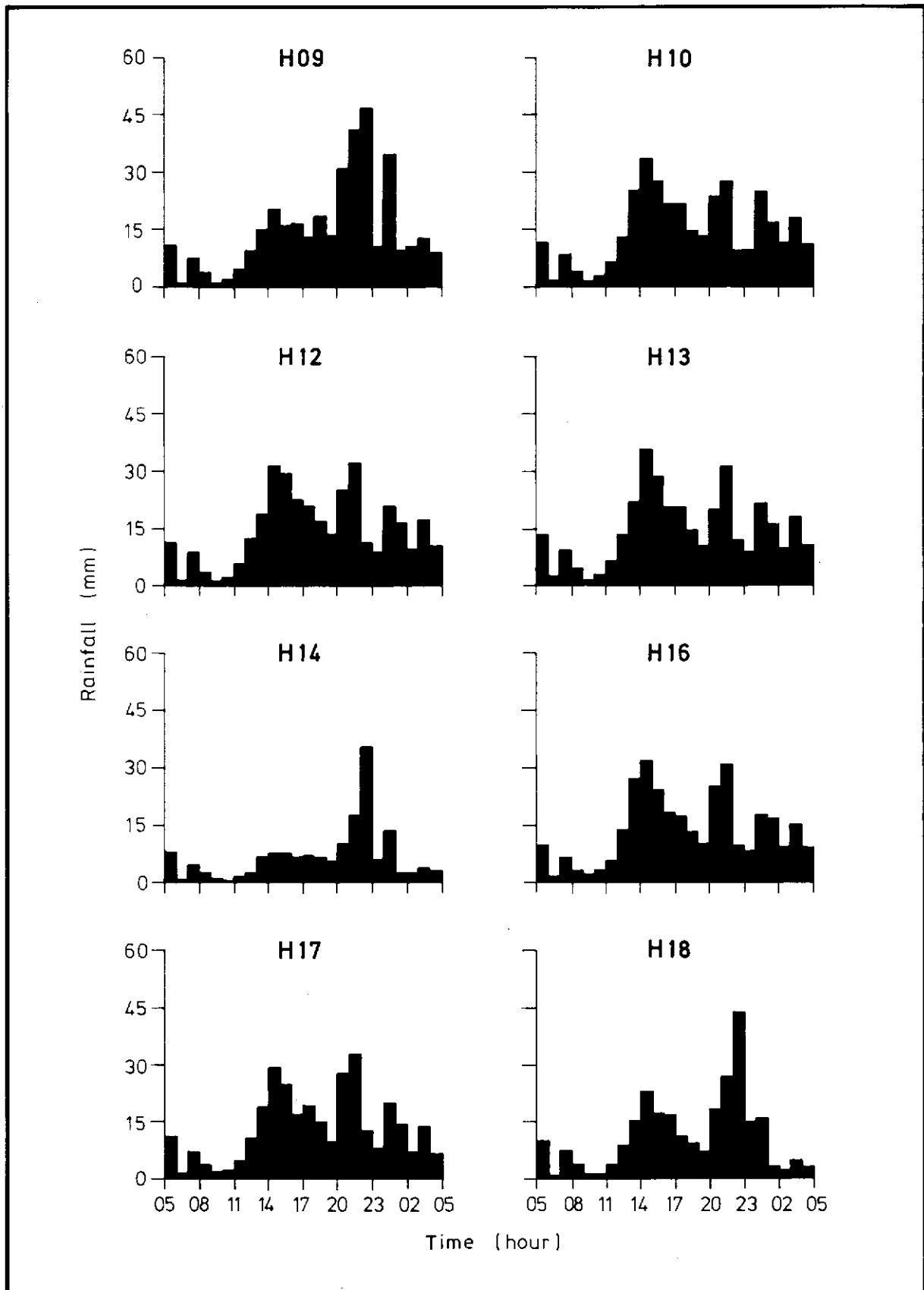


Figure B1 - Histograms of Hourly Rainfall Recorded by GCO Raingauges on 20th to 21st May 1989 (Sheet 2 of 4)

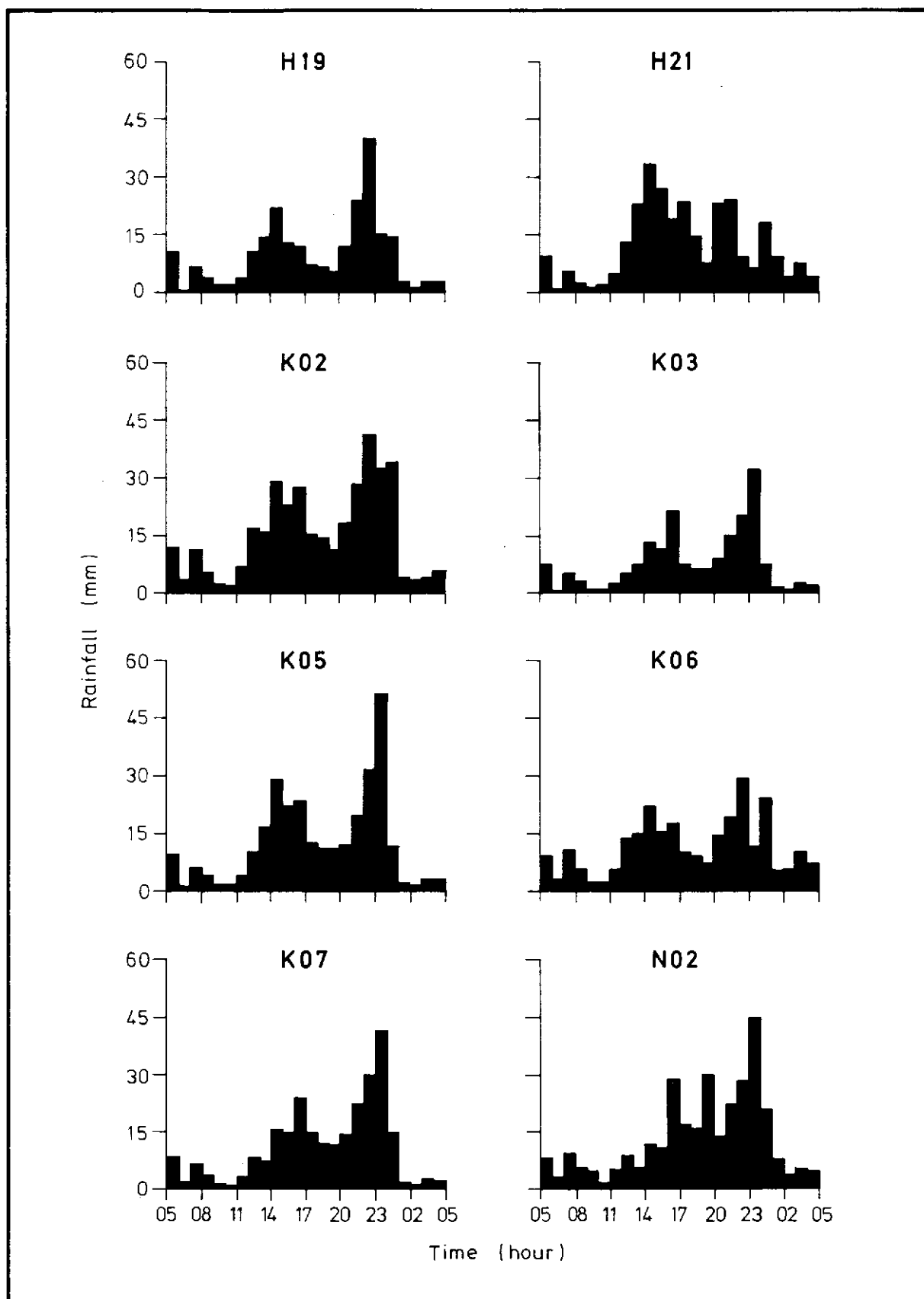


Figure B1 - Histograms of Hourly Rainfall Recorded by GCO Raingauges on 20th to 21st May 1989 (sheet 3 of 4)

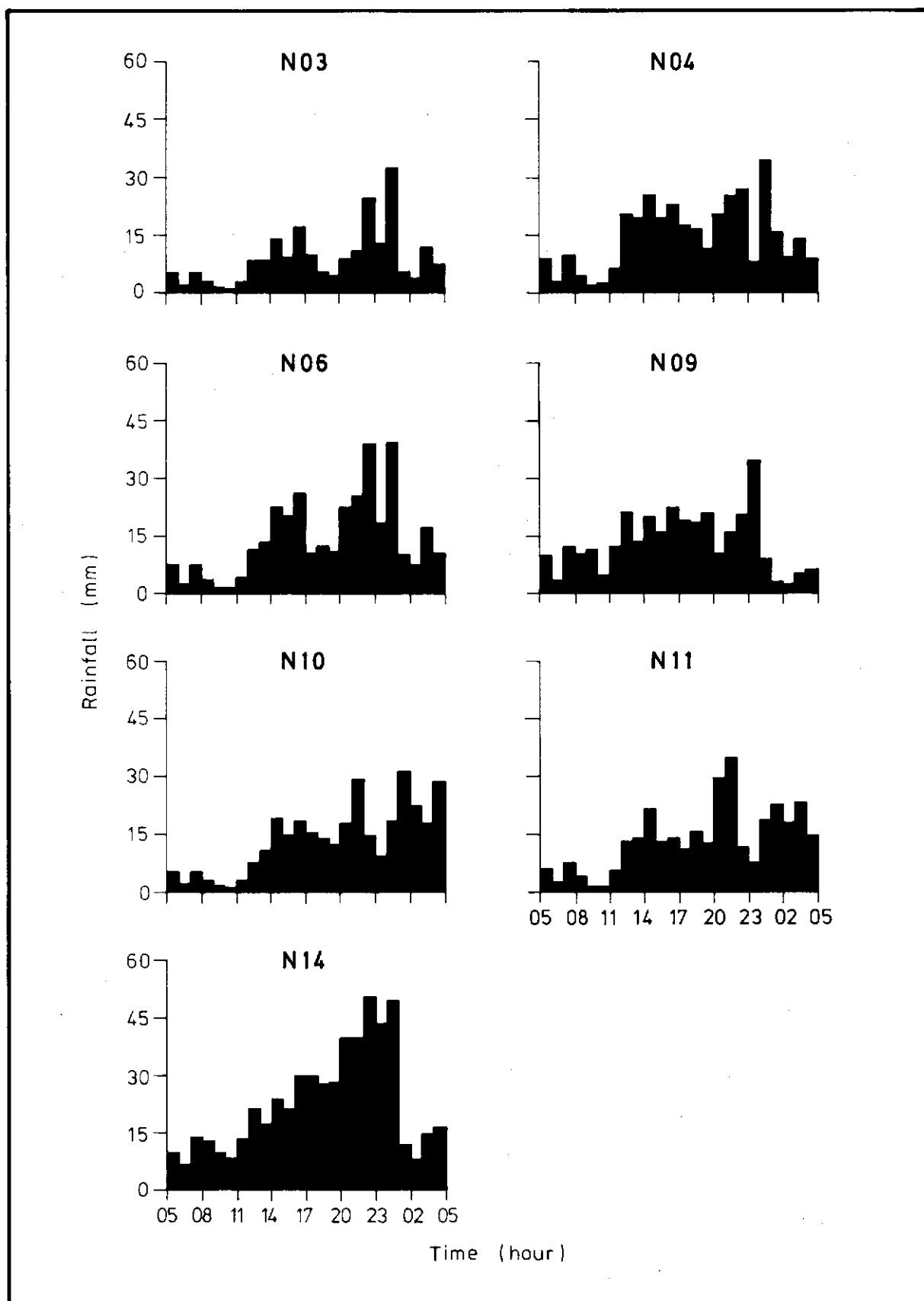


Figure B1 - Histograms of Hourly Rainfall Recorded by GCO Raingauges on 20th to 21st May 1989 (sheet 4 of 4)

APPENDIX C

DAILY RAINFALL AT THE ROYAL OBSERVATORY IN 1989

APPENDIX C

LIST OF TABLE

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Table C1 - Summary of Daily Rainfall at the Royal Observatory in 1989

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	0.0	0.0	0.0	0.3	41.3	0.9	Trace	0.5	Trace	8.2	8.8	0.0
2	0.0	0.0	0.0	Trace	208.4	0.4	Trace	9.9	0.0	0.7	Trace	0.0
3	0.0	0.0	0.2	0.8	30.4	7.4	Trace	0.0	0.0	0.0	Trace	0.0
4	Trace	0.0	0.6	7.4	0.6	0.0	0.0	Trace	10.2	0.0	0.1	0.0
5	5.2	Trace	0.2	11.4	5.8	2.6	0.0	10.4	0.4	0.1	0.0	0.0
6	0.1	0.0	Trace	7.6	0.0	10.2	0.0	0.0	22.6	0.0	0.0	0.0
7	0.0	0.0	0.0	39.2	0.0	0.0	0.0	Trace	59.4	0.0	0.0	0.0
8	0.0	Trace	0.0	55.6	Trace	Trace	0.0	0.0	0.7	Trace	0.0	0.0
9	0.1	2.7	0.0	2.3	0.0	0.0	0.0	0.0	0.0	0.0	Trace	0.0
10	0.1	0.0	0.0	0.0	0.2	5.5	23.8	1.5	0.0	0.0	Trace	0.0
11	0.0	0.0	0.0	0.0	Trace	7.1	7.4	10.6	0.0	0.0	Trace	0.0
12	5.7	0.0	0.0	Trace	0.0	5.0	Trace	2.8	0.0	5.3	Trace	0.0
13	0.5	0.0	0.0	0.4	5.5	0.0	0.0	Trace	0.0	0.9	1.4	0.0
14	4.3	0.0	0.0	Trace	2.3	Trace	0.0	0.0	Trace	Trace	6.8	0.0
15	0.0	0.0	0.0	23.8	0.0	Trace	0.0	4.7	Trace	0.0	0.0	0.0
16	0.0	0.0	1.9	0.3	0.1	Trace	0.0	0.0	23.3	Trace	0.0	0.0
17	Trace	0.0	0.1	29.5	21.1	Trace	11.5	0.5	41.2	Trace	0.0	0.0
18	Trace	Trace	3.1	0.1	0.0	Trace	119.7	Trace	1.8	0.0	0.0	0.2
19	Trace	Trace	0.1	0.0	6.7	Trace	Trace	0.0	6.3	0.0	0.0	1.4
20	0.0	Trace	Trace	0.0	322.8	3.5	0.5	5.8	13.0	0.0	0.0	0.0
21	Trace	Trace	Trace	Trace	102.9	1.0	0.0	5.1	5.5	Trace	0.0	Trace
22	Trace	Trace	4.1	7.6	0.7	64.5	0.2	75.6	28.7	0.0	Trace	2.8
23	0.0	0.0	0.0	12.0	1.9	12.8	3.9	53.1	Trace	0.0	0.0	8.6
24	0.0	0.0	Trace	0.0	6.1	0.0	0.7	2.1	0.0	0.0	Trace	5.6
25	1.6	0.0	37.4	2.7	6.9	Trace	Trace	Trace	Trace	0.0	3.0	0.5
26	1.4	0.0	0.1	0.1	2.2	4.5	Trace	7.5	0.0	0.0	0.2	Trace
27	3.6	Trace	0.0	Trace	1.6	11.6	0.0	0.3	0.0	0.0	Trace	0.0
28	1.3	0.0	0.0	Trace	Trace	Trace	8.9	16.1	1.3	0.0	Trace	0.0
29	Trace		0.0	0.0	Trace	Trace	59.1	11.2	4.5	Trace	0.0	Trace
30	0.0		0.0	0.0	0.9	0.5	2.2	0.3	9.2	0.0	0.0	4.6
31	Trace		0.0		3.5		0.0	Trace		0.0		16.5
Total	23.9	2.7	47.8	201.1	771.9	137.5	237.9	218.0	228.1	15.2	20.3	40.2

The Total Rainfall in 1989 is 1944.6 mm.

LIST OF DRAWING

Drawing
No.

GCSP 8/6

Location Map of Landslides and Related Incidents
in 1989