# FACTUAL REPORT ON HONG KONG RAINFALL AND LANDSLIDES IN 2006

**GEO REPORT No. 244**

**H.S.W. Kong & S.M. Tam**

**GEOTECHNICAL ENGINEERING OFFICE**
**CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT**
**THE GOVERNMENT OF THE HONG KONG**
**SPECIAL ADMINISTRATIVE REGION**

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Prepared by:

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

# PREFACE

In keeping with our policy of releasing information which may be of general interest to the geotechnical profession and the public, we make available selected internal reports in a series of publications termed the GEO Report series. The GEO Reports can be downloaded from the website of the Civil Engineering and Development Department (http://www.cedd.gov.hk) on the Internet. Printed copies are also available for some GEO Reports. For printed copies, a charge is made to cover the cost of printing.

The Geotechnical Engineering Office also produces documents specifically for publication. These include guidance documents and results of comprehensive reviews. These publications and the printed GEO Reports may be obtained from the Government's Information Services Department. Information on how to purchase these documents is given on the last page of this report.

R.K.S. Chan
Head, Geotechnical Engineering Office
March 2009

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# FOREWORD

This report presents a summary of the factual information on rainfall and landslides in Hong Kong throughout 2006. Details of most of the landslides were obtained from the records of incidents reported to the Geotechnical Engineering Office (GEO), Civil Engineering and Development Department (CEDD). Supplementary information was collected from the Agriculture, Fisheries and Conservation Department, Architectural Services Department, Drainage Services Department, Fire Services Department, Highways Department, Housing Department, Lands Department, Water Supplies Department and the GEO's landslide investigation consultants. The Hong Kong Observatory provided weather and rainfall information. The Standards and Testing Division carried out a review of the available rainfall records as well as rainfall analyses, and prepared Section 2 of this report. All contributions are gratefully acknowledged.

K.K.S. Ho
Chief Geotechnical Engineer/LPM Division 1

## ABSTRACT

This report presents a summary of the factual information on rainfall and landslides in Hong Kong throughout 2006. Rainfall information was obtained from the Hong Kong Observatory (HKO) to supplement the information available in the Geotechnical Engineering Office (GEO). Details of the landslides were obtained from the records of incidents reported to the GEO. Supplementary information was provided by the Agriculture, Fisheries and Conservation Department, Architectural Services Department, Drainage Services Department, Fire Services Department, Highways Department, Housing Department, Lands Department, Water Supplies Department and the GEO's landslide investigation consultants, namely Fugro Scott Wilson Joint Venture and Maunsell Geotechnical Services Limited.

Rainfall at the HKO's Principal Raingauge at Tsim Sha Tsui in 2006 amounted to 2,627.8 mm, which was about 18.7% above the mean rainfall of 2,214 mm recorded between 1961 and 1990. Three Black Rainstorm Warnings were issued between 24 April 2006 and 16 July 2006, 11 Red Rainstorm Warnings were issued between 24 April 2006 and 13 September 2006, and 25 Amber Rainstorm Warnings were issued between 24 April 2006 and 21 November 2006.

Four Landslip Warnings were issued on 3 May 2006, 2 June 2006, 9 June 2006 and 13 September 2006. A total of 198 incidents that occurred in 2006 were reported to the Government. Of these, 193 were classified as genuine landslides. Of the 193 genuine landslides, five were major failures (i.e. with a failure volume of 50 $m^3$ or more, or where a fatality has occurred).

No injury or fatality was reported as a result of the landslide incidents that occurred in 2006. Other notable consequences of the landslides included the evacuation of eight registered squatter dwellings and one building (village house). Eighteen landslides resulted in the temporary partial closure of sections of roads and another 13 landslides resulted in the temporary closure of sections of pedestrian pavements, footpaths or other forms of minor access.

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## 1. INTRODUCTION

This report presents a summary of the factual information on rainfall and landslides that occurred in Hong Kong throughout 2006. Rainfall information was obtained from the Hong Kong Observatory (HKO) to supplement the information available in the Geotechnical Engineering Office (GEO). Details of the landslide were obtained from the records of incidents reported to the GEO. Supplementary information was provided by the Agriculture, Fisheries and Conservation Department (AFCD), Architectural Services Department (Arch SD), Drainage Services Department (DSD), Fire Services Department (FSD), Highways Department (HyD), Housing Department (HD), Lands Department (Lands D), Water Supplies Department (WSD) and the GEO's landslide investigation consultants, namely Fugro Scott Wilson Joint Venture and Maunsell Geotechnical Services Limited under Agreements Nos. CE 49/2005 (GE) and CE 50/2005 (GE) respectively.

In this report, a landslide is defined as the detachment or excessive displacement of soil or rock mass, and includes failure of fill slope, cut slope, retaining wall, natural hillside, disturbed terrain, together with rockfall and boulder fall. A 'major' landslide is defined as a failure in which the estimated/recorded volume of the detached or displaced mass is $\geq$50 $m^3$ or where a fatality has occurred. A 'very minor' landslide is defined as a failure that is small in scale (i.e. $\leq$5 $m^3$ for failure involving soil or $\leq$0.1 $m^3$ for rockfall/boulder fall), and does not give rise to notable consequences (e.g. casualty, 'near-miss', evacuation of buildings or squatter dwellings, road closure, nuisance to the public, etc.). Landslides that are not classified as 'major' or 'very minor' are taken as 'minor'.

## 2. RAINFALL

### 2.1 The Raingauge System

The GEO, in cooperation with the HKO, operates an automatic raingauge system that transmits real-time rainfall data through either telephone lines or General Packet Radio Service (GPRS), viz. a wireless transmission technology, to the GEO and the HKO at five-minute intervals. During 2006, this system comprised 86 GEO raingauges and 24 HKO raingauges. The locations of the raingauges are shown in Figure 1. The raingauges are of the tipping-bucket type, tipping every 0.5 mm of rainfall.

### 2.2 Rainfall Records

The data from the raingauge system are checked, verified and stored by the GEO in a database, from which they can be extracted for analysis. This report presents a selection of rainfall parameters for the year, for individual months and individual rainstorms.

The weather in 2006 was described by the HKO, in the Monthly Weather Summary for December 2006 (HKO, 2007), as follows:

> "Globally, the year 2006 is the sixth warmest year on record. In Hong Kong, it was the eighth warmest year since record began in 1884. The annual mean temperature of 23.5 degrees was 0.5 degree higher than normal. With the northeast

> monsoon weaker than normal over China, the monthly mean temperatures of October 2006 (26.4 degrees) equalled the record of October set in 1983, while that of November 2006 (23.3 degrees) broke the record of November (23.2 degrees set in 1998). The year 2006 was also wet. The annual rainfall of 2,627.8 millimetres was about 19 per cent above normal. The extra rainfall was mainly due to an active trough of low pressure over the South China Coast in May, the combined effect of an active southwesterly and Severe Tropical Storm Bilis in July and a tropical depression in September."
>
> "In 2006, a total of 26 tropical cyclones formed over the western North Pacific and the South China Sea, while one tropical cyclone formed over the central part of the North Pacific and crossed the International Date Line into the western North Pacific. In the past 9 years, with the exception of 2004, the annual number of tropical cyclones in this ocean basin has been less than the annual average of 31. Seven tropical cyclones affected Hong Kong in 2006, which was near normal."

The following are excerpts from the HKO's Monthly Weather Summary describing the weather condition when the most intense rainstorms occurred in the wet season (i.e. between April and September). Further details on the monthly weather are available in the HKO Website (http://www.hko.gov.hk/wxinfo/pastwx/mws.htm).

> "Heavy rain and thunderstorm began to buffet the territory in the small hours of April 24 when a trough of low pressure reached the south China coast. The Black Rainstorm Warning was issued for the first time this year. During the heavy downpour, over 200 millimetres of rainfall was recorded in the western part of Hong Kong Island. There were 16 reports of flooding, mainly in Hong Kong Island."
>
> "Affected by an active trough of low pressure, the weather was unsettled with heavy showers and squally thunderstorms on the first three days of the month (June). The heavy downpour on 2 June brought over 150 millimetres of rainfall to Tsuen Wan, Shatin, Sai Kung and the northern part of Lantau Island."
>
> "Heavy rain and squally thunderstorms returned on 9 June as a trough of low pressure over southern China moved towards the coast. More than 100 millimetres of rainfall was recorded over most parts of Hong Kong and there were over 50 reports of flooding. On that night, a squall line developed over the Pearl River Estuary and swept across Hong Kong, bringing heavy rain and severe squalls."

> "On the early morning of 16 July, the weather deteriorated further with heavy downpour and squally thunderstorms. During the torrential rain, more than 150 millimetres of rainfall was recorded in Hong Kong Island, Kowloon, Cheung Chau and Tseung Kwan O, necessitating the issuance of the Black Rainstorm Warning. Between 2 a.m. and 3 a.m., a record-breaking 115.1 millimetres of rainfall was registered at the Hong Kong Observatory Headquarters, breaking the previous record of hourly rainfall of 109.9 millimetres recorded from 6 a.m. to 7 a.m. on 8 May 1992."

> "An area of low pressure over the northern part of the South China Sea developed into a tropical depression on 12 September. It moved north initially and then took on a west-northwesterly track. The tropical depression weakened into an area of low pressure over coastal waters of western Guangdong the following night. The outer rain band of the tropical depression brought torrential rain to the territory on 13 September. Over 200 millimetres of rainfall was recorded in most places of Hong Kong. There were over 30 reports of flooding and 9 reports of landslide."

The rainfall of 102.4 mm as recorded at the HKO in the first quarter of 2006 is 26% below normal. The monthly rainfall recorded during the wet season, except August, are all above the corresponding monthly normal. The total rainfall of 2,364.7 mm in the wet season is 27% above normal. For the last quarter of 2006, the total rainfall of 160.7 mm is 22% below normal. The annual rainfall for 2006 of 2,627.8 mm was about 18.7% above the mean rainfall (2,214.3 mm) recorded between 1961 and 1990. The cumulative rainfall for 2006 is compared with the highest, lowest and mean rainfall in Figure 2.

Figures 3a, 3b, 3c and 3d show the total monthly rainfall distribution in 2006.

Figure 4 shows the total annual rainfall distribution during 2006, together with the locations of the reported landslides.

## 2.3 Rainstorms in 2006

The maximum 24-hour, five-hour and one-hour rolling rainfall (with five-minute basic units) for the 23 rainstorms in 2006 during which time the daily rainfall exceeded 50 mm at the HKO or at any GEO raingauges, are given in Table 1. Also included in Table 1 are the 4-day and 15-day antecedent rainfalls at the HKO, the number of reported landslides and the Landslide Potential Index (LPI). The LPI of a rainstorm depicts the relative severity of the rainstorm with respect to its potential in causing landslides. Similar data from selected major rainstorms in previous years are included in the table for comparison. Other rainfall parameters for these 23 rainstorms are shown in Table A1 of Appendix A.

Figures 5 to 27 show the isohyets of the maximum rolling 24-hour rainfall during the above 23 rainstorms, together with the landslide locations, and the locations and values of maximum rainfall for durations ranging from five minutes to 48 hours.

The 23 rainstorms in 2006 had triggered landslide incidents. There were 25 and 16 reported landslides associated with the 13 to 14 September 2006 and 16 to 17 July 2006 rainstorms respectively. Three of the other rainstorms resulted in 12 to 13 reported landslides in each event.

### 2.4 Warnings Issued by the Hong Kong Observatory

Table 2 summarises the details of the Thunderstorm, Flood, Landslip, Tropical Cyclone and Rainstorm Warnings issued by the HKO and the GEO in 2006. Three Black Rainstorm Warnings were issued between 24 April 2006 and 16 July 2006, 11 Red Rainstorm Warnings were issued between 24 April 2006 and 13 September 2006, and 25 Amber Rainstorm Warnings were issued between 24 April 2006 and 21 November 2006. Four Landslip Warnings were issued between 3 May 2006 and 13 September 2006.

## 3. LANDSLIDES

### 3.1 Landslide Occurrence in 2006

Landslide incidents reported to the GEO and other Government departments in 2006 are summarised in Table 3.

A total of 198 landslide incidents were reported to the various Government departments. These include 158 incidents reported to the GEO, one of which was identified by the Landslide Investigation Consultants, Maunsell Geotechnical Services Limited, and 40 incidents reported to other Government departments (i.e. AFCD, Arch SD, DSD, FSD, HyD, HD, Lands D and WSD). Of these 198 reported incidents, 193 were classified as genuine landslides (see details in Appendix B). The other reported incidents either were non-landslide events (e.g. tree fall), or involved very small erosion or washout due to surface water flow with no geotechnical concern.

Of the 193 landslides, five (3%) were major landslides (see Table B1 in Appendix B), 162 were minor landslides, and 26 were very minor landslides with negligible consequence.

Selected notable landslides are presented in Section 4 and illustrated in Plates 1 to 5. For those landslide incidents inspected by the GEO, the information on the landslides was recorded in GEO Incident Reports (as well as in Landslip Cards for major landslides). For those landslide incidents attended to by other Government departments responsible for slope maintenance, landslide incident reports were prepared by the respective departments. The above information, together with the scanned images of all the Incident Reports and Landslip Cards prepared by the GEO and other Government departments, has been uploaded onto the Slope Information System (SIS), which is accessible by the general public through computer terminals in the GEO. Further details of these failures can be found in the incident files of the three District Divisions and the Landslip Preventive Measures Division 1 of the GEO.

Wherever possible, the dates and times of the landslides were assessed by geotechnical professionals. Some incidents were not reported to the GEO or other Government departments until several days or weeks after they had occurred. For these incidents, it is difficult to establish the exact time of occurrence. Of the 193 landslides, the timing of

occurrence was determined to within a day for 74 incidents.

It should be noted that almost certainly some other landslides had not been reported to the Government, such as those in remote areas with no immediate consequences.

## 3.2 Consequence of Landslides

### 3.2.1 General

The consequence of landslides in terms of the number of landslide incidents affecting various types of facilities (e.g. buildings, roads, registered squatter dwellings, catchwaters, etc.) in different regions is summarised in Table 4. It should be noted that a failure might affect more than one type of facility.

Significant consequences of landslides (e.g. casualties, evacuation of buildings or registered squatter dwellings, closure of roads, etc.), as classified with respect to the type of slope failure, are shown in Table 5. Table 6 presents the distribution of the different facility groups affected by major landslides. Further descriptions of selected notable landslides are presented in Section 4 below.

### 3.2.2 Buildings

Twelve landslides, one of which was major, affected buildings. Details of the major failure are described in Section 4.2. Of these 12 landslides, one resulted in the temporary evacuation of a village house.

### 3.2.3 Roads and Transport Facilities

Thirty-three landslides, two of which were major, affected sections of roads. Eighteen landslides resulted in the temporary partial closure/blockage of road sections. Landslide Incidents Nos. 2006/6/0623, and 2006/9/0710 are described in Sections 4.3, 4.7 and 4.8 respectively.

### 3.2.4 Registered Squatter Dwellings

Twelve landslides, none of which was major, affected registered squatter dwellings (i.e. dwellings that contain tolerated squatter structures, which were surveyed in Housing Department's 1982 Squatter Structure Survey). One landslide resulted in the permanent evacuation of a registered squatter dwelling (comprising two squatter structures) and four resulted in the temporary evacuation of a total of seven registered squatter dwellings (comprising 12 squatter structures). The breakdown is shown in Table 5.

### 3.2.5 Catchwaters and Reservoirs

Seven minor landslides affected catchwaters but there was no significant consequence.

3.2.6 Construction Sites

One major landslide affected an active construction site. There was no significant consequence.

3.2.7 Other Facilities

Other facilities affected by landslides included pedestrian pavements, footways, minor footpaths, minor access facilities, carparks, playgrounds, parks, gardens, backyards, open areas, etc. Fifty-two landslides, all of which were minor, affected pedestrian pavements, footways, minor footpaths and access facilities. Of these 52 landslides, 13 resulted in the temporary closure of sections of pedestrian pavements, footpaths and other forms of minor accesses. A total of 77 landslides affected carparks, playgrounds, parks, gardens, backyards, open areas, etc., one of which was major.

3.3 Types of Slope Failures

3.3.1 General

Landslides reported to the GEO and other Government departments have been classified into five types of slope failures, i.e. fill slope, cut slope, retaining wall, natural hillside and registered Disturbed Terrain. The numbers of different types of slope failures are shown in Table 7.

3.3.2 Fill Slopes

There were 16 fill slope failures, which comprised about 8% of all reported landslides. Two of these failures were major, including a temporary fill slope within a construction site. Landslide Incident No. 2006/06/0623 is described in Sections 4.3.

3.3.3 Cut Slopes

There were 124 cut slope failures, which comprised about 64% of all reported landslides. These were further classified according to the types of materials involved, i.e. soil, soil/rock and rock.

Sixty-eight landslides occurred on soil cut slopes, none of which was major. Forty-five landslides occurred on soil/rock cut slopes, two of which were major. Eleven landslides occurred on rock cut slopes, none of which was major. Landslide Incidents Nos. 2006/9/0726 and 2006/9/0710 are described in Sections 4.4 and 4.5 respectively.

3.3.4 Retaining Walls

Twelve landslides involved failure of retaining walls, which amounted to about 6% of all reported landslides. None of these was major.

3.3.5 Natural Hillsides

There were 37 natural hillside failures, which comprised about 20% of all reported landslides. One of these was major (Incident No. LI2006/03/2001) and is described in Section 4.2.

3.3.6 Registered Disturbed Terrain Features

There were four registered Disturbed Terrain failures, which comprised about 2% of all reported landslides. None of these was major.

3.4 Landslide Volume Distribution

Tables 8 and 9 show the distribution of landslide volumes for all the reported landslides. A total of 146 landslides (about 76%) involved less than 5 $m^3$ of material. Five of the reported landslides (about 3%) involved a failure volume of 50 $m^3$ or more. Of these five major failures, one affected a registered fill slope and one affected a temporary fill slope within a construction site, two affected soil/rock cut slopes and one affected natural hillsides.

## 4. NOTABLE LANDSLIDES

### 4.1 General

Out of the 193 genuine landslides reported to the Government in 2006, Five incidents are described in more details below. These five incidents have been selected mainly on the basis of their consequence or scale of failure.

### 4.2 Significant Signs of Distress on the Natural Hillsides at Kwun Yam Shan, North of Tate's Ridge (Incident No. LI2006/03/2001)

(Significant signs of distress were identified on the natural hillsides above the source area of the August 2005 landslide (Incident No. 2005/08/0422) at Kwun Yam Shan, Sha Tin, Plate 1)

Significant signs of distress, comprising a system of extensive and continuous tension cracks, were identified in March 2006 by the Landslide Investigation Consultants (Maunsell Geotechnical Services Ltd.), during a site inspection of the August 2005 landslide at Kwun Yam Shan (Incident No. 2005/08/0422, see GEO (2006)). The tension cracks were up to a total length of about 100 m with a local maximum vertical displacement of about 1.1 m, a maximum depth of about 1.7 m and a horizontal separation of up to about 300 mm.

The tension cracks, together with the August 2005 landslide, defined an area of distressed hillside where a hummocky morphology with concave and convex breaks-in-slope, relatively smaller scale tension cracks, cavities/ground collapse features and erosion gullies were located.

There is much anthropogenic disturbance on the hillside. Numerous military trenches and other wartime excavations are located on the ground above and within the distressed hillside.

Based on debris mobility analyses, the distressed groundmass if detached from the hillside (with an estimated source volume of about 10,000 $m^3$) would enter the streamcourse below and probably develop into a debris flow, which could affect a road bridge and some village houses further downstream.

4.3 The 2 June 2006 Landslide Incident on Slope No. 7NE-D/FR58 at Leung Yau Road, Ma On Shan Tsuen (Incident No. 2006/06/0623)

(A major failure of a masonry retaining wall which resulted in temporary closure of Leung Yau Road, Plate 2)

At about 2:45 p.m. on 2 June 2006, when the Red Rainstorm Warning and the Landslip Warning were in effect, a major landslide with a failure volume of about 350 $m^3$ occurred on slope No. 7NE-D/FR58 along Leung Yau Road, which is the sole access to Ma On Shan Tsuen. The landslide debris was deposited on Leung Yau Road. As a result, Leung Yau Road was temporarily closed for about half a day. No casualties were reported as a result of the incident.

The feature comprises a 7 m high masonry wall with a 3 m high fill slope above. The landslide affected the masonry wall portion of the feature and the full height of the retaining wall collapsed. The landslide debris comprised fill and masonry blocks.

4.4 The 13 September 2006 Landslide Incident on Slope No. 6NE-B/C65 at Hong Kong Horse Riding School, Kam Tin Road (Incident No. 2006/09/0726)

(A major landslide on a cut slope which affected the operation of the Hong Kong Horse Riding School, Plate 3)

At about 7:45 p.m. on 13 September 2006, when the Amber Rainstorm Warning and the Landslip Warning were in effect, a landslide comprising two failure scars, with a total failure volume of about 100 $m^3$, occurred on slope No. 6NE-B/C65 at the Hong Kong Horse Riding School at Kam Tin Road. Most of the debris was deposited on the open area near the school entrance. The operation of the Horse Riding School and a steel structure located at the slope toe were affected as a result of the incident. No casualties were reported.

4.5 The 13 September 2006 Landslide on Slope No. 15NE-B/C17 along Shek O Road (Incident No. 2006/09/0710)

(A minor landslide involving a soil cut slope, which resulted in temporary closure of Shek O Road, Plate 4)

At about 12:30 p.m. on 13 September 2006, when the Tropical Depression Signal No.3 was hoisted and the Amber Rainstorm Warning and the Landslip Warning were in effect, a

landslide with a failure volume of about 20 $m^3$ occurred on slope No. 15NE-B/C17 located above the north-bound lane of Shek O Road. Landslide debris was deposited on the road and no casualties were reported as a result of the incident. One lane of Shek O Road was temporarily closed for 5 days until completion of the urgent repair works.

4.6 The 3 August 2006 Rockfall on Slope No. 11SE-A/CR262 behind Block B, No. 6 Dragon Court, Dragon Terrace, Tin Hau (Incident No. 2006/08/0691)

(A rockfall occurred on Slope No. 11SE-A/CR262, situated behind apartment Block B at No. 6 Dragon Court, Dragon Terrace, Tin Hau, which resulted in damage to a car parked at the slope toe, Plate 5)

At about 5 a.m. on 3 August 2006 when Tropical Storm Prapiroon Warning Signal No.3 was hoisted, a rockfall occurred on slope No. 11SE-A/CR262, which is situated behind apartment Block B at No. 6 Dragon Court on Dragon Terrace in Tin Hau. Several pieces of broken chunam plaster fell from the slope and hit a car, which was parked in an area of open space below. The windscreen and roof of the car were damaged as a result. A rock block, with an estimated volume of about 0.6 $m^3$, was dislodged and remained perched on a drainage channel above the crest of the retaining wall portion of the registered slope feature. A tree fall occurred adjacent to the detached rock block, which also remained on the drainage channel. No casualties were reported as a result of the incident.

The majority of slope No. 11SE-A/CR262 is under the maintenance responsibility of the owners of Lot No. IL 8311 & Ext. and was the subject of an 'Advisory' letter issued by the Buildings Department (BD) in May 2005 following the completion of a Stage 2 Study under the GEO's Landslip Preventive Measures (LPM) Programme. Ground investigation initiated by the 'Advisory' letter was underway at the time of the rockfall incident.

## 5. CONCLUSIONS

Rainfall at the HKO's Principal Raingauge at Tsim Sha Tsui in 2006 amounted to 2,627.8 mm, which was about 18.7% above the mean rainfall of 2,214 mm recorded between 1961 and 1990. In 2006, four Landslip Warnings were issued between 3 May 2006 and 13 September 2006. Three Black Rainstorm Warnings were issued between 24 April 2006 and 16 July 2006, and 11 Red Rainstorm Warnings were issued between 24 April 2006 and 13 September 2006. Of the 193 genuine landslides, five were 'major' landslides, 162 were 'minor' landslides and 26 were 'very minor' landslides with negligible consequences.

None of the landslide incidents in 2006 resulted in fatality or injury. Notable consequences of the landslides in 2006 included permanent evacuation of one registered squatter dwelling (comprising two squatter structures), temporary evacuation of seven registered squatter dwellings (comprising 12 squatter structures), and one village house. Thirty-three landslides affected roads, 18 of which resulted in the temporary closure of sections of roads.

## 6. REFERENCES

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LIST OF TABLES

Table 1 - Rainfall and Landslides in 2006 As Compared with Selected Previous Major Rainstorms (Sheet 1 of 2)

| Date[1] of Rainstorm Event | Maximum Rainfall (mm)[2] | | | | | | | | | LPI[4] | Number of Landslides Reported to GEO[5] |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Hong Kong Observatory (HKO) | | | | | GEO Raingauges[3] | | | | | |
| | 24-hr | 5-hr | 1-hr | Antecedent | | 24-hr | | 5-hr | | 1-hr | |
| | | | | 4-day | 15-day | | | | | | |
| 13-14 Sept 2006 | 248.4 | 164.2 | 50.4 | 100.9 | 156.5 | 391.0 | (N30) | 212.0 | (N30) | 85.5 (N30) | 5 | 25 |
| 2-4 May 2006 | 178.3 | 103.6 | 45.3 | 67.6 | 197.1 | 268.5 | (N35) | 218.5 | (N32) | 91.0 (N22) | 1 | 7 |
| 16-17 Jul 2006 | 195.6 | 195.4 | 115.1 | 7.2 | 108.8 | 218 | (H12) | 218.0 | (H12) | 126.5 (H04) | - | 16 |
| 9-10 Jun 2006 | 161.5 | 89.9 | 34.2 | 13.6 | 239.2 | 329.5 | (N13) | 187.5 | (N40) | 103.0 (N13) | 1 | 12 |
| 24-25 Apr 2006 | 109.4 | 94.1 | 64.2 | 0.2 | 2.2 | 270.0 | (H05) | 242.0 | (H05) | 166.5 (H05) | - | 13 |
| 27-30 Jul 2006 | 109.8 | 61.0 | 31.0 | 10.1 | 218.2 | 161.0 | (N45) | 89.0 | (H20) | 57.0 (H03) | - | 5 |
| 9-10 Sept 2006 | 95.9 | 89.5 | 55.7 | 55.0 | 82.9 | 140.0 | (N47) | 125.0 | (N47) | 86.5 (H04) | - | 0 |
| 2-3 Jun 2006 | 80.3 | 76.7 | 43.6 | 78.1 | 268.3 | 292.0 | (N40) | 213.5 | (N14) | 121.5 (N14) | 1 | 12 |
| 21-22 Nov 2006 | 75.9 | 52.8 | 19.7 | 1.6 | 11.1 | 139.5 | (N51) | 113.5 | (N51) | 60.0 (N19) | - | 1 |
| 21-22 May 2006 | 69.7 | 42.0 | 18.1 | 16.0 | 17.6 | 106.5 | (H09) | 71.0 | (H09) | 37.5 (H09) | - | 1 |
| 28-29 Apr 2006 | 66.1 | 47.8 | 20.9 | 129.3 | 131.5 | 178.5 | (N47) | 150.0 | (N47) | 72.5 (N13) | - | 3 |
| 13-14 Jun 2006 | 65.2 | 64.4 | 42.1 | 182 | 356 | 139.0 | (K06) | 132.5 | (K06) | 109.0 (K06) | - | 4 |
| 3-7 Aug 2006 | 61.1 | 24.0 | 11.5 | 29.8 | 285.5 | 156.0 | (N17) | 87.0 | (N17) | 58.5 (N46) | - | 7 |
| 28-29 May 2006 | 59.7 | 37.7 | 24.7 | 6.0 | 147.1 | 108.0 | (N19) | 74.0 | (N36) | 46.5 (N26) | - | 2 |
| 29 Jun 2006 | 59.6 | 15.8 | 8.5 | 51.1 | 73.8 | 95.5 | (N31) | 72.5 | (N26) | 48.5 (N31) | - | 1 |
| 19-20 Aug 2006 | 51.1 | 51.1 | 41.0 | 0.0 | 77.9 | 95.5 | (H15) | 95.0 | (H15) | 83.0 (H15) | - | 0 |
| 9-11 Aug 2006 | 45.6 | 41.2 | 34.6 | 10.6 | 358.2 | 74.0 | (N34) | 65.0 | (N34) | 47.0 (N30) | - | 2 |
| 24-26 Aug 2006 | 47.7 | 22.4 | 11.8 | 0.1 | 100.5 | 112.0 | (N41) | 76.0 | (N41) | 41.5 (N46) | - | 1 |
| 8-12 Jul 2006 | 34.1 | 19.7 | 18.1 | 21.5 | 107.2 | 143.5 | (N47) | 104.0 | (N47) | 62.0 (K09) | - | 3 |
| 17 May 2006 | 15.9 | 10.0 | 2.8 | 1.6 | 181.4 | 54.0 | (N37) | 32.0 | (N41) | 12.5 (K07) | - | 0 |
| 19-23 Jun 2006 | 11.4 | 10.0 | 5.8 | 0.3 | 263 | 78.5 | (N40) | 74.5 | (N40) | 61.0 (N12) | - | 0 |
| 16-17 Oct 2006 | 7.1 | 7.1 | 4.1 | 16.0 | 21.7 | 145.0 | (N21) | 145.0 | (N21) | 72.0 (N21) | - | 0 |
| 4-5 Sept 2006 | 3.8 | 3.2 | 2.0 | 0.0 | 66.2 | 189.0 | (N19) | 186.0 | (N19) | 100.5 (N19) | - | 2 |

Notes:
(1) Rainstorms are arranged in order of the rolling 24-hour rainfall at the Hong Kong Observatory, Tsim Sha Tsui.
(2) The maxima are calculated using 5-minute rainfall as the basic unit, except those recorded at the HKO. They are the rolling rainfall amounts using one-clock hour rainfall as the basic unit.
(3) The maxima are selected from the 86 GEO Raingauges for the rainstorms. The GEO Raingauge reference number is shown in brackets.
(4) Landslide Potential Index (LPI) has been calculated for rainstorms that resulted in the issue of Landslip Warning.
(5) Reported totals are for landslides attributed to the rainstorm events.
(6) LPI is not calculated since comprehensive rainfall data before 1984 are not available.



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Table 1 - Rainfall and Landslides in 2006 As Compared with Selected Previous Major Rainstorms (Sheet 2 of 2)

| Date[1] of Rainstorm Event | Maximum Rainfall (mm)[2] | | | | | | | | LPI[4] | Number of Landslides Reported to GEO[5] |
|---|---|---|---|---|---|---|---|---|---|---|
| | Hong Kong Observatory (HKO) | | | | | GEO Raingauges[3] | | | | |
| | 24-hr | 5-hr | 1-hr | Antecedent 4-day | Antecedent 15-day | 24-hr | 5-hr | 1-hr | | |
| Selected Major Rainstorms in Previous Years (for comparison only) | | | | | | | | | | |
| 17 Jun 1983 | 347.0 | 274.0 | 69.0 | 2.0 | 77.0 | 460.0 | 303.0 | 101.0 | N/A[6] | 155 |
| 20-21 May 1989 | 388.0 | 149.0 | 37.0 | 28.0 | 42.0 | 566.0 | 224.0 | 51.0 | 6 | 378 |
| 7-9 May 1992 | 324.0 | 196.0 | 110.0 | 65.0 | 71.0 | 385.0 | 244.0 | 110.0 | 3 | 314 |
| 15-16 Jun 1993 | 155.0 | 129.0 | 54.0 | 18.0 | 275.0 | 285.0 | 195.0 | 111.0 | 1 | 123 |
| 4-5 Nov 1993 | 107.0 | 31.0 | 9.0 | 8.0 | 8.0 | 742.0 | 350.0 | 94.0 | 3 | 394 |
| 21-25 Jul 1994 | 290.0 | 138.5 | 62.5 | 18.5 | 297.5 | 956.0 | 394.5 | 211.5 | 10 | 208 |
| 3-11 Aug 1994 | 69.5 | 46.5 | 26.0 | 8.0 | 717.5 | 381.0 | 206.5 | 103.5 | 3 | 46 |
| 11-15 Aug 1995 | 314.5 | 117.5 | 59.5 | 5.5 | 442.5 | 468.0 | 268.5 | 106.0 | 6 | 110 |
| 3-5 Jun 1997 | 139.5 | 85.5 | 62.0 | 1.0 | 31.5 | 367.5 | 277.0 | 128.5 | 2 | 81 |
| 1-4 Jul 1997 | 110.0 | 49.0 | 18.0 | 183.0 | 380.0 | 799.0 | 296.0 | 125.0 | 6 | 150 |
| 8-9 Jun 1998 | 429.0 | 164.0 | 48.0 | 58.0 | 181.0 | 562.0 | 223.0 | 98.0 | 9 | 96 |
| 22-26 Aug 1999 | 313.0 | 143.0 | 51.0 | 11.0 | 175.0 | 565.0 | 249.0 | 121.0 | 8 | 269 |
| 16-21 Aug 2005 | 385.5 | 134.0 | 41.5 | 101.0 | 200.5 | 570.0 | 195.0 | 82.0 | 10 | 229 |

Notes:
(1) Rainstorms are arranged in order of the rolling 24-hour rainfall at the Hong Kong Observatory, Tsim Sha Tsui.
(2) The maxima are calculated using 5-minute rainfall as the basic unit, except those recorded at the HKO. They are the rolling rainfall amounts using one-clock hour rainfall as the basic unit.
(3) The maxima are selected from the 86 GEO Raingauges for the rainstorms. The GEO Raingauge reference number is shown in brackets.
(4) Landslide Potential Index (LPI) has been calculated for rainstorms that resulted in the issue of Landslip Warning.
(5) Reported totals are for landslides attributed to the rainstorm events.
(6) LPI is not calculated since comprehensive rainfall data before 1984 are not available.

Table 2 - Warnings Issued by the Hong Kong Observatory in 2006[1, 2]

| Month | Monthly Total Rainfall (mm) | Dates on which Warnings were in Effect | | | | |
|---|---|---|---|---|---|---|
| | | Thunderstorm[3] | Flooding | Landslip | Tropical Cyclone[4] | Rainstorm |
| January | 16.3 | - | - | - | - | - |
| February | 37.7 | 28 | - | - | - | - |
| March | 48.4 | 23, 24, 25 | - | - | - | - |
| April | 199.2 | 15, 24, 26, 27, 28 | 28 | - | - | 24 (2 x Amber, 2 x Red & Black), 28 (Amber) |
| May | 431.5 | 2, 3, 5, 11, 13, 21, 22, 23, 27, 28, 31 | 2 - 3 | 3 (02:30 - 13:00) | 15-18 (1-3, CHANCHU) | 2-3 (2 x Amber & Red) |
| June | 469.2 | 1, 2, 3, 5, 6, 7, 8, 9, 12, 13, 18, 19, 20, 21, 22, 26, 27, 28, 29, 30 | 9 | 2 (14:00 - 22:15), 9 (14:30 - 17:20) | 27 - 28 (1, JELAWAT) | 2 (2 x Amber & Red), 9 (4 x Amber, 2 x Red & Black), 13 (Amber & Red) |
| July | 569.2 | 2, 3, 4, 7, 8, 9, 10, 11, 13, 14, 15, 16, 24, 25, 26, 27, 28, 29 | - | - | - | 8 (Amber), 16 (2 x Amber, 2 x Red & Black), 27 (Amber), 28 (Amber) |
| August | 275.4 | 2, 5, 6, 8, 9, 10, 18, 19, 20, 24, 25, 26, 27, 28 | - | - | 1-4 (1-3, PRAPIROON), 9 - 10 (1, BOPHA), 24 - 25 (1, no name) | 10 (Amber), 19 (Amber) |
| September | 420.2 | 2, 3, 4, 6, 7, 8, 9, 10, 13, 14, 15 | - | 13 (11:45) - 14 (04:15) | 12-13 (1-3, no name) | 9 (2 x Amber & Red), 13 (3 x Amber & Red) |
| October | 31.2 | 16 | - | - | 31 (1, CIMARON) | - |
| November | 99.6 | 21 | - | - | 1 - 3 (1, CIMARON) | 21 (Amber) |
| December | 29.9 | - | - | - | - | - |
| Total | 2,627.8 | 129 Warnings | 3 Warnings | 4 Warnings | 7 Warnings | 39 Warnings (25 x Amber, 11 x Red & 3 x Black) |

Notes:
(1) Landslip Warnings were issued after consultation between the GEO and the HKO.
(2) Warnings and signals in this Table were based on the HKO.
(3) More than one Thunderstorm Warning may have been issued within a day but showed once in this Table for clarity.
(4) The tropical cyclone warning signal no. hoisted is shown in the brackets followed by the name of the tropical cyclone.

Table 3 - Number of Landslides in 2006 Reported to Government

| Department | Total Number of Landslides | Genuine Landslides |
|---|---|---|
| Agriculture, Fisheries and Conservation Department | 4 (0) | 4 (0) |
| Architectural Services Department | 15 (4) | 11 (3) |
| Drainage Services Department | 0 (0) | 0 (0) |
| Fire Services Department | 0 (0) | 0 (0) |
| Geotechnical Engineering Office, Civil Engineering and Development Department | 158* | 157* |
| Highways Department | 38 (32) | 36 (31) |
| Housing Department | 0 (0) | 0 (0) |
| Lands Department | 14 (9) | 14 (9) |
| Water Supplies Department | 15 (1) | 15 (1) |
| Total | 244 (46) | 237 (44) |

Legend:

15 (4) Fifteen incidents of which 4 were also reported to the GEO.

Note: * denotes number of landslides reported to the GEO discounting false alarm, duplicate cases, etc. Incident No. LI2006/03/2001 reported by the Landslide Investigation Consultant (LIC) was counted as a GEO case.

Table 4 - Number of Landslides Affecting Different Facilities

| Affected Facility | Hong Kong Island | Kowloon | New Territories and Outlying Islands | All |
|---|---|---|---|---|
| Squatter Dwellings | 1 (0) | 0 (0) | 11 (0) | 12 (0) |
| Buildings | 0 (0) | 0 (0) | 12 (1) | 12 (1) |
| Roads | 16 (0) | 4 (0) | 13 (3) | 33 (3) |
| Transportation Facilities (railways, tramways, LRT, etc.) | 0 (0) | 0 (0) | 0 (0) | 0 (0) |
| Pedestrian Pavements/Footways | 9 (0) | 1 (0) | 2 (0) | 12 (0) |
| Minor Footpaths/Access | 5 (0) | 2 (0) | 33 (0) | 40 (0) |
| Construction Sites | 1 (1) | 0 (0) | 0 (0) | 1 (1) |
| Open Areas | 13 (0) | 2 (0) | 29 (0) | 44 (0) |
| Catchwaters | 1 (0) | 0 (0) | 7* (0) | 8 (0) |
| Others (e.g. carparks, parks, playgrounds, gardens, backyards, etc.) | 10 (0) | 3 (0) | 19 (1) | 32 (1) |
| Total | 56 (1) | 12 (0) | 126 (5) | 194 (6) |

Legend:

13 (3) Thirteen landslides, three of which were major failures.

* One of the incidents affected the area below a catchwater overflow weir.

Notes:

(1) One of the incidents, which was a major landslide, affected two key types of facility.

(2) Reported incidents that were not genuine landslides have been excluded.

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Table 5- Landslide Consequence Related to Type of Failure

| Type of Failure | | Number of Squatter Dwellings[1] Evacuated | | Number of Blocks, Houses or Flats Evacuated or Partially Closed | Number of Landslides involving Closure | | | Deaths | Injuries |
|---|---|---|---|---|---|---|---|---|---|
| | | Permanent | Temporary | | Roads | Pedestrian Pavements | Footpaths, Back Lanes, Private Access | | |
| Fill Slope | | 0 | 0 | 0 | 2 | 1 | 0 | 0 | 0 |
| Cut Slope | Soil | 0 | 6(10) | 1 | 3 | 0 | 1 | 0 | 0 |
| | Soil/Rock | 0 | 0 | 0 | 11 | 2 | 0 | 0 | 0 |
| | Rock | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| Retaining Wall | | 0 | 1(2) | 0 | 1 | 1 | 1 | 0 | 0 |
| Natural Hillside | | 1(2) | 0 | 0 | 1 | 1 | 3 | 0 | 0 |
| Disturbed Terrain | | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |

Legend:
6(10) Number of squatter dwellings evacuated with the number of tolerated squatter structures evacuated shown in brackets.

Notes:
(1) A squatter dwelling is defined as a place of residence that contains one or more “tolerated squatter structures”, i.e. structures built for domestic purpose or non-domestic purpose and registered in the 1982 Housing Department’s Squatter Structure Survey (GEO, 2004).
(2) A failure may give rise to more than one key type of consequence.

Table 6 - Distribution of Facility Groups Affected by Major Landslides

| | Facility Group Affected or Potentially Affected by Major Landslides (Group No.) | | | | | | |
|---|---|---|---|---|---|---|---|
| | 1a | 1b | 2a | 2b | 3 | 4 | 5 |
| All Major Landslides | 1 | 0 | 0 | 1 | 2 | 2 | 0 |
| Major Landslides on Man-made Slopes | 0 | 0 | 0 | 1 | 2 | 1 | 0 |
| Major Landslides on Natural Hillsides | 1 | 0 | 0 | 0 | 0 | 1 | 0 |

Notes: (1) Facility groups are classified in accordance with that adopted for the New Priority Classification Systems (Wong, 1998).
(2) A given landslide may affect more than one key type of facility.

Table 7 - Number of Landslides Classified by Type of Slope Failure

| Type of Failure | | Number | Percentage (%) |
|---|---|---|---|
| Fill Slope | | 16 (2) | 8.3 |
| Cut Slope | Soil | 68 (0) | 35.2 |
| | Soil/Rock | 45 (2) | 23.3 |
| | Rock | 11 (0) | 5.7 |
| Retaining Wall | | 12 (0) | 6.2 |
| Natural Hillsides | | 37 (1) | 19.2 |
| Disturbed Terrain | | 4 (0) | 2.1 |
| Total | | 193 (5) | 100 |

Legend:
38 (1) Thirty-eight landslides of which one was a major failure.

Notes: (1) Where a landslide involved more than one type of failure, the predominant type of failure has been assumed in the above classification.
(2) Incidents which were not genuine landslides have been excluded.

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Table 8 - Landslide Volume Distribution with Respect to Geographical Locations

| Volume of Failure ($m^3$) | Hong Kong Island | Kowloon | New Territories and Outlying Islands | All |
|---|---|---|---|---|
| <5 | 43 | 12 | 92 | 146 (75.6%) |
| ≥5 to <10 | 2 | 0 | 9 | 11 (5.7%) |
| ≥10 to <20 | 5 | 0 | 13 | 18 (9.3%) |
| ≥20 to <50 | 6 | 0 | 7 | 13 (6.7%) |
| ≥50 to <200 | 1 | 0 | 2 | 3 (1.6%) |
| ≥200 to <500 | 0 | 0 | 1 | 1 (0.5%) |
| ≥500 to <1000 | 0 | 0 | 0 | 0 (0%) |
| ≥1000 | 0 | 0 | 1 | 1 (0.5%) |
| Total | 57 | 12 | 125 | 193 (100%) |

Legend:
146 (75.6%) 146 landslides, which amount to 75.6% of the 193 genuine landslides reported to the Government.

Table 9 - Landslide Volume Distribution with Respect to Type of Failure

| Volume of Failure ($m^3$) | Fill Slope | Cut Slope | | | Retaining Wall | Natural Hillside | Disturbed Terrain | Total |
|---|---|---|---|---|---|---|---|---|
| | | Soil Slope | Soil/Rock | Rock | | | | |
| <5 | 7 | 59 | 39 | 8 | 9 | 23 | 1 | 146 (75.6%) |
| ≥5 to <10 | 0 | 5 | 0 | 0 | 1 | 4 | 1 | 11 (5.7%) |
| ≥10 to <20 | 4 | 3 | 2 | 3 | 0 | 4 | 2 | 18 (9.3%) |
| ≥20 to <50 | 3 | 1 | 2 | 0 | 2 | 5 | 0 | 13 (6.7%) |
| ≥50 to <200 | 1 | 0 | 2 | 0 | 0 | 0 | 0 | 3 (1.6%) |
| ≥200 to <500 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 (0.5%) |
| ≥500 to <1000 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 (0%) |
| ≥1000 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 (0.5%) |
| Total | 16 (8.3%) | 68 (35.2%) | 45 (23.3%) | 11 (5.7%) | 12 (6.2%) | 37 (19.2%) | 4 (2.1%) | 193 (100%) |

Legend:
68 (35%) 68 landslides which amount to about 35% of the 193 genuine landslides reported to the Government.

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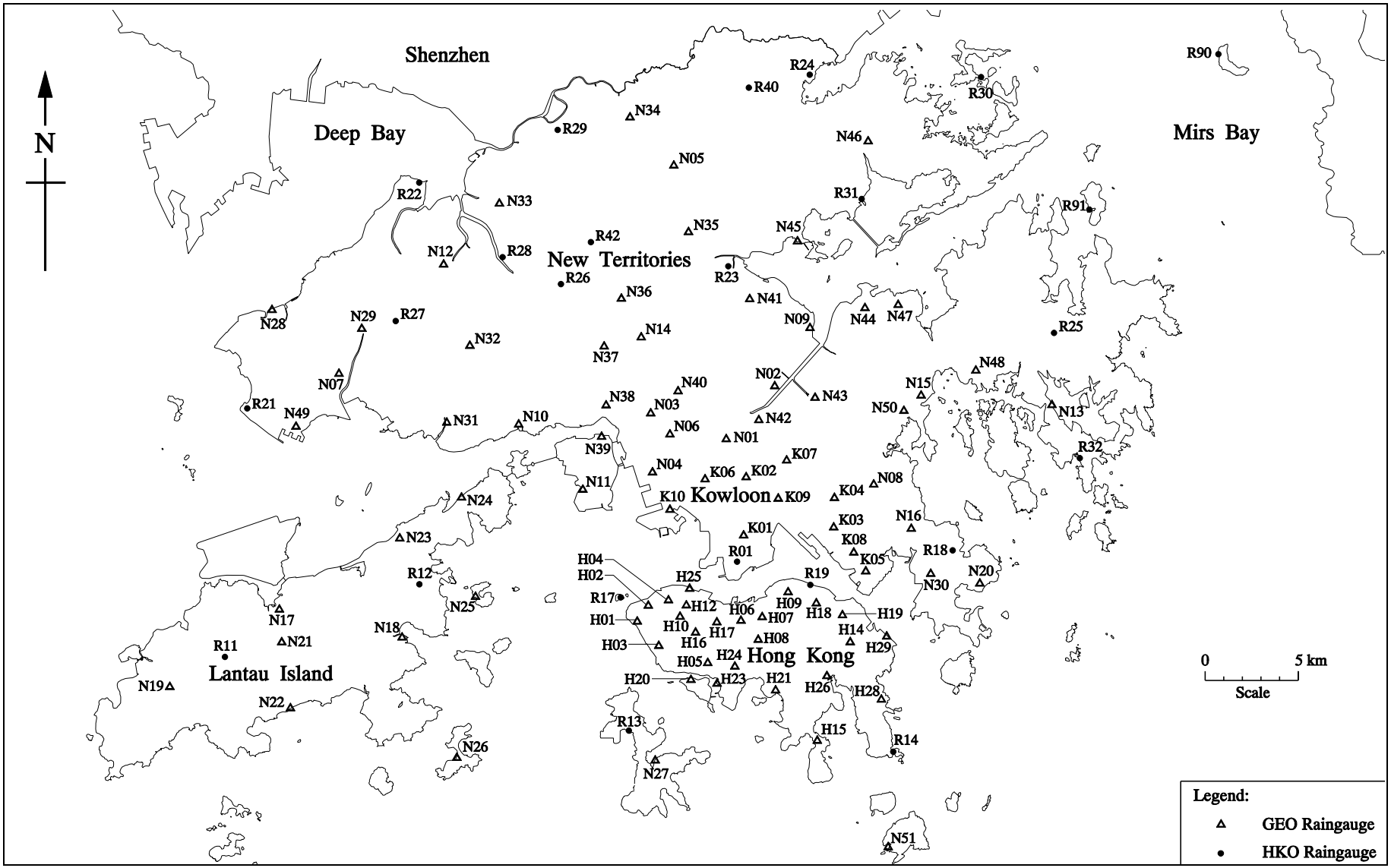


Figure 1 - Locations of GEO and HKO Automatic Raingauges

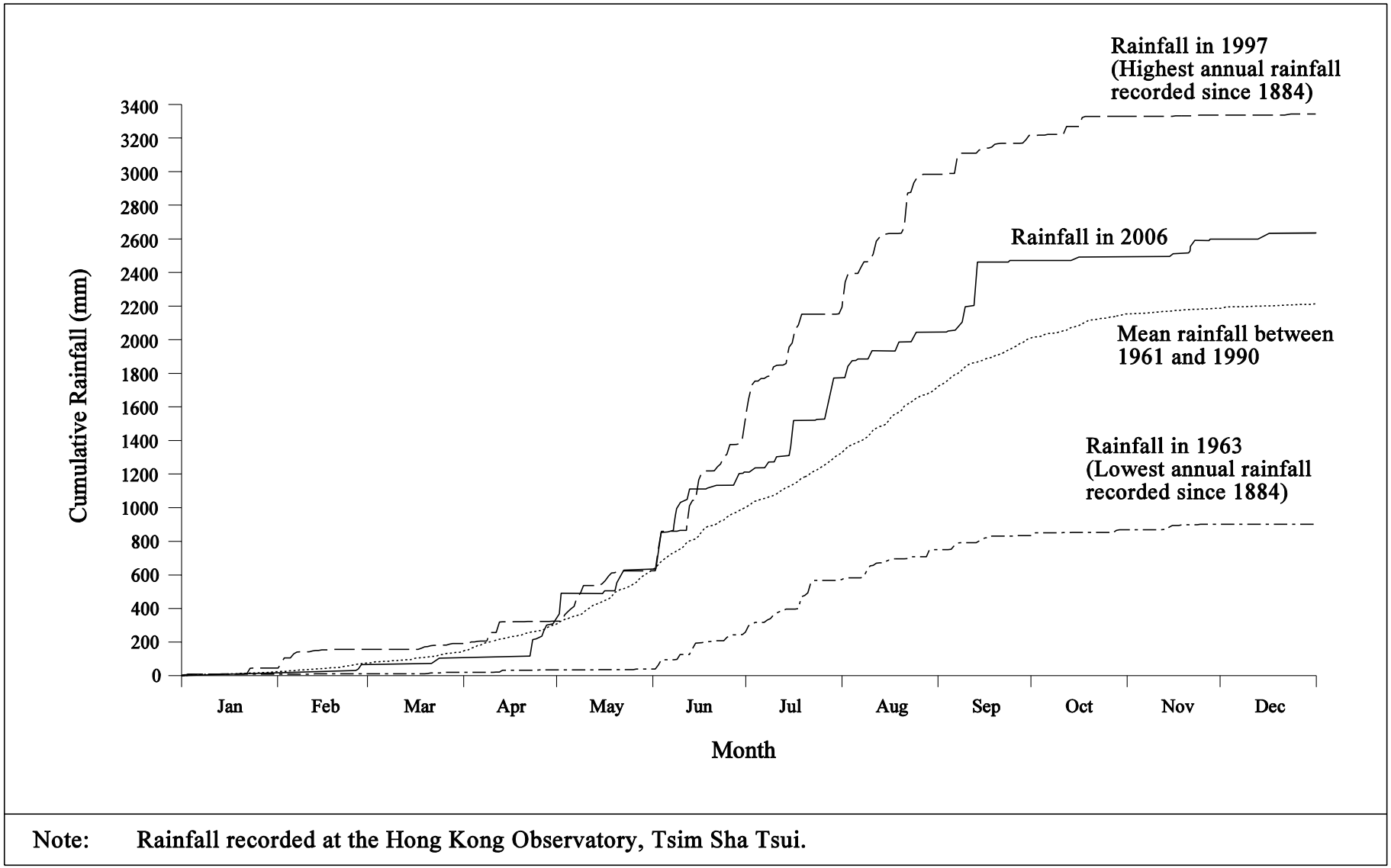


Figure 2 - Cumulative Rainfall for 2006 at the Hong Kong Observatory and its Recorded Highest, Mean and Lowest Cumulative Rainfalls



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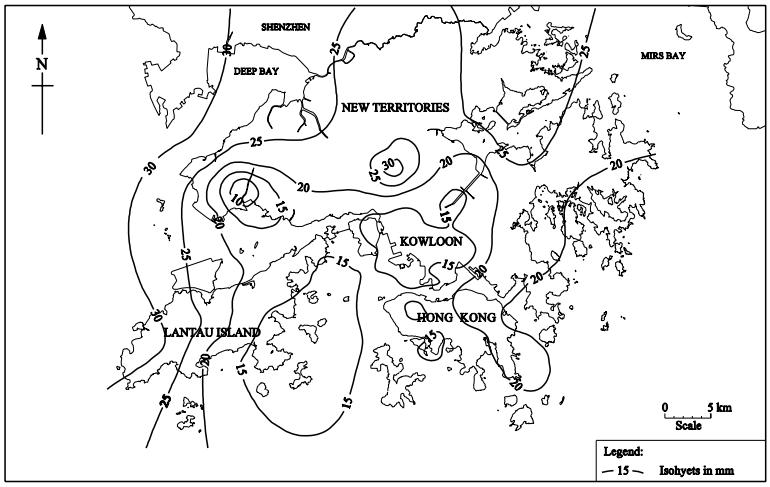


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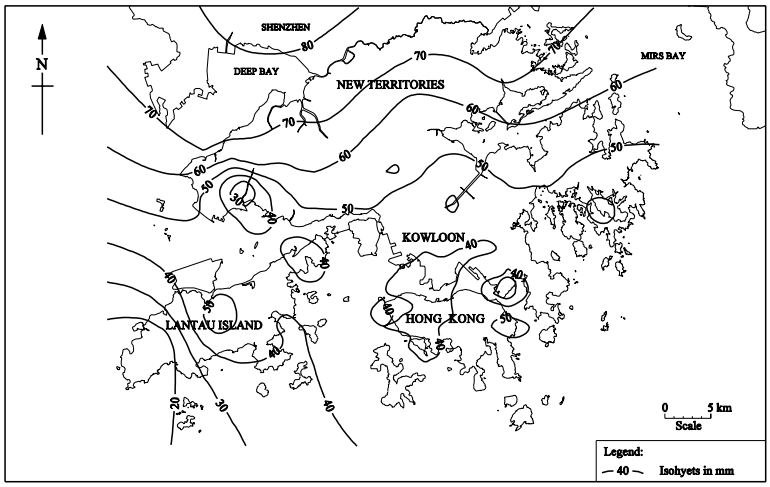


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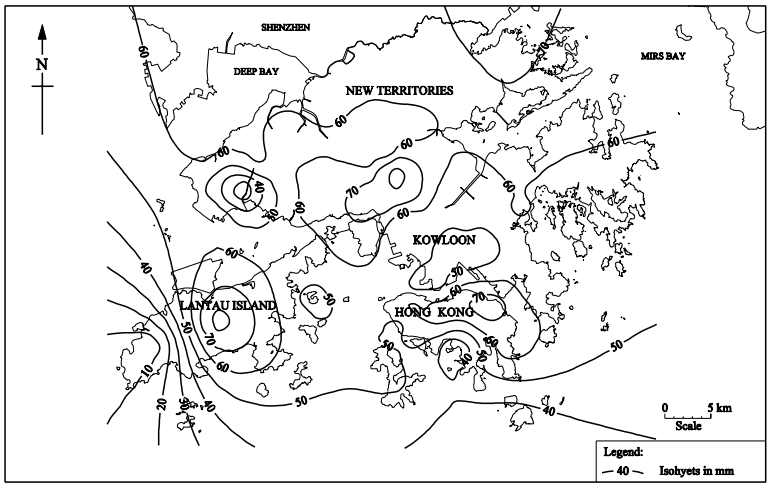
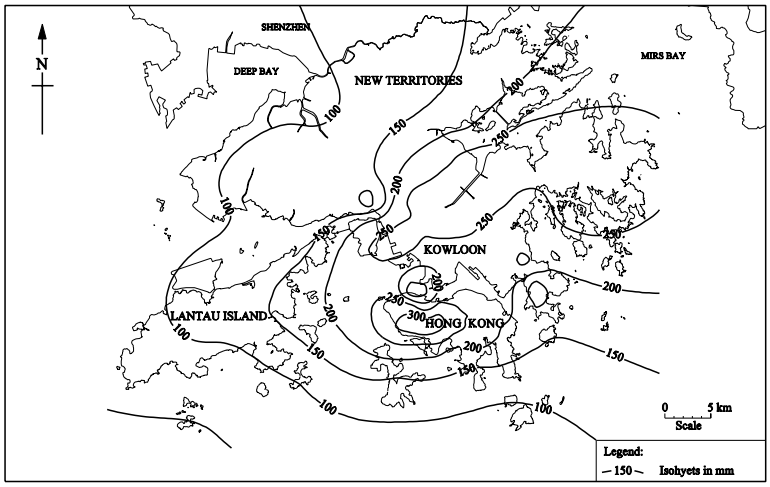


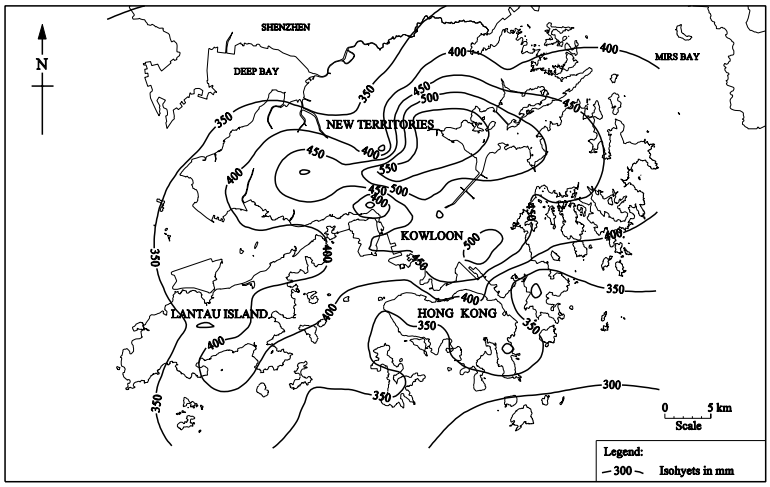

**March 2006**

**Note:** **Isohyets are based on all the GEO raingauges and the raingauge at the Hong Kong Observatory.**

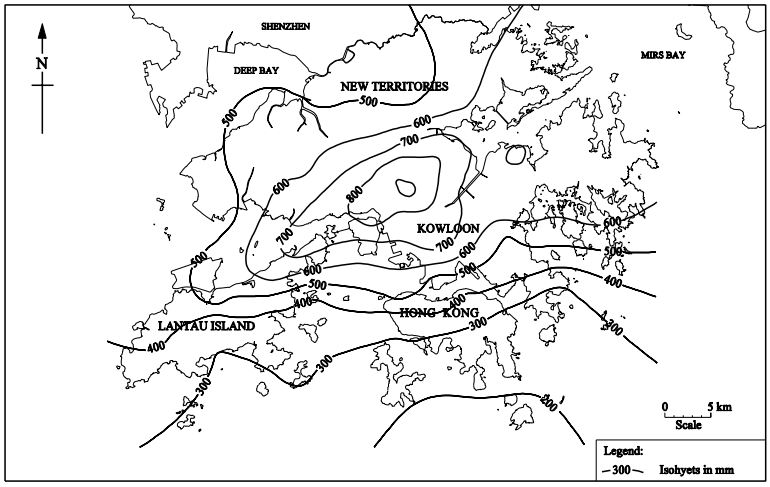
Figure 3a - Total Monthly Rainfall Distribution in 2006




April 2006



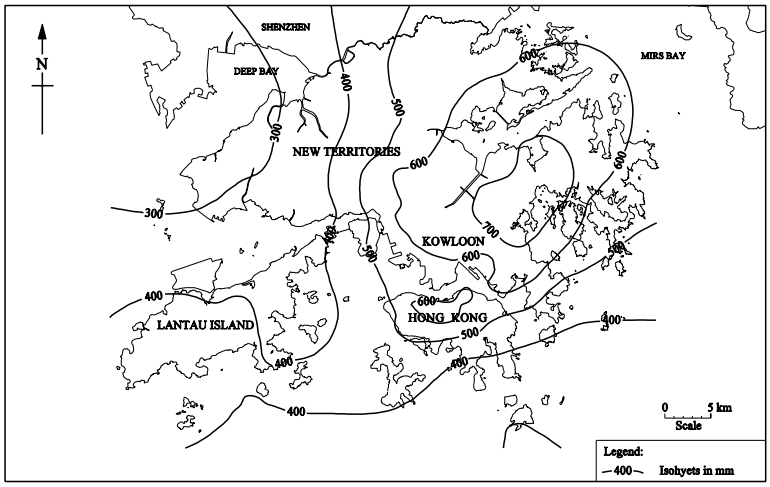

May 2006



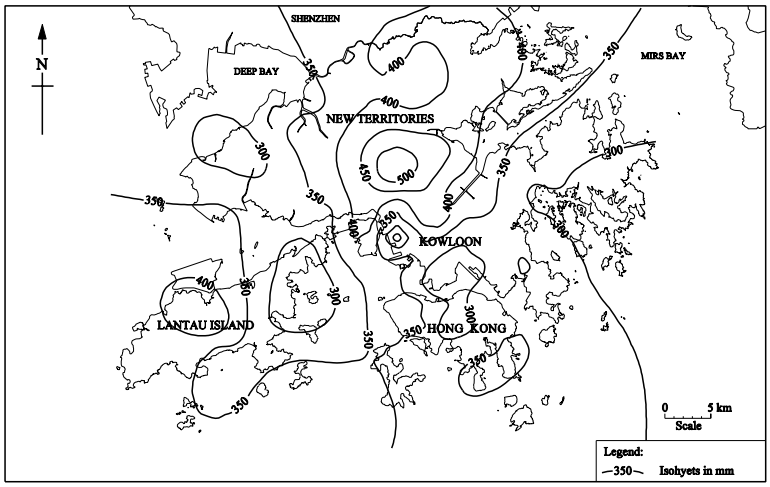

June 2006

Note: Isohyets are based on all the GEO raingauges and the raingauge at the Hong Kong Observatory.

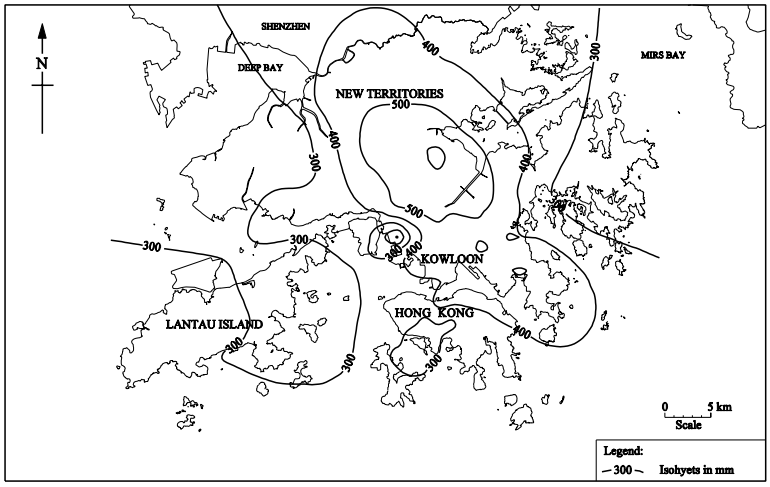
Figure 3b - Total Monthly Rainfall Distribution in 2006




July 2006




August 2006




September 2006

Note: Isohyets are based on all the GEO raingauges and the raingauge at the Hong Kong Observatory.

Figure 3c - Total Monthly Rainfall Distribution in 2006

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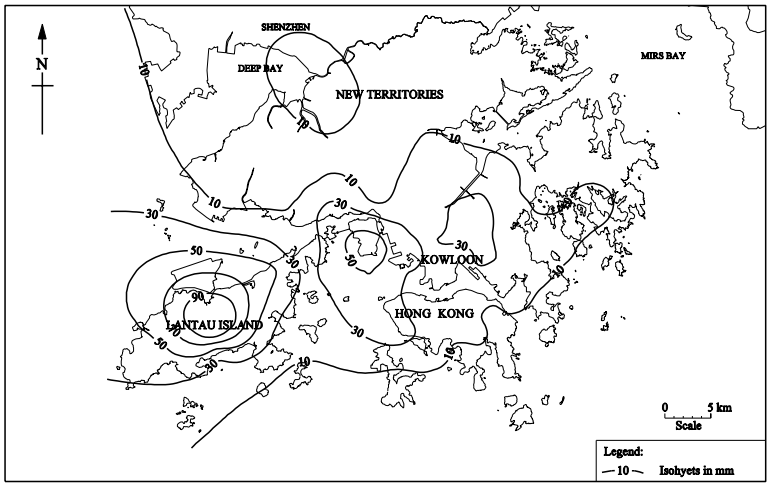
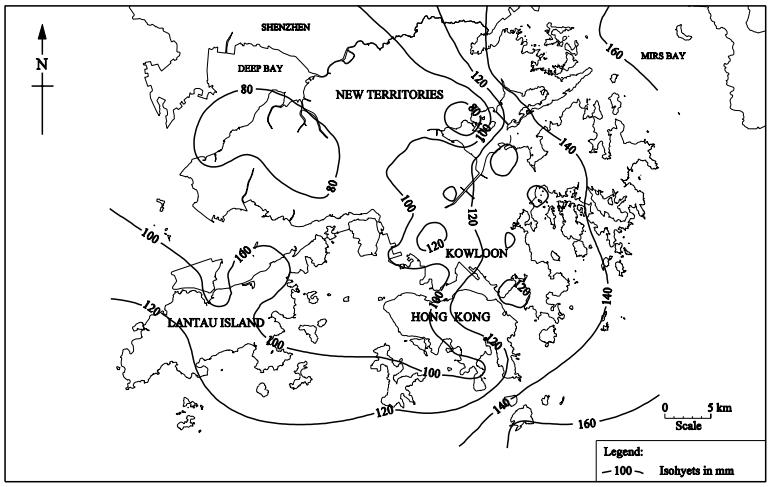
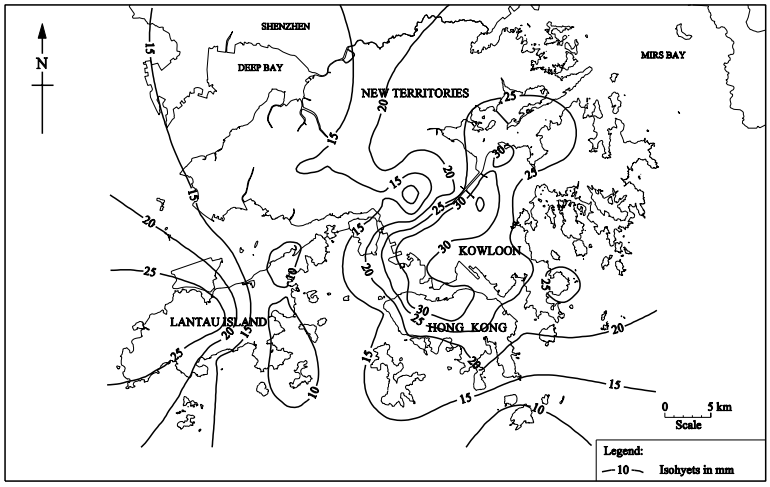



October 2006




November 2006




December 2006

Note: Isohyets are based on all the GEO raingauges and the raingauge at the Hong Kong Observatory.

Figure 3d - Total Monthly Rainfall Distribution in 2006

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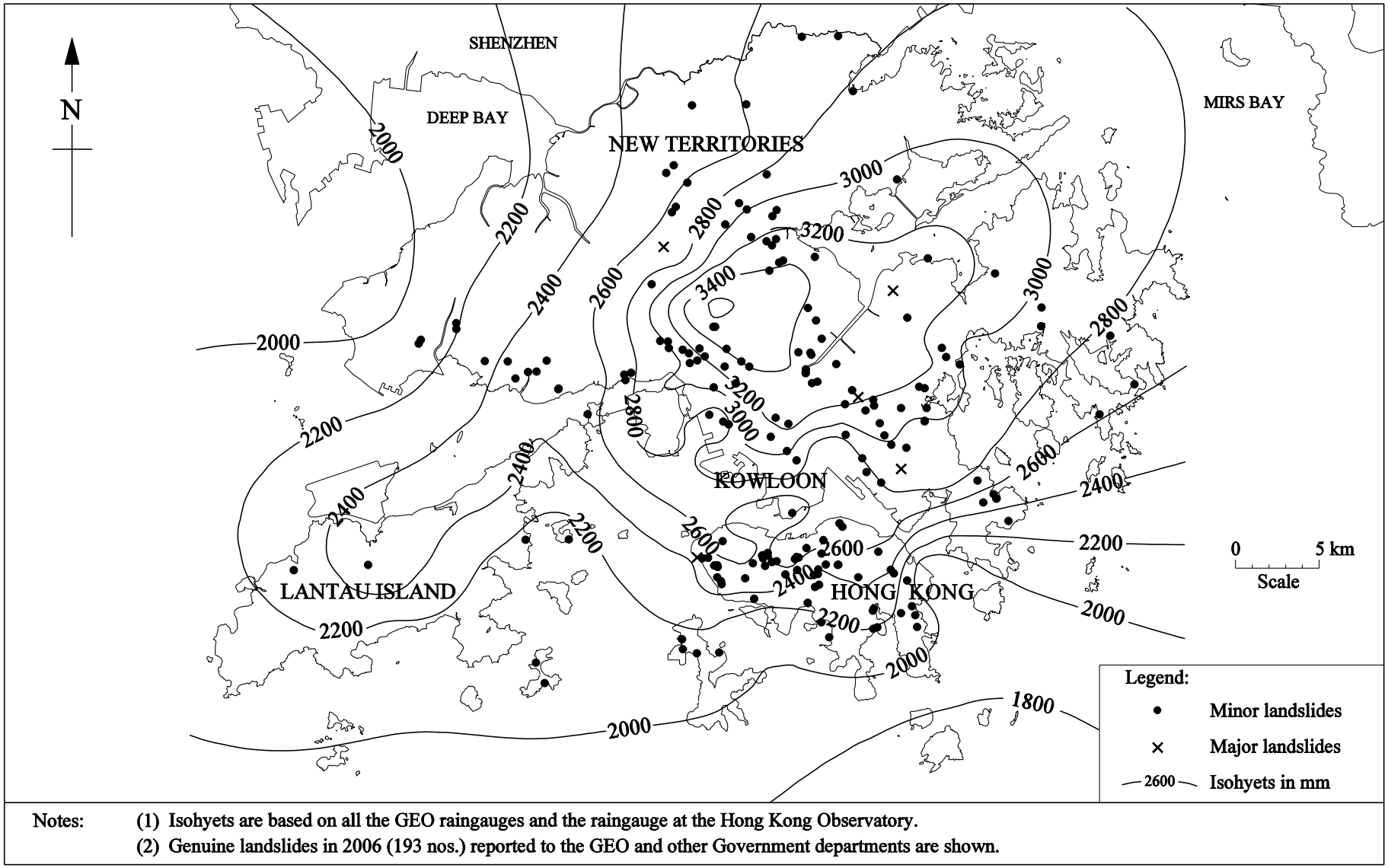
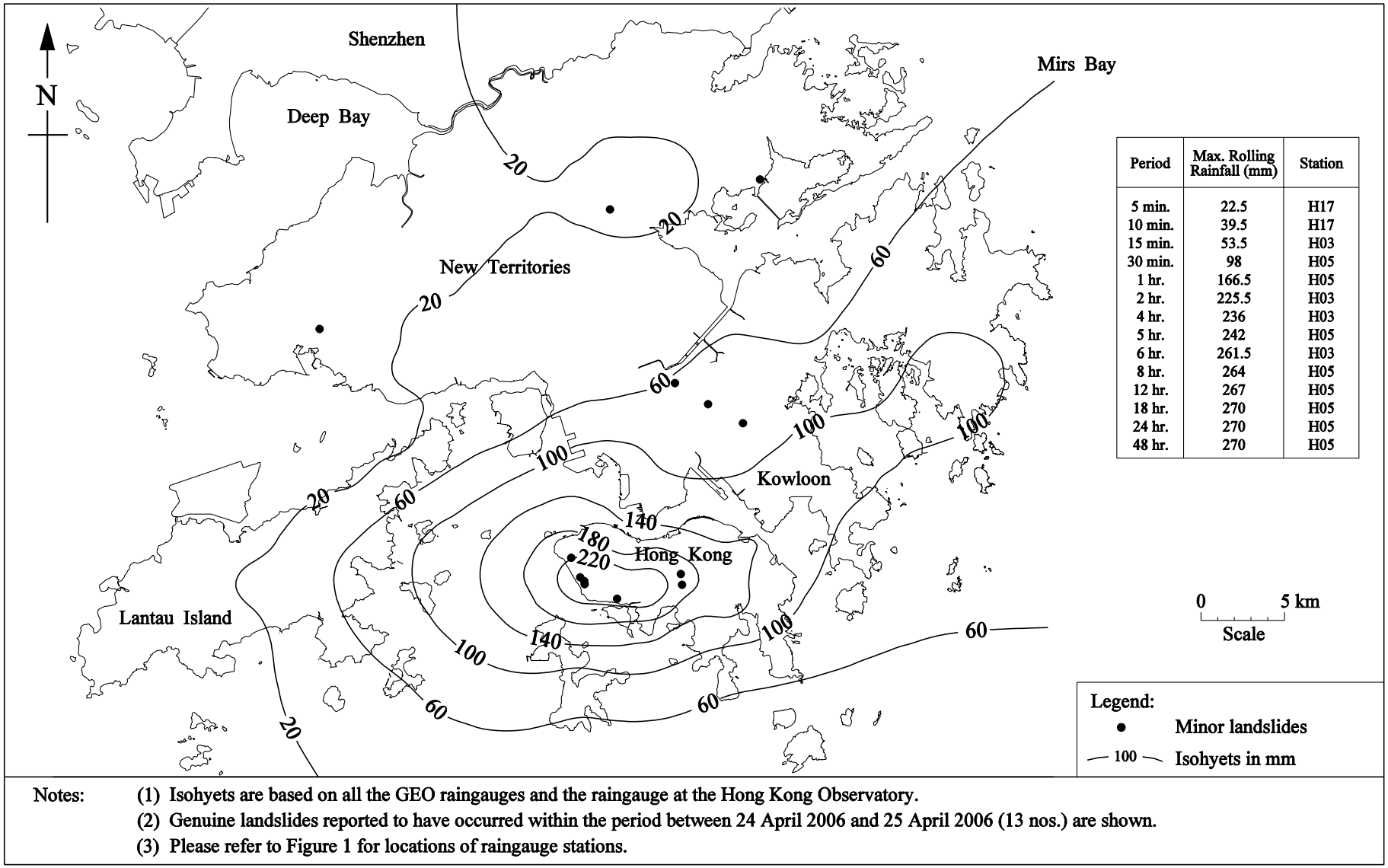



Figure 4 - Total Annual Rainfall Distribution and Locations of Landslides in 2006




| Period | Max. Rolling Rainfall (mm) | Station |
|---|---|---|
| 5 min. | 22.5 | H17 |
| 10 min. | 39.5 | H17 |
| 15 min. | 53.5 | H03 |
| 30 min. | 98 | H05 |
| 1 hr. | 166.5 | H05 |
| 2 hr. | 225.5 | H03 |
| 4 hr. | 236 | H03 |
| 5 hr. | 242 | H05 |
| 6 hr. | 261.5 | H03 |
| 8 hr. | 264 | H05 |
| 12 hr. | 267 | H05 |
| 18 hr. | 270 | H05 |
| 24 hr. | 270 | H05 |
| 48 hr. | 270 | H05 |

Figure 5 - Maximum Rolling 24-hour Rainfall Distribution for the Period between 24 April 2006 (00:00) and 25 April 2006 (24:00) and Locations of Landslides

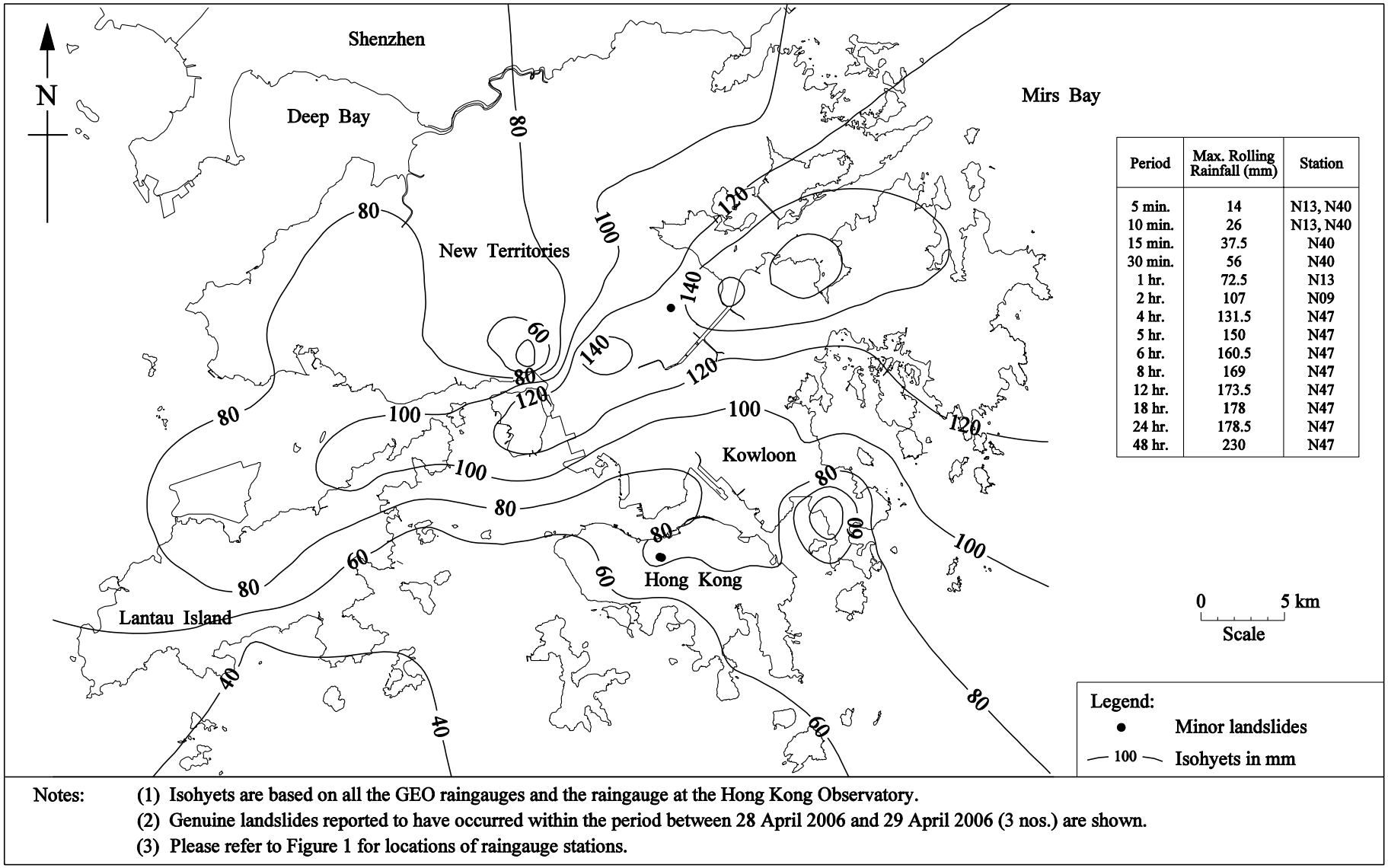
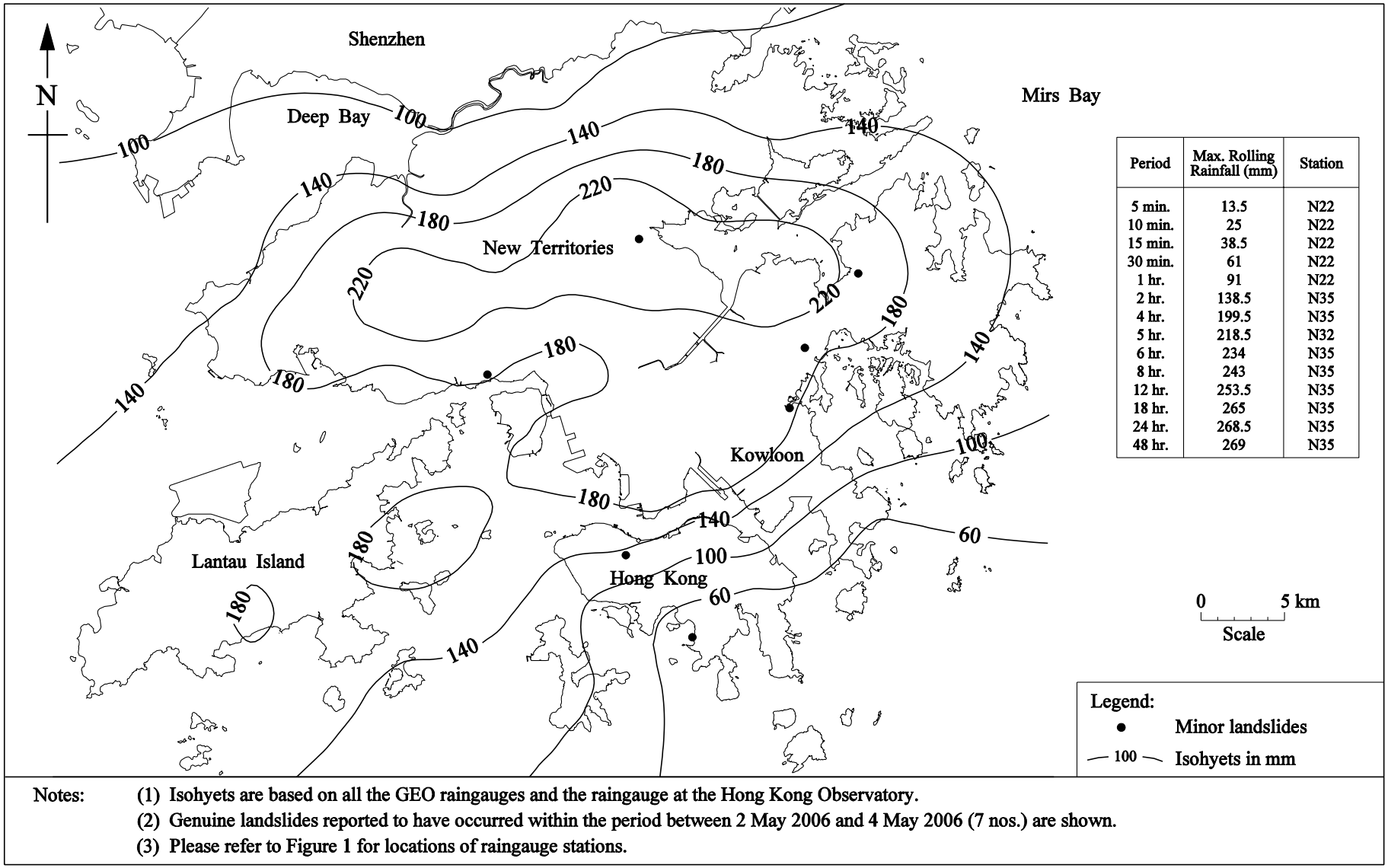


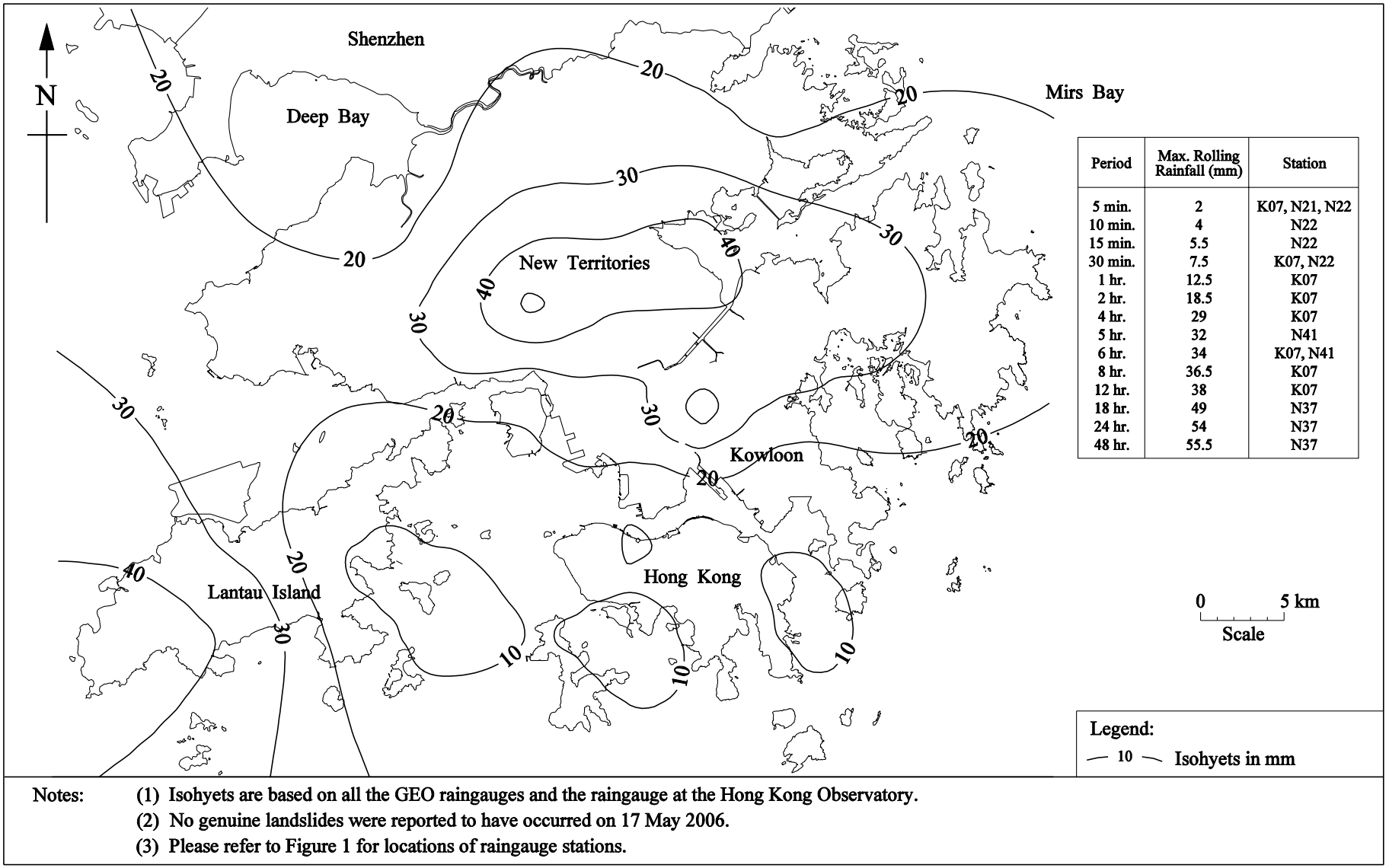

Figure 6 - Maximum Rolling 24-hour Rainfall Distribution for the Period between 28 April 2006 (00:00) and 29 April 2006 (24:00) and Locations of Landslides




| Period | Max. Rolling Rainfall (mm) | Station |
|---|---|---|
| 5 min. | 13.5 | N22 |
| 10 min. | 25 | N22 |
| 15 min. | 38.5 | N22 |
| 30 min. | 61 | N22 |
| 1 hr. | 91 | N22 |
| 2 hr. | 138.5 | N35 |
| 4 hr. | 199.5 | N35 |
| 5 hr. | 218.5 | N32 |
| 6 hr. | 234 | N35 |
| 8 hr. | 243 | N35 |
| 12 hr. | 253.5 | N35 |
| 18 hr. | 265 | N35 |
| 24 hr. | 268.5 | N35 |
| 48 hr. | 269 | N35 |

Notes:
(1) Isohyets are based on all the GEO raingauges and the raingauge at the Hong Kong Observatory.
(2) Genuine landslides reported to have occurred within the period between 2 May 2006 and 4 May 2006 (7 nos.) are shown.
(3) Please refer to Figure 1 for locations of raingauge stations.

Figure 7 - Maximum Rolling 24-hour Rainfall Distribution for the Period between 2 May 2006 (00:00) and 4 May 2006 (24:00) and Locations of Landslides




| Period | Max. Rolling Rainfall (mm) | Station |
|---|---|---|
| 5 min. | 2 | K07, N21, N22 |
| 10 min. | 4 | N22 |
| 15 min. | 5.5 | N22 |
| 30 min. | 7.5 | K07, N22 |
| 1 hr. | 12.5 | K07 |
| 2 hr. | 18.5 | K07 |
| 4 hr. | 29 | K07 |
| 5 hr. | 32 | N41 |
| 6 hr. | 34 | K07, N41 |
| 8 hr. | 36.5 | K07 |
| 12 hr. | 38 | K07 |
| 18 hr. | 49 | N37 |
| 24 hr. | 54 | N37 |
| 48 hr. | 55.5 | N37 |

Notes:
(1) Isohyets are based on all the GEO raingauges and the raingauge at the Hong Kong Observatory.
(2) No genuine landslides were reported to have occurred on 17 May 2006.
(3) Please refer to Figure 1 for locations of raingauge stations.

Figure 8 - Maximum Rolling 24-hour Rainfall Distribution for the Period between 00:00 and 24:00 on 17 May 2006 and Locations of Landslides



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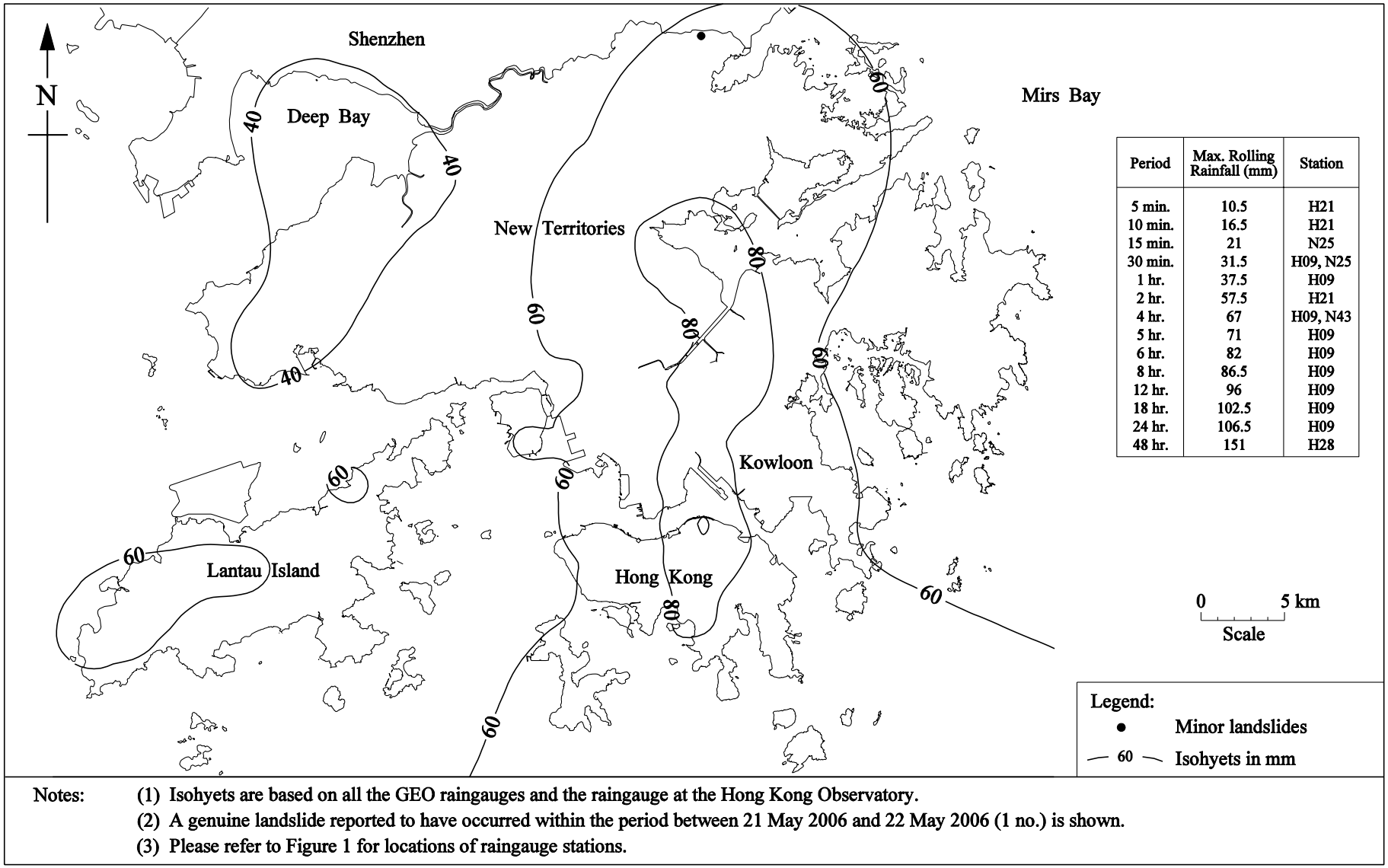
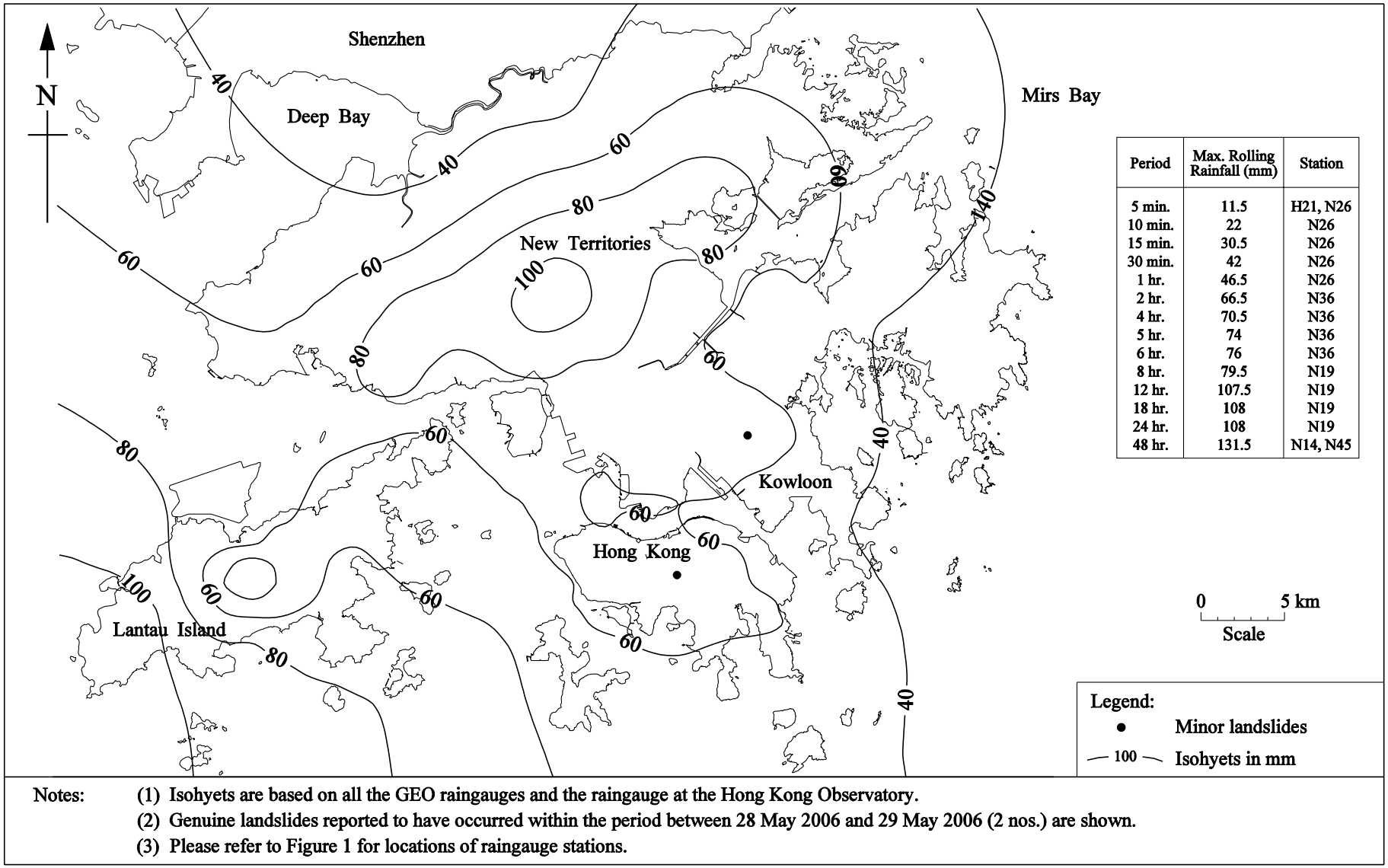



| Period | Max. Rolling Rainfall (mm) | Station |
|---|---|---|
| 5 min. | 10.5 | H21 |
| 10 min. | 16.5 | H21 |
| 15 min. | 21 | N25 |
| 30 min. | 31.5 | H09, N25 |
| 1 hr. | 37.5 | H09 |
| 2 hr. | 57.5 | H21 |
| 4 hr. | 67 | H09, N43 |
| 5 hr. | 71 | H09 |
| 6 hr. | 82 | H09 |
| 8 hr. | 86.5 | H09 |
| 12 hr. | 96 | H09 |
| 18 hr. | 102.5 | H09 |
| 24 hr. | 106.5 | H09 |
| 48 hr. | 151 | H28 |

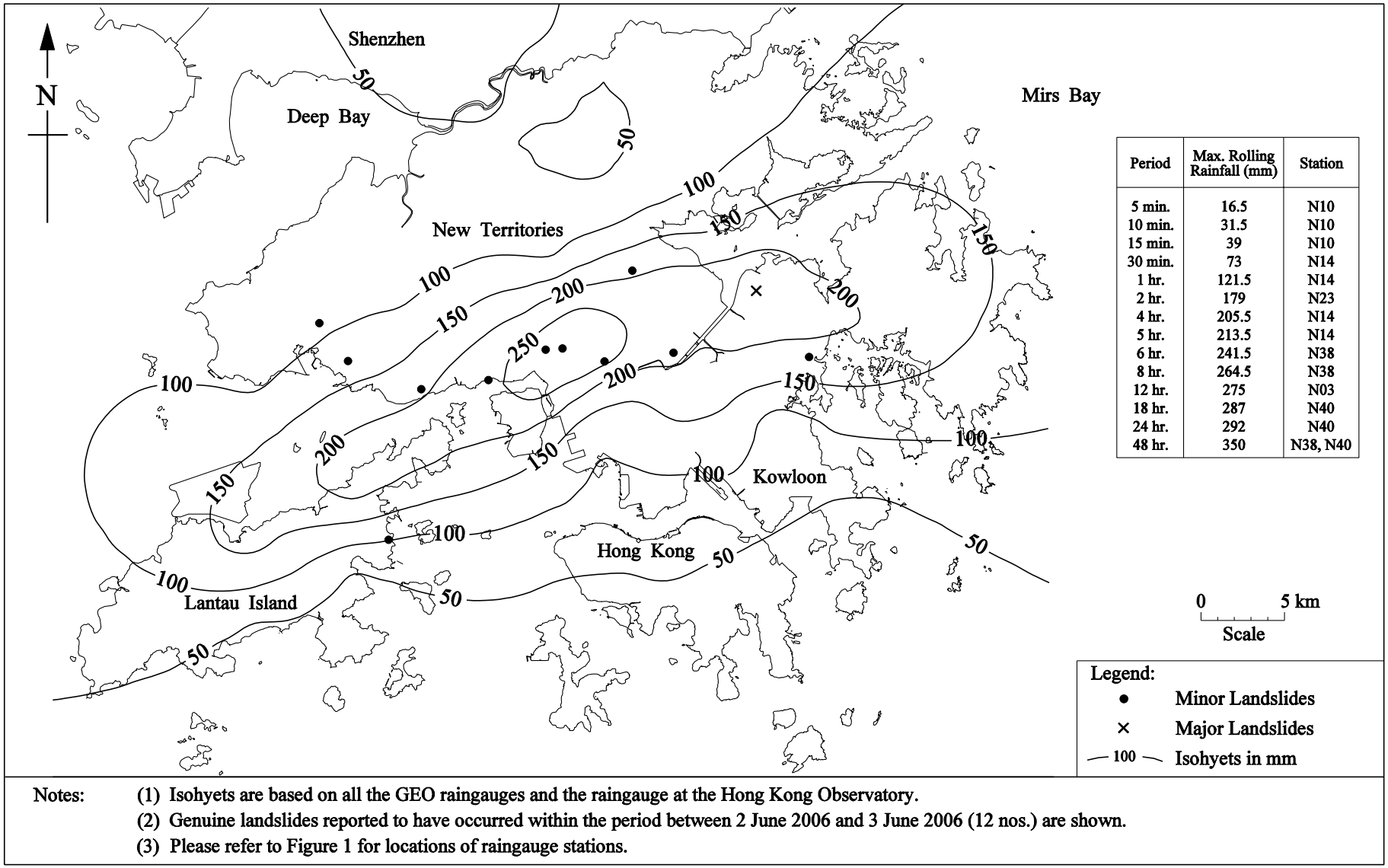
Notes:
(1) Isohyets are based on all the GEO raingauges and the raingauge at the Hong Kong Observatory.
(2) A genuine landslide reported to have occurred within the period between 21 May 2006 and 22 May 2006 (1 no.) is shown.
(3) Please refer to Figure 1 for locations of raingauge stations.

Figure 9 - Maximum Rolling 24-hour Rainfall Distribution for the Period between 21 May 2006 (00:00) and 22 May 2006 (24:00) and Locations of Landslides




| Period | Max. Rolling Rainfall (mm) | Station |
|---|---|---|
| 5 min. | 11.5 | H21, N26 |
| 10 min. | 22 | N26 |
| 15 min. | 30.5 | N26 |
| 30 min. | 42 | N26 |
| 1 hr. | 46.5 | N26 |
| 2 hr. | 66.5 | N36 |
| 4 hr. | 70.5 | N36 |
| 5 hr. | 74 | N36 |
| 6 hr. | 76 | N36 |
| 8 hr. | 79.5 | N19 |
| 12 hr. | 107.5 | N19 |
| 18 hr. | 108 | N19 |
| 24 hr. | 108 | N19 |
| 48 hr. | 131.5 | N14, N45 |

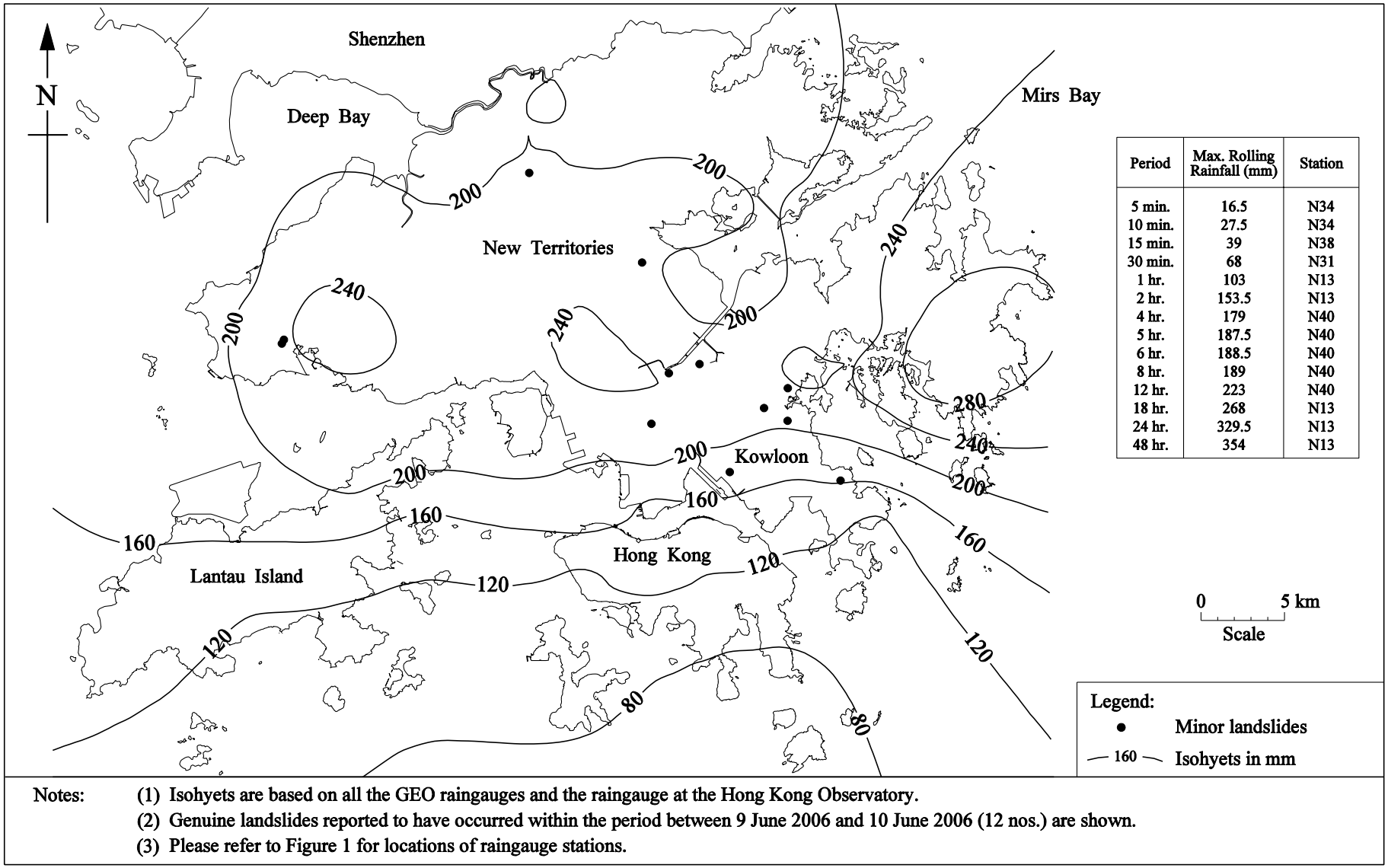
Figure 10 - Maximum Rolling 24-hour Rainfall Distribution for the Period between 28 May 2006 (00:00) and 29 May 2006 (24:00) and Locations of Landslides




| Period | Max. Rolling Rainfall (mm) | Station |
|---|---|---|
| 5 min. | 16.5 | N10 |
| 10 min. | 31.5 | N10 |
| 15 min. | 39 | N10 |
| 30 min. | 73 | N14 |
| 1 hr. | 121.5 | N14 |
| 2 hr. | 179 | N23 |
| 4 hr. | 205.5 | N14 |
| 5 hr. | 213.5 | N14 |
| 6 hr. | 241.5 | N38 |
| 8 hr. | 264.5 | N38 |
| 12 hr. | 275 | N03 |
| 18 hr. | 287 | N40 |
| 24 hr. | 292 | N40 |
| 48 hr. | 350 | N38, N40 |

Notes:
(1) Isohyets are based on all the GEO raingauges and the raingauge at the Hong Kong Observatory.
(2) Genuine landslides reported to have occurred within the period between 2 June 2006 and 3 June 2006 (12 nos.) are shown.
(3) Please refer to Figure 1 for locations of raingauge stations.

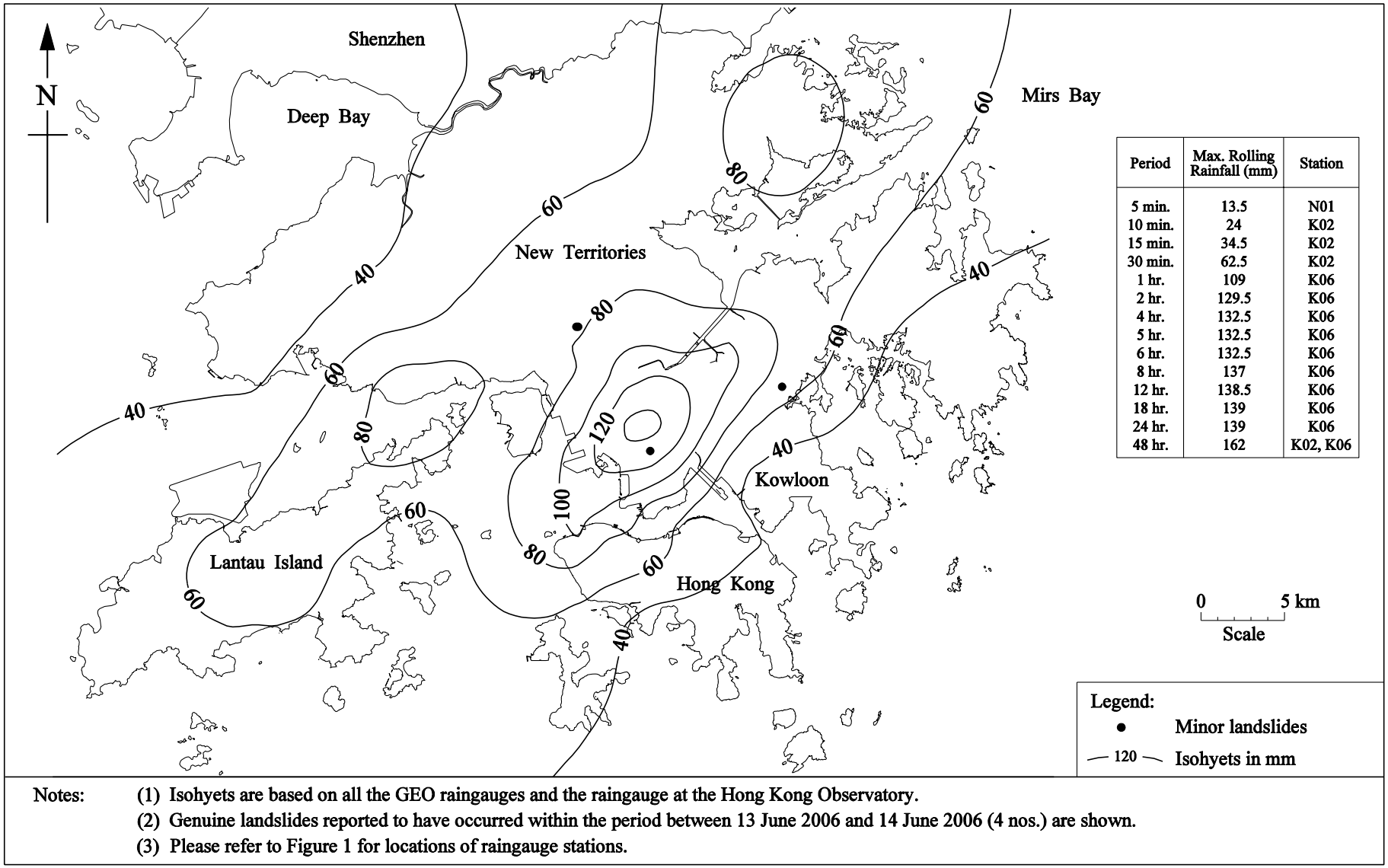
Figure 11 - Maximum Rolling 24-hour Rainfall Distribution for the Period between 2 June 2006 (00:00) and 3 June 2006 (24:00) and Locations of Landslides




| Period | Max. Rolling Rainfall (mm) | Station |
|---|---|---|
| 5 min. | 16.5 | N34 |
| 10 min. | 27.5 | N34 |
| 15 min. | 39 | N38 |
| 30 min. | 68 | N31 |
| 1 hr. | 103 | N13 |
| 2 hr. | 153.5 | N13 |
| 4 hr. | 179 | N40 |
| 5 hr. | 187.5 | N40 |
| 6 hr. | 188.5 | N40 |
| 8 hr. | 189 | N40 |
| 12 hr. | 223 | N40 |
| 18 hr. | 268 | N13 |
| 24 hr. | 329.5 | N13 |
| 48 hr. | 354 | N13 |

Notes:
(1) Isohyets are based on all the GEO raingauges and the raingauge at the Hong Kong Observatory.
(2) Genuine landslides reported to have occurred within the period between 9 June 2006 and 10 June 2006 (12 nos.) are shown.
(3) Please refer to Figure 1 for locations of raingauge stations.

Figure 12 - Maximum Rolling 24-hour Rainfall Distribution for the Period between 9 June 2006 (00:00) and 10 June 2006 (24:00) and Locations of Landslides




| Period | Max. Rolling Rainfall (mm) | Station |
|---|---|---|
| 5 min. | 13.5 | N01 |
| 10 min. | 24 | K02 |
| 15 min. | 34.5 | K02 |
| 30 min. | 62.5 | K02 |
| 1 hr. | 109 | K06 |
| 2 hr. | 129.5 | K06 |
| 4 hr. | 132.5 | K06 |
| 5 hr. | 132.5 | K06 |
| 6 hr. | 132.5 | K06 |
| 8 hr. | 137 | K06 |
| 12 hr. | 138.5 | K06 |
| 18 hr. | 139 | K06 |
| 24 hr. | 139 | K06 |
| 48 hr. | 162 | K02, K06 |

Figure 13 - Maximum Rolling 24-hour Rainfall Distribution for the Period between 13 June 2006 (00:00) and 14 June 2006 (24:00) and Locations of Landslides

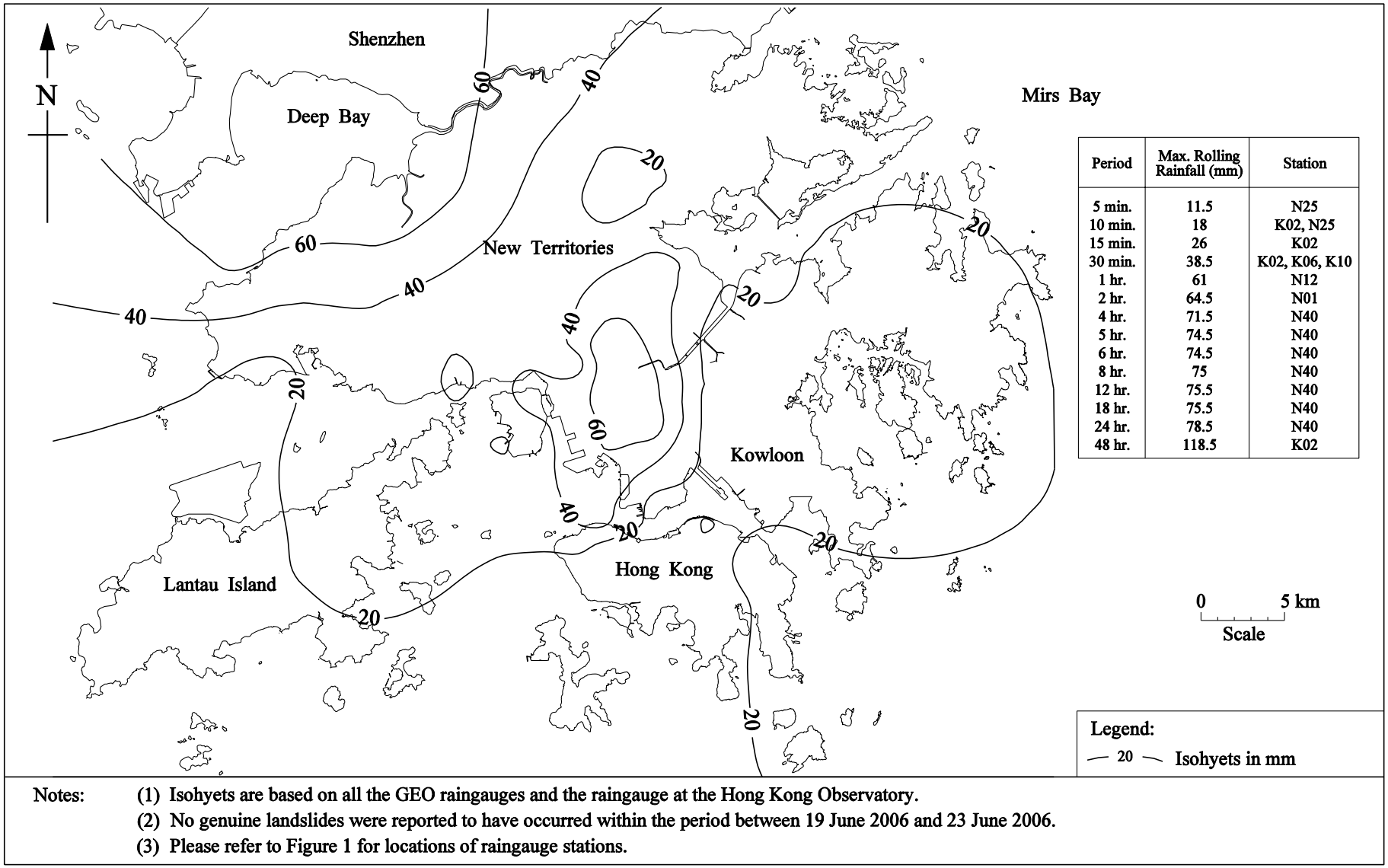
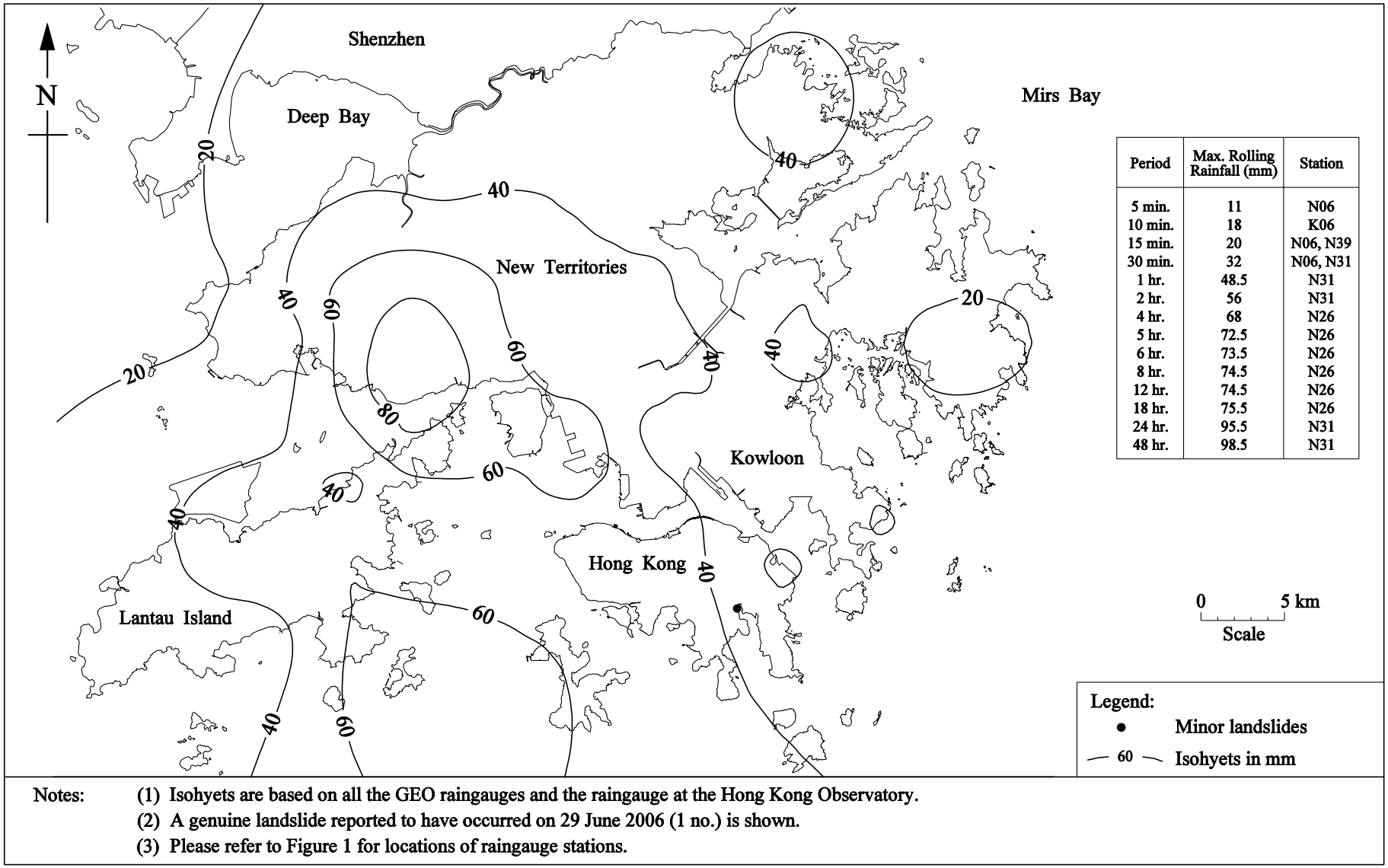


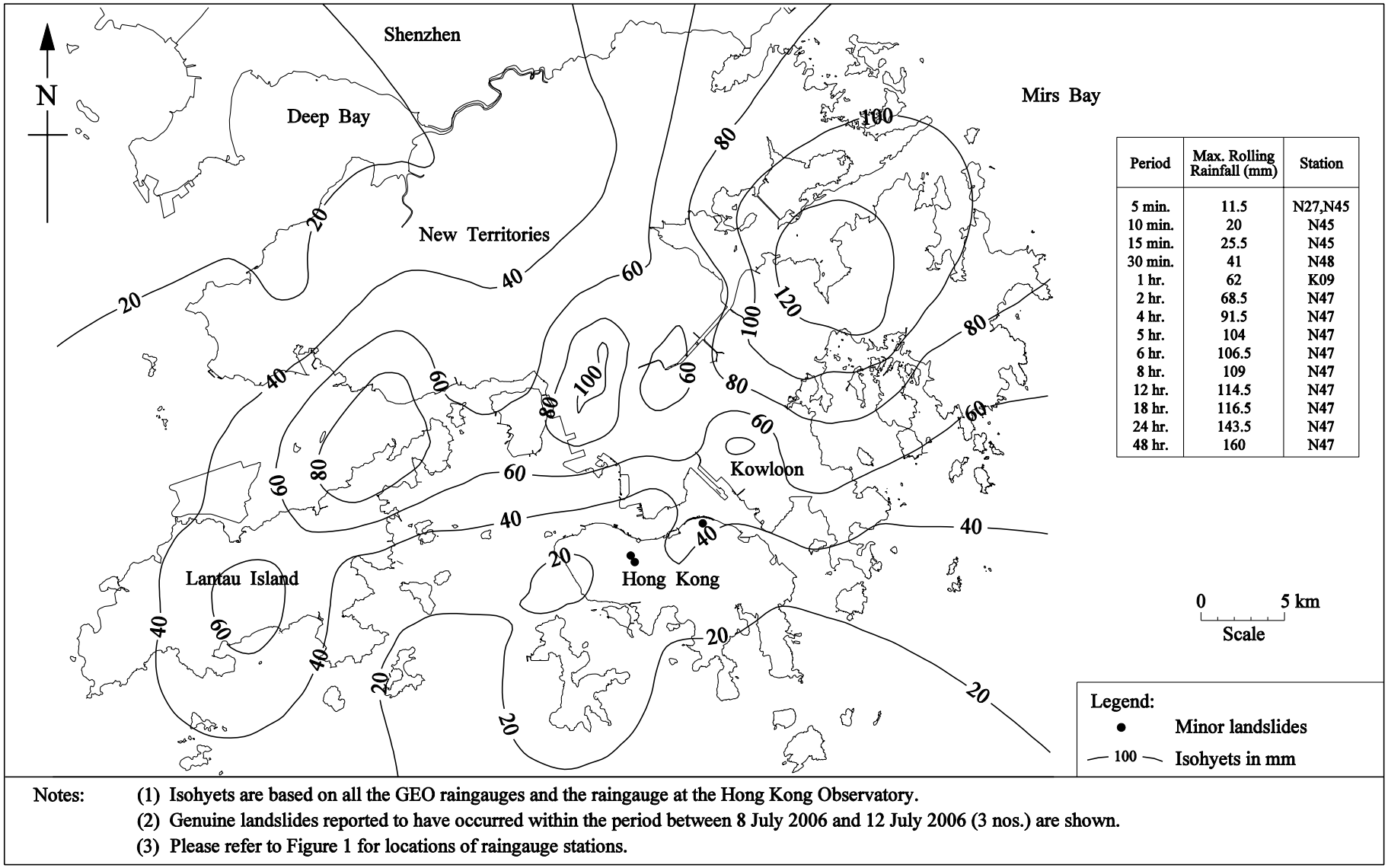

Figure 14 - Maximum Rolling 24-hour Rainfall Distribution for the Period between 19 June 2006 (00:00) and 23 June 2006 (24:00) and Locations of Landslides




| Period | Max. Rolling Rainfall (mm) | Station |
|---|---|---|
| 5 min. | 11 | N06 |
| 10 min. | 18 | K06 |
| 15 min. | 20 | N06, N39 |
| 30 min. | 32 | N06, N31 |
| 1 hr. | 48.5 | N31 |
| 2 hr. | 56 | N31 |
| 4 hr. | 68 | N26 |
| 5 hr. | 72.5 | N26 |
| 6 hr. | 73.5 | N26 |
| 8 hr. | 74.5 | N26 |
| 12 hr. | 74.5 | N26 |
| 18 hr. | 75.5 | N26 |
| 24 hr. | 95.5 | N31 |
| 48 hr. | 98.5 | N31 |

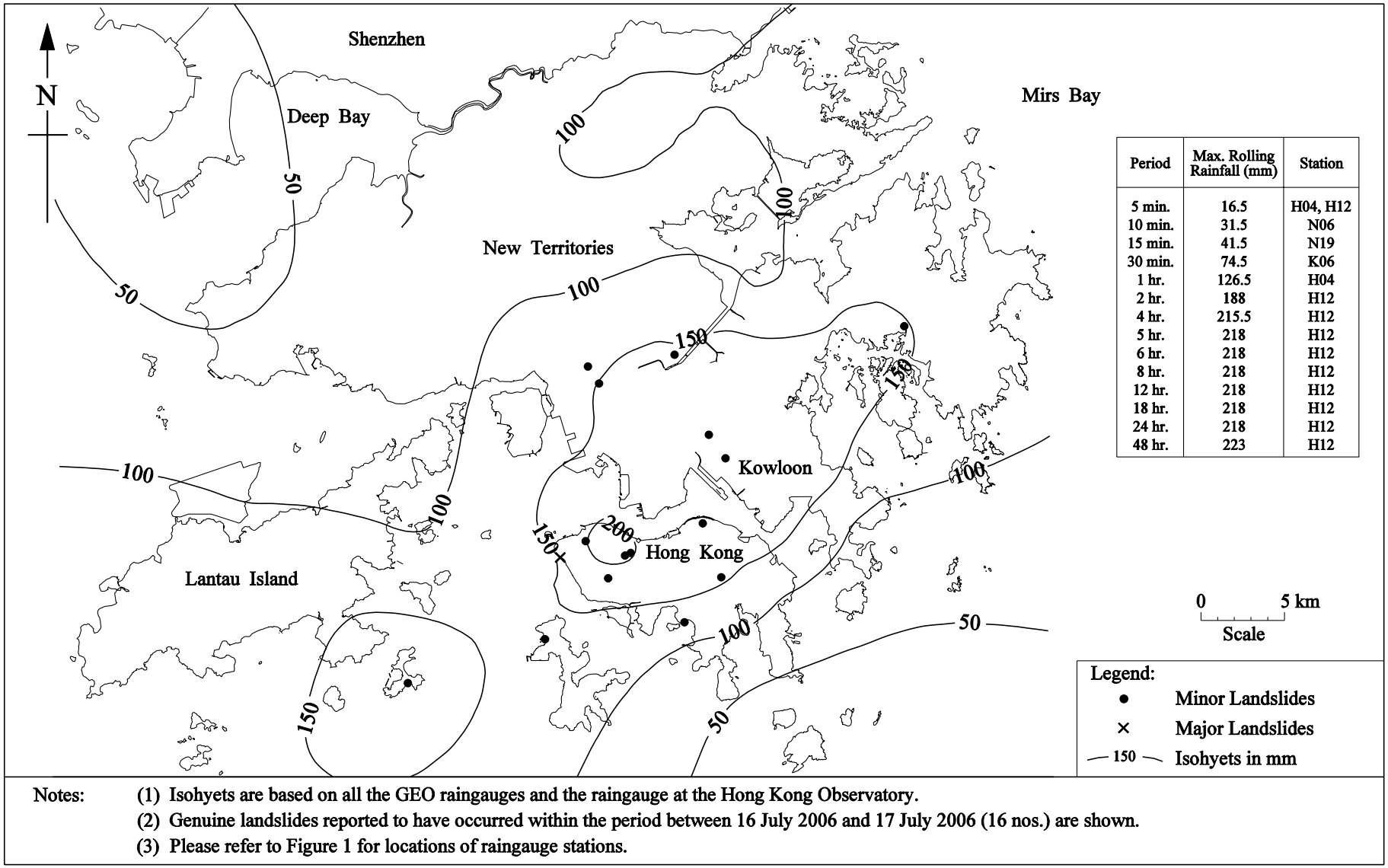
Notes:
(1) Isohyets are based on all the GEO raingauges and the raingauge at the Hong Kong Observatory.
(2) A genuine landslide reported to have occurred on 29 June 2006 (1 no.) is shown.
(3) Please refer to Figure 1 for locations of raingauge stations.

Figure 15 - Maximum Rolling 24-hour Rainfall Distribution for the Period between 00:00 and 24:00 on 29 June 2006 and Locations of Landslides




| Period | Max. Rolling Rainfall (mm) | Station |
|---|---|---|
| 5 min. | 11.5 | N27,N45 |
| 10 min. | 20 | N45 |
| 15 min. | 25.5 | N45 |
| 30 min. | 41 | N48 |
| 1 hr. | 62 | K09 |
| 2 hr. | 68.5 | N47 |
| 4 hr. | 91.5 | N47 |
| 5 hr. | 104 | N47 |
| 6 hr. | 106.5 | N47 |
| 8 hr. | 109 | N47 |
| 12 hr. | 114.5 | N47 |
| 18 hr. | 116.5 | N47 |
| 24 hr. | 143.5 | N47 |
| 48 hr. | 160 | N47 |

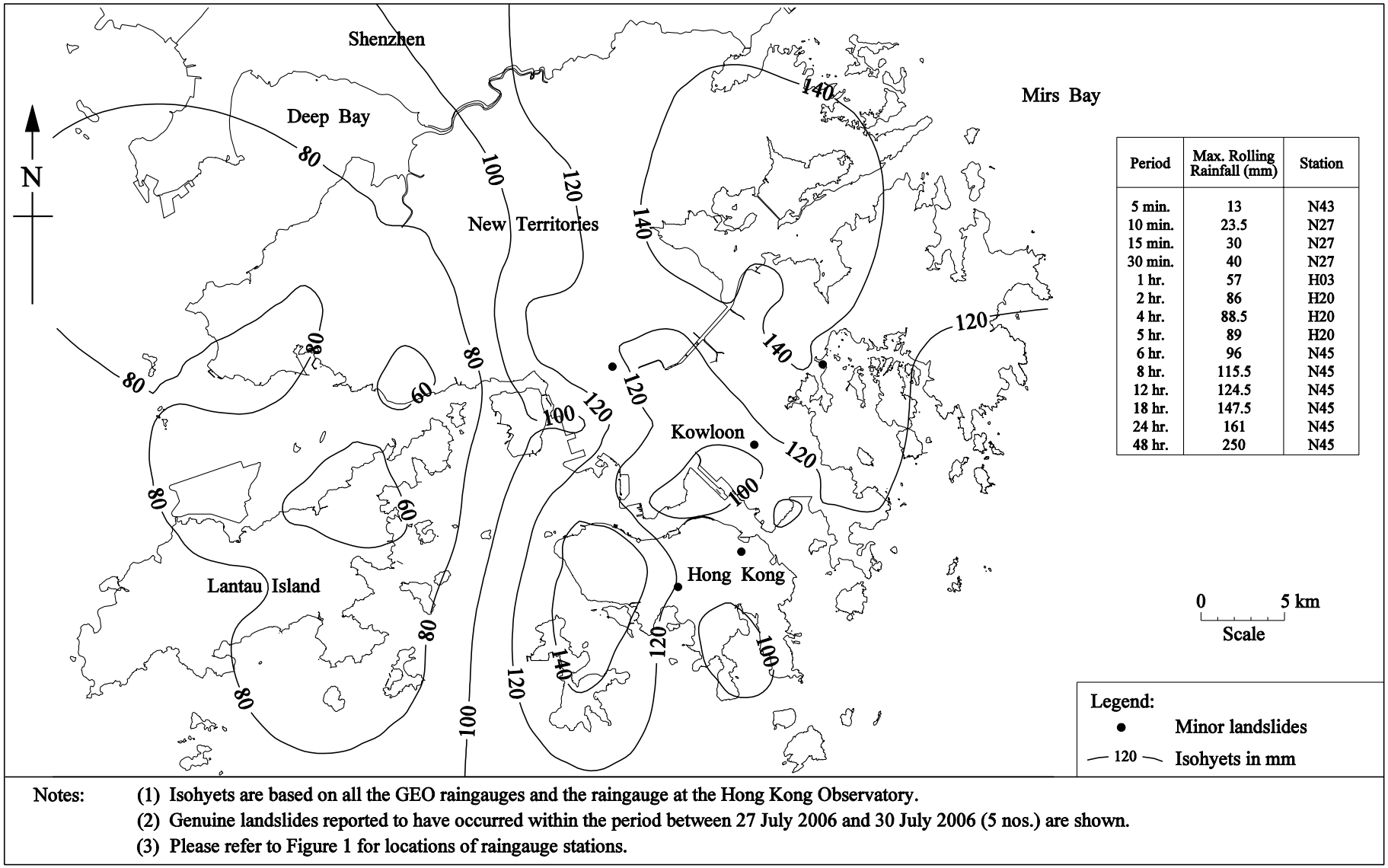
Figure 16 - Maximum Rolling 24-hour Rainfall Distribution for the Period between 8 July 2006 (00:00) and 12 July 2006 (24:00) and Locations of Landslides




| Period | Max. Rolling Rainfall (mm) | Station |
|---|---|---|
| 5 min. | 16.5 | H04, H12 |
| 10 min. | 31.5 | N06 |
| 15 min. | 41.5 | N19 |
| 30 min. | 74.5 | K06 |
| 1 hr. | 126.5 | H04 |
| 2 hr. | 188 | H12 |
| 4 hr. | 215.5 | H12 |
| 5 hr. | 218 | H12 |
| 6 hr. | 218 | H12 |
| 8 hr. | 218 | H12 |
| 12 hr. | 218 | H12 |
| 18 hr. | 218 | H12 |
| 24 hr. | 218 | H12 |
| 48 hr. | 223 | H12 |

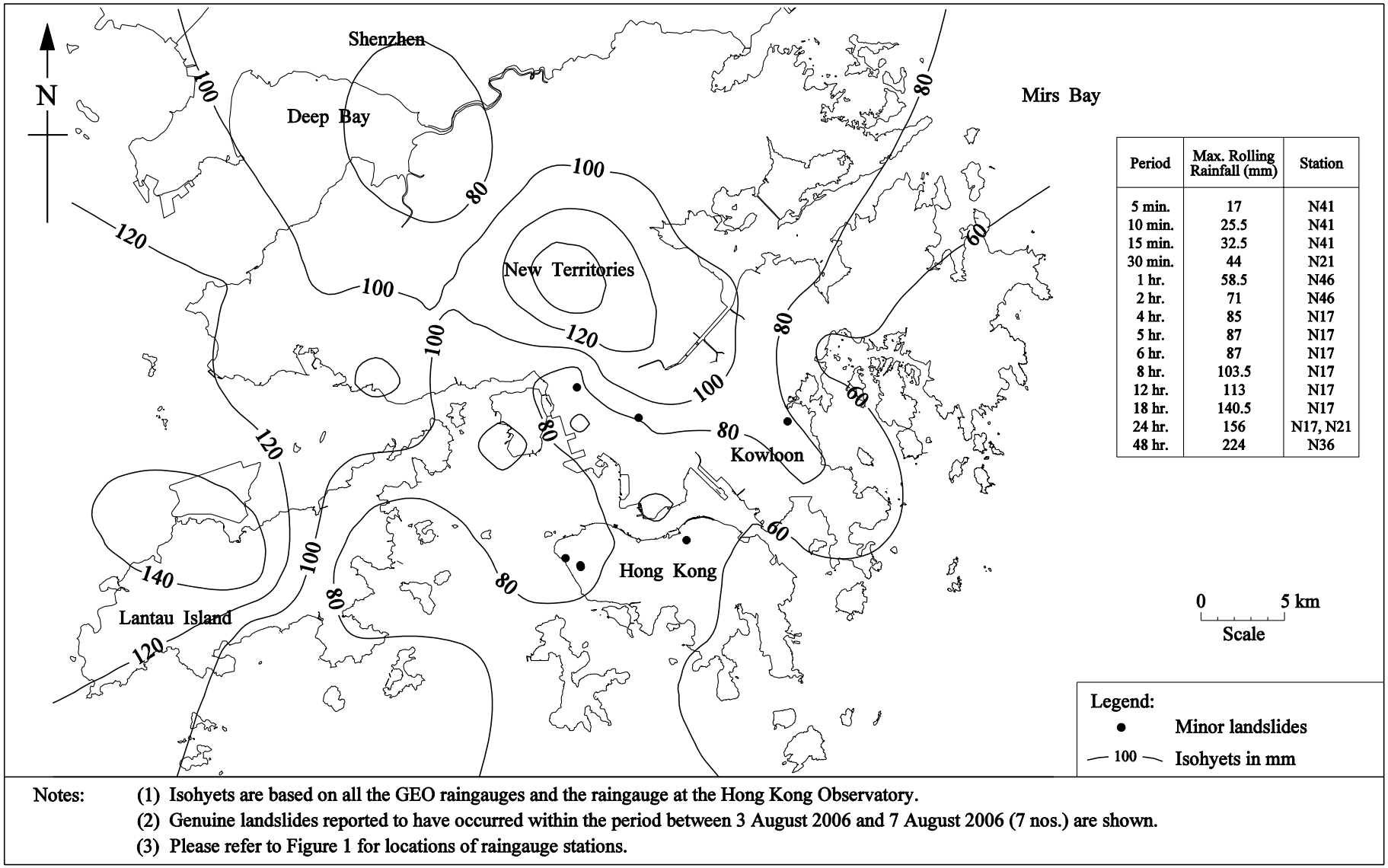
Notes:
(1) Isohyets are based on all the GEO raingauges and the raingauge at the Hong Kong Observatory.
(2) Genuine landslides reported to have occurred within the period between 16 July 2006 and 17 July 2006 (16 nos.) are shown.
(3) Please refer to Figure 1 for locations of raingauge stations.

Figure 17 - Maximum Rolling 24-hour Rainfall Distribution for the Period between 16 July 2006 (00:00) and 17 July 2006 (24:00) and Locations of Landslides




| Period | Max. Rolling Rainfall (mm) | Station |
|---|---|---|
| 5 min. | 13 | N43 |
| 10 min. | 23.5 | N27 |
| 15 min. | 30 | N27 |
| 30 min. | 40 | N27 |
| 1 hr. | 57 | H03 |
| 2 hr. | 86 | H20 |
| 4 hr. | 88.5 | H20 |
| 5 hr. | 89 | H20 |
| 6 hr. | 96 | N45 |
| 8 hr. | 115.5 | N45 |
| 12 hr. | 124.5 | N45 |
| 18 hr. | 147.5 | N45 |
| 24 hr. | 161 | N45 |
| 48 hr. | 250 | N45 |

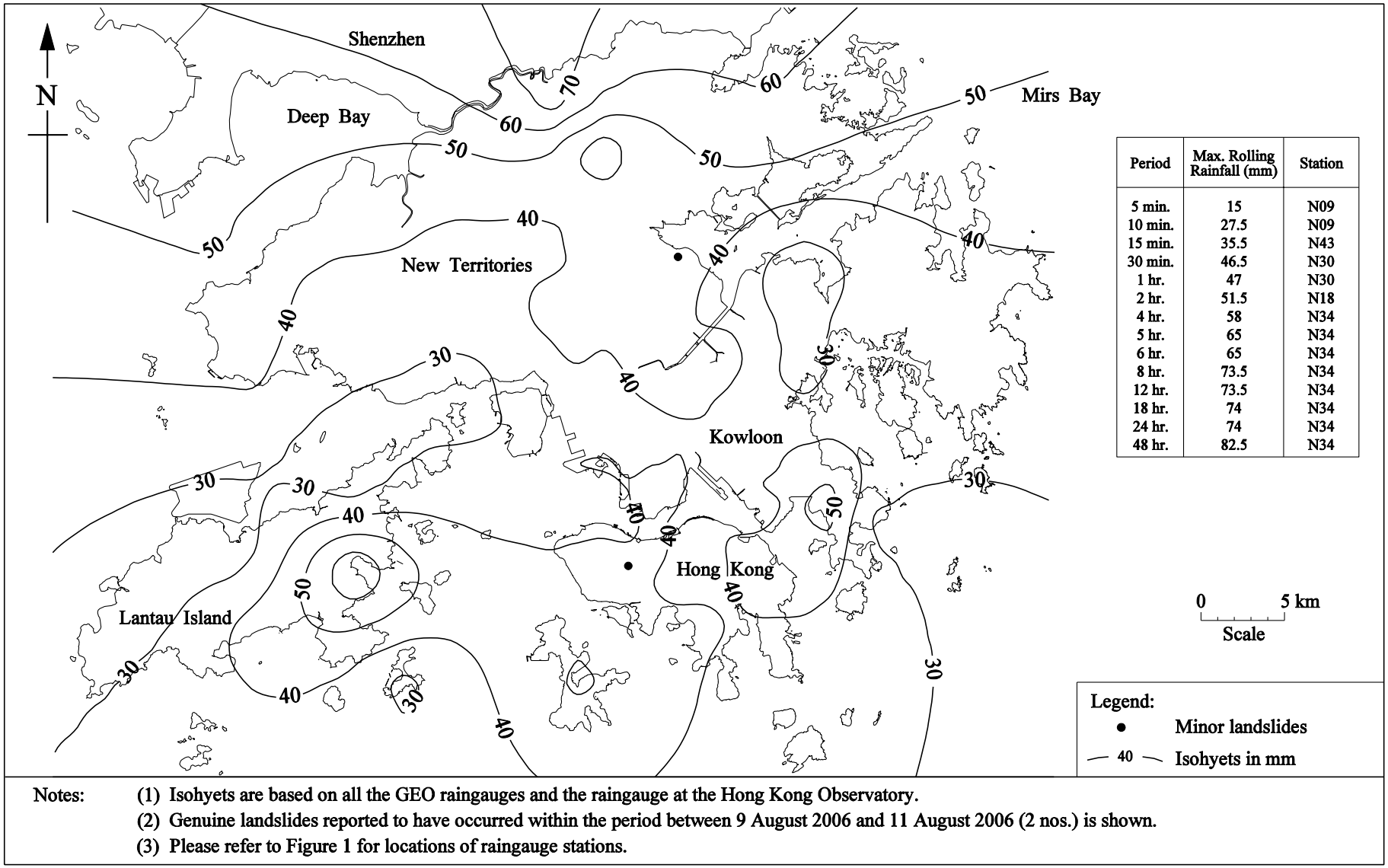
Figure 18 - Maximum Rolling 24-hour Rainfall Distribution for the Period between 27 July 2006 (00:00) and 30 July 2006 (24:00) and Locations of Landslides




| Period | Max. Rolling Rainfall (mm) | Station |
|---|---|---|
| 5 min. | 17 | N41 |
| 10 min. | 25.5 | N41 |
| 15 min. | 32.5 | N41 |
| 30 min. | 44 | N21 |
| 1 hr. | 58.5 | N46 |
| 2 hr. | 71 | N46 |
| 4 hr. | 85 | N17 |
| 5 hr. | 87 | N17 |
| 6 hr. | 87 | N17 |
| 8 hr. | 103.5 | N17 |
| 12 hr. | 113 | N17 |
| 18 hr. | 140.5 | N17 |
| 24 hr. | 156 | N17, N21 |
| 48 hr. | 224 | N36 |

Notes:
(1) Isohyets are based on all the GEO raingauges and the raingauge at the Hong Kong Observatory.
(2) Genuine landslides reported to have occurred within the period between 3 August 2006 and 7 August 2006 (7 nos.) are shown.
(3) Please refer to Figure 1 for locations of raingauge stations.

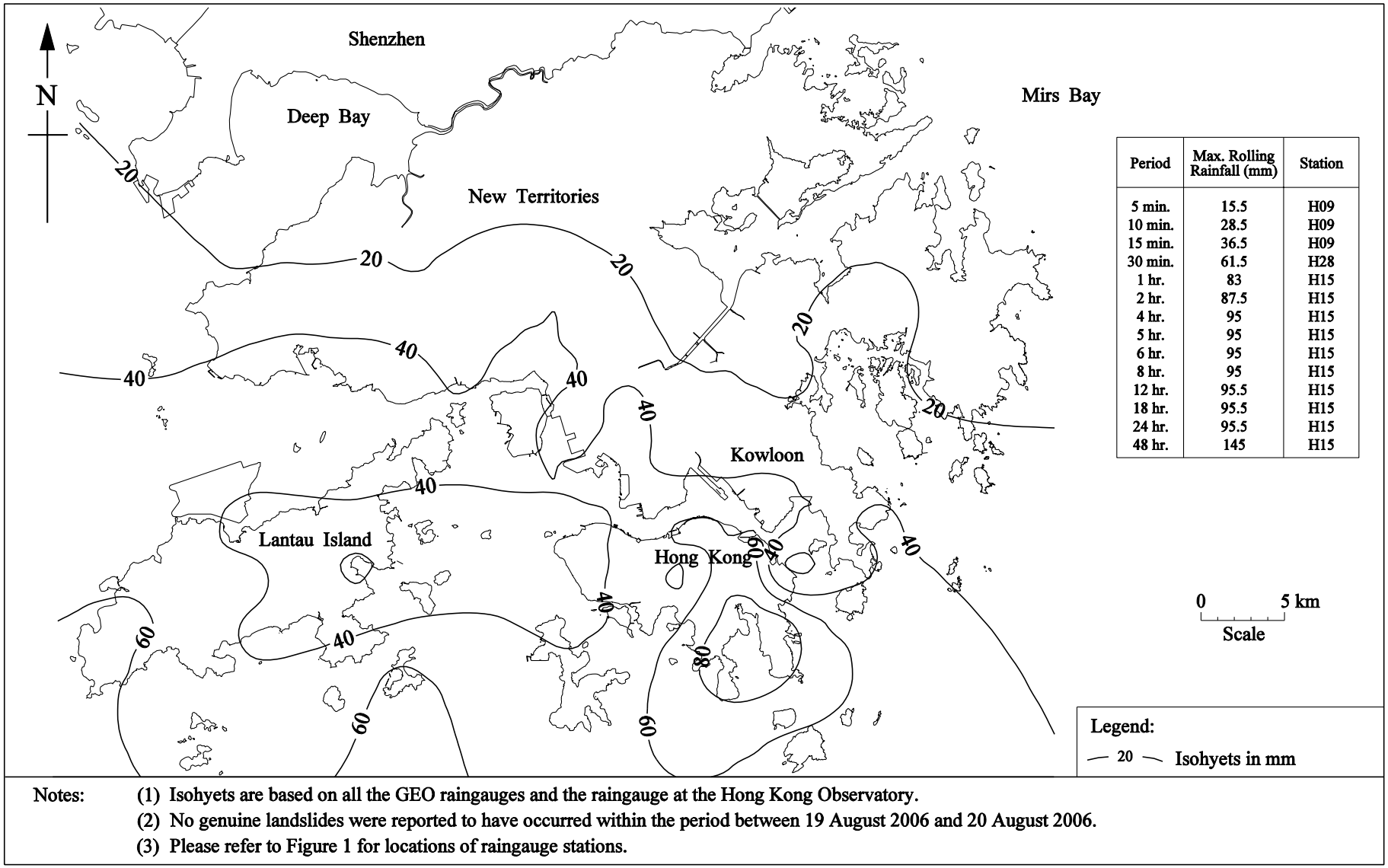
Figure 19 - Maximum Rolling 24-hour Rainfall Distribution for the Period between 3 August 2006 (00:00) and 7 August 2006 (24:00) and Locations of Landslides




| Period | Max. Rolling Rainfall (mm) | Station |
|---|---|---|
| 5 min. | 15 | N09 |
| 10 min. | 27.5 | N09 |
| 15 min. | 35.5 | N43 |
| 30 min. | 46.5 | N30 |
| 1 hr. | 47 | N30 |
| 2 hr. | 51.5 | N18 |
| 4 hr. | 58 | N34 |
| 5 hr. | 65 | N34 |
| 6 hr. | 65 | N34 |
| 8 hr. | 73.5 | N34 |
| 12 hr. | 73.5 | N34 |
| 18 hr. | 74 | N34 |
| 24 hr. | 74 | N34 |
| 48 hr. | 82.5 | N34 |

Notes:
(1) Isohyets are based on all the GEO raingauges and the raingauge at the Hong Kong Observatory.
(2) Genuine landslides reported to have occurred within the period between 9 August 2006 and 11 August 2006 (2 nos.) is shown.
(3) Please refer to Figure 1 for locations of raingauge stations.

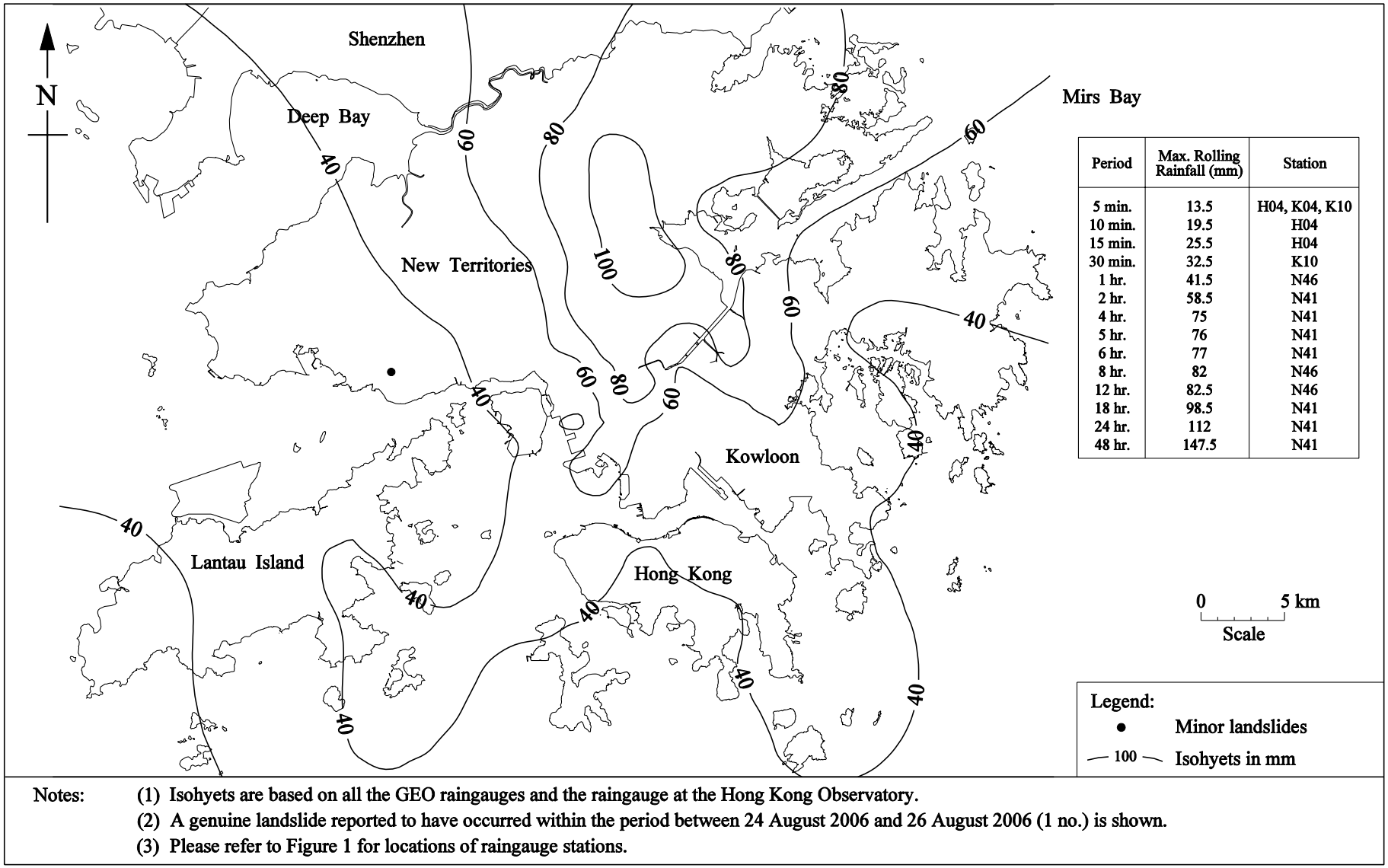
Figure 20 - Maximum Rolling 24-hour Rainfall Distribution for the Period between 9 August 2006 (00:00) and 11 August 2006 (24:00) and Locations of Landslides




| Period | Max. Rolling Rainfall (mm) | Station |
|---|---|---|
| 5 min. | 15.5 | H09 |
| 10 min. | 28.5 | H09 |
| 15 min. | 36.5 | H09 |
| 30 min. | 61.5 | H28 |
| 1 hr. | 83 | H15 |
| 2 hr. | 87.5 | H15 |
| 4 hr. | 95 | H15 |
| 5 hr. | 95 | H15 |
| 6 hr. | 95 | H15 |
| 8 hr. | 95 | H15 |
| 12 hr. | 95.5 | H15 |
| 18 hr. | 95.5 | H15 |
| 24 hr. | 95.5 | H15 |
| 48 hr. | 145 | H15 |

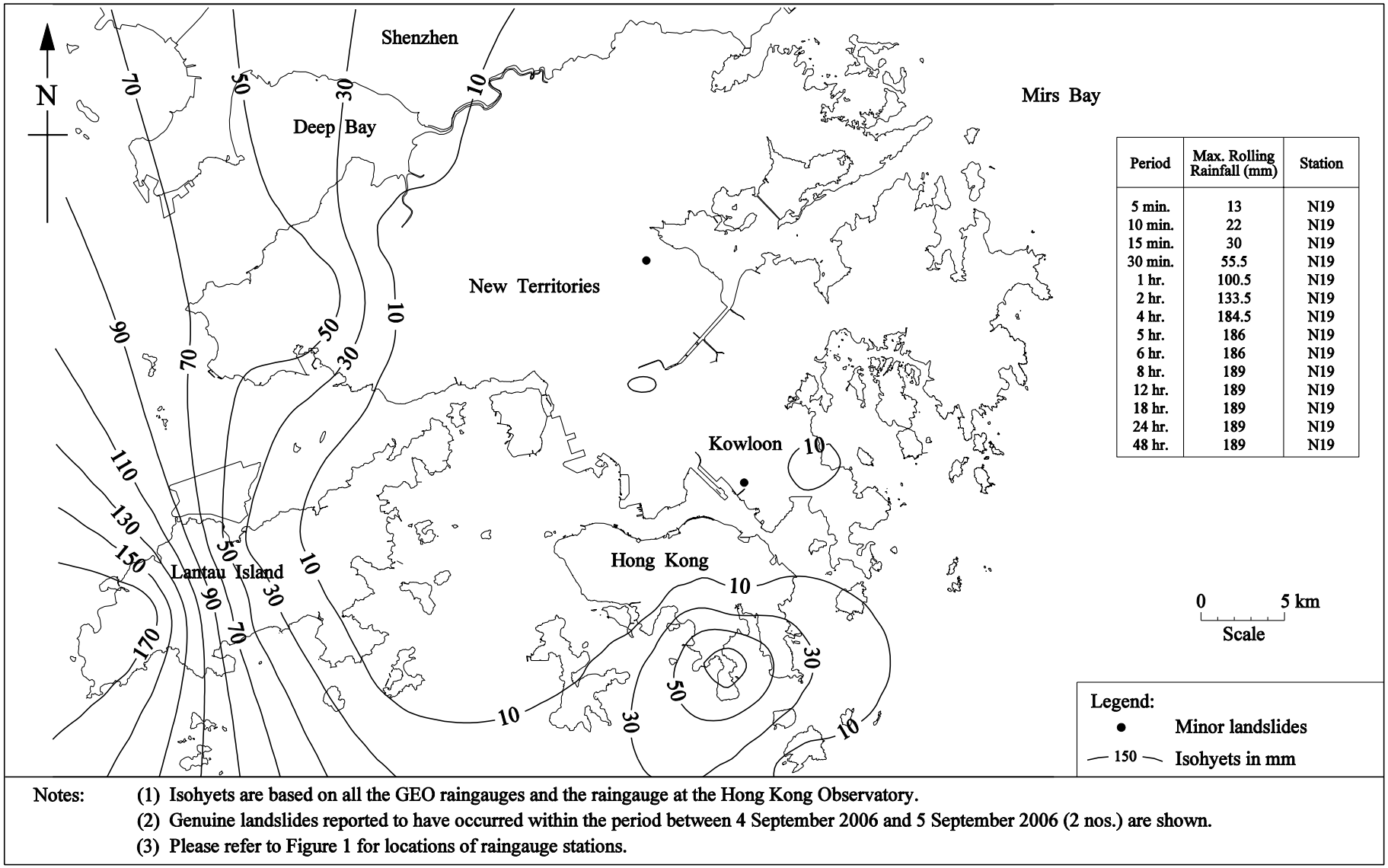
Notes:
(1) Isohyets are based on all the GEO raingauges and the raingauge at the Hong Kong Observatory.
(2) No genuine landslides were reported to have occurred within the period between 19 August 2006 and 20 August 2006.
(3) Please refer to Figure 1 for locations of raingauge stations.

Figure 21 - Maximum Rolling 24-hour Rainfall Distribution for the Period between 19 August 2006 (00:00) and 20 August 2006 (24:00) and Locations of Landslides




| Period | Max. Rolling Rainfall (mm) | Station |
|---|---|---|
| 5 min. | 13.5 | H04, K04, K10 |
| 10 min. | 19.5 | H04 |
| 15 min. | 25.5 | H04 |
| 30 min. | 32.5 | K10 |
| 1 hr. | 41.5 | N46 |
| 2 hr. | 58.5 | N41 |
| 4 hr. | 75 | N41 |
| 5 hr. | 76 | N41 |
| 6 hr. | 77 | N41 |
| 8 hr. | 82 | N46 |
| 12 hr. | 82.5 | N46 |
| 18 hr. | 98.5 | N41 |
| 24 hr. | 112 | N41 |
| 48 hr. | 147.5 | N41 |

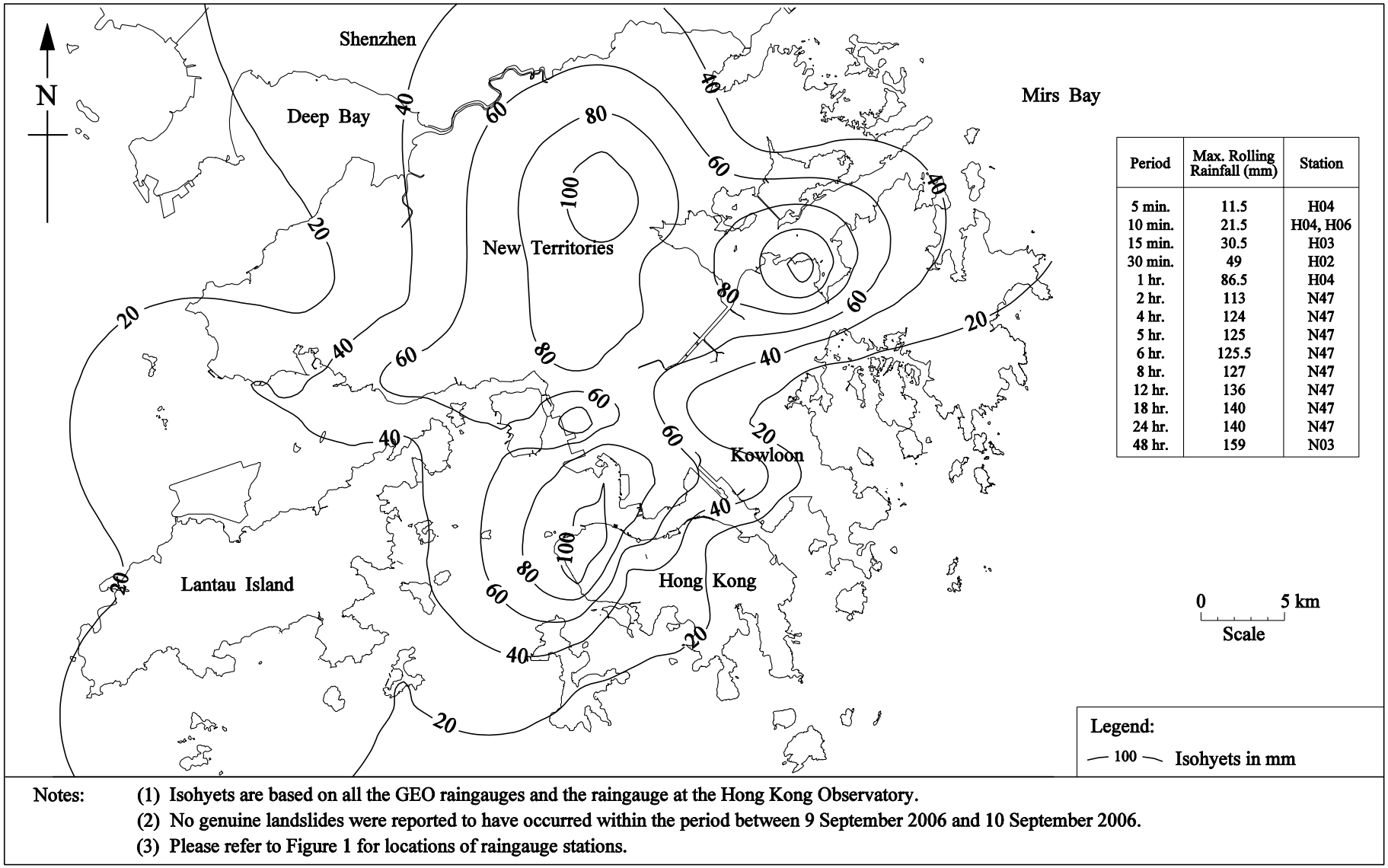
Figure 22 - Maximum Rolling 24-hour Rainfall Distribution for the Period between 24 August 2006 (00:00) and 26 August 2006 (24:00) and Locations of Landslides




| Period | Max. Rolling Rainfall (mm) | Station |
|---|---|---|
| 5 min. | 13 | N19 |
| 10 min. | 22 | N19 |
| 15 min. | 30 | N19 |
| 30 min. | 55.5 | N19 |
| 1 hr. | 100.5 | N19 |
| 2 hr. | 133.5 | N19 |
| 4 hr. | 184.5 | N19 |
| 5 hr. | 186 | N19 |
| 6 hr. | 186 | N19 |
| 8 hr. | 189 | N19 |
| 12 hr. | 189 | N19 |
| 18 hr. | 189 | N19 |
| 24 hr. | 189 | N19 |
| 48 hr. | 189 | N19 |

Notes:
(1) Isohyets are based on all the GEO raingauges and the raingauge at the Hong Kong Observatory.
(2) Genuine landslides reported to have occurred within the period between 4 September 2006 and 5 September 2006 (2 nos.) are shown.
(3) Please refer to Figure 1 for locations of raingauge stations.

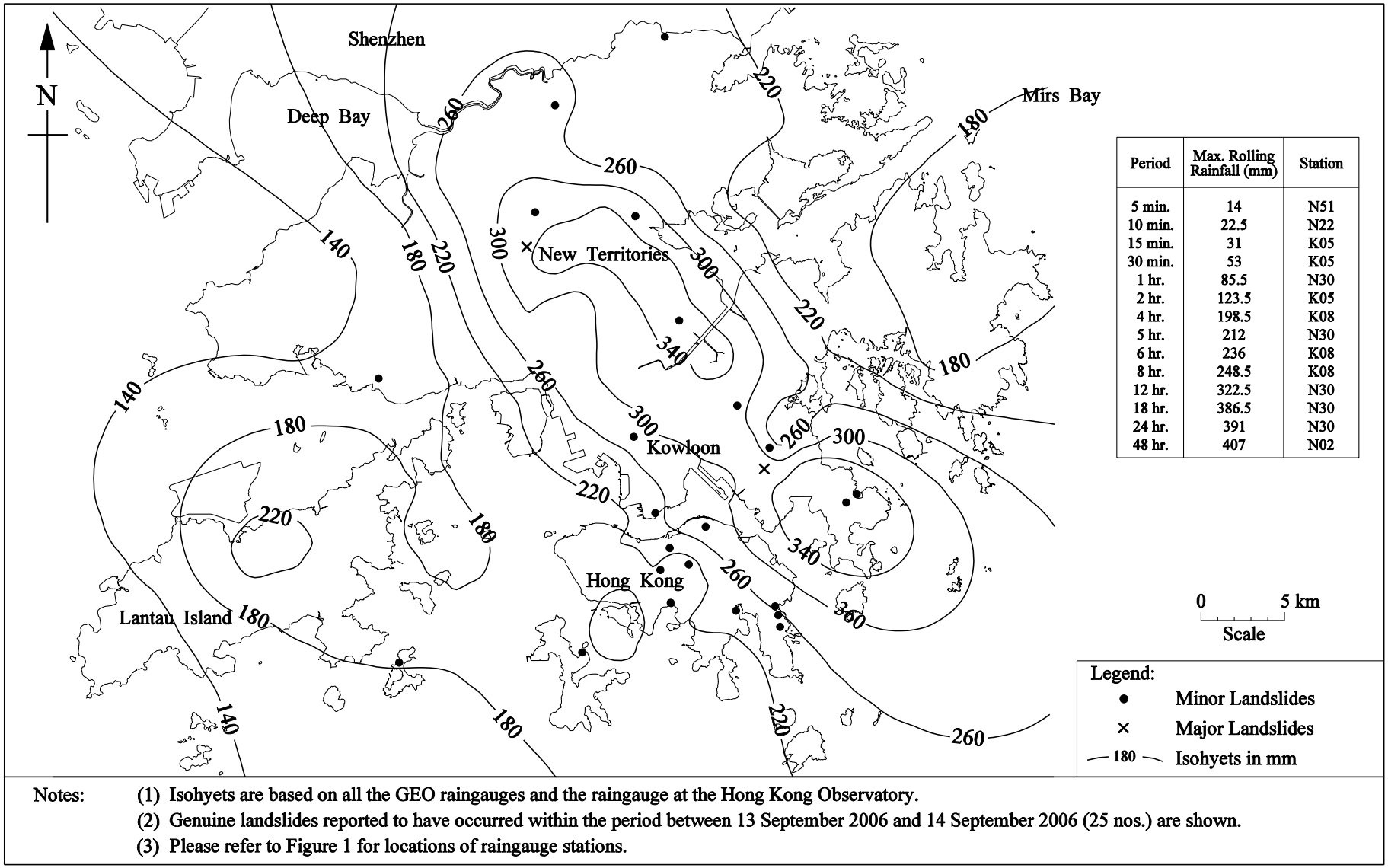
Figure 23 - Maximum Rolling 24-hour Rainfall Distribution for the Period between 4 September 2006 (00:00) and 5 September 2006 (24:00) and Locations of Landslides




| Period | Max. Rolling Rainfall (mm) | Station |
|---|---|---|
| 5 min. | 11.5 | H04 |
| 10 min. | 21.5 | H04, H06 |
| 15 min. | 30.5 | H03 |
| 30 min. | 49 | H02 |
| 1 hr. | 86.5 | H04 |
| 2 hr. | 113 | N47 |
| 4 hr. | 124 | N47 |
| 5 hr. | 125 | N47 |
| 6 hr. | 125.5 | N47 |
| 8 hr. | 127 | N47 |
| 12 hr. | 136 | N47 |
| 18 hr. | 140 | N47 |
| 24 hr. | 140 | N47 |
| 48 hr. | 159 | N03 |

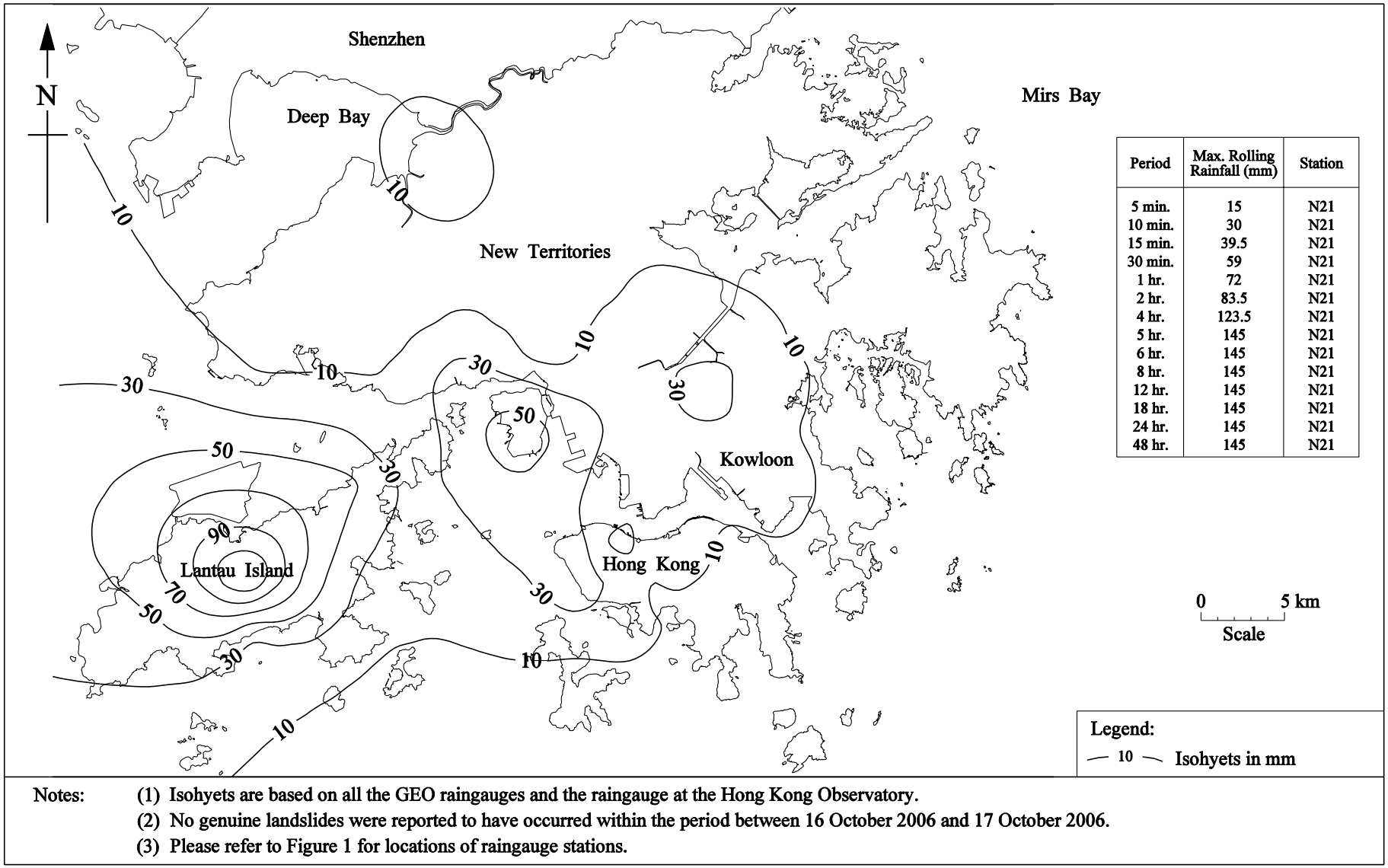
Notes:
(1) Isohyets are based on all the GEO raingauges and the raingauge at the Hong Kong Observatory.
(2) No genuine landslides were reported to have occurred within the period between 9 September 2006 and 10 September 2006.
(3) Please refer to Figure 1 for locations of raingauge stations.

Figure 24 - Maximum Rolling 24-hour Rainfall Distribution for the Period between 9 September 2006 (00:00) and 10 September 2006 (24:00) and Locations of Landslides




| Period | Max. Rolling Rainfall (mm) | Station |
|---|---|---|
| 5 min. | 14 | N51 |
| 10 min. | 22.5 | N22 |
| 15 min. | 31 | K05 |
| 30 min. | 53 | K05 |
| 1 hr. | 85.5 | N30 |
| 2 hr. | 123.5 | K05 |
| 4 hr. | 198.5 | K08 |
| 5 hr. | 212 | N30 |
| 6 hr. | 236 | K08 |
| 8 hr. | 248.5 | K08 |
| 12 hr. | 322.5 | N30 |
| 18 hr. | 386.5 | N30 |
| 24 hr. | 391 | N30 |
| 48 hr. | 407 | N02 |

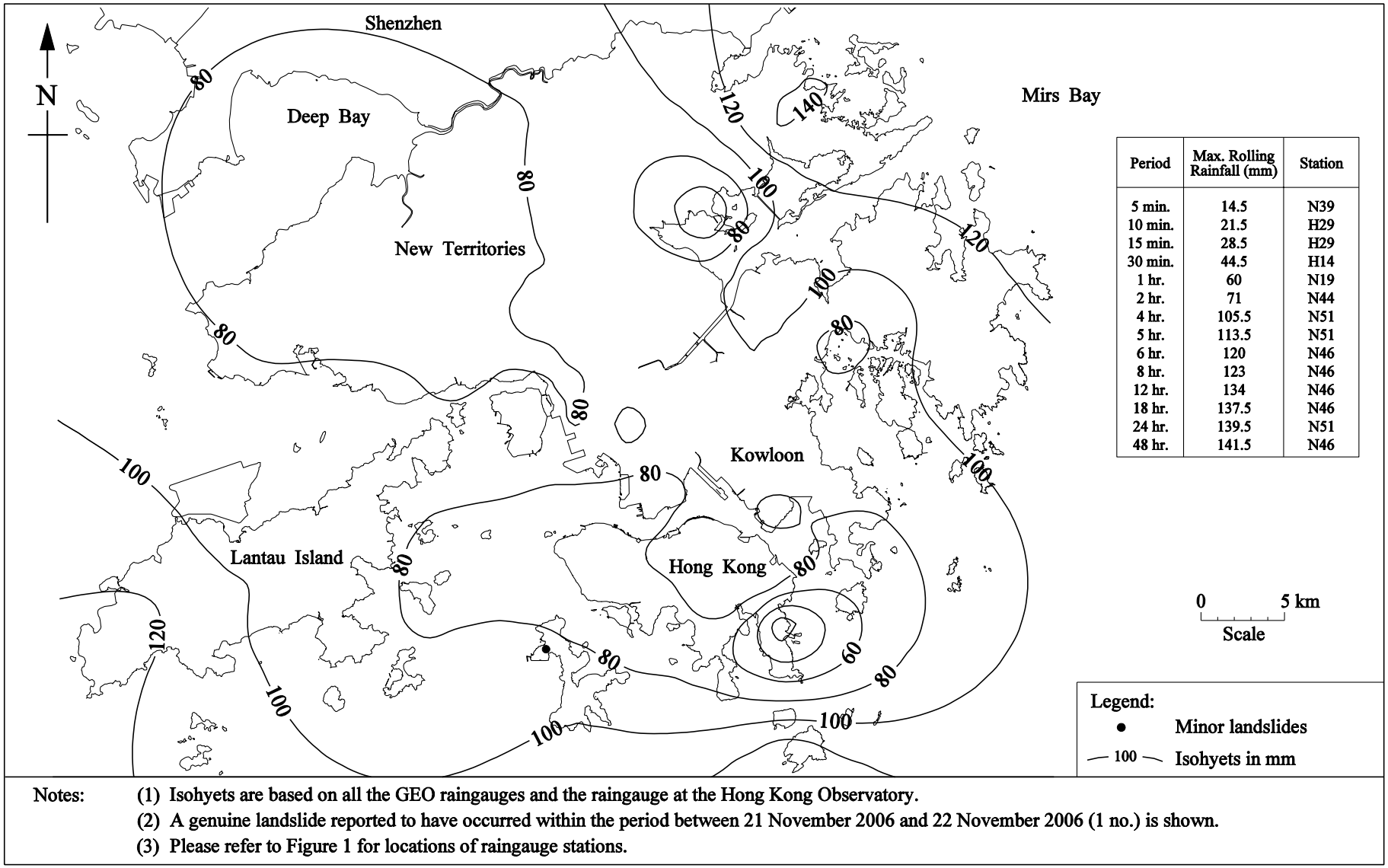
Figure 25 - Maximum Rolling 24-hour Rainfall Distribution for the Period between 13 September 2006 (00:00) and 14 September 2006 (24:00) and Locations of Landslides




| Period | Max. Rolling Rainfall (mm) | Station |
|---|---|---|
| 5 min. | 15 | N21 |
| 10 min. | 30 | N21 |
| 15 min. | 39.5 | N21 |
| 30 min. | 59 | N21 |
| 1 hr. | 72 | N21 |
| 2 hr. | 83.5 | N21 |
| 4 hr. | 123.5 | N21 |
| 5 hr. | 145 | N21 |
| 6 hr. | 145 | N21 |
| 8 hr. | 145 | N21 |
| 12 hr. | 145 | N21 |
| 18 hr. | 145 | N21 |
| 24 hr. | 145 | N21 |
| 48 hr. | 145 | N21 |

Notes:
(1) Isohyets are based on all the GEO raingauges and the raingauge at the Hong Kong Observatory.
(2) No genuine landslides were reported to have occurred within the period between 16 October 2006 and 17 October 2006.
(3) Please refer to Figure 1 for locations of raingauge stations.

Figure 26 - Maximum Rolling 24-hour Rainfall Distribution for the Period between 16 October 2006 (00:00) and 17 October 2006 (24:00) and Locations of Landslides




| Period | Max. Rolling Rainfall (mm) | Station |
|---|---|---|
| 5 min. | 14.5 | N39 |
| 10 min. | 21.5 | H29 |
| 15 min. | 28.5 | H29 |
| 30 min. | 44.5 | H14 |
| 1 hr. | 60 | N19 |
| 2 hr. | 71 | N44 |
| 4 hr. | 105.5 | N51 |
| 5 hr. | 113.5 | N51 |
| 6 hr. | 120 | N46 |
| 8 hr. | 123 | N46 |
| 12 hr. | 134 | N46 |
| 18 hr. | 137.5 | N46 |
| 24 hr. | 139.5 | N51 |
| 48 hr. | 141.5 | N46 |

Notes:
(1) Isohyets are based on all the GEO raingauges and the raingauge at the Hong Kong Observatory.
(2) A genuine landslide reported to have occurred within the period between 21 November 2006 and 22 November 2006 (1 no.) is shown.
(3) Please refer to Figure 1 for locations of raingauge stations.

Figure 27 - Maximum Rolling 24-hour Rainfall Distribution for the Period between 21 November 2006 (00:00) and 22 November 2006 (24:00) and Locations of Landslides



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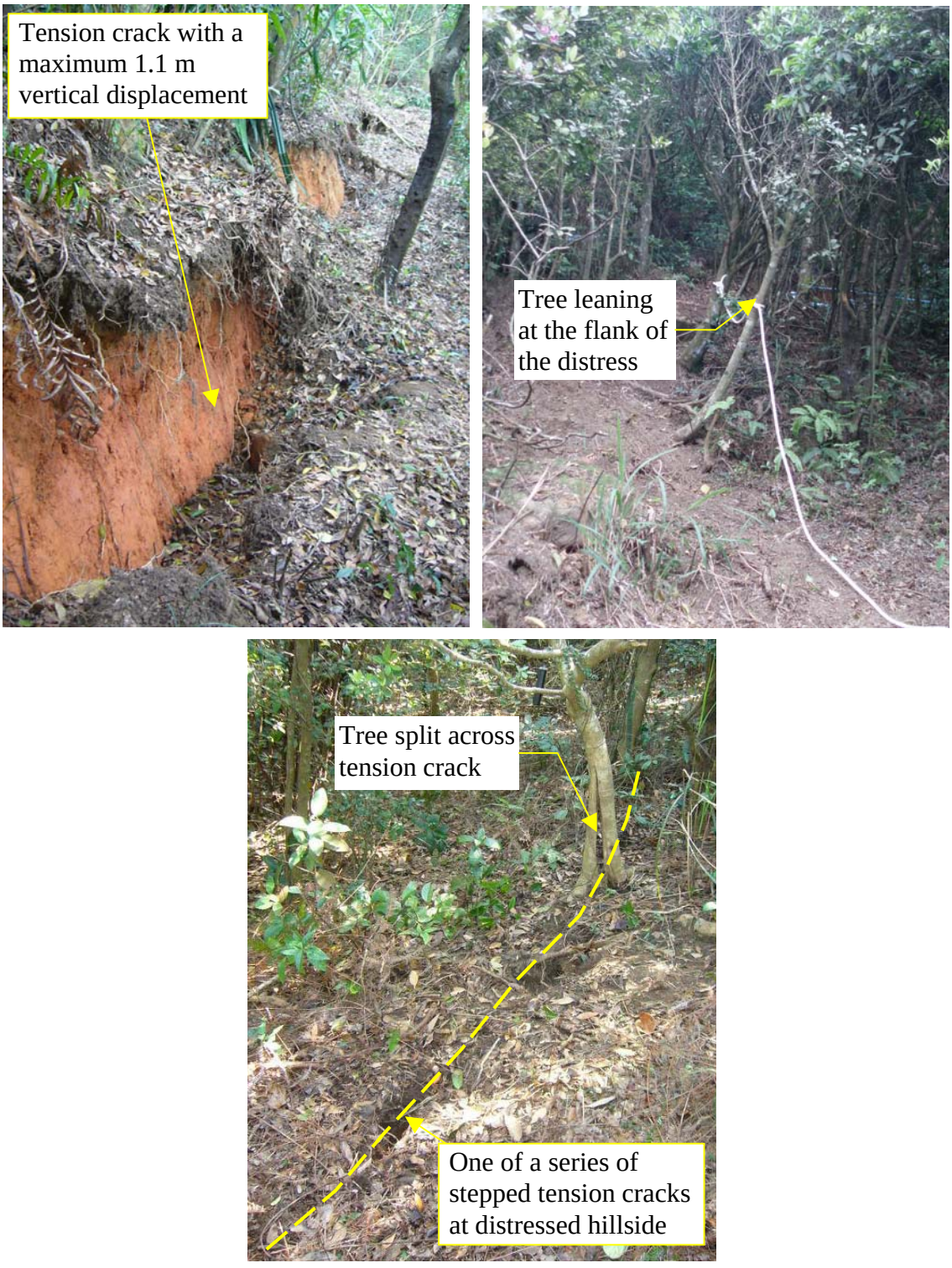


Description: Significant signs of distress were identified on the natural hillside above the source of the August 2005 landslide at Kwun Yam Shan, Sha Tin.

Plate 1 - Significant Signs of Distress on the Natural Hillsides at Kwun Yam Shan, North of Tate's Ridge (Incident No. LI2006/03/2001)

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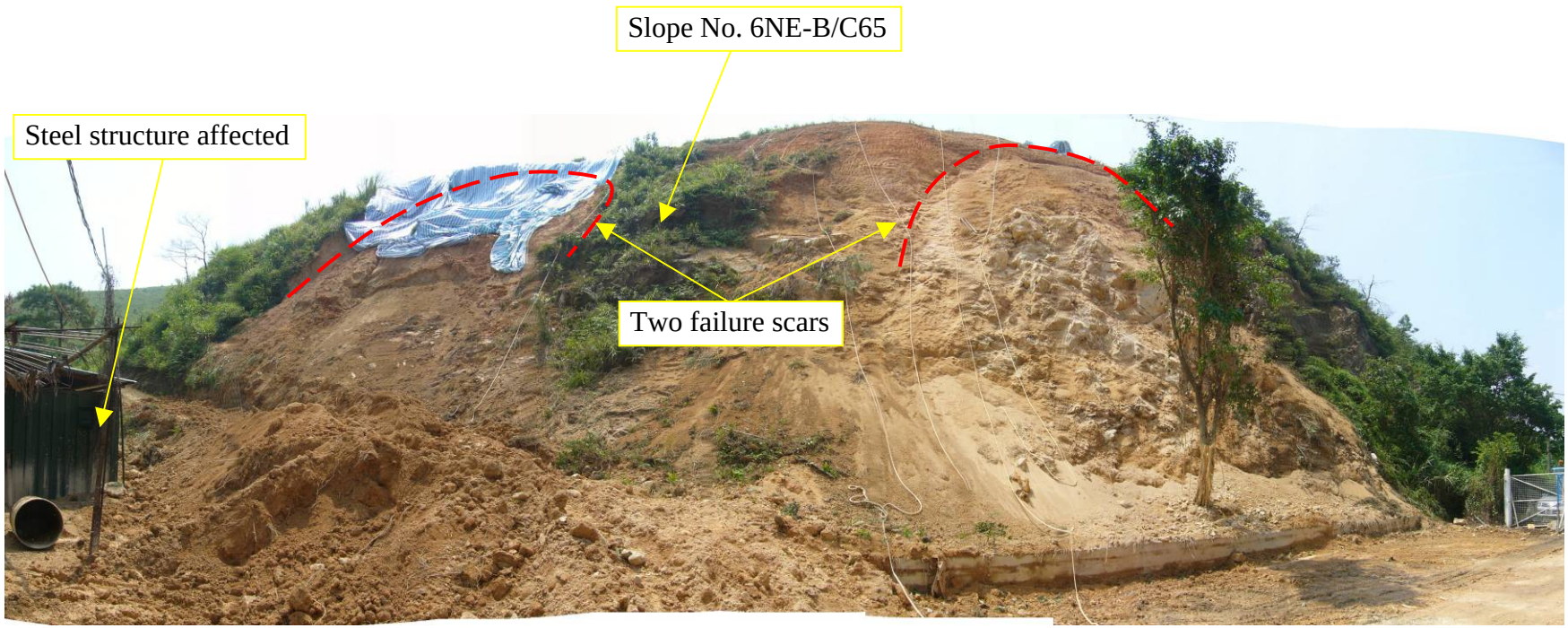
Description: A major failure of a masonry retaining wall which resulted in temporary closure of Leung Yau Road.

Plate 2 - The 2 June 2006 Landslide Incident on Slope No. 7NE-D/FR58 at Ma On Shan Tsuen, Leung Yau Road (Incident No. 2006/06/0623)




Description: A major landslide on a cut slope which affected the operation of the Hong Kong Horse Riding School.

Plate 3 - The 13 September 2006 Landslide Incident on Slope No. 6NE-B/C65 at Hong Kong Horse Riding School, Kam Ting Road (Incident No. 2006/09/0726)



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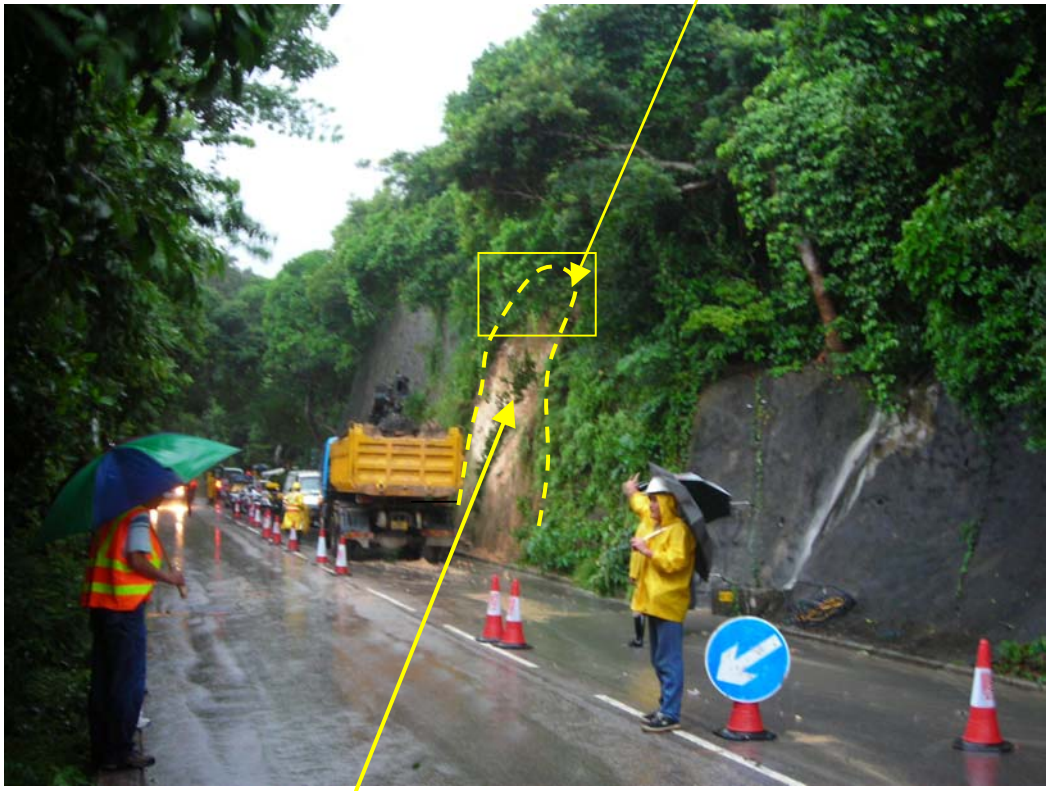
Grade II/III volcanic rock core-slab with sub-horizontal joints



13 September 2006 Landslide

Description: A minor landslide involving a soil/rock cut slope, which resulted in temporary closure of Shek O Road.

Plate 4 - The 13 September 2006 Landslide Incident on Slope No. 15NE-B/C17 along Shek O Road (Incident No. 2006/09/0710)

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Description:
Rockfall on Slope No. 11SE-A/CR262, situated behind apartment Block B at No. 6 Dragon Court on Dragon Terrace in Tin Hau, which resulted in damage to a car parked at the slope toe.

Plate 5 - The 3 August 2006 Rockfall Incident on Slope No. 11SE-A/CR262 behind Block B, No. 6 Dragon Court, Dragon Terrace, Tin Hau (Incident No. 2006/08/0691)

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# APPENDIX A

## SOME SELECTED RAINFALL PARAMETERS FOR 23 RAINSTORMS WITH DAILY RAINFALL EXCEEDING 50 mm

LIST OF TABLES

Table A1 - Some Selected Rainfall Parameters for 23 Rainstorms with Daily Rainfall Exceeding 50 mm (Sheet 1 of 3)

| Rainstorm (2006) | | 5 min | | 10 min | | 15 min | | 30 min | |
|---|---|---|---|---|---|---|---|---|---|
| | | Max. rainfall (mm) | Station | Max. rainfall (mm) | Station | Max. rainfall (mm) | Station | Max. rainfall (mm) | Station |
| 1 | 24-25 Apr 2006 | 22.5 | H17 | 39.5 | H17 | 53.5 | H03 | 98 | H05 |
| 2 | 28-29 Apr 2006 | 14 | N13, N40 | 26 | N13, N40 | 37.5 | N40 | 56 | N40 |
| 3 | 2-4 May 2006 | 13.5 | N22 | 25 | N22 | 38.5 | N22 | 61 | N22 |
| 4 | 17 May 2006 | 2 | K07, N21, N22 | 4 | N22 | 5.5 | N22 | 7.5 | K07, N22 |
| 5 | 21-22 May 2006 | 10.5 | H21 | 16.5 | H21 | 21 | N25 | 31.5 | H09, N25 |
| 6 | 28-29 May 2006 | 11.5 | H21, N26 | 22 | N26 | 30.5 | N26 | 42 | N26 |
| 7 | 2-3 Jun 2006 | 16.5 | N10 | 31.5 | N10 | 39 | N10 | 73 | N14 |
| 8 | 9-10 Jun 2006 | 16.5 | N34 | 27.5 | N34 | 39 | N38 | 68 | N31 |
| 9 | 13-14 Jun 2006 | 13.5 | N01 | 24 | K02 | 34.5 | K02 | 62.5 | K02 |
| 10 | 19-23 Jun 2006 | 11.5 | N25 | 18 | K02, N25 | 26 | K02 | 38.5 | K02, K06, K10 |
| 11 | 29 Jun 2006 | 11 | N06 | 18 | K06 | 20 | N06, N39 | 32 | N26, N31 |
| 12 | 8-12 Jul 2006 | 11.5 | N27, N45 | 20 | N45 | 25.5 | N45 | 41 | N48 |
| 13 | 16-17 Jul 2006 | 16.5 | H04, H12 | 31.5 | N06 | 41.5 | N19 | 74.5 | K06 |
| 14 | 27-30 Jul 2006 | 13 | N43 | 23.5 | N27 | 30 | N27 | 40 | N27 |
| 15 | 3-7 Aug 2006 | 17 | N41 | 25.5 | N41 | 32.5 | N41 | 44 | N21 |
| 16 | 9-11 Aug 2006 | 15 | N09 | 27.5 | N09 | 35.5 | N43 | 46.5 | N30 |
| 17 | 19-20 Aug 2006 | 15.5 | H09 | 28.5 | H09 | 36.5 | H09 | 61.5 | H28 |
| 18 | 24-26 Aug 2006 | 13.5 | H04, K04, K10 | 19.5 | H04 | 25.5 | H04 | 32.5 | K10 |
| 19 | 4-5 Sept 2006 | 13 | N19 | 22 | N19 | 30 | N19 | 55.5 | N19 |
| 20 | 9-10 Sept 2006 | 11.5 | H04 | 21.5 | H04, H06 | 30.5 | H03 | 49 | H02 |
| 21 | 13-14 Sept 2006 | 14 | N51 | 22.5 | N22 | 31 | K05 | 53 | K05 |
| 22 | 16-17 Oct 2006 | 15 | N21 | 30 | N21 | 39.5 | N21 | 59 | N21 |
| 23 | 21-22 Nov 2006 | 14.5 | N39 | 21.5 | H29 | 28.5 | H29 | 44.5 | H14 |

Table A1 - Some Selected Rainfall Parameters for 23 Rainstorms with Daily Rainfall Exceeding 50 mm (Sheet 2 of 3)

| Rainstorm (2006) | | 1 hr | | 2 hr | | 4 hr | | 5 hr | | 6 hr | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Max. rainfall (mm) | Station | Max. rainfall (mm) | Station | Max. rainfall (mm) | Max. rainfall (mm) | Max. rainfall (mm) | Station | Max. rainfall (mm) | Station |
| 1 | 24-25 Apr 2006 | 166.5 | H05 | 225.5 | H03 | 236 | H03 | 242 | H05 | 261.5 | H03 |
| 2 | 28-29 Apr 2006 | 72.5 | N13 | 107 | N09 | 131.5 | N47 | 150 | N47 | 160.5 | N47 |
| 3 | 2-4 May 2006 | 91 | N22 | 138.5 | N35 | 199.5 | N35 | 218.5 | N32 | 234 | N35 |
| 4 | 17 May 2006 | 12.5 | K07 | 18.5 | K07 | 29 | K07 | 32 | N41 | 34 | K07, N41 |
| 5 | 21-22 May 2006 | 37.5 | H09 | 57.5 | H21 | 67 | H09, N43 | 71 | H09 | 82 | H09 |
| 6 | 28-29 May 2006 | 46.5 | N26 | 66.5 | N36 | 70.5 | N36 | 74 | N36 | 76 | N36 |
| 7 | 2-3 Jun 2006 | 121.5 | N14 | 179 | N23 | 205.5 | N14 | 213.5 | N14 | 241.5 | N38 |
| 8 | 9-10 Jun 2006 | 103 | N13 | 153.5 | N13 | 179 | N40 | 187.5 | N40 | 188.5 | N40 |
| 9 | 13-14 Jun 2006 | 109 | K06 | 129.5 | K06 | 132.5 | K06 | 132.5 | K06 | 132.5 | K06 |
| 10 | 19-23 Jun 2006 | 61 | N12 | 64.5 | N01 | 71.5 | N40 | 74.5 | N40 | 74.5 | N40 |
| 11 | 29 Jun 2006 | 48.5 | N31 | 56 | N31 | 68 | N26 | 72.5 | N26 | 73.5 | N26 |
| 12 | 8-12 Jul 2006 | 62 | K09 | 68.5 | N47 | 91.5 | N47 | 104 | N47 | 106.5 | N47 |
| 13 | 16-17 Jul 2006 | 126.5 | H04 | 188 | H12 | 215.5 | H12 | 218 | H12 | 218 | H12 |
| 14 | 27-30 Jul 2006 | 57 | H03 | 86 | H20 | 88.5 | H20 | 89 | H20 | 96 | N45 |
| 15 | 3-7 Aug 2006 | 58.5 | N46 | 71 | N46 | 85 | N17 | 87 | N17 | 87 | N17 |
| 16 | 9-11 Aug 2006 | 47 | N30 | 51.5 | N18 | 58 | N34 | 65 | N34 | 65 | N34 |
| 17 | 19-20 Aug 2006 | 83 | H15 | 87.5 | H15 | 95 | H15 | 95 | N15 | 95 | H15 |
| 18 | 24-26 Aug 2006 | 41.5 | N46 | 58.5 | N41 | 75 | N41 | 76 | N41 | 77 | N41 |
| 19 | 4-5 Sept 2006 | 100.5 | N19 | 133.5 | N19 | 184.5 | N19 | 186 | N19 | 186 | N19 |
| 20 | 9-10 Sept 2006 | 86.5 | H04 | 113 | N47 | 124 | N47 | 125 | N47 | 125.5 | N47 |
| 21 | 13-14 Sept 2006 | 85.5 | N30 | 123.5 | K05 | 198.5 | K08 | 212 | N30 | 236 | K08 |
| 22 | 16-17 Oct 2006 | 72 | N21 | 83.5 | N21 | 123.5 | N21 | 145 | N21 | 145 | N21 |
| 23 | 21-22 Nov 2006 | 60 | N19 | 71 | N44 | 105.5 | N51 | 113.5 | N51 | 120 | N46 |

Table A1 - Some Selected Rainfall Parameters for 23 Rainstorms with Daily Rainfall Exceeding 50 mm (Sheet 3 of 3)

| Rainstorm (2006) | | 8 hr | | 12 hr | | 18 hr | | 24 hr | | 48 hr | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Max. rainfall (mm) | Station | Max. rainfall (mm) | Station | Max. rainfall (mm) | Station | Max. rainfall (mm) | Station | Max. rainfall (mm) | Station |
| 1 | 24-25 Apr 2006 | 264 | H05 | 267 | H05 | 270 | H05 | 270 | H05 | 270 | H05 |
| 2 | 28-29 Apr 2006 | 169 | N47 | 173.5 | N47 | 178 | N47 | 178.5 | N47 | 230 | N47 |
| 3 | 2-4 May 2006 | 243 | N35 | 253.5 | N35 | 265 | N35 | 268.5 | N35 | 269 | N35 |
| 4 | 17 May 2006 | 36.5 | K07 | 38 | K07 | 49 | N37 | 54 | N37 | 55.5 | N37 |
| 5 | 21-22 May 2006 | 86.5 | H09 | 96 | H09 | 102.5 | H09 | 106.5 | H09 | 151 | H28 |
| 6 | 28-29 May 2006 | 79.5 | N19 | 107.5 | N19 | 108 | N19 | 108 | N19 | 131.5 | N14, N45 |
| 7 | 2-3 Jun 2006 | 264.5 | N38 | 275 | N03 | 287 | N40 | 292 | N40 | 350 | N38, N40 |
| 8 | 9-10 Jun 2006 | 189 | N40 | 223 | N40 | 268 | N13 | 329.5 | N13 | 354 | N13 |
| 9 | 13-14 Jun 2006 | 137 | K06 | 138.5 | K06 | 139 | K06 | 139 | K06 | 162 | K02, K06 |
| 10 | 19-23 Jun 2006 | 75 | N40 | 75.5 | N40 | 75.5 | N40 | 78.5 | N40 | 118.5 | K02 |
| 11 | 29 Jun 2006 | 74.5 | N26 | 74.5 | N26 | 75.5 | N26 | 95.5 | N31 | 98.5 | N31 |
| 12 | 8-12 Jul 2006 | 109 | N47 | 114.5 | N47 | 116.5 | N47 | 143.5 | N47 | 160 | N47 |
| 13 | 16-17 Jul 2006 | 218 | H12 | 218 | H12 | 218 | H12 | 218 | H12 | 223 | H12 |
| 14 | 27-30 Jul 2006 | 115.5 | N45 | 124.5 | N45 | 147.5 | N45 | 161 | N45 | 250 | N45 |
| 15 | 3-7 Aug 2006 | 103.5 | N17 | 113 | N17 | 140.5 | N17 | 156 | N17, N21 | 224 | N36 |
| 16 | 9-11 Aug 2006 | 73.5 | N34 | 73.5 | N34 | 74 | N34 | 74 | N34 | 82.5 | N34 |
| 17 | 19-20 Aug 2006 | 95 | H15 | 95.5 | H15 | 95.5 | H15 | 95.5 | H15 | 145 | H15 |
| 18 | 24-26 Aug 2006 | 82 | N46 | 82.5 | N46 | 98.5 | N41 | 112 | N41 | 147.5 | N41 |
| 19 | 4-5 Sept 2006 | 189 | N19 | 189 | N19 | 189 | N19 | 189 | N19 | 189 | N19 |
| 20 | 9-10 Sept 2006 | 127 | N47 | 136 | N47 | 140 | N47 | 140 | N47 | 159 | N03 |
| 21 | 13-14 Sept 2006 | 248.5 | K08 | 322.5 | N30 | 386.5 | N30 | 391 | N30 | 407 | N02 |
| 22 | 16-17 Oct 2006 | 145 | N21 | 145 | N21 | 145 | N21 | 145 | N21 | 145 | N21 |
| 23 | 21-22 Nov 2006 | 123 | N46 | 134 | N46 | 137.5 | N46 | 139.5 | N51 | 141.5 | N46 |

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# APPENDIX B

## LIST OF LANDSLIDE INCIDENTS REPORTED TO THE GOVERNMENT

# LIST OF TABLES

Table B1 - List of Major Landslide Incidents

| Incident No. | Location | Slope No. | Failure | | | Facility Affected | Consequence |
|---|---|---|---|---|---|---|---|
| | | | Date (Time) | Feature Type | Scale ($m^3$) | | |
| 2006/06/0623 | Leung Yau Road, Ma On Shan Tsuen | 7NE-D/FR58 | 2/6 (14:45) | Fill | 350 | Road | 1 lane of road temporarily closed |
| 2006/07/0667 | 216 Victoria Road, Pok Fu Lam | Unregistered | 16/7 | Fill | 100 | Construction site | - |
| 2006/09/0722 | Near Sau Mau Ping Services Reservoir, Anderson Road, Sau Mau Ping | 11NE-D/C164 | 14/9 (03:00) | Soil/rock cut | 60 | Road | 1 lane of road temporarily closed |
| 2006/09/0726 | Hong Kong Horse Riding School, Kam Tin Road, Yuen Long | 6NE-B/C65 | 13/9 (19:45) | Soil/rock cut | 100 | Backyard | - |
| LI2006/03/2001 | Kwun Yam Shan, Shatin | Natural hillside | Mar 06 | Natural hillside | 10,000* | Road# and village house# | - |

Legend:

* Estimated displaced volume obtained by GEO's landslide investigation consultants and agreed with GEO's District Divisions.

\# Facilities potentially affected by the failure if detached from the hillside and developed into a channelised debris flow.

Table B2 - List of Landslide Incidents in Hong Kong Island (Sheet 1 of 5)

| Incident No. | Location | Slope No. | Call | | Failure | | | Facility Affected | Consequence |
|---|---|---|---|---|---|---|---|---|---|
| | | | Date | From | Date (Time) | Feature Type | Scale ($m^3$) | | |
| 2006/02/0572 | Opposite 8 Pak Pat Shan Road, Tai Tam | 15NE-A/C187 | 19/2 | HyD | 19/2 (12:50) | Soil/rock cut | 1 (Rockfall) | Pedestrian pavement | Pedestrian pavement closed |
| 2006/03/0574 | Mount Butler Quarry | 11SE-C/C642 | 10/1 | ArchSD | Unknown | Soil cut | 3 | Minor footpath / access | - |
| 2006/03/0575 | Mount Butler Quarry | 2 m high rock cut slope(1) | 10/1 | ArchSD | Unknown | Rock cut | 2 | Minor footpath / access | - |
| 2006/03/0579# | Tai Hang Road near junction with Tai Hang Drive above 11SE-C/C159 | Natural hillside | - | HyD | 24/3 | Natural hillside | 0.1 (Boulder fall) | Open area | - |
| 2006/04/0586 | Behind 232 Aberdeen Main Street | 11SW-D/C39 | 24/4 | BD | 24/4 | Soil/rock cut | 0.5 (Rockfall) | Backlane | - |
| 2006/04/0588 | 137-139 Blue Pool Road, Happy Valley | 3 m high fill slope(1) | 24/4 | Police | 24/4 (early morning) | Fill | 25 | Pedestrian pavement | - |
| 2006/04/0589 | Information Crescent Cyberport, Pok Fu Lam | 11SW-C/FR61 | 24/4 | HyD | 24/4 | Fill | 20 | Pedestrian pavement | - |
| 2006/04/0590 | Near 6-8 Deep Water Bay Road | 11SE-C/FR28 | 26/4 | HyD | 24/4 | Fill | 45 | Pedestrian pavement | Pedestrian pavement closed |
| 2006/04/0592 | Northeast of Sheffield Garden, 5 Shiu Fai Terrace | 11SW-D/R206 | 28/4 | HyD | 28/4 (08:40) | Retaining wall | 1 | Road | 1 lane of road closed |
| 2006/05/0596 | Hong Kong Cemetery | 11SW-D/C2146 | 2/5 | ArchSD | 28/4 | Soil cut | 2 | Debris on slope | - |
| 2006/05/0597 | 63, South Bay Road | 15NE-A/C283 | 3/5 | HyD | 3/5 | Soil/rock cut | 0.5 | Road | 1 lane of road closed |
| 2006/05/0600 | At junction of May Road and Magazine Gap Road, The Peak. | 11SW-D/C317 | 3/5 | Police | 3/5 (04:00) | Rock cut | 0.5 | Debris on slope | - |

Table B2 - List of Landslide Incidents in Hong Kong Island (Sheet 2 of 5)

| Incident No. | Location | Slope No. | Call | | Failure | | | Facility Affected | Consequence |
|---|---|---|---|---|---|---|---|---|---|
| | | | Date | From | Date (Time) | Feature Type | Scale ($m^3$) | | |
| 2006/05/0601 | Victoria Road, Pok Fu Lam | 11SW-C/F419 | 3/5 | Public | 24/4 | Fill | 3 | Open area | - |
| 2006/05/0604 | Victoria Road, Pok Fu Lam | 11SW-C/F211 | 4/5 | Public | 24/4 | Fill | 3 | Maintenance stairway | - |
| 2006/05/0608 | TWGHs Coffin Home, 9 Sandy Bay Road, Pok Fu Lam | 11SW-C/FR145 | 16/5 | BD | 24/4 | Retaining wall | 1 | Squatter structure | 1 squatter dwelling within private lot temporarily evacuated. |
| 2006/05/0613 | At 80m east of 12 Wong Nai Chung Gap Road, Hong Kong | 11SW-D/C373 | 31/5 | HyD | 31/5 (03:15) | Soil/rock cut | 0.14 (Rockfall) | Pedestrian pavement | Pedestrian pavement closed |
| 2006/06/0614 | Shek O Road near lamp post 33783 | 15NE-B/C38 | 1/6 | Public | 1/6 (afternoon) | Soil/rock cut | 1 (Rockfall) | Road | - |
| 2006/06/0648 | Tai Tam Reservoir Road, Tai Tam, opposite lamp post 49126 | Natural hillside | 29/6 | LandsD | 29/6 (10:00) | Natural hillside | 1 | Road | - |
| 2006/07/0650 | Lamp post 22807, Tai Hang Road, Happy Valley | 11SE-C/C583 | 6/7 | Police | 6/7 (00:00) | Rock cut | 1 (Rockfall) | Pedestrian pavement | Pedestrian pavement closed |
| 2006/07/0652 | 30 Kai Yuen Street, North Point | 11SE-A/FR439 | 10/7 | BD | 8/7 | Fill | 1.5 | Backlane | - |
| 2006/07/0654 | Natural drainage line below Barker Road (below feature 11SW-D/FR126) | Natural hillside | 10/7 | GEO | 8/7 (12:00) | Natural hillside | 1.5 | Road | Muddy water spilling over onto the road |
| 2006/07/0660 | 48 Mount Kellett Road, The Peak | 11SW-C/C681 | 16/7 | Police | 16/7 (10:00) | Soil/rock cut | 0.2 | Minor footpath / access | - |
| 2006/07/0661 | 44 - 58 Yalford Building, Tanner Road | 11SE-A/FR439 | 16/7 | Police | 16/7 (00:30) | Fill | 10 | Open area | - |
| 2006/07/0662 | Near 99 Repulse Bay Road | 15NE-A/C47 | 16/7 | Police | 16/7 (08:15) | Soil/rock cut | 3 | Road | - |
| 2006/07/0664 | Entrance of 1 Chatham Path, The Peak | 11SW-D/CR319 | 17/7 | Public | 16/7 (12:00) | Soil cut | 0.2 | Footpath | - |

Table B2 - List of Landslide Incidents in Hong Kong Island (Sheet 3 of 5)

| Incident No. | Location | Slope No. | Call | | Failure | | | Facility Affected | Consequence |
|---|---|---|---|---|---|---|---|---|---|
| | | | Date | From | Date (Time) | Feature Type | Scale ($m^3$) | | |
| 2006/07/0665# | Natural slope below Magazine Gap Road (opposite 11 Magazine Gap Road) | Natural hillside | 12/7 | GEO | 8/7 (10:00) | Natural hillside | 5 | Open area | - |
| 2006/07/0667 | 216 Victoria Road, Pok Fu Lam | Unregistered at time of failure | 18/7 | Public | 16/7 | Fill | 100 | Construction site | - |
| 2006/07/0678 | Hatton Road, Lung Fu Shan | 11SW-A/C606 | 21/7 | Public | 18/7 | Soil cut | 1 | Road | ½ lane of road blocked |
| 2006/07/0680 | Deep Water Bay Road | 11SW-D/C1320 | 29/7 | HyD | 29/7 (13:00) | Soil cut | 0.8 | Road | - |
| 2006/07/0681 | Natural slope above 11SE-A/CR781, Yiu Hing Road | Natural hillside | 30/7 | Police | 30/7 (22:45) | Natural hillside | 27 | Pedestrian pavement | Pedestrian pavement closed |
| 2006/07/0683# | Natural slope near 31 - 33 Village Terrace (between features Nos. 11SW-D/FR301 and 11SW-D/CR1170) | Natural hillside | 20/7 | DO | 20/7 | Natural hillside | 1 | Open area (Natural terrain & streamcourse) | - |
| 2006/08/0691 | 6 Dragon Terrace, Dragon Court | 11SE-A/CR262 | 3/8 | Police | 3/8 (00:00) | Soil/rock cut | 0.6 (Rockfall) | Open carpark | One car damage, open carpark closed |
| 2006/08/0694 | Ebenezer School & Home for the Visually Impaired, 131 Pok Fu Lam Road, Pok Fu Lam | 11SW-C/FR319 | 4/8 | Public | 3/8 | Retaining wall | 4 | Open carpark | Pedestrian pavement and open carpark closed |
| 2006/08/0695 | Ebenezer School & Home for the Visually Impaired, 131 Pok Fu Lam Road, Pok Fu Lam | 11SW-C/C87 | 4/8 | Public | 3/8 | Rock cut | 0.5 (Rockfall) | Backlane | - |
| 2006/08/0696 | The Dutchess of Kent Children's Hospital, 12 Sandy Bay Road, Pok Fu Lam | Natural hillside | 4/8 | Public | 3/8 | Natural hillside | 10 (Rockfall) | Open area | - |



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Table B2 - List of Landslide Incidents in Hong Kong Island (Sheet 4 of 5)

| Incident No. | Location | Slope No. | Call | | Failure | | | Facility Affected | Consequence |
|---|---|---|---|---|---|---|---|---|---|
| | | | Date | From | Date (Time) | Feature Type | Scale ($m^3$) | | |
| 2006/09/0709 | Victoria Road below Caritas Wo Cheng Chung Secondary School | 11SW-C/C383 | 13/9 | BD | Unknown | Soil/rock cut | 0.5 | Pedestrian pavement | - |
| 2006/09/0710 | Near 17 Shek O Road, Shek O | 15NE-B/C17 | 13/9 | Police | 13/9 (12:30) | Soil/rock cut | 20 | Road | 1 lane of road closed |
| 2006/09/0711 | Mount Butler Road near Sir Cecil's Ride | 11SE-C/C84 | 13/9 | TD | 13/9 (11:00) | Soil/rock cut | 20 | Road | 2 lanes of road blocked |
| 2006/09/0712 | Roadside slope near 66 Deep Water Bay Road | Unregistered at time of failure | 13/9 | TD | 13/9 (11:00) | Soil/rock cut | 0.1 (Rockfall) | Road | 1 lane of road blocked |
| 2006/09/0713 | Pak Fuk Road, Braemar Hill | 11SE-A/C502 | 13/9 | FSD | 13/9 (09:00) | Soil/rock cut | 3 | Road | 1 lane of road blocked |
| 2006/09/0714 | 26 Magazine Gap Road | 11SW-D/C1241 | 13/9 | Police | Unknown | Soil cut | 0.5 (Rockfall) | Carpark | - |
| 2006/09/0716 | Mount Nicholson Road near lamp post 20772 | 11SW-D/CR335 | 13/9 | HyD | 13/9 | Soil/rock cut | 1 | Road | 1 lane of road blocked |
| 2006/09/0717 | Opposite 23 Big Wave Bay Road, Shek O | 15NE-B/C72 | 13/9 | HyD | 13/9 (16:15) | Soil/rock cut | 10 | Road | |
| 2006/09/0729 | Below Tai Tam Road near Tai Tam Tuk Reservoir | 1.5 m high soil cut slope(1) | 14/9 | LandsD | 13/9 | Soil cut | 2 | footpath | - |
| 2006/09/0731 | 6 Leighton Lane, Causeway Bay | 11SW-B/CR384 | 14/9 | BD | 13/9 (11:00) | Soil/rock cut | 3 | Open area | - |
| 2006/09/0733 | Natural slope near a stream course, about 15 m south of Man Yat House, Hing Man Estate | Natural hillside | 15/9 | Public | Unknown | Natural hillside | 4 | Streamcourse | - |
| 2006/10/0741 | Near 2 Big Wave Bay Road | 15NE-B/C141 | 11/10 | Public | 13/9 (09:00) | Soil cut | 10 | Open area | - |
| 2006/11/0746 | West of Wo Hing House, Hing Wah Estate, Chai Wan | 11SE-D/C417 | 8/11 | Police | 8/11 (3:10) | Soil/rock cut | 2 | Open area | - |
| 2006/12/0753 | Hillside above Chatham Path (about 70 m north-east of 23 Barker Road) | Natural hillside | 18/12 | Public | 18/12 (09:00) | Natural hillside | 0.2 (Boulder fall) | Minor footpath / access | - |

Table B2 - List of Landslide Incidents in Hong Kong Island (Sheet 5 of 5)

| Incident No. | Location | Slope No. | Call | | Failure | | | Facility Affected | Consequence |
|---|---|---|---|---|---|---|---|---|---|
| | | | Date | From | Date (Time) | Feature Type | Scale ($m^3$) | | |
| ArchSD/HK/2006/03/0001 WCS | Bowen Road, Lover's Stone Garden | 11SW-D/C426 | - | ArchSD | 24/3 (15:54) | Soil/rock cut | 0.2 | Debris deposited on slope | - |
| WSD/2006/9/1/HK# | Adjoining catchwater within Shek O Country Park | 11SE-D/C522 | 14/9 | WSD | Unknown | Soil cut | 1 | Open area | - |
| WSD/2006/9/2/HK | Along Ch. 800 to 920 of catchwater, west of Turtle Beach Bathing Area, Tai Tam | 15NE-A/C455 | 18/9 | WSD | Unknown | Rock cut | 10 (Rockfall) | Catchwater | - |
| AFCD/2006/07/0004 | Mount Parker Road | 11SE-C/C111 | 12/10 | AFCD | 17/7 | Soil/rock cut | 3 | Open area | - |
| HyD/HK/2006/07/0022 | Natural slope above eastern end of feature No. 11SW-B/R493 of 96 MacDonnell Road | Natural hillside | 17/7 | HyD | 16/7 | Natural hillside | 0.1 (Boulder fall) | Backlane | - |
| HyD/HK/2006/08/0026 | Above private slope 11SW-D/C267, 62 Peak Road | Natural hillside | - | HyD | 9/8 | Natural hillside | 0.5 (Boulder fall) | Backlane | - |
| HyD/HK/2006/08/0028# | Mount Cameron Road, opposite lamp post 18908 | 11SW-D/FR123 | - | HyD | Unknown | FR | 3 | Open area | |

Legend:

* Information obtained by GEO's landslide investigation consultants and agreed with GEO's District Divisions.

\# Very minor landslide with negligible consequence (see Section 1 of the report for definition).

(1) The slope feature does not meet the slope registration criteria given in GEO Circular No. 15.

Table B3 - List of Landslide Incidents in Kowloon (Sheet 1 of 2)

| Incident No. | Location | Slope No. | Call | | Failure | | | Facility Affected | Consequence |
|---|---|---|---|---|---|---|---|---|---|
| | | | Date | From | Date (Time) | Feature Type | Scale ($m^3$) | | |
| 2006/04/0584# | Near Pak Fa Lam Road, Fei Ngo Shan Road, Wong Tai Sin | 11NE-B/C649 | 24/4 | HyD | 24/4 | Soil/rock cut | 2 | Road | - |
| 2006/04/0585 | No. 28-30 Braga Circuit (at rear of 85 Waterloo Road), lot No. KIL10341, Kowloon City | 11NW-D/FR112 | 24/4 | BD | 23/4 | Retaining wall | 0.5 | Carpark | - |
| 2006/06/0629 | No. 34E Braga Circuit, Kowloon City | 11NW-D/C534 | 9/6 | Public | Unknown | Soil cut | 1 | Access road | - |
| 2006/06/0635 | Yi Chez Lau, Garden Estate, Ngau Tau Kok | 11NE-C/C32 | 9/6 | Police | 9/6 | Soil/rock cut | 2 | Open Area | - |
| 2006/06/0638 | Below No. 15 Magnolia Road, Tai Hang Tung Road, Sham Shui Po | 11NW-B/FR191 | 13/6 | ICC | 13/6 (10:00) | Fill | 3 | Road | 1 lane of road temporarily closed |
| 2006/06/0647 | Jat's Incline, Wong Tai Sin | 11NE-A/C358 | 26/6 | HyD | Unknown | Soil/rock cut | 0.3 (Rockfall) | Road | - |
| 2006/07/0663 | No. 55 Lee Kee Building, Ngau Tau Kok | 11NE-C/DT2 | 16/7 | ICC | 16/7 (15:00) | Disturbed terrain | 0.5 | Backlane | - |
| 2006/09/0706 | North to Kwun Tong MTR Station Exit C, Hip Wo Street, Kwun Tong | 11NE-D/C67 | 7/9 | GEO | 7/9 (15:00) | Rock cut | 1 (Rockfall) | Pedestrian pavement | - |

Table B3 - List of Landslide Incidents in Kowloon (Sheet 2 of 2)

| Incident No. | Location | Slope No. | Call | | Failure | | | Facility Affected | Consequence |
|---|---|---|---|---|---|---|---|---|---|
| | | | Date | From | Date (Time) | Feature Type | Scale ($m^3$) | | |
| 2006/09/0721 | Junction of Salisbury Road and Chatham Road South, Tsim Sha Tsui | 11SW-B/CR46 | 13/9 | Police | 13/9 (23:10) | Soil/rock cut | 0.3 | Road | 1 lane of road temporarily closed |
| 2006/11/0745# | Behind Tak Fok Temple, near North Kowloon Magistracy, Tai Po Road, Sham Shui Po | 2.5 m high soil cut slope (1) | 2/11 | DLO | September | Soil cut | 2 | Minor footpath | - |
| ArchSD/PM2/ 2006/06/0001 | Phoenix House, Lung Cheung Road, Sham Shui Po | 11NW-B/FR60 | 6/7 | Arch SD | 9/6 | Fill | 4 | Open area | - |
| ArchSD/SD/ 2006/07/0001 | Leisure Road, Hammer Hill, Wong Tai Sin | 11NE-A/FR242 | 18/7 | Arch SD | 16/7 | Retaining wall | 3 | Backyard | - |

Legend:

* Information obtained by GEO's landslide investigation consultants and agreed with GEO's District Divisions.

\# Very minor landslide with negligible consequence (see Section 1 of the report for definition).

(1) The slope feature does not meet the slope registration criteria given in GEO Circular No. 15.

Table B4 - List of Landslide Incidents in New Territories and Outlying Islands (Sheet 1 of 11)

| Incident No. | Location | Slope No. | Call | | Failure | | | Facility Affected | Consequence |
|---|---|---|---|---|---|---|---|---|---|
| | | | Date | From | Date (Time) | Feature Type | Scale ($m^3$) | | |
| 2006/01/0569 | Near Ch. 950, Shing Mun Catchwater, Tsuen Wan | Natural terrain | 10/1 | WSD | Unknown | Natural Terrain | 30 | Open area | - |
| 2006/02/0571 | No. 76 Tong Kung Leng, Sheung Shui | Unregistered at time of failure | 2/2 | DO | 30/1 (0:00) | Retaining Wall | 2 | Minor footpath | - |
| 2006/03/0576 | Near Lot No. 1146 in DD84, Sheung Shan Kai Wat, Ta Kwu Ling | Natural terrain | 14/3 | DLO | Unknown | Natural Terrain | 45 | Pig farm | - |
| 2006/03/0577 | To Yuen Tung, Ma Wo, Tai Po | 7NW-B/CR224 | 24/3 | Lands D | 20/3 (10:00) | Soil cut | 0.03 (Rockfall) | Open area | - |
| 2006/03/0578 | Kau Lung Hang, Tai Po | 3SW-D/DT10 | 24/3 | Lands D | 10/3 (11:00) | Disturbed terrain | 10 | Open area | - |
| 2006/04/0580 | Opposite Lam Tsuen San Tsuen, Tong Sheung Tsuen, Tai Po | 2.6 m high fill slope(1) | 6/4 | FSD | 6/4 (12:30) | Fill | 10 | River | - |
| 2006/04/0582 | Near Kwun Yam Shan, Shatin Pass Road, Sha Tin | 11NE-A/C351 | 24/4 | HyD | 24/4 | Rock cut | 1 (Rockfall) | Road | - |
| 2006/04/0583 | Near slope No. 7NW-A/C23, Tai Po Road, Tai Po | Unregistered at time of failure | 24/4 | HyD | 24/4 (05:00) | Soil/rock cut | 1 | Road | - |
| 2006/04/0593 | 7 Au Pui Wan Tsuen, Sha Tin | Natural terrain | 29/4 | Police | Unknown | Natural terrain | 1 | Open area | - |
| 2006/04/0594 | No. 7 Yiu Dau Ping Village, Sha Tin | Natural terrain | 29/4 | Police | Unknown | Natural terrain | 1 | Building | - |
| 2006/05/0595 | House Nos. 10 - 12, Heung Chung Village, Sai Kung | 11NE-B/C541 | 2/5 | Police | 02/5 (21:00) | Soil cut | 5 | Squatter dwelling | 1 squatter dwelling and 11 persons temporarily evacuated |

Table B4 - List of Landslide Incidents in New Territories and Outlying Islands (Sheet 2 of 11)

| Incident No. | Location | Slope No. | Call | | Failure | | | Facility Affected | Consequence |
|---|---|---|---|---|---|---|---|---|---|
| | | | Date | From | Date (Time) | Feature Type | Scale ($m^3$) | | |
| 2006/05/0598# | Slope under Tuen Mun Highway, Ting Kau, Tsuen Wan | 6SE-C/F10 | 3/5 | Police | 03/5 | Fill | 1 | Open area | - |
| 2006/05/0599 | Behind House 13, Mau Ping New Village, Sai Kung | Natural terrain | 3/5 | Police | 03/5 (10:15) | Natural Terrain | 40 | Open area | - |
| 2006/05/0602 | Luk Keng Road | 3NE-C/C121 | 3/5 | ICC | Unknown | Soil/Rock cut | 20.5 (Rockfall) | Road | - |
| 2006/05/0603 | Behind house No. 36B Pan Chung Village, Tai Po | 2.5 m high soil cut slope(1) | 8/5 | DO | 03/5 | Soil cut | 2.5 | Minor Footpath | - |
| 2006/05/0605 | At toe of slope No. 7SW-D/C986, above Lion Rock Tunnel Road, Sha Tin | Natural terrain | 11/5 | HyD | 25/4 (09:00) | Natural terrain | 1 | Open area | - |
| 2006/05/0606 | Licence Area No. T19724, Shek Lin Road, Tai Po | Natural terrain | 15/5 | ICC | 08/5 | Natural terrain | 15 | Squatter dwelling | - |
| 2006/05/0607 | Near House 84, Tseng Tau Sheung Tsuen, Tuen Mun | Unregistered at time of failure | 16/5 | DO | 25/4 (11:00) | Soil cut | 4 | Open area | - |
| 2006/05/0609 | Lower portion of slope 15NW-A/CR100, 11 Hung Shing Ye, Lamma Island | 15NW-A/CR100 | 22/5 | BD | 12/5 | Soil cut | 0.7 | Backlane | - |
| 2006/06/0612 | Lam Ha Road, Sai Kung | 11NE-B/C426 | 28/5 | Public | 28/5 (15:00) | Soil cut | 5 | Pedestrian Pavement | - |
| 2006/06/0615 | Tai Po Country Trail, Lo Lau Uk, Tai Po | 7NW-D/C397 | 2/6 | FSD | 2/6 (12:00) | Soil cut | 5 | Road | 1 lane of road blocked |
| 2006/06/0616# | Near Sea Cliff Lodge, Castle Peak Road (Ting Kau Section), Tsuen Wan | 6SE-C/C475 | 2/6 | Police | 2/6 (12:00) | Soil/rock cut | 1 | Access road | - |
| 2006/06/0617 | House 35A, Po Lo Che Road, Sai Kung | 8SW-C/R67 | 2/6 | ICC | 2/6 (12:45) | Retaining wall | 20.4 | Minor Footpath | Footpath temporarily closed |

Table B4 - List of Landslide Incidents in New Territories and Outlying Islands (Sheet 3 of 11)

| Incident No. | Location | Slope No. | Call | | Failure | | | Facility Affected | Consequence |
|---|---|---|---|---|---|---|---|---|---|
| | | | Date | From | Date (Time) | Feature Type | Scale ($m^3$) | | |
| 2006/06/0620 | Behind 235, Pai Tau Village, Sai Kung | 7SW-B/C338 | 2/6 | DO | 2/6 (14:00) | Soil cut | 1.5 | Building | One village house and 8 persons temporarily evacuated |
| 2006/06/0621 | Behind squatter hut No. 142B, Tseng Tau Tsuen Chung Tsuen, Tuen Mun | 6SW-A/C314 | 2/6 | Public | 2/6 (12:00) | Soil cut | 3 | Squatter dwelling | Two squatter dwellings and four persons temporarily evacuated |
| 2006/06/0622 | Above Yuen Yuen Institute, Lo Wai, Tsuen Wan | 7SW-A/R62 | 2/6 | Lands D | 2/6 (09:00) | Soil cut | 1.5 | Squatter dwelling | - |
| 2006/06/0623 | Leung Yau Road, Ma On Shan Tsuen, Sha Tin | 7NE-D/FR58 | 2/6 | DLO | 2/6 (14:45) | Fill | 350 | Road | 1 lane of road blocked |
| 2006/06/0624 | Near Gilwell Campsite (opposite to lamp post VE0774), Fei Ngo Shan | 2 m high soil cut slope(1) | 2/6 | ICC | Unknown | Soil cut | 1 | Access road | 1 lane of access road closed |
| 2006/06/0625 | Kwun Ping Road (near lamp post EB2963), Sha Tin | Natural terrain | 2/6 | DO | Unknown | Natural Terrain | 0.3 (Boulder fall) | Road | 1 lane of road closed |
| 2006/06/0626# | Near Tai Lam Chung Catchwater, So Kwun Wat, Tuen Mun | Unregistered at time of failure | 3/6 | Police | 2/6 (12:00) | Soil cut | 3 | Access road | - |
| 2006/06/0628# | Access road within Trappist Haven Monastery, Lantau Island | 10SW-B/C303 | 5/6 | Police | 3/6 | Soil cut | 5 | Minor footpath / access | - |
| 2006/06/0630 | Walkway northeast of the Cairnhill, Route Twisk, Tsuen Wan | 6SE-B/DT24 | 7/6 | Public | 2/6 | Disturbed terrain | 10 | Minor Footpath | Footpath blocked |
| 2006/06/0631 | No. 85 Hilltop Garden, Pun Shan Chau Village, Tai Po | Natural terrain | 9/6 | ICC | 9/6 (11:00) | Natural terrain | 1.5 | Access road | - |
| 2006/06/0632# | Along walkway to Tsing Fai Tong, Sham Tseng, Tsuen Wan | Natural terrain | 6/6 | DO | Unknown | Natural terrain | 5 | Walking trail | - |

Table B4 - List of Landslide Incidents in New Territories and Outlying Islands (Sheet 4 of 11)

| Incident No. | Location | Slope No. | Call | | Failure | | | Facility Affected | Consequence |
|---|---|---|---|---|---|---|---|---|---|
| | | | Date | From | Date (Time) | Feature Type | Scale ($m^3$) | | |
| 2006/06/0633 | Near Sam Yuk Middle School (Lamp Post EB5803), Clear Water Bay Road, Sai Kung | 2 m high soil/rock cut slope[(1)] | 9/6 | Police | 9/6 (14:28) | Soil/rock cut | 0.4 (Rockfall) | Road | 1 lane of road temporarily closed |
| 2006/06/0637# | Ma Wan Fisherman's Village | 10NE-A/DT4 | 6/6 | DO | 6/6 (14:00) | Disturbed terrain | 5 | Open area | - |
| 2006/06/0639a# | Tsing Shan Trail, Tuen Mun | 2 m high soil cut slope[(1)] | 13/6 | GEO | 12/6 (0:00) | Soil cut | 1 | Hiking trail | - |
| 2006/06/0639b# | Tsing Shan Trail, Tuen Mun | 1.5 m high soil cut slope[(1)] | 13/6 | GEO | 12/6 (0:00) | Soil cut | 1 | Hiking trail | - |
| 2006/06/0640 | Behind House 55 Hing Keng Shek, Sai Kung | 7SE-D/C148 | 14/6 | Public | 14/6 (16:30) | Soil cut | 1.5 | Backyard | - |
| 2006/06/0641# | Near Lamp Post V5453, Cheung Lek, Sheung Shui | Natural terrain | 10/6 | DO | 9/6 (00:00) | Natural terrain | 4 | Streamcourse | - |
| 2006/06/0642 | Near House 6A, Choi Yuen Tsuen, Tsing Lung Tau, Tsuen Wan | Natural terrain | 15/6 | DO | 2/6 | Natural terrain | 1 (Boulder fall) | Minor Footpaths | Footpath blocked |
| 2006/06/0643 | Near Lamp Post No. V5359, Ta Ku Ling San Tsuen, Sai Kung | 2.5 m high soil cut slope[(1)] | 9/6 | Public | 9/6 (13:00) | Soil cut | 1 | Access road | - |
| 2006/06/0644 | Behind squatter hut no. RTW/4A/48-49, northeast of slope No. 6SE-D/C48, off Route Twisk, Tsuen Wan | Natural terrain | 19/6 | GEO | June | Natural terrain | 8 | Squatter dwelling | 1 squatter dwelling and 8 persons permanently evacuated |
| 2006/06/0645 | Near Village Office at Hing Keng Shek, Sai Kung | Natural terrain | 21/6 | DO | 9/6 (14:30) | Natural terrain | 4 | Open area | - |
| 2006/06/0646 | Yuet Lai Court, Lai King Hill Road, Kwai Chung | 11NW-A/C12 | 22/6 | Public | Unknown | Soil/rock cut | 1 | Open area | - |
| 2006/07/0649 | Kau Tsin Uk, Sai Kung | 11NE-B/CR314 | 22/6 | Lands D | 9/6 (15:30) | Retaining wall | 3 | Backyard | - |

Table B4 - List of Landslide Incidents in New Territories and Outlying Islands (Sheet 5 of 11)

| Incident No. | Location | Slope No. | Call | | Failure | | | Facility Affected | Consequence |
|---|---|---|---|---|---|---|---|---|---|
| | | | Date | From | Date (Time) | Feature Type | Scale ($m^3$) | | |
| 2006/07/0651 | Tai Wo Tsuen, Fu Yung Shan Road, Tsuen Wan | 2 m high soil cut slope(1) | 8/7 | Police | Unknown | Soil cut | 2 | Squatter dwellings | 3 squatter dwellings temporarily evacuated |
| 2006/07/0655 | Behind Che Kung Miu Temple, Sha Tin | Natural terrain | 14/7 | Lands D | 14/5 (10:00) | Natural terrain | 1.2 (Boulder fall) | Minor Footpath | - |
| 2006/07/0656 | Behind house No. 203 Shek Lei Hang Village, Shek Pai Street, Kwai Chung | 2 m high soil cut slope(1) | 17/7 | DPO | 16/7 (03:00) | Soil cut | 2 | Squatter dwellings | - |
| 2006/07/0657 | 307 Yi Pei Chun New Village, Wo Yi Hop Road, Tsuen Wan | 7SW-C/C115 | 16/7 | Police | 16/7 (03:00) | Soil cut | 40 | Building | - |
| 2006/07/0659 | 72B Lung Tsai Tsuen, Cheung Chau | 14NW-D/R199 | 16/7 | FSD | 16/7 (02:30) | Retaining wall | 9 | Building | - |
| 2006/07/0666 | No. 300 Pai Tau Village, Sha Tin | 7SW-D/C987 | 17/7 | Police | 17/7 (morning) | Soil cut | 0.2 | Backlane | - |
| 2006/07/0668 | Behind house No. 7, Yiu Dau Ping, Fo Tan | 7SW-B/C638 | 19/7 | Lands D | 28/4 | Soil/rock cut | 2.4 | Squatter dwellings | - |
| 2006/07/0669 | Behind house no. 41, To Shek Village, Sha Tin | 7SE-C/C252 | 19/7 | ICC | 09/6 | Soil/rock cut | 0.2 | Buildings | - |
| 2006/07/0670 | Behind House 323, Ha Wo Che Village, Sha Tin | 7SE-A/C402 | 19/7 | Consultant | 19/7 | Soil cut | 1 | Squatter dwellings | - |
| 2006/07/0671 | Ying Pun Tsuen, Sheung Shui | 2SE-D/C63 | 17/7 | Public | Unknown | Soil cut | 3 | Minor Footpath | - |
| 2006/07/0672 | Slope behind 49 Po Wah Yuen, Lamma Island (Yung She Wan) | 14NE-B/CR180 | 18/7 | LandsD | 16/7 (02:00) | Soil cut | 15 | Backlane | Backlane closed |
| 2006/07/0673 | Northeast of No. 140, The Peak, Ma On Shan Upper Village, Sha Tin | 7SE-B/C146 | 21/7 | Lands D | Unknown | Soil cut | 3 | Squatter dwelling | - |



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Table B4 - List of Landslide Incidents in New Territories and Outlying Islands (Sheet 6 of 11)

| Incident No. | Location | Slope No. | Call | | Failure | | | Facility Affected | Consequence |
|---|---|---|---|---|---|---|---|---|---|
| | | | Date | From | Date (Time) | Feature Type | Scale ($m^3$) | | |
| 2006/07/0674 | Yung Shue O, Sai Kung | 8NW-C/CR95 | 21/7 | Lands D | 3/5 | Soil cut | 2 | Access road | - |
| 2006/07/0675 | Nai Chung, Sai Kung | 7NE-D/C45 | 18/7 | DLO | Unknown | Soil cut | 2 | Building | - |
| 2006/07/0677# | Footpath near Shatin North Service Reservior, Sha Tin | Natural terrain | 7/7 | DLO | June | Natural terrain | 2005 (Boulder fall) | Minor Footpath | - |
| 2006/07/0684 | Behind House No. 19, Fisherman's Village, Sai Kung | 1.8 m high soil cut slope(1) | 30/7 | FSD | 30/7 (10:30) | Soil cut | 2 | Squatter dwelling | - |
| 2006/07/0685 | Near No. 4 Lung Wo Village (between lamp post Nos. VE0012 and VE 2163), Sai Kung | Unregistered at time of failure | 30/7 | Police | 30/7 (16:30) | Soil cut | 0.5 | Access road | - |
| 2006/08/0686 | Adjacent to Lot 827SD & SE DD111, Sheung Che, Yuen Long | Natural terrain | 1/8 | DSD | Unknown | Natural terrain | 1 | Open area | - |
| 2006/08/0688 | Approximately 90 m to the West of Shing Mun Tunnel Viaduct toward Tsuen Wan, Sha Tin | 7SW-C/C1008 | 1/8 | HyD | 28/7 | Rock cut | 10 (Rockfall) | Open area | - |
| 2006/08/0692# | Sai Wan, Sai Kung | 8SE-A/C86 | 2/8 | DLO | Unknown | Soil cut | 2 | Minor Footpath | - |
| 2006/08/0697 | Near lamp post No. V5358, Ta Ku Ling San Tsuen, Sai Kung | 1 m high soil cut slope(1) | 7/8 | Public | 7/8 (10:15) | Soil cut | 0.3 | Access road | - |
| 2006/08/0698 | Behind House No. 2, Tai Po Kau San Wai Village, Tai Po | Natural terrain | 11/8 | Lands D | 10/8 (01:00) | Natural terrain | 12 (Boulder fall) | Open area | - |
| 2006/08/0700 | Behind House No. 14 Chung Shan Terrace, Lai Chi Kok, Kwai Tsing | 11NW-A/C146 | 16/8 | BD | Unknown | Soil/rock cut | 22 (Rockfall) | Backyard | - |
| 2006/08/0701# | Access road in Tai Lam Correctional Institute, Tai Lam, Tuen Mun | 6SW-D/C460 | 26/8 | CSD | 26/8 (06:00) | Soil/rock cut | 0.5 | Access road | - |

Table B4 - List of Landslide Incidents in New Territories and Outlying Islands (Sheet 7 of 11)

| Incident No. | Location | Slope No. | Call | | Failure | | | Facility Affected | Consequence |
|---|---|---|---|---|---|---|---|---|---|
| | | | Date | From | Date (Time) | Feature Type | Scale ($m^3$) | | |
| 2006/09/0704 | 10m South of House No. 10, Pun Shan Chau Village, Tai Po | Unregistered at time of failure | 4/9 | Public | 4/9 (10:00) | Soil/rock cut | 3 | Open area | - |
| 2006/09/0705 | House 26, Cho Ma Wu Village, Nam Hang, Tai Po | 2 m high soil cut slope(1) | 7/9 | Lands D | Unknown | Soil cut | 3 | Open area | - |
| 2006/09/0707 | House 3, Che Tei Tsuen, Tai Po | 3SW-C/R42 | 11/9 | Lands D | Unknown | Retaining wall | 46 | Access road | - |
| 2006/09/0708 | Adjacent natural streamcourse, west of Lo Wai Road, Lo Wai, Tsuen Wan | 7SW-C/R86 | 12/9 | Lands D | Unknown | Retaining wall | 2 | Streamcourse | - |
| 2006/09/0715 | Behind 3 Siu Kwai Wan San Tsuen, Cheung Chau | 14NW-D/CR68 | 13/9 | DO | 13/9 (12:40) | Soil/rock cut | 2 | Backlane | - |
| 2006/09/0718 | Behind house at Lot 202 in DD5 Luk Chau Wan, Lamma Island | 15NW-A/C94 | 13/9 | DLO | 13/9 (08:00) | Soil/rock cut | 1.1 (Rockfall) | Backlane | - |
| 2006/09/0719 | Lin Ma Hang Road, Sha Tau Kok | 3NW-B/C13 | 13/9 | ETC | 13/9 (21:00) | Soil cut | 6 | Road | - |
| 2006/09/0722 | Near Sau Mau Ping Services Reservoir, Anderson Road, Sau Mau Ping, Sai Kung | 11NE-D/C164 | 14/9 | FSD | 14/9 (03:00) | Soil/rock cut | 60 | Road | 1 lane of road closed |
| 2006/09/0723 | Slope behind house No. 21, San Wai Tsai, Tai Po | Unregistered at time of failure | 14/9 | Public | 13/9 (18:00) | Soil cut | 1.1 | Backlane | - |
| 2006/09/0724 | Fei Ngo Shan Road, Sai Kung | 11NE-A/C512 | 14/9 | Police | 14/9 (09:30) | Soil/rock cut | 10 | Road | 1 lane of road closed |
| 2006/09/0725 | Clear Water Bay Road (opposite to lamp post EB5844), Sai Kung | 2 m high soil cut slope(1) | 14/9 | Police | 14/9 (11:30) | Soil cut | 0.8 | Road | 1 lane of road closed |
| 2006/09/0726 | Hong Kong Horse Riding School, Kam Tin Road, Yuen Long | 6NE-B/C65 | 14/9 | Public | 13/9 (19:45) | Soil/rock cut | 100 | Backyard | - |
| 2006/09/0727# | Near slope No. 6SW-D/C695, Siu Lam Road, Tuen Mun | 2.5 m high soil cut slope(1) | 14/9 | BD | 14/9 (10:00) | Soil cut | 3 | Access road | - |

Table B4 - List of Landslide Incidents in New Territories and Outlying Islands (Sheet 8 of 11)

| Incident No. | Location | Slope No. | Call | | Failure | | | Facility Affected | Consequence |
|---|---|---|---|---|---|---|---|---|---|
| | | | Date | From | Date (Time) | Feature Type | Scale ($m^3$) | | |
| 2006/09/0728 | House 14, Kwei Tei Village, Sha Tin | 7SE-A/C191 | 14/9 | Lands D | 14/9 (11:30) | Soil cut | 3 | Open area | - |
| 2006/09/0732# | Near 7A Sun Tei Village, Sai Kung | 1.5 m high retaining wall(1) | 15/9 | Lands D | 14/9 (01:00) | Retaining wall | 1 | Access road | - |
| 2006/09/0734 | Near house No. 208, Sheung Sze Wan Road, Sai Kung | 12NW-C/C81 | 16/9 | Police | 14/9 | Soil cut | 4 | Open area | - |
| 2006/09/0735 | Sha Tin Tau New Village, Sha Tin | 7SE-C/C286 | 19/9 | Public | 19/9 (08:00) | Soil cut | 2 | Minor Footpath | - |
| 2006/09/0736 | Mai Po Lung Tsuen, Yuen Long | 2SE-A/C51 | 19/9 | GEO | Unknown | Soil cut | 1 | Open area | - |
| 2006/09/0737 | Ta Shek Wu Tsuen, Yuen Long | 6NE-B/CR88 | 20/9 | Public | 19/9 (13:30) | Soil/rock cut | 2 | Backlane | - |
| 2006/09/0738 | Ta Shek Tong Tsuen, Fan Kam Road, Pat Heung, Yuen Long | Unregistered at time of failure | 20/9 | Public | 15/9 (09:45) | Soil cut | Sign of distress | Open area | - |
| 2006/10/0740 | Along access road to WSD pumping station, Peng Chau | 10SE-A/C6 | 3/10 | Public | Unknown | Soil/rock cut | 1 | Road | - |
| 2006/10/0742# | 5 m to the north of slope No. 7SW-C/C392, Kwai Tsing | Natural terrain | 16/10 | DLO | Unknown | Natural terrain | 1 | Minor Footpath | - |
| 2006/10/0743 | North of the Clear Water Bay Country Park Management Centre, Sai Kung | Natural terrain | 23/10 | FSD | 20/10 (5:00) | Natural terrain | 15 | Open area | - |
| 2006/10/0744 | Near Cha Liu Au, Fei Ngo Shan, Sai Kung | Natural terrain | 24/10 | Public | 20/10 (17:30) | Natural terrain | 1 | Open area | - |
| 2006/11/0748# | Above slope No. 7NW-B/C423, Ma Wo, Tai Po | Natural terrain | 21/11 | DO | 6/11 | Natural terrain | 0.5 | Open area | - |



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Table B4 - List of Landslide Incidents in New Territories and Outlying Islands (Sheet 9 of 11)

| Incident No. | Location | Slope No. | Call | | Failure | | | Facility Affected | Consequence |
|---|---|---|---|---|---|---|---|---|---|
| | | | Date | From | Date (Time) | Feature Type | Scale ($m^3$) | | |
| 2006/11/0750 | Behind house No. 23, Tai Shan Central, Lamma Island | 14NE-B/C202 | 22/11 | Public | 22/11 (11:00) | Soil cut | 0.1 (Boulder fall at crest of the slope) | Building | Window of House No. 23 damaged |
| 2006/12/0752 | West of house No. 77 Kau Wa Keng San Tsuen, Kwai Tsing | 2.5 m high soil/rock cut slope(1) | 14/12 | Public | Unknown | Soil/rock cut | 1.5 | Backyard | - |
| ArchSD/NT/ 2006/04/0001 | Tai Mei Tuk Management Centre, Tai Po | 3SE-D/C61 | 8/5 | Arch SD | 26/4 (16:00) | Soil cut | 4 | Drainage channel | - |
| ArchSD/PM2/ 2006/05/0001 | Lady MacLehose Holiday Village, Sai Kung | 8SW-B/C222 | 20/5 | Arch SD | 12/5 | Soil cut | 0.5 | Backlane | - |
| WSD/2006/5/ 1/NTW | Tai Lam Chung Catchwater (Section C), Ch 4630-4740, Yuen Long | 6NE-D/CR275 | 6/5 | WSD | Unknown | Soil cut | 1 | Catchwater | - |
| WSD/2006/5/ 2/NTE | East Dam, High Island Reservoir, Sai Kung | 8SE-D/C8 | 8/5 | WSD | Unknown | Rock cut | 15 (Rockfall) | Open area | - |
| LandsD/ST/ 2006/05/0001 | Behind house No. 14, San Tin Village, Sha Tin | 7SW-D/CR436 | 15/5 | Lands D | May | Soil cut | 3 | Building | - |
| AFCD/2006/06/ 0001 | Shing Mun Road, Shing Mun Country Park, Kwai Tsing | 7SW-C/C943 | 3/6 | AFCD | 2/6 | Soil cut | 10 | BBQ area | - |
| LandsD/SK/ 2006/06/0002 | Behind house No. 2A, Tai Hang Hau, Sai Kung | Natural terrain | 6/6 | Lands D | 6/6 | Natural terrain | 0.05 | Open area | - |
| LandsD/ST/ 2006/06/0003 | Adjacent to House No. 19, San Tin Village, Sha Tin | 7SW-D/CR436 | 23/6 | Lands D | 9/6 (12:47) | Soil cut | Sign of distress | Building | - |
| AFCD/2006/ 06/0002 | Sheung Sze Trail, Tai Mo Shan, Tsuen Wan | Natural terrain | 14/6 | AFCD | 14/6 | Natural terrain | 3 | Hiking trail | Trail closed |
| AFCD/2006/ 06/0003 | Sheung Sze Trail, Tai Mo Shan, Tsuen Wan | Natural terrain | 14/6 | AFCD | 14/6 | Natural terrain | 40 | Hiking trail | Trail closed |
| WSD/2006/6/ 1/NTW | Tai Lam Chung Catchwater Section O, Ch. 9520 - Ch. 9645, Tsuen Wan | 6SE-B/CR101 | 2/6 | WSD | Unknown | Soil cut | 2 | Catchwater | - |

Table B4 - List of Landslide Incidents in New Territories and Outlying Islands (Sheet 10 of 11)

| Incident No. | Location | Slope No. | Call | | Failure | | | Facility Affected | Consequence |
|---|---|---|---|---|---|---|---|---|---|
| | | | Date | From | Date (Time) | Feature Type | Scale ($m^3$) | | |
| WSD/2006/6/2/NTW | Shing Mun Catchwater near SMOF 27, Tsuen Wan | 6SE-B/CR234 | 2/6 | WSD | Unknown | Soil/rock cut | 2 | Catchwater | - |
| WSD/2006/6/3/NTW | Shing Mun Catchwater adjoining Catchwater to the west of DD360 Lot 1107, Tsuen Wan | 6SE-B/CR194 | 2/6 | WSD | Unknown | Soil cut | 2 | Catchwater | - |
| WSD/2006/6/4/NTW | Adjoining WSD Access Road NT26 & NT31, Tai Lam Country Park, Tuen Mun | 6SW-D/C466 | 2/6 | WSD | Unknown | Soil/rock cut | 2 (Rockfall) | Access road | - |
| WSD/2006/6/7/NTW | Section M, Ch. 4560 to Ch. 4590, Tai Lam Chung Catchwater, above Tuen Mun Road, Ting Kau | 6SE-D/FR105 | 6/6 | WSD | Unknown | Fill | 10 | Overflow weir channel | - |
| WSD/2006/6/9/NTW | Adjoining WSD Access Road NT31 near spot levels 96.3, 98.6 & 101.3, Tuen Mun | 6SW-D/C606 | 12/6 | WSD | Unknown | Soil cut | 1 | Access road | - |
| WSD/2006/6/10/NTW# | Catchwater H&I near So Kwun Wat Road, Tuen Mun | 6SW-D/C108 | 12/6 | WSD | Unknown | Soil cut | 2 | Access road | - |
| WSD/2006/6/11/NTW | Shing Mun Catchwater Ch. 7750, Tsuen Wan | 6SE-B/C263 | 14/6 | WSD | Unknown | Soil/rock cut | 2 | Catchwater | - |
| ArchSD/SK/2006/07/0001 | Tai Mong Tsai, Sai Kung (Pak Tam Chung Country Park Management Centre) | 8SW-B/C122 | 17/7 | Arch SD | 17/7 | Soil cut | 2 | Open area | - |
| ArchSD/KWT/2006/08/0001 | TWGHS Chen Zoo Men Collage, Kwai Chung Circuit, Kwai Tsing | 7SW-C/CR71 | 4/8 | Arch SD | 4/8 | Rock cut | 0.06 (Rockfall) | Pedestrian Pavement | Pedestrian pavement closed |
| ArchSD/SC/2006/08/0001 | Lung Yan Road, Beacon Hill, Sha Tin | 11NW-B/F253 | 10/10 | Arch SD | 7/8 | Fill | 10 | Open area | - |
| LandsD/SK/2006/09/0001 | House No. 3, Tung A, Sai Kung Man Yee Road, Sai Kung East Country Park | 12NE-A/C17 | 19/9 | Lands D | Unknown | Rock cut | 4 (Rockfall) | Building | - |

Table B4 - List of Landslide Incidents in New Territories and Outlying Islands (Sheet 11 of 11)

| Incident No. | Location | Slope No. | Call | | Failure | | | Facility Affected | Consequence |
|---|---|---|---|---|---|---|---|---|---|
| | | | Date | From | Date (Time) | Feature Type | Scale ($m^3$) | | |
| LandsD/TW/ 2006/09/0001 | Choi Yuen Tsuen, northern side of the Top, Hong Kong Garden, Tsuen Wan | 6SW-D/C416 | 4/9 | Lands D | Unknown | Soil cut | 4 | Building | - |
| HyD/NTE/ 2006/09/0036 | Fu Tei Au Road, Sheung Shui | 3SW-A/C16 | 31/10 | HyD | 14/9 | Soil cut | 0.5 | Open area | - |
| HyD/NTE/ 2006/05/0016 | Lin Ma Hang Road | 3NE-A/C103 | 31/10 | HyD | 23/5 | Soil/rock cut | 0.1 (Rockfall) | Open area | - |
| WSD/2006/6/5/ HK# | Shek Mun Kap Road, Shek Mun Kap, Tung Chung, Lantau Island | 9SE-C/C34 | 5/6 | WSD | Unknown | Soil cut | 3 | Minor footpath / access | - |
| WSD/2006/6/6/ HK# | Adjoining catchwater near spot level 127.5 | 9SW-D/CR120 | 5/6 | WSD | Unknown | Soil cut | 1 | Catchwater | - |
| LI2006/03/2001 | Kwun Yam Shan, Sha Tin | Natural terrain | Mar | LIC | Unknown | Natural terrain | 10,000* | Road+ and village house+ | - |

Legend:

| | |
|---|---|
| * | Information obtained by GEO's landslide investigation consultants and agreed with GEO's District Divisions. |
| # | Very minor landslide with negligible consequence (see Section 1 of the report for definition). |
| (1) | The slope feature does not meet the slope registration criteria given in GEO Circular No. 15. |
| + | Facilities potentially affected by the Incident No. LI2006/03/2001. |



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# 土力工程處刊物及訂購資料

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# 土力工程處之主要刊物

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## GEOTECHNICAL MANUALS

Geotechnical Manual for Slopes, 2nd Edition (1984), 300 p. (English Version), (Reprinted, 2000).

斜坡岩土工程手冊(1998)，308頁(1984年英文版的中文譯本)。

Highway Slope Manual (2000), 114 p.

## GEOGUIDES

| | |
|---|---|
| Geoguide 1 | Guide to Retaining Wall Design, 2nd Edition (1993), 258 p. (Reprinted, 2007). |
| Geoguide 2 | Guide to Site Investigation (1987), 359 p. (Reprinted, 2000). |
| Geoguide 3 | Guide to Rock and Soil Descriptions (1988), 186 p. (Reprinted, 2000). |
| Geoguide 4 | Guide to Cavern Engineering (1992), 148 p. (Reprinted, 1998). |
| Geoguide 5 | Guide to Slope Maintenance, 3rd Edition (2003), 132 p. (English Version). |
| 岩土指南第五冊 | 斜坡維修指南，第三版(2003)，120頁(中文版)。 |
| Geoguide 6 | Guide to Reinforced Fill Structure and Slope Design (2002), 236 p. |
| Geoguide 7 | Guide to Soil Nail Design and Construction (2008), 97 p. |

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## GEOSPECS

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| Geospec 1 | Model Specification for Prestressed Ground Anchors, 2nd Edition (1989), 164 p. (Reprinted, 1997). |
| Geospec 3 | Model Specification for Soil Testing (2001), 340 p. |

## GEO PUBLICATIONS

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| GCO Publication No. 1/90 | Review of Design Methods for Excavations (1990), 187 p. (Reprinted, 2002). |
| GEO Publication No. 1/93 | Review of Granular and Geotextile Filters (1993), 141 p. |
| GEO Publication No. 1/2000 | Technical Guidelines on Landscape Treatment and Bio-engineering for Man-made Slopes and Retaining Walls (2000), 146 p. |
| GEO Publication No. 1/2006 | Foundation Design and Construction (2006), 376 p. |
| GEO Publication No. 1/2007 | Engineering Geological Practice in Hong Kong (2007), 278 p. |

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## GEOLOGICAL PUBLICATIONS

The Quaternary Geology of Hong Kong, by J.A. Fyfe, R. Shaw, S.D.G. Campbell, K.W. Lai & P.A. Kirk (2000), 210 p. plus 6 maps.

The Pre-Quaternary Geology of Hong Kong, by R.J. Sewell, S.D.G. Campbell, C.J.N. Fletcher, K.W. Lai & P.A. Kirk (2000), 181 p. plus 4 maps.

## TECHNICAL GUIDANCE NOTES

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