Factual Report on Hong Kong Rainfall and Landslides in 2014

GEO Report No. 329

E.Y.M. Chan, R.H.C. Law, R.W.H. Lee & S.M. Ting

Geotechnical Engineering Office
Civil Engineering and Development Department
The Government of the Hong Kong
Special Administrative Region

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**This report was originally produced in May 2015
as Special Project Report No. SPR 2/2015**

First published, August 2017

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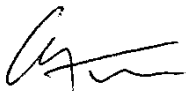
Preface

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 in print. These include guidance documents and results of comprehensive reviews. They can also be downloaded from the above website.

The 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 second last page of this report.



W.K. Pun
Head, Geotechnical Engineering Office
August 2017

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Foreword

This report presents a summary of the factual information on rainfall and landslides in Hong Kong throughout 2014. Details of the landslides were obtained from records of landslide incidents reported to the Geotechnical Engineering Office (GEO) of the Civil Engineering and Development Department (CEDD). Supplementary information was collected from the Agriculture, Fisheries and Conservation Department, Architectural Services Department, Drainage 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 of the GEO 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.

Y. Lam
Chief Geotechnical Engineer/LPM Division 1

Abstract

This report presents a summary of the factual information on rainfall and landslides in Hong Kong throughout 2014. 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 records of landslide incidents reported to the GEO. Supplementary information was collected from the Agriculture, Fisheries and Conservation Department, Architectural Services Department, Drainage Services Department, Highways Department, Housing Department, Lands Department, Water Supplies Department, and the GEO's landslide investigation consultants, namely Fugro ACSL Joint Venture (previously known as Fugro URS Joint Venture) and Halcrow China Limited.

Rainfall recorded in 2014 at the HKO's Principal Raingauge at Tsim Sha Tsui amounted to 2,638.3 mm, a surplus of about 10 percent comparing to the mean rainfall of 2,398.5 mm between 1981 and 2010. Two Black Rainstorm Warnings were issued on 30 March and 8 May 2014. Nine Red Rainstorm Warnings and 32 Amber Rainstorm Warnings were issued between 30 March and 13 August 2014, and between 29 March and 3 October 2014 respectively.

Five Landslip Warnings were issued between 30 March and 13 August 2014. A total of 252 incidents were reported to the Government in 2014. Of these, 237 were classified as genuine landslides and 14 of them were designated as major failure (i.e. with a failure volume of 50 m^3 or more, or where a fatality has occurred).

There were 27 landslides in 2014 with notable consequences. Of these landslides, two led to permanent evacuation of squatter dwellings, two led to temporary evacuation of squatter dwellings, and one led to temporary closure of a kitchen on the ground floor of a village house. The remaining 22 landslides resulted in temporary closure of roads. Other landslides in 2014 primarily affected open areas, footpaths or minor access roads and catchwaters, without any significant direct or indirect consequence. No injury or fatality was reported as a result of the 2014 landslides.

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1 Introduction

This report summarises the factual information on rainfall and reported landslides in Hong Kong throughout 2014. 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 records of landslide incidents reported to the GEO. Supplementary information was collected from the Agriculture, Fisheries and Conservation Department (AFCD), Architectural Services Department (ArchSD), Drainage Services Department (DSD), Highways Department (HyD), Housing Department (HD), Lands Department (LandsD), Water Supplies Department (WSD), and the GEO's landslide investigation consultants, namely Fugro ACSL Joint Venture (previously known as Fugro URS Joint Venture) and Halcrow China Limited under Agreement Nos. CE 37/2013 (GE) and CE 38/2013 (GE) respectively.

In this report, a landslide is defined as the detachment or excessive displacement of soil or rock mass, and includes failure of a fill slope, cut slope, retaining wall, natural hillside, or disturbed terrain, as well as 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 ≥ 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. ≤ 5 m^3 for failures involving soil, or ≤ 0.1 m^3 for rockfalls/boulder falls) and does not give rise to any significant public nuisance or notable consequences (e.g. casualty, evacuation of buildings or squatter dwellings, road closure, 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 collaboration with the HKO, operates an automatic raingauge system that transmits rainfall data through either telephone lines or the General Packet Radio Service (GPRS) of the mobile network, viz. a wireless transmission technology, to the GEO and the HKO at 5-minute intervals. The system comprises 88 GEO raingauges and 22 HKO raingauges. The raingauges are of the tipping-bucket type, tipping for every 0.5 mm of rainfall. The locations of the automatic raingauges are shown in Figure 2.1.

2.2 Rainfall Records

The rainfall 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 whole year of 2014, as well as individual months and individual rainstorms.

The weather in 2014, as described by the HKO (2015), is excerpted as follows:

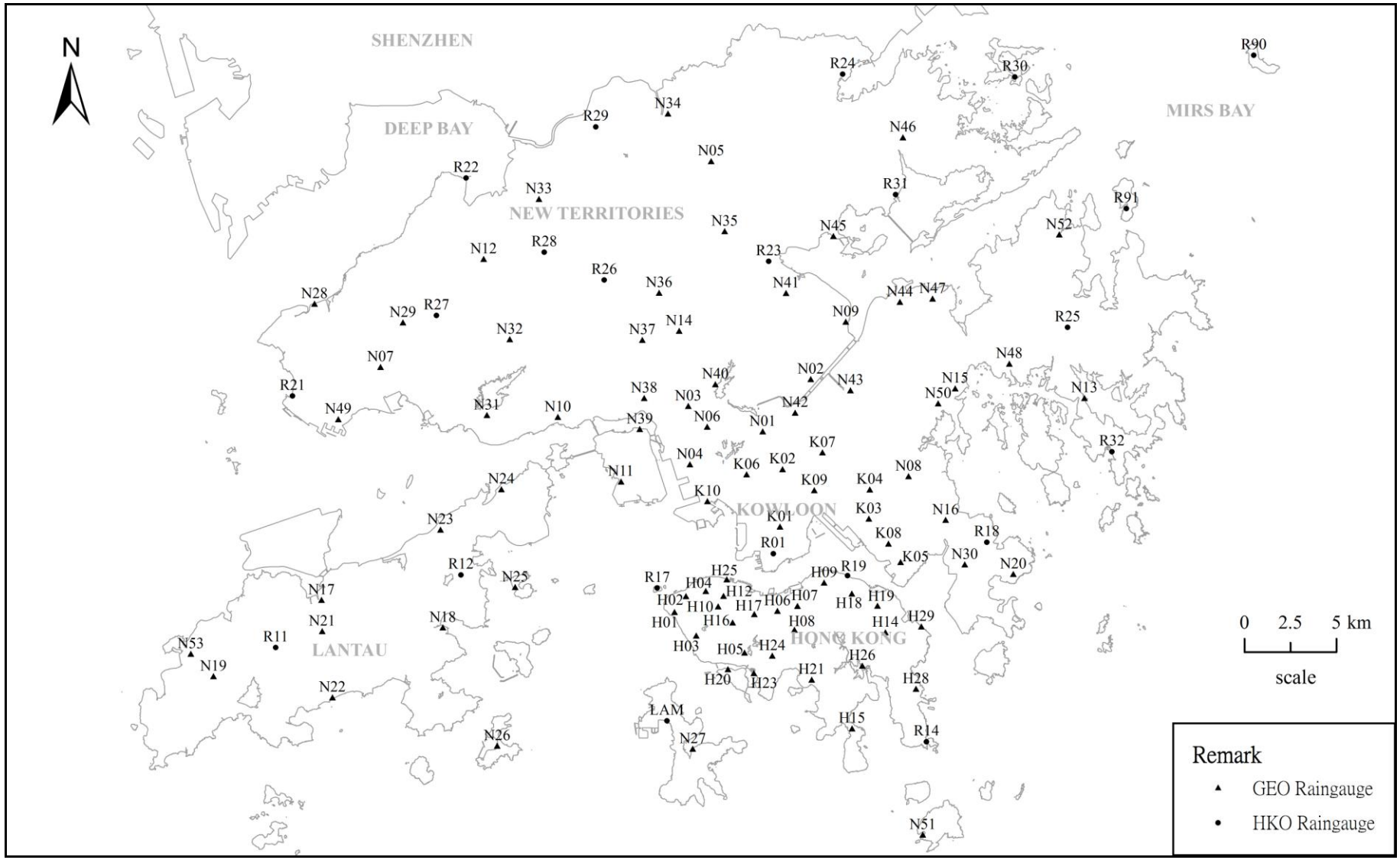


Figure 2.1 Locations of GEO and HKO Automatic Raingauges

> "With unsettled weather and well above normal rainfall in March, May and August, 2014 was also a wet and thundery year. The annual total rainfall was 2,638.3 millimetres, a surplus of 10 percent comparing to the 1981-2010 normal of 2,398.5 millimetres (and about 19 percent above the 1961-1990 normal). The total number of days with thunderstorms reported at the Hong Kong Observatory was 59 days. It is the highest since records began in 1947, shattering the previous record of 53 days set in 1997 and 2013. Affected by troughs of low pressure, there were torrential rain and intense thunderstorms in Hong Kong on 30 March and 8 May, requiring the Observatory to issue the Black Rainstorm Warning. The intense thunderstorms on 30 March also brought widespread hail and severe squalls to the territory."

> "A total of 24 tropical cyclones occurred over the western North Pacific and the South China Sea in 2014, less than the long term (1961-2010) average of around 30. There were 11 tropical cyclones reaching typhoon intensity or above during the year, below the long term average of about 15. In Hong Kong, four tropical cyclones necessitated the issuance of local tropical cyclone warning signals, lower than the long term average of about six in a year. The No. 8 Gale or Storm Signal was issued during the passage of Typhoon Kalmaegi in September."

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 2014). Further details on the monthly weather are available on the HKO Website (http://www.hko.gov.hk/wxinfo/pastwx/mws.htm).

> "An easterly replenishment of cooler air led to cooler, humid and foggy weather on 28 March. Meanwhile, the convergence of contrasting air masses near the Pearl River Delta intensified as a trough of low pressure approached the coast of Guangdong. Showers and thunderstorms started to affect Hong Kong on 29 March, and became even more intense on the evening of 30 March. Over a period of 3 to 4 hours, more than 100 millimetres of rainfall were recorded in Kowloon and the New Territories. Rainfall in Yuen Long, Tuen Mun, Tsuen Wan and Shatin exceeded 150 millimetres. The hourly rainfall of 56 millimetres recorded at the Hong Kong Observatory between 9 and 10 p.m. on 30 March was the highest in March since record began in 1884. The Black Rainstorm Warning was issued at 8:40 p.m., the first time in March since the Rainstorm Warning System commenced operation in 1992. There were flooding reports in Kowloon and the New Territories including the MTR stations at Kowloon Tong and Wong Tai Sin. Intense thunderstorms also brought widespread hail and severe squalls to the territory. A maximum gust exceeding 130 kilometres per

hour was reported at Lau Fau Shan, and one person was injured as stacked containers at the Kwai Chung Container Terminals toppled over. Outbreaks of heavy rain and squally thunderstorms continued throughout the night as the unsettled weather persisted till the end of the month."

"Intense thunderstorms associated with a trough of low pressure swept across the coast of Guangdong on the night of 8 May and brought widespread heavy rain and squalls to Hong Kong. The Black Rainstorm Warning was issued at 10:30 p.m. and more than 70 millimetres of rainfall were generally recorded over the territory. Affected by troughs of low pressure near the south China coastal areas, the weather remained unsettled with outbreaks of heavy showers and squally thunderstorms in the following five days. The rain was particularly heavy and persistent over the northern part of the New Territories on 11 May with more than 200 millimetres of rainfall recorded over Tai Po, Sha Tau Kok and Sheung Shui. There were 26 reports of flooding and 33 reports of landslides in Hong Kong during the heavy rain episodes."

"A southwest monsoon then maintained generally hot weather with sunny periods and thundery showers over the next five days. As another trough of low pressure lingered along the south China coast, the weather in Hong Kong became even more unsettled with occasional heavy showers and squally thunderstorms from 21 to 25 June. The showers were particularly heavy on the morning of 22 June. Rainfall exceeded 70 millimetres over widespread areas and more than 150 millimetres were recorded at Lamma Island, Cheung Chau, the eastern part of Lantau Island and the western part of Hong Kong Island."

"Sunny periods and a few showers on 10 and 11 August were followed by outbreaks of heavy rain and thunderstorms on 12 and 13 August under the influence of enhanced southwest monsoon associated with a trough of low pressure over the south China coastal areas. Around 270 millimetres of rainfall were recorded at the Observatory over these two days. A waterspout was observed over the waters south of Ap Lei Chau in the evening on 12 August. As the trough weakened and the southwest monsoon moderated, rain eased off with sunny intervals on 14 August."

"Local weather remained generally fine on 15-18 August before unsettled weather with squally thunderstorms returned on 19 and 20 August as another trough of low pressure approached from southern China. Heavy rain over these two days brought over 130 millimetres of rainfall to the Observatory, and together with

> the downpour a week earlier, rainfall over the two heavy rain episodes amounted to 400 millimetres, more than 90 per cent of the normal for August."
>
> "Meanwhile, tropical cyclone Kalmaegi intensified into a typhoon east of the Philippines on 14 September. It moved across Luzon and tracked generally west-northwestwards across the South China Sea on 15 September. Local weather was very hot with sunny periods at first. It became cloudy to overcast as winds strengthened gradually with a few squally showers and thunderstorms later that day. Kalmaegi passed to the south-southwest of Hong Kong and brought gale force winds to the territory with heavy squally showers during the night. Under the combined effect of Kalmaegi and a ridge of high pressure along the southeastern coast of China, local weather remained showery and rather windy over the next couple of days."

The rainfall recorded at the HKO in the first quarter of 2014 is 247.1 mm (52% above the normal rainfall). The total rainfalls recorded in the second and third quarter are 1,256.3 mm (34% above normal) and 949.3 mm (16% below normal) respectively. For the last quarter of 2014, the total rainfall is 185.6 mm (12% above normal). The annual rainfall for 2014 is 2,638.3 mm, about 10 percent higher than the annual normal of 2,398.5 mm recorded between 1981 and 2010. The cumulative rainfall for 2014 is compared with the highest, lowest and mean rainfall in Figure 2.2.

Figure 2.3 show the monthly rainfall distribution in 2014. Figure 2.4 shows the annual rainfall distribution in 2014, together with the locations of the reported landslides.

2.3 Rainstorms in 2014

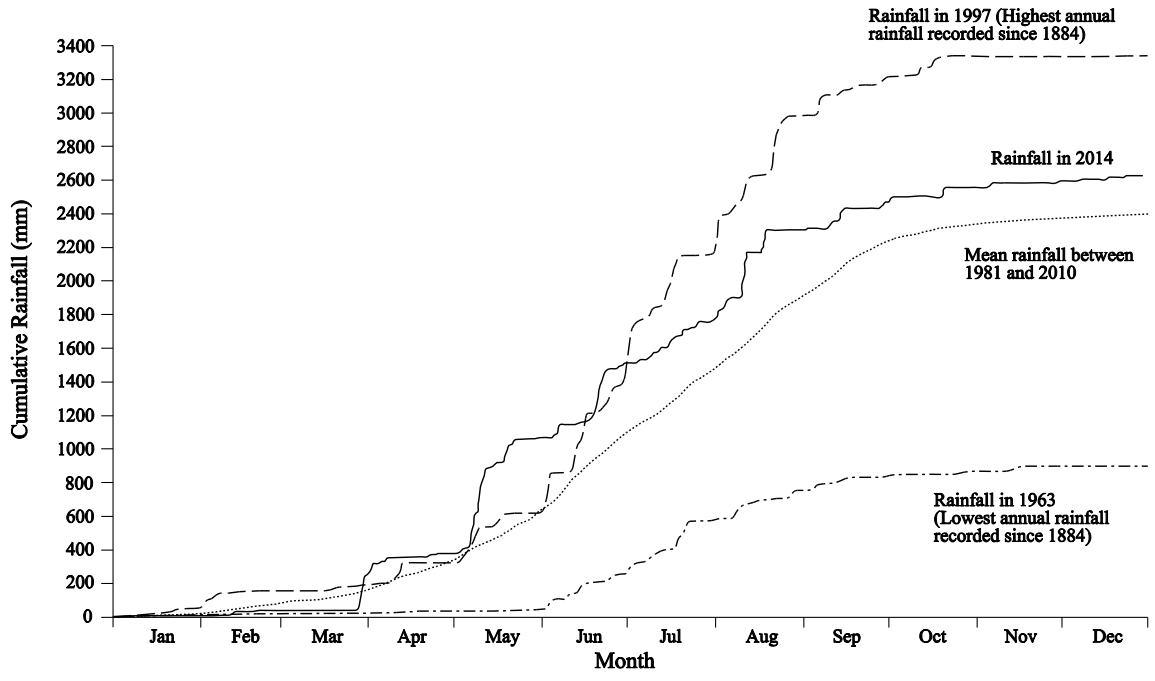
Table 2.1 tabulates the rainfall parameters for ten rainstorms in 2014, during which the daily rainfall exceeded 100 mm at any of the HKO and the GEO raingauges. The parameters include the maximum 24-hour, 4-hour and 1-hour rolling rainfalls (based on 5-minute rainfall data). Table 2.1 also includes the 4-day and 15-day antecedent rainfalls at the HKO's Principal Raingauge. Similar data for selected major rainstorms in previous years are included in Table 2.1 for comparison. Other rainfall parameters for the above ten rainstorms are also shown in Table A1 of Appendix A.

Figures A1 to A10 of Appendix A show the isohyets of the maximum rolling 24-hour rainfall during the above ten rainstorms, together with the locations of reported landslides with incident date or incident reported date that can be attributed to the rainstorm event, and the locations and values of maximum rolling rainfall for durations ranging from five minutes to 48 hours.

The rainstorms of 30 March to 1 April 2014, 8 to 14 May 2014 and 21 to 24 May 2014 had caused 31, 103 and 14 reported landslides respectively. Each of the other rainstorms in 2014 resulted in less than ten reported landslides.

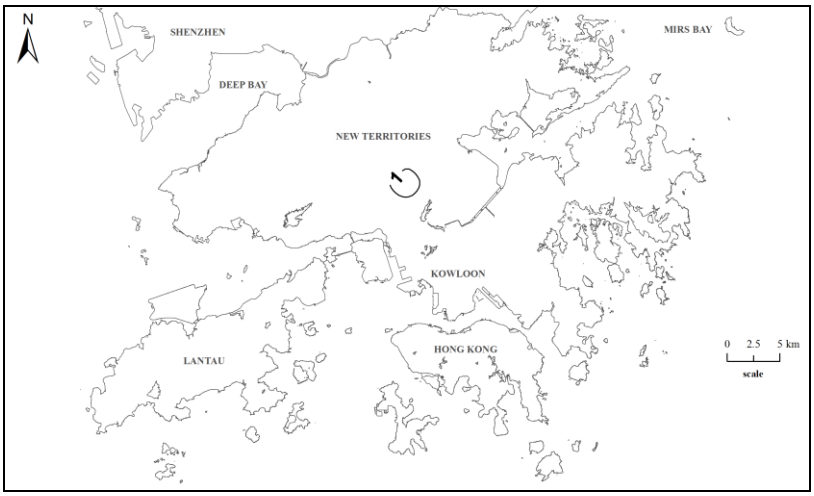
2.4 Warnings Issued by the Hong Kong Observatory

Table 2.2 summarises the details of the Thunderstorm, Flooding, Landslip, Tropical Cyclone and Rainstorm Warnings issued by the HKO in 2014. Two Black Rainstorm Warnings were issued on 30 March and 8 May 2014. Nine Red Rainstorm Warnings and 32 Amber Rainstorm Warnings were issued between 30 March and 13 August 2014, and between 29 March and 3 October 2014 respectively. Five Landslip Warnings were issued between 30 March and 13 August 2014.

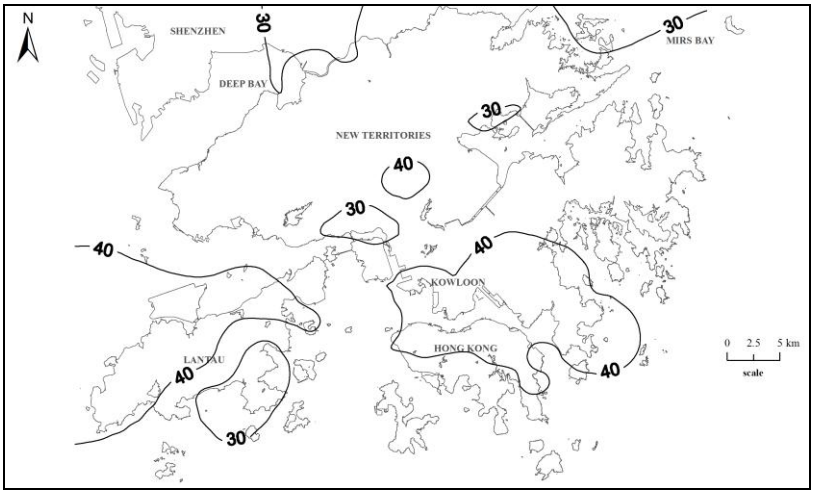


Note: Rainfall recorded at Hong Kong Observatory, Tsim Sha Tsui.

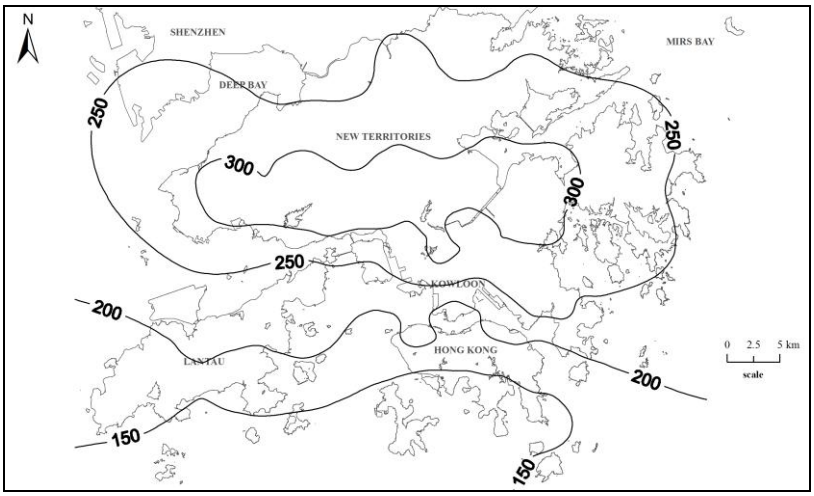
Figure 2.2 Cumulative Rainfall for 2014 at the Hong Kong Observatory and its Recorded Highest, Mean and Lowest Cumulative Rainfalls



January 2014



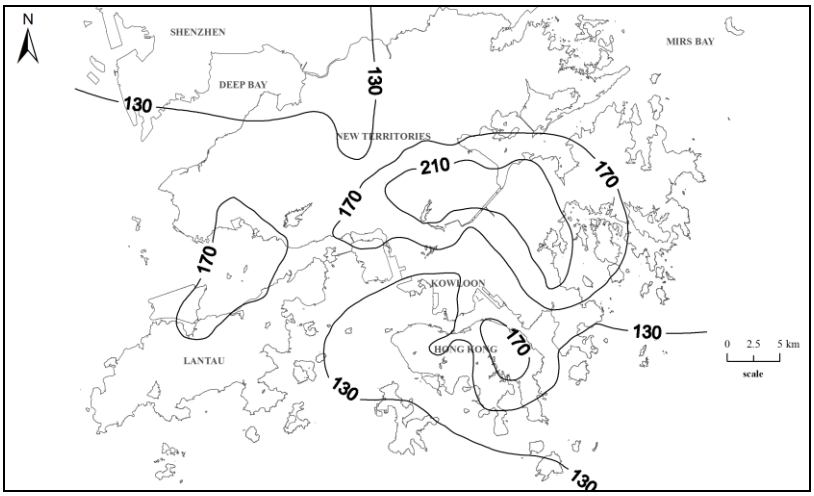
February 2014



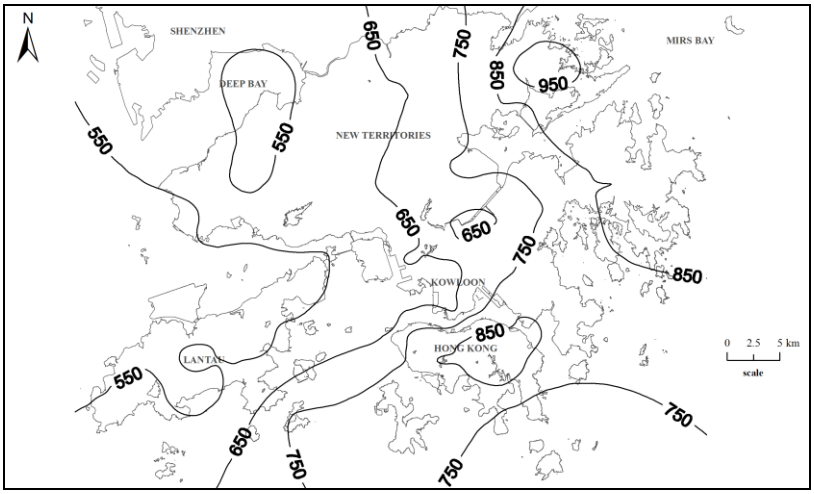
March 2014

Note: Isohyets are based on the GEO and HKO raingauges.

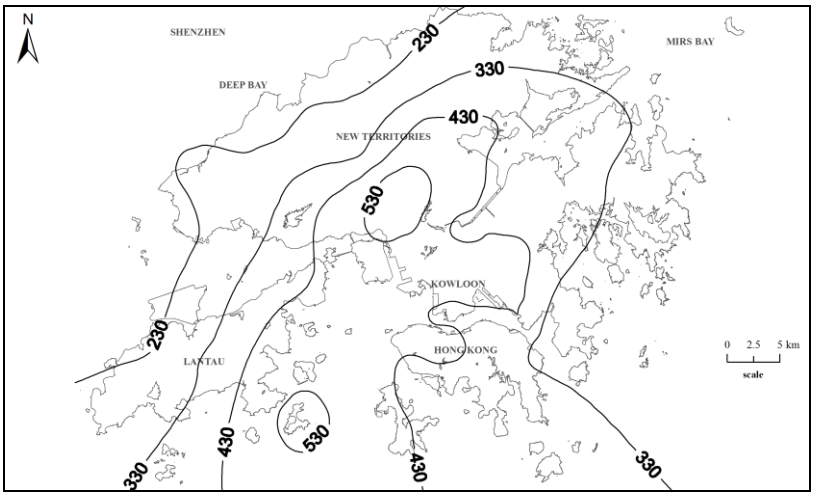
Figure 2.3 Monthly Rainfall Distribution in 2014 (Sheet 1 of 4)



April 2014



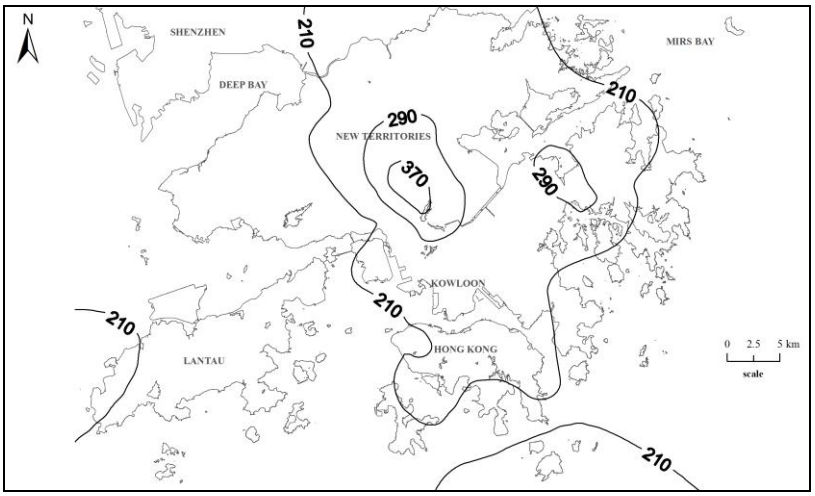
May 2014



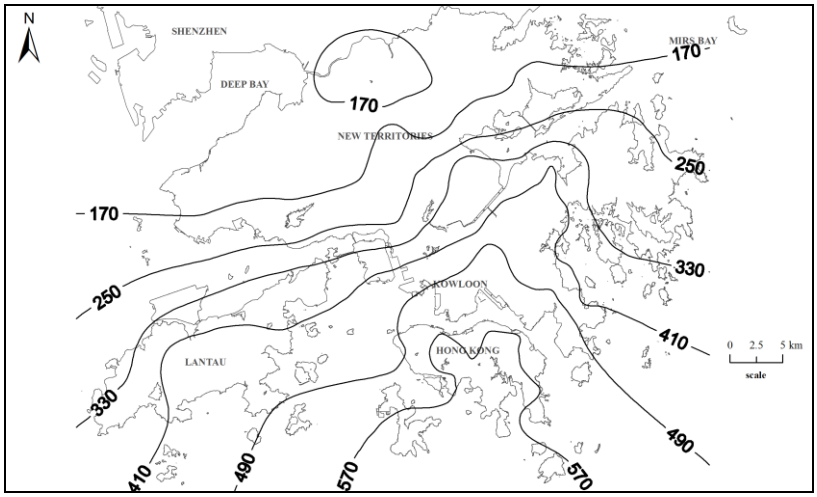
June 2014

Note: Isohyets are based on the GEO and HKO raingauges.

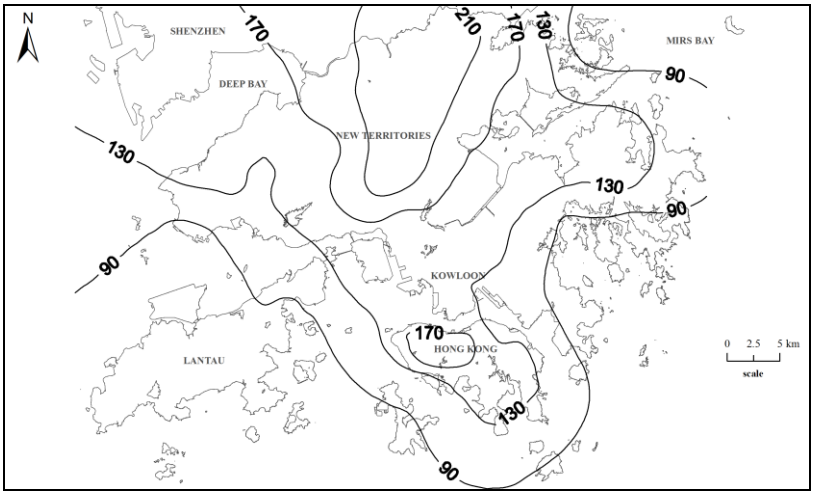
Figure 2.3 Monthly Rainfall Distribution in 2014 (Sheet 2 of 4)



July 2014



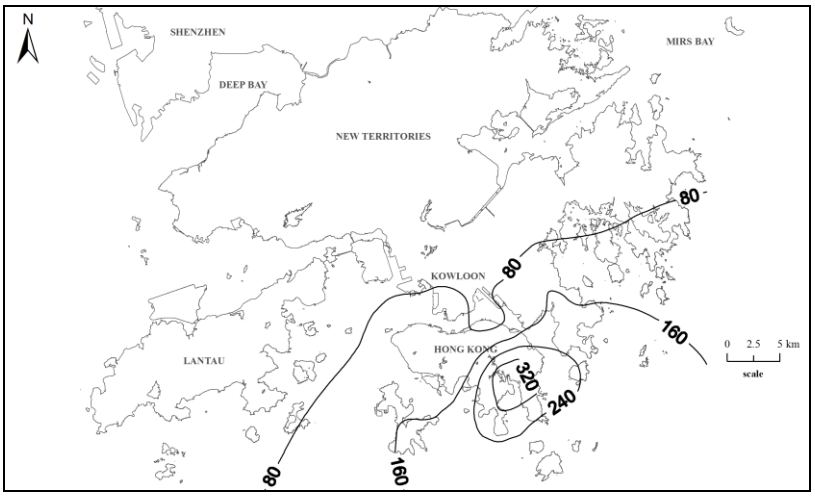
August 2014



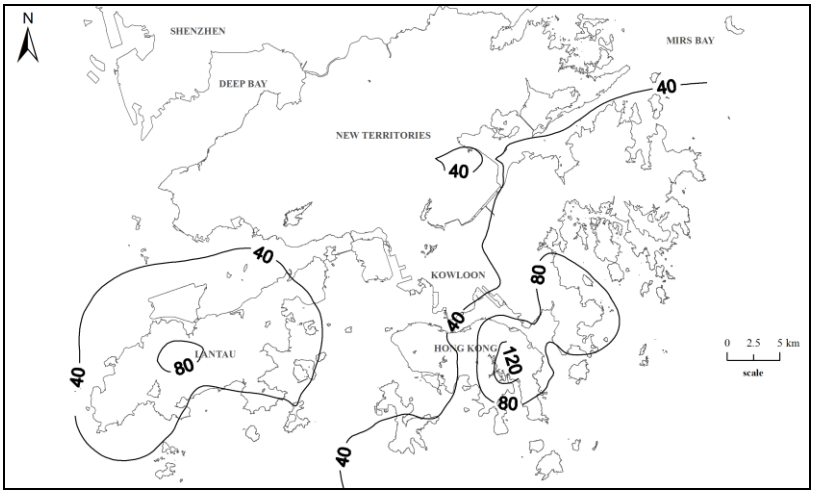
September 2014

Note: Isohyets are based on the GEO and HKO raingauges.

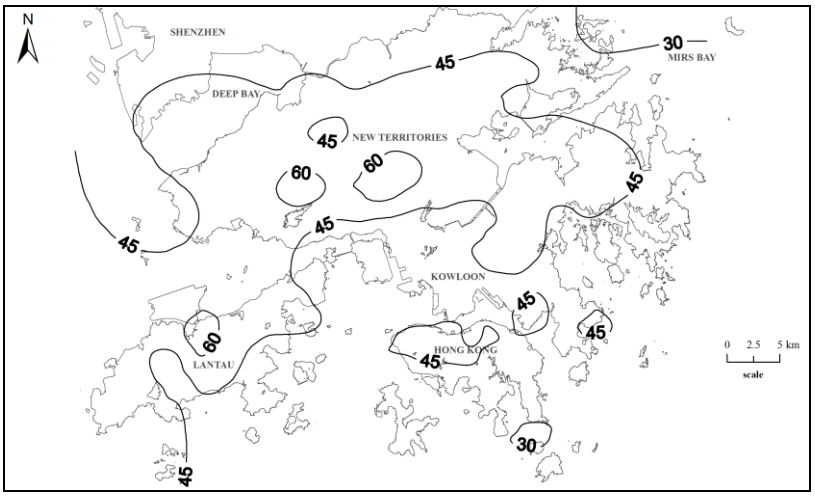
Figure 2.3 Monthly Rainfall Distribution in 2014 (Sheet 3 of 4)



October 2014



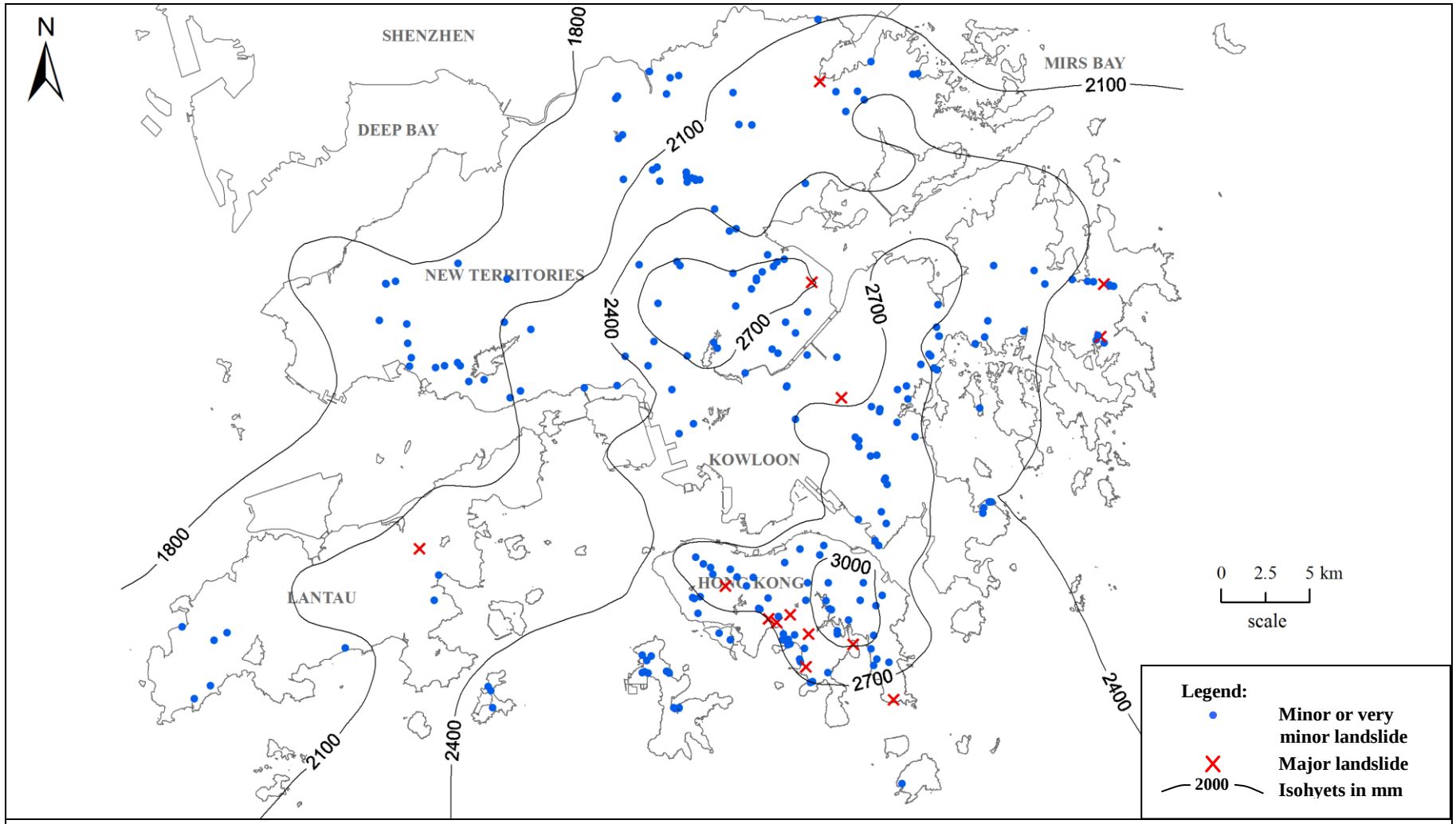
November 2014



December 2014

Note: Isohyets are based on the GEO and HKO raingauges.

Figure 2.3 Monthly Rainfall Distribution in 2014 (Sheet 4 of 4)



Notes: (1) Isohyets are based on the GEO and HKO raingauges.
(2) Only the genuine landslides in 2014 (237 nos.) reported to the GEO and other Government Departments are shown.

Figure 2.4 Annual Rainfall Distribution and Locations of Reported Landslides in 2014

Table 2.1 Rainfall and Landslides in 2014 and Selected Previous Major Rainstorms (Sheet 1 of 2)

Date of Rainstorm Event [1]	Maximum Rainfall (mm) [2]								Number of Landslides Reported [4]
	Hong Kong Observatory (HKO)					GEO Raingauges [3]			
	24-hr	4-hr	1-hr	Antecedent		24-hr	4-hr	1-hr	
				4-day	15-day				
12-14 August 2014	231	88.5	50	5.5	137	350.5 (H17)	194.5 (N27)	124.5 (N27)	7
8-14 May 2014	185	98	66.5	38	61	367.5 (H26)	256 (H26)	107 (H05)	103
21-26 June 2014	138	86	32	45	137.5	319 (N26)	171 (N26)	91 (N26)	2
30 March - 1 April 2014	112	96.5	56	18.5	18.5	307.5 (N37)	208 (N07)	113 (N07)	31
19-21 August 2014	101	52	37.5	0	335	142.5 (N21)	83.5 (N21)	66 (N21)	2
21-24 May 2014	65.5	12	9.5	61.5	518.5	208 (N46)	111.5 (N46)	72 (H01)	14
16 September 2014	55.5	23	19.5	66.5	80	108 (H16)	51.5 (H16)	50 (H16)	1
8-9 June 2014	54	54	50	25.5	34.5	212 (H19)	203.5 (H19)	131 (H19)	4
8 November 2014	26	9	4	12	12	114.5 (H26)	67.5 (H14, H26)	36.5 (H14, H19)	0
3-5 October 2014	25.5	16	16	38	39	312 (H26)	193.5 (H26)	121.5 (H04)	0

Notes:
(1) Rainstorms are arranged in order of the rolling 24-hour rainfall at the Hong Kong Observatory in Tsim Sha Tsui.
(2) The maximum rainfalls are calculated using 5-minute rainfall as the basic unit, except those recorded at the HKO, for which the rolling rainfall is calculated using one-clock hour rainfall as the basic unit.
(3) The maximum rainfalls are selected from the 88 GEO Raingauges for the rainstorms. The GEO Raingauge reference number is shown in brackets.
(4) Reported number of landslides refer to those genuine landslides that can be attributed to the rainstorm events.

Table 2.1 Rainfall and Landslides in 2014 and Selected Previous Major Rainstorms (Sheet 2 of 2)

Date of Rainstorm Event	Maximum Rainfall (mm) [1]								Number of Landslides Reported [2]
	Hong Kong Observatory (HKO)					GEO Raingauges [3]			
	24-hr	4-hr	1-hr	Antecedent		24-hr	4-hr	1-hr	
				4-day	15-day				
Selected Major Rainstorms in Previous Years (for comparison only)									
20-21 May 1989	387.8	119.3	37.3	27.9	41.7	566 (N14)	194.5 (N14)	61.5 (N14)	378
7-9 May 1992	324.7	195	109.9	4.2	9.1	386.5 (H10)	243 (H10)	144.5 (H19)	314
15-16 June 1993	155.1	122.3	54.1	155.8	296.1	285 (N13)	191.5 (N13)	111 (H13)	123
4-5 November 1993	106.6	27.8	9.4	0	0	745 (N17)	285 (N17)	114 (N17)	394
21-25 July 1994	310.2	141.9	70.4	18.7	310.1	956 (N14)	365 (N14)	211.5 (N14)	208
3-11 August 1994	74.1	44.9	27.1	8.1	759.1	381 (N14)	187.5 (N14)	103.5 (N14)	46
11-15 August 1995	325.7	109.1	43.8	5.1	436.9	468 (H08)	223.5 (H14)	106 (N14)	110
3-5 June 1997	150.2	83.7	46.4	0.9	33.6	367.5 (N04)	262.5 (N04)	128.5 (N04)	81
1-4 July 1997	148.8	106.7	45.4	33.5	362.7	800 (N09)	249.5 (N09)	125 (N01)	150
8-9 June 1998	428.4	152.4	71.7	86.6	246.8	562 (N15)	218.5 (N15)	98 (N09)	96
22-26 August 1999	313.1	127.4	50.7	6.8	170.3	565 (N14)	230.5 (N10)	120.5 (N10)	269
16-21 August 2005	416.4	122.9	39.1	110.7	214.1	570 (N01)	173.5 (N18)	82 (N25)	229
6-9 June 2008	417.6	246.3	145.5	99.9	242.5	622.5 (N19)	384 (N19)	153.5 (N21)	363

Notes:
(1) The maximum rainfalls are calculated using 5-minute rainfall as the basic unit, except those recorded at the HKO, for which the rolling rainfall is calculated using one-clock hour rainfall as the basic unit.
(2) Reported number of landslides refer to those genuine landslides that can be attributed to the rainstorm events.
(3) The maximum rainfalls are selected from all the available GEO Raingauges for the rainstorms. The GEO Raingauge reference number is shown in brackets.

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Table 2.2 Warnings Issued by the Hong Kong Observatory in 2014

Month	Monthly Total Rainfall (mm)	Dates on which Warnings [1] were in Effect				
		Thunderstorm [2]	Flooding	Landslip [3]	Tropical Cyclone [4]	Rainstorm
January	0	-	-	-	-	-
February	39.5	-	-	-	-	-
March	207.6	29, 30, 31	30-31	30-31, 31	-	29 (Amber), 30 (2 x Amber), 30 (Red), 30 (Black), 31 (Amber)
April	132.4	1, 2, 3, 8	-	-	-	3 (Amber)
May	687.3	5, 8, 10, 11, 13, 14, 16, 18, 19, 20, 21, 22, 23, 24, 25, 27, 29	8-9, 11	9, 11-12	-	5 (Amber), 8 (Amber), 8 (2 x Red), 8 (Black), 9 (3 x Amber), 11 (3 x Amber), 11 (Red), 20 (Amber), 21 (Amber)
June	436.6	3, 5, 6, 7, 8, 16, 17, 18, 19, 20, 21, 23, 24, 25, 29, 30	-	-	14-15 (1, HAGIBIS)	8 (2 x Amber), 8 (Red), 21 (Amber), 22 (2 x Amber), 22 (Red)
July	260.5	1, 2, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27	-	-	16-19 (1-3, RAMMASUN)	22 (Amber), 24 (Amber)
August	548.2	1, 2, 3, 4, 5, 6, 7, 8, 11, 12, 13, 14, 19, 20, 21, 22, 27, 31	-	13	-	1 (Amber), 3 (Amber), 12 (Amber), 12 (Red), 13 (4 x Amber), 13 (2 x Red), 20 (Amber)
September	140.6	4, 5, 6, 7, 8, 12, 13, 14, 15, 16, 17, 19, 30	-	-	7-8 (1, No name) 14-17 (1-8, KALMAEGI)	-
October	109.8	1, 2, 3	-	-	-	1 (Amber), 3 (Amber)
November	31.1	-	-	-	-	-
December	44.7	-	-	-	-	-
Total	2,638.3	176 Warnings	3 Warnings	5 Warnings	4 Warnings	43 Warnings (32 x Amber, 9 x Red, 2 x Black)

Notes:
(1) Warnings and signals were based on the information from the HKO.
(2) More than one Thunderstorm Warning may have been issued within a day but have only been shown once for clarity.
(3) Landslip Warning was issued after consultation between the GEO and the HKO.
(4) Tropical Cyclone Warning signal number hoisted is shown in the bracket followed by the name of the tropical cyclone.

3 Landslides

3.1 Landslides in 2014

Landslide incidents that occurred in 2014 and reported to the GEO and other government departments are summarised in Table 3.1.

Table 3.1 Breakdown of Landslides in 2014 Reported to Government Departments

Department	Reported Number of Landslides	Genuine Landslides
Agriculture, Fisheries and Conservation Department	28 (3)	28 (3)
Architectural Services Department	18 (1)	18 (1)
Drainage Services Department	0	0
Geotechnical Engineering Office, Civil Engineering and Development Department	181[(1)]	167[(1)]
Highways Department	36 (32)	35 (32)
Housing Department	0	0
Lands Department	2 (0)	2 (0)
Water Supplies Department	27 (4)	27 (4)
Total	292 (40)[(2)]	277 (40)[(2)]

Legend:

36 (32) Thirty-six incidents were reported to the government department concerned, 32 of which were also reported to the GEO separately by other parties (i.e. duplicate cases)

Notes:

(1) A total of 181 landslide incidents that occurred in 2014 (discounting duplicate cases) were reported to the GEO, of which 167 were classified as genuine landslides.

(2) The number of reported landslide incidents that occurred in 2014 (discounting duplicate cases) is **252** [292 - 40]. The number of genuine landslides is **237** [277 - 40].

A total of 252 landslide incidents that occurred in 2014 were reported to various government departments. These include 181 incidents (discounting duplicate cases) reported to the GEO. Another 71 incidents were reported to other government departments (i.e. AFCD, ArchSD, HyD, LandsD and WSD). Of these 252 reported incidents, 237 were genuine landslides (see details in Appendix B). The other reported incidents were non-landslide events such as tree falls and flooding.

Of the 237 genuine landslides, 14 (5.9%) were major landslides (see Table B1 in Appendix B), 146 (61.6%) were minor landslides and 77 (32.5%) were very minor landslides with negligible consequences (see Section 1).

Selected notable landslides are presented in Section 4 and illustrated in Figures 4.1 to 4.3. For those landslide incidents inspected by the GEO, the information on the landslides was recorded in incident reports prepared by the GEO. 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 is available in the Slope Information System (SIS). Further details of these slope failures can be found in the relevant 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. Of the 237 landslides, the timing of occurrence was determined to within one day for 38 incidents based on the reported date of failure given in the incident reports. For the remaining landslide incidents, the timing of occurrence could not be ascertained due to lack of information or that the incidents were not reported to the GEO or other government departments until several days or even weeks after occurrence.

3.2 Consequence of Landslides

The consequence of landslides in terms of the types of facilities affected (e.g. buildings, roads, registered squatter dwellings, catchwaters, construction sites, etc.) in different regions is summarised in Table 3.2. In regard to the landslides with significant consequences (e.g. casualties, evacuation of buildings or squatter dwellings, temporary closure of roads, etc.), they are classified with respect to the types of slope failures, as shown in Table 3.3. The facility groups affected by the major landslides are presented in Table 3.4. Further descriptions of some selected notable landslides of 2014 are given in Section 4 below.

3.3 Types of Slope Failures

Landslides reported to the GEO and other government departments have been classified into five major types of slope failures, i.e. fill slopes, cut slopes, retaining walls, natural hillside and registered disturbed terrain. The breakdown of different types of slope failures is shown in Table 3.5.

Table 3.2 Breakdown of Landslides by Types of Affected Facilities

Types of Affected Facilities	Hong Kong Island	Kowloon	New Territories and Outlying Islands	All
Buildings (including village houses)	4 (1)	0	20 (1)	24 (2)
Registered Squatter Dwellings	1 (0)	2 (0)	19 (0)	22 (0)
Roads	16 (3)	1 (0)	20 (1)	37 (4)
Transportation Facilities (e.g. railways, tramways, etc.)	0	0	0	0
Pedestrian Pavements/Footways	1 (0)	0	5 (0)	6 (0)
Minor Footpaths / Access Paths / Access Roads	21 (1)	3 (0)	66 (3)	90 (4)
Construction Sites	1 (0)	0	2 (0)	3 (0)
Open Areas	6 (2)	1 (0)	15 (1)	22 (3)
Catchwaters	5 (0)	0	9 (0)	14 (0)
Others (e.g. carparks, parks, playgrounds, gardens, backyards, etc.)	2 (0)	0	19 (0)	21 (0)
Nil	5 (2)	0	7 (0)	12 (2)
Total	62 (9)	7 (0)	182 (6)	251 (15)

Legend:

23 (1) Twenty-three landslides of which one was a major failure

Notes:
(1) Incidents that were not genuine landslides have been excluded.
(2) A given landslide may affect more than one type of facility.
(3) Nil consequence refers to incidents where the landslide debris came to rest on the slopes, not affecting any facilities.

Table 3.3 Breakdown of Landslide Consequences by Types of Slope Failures

Types of Slope Failures		Number of Squatter Dwellings[(1)] Evacuated		Number of Floors, Houses or Flats Evacuated or Partially Closed	Number of Incidents Involving Closure			Deaths	Injuries Reported to GEO
		Permanent	Temporary		Roads	Pedestrian Pavements	Footpaths, Alleyways or Private Access Paths		
Fill Slopes		0	0	0	0	0	0	0	0
Cut Slopes	Soil	0	1 (1)	1[(3)]	13	0	6	0	0
	Soil/rock	1 (1)	0	0	3	0	1	0	0
	Rock	1 (1)	0	0	2	0	0	0	0
Retaining Walls		0	0	0	1	0	0	0	0
Natural Hillside		0	0	0	3	2	5	0	0
Registered Disturbed Terrain		0	1 (1)	0	0	0	0	0	0
Total		2 (2)	2 (2)	1	22	2	12	0	0

Legend:

1 (1) 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. all structures registered in 1982 Housing Department's Squatter Structure Survey (GEO, 2010).

(2) A failure may give rise to more than one type of consequence.

(3) A cut slope failure (Incident No. 2014/03/1480) resulted in temporary closure of a kitchen on the ground floor of a village house in Fishermen New Village, Tui Min Hoi, Sai Kung.

Table 3.4 Breakdown of Facility Groups Affected by Major Landslides

Types of Major Landslides	Facility Group Affected by Major Landslides (Group No.)						
	1a	1b	2a	2b	3	4	5
All Major Landslides	1	1	0	0	2	8	3
Major Landslides on Man-made Slopes	1	0	0	0	1	4	0
Major Landslides on Registered Disturbed Terrain	0	0	0	0	0	0	0
Major Landslides on Natural Hillside	0	1	0	0	1	4	3

Notes: (1) Facility groups are classified in accordance with the GEO Technical Note No. 15 (GEO, 2007).
(2) A given landslide may affect more than one type of facility.

Table 3.5 Breakdown of Landslides by Types of Slope Failures

Types of Slope Failures		Number	Percentage (%)
Fill Slopes		11 (1)	4.6
Cut Slopes	Soil	108 (3)	45.6
	Soil/rock	25 (1)	10.6
	Rock	11 (0)	4.6
Retaining Walls		10 (0)	4.2
Natural Hillside		63 (9)	26.6
Registered Disturbed Terrain		9 (0)	3.8
Total		237 (14)	100

Legend:

25 (1) Twenty-five landslides, one of which was a major failure

Note: Where a landslide involved more than one type of failure, the predominant type of failure has been considered in the above classification.

3.4 Landslide Volume Distribution

Tables 3.6 and 3.7 show the distribution of failure volumes for all the reported landslides. A total of 136 landslides (57.4%) involved less than 5 m^3 of material. There were 14 major landslides (with a failure volume of 50 m^3 or more), nine of which occurred on natural hillside and the other five occurred on man-made features. The largest incident occurred at Shouson Hill Road which involved a concrete wall at crest, a soil cut slope at toe and a natural hillside in-between the two features, with debris volume of about 420 m^3. The incident resulted in temporary closure of a section of the road at toe and prolonged closure of one of the two lanes of the road for the implementation of emergency works (refer to Section 4.2).

Table 3.6 Landslide Volume Distribution with Respect to Geographical Locations

Volume of Failure (m^3)	Hong Kong Island	Kowloon	New Territories and Outlying Islands	All
< 5	29	7	100	136 (57.4%)
≥ 5 to < 10	7	0	24	31 (13.1%)
≥ 10 to < 20	7	0	20	27 (11.4%)
≥ 20 to < 50	10	0	19	29 (12.2%)
≥ 50 to < 200	6	0	6	12 (5.1%)
≥ 200 to < 500	2	0	0	2 (0.8%)
≥ 500 to < 1,000	0	0	0	0 (0%)
≥ 1,000	0	0	0	0 (0%)
Total	61	7	169	237 (100%)

Legend:

12 (5.1%) Twelve landslides, which amount to 5.1% of the total 237 genuine landslides reported to the Government

Table 3.7 Landslide Volume Distribution with Respect to Types of Slope Failures

Volume of Failure (m^3)	Fill Slopes	Cut Slopes			Retaining Walls	Natural Hillside	Registered Disturbed Terrain	Total
		Soil	Soil/rock	Rock				
< 5	4	66	16	11	5	27	7	136 (57.4%)
≥ 5 to < 10	1	14	3	0	2	11	0	31 (13.1%)
≥ 10 to < 20	1	12	3	0	2	7	2	27 (11.4%)
≥ 20 to < 50	4	13	2	0	1	9	0	29 (12.2%)
≥ 50 to < 200	1	2	1	0	0	8	0	12 (5.1%)
≥ 200 to < 500	0	1	0	0	0	1	0	2 (0.8%)
≥ 500 to < 1,000	0	0	0	0	0	0	0	0 (0%)
≥ 1,000	0	0	0	0	0	0	0	0 (0%)
Total	11	108	25	11	10	63	9	237 (100%)

Legend:

27 (11.4%) Twenty-seven landslides, which amount to 11.4% of the total 237 genuine landslides reported to the Government.

Note: Where a landslide involved more than one type of failure, the predominant type of failure has been considered in the above classification.

4 Notable Landslides

4.1 General

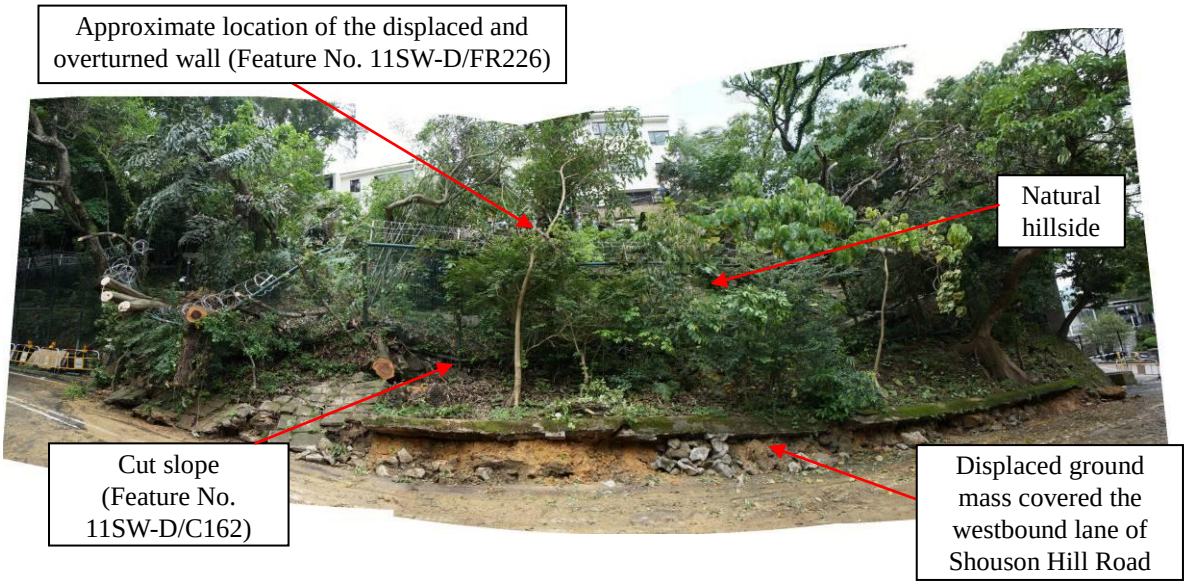
Of the 237 genuine landslides reported to the Government that occurred in 2014, three incidents are described in more detail below. These three incidents have been selected on the basis of their consequences.

4.2 The 12 May 2014 Landslide on Slope Nos. 11SW-D/C162 and 11SW-D/FR226 and the Natural Hillside in-between the Two Features, below No. 18 Shouson Hill Road (Incident No. 2014/05/1531)

At about 3:00 a.m. on 12 May 2014 when Landslip Warning was in effect, a major landslide occurred below the building platform of No. 18 Shouson Hill Road. The landslide, with debris volume of about 420 m^3, involved a concrete wall at crest (part of Feature No. 11SW-D/FR226), a soil cut slope at toe (Feature No. 11SW-D/C162) and a densely vegetated natural hillside in-between the two features Figure 4.1(a). Another cut slope (Feature No. 11SW-D/C165) adjoining feature No. 11SW-D/C162 was also slightly affected by the landslide at its western end. The concrete wall at crest had displaced and overturned Figure 4.1(b). The building platform of house No. 4 of No. 18 Shouson Hill Road partially collapsed and the spread footing of the 3-storey house was exposed Figure 4.1(c). At the toe of the landslide, the soil cut slope and the natural hillside had displaced by about 2 m downslope in a relatively intact manner. No casualty was reported, but debris from the landslide in association with the fallen trees blocked both lanes of Shouson Hill Road, resulting in closure of a section of the road. The eastbound lane of the road was re-opened after six days upon completion of the immediate emergency works whilst the westbound lane was re-opened in early October 2014 (i.e. about five months after the landslide) following the implementation of the further emergency works which comprised the installation of soil nails on the slope and the construction of a mass concrete toe wall.

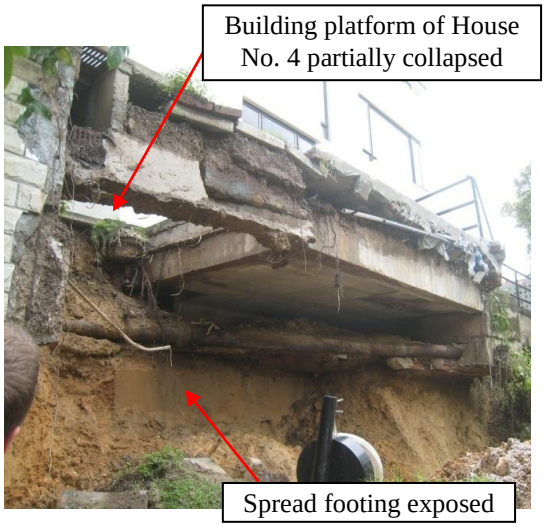
4.3 The 12 May 2014 Landslide on an Unregistered Cut Slope and the adjoining Slope No. 11SE-C/C237 near No. 23 Repulse Bay Road (Incident No. 2014/05/1532)

At about 4:00 a.m. on 12 May 2014 when Landslip Warning was in effect, a major landslide occurred at Repulse Bay Road (Figure 4.2). The landslide, with an estimated failure volume of 60 m^3, involved a shallow slip encompassing primarily an unregistered soil/rock cut slope and part of the adjoining registered soil cut slope (Feature No. 11SE-C/C237). The debris, comprising large rock blocks with soil and some vegetation, was deposited on two of the three traffic lanes of Repulse Bay Road at the section. No casualty was reported as a result of the landslide, but the westbound lane of the road was closed for four days for the implementation of emergency works. The landslide attracted a widespread media attention as it occurred right before the rush hours and could have a potential to severely affect the traffic of a major road in the Southern District.



(a) General View of the Landslide

(b) Displaced and Overturned Wall below the Building Platform



(c) Partially Collapsed Building Platform at Crest

Figure 4.1 Views of the 12 May 2014 Landslide below No. 18 Shouson Hill Road (Incident No. 2014/05/1531)

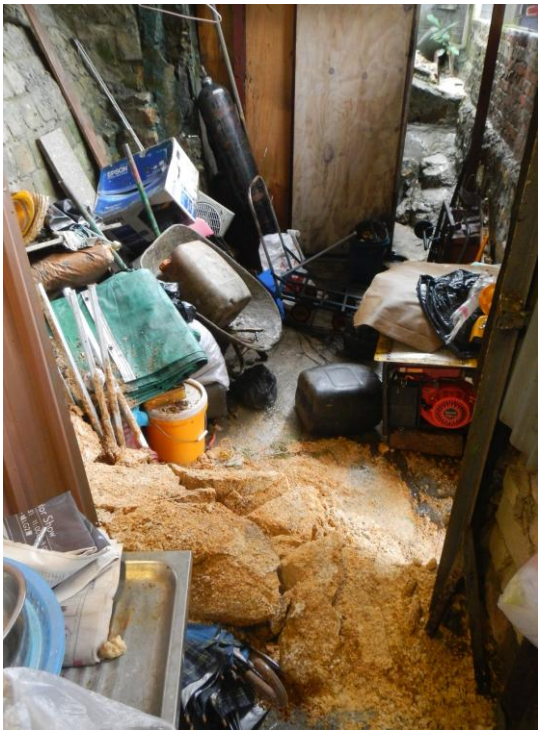
Figure 4.2 General View of the 12 May 2014 Landslide on an Unregistered Cut Slope and the adjoining Slope No. 11SE-C/C237 near No. 23 Repulse Bay Road (Incident No. 2014/05/1532)

4.4 The 12 May 2014 Landslide on Slope No. 11SE-B/C435 behind No. 28C Cha Kwo Ling Tsuen, Kwun Tong (Incident No. 2014/05/1533)

At about 6:00 a.m. on 12 May 2014 when Landslip Warning was in effect, a landslide occurred at the middle portion of a soil/rock cut slope (Feature No. 11SE-B/C435) behind a squatter dwelling at No. 28C Cha Kwo Ling Tsuen, Kwun Tong Figure 4.3(a). The landslide, with an estimated failure volume of 0.5 m^3, involved a shallow detachment from the lower slope portion. The debris, comprising highly decomposed rock and some pieces of chunam, was deposited at the kitchen of a flimsy squatter dwelling at toe and a back alley leading to it Figure 4.3(b). Following the landslide, the squatter dwelling concerned was permanently evacuated under a Category 1 Non-development Clearance[1] recommended by the GEO. No casualty was reported.

[1] Category 1 Non-development Clearance recommendations are issued to squatter structures that are in "immediate and obvious" danger; the clearance is compulsory and will be backed up by force if necessary.

(a) The Landslide



(b) Debris Deposited inside the Kitchen at Slope Toe

Figure 4.3 Views of the 12 May 2014 Landslide on Slope No. 11SE-B/C435 behind No. 28C Cha Kwo Ling Tsuen, Kwun Tong (Incident No. 2014/05/1533)

5 Conclusion

Rainfall recorded at the HKO's Principal Raingauge at Tsim Sha Tsui amounted to 2,638.3 mm in 2014, a surplus of about 10 percent comparing to the mean rainfall of 2,398.5 mm between 1981 and 2010. In 2014, five Landslip Warnings were issued between 30 March and 13 August, and two Black Rainstorm Warnings were issued on 30 March and 8 May. Nine Red Rainstorm Warnings and 32 Amber Rainstorm Warnings were issued between 30 March and 13 August 2014, and between 29 March and 3 October 2014 respectively. Of the 237 genuine landslides, 14 were major failures, 146 were minor failures and 77 were very minor failures with negligible consequences.

There were 27 landslides in 2014 with notable consequences. Of these landslides, two led to permanent evacuation of squatter dwellings, two led to temporary evacuation of squatter dwellings, and one led to temporary closure of a kitchen on the ground floor of a village house. The remaining 22 landslides resulted in temporary closure of roads. Other landslides in 2014 primarily affected open areas, footpaths or minor access roads and catchwaters, without any significant direct or indirect consequence. No injury or fatality was reported as a result of the 2014 landslides.

6 References

GEO (2007). *GEO Technical Guidance Note No. 15 (TGN 15) - Guidelines for Classification of Consequence-to-Life Category for Slope Features*. Geotechnical Engineering Office, Hong Kong, 14 p.

GEO (2010). *GEO Circular No. 3 - Non Development Clearance (Slope Safety) of Squatters.* Geotechnical Engineering Office, Hong Kong, 20 p.

HKO (2015). *The Year's Weather - 2014.* Hong Kong Observatory, Hong Kong, 8 p.

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Appendix A

Some Selected Rainfall Parameters for the Ten Rainstorms in 2014 with Daily Rainfall Exceeding 100 mm

List of Tables

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Table A1 Some Selected Rainfall Parameters for the 10 Rainstorms with Daily Rainfall Exceeding 100 mm in 2014 (Sheet 1 of 3)

Rainstorm		5-min		10-min		15-min		30-min	
		Max. rainfall (mm)	Raingauge Station	Max. rainfall (mm)	Raingauge Station	Max. rainfall (mm)	Raingauge Station	Max. rainfall (mm)	Raingauge Station
1	30 March - 1 April 2014	24.5	K06	41.5	K06, K07	58	K07	91	K07
2	8-14 May 2014	23.5	H05	39.5	H05	52.5	H24	83.5	H05
3	21-24 May 2014	19	H12	30.5	H12	39	H12	52.5	H03
4	8-9 June 2014	18.5	H28	31.5	H17, N51	45	N51	74.5	N51
5	21-26 June 2014	15.5	K07	27	N26	40.5	N26	66	N26
6	12-14 August 2014	27.5	N24	31.5	N24	41.5	N23	76	N27
7	19-21 August 2014	13.5	K05	22.5	K01	30	K01	42.5	H12
8	16 September 2014	14.5	N47	24	H04, H12, H25	36.5	H04	49.5	H16
9	3-5 October 2014	21	H04	34	H04	48	H04	80	H04
10	8 November 2014	8	H14	15.5	H14	22.5	H14	30.5	H14

Table A1 Some Selected Rainfall Parameters for the 10 Rainstorms with Daily Rainfall Exceeding 100 mm in 2014 (Sheet 2 of 3)

Rainstorm		1-hr		2-hr		4-hr		5-hr		6-hr	
		Max. rainfall (mm)	Raingauge Station	Max. rainfall (mm)	Raingauge Station	Max. rainfall (mm)	Raingauge Station	Max. rainfall (mm)	Raingauge Station	Max. rainfall (mm)	Raingauge Station
1	30 March - 1 April 2014	113	N07	194.5	N07	208	N07	233.5	N32	249	N32
2	8-14 May 2014	107	H05	150	H26	256	H26	282.5	H26	315.5	H26
3	21-24 May 2014	72	H01	83	N27	111.5	N46	114.5	N46	143	N46
4	8-9 June 2014	131	H19	193	H19	203.5	H19	203.5	H19	203.5	H19
5	21-26 June 2014	91	N26	127.5	N27	171	N26	219	N26	240	N26
6	12-14 August 2014	124.5	N27	171.5	N27	194.5	N27	207.5	N27	218	N27
7	19-21 August 2014	66	N21	68.5	N21	83.5	N21	83.5	N21	84	N21
8	16 September 2014	50	H16	50	H16	51.5	H16	56.5	H04	57	H04, H16
9	3-5 October 2014	121.5	H04	175.5	H26	193.5	H26	193.5	H26	236	H26
10	8 November 2014	36.5	H14, H19	50	H14	67.5	H14, H26	77	H26	81.5	H26

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Table A1 Some Selected Rainfall Parameters for the 10 Rainstorms with Daily Rainfall Exceeding 100 mm in 2014 (Sheet 3 of 3)

Rainstorm		8-hr		12-hr		18-hr		24-hr		48-hr	
		Max. rainfall (mm)	Raingauge Station	Max. rainfall (mm)	Raingauge Station	Max. rainfall (mm)	Raingauge Station	Max. rainfall (mm)	Raingauge Station	Max. rainfall (mm)	Raingauge Station
1	30 March - 1 April 2014	251	N32	251	N32	302.5	N32	307.5	N37	333.5	N37
2	8-14 May 2014	345.5	H26	366.5	H26	366.5	H26	367.5	H26	431.5	N13
3	21-24 May 2014	158	N46	175	N46	177	N46	208	N46	229.5	N46
4	8-9 June 2014	203.5	H19	212	H19	212	H19	212	H19	215.5	H19
5	21-26 June 2014	245.5	N26	259	N26	265	N26	319	N26	355.5	N26
6	12-14 August 2014	224.5	N27	242	N27	310.5	H17	350.5	H17	371.5	H17
7	19-21 August 2014	86.5	N21	94.5	N21	133.5	N21	142.5	N21	176	N21
8	16 September 2014	62.5	N35	86.5	H16	96	H16	108	H16	125	N34
9	3-5 October 2014	242	H26	293.5	H26	312	H26	312	H26	321	H26
10	8 November 2014	93	H26	106.5	H26	114	H26	114.5	H26	137	H26

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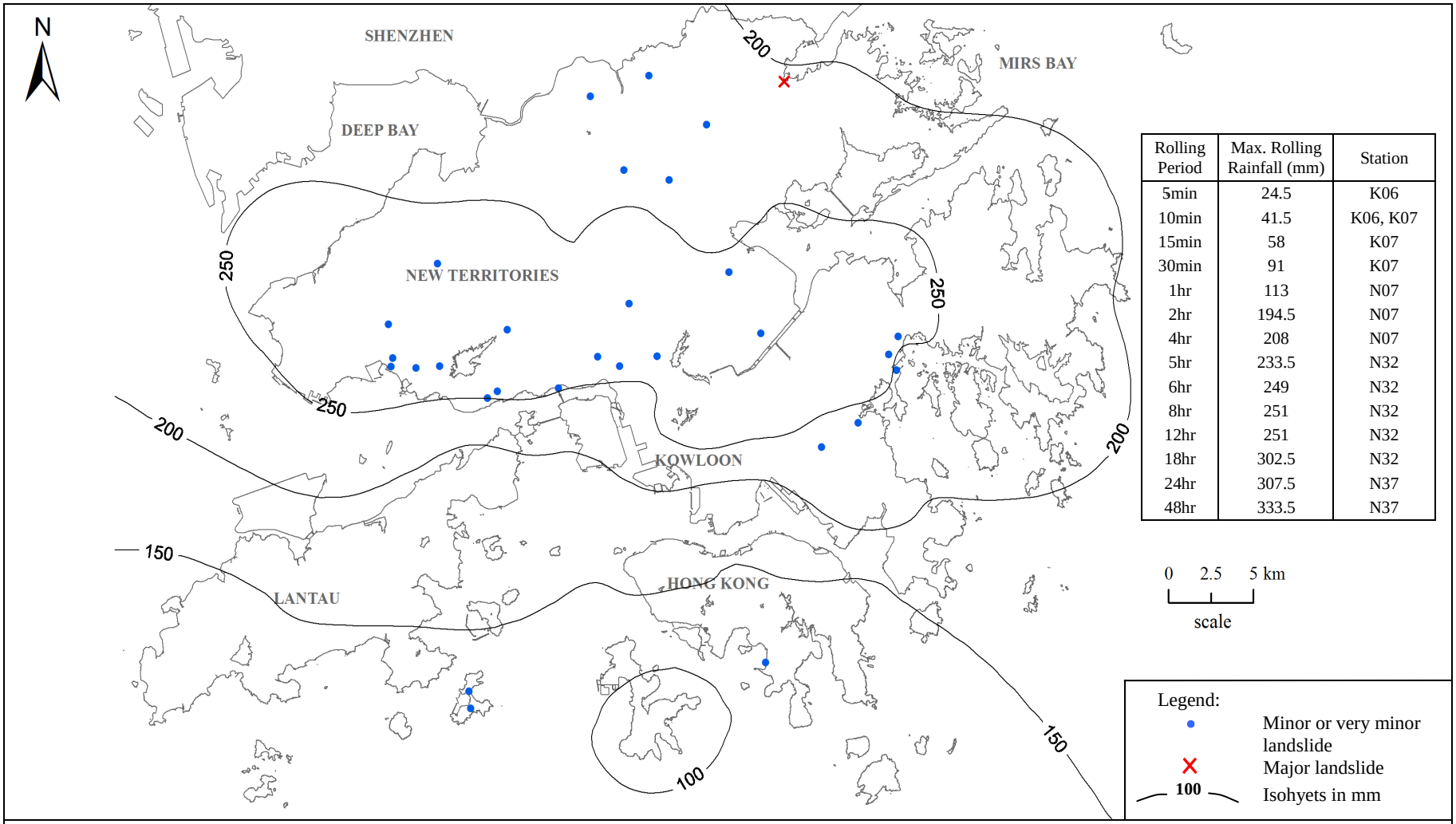
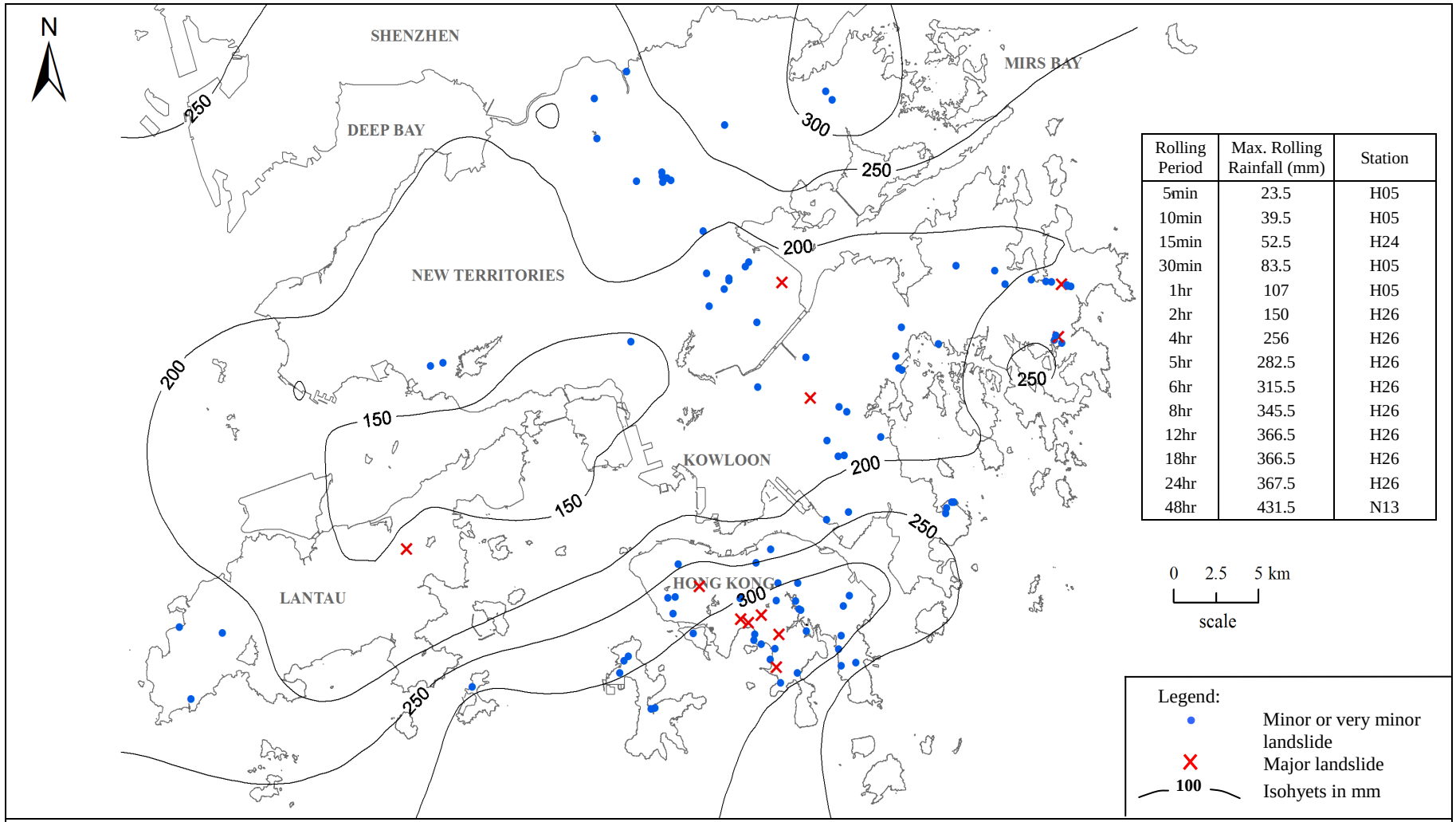


Rolling Period	Max. Rolling Rainfall (mm)	Station
5min	24.5	K06
10min	41.5	K06, K07
15min	58	K07
30min	91	K07
1hr	113	N07
2hr	194.5	N07
4hr	208	N07
5hr	233.5	N32
6hr	249	N32
8hr	251	N32
12hr	251	N32
18hr	302.5	N32
24hr	307.5	N37
48hr	333.5	N37

Notes:
(1) Isohyets are based on the GEO and HKO raingauges. The maximum rainfalls in the table are selected from the GEO Raingauges.
(2) Thirty-one genuine landslides reported to have occurred within the period between 30 March and 1 April 2014.
(3) Please refer to Figure 2.1 for locations of raingauge stations.

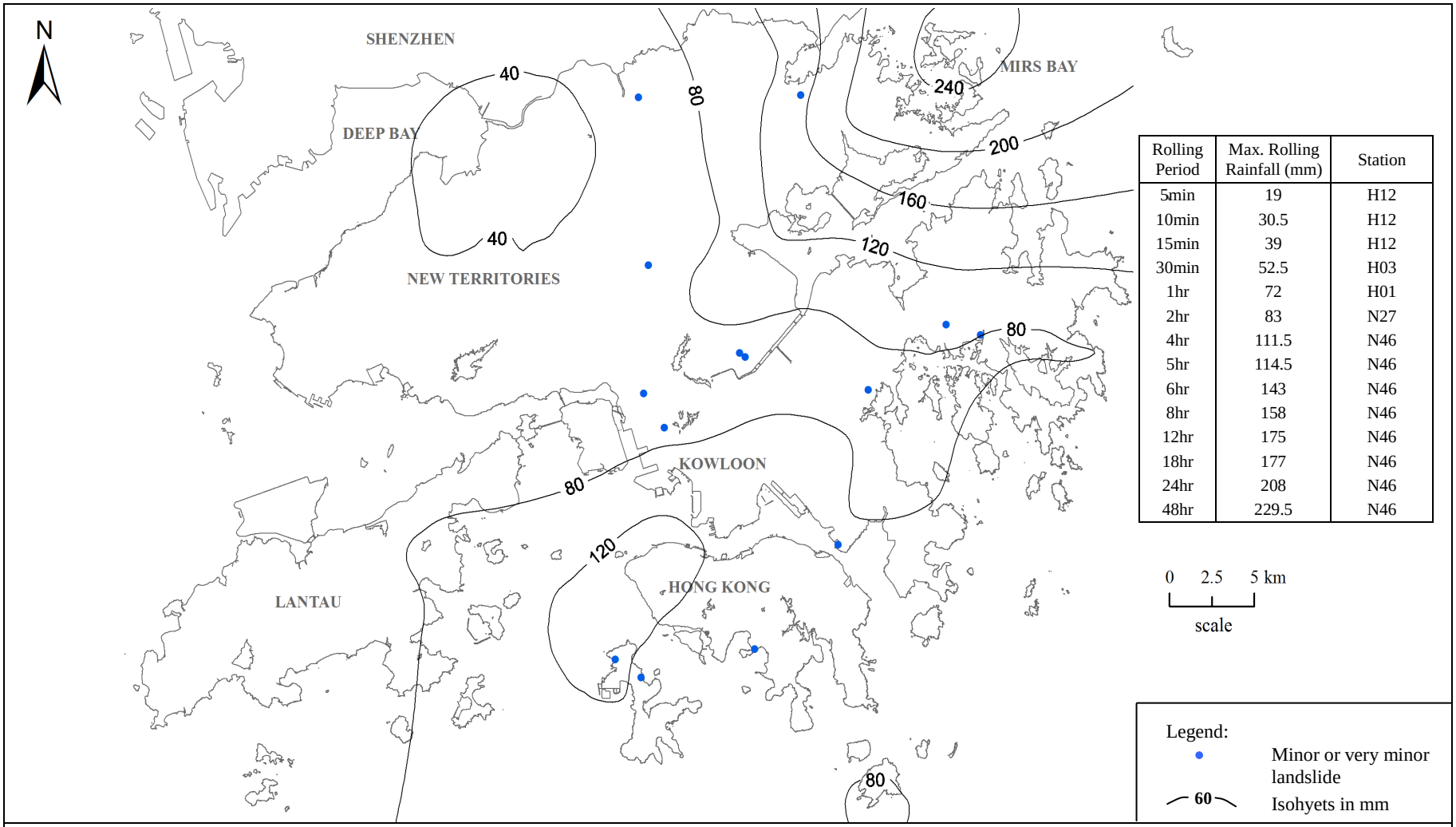
Figure A1 Maximum Rolling 24-hour Rainfall Distribution for the Period between 30 March (00:00) and 1 April 2014 (24:00) and Locations of Landslides



Rolling Period	Max. Rolling Rainfall (mm)	Station
5min	23.5	H05
10min	39.5	H05
15min	52.5	H24
30min	83.5	H05
1hr	107	H05
2hr	150	H26
4hr	256	H26
5hr	282.5	H26
6hr	315.5	H26
8hr	345.5	H26
12hr	366.5	H26
18hr	366.5	H26
24hr	367.5	H26
48hr	431.5	N13

Notes:
(1) Isohyets are based on the GEO and HKO raingauges. The maximum rainfalls in the table are selected from the GEO Raingauges.
(2) One hundred and three genuine landslides reported to have occurred within the period between 8 May and 14 May 2014.
(3) Please refer to Figure 2.1 for locations of raingauge stations.

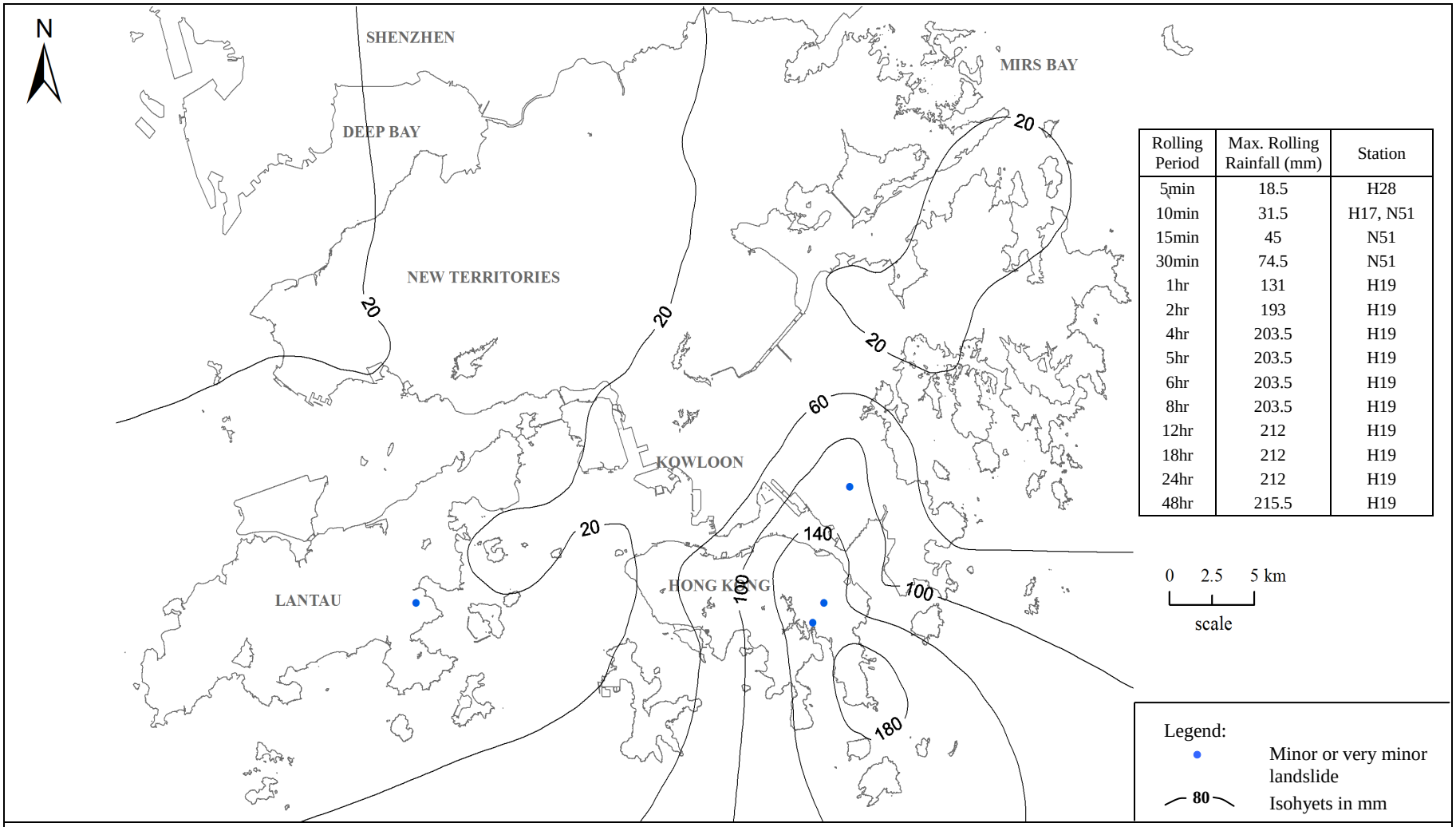
Figure A2 Maximum Rolling 24-hour Rainfall Distribution for the Period between 8 May (00:00) and 14 May 2014 (24:00) and Locations of Landslides



Rolling Period	Max. Rolling Rainfall (mm)	Station
5min	19	H12
10min	30.5	H12
15min	39	H12
30min	52.5	H03
1hr	72	H01
2hr	83	N27
4hr	111.5	N46
5hr	114.5	N46
6hr	143	N46
8hr	158	N46
12hr	175	N46
18hr	177	N46
24hr	208	N46
48hr	229.5	N46

Notes:
(1) Isohyets are based on the GEO and HKO raingauges. The maximum rainfalls in the table are selected from the GEO Raingauges.
(2) Fourteen genuine landslides reported to have occurred within the period between 21 May and 24 May 2014.
(3) Please refer to Figure 2.1 for locations of raingauge stations.

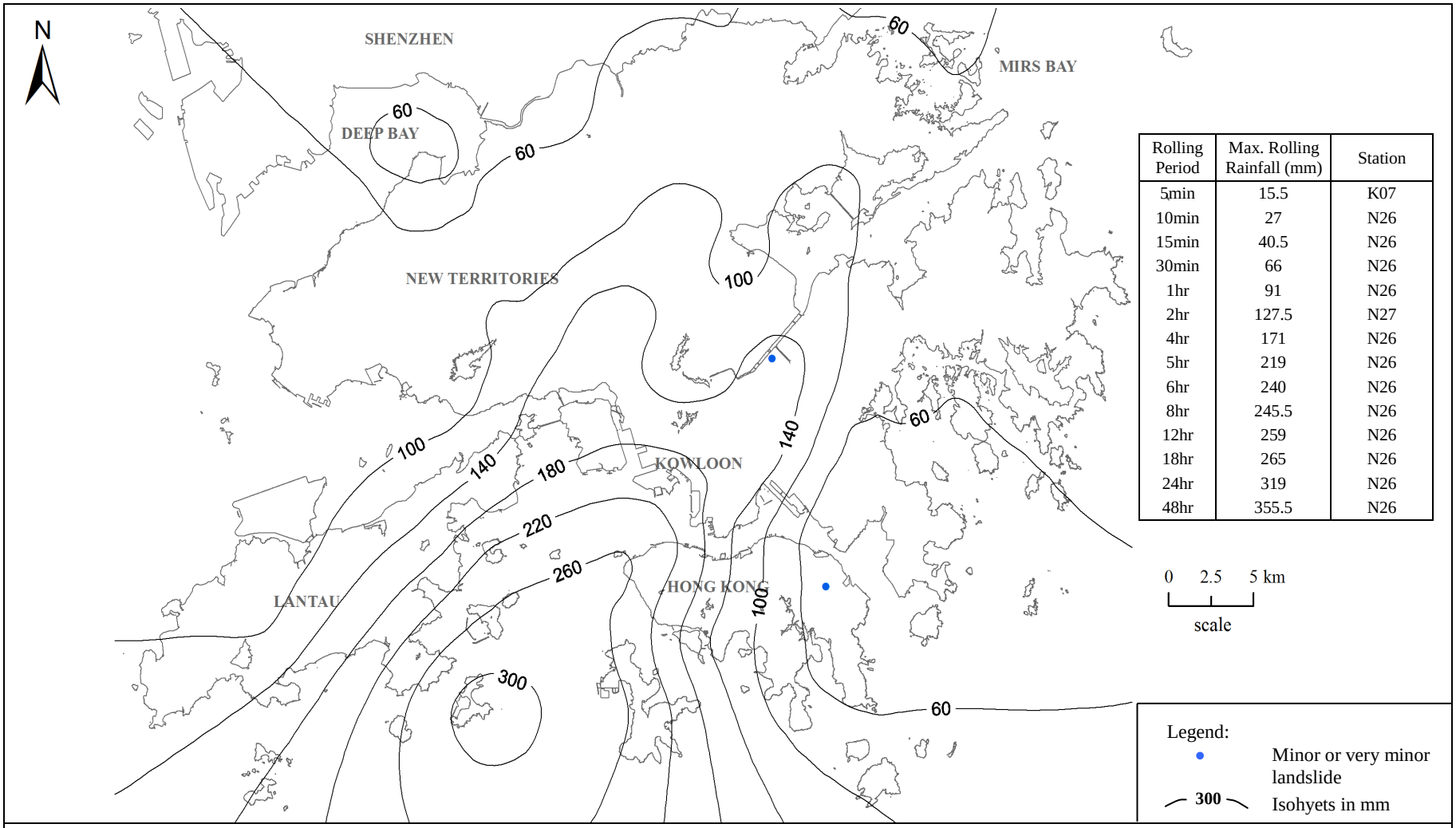
Figure A3 Maximum Rolling 24-hour Rainfall Distribution for the Period between 21 May (00:00) and 24 May 2014 (24:00) and Locations of Landslides



Rolling Period	Max. Rolling Rainfall (mm)	Station
5min	18.5	H28
10min	31.5	H17, N51
15min	45	N51
30min	74.5	N51
1hr	131	H19
2hr	193	H19
4hr	203.5	H19
5hr	203.5	H19
6hr	203.5	H19
8hr	203.5	H19
12hr	212	H19
18hr	212	H19
24hr	212	H19
48hr	215.5	H19

Notes:
(1) Isohyets are based on the GEO and HKO raingauges. The maximum rainfalls in the table are selected from the GEO Raingauges.
(2) Four genuine landslides reported to have occurred within the period between 8 June and 9 June 2014.
(3) Please refer to Figure 2.1 for locations of raingauge stations.

Figure A4 Maximum Rolling 24-hour Rainfall Distribution for the Period between 8 June (00:00) and 9 June 2014 (24:00) and Locations of Landslides



Rolling Period	Max. Rolling Rainfall (mm)	Station
5min	15.5	K07
10min	27	N26
15min	40.5	N26
30min	66	N26
1hr	91	N26
2hr	127.5	N27
4hr	171	N26
5hr	219	N26
6hr	240	N26
8hr	245.5	N26
12hr	259	N26
18hr	265	N26
24hr	319	N26
48hr	355.5	N26

Notes:
(1) Isohyets are based on the GEO and HKO raingauges. The maximum rainfalls in the table are selected from the GEO Raingauges.
(2) Two genuine landslides reported to have occurred within the period between 21 June and 26 June 2014.
(3) Please refer to Figure 2.1 for locations of raingauge stations.

Figure A5 Maximum Rolling 24-hour Rainfall Distribution for the Period between 21 June (00:00) and 26 June 2014 (24:00) and Locations of Landslides

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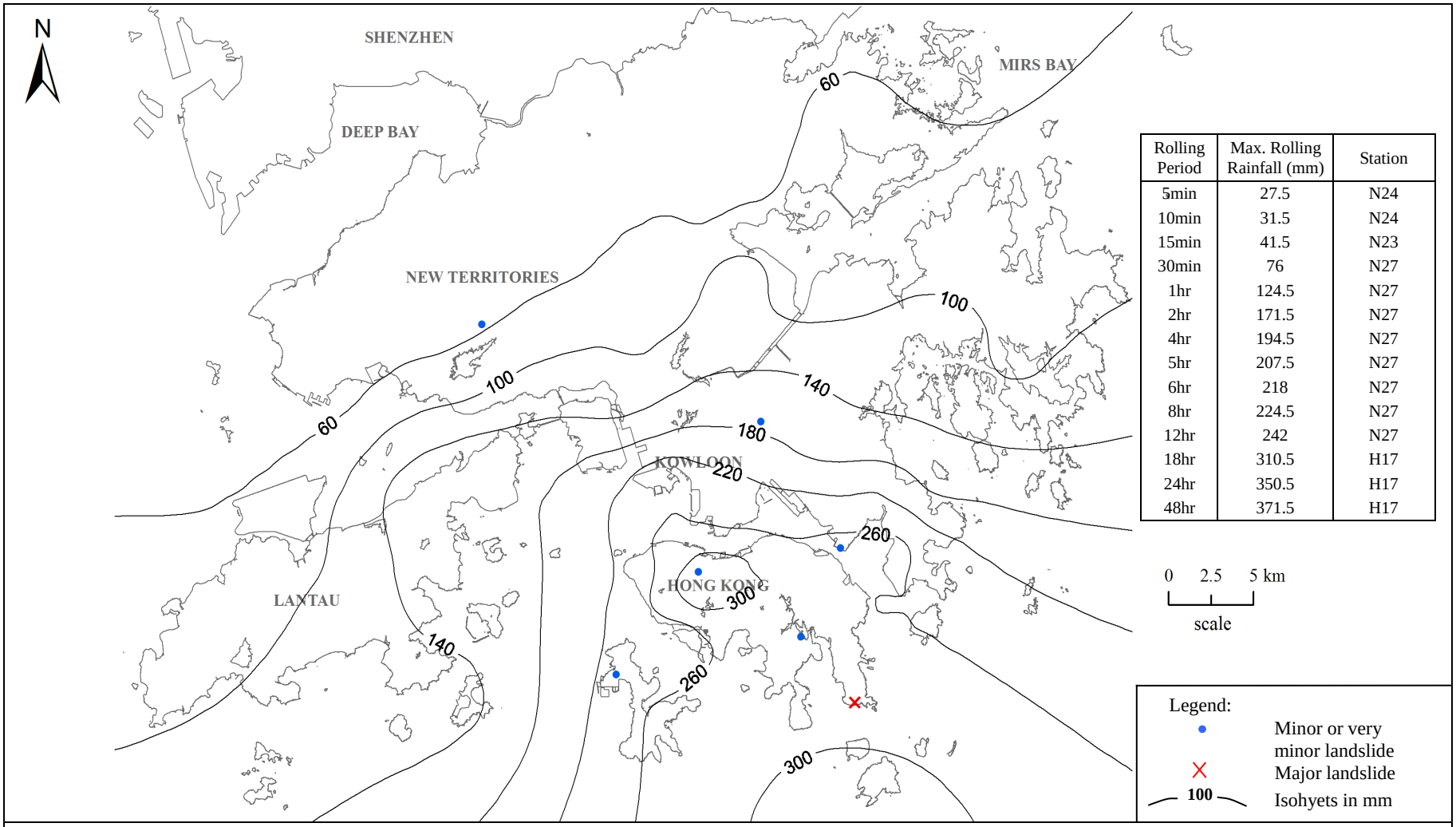
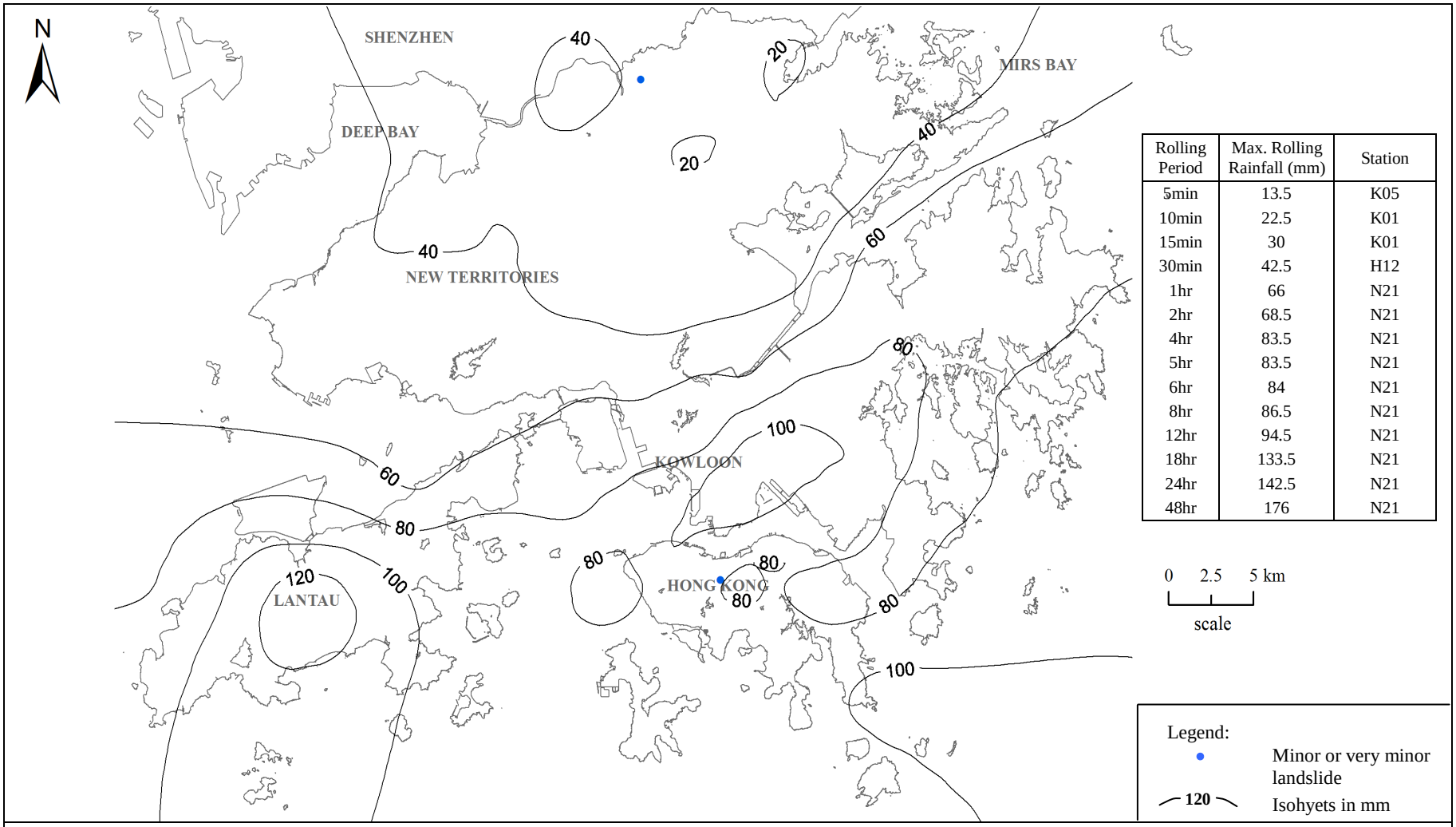


Rolling Period	Max. Rolling Rainfall (mm)	Station
5min	27.5	N24
10min	31.5	N24
15min	41.5	N23
30min	76	N27
1hr	124.5	N27
2hr	171.5	N27
4hr	194.5	N27
5hr	207.5	N27
6hr	218	N27
8hr	224.5	N27
12hr	242	N27
18hr	310.5	H17
24hr	350.5	H17
48hr	371.5	H17

Notes:
(1) Isohyets are based on the GEO and HKO raingauges. The maximum rainfalls in the table are selected from the GEO Raingauges.
(2) Seven genuine landslides reported to have occurred within the period between 12 August and 14 August 2014.
(3) Please refer to Figure 2.1 for locations of raingauge stations.

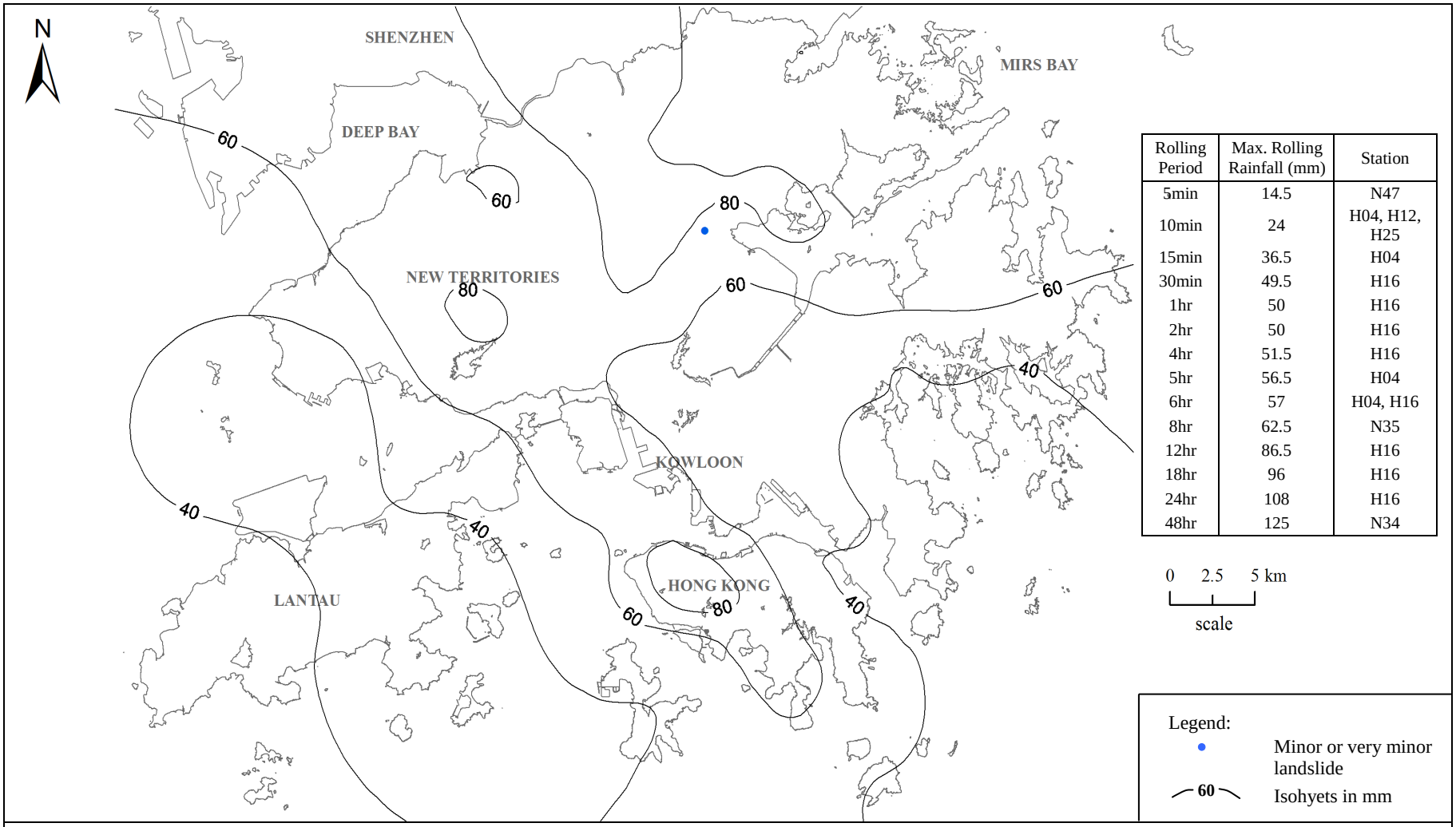
Figure A6 Maximum Rolling 24-hour Rainfall Distribution for the Period between 12 August (00:00) and 14 August 2014 (24:00) and Locations of Landslides



Rolling Period	Max. Rolling Rainfall (mm)	Station
5min	13.5	K05
10min	22.5	K01
15min	30	K01
30min	42.5	H12
1hr	66	N21
2hr	68.5	N21
4hr	83.5	N21
5hr	83.5	N21
6hr	84	N21
8hr	86.5	N21
12hr	94.5	N21
18hr	133.5	N21
24hr	142.5	N21
48hr	176	N21

Notes:
(1) Isohyets are based on the GEO and HKO raingauges. The maximum rainfalls in the table are selected from the GEO Raingauges.
(2) Two genuine landslides reported to have occurred within the period between 19 August and 21 August 2014.
(3) Please refer to Figure 2.1 for locations of raingauge stations.

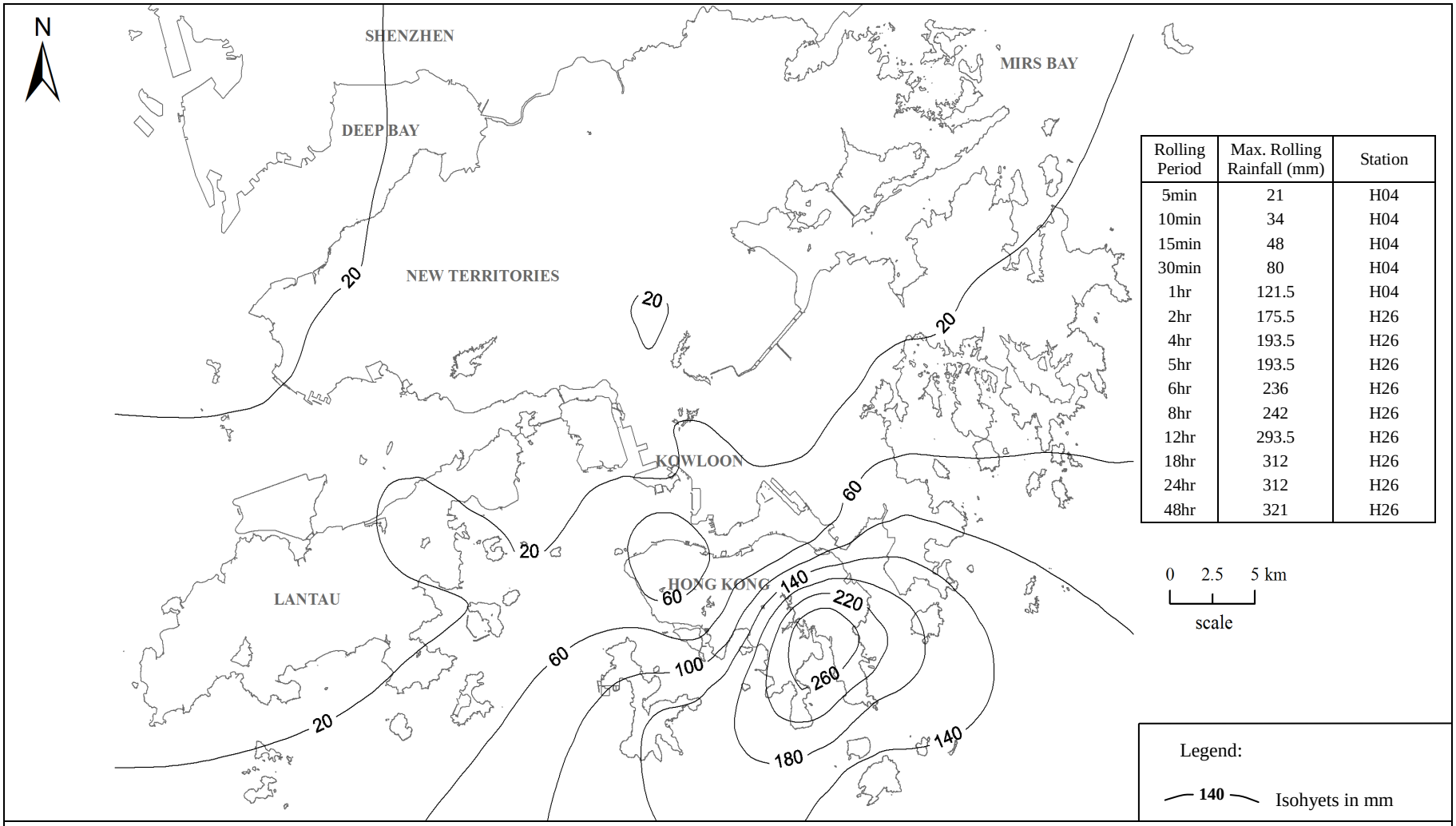
Figure A7 Maximum Rolling 24-hour Rainfall Distribution for the Period between 19 August (00:00) and 21 August 2014 (24:00) and Locations of Landslides



Rolling Period	Max. Rolling Rainfall (mm)	Station
5min	14.5	N47
10min	24	H04, H12, H25
15min	36.5	H04
30min	49.5	H16
1hr	50	H16
2hr	50	H16
4hr	51.5	H16
5hr	56.5	H04
6hr	57	H04, H16
8hr	62.5	N35
12hr	86.5	H16
18hr	96	H16
24hr	108	H16
48hr	125	N34

Notes:
(1) Isohyets are based on the GEO and HKO raingauges. The maximum rainfalls in the table are selected from the GEO Raingauges.
(2) One genuine landslide reported to have occurred on 16 September 2014.
(3) Please refer to Figure 2.1 for locations of raingauge stations.

Figure A8 Maximum Rolling 24-hour Rainfall Distribution for the Period between 16 September (00:00) and 16 September 2014 (24:00) and Locations of Landslides



Rolling Period	Max. Rolling Rainfall (mm)	Station
5min	21	H04
10min	34	H04
15min	48	H04
30min	80	H04
1hr	121.5	H04
2hr	175.5	H26
4hr	193.5	H26
5hr	193.5	H26
6hr	236	H26
8hr	242	H26
12hr	293.5	H26
18hr	312	H26
24hr	312	H26
48hr	321	H26

Notes:
(1) Isohyets are based on the GEO and HKO raingauges. The maximum rainfalls in the table are selected from the GEO Raingauges.
(2) No genuine landslide reported to have occurred within the period between 3 October and 5 October 2014.
(3) Please refer to Figure 2.1 for locations of raingauge stations.

Figure A9 Maximum Rolling 24-hour Rainfall Distribution for the Period between 3 October (00:00) and 5 October 2014 (24:00) and Locations of Landslides

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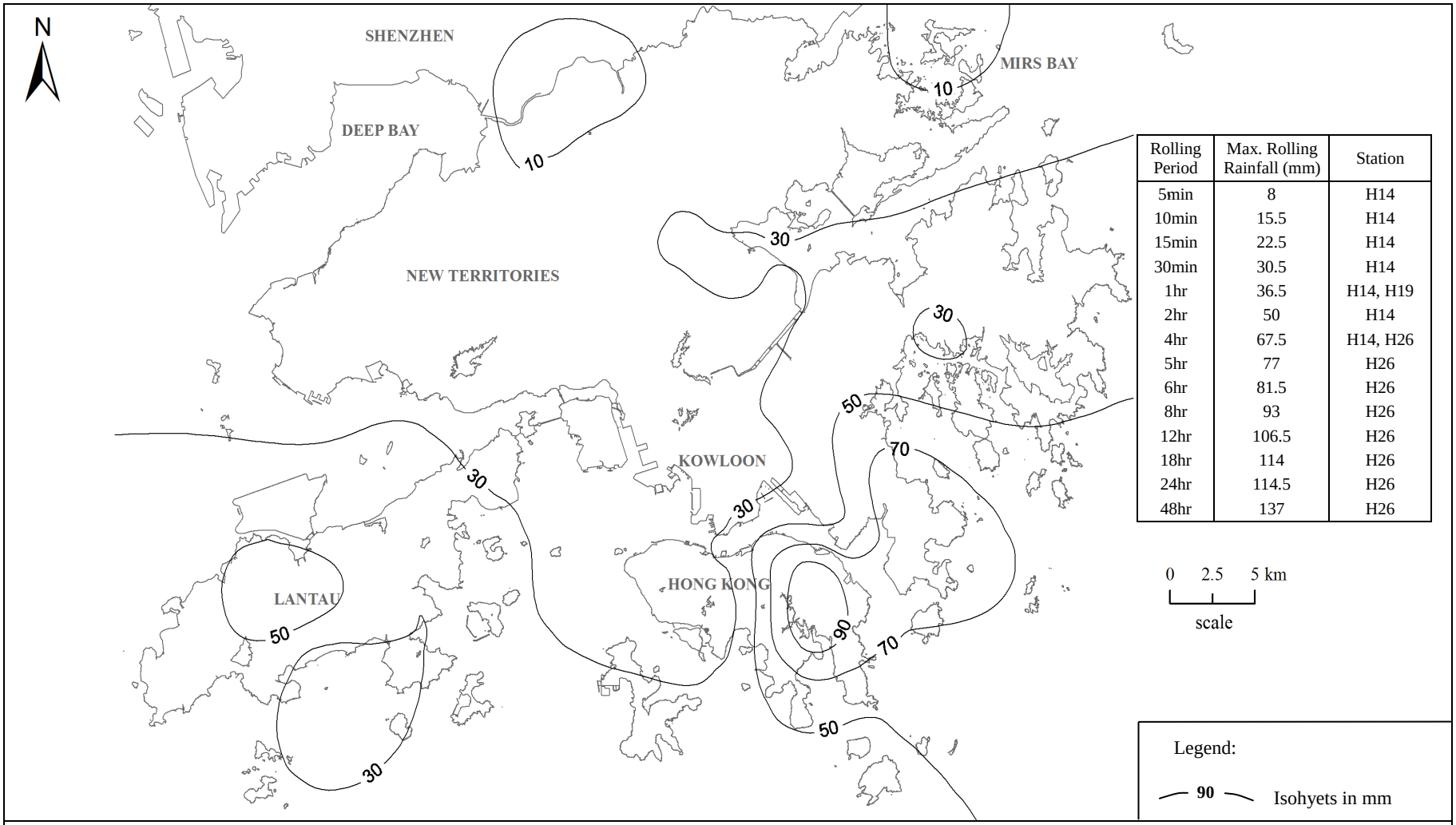

Rolling Period	Max. Rolling Rainfall (mm)	Station
5min	8	H14
10min	15.5	H14
15min	22.5	H14
30min	30.5	H14
1hr	36.5	H14, H19
2hr	50	H14
4hr	67.5	H14, H26
5hr	77	H26
6hr	81.5	H26
8hr	93	H26
12hr	106.5	H26
18hr	114	H26
24hr	114.5	H26
48hr	137	H26

Notes:
(1) Isohyets are based on the GEO and HKO raingauges. The maximum rainfalls in the table are selected from the GEO Raingauges.
(2) No genuine landslide reported to have occurred on 8 November 2014.
(3) Please refer to Figure 2.1 for locations of raingauge stations.

Figure A10 Maximum Rolling 24-hour Rainfall Distribution for the Period between 8 November (00:00) and 8 November 2014 (24:00) and Locations of Landslides

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Appendix B

List of Landslide Incidents Reported to the Government

List of Tables

Table B1 List of Major Landslide Incidents (Sheet 1 of 2)

Incident No.	Location	Feature Registration No. (if any)	Failure			Facility Affected	Consequence
			Date (Time)	Feature Type	Scale (m^3)		
2014/04/1488	Behind an abandoned school, Nam Chung, Sha Tau Kok	3NE-C/C115	Unknown	Soil cut	130	Open area	-
2014/05/1516	Residence Road, the Chinese University of Hong Kong	7NE-C/C228	08/05 (23:30)	Soil cut	120	Road	All two lanes of Residence Road temporarily closed
2014/05/1523	Access road to Mao Tso Ngam Village, Shatin (near Lamp Post No. V8144)	Natural hillside	08/05 (23:30)	Natural hillside	70	Access road	-
2014/05/1531	R.B.L. Lot No.889 R.P., Evergreen Garden, No. 18 Shouson Hill Road	11SW-D/C162 & 11SW-D/FR226	12/05 (03:00)	Soil cut, fill, retaining wall, natural hillside	420	Building; Road	All two lanes of Shouson Hill Road temporarily closed and a building platform partially collapsed
2014/05/1532	No. 23 Repulse Bay Road	11SE-C/C237	12/05 (04:00)	Soil/rock cut	60	Road	Two lanes of Repulse Bay Road temporarily closed
2014/05/1545	Opposite to No. 66 Deep Water Bay Road	Natural hillside	Unknown	Natural hillside	90	Road	All two lanes of Deep Water Bay Road temporarily closed
2014/05/1552	Chek Keng Maclehose Trail towards Tai Long Au, in-between Hiking Trail Mark Nos. M040 and M041, Tai Po	Natural hillside	13/05 (17:30)	Natural hillside	150	Minor footpath	Maclehose Trail blocked

Table B1 List of Major Landslide Incidents (Sheet 2 of 2)

Incident No.	Location	Feature Registration No. (if any)	Failure			Facility Affected	Consequence
			Date (Time)	Feature Type	Scale (m^3)		
2014/05/1568	Natural hillside at the east of a footpath leading from Sai Wan Road to Sai Wan Village, Sai Kung	Natural hillside	13/05 (21:00)	Natural hillside	126	Minor footpath	Footpath to Sai Wan Village partially blocked
2014/05/1572	Natural hillside bewteen Headland Road and South Bay Road	Natural hillside	Unknown	Natural hillside	200	Nil (open hillside failure far away from man-made facility at toe)	-
2014/05/1575	No. 18 Gough Hill Road	Natural hillside	12/05	Natural hillside	60	Open area	-
2014/07/1617	Behind Shing House, Shek Kwu Chau Treatment & Rehabilitation Centre, Shek Kwu Chau	Natural hillside	08/05	Natural hillside	120 (Boulder fall)	Cottage	-
2014/08/1634	Near Nos. 53-54 Nga Choi Hang Tsuen, Cape D'Aguilar, Shek O	< 3 m high fill slope	13/08 (13:00)	Fill	70	Open area	-
2014/11/1649	Natural hillside above feature No. 15NE-B/C192 and below Red Hill Road, Red Hill Peninsula, Tai Tam	Natural hillside	25/08	Natural hillside	120	Nil	-
2014/05/1027AF (AFCD/2014/05/0003)	Tze Lo Lan Shan Path, Tai Tam Country Park	Natural hillside	16/05	Natural hillside	175	Minor footpath	Minor footpath temporarily closed

Note: (1) The bracket denotes the landslide number adopted by the governemt department concerned, other than the GEO.

Table B2 List of Landslide Incidents on Hong Kong Island (Sheet 1 of 8)

Incident No.[1]	Location	Feature Registration No. (if any)	Reported		Failure			Facility Affected	Consequence
			Date	By	Date (Time)	Feature Type	Scale (m^3)		
2014/01/1468	Natural hillside opposite to No. 2 Bowen Road and below Feature No. 11SW-B/R342	Natural hillside	02/01	HyD	02/01 (16:30)	Natural hillside	13	Building	-
2014/04/1489	South Bay Road	15NE-A/C100	03/04	Police	Unknown	Rock cut	0.1 (Rockfall)	Road	One lane of South Bay Road temporarily closed
2014/04/1494	Junction of Kotewall Road and Hatton Road	11SW-A/R924	07/04	HyD	06/04 (23:40)	Retaining wall (masonry)	1.5	Road	Two lanes of Kotewall Road temporarily closed and a bus stop at toe of the wall suspended
2014/04/1506	Natural hillside above Feature No. 11SW-D/CR1180, Magazine Gap Road	Natural hillside	21/04	HyD	21/04	Natural hillside	1 (Boulder fall)	Road	One lane of Magazine Gap Road temporarily closed
2014/05/1517	Mount Parker Road near Quarry Gap (Tai Fung Au), North Point	11SE-C/C240	09/05	HyD	09/05 (10:50)	Soil/rock cut	8	Road	-
2014/05/1518	Lugard Road	11SW-A/C470	09/05	Police	Unknown	Soil/rock cut	0.5 (Boulder fall)	Road	-
2014/05/1519	Near St. Mary's Church, No. 2A Tung Lo Wan Road, Causeway Bay	< 3 m high cut slope	09/05	Police	Unknown	Soil cut	2	Open area	-

Table B2 List of Landslide Incidents on Hong Kong Island (Sheet 2 of 8)

Incident No.[1]	Location	Feature Registration No. (if any)	Reported		Failure			Facility Affected	Consequence
			Date	By	Date (Time)	Feature Type	Scale (m^3)		
2014/05/1524	140 m east of Columbarium, Chinese Permanent Cemetery, Cape Collinson, Chai Wan	11SE-D/CR538	09/05	WSD	Unknown	Soil/rock cut	25	Catchwater	Blockage of catchwater
2014/05/1528	Ap Lei Chau Bridge Road, Ap Lei Chau	Natural hillside	12/05	Public	Unknown	Natural hillside	1.2	Road	All two lanes of Ap Lei Chau Bridge Road temporarily closed
2014/05/1529	Shek O Road near Cape D'Aguilar	15NE-B/C10	12/05	Police	12/05 (03:22)	Soil/rock cut	10	Road	One lane of Shek O Road temporarily closed
2014/05/1530	Shek O Road near Lan Nai Wan	15NE-B/C41	12/05	Police	12/05 (04:05)	Soil/rock cut	10	Road	One lane of Shek O Road temporarily closed
2014/05/1531	R.B.L. Lot No.889 R.P., Evergreen Garden, No. 18 Shouson Hill Road	11SW-D/C162 & 11SW-D/FR226	12/05	Police	12/05 (03:00)	Soil cut, fill, retaining wall, natural hillside	420	Building; Road	All two lanes of Shouson Hill Road temporarily closed and a building platform partially collapsed

Table B2 List of Landslide Incidents on Hong Kong Island (Sheet 3 of 8)

Incident No.[(1)]	Location	Feature Registration No. (if any)	Reported		Failure			Facility Affected	Consequence
			Date	By	Date (Time)	Feature Type	Scale (m^3)		
2014/05/1532	No. 23 Repluse Bay Road	11SE-C/C237	12/05	Police	12/05 (04:00)	Soil/rock cut	60	Road	Two lanes of Repulse Bay Road temporarily closed
2014/05/1536	Near Seaview Promenade and No. 44 Island Road	Natural hillside	12/05	Public	Unknown	Natural hillside	1.4	Minor footpath	-
2014/05/1538	Adjacent to No. 222 Pokfulam Village	2.3 m high retaining wall	12/05	Public	11/05 (22:00)	Retaining wall	0.65	Open area	-
2014/05/1539	Natural hillside adjacent to Feature No. 15NW-B/C384	Natural hillside	12/05	Police	Unknown	Natural hillside	20	Other (open car park)	-
2014/05/1542	No. 17 South Bay Road near Feature No. 15NE-A/R29	1.5 m high retaining wall	12/05	HyD	Unknown	Retaining wall	10	Open area	-
2014/05/1544	South Bay Road	15NE-A/C99	12/05	HyD	Unknown	Soil/rock cut	0.9	Road	-
2014/05/1545	Opposite to No. 66 Deep Water Bay Road	Natural hillside	12/05	HyD	Unknown	Natural hillside	90	Road	All two lanes of Deep Water Bay Road temporarily closed
2014/05/1554	Above Black's Link and below access road to Black's Link Fresh Water Service Reservoir	11SW-D/C1307	13/05	HyD	Unknown	Soil/rock cut	6	Access road	-
2014/05/1556	No. 99 Repulse Bay Road	15NE-A/C47	14/05	HyD	Unknown	Soil/rock cut	1.5	Road	-

Table B2 List of Landslide Incidents on Hong Kong Island (Sheet 4 of 8)

Incident No.[1]	Location	Feature Registration No. (if any)	Reported		Failure			Facility Affected	Consequence
			Date	By	Date (Time)	Feature Type	Scale (m^3)		
2014/05/1559	Footpath (Hong Kong Trail) from Chi Fu Fa Yuen to Tin Wan	< 3 m high cut slope	09/05	AFCD	Unknown	Soil/rock cut	0.2 (Rockfall)	Minor footpath	-
2014/05/1564	Adjacent to Shek Pai Wan Road roundabout to Wah Fu Estate	Natural hillside	15/05	Public	13/05	Natural hillside	30.16	Minor footpath	-
2014/05/1572	Natural hillside bewteen Headland Road and South Bay Road	Natural hillside	16/05	LCSD	Unknown	Natural hillside	200	Nil (open hillside failure far away from man-made facility at toe)	-
2014/05/1575	No. 18 Gough Hill Road	Natural hillside	20/05	Public	12/05	Natural hillside	60	Open area	-
2014/05/1578	Natural hillside near No. 51 Seaview Promenade, Repulse Bay	Natural hillside	21/05	HyD	Unknown	Natural hillside	0.4	Minor footpath	-
2014/05/1583	To Tei Wan Village, Shek O	15NE-B/C238	21/05	LandsD	12/05	Soil/rock cut	1.7	Squatter structure	Category 1 NDC[2] recommendation on a squatter structure made to LandsD
2014/06/1613	Tai Tam Road, 100 m north of Hing Man Estate, Chai Wan	11SE-D/C321	22/06	Police	Unknown	Soil/rock cut	0.01	Road	-

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Table B2 List of Landslide Incidents on Hong Kong Island (Sheet 5 of 8)

Incident No.[1]	Location	Feature Registration No. (if any)	Reported		Failure			Facility Affected	Consequence
			Date	By	Date (Time)	Feature Type	Scale (m^3)		
2014/07/1623	Natural hillside above Feature No. 15NE-A/C537	Natural hillside	22/07	Public	22/07 (14:30)	Natural hillside	6.4	Nil	-
2014/07/1624	Natural hillside above Feature No. 15NW-B/C402 (near feature Nos. 15NW-B/NS6 & 15NW-B/NS7), behind Larvotto, Ap Lei Chau	Natural hillside	27/07	BD	Unknown	Natural hillside	4	Nil (open hillside failure away from the developed area at toe)	-
2014/08/1628	Natural hillside near No. 62 Chung Hom Kok Road	Natural hillside	01/08	ICC	Unknown	Natural hillside	22.5	Minor footpath	-
2014/08/1634	Near Nos. 53-54 Nga Choi Hang Tsuen, Cape D'Aguilar, Shek O	< 3 m high fill slope	15/08	LandsD	13/08 (13:00)	Fill	70	Open area	-
2014/08/1637	No. 89 Repulse Bay Road	15NE-A/C751	18/08	Public	Unknown	Rock cut	0.35	Other (staircase)	-
2014/08/1638	Footpath at the northeast of Pok Fu Lam Village	11SW-C/C407	18/08	LandsD	Unknown	Soil/rock cut	1.3	Access road	-
2014/08/1639	Wan Chai Gap Road near Feature No. 11SW-D/C1359	< 3 m high cut slope	20/08	HyD	Unknown	Soil cut	7	Road	-
2014/09/1642	Natural hillside above Feature No. 11SW-B/ C101	Natural hillside	15/08	ICC	15/08	Natural hillside	0.02 (Boulder fall)	Building	-
2014/09/1645	Lugard Road	11SW-C/C308	15/09	HyD	Unknown	Soil/rock cut	0.03 (Rockfall)	Access road	-

Table B2 List of Landslide Incidents on Hong Kong Island (Sheet 6 of 8)

Incident No.[1]	Location	Feature Registration No. (if any)	Reported		Failure			Facility Affected	Consequence
			Date	By	Date (Time)	Feature Type	Scale (m^3)		
2014/09/1646	Nos. 15-23 Stanley Village Road, Stanley	15NE-A/CR160	21/07	BD	08/05	Retaining wall	16	Building	-
2014/10/1647	Natural hillside above Feature No. 11SE-A/C80, King's Road, Quarry Bay	Natural hillside	12/10	HyD	12/10	Natural hillside	0.02 (Boulder fall)	Pedestrian pavement	Partial closure of pedestrian pavement
2014/11/1649	Natural hillside above Feature No. 15NE-B/C192 and below Red Hill Road, Red Hill Peninsula, Tai Tam	Natural hillside	07/11	Public	25/08	Natural hillside	120	Nil	-
2014/12/1652	Lugard Road	Natural hillside	09/12	Public	08/12	Natural hillside	0.01 (Boulder fall)	Access roads	-
2014/01/1002HY (HyD/HK/2014/01/0001)	Shek O Road (near Lamp Post No. 32058)	15NE-B/F17	24/02	HyD	06/01	Fill	6	Nil	-
2014/03/1005AF (AFCD/2014/03/0001)	Sir Cecil's Ride, Tai Lam Country Park	2.8 m high cut slope	05/03	AFCD	Unknown	Soil cut	0.5	Minor footpath	-
2014/05/1018AD (ArchSD/Wch(S)/2014/05/0004)	Mount Butler Quarry Site	11SE-C/C642	13/05	ArchSD	12/05	Soil cut	20	Minor footpath	-
2014/05/1019AD (ArchSD/NP&CB/2014/05/0005)	Wai Tsui Cresent Community Garden, North Point	11SE-A/C881	12/05	ArchSD	09/05	Soil cut	3	Open area	-
2014/05/1020AD (ArchSD/S/2014/05/0006)	Opposite to Chung Hom Kok Beach Children's Playground	15NE-C/C459	13/05	ArchSD	13/05	Soil cut	25	Minor footpath	-

Table B2 List of Landslide Incidents on Hong Kong Island (Sheet 7 of 8)

Incident No.[1]	Location	Feature Registration No. (if any)	Reported		Failure			Facility Affected	Consequence
			Date	By	Date (Time)	Feature Type	Scale (m^3)		
2014/05/1027AF (AFCD/2014/05/0003)	Tze Lo Lan Shan Path, Tai Tam Country Park	Natural hillside	21/05	AFCD	16/05	Natural hillside	175	Minor footpath	Minor footpath temporarily closed
2014/05/1044AF (AFCD/2014/05/0023)	Tai Tam Nursery Forest Track	11SE-C/C862	16/06	AFCD	13/05	Soil cut	0.7	Minor footpath	-
2014/05/1045AF (AFCD/2014/05/0024)	Forest Trail at Ma Tong Au, Shek O	11SE-D/C361	16/06	AFCD	12/05	Soil cut	0.2	Minor footpath	-
2014/05/1048WS (WSD/2014/5/2/HKI)	Tai Tam Reservoir Road, Tai Tam	15NE-A/C208	12/05	WSD	Unknown	Soil cut	21.6	Access road	Part of the access road temporaily closed
2014/05/1053WS (WSD/2014/5/8/HKI)	East of Tai Tam Reservoir, Mount Parker Road, Tai Tam	11SE-C/C659	12/05	WSD	Unknown	Soil/rock cut	0.9	Access road	-
2014/05/1054WS (WSD/2014/5/9/HKI)	Aberdeen East Catchwater	11SW-D/CR795	20/05	WSD	Unknown	Soil cut	5	Catchwater	-
2014/05/1055WS (WSD/2014/5/10/HKI)	Aberdeen East Catchwater	11SW-D/CR798	19/05	WSD	Unknown	Soil cut	9.6	Catchwater	-
2014/05/1056WS (WSD/2014/5/11/HKI)	Deep Water Bay Road	11SW-D/C1843	19/05	WSD	Unknown	Soil cut	14	Construction site	-
2014/05/1057WS (WSD/2014/5/12/HKI)	Tai Tam East Catchwater (CH. 5595 - CH. 5610)	15NE-B/C230	12/05	WSD	Unknown	Soil cut	48	Catchwater	-

Table B2 List of Landslide Incidents on Hong Kong Island (Sheet 8 of 8)

Incident No.[1]	Location	Feature Registration No. (if any)	Reported		Failure			Facility Affected	Consequence
			Date	By	Date (Time)	Feature Type	Scale (m^3)		
2014/05/1058WS (WSD/2014/5/13/ HKI)	Tai Tam Reservoir Road, Tai Tam	11SE-C/C680	15/05	WSD	Unknown	Soil cut	4.8	Access road	-
2014/05/1059WS (WSD/2014/5/14/ HKI)	Mount Parker Road, southeast of Tai Tam Reservoir, Tai Tam	11SE-C/C681	12/05	WSD	Unknown	Soil/rock cut	1.5	Access road	-
2014/06/1061AD (ArchSD/CW/ 2014/06/0001)	Cape Collinson Crematorium	11SE-D/F19	19/06	ArchSD	09/06	Fill	10	Minor footpath	-
2014/06/1063WS (WSD/2014/6/2/ HKI)	Aberdeen Reservoir Road (southeast of Feature No. 11SW-D/DT23)	< 3 m high cut slope	05/06	WSD	Unknown	Soil cut	0.4	Minor footpath	Minor footpath partially blocked
2014/06/1064WS (WSD/2014/6/3/ HKI)	Tai Tam East Catchwater (CH. 0260 - CH. 0670)	11SE-C/CR230	09/06	WSD	Unknown	Soil/rock cut	27.5	Catchwater	-
2014/08/1067WS (WSD/2014/8/1/ HKI)	Tai Tam Tuk Reservoir Road	15NE-A/C205	13/08	WSD	Unknown	Soil cut	35	Road	Tai Tam Tuk Reservoir Road (one lane road) temporarily closed

Notes: (1) The bracket denotes the landslide number adopted by the governemt department concerned, other than the GEO.
(2) Category 1 Non-development Clearance (NDC) recommendations are issued to squatter structures that are in 'immediate and obvious' danger; the clearance is compulsory and will be backed up by force if necessary.

Table B3 List of Landslide Incidents in Kowloon

Incident No.[1]	Location	Feature Registration No. (if any)	Reported		Failure			Facility Affected	Consequence
			Date	By	Date (Time)	Feature Type	Scale (m^3)		
2014/05/1533	No. 28C Cha Kwo Ling Tsuen, east of Cha Kwo Ling Road Temple, Kwun Tong	11SE-B/C435	12/05	Police	12/05 (06:00)	Rock cut	0.5	Squatter structure	Category 1 NDC[2] recommendation on a squatter structure made to LandsD
2014/05/1592	South of Sam Ka Tsuen, Lei Yue Mun	11SE-B/C108	23/05	DO	Unknown	Rock cut	2.5	Open area	-
2014/05/1594	Near Distance Post No. W022 of Wilson Trail Section 3, Tseung Kwan O	2.5 m high cut slope	29/05	DLO	Unknown	Soil cut	1.85	Minor footpath	-
2014/07/1619	No. 81 Ma Pui Village, Lei Yue Mun	11SE-B/C244	04/07	ICC	03/07	Soil cut	1.26	Minor footpath	-
2014/08/1633	No. 81 Ma Pui Village, Lei Yue Mun	11SE-B/C244	15/08	Police	15/08	Soil cut	0.3	Squatter structure	-
2014/08/1635	Shatin Pass Road (near Lamp Post No. AB6036)	Natural hillside	16/08	Police	Unknown	Natural hillside	0.1 (Boulder fall)	Road	-
2014/10/1070WS (WSD/2014/10/1/ NTW)	Lai Chi Kok Salt Water Service Reservoir and Pumping Station	11NW-A/C207	14/10	WSD	Unknown	Rock cut	2.3 (Rockfall)	Access road	Restricted access to WSD facilities partially blocked

Notes: (1) The bracket denotes the landslide number adopted by the governemt department concerned, other than the GEO.
(2) Category 1 Non-development Clearance (NDC) recommendations are issued to squatter structures that are in 'immediate and obvious' danger; the clearance is compulsory and will be backed up by force if necessary.

Table B4 List of Landslide Incidents in the New Territories (Sheet 1 of 18)

Incident No.[(1)]	Location	Feature Registration No. (if any)	Reported		Failure			Facility Affected	Consequence
			Date	By	Date (Time)	Feature Type	Scale (m^3)		
2014/01/1469	East of Garden Terrace, Tsuen Wan	6SE-D/C25	07/01	HyD	Unknown	Soil cut	0.01	Road	-
2014/01/1470	Opposite to Tai Po Tau Pumping Station and Lamp Post No. N3784, Tai Po Road - Tai Wo Section	7NW-A/CR3	15/01	HyD	Unknown	Soil/rock cut	2.5	Road	One lane of Tai Po Road temporarily closed
2014/03/1473	15 m south of Feature No. 5NE-D/C104, Tsz Tin Tsuen, Tuen Mun	2.8 m high retaining wall	25/03	Public	Unknown	Masonry wall	2.2	Open area; Village house	-
2014/03/1475	Access road to Fan Kam Road, Lin Tong Mei Tsoi Yuen, Sheung Shui (east of Feature No. 3SW-C/C276)	3.5 m high fill slope	31/03	ICC	Unknown	Fill	1	Access road	-
2014/03/1478	No. 360 Tai Kiu Tsuen, north of Wo Yi Hop Lane, Tsuen Wan	7SW-A/DT26	31/03	LandsD	30/03 (20:00)	Disturbed terrain	2.5	Access road	-
2014/03/1479	No. 57 Kap Pin Long Tsuen, Sai Kung	2.5 m high cut slope	31/03	ICC	Unknown	Soil cut	5.6	Open area	-
2014/03/1480	Behind House No. 12 Fishermen New Village, Tui Min Hoi, Sai Kung	3.2 m high cut slope	31/03	DLO	Unknown	Soil cut	1	Village house	The kitchen on the ground floor temporarily closed
2014/03/1481	Chuk Yeung Road, Sai Kung (near Lamp Post No. V5509)	Natural hillside	31/03	Police	Unknown	Natural hillside	0.15 (Boulder fall)	Access road	-

Table B4 List of Landslide Incidents in the New Territories (Sheet 2 of 18)

Incident No.[(1)]	Location	Feature Registration No. (if any)	Reported		Failure			Facility Affected	Consequence
			Date	By	Date (Time)	Feature Type	Scale (m^3)		
2014/03/1482	Po Kak Tsai, Fanling	3SW-B/R23	31/03	CEPP	31/03 (15:30)	Masonry wall	26	Construction site	-
2014/04/1484	Mok Tse Che New Village, Sai Kung (near Lamp Post No. N9012)	11NE-B/C543	31/03	ICC	Unknown	Soil cut	0.2	Access road	-
2014/04/1485	Ngau Sze Hang Tsuen, Sha Ling New Village, Lo Wu	3.2 m high fill slope	01/04	LandsD	31/03	Fill	3.5	Access road	-
2014/04/1486	Tit Hang Tsuen, Yung Long	2SE-B/C348	01/04	LandsD	31/03	Soil cut	0.2	Other (asbestos canopy)	-
2014/04/1487	Below The Terraces, Fei Ngo Shan Road	11NE-B/C427	01/04	HyD	Unknown	Soil cut	4	Access road	-
2014/04/1488	Behind an abandoned school, Nam Chung, Sha Tau Kok	3NE-C/C115	31/03	ICC	Unknown	Soil cut	130	Open area	-
2014/04/1490	House Nos. 13 & 14 Fishermen Village, Tui Min Hoi, Sai Kung	3.2 m high cut slope	02/04	DO	Unknown	Soil cut	< 5	Nil	-
2014/04/1491	8 m south of House No. 183, Tseng Tau Chung Tsuen, Tuen Mun	6SW-A/C357	02/04	LandsD	Unknown	Soil cut	3	Squatter structure; Open area	-
2014/04/1492	So Kwun Wat, Tuen Mun	6SW-C/R49	03/04	LandsD	03/04 (10:30)	Masonry wall	2	Open area	-

Table B4 List of Landslide Incidents in the New Territories (Sheet 3 of 18)

Incident No.[(1)]	Location	Feature Registration No. (if any)	Reported		Failure			Facility Affected	Consequence
			Date	By	Date (Time)	Feature Type	Scale (m^3)		
2014/04/1493	Lower Shing Mun Road, near Fu Shan Crematorium	Natural hillside	06/04	Police	Unknown	Natural hillside	25	Access road;Other (private utility services)	Access road temporarily closed
2014/04/1495	DD118 Lot 1212 RP and adjoining Government land, Nam Hang Pai, Yuen Long	3 m high fill slope	04/04	ICC	Unknown	Fill	45	Other (existing streamcourse)	-
2014/04/1496	Ping Che Road, Ta Ku Ling	3NW-D/C113	07/04	LandsD	Unknown	Soil cut	1	Open area	-
2014/04/1497	25 m west of Feature No. 3SE-C/DT56, adjacent to Kwun Yam Temple, Tung Tsz, Tai Po	2 m high cut slope	09/04	Public	Unknown	Soil cut	0.05	Access road	-
2014/04/1498	Chung Shan, Tuen Mun	6NW-C/CR54	10/04	Public	Unknown	Soil cut	0.67	Squatter structure	-
2014/04/1499	Chuk Yeung Road, Sai Kung (near Lamp Post No. V5509)	< 3 m high cut slope	12/04	HyD	Unknown	Soil cut	0.02 (Rockfall)	Road	-
2014/04/1500	Chung Yuen, Tai Po Kau, Tai Po	7NW-D/C131	15/04	LandsD	Unknown	Soil cut	4	Squatter structure	-
2014/04/1501	Lung Shan Tsuen, Tsiu Keng, Fan Kam Road	2SE-D/C85	15/04	LandsD	Unknown	Soil cut	2.5	Nil	-
2014/04/1502	Between an LCSD's sitting-out area in Ting Kau (near Lido Beach) and DD 399 Lot No. 425	3.6 m high fill slope	11/04	Public	30/03 (22:00)	Fill	28.8	Open area; Construction site	-

Table B4 List of Landslide Incidents in the New Territories (Sheet 4 of 18)

Incident No.[1]	Location	Feature Registration No. (if any)	Reported		Failure			Facility Affected	Consequence
			Date	By	Date (Time)	Feature Type	Scale (m^3)		
2014/04/1503	House No. 27, Fo Tan Village, Sha Tin	7SE-A/C591	03/04	LandsD	Unknown	Soil cut	1	Village house	-
2014/04/1504	11 m east of Feature No. 5NE-D/R7 at Tsz Tin Tsuen, Tuen Mun	2 m high cut slope	16/04	LandsD	Unknown	Soil cut	1.2	Squatter structure	-
2014/04/1505	Above Tai Lam Chung Catchwater	6SE-B/CR113	17/04	Public	30/03 (22:00)	Rock cut	2 (Rockfall)	Catchwater	-
2014/04/1507	Natural hillside above Feature No. 8NW-C/C49, Sai Sha Road, Sai Kung	Natural hillside	19/04	HyD	Unknown	Natural hillside	0.05 (Rockfall)	Road	-
2014/04/1508	Kwong Pan Tin Tsuen, Route Twisk (near Lamp Post No. VC0604)	Natural hillside	22/04	LandsD	30/03 (22:00)	Natural hillside	0.5	Squatter structure	-
2014/04/1509	No. 68A Choi Yuen Tsuen, Tsing Lung Tau	6SW-D/CR389	24/04	LandsD	30/03 (22:00)	Soil cut	2.65	Squatter structure	-
2014/05/1510	At the junction of access road to Fei Ngo Shan Service Reservoir and Fei Ngo Shan Road	11NE-B/C203	06/05	HyD	Unknown	Soil cut	0.8 (Boulder fall)	Road	Fei Ngo Shan Road (one lane road) partially blocked
2014/05/1511	Tai Mo Shan Road, Tai Mo Shan Country Park	7NW-C/C139	07/05	Arch SD	30/03 (22:00)	Rock cut	2	Other (country park)	-
2014/05/1512	Ho Chung Road, Sai Kung	7SE-D/C200	09/05	FSD	Unknown	Soil cut	15	Road	Ho Chung Road (one lane road) partially blocked

Table B4 List of Landslide Incidents in the New Territories (Sheet 5 of 18)

Incident No.[(1)]	Location	Feature Registration No. (if any)	Reported		Failure			Facility Affected	Consequence
			Date	By	Date (Time)	Feature Type	Scale (m^3)		
2014/05/1513	Pak Tam Road, Sai Kung	8NW-D/C45	09/05	FSD	Unknown	Soil cut	25	Road	One lane of Pak Tam Road temporarily closed
2014/05/1514	Behind House No. 33A Pik Shui Sun Tsuen, Sai Kung	2 m high cut slope	09/05	LandsD	Unknown	Soil cut	5	Squatter structure	-
2014/05/1515	Below House No. 9 Tan Shan Tsuen, Tan Shan Road, Sai Kung	2 m high cut slope	09/05	Police	Unknown	Soil cut	1	Minor footpath	-
2014/05/1516	Residence Road, the Chinese University of Hong Kong	7NE-C/C228	09/05	Public	08/05 (23:30)	Soil cut	120	Road	All two lanes of Residence Road temporarily closed
2014/05/1520	Near House No. 2A Tai Lam Liu Tsuen, Kwong Wing Lane, Shatin	8 m high fill slope	09/05	Police	08/05 (23:00)	Fill	21	Village house; Open area	-
2014/05/1521	No. 14 Fishermen Village, Tui Min Hoi, Sai Kung	2.5 m high cut slope	09/05	DO	Unknown	Soil cut	5	Village house	-
2014/05/1522	Behind house No. 42 Lo Wu Village, Lo Wu Station Road	1.5 m high cut slope	09/05	Public	Unknown	Rock cut	0.07 (Rockfall)	Minor footpath	-
2014/05/1523	Access road to Mao Tso Ngam Village, Shatin (near Lamp Post No. V8144)	Natural hillside	09/05	DO	08/05 (23:00)	Natural hillside	70	Access road	-

Table B4 List of Landslide Incidents in the New Territories (Sheet 6 of 18)

Incident No.(1)	Location	Feature Registration No. (if any)	Reported		Failure			Facility Affected	Consequence
			Date	By	Date (Time)	Feature Type	Scale (m^3)		
2014/05/1525	Hok Tau Road, Fanling	3SW-B/C296	11/05	HyD	Unknown	Soil cut	21	Road	Part of Hok Tau Road (one lane road) temporarily closed
2014/05/1526	Access road leading to No. 24 Ma Tso Lung Village, Sheung Shui	2SE-B/C331	11/05	Police	11/05	Soil cut	9.5	Access road	-
2014/05/1527	Bride's Pool Road	3NE-D/C103	11/05	HyD	Unknown	Soil cut	26	Road	One lane of Bride's Pool Road temporarily closed
2014/05/1535	Lung Ha Wan Road, Sai Kung	12NW-D/C7	12/05	Police	Unknown	Soil cut	0.3	Road	Lung Ha Wan Road (one lane road) temporarily closed
2014/05/1541	Near House No. 32 Tui Min Hoi Village, Sai Kung	Natural hillside	09/05	LandsD	Unknown	Natural hillside	2	Access road	-
2014/05/1546	Ying Pun, Fanling	3SW-C/C624	13/05	DO	Unknown	Soil cut	13	Other (pavilion)	-
2014/05/1547	Natural hillside adjacent to a natural streamcourse, 13 m south of Feature No. 6SW-A/CR215	Natural hillside	30/04	DSD	Unknown	Natural hillside	2.36	Other (existing streamcourse)	-

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Table B4 List of Landslide Incidents in the New Territories (Sheet 7 of 18)

Incident No.[1]	Location	Feature Registration No. (if any)	Reported		Failure			Facility Affected	Consequence
			Date	By	Date (Time)	Feature Type	Scale (m^3)		
2014/05/1550	Northwest of House No. 49, Area 6, Shatin Tau New Village	3.5 m high cut slope	10/05	LandsD	Unknown	Soil cut	1.5	Squatter structure	-
2014/05/1551	North of Fung Chu Villa at DD 252, Lot No. 275	8SW-A/C66	13/05	Police	13/05 (14:13)	Soil cut	13	Access road	-
2014/05/1552	Chek Keng Maclehose Trail towards Tai Long Au, in-between Hiking Trail Mark Nos. M040 and M041, Tai Po	Natural hillside	13/05	FSD	13/05 (17:30)	Natural hillside	150	Minor footpath	Maclehose Trail blocked
2014/05/1553	Lung Ha Wan Road, Sai Kung	12NW-C/C349	12/05	LandsD	Unknown	Soil cut	25	Road	Lung Ha Wan Road (one lane road) temporarily closed
2014/05/1557	Ki Lun Village, Sheung Shui	2SE-B/C101	12/05	LandsD	Unknown	Soil cut	1	Nil	-
2014/05/1558	Behind House No. 43E Kam Shan, Tai Po	7NW-B/C675	13/05	LandsD	Unknown	Soil cut	0.4	Squatter structure	-
2014/05/1560	Pak Fa Lam Road, Sai Kung, north of Feautre No. 11NE-B/C962	2.5 m high cut slope	14/05	Public	Unknown	Soil cut	1.2	Access road	-
2014/05/1561	Chek Keng Maclehose Trail towards Tai Long Au near Ham Tin Wan, Sai Kung	Natural hillside	14/05	AFCD	Unknown	Natural hillside	22	Minor footpath	Maclehose Trail blocked
2014/05/1562	Natural hillside adjacent to Feature No. 11NE-B/R59	Natural hillside	12/05	Public	Unknown	Natural hillside	2	Catchwater	-

Table B4 List of Landslide Incidents in the New Territories (Sheet 8 of 18)

Incident No.[(1)]	Location	Feature Registration No. (if any)	Reported		Failure			Facility Affected	Consequence
			Date	By	Date (Time)	Feature Type	Scale (m^3)		
2014/05/1565	Lung Ha Wan Road, Sai Kung	12NW-D/C4	12/05	Police	Unknown	Rock cut	0.3 (Rockfall)	Road	-
2014/05/1566	Footpath leading from Sai Wan Road to Sai Wan Village, Sai Kung	4 m high cut slope	14/05	Public	13/05 (21:00)	Soil cut	12	Minor footpath	Footpath to Sai Wan Village partially blocked
2014/05/1567	Footpath leading from Sai Wan Road to Sai Wan Village, Sai Kung	8SE-A/C86	14/05	Public	13/05 (21:00)	Soil cut	7	Minor footpath	Footpath to Sai Wan Village partially blocked
2014/05/1568	Natural hillside at the east of a footpath leading from Sai Wan Road to Sai Wan Village, Sai Kung	Natural hillside	14/05	Public	13/05 (21:00)	Natural hillside	126	Minor footpath	Footpath to Sai Wan Village partially blocked
2014/05/1569	Footpath leading from Sai Wan Road to Sai Wan Village, Sai Kung	3 m high cut slope	14/05	Public	13/05 (21:00)	Soil cut	16	Minor footpath	Footpath leading to Sai Wan Village partially blocked
2014/05/1570	Lam Tin Morning Walk Trail, opposite to Kwong Yat House, Kwong Tin Estate, Lam Tin	11NE-D/DT47	15/05	HyD	Unknown	Disturbed terrain	13	Access road; Open area	-
2014/05/1571	100 m southeast of Yuen Tun Ha, Tai Po	2.5 m high cut slope	16/05	LandsD	Unknown	Soil cut	4.5	Minor footpath	-

Table B4 List of Landslide Incidents in the New Territories (Sheet 9 of 18)

Incident No.[(1)]	Location	Feature Registration No. (if any)	Reported		Failure			Facility Affected	Consequence
			Date	By	Date (Time)	Feature Type	Scale (m^3)		
2014/05/1574	Lung Ha Wan Road, Sai Kung	12NW-C/C207	12/05	LandsD	Unknown	Soil cut	16	Road	Lung Ha Wan Road (one lane road) temporarily closed
2014/05/1579	Mang Kung Wo Road, Sai Kung (near Lamp Post No. VE2357)	2.5 m high cut slope	21/05	Police	Unknown	Soil cut	3.5 (Boulder fall)	Minor footpath	-
2014/05/1580	Northwest of No. 60 Fu Tei Au Road, Lo Wu	3SW-A/CR39	22/05	LandsD	Unknown	Soil cut	2.6	Squatter structure	-
2014/05/1581	Behind House No. 57A1, Tai Lung	Natural hillside	22/05	LandsD	17/05	Natural hillside	8.5	Nil	-
2014/05/1582	Wah King Hill Road, Lai King	11NW-A/C259	23/05	HyD	23/05 (07:00)	Rock cut	2 (Rockfall)	Road	One lane of Wah King Hill Road temporarily closed
2014/05/1584	Natural hillside along Anderson Road, beneath Haven of Hope Sunnyside School, Tseung Kwan O	Natural hillside	20/05	ICC	Unknown	Natural hillside	0.04 (Boulder fall)	Pedestrian pavement	-
2014/05/1585	House No. 11 Tong Yan San Tsuen (South), Ping Shan, Yuen Long	3.1 m high cut slope	16/05	DLO	30/03 (22:00)	Soil cut	0.5	Squatter structure; Minor footpath	Part of the footpath behind a squatter structure blocked

Table B4 List of Landslide Incidents in the New Territories (Sheet 10 of 18)

Incident No.[(1)]	Location	Feature Registration No. (if any)	Reported		Failure			Facility Affected	Consequence
			Date	By	Date (Time)	Feature Type	Scale (m^3)		
2014/05/1586	Behind House No. 92 Pai Tau Village, Shatin	2.8 m high cut slope	24/05	Police	Unknown	Soil cut	2	Squatter structure	Temporary evacuation of one squatter structure
2014/05/1587	Staircase leading to No. 187 Pai Tau Village, Shatin	< 3 m high cut slope	24/05	Police	Unknown	Soil cut	0.01	Minor footpath	-
2014/05/1589	Kwai Tei New Village, Fo Tan, Shatin	Natural hillside	16/05	DO	Unknown	Natural hillside	13	Village house	-
2014/05/1590	Access road leading to Tam Wat, Sai Kung (between Lamp Post Nos. VA4993 and VA4994)	2 m high cut slope	26/05	Public	Unknown	Soil cut	2.1	Access road	-
2014/05/1591	Ho Chung Road, Sai Kung (between Lamp Post Nos. EA66187 and EA6619)	2.5 m high cut slope	16/05	WSD	Unknown	Soil cut	1.5	Road	-
2014/05/1593	Opposite to Chin Kwai House, Kwai Chung Estate, Kwai Tsing	7SW-C/C321	26/05	LandsD	Unknown	Soil cut	3	Open area	-
2014/05/1596	Access road to Ling Wan Monastery, Pat Heung, Yuen Long (next to Lamp Post No. FA7351)	< 3 m high cut slope	29/05	LandsD	Unknown	Soil cut	3	Access road	-
2014/06/1597	Government land between Lot Nos. 1336 and 1293 in DD 44, Luk Keng Chan Uk, Luk Keng	2 m high cut slope	26/05	DLO	Unknown	Soil cut	1	Minor footpath	-

Table B4 List of Landslide Incidents in the New Territories (Sheet 11 of 18)

Incident No.[1]	Location	Feature Registration No. (if any)	Reported		Failure			Facility Affected	Consequence
			Date	By	Date (Time)	Feature Type	Scale (m^3)		
2014/06/1598	Footpath at Lai Chi Wo	2.2 m high cut slope	30/05	Public	Unknown	Soil cut	1	Minor footpath	-
2014/06/1599	Opposite to No. 169, Lai Chi Wo Village	2.5 m high cut slope	30/05	Public	Unknown	Soil cut	33	Village house	-
2014/06/1601	East of House No. 3C Tai Mong Tsai Village, Sai Kung	2.8 m high cut slope	30/05	Police	Unknown	Soil cut	3.6	Minor footpath	-
2014/06/1604	Shan Shue Wo Tsuen, Ho Chung, Sai Kung	2.5 m high cut slope	27/05	DLO	Unknown	Soil cut	0.1	Road	-
2014/06/1607	Ma Yau Tong Road, Tseung Kwan O (between Lamp Post Nos. EB1955 and EB1959)	< 3 m high cut slope	09/06	DLO	Unknown	Soil cut	0.01	Road	-
2014/06/1608	Chuen Lung Track, Chuen Lung, Tsuen Wan	2.5 m high cut slope	13/06	DLO	10/05	Soil cut	3	Other (country park facilities)	-
2014/06/1611	Fisherman Village, Pak Sha Wan, Sai Kung	< 5 m high fill slope	20/06	Public	Unknown	Fill	0.03 (Boulder fall)	Minor footpath	-
2014/06/1616	Southwest of House No. 21B Ma Yau Tong Village, Tseung Kwan O	2.6 m high cut slope	12/06	ICC	Unknown	Soil cut	0.01	Minor footpath	-
2014/07/1620	Between House Nos. 52 and 79, Area 6, Shatin Tau New Village	7SE-C/DT25	18/07	Police	18/07 (17:30)	Disturbed terrain	10	Squatter structure; Minor footpath	Temporary evacuation of a squatter structure

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Table B4 List of Landslide Incidents in the New Territories (Sheet 12 of 18)

Incident No.[1]	Location	Feature Registration No. (if any)	Reported		Failure			Facility Affected	Consequence
			Date	By	Date (Time)	Feature Type	Scale (m^3)		
2014/07/1621	Natural hillside adjacent to Feature No. 3NE-D/CR72, Kuk Po, Sha Tau Kok	Natural hillside	16/06	Public	Unknown	Natural hillside	15	Open area	-
2014/07/1622	Lin Ma Hang Road	3NE-A/C126	22/07	HyD	Unknown	Soil cut	7.2	Road	Lin Ma Hang Road (one lane road) temporarily closed
2014/08/1626	Footpath near Hap Mun Bay Beach, Sai Kung	Natural hillside	28/07	DLO	Unknown	Natural hillside	8.4	Pedestrian pavement	-
2014/08/1630	Natural hillside above Sha Tin Road, Yuen Chau Kok, Shatin	Natural hillside	26/06	DO	22/06	Natural hillside	12	Pedestrian pavement	-
2014/08/1636	Near Feature No. 2SE-B/C278, Kwu Tung Village	2.5 m high cut slope	18/08	Public	Unknown	Soil cut	0.2	Squatter structure	-
2014/08/1640	Near House No. 243 Sandy Ridge New Village, Lo Wu	1.9 m high retaining wall	25/08	DO	23/08	Masonry wall	9.7	Village house; Minor footpath	-
2014/09/1641	Footpath near Tai Po Kau Park, Tai Po	2.5 m high cut slope	29/08	DLO	Unknown	Soil cut	1.8	Minor footpath	-
2014/09/1644	No. 10A Kam Shan Village, Tai Po	1.8 m high cut slope	17/09	Police	Unknown	Soil cut	1	Village house	-
2014/11/1651	House No. 12 O Long Village, Sai Kung	3 m high cut slope	05/11	ICC	Unknown	Soil cut	0.5	Squatter structure	-

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Table B4 List of Landslide Incidents in the New Territories (Sheet 13 of 18)

Incident No.[1]	Location	Feature Registration No. (if any)	Reported		Failure			Facility Affected	Consequence
			Date	By	Date (Time)	Feature Type	Scale (m^3)		
2014/01/1001AD (ArchSD/F/2014/01/0001)	Wo Hop Shek Cemetery, Fanling	3SW-C/DT80	29/01	ArchSD	Unknown	Disturbed terrain	3	Other (Cemetery)	-
2014/03/1004AD (ArchSD/TM/2014/03/0001)	Tai Lam Correctional Institution	6SW-D/DT18	23/03	ArchSD	Unknown	Disturbed terrain	2	Building	-
2014/03/1006LD (LandsD/TM/2014/03/0001)	Pine Villas, Tuen Mun	6SW-C/F8	31/03	LandsD	Unknown	Fill	0.2	Access road	-
2014/04/1007AD (ArchSD/F/2014/04/0001)	Urn grave section No. U1972, Wo Hop Shek Cemetery, Fanling	3SW-C/C631	01/04	ArchSD	Unknown	Soil cut	15	Other (Cemetery)	-
2014/04/1008AD (ArchSD/F/2014/05/0001)	Wo Hop Shek Cemetery, Fanling	3SW-C/DT84	30/04	ArchSD	Unknown	Disturbed terrain	2	Other (Cemetery)	-
2014/04/1009AF (AFCD/2014/04/0001)	Tai Po Kau Loop Track, Tai Po Kau Nature Reserve, Tai Po	Natural hillside	03/04	AFCD	02/04	Natural hillside	0.5 (Boulder fall)	Nil	-
2014/04/1010AF (AFCD/2014/04/0002)	Tai Lam Forest Track - Tin Fu Tsai Section	Natural hillside	14/04	AFCD	02/04	Natural hillside	40	Access road; Other (existing streamcourse)	-
2014/04/1011HY (HyD/NTE/2014/04/0020)	Natural hillside near Nos. 9A & 9B Hing Keng Shek Village, Sai Kung	Natural hillside	07/05	HyD	24/04	Natural hillside	0.5	Minor footpath	-
2014/04/1012WS (WSD/2014/4/1/NTW)	Tai Lam Chung Catchwater (Sections H & I, CH. 5000 - CH. 5060)	6SW-A/CR74	02/04	WSD	Unknown	Soil cut	6	Catchwater	-

Table B4 List of Landslide Incidents in the New Territories (Sheet 14 of 18)

Incident No.[1]	Location	Feature Registration No. (if any)	Reported		Failure			Facility Affected	Consequence
			Date	By	Date (Time)	Feature Type	Scale (m^3)		
2014/04/1013WS (WSD/2014/4/2/ NTW)	Tai Lam Chung Catchwater (Section K, CH. 1040 - CH. 1085)	6SE-C/C520	03/04	WSD	Unknown	Soil/rock cut	0.9	Catchwater	-
2014/04/1014WS (WSD/2014/4/3/ NTW)	Tai Lam Chung Catchwater (Sections H & I), near So Kwun Wat Road	6SW-D/C112	03/04	WSD	Unknown	Soil/rock cut	1.6	Access road	-
2014/04/1015WS (WSD/2014/4/4/ NTW)	Adjoining WSD Access Road NT24, Tuen Mun	6SW-D/C667	10/04	WSD	Unknown	Soil cut	6	Access road	-
2014/05/1016AD (ArchSD/TP/2014/ 05/0002)	Tai Po Kau Track, Tai Po	7NW-D/C415	09/05	AFCD	Unknown	Soil cut	5	Access road	-
2014/05/1017AD (ArchSD/F/2014/ 05/0003)	Wo Hop Shek Cemetery, Fanling	3SW-C/C299	13/05	ArchSD	Unknown	Soil cut	15	Other (Cemetery)	-
2014/05/1021AD (ArchSD/F/2014/ 05/0007)	Wo Hop Shek Cemetery, Fanling	3SW-C/DT80	16/05	ArchSD	Unknown	Disturbed terrain	2	Other (Cemetery)	-
2014/05/1022AD (ArchSD/F/2014/ 05/0008)	Wo Hop Shek Cemetery, Fanling	3SW-C/C165	12/05	ArchSD	Unknown	Soil cut	25	Other (Cemetery)	-
2014/05/1023AD (ArchSD/F/2014/ 05/0009)	Wo Hop Shek Cemetery, Fanling	3SW-C/C741	12/05	ArchSD	Unknown	Soil cut	1	Other (Cemetery)	-
2014/05/1024AD (ArchSD/F/2014/ 05/0010)	Wo Hop Shek Cemetery, Fanling	3SW-C/DT93	16/05	ArchSD	Unknown	Disturbed terrain	1	Other (Cemetery)	-

Table B4 List of Landslide Incidents in the New Territories (Sheet 15 of 18)

Incident No.[(1)]	Location	Feature Registration No. (if any)	Reported		Failure			Facility Affected	Consequence
			Date	By	Date (Time)	Feature Type	Scale (m^3)		
2014/05/1025AD (ArchSD/SK/ 2014/05/0011)	Sai Kung West Country Park Management Centre	8SW-B/C160	21/05	ArchSD	Unknown	Soil cut	15	Open area	-
2014/05/1026AF (AFCD/2014/05/ 0002)	Near Feature No. 7SW-B/C698, Shing Mun Forest Track - Lead Mine Pass Section, Tsuen Wan	Natural hillside	19/05	AFCD	09/05	Natural hillside	30	Access road	-
2014/05/1028AF (AFCD/2014/05/ 0004)	Kong Ha Au Barbecue Site	Natural hillside	19/05	AFCD	12/05	Natural hillside	20	Other (BBQ site)	-
2014/05/1029AF (AFCD/2014/05/ 0005)	Tai Po Kau Forest Track, near extrance of Tai Pu Kau Nature Trail, Tai Po	2 m high cut slope	19/05	AFCD	09/05	Soil cut	2	Access road	-
2014/05/1030AF (AFCD/2014/05/ 0006)	Tai Po Kau Forest Track - Kau Lead Section, Tai Po	7NW-D/C380	19/05	AFCD	09/05	Soil cut	1.5 (Rockfall)	Access road	-
2014/05/1031AF (AFCD/2014/05/ 0007)	Near Feature No. 7NW-D/C376, Tai Po Kau Forest Track - Kau Lead Section, Tai Po	1.5 m high cut slope	19/05	AFCD	09/05	Soil cut	0.5	Access road	-
2014/05/1032AF (AFCD/2014/05/ 0008)	Tai Po Kau Forest Track - Fire Lookout Section, Tai Po	7NW-D/C419	19/05	AFCD	09/05	Soil cut	10	Access road	-
2014/05/1033AF (AFCD/2014/05/ 0009)	Wilson Trail Section 7, near Shing Mun Reservior	Natural hillside	22/05	AFCD	19/05	Natural hillside	5	Pedestrian pavement	Pedestrian pavement temporarily closed

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Table B4 List of Landslide Incidents in the New Territories (Sheet 16 of 18)

Incident No.[1]	Location	Feature Registration No. (if any)	Reported		Failure			Facility Affected	Consequence
			Date	By	Date (Time)	Feature Type	Scale (m^3)		
2014/05/1034AF (AFCD/2014/05/0012)	Maclehose Trail Stage 2 (near Lamp Post No. V4904)	Natural hillside	26/05	AFCD	14/05	Natural hillside	10	Minor footpath	-
2014/05/1035AF (AFCD/2014/05/0013)	Maclehose Trail Stage 2 (30 m from a distance post)	Natural hillside	26/05	AFCD	14/05	Natural hillside	5	Minor footpath	-
2014/05/1036AF (AFCD/2014/05/0014)	Maclehose Trail Stage 2	Natural hillside	26/05	AFCD	14/05	Natural hillside	5	Nil	-
2014/05/1037AF (AFCD/2014/05/0015)	Maclehose Trail Stage 2 (near a natural streamcourse)	Natural hillside	26/05	AFCD	14/05	Natural hillside	5	Minor footpath	-
2014/05/1038AF (AFCD/2014/05/0016)	Maclehose Trail Stage 2 (in-between Hiking Trail Mark Nos. M39 & M40)	Natural hillside	26/05	AFCD	14/05	Natural hillside	5	Minor footpath	-
2014/05/1039AF (AFCD/2014/05/0017)	Cheung Sheung Country Trail - Jacob's Ladder	Natural hillside	27/05	AFCD	16/05	Natural hillside	18	Minor footpath	-
2014/05/1040AF (AFCD/2014/05/0018)	Near Feature No. 8SW-A/C351, Kei Ling Ha Forest Track	Natural hillside	27/05	AFCD	09/05	Natural hillside	30	Minor footpath	-
2014/05/1041AF (AFCD/2014/05/0020)	Ng Tung Chai, Tai Mo Shan Country Park	Natural hillside	04/06	AFCD	25/05	Natural hillside	0.8	Minor footpath	-
2014/05/1042AF (AFCD/2014/05/0021)	Ng Tung Chai, Tai Mo Shan Country Park	Natural hillside	04/06	AFCD	28/05	Natural hillside	0.5	Minor footpath	-

Table B4 List of Landslide Incidents in the New Territories (Sheet 17 of 18)

Incident No.[1]	Location	Feature Registration No. (if any)	Reported		Failure			Facility Affected	Consequence
			Date	By	Date (Time)	Feature Type	Scale (m^3)		
2014/05/1043AF (AFCD/2014/05/0022)	Near Distance Post No. W022, Wilson Trail Section 7	Natural hillside	10/06	AFCD	30/05	Natural hillside	2	Minor footpath	-
2014/05/1046AF (AFCD/2014/05/0025)	Footpath at Pat Sin Leng Country Park	Natural hillside	26/06	AFCD	30/05	Natural hillside	1	Minor footpath	-
2014/05/1047LD (LandsD/2014/05/0130)	Tan Cheung Road, Sai Kung	8SW-A/C163	13/05	LandsD	09/05	Soil/rock cut	0.1	Access road	-
2014/05/1050WS (WSD/2014/5/4/NTE)	Adjoining pipeline beyond WSD Access Road NT67 from Pak Tam Road, Sai Kung Country Park	8NW-D/C38	12/05	WSD	Unknown	Soil/rock cut	8	Nil	-
2014/05/1051WS (WSD/2014/5/6/NTW)	Tai Lam Chung Catchwater (Section H, CH. 1900 - CH. 2130)	6SW-C/C68	15/05	WSD	Unknown	Soil/rock cut	0.1	Catchwater	-
2014/05/1052WS (WSD/2014/5/7/NTW)	Tai Lam Chung Catchwater (Section H, CH. 1135 - CH. 1280)	6SW-D/CR100	15/05	WSD	Unknown	Soil/rock cut	0.3	Catchwater	-
2014/05/1060WS (WSD/2014/5/15/NTE)	Behind House No. 12A Ma Niu Village, Kau To, Shatin	7SE-A/DT41	31/05	WSD	Unknown	Disturbed terrain	0.1	Village house	-
2014/07/1065AD (ArchSD/F/2014/07/0001)	Adjacent to Feature No. 3SW-C/C650, Wo Hop Shek Cemetery, Fanling	< 3 m high cut slope	18/07	ArchSD	Unknown	Soil cut	2	Other (Cemetery)	-

Table B4 List of Landslide Incidents in the New Territories (Sheet 18 of 18)

Incident No.[1]	Location	Feature Registration No. (if any)	Reported		Failure			Facility Affected	Consequence
			Date	By	Date (Time)	Feature Type	Scale (m^3)		
2014/08/1066AF (AFCD/2014/08/0001)	Upslope of Feature Nos. 6SW-B/C108 & 6SW-B/C109, Tai Tong Track, Tai Lam Country Park	Natural hillside	14/08	AFCD	Unknown	Natural hillside	0.1 (Boulder fall)	Access road	-
2014/10/1069HY (HyD/NTW/2014/09/0036)	Wong Yin Street, Tuen Mun	0.5 m high cut slope	31/10	HyD	Unknown	Soil cut	4	Access road	-

Note: (1) The bracket denotes the landslide number adopted by the governemt department concerned, other than the GEO.

Table B5 List of Landslide Incidents on Outlying Islands (Sheet 1 of 3)

Incident No.[(1)]	Location	Feature Registration No. (if any)	Reported		Failure			Facility Affected	Consequence
			Date	By	Date (Time)	Feature Type	Scale (m^3)		
2014/02/1472	House No. 23, Wang Long Village, Lamma Island	Natural hillside	13/02	Police	Unknown	Natural hillside	0.06 (Boulder fall)	Village house	-
2014/03/1474	No. 134B Pak She San Tsuen, Wo Shun Lane, Cheung Chau	1.4 m high retaining wall	31/03	BD	30/03 (09:00)	Retaining wall	8.5	Village house; Backlane	-
2014/04/1483	East of No.1 Middle Hill Road, Ko Shan Village, Cheung Chau	14NW-D/R48	31/03	Police	Unknown	Retaining wall	2	Village house; Backlane	-
2014/05/1537	Behind House No. 14 Siu Kwai Wan, east of Feature No. 14NW-D/R317, Cheung Chau	2 m high cut slope	12/05	Police	Unknown	Soil cut	0.25	Village house; Backlane	-
2014/05/1540	House No. 31 Yung Shue Long New Village, Lamma Island	14NE-B/C166	12/05	Police	Unknown	Soil cut	10.5	Village house	-
2014/05/1543	220 m southeast of Lo So Shing School, Lamma Island	15NW-C/CR97	12/05	Police	Unknown	Soil/rock cut	15.7	Pedestrian pavement	-
2014/05/1548	No. 133 Tai Peng Village, Lamma Island	1.5 m high cut slope	13/05	Police	Unknown	Soil cut	0.63	Village house	-
2014/05/1549	No. 9 Tai Shan Central, Lamma Island	3.1 m high cut slope	13/05	DC Member	Unknown	Soil cut	0.06	Squatter structure	-
2014/05/1563	No. 16 Sok Kwu Wan Second Street, Sok Kwu Wan, Lamma Island	Natural hillside	15/05	Police	Unknown	Natural hillside	18.85	Open area	-

Table B5 List of Landslide Incidents on Outlying Islands (Sheet 2 of 3)

Incident No.[(1)]	Location	Feature Registration No. (if any)	Reported		Failure			Facility Affected	Consequence
			Date	By	Date (Time)	Feature Type	Scale (m^3)		
2014/05/1573	Sok Kwu Wan, Lamma Island (Near Lamp Post No. 36934)	Natural hillside	17/05	FSD	Unknown	Natural hillside	5 (Boulder fall)	Other (verge)	-
2014/05/1577	Keung Shan Road, Lantau	13NW-B/C190	19/05	HyD	15/05	Soil cut	0.15 (Boulder fall)	Road	-
2014/05/1595	Behind No. 13 Fan Kwai Tong, Tai O, Lantau	13NW-A/CR4	27/05	LandsD	11/05 (20:00)	Soil cut	5	Squatter structure	-
2014/06/1600	No. 5, Shek Li Ka Nam, Yung Shue Wan, Lamma Island	Natural hillside	23/05	LandsD	Unknown	Natural hillside	7.07	Minor footpath	-
2014/06/1606	Lo Tik Wan, Lamma Island (near Lamp Post No. 42148)	15NW-A/F12	26/05	DLO	Unknown	Fill	25.13	Minor footpath	-
2014/06/1609	Natural hillside near Lamp Post No. VC 0074, Lai Chi Yuen Tsuen, Mui Wo, Lantau	Natural hillside	11/06	Public	Unknown	Natural hillside	1.8	Access road	-
2014/06/1614	No. 17 Sok Kwu Wan 2nd Street, Lamma Island	Natural hillside	20/06	Public	Unknown	Natural hillside	1.31 (Boulder fall)	Squatter structure	-
2014/07/1617	Behind Shing House, Shek Kwu Chau Treatment & Rehabilitation Centre, Shek Kwu Chau	Natural hillside	27/06	LandsD	08/05	Natural hillside	120 (Boulder fall)	Cottage	-
2014/07/1618	West of Lot No. 338, Lo Tik Wan, Lamma Island	15NW-A/CR70	03/07	Public	Unknown	Soil cut	26.2	Village house	-

Table B5 List of Landslide Incidents on Outlying Islands (Sheet 3 of 3)

Incident No.[1]	Location	Feature Registration No. (if any)	Reported		Failure			Facility Affected	Consequence
			Date	By	Date (Time)	Feature Type	Scale (m^3)		
2014/08/1625	Natural hillside behind Seaview Holiday Resort, Tung Wan Tau Road, Silver Mine Bay, Lantau	Natural hillside	18/07	Public	Unknown	Natural hillside	7.85	Open area	-
2014/08/1629	House No. 27 Tai Shan East, Lamma Island	14NE-B/C112	13/08	Police	13/08	Soil cut	0.25	Squatter structure	-
2014/11/1650	DDPT Lot No. 44, Po Toi Island	Natural hillside	13/11	DO	Unknown	Natural hillside	3.6 (Boulder fall)	Village house	-
2014/02/1003WS (WSD/2014/2/1/ HKI)	Adjoining Catchwater within Lantau South County Park (near CH. 0043.5), Lantau	13NW-B/C68	22/02	WSD	Unknown	Rock cut	0.05 (Rockfall)	Catchwater	-
2014/05/1049WS (WSD/2014/5/3/ HKI)	Lantau Catchwater (Section A), Lantau	13NW-D/CR41	12/05	WSD	Unknown	Soil cut	28	Catchwater	-
2014/06/1062WS (WSD/2014/6/1/ HKI)	Adjoining Lantau Catchwater (Section B), Lantau	13NW-D/CR4	06/06	WSD	Unknown	Soil cut	1 (Rockfall)	Catchwater	-
2014/10/1068AD (ArchSD/ Southern/2014/ 10/0001)	North of Lamp Post No. U77326, South Lantau Road, Lantau	13NE-B/C131	17/10	ArchSD	Unknown	Soil cut	5	Open area	-

Note: (1) The bracket denotes the landslide number adopted by the governemt department concerned, other than the GEO.

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Geotechnical Manual for Slopes, 2nd Edition (1984), 302 p. (English Version), (Reprinted, 2011).

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.

GEOSPECS

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

GCO Publication No. 1/90	Review of Design Methods for Excavations (1990), 187 p. (Reprinted, 2002).
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GEO Publication No. 1/2007	Engineering Geological Practice in Hong Kong (2007), 278 p.
GEO Publication No. 1/2009	Prescriptive Measures for Man-Made Slopes and Retaining Walls (2009), 76 p.
GEO Publication No. 1/2011	Technical Guidelines on Landscape Treatment for Slopes (2011), 217 p.

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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.

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