HONG KONG GEOLOGICAL SURVEY *SHEET REPORT NO. 2*

Geology of Chek Lap Kok

Geotechnical Engineering Office
Civil Engineering Department
HONG KONG

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1:5 000 Sheet 9-NE-C/D

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Cover: Oblique aerial view of Chek Lap Kok
taken from the northwest in May 1990.

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Foreword

This Report describes the onshore solid and superficial geology of Chek Lap Kok island prior to the new airport development, as depicted on Sheet 9-NE-C/D Edition 2. The account forms part of a series of publications that accompanies the 1:5 000 Geological Map Series HGP5. These large-scale maps complement the 1:20 000 Geological Map Series, providing greater geological detail in areas of urban and infrastructure development. The 1:20 000 Geological Map Sheet 9 (Tung Chung) and accompanying Memoir No. 6, Geology of Lantau Island, will also contain information on the geology of Chek Lap Kok.

The mapping was undertaken by the Hong Kong Geological Survey, which is a Section of the Planning Division of the GEO. The Section was led by Mr P. J. Strange and Dr I. R. Basham during the period of mapping and compilation of this report and accompanying map; the Division was under the direction of Dr R. P. Martin in this period.

The geological survey of Chek Lap Kok was undertaken mostly by Dr R. L. Langford between February 1989 and February 1992. Additional field data were gathered by Mr P. A. Kirk in the latter part of the field survey, and have been used to improve the accompanying published map. The report was prepared by Dr Langford, in the first instance as an internal document designed to assist engineers and geologists working on the new airport project. In addition, the report has been revised with information obtained from the many additional boreholes sunk prior to excavation, but does not take account of new exposures created since levelling of the island for the new airport commenced in 1991.

Although the geology depicted on the accompanying map and described in this report predates the site formation on Chek Lap Kok, the results of the survey should have a continuing long-term benefit. Exposures on the coast and in the hills provided important details on rock relationships, allowing the development of a three-dimensional model of the structure and alteration of the rocks. The final model, presented in this report, should be of continuing value, particularly as most of the structures are vertical or steeply inclined. The unique archive of rock samples, field photographs and notes are an important resource for any further geological study, and for those interested in rock properties at the airport site.

The survey has benefited greatly from the co-operation of many organizations and individuals. In particular, the Royal Hong Kong Auxiliary Air Force helped by deploying field parties to the remote and rugged parts of the island. Mr W. Meacham of the Hong Kong Archaeological Society provided access to survey sites that enhanced our understanding of the formation of superficial deposits on the island. The Provisional Airport Authority helped by providing access to drillcores and allowing samples to be taken that proved invaluable in understanding the nature and distribution of the granite of the island.

A. W. Malone
Principal Government Geotechnical Engineer
August 1994

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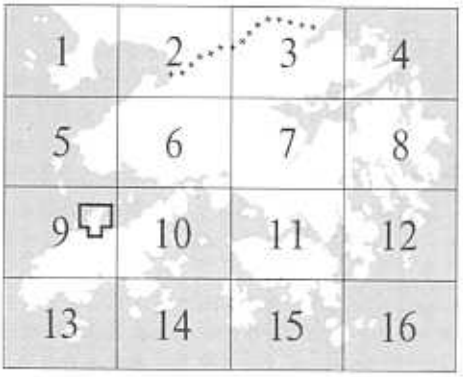
Map and Report Series Notes

- This Sheet Report describes the geology of Chek Lap Kok, and should be read in conjunction with 1:5 000 Geological Map Sheet 9-NE-C/D.

- The Report forms one of a series that records the findings of detailed mapping that extends the results of the Hong Kong Geological Survey Memoirs and 1:20 000 Geological Maps. An index of 1:20 000 maps and the location of 1:5 000 Sheet 9-NE-C/D is shown below.



- Individual superficial deposits in the onshore area are not generally considered mappable if less than 2 m thick. In the littoral areas the surface material is shown, in most areas regardless of thickness.

- Grid references are based on the Hong Kong 1980 Metric Grid as shown on the 1:5 000 Geological Map. Eight-figure references indicate positions to the nearest 10 metres, with Eastings followed by Northings, e.g., 1156 1827. Six-figure references indicate positions to the nearest 100 metres, and usually refer to a general area of interest. Where the full grid reference is specified, for boreholes for example, it begins with number 8 and may include a decimal point, indicating fractions of a metre.

- Hong Kong Principal Datum (PD) is 1.2 m below Mean Sea Level, and 0.15 m above Admiralty Chart Datum. The littoral zone nominally ends at about chart datum, i.e. the lowest water mark.

- Samples in the Territory-wide rock collection archived by the Hong Kong Geological Survey are prefixed HK followed by a serial number, e.g. HK2263.

- Boreholes are referred to by the contractor's number for that hole followed by the Geotechnical Information Unit accession number for the relevant ground investigation report, e.g. L24/3427A.

- The system used in this report for grain size description and classification of rocks and superficial deposits is summarized in Table 1.

Table 1 - Grain Size Description and Classification of Rocks and Superficial Deposits in Hong Kong

Superficial Deposits		Grain Size mm	Solid Rocks												
			Sedimentary Rocks		Pyroclastic Rocks	Igneous Rocks								Metamorphic Rocks	
						Acid			Acid-Intermediate			Intermediate	Basic	Other	Foliated	Other
Boulders		200	Sedimentary Breccia, Conglomerate		Pyroclastic Breccia, Agglomerate	Very Coarse	Pegmatite		Quartz Syenite	Syenite	Quartz Monzonite		Gabbro	Lamprophyre	Schist	Quartzite, Marble, Hornfels, Fault gouge, Fault breccia
Cobbles		60														
Gravel	Coarse	20														
	Medium	6			Lapilli-Tuff	Coarse										
	Fine	2				Medium	Granite	Granodiorite								
Sand	Coarse	0.6	Sandstone		Coarse Ash Tuff	Fine										
	Medium	0.2					Aplite, Microgranite	Micro-granodiorite					Microgabbro			
	Fine	0.06														
Mud	Silt		Siltstone	Mudstone	Fine Ash Tuff	Very Fine, Aphanitic	Rhyolite	Dacite	Quartz Trachyte	Trachyte	Quartz Latite	Andesite	Basalt		Mylonite, Phyllite	
	Clay	0.002	Claystone				Rhyodacite									