



Mapping

Maps are used in Hong Kong for public administration, town planning, housing, land development as well as leisure purposes by the Government, utility companies, developers and the general public. The Survey and Mapping Office (SMO) of the Lands Department is committed to the provision of accurate and up-to-date maps in a wide selection of topics and scales to support the rapid and intensive development of Hong Kong. Guidebooks and thematic maps of special interests are also produced to meet the requirements of different sectors.

1:1 000 Basic Mapping: Early mapping of urban Hong Kong and Kowloon was at 1:600 scale, and showed no height or contour information. In the early 1950s, it was decided that the New Territories area would be mapped at a scale of 1:1 200. Originally intended to replace the old Demarcation District sheets surveyed in the early 1900s, the mapping evolved as a predominantly planimetric record, eventually supplementing rather than replacing the sheets.

Early in the 1960s, it was realised that accurate large-scale maps with contours were required for planning and development and that these could only be produced rapidly by aerial survey. In 1962, a British company was awarded a contract to carry out aerial photography and photogrammetric plotting. Ground control, field checking and completion were provided by government survey staff.

This project was completed in 1971, providing mapping at 1:600 scale, with five-foot contours, covering Hong Kong Island, Kowloon and New Kowloon. All but the hilly areas and outlying islands of the New Territories were covered at 1:1 200 scale, with 10-foot contours.

Following the adoption of a metrication policy in the early 1970s, the SMO had to convert some 3 000 sheets to the metric scale of 1:1 000, with metric contours and spot levels. This work was greatly assisted by the establishment of the Photogrammetric and Air Survey Section in 1976. The section now provides digital mapping at various scales from photographs taken from the air and also produces digital terrain data for engineering design, earthwork calculation and topographic mapping.

To complete full coverage of this mapping series, some 150 additional sheets have to be produced, mostly for the hilly areas and remote islands. A mapping programme to survey these unmapped areas by photogrammetric method was started in 1994 and completed in early 1997. To date, all the 1:1 000 basic map sheets are available both on paper and in digital form.

Revision: Updating of maps is carried out continuously, priority being given to the revision of maps located in

the areas of greater activity and rapid development. For this purpose, a survey intelligence system has been set up to collect survey information on proposed construction projects and building works and to record their anticipated completion dates. With this information in hand, a revision programme can be planned to update major changes on ground within a short period after their completion. Today, the production of all series of maps has been computerised. The revision cycle is shorter than before.

Topographic Maps: While 1:1 000 maps produced by the SMO are essential for planning and land administration, smaller scale topographic maps are also required by the government departments and the public for various purposes. Medium and small scale topographic maps are derived from the large-scale maps by means of map compilation through photographic or digital reduction. Symbolisation and generalisation of map details are needed to enhance legibility due to the scale change.

The 1:5 000 topographic map series was produced in mid-1970. It started with the urban districts and then extended to the New Territories. In 1996, the 1:5 000 scale map was converted to digital form.

The first bilingual topographic map of Hong Kong published by the SMO is the 1:50 000 map. The 1:50 000 map comprises two sheets with hill shading and layer tinting. A joined version in one single sheet ideal for use as a wall map is also available.

The bilingual 1:100 000 scale map series showing Hong Kong on one sheet features elevation tints and hill shading. Another single sheet map at 1:200 000 scale which shows more generalised views of the topography of the territory is also available.

Hong Kong 1980 (HK1980) Grid is shown on most topographic maps. The HK1980 Grid is based on the Hong Kong 1980 Geodetic Datum. On 1:20 000 maps and other maps of smaller scale, the geodetic co-ordinates (latitude and longitude) and the Universal Transverse Mercator (UTM) Grid are also shown. The latitude, longitude and the UTM Grid are based on the World Geodetic System 1984. A booklet "Explanatory Notes on Geodetic Datum in Hong Kong" published by the SMO describes the map projection formulae and datum conversion parameters. It is available for sale at the Map Publications Centre (HK) or it can be downloaded free of charge from the SMO Geodetic Survey web page at: <http://www.geodetic.gov.hk/smo/gsi/programs/en/grid.htm>. Map users can use the information in the booklet to convert the positional reference of a point from one datum to another datum. In addition, the Web-based Transformation Tools in the web site can provide instant conversion between different geodetic datums.

Special Maps: Since its first publication in 1988, the *Hong Kong Guide* has continued to be the best seller among various map products. The *Hong Kong Guide 2009*, about the size of A4, was published in early 2009. This guidebook contains a wealth of information that most users will find useful.

After the first map of the popular countryside series was published in 1971, the demand for this type of maps has been strong and steady. There are five sheets in this series, each showing detailed information of leisure amenities and footpaths, especially within country parks.

A special series of street maps at 1:10 000 scale (SM10C) covering the whole of Hong Kong was available by the end of 1998. To date, 59 sheets are available.

A coloured urban map/town map series of scale around 1:8 000 (scale varies depending on the extent of the entire district/area to be shown) is printed on both sides of a paper sheet aiming to provide a map of an entire district/area of the urban area or the New Territories on a single face of a sheet. At present, seven sheets have been published and are available for sale.

The satellite image map (PRDM300S) at 1:300 000 scale showing the Zhu Jiang (Pearl River) Delta region is available. Major place names are added to the image to help identify locations.

The 1:50 000 Helicopter Flying Chart (2 sheets) and 1:100 000 Local Flying Chart are produced to show the flight areas in Hong Kong. Relevant aeronautical information is overprinted in red and blue on topographic base maps.

The SMO also produces other smaller page-sized maps to show thematic topics in publications such as the *Hong Kong Yearbook* and these maps are also available to the public. A 1:200 000 scale topographic map and some of the thematic maps can be browsed and downloaded free of charge through the Internet.

Orthophoto Maps: Starting from 2004, a series of Orthophoto Maps OPM50 and OPM100, of scale 1:50 000 and 1:100 000 are published covering the whole territory of Hong Kong. The Orthophoto Maps are produced from aerial photographs using digital photogrammetric technology for data processing, ortho-rectification and mosaicking.

Geological Maps: The SMO has produced for the Geotechnical Engineering Office (GEO) of Civil Engineering and Development Department the HGM20 series of geological maps comprising 15 sheets at scale 1:20 000. They depict solid and superficial geology of Hong Kong. Another 1:20 000 series on solid geology, HGM20S, consists of a sheet of the San Tin area. GEO has also produced three sets of geological survey plans of series HGP5, HGP5A and HGP5B showing solid and superficial, superficial, and solid geology respectively in selective areas including Yuen Long, Sha Tin and Chek Lap Kok, etc. On the geological maps, the mapbase is provided by SMO and the geological data by GEO.

Digital Maps: The SMO supplies topographic maps, orthophotos, land boundary data, Geo-reference Database and GeoCommunity Database in digital form. Many utility companies, engineering consultants, computing system consultants and education institutes have established their own automated mapping, facilities management, customer support and geographic information systems using the digital maps provided by the SMO as their common reference.

Data Scale and Format :

Product	Digital Topographic Map Database	Digital Land Boundary Database	Geo-Reference Database (Building Name & Address, Road Centre Line and Site Polygon)	Digital Orthophoto	GeoCommunity Database
Scale/ Ground Pixel Size	1:1 000 1:5 000 1:10 000 * 1:20 000 *	1:1 000		0.5m x 0.5m	
Data Format	ArCInfo Export (EΦΦ), AutoCAD (DXF), (DWG), MicroStation(DGN) * TIFF format is also available		All as stated in left table, plus ASCII format except Building Name & Address are only available in ASCII	TIFF	Excel, Access

Members of the public who wish to purchase these data may obtain a Digital Map Order Form from the SMO Map Publications Centres or download from the Internet (<http://www.landsd.gov.hk/mapping/welcome.htm>). They may also apply for sample data of Digital Topographic Map Databases for testing their computer systems at the same web site.

A non-exclusive and non-transferable Data Licence will be issued to a customer after purchasing the digital data. It permits the licensee to use the data under specific terms and conditions.

The SMO puts in a lot of effort to continuously update the digital map database covering the whole territory of Hong Kong. The database has not only formed the basis for city planning, land management, engineering works, administration and security activities, it also provides tremendous potential for the SMO and users to develop more new products and applications. The "Value Added Reseller (VAR) Service" was launched in late 1998 with an aim to open up the opportunities for the business sector to develop various types of value-added map product using the SMO's digital map data. The "Internet Map Permittee (IMP) Service" was launched in early 2001. The IMP may make use of the SMO's digital map in developing map information applications for delivery on its web site. The IMP may also deliver the map information for use at the Internet Map Redistribution User's (IMRU) web site. Both the VAR and IMP Services are non-exclusive and proposals are welcome.

Map Sales and Archives: The Map Catalogue and paper map products published by the SMO can be obtained from its Map Publications Centre (HK) on 23rd Floor, North Point Government Offices, 333 Java Road, North Point, Hong Kong (tel. 2231 3187) and the Map Publications Centre (Kln) at 382 Nathan Road, Yau Ma Tei, Kowloon (tel. 2780 0981), and from all District Survey Offices (except District Survey Office/Kowloon). Popular items are also obtainable from the online Government Bookstore through website at: <http://www.bookstore.gov.hk>, selected Post Offices and some bookshops.

Digital map products can be purchased at the Map Publications Centre (HK) on 23rd Floor of the North Point Government Offices (tel. 2231 3187).

Aerial photos and maps of previous editions are available at the Map and Aerial Photo Library on 23rd Floor of the North Point Government Offices (tel. 2231 3185).

Enquiry: Enquiries on digital and paper map products of the SMO can be made at tel. 2231 3187, or through e-mail at: smosale1@landsd.gov.hk.