

**The Supply and Demand of
Land/Engineering Survey Technicians
in Hong Kong**

**By
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**THE SUPPLY & DEMAND OF
LAND/ENGINEERING SURVEY TECHNICIANS IN HONG KONG**

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1. BACKGROUND

The shortage of qualified survey technicians (Land and Engineering) in recent years was generally felt by all employers, both in the public and private sectors. This was brought to the attention of the Education Committee of the Hong Kong Institute of Surveyors Land Survey Division. To ascertain the degree of shortage it was agreed that a working group be set up to investigate the demand and supply of Land and Engineering Survey Technicians.

In order to obtain a balanced view of the situation it was decided that the working group should consist of representatives from a wider spectrum, including those from professional and technical institutes. Mr. J. G. Lanham, being also a member of the teaching staff of the Hong Kong Polytechnic, was included in the Working Group so that his intimate knowledge of the past and present situation of academic institutes in Hong Kong could contribute towards making this study accurate and comprehensive.

The Working Group consists of the following members :

Mr. YEUNG Kin-fai (Co-ordinator)	HKIS
Mr. J. G. LANHAM	RICS
Mr. T. N. WONG	HKILS
Mr. T. C. CHAN	ICES
Mr. Y. L. LO	"
Mr. LAW Chok-kam	SST

It was hoped that the findings of the Working Group could subsequently be used as a background to guide the establishment of training courses at technician level in local education institutes, in order to alleviate the problem of technician shortage.

2. TERMS OF REFERENCE

2.1 The terms of reference for the Working Group was laid down by the Chairman of the Land Survey Division Education Committee, which were stated as:

(a) To investigate the demand and supply of land/engineering survey technicians.

(b) To review existing training facilities for land/engineering survey technicians.

(c) To make recommendation to cope with the requirements.

2.2 The term "Survey Technician" was agreed by the Working Group to be a person with the minimum qualification of an Ordinary Certificate, or equivalent, in Land Surveying. This was extended to include:

(a) holder of a Higher Diploma/Higher Certificate from the Hong Kong Polytechnic, or equivalent,

(b) holder of an Ordinary Certificate in Land Surveying or equivalent, e.g. those who have successfully finished the technician training course organised by the Survey and Mapping Office Training School.

(c) technical institute graduates.

(d) Associate Member of the "Society of Surveying Technicians"

2.3 The Working Group had considered the possibility of including graduates from other post-secondary institutions, but concluded that their standards vary extensively and have to be considered case by case. In any case the numbers produced were too small to warrant any serious consideration.

3. THE PRESENT POPULATION OF SURVEY TECHNICIANS IN HONG KONG

3.1 Survey Technicians are employed by both the Public and Private Sectors. Before attempting to consider the demand, it is necessary to look into the present population and distribution of Survey Technicians.

3.2 According to the manpower survey conducted over the last 16 years by the Building and Civil Engineering Industry Training Board of the Vocation Training Council, there was a steady increase in the population of survey technicians in Hong Kong. Comparing the figures in 1989 with that of 1973, the population was increased by about 3 times. Although one could notice a sudden surge in 1979 and 1981, this was believed to be connected more with the boom in the building industry in the private sector than with the construction of any major public projects at that time.

3.3 Although it had been considered that a study of the demand and supply could be started by first assessing the existing number of technicians employed by the industry. However, after careful consideration, it was believed that with the rather scarce resources of the Working Group, such a survey would take too long to complete. Furthermore, whereas the population has been fluctuating over the last 16 years, a more accurate prediction of the general trend of population variation could be obtained by extrapolating from past statistics. Although this approach could not be exact for a particular year, over the long term the predictions could be more accurate.

3.4 Appendix I is a consolidate record of the population of survey technicians since

1973, based on the manpower surveys. Despite fluctuations, there was a definite trend of population increase, from 328 in 1973 to 992 in 1989, which is equivalent to 7.16% per annum.

- 3.5 One should note that the manpower survey did not include land survey technicians employed by the Buildings and Lands Department (formally Lands Department) of the Government, but did include those employed by engineering departments such as Civil Engineering Services Department, Highways Department, etc. Appendix II lists the population of survey technicians employed by the Buildings and Lands Department from 1977 to 1991, and which reveals that the population was almost static during that period. Likewise for the population of engineering departments (Appendix III) over the last 7 years, which hovered around 240-260. Thus the population of survey technicians in Government did not seem to follow any pattern nor was it dependent on the economic situation of the Territory.

4 THE DEMAND OF SURVEY TECHNICIANS

4.1 Growth

4.1.1 As deduced from the manpower survey of the VTC the average annual growth of the technician population was about 7%. It is believed that this growth can be sustained because of the continued development of the infra-structure of Hong Kong, especially in relation to the port and airport development.

4.1.2 One may argue that whereas previously Hong Kong was relatively undeveloped and therefore could sustain, over the last 2 decades, a phenomenal growth. This high growth rate is unlikely to continue into the future. However, in the short term (say within the next decade) it is certain that activities from both the private and public sectors will maintain the demand and growth of survey technicians.

4.2 Replacement of Wastage

Wastage of the existing population can be attributed to retirement and resignation, emigration and change of jobs. It is not possible to find out, especially in the private sectors, the percentage of wastage due to individual categories. It is assumed that there is an overall 5% wastage per annum. In real terms this will be in the region of 50 per year.

4.3 The Demand for Training Places

4.3.1 Where there are demands for survey technicians to fill vacancies due to general growth and to replace wastage, there are corresponding demands for training places which academic institutions have to provide in order to turn out the required number of qualified technicians. The demand for training places is even greater than that required for the above two purposes because there is the

additional demand from existing non-qualified technicians who are mostly serving in the private sector. It was pointed out in paragraph 2.2 that the minimum academic requirement is an Ordinary Certificate in Land Surveying. Over the past years and since 1974 the Hong Kong Polytechnic together with the Morrison Hill Technical Institute had produced about 1100 graduates of various land surveying courses(see AppendixIV). Assuming an attrition rate of 5% per annum, this would have been reduced to about 740 still remaining in the profession. Comparing this figure with the projected current number of technicians of about 1140, it could be deduced that about 400 were not locally trained to qualify as survey technicians. Even if we assume that half of that number, i.e. 200, had been trained overseas or in China, at least 200 are still under-qualified and need to acquire the required training.

- 4.3.2 As a result of technological development, land surveying and cartography have gradually evolved and combined into a branch of science which could generally be called geographical information technology. At technician level, however, and especially in engineering surveying, there is still a need for the separate services of surveyors and cartographers. Nevertheless, the same Certificate Course, with common subjects in the first year, is now being attended by trainees of both disciplines. Thus at least from government, the demand for Ordinary Certificate places for technicians of the Cartographic stream has also to be taken into account. Out of a total of 430 cartographic technicians and assuming a growth rate of 2% per annum and a wastage rate of 5%, the demand for training places will be 9+21.

4.4 Summary of Demand

	<u>Qualified Tech.</u>	<u>Survey</u>	<u>Carto.</u>
Growth		76	9 (2%)
Wastage		50	21 (5%)
Yet to be trained	200		
		<hr/>	
	200	126	30

5. **THE SUPPLY**

5.1 At present the only academic institution providing training in Land Surveying is the Hong Kong Polytechnic. It runs courses at various levels and under various modes (see the Table and Chart at Appendix IV). However, among these courses the Certificate Course Higher Diploma Course are at technician level as defined earlier in paragraph 2.2. It is understood that the Polytechnic is equipped, both in staff resources and equipment, to run one course at each level, with a maximum of 30 to each class. With stretched resources it can probably run an additional Certificate Course. Thus altogether the Polytechnic can train about 90 technicians annually.

(N.B. The Higher Certificate Course will be restarted in October 1991. However, this is considered as an extension of the Certificate Course and no additional survey technicians will be produced.)

5.2 The Morrison Hill Technical Institute is at present running a Certificate Course in Engineering Surveying, with a maximum of 30 training places. The course is definitely useful in raising the standard of land surveying in the construction industry. With a little modification, the course should be able to cater for Land Surveying Technicians in general.

5.3 The Polytechnic and the Technical Institute together could supply a maximum of 120 training places.

6. CONCLUSION

6.1 There is a constant demand of at least 120 new land and engineering survey technicians annually to satisfy the need of the community in connection with civil engineering projects, the construction industry and mapping in general. They are required to fill vacancies due to a general expansion in demand.

6.2 When Land Surveying training facilities were considered, we were mindful that training places have to be provided to cartographic technicians who are mostly employed by Government. The demand for this category is 30 per year.

6.3 In addition, we have found that there are at least 200 serving technicians, mostly in the private sector, who need further training in order to be properly qualified.

6.4 It is apparent that the demand for Land/Engineering Survey Technicians exceeds the supply. In the past, employers have been forced to employ some unqualified technicians, with the hope that they can pick up some surveying knowledge while being engaged in the work. Alternatively, surveying was entrusted to people who were trained in a related discipline such as building construction with very barely sufficient knowledge to do simple surveying.

6.5 The above make-shift arrangement is definitely detrimental to the standard of surveying. The supervisors of these technicians have to spend a much greater effort to give detailed instructions and to check their work. Very often they may be trusted to do only simple and routine tasks.

7. RECOMMENDATION

- 7.1 To maintain the standard of surveying, there is a definite need to provide more training facilities to survey technicians in Hong Kong. The expansion of training facilities can be done by either expanding existing facilities or to set up courses at more academic institutes.
- 7.2 The Hong Kong Polytechnic is already well equipped to run courses in Land Surveying at different levels. To run more courses there has the advantage of economy of scale. However, it is already heavily committed and any expansion has to be accomplished by the expansion of its manpower resources and equipment.
- 7.3 Alternatively, since the courses are required at technician level only, Technical Institutes should be capable of running them. Undoubtedly, they will encounter teething problems at the beginning, such as the recruitment of teaching staff at the right calibre and the arrangement of suitable practical tasks. However, running courses at TIs has the advantages of decentralizing training facilities away from the urban centre. Many of the technicians who live and work in more remote parts of NT and wish to attend evening courses may find it convenient if there are such facilities nearby.
- 7.4 There are requirements for both full time and part times courses, to cater for different needs. It is expected that the majority of students will be serving technicians and are expected to attend the course in the part-time-day-release or evening & weekend mode. Only a small proportion of the training courses should be in the full time mode, to cater for students not yet serving in the profession.

APPENDICES

- I. The population of Land Surveyors, Land Survey Technicians and Levellers.
- II. The Population of Survey Technicians in the Buildings and Lands Department since 1977/
- III. The Population of Survey Technicians in Engineering Departments of the Government since 1985.
- IV. The Output from Land Surveying Courses.

