

Report
on
The Supply and Demand
of
Professional Land Surveyors in Hong Kong
by



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(Hong Kong Branch)



The Hong Kong Institute of Land Surveyors



The Hong Kong Institute of Surveyors

November 1986

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1. BACKGROUND

The three Institutes representing the Land Surveying profession in Hong Kong, that is, the Hong Kong Branch of the Royal Institution of Chartered Surveyors, the Hong Kong Institute of Land Surveyors, and the Hong Kong Institute of Surveyors, commissioned a joint Working Party to investigate the future supply and demand of professional Land Surveyors in Hong Kong. The Working Party was established in response to growing concern and controversy over the future provision of Land Surveyors. In particular concern was expressed by the President of the H.K.I.S. and the Chairman of the R.I.C.S.(H.K.) in their joint letter of 31 December 1985 to the Chairman of the Universities and Polytechnics Grants Committee. The letter was an outcome of a discussion forum jointly attended by the Education Committees of the two Institutes on 20 December 1985, and stated inter alia "..... the need to establish a degree course in Land Surveying cannot be overemphasised as there is a severe shortage of Land Surveyors in Hong Kong". This concern has been shared by others who feel that reliance on overseas training schemes should be reduced over the next few years, and that a locally established training route should be developed to meet the aspirations of prospective surveyors.

A difference of opinion has been expressed by other profession who questioned the justification in allocating resources to a course which may provide Hong Kong with an excessive number of Land Surveyors.

The Institutes therefore agreed that a more comprehensive investigation should be undertaken, and so formed the Working Party. A report was produced in July 1986. It was studied by individual Institutes and subsequently discussed between their Chairmen/Presidents. The report in the present form has been agreed between the three Institutes.

2. TERMS OF REFERENCE

2.1 The terms of reference for the Working Party were agreed between the Presidents/Chairmen of the three Institutes, and were stated as :-

- a. "To investigate on the demand and supply of Land Surveyors (including estimate on potential development fields).
- b. Review on existing Land Surveying education facilities and make recommendations to cope with requirements."

2.2 The title "Land Surveyor" has been taken to be a person with a recognised qualification in the discipline of Land Surveying, which in Hong Kong normally means a person who has passed the final professional examinations or holds an accepted degree, together with a further pass in a test of professional competence.

2.3 It is noteworthy that the minimum time normally taken to achieve the professional qualification is five years, so that the output from any locally established course could not be fully qualified until the early 1990's. For this reason, and because the year 1997 provides a suitable threshold, projections were made to cover the next 12 years, while at the same time acknowledging the vagaries of any prediction over such a period.

3. THE PRESENT LAND SURVEYING POPULATION IN HONG KONG

Before attempting to predict future requirements it is useful to outline the current number and distribution of Land Surveyors working in Hong Kong as in June 1986 :-

Government	68
Department of Buildings & Lands	
Engineering Development Department	
Other (including Housing, Water Supplies, Agric. & Fish., etc.)	
Private	
Private Practice Land Surveyors	6
Surveyors with Engineering Consultants/ Contractors/Utilities	8
Academic	
Land Surveyors in Academic Institutions with Professional Qualifications and/ or Higher Degrees	9
	Total
	<u>91</u>

The figures indicate that the great majority of Land Surveyors are presently employed in the public sector. It is of interest to note that the Building and Civil Engineering Industry Manpower Survey Report of 1985 quotes the number of "Technologist" level Land Surveyors in the industry as 397. The "Technologist" definition in this survey includes Professionals, and Degree and Higher Diploma holders, but the number is nevertheless surprisingly large, and is indicative of a substantial number employed in the construction industry who are called Land Surveyors but who do not appear in professional listings. [Further details of the Manpower Survey are given in Appendix I(V).]

4. THE DEMAND

In attempting to predict the demand for qualified Land Surveyors over the next 12 years consideration must be given to :-

- i. the probable reduction in the existing population through retirement, localisation, and other factors; and

- ii. the probable increase in demand resulting from all likely growth factors.

4.1 Reduction

Government

i. Retirements (at 60) Local and Expatriate	12
ii. Termination of Expatriate Contracts	24
iii. Other Estimated Wastage - Emigration, Change of Job, Early Retirement, etc. (one per year)	12
Total	<u>48</u>

(This amounts to 70% of the Government Total)

Other Employers (Wastage at 50%)

iv. Private Practice	3
v. Consultants/Contractors/Utilities	4

Academic

Overall Total	<u><u>62</u></u>
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It is recognised with respect to :

4.1.ii. that possibly not all expatriate officers will wish or be required to terminate their contracts by 1997;

4.1.iii. that the estimate of losses to Government for other reasons is very uncertain, but the figure is considered to err on the cautious side;

4.1.iv. - v. that the losses to other employers is also very uncertain, but their mix (local/expatriate, age-range) follows the Government fairly closely, so a 50% estimate is also conservative, while taking account of the rather lower pressure for localisation in these areas.

4.2 Growth In Demand

It must be accepted that in a profession which has close links with the construction industry, and where fluctuations in fortune in the latter are common, that any future projections of demand stand the risk of being seriously in error.

4.2.1 Government Sector

Projections may be made in either of two ways. The first is to evaluate the past growth trend over as long a period as possible, and project this forwards. The second is to attempt to identify and quantify all the factors which are likely to contribute to the demand over the next 12 years. Both approaches will be taken account of here, by firstly evaluating a past rate of growth for the public sector, followed by an examination of whether identifiable future trends support this rate.

The table below shows the expansion of the two major Land Surveyor employer Departments of Government since 1950 at approximately 5 year intervals.

<u>Year</u>	<u>Level</u>		<u>Total</u>	<u>Annual Growth</u> %
	<u>Direct</u>	<u>Profess.</u>		
50/51	1	9	10	0.0
55/56	1	9	10	0.0
60/61	1	10	11	1.9
66/67	1	16	17	9.1
70/71	2	19	21	4.3
74/75	3	32	35	10.8
79/80	3	34	37	1.1
84/85	5	54	59	11.9

Average Annual Growth over 35 years : 5.15%

Average Annual Growth over the past 10 years : 5.18%

It is significant that although growth rates have fluctuated between 1% and 11%, an average of about 5% growth per annum has been maintained overall, and further that this rate still applies if only the last 10 years are considered.

The Working Party considered whether an adoption of this rate is reasonable for forward projections of growth in the public sector. The following factors were taken into account :

4.2.1.1 At present there is virtually no growth in these Government Departments. However the present situation follows a period of rapid expansion, and is to be expected from the apparently common fluctuations in growth indicated by the Table.

4.2.1.2 The current standstill should be viewed with regard to the aftermath of political uncertainty and economic downturn during the 1983/84 Sovereignty talks between Britain and China. In the past 35 years covered by the Table, similar or more extreme periods of political uncertainty have been seen to cause only temporary setbacks in economic growth. Recent sales of land and property are among several factors indicating that an upward trend in the economy is again underway.

4.2.1.3 A number of positive growth factors apply more specifically to the Land Surveying profession -

- i. The continued growth of Hong Kong's infrastructure - new towns, road and rail trunk routes, land reclamation and development, etc. For instance, during 1986/87 work will start on new projects funded from the Capital Work Reserve Fund to a value of about \$7,370 million, in addition to expenditure on ongoing projects of \$6,625 million. [See Appendix II.]
- ii. The proposal to improve the demarcation and registration of New Territories property boundaries either through a Boundaries Rectification Ordinance or under existing powers. It is believed that once underway, there will be a strong and growing public demand for this service.

- iii. The proposed Land Survey Ordinance will permit the private surveyor to carry out more cadastral surveys, particularly in sub-division surveys. All these cadastral plans will have to be scrutinized by the survey authority before registration, thereby demanding additional staff requirement.
- iv. The changing nature of the profession. The technology of Land Surveying is undergoing rapid change, apparently causing a greater demand for technologists at the higher level. A particular case is the collection, storage, and handling of land related data in digital form. The proposed establishment of a Land Information System in Hong Kong exemplifies this, with Land Surveyors being the prime activators.

4.2.1.4 Possible negative factors affecting growth are considered to include -

- i. Another period of political uncertainty and fall in confidence as 1997 approaches.
- ii. A downturn in the economy of Hong Kong resulting from external factors.

The likelihood of either factor cannot here be assessed.

4.2.1.5 Taking into account all these factors it was considered that an average growth rate in the public sector over the next 12 years can be conservatively estimated to continue at 5% per annum. The rate should be applied to the total number of Land Surveyors in Government service since many factors, but particularly the Land Information System proposal, affect most relevant departments.

The report of the Building and Civil Engineering Industry Training Board Manpower Survey [Conclusions, see Appendix I(ii)] stated, "..... the demand for properly trained workers at all skill levels will continue to grow". With regard to

Technologist Land Surveyors they concluded that the average number of trainees to be taken on annually over the next 6 years should be 22 - 31. For a starting total in that category of 397 this represents a growth rate of 5.5% to 7.8%, further indicating that the rate here selected of 5% is on the conservative side.

Applying a growth rate of 5% per annum to the present total of 68 Government Land Surveyors over 12 years produces an establishment of 122. Furthermore, the new activities relating to Boundary Rectification Ordinance, Land Survey Ordinance and Land Information System will require 18 additional Land Surveyors. Thus a total establishment of 140 will be produced - an increase of 72.

4.2.2 Private Practice Sector

This sector is small in Hong Kong, which is a reflection of the large provision by Government of Land Surveying services.

There are at present 6 private Land Surveying companies which have professional Land Surveyors on their staff, although 11 companies listed in the Hong Kong telephone directory offer Land Surveying services.

The most significant factor prompting growth in this sector would be the enactment of the Land Survey Ordinance, permitting the registration of Land Surveyors, and their bidding for various surveying services currently provided by Government, including cadastral. Discussions on this Ordinance were begun in 1982, but no decisions are known to have yet been made. The enactment of the proposed Boundaries Rectification Ordinance would be an additional spur to growth.

The Institutes are optimistic, and consider that in 12 years time the private sector is likely to become more established, particularly since developments in South China are causing increasing demand for professional expertise from Hong Kong (see para. 3.3.1 of the Manpower Survey 1985). They therefore estimate an increase of 25 in this sector by 1997.

Another small potential growth area in this sector is in support of the survey instrument manufacturing agencies. The status of the Hong Kong agencies is being enhanced as the importation of instruments to China continues to grow, so that there is a likelihood of professional Land Surveyors being employed here as occurs elsewhere. However, the numbers are considered too uncertain to be quantified in future estimates.

4.2.3 Consultants, Contractors and Utilities Sector

This sector has the potential to significantly effect estimates since it is subject to many unquantifiable factors.

4.2.3.1 Four Consultancy firms have 6 of the 8 surveyors currently employed in this sector, with the M.T.R. and K.C.R. Companies employing the remaining 2. Listed in the Appendix III are some 20 other large consultants, contractors or utilities companies identified by the Working Party to undertake work which would be expected to require Land Surveyors, but which are not known to include professional Land Surveyors on their staff. The list is by no means complete, but suggests that for such companies either lower grade surveyors carry out the work, or it is done by staff trained in fields other than Land Surveying. As a result of analysis of the Manpower Survey data (1985), and consideration of recent budget allocations on major construction contracts, it is believed that both these reasons apply.

4.2.3.2 The Manpower Survey provides information on education levels and salary levels for each job category, including "Technologist" Land Surveyors. Of the 397 "Land Surveyors" only 23 are trained to degree or higher level, while as many as 292 have earned their job title through on-the-job training. However 132 "Land Surveyors" receive salaries over \$10,000 per month, suggesting that many hold high qualifications in some unspecified discipline.

4.2.3.4 On all Government Group A Contracts tendered for construction work, a mandatory clause is included which requires the contractor to employ a "competent and experienced surveyor" to do the survey work [see Appendix IV]. While the "competent and experienced surveyor" is not specified as a professionally qualified Land Surveyor, evidence obtained on Statistics of Survey Costs in Public Works indicates that the surveyors employed are very much less than this, even though such staff are budgeted for. The Table following summarises these statistics :

<u>Department/ Office</u>	<u>Data Period</u>	<u>Contract Sum Totals</u>	<u>Contractor's Setting-out Fee</u>
		HK\$(M)	HK\$(M)
Highways/H.K.	84/85	127.70	1.639
Highways/Kowloon	84/85	47.33	0.636
Highways/N.T.	84/85/86	441.40	4.628
Drainage/C.E.S.D.	84/85/86	117.30	3.421
Housing Department	85/86	243.00	1.860
Postworks/C.E.S.D.	84/85/86	229.20	3.785
TOTALS		1206.00	15.970

It is noted that the total fees allocated for setting out (about \$16M) are to include the provision of necessary survey instruments and labour costs in addition to the employment of qualified personnel for setting out. Nevertheless this sum, when averaged over the periods of all these contracts, gives an average provision of \$15,192 per month, a figure which should allow the utilisation of properly qualified Land Surveyors. However where information on the qualifications and experience of surveyors is provided with these statistics, of the 47 contracts listed it appears that two have employed surveyors which could be classified as "Technologist" (Manpower Survey) and none were professionally qualified. Most have Certificate level qualifications or merely several years of site experience, while a few have various qualifications in Civil Engineering or Building.

4.2.3.5 It is the strongly felt opinion of the three Institutions that for the maintenance or attainment of satisfactory standards in the increasingly technological construction industry, Clause 19 of the Government's General Conditions of Contract should more specifically state the professional qualification requirement of the site surveyor, and should be strictly adhered to and enforced. If there is a supply of suitably qualified Land Surveyors, we see no reason why it should not be.

4.2.3.6 Since it is expected that a proportion of such qualified surveyors would be at the professional level, since the projected development works referred to in para. 4.2.1.3.i and Appendix II would affect this sector also, and in consideration of the 20 companies in Appendix III without professional Land Surveyors, it has been concluded that a reasonable estimate for the demand in this sector after 12 years would be an additional 16 Land Surveyors.

4.2.4 Academic Sector

The academic sector essentially comprises those Land Surveyors involved in the education and training of future surveyors. The Land Surveyor definition is here broadened to include Higher Degree holders since a Higher Degree is generally equated with professional status in academic institutions.

The existing total of 9 Land Surveyors in this sector are all based at the Hong Kong Polytechnic (Centre of Land and Engineering Surveying) and this is the only institution at present running courses primarily for Land Surveying personnel. The Morrison Hill Technical Institute has offered a part time Certificate in this discipline but has not as yet received sufficient response to inaugurate the course. Other institutions, including the Hong Kong University, the City Polytechnic, the Morrison Hill and Haking Wong Technical Institutes all teach Land Surveying as a subsidiary part of other courses such as Civil Engineering or Building. At none of these institutions are Land

Surveyors employed to teach this subject. However since these component parts are in most cases not enough to occupy a Land Surveyor full time, it is unlikely that there will be a significant change in this area.

Should a Land Surveying degree course be commenced, the Working Party estimates that an overall total of 14 surveyors in this sector would be required to meet the needs of Land Surveying training in Hong Kong in 12 years time. This is an increase of 5 over the present number.

4.3 Summary of Demand

Government	72
Private Practice	25
Consultants/Contractors/Utilities	16
Academic	5
Total	<u>118</u>
Total Wastage	<u>62</u>
OVERALL TOTAL	<u><u>180</u></u>

5. THE SUPPLY

This estimate of supply will be based on the provision of Land Surveyors under existing training arrangements.

The anticipated supply over the next 12 years will come from prospective surveyors at many different stages of the training process. Some are close to full qualification, with only 2 final professional test to complete, some are in preparation for final written examinations, others are working at an intermediate stage, and in the 12 year period others will pass through a training process in its entirety.

5.1 Closest to qualification are those who have passed final examinations or hold an exempting Degree, and who are undertaking a test of professional competence (T.P.C.). In Government service these are identified as Assistant Land Surveyors in trainee posts, and they currently total 14. In addition to those sponsored by Government are candidates in Government service who have passed R.I.C.S. Finals through their own efforts - currently 6. These do not at present have the opportunity to embark on a T.P.C., part of which requires suitable experience under an approved supervisor. However it is considered probable that an opportunity will be given in the near future.

5.2 Outside Government service are some 15 graduates from overseas Land Surveying courses, most of whom are now working in fields other than Land Surveying. The Working Party estimate that no more than 5 of these are likely to fully qualify over the next 12 years, a major hurdle for them being acceptable supervision for the test of professional competence.

5.3 A less easily quantified group are those in Government service who are now eligible to enter for R.I.C.S. Final Examinations as a result of either passing R.I.C.S. Intermediate (Part I/II) Examinations as private candidates, or via the alternative channel of Membership of the Society of Surveying Technicians. Now that the R.I.C.S. has stopped the first channel of qualification, serving technicians who want to qualify through self study will have to resort to the second channel. However there are still 15 candidates belonging to the first group who are attempting the Final Examination this year or will do so within one or two years. On past evidence of success rate, it is estimated that 12 will succeed.

The latter group, who by virtue of holding a B.T.E.C. validated Hong Kong Polytechnic Higher Certificate in Land Surveying have become members of the Society of Surveying Technicians, become eligible to enter for R.I.C.S. Finals after the age of 30, and having passed a practical test. This bridging facility for technicians has been used in the past, but because of the T.P.C. hurdle which still applies, and because the number gaining the required Higher Certificate is now declining owing to lack of support for the prerequisite Certificate course, an estimate of one per two years is considered realistic for this group, providing a further 6.

5.4 Trainees at an earlier stage on the qualification route include 5 currently on Government scholarships at overseas institutions, all of whom are expected to become fully qualified within the 12 years.

5.5 Also in full time education are students at the Hong Kong Polytechnic studying for the Higher Diploma in Land Surveying. None have yet completed the course which commenced in 1984, but the number graduating is likely to be in the order of 20 per year from 1987. The course is aimed primarily at meeting the Land Surveying needs at the "Technologist" level. Present indications are that if the students achieve passes with merit in at least 8 subjects at the levels IV and V they are likely to be granted exemption from the R.I.C.S. I/II examination. They would then need to pursue self study for the R.I.C.S. Finals, and again overcome the T.P.C. hurdle. The earliest they could thus achieve full professional status is in 1990. It is also considered probable that if a higher level degree course is instituted in Hong Kong, then the output and level of this Higher Diploma Course would come review. For these reasons it is estimated that the maximum number likely to gain full qualifications after 12 years is 20.

5.6 A final potential source of Land Surveyors are those at present undertaking or likely in the future to commence courses in overseas institutions through private financing. There has been interest in the past, as para. 5.2 indicates, although the success rate to full qualification is very low. It is estimated that the maximum number of probable qualifications via this route is two per year, and that if a local degree course is established then this output will decline because of the cheaper local alternative after 1990. It is considered that if such alternative does become available, then the overseas source of supply should not be taken into account as a matter of principle. They therefore estimate that the supply from this source will not exceed 10.

5.7 Summary of Supply

Government

Sponsored - (at T.P.C. stage)	14
Self Study - (at T.P.C. stage)	6
Scholarships - (before Finals)	5
Self Study - (with R.I.C.S. I/II)	12
Self Study - (bridging from M.S.S.T.)	6

Others

Private - (at T.P.C. stage)	5
Future Higher Diploma Holders	20
Future Overseas Graduates	10

OVERALL TOTAL	<u>78</u>
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6. CONCLUSIONS

We conclude that the demand for qualified Land Surveyors in 12 years time as a result of wastage of present numbers, of growth in surveying activities, and in anticipation of raised standards of Land Surveying in the construction industry, may be conservatively estimated to be 180.

We conclude that the supply of such Land Surveyors to come from existing training provision during the 12 years may be generously estimated to be 78.

We therefore foresee a net deficit in 1998 of at least 102 professional Land Surveyors.

7. RECOMMENDATIONS

The following recommendations are made :-

- i. A degree course in Land Surveying is to be instituted in Hong Kong - chiefly because of the perceived shortage in 12 years time stated in para. 6, but also in recognition of the factor that as Hong Kong comes closer to being a Special Administrative Region of China it is important that it is seen to be capable of supplying its own professional needs. The present method of gain professional qualification mainly through passing R.I.C.S. examinations will gradually have to be replaced by that of gaining a local qualification. This is in line with other engineering and surveying disciplines which already have done so or are in the process of establishing local qualification channels. Although there may still be students going abroad to seek overseas qualifications in future, the three Institutions recognise that a local degree course will ensure a steady supply of professional Land Surveyors before and after 1997.
- ii. A local degree course, in conjunction with the Test of Professional Competence organised locally, should be the future pattern of qualification of professional Land Surveyors.

- iii. The course is to be inaugurated if possible in 1988. With this date the first full qualifiers after a three year course of study and a two year professional attachment would appear in 1993.
- iv. An intake of 20 per year for 5 years would ensure that by 1998 the need is adequately but not excessively met.
- v. There is no preference for a particular institution to establish the degree course, but we recognise the fact that the Hong Kong Polytechnic already possesses to a large extent the required staffing and equipment. To initiate a course there would probably cost less than at other institutions.
- vi. In order to provide and monitor training leading to the T.P.C., a Graduate Training Scheme in Government should be established. Private practitioners should also be encouraged to participate in providing training places.
- vii. The Institutes want to emphasis the importance of employing qualified Land Surveyors in supervising the survey work of large civil engineering projects. Thus the clauses in the Government's Civil Engineering Manual regarding the employment of competent and experienced Land Surveyors should be modified to state more specifically the qualification requirement of site surveyors, with the eventual aim of requiring the employment of qualified Land Surveyors.

Appendices

- I. Building & Civil Engineering Industry Training Board Manpower Survey Report 1985 - Conclusion and Extracts from Tables

- II. Government Estimates of Expenditure 1986-87 - Extracts from Volumes I & II

Fund Allocation for New Projects
 e.g. E.D.D. Estimates for Highways, para. 21 & 22

Capital Works Reserve Fund
 Buildings, para. 18
 Engineering, para. 27
 N.T. Development, para. 38

- III. Cross Section of Major Consultant, Contractor and Utility Companies Without Qualified Land Surveyors

- IV. Civil Engineering Manual of the C.E.S.D., Hong Kong Government
 - Copy from Chapter II5 Appendix 9 of the C.E. Manual

APPENDIX I- Building and Civil Engineering Industry Training Board
Manpower Survey Report 1985
Conclusion and extracts from tables

SECTION III

CONCLUSIONS

3.1 After carefully analyzing the findings of the present survey, the Training Board is of the opinion that they reflect a fairly reliable picture of the industry's manpower situation in March - April 1985 when the survey was conducted.

Manpower changes

3.2 The findings of the survey reveal that the technical manpower of the building and civil engineering industry has increased from 86 151 (excluding 3 380 trainees/apprentices) in April 1983 when the previous manpower survey was conducted, to 87 649 (excluding 1 789 trainees/apprentices) in March - April 1985, representing an annual growth rate of about 0.9% between 1983 and 1985. The growth seems insignificant, however, when compared with the annual reduction of 7% for the period between 1981 and 1983. It appears that the manpower of the industry has undergone a consolidation stage in the last two years.

3.3 In terms of individual job levels, there has been a relatively higher increase in the numbers of technologists and technicians, which, in the opinion of the Training Board, matches the technological changes and other development of the industry. In analysing the increase in the number of technologists and technicians as revealed by the survey, the Training Board has made the following observations:

- (i) More technologists and technicians are being employed by contractors and consulting firms for projects outside Hong Kong, mainly in China.
- (ii) Some employers might have mistakenly reported some of their technicians as technologists, e.g. surveying technicians (quantity) as quantity surveyors, engineering technicians as engineers.
- (iii) Expansions in the construction departments of certain public utilities companies were reported.

3.4 With regard to the total number of craftsmen, operatives and general workers, there has not been much change over the last two years. As suggested by the Training Board, the industry has been undergoing a phase of consolidation with growing adoption of mechanization, resulting in advanced machinery and equipment replacing more manual workers, especially those unskilled and semi-skilled.

Future manpower demand

3.5 The Training Board feels strongly that with the rapid rising standard in construction projects, the demand for properly trained workers at all skill levels will continue to grow and that planning and design personnel will be the first ones to be in demand with the recovery of the property and building industry.

3.6 The Training Board wishes to emphasize that manpower training is a long-term process and should not be deterred by short-term business fluctuations. As reflected by the drop in the number of trainees/apprentices (from 3 380 in the 1983 survey to 1 789 in the 1985 survey) at the time of the survey, the industry was less willing to take on trainees/apprentices while it was experiencing certain difficulties. The Training Board urges employers in the industry not to slacken their efforts in manpower training because periods of low business activities are the best time to train and upgrade workers of the industry to meet demands for future recovery.

3.7 In assessing the future manpower demands of the construction industry, the Training Board has taken into consideration the following developments:

- (i) The recovery of the local property market and the building industry following the settlement of the 1997 issue;
- (ii) The continuous implementations of housing and other construction projects in the public sector against the completion of the MTR projects;
- (iii) The volume of construction projects in China planned, designed and undertaken by Hong Kong companies; and
- (iv) The complexity and methods of present day's construction which demand for more and better qualified personnel.

3.8 Using the data collected in the series of manpower surveys of the industry conducted to date, the "adaptive forecasting method" and the estimated expenditure on construction in the next several years, the Training Board has projected up to and including 1 991 the industry's likely manpower requirement at the technologist, technician and craftsman levels respectively. Together with an estimated 3% natural wastage, the average annual demand for workers for the next six years would be as follows:

Table 1: Average annual demand for workers
from 1986 to 1991

Job level	Average annual demand in the next 6 years
Technologist	420 - 590
Technician	810 - 1 000
Craftsman	1 700 - 2 200

3.9 In arriving at the above forecast, the Training Board wishes to point out that the demand for technologists would be met in part by Hong Kong students educated overseas and returning to Hong Kong for employment. Employers are urged to provide sufficient practical training places for both local and overseas graduates to enable them to complete their training.

3.10 The Training Board will conduct the next manpower survey in 1987 when the above forecast will be reviewed and updated.

NUMBER EMPLOYED (EXCLUDING TRAINEES/APPRENTICES)

現有僱員人數（受訓者及學徒除外）

Job Title 職稱	Number Employed 現有僱員人數				Total 總數
	Permanent/Direct 長工		Casual/Indirect 散工		
	Male 男	Female 女	Male 男	Female 女	
TECHNOLOGIST LEVEL 技師級					
Architect 建築師	866	80	-	-	946
Builder 建造師	370	6	-	-	376
Building Services Engineer 屋宇裝備工程師	282	2	1	-	285
Building/Maintenance Surveyor 屋宇／保養測量師	220	8	-	-	228
Civil Engineer 土木工程師	2 355	22	3	-	2 380
Electrical Engineer 電機工程師	329	-	-	-	329

Estate/Valuation Surveyor 產業測量師	315	36	-	-	351
Geotechnical Engineer 土力工程師	267	5	-	-	272
Interior Designer 室內設計師	80	26	-	1	107
Land Surveyor 土地測量師	396	1	-	-	397
Landscape Architect 環境美化建築師	36	10	-	-	46
Mechanical Engineer 機械工程師	274	-	1	-	275
Quantity Surveyor 工料測量師	723	41	-	-	764
Structural Engineer 結構工程師	632	25	4	-	661
Town Planner 城市設計師	125	36	-	-	161
Sub-total 分類總數	7 270	298	9	1	7 578
TECHNICIAN LEVEL 技術員級					
Clerk of Works/Inspector/ Foreman (Architect's/Engineer's) 監工 (建築師或工程師所僱用)	2 994	9	6	-	3 009

Job Title 職稱	Higher Degree 高級學位		Degree 大學學位		Associate-ship 理工院士		Post-secondary 專上程度		Profession Diploma 專業文憑	
	No. of Firms 廠數	No. of Workers 工人數	No. of Firms 廠數	No. of Workers 工人數	No. of Firms 廠數	No. of Workers 工人數	No. of Firms 廠數	No. of Workers 工人數	No. of Firms 廠數	No. of Workers 工人數
TECHNOLOGIST LEVEL (Continued) 技師級 (續)										
Land Surveyor 土地測量師	-	-	20	46	12	30	17	43	22	135
Landscape Architect 環境美化建築師	2	3	8	30	-	-	-	-	3	12
Mechanical Engineer 機械工程師	1	1	38	111	6	21	3	5	4	42
Quantity Surveyor 工料測量師	6	14	84	207	38	101	36	67	51	113
Structural Engineer 結構工程師	13	38	90	427	9	28	9	25	12	70
Town Planner 城市設計師	3	6	6	122	-	-	-	-	1	33
Sub-total 分類總數		287		4 223		546		370		1 073
TECHNICIAN LEVEL 技術員級										
Clerk of Works/ Inspector/Foreman (Architect's/ Engineer's) 監工 (建築師或 工程師所僱用)	1	1	14	21	10	24	9	21	21	38
Draughtsman 繪圖員	-	-	1	10	1	47	25	79	7	36
Estimator 估價員	-	-	8	21	5	13	13	22	9	16
Foreman (Contractor's) 管工 (建造商所 僱用)	-	-	-	-	4	5	13	30	12	32

Higher Diploma 高級文憑		Diploma 文憑		Higher Cert. 高級證書		Cert. 證書		Form 5 中學五年級		Craft Cert. 技工證書		Below Form 5 中五以下	
No. of Firms 廠數	No. of Workers 工人人數	No. of Firms 廠數	No. of Workers 工人人數	No. of Firms 廠數	No. of Workers 工人人數	No. of Firms 廠數	No. of Workers 工人人數	No. of Firms 廠數	No. of Workers 工人人數	No. of Firms 廠數	No. of Workers 工人人數	No. of Firms 廠數	No. of Workers 工人人數
24	52	2	2	18	75	4	13	1	1	-	-	-	-
1	1	-	-	-	-	-	-	-	-	-	-	-	-
12	84	3	7	4	4	-	-	-	-	-	-	-	-
57	185	6	16	32	58	3	3	-	-	-	-	-	-
12	66	-	-	5	7	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-
	813		39		194		26		7		-		-
23	68	17	971	21	1 054	8	393	32	75	-	-	1	345
22	124	50	631	34	477	64	952	116	560	1	1	4	18
23	60	12	26	25	57	11	21	8	18	-	-	-	-
26	70	52	233	117	522	108	621	498	1 974	3	5	102	287

DISTRIBUTION OF EMPLOYEES BY MONTHLY INCOME RANGE

根據每月收入幅度劃分工人人數的分佈情況

Job Title 職稱	Under \$2,000 以下	\$2,001- \$2,500	\$2,501- \$3,500	\$3,501- \$4,500	\$4,501- \$6,000	\$6,001- \$8,000	\$8,001- \$10,000	Over \$10,000 以上	Unspecified 未列明
TECHNOLOGIST LEVEL 技師級									
Architect 建築師	-	-	-	5	14	28	182	685	32
Builder 建造師	-	-	-	6	18	63	73	171	45
Building Services Engineer 屋宇裝備工程師	-	-	-	2	29	34	86	126	8
Building/Maintenance Surveyor 屋宇 / 保養測量師	-	-	-	-	11	1	9	207	-
Civil Engineer 土木工程師	-	-	2	35	124	396	309	1 496	18
Electrical Engineer 電機工程師	-	-	-	-	18	25	182	101	3
Estate/Valuation Surveyor 產業測量師	-	-	-	2	4	3	162	180	-

Geotechnical Engineer 土力工程師	-	-	-	7	12	66	45	141	1
Interior Designer 室內設計師	-	-	-	1	20	62	10	12	2
Land Surveyor 土地測量師	-	-	1	31	75	106	50	132	2
Landscape Architect 環境美化建築師	-	-	-	-	-	-	4	41	1
Mechanical Engineer 機械工程師	-	-	-	1	62	37	57	118	-
Quality Surveyor 工料測量師	-	-	6	26	158	148	163	249	14
Structural Engineer 結構工程師	-	-	-	15	140	120	88	296	2
Town Planner 城市設計師	-	-	-	-	-	-	1	158	2
Sub-total 分類總數	-	-	9	131	685	1 089	1 421	4 113	130
TECHNICIAN LEVEL 技術員級									
Clerk of Works/ Inspector/Foreman (Architect's/ Engineer's) 監工（建築師或 工程師所僱用）	-	-	24	26	751	1 980	42	176	10

Appendix 7

附錄七

Average number of trainees/apprentices
to be taken on annually between 1986 and 1991

一九八六年至一九九一年間
每年應招收受訓者／學徒的平均人數

Job title 職稱	No. of workers employed at time of survey 調查期間 工人人數	Average no. of trainees/ apprentices to be taken on annually between 1986 to 1991 一九八六年至一九九一 年間每年應招收受訓者 ／學徒的平均人數
TECHNOLOGIST LEVEL 技師級		
Architect 建築師	946	52 - 74
Builder 建造師	376	21 - 29
Building Services Engineer 屋宇裝備工程師	285	16 - 22
Building/Maintenance Surveyor 屋宇／保養測量師	228	13 - 18
Civil Engineer 土木工程師	2 380	132 - 185
Electrical Engineer 電機工程師	329	18 - 26
Estate/Valuation Surveyor 產業測量師	351	19 - 27
Geotechnical Engineer 土力工程師	272	15 - 21
Interior Designer 室內設計師	107	6 - 8
Land Surveyor 土地測量師	397	22 - 31
Landscape Architect 環境美化建築師	46	3 - 4
Mechanical Engineer 機械工程師	275	15 - 21

Code 編號	Job Title 職位名稱	Job Description 職責簡述
TECHNOLOGIST LEVEL (Continued) 技師級 (續)		
109	Interior Designer 室內設計師	Plans and designs interiors and supervises interior building contracts normally within an existing building. 策劃及設計屋宇內部，並通常在現有建築物內監督室內設計建築合約
110	Land Surveyor 土地測量師	Undertakes the physical surveying of land and collates data for the preparation of plans and maps to particular requirements or specifications including large-scale surveying, cadastral surveying for land registration, topographical surveying by ground and/or air methods, geodetic surveying and hydrographic surveying. 從事土地之實體測量及整理資料以編製符合特殊需求或規格之圖則及地圖，其工作包括大規模之測量、為土地登記而進行之地籍測量、運用地面及／或空中方法而進行之地形測量、大地測量及水路測量。
111	Landscape Architect 環境美化建築師	Identifies and advises on construction projects requiring landscaping and other major landscaping projects; designs landscaping; organises and supervises, landscaping work; and liaises with relevant authorities and other professionals. 鑒定需要美化環境之建造工程與其他美化環境主要工程及提供意見；設計美化環境；組織及督導環境美化工作；以及與有關當局及其他專業人士聯絡。

Head 43—ENGINEERING DEVELOPMENT DEPARTMENT

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Memorandum Note

Summary of Expenditure

	Actual expenditure 1984-85 \$	Approved estimate 1985-86 \$	Revised estimate 1985-86 \$	Estimate 1986-87 \$
Recurrent Account				
Personal Emoluments	282,908,610	290,785,000	316,500,000	327,966,000
Departmental Expenses	230,287,902	239,484,000	225,000,000	308,911,000
Other Charges	152,000,255	144,566,000	144,500,000	58,066,000
Capital Account				
Plant, Equipment and Works	4,285,732	3,328,000	2,500,000	4,003,000
Other Non-Recurrent	980,287	4,021,000	3,600,000	1,055,000
Total	670,462,786	682,184,000	692,100,000	700,001,000

Controlling Officer: Director of Engineering Development

The estimate of the amount required in 1986-87 for the salaries and expenses of the Engineering Development Department is \$700,001,000. This represents an increase of \$17,817,000 on the approved estimate for 1985-86 and of \$29,538,214 on actual expenditure in 1984-85.

Organization

2 The department comprises the Headquarters, the Civil Engineering Office, the Geotechnical Control Office, the Highways Office, the Mass Transit Office and the Railway Development Office.

3 The *Civil Engineering Office* is concerned primarily with the design and construction of marine works including reclamation, stormwater drainage and sewerage, sewage treatment and disposal systems as well as engineering works for solid waste disposal. Except in the new towns, it also undertakes the engineering feasibility investigation of planned development and major site formation works for such development.

4 The *Geotechnical Control Office* is concerned with a wide range of geotechnical engineering activities related to the safe and economic use and development of land, with particular emphasis on the stability of existing and future slopes associated with both buildings and engineering works. It is responsible for investigating the stability of existing slopes, for designing and executing landslip preventive works to public slopes and for making recommendations on the need for preventive works to private slopes. It exercises geotechnical control over public and private developments by checking geotechnical designs and standards of site supervision. The Office also manages the two government quarries and supervises contract quarries. It operates the public works laboratories, and it provides site investigation, terrain evaluation, geological survey and general geotechnical advisory services.

5 The *Highways Office* is responsible for planning, designing, constructing and maintaining the public road system and associated lighting, sewer and drainage works. It also provides advice on road and drainage matters relating to land sales and government and private developments.

6 The *Mass Transit Office* is responsible for formulating public works policies concerning the Mass Transit Railway and for monitoring and co-ordinating the performance of the various services provided by the lands and works group of departments in respect of the design, construction and operation of the Mass Transit Railway. It is responsible for the co-ordination of the Mass Transit Railway with public and private development and for its integration with existing and planned surface transport facilities. It also acquires land and buildings for the purpose of building the railway, assesses claims for loss of business, pays advance compensation to small businesses whose trade is affected by the construction of the railway, and processes private treaty grants of land to the Corporation for development purposes.

7 The *Railway Development Office* is responsible for the design and construction of the double-tracking and electrification of the Kowloon-Canton Railway from Hung Hom to Lo Wu, including new railway stations, the remodelling of existing stations and all associated works.

Controlling Officer's Report

8 The department is responsible for nine main activities as follows—

Civil engineering services

1. Designing, constructing and maintaining public marine facilities, hydrographic surveying and checking private submissions.
2. Designing, constructing and maintaining civil engineering works at Hong Kong International Airport.
3. Designing and constructing stormwater drainage, sewerage and sewage treatment and disposal systems as well as facilities for solid waste disposal by means of controlled tipping and supervising public dumps.
4. Land development projects.

5. Investigating the stability of existing slopes and retaining walls; checking designs for geotechnical features connected with civil engineering and building works; setting standards for geotechnical works; providing site-investigation, materials-testing and geological and aerial-photography interpretation services.
6. Operating government quarries and supervising contract quarries.
Highway support services
7. Planning, designing, constructing and maintaining the public highways system and associated road lighting, sewer and drainage work; advising on private developments; co-ordinating and reinstating trench works carried out by utility undertakings.
Mass Transit
8. Co-ordinating construction of and acquiring land for the Mass Transit Railway.
Railway development
9. Planning, designing and constructing engineering works for the Kowloon-Canton Railway.

9 The following table indicates how much of the total provision is expected to be spent on each activity compared with the two previous years—

	(1) <i>Actual expenditure 1984-85 \$ million</i>	(2) <i>Approved estimate 1985-86 \$ million</i>	(3) <i>Revised estimate 1985-86 \$ million</i>	(4) <i>Estimate 1986-87 \$ million</i>	<i>Increase of (4) over (2) \$ million</i>
Activity 1					
(Staff establishment)	(183)	(164)	(164)	(164)	(-)
Personal emoluments	11.7	12.0	13.7	14.2	2.2
Other recurrent	9.7	11.7	11.9	13.1	1.4
Capital	0.9	0.2	0.1	0.3	0.1
	<u>22.3</u>	<u>23.9</u>	<u>25.7</u>	<u>27.6</u>	<u>3.7</u>
Activity 2					
(Staff establishment)	(67)	(63)	(63)	(63)	(-)
Personal emoluments	5.2	5.5	5.9	6.0	0.5
Other recurrent	8.7	9.0	9.0	9.7	0.7
Capital	0.1	0.2	1.1	0.1	-0.1
	<u>14.0</u>	<u>14.7</u>	<u>16.0</u>	<u>15.8</u>	<u>1.1</u>
Activity 3					
(Staff establishment)	(342)	(341)	(341)	(341)	(-)
Personal emoluments	31.0	32.0	34.1	35.3	3.3
Other recurrent	0.8	1.2	1.2	1.3	0.1
Capital	0.1	0.2	0.5	—	-0.2
	<u>31.9</u>	<u>33.4</u>	<u>35.8</u>	<u>36.6</u>	<u>3.2</u>
Activity 4					
(Staff establishment)	(274)	(265)	(265)	(265)	(-)
Personal emoluments	21.7	23.2	25.6	26.7	3.5
Other recurrent	2.5	2.9	2.6	2.6	-0.3
Capital	—	0.1	—	—	-0.1
	<u>24.2</u>	<u>26.2</u>	<u>28.2</u>	<u>29.3</u>	<u>3.1</u>
Activity 5					
(Staff establishment)	(455)	(451)	(451)	(451)	(-)
Personal emoluments	48.3	49.0	53.6	56.5	7.5
Other recurrent	5.9	8.2	9.1	6.8	-1.4
Capital	2.3	2.3	1.4	2.0	-0.3
	<u>56.5</u>	<u>59.5</u>	<u>64.1</u>	<u>65.3</u>	<u>5.8</u>
Activity 6					
(Staff establishment)	(189)	(182)	(182)	(182)	(-)
Personal emoluments	11.1	11.1	11.4	11.4	0.3
Other recurrent	33.6	33.3	33.3	23.4	-9.9
Capital	—	—	—	—	—
	<u>44.7</u>	<u>44.4</u>	<u>44.7</u>	<u>34.8</u>	<u>-9.6</u>

	(1) <i>Actual expenditure 1984-85 \$ million</i>	(2) <i>Approved estimate 1985-86 \$ million</i>	(3) <i>Revised estimate 1985-86 \$ million</i>	(4) <i>Estimate 1986-87 \$ million</i>	<i>Increase of (4) over (2) \$ million</i>
Activity 7					
(Staff establishment)	(2 117)	(2 055)	(2 055)	(2 055)	(—)
Personal emoluments	131.3	134.7	149.5	155.3	20.6
Other recurrent	320.8	317.2	301.9	309.7	-7.5
Capital	1.9	4.4	3.0	2.6	-1.8
	<u>454.0</u>	<u>456.3</u>	<u>454.4</u>	<u>467.6</u>	<u>11.3</u>
Activity 8					
(Staff establishment)	(86)	(82)	(82)	(82)	(—)
Personal emoluments	11.1	11.5	11.1	11.0	-0.5
Other recurrent	0.2	0.3	0.3	0.3	—
Capital	—	—	—	—	—
	<u>11.3</u>	<u>11.8</u>	<u>11.4</u>	<u>11.3</u>	<u>-0.5</u>
Activity 9					
(Staff establishment)	(166)	(145)	(145)	(145)	(—)
Personal emoluments	11.5	11.8	11.6	11.6	-0.2
Other recurrent	0.1	0.2	0.2	0.1	-0.1
Capital	—	—	—	—	—
	<u>11.6</u>	<u>12.0</u>	<u>11.8</u>	<u>11.7</u>	<u>-0.3</u>
Total					
(Staff establishment)	(3 879)	(3 748)	(3 748)	(3 748)	(—)
Head	670.5	682.2	692.1	700.0	17.8

Activity 1

10 During 1985-86 the construction of the piers at Stonecutters Island was completed and work continued on the dredging of Shing Mun River at Sha Tin. Construction of a pedestrian covered-way between the two ferry piers at North Point, the helicopter landing site at Cheung Chau, new piers at Shek Pik, Yung Shue Wan and the Aberdeen Marine Base and improvement of facilities at Cheung Chau ferry pier commenced in 1985-86. The increase of \$3.7 million (15.5%) over the approved provision for 1985-86 is mainly due to the pay adjustments and awards approved during 1985-86 and increased requirements for seawall maintenance.

Activity 2

11 During 1985-86 work on extension of the cargo aircraft parking apron continued, and the survey of the airport pavement was substantially completed. Construction of the runway hardshoulders and taxiway resurfacing is expected to commence in 1986-87.

Activity 3

12 During 1985-86 sewage treatment works at Tai Po and Cheung Chau, river training works at Lo Wu, a screening plant at Chai Wan, three pumping stations at Kai Tak and one at Kowloon East, trunk stormwater drain extensions at Sham Shui Po, To Kwa Wan and Quarry Bay reclamations, a trunk sewer extension in Wong Tai Sin, a sewer syphon under Kwun Tong Road, and the dredging of the channel section of Kowloon Bay were completed.

13 Work continued on screening plants at Kwun Tong, Sham Shui Po, and Wanchai (west), sewage treatment works at Mui Wo and Tsing Yi, a submarine outfall for Central District, trunk stormwater drain extension at the Western reclamation, and works connected with water quality improvement schemes for Kowloon Bay.

14 Controlled tips managed by the department include tips at Junk Bay, Ma Yau Tong, Shuen Wan, Pillar Point Valley and Jordan Valley.

15 During 1986-87 construction of a sewage treatment works at Pillar Point, screening plants at North Point, Wanchai (east), Shau Kei Wan and To Kwa Wan, submarine outfalls at North Point, Shau Kei Wan and To Kwa Wan, trunk sewers in Java Road and Sung Wong Toi Road, extension of trunk stormwater drains at Cheung Sha Wan reclamation, the box culvert diversion for Clear Water Bay Road development, roads and drainage for Pak Kong village extension stage I, and site preparation work for Junk Bay controlled tip stage II are expected to start.

Activity 4

16 During 1985-86 construction of the seawalls at Cheung Sha Wan reclamation stage II phase B and Aldrich Bay reclamation Area C, the seawall and breakwater at Chai Wan reclamation and the remaining seawalls at Ap

Lei Chau east reclamation was completed. Work continued on reclamations at Stonecutters Island and Telegraph Bay, the seawall and reclamation at Siu Chai Wan stage I, site formation for Tai Po Industrial Estate stage III phase 2, and the seawall at Aberdeen reclamation stage II phase 2C. Construction of the new seawall extension at Sai Kung town and the breakwater at Stonecutters Island, site formation for Diamond Hill development stage I commenced in 1985-86. It is expected that work on Hung Hom Bay reclamation, Aldrich Bay reclamation Area D stage II, reclamation for the Tai Lam Chung Marine Police Base, seawall and reclamation at Sam Ka Tsuen, and part of Tai Lam Bay reclamation stage II will commence in 1986-87.

Activity 5

17 During 1985-86 the Geotechnical Control Office completed stabilization works on 15 fill slopes, 17 cut slopes and six retaining walls, one natural slope and an extensive boulder stabilization scheme. Work commenced on nine fill slopes, 18 cut slopes and one natural slope. Over 6 000 design submissions for government and private projects were checked by the Office. Reports on six geotechnical area studies were published, and detailed geological mapping continued on 440 square kilometres of Hong Kong. The preparation of three geoguides was in hand, 12 special research projects were completed and two further geotechnical publications were made available for sale to the public. Site investigations were carried out on more than 200 sites, and over 200 000 tests were carried out in the public works laboratories.

Activity 6

18 During 1985-86 the Geotechnical Control Office continued to operate two government quarries and to supervise eight contract quarries to ensure an adequate supply of quarry products to meet the territory's needs. The government quarries produced approximately 700 000 tonnes of aggregate and 180 000 tonnes of bituminous products.

Activity 7

19 During 1985-86, apart from routine maintenance, a number of major road projects were opened to traffic while some 140 road projects were under construction and about 85 were in an advanced stage of planning. The Highways Office was responsible for the maintenance of over 1 300 kilometres of roads which included three major road tunnels and about 540 flyovers and bridges. In addition, the Office also maintained about 230 footbridges and 150 subways. About 1 300 drainage plans and 400 development conditions were checked. The Office also co-ordinated and reinstated more than 27 000 trench works carried out by utility companies. Emergency organizations were set up to deal with emergency repairs to roads, landslips, and flooding during typhoons and rainstorms.

20 The revised expenditure for 1985-86 on projects undertaken by the Highways Office amounted to \$648,000,000. The major projects completed include the second stage of the Island Eastern Corridor, the road through Aberdeen, Tai Hang Road widening, King's Road realignment near Tai Koo Shing, the transport interchange at Mong Kok railway station, Canton Road widening, Cha Kwo Ling Road near Cha Kwo Ling Village, stage II roads and drains in Section B of Kowloon Bay development, the section of the New Territories trunk road from Tai Po to Wo Hop Shek and stage I phase I of roads and drains in Tong Yan San Tsuen, Yuen Long.

21 In 1986-87 the estimated expenditure on projects supervised by the Highways Office is expected to be about \$842,000,000, an increase of \$194,000,000 (29.9%) over the revised expenditure for 1985-86. Construction will continue on the following major projects in the Public Works Programme—

Roads and drainage works in Sai Wan Ho reclamation

Roads and drainage works in section D of Kowloon Bay development

Grade separated access to Wanchai reclamation which includes the construction of an elevated road from Hung Hing Road to Gloucester Road, a seafront road from Tonnochy Road to Fleming Road, the O'Brien Road footbridge and a transport interchange

Stage III of west Kowloon corridor

Flyover from Cheung Sha Wan Road to Boundary Street

Reconstruction of the Princess Margaret Road flyover to a dual two-lane carriage-way

Route 5 between Sha Tin and Tsuen Wan

Vehicular border link at Lok Ma Chau

New Territories circular road between Pak Shek Au and Fan Kam Road

New Territories circular road between Mai Po and Pak Shek Au

Widening of Man Kam To Road from Lin Ma Hang Road to the cross border control facilities

Lam Kam Road improvement stage I

Upgrading of Ngong Ping Road

Sha Tau Kok Road improvement

22 The following major projects are in category A of the Public Works Programme and construction is expected to start in 1986-87—

Upgrading of Connaught Road which includes construction of Pedder Street underpass, Rumsey Street flyover, Harcourt Road flyover and other ancillary works

Lau Sin Street flyover

Elevated road from Gloucester Road to Tonnochy Road

Widening of Carpenter Road

Stage I phase II roads and drains in Tong Yan San Tsuen

Tai Po Road improvement stage I

Activity 8

23 During 1985-86 the Mass Transit Office co-ordinated the construction and acquisition of land and expropriation of property for the Mass Transit Railway island line and the preparation of conditions of grant by private treaty of land to be developed by the Mass Transit Railway Corporation. Private treaty grants executed included the development above Chai Wan depot (Heng Fa Chuen) and six other above-station developments, namely, Fortress, North Point, Wanchai, Tin Hau, Chai Wan and Sheung Wan.

Activity 9

24 During 1985-86 the Railway Development Office completed the cross-border footbridge at Lo Wu, the foundations and structural steel frame for the new Lo Wu terminal building, the transport interchange at Mong Kok station and the subways under Chatham Road in connection with the provision of a shunt neck to improve the Kowloon Station goods yard. Construction of the superstructure over the Kowloon Station goods yard will begin in early 1986. The construction of the new Lo Wu terminal building, the permanent station at Tai Wai and the goods yard at Mong Kok are in progress. The Office also commenced planning and design work for the Hung Hom Bay reclamation which will provide land for the Kowloon-Canton Railway goods yard expansion and other developments.

Ambit and provision

Recurrent Account

Personal Emoluments

25 Provision of \$327,966,000 for personal emoluments represents an increase of \$37,181,000 on the approved provision for 1985-86, and takes into account pay adjustments and awards approved during 1985-86.

26 The 1985-86 Estimates showed 3 876 permanent posts and three supernumerary posts, from which a net 129 permanent posts and two supernumerary posts have been deleted. The approved establishment shown in the Estimates is 3 747 permanent posts and one supernumerary post.

27 Subject to certain conditions, the Controlling Officer may under delegated powers create or delete non-directorate posts during 1986-87, but the notional annual mid-point salary value of all such posts must not exceed \$269,927,000. The notional annual mid-point salary value of non-directorate posts shown in the Estimates is \$269,927,000.

28 Provision of \$23,653,000 under *Subhead 002 Allowances* is for standard allowances and the following non-standard allowance—

	Rate
post allowance for Survey Officers and Senior Survey Officers in the land and engineering streams	monthly allowance equal to the officer's next increment

Departmental Expenses

29 Provision of \$42,123,000 under *Subhead 104 Light and power* includes provision for the payment of electricity bills for offices, street lighting and traffic signals. The increase of \$41,013,000 (3 694.9%) over the approved provision for 1985-86 is mainly due to the inclusion of provision of \$41,000,000 for street lighting and traffic signals previously shown under a subhead entitled Lighting of streets and traffic signals.

30 Provision of \$272,000 under *Subhead 106 Temporary staff* includes provision for the remuneration of post-secondary students employed during the summer vacation. The increase of \$27,000 (11.0 %) over the approved provision for 1985-86 is mainly due to the increased rate of allowance paid to temporary staff.

31 Provision of \$200,000 under *Subhead 109 Training expenses* is for training courses and the purchase of publications, equipment and teaching aids for departmental training of technical staff. The increase of \$190,000 (95.0%) over the approved provision for 1985-86 is mainly due to the inclusion of requirements for external training courses.

32 Provision of \$4,155,000 under *Subhead 111 Hire of services and professional fees* includes provision for the engagement of professional assistance to undertake work which the department is not able to carry out in-house because of a shortage of staff, employment of public accountants to assess claims for pecuniary losses arising from resumption of land for the Mass Transit Railway and contracting out soil and steel tests to commercial laboratories.

Extract from Government Estimates of Expenditure, 1986/87, Vol II

- Memorandum notes on Capital Works Reserve Fund

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CAPITAL WORKS RESERVE FUND

2 In accordance with the Resolution, all revenue from land transactions, other than those transactions decided upon before the coming into force of the Joint Declaration and those not conferring a benefit after 1997, is paid into the suspense account of the Fund. Sharing and calculation of the cost of land production is carried out by the Sino-British Land Commission at the end of each quarter. The interest accruing to the suspense account is shared once a year at the beginning of the financial year. It is estimated that sharing in 1985-86 will result in \$572 million being transferred to the works account. In 1986-87 the estimate of the Government's share is \$2,000 million and a further \$38 million is expected to come from interest earned on the suspense account balances in 1985-86 and the works account balances in 1986-87. Details of the financial position of the three accounts are shown in tabular form after the detailed estimates of expenditure from the Fund.

3 Expenditure from the Fund is limited in respect of each subhead by the allocation shown under the column headed 'Estimate 1986-87' in the Fund estimates, and this may not be exceeded in 1986-87 without the prior approval of the Financial Secretary. Where an approved project estimate is shown in respect of any project, the total commitment incurred may not exceed the approved estimate, and the estimate may not be altered without the prior approval of Finance Committee or the Financial Secretary under delegated powers.

4 The balances available in the works and reserve accounts of the Fund at 1 April 1986 are estimated to total \$5,807.8 million. During 1986-87, it is estimated that \$4,390 million from the general revenue and \$2,007.8 million from the suspense account will be transferred to the reserve and works accounts. The estimated transfer from the suspense account represents the Government's share of revenue from land transactions in 1986-87 and interest earned on suspense account balances during 1985-86. In addition, \$30 million is expected to accrue to the works account from interest on its balances during 1986-87 and an arbitrary amount of \$15 million has been included for donations and for contributions by the Urban Council towards joint venture projects. The Fund will thus have available \$12,250.6 million to meet estimated payments of \$6,625.1 million during 1986-87. The Fund will therefore have estimated balances in the works and reserve accounts at 31 March 1987 totalling \$5,625.5 million.

5 The estimate of the amount required in 1986-87 for expenditure on projects in category A of the Public Works Programme and on those projects which it has been agreed will be upgraded to category A during the year, together with land acquisition and minor works of a non-recurrent nature funded from block allocations, is \$6,625 million. This figure includes all donations and Urban Council contributions to joint venture projects, but does not include the cost of projects undertaken by the Government on behalf of and wholly financed by the Urban Council.

6 The selection of new projects to start in 1986-87 from among all projects in category AB of the Public Works Programme was undertaken initially by the Public Works Priorities Committee, having regard to the limit on total new commitments laid down by the Financial Secretary and the readiness of projects to proceed. Public Works Sub-Committee subsequently endorsed this selection, and all selected items are shown in the Fund estimates.

7 The outstanding commitment in respect of projects in hand in the Public Works Programme and in respect of land acquisition on 1 April 1985 was \$18,061 million. This was increased by the injection of new projects during 1985-86 by \$4,719 million giving a total outstanding commitment of \$22,780 million. The revised estimate of expenditure during 1985-86 is \$6,024 million, and so the outstanding commitment at 31 March 1986 will be about \$16,756 million.

8 During 1986-87 work will start on new projects the total value of which is about \$7,370 million. After allowing for estimated expenditure in 1986-87 of \$6,625 million, the outstanding commitment at 31 March 1987 will be about \$17,501 million.

Head 701—Land Acquisition

9 The Financial Secretary has delegated to the Director of Lands power to authorize expenditure from Head 701 of the Fund.

10 The estimate of the allocation required in 1986-87 for expenditure on compensation and *ex-gratia* allowances for the acquisition and associated clearance of all land and property reverting to the Crown and on *ex-gratia* allowances for clearance of Crown Land for projects in the Public Works Programme, is \$1,200.8 million. *Ex-gratia* allowances for clearance of Crown Land not required for projects in the Public Works Programme are charged to Head 91 Lands Department Subhead 221 Clearance of Crown land—*ex-gratia* allowances.

11 The allocation of \$48,000,000 for 1002CA—*Compensation for surrenders and resumptions: urban improvement districts: Yau Ma Tei, Wan Chai and Western* is for payment of compensation for the acquisition of properties and for payment of *ex-gratia* compensation to owners within the urban improvement districts. It also provides for the acceptance of voluntary surrenders of properties frozen under the outline zoning plans. The cost of properties resumed in connection with the Hong Kong Housing Society's urban improvement scheme will continue to be borne by the Society.

12 The allocation of \$140,000,000 for 1004CA—*Compensation for surrenders and resumptions: miscellaneous* is a block allocation for resumption costs for proposed sites in connection with the implementation of statutory outline zoning plans, for projects to be undertaken by non-government or quasi-government bodies including the Regional and Urban Councils and the Housing Authority and for projects undertaken under the Foreshore and Seabed (Reclamation) Ordinance 1985 not being projects covered by any other funding arrangements. The allocation is intended to cover resumptions in connection with the implementation of an outline zoning plan in area 25, Tsuen Wan, resumptions in connection with the new Eastern Harbour Crossing and a number of smaller resumptions connected with the Urban Council, Private Sector Participation Scheme and Home Ownership Scheme sites amongst others.

CAPITAL WORKS RESERVE FUND

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13 The allocation of \$500,000 for 1006CA—*Mass Transit Railway: land acquisition* is for expenditure on land acquisition for the Modified Initial System, the Tsuen Wan Extension and the Island Line not directly recoverable from the Mass Transit Railway Corporation (i.e. expenditure to be incurred on acquiring sites, and on making them available for granting permanently to the Corporation or for temporary use as works areas for which rentals will be charged). The Corporation pays premia for rentals in respect of land granted or leased to it. These are credited to general revenue. All expenditure on land acquisition which is directly reimbursable by the Corporation has been charged to an advance account with effect from 1 April 1980. Expenditure on land acquisition in respect of the Island Line was previously charged to a separate subhead. Accounts for the two subheads were combined with effect from 1 April 1985.

14 The allocation of \$5,000,000 for 1007CA—*Mass Transit Railway: route protection* is for government contributions to development costs for sites lying along Mass Transit Railway routes (including some along the Island Line and the potential East Kowloon Line) which have not yet been agreed, but in respect of which special foundation works are required in anticipation of possible future railway extensions. With effect from 1 April 1985, accounts for this subhead were combined with those for the subhead for Mass Transit Island Line: route protection.

15 A total of \$1,000,000,000 for Subheads 1010CA to 1018CA is for meeting all land acquisition costs other than direct works costs and all *ex-gratia* allowances in respect of projects in the Public Works Programme in the nine development areas: Tsuen Wan/Kwai Chung/Tsing Yi; Sha Tin; Tuen Mun; Tai Po/Fanling/Sheung Shui; Yuen Long/Tin Shui Wai; Junk Bay/Sai Kung; Urban Kowloon; Urban Hong Kong Island; and Islands.

Head 703—Buildings

16 The Financial Secretary has delegated to the Director of Building Development power to authorize expenditure from Head 703 of the Fund.

17 The estimate of the amount required in 1986–87 for expenditure on a variety of government building projects is \$918,500,000. This does not include provision for building items related to public housing and the new towns.

18 Significant building projects to start in 1986–87 include 3014FS—*Wholesale market at Kennedy Town*, 3019GO—*Government Offices block, Wan Chai*, 3051LP—*New Territories Regional Headquarters*, 3119LP—*New Police Headquarters complex, phase 1, works*, 3026MH—*Queen Elizabeth Hospital, Block B, extension* and the piling works of the Shau Kei Wan Hospital under 3030MH—*Shau Kei Wan Hospital, polyclinic and staff quarters—piling and superstructure works*.

19 Allocation of \$2,500,000 for 3001GX—*Minor investigations for building projects* is a block allocation to which expenditure on minor site investigation works costing not more than \$250,000 in respect of each site is charged.

20 Allocation of \$300,000 for 3002GX—*Minor outstanding building items* is a block allocation with an arbitrary amount which may be used initially for urgent payments in respect of minor outstanding works to a value not exceeding \$100,000 on any building project which has been substantially completed and which is no longer shown in the Fund estimates. Approval will be sought from the Financial Secretary under delegated powers to reinstate such projects in the Fund estimates during the year and once this approval has been obtained, expenditure will be transferred to the original project.

21 Allocation of \$30,100,000 for 3003GX—*Minor building works selected from items in category D of the Public Works Programme* is a block allocation to which expenditure on minor building items selected from category D of the Public Works Programme is charged.

22 Allocation of \$12,000,000 for 3004GX—*Refurbishment of government buildings* is a block allocation to which expenditure on works estimated to cost less than \$1,500,000 for refurbishment of government buildings is charged.

23 Expenditure on furniture and equipment for government buildings was charged to a block allocation prior to 1983–84. With effect from 1 April 1983, it has been charged to each building project, and the estimated cost is included within the approved project estimate for each project, and not shown separately.

Head 705—Engineering

24 The Financial Secretary has delegated to the Director of Engineering Development power to authorize expenditure from Head 705 of the Fund.

25 The estimate of the amount required in 1986–87 for expenditure on civil engineering and highways projects, other than waterworks and new towns development projects, is \$1,176,940,000. Of this allocation, \$452,940,000 is for civil engineering projects and \$724,000,000 is for highways projects.

26 Electrification works on the Kowloon Canton Railway from Kowloon Station to Lo Wu are now complete. The Kowloon Canton Railway Corporation was statutorily established in February 1983 and is a financially independent body. Outstanding projects for railway modernization works remaining in the Public Works Programme will, however, continue to be carried out by Government. Allocations totalling \$105,940,000 are provided for carrying out such modernization works in 1986–87.

27 Significant civil engineering and highways projects to start in 1986–87 include 5033AA—*Kai Tak Airport—runway shoulders and taxiway resurfacing*, 5024CD—*Improvement to Shenzhen River bends at Lok Ma Chau and Liu Pok*, stage 1 of the Hung Hom Bay reclamation (5228CL), the construction of a dual 2-lane carriageway

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between Mai Po and Au Tau under 5172TH—*New Territories circular road improvements, Au Tau to Fan Kam Road—Au Tau to Mai Po and remaining works* and 5197TH—*upgrading and dualling of Connaught Road and ancillary roadworks.*

28 Allocation of \$1,250,000 and \$800,000 respectively for 5001CX—*Minor investigations for civil engineering projects* and 5001TX—*Minor investigations for highways projects* are block allocations for expenditure on minor site investigation works costing not more than \$250,000 in respect of each site.

29 Allocation of \$200,000 each for 5002CX—*Minor outstanding civil engineering items* and 5002TX—*Minor outstanding highway items* are block allocations for minor outstanding works for civil engineering and highways items. They are for use in a similar manner to the block allocation described in paragraph 20 above.

30 Allocation of \$5,500,000 and \$8,300,000 respectively for 5003CX—*Minor civil engineering works selected from items in category D of the Public Works Programme* and 5003TX—*Minor highway engineering works selected from items in category D of the Public Works Programme* are block allocations to which expenditure on minor civil engineering and highway works selected from category D of the Public Works Programme, including improvements to existing facilities, in Hong Kong, Kowloon and the rural New Territories is charged.

31 Allocation of \$12,000,000 for 5004TX—*Minor roads and bridges* is for minor reconstruction, minor improvements (street widening, bus bays and traffic islands) and construction of footpaths in Hong Kong, Kowloon and the rural New Territories.

32 Allocation of \$26,000,000 for 5005TX—*Traffic engineering works* is for installation of street lighting on existing roads and in villages, purchase of parking meters, pedestrian and vehicular aids and Mass Transit Railway traffic management and associated works.

33 Allocation of \$11,000,000 for 5006TX—*Works contingent on development* is a block allocation to which expenditure on modifications to public roads, drains and sewers contingent on development is charged.

34 Allocation of \$58,000,000 for 5001BX—*Landslip preventive measures* is a block allocation to which expenditure on landslip preventive works and related studies (other than those directly related to specific development projects in the Public Works Programme) is charged.

Head 707—New Towns and Public Housing (other than Housing Authority)

35 The Financial Secretary has delegated to the Director of New Territories Development power to authorize expenditure from Head 707 of the Fund.

36 The estimate of the amount required in 1986–87 for expenditure on development in the new towns of Tsuen Wan, Sha Tin, Tuen Mun, Tai Po, Fanling/Shek Wu Hui, Yuen Long, Junk Bay and rural townships is \$2,814,190,000. \$109,270,000 is allocated for temporary housing, improvements to squatter areas and public housing not funded by the Housing Authority, \$615,680,000 for Tsuen Wan new town, \$436,720,000 for Sha Tin new town, \$500,650,000 for Tuen Mun new town, \$496,060,000 for Tai Po/Fanling development, \$208,180,000 for Yuen Long and rural development (including Tin Shui Wai), \$378,600,000 for Junk Bay new town and \$69,030,000 for the block allocations. Of the allocation of \$2,704,920,000 for the new towns and rural township developments (excluding temporary housing, squatter area improvements and public housing not funded by the Housing Authority), \$730,050,000 is for community facilities, \$1,388,260,000 for civil engineering, \$431,930,000 for highways and \$154,680,000 for waterworks projects.

37 The Government's direct commitments for the provision of public housing in the urban area through the Public Works Programme is reducing as projects left in the Programme when the present Housing Authority was formed in 1973 are completed. The allocation of \$109,270,000 for public housing includes \$640,000 for the conversion and redevelopment of Shek Kip Mei estate, \$91,000,000 for temporary housing areas constructed by the Housing Department and \$17,630,000 for improvements to squatter areas.

38 Significant New Territories development projects to start in 1986–87 include 7113TH—*Widening of Kwai Chung Road and grade-separated intersection at Kwai On Road*, 7288TH—*Route 5—section between Wo Yi Hop and Shek Wai Kok*, 7046MH—*Public mortuary, Sha Tin*, 7044WC—*Water supply for Ma On Shan development, stage I*, 7239CL—*Tuen Mun New Town engineering development, stage IIB, package 20, phase IV (part)*, 7244CL—*Sha Tau Kok development, site formation and servicing—phase II*, 7227CL—*Tin Shui Wai development, package 3, part II—land formation and main drainage*, 7157RO—*Yuen Long town park*, 7187CL—*Junk Bay development, head of Bay, stage II engineering works*, 7194TH—*Junk Bay development—principal access road and* 7045WC—*Water supply to Junk Bay—stage II.*

39 Allocation of \$1,800,000 for 7004CX—*Minor investigations for new towns and public housing (other than Housing Authority) projects* is a block allocation to which expenditure on minor site investigation works costing not more than \$250,000 in respect of each site is charged.

40 Allocation of \$500,000 for 7005CX—*Minor outstanding new towns and public housing (other than Housing Authority) items* is a block allocation for minor outstanding works to be used in a similar manner to the block allocation described in paragraph 20 above.

41 Allocation of \$16,500,000 for 7006CX—*Minor new towns and public housing (other than Housing Authority) works selected from items in category D of the Public Works Programme* is a block allocation to which expenditure on minor works within the new town lay-outs selected from category D of the Public Works Programme is charged.

CAPITAL WORKS RESERVE FUND

42 Allocation of \$5,230,000 for 7007CX—*Minor landscaping works in the new towns* is a block allocation to which expenditure on minor amenity planting and landscaping of unallocated Crown land within the new town lay-outs costing less than \$200,000 for each site is charged.

43 Allocation of \$25,000,000 for 7008CX—*Consultants' fees and charges for new towns and public housing (other than Housing Authority) projects* is a block allocation to which expenditure on consultant architects' and engineers' fees for the design of works projects in category AB of the Public Works Programme is charged. Site investigations undertaken as part of such consultancy agreements are also funded under this block allocation.

44 Allocation of \$20,000,000 for 7009WX—*Fresh and salt water distribution systems contingent upon New Towns engineering works* is a block allocation to which expenditure on fresh and salt water main-laying works carried out in conjunction with civil engineering and roadworks in the new towns of Tsuen Wan, Tuen Mun, Sha Tin, Tai Po and Fanling, Junk Bay and the rural townships is charged.

Head 709—Waterworks

45 The Financial Secretary has delegated to the Director of Water Supplies power to authorize expenditure from Head 709 of the Fund.

46 The estimate of the amount required in 1986–87 for expenditure on waterworks projects is \$514,620,000.

47 Significant projects underway or due to start in 1986–87 include 9072GG—*Waterworks centralized workshop at Lung Cheung Road*, 9070WF—*Pak Kong treatment works and water transfer facilities, stage I*, 9074WF—*Future increase of water supply from China—stage II*, 9085WF—*Additional fresh water supply to Chai Wan*, 9101WF—*Improvement of the fresh water supply to Quarry Bay and Shau Kei Wan* and 9011WS—*Improvement to Kwun Tong/Jordan Valley salt water flushing system*.

48 Allocation of \$1,000,000 for 9001WX—*Minor investigations for waterworks projects* is a block allocation to which expenditure on minor site investigation works costing not more than \$250,000 in respect of each site is charged.

49 Allocation of \$100,000 for 9002WX—*Minor outstanding waterworks items* is a block allocation for minor outstanding works to be used in a similar manner to the block allocation described in paragraph 20 above.

50 Allocation of \$3,000,000 for 9003WX—*Minor waterworks selected from items in category D of the Public Works Programme* is a block allocation to which expenditure on minor waterworks projects selected from category D of the Public Works Programme is charged.

Cross section of major Consultant, Contractor, and Utility Companies
without qualified Land Surveyors :-

Binnie & Partners
Freeman Fox & Partners
Wilbur Smith & Associates
Paul Y Construction
Kumagai Gumi
Gammon (Hong Kong)
Leighton Contractors
Kier International
Costain International
Vianini Lavori
Peter Pun & Associates
Watson
Hong Kong Electric
Hong Kong Telephone
China Light & Power
Hong Kong Gas
Palmer & Jurner
Henry Boot
Franki
Shun Shing Construction

According to the Hong Kong Government's Civil Engineering Manual, Chapter 5 Appendix 9, the following clause specifying the employment of a surveyor is to be included in all Government Group A Contracts :-

Setting-out of Works

The Contractor's attention is drawn to Clause 19 of the General Conditions of Contract. The Contractor shall submit for approval within 7 days from the day of acceptance of his tender the name and particulars of the person employed by him for setting-out of all the works under the Contract. This person shall be competent and experienced and shall preferably possess an acceptable degree/diploma or other suitable qualification or experience appropriate to the works of his Contract. He shall be authorized to receive from the Engineer and the Engineer's Representative all survey data relevant to the Contract and shall be available on site for this purpose when necessary. The Contractor shall ensure that all necessary equipment and labour for setting-out is available when required. The Contractor shall be supplied with a drawing showing the location of any points, levels and lines of reference on which the setting out of the Works is to be based.

Clause 19 of the General Conditions of Contract states :

- (1) The Contractor shall be responsible for the true and proper setting-out of the Works in relation to original points, lines and levels of reference given by the Engineer in writing or shown on any Drawings and for the correctness, subject as above-mentioned, of the position, levels, dimensions and alignment of all parts of the Works and for the provision of all necessary instruments, appliances and labour in connection therewith.

- (2) If at any time during the progress of the Works any error shall appear or arise in the position, levels, dimensions or alignment of any part of the Works, the Contractor on being required so to do by the Engineer or the Engineer's Representative shall, at his own expense, rectify such error to the satisfaction of the Engineer or the Engineer's Representative unless such error is based on incorrect data supplied in writing or shown on any document by the Engineer or the Engineer's Representative in which case the expense of rectifying the same shall be borne by Government.
- (3) The checking of any setting-out or of any line or level by the Engineer or the Engineer's Representative shall not in any way relieve the Contractor of his responsibility for the correctness thereof and the Contractor shall carefully protect and preserve all bench-marks, site-rails, pegs and other things used in setting out the Works.