DEVELOPMENTS IN THE BUILDING MAINTENANCE WORKS SECTOR

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Abstract

Significant growth in the building maintenance work sector has been evident in many countries due to the aging process of buildings and increasing awareness of the public on the condition of their living environment. However, the sector is still being considered as fragmented, inefficient, lack of specialisation and control on quality of work. This verdict is not without reasons. This paper attempts to highlight the general characteristics of the maintenance works sector and its relationship with the construction industry as a whole. Discussions will be made on overcoming the difficulties in improving the operational efficiency, quality standards etc. with a view to strengthening the market and reputation of firms involved. With the recent move by the Hong Kong Special Administrative Region government to introduce compulsory inspection and repair of buildings to the territory, certain growth opportunities will emerge which necessitate a structural change to the sector. Data and research results from both Hong Kong and the U.K. will be used to illustrate the points and conclusions made.

Keywords

Maintenance Works Sector, Construction Industry, Standardisation, Regulations, Training, Opportunities

Introduction

Building maintenance has long been neglected or misunderstood by most people, including those within the construction industry and building owners (Chanter & Swallow 1996). Most people know of and would like to be involved in new construction works, rather than maintenance and repair works. Few people appreciated the importance and effect of good maintenance (or lack of) on health and safety, durability and value of the property stock. Works of maintenance are mostly hidden and therefore not well appreciated by the general public.

However, without the active contribution of the maintenance works sector, most of the buildings and our surrounding environment would have fallen into disrepair. This paper tries to highlight the characteristics of the maintenance works sector and analyse the crisis pertaining to maintenance contractors. Discussion is made on the ways to improve the weaknesses and development tactics explored for the sector to face the challenge ahead. For the purpose of this paper, maintenance works sector refers to construction works in the field of repair, re-decoration and renovation works on buildings.

The Maintenance Works Sector

The property and construction sector contributes approximately 25% to Gross Domestic Product (GDP) of Hong Kong. Of the elements which make up the property and construction sector, construction industry constitute just under 6% (Walker & Rowlinson 1990). The total value of work done by the construction sector reached HK$191,537 million in 1995 (Table 1). The share of maintenance, repair and decoration by the private sector has grown from an average 5.7% of the total construction work done in the early 80's to an average of 12% in the early 90's and valued at HK$23,500 million in 1995 (Table 2 & Figure 1 & 2). One of the reasons for this has been the remarkable economic growth of Hong Kong in the 70's. The growth accompanied booming of the property market and growing population has brought about a large amount of construction activities. The total stock of residential flats had reached 752,170 units at the end of 1990. About 38% of the private residential building stock has reached the age of 21 or over (Ho 1993). The infrastructure, including all buildings, needed to be kept or upgraded to keep pace with the economic growth.

The continual growth in the demand of maintenance works started in the mid-80's had also brought about a higher than average gross margin from 1985 until 1990 (Table 2 & Figure 3). The maintenance works sector at that time was mostly dominated by large construction firms which had operated for a relatively long period of time in the industry. They were faced with less competition and therefore margins were higher than the industry average. However, the extra profit compared with the industry from 1987 has been decreasing and was more or less in line with the industry's average since 1993 (Table 2 & Figure 3). The great number of small firms which entered into competition in this sector is one of the major reasons for this. The maintenance works sector is particularly easy to enter as the value of works are usually small compared to new construction works.

An interesting fact is that the number of persons directly engaged in all construction activities within the period 1981 to 1995 has only increased slightly whereas the number of persons engaged in maintenance work nearly doubled (Table 3 & Figure 4). Another phenomenon is that the sizes of construction firms have been decreasing over the years (Table 3 & Figure 5). The figure dropped from 23 persons per firm in 1981 to 8 persons per firm in 1995, at an average rate of about 5% decrease per year (Table 3). Within the same period, the number of construction firms has grow from 4,905 in 1981 to 18,845 in 1995, at an average rate of 20% increase per year (Table 3 & Figure 6). The above mentioned decrease in size of firms and growth in the number of firms for the maintenance and repair sector has been similar. In 1991, 73% of all construction firms are small with only 3 persons per firm and with an annual gross value of construction work performed under HK$2 million (Census & Statistics Department 1991). It is apparent that there has been an increasingly large number of small sized contractor firms entering the market. A recent study in the U.K. indicated similar results with an average of 3.3 persons per firm (Rolfe & Leather 1995).

Difficulties Facing the Sector

The construction industry has virtually no barrier of entry. This is aggravated by the fact that construction works are mostly carried out by a number of different sub-contractors (usually with further sub-contracting), there is no need to hire permanent staff or even any staff at all. Rolfe & Leather (1995) in their study revealed 65% of the contractors they surveyed were either single, self-employed or firms utilising people under self-employed arrangements. This has brought about the common problems of poor control and quality of work obtained.

The maintenance works sector is typically fragmented and disorganised because size of each piece of work is small which involved different trades or scattered around different geographical areas. Sub-contracting to small-sizes firms or even individual is common in order to cater for this situation. Rolfe & Leather (1995) found that 97% of the general builders surveyed subcontract their work to other firms. Economy of scale is not possible and because work sites are keep changing, it is difficult to exercise staff and quality control. The works are labour intensive and generally inefficient in terms of resource utilisation. Larger contractors find it difficult to enter this sector of the market, and when they do, the results are not always successful (Leather, Mackintosh, Holmes and Hoyes 1990).

Because of the piecemeal nature maintenance work is difficult to specialise. Also maintenance included emergency works which no large scale preparation or detailed specification can be implemented. Even for day-to-day maintenance performance specifications are often used rather than specification on materials and workmanship. Nevertheless, certain aspects of repair or replacement works such as re-roofing, re-painting, concrete repair, re-wiring etc. are being developed into specialised trades. Maintenance contractors tend to become specialised in works for certain types of buildings such as renovation for residential or commercial properties. The specialisation will improve the overall efficiency of the sector and eventually quality and status of the parties involved can be upgraded.

Standardisation and Regulations

Very often the quality of work achieved in maintenance work is much more inconsistent compared to new work. Without close supervision, the use of inferior materials and malpractice are common especially for hidden works. Problems such as constraints in compatibility with existing finishes and fittings or matching with a design/material which is obsolete or outdated may be difficult to deal with. Sometimes the defects are so serious that they cannot be rectified. Standardisation is one of the means to control quality. Although maintenance works are so varied that it is almost impossible or not economical to be standardised, certain items of works such as re-roofing, concrete repair etc. can be standardised in terms of work procedures and material specifications to achieve a more consistent standard.

At present building regulations are being developed to promote inspection and repair but there are few control on repair and maintenance standards and no control on the contractors themselves, such as licensing for maintenance contractors. With the present quality of operatives within the sector, self-regulation by the industry is not reliable. This is

particularly noticeable in the general maintenance works sector as most works are initiated by the owner of the house who is ill-equipped to diagnose the problem and very few will employ a surveyor to safeguard their interest. As a result there is heavy reliance on the expertise of builders and tradespeople to identify what works needs to be done (Holmes and Worthing 1991). This absence of control enables incompetent and dishonest contractors to flourish in the market at the expense of more reputable firms (Rolfe & Leather 1995) and the poor general public's view on the sector as a whole. The legal requirement of registration of gas installers, electrician and plumbers with the respective authorities is useful in maintaining standards of competence, familiarity with changes in regulations and good practice. Amendment of building regulations which are specific on quality and employment of licensed builders with particular skills for specified type of work is necessary.

R & D and Training

The above suggestions on standardisation and regulations have brought about the question on research and development (R & D). R & D may not be economical or efficient due to the small scale of works and small sizes of firms involved. Both the government and the private sector should collaborate and give more resources and accord higher priority for R & D activities. Aspects like maintainability, planned maintenance budgeting and control, maintenance project organisation, compatibility in use of materials, life cycle costing, durability of materials, quality management etc. should be explored. Experience gained by contractors in carrying out works under various building conditions and occupancy can also be shared within the industry.

Rolfe & Leather (1995) indicated only half of the workmen surveyed had undergone formal training in construction. No matter how technology improves, there will always be a need for skilled operatives and supervisors who not only know what they are doing but why it is important to do it well. Similar training and licensing requirement by trade bodies may be considered for other trades such as carpenters, roofers, decorators etc. This will enhance the efficiency of training courses and in updating good practice. Designers should also be aware that the occupancy stage is the longest and most important aspect in the building life cycle. Care should be taken to improve a building element's durability and maintainability, apart from aesthetically pleasing only. Proper access should also be provided for carrying out of future maintenance works.

Insecurity of employment and absence of a career structure can reduce work performance significantly with adverse effect on productivity. However, even with a stable demand , the requirement for individual trades would likely to fluctuate. To be successful, training must combine a stable, secured employment and career prospects for operatives with a degree of manpower mobility and flexibility.

Opportunities

It is common practice that maintenance works in the private sector are mostly unplanned. This is the result of the long term neglect of building owners on maintenance aspects of

their buildings. It is not surprising as in the past 30 years the government has taken up the responsibility for most of the inspection works to all private buildings under the Buildings Ordinance (Ho 1993). With the growing awareness of owners and future legislation on compulsory inspection, there are tremendous opportunities for contractors to approach the owners corporations of buildings which renovation seem imminent.

Contractors should also consider to partner up with a property management firm or owners corporation and become term contractors for a building or housing estate. This not only provide a continuity of work and improvement of cash flow but also gain other side benefits such as building up of reputation, specialisation and obtain economy of scale. Construction ranked third largest after Industry and Agriculture in G.N.P. of the Peoples Republic of China (PRC)(Fu 1991). In 1986 to 1990, a total floor area of 64 billion m^2 were built. It was estimated that nearly 25 million people were involved in construction related activities in 1990, representing 4.3% of the total working population. It is estimated that growth will sustain well into the 21st century. With this vast amount of buildings being built, it is expected that the demand for property management and maintenance will grow simultaneously. At present, the concept and importance of property management and maintenance in the PRC has not been well received and understood. With proper education and promotion, this will be a huge market to be explored.

Conclusions

There is no doubt that people will become more and more aware and concern for the condition of their living environment. Continual education and legislation enforcement will certainly be fruitful. There is an increasing number of contractors which branch off or promote themselves as "maintenance contractors" or "renovators" specialised in the field of repair and renovation. It seems that the general public is gradually being educated to realise that repair and renovation work need to be done by specialists, because of the different nature of work.

Maintenance contractors should also try to improve efficiency by standardisation and improving control of work. Specialisation of work and more active marketing, training and career development should be considered and implemented. This coupled with people's expectation of improvement in the living environment opened up a challenging future for the maintenance works sector.

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Table 1

Gross value of work done and profit margins of all construction firms

Year	Gross value of work done (HK$m)	Gross surplus (HK$m)	Profit margin
1981	33,968	2,747	8.1%
1982	38,082	2,853	7.5%
1983	38,853	2,885	7.4%
1984	40,307	2,460	6.1%
1985	39,333	1,874	4.8%
1986	44,860	1,765	3.9%
1987	55,837	2,004	3.6%
1988	69,267	2,719	3.9%
1989	86,007	4,476	5.2%
1990	99,842	5,303	5.3%
1991	109,879	7,069	6.4%
1992	120,529	7,398	6.1%
1993	148,449	9,545	6.4%
1994	166,923	10,567	6.3%
1995	191,537	12,198	6.4%

Source : Survey of Building, Construction & Real Estate Sectors, 1981 to 1995, Census and Statistics Department

Table 2

Decoration, repair and maintenance - Market size and profitability trends

Year	Gross value of work done (HK$m)	Percentage of total construction	Gross operating surplus	Gross profit margin	Gross margin relative to the whole industry
1981	2,127	6.3%	139	6.5%	0.80
1982	1,782	4.7%	128	7.2%	0.96
1983	2,409	6.2%	164	6.8%	0.92
1984	3,362	8.3%	180	5.4%	0.89
1985	3,510	8.9%	211	6.0%	1.25
1986	4,939	11.0%	262	5.3%	1.36
1987	6,324	11.3%	369	5.8%	1.61
1988	7,335	10.6%	489	6.7%	1.72
1989	9,650	11.2%	672	7.0%	1.35
1990	11,118	11.1%	646	5.8%	1.09
1991	10,913	9.9%	605	5.5%	0.86
1992	14,567	12.1%	845	5.8%	0.95
1993	17,964	12.1%	1,174	6.5%	1.02
1994	22,992	13.8%	1,473	6.4%	1.02
1995	23,500	12.3%	1,568	6.7%	1.05

Source : Survey of Building, Construction & Real Estate Sectors, 1981 to 1995, Census and Statistics Department

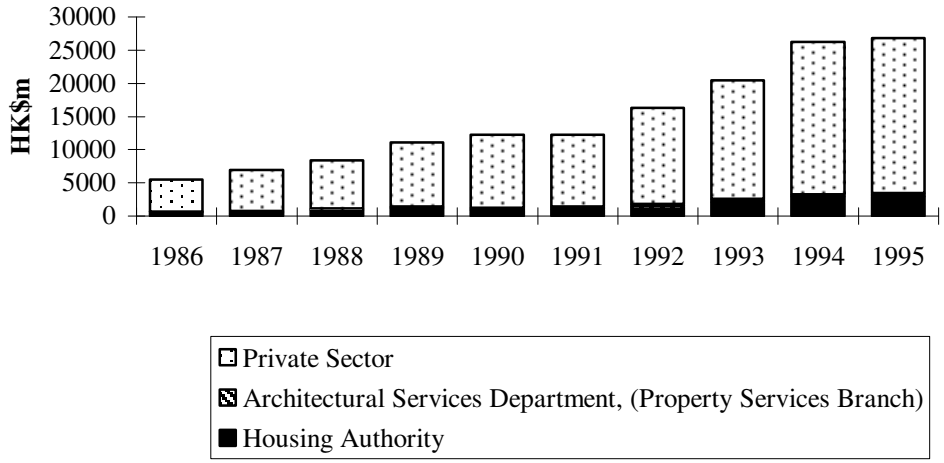
Table 3

Number of construction firms and persons directly engaged

	No. of construction firms		Persons directly engaged		Average no. of persons per firm	
Year	all	repair	all	repair	all	repair
1981	4905	1858	114797	13801	23	7
1982	5396	1959	96639	10259	20	5
1983	5870	2238	96639	12694	16	6
1984	6779	2594	98166	16503	14	6
1985	7321	2815	97148	15881	13	6
1986	8570	3514	110044	19779	13	6
1987	9508	3644	116635	21837	12	6
1988	10672	4259	117015	22313	11	5
1989	12023	4735	118428	23680	10	5
1990	13491	5144	127395	24350	9	5
1991	12790	5528	119469	26346	9	5
1992	15196	6017	131402	28661	9	5
1993	17043	6699	132814	28283	8	4
1994	18936	7681	138293	29800	7	4
1995	18845	7060	152102	28107	8	4

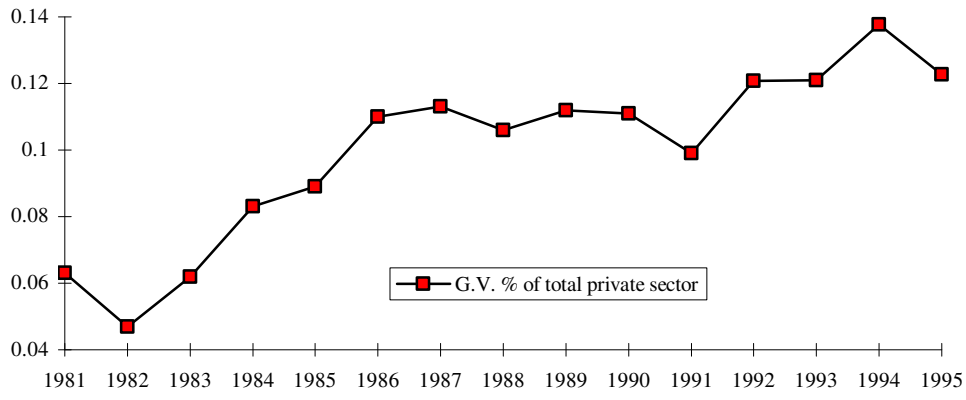
Source : Survey of Building, Construction & Real Estate Sectors, 1981 to 1995, Census and Statistics Department

Figure 1 Decoration, repair and maintenance - Gross value of construction work performed



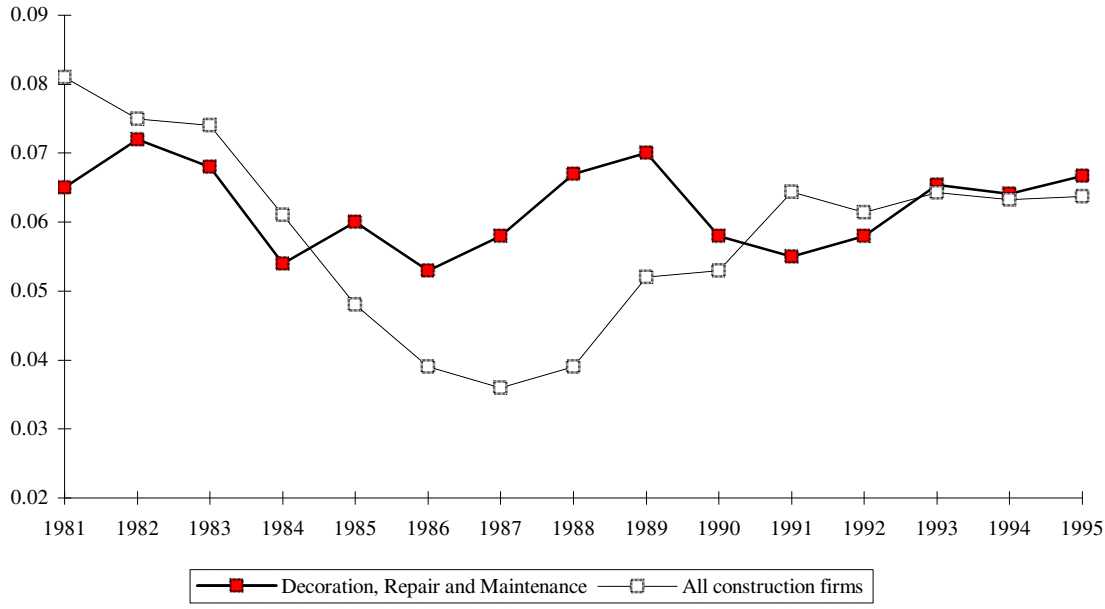
Source : Survey of Building, Construction & Real Estate Sectors, 1986 to 1995, Census and Statistics Department.

Figure 2 Percentage of decoration, repair and maintenance on all construction works



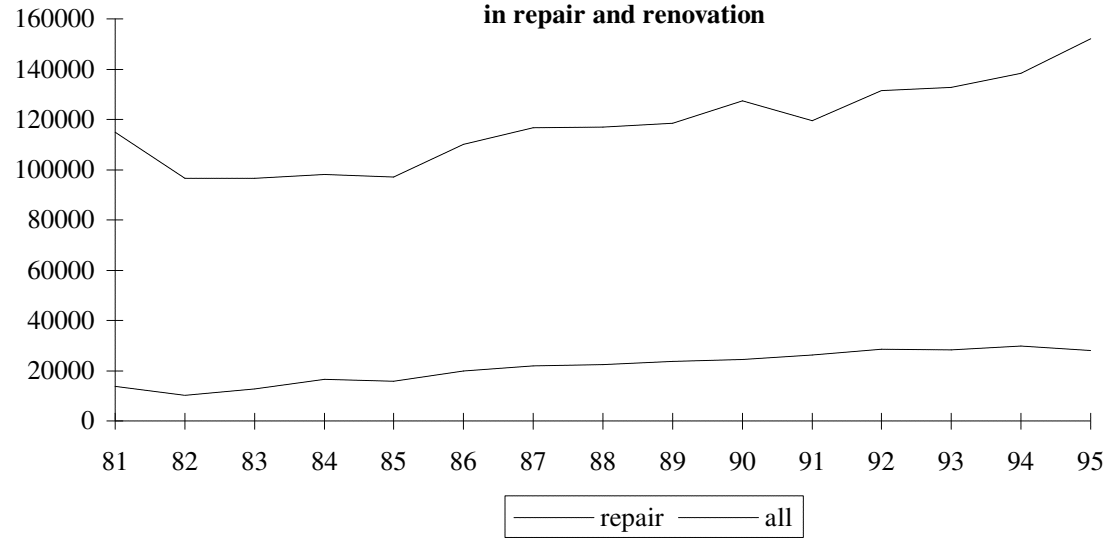
Source : Survey of Building, Construction & Real Estate Sectors, 1981 to 1995, Census and Statistics Department.

Figure 3 Comparison of Profitability Trends



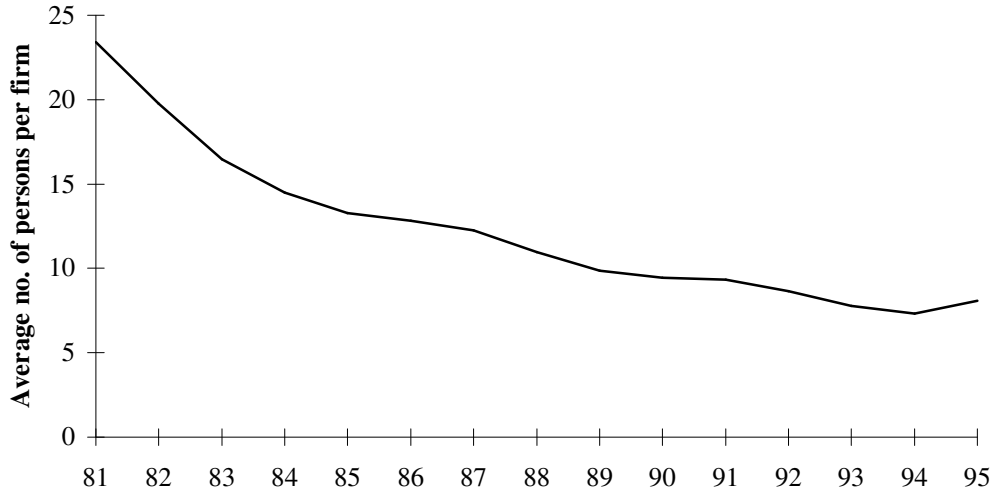
Source : Survey of Building, Construction & Real Estate Sectors, 1981 to 1995, Census and Statistics Department.

Figure 4 Number of persons directly engaged in construction works and those specialised in repair and renovation



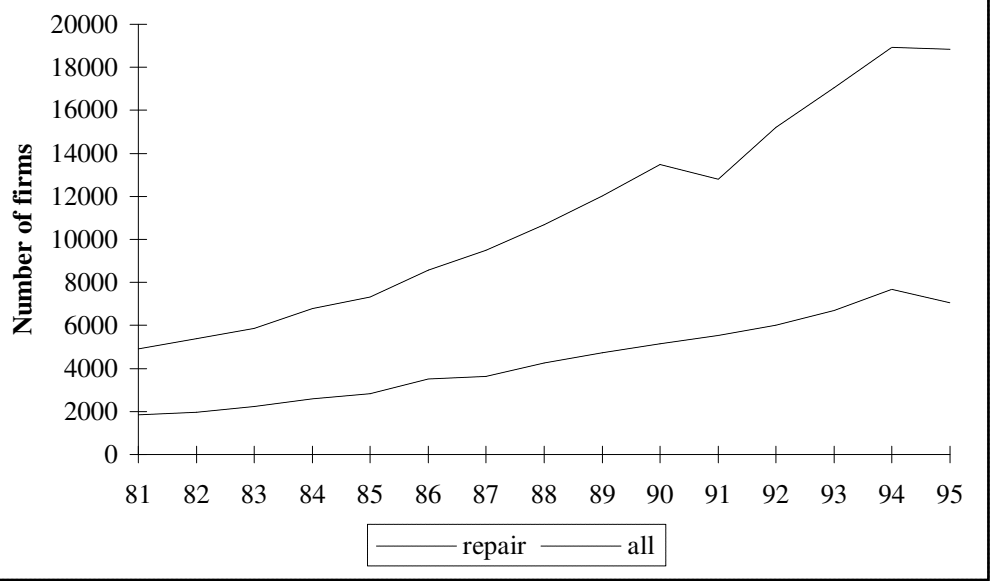
Source : Survey of Building, Construction & Real Estate Sectors, 1981 to 1995, Census and Statistics Department.

Figure 5 Average size of construction firms



Source : Survey of Building, Construction & Real Estate Sectors, 1981 to 1995, Census and Statistics Department.

Figure 6 Growth of number of all construction firms and those specialised in repair and renovation



Source : Survey of Building, Construction & Real Estate Sectors, 1981 to 1995, Census and Statistics Department.