

An Annual Report of the Construction Industry of China Hong Kong

2007-2008

prepared by

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*About the Research Centre for Construction and Real Estate Economics
(RCCREE):*

The RCCREE is the Hong Kong Polytechnic University Centre for solution oriented research and consultancy in construction and real estate economics. It undertakes internationally relevant multi-disciplinary research that supports the advancement of the construction and real estate industries in the following areas: Economic Policy and Institutional Analysis, Real Estate Economics, Construction Economics, Housing, Human Behaviour in Economic Decision making, and Value Management and Facilities Performance. For further information, please contact Professor Francis K.W. Wong, Director of RCCREE (bskwwong@polyu.edu.hk) or Professor Eddie C.M. Hui, Deputy Director (bscmhui@polyu.edu.hk).

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COUNTRY REPORT

[As at October 2008, ¥1,000 = HK\$ 73.14; HK\$1 = ¥13.67; US\$ 1 = HK\$ 7.76]

1. EXECUTIVE SUMMARY

Hong Kong enjoyed a high growth rate in GDP in 2007 (6.4%), with a per capita GDP of US\$29,914. While the service sector saw the highest growth (7.4%), the growth rate of the construction sector was 0.04%. The construction sector recorded a positive growth rate since 1997. The Economics outlook for the first half of 2008 was still optimistic. However, the consequences following the collapse of the property market in US, the bankruptcy of Lehman Brothers and the bail out of other financial institutions (e.g. AIG, Freddie Mae and Fannie Mae) by the US government, together with the slump of the stock markets, people are becoming pessimistic towards the latter half of 2008 and next year. While the slowdown in growth of advanced economies in Europe and the US will have some impact on the economies of emerging markets and the Mainland, the sustained rapid economic growth of the Mainland and its increasingly intensified economic integration with Hong Kong will to a limited extent help the economic development and cushion the impact of the slowdown on Hong Kong.

With respect to the labour market, the unemployment rate has hit an all-time low at around 4%. The unemployment rate of construction sector kept decreasing in these consecutive as there were more job vacancies created by the major projects, e.g. Hong Kong West and Tsuen Wan drainage tunnel, rebuilt the Lo Wu Correctional Institution etc.

Construction Cost has picked up after it hit a bottom in 2003. It is more or less in parity of 1997 when the construction cost was at its peak. The high construction cost can be reflected from the increase in construction materials. The prices of major construction materials such as hardwood and steel products have risen by as much as 50% over 4 years.

While there was no published wages for construction workers, the wages have not risen in par with the rise in living standard as reflected from the many demonstrations of the construction workers and 40-day strike by the bar benders in Hong Kong, which has led to a near stand-still of the construction industry. The salaries of ATPC have risen by an average of 9-13% over 2 years, with the exception of project managers and safety officers.

There is no institutional or legal entry barrier to the construction market in Hong Kong. Foreign firms are required to fulfil the same set of criteria as local firms to get listed with the authority. Hence, the import of construction services does not appear to be very active and has consistently stayed at less than 4% of the total construction volume. Most of the import and export services are carried out within the Asian region, with the Chinese Mainland taking the highest percentage. The major services were project management, contracting and engineering consulting. Export of construction services to regions outside Asia is negligible.

The outlook of the construction industry looks promising in the next 10-15 years as the government has outlined a series of infrastructural projects, many of which are cross-border such as the bridge linking Hong Kong, Macau and Zhuhai. It is envisaged at least HK\$250 billion public money will be spent and 250,000 job vacancies will be created. The extent to which these projects will benefit the construction labour market remains to be seen.

2. MACRO ECONOMIC REVIEW AND OUTLOOK

2.1 MAIN MACROECONOMIC INDICATORS

	2000	2001	2002	2003	2004	2005	2006	2007
GDP and Components								
GDP in chained(2006) dollars (HK\$ million)	1,126,279	1,131,880	1,152,718	1,187,369	1,287,900	1,139,110	1,475,910	1,569,890
GDP at current market price (HK\$ million)	1,317,650	1,299,218	1,277,314	1,234,761	1,291,923	1,382,590	1,475,910	1,616,215
GDP growth (%)	8	0.5	1.8	3	8.5	7.1	7	6.4
Primary sector (HK\$ million)	1,161	1,177	1,138	940	958	947	942	n.a.
% growth	-21.4	1.4	-3.3	-17.4	1.9	-1.1	-0.5	n.a.
Manufacturing sector (HK\$ million)	67,646	59,760	51,396	44,403	44,455	45,547	45,761	n.a.
% growth	6.8	-11.7	-14.0	-13.6	0.1	2.5	0.4	n.a.
Services sector (HK\$ million)	1,077,256	1,076,998	1,079,476	1,062,714	1,119,304	1,207,873	1,297,545	n.a.
% growth	4.7	-0.02	0.2	-1.5		7.9	7.4	n.a.
Construction sector (HK\$ million)	62,054	57,167	51,534	44,910	40,376	38,538	38,688	n.a.
% growth	-5.3	-7.9	-9.9	-12.9	-10.1	-4.6	0.04	n.a.
Demographic Indicators								
Population	6,711,500	6,730,300	6,725,800	6,764,200	6,797,700	6,837,800	6,909,500	6,963,100
Population growth rate (%)	1.1	0.3	-0.1	0.6	0.5	0.6	1.0	0.8
Total labour force	3,374,200	3,425,900	3,474,000	3,472,500	3,515,900	3,538,100	3,581,400	3,640,500
Labour force growth rate (%)	1.6	1.5	1.4	0	1.3	0.6	1.2	1.6
Unemployment rate (not seasonally adjusted)	4.9	5.1	7.3	7.9	6.8	5.6	4.8	4
Financial Indicators								
Changes in consumer price index (%)	-3.8	-1.6	-3.0	-2.6	-0.4	1.0	2.0	2.0
Changes in GDP deflator (%)	-3.6	-1.9	-3.5	-6.2	-3.5	-0.1	-0.3	3
Short term interest rate* (%)	6.21	3.45	1.60	0.81	0.25	2.88	4.05	2.33
Long term interest rate**(%)	7.48	6.37	5.40	3.93	4.59	3.55	4.83	3.58
Annual average exchange rate with \$US (HK\$)	7.791	7.799	7.799	7.787	7.788	7.777	7.768	7.803

Notes

n.a.: data not available

* yield of 91-day Exchange Fund Bills (mid-year)

**yield of 10-year Exchange Fund Notes (mid-year)

Sources:

GDP, Demographic and Financial Indicators:

Government of the HKSAR web-page at http://www.censtatd.gov.hk/hong_kong_statistics

Short and long term interest rates:

Monthly Statistical Bulletin, Hong Kong Monetary Authority.

Table 2.1 – Macro-Economic Indicators

2.1.1 Overview of National Economy

According to the Economic Analysis and Business Facilitation Unit (2007) of the Hong Kong Government, growth in GDP was 6.4% in 2007. The years of 2004, 2005, 2006 and 2007 marked the largest growth in any four consecutive years since 1988. GDP per capita was HK\$215,006 (US\$27,565), which represented a 5.9% year-on-year growth rate. The growth rate of the services sector was the highest (7.4%) among all sectors. The growth rate of the construction sector was 0.04% in 2007. The construction sector recorded a position growth rate since 1997.

The reviving economic performance was greatly attributed to the steady global economic growth and Mainland's policies in favour of Hong Kong, such as the Closer Economic Partnership and Individual Travel Policy. Stock prices and market turnover surged to a high record in October 2007, before the global financial market turbulence affected which caused some pull-back. The property market improved distinctly further, especially in the latter part of 2007, with a marked pick up in both sale prices and transactions under a favourable interest rate environment and the persistent strength in the economy.

The labour market improved due to the sustained economic expansion. The unemployment rate fell to 4% and the seasonally adjusted unemployment rate fell to 3.4% in the fourth quarter of 2007, which was the lowest in almost 10 years. The consumer price index only increased 2%, which suggested a moderate inflation in 2007, although there was significant increase of imported foodstuffs and consumer goods due to the weakening purchase power of Hong Kong dollars and the global food inflation.

2.2.2 Economy off First Half of 2008

Hong Kong's economy continued to experience a substantial growth rate in the first half of 2008. The real GDP increased by 7.1% compared with a year earlier. According to the First Quarter Economic Report 2008, the economy extended the run of distinctly above-trend growth to 18 quarters. The performance of the financial sector was particularly spectacular, a manifestation of the significant benefits brought about by the financial integration between the Mainland and Hong Kong. Although there was a global credit market turmoil caused by the US sub-prime mortgage problem, the Hong Kong economy still held up well in recent period with our motherland's economy growing robustly. By the vibrant performance of Mainland and other emerging economies and the further expansion of the EU market, there was a further notable growth of 8.3% in real terms in the first quarter. The exports of services also grew rapidly further by 10.8% in real terms on the back of a continued surge in financial services. According to The Global Enabling Trade Report 2008 released by the World Economic Forum, Hong Kong ranked the top in the Enabling Trade Index ranking. Domestic demand continued to display strength and inflation remained mild. The labour market continued to improve with the unemployment rate reached record low at 3.4% since mid-1998.

3. OVERVIEW OF THE CONSTRUCTION INDUSTRY

3.1 CONSTRUCTION INVESTMENTS

The total gross value of construction works performed by main contractors increased by 8% in nominal terms, from a year earlier, to HK\$48.9 billion in the first 2 quarters of 2008. After discounting price changes, the total gross value of construction work performed by main contractors increased by 5.1% in real terms over the same period.

Analysed by type of construction work, the gross value of construction work performed at private sector sites totalled HK\$93 billion in 2007, up by 2.9% in nominal terms from a year earlier. The increase was mainly associated with the progressive stepping up of works at some large commercial building sites.

The gross value of construction work performed at public sector sites decreased by 3.9% in nominal terms from a year earlier to HK\$7.56 billion in the 2 quarters of 2008. The decrease was mainly due to completion of works on some large transportation projects.

The outlook for the next years and thereafter is promising as the Chief Executive of Hong Kong has outlined 10 major investment plans including:

1. South Island Line
2. Shatin to Central Link
3. Tuen Mun Western Bypass and Tuen Mun-Chek Lap Kok Link
4. Guangzhou-Shenzhen-Hong Kong Express Link
5. Hong Kong-Zhuhai-Macau Bridge
6. Hong Kong-Shenzhen Airport Co-operation
7. Hong Kong-Shenzhen Joint Development of the Lok Ma Chau Loop
8. West Kowloon Cultural District
9. Kai Tak Development Plan
10. New Development Areas (NDAs)

It is envisaged that over HK\$250 billion will be invested in the next decade. These projects are estimated to bring more than \$100 billion added value annually from the commissioning to mature stage. And, about 250,000 additional jobs would be created by these projects.

Type of Investment (HK\$ Million)	2003	2004	2005	2006	2007	2008-10 (Q1-Q2)
Private Sector	35,187	28,021	26,356	24,855	28,973	16,113
Public Sector	32,378	28,533	22,334	17,135	14,503	7,563
Repair and Maintenance	31,468	36,618	42,160	48,240	49,390	25,181
Total	99,032	93,171	90,851	90,230	92,866	48,856

Table 3.1 Construction Investment by Sector (in nominal terms)

3.2 CONSTRUCTION COMPANIES

The latest published statistics from the Census and Statistics Department shows that the number of establishments engaged in building and civil engineering industries is 19,057 as of 2006 whereas the number of persons directly engaged in these industries is 135,337. The following table shows the three year trend from 2003 to 2006.

	2003	2004	2005	2006
Number of Establishments	19,520	18,302	17,985	19,057
Number of Persons directly engaged	124,933	122,077	122,870	135,337

Table 3.2 – Number of establishments, and of persons directly engaged

3.3 EMPLOYEES AND CONSTRUCTION LABOR (NUMBER OF CONSTRUCTION WORKERS BY JOB TYPE)

3.3.1 Principal Jobs

Job Levels	May 2007
Professional/Technologist	16 012
Technician	27 002
Skilled & Semi-Skilled worker	34 822
General Worker	12 881
Total	90 717

Source: *Manpower Survey Reports on the Building and Civil Engineering Industry*, Building and Civil Engineering Industry Training Board, Vocational Training Council, bi-annual issue of 2006.

Table 3.3.1 - Number of workers employed in principal jobs of construction, building and civil engineering and related disciplines

3.3.2 Persons in Establishments

Main industry group	2003	2004	2005	2006
New construction works – Pre-erection works at construction sites	3 932	4 341 (10.4%)	2 004 (-53.8%)	1 790 (-10.7%)
New construction works – Architectural and civil engineering works at construction sites	31 694	28 478 (-10.1%)	29 786 (4.6%)	29 976 (-9.4%)
New construction works – Miscellaneous new construction works	9 471	6 305 (-33.4%)	7 274 (15.4%)	9 746 (34%)
Decoration, repair and maintenance	21 856	25 117 (14.9%)	21 282 (-15.3%)	24 688 (16%)
Special Trades – Erection and general finishing, electrical and mechanical fitting, gas and water fitting and miscellaneous	57 982	57 836 (-0.3%)	62 524 (8.1%)	72 137 (15.4%)
All construction activities	124 933	122 077 (-2.3%)	122 870 (0.6%)	135 337 (10.1%)

Source: *The Report on 2006 Annual Survey of Building, Construction and Real Estate Sectors*,
The Census and Statistics Department, Hong Kong Special Administrative Region.

Table 3.3.2 - Number of persons directly engaged in
the building and civil engineering establishments

3.3.3 Site Workers

The following table reveals that the number of manual workers engaged at construction sites has been decreasing over time in Hong Kong. The phenomenon of reduction of manual workers is twofold: 1) advanced technology or technique greatly simplifies the construction process and reduce the number of people directly required; and 2) the number of construction projects, no matter in the private or public sector, has been dwindling year by year.

Year	Qtr	Public	% change	Private	% change	Building	% change	Civil Engg.	% change	Total	% change
2008	1	18965	2.4%	31576	0.01%	38410	1.85%	12131	-2.1%	50541	0.87%
2007	1	20569	-2.77%	29797	-3.85%	36517	0.30%	13849	-5.13%	50366	-1.25%
	2	19232	-6.5%	31866	6.9%	37667	3.15%	13431	-3.02%	51098	1.45%
	3	18762	-2.44%	30411	-4.57%	36133	-4.07%	13040	-2.91%	49173	-3.77%
2006	4	18521	-1.3%	31582	3.85%	37712	4.37%	12391	-4.98%	50103	1.89%
	1	20014	-2.30%	30990	-5.52%	36406	-6.29%	14598	1.12%	51004	-4.28%
	2	20485	4.68%	32801	0.30%	38849	0.08%	14437	7.31%	53286	1.94%
	3	19569	-7.46%	32704	-3.10%	38819	-4.07%	13454	-6.76%	52273	-4.78%
2005	4	21147	-6.37%	33750	5.90%	40468	4.38%	14429	-8.02%	54897	0.81%
	1	22586	-7.08%	31870	-2.06%	38769	-6.01%	15687	0.58%	54456	-4.20%
	2	24306	-8.12%	32540	-3.00%	41250	-0.10%	15596	-16.63%	56846	-5.26%
	3	26454	-7.84%	33547	-9.47%	41293	-9.14%	18708	-7.90%	60001	-8.76%
2004	4	28704	12.45%	37057	10.86%	45449	16.25%	20312	2.31%	65761	11.55%
	1	25525	-4.29%	33426	-6.67%	39097	-8.72%	19854	1.03%	58951	-5.65%
	2	26668	-4.15%	35814	-7.56%	42830	-9.03%	19652	0.86%	62482	-6.13%
	3	27824	6.88%	38741	5.48%	47081	3.64%	19484	12.41%	66565	6.06%
	4	26034	-0.88%	36727	2.27%	45428	2.90%	17333	-3.87%	62761	0.94%

Source: *The Quarterly Report of Employment and Vacancies at Construction Sites*; The Census and Statistics Department, Hong Kong Special Administrative Region.

Table 3.3.3 - Number of Manual Workers engaged at Construction Sites
(analyzed by sector and type of project)

3.3.4 Unemployment rate of Construction Sector

	2005	2006	2007	2008Q1
Unemployed (Thousands)	39	33.8	25.1	21.3
Unemployment rate (%)	12.9	11.2	8.3	7.5

Source: *Hong Kong Monthly Digest of Statistics*, The Census and statistics Department, Hong Kong Special Administrative Region

Table 3.3.4 – Unemployed and Unemployment Rate of the Construction Sector

The unemployment rate of construction sector was 7.5% in the first quarter of 2008. More job vacancies were created by the major projects, e.g. Hong Kong West and Tsuen Wan drainage tunnel, the Lo Wu Correctional Institution, an extension block at the Prince of Wales Hospital etc. Although the unemployment kept decreasing in these consecutive years, the employment rate in the construction sector caused considerable concerns.

3.4 PRODUCTIVITY

3.4.1 Value-added per Employee

Effective cost control increases the efficiency of each unit of resources engaged. The fairly remarkable observations are the positive figures of the value-added per construction workers in 2004, 2005 and 2006, as shown in the following table.

Main industry group	2004	2005	2006
New construction works – Pre-erection works at construction sites	41%	28%	26%
New construction works – Architectural and civil engineering works at construction sites	19%	21%	21%
New construction works – Miscellaneous new construction works	37%	33%	30%
Decoration, repair and maintenance	28%	28%	28%
Special Trades – Erection and general finishing, electrical and mechanical fitting, gas and water fitting and miscellaneous	36%	36%	43%
All construction activities	26%	28%	29%

Source: The Census and Statistics Department, Hong Kong Special Administrative Region.

Table 3.4.1 - Value added as percentage of gross output for all building and civil engineering establishments:

3.4.2 Physical Measurement of Construction Production

(Unit: '000 sq.m.*)

End use of building	2003	2004	2005	2006
Private residential premises+	9 563	8 169 (-14.6%)	6 591 (-19.3%)	6 068 (-7.9%)
Office buildings	596	** (**)	** (**)	945
Hotels and boarding houses	590	654 (10.8%)	794 (21.4%)	587 (-26.1%)
Multi-purpose commercial premises	1 385	1 471 (6.2%)	1 303 (-11.4%)	890 (-31.7%)
Total	12 646	10 964 (-13.3%)	9 502 (-13.3%)	8 624 (-9.2%)

* Area (sq. m) refers to gross floor area of buildings when completed.

+ Includes buildings purely for residential purpose and combined residential and non-residential buildings.

Source: *The Report on 2005 Annual Survey of Building, Construction and Real Estate Sectors*,
The Census and Statistics Department, Hong Kong Special Administrative Region.

Table 3.4.2 - Physical Measurement of Construction Production

3.5. CONSTRUCTION COST

3.5.1 Unit Construction Cost

Construction costs are compiled from average fixed price competitive tenders published by Davis Landon & Seah, a leading cost consultancy firm in Hong Kong. After the peak in 1997, construction costs fell for 6 consecutive years until they reached the bottom in 2003, when Hong Kong was hit by SARS (Severe Acute Respiratory Syndrome). Afterwards, costs have gradually picked up following the recovery of the property and construction markets. The latest figures for 2008Q1 show that construction costs are now almost as well as they were in 1997. Indeed, 5-Star hotels cost more to build than they were in 1997, probably due to the diversion of resources to the hotel construction boom in Macau.

(Unit: HK\$/m² CFA)

	Residential (High-Rise)		Commercial office		Industrial		Hotel
	Standard	Luxurious	Standard	Prestige	Light	Heavy	5-Star
1995	8,000-8,500	8,500-10,000	8,500-9,500	12,000 up	4,800-5,000	5,300-6,300	14,000 up
1996	9,000-9,500	9,500-12,500	9,500-10,700	13,000 up	5,400-5,700	6,100-7,200	16,000 up
1997	11,000-12,000	11,500-15,000	11,550-13,500	15,500 up	6,500-7,000	7,100-8,500	19,500 up
1998	10,000-11,000	11,000-13,500	10,500-12,500	14,300 up	5,600-6,200	6,300-7,500	18,000 up
1999	9,800-10,700	10,800-13,200	10,300-12,100	13,800 up	5,500-6,100	6,200-7,100	17,500 up
2000	9,300-10,000	10,500-12,800	9,700-11,500	13,500 up	5,500-6,000	6,000-6,900	17,500 up
2001	9,100-9,800	10,300-12,600	9,700-11,500	13,500 up	5,500-6,000	6,000-6,800	17,500 up
2002	8,500-9,000	9,800-11,700	9,500-11,200	13,500 up	5,400-5,800	5,900-6,600	17,200 up
2003	7,600-8,200	9,000-10,800	9,000-10,600	12,300 up	4,900-5,500	5,300-6,100	16,300 up
2004	7,850-8,450	9,250-11,050	9,300-10,900	12,700 up	5,250-5,850	5,650-6,450	16,700 up
2005	8,300-8,900	9,750-11,600	9,750-11,450	13,300 up	5,550-6,150	5,950-6,800	17,500 up
2006	8,750-9,350	10,350-12,300	10,550-12,350	14,300 up	5,900-6,550	6,350-7,250	18,700 up
2007Q1	9,050-9,650	10,650-12,700	10,850-12,750	14,800 up	6,100-6,750	6,550-7,450	19,250 up
2007Q2	9,450-10,100	11,100-13,250	11,350-13,350	15,550 up	6,400-7,100	6,900-7,850	20,200 up
2007Q3	10,100-10,800	11,800-14,100	12,100-14,250	16,600 up	6,800-7,600	7,350-8,400	21,500 up
2007Q4	10,000-10,700	11,700-14,000	12,000-14,100	16,400 up	6,750-7,500	7,250-8,300	21,300 up
2008Q1	10,600-11,400	12,550-14,850	12,850-15,000	17,400 up	7,350-8,150	7,900-9,000	22,450 up

* The costs per square metre are based on Construction Floor Areas measured to the outside face of the external walls/ external perimeter including lift shafts, stairwells, balconies, plant rooms, water tanks and the like. The cost excludes site formation works, external works, land cost, professional fees, finance and legal expenses.

1995-2006 based on Quarterly data in Q4. 2007 Q1 is first quarter data and 2007 Q2 is second quarter data.

Source: 1995-2004 *Current building cost information data in Hong Kong*. Davis Langdon & Seah International.
2005-2007 *Quarterly construction cost review, Hong Kong*. Davis Langdon & Seah.

Table 3.5.1 – Unit Construction Costs

3.5.2 Average Wholesale Prices of Selected Building Materials

As the general upward trend of construction costs shown in Section 5.2 would foretell, costs of major building materials have been rising in the last 5 years. As the following table shows, some key materials, such as bitumen, diesel fuel for industrial use, sawn hardwood, homogeneous non-slip floor tiles, galvanised mild steel angles and steel plates, metal formwork, sand, mild steel round bars, high tensile steel bars and sawn hardwood timber formwork, have their latest unit costs increased by more than 50% when compared to 2004. The increasing trend of the costs of building materials is due to the inflation and the appreciation of Renminbi as most of the construction materials in Hong Kong are imported from China. This upsurge in material prices is believed to be more attributable to the general increase in prices of commodities around the globe recently, than to the slow recovery of the construction market in Hong Kong.

		2004	2005	2006	2007	March 2008
Aggregates (HK\$ per tonne)		40	38	38	40	44
Bitumen (HK\$ per tonne)		3800	4200	5400	5400	6467
Concrete blocks, 100mm thick		45	42	42	43	57
Diesel fuel	For industrial use (light) (\$ per 200-litre drum)	1108	1320	1568	1572	1964
	For road use (HK\$ per 100 litre)	664	770	886	874	990
Glass - Clear sheet glass, 5mm thick (HK\$ per square metre)		81	81	81	87	97
Glazed ceramic wall tiles	White tiles, 108mm*108mm	66	63	69	77	91
	Colour tiles, 200mm*200mm	187	192	203	221	260
Hardwood	Sawn hardwood, 50*75 mm column	2284	3072	3218	3474	3607
Homogeneous floor tiles	Non-slip tile, 200mm*200mm	69	72	86	98	131
Galvanised mild steel	Steel plates (HK\$ per tonne)	6283	6674	6771	7629	10021
	Steel angles (HK\$ per tonne)	6203	6568	7404	10047	14713
	Steel flats (HK\$ per tonne)	6609	7212	9772	8541	9756
Metal formwork	Steel plate, 4mm thick (HK\$ per tonne)	4438	4881	4588	5059	6979
Mosaic tiles	Unglazed tiles, 18mm*18mm	52	44	37	47	50
	Glass tiles, 25mm*25mm (\$ per square metre)	25	27	22	27	29
	Glazed tiles, 45mm*45mm	58	55	58	61	73
Paint	Emulsion paint (HK\$ per litre)	32	35	35	35	37
	Acrylic paint (HK\$ per litre)	34	35	34	34	36
Portland cement (ordinary) (HK\$ per tonne)		491	511	517	516	524

Sand (HK\$ per tonne)		25	27	34	56	58
Steel reinforcement	Mild steel round bars, 6mm to 20mm	3815	4101	4237	5275	7896
	High tensile steel bars, 10mm to 40mm	3668	3764	3877	5183	8406
Timber formwork	Plywood, formwork, 19mm thick	60	67	61	64	64
	Sawn hardwood, 25mm thick plank	1504	2140	2023	2452	2666
uPVC lined GMS pipes	20mm diameter pipes, 5.5 long	166	170	170	166	n.a.
uPVC pipes	32mm diameter pipes, 4m long (HK\$ per	42	40	41	39	42

Note 1: Prices from January 2005 onwards are not directly comparable to those published which included delivery charges.

Note 2: Prices are based on June data from 2004 to 2007 and in Hong Kong dollars.

Source: Average Wholesale Prices of Selected Building Materials, Census and Statistics Department, Hong Kong Special Administrative Region (Contact person: Miss Kwan, Telephone: 852-2805-6413).
Web-site: <http://www.censtatd.gov.hk> (Products and Services - Publications - Commerce and Industry - Average Wholesale Prices of Selected Building Materials).

Table 3.5.2 - Average Wholesale Prices of Selected Building Materials

3.5.3 Average Sectoral Wages per Month

There is no data on the average monthly sectoral wages for the construction industry. In the following table, the FIRE (financing, insurance, real estate and business services) is used instead for comparison with the manufacturing and personal services sectors.

(Unit: HK\$ per month)

	Financing, insurance, real estate and business services	Manufacturing	Personal services
2001 Sept	10896	12175	6336
2001 Dec	11845	12106	6183
2002 Mar	10544	11837	6225
2002 June	10557	11922	6247
2002 Sept	10627	12243	6148
2002 Dec	10564	11769	6089
2003 Mar	10561	11433	6051
2003 June	10985	11405	5971
2003 Sept	10574	11648	5983
2003 Dec	10446	11566	5897
2004 Mar	10028	11548	5809
2004 June	9918	11794	6033
2004 Sept	9605	11173	6338
2004 Dec	9786	11483	6071
2005 Mar	9996	11486	5993
2005 June	9472	12054	5917
2005 Sept	9722	11254	5852
2005 Dec	10039	11663	5963
2006 Mar	10055	11867	5859
2006 June	9946	11912	6021
2006 Sept	10222	12079	6018
2006 Dec	10702	12050	6120
2007 Mar	10987	12003	6314
2007 June	11430	11767	6521
2007 Sept	11228	11828	6699
2007 Dec	11155	11917	6746

Note 1: The average sectoral wages are extracted from the table of "Average Wage Rates by Industry Sector, Broad Occupational Group".

Note 2: All the average monthly salaries are extracted from "Supervisory, technical, clerical and miscellaneous non-production workers" sections under the FIRE, Manufacturing and Personal services groups.

Source: *Hong Kong Monthly Digest of Statistics*, The Census and Statistics Department, Hong Kong Special Administrative Region.

Table 3.5.3 - Average Sectoral Wages Per Month

3.5.4 Construction Industry Salaries and Wages –Technicians and Unskilled Workers

Whilst the material costs have been generally on their rising trend, the average monthly salary of technicians and the average daily wage of unskilled workers in the construction industry have not recovered to their levels in 2003. This lends further support to the argument in Section 5.2 that material cost increase has more to do with the global price increase in commodities than to the slow recovery of the home construction sector.

	Technicians Monthly Salary (HK\$)	Unskilled Workers Daily Wage (HK\$)
2003 June	10985	601.1
2004 June	9918	584.9
2005 June	9472	571.7
2006 June	9946	565.9
2007 June	n.a.	569.9
2008 April	11318	570.8

n.a.: data not available

Unskilled Workers Daily Wage is extracted from "Average Daily Wages of Workers Engaged in Public Sector Construction Projects". Figures are based on the data from "General Workers", which include labourers, excavators, concretors labourers, bricklayer's labourers, plasterer's labourers, heavy load labourers and driver's linesmen.

Technicians Monthly Salary are extracted from "The Supervisory, technical, clerical and miscellaneous non-production workers section" of the "Average Wage Rates by Industry Sector - Financing, insurance, real estate and business services"

Sources: (for unskilled workers' daily wage) Average Daily Wages of Workers Engaged in Public Sector Construction Projects. Census and Statistics Department, Hong Kong Special Administrative Region (Contact person: Miss Lam, Telephone: 852-2887-5207).
(for technicians' monthly salary) Hong Kong Monthly Digest of Statistics, Various issues.

Table 3.5.4 - Construction Industry Salaries And Wages –
Technicians and Unskilled Workers

3.5.5 Construction Industry Salaries and Wages – Construction Professionals

There were some wage increases for certain professionals, but in no way comparable with that of material prices. Between 2004 and 2007, only architects, electrical engineer and personnel manager/ human resources manager/ staff relations manager working in the industry have registered above 20% growth. Their monthly wages increased by 28.3% over two years for the architects, by 24.5% for the electrical engineer and by 31.7% for the last. Administration officer/ executive officer, civil engineer and mechanical engineer also enjoyed a double digit growth in their salaries over the same 2-year period, which were 13.4%, 14.6% and 14.2% separately, and followed by 5.3% for building services engineers, 7.6% for safety officer and 3.9% for I.T./ computer manager. Meanwhile, there was a reduction of 13.8% for financial manager/accounting manager, 7.5% project manager and 6.7% for structural engineer.

(Unit: Median monthly salary in HK\$)

Professionals in Building and construction and related trades	2004 June	2005 June	2006 June	2007 June
Accountant	26900	22900	26900	30200
Administrative Officer / Executive Officer	14900	16900	16900	n.a.
Architect	38500	41600	42600	49400
Administration Manager/ Company Secretary/ Office Manager	23500	n.a.	25600	n.a.
Building Services Engineer	28500	29300	30800	30000
Civil Engineer	28700	28000	30900	32900
Electrical Engineer	30200	30700	32700	37600
Financial Manager/ Accounting Manager	n.a.	54500	44600	47000
I.T./ Computer Manager	n.a.	n.a.	35800	37200
Mechanical Engineer	33200	31900	33800	37900
Personnel Manager/ Human Resources Manager/ Staff Relations Manager	n.a.	n.a.	35000	46100
Project Manager	52200	50900	51300	48300
Quantity Surveyor	28800	28700	29300	28900
Safety Officer	31600	29800	30300	29200
Structural Engineer	26800	21000	27500	25000

n.a. : data not available

Source: Report of Salaries and Employee Benefits Statistics, Managerial and Professional Employees (Excluding Top Management), Wages and Labour Costs Statistics Section, Census and Statistics Department, Hong Kong Special Administrative Region.
 Web-site: <http://www.censtatd.gov.hk> (Hong Kong statistic- Statistical Tables-Subject-Labour - Table 029).

Table 5.5 - Construction Industry Salaries And Wages –
 Construction Professionals

3.5.6 Construction Industry Salaries and Wages – Skilled Workers

The slow recovery of the construction industry seems to have benefited, if only marginally, some senior managers, architects and engineers only. Of all the 32 categories of workers listed below, only 1 of them had their average daily wages increased over 5 years. Only structural steel welders had the positive growth. However, the growth rate was 3.5% over 5 years. The remaining 31 categories of skilled workers have seen their wages go down by 4.5% to 36.5%. The hardest hit are the building services maintenance mechanics. Their average daily wages dipped by 36.5% over 5 years. The categories of workers that suffered double-digit wage reduction over 5 years include nearly all the major trades: concretors, bricklayers, drainlayers, mason, bar benders and fixers, metal worker structural steel erectors, riggers/metal formwork erectors, formwork carpenters, joiners, plumbers, construction plant mechanics, rock-breaking drillers, asphalter, bamboo, plasterers, painters and decorators, leveller, marble workers, electrical fitter, mechanical fitters, refrigeration/AC/ventilation mechanic, fire services mechanic, lift and escalator mechanic and power cable jointer. It seems that the construction boom in Macau has not benefited much local construction workers.

(Unit: Average daily wage in HK\$)

	2003 June	2004 June	2005 June	2006 June	2007 June	2008 Mar
Concretor	1072.4	1026.3	923.5	940.3	948.2	932.8
Bricklayer	971.9	961.3	886.3	840.1	841.3	816.1
Drainlayer	955.6	927.5	874.7	861.9	826.5	814.7
Mason	903.7	849.9	853.2	933.6	925.2	714.6
Bar bender and fixer	1297.4	1225.4	1159.6	1154.0	1142.9	1067.4
Metal worker	890.4	853.1	840.9	822.3	914.2	775.2
General welder	848.9	790.1	783.7	786.6	778.3	783.6
Structural steel erector	1063.1	966.2	961.8	884.8	847.5	897.7
Structural steel welder	879.7	939.0	946.2	920.2	970.7	911.1
Rigger/metal formwork erector	980.7	810.4	724.1	777.7	843.4	829.9
Carpenter (formwork)	1254.0	1146.9	1073.7	1076.9	993.1	986.9
Joiner	1059.2	1029.4	982.1	953.9	926.7	868
Plumber	986.8	933.8	903.3	836.8	798.8	784
Construction plant mechanic	859.8	802.7	807.6	816.5	774.3	724.6
Plant & equipment operator (load shifting)	809.2	784.4	765.6	767.0	761.6	737.7
Truck driver	653.1	604.6	572.5	613.1	591.7	602.6
Rock-breaking driller	889.8	821.0	851.2	781.7	774.3	796.6
Asphalter (road construction)	876.6	715.3	783.9	756.9	913.9	679.2
Bamboo scaffolder	1164.6	1077.3	1089.1	1108.3	1076.7	1033.5
Diver	1725.2	1596.4	1687.4	1543.3	1821.1	1647.8
Plasterer	976.1	934.9	883.3	890.3	829.6	802.8
Glazier	895.5	843.2	878.2	770.0	751.9	811.7
Painter and decorator	907.7	878.4	853.6	791.2	753.0	740.6
Leveller	771.0	757.9	700.3	726.7	715.4	686.2
Marble worker	1132.7	1003.2	969.2	826.1	866.6	942.4
Electrical fitter (incl. electrician)	794.6	763.7	742.0	715.1	727.7	678.8
Mechanical fitter	764.2	752.5	705.1	589.1	666.0	683.8
Refrigeration/AC/ventilation mechanic	675.9	685.1	659.3	595.4	638.4	591.4
Fire services mechanic	797.6	762.7	758.2	737.8	788.6	710
Lift and escalator mechanic	769.1	785.7	820.8	815.7	804.5	655.1
Building services maintenance mechanic	987.2	728.9	852.9	743.7	537.5	626.4
Power cable jointer	575.0	725.6	831.3	600.0	600.0	479.3

Source: Average Daily Wages of Workers Engaged in Public Sector Construction Projects, Census and Statistics Department, Hong Kong Special Administrative Region (Contact person: Miss Lam, Telephone: 852-2887-5207).

Table 5.6 - Construction Industry Salaries And Wages –Skilled Workers

3.6 IMPORT AND EXPORT OF CONSTRUCTION SERVICES

3.6.1 Annual Import/Export of Construction Services

Latest statistics on import and export of services can be found on "Report on Hong Kong Trade in Services Statistics for 2006" which is freely downloadable from the government web-site (<http://www.statisticalbookstore.gov.hk/en/index.html>). However, the construction sector is described as one of the sectors which have less significant amount of TIS (Trade in Services) transactions". There is not much import of construction services because the great majority of construction works are done by "local" firms. However, that doesn't imply discrimination against

foreign contractors as the next paragraph will explain. Neither is there much export of construction services, because indigenous local contractors are generally active in the traditional building construction sector, and they may not have the competitive advantages to compete in international markets yet.

Hong Kong has been consistently ranked the top in the Index of Economic Freedom for 14 consecutive years ever since it was first co-published by The Heritage Foundation and The Wall Street Journal in 1995. Hong Kong being the freest economy in the world, the local government does not differentiate between foreign and local contractors. Announcing with a Technical Circular (*Works Branch Technical Circular No. 9/97: Rules for the Administration of the List of Approved Contractors for Public Works, 26 May 1997*), the government has abolished since 1997 the differentiation between foreign and local contractors eligible to tender for public works. From then on, both foreign and local contractors have been subject to the same sets of criteria, rules and regulations. Once registered, they are all "local" firms, and, by definition, their services are rendered locally and not "imported". There is no statistics on the origin of the contractors, and hence there is not much "importation" of construction services except for those one-off special cases when construction services have to be procured on an *ad hoc* basis.

The exports and imports of services are listed below:

Major Service Group	Year	Export of services			Import of services			Net export of services
		HK\$ million	Share ³ (%)	Year-on-year % change	HK\$ million	Share ³ (%)	Year-on-year % change	HK\$ million
Construction services ¹	2003	3968	3.4	48.2	3110	2.7	13.9	858
	2004	2941	2.7	-25.9	2697	2.5	-13.3	244
	2005	2436	2.3	-17.2	2122	2.0	-21.3	314
	2006	2083	1.9	-14.5	1872	1.7	-11.8	211
Architectural, engineering and other technical services ²	2003	590	-	74.0	207	-	32.7	383
	2004	929	-	57.5	246	-	18.8	683
	2005	1035	-	11.4	283	-	15.0	752
	2006	1191	-	15.1	306	-	8.1	885

¹Construction services include "(g)eneral construction work (including new work, additions and alterations, repair and maintenance) and installation work at sites, buildings and structures that usually lasts for less than one year".

²Architectural, engineering and other technical services include "(a)dvisory architectural services; architectural design services; contract administration services; advisory and consultative engineering services; engineering design services for construction projects or industrial processes; and urban planning and landscape architectural services".

³Share (%) is the share of export (or import) in total "building and construction".

Sources: *Report on Hong Kong Trade in Services Statistics for 2006*, p.21.
2006 Gross Domestic Report, p.41

Table 3.6.1 – Annual Import/Export of Construction and Consultancy Services

There is not much import nor export of construction services, though Hong Kong managed to have a positive net export of services between 2003 and 2006. In 2006, there were HK\$2083 million and HK\$1872million worth of construction services exported and imported respectively, resulting in a net export of services worth HK\$211 million. The value of exported construction services represented 2% – 3.4% of the total "Building and Construction" only in the years 2003 - 2006, or a mere 0.36% of the total value of all exports of services in 2006.

On the other hand, there is an increasing trend of export of Architectural, engineering and other technical services. The value increased to HK\$1,191 million in 2006. In that year, the total value of "Building and Construction" was HK\$105,960 million. If we assume that professional fees amounted to 3% of the value, the consultancy fees would be HK\$3,179 million. Compared to HK\$3,179 million, the HK\$1,191 million earned from export of services amounted to more than 30%. In Hong Kong, architects, engineers and other professionals appear to have relied on export of services much more than the contractors. It has been commented that professional skills and expertise, which have their origins from the British institutions, have been much treasured by China Mainland, Dubai, India and other South East countries. In Hong Kong professionals seem to have more exportable advantages than building construction firms.

3.6.2 Top 5 Countries for Construction Import/Export

The sources of imports and destinations of exports of construction and consultancy services are summarised in the following table.

Major service group/Region	Year	Export of services	Import of services	Net export of services
		HK\$million	HK\$million	HK\$million
<i>Construction services</i>	2003	3968	3110	858
	2004	2941	2697	244
	2005	2436	2122	314
	2006	2083	1872	211
Asia	2003	3737	2749	988
	2004	2941	2166	775
	2005	2330	1959	371
	2006	2054	1787	267
Australasia and Oceania	2003	<0.5	**	**
	2004	<0.5	**	**
	2005	**	<0.5	**
	2006	<0.5	<0.5	<0.5
Central and South America	2003	**	**	**
	2004	<0.5	<0.5	<0.5
	2005	<0.5	<0.5	<0.5
	2006	<0.5	<0.5	<0.5
North America	2003	12	**	**
	2004	<0.5	**	**
	2005	**	**	**
	2006	**	**	**
Western Europe	2003	**	**	**
	2004	<0.5	**	**
	2005	<0.5	**	**
	2006	<0.5	**	**
Others	2003	<0.5	<0.5	<0.5
	2004	<0.5	<0.5	<0.5
	2005	<0.5	<0.5	<0.5
	2006	**	<0.5	**
<i>Architectural, engineering and other technical services</i>	2003	590	207	383
	2004	929	246	683
	2005	1035	283	752
	2006	1191	306	885
Asia	2003	491	93	398
	2004	780	154	626
	2005	913	166	747
	2006	1036	195	841
Australasia and Oceania	2003	2	2	<0.5
	2004	**	**	**
	2005	6	**	**
	2006	**	4	**
Central and South America	2003	<0.5	<0.5	<0.5
	2004	<0.5	<0.5	<0.5
	2005	<0.5	<0.5	<0.5
	2006	<0.5	<0.5	<0.5
North America	2003	43	7	36
	2004	107	44	63
	2005	52	16	36
	2006	**	26	**
Western Europe	2003	48	**	**
	2004	4	42	-38
	2005	22	82	-60
	2006	26	76	-50
Others	2003	7	**	**
	2004	**	**	**
	2005	43	**	**
	2006	64	5	59

** Data suppressed for confidentiality reason

Sources: *Report on Hong Kong Trade in Services Statistics for 2006*, p.34.

Table 3.6.2 – Source/Destinations of Import/Export of Construction & Consultancy Services

Most of the import and export services are carried out within the Asian region, with the Chinese Mainland taking the highest percentage. The major services were project management, contracting and engineering consulting. Export of construction services to regions outside Asia is negligible.

However, consultants have generated some revenues from places outside Asia. For the other regions, which include countries/ territories of Commonwealth of Independent States and Eastern Europe, Middle East and Africa, they generated HK\$64 million from these regions in year 2006. That was about 5% of the total revenues they got from exporting their services. As the Gulf economies prospered due to increasing oil prices, the Middle East has become an emerging export market for Hong Kong's construction services. However, Western Europe is the second largest sources of imports of consultancy services. In the year 2006, Western Europe imported 25% of all the services.

Many Asian countries (e.g. India and Vietnam), which have recovered from the financial crisis, would like to continue upgrading their basic infrastructure, road networks, port facilities, housing and city planning. Some are seeking alternative production bases. Private participation is on the rise. More foreign firms are allowed to participate as investors in the ownership and also participate in the management of these projects. For example, the Hong Kong Mass Transit Railway Corporation (MTRC), listed on the Hong Kong stock exchange, earlier 2008 won a major engineering and project management contract in the construction of the Delhi Airport Metro Express Line (AMEL).

Middle East is another booming market. According to the Middle East Business Intelligence (MEED), the value of infrastructure projects planned or underway in the Gulf Cooperation Council countries (GCC - with Saudi Arabia, the United Arab Emirates, Kuwait, Bahrain, Qatar, and Oman as its members) amounted to over US\$1,600 billion as of January 2008. Of that amount, the UAE led the league by having US\$706 billion worth of projects, followed by Saudi Arabia (US\$399 billion), Kuwait (US\$275 billion), Qatar (US\$157 billion), Oman (US\$51 billion), and Bahrain (US\$28 billion).

Seeing these opportunities, more Hong Kong construction companies are active in the Middle East construction market. For example, Wai Kee Holdings, a Hong Kong contractor, formed a strategic alliance with a UAE contractor, Arabian Construction Company, and have been jointly awarded some projects. A Hong Kong construction company, Paul Y, was awarded the contract worth US\$77 million to build the Arraya Office Tower in Kuwait, a 54-storey office tower due for completion in July 2008. Another Hong Kong construction company, Chun Wo Development, which also has a property development arm, has purchased two pieces of land in Abu Dhabi (the capital city of the UAE) for residential development.

4. Outlook of the Construction Industry

Since the later 1990's, the number of new constructions in Hong Kong have been recorded with a downward tendency. To drive up the construction activities, many major infrastructure projects were

announced, many of which have had their details published and tenders are expected to be released soon.

1. Hong Kong-Zhuhai-Macau Bridge

The 29.6km-Bridge will connect Hong Kong, Zhuhai and Macau in a "Y" shape. Under the current plan, the six-lane bridge will have two reclaimed islands built, with a tunnel passing underground of the islands in order to ensure sea vessels to pass through smoothly in the Pearl River Delta ports.

Hong Kong, Guangdong and Macau have agreed to mutually fund the construction of the Hong Kong-Zhuhai-Macau Bridge at the 11th Plenary of Hong Kong-Guangdong Co-operation Joint Conference in Guangzhou in August 2008, which will also see a contribution from the Central Government and the construction of the bridge will start by 2010. Boundary crossing facilities and link roads to the bridge will be funded by each jurisdiction within their boundaries. The projects financing will be in the form of BOT (build-operate-transfer) with the three governments filling the funding gap. Hong Kong will contribute 6.75 billion yuan (43% of the contribution) with the Guangdong-Central Government contribution of 7 billion (44.5% of the contribution), while Macau will pay 1.98 billion (12.5% of the contribution). The three sides' total contribution will be 15.73 billion yuan or 42% of the bridge's construction cost. The remainder will be financed by bank loans. The other large-scale cross-boundary infrastructure will be pushed forward by Hong Kong and Guangdong. The three sides agreed to share the subsidy amount by adhering to principle of equalisation of cost-to-benefit ratios which takes into account the economic benefits to each side. Hong Kong would be responsible for 50.2%, the Mainland 35.1% and Macau 14.7%.

2. Express Link

2.1 West Island Line

The construction of MTR West Island Line will extend the existing MTR Island Line from Sheung Wan to Kennedy Town, via Sai Ying Pun and University. The 3-km extension is expected to commence in 2009. The estimated project cost of West Island Line is about HK\$8.9 billion.

There will be funding support of approximately HK\$6 billion required from HKSAR Government to bridge the funding gap of the railway project. As there is no suitable site along West Island Line alignment for property development, the Government will provide funding support in the way of capital grant in two stages, which is commonly adopted for public works funding in Hong Kong. The first stage funding support expected later will cover the expenditure of the design phase. The second stage funding support covering the funding gap arising from the construction is expected after the completion of the detailed design when a more accurate estimate of the project cost is available. The project will bring substantial economic, social and environmental benefits to the community of HK\$44 billion over 40 years of operation and generate about 3,000 employment opportunities. While capital grant will connect the funding gap of the project, the Government will consider the most viable alternatives for funding each railway project on a case-by-case basis.

2.2 South Island Line (East)

The South Island Line (East) will run from South Horizons, via Lei Tung, Wong Chuk Hang and Ocean Park, to Admiralty. The 7-km extension will be connected with the existing MTR network. The estimated cost of the extension is over HK\$7 billion. It is expected to commence in 2011 and complete in 2015.

To bridge the funding gap of the project, the MTR Corporation suggests adopting 'rail plus property model'. An integrated planning and development approach at station and depot sites will create the communities with a higher quality living and facilitate the rejuvenation of Wong Chuk Hang which will generate more economic activities.

2.3 The Guangzhou-Shenzhen-Hong Kong Express Rail Link

The Guangzhou-Shenzhen-Hong Kong Express Rail Link is a 142 km high-speed rail link. It will run from Shibi in Guangzhou, via Humen in Dongguan and Longhua and Futian in Shenzhen to the West Kowloon Terminus in Hong Kong. The Express Rail Link will connect to the new high-speed national rail network which is being developed, including the Beijing-Guangzhou and Hangzhou-Fuzhou-Shenzhen Passenger Lines.

The Hong Kong section will be from the boundary to the new terminus located in West Kowloon which is 26 km long. The construction of the project is expected to start in 2009 and complete in 2014/2015.

The HKSAR Government's decision is to adopt the Concession Approach. Under the Concession Agreement, the cost of the project will be funded by the HKSAR Government. The MTR Corporation will be assigned to the design and construction of the project. After the completion of the Express Link, it will be operated by the MTR Corporation under a service concession agreement and the MTR Corporation will pay concession payments to the Government.

3. Hong Kong-Shenzhen Joint Development of the Lok Ma Chau Loop

The Lok Ma Chau Loop, an area near the Hong Kong-Shenzhen border, is being studied to develop it to the cities' mutual benefit. The coordination body, the Hong Kong-Shenzhen Joint Task Force on Boundary District Development, has been established recently for the purpose. The Task Force has already announced that a border-crossing to be established in Liantang, the northeastern part of Hong Kong. Hong Kong and Shenzhen decided to appoint academic institutions to collect public views on the future development of the Loop at the joint task force's first meeting in March.

4. Kai Tak Cruise Terminal

Kai Tak cruise terminal will be constructed at the site of the former Kai Tak Airport to help Hong Kong become a regional cruise hub.

The Government has announced on 9 July 2008 the plan to re-tender the cruise terminal project at Kai Tak. The successful tenderer is expected to design, build, operate, manage and maintain the new cruise terminal for 50 years. The Government issued an open land tender for the new cruise terminal project in November 2007, which closed in March 2008. Two submissions were received, but they did not fully conformed with the requirements laid down in the tender document.

As the cruise market will bring the substantial economic benefits to Hong Kong, the Government decided to seek the approval of the Legislative Council to fund the site formation works for, and the construction costs for government facilities in, the cruise terminal project. The Government will seek the approval in the fourth quarter of 2008 and will re-tender the site by the end of 2008 with the aim

of awarding the tender by the third quarter of 2009. The first berth of the new cruise terminal is expected to start operations by the second quarter of 2013.

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The RCCREE is the Hong Kong Polytechnic University Centre for solution oriented research and consultancy in construction and real estate economics. It undertakes internationally relevant multi-disciplinary research that supports the advancement of the construction and real estate industries in the following areas: Economic Policy and Institutional Analysis, Real Estate Economics, Construction Economics, Housing, Human Behaviour in Economic Decision making, and Value Management and Facilities Performance. For further information, please contact Professor Francis K.W. Wong, Director of RCCREE (bskwwong@polyu.edu.hk) or Professor Eddie C.M. Hui, Deputy Director (bscmhui@polyu.edu.hk).

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THEME PAPER: IMPROVEMENT OF THE PRODUCTIVITY OF THE CONSTRUCTION INDUSTRY

1. EXECUTIVE SUMMARY

A productive and competitive building and construction industry is of critical importance to promoting the economic growth of Hong Kong. This paper explores the three main facets of construction productivity: (I) The status quo of the construction productivity and the contribution of the construction industry to Hong Kong's GDP, with a discussion on the different ways of estimating productivity performance as well as the causes of low productivity. (II) Measures to improve the productivity of the construction industry in light of the report by the Construction Industry Review Committee (CIRC). (III) Future development with suggestions of what remains to be done by the Construction Industry Council (CIC) to implement the 109 recommendations made by CIRC, and how these can be achieved.

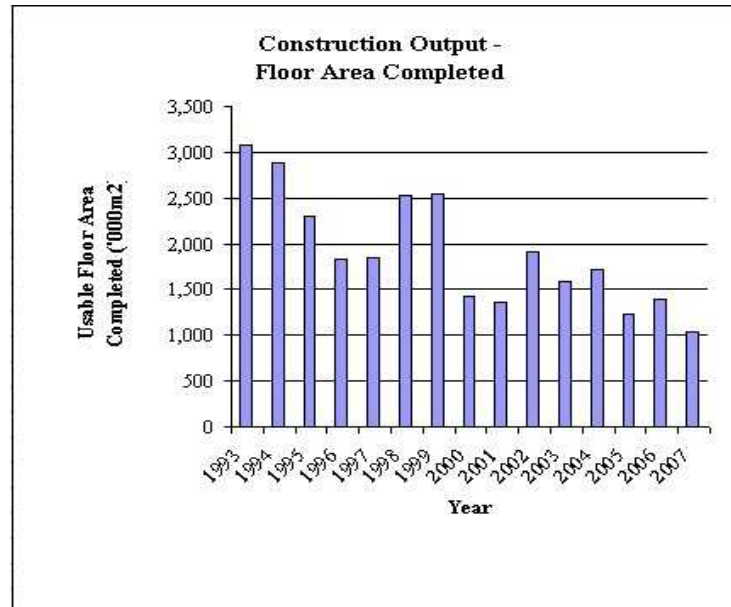
The objective of the paper is to depict the general situation in construction productivity in Hong Kong by exploring reasons of low productivity and proposing practicable measures for improvements. It is imperative to improve construction productivity for creating and sustaining a built environment that is conducive to fostering economic growth and raising quality of life.

2. STATUS QUO OF CONSTRUCTION PRODUCTIVITY

Construction Productivity

The construction industry is of critical importance to the growth and success of the Hong Kong economy (Leung et al, 2004). Due to the large size of the construction industry, productivity changes within it have significant direct effects on the overall productivity and economic well-being of the territory. Stoeckel and Quirke (1992) estimated that a 10% lift in productivity in construction would boost GDP by 2.5%. In 2006, Hong Kong's nominal Gross Domestic Product (GDP) was HK\$ 1,476 billion, of which HK\$ 39 billion or 2.6% was spent on construction activities. Meanwhile, it accounted for 32.9% of Gross Domestic Fixed Capital Formation (GDFCF). About 8% of the total workforce was employed by the construction industry in that year.

Measuring productivity can be straightforward in concept, taking consideration of input and output—Manpower, Management, Materials, Money and Machines (Olomolaiye, 1998). It can be expressed as: $\text{Productivity} = \text{Output} / \text{Input}$. In a previous AsiaConstruct Report (2003), construction productivity (production) was estimated in terms of floor areas completed. In spite of fluctuations, there has been a tendency of decrease in productivity over the years, especially after financial crisis in 1997.



Source: Census & Statistic Department, Hong Kong

However, the productivity indicator can also be estimated in many other ways and/or in different units, such as square meter per man-day, or square meter or million dollars of construction per person. The practical measures of productivity include labour productivity, labour efficiency and plant productivity. So far, there has been no consistency in measurement of productivity by the industry or academia.

According to a study commissioned by the *Hong Kong Construction* in 1999, there has also been a slight year-on-year decrease, as a long-term average, in the growth of the total factor productivity of the local construction industry since 1972 (CIRC, 2001). The local construction industry is fragmented with an adversarial culture. There are a small number of large local contractors while most local construction companies are small in size (HKTDC, 2001). Local construction activities are also regarded as 3-Ds: dangerous, dirty and demanding. In 2007, 18.9% of all industrial injuries were from construction activities, of which 76% were fatal (Census and Statistics Department, 2008). Additionally, labour-intensity, an under-developed subcontracting sector, lack of buildable designs, and inadequate automation are all the myriad of factors that exercise adverse influence over construction productivity.

Enhancing Construction Productivity

Improving productivity is a major concern of the construction industry on facilitating the effective and efficient conversion of resources into marketable products, and consequently improving business profitability. It can also help to minimize or optimize project durations and improve construction site process efficiency.

In April 2000, the Chief Executive of the Hong Kong Special Administrative Region formed the Construction Industry Review Committee (CIRC) to review the current state of the industry and recommend improvement measures. The Committee has proposed a large number of improvement measures aiming for better performance of the industry, including construction productivity. There were also recommendations on certain areas which, if carried out, would improve the existing tendering process and procurement logistics.

In April 2007, the then Environment, Transport and Works Bureau (now re-organized as the Development Bureau), in conjunction with the newly established Construction Industry Council (CIC), released the progress report, with their comments, on the follow-up actions taken to implement the CIRC recommendations. A full picture of the up-to-date progress of implementation actions and time frame can be browsed at the CIC website (www.hkcic.org).

3. MEASURES TO IMPROVE THE PRODUCTIVITY OF THE CONSTRUCTION INDUSTRY:

Observance of the Law - Improved Security of Payment to Contractors and Subcontractors

Good cash flow management is essential to the success of contractors and subcontractors. The prospects of prompt payment for completed work offer a strong incentive to contractors and subcontractors to deliver quality service, as well as establishing the fair market. However, the locally "pay-when-paid" and "pay-if-paid" arrangements are common in the local industry. There is much room for improvement in the area of security of payment to contractors and subcontractors.

The following good practices over project payment were promoted widely in the industry (CIRC, 2001):

- (a) Project requirements should be clearly defined to reduce payment uncertainty;
- (b) Adequate rules for measurement and valuation should be agreed and observed;
- (c) Pre-pricing of variations, wherever practicable;
- (d) Payments to contractors and subcontractors should be made within the periods stated in the contracts;
- (e) Retention should be released at the times specified in the contract;
- (f) The use of bonds or parent company guarantees should be considered to release retention monies to subcontractors where work is completed well before the completion of the main works;
- (g) Main contractors should only deduct discount when their contracts permit it;
- (h) Final account preparation should proceed throughout the contract period and not be left until completion. In any case, it should be completed promptly upon the completion of the contract;
- (i) Settlement of the final account and payment of monies due should be made within the period given in the contract;
- (j) Subcontractors' work schedule and co-ordination obligations should be set having regard to a clear overall programme for the project; and
- (k) Obligations regarding the protection of work should be reasonable.

CIRC has been monitoring the progress of implementation. To enhance the security of payment to subcontractors and workers, the Housing Authority (HA) also introduced new contractual requirements for building contracts in May 2006 and extended such requirements to demolition contracts in September 2006. The requirements include engaging designated labour relations personnel, paying wages through auto pay and employer's direct payment to workers in proven cases of default. Imposition of on-demand bonds will be applied to all HA new works contracts to address cases where main contractors are in liquidation or under petitions for winding up. Although some discussion has been in place for legislation of payment security as being practiced in other countries (such as Australia, New Zealand, Singapore and the UK), it remains to be seen whether the local industry would adopt such a move (Lam and Wong, 2007).

Aiming at streamlining the procurement practice, the ETWB promulgated a set of guidelines on the selection of procurement route for public works projects in October 2004. For public housing projects, HA has awarded a contract for piloting on "Modified Guaranteed Maximum Price Contracting" for completion by 2009.

Improving Relationship between Contractors and Subcontractors

The subcontracting segment of the industry needs recognition and development in order to be attractive to the next generation of construction workers. The development of sub-contractors is crucial to worker development and welfare, as well as productivity and quality standards for the future. The CIC can play an active role in the development of their subcontractors. Meanwhile, contractors could assist in raising the performance standards of their subcontractors through the following measures (CIC, 2007):

- (a) Incorporating quality considerations in selecting subcontractors;
- (b) Nurturing stable partnerships with subcontractors of a good standing through feedback and review in the pre-contract and post-contract stages;
- (c) Enhancing the transparency of the subcontracting process by means of written contracts with each subcontractor, clearly setting out the mutual obligations and responsibilities;
- (d) Fostering fair dealings with subcontractors; and
- (e) Improving security of payment to subcontractors.

Human Resources

With labour being a major influential factor in the construction productivity, the level of productivity is directly related to the "driving, induced and restraining forces acting upon workers" (Maloney, 1983). If innovative technology in the construction industry is to be adopted, construction labour force should be able to catch up through readily acquiring the necessary skills. More effective utilization of a large pool of narrow-skilled and core multi skilled workforces can result in higher productivity on some projects (Olomolaiye, 1998).

In Hong Kong, the Construction Workers Registration Authority was established in 2004 to administer the implementation of the Construction Workers Registration Ordinance. It is a mandatory construction workers registration system which is expected to substantially benefit the construction industry. All the construction craftsmen working on the site are required to register, and there are different layers of trade test achievements, such as

- (a) Trade test for Construction Craftsmen;
- (b) Trade test for Electrical and Mechanical Workers;
- (c) Intermediate trade test for semi-skilled construction craftsmen;
- (d) Intermediate Trade test for Semi-skilled electrical and Mechanical Workers;
- (e) Certification for workers on Gondola and Builder's Lift Operation;
- (f) Certification for Construction Crane Operation;
- (g) Certification for Load shifting Machine Operation.

In Singapore, multi-skilling of workers was introduced by the government, as part of its programme to improve the productivity of the construction industry and reduce its reliance on foreign workers (BCA and MOM, 2003). Under the new rules, workers would need to have full skill certifications in two related trades to qualify for the lower levy payable by employers of certified skilled workers. It is suggested that Hong Kong Construction Workers Registration Authority (CWRA) should consider adopting similar rules so as to minimize workers' ineffective activities and increase their productivity.

In the meantime in Hong Kong, training on assembly type skills should be stepped up, since these will be needed as the level of prefabrication goes up, whilst basic craft skills such as plastering and tiling should still be improved to ensure quality works. Skill enhancing courses and foremen training should be introduced as part of continuous training.

Increase in the Volume of Construction

Figure 1 above shows there has been a significant decrease in construction output after the Asian financial crisis in 1997, estimated in terms of floor areas completed. The volume of construction in Hong Kong, and hence the business opportunities, have remained very limited, although there is a strong potential for Hong Kong firms to go into new business in the Mainland market. By combining expertise in accounting, financing and legal services with construction expertise, the construction sector can provide a comprehensive service package to Hong Kong developers undertaking property development in the Mainland. Efforts have been made by the Works Bureau and the Hong Kong Trade Development Council in promoting the export of Hong Kong's construction services to the Mainland market and elsewhere.

Improvement in the Efficiency of Work Execution on Construction Sites

There should be wider use of prefabrication and other buildability measures. Prefabrication coupled with the use of standardized and modular components will contribute to improved buildability and associated efficiency gains. The Housing Authority (HA) has adopted prefabrication since the mid-1980s. Precast concrete facades are now a mandatory requirement for all standard public housing blocks. A variety of other prefabricated building components such as precast concrete structural elements and panel wall partitions have also been tried out. Whilst the HA's experience has confirmed the benefits of prefabrication, it also demonstrates that prefabrication requires a sufficiently large scale of operation to be cost-effective.

The Buildings Department (BD) issued a Joint Practice Note in February 2002 to promote the use of non-structural prefabricated external walls through exemptions from gross floor area and/or site coverage calculations, followed by a code of practice on the design, construction and quality control of precast concrete construction in November 2003. More recently, the ETWB has launched a database on its website to promote the wider use of standardized components and practices (CIRC, 2007).

Buildability is a term more often heard in Singapore than in Hong Kong. As design and construction still remain predominantly separate functions, developers' drive and designers' attention to buildable designs will have significant impact on site construction methods and their efficiency. The Building & Construction Authority in Singapore has publicised the concept of "buildability", which focuses on the 3S Principles of Buildable Design in their assessment scheme. These principles are: (i) standardization – repetition of grids, sizes of components and connection details; (ii) simplicity – use of uncomplicated building construction systems and installation details; and (iii) single integrated elements – those that combine related components together into a single element that may be prefabricated in the factory (BCA, 2005). Being inspired by the Singapore approach, a research team at the Hong Kong Polytechnic University has worked on a Buildability Assessment Model to enable benchmarking of the buildable designs in Hong Kong (Lam et al, 2006).

Information Technology

The construction industry is information-intensive. To maximize the benefits of IT and to achieve significant productivity gain through improved information flow across processes and disciplines, the industry should give priority to setting common standards and developing a common data infrastructure for seamless electronic communication among stakeholders. A number of initiatives have been undertaken by the Hong Kong Government which with an objective of the development of a common platform for electronic communication in the industry. Such initiatives include the ongoing consultancy study on the alignment of planning, lands and works data; the consultancy study on CAD standard for drawings for works projects; and the feasibility study commissioned by the Buildings Department on the development of an electronic system for building plan submission and document management. The conversion scheme to digitalize the building plans kept by the Buildings Department is already in use.

Whilst setting priority areas for software development were completed, more follow-up actions include: (a) Raising information technology literacy of the construction industry. Some measures have been pioneered by the Government, but yet to be rolled out by CIC for the private sector to adopt; (b) Wider adoption of IT including the feasibility study of electronic checking of building plans, and a common platform for electronic communications within the local construction (CIC, 2007).

Improving Construction Management

Past studies found that poor management was responsible for over half of the time wasted on a job site (Business Round Table, 1983). Good management is required for profitability and success. Scientific management covers responsibility for employing, training and equipping workers for construction project in order to achieve optimum productivity through proper plans, control and coordination of resources (Olomolaiye, 1998).

Hong Kong construction industry should aim to make the high standards of Japanese construction management commonplace. Japan has done comprehensive research and set the good example for other countries. For example, more building sites in Hong Kong have adopted the "5S" approach in tidying up site environment for improving work efficiency. This workplace management concept originated in Japan and represents 'organization', 'neatness', 'cleanliness', 'standardization' and 'discipline'. A tidy and ordered work environment can significantly contribute to high efficiency and productivity (OSHC, 2008)

Construction Automation Initiative

Construction in developed countries is leaning towards full or semi-automation in the construction process, although much of it is still in the developmental stage. This could be a long term objective to implement more automated processes as and when the technology is available and affordable. As our contractors get more sophisticated and as more design and build contracts are anticipated, the scope for automation is likely to increase. In the meanwhile efforts to promote mechanization, especially at the subcontractor's level should continue (BCA, 2005).

The use of IT has found its ways into building automation in a number of ways. Recently, seamless co-ordination of temporary works and plant/worker operation can be achieved through the application of virtual prototyping, which has hitherto been used in aircraft manufacturing. The use of Building Information Modelling (BIM) has also automated design activities such as sun-shade analysis, structural behaviour simulation, as well as clash detection. This suite of techniques can also be extended to beneficial use at the facilities management stage.

4. FUTURE DEVELOPMENT

All the measures have been formulated and implemented to promote an efficient, innovative and productive industry. Various measures and suggestions have been proposed to achieve better performance. The improvements in productivity and efficiency are expected to enhance our global competitiveness, providing us with a more promising outlook of business opportunities.

Through the joint effort of Government and the industry, substantial progress has been achieved on the remaining 109 CIRC recommendations, of which some are related to productivity improvements:

- (a) Process re-engineering to achieve better integration;
- (b) Facilitating regulators;
- (c) Achieving Clear accountability within parties;
- (d) Nurturing a Professional Workforce;
- (e) Export potential of the construction industry;
- (f) Achieving Value in Construction Procurement;
- (g) Wider use of standardization in component design and processes;
- (h) Wider use of prefabrication;
- (i) Wider application of information technology (IT) in project implementation, and
- (j) Investment in construction-related R&D.

Further measures on productivity improvement include: more integrated supply chains with longer term relationship that would encourage learning and continuous improvement; partnering between clients and the industry; adoption of best value principles that balance quality and cost, and procurement practices that incorporates consideration of life-cycle costing. The public sector should take a lead in: (i) the use of 'Alternative Dispute Resolution' to minimize legal disputes; (ii) the mandatory registration of sub-contractors to enhance site supervision; and (iii) the development of a productivity research strategy. Last but not least, there could be closer links between universities and the industry on research (CIB, 2005).

5. CONCLUSION

Construction productivity is of critical importance to the growth and success of the Hong Kong's economy. The productivity issue has therefore to be considered and addressed from all angles. For the purpose of improving productivity, it is necessary to renovate the industry structure as well as improve construction management at industry, corporate and project levels.

The paper has described the states quo of the construction productivity, measures to improve it, and future development. The successful implementation of the productivity measures will improve the industry's competitiveness significantly, enabling it to look beyond the borders of Hong Kong to find new business opportunities. Additionally, with the opening of the Mainland market and the need for extensive infrastructural development there, Hong Kong has strong potential to develop into an infrastructure service integrator for the Mainland market. To capture these opportunities and to compete successfully, the construction industry must move swiftly forward with its reform programme (CIRC, 2001).

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