

An Annual Report of the Construction Industry of China Hong Kong

2008-2009

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).

October 2009

COUNTRY REPORT

[As at September 2009, 1.00 MYR = HK\$ 2.2; US\$ 1 = HK\$ 7.75]

1. EXECUTIVE SUMMARY

The knock-on effect of the financial tsunami took its toll on the economy of Hong Kong, which had been going downturn in the second half of 2008. Statistics available from the website of the Census and Statistics Department (2009) show that nominal GDP growth rate in 2008 was 3.8% compared with the year before. However, the year-on-year change was -2.2% in the second quarter of 2009. In the construction sector, the net output decreased by 7.0% in the first quarter of 2009 when compared with the same quarter of 2008. However, benefiting from stimulus measures by the Mainland and local authorities, the Hong Kong economy started to rebound since the second quarter of 2009.

In the labour market, the unemployment rate was 2.3% in April – June of 2009. However, the construction industry is hardest hit: its unemployment rate was whopping 13.4% during the period. Afterwards, the unemployment rate of the construction sector has been expected to drop slightly, especially in decoration and maintenance works. As the economy went into recession in the first half of the year, wages in construction sector managed to stay basically unchanged, as suggested by the Index of Composite Labour Wages for Building Contracts and the Index of Composite Labour Wages for Civil Engineering Contracts decreased. In view of upcoming series of projects ahead, wages are expected to edge upwards following increase in the demand for workers.

The outlook of the construction industry is also set to be good in the 10 to 15 years ahead. The government has outlined a series of infrastructure projects, for example South and West Island line, Hong Kong-Zhuhai-Macau Bridge and Lam Tin Tunnel. The Keynesian multiplier effects of economic stimulation and employment opportunities are expected to set in when real public money is finally injected into the infrastructure projects. It is anticipated that the construction labour market will be a direct beneficiary of the massive infrastructure programmes.

2. MACRO ECONOMIC REVIEW AND OUTLOOK

2.1 MAIN MACROECONOMIC INDICATORS

	2004	2005	2006	2007	2008
GDP and Components					
GDP in chained (2006) dollars (HK\$ million)	1,287,900	1,139,110	1,475,910	1,569,890	1,607,900
GDP at current market price (HK\$ million)	1,291,923	1,382,590	1,475,910	1,616,215	1,678,500
GDP growth (%)	8.5	7.1	7	6.4	3.8
Primary sector (HK\$ million)	958	947	942	1,009	n.a.
% growth	1.9	-1.1	-0.5	7.11	n.a.
Manufacturing sector	44,455	45,547	45,761	39,319	n.a.
% growth	0.1	2.5	0.4	-14.1	n.a.
Services sector (HK\$ million)	1,119,304	1,207,873	1,297,545	1,431,815	n.a.
% growth		7.9	7.4	10.4	n.a.
Construction sector (HK\$ million)	40,376	38,538	38,688	40,153	n.a.
% growth	-10.1	-4.6	0.04	3.79	n.a.
Demographic Indicators					
Population	6,797,700	6,837,800	6,909,500	6,963,100	7,008,900
Population growth rate (%)	0.5	0.6	1.0	0.8	0.8
Total labour force	3,515,900	3,538,100	3,581,400	3,640,500	3,668,000
Labour force growth rate (%)	1.3	0.6	1.2	1.6	1.0
Unemployment rate (not seasonally adjusted)	6.8	5.6	4.8	4	3.5
Financial Indicators					
Changes in consumer price index (%)	-0.4	1.0	2.0	2.0	4.3
Changes in GDP deflator (%)	-3.5	-0.1	-0.3	3	1.4
Short term interest rate* (%)	0.25	2.88	4.05	2.33	1.13
Long term interest rate** (%)	4.59	3.55	4.83	3.58	3.47
Annual average exchange rate with \$US (HK\$)	7.788	7.777	7.768	7.803	7.783

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

Being adversely affected by the financial crises, the volume of world trade and financial activities suddenly dried up. The contraction of wealth has led to a corresponding tightening of consumer spending as well as corporate investment. In Hong Kong, the GDP decreased by 2.6% in real terms on year-to-year basis in the last quarter of 2008. Worse still, it continued to contract more, 7.8% in real terms on year-to-year basis, in the first quarter of 2009.

Yet, benefiting from the almost miraculous fast growth of the Mainland economy and the stable local consumption, there was a relatively moderate decline of 3.8% in the real GDP in the second quarter of 2009. Stable local consumption may be a consequence of the rebound in the stock and property markets, as well as relief measures by the Government. Meanwhile, inflation continued to come down, following the global trend. There was a mere 1.6% increase in the consumer price index.

There was overt pessimism in labour market in the early 2009 as companies cut wages if not also laying off their workers. The unemployment rate rose to 5.4% in early 2009 from 5.2% a year earlier. The situation may however get better in the second half of 2009 as the Government has started measures to stimulate the labour market. For example they have launched an Internship Programme for University Graduates and commenced some of the mega construction projects to boost employment opportunities for workers and university graduates respectively.

2.2.2 Economy off First Half of 2009

The Hong Kong economy started to rebound in the second quarter of 2009. The Hong Kong Government attributed this to “the faster growth of the Mainland economy and the easing of recessionary forces in the advanced economies” (*Half-Yearly Economic Report 2009*). The contraction of real GDP of 7.8% in the first quarter of 2009 was followed with a lesser decline of 3.8% in the second quarter. Indeed, there was a real GDP growth of 3.3% in the second quarter, when measured on a seasonally adjusted quarter-to-quarter basis. Both the exports of goods and the exports of services have recorded a narrower decline compared with the quarter earlier. There has been an improvement of exports in the Mainland, though exports to European countries or US have not been recovered. With economic recovery in the second quarter of 2009, total employment improved thereby helping to slow down the unemployment rate. With the stronger-than-expected rebound in the second quarter, it is estimated that the GDP in the later half of 2009 will manage to have a narrow decline only.

3. TRADING

3.1 ANNUAL IMPORT AND EXPORT

Volume of import and export decreased in the first half of 2009 compared with a year earlier. The decrease was mainly due to economic downturn of Hong Kong and other countries after the global financial crises.

3.1.1 Value of import and export

Year	Import		Export	
	HK\$ million	Year-on-year % change	HK\$ million	Year-on-year % change
2006	2,599,804	+11.6	2,461,027	+9.4
2007	2,868,011	+10.3	2,687,513	+9.2
2008 (June)	247,196	+1.3	223,223	-0.6
2009 (June)	227,620	-7.9	211,136	-5.4

Source: *External Merchandise Trade Aggregate Figures*, The Census and Statistics Department, Hong Kong Special Administrative Region

Table 3.1.1 Value of import and export

3.1.2 Top 5 major trading countries of import and export in value

(HK\$ Million)

Year	Top 5 major trading countries				
	China	USA	Japan	Singapore	Taiwan
2006	2,349,162	494,699	388,562	213,449	247,024
2007	2,637,984	506,970	406,896	245,225	258,037
2008 (June)	216,056	42,828	35,051	19,903	20,282
2009 (June)	219,129	34,906	29,310	18,262	19,417

Source: *Total trade with ten main countries/territories*, The Census and Statistics Department, Hong Kong Special Administrative Region.

Table 3.1.2 Top 5 major trading countries value

3.1.3 Five major import and export product by value

(HK\$ Million)

5 major products	Import				Export			
	2006	2007	2008 (June)	2009 (June)	2006	2007	2008 (June)	2009 (June)
Electrical machinery, apparatus and appliances, and electrical parts thereof	629,143	740,115	59,167	61,947	13,507	7,917	540	466
Telecommunications and sound recording and reproducing apparatus and equipment	335,208	385,444	31,960	27,101	829	7,910	667	435
Office machines and automatic data processing machines	284,995	249,433	19,251	22,028	-	-	-	-
Miscellaneous manufactured articles	155,158	205,240	17,865	15,694	15,259	16,469	1,063	825
Articles of apparel and clothing accessories	146,439	149,387	13,206	11,460	52,233	38,889	2,344	376
Plastics in primary forms	-	-	-	-	5,060	6,064	528	481

Source: *Domestic Exports of Ten Principal Commodity Division & Imports of Ten Principal Commodity Divisions*, The Census and Statistics Department, Hong Kong Special Administrative Region.

Table 3.1.3 Five major import and export product by value

4. OVERVIEW OF THE CONSTRUCTION INDUSTRY

4.1 COST VALUE OF CONTRACT/ EXPENDITURE

(HK\$ Million)

Type of Contract / Expenditure	2004	2005	2006	2007	2008	2009 Q1
Project value						
Residential building	20085	16947	15500	20613	20064	5160
Non-residential building	17425	17059	13894	17288	17195	3868
Infrastructure	19044	14678	12319	10934	10935	3106
Mechanical and electrical works	13031	36745	29724	29079	36632	3557
Repair and maintenance	23587	17613	14663	14957	16255	8276
Total	93172	103042	86100	92871	101081	23967

Source: *Report on the Quarterly Survey of Construction Output*, The Census and Statistics Department, Hong Kong Special Administrative Region.

Table 4.1 Cost value of Construction Contract / Expenditure

4.2 CONSTRUCTION AND CONSULTANT COMPANIES

4.2.1 Number of contractor by type

Type of contractor	2003	2004	2005	2006	2007
Site formation and clearance, foundation works and combination of site formation, clearance and foundation works	39	45	35	12	26
Erection of architectural superstructures & Combination of pre-erection works, erection of architectural superstructures, and civil engineering construction activities	154	128	116	157	187
Civil engineering construction	128	94	84	90	86
Total	321	267	235	259	299

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

Table 4.2.1 Principle statistics for main contractors at construction sites

4.2.2 Number of consultant by type

Type of consultant	2003	2004	2005	2006	2007
Real estate development or leasing	3084	3276	3351	3037	3134
Real estate maintenance management	431	292	367	543	581
Real estate brokerage and agency	1496	1050	1220	1306	1411
Architect, surveyor and project engineer	1159	1186	1231	1250	1304

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

Table 4.2.2 Number of consultant by type

4.3 EMPLOYEES AND CONSTRUCTION LABOR

4.3.1 Number of construction worker by job type

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 2007.

Table 4.3.1 - Number of workers employed in principal jobs of construction, building and civil engineering and related disciplines

4.3.2 Persons in Establishments

Main industry group	2003	2004	2005	2006	2007
New construction works – Pre-erection works at construction sites	3 932	4 341 (10.4%)	2 004 (-53.8%)	1 790 (-10.7%)	1 865 (4.2%)
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%)	23 886 (-11.5%)
New construction works – Miscellaneous new construction works	9 471	6 305 (-33.4%)	7 274 (15.4%)	9 746 (34%)	9 924 (1.8%)
Decoration, repair and maintenance	21 856	25 117 (14.9%)	21 282 (-15.3%)	24 688 (16%)	20 191 (-18.2%)
Special Trades – Erection and general finishing, electrical and mechanical fitting, gas and water fitting and	57 982	57 836 (-0.3%)	62 524 (8.1%)	72 137 (15.4%)	58 427 (-19%)
All construction activities	124 933	122 077 (-2.3%)	122 870 (0.6%)	135 337 (10.1%)	114 294 (-15.5%)

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

Table 4.3.2 - Number of persons directly engaged in the building and civil engineering establishments

4.4 PRODUCTIVITY

4.4.1 Physical Measurement of Construction Production

(Unit: `000 sq.m.*)

End use of building	2003	2004	2005	2006	2007
Private residential premises+	9 563	8 169 (-14.6%)	6 591 (-19.3%)	6 068 (-7.9%)	5 860 (-3.4%)
Office buildings	596	** (**)	** (**)	945	1 030 (9%)
Hotels and boarding houses	590	654 (10.8%)	794 (21.4%)	587 (-26.1%)	274 (-53.3%)
Multi-purpose commercial premises	1 385	1 471 (6.2%)	1 303 (-11.4%)	890 (-31.7%)	1 156 (29.9%)
Total	12 646	10 964 (-13.3%)	9 502 (-13.3%)	8 624 (-9.2%)	8 529 (-1.1%)

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

Table 4.4.1 - Physical Measurement of Construction Production

4.5 CONSTRUCTION COST

4.5.1 Major construction material average price

As the following table indicates, unit costs of some key materials, in particular galvanised mild steel, metal formwork, steel reinforcement and timber formwork, increased a lot in 2008. However, since 2009, the increases in costs have abated, and the costs of most materials have actually dropped. For example, the unit costs of galvanised mild steel and steel reinforcement have fallen by about 40%.

		2004	2005	2006	2007	2008	2009 (March)
Aggregates (HK\$ per tonne)		40	38	38	40	45	48
Bitumen (HK\$ per tonne)		3800	4200	5400	5400	6940	6620
Concrete blocks, 100mm thick		45	42	42	43	60	59
Diesel fuel	For industrial use (light)	1108	1320	1568	1572	2389	1725
	For road use (HK\$ per 100 litre)	664	770	886	874	1171	807
Glass - Clear sheet glass, 5mm thick (HK\$ per square metre)		81	81	81	87	93	109
Glazed ceramic wall tiles	White tiles, 108mm*108mm	66	63	69	77	110	110
	Colour tiles, 200mm*200mm	187	192	203	221	260	270
Hardwood	Sawn hardwood, 50*75 mm column	2284	3072	3218	3474	3628	3762
Homogeneous floor tiles	Non-slip tile, 200mm*200mm	69	72	86	98	148	141
Galvanised mild steel	Steel plates (HK\$ per tonne)	6283	6674	6771	7629	11387	6940
	Steel angles (HK\$ per tonne)	6203	6568	7404	10047	15755	10180
	Steel flats (HK\$ per tonne)	6609	7212	9772	8541	11500	8942
Metal formwork	Steel plate, 4mm thick (HK\$ per tonne)	4438	4881	4588	5059	8258	4817
Mosaic tiles	Unglazed tiles, 18mm*18mm	52	44	37	47	59	53
	Glass tiles, 25mm*25mm	25	27	22	27	31	31
	Glazed tiles, 45mm*45mm	58	55	58	61	79	86
Paint	Emulsion paint (HK\$ per litre)	32	35	35	35	39	38
	Acrylic paint (HK\$ per litre)	34	35	34	34	38	39
Portland cement (ordinary) (HK\$ per tonne)		491	511	517	516	538	580
Sand (HK\$ per tonne)		25	27	34	56	83	74
Steel reinforcement	Mild steel round bars, 6mm to 20mm	3815	4101	4237	5275	9602	5819
	High tensile steel bars, 10mm to 40mm	3668	3764	3877	5183	9742	4911
Timber formwork	Plywood, formwork, 19mm thick	60	67	61	64	67	61
	Sawn hardwood, 25mm thick plank	1504	2140	2023	2452	2960	3068
uPVC lined GMS pipes	20mm diameter pipes, 5.5 long	166	170	170	166	n.a.	n.a.
uPVC pipes	32mm diameter pipes, 4m long (HK\$ per	42	40	41	39	42	45

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 2008 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 4.5.1 – Major construction material average price

4.5.2 Construction Industry Salaries and Wages

4.5.2.1 Construction Industry Salaries and Wages – Technicians and Unskilled Workers

In 2009, the average monthly salary of technicians dropped to its lowest for a period of 6 years since 2004. The average daily wage of unskilled workers remained more or less the same as the years before.

	Technicians Monthly Salary (HK\$)	Unskilled Workers Daily Wage (HK\$)
2004 June	9918	584.9
2005 June	9472	571.7
2006 June	9946	565.9
2007 June	11430	569.9
2008 June	11047	565.2
2009 April	8645	570.1

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, various issues.
(for technicians' monthly salary) *Monthly and Annual Digest of Statistics*. Census and Statistics Department, Hong Kong Special Administrative Region, various issues.

Table 4.5.2.1 - Construction Industry Salaries And Wages – Technicians and Unskilled Workers

4.5.2.2 Construction Industry Salaries and Wages – Construction Professionals

Certain professionals had a substance increase of more than 10% in their wages, such as accountant, administrative manager, building service manager, civil engineer, financial manager, project manager and structural engineer. On the other hand, there were also wage decreases for some other professionals. For example, human resources manager saw their wages decrease by around 40%.

(Unit: Median monthly salary in HK\$)

Professionals in Building and construction and related trades	2004 June	2005 June	2006 June	2007 June	2008 June
Accountant	26900	22900	26900	30200	31900
Administrative Officer / Executive Officer	14900	16900	16900	n.a.	19300
Architect	38500	41600	42600	49400	47700
Administration Manager/ Company Secretary/ Office Manager	23500	n.a.	25600	n.a.	42500
Building Services Engineer	28500	29300	30800	30000	31800
Civil Engineer	28700	28000	30900	32900	34700
Electrical Engineer	30200	30700	32700	37600	28000
Financial Manager/ Accounting Manager	n.a.	54500	44600	47000	54600
I.T./ Computer Manager	n.a.	n.a.	35800	37200	38100
Mechanical Engineer	33200	31900	33800	37900	30100
Personnel Manager/ Human Resources Manager/ Staff Relations Manager	n.a.	n.a.	35000	46100	27700
Project Manager	52200	50900	51300	48300	54600
Quantity Surveyor	28800	28700	29300	28900	23500
Safety Officer	31600	29800	30300	29200	29900
Structural Engineer	26800	21000	27500	25000	29900

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 4.5.2.2 - Construction Industry Salaries and Wages – Construction Professionals

4.5.2.3 Construction Industry Salaries and Wages – Skilled Workers

Of all the 32 categories of workers listed below, the average daily wages of more than half increased in 2009. More construction projects were kick-started in the year thus driving up the demand for workers as well as their wages. Especially for power cable jointer, there was about 50% increases in their wages.

(Unit: Average daily wage in HK\$)

	2003 June	2004 June	2005 June	2006 June	2007 June	2008 June	2009 April
Concretor	1072.4	1026.3	923.5	940.3	948.2	922.6	915.2
Bricklayer	971.9	961.3	886.3	840.1	841.3	852.9	855.0
Drainlayer	955.6	927.5	874.7	861.9	826.5	805.9	875.7
Mason	903.7	849.9	853.2	933.6	925.2	778.8	859.2
Bar bender and fixer	1297.4	1225.4	1159.6	1154.0	1142.9	1070.6	1070.2
Metal worker	890.4	853.1	840.9	822.3	914.2	757.4	818.1
General welder	848.9	790.1	783.7	786.6	778.3	798.1	786.8
Structural steel erector	1063.1	966.2	961.8	884.8	847.5	898.1	896.2
Structural steel welder	879.7	939.0	946.2	920.2	970.7	878.0	911.1
Rigger/metal formwork erector	980.7	810.4	724.1	777.7	843.4	779.2	810.8
Carpenter (formwork)	1254.0	1146.9	1073.7	1076.9	993.1	983.4	993.1
Joiner	1059.2	1029.4	982.1	953.9	926.7	865.9	846.2
Plumber	986.8	933.8	903.3	836.8	798.8	797.9	831.9
Construction plant mechanic	859.8	802.7	807.6	816.5	774.3	721.4	747.4
Plant & equipment operator (load shifting)	809.2	784.4	765.6	767.0	761.6	764.8	735.9
Truck driver	653.1	604.6	572.5	613.1	591.7	593.9	590.4
Rock-breaking driller	889.8	821.0	851.2	781.7	774.3	779.1	766.6
Asphalter (road construction)	876.6	715.3	783.9	756.9	913.9	680.7	674.4
Bamboo scaffolder	1164.6	1077.3	1089.1	1108.3	1076.7	1060.7	1025.9
Diver	1725.2	1596.4	1687.4	1543.3	1821.1	1555	1720.7
Plasterer	976.1	934.9	883.3	890.3	829.6	820	822.2
Glazier	895.5	843.2	878.2	770.0	751.9	816.1	717.1
Painter and decorator	907.7	878.4	853.6	791.2	753.0	725.4	774.1
Leveller	771.0	757.9	700.3	726.7	715.4	689.7	696.4
Marble worker	1132.7	1003.2	969.2	826.1	866.6	723.1	700.0
Electrical fitter (incl. electrician)	794.6	763.7	742.0	715.1	727.7	667.7	692.8
Mechanical fitter	764.2	752.5	705.1	589.1	666.0	661.5	670.8
Refrigeration/AC/ventilation mechanic	675.9	685.1	659.3	595.4	638.4	584.2	530.4
Fire services mechanic	797.6	762.7	758.2	737.8	788.6	652.1	740.1
Lift and escalator mechanic	769.1	785.7	820.8	815.7	804.5	528.4	719.9
Building services maintenance mechanic	987.2	728.9	852.9	743.7	537.5	778.3	769.0
Power cable jointer	575.0	725.6	831.3	600.0	600.0	479.3	900.9

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 4.5.2.3 - Construction Industry Salaries And Wages –Skilled Workers

4.6 IMPORT AND EXPORT OF CONSTRUCTION SERVICES

4.6.1 Annual Import/Export of Construction work

Latest statistics on import and export of services can be found on “Report on Hong Kong Trade in Services Statistics for 2007” 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 expect 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:

		Export of services			Import of services			Net export of services
Major Service Group	Year	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
	2007	2699	2.4	29.6	2303	2.1	23.0	396
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
	2007	1933	-	62.3	474	-	54.9	1459

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 2007*
2007 Gross domestic Product Report

Table 4.6.1 – Annual Import/Export of Construction and Consultancy Services

There is not much import or export of construction services, though Hong Kong managed to have a positive net export of services between 2003 and 2007. In 2007, there were HK\$2,699 million and HK\$2,303 million worth of construction services exported and imported respectively, resulting in a net export of services worth HK\$396 million. On the other hand, there is an increasing trend of export of Architectural, engineering and other technical services. The value increased to HK\$1,933 million in 2007.

4.6.2 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	
Construction services	2004	2941	2697	244	
	2005	2436	2122	314	
	2006	2083	1872	211	
	2007	2699	2303	396	
Asia	2004	2941	2166	775	
	2005	2330	1959	371	
	2006	2054	1787	267	
	2007	2651	**	**	
	Australasia and Oceania	2004	<0.5	**	**
		2005	**	<0.5	**
		2006	<0.5	<0.5	<0.5
		2007	<0.5	<0.5	<0.5
	Central and South America	2004	<0.5	<0.5	<0.5
		2005	<0.5	<0.5	<0.5
		2006	<0.5	<0.5	<0.5
		2007	<0.5	<0.5	<0.5
	North America	2004	<0.5	**	**
		2005	**	**	**
		2006	**	**	**
		2007	**	**	**
	Western Europe	2004	<0.5	**	**
		2005	<0.5	**	**
		2006	<0.5	**	**
		2007	**	<0.5	**
Others	2004	<0.5	<0.5	<0.5	
	2005	<0.5	<0.5	<0.5	
	2006	**	<0.5	**	
	2007	**	<0.5	**	
Architectural, engineering and other technical services	2004	929	246	683	
	2005	1035	283	752	
	2006	1191	306	885	
	2007	1933	474	1459	
Asia	2004	780	154	626	
	2005	913	166	747	
	2006	1036	195	841	
	2007	1466	310	1136	
	Australasia and Oceania	2004	**	**	**
		2005	6	**	**
		2006	**	4	**
		2007	16	**	**
	Central and South America	2004	<0.5	<0.5	<0.5
		2005	<0.5	<0.5	<0.5
		2006	<0.5	<0.5	<0.5
		2007	<0.5	<0.5	<0.5
	North America	2004	107	44	63
		2005	52	16	36
		2006	**	26	**
		2007	166	99	67
	Western Europe	2004	4	42	-38
		2005	22	82	-60
		2006	26	76	-50
		2007	26	50	-24
Others	2004	**	**	**	
	2005	43	**	**	
	2006	64	5	59	
	2007	280	**	**	

** Data suppressed for confidentiality reason

Sources: *Report on Hong Kong Trade in Services Statistics for 2007*

Table 4.6.2 – Source/Destinations of Import/Export of Construction & Consultancy Services

Most of the construction and consultancy services continue to be carried out within the Asian region, and with the Chinese Mainland in particular. Export of construction and consultancy services to regions outside Asia is negligible. Consultants fared better than construction firms. In 2007, the net export of construction services was HK\$396 million, whilst the net export of consultancy service was HK\$1459 million or 2.7 times more the value of the former.

5. CONSTRUCTION OUTLOOK 2009/2010

5.1 CONSTRUCTION PROSPECT

The Chief Executive announced ten mega-projects in his *2007-08 Policy Address*. The projects include: Transport Infrastructure of the South Island Line, the Sha Tin-Central Link, the Tuen Mun Western Bypass and the Tuen Mun-Chek Lap Kok Link; the Cross-boundary Infrastructure projects of the Guangzhou-Shenzhen-Hong Kong Express Rail Link, the Hong Kong-Zhuhai-Macao Bridge, the Hong Kong-Shenzhen Airport Co-operation, and the Hong Kong-Shenzhen Joint Development of the Lok Ma Chau Loop; and the New Urban Development Areas of the West Kowloon Cultural District, the Kai Tak Development Plan and of the New Development Areas.

Whilst most of these projects are still on the drawing boards, some have been commenced. The economic benefits brought by these infrastructure developments are expected to be crucial. Not only will there be more job opportunities created but also the GDP will be boosted. Within the mega projects ahead, Hong Kong construction industry is set to look promising in the near future.

5.2 FORCAST OF CONSTRUCTION VALUE

Forecast of construction value		
Type of works	Estimated cost of 2009	Estimated cost of 2010
Maintenance	>1,800,000,000	n.a.
Building	11,889,950,000	10,435,300,000
Civil Engineering	4,962,590,000	1,152,900,000
Highway	29,960,400,000	>4,557,800,000
Building Service	321,100,000	1,671,000,000
Sewage Treatment and Disposal	2,440,000,000	>1,429,000,000
Drainage Service	300,000,000	n.a.
Flood Prevention	91,200,000	1,600,000,000
Total:	HKD >51,765,240,000	HKD >20,846,000,000

Breakdown of project details refer to the appendix. I

Table 5.2 – Forecast of Construction Works 2009-2010

5.3 ISSUES AND CHALLENGES

As the economies in many Asian countries (e.g. China, India and Vietnam) and Middle East have managed its continuous growth track despite of the financial tsunami, it is anticipated that their authorities would continue upgrading their basic infrastructure, road networks, port facilities, housing and city planning. With this drive come opportunities for construction and consultancy firms that are competitive enough to export their services. For example, the Hong Kong Mass Transit Railway Corporation (MTRC), a publicly listed firm on the Hong Kong stock exchange, won a major engineering and project management contract in the construction of the Delhi Airport Metro Express Line (AMEL) in 2008. However, the track record has shown that construction firms may have to do more to be competitive in the overseas markets, though their professional and technical employees may find good opportunities lying ahead locally as the ten mega projects will go to their full swing soon.

Appendix – Details of Incoming Construction Works

Sources: web-sites of the Legislative Council, the Works Branch of Development Bureau, and the Architectural Services Department.

Incoming Construction works 2009					
Type of Works	Title of Contract	Date of Commencement	Estimate of Cost (HKD)	Sub-total Contract sum	Total Contract Sum
Maintenance work	Maintenance Term Contract for Hong Kong Islands Eastern & Outlying Islands (Apr 2010 to Mar 2013)	Nov 2009	> 300,000,000	>1,800,000,000	
	Maintenance Term Contract for Hong Kong Islands Western, Southern & Lantau Island (Apr 2010 to Mar 2013)	Nov 2009	> 300,000,000		
	Maintenance Term Contract for Tai Po, North District & outlying Islands (North) (Apr 2010 to Mar 2013)	Nov 2009	> 300,000,000		
	Maintenance Term Contract for Tuen Mun & Yuen Long (Apr 2010 to Mar 2013)	Nov 2009	> 300,000,000		
	Maintenance Term Contract for Central, Peak and Mid-levels (Apr 2010 to Mar 2013)	Nov 2009	> 300,000,000		
	Maintenance Term Contract for Wan Chai South & Wan Chai North (Apr 2010 to Mar 2013)	Nov 2009	> 300,000,000		
Building work	Second secondary school at development near Choi Wan Road and Jordan Valley, Kwun Tong	Nov 2009	248,000,000		
	Sports centre and community hall in Area 101, Tin Shui Wai	Nov 2009	629,800,000		
	Lam Tin North Municipal Services Building	Nov 2009	785,000,000		
	Redevelopment of Victoria Park Swimming Pool Complex	Nov 2009	1,197,700,000		

Provision of a columbarium and garden of remembrance at Kiu Tau Road, Wo Hop Shek	Dec 2009	629,500,000		
Redevelopment of Kwun Tong Swimming Pool Complex and Kwun Tong Recreation Ground	Dec 2009	1,323,800,000		
Construction of Aberdeen Fire Station cum Ambulance Depot at Nam Fung Road, Aberdeen (NSC)	Dec 2009	> 300,000,000		
Development of Government Helipad at the Hong Kong Convention and Exhibition Centre	Dec 2009	59,100,000		
A 30-classroom primary school at development near Choi Wan Road and Jordan Valley, Kwun Tong	Dec 2009	189,900,000		
Centennial Campus, phase 1, The University of Hong Kong and Centennial Campus, phase 2, The University of Hong Kong	Third quarter of 2009	2,037,200,000		
Institute for Advanced Study, The Hong Kong University of Science and Technology	Third quarter of 2009	187,200,000		
New academic building, The Hong Kong University of Science and Technology	Third quarter of 2009	668,500,000		
Academic and administration building, City University of Hong Kong	Third quarter of 2009	888,500,000		
Centralized general research laboratory complex (block 1) in Area 39, The Chinese University of Hong Kong	Third quarter of 2009	455,800,000		
701-place student residences, The Hong Kong University of Science and Technology	Third quarter of 2009	213,000,000		
Student hostel, phase 4 (700 places), City University of Hong Kong	Third quarter of 2009	182,000,000		
Innovation Tower, The Hong Kong Polytechnic University	Third quarter of 2009	621,150,000		
Extension to the existing University Library at Central Campus, The Chinese University of Hong Kong	Fourth quarter of 2009	251,700,000		

	Student hostel, phase 3, The Hong Kong Polytechnic University	Third quarter of 2009	522,100,000	
	Provision of Columbarium and Garden of Remembrance at Kiu Tau Road, Wo Hop Shek	Fourth quarter of 2009	> 500,000,000	11,889,950,000
Civil Engineering works	Elevated Walkway between Tong Ming Street and Tong Tak Street, Tseung Kwan O	Nov 2009	<100,000,000	
	Ground investigation for Tseung Kwan O – Lam Tin Tunnel and Associated works	Dec 2009	19,890,000	
	Ground investigation – New Territories West (Term Contract)	Dec 2009	< 100,000,000	
	Remaining site formation and engineering infrastructure works at Tai Po Area 39	Dec 2009	< 100,000,000	
	Wan Chai development phase II, engineering works	Dec 2009	4,642,700,000	4,962,590,000
Highway work	Traffic improvements to Tuen Mun Road Town Centre Section	Dec 2009	1,814,400,000	
	Central-Wan Chai Bypass and Island Eastern Corridor Link	Fourth quarter of 2009	28,146,000,000	29,960,400,000
Building Service work	Conversion of aqua privies into flushing toilets - phase 6	Nov 2009	221,100,000	
	Physical upgrade of existing facilities of Kowloon Bay PTI	Dec 2009	<100,000,000	321,100,000
Sewage Treatment and Disposal Projects	Upgrading of Mui Wo sewage treatment works and sewage at Mui Wo Centre and Wang Tong	Nov 2009	> 200,000,000 to 300,000,000	
	Harbour Area Treatment Scheme stage 2A – upgrading works at Stonecutters Island sewage treatment works – sludge treatment facilities	Nov 2009	> 300,000,000	
	Control of water pollution at Jordan Valley	Nov 2009	> 300,000,000	
	North District and Tolo Harbour regional sewerage – upgrading of sewage pumping stations and trunk sewers	Dec 2009	> 100,000,000 to 200,000,000	

	Tolo Harbour sewerage of unsewered areas stage 2 – package 1	Dec 2009	<100,000,000		
	Upgrading of Tuen Mun sewerage, phase 1	Dec 2009	1,340,000,000	2,440,000,000	
Drainage Service work	Harbour Area Treatment Scheme stage 2A – upgrading of seven preliminary treatment works at Hong Kong Island	Nov 2009	> 300,000,000	300,000,000	
Flood Prevention Projects	Hang Hau Tsuen Channel at Lau Fau Shan	Dec 2009	91,200,000	91,200,000	
					51,765,240,000

Incoming Construction works 2010

Type of Works	Title of Contract	Date of Commencement	Estimate of Cost (HKD)	Sub-total Contract sum	Total Contract Sum
Building work	District open space in Area 37, Tseung Kwan O	Jan 2010	140,600,000		
	Local open space in Area 25, Fanling/Sheung Shui	Jan 2010	51,300,000		
	A 24-classroom primary school at the junction of Victoria Road and Pok Fu Lam Road, Pok Fu Lam	Jan 2010	255,600,000		
	Revitalisation Scheme - Conversion of Old Tai O Police Station into Tai O Heritage Hotel	Jan 2010	66,700,000		
	Conversion of secondary pool of Lai Chi Kok Park Swimming Pool into indoor heated pool	Feb 2010	166,700,000		
	Sludge treatment facilities	Feb 2010	5,154,400,000		
	Construction of rank and file quarters for Immigration Department at Wo Yi Hop Road, Kwai Chung	Apr 2010	275,000,000		
	Redevelopment of departmental quarters for Customs and Excise Department at Lee Kung Street, Hung Hom	Jun 2010	275,000,000		
	North Lantau Hospital, Phase 1	First quarter of 2010	> 500,000,000		
	Joint-user Complex in Area 44, Fanling	First quarter of 2010	> 100,000,000 to 200,000,000		
	Construction of an Annex Building for Ko Shan Theatre	Second quarter of 2010	> 500,000,000		
	Special School at Area 16, Tuen Mun for the Physically Disabled Children	Second quarter of 2010	> 200,000,000 to 300,000,000		
	Phased Re-provisioning of Cape Collinson Crematorium	Third quarter of 2010	> 500,000,000		
Construction of Additional Courtrooms and Associated Facilities in the High Court Building	Third quarter of 2010	< 50,000,000			

	Extension of Man Kam To Food Inspection Facilities	Third quarter of 2010	> 100,000,000 to 200,000,000		
	Reprovisioning of Yaumatei specialist Clinic at Queen Elizabeth Hospital	Third quarter of 2010	> 500,000,000		
	Joint-user Complex at Bailey Street, To Kwa Wan Reclamation	Third quarter of 2010	> 400,000,000 to 500,000,000		
	Redevelopment of Chi Ma Wan Prison Area	Fourth quarter of 2010	> 500,000,000		
	Kai Tak Government Offices	Fourth quarter of 2010	> 500,000,000		10,435,300,000
Civil Engineering work	West Island Line - essential public infrastructure works	Mar 2010	136,000,000		
	Construction of a secondary boundary fence and new sections of primary boundary fence and boundary patrol road	First quarter of 2010	395,000,000		
	Hong Kong-Zhuhai-Macao Bridge Hong Kong Boundary Crossing Facilities detailed design and ground investigation	2010	621,900,000		1,152,900,000
Highway work	Speed map panels in the New Territories	Jan 2010	70,900,000		
	Widening of Tolo Highway/Fanling Highway between Island House Interchange and Fanling	Jun 2010	4,486,900,000		
	Hong Kong – Zhuhai – Macao Bridge (HZMB)	2010	N.A.		>4,557,800,000
Building Service work	District cooling system at the Kai Tak development	Apr 2010	1,671,000,000		1,671,000,000
Sewage Treatment and Disposal Projects	Tai Po sewage treatment works, stage 5 phase 2B	Jan 2010	659,000,000		
	Port Shelter Sewerage	Mid 2010	N.A.		
	Upgrading of Tuen Mun Sewerage, Phase 1	Mid 2010	170,000,000		
	North District Sewerage, stage 1 phase 2C and stage 2 phase 1	End 2010	600,000,000		>1,429,000,000

Flood Prevention Projects	Reconstruction and Improvement of Kai Tak Nullah (Choi Hung Road Section) in Wong Tai Sin	Early 2010	1,600,000,000	1,600,000,000	
					>20,846,000,000

Incoming Construction works 2011- 12

Type of Works	Title of Contract	Date of Commencement	Estimate of Cost (HKD)		
Building work	West Kowloon Law Courts Building	First Quarter of 2011	> 500,000,000	2,725,000,000	
	Construction of a station for the New Terminal Doppler Weather Radar	First Quarter of 2011	> 100,000,000 to 200,000,000		
	Community Hall at the Housing Site in Area 18, Tuen Mun	First Quarter of 2011	> 50,000,000 to 100,000,000		
	Indoor Recreation Centre in Area 4, Tsing Yi	First Quarter of 2011	> 500,000,000		
	A Sub-Divisional Fire Station with Ambulance Facility cum Urban Search and Rescue Equipment Store at Cheung Yip Street, Kowloon Bay	Second quarter of 2011	> 200,000,000 to 300,000,000		
	A 30-classroom Primary School at Kai Tak Development, Kowloon (Site 1A-3)	Second quarter of 2011	> 200,000,000 to 300,000,000		
	Cross District Community Cultural Centre in Lower Ngau Tau Kok Estate, Kwun Tong	First Quarter of 2012	> 500,000,000		
	Kowloon East Police Regional Headquarters and Operational Base cum Ngau Tau Kok Divisional Police Station at 105 Concorde Rd, Kai Tak	First Quarter of 2012	> 500,000,000		
Civil Engineering work	Kai Tak development - Kai Tak approach channel and Kwun Tong typhoon shelter	Apr 2011	N.A.	>5,900,000,000	
	Improvement works and Kai Tak development - remaining infrastructure works for developments at the former runway	Jan 2012	N.A.		
	Tseung Kwan O Tunnel	Late 2012	5,900,000,000		

Highway work	Tuen Mun - Chek Lap Kok Link and Tuen Mun Western Bypass	2011	20,000,000,000	>27,900,000,000
	Tsuen Wan Bypass, widening of Tsuen Wan Road between Tsuen Tsing Interchange and Kwai Tsing Interchange and associated junction improvement works	Dec 2011	N.A.	
	Hiram's Highway Improvement Stage 2	End 2011	N.A.	
	Central Kowloon Route	2012	N.A.	
	Trunk Road T2	2012	7,900,000,000	
Drainage Service work	Yuen Long and Kam Tin Sewerage Treatment Upgrade - Upgrading of San Wai Sewage Treatment Works	Early 2011	1,100,000,000	>1,100,000,000
	Lam Tsuen Valley Sewerage	Oct 2011	N.A.	
> 936,525,000,000				

THEME PAPER: INTEGRATION OF VALUE CHAIN TO ENHANCE THE PRODUCTIVITY AND EFFICIENCY OF THE CONSTRUCTION INDUSTRY

1. EXECUTIVE SUMMARY

It is posited that the productivity of the construction value chain is achieved by positive integration of all construction parties. This paper therefore presents the current situation in Hong Kong. Its objective is threefold. First, several major problems that resulted from the fragmented value chain are identified. It is expected that poor communication, ineffective collaboration and futile construction management are common sources for inefficiency and low productivity of the construction industry. Second, various initiatives and measures that have been taken in Hong Kong to improve the integration of the construction value chain are described. Important initiatives and measures include construction partnering, value management, integrative information systems, economic assurance programs, private sector involvement, etc. Third, future initiatives and measures, such as wider use of partnering, the introduction of contractual partnering and zero defect campaign, have been introduced. Being one of the most important industries in Hong Kong, the construction industry must be able to improve the competency level of their employees and workers in order to maintain its productivity toward sustainable construction.

2. INTEGRATION OF THE CONSTRUCTION VALUE CHAIN

Similar to many other regions, the construction industry in Hong Kong is fragmented and is embedded with an adversarial culture. In such a conflicting and incompatible value chain, how to emulate the productivity, and hence profitability, becomes an important issue. Prior to discussing what initiatives and measures we should take to improve the construction workforce, several major problems are identified and presented below:

1. *Poor communication and inefficient information flow.* Since the construction value chain involves resources transferring among construction parties (Cheng et al., 2001), poor communication and inefficient information flow would result in the “emergence of dysfunctional supply chains” (Love et al., 1999).
2. *Devaluing the construction industry.* Although it is expected that each party of the construction value chain would add value to the construction project, poor collaboration usually leads to poor project performance or even project failure. Such a bad news would spread around the region rapidly, resulting in devaluing the local construction industry.
3. *Impeding environmental sustainable construction.* According to McInnis (2001), the approach currently used by Hong Kong government is a medium by medium system of pollution control, in which a penalty and registry system is established for regulating pollution under “five large categories or media (air, waste, noise, water and land)”. The system has been criticized of being too complicated in consolidating the whole value chain in regulating environmental pollution, which is a key issue in environmental sustainable construction.

3. INITIATIVES AND MEASURES ADOPTED

Since a construction project is performed by various players who should add value to it, integrating them effectively would ensure that the value actually generates for the project. The issues mentioned in the previous section have attracted local attentions where proper initiatives and measures have been provided to improve the operation of the value chain. For example, according to the report jointly written by the then Environment, Transport and Works Bureau (ETWB, 2007) (now re-organized as the Development Bureau) and the Construction Industry Council (CIC), many CIRC (Construction Industry Review Committee) recommendations were put into practice. In addition to those CIRC recommendations mentioned in our theme paper 2008 (e.g., workforce development, prefabrication, automation) (Anson et al., 2008), other major initiatives and measures that have been implemented to improve the integrated value chain are presented hereinafter.

3.1 PARTNERING INITIATIVE

Partnering has long been supported for its effect on strengthening the value chain. The study by Phua (2006) indicates that partnering in Hong Kong is selectively adopted and is “significantly determined by the industry’s level of institutional norms”. Such a driving force from the industry would help to motivate the application of partnering. In Hong Kong, the Government has widely promoted construction partnering. According to ETWB (2007), over 80 partnering workshops have been held to “enhance mutual understanding and communication” at the start of public housing projects. Informal partnering has been adopted in over 30 public works contracts. Local forums for experience sharing have also been held during the past years. On the other hand, contractors have been influenced to take part in non-contractual partnering. For example, Yau Lee Group (YLG, 2009) has been partnering with clients and other players to not only streamline the project construction process but also jointly develop innovative techniques and tools, with an aim to improve work efficiency and reduce cost concurrently. The objective, according to the firm, is to “uplift the quality, health and safety, environmental protection and efficiency to enhance the competitiveness” of the company as well as the whole value chain.

3.2 VALUE MANAGEMENT INITIATIVE

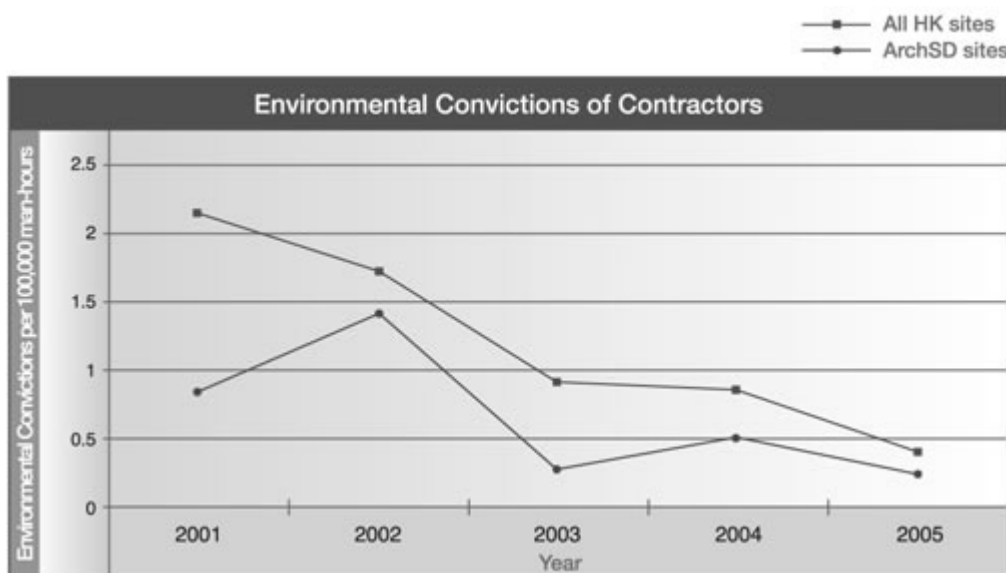
An effective ways to improve value chain management is to “remove non-value added steps and reduce waste cycle time in the process which equates into the bottom line dollar savings”. This inevitably corroborates that value management (VM) is a critical factor of value chain performance. VM, since its introduction into public works projects in 1996, has been “widely used by works departments” in Hong Kong, and its enhanced procedures were promulgated in August 2002 (ETWB, 2007). Future applications of VM and its closely related concept, value engineering, are expected to continue in both private and public sectors.

3.3 GREEN SUPPLY CHAIN MANAGEMENT INITIATIVE

Green supply chain management has been implemented by Hong Kong Government for some years. Both the private and public sectors are active in promoting the concept. According to the Architectural Services Department (ASD, 2005), procurement conditions are comprehensively prescribed by the General Specification for Building (GSB) (2003 Edition). The GSB has a profound impact on the tender outcome since the lowest bid would no longer be the determining factor in a tendering process. The externalities being taken into account,

the emphasis has been placed on designs that might be more expensive initially but can lead to greater potential for sustainable features and reduced environmental pollution costs. The ASD encourages project participants to exploit the opportunities for developing sustainable designs and “vet the blueprints against a list of environmental design features”, including sustainable planning, enhancement of the physical environment, energy conservation, etc.

A productive value chain management should also include monitoring and evaluation of project participants. The ASD reviews their contractors and consultants quarterly once the tender is awarded. Such a review includes assessment on environmental pollution control (air, noise, water, and waste pollution) and compliance with the trip ticket system (a permit for dumping construction and demolition waste in designated landfills). A consultant or contractor whose performance was reviewed as unsatisfactory would be adversely affected with their chances of winning future contracts being diminished. A supplier getting two poor review ratings in a row will be barred from bidding future projects. As shown in the following figure (ASD, 2006), environmental convictions of contractors on ASD’s construction sites are less than the Hong Kong average from years 2002 to 2005. According to the ASD (2006), this is due to their efforts in raising “the environmental standard of the (value) chain in the tendering process” and their “training to raise the contractors’ environmental awareness”.



Source: ASD (2006)

3.4 LEGAL AND ADMINISTRATIVE INITIATIVE

Regulations and standard administration are revised continually to enhance the integration of the construction value chain. According to McInnis (2001), despite the fragmentation within the construction industry, environmental regulation has been considered as promoting value chain integration. The recent Environmental Impact Assessment Ordinance (Cap 499), for example, is described as “a major step forward in integrating environmental controls (for more rational) pollution” handling for environmentally sustainable construction.

Adjudication is another important policy development for the Hong Kong construction industry. Although the application of mediation and arbitration in local construction dispute

resolution are regarded as successful, the use of adjudication has started recently. Hill and Wall (2008) suggested that conflicts between parties can be solved by effective adjudication, especially within the subcontracting community. As they noted, the Hong Kong Government has tried adjudication in a small number of its construction contracts. Yet, its further adoption is not intended although such a feature has been worked in other countries (Hill and Wall, 2008), such as Singapore (Cheng, 2008).

3.5 INTEGRATED SYSTEMS INITIATIVES

Environmental Management System (EMS), which helps to reduce and avoid environmental nuisances arising from the construction works on site, has been promoted by the government and has been implemented by contractors in projects in both the public and private sectors. For example, in order to enhance the environmental performance in delivering its services to the public, the Civil Engineering and Development Department (CEDD, 2006) extended the scope of the EMS to cover all works performed by contractors, who are required to set up an EMS on site to implement and monitor the performance of various environmental mitigation measures. To improve the effectiveness and efficiency of work with contractors further, the Department has combined the Quality Management System (QMS) and the EMS to form an Integrated Management System (IMS) in September 2006, which has successfully fulfilled the requirements of both ISO9001:2000 and ISO 14001:2004, (CEDD, 2007, 2008).

3.6 ECONOMIC ASSURANCE PROGRAMS

A free market has been argued to be the best economic system that is conducive to productivity gains. It drives costs down without scarifying, if not concurrently also raising, quality. However, the positive effect of free market system on productivity gains can be further enhanced with greater collaboration within the construction value chain. For example, the ASD (2008) implemented effective construction cost control and monitoring systems in 2008 to mitigate budget overrun during the construction phase, which “include a web based contract variation management system that enables a real-time access of project financial information by the project team; a dispute resolution advisors system for overall contract administration which can trace possible problematic areas and claims throughout the project period; and a series of professional and independent audits throughout the project period, including audits or checking by the Commissioner of Audit and Independent Commission Against Corruption (ICAC)”.

3.7 SAFETY MANAGEMENT INITIATIVE

Safe construction is also one important issue that would affect the quality of an integrated construction value chain. In Hong Kong, construction safety laws and regulations are governed by two chapters: (1) CAP59 – Factories and Industrial Undertaking Ordinances, and (2) CAP509 – Occupational Safety and Health Ordinances (HKSAR, 2006). Other than the statutory provision, both public and private construction companies have also established their safety policy to improve site safety.

In 2008, the CEDD (2009) organized a significant number of seminars to professional and technical personnel to share their experience in construction safety, landscape design, arboricultural knowledge and sustainable design. Such inter-organizational knowledge sharing strengthens the inter-operational environment of the construction value chain. For example, while contractors are contractually required to provide various forms of safety

training for their workers, the CEDD (2009) has taken heed of the safety training needs of the contractor's site supervisory staff. Apart from in-house departmental training, the Department also organized health and safety training (e.g., ad-hoc safety training seminars and courses) for about 715 attendances (including site staff from contractors) in 2008.

In the private sector, Gammon Construction Limited (GCL, 2009) has their own manual and allows both their internal staff and their subcontractors to be acquainted with the requirements so that the project-wide safety, health, and environmental management system can be complied with. The manual not only follows the British Standards Institute's safety management code, namely OHSAS (Occupational Health and Safety Assessment Series) 18001 and the ISO 14001: 1996 Environmental Management Systems – Specification with Guidance for Use, but also refers to the Code of Practice on Safety Management published by the Labour Department of the Hong Kong Special Administrative Region.

3.8 USER-DRIVEN INTEGRATED VALUE CHAIN

Integration activities can be driven, often very effectively, by end users. For example, Sun Hung Kai Properties Limited (SHKP), one of the largest property developers not only in Hong Kong but also in the globe, has set up value chain integration for improving their products and services to their end users. It makes business sense to promote greenery and energy efficiency in order to offer healthy environments to residents, encourage green living, and promote environmental awareness in children (SHKP, 2009a). In doing so, they claimed to have strived to offer users with stringent quality monitoring in all stages of property development through effective vertical integration that ensures control over all aspects from planning and design to construction, material sourcing, project monitoring and property management (SHKP, 2009b).

3.9 PRIVATE SECTOR INVOLVEMENT ENRICHING CONSTRUCTION VALUE CHAIN

The Hong Kong Government has promoted the private sector involvement (PSI), which aims to enhance public projects' cooperation between the governmental departments and the private sector, for some years. Under the PSI, there are two major types – the Public Private Partnership (PPP) and the outsourcing (Efficiency Unit, 2009). PPPs are contractual arrangements where the public and private sectors both bring their complementary skills and contributions to the value chain. The six forms of the PPP are creating wider markets, joint ventures, partnership investments, franchises, private financing initiatives, and partnership companies (Efficiency Unit, 2009). These alternative procurement methods enrich the flexibility of the value chain structure between public and private sectors.

3.10 INTEGRATION BETWEEN CLIENTS

Other than the integration of different construction players, integration between clients has also been initiated by Hong Kong Government. The Development Bureau (DEVB) was established on 1st of July, 2007 to better coordinate major infrastructure projects commissioned by the nine governmental works departments (namely Architectural Services Department, Buildings Department, Civil Engineering and Development Department, Drainage Services Department, Electrical & Mechanical Services Department, Lands Department, Land Registry, and Water Supplies Department), so that more efficient coordination and resolution of inter-departmental issues could be ensured at an early stage

(DEVB, 2007). It is expected that consolidating the nine departments under the DEVB to deliver their infrastructure projects can maintain the Hong Kong's position as "Asian's world city" and to create jobs for Hong Kong people.

3.11 INFORMATION TECHNOLOGY (IT) IMPLEMENTATION

The adoption of information communication technology can help coordination and collaboration between the projects participants through effective flow of data and communication (Liu et al., 2006). The Hong Kong government has recently adopted the submission of building plans through electronic means. By following the guidelines and fulfilling the requirements, Authorized Persons (APs) can submit building plans electronically (BD, 2008). On the other hand, the manual and time-consuming procurement process is also replaced by the newly adopted E-procurement. Several private companies in Hong Kong have adopted this approach and claimed to have attained great success. It is believed that on one hand, less paperwork is more environmentally friendly, and on the other, lowered transaction costs and fewer repetitious administrative procedures can eventually streamline the procurement process as a whole (Bendoly et al., 2005).

4. FUTURE DEVELOPMENT

The change intervention must start from the senior management of the organizations and must first be carried out internally within the organization. After progress has been made within the organization, change could then be extended to all parties external to the organization within the value chain. The following recommendations pertaining to improving integration of the construction supply chain are extracted from several recent reports including ETWB (2007):

4.1 WIDER ADOPTION OF THE PARTNERING APPROACH

The integration of design and construction, together with the adoption of fabrication and standardization, contribute significantly to productivity because collectively such measures facilitate more efficient communications and hence more effective decision making and cost-effective innovation. Consequently, there is also enhanced interoperability and the project delivery cycle is shortened. The Hong Kong Housing Authority has implemented the "feed-forward partnering approach" to involve project team members in design reviews, while project steering committees were formed to lead and coordinate multidisciplinary public works projects (ETWB, 2007). With the successful application of construction partnering in public projects, it is at the right time to extend its usefulness to the private sector.

By entering into contract with the private sector, the government can reduce the level of subsidy required without lowering the efficiency of the work, as the private sector should have the complete responsibility for the design, build, maintenance, and operation of a service (Efficiency Unit, 2008). It has been advocated that this partnering approach should be more widely adopted so that the overall performance of the Hong Kong construction industry will be further enhanced.

4.2 INTEGRATION OF PARTNERING INTO CONTRACT

Although informal partnering helps to promote collaboration among contractual parties, there is no risk reward sharing in the contract. Contractual partnering (or the so called "contracting

alliancing”) has hence emerged as an alternative procurement method. It is mainly used to select contractors for projects where risk and uncertainty is problematic (Walker et al., 2002). Its principles are similar to those of informal partnering, except that contractual partnering focuses on establishing a formal relationship contract and the parties would be rewarded when they could reduce the total cost of the project.

Given the trial made for the New Engineering Contract (NEC) in the UK and successful applications in Australia, contractual partnering has already drawn the attention of Hong Kong Government. However, more research has to be made to study its usefulness in Hong Kong, especially the extent of the difficulty in its application in the private sector. It is because it promotes the share of risks among contractual parties, which would not be welcomed by most clients who are usually able to transfer their construction risks to the general contractor by their bargaining power, and by making use of contract terms favourable to them. Only those clients (e.g., governmental departments) who are willing to take more social responsibility or look for more productive contractual arrangement would be interested to use contractual partnering. As noted by Thomas Ho (2009), Chief Executive of Gammon Construction Limited, due to the dried-up of private project funding, contractors are difficult to bear financial risks unless positive contract conditions (or partnering-typed contracts) would be offered by the clients.

4.3 THE MATERIAL LINK OF THE SUPPLY CHAIN

No construction work can be carried out without materials. Its supply is therefore a critical issue in the effective and complete integration of the supply chain. Developing a systematic supply chain management (SCM) model then becomes an important factor to enhance productivity. SCM often makes the use of ICT (Information and Communication Technology) to enhance communication, re-engineering of material flow, changing of culture and performance measures identification (Chin et al., 2004). For example, the Yue Yuen Group, a shoes company, implemented such an effective SCM system to help deliver products punctually and meet different clients’ needs (Du, 2007). Though it is an example of the manufacturing sector, it is believed that the same philosophy can be adapted to and adopted by construction firms to uplift the overall supply chain performance and productivity of the construction industry.

4.4 OTHER INITIATIVES

Construction organizations continue to organise inter-organizational training activities for strengthening the construction value chain. In 2008, the CEDD (2009) conducted a comprehensive survey to gauge the safety training needs of site supervisory staff. The survey findings support the provision of training courses in the next two years for target parties including contractors.

Moreover, contractors have focused on other initiatives. For example, in addition to implementing the current “Six-Point Safety Focus” (embodied by “leadership”, “constructability”, “near miss and audit”, “care and engagement”, “belief in our systems” and “role of the safety team”), Gammon Construction Limited has a new initiative on a target of Zero Harm (meaning no death and no injury caused to the public, or to their own people) on or before the end of 2012 (GCL, 2009). According to the company, they will not only put huge effort to train and support their managers and members of their value chain for the new

initiative, but will also elicit stakeholders' views on the safety of construction workers and their support for the new initiative.

Another initiative is the promotion of impartial contractual arrangement in the construction value chain. As Ho (2009) argued, in addition to the fair deal between construction parties, the value chain should be assured of security of payment and the address of any inflationary risks in the contracts. Cheng et al. (2009) also contended that the Hong Kong construction industry should review the issue of security of payment, "considering more for the betterment of the construction industry as a whole and less for one's own immediate or short-term interests". In a similar vein, the use of voluntary adjudication in solving contractual disputes will be encouraged to effectuate the dispute resolution system for the industry.

The wider use of ICT should also be considered. For example, being a "single information communication point", an information hub (IH) enables "data sharing and coordination in supply chain" (Xue et al., 2007). Moreover, layering technique can be harnessed to manage the complex information that is characteristic of drawings and CAD models. In Hong Kong, layer guidelines based on ISO 15667 have been tested. Whilst there is no industry-wide standard yet (Howard et al., 2006), the public sector has implemented a similar standard called CAD Standard for Works Projects (CSWP), as outlined by Tse and Wong (2004). Further efforts and resources should therefore be invested to develop these technologies so as to better facilitate the construction procedures. Recently, there has been some encouraging advancement in the use of Building Information Modelling (BIM) and Virtual Prototyping, which allow on-screen simulation and evaluation of design and construction manoeuvres before they occur on site.

5. CONCLUSION

It is evident from the foregoing discussion that the construction value chain suffers from several major problems that reduce its productivity. In considering this, Hong Kong Government and the local construction industry have put their efforts to implement initiatives and measures for the purpose of better connecting the construction players together. Among others, collaboration-based strategies, such as construction partnering and inter-organisational operations, have been highly promoted. In the future, initiatives and measures would be associated with the quality of the contract (such as the concepts of contractual partnering and impartial contracts) and the inter-organisational activities (such activities as training, resource sharing, campaign and promotion, dispute resolution).

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