

**The 14<sup>th</sup>**

**ASIA CONSTRUCT CONFERENCE**

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***Japan Country Report***

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**PREPARED BY**



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## Country Report (Japan)

### I. Overview

The Japanese economy has been in recovery trend since FY 2002 and recorded successive years of 2% economic growth from FY2003 to 2007. However, due to the effects of the global economic chaos triggered by the American subprime loan crisis last summer, as well as high resource prices, the economy seems to be slowing this year.

Japan's construction investment, which has been decreasing since the mid-1990s, was valued at ¥48.7 trillion yen in FY2007 (¥17.9 trillion in government spending, ¥30.8 trillion in private spending), about half of the value of the peak year (FY1992). Government investment has consistently declined in the 2000s, and private investment began falling in FY2007.

The current condition of the Japanese construction industry can be summarized as follows:

- (1) Small and medium-sized companies with fewer than 100 employees account for 97.5% of the industry, and their share of the market has been rising in recent years.
- (2) The numbers of construction industry workers by trade/field show that a noticeable decline in the number of employees in "general contracting company" in the last ten years,
- (3) Trend of declining labor productivity in the construction industry is continuing. The reasons should be the decreased construction investment, redundant workers, various productivity impediments at construction sites or in construction companies,
- (4) The cost of materials has risen in recent years due to high steel and natural resource prices worldwide. On the other hand, wages of construction workers are below the average for workers in all industries and in the manufacturing industry.
- (5) Orders volume of construction works overseas was increased since FY2006 and valued at ¥1,681.3 billion in FY2007. A breakdown shows that Asia (¥861.6 billion) and the Middle East (¥472.7 billion) accounted for a large percentage.

## II. Macro Economic Review and Future Projections

### 1. Overview of the Japanese Economy

The Japanese economy has grown by 2% annually since 2003, continuing on a path of moderate recovery. Nonetheless, the effects of the global economic chaos triggered by the American subprime loan crisis last summer, combined with high resource prices, ended the longest economic recovery in the postwar period, which had been ongoing since February 2002. The economy has now begun to show signs of decline. The Cabinet Office revised, in its monthly economic report issued in August 2008, the expression of the overall economic assessment to "weakening" which has not been used since May 2001. The Bank of Japan also indicated its awareness in a public statement made after the August Monetary Policy Meeting, that "there is a strong possibility that the economic slowdown will be prolonged."

Given the low level of recent indicators, such as the Trade Statistics of June of 2007 indicated that total exports dip into the negative for the first time in 55 months, there is growing concern that the economic slowdown could be prolonged.

Figure 1 Macroeconomic Trends (FY)

Fiscal year	1990	1995	2000	2003	2004	2005	2006	2007	2008
Real GDP	4,679,132	4,827,495	5,056,219	5,177,129	5,279,826	5,407,061	5,541,143	5,628,644	5,654,105
(year-on-year change)	6.0%	2.5%	2.6%	2.1%	2.0%	2.4%	2.5%	1.6%	0.5%
Real private final consumption expenditures	2,494,772	2,737,642	2,837,575	2,930,670	2,966,892	3,024,697	3,078,090	3,120,523	3,135,572
(y-o-y change)	4.8%	2.5%	0.7%	0.6%	1.2%	1.9%	1.8%	1.4%	0.5%
(contribution rate)	2.6	1.4	0.4	0.4	0.7	1.1	1.0	0.8	0.3
Real government final consumption expenditures	622,302	747,156	857,142	923,308	938,869	946,019	946,900	953,325	960,212
(y-o-y change)	2.9%	4.1%	4.3%	2.6%	1.7%	0.8%	0.1%	0.7%	0.7%
(contribution rate)	0.5	0.6	0.7	0.5	0.3	0.1	0	0.1	0.1
Real private housing	264,565	239,526	203,609	183,569	186,619	184,299	184,718	160,229	155,257
(y-o-y change)	6.0%	-5.6%	-0.1%	-0.2%	1.7%	-1.2%	0.2%	-13.3%	-3.1%
(contribution rate)	0.3	-0.3	0.0	0.0	0.1	0	0	-0.4	-0.1
Real private corporate facilities	904,887	678,691	729,631	733,157	783,254	835,762	882,951	882,225	880,897
(y-o-y change)	12.0%	3.1%	7.2%	6.1%	6.8%	6.7%	5.6%	-0.1%	-0.2%
(contribution rate)	2.2	0.5	1.0	0.8	1.0	1.0	0.9	0.0	0.0
Real public fixed asset formation	298,240	406,024	344,449	281,040	245,210	231,581	210,486	206,731	194,886
(y-o-y change)	4.1%	7.5%	-7.6%	-9.5%	-12.7%	-5.6%	-9.1%	-1.8%	-5.7%
(contribution rate)	0.3	0.6	-0.6	-0.6	-0.7	-0.3	-0.4	-0.1	-0.2
Real inventory increase	24,872	17,737	20,428	11,274	18,016	18,200	29,285	28,679	26,230
(y-o-y change)	-11.7%	15458.8%	192.2%	626.1%	59.8%	1.0%	60.9%	-2.1%	-8.5%
(contribution rate)	-0.1	0.4	0.9	0.3	0.1	0	0.2	0	0.0
Real financial services net exports	69,494	9,587	62,953	112,651	140,726	170,637	215,784	281,744	305,047
(y-o-y change)	11.8%	-79.2%	7.5%	57.0%	24.9%	21.3%	26.5%	30.6%	8.3%
(contribution rate)	0.2	-0.7	0.1	0.8	0.5	0.6	0.8	1.2	0.4
Nominal GDP	4,514,728	4,964,573	5,041,188	4,937,475	4,984,906	5,037,885	5,121,841	5,150,837	5,141,443
(y-o-y change)	8.5%	1.9%	0.9%	0.8%	1.0%	1.1%	1.7%	0.6%	-0.2%

Source: Research Institute of Construction and Economy (RICE)

(Unit: ¥100 million. Real values reflect 2000 prices.)

## 2. Major Economic Indicators

Figure 2 List of Major Economic Indicators

	2002	2003	2004	2005	2006	2007
GDP (real, FY)	5,070,149	5,177,129	5,279,826	5,407,061	5,541,245	5,630,471
GDP growth (% , FY)	1.1%	2.1%	2.0%	2.4%	2.5%	1.6%
GDP (nominal, FY)	4,898,752	4,937,475	4,984,906	5,037,885	5,021,987	5,152,928
GDP (nominal, calendar year)	4,913,122	4,902,940	4,983,284	5,017,344	5,089,251	5,155,811
Agriculture, forestry and fishing total output	90,134	88,437	85,338	81,165	79,422	-
% growth	-0.9%	-1.9%	-3.5%	-4.9%	-2.1%	-
Manufacturing total output	1,012,715	1,027,566	1,054,101	1,078,765	1,086,028	-
% growth	-2.7%	1.5%	2.6%	2.3%	0.7%	-
Construction total output	338,930	323,328	329,538	318,614	321,480	-
% growth	-4.6%	-4.6%	1.9%	-3.3%	0.9%	-
Service industry	3,471,343	3,463,609	3,514,307	3,538,800	3,602,321	-
% growth	-0.5%	-0.2%	1.5%	0.7%	1.8%	-
Demographic Indicators						
Population (thousands)	127,486	127,694	127,787	127,768	127,770	127,771
Population growth rate (%)	0.13%	0.16%	0.07%	-0.01%	0.00%	-0.03%
Total labor force (thousands)	6,689	6,666	6,642	6,650	6,657	6,669
Labor force growth rate (%)	-0.93%	-0.34%	-0.36%	0.12%	0.11%	0.18%
Unemployment rate (%)	5.4%	5.3%	4.7%	4.4%	4.1%	3.9%
Financial Indicator						
Short-term interest rate (%)	0.10	0.05	0.03	0.04	0.26	0.63
Long-term interest rate (%)	1.007	1.380	1.445	1.456	1.634	1.478
Changes in consumer price (%)	100.6	100.3	100.3	100.0	100.3	100.3
Short-term prime rate (%)	1.375	1.375	1.375	1.375	1.625	1.875
Long-term prime rate (%)	1.65	1.7	1.55	1.85	2.35	2.3
Exchange rate against US\$	125.31	115.93	108.19	110.22	116.30	117.75

Source: Annual Report on National Accounts (Cabinet Office, June 2008), Website of Ministry of Internal Affairs and Communications and the Bank of Japan, Financial Economic Statistics Monthly (Bank of Japan, August 2008).

\*1: GDP figures for 2007 are from the Secondary Preliminary Figures (published June 11, 2008). Real values: 2000 prices.

\*2: Total output figures are nominal figures for the calendar year.

\*3: Population figures are estimates as of October each year.

\*4: Consumer price index uses 2005 as 100.

\*5: Short-term interest rates are calculated using the average published interest rate for domestic commercial paper.

\*6: Long-term interest rates are the rates on 10-year government bonds.

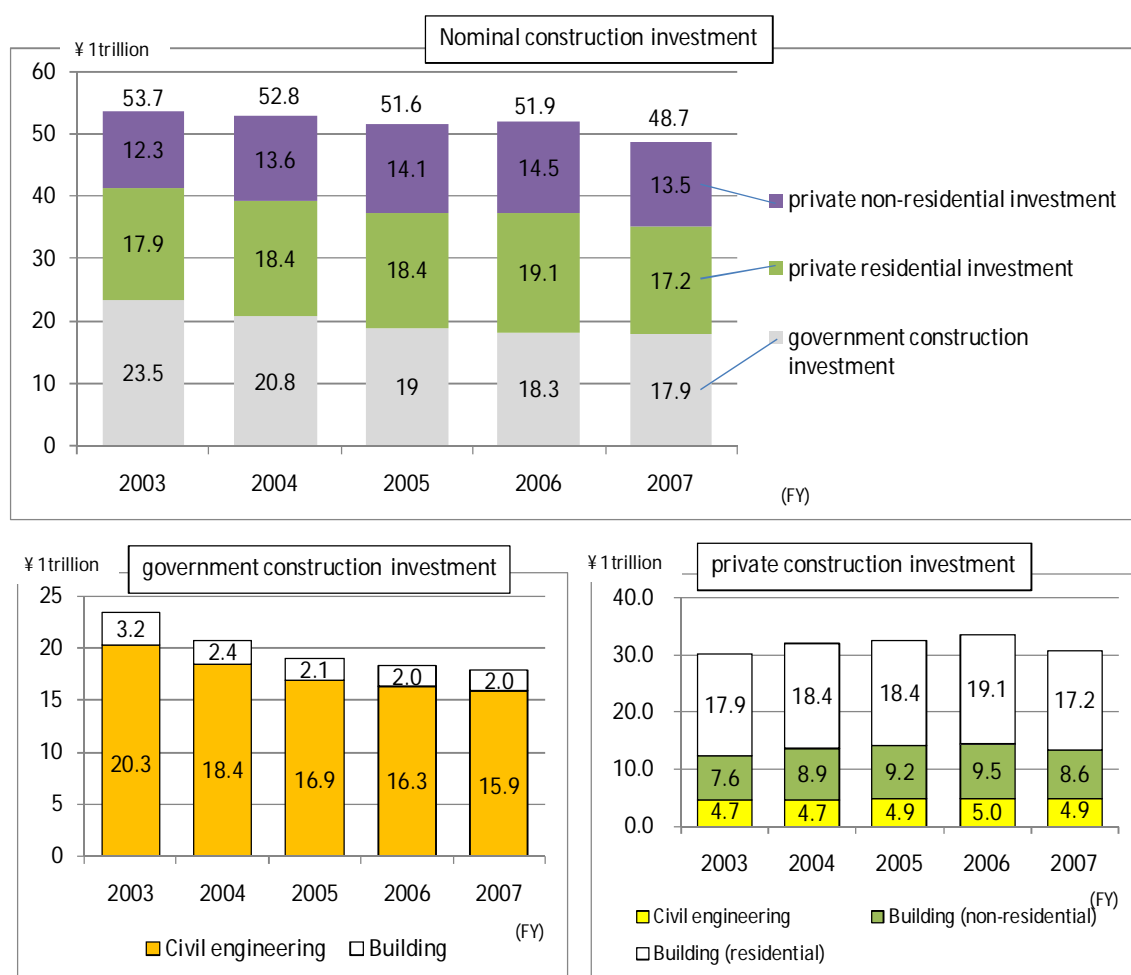
### III. Overview of the Construction Industry

#### 1. Construction Investment

Construction investment in FY2007 was valued at ¥48.7 trillion yen, including ¥17.9 trillion in government spending and ¥30.8 trillion in private spending. Total construction investment is down 42.0% from the peak FY1992, while government investment is down 49.1% from the peak FY1995 and private investment is down 44.7% from the peak FY1990.

Recent trends in construction investment show that government investment has been declining continuously, and private investment also started to decline in 2007.

Figure 3 Construction Investment Trends



Government Construction Investment

Private Construction Investment

Source: "2008 Construction Investment Forecast," Ministry of Land, Infrastructure and Transportation (MLIT).

RICE's FY2008-2009 Construction Investment Forecast published July 2008. It indicated that construction investment, which had fallen considerably in FY2007 as to dip beneath the ¥50 trillion threshold, would be at about the ¥48 trillion level in both FY2008 and 2009. The amount of FY2008 is expected to decrease by 0.4% from FY2007 year to ¥48.85 trillion. Government

construction investment is expected to continue to decline for the tenth successive year, down by 7.6% from FY2007, while private residential construction investment is expected to rise, by 4.1%. Private non-residential construction investment is expected to increase 6.2%, reflecting a 2.4% increase in private civil engineering and an 8.4% increase in private non-residential construction investment.

Construction investment in FY2009 is expected to decrease 0.2% from FY2008 to ¥48.96 trillion. Government construction investment is expected to continue its decline, falling 5.9% year-on-year (y-o-y). Growth in private residential construction investment is expected to slow from the previous year, but is still expected to rise by 3.7%. Private non-residential construction investment is expected to continue to show positive growth, increasing 2.8%, reflecting a 3.2% increase in private civil engineering and a 2.2% increase in private non-residential.

Please note that the forecast did not include the effect of world-wide economic turmoil of last several months.

Figure 4 Construction Investment Forecast

FY	1990	1995	2000	2004	2005	2006 (Estimated)	2007 (Estimated)	2008 (Projected)
Nominal construction investment (Y-o-Y growth rate)	814,395 11.4%	790,169 0.3%	661,948 -3.4%	528,246 -1.6%	515,676 -2.4%	518,600 0.6%	486,700 -6.2%	488,500 0.4%
Nominal government construction investment (Y-o-Y growth rate) (Contribution to GDP)	257,480 6.0% 2.0	351,986 5.8% 2.5	299,601 -6.2% -2.9	208,282 -11.2% -4.9	189,738 -8.9% -3.5	182,900 -3.6% -1.3	179,000 -2.1% -0.8	165,400 -7.6% -2.8
Nominal private residential construction (Y-o-Y growth rate) (Contribution to GDP)	257,217 9.3% 3.0	243,129 -5.2% -1.7	202,756 -2.2% -0.7	183,748 2.6% 0.9	184,258 0.3% 0.1	191,000 3.7% 1.3	172,100 -9.9% -3.6	179,100 4.1% 1.4
Nominal private non-residential construction (Y-o-Y growth rate) (Contribution to GDP)	299,698 18.4% 6.4	195,053 -1.8% -0.4	159,591 0.7% 0.2	136,216 10.4% 2.4	141,680 4.0% 1.0	144,700 2.1% 0.6	135,600 -6.3% -1.8	144,000 6.2% 1.7
Real construction investment (Y-o-Y growth rate)	840,446 7.6%	777,268 0.2%	661,947 -3.6%	533,340 -2.7%	514,784 -3.5%	507,781 -1.4%	467,334 -8.0%	461,500 -1.2%

(Unit: ¥100 million. Real values reflect 2000 prices.)

\*1: Figures for FY 2007 are from the FY 2008 Construction Investment Forecast issued by the Ministry of Land, Infrastructure and Transportation.

\*2: Private non-residential construction investment = private non-residential construction investment plus private civil engineering investment.

Source: Research Institute of Construction and Economy (RICE)

## 2. Construction Companies

There were 507,528 licensed construction companies in Japan as of the end of March 2008, down 16,745 (3.2%) from the same month the previous year. Compared with the end of March 2000, when the number of licensed construction companies was at its peak, there are 93,452 fewer (a 15.5% decrease).

A breakdown of the number of licensed construction companies shows that "corporations with ¥3 million up to ¥10 million in capital" account for the highest percentage (36.4%), followed by "corporations with ¥10 million up to ¥20 million in capital" (25.9%) and "sole proprietors" (20.9%).

Figure 5 No. of Licensed Companies, Composition Ratio, and Cumulative Composition Ratio by Capital Classification

Capital classification	No. of licensed	Composition ratio	Cumulative composition
Sole proprietor	106,064	20.9%	20.9%
Corporation with less than ¥3 million in capital	3,091	0.6%	21.5%
Corporation with ¥3 million up to ¥10 million in capital	184,769	36.4%	57.9%
Corporation with ¥10 million up to ¥20 million in capital	131,483	25.9%	83.8%
Corporation with ¥20 million up to ¥100 million in capital	75,970	15.0%	98.8%
Corporation with ¥100 million up to ¥1 billion in capital	4,592	0.9%	99.7%
Corporation with ¥1 billion up to ¥10 billion in capital	1,151	0.2%	99.9%
Corporation with ¥10 billion or more in capital	408	0.1%	100.0%
	507,528	-	-

Source: "Results of the Survey of on the Number of Licensed Construction Companies," MLIT.

A breakdown by the number of employees is as follows; among the 232,362 companies with projects valued at ¥1 million or more yearly, 59.3% of them have fewer than 10 employees. This highlights the weight of small and medium-sized companies in the market. Compared with 1996, the number of companies has fallen by 63,879 (down 21.7%) . The share of companies with 10-99 employees has decrease, while the share of companies with 9 or fewer employees has grown over the past decade. This shows the weight of small and medium-sized companies has been increasing.

Figure 6 Number of Construction Companies by Size (No. of Employees) in 1996, 2006

No. of employees	1996			2006		
	No. of companies	Composition ratio	Cumulative composition ratio	No. of companies	Composition ratio	Cumulative composition ratio
9 or fewer	164,731	55.6%	55.6%	137,752	59.3%	59.3%
10-99	124,482	42.0%	97.6%	88,768	38.2%	97.5%
100-999	6,345	2.1%	99.8%	5,316	2.3%	99.8%
1000 or more	683	0.2%	100.0%	527	0.2%	100.0%
Total	296,241	-	-	232,362	-	-

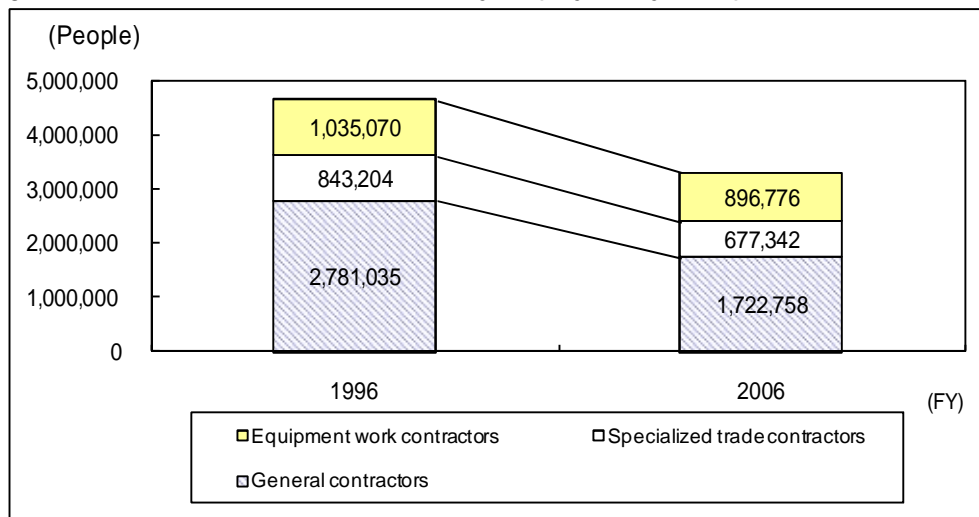
Source: Statistics on Construction Undertaken<sup>1</sup> (March 2007), MLIT.

<sup>1</sup> In the Statistics on Construction Undertaken, some inconsistencies in the coefficients may emerge due to rounding because the figures are obtained by applying the extraction rate of each survey subject to the survey data submitted, multiplying the inverse, and restoring the number of licensed construction companies nationwide, which is the parent population.

### 3. Employees and Construction Labor

The numbers of construction industry employees by trade/field shows that 1,722,758 (52.3%) work for "general contractors," 677,342 (20.5%) work for "specialized trade contractors," and 896,776 (27.2%) work for "equipment work contractors," for a total of 3,296,876 employees. This total is down 1.36 million from 1996, reflecting a particularly large decrease in the number of general contractors.

Figure 7 Number of Construction Industry Employees by Occupation in 1996 and 2006



	1996		2006	
	No. of employees	Composition ratio	No. of employees	Composition ratio
General contractors	2,781,035	59.7%	1,722,758	52.3%
Specialized trade contractors	843,204	18.1%	677,342	20.5%
Equipment work contractors	1,035,070	22.2%	896,776	27.2%
Total	4,659,309	100.0%	3,296,876	100.0%

Source: Statistics on Construction Projects Implemented (March 2007), MLIT.

### 4. Productivity

The low level of labor productivity in the construction industry versus manufacturing and other industries is largely attributed to macro factors such as declining construction investment and the superfluous workers. However, micro level impediments to productivity also exist at work sites and in companies. The major factors involved are as follows:

(1) Construction works are outdoor production, single item production and made-to-order.

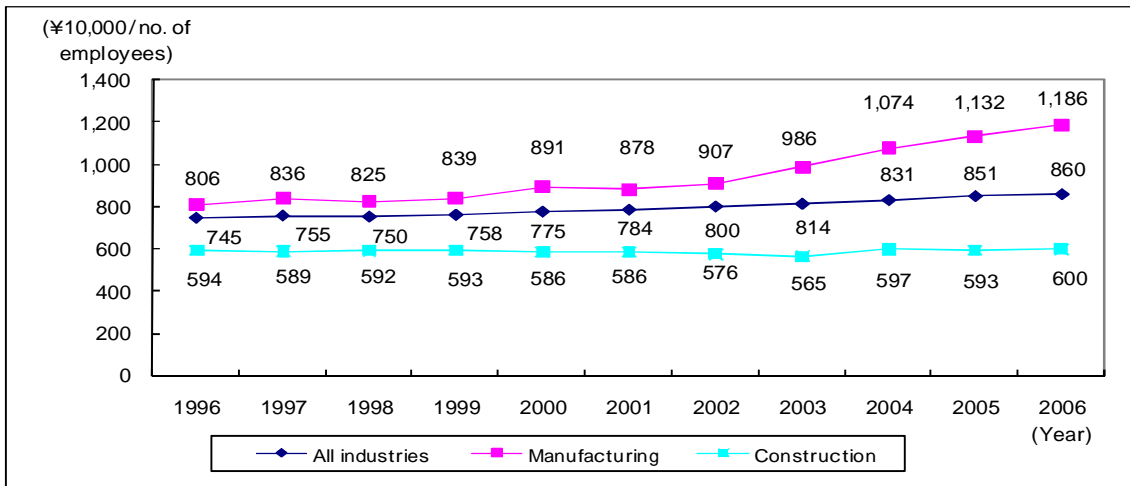
Therefore, productivity improvement in workplace that would bring about major reforms in the production system has not been adequately developed.

(2) The ratio of employees in back-office section is increasing caused by the decline of order volume for each construction company.

(3) The state of "too many layers of subcontractors" leads to increase the overhead costs.

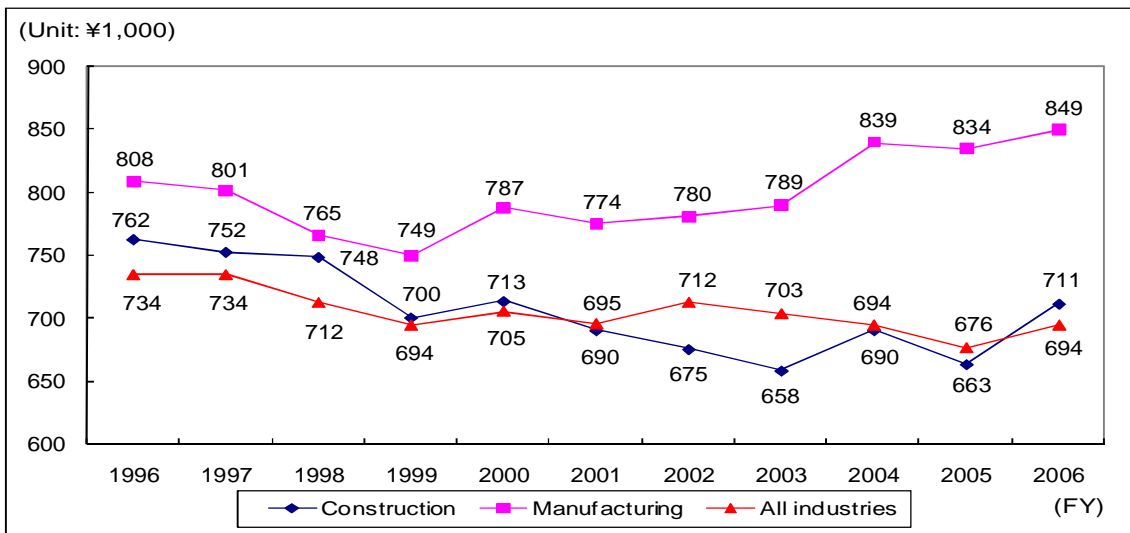


Figure 8 Trends in Real Labor Productivity in the Construction Industry



Source: Annual Report on National Accounts (FY 2008), real prices, base year: 2000, fixed standard year method.  
 Note: Real labor productivity = GDP by economic activity / no. of employees engaged in each economic activity

Figure 9 Added Value Per Employee



Source: Corporate statistics.

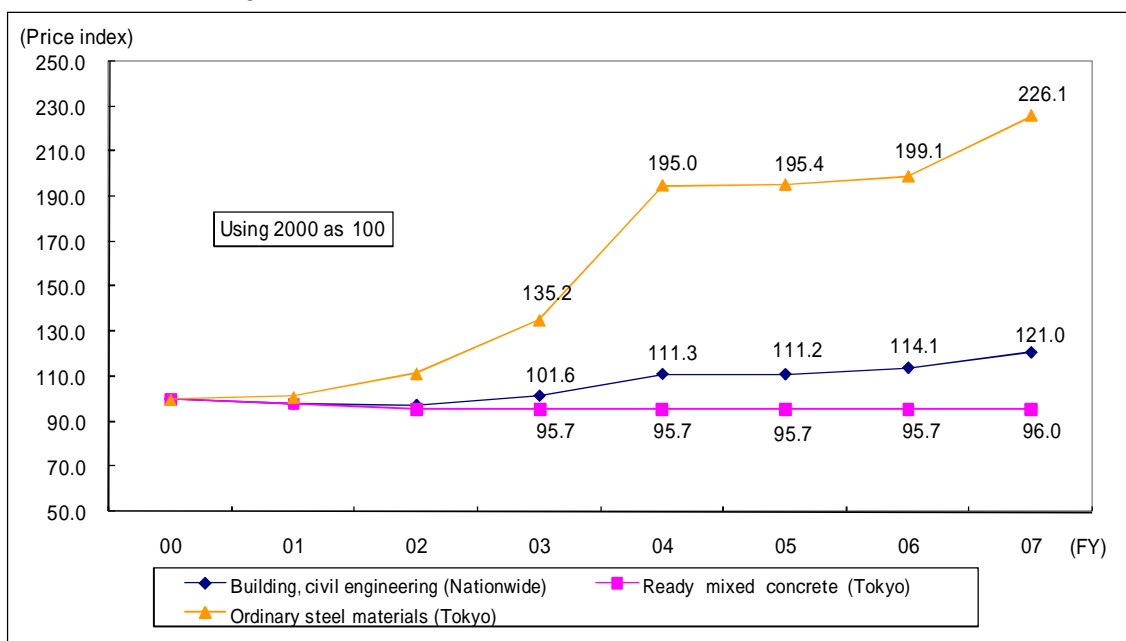
Note: Value added = operating income + personnel expenses + interest expenses/discount expenses + taxes and public fees, etc.

## 5. Construction Costs

### (1) Average Construction Material Prices

Figure 10 shows the trends in prices of major materials in the form of an index based on the average prices in 2000 (construction materials price index). The nationwide index combining building and civil engineering has been increasing since 2003. This is largely due to the steep rise of steel product prices. Worldwide increase of demand for steel product caused the sharp gain of the price in 2003-04. In 2007-2008, rising shipping costs resulting from recent natural resource price hikes caused the next sharp rise. In light of this serious problem in 2007-2008, the MLIT decided to activate the "special clause for sliding contract sum by the steep price change of each item" in June 2008, for the first time in 28 years.

Figure 10 Trends in the Construction Materials Price Index

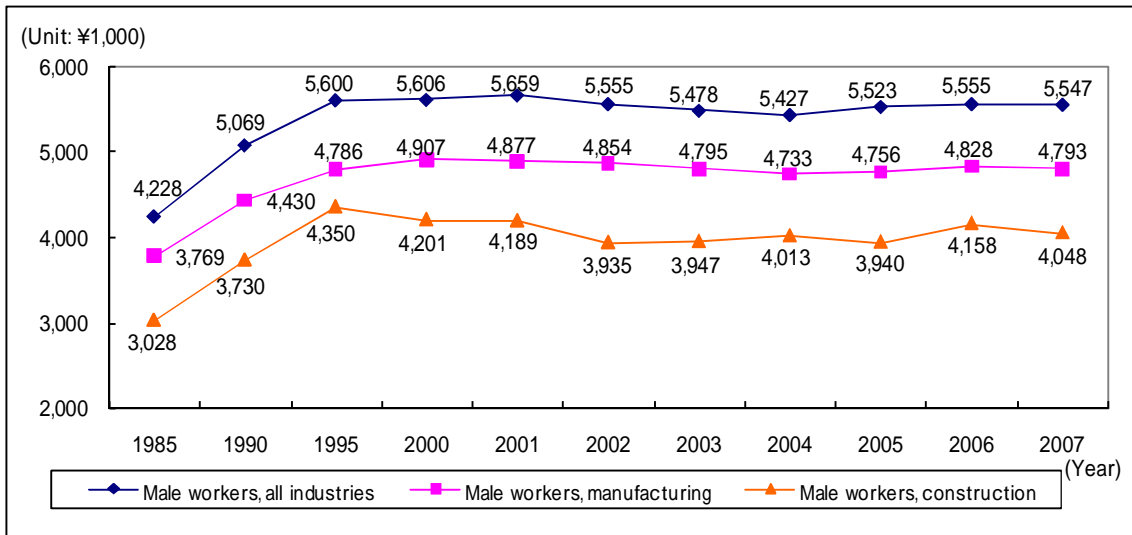


Source: Economic Research Association.

### (2) Construction Industry Wages

Until the early 1990s, wages of production workers in the construction industry had been rising alongside of workers in other industries. However, the decrease of wage began in 1995, earlier than other industries, and this drop caused the widening of gap between the construction industry and other industries. Since then wages increased, and in FY2006 ¥210,000 (5.5% increase from previous year), but fell again in 2007. As a result, annual wages are about ¥1.5 million (27.0%) lower than the average for male production workers in all industries and about ¥750,000 (15.5%) lower than the average for male production workers in the manufacturing industry.

Figure 11 Trends in Total Annual Wages of Production Workers

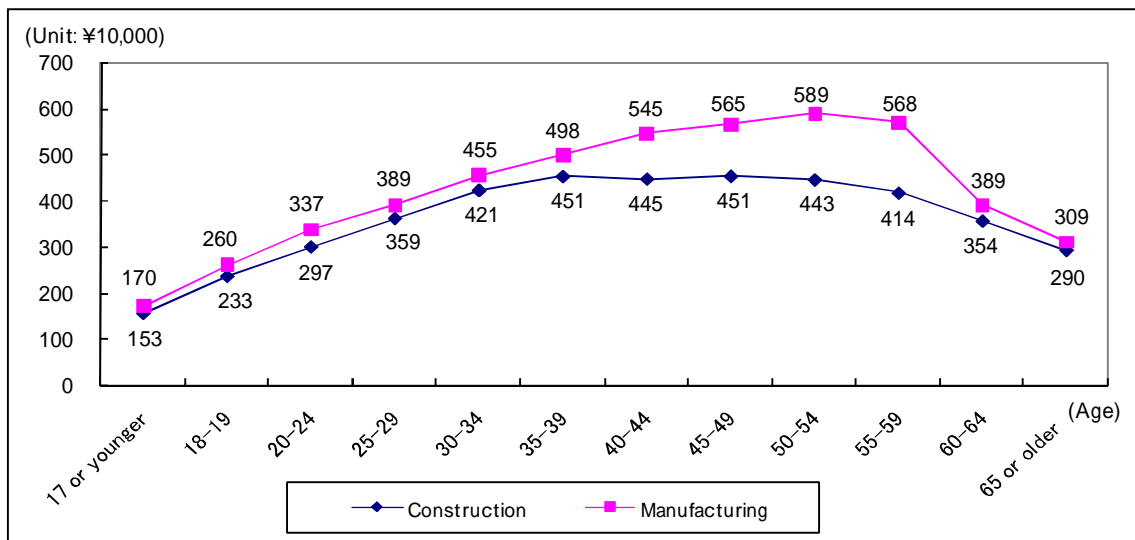


Source: Basic Survey of Wage Structures, Ministry of Health, Labor, and Welfare.

Note: Total annual wages = fixed monthly salary × 12 (months) + annual bonus and other special pay

The wage curve for production workers by age in the construction industry shows that wage increases level off at 40-50 year olds and older when workers likely own homes and have a burden of payment for their children's education..A large gap between this curve and that of manufacturing industry is highly visible.

Figure 12 Annual Wages for Male Production Workers in Construction and Manufacturing



Source: Basic Statistical Survey of Wage Structures, Ministry of Health, Labour, and Welfare.

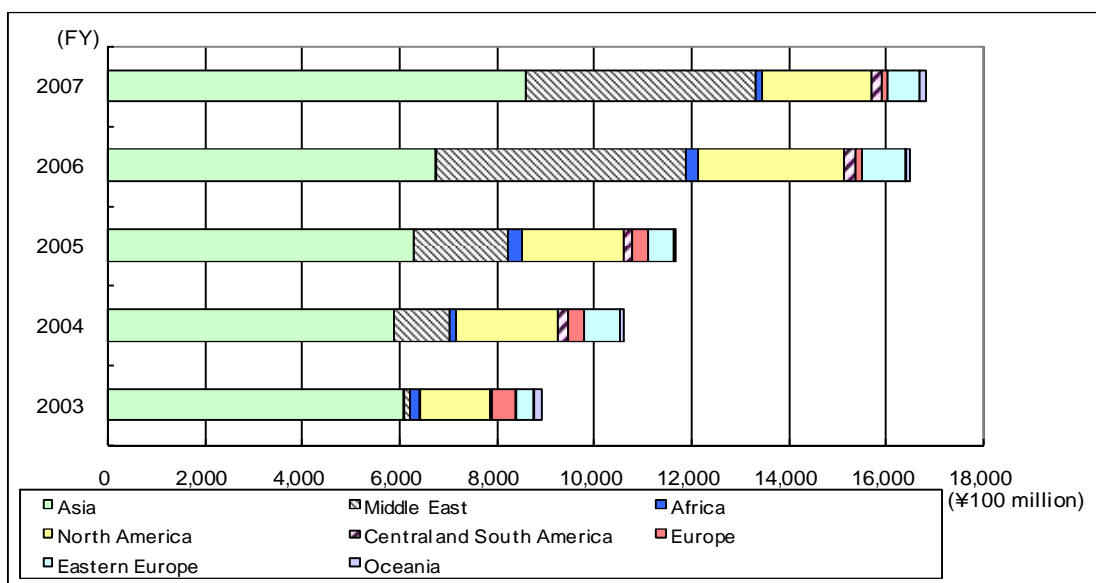
Note: Total annual wages = Total fixed monthly salary × 12 (months) + annual bonus and other bonuses

## 6. Overseas Operation of the Japanese Construction Industry

Construction orders of Japanese companies from overseas trended at about the ¥1 trillion level for more than 20 years since first crossing the ¥1 trillion threshold in FY1983. While orders received in 2007 set a new record of ¥1,681.3 billion, up ¥32.9 billion from the previous peak figure of the FY2006. The ratio of overseas order volume to domestic construction investment is also increasing, and rose 3.5% in 2007.

Order acceptance by region in FY2007 shows that orders from Asia (up ¥184.4 billion) and Oceania (up ¥4.5 billion) increased, while orders from other areas decreased. There was a decline in orders from the Middle East, in reaction to the large increase of FY2006, nevertheless, the amount remained very high, at ¥472.7 billion.

Figure 13 Overseas Construction Orders Received in 2003-2007 (by Region)



(Unit: ¥100 million)

	2003	2004	2005	2006	2007
Asia	6,106	5,885	6,304	6,772	8,616
Middle East	109	1,170	1,943	5,143	4,727
Africa	229	113	298	243	117
North America	1,417	2,100	2,093	2,994	2,273
Central and South America	63	202	160	238	201
Europe	475	316	333	126	122
Eastern Europe	390	765	505	917	661
Oceania	154	67	75	51	96
Total	8,942	10,617	11,710	16,484	16,813

Source: Overseas Construction Association of Japan.

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## Improving Productivity in the Construction Industry

### I. Overview

Construction investment in Japan reached ¥84 trillion at its peak in FY 1992, but is expected to fall below ¥50 trillion, less than 60% of the peak figure, in FY 2007 and thereafter. Government construction investment in particular has fallen by more than half from the peak period. Moreover, government policy plans suggest that public investment will continue to experience a 3% to 5% year-on-year decline until FY 2011.

However, adjustment of supply side of construction market has been delaying. While there were about 530,000 licensed construction companies in FY 1992, that number peaked at 600,000 in FY 1999 and then began dropping, falling to around 540,000 in FY 2005. The number of construction industry employees was 6.19 million in FY 1992, reached 6.85 million in FY 1997, and then retreating to the level of about 5.59 million by FY 2006.

In a market characterized by this kind of imbalance between supply and demand, Japan's labor productivity has undergone a considerable decline on per employee basis. This report discusses current productivity in the Japanese construction industry and describes efforts and issues related to improving construction industry productivity from the perspectives of both policy prescriptions and construction production systems.

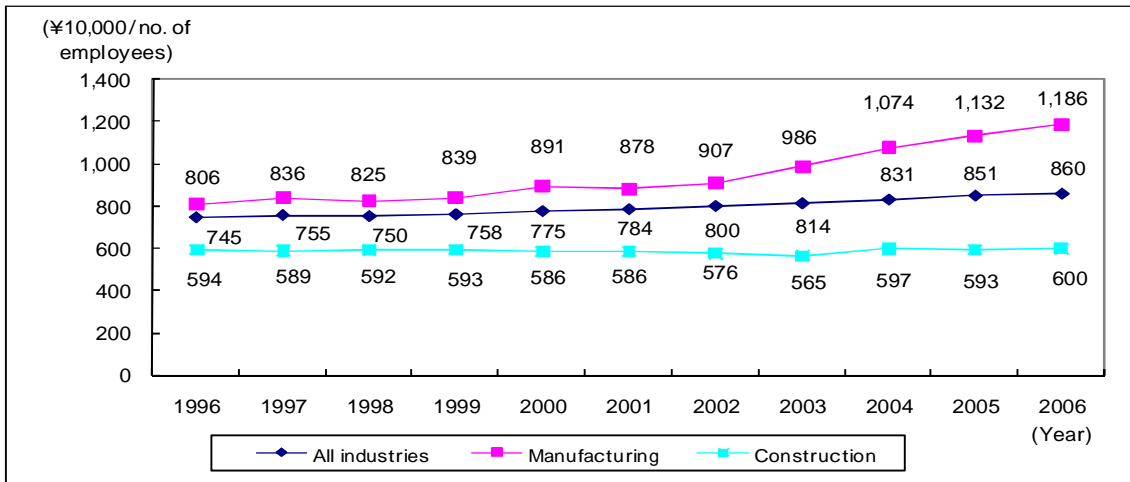
### II. Current Productivity in the Construction Industry

Trends in Japanese labor productivity expressed in the shape of "GDP by economic activity divided by the number of employees engaged in the economic activity" show that all industries was ¥7.45 million at the FY 1996, it had increased to ¥8.60 million at the FY 2006. However, labor productivity in the construction industry was ¥5.94 million at the FY 1996, and it was almost the same level of ¥6.00 million at the FY2006.

The low level of labor productivity in the construction industry versus manufacturing and other industries is largely attributed to macro factors such as declining construction investment and the superfluous workers. However, micro level impediments to productivity also exist at work sites and in companies. The major factors involved are as follows:

- (1) Construction works are outdoor production, single item production and made-to-order. Therefore, productivity improvement in workplace that would bring about major reforms in the production system has not been adequately developed.
- (2) The ratio of employees in back-office section is increasing caused by the decline of order volume for each construction company.
- (3) The state of "too many layers of subcontractors" leads to increase the overhead costs.

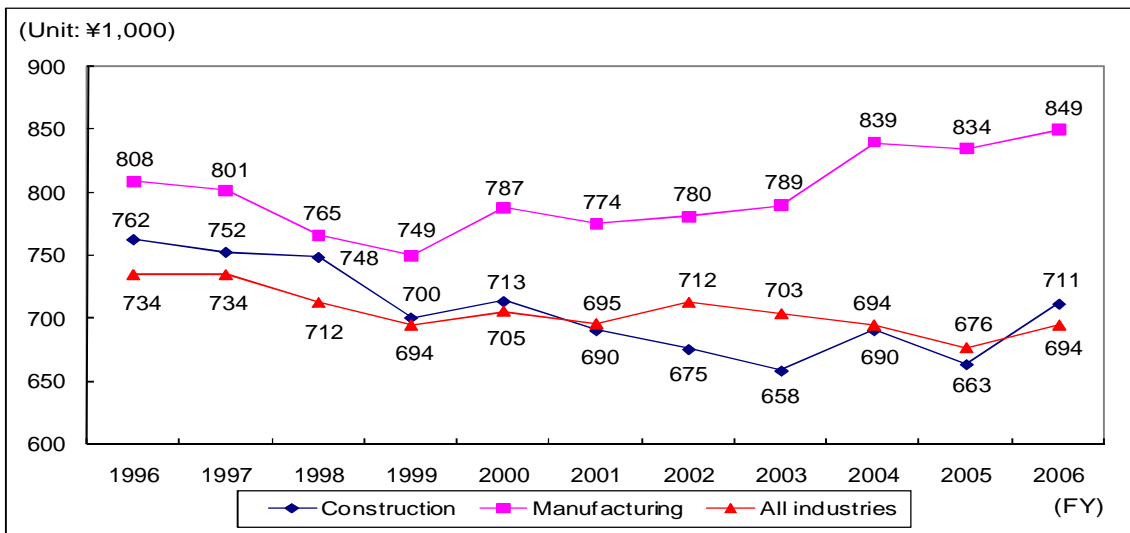
Figure 1 Trends in Real Labor Productivity in the Construction Industry



Source: Annual Report on National Accounts (FY 2008), real prices, base year: 2000, fixed standard year method.

Note: Real labor productivity = GDP by economic activity / no. of employees engaged in each economic activity

Figure 2 Added Value Per Employee



Source: Corporate statistics.

Note: Value added = operating income + personnel expenses + interest expenses/discount expenses + taxes and public fees, etc.

### III. Efforts and Issues Involved in Improving Construction Industry Productivity

#### III - (1) Construction Industry Policies

With construction industry productivity continuing to decline, the Ministry of Land, Infrastructure, Transport and Tourism (MLIT) has published *Construction Industry Policies 2007*. This document promotes efforts to strengthen the following five construction industry policies, and describes the need to promote “structural reform” in the construction industry.

- (1) Establish a fair competitive base
- (2) Promote reorganizing efforts
- (3) Reform the tender and contract system to promote competition by both technologies and management
- (4) Organize equal and highly transparent construction production systems
- (5) “Human resource development” to sustain the object producing industries

(1) Establish a fair competitive base

Eliminating bid-rigging and other types of misconduct and ensuring full legal compliance are the keys to restoring the trust of citizens and improving the attractiveness of the construction industry. It is of the utmost importance that a fair competitive environment is established in which those who work serious and make a effort do not suffer a loss. This must be done by preventing the burden on subcontractors and workers that result from orders obtained through comprehensive subcontracting and extremely low prices. To achieve this, ensuring legal compliance is a pressing concern, and the government needs to respond forcefully to incidents of legal misconduct.

a) Clarify the rules and ensure legal compliance

- Establish a “Head Office for Construction Industry Legal Compliance Promotion” to strengthen legal compliance promotion systems.
- Prohibit comprehensive subcontracting (Revision of the Construction Business Act) to ensure appropriate construction work execution.

b) Strengthen penalties for legal misconduct

- To abolish bid-rigging, consider extending the business suspension period and extending the maximum suspension period of designation.
- Strengthen penalties for falsifying reports in the Business Evaluation.

c) Provide information to consumers

- Publish negative information on construction companies (supervisory reprimands, suspension of designation, etc.) to strengthen selectivity and monitoring by consumers.
- Disclose profit information by sector (civil engineering division, building division, international division) to ensure appropriate evaluation of business condition.

(2) Promote reorganizing efforts

In the construction industry, further reorganizing and shakeouts are inevitable to correct the excessive supply structure, and efforts must be made to development an environment to promote restructuring. We need to review the obstacles that impede management decisions of individual companies for mergers and other forms of reorganization, and to enact policies to



provide incentives for restructuring.

To support the challenge of companies to move into new markets, such as overseas construction or into upstream or downstream markets, and the fields of agriculture, welfare, and the environment, none of which construction industry have yet extended to in a large scale, helps expand the flexibility of managing of companies. Government needs to cultivate an environment for this challenge, same as for promotion of restructuring.

a) Systems design that do not hinder corporate management decisions

- Create corporate group evaluation systems in the Business Evaluation that promote corporate reorganization.
- Reform the engineer system so that it does not impede the free conduct of corporate business activities.

b) Create incentives for restructuring

- Provide incentives through the use of the Special Measures Law for Industrial Revitalization (revise industry guidelines and ensure flexibility of appliance) to promote corporate restructuring.
- Provide financing support to promote corporate partnerships between small and medium-sized construction companies (mergers, business succession).

c) Support expansions into overseas construction markets

- Develop a database of specialized information to promote overseas expansion, and create an advisor system for providing instruction and advice.
- Strengthen financing support for project formation of infrastructure public-private partnership (PPP) projects.
- Promote measures for active use of Japanese construction technologies in ODA projects.

d) Review the division of roles between the public and private sectors, and expand the sphere of construction industry activities

- Use PFI and the designated administrator system to utilize the funds, technologies and know-how of private companies.
- Promote the use of CM/PM system to expand the market of fee-based business.
- Implement model projects to promote advancement into agriculture and other fields by small and medium-sized companies.

(3) Reform the tender and contract system to promote competition in both technologies and management

It is necessary to create a “virtuous cycle” in which refining technologies and management and doing good work leads to the next job as a basic rule. For this purpose, we need to achieve the highest value for procurements in terms of both cost and quality by introducing a tender and contract system that is fair, transparent, competitive, not contaminated by bid-rigging or other misconduct. To do this, we need to expand the open and competitive bidding system characterized by high competition and transparency, to bolster the comprehensive evaluation system, and to promote the introduction and expansion of bid bonds in order to create the

conditions for achieving these.

As local public authorities expand the range of applicability of the open and competitive bidding system, they need to comprehensively consider their operational structure, the type and scale of construction projects and the characteristics of the construction companies. They also need to create market conditions that promote competition between similarly positioned companies, and to ensure that contributions to the local community are appropriately measured in comprehensive evaluations and qualifications.

a) Promote competition on price and quality, technologies, and management

- Expand open and competitive bidding system and comprehensive evaluation system to develop a competitive environment in which the “companies with the best engineering, execution and management skills” can grow and thrive.
- Promote the introduction of bid bonds to utilize market functions.
- Revise the Business Evaluation to ensure that companies are being fairly evaluated for public works.

b) Revise the tender and contract system responding to local actual conditions

- Establish proper order criteria and bid participation condition to set up markets that are well suited to character and scale of project, and to the feature of construction companies.
- Promote the diffusion of a “Comprehensive Evaluation Manual for Local Public Authorities” for appropriate evaluation of contributions to the local community and so on.

c) Strengthen countermeasures to the low-cost bidding

- Expand comprehensive evaluation system including the evaluation of executing structure to achieve public procurement at high quality and price.
- Promote the introduction and expansion of standards for disqualification in lower limit bid price systems and low bid price investigation systems run by local public authorities.
- Strengthen ties with the Fair Trade Commission.

(4) Organize equal and highly transparent construction production systems

The aim of construction production systems is to provide most valuable service and highest value for money (VFM) to the end users of the construction products, and this goal must be achieved through competition that promotes the survival and growth of companies with the best engineering, execution, and management capabilities.

To achieve this kind of construction production system, based on the “post-collusion era”, we need to establish equal relationships between clients, designers, and builders, clarify the roles and responsibilities of each player, and improve transparency.

a) Use various means of procurement

- Use detailed design contracting system that requires advanced technologies, design-build contracting methods and consortia of construction consultants and construction companies.
- Use proposal method to select the designer.
- Formulation of structure to promote the CM/PM method to supplement client skills and

systems.

b) Clarify roles and responsibilities, improve transparency

- Promote three-party consultation between the client, designer, and builder in order to share design ideas and adapt to changes of conditions.
- Establish the effect of interruption of prescription (revise the Construction Industry Law) in regards to dispute handling within the Committee for Adjustment of Construction Work Disputes to promote simple, prompt, and fair solutions to contract disputes.

c) Build appropriate subcontracting relationships

- Establish the “Head Office for Construction Industry Legal Compliance Promotion” to strengthen legal compliance promotion systems.
- Formulate the Construction Industry Legal Compliance Guidelines to clarify actions that clarify legal misconduct.
- Implement subcontracting safety net debt guarantee programs to facilitate the procurement of funds by subcontractors.

(5) “Human resources development” to sustain the object producing industry

Construction production is an outdoor, single-item, made-to-order production and production success or failure is largely determined by how well engineers and skilled workers demonstrate their engineering capabilities and technical skills under conditions and contexts of execution that differ from project to project. Thus, construction production is a people-based industry, and it is essential to secure, cultivate, and evaluate talented human resources who can sustain the construction industry in order to change the construction industry more attractive. With the population declining and birthrates falling, we need to examine ways to promote the re-employment of baby boomers who are now reaching retirement age in large numbers, to promote the entry of women to the industry, and to utilize foreign worker training programs that are founded on equal treatment of Japanese foreign workers.

Also, improving productivity in the construction industry through supporting standardization that helps introduction of ICT and technological development will enable to prepare for the anticipated decline in the productive age population.

a) Secure and train personnel, improve worker treatment

i) Evaluate engineers and skilled workers, improve treatment

- Proper evaluation of core skilled workers in the Business Evaluation and the comprehensive evaluation system to improve productivity and ensure quality in the construction industry.
- Promote the utilization of the revised Law on the Improvement of Employment for Construction Workers, which makes it possible for construction workers to be temporarily dispatched or hired through business associations.

ii) Improve and transfer technologies and skills

- Support pioneering/leading efforts of business associations to contribute skill-up of young workers guided by experienced workers and veterans.

- Promote the use of cross-industrial training institutions for engineers and skilled workers.
- iii) Strengthen cultivation of future human resources
  - Policies to strengthen the cultivation of future human resources that link vocational high schools with the local construction industry.
  - Policies aimed at actively training and employing women.
  - Use of trainees from other countries.
- b) Promote IT and other technological developments
  - i) Improve networking within the construction industry
    - Promote diffusion of the Construction Industry NETwork (CI-NET) to improve the operational efficiency of construction companies through adoption of electronic systems for exchanging estimates and orders between contractors and subcontractors.
  - ii) Promote technological developments in the private sector.
    - Use the New Technology Information System (NETIS) to collect and share information on new technologies, and induce effective new technologies developed by private companies into public works projects.

### III-(2) Efforts to Improve Productivity Through the Construction Production Systems of Construction Companies

Given its structure of excessive supply, further restructuring and shakeouts in the construction industry are inevitable. In an era characterized by declining construction investment, maintaining steady growth is becoming more difficult than previous eras, when construction investment was rising. As a result, construction companies are striving to strengthen management and engineering capabilities by using new technologies and ICT to achieve greater project efficiency and by shifting their focus from construction project sales to profits. As is happening in other industries, companies are continuing to seek out the optimal business formats for improving productivity, including consideration of mergers and partnerships with other companies, and restructuring.

#### 1. Improve management capabilities

##### (1) Expand sphere of activity

Companies are expanding the sphere of activity of the construction industry, which has thus far been centered around building projects, and are beginning to pursue new business opportunities.

In particular, large and semi-large construction companies are pursuing to move into upstream and downstream markets (such as planning, design, maintenance/repair, and other related fields). These are markets where construction companies can easily leverage the technologies and know-how they have already developed, and they would be attractive markets for construction companies aiming to offer "comprehensive construction services," such as those typified by PFI projects. These are also fields where CM and PM methods are expected to be more actively used as supplementary management systems for the client from the perspective of ensuring transparency and third-party objectivity.

Also, there are an increasing number of construction companies interested in pursuing business opportunities in a broader range of fields, such as development of overseas markets as well as in such new fields as agriculture, the environment, and welfare projects. Many construction companies are citing industries like food production, the environment, energy conservation, disaster reduction, and health/welfare as fields in which the need for construction investment is rising. They are therefore actively establishing offices that specialize in these fields because of their potential for future growth.

Figure 3 Expanding the sphere of activity of construction companies (into upstream and downstream markets)

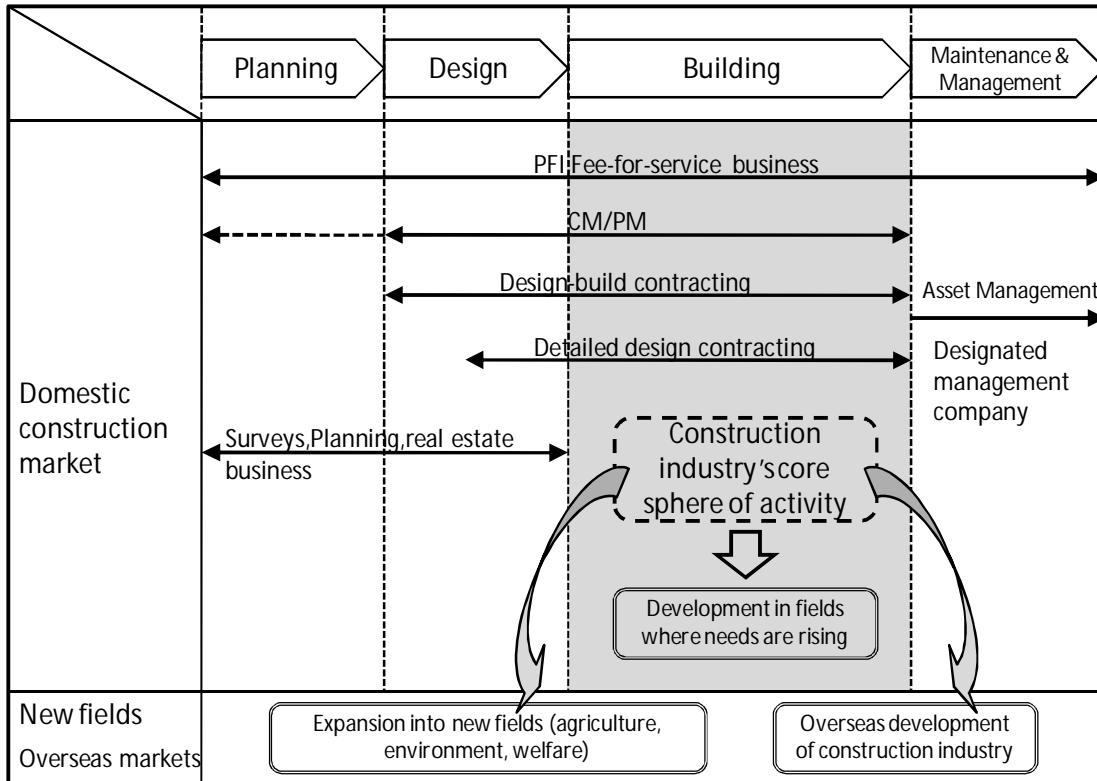


Figure 4 Types of efforts and recent developments

Types of efforts	Recent developments
PFI, fee-for-service business	<ul style="list-style-type: none"> <li>- Most are in the field of education and culture and Most are managed by municipal governments.</li> <li>- Of those projects in which a construction company is the core company, more than half are large or semi-large general contractors.</li> </ul>
CM/PM method	<ul style="list-style-type: none"> <li>- Establishing specialized divisions and offering services.</li> <li>- Construction consultants are also actively involved (CMR).</li> </ul>
Design-build contracting	<ul style="list-style-type: none"> <li>- Upstream strategies are being strengthened, and the ratio of design-build orders is increasing particularly among large and semi-large general contractors.</li> <li>- Strengthens management of proposals incorporating land information from the planning stage. Places priority on project efficiency.</li> </ul>
Asset management	<ul style="list-style-type: none"> <li>- With new demand stagnating, the asset renewal market is attracting attention.</li> <li>- Public authorities that subcontract everything out to construction companies, including bridge pier inspections, repair, and cleaning, are appearing.</li> </ul>
Designated manager system	<ul style="list-style-type: none"> <li>- The number of new entrants is steadily increasing.</li> <li>- The ratio of private companies acting as designated managers was 18.3% in September 2006.</li> </ul>
Expansion into new fields	<ul style="list-style-type: none"> <li>- Small and medium-sized companies are making efforts to expand into new fields, and efforts recognized as model cases should receive support.</li> <li>- Strive to ensure widespread education and outreach. Promote efforts by small and medium-sized</li> </ul>
Overseas developments	<ul style="list-style-type: none"> <li>- Develop an overseas construction project library (database), and provide general information needed for developing overseas.</li> <li>- Strengthen collection of overseas PPP information and establish research associations to support PPP</li> </ul>

## (2) Reorganize construction companies

While the number of licensed companies and employees in the construction industry is falling, construction investment is undergoing an even more dramatic deceleration. As a result, the construction industry continues to be characterized by excess supply. In this environment, individual companies are focusing investment of resources into their particular fields of expertise, and are restructuring their businesses, developing ties with or purchasing other companies to supplement their business activities.

While large and semi-large construction companies are trying to reinforce their businesses by purchasing or forming partnerships with companies in different businesses or different sales regions, some are withdrawing from fields like real estate, where revenues are not expected to increase, and are re-investing their resources in more narrowly focused endeavors.

Small and medium-sized companies, like large and semi-large companies, are engaging in business integration through mergers and the establishment of collaborative unions aimed at strengthening the business base through mutual complementarity. They are also integrating back office departments across companies using ICT, and are collaborating on the procurement and shipment of equipment and materials.

On specialized projects, companies in different industries are forming online networks, establishing groups to engage in joint order acceptance, and engaging in corporate mergers with companies in the same industries, or companies in other industries.

## 2. Improve engineering capabilities

The low level of work site productivity due to the nature of this industry's outdoor, single item, made-to-order production model is an impediment to improving construction industry productivity. To combat this problem, we need to improve engineering capabilities so as to bring about a major transformation in construction production systems, or in other words, to increase the efficiency of site management and project implementation. We also need to increase productivity in response to the decrease in the number of construction industry employees that is expected to occur in the future.

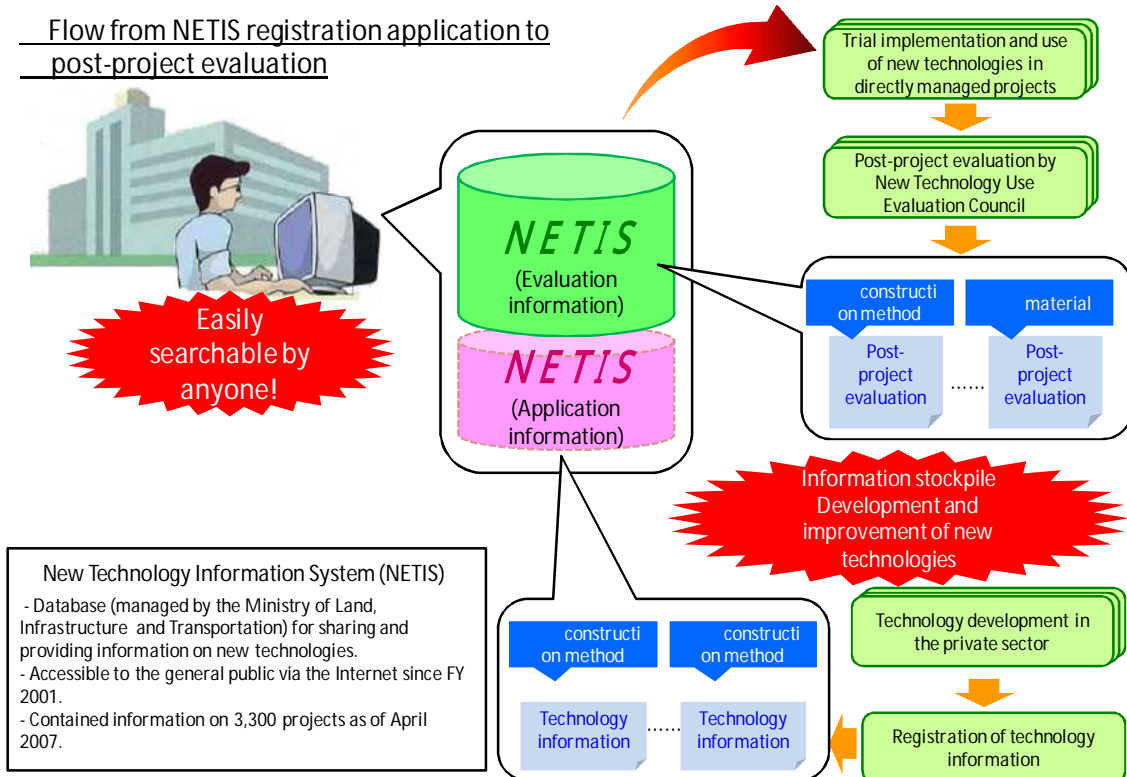
### (1) Use new technologies

Using proven new technologies, such as energy saving measures, is an effective way to increase the efficiency of site management and project implementation.

The New Technology Information System (NETIS) was developed to facilitate the active application of useful new technologies developed by private companies in public works projects. It is being developed and used by the Ministry of Land, Infrastructure, Transport and Tourism (MLIT). NETIS collects information on new technologies developed in the private sector, and incorporates it into a single organized database that covers all information on projects directly managed by the MLIT from trial implementation to the evaluation and verification of results. By publicizing information on useful new technologies and new construction methods not only among construction project purchasers, but also among private construction companies, the MLIT is promoting the dissemination of technologies and methods that will help improve

productivity. A system that supplies information on construction technologies, including evaluation results, will not only contribute to the development of the comprehensive evaluation method, but will also increase its importance for improving productivity.

Figure 5 Overview of the New Technology Information System (NETIS)

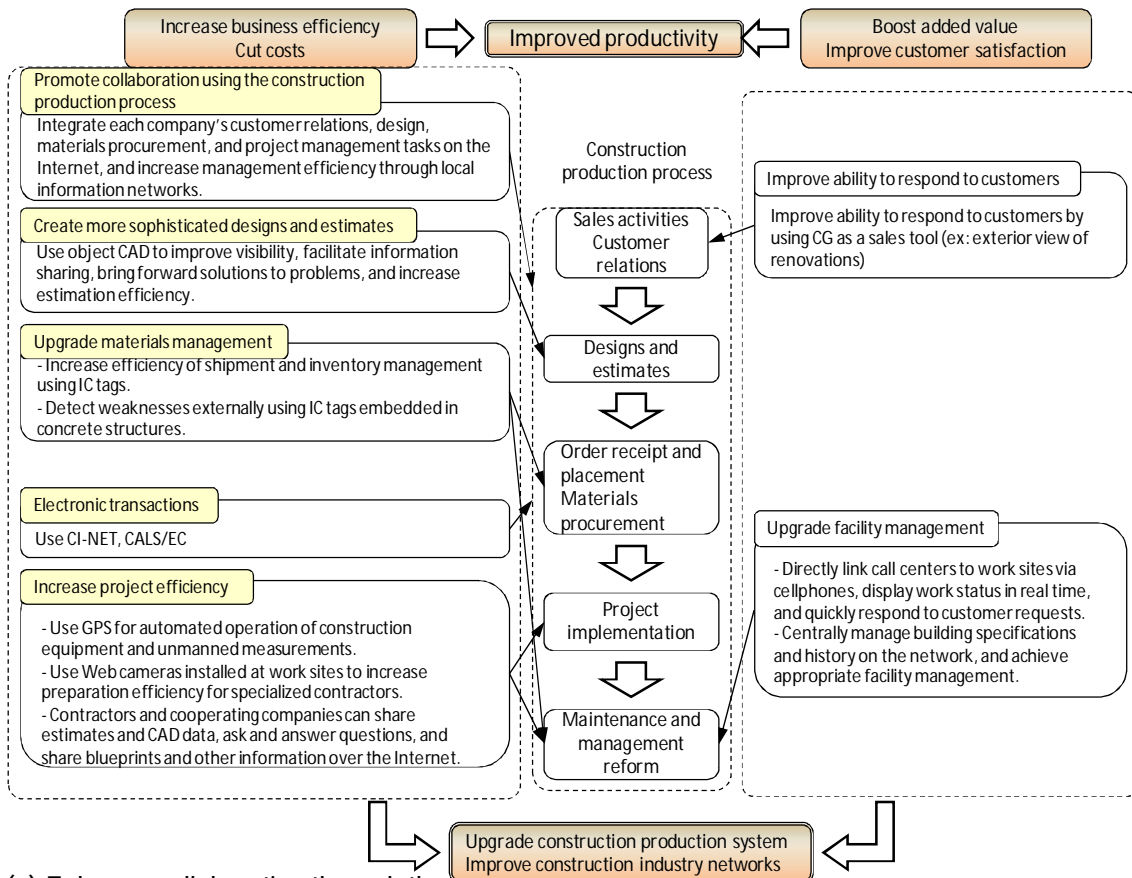


(2) Use of ICT

ICT is being used in increasingly sophisticated ways in the construction industry. The introduction of ICT by companies in their efforts to increase business efficiency, cut costs, raise added value, and improve customer satisfaction, has thus far largely been based on the independent judgments of individual companies. In recent years, however, efforts have been made to increase efficiency in the construction production process as a whole by creating networks that include clients, cooperating companies, and other relevant parties, and by incorporating ICT into the bidding, delivery, ordering, materials management, and contract management processes. Efforts are also being made to increase the efficiency of construction mechanization by creating networks using CAD systems and ICT equipment.



Figure 6 Use of ICT in the construction industry



(a) Enhance collaboration through the construction production process

Efforts are being made to create an information network among specialized contractors and to facilitate joint construction projects. This makes it possible for the tasks that once would have been managed solely by a general contractor, such as customer relations, estimate preparation, design, subcontracting of specialized contractors, materials procurement, and building project management, to be divided up, and for individual services to be ordered through an information management center. Concentrating all information on an intranet at an information management center makes it possible to confirm workload and material quantities and to consolidate all work and materials orders and project management information. Costs can be kept down by ordering materials in bulk, and accurate information on project progress and labor investments can be obtained. This contributes to improved management efficiency.

(b) Upgrade designs and quantity surveys

Introduction of Building Information Modeling (BIM) using new-generation CAD systems is primarily being promoted in the architecture departments of large construction companies.

Use of new-generation CAD programs makes it possible to seamlessly transmit and share all information related to a project, including quantitative information on the construction product, and to investigate anticipated problems early in the process. As a result, builders have been freed from the time-wasting process of waiting or doing things over again. It is now possible for

labor and materials to be delivered to a worksite in a timely manner, and this has made significant increases in productivity possible. This process not only means shorter construction times for clients, but also helps them engage in effective asset management by using accumulated information as maintenance management information.

For builders, who begin participating in a project early in the process, this system improves their ability to meet their customers' needs.

Figure 7 Comparison of conventional and new-generation CAD systems

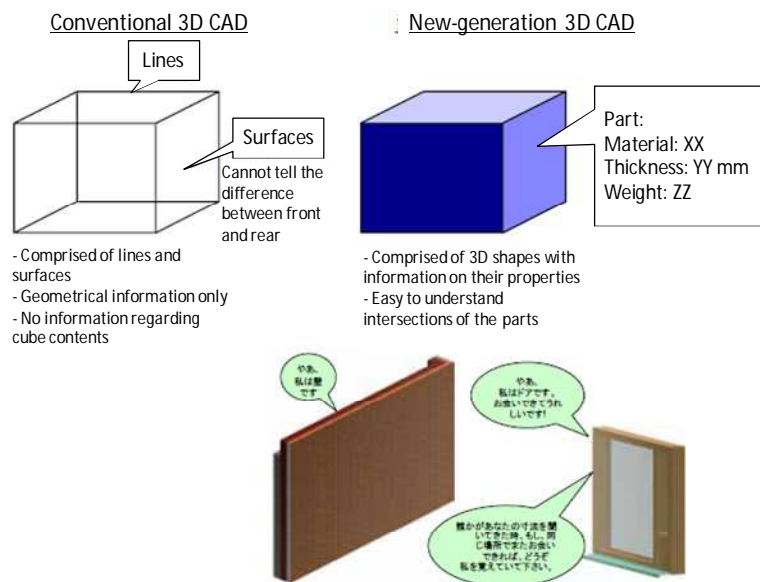
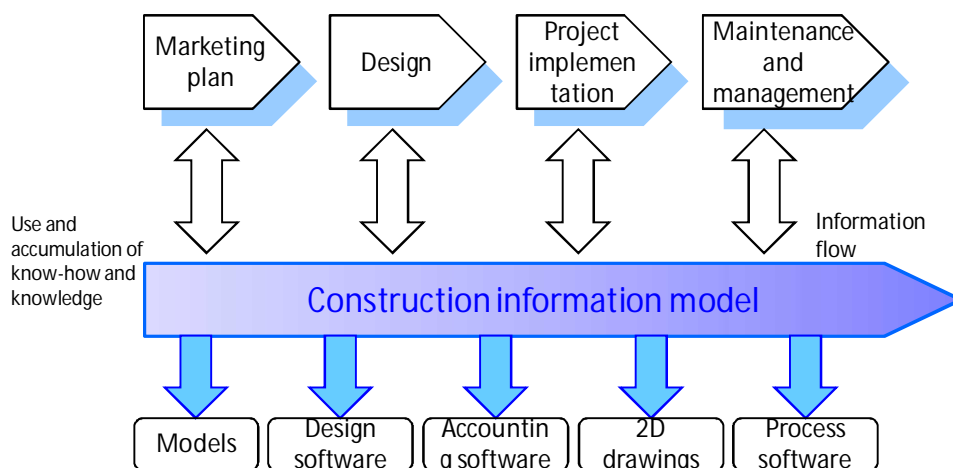


Figure 8 Image of construction production process using BIM

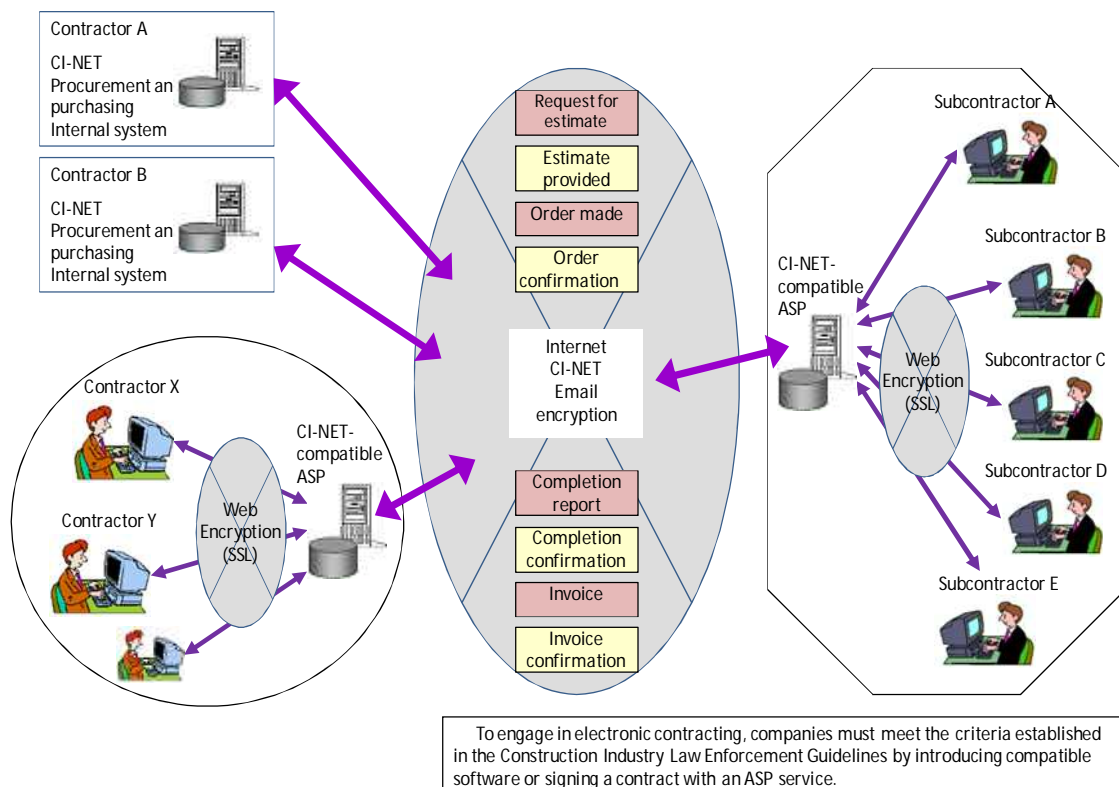


(c) Electronic transactions

Using the Construction Industry NETWORK (CI-NET), private sector contractors and subcontractors can electronically exchange ledger data, such as estimates and purchase orders, and can improve the efficiency of their operations. As of the end of FY 2006, about 8,000 companies were participating in this network.

Meanwhile, use of the Continuous Acquisition and Life-cycle Support/Electronic Commerce (CALs/EC) System by both private and public institutions is also expanding. CALs/EC involves use of digital information technologies related to public works projects for electronic bidding, approval, contracts, and delivery. It aims to increase the efficiency of document and technical information exchange between parties involved in public works projects, and to promote information sharing, as well as to improve the quality of public works projects. Electronic bidding was used in about 90% of the projects directly managed by the MLIT in FY 2006.

Figure 9 CI-NET overview



(d) Increase efficiency through ICT applied project implementation

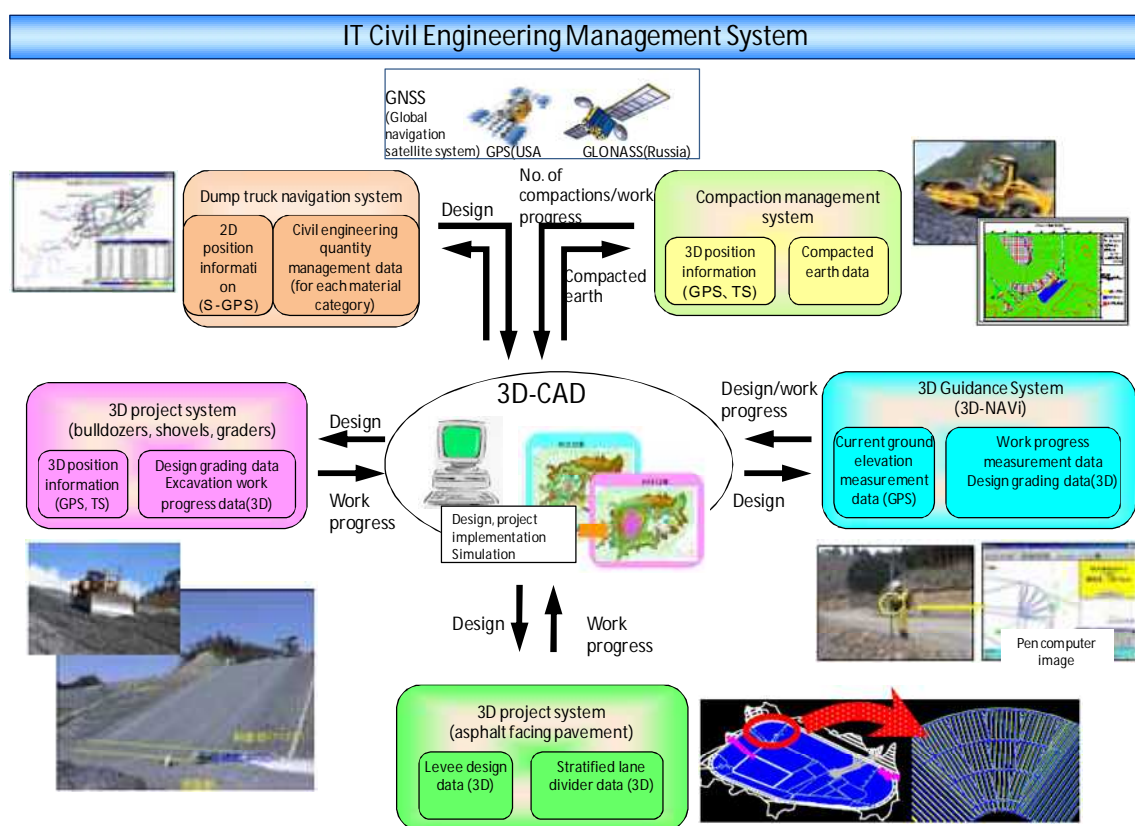
Increasing project efficiency is an effort to simplify project management and quality management through the use of various kinds of information devices that promote mechanization and labor savings. It will also save labor in various construction processes.

For example, construction machinery can be automatically operated using GPS, total stations, and 3D design data made possible by 3D CAD. Because these systems can ascertain height and other positioning information in real time, they eliminate the need for on-site positioning

adjustments and thus save large amounts of labor. Also, because they do not rely on the skill or experience of the operator, they make consistent, highly precise operations possible. By eliminating the need for unnecessary motion and because it can be operated with a minimum number of personnel, it also has the advantage of improving safety.

There are also examples of information networks being used to increase efficiency. Installation of a Web camera at a work site makes it possible to confirm project progress in real time and shortens the amount of time needed by specialized contractors for preparation. Also, the use of cell phones and the ability to communicate information on repairs, building diagnostics, and regular inspection information using digital cameras and computer applications, saves large amounts of labor and cuts down on the use of paper.

Figure 10 Example of IT use in project implementation



#### IV. Conclusions: the Future of the Japanese Construction Industry

The excess supply in the construction industry is casting a long shadow of corporate bankruptcies. Bankruptcies among construction companies in the first half of 2008 (Teikoku Databank, TDB) reached 1,633, a 16.2% increase over the same period last year, particularly among large and medium-sized companies prominent in local areas. These failures can be attributed to a decrease in public works projects, a recent increase in the prices for materials, and the financial collapse of condominium property companies.

Price dumping and bankruptcies due to the imbalance between construction supply and demand are increasing, and the number of construction companies has not declined in conjunction with the decrease in construction investment. These negative impact that subcontractors and workers has been suffered from, has been a factor in reducing productivity in the construction industry. Also, the construction worker population is aging due to overall population decline, and the transmission of technologies and skills to future generations poses a pressing challenge.

Policy efforts include projects to support expansions into new industries, as outlined in the construction industry policy for 2007, "Promoting Restructuring Efforts." MLIT is promoting, under the "Supporting Program for the Construction Industry to Modeling in Expansion into New Fields and Management Reform /in Securing and Training Skilled Construction Worker", the management reform efforts that contribute to productivity improvements being undertaken by local construction companies and efforts to contribute to the recruitment and training of skilled construction workers various companies. MLIT is accepting public proposals that meet certain criteria for projects deemed to be model cases, and highlighting the most progressive cases and widely disseminating information about these cases, The construction industry has contributed to the local community during emergency situations through emergency response and recovery actions in the past. However, as a industry with strong ties with the local communities, it is also expected to be a new player to fulfill the service needs of local government such as public facility maintenance and management, to work in agricultural industry in which human resources are seriously lacking, and to supply public transportation and welfare services in the underpopulated regions.

Utilizing ICT is important in construction production systems. In Japan, high-speed communications networks, including optical fiber networks, have already been developed, and this has allowed the expansion of electronic bidding and electronic delivery. The country is developing an environment in which construction companies can take full advantage of ICT.

CAD technologies are developing from conventional 2D and 3D systems to new-generation object CAD and 4D CAD systems. Object CAD is a technology for sterically creating a design on a computer screen by not only using the shapes of objects (architectural components such as walls, pillars, and fittings), but also by integrating the parts with the information related to their materials, dimensions, shapes, colors, and weights. With the addition of the concept of time, it has become possible to assess the process conditions in four dimensions. As a result, it has become possible to (1) easily transmit and share all information related to a project, including quantitative information, (2) accurately ascertain the content of a project intuitively by improving visibility, and thus to improve customer satisfaction, and (3) use the information entered into CAD programs as maintenance and management information, thereby contributing to appropriate post-project asset management.

Building Information Modeling (BIM) using new-generation CAD systems makes it possible to

link tasks based on the accumulated information once all the necessary information related to the life cycle of the construction product has been entered into the system. BIM is also useful insofar as it shortens project times for both builders and clients, and insofar as it can be used as a tool for asset maintenance and management.

Application of ICT in the construction industry has lagged behind other industries. However, while there is some difference between large companies and their small and medium-sized counterparts in terms of ICT implementation, progress is being made on the adoption of ICT by construction companies as a whole. ICT is now well recognized as an effective way to improve business efficiency and reduce costs.

In the future, companies will need to improve their engineering and management skills if they are to survive in a competitive marketplace, and ICT is sure to be more widely recognized as an effective tool for achieving this.

Construction companies are striving to upgrade the construction production system by working to integrate ICT into the construction industry, and striving to achieve corporate management that takes full advantage of the unique character of the construction industry and its intricate network of clients, designers, and builders.