RESEARCH INSTITUTE OF CONSTRUCTION AND ECONOMY

The 9th

***ASIA*CONSTRUCT** Conference

Australia, 8-9 December, 2003

JAPAN COUNTRY REPORT

2003-2004

PREPARED BY

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RESEARCH INSTITUTE OF CONSTRUCTION AND ECONOMY

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1.1 Macroeconomic Review and Overview

(1) The Japanese real-term economic growth rate achieved growth in FY2002 for the first time in two years, resulting in an all-time high of ¥541.2 trillion. The real GDP announced on September 10, 2003 for the first quarter of FY2003 grew 1.0% from the previous quarter, resulting in the sixth consecutive quarter of positive growth. Capital investment grew significantly by 4.7% from the previous period to accompany the recovery in corporate profits. And it is thought that the increase in the export induced by the upbeat U.S. economy is also contributing greatly.

However, residential investment decreased for the sixth consecutive quarter. The recovery in corporate profits remains limited to large corporations, which indicates that more time is required for the economy to fully recover.

(2) The national government's outstanding debt as of the end of June 2003 increased to ¥643.7599 trillion, which exceeded the FY2001 figure of ¥600 trillion and far exceeds Japan's GDP. For example, the outstanding debt at the end of FY2002 was equivalent to about 140% of the GDP for that fiscal year. The increase in outstanding debt is due to sluggish tax revenue caused by the recession. Since 2001, the Koizumi Cabinet has promoted structural reform in order to achieve economic recovery, ranging from the cleaning up of bad debt to the reform of quasi-governmental agencies, and has also reduced public works project expenditures.

1.2 Trends in the Construction Industry

(1) In FY2002, nominal construction investment fell 7.1% from the previous year, sinking below the ¥60 trillion mark for the first time in 16 years to total ¥56.52 trillion. Government construction investment was down 10.2%, private residential construction investment was down 3.5%, and private non-residential construction investment was down 5.7%.

(2) Forecasts indicate that nominal construction investment in FY2003 will fall by 4.1% from the previous fiscal year, dropping to ¥54.21 trillion. Government construction investment is expected to decline by 8.8% due to a continued decrease in spending at both the national and local levels, and in spite of the availability of funds carried forward from the supplementary budget approved at the end of FY2002. Private residential investment is forecasted to remain at roughly the same level as the previous year in the absence of positive indicators, while last-minute housing starts triggered by the upcoming end to home loan tax cuts at the end of 2003 will only have a temporary effect on private residential investment. Private non-residential investment is forecasted to decrease by 1.3%, as the recovery in corporate profits is expected to require some time before it results in new investment.

(3) Nominal construction investment in FY2004 is expected to fall 3.1% from the previous year to ¥52.54 trillion, resulting in the eighth consecutive year of negative growth since FY1996. Government construction investment is forecasted to decrease by 7.8%, taking into account the 3% decline in public works investment expenditures mandated by the national government for FY2004 and policies to reduce independent local projects in local government budget proposals by 5% annually until FY2006. Private residential investment is forecasted to decline by 0.7% based on the severity of the economy. Private non-residential investment is forecasted to increase by 2.1% due to increasing capital investments by corporations, which would result in the first positive growth in four years.

1.3 Administration and Regulation of the Construction Industry

In Japan, the Ministry of Land, Infrastructure and Transport (MLIT) is responsible for administrating the construction industry as a whole, and performs such functions as the licensing and evaluation of construction companies and bidding system reform. In addition to the MLIT, local governments, quasi-governmental agencies, and other public institutions that commission construction work administrate construction companies based on the supervisory function provided by the MLIT but also using their own evaluation and registration systems.

Recognizing the trend toward globalization in recent years, more construction service buyers are using open and competitive bidding, as well as new bidding methods such as the value engineering (VE) system, in which technical proposals are accepted during the bidding process, and the integrated evaluation system, in which the function and quality of the proposed structure are evaluated together during the bidding process.

1.4 Enhancement and Development of the Construction Industry

A vast array of policies aimed at developing and enhancing the construction industry has been implemented. For example, policies have been implemented to improve product quality assurance through the application of ISO9000 series standards, to raise the skill levels of on-site workers and managers, and to increase construction safety by preventing human error. Environmental protection measures have also been introduced to promote the use of information technologies in the construction sector, the research and development of new materials and earthquake-resistant construction methods, and the enactment of a construction materials recycling law.

1.5 Globalization of Construction Services

(1) The Japanese construction market has traditionally not made any distinctions between domestic and foreign companies in terms of requirements for obtaining business permits or other procedures. An action plan was introduced in 1994 to further increase the transparency, objectivity, and competitiveness of bidding and contracting procedures, and to enhance the rules against discrimination between

domestic and foreign companies. Furthermore, Japan became a party to the WTO Agreement on Government Procurement in 1996.

In fiscal 2003, ten of the foreign construction companies that had obtained business licenses in Japan originated in Asia.

(2) The Asian construction market is the largest overseas market for Japanese construction companies, and nearly 70% of the sum total of overseas construction orders in fiscal 2001 came from Asia.

Japan's activities in the Asian market include, as part of its ODA efforts, technological cooperation such as the transfer of construction technologies and business know-how. Through the project orders they receive, Japanese construction companies build cooperative relationships with joint venture partners and the local companies that serve as their subcontractors, and transfer technologies in the fields of process management and quality control.

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Chapter 2 Macro Economic and Construction Industrial Review and Outlook

Table 2-1 Major macroeconomic indicators

	1999	2000	2001	2002	2003
GDP & Components (monetary unit : billion yen)					
GDP at real prices	5,239,817	5,391,611	5,324,445	5,412,000	5,507,779
GDP growth(%)	1.0	3.2	-1.2	1.6	1.8
GDP at current market prices	5,106,873	5,154,251	5,025,855	4,991,650	4,978,933
Agriculture,Forestry,Fishring,Mining & Quarrying	82,380	77,717	76,356	—	—
% growth	△ 8.4	△ 5.7	△ 1.8	—	—
Manufacturing sector	1,109,912	1,121,140	1,042,308	—	—
% growth	△ 2.2	1.0	△ 7.0	—	—
Services sector	**3,513,921**	**3,555,548**	**3,598,267**	—	—
% growth	△ 0.8	1.2	1.2	—	—
Construction sector	384,946	379,363	357,623	—	—
% growth	△ 3.1	△ 1.5	△ 5.7	—	—
Demographic Indicators					
Population(1000s)	126,686	126,926	127,291	127,435	127,610
Population growth rate(%)	0.16	0.35	0.48	0.40	0.25
Total labour force(1000s)	68,110	68,220	67,570	67,170	66,930
Labour force growth rate(%)	△ 0.07	0.09	△ 0.79	△ 1.54	△ 0.95
Unemployment rate(%)	4.6	4.6	5.2	5.4	5.1
Financial Indicators					
Short term interest rate(%)	0.17	0.23	0.13	0.1	0.03
Long term interest rate(%)	1.836	1.663	1.311	1.007	0.47
Changes in consumer price index(%)	100.7	100.0	99.3	98.4	98.2
Base lending rate(Commercial banks)	1.375	1.5	1.375	1.375	1.375
Base lending rate(Finance companies)	2.2	2.1	1.85	1.65	1.25
Change against US$	113.91	107.77	121.53	125.31	118.26

Sources:Construction Economy Forecast (RICE, Oct 2003); *Annual Report on National Accounts* (Cabinet Office, March 2003); the Ministry of Public Management, Home Affairs, Posts and Telecommunications Internet home page; *Bank of Japan Monthly Bulletin* (compiled by the Research and Statistics Department, Jul 2003)

Notes:

1. GDP figures are for the fiscal year. GDP figures for 2003 are estimates. Real figures are based on FY 1995 prices.
2. All gross productivity figures are in nominal terms.
3. Populations figures are estimates.
4. Figures for labor force population and unemployment rates are as of the end of December for each year. Figures for 2003 are current as of August.
5. The consumer price index assumes a baseline figure of 100 for 2000.
6. Interest rate figures are from year-end statistics (except for 2003 figures which reflect interest rates as of June 30).
7. Short-term interest rates reflect the average interest rates published in the domestic commercial papers.
8. Long-term interest rates reflect interest rates on long-term (10-year) government bonds.
9. The consumer price index for 2003 is as of June 30.
10. The base lending rates (Commercial Banks) reflect the short-term prime rates.
11. The base lending rates (Finance Companies) reflect the long-term prime rates.
12. Exchange rate figures are annual averages (except for 2003 figures, which reflect the average for June).

2.1.1 Overview of the Japanese Economy

The nominal GDP for the Japanese economy was 499.195 trillion yen in FY2002, representing a decline of 0.7% over the previous fiscal period. This is the first time since FY1994 that nominal GDP has fallen below the 500-trillion-yen level. The real-term economic growth rate was 1.6%, compared with the previous figure of -1.2%, and was the first positive growth rate in two years. The real GDP figure of 541.2 trillion yen was the largest to date. Although the Japanese economy attained real growth, unemployment rate has remained high at 5.1% (August 2003), and a recovery in the employment and income environment may still be some time off in the future.

The Koizumi government has been implementing structural reforms since April 2001 in the belief that these are indispensable for economic growth. The Government has sought economic recovery through financial reconstruction. The reforms have included; (1) the speeding up of the processing of non-performing loans by banks, (2) the reform of public corporations, (3) the reduction in public works expenditure, (4) the raising of the share of the health insurance premiums to be paid by the insured, (5) the abolition of the special tax exemptions for spouse and, (6) the changing the system for the collection of social insurance premiums to one based on annual income level. Privatization of four public highway corporations and the local finance reform are also on the reform agenda.

In the meantime, increasing public debts, creeping deflation, lingering non-performing loans, and other economic problems challenge Japan's economic recovery. The total outstanding Japanese government debt (government bonds, borrowing, Financial Bills (FB)) as of the end of FY2002 came to 668.7605 trillion yen, the highest in history. This total is 61.4483 trillion yen higher than the outstanding government debt total of 607.3122 trillion yen at the end of FY2001, and corresponds to about 140% of nominal GDP in FY2002. Although the Nikkei Index, around the 14,000-yen level immediately after Prime Minister Koizumi assumed office in April, 2001, has continued to stagnate for some considerable time, it has recently finally recovered to the 10,000-yen level.

The supply-side oriented structural reforms of the Government have discouraged private consumption and private non-residential investment. In the meantime, both public investment and government consumption are to be further curtailed. The Government believes that industries in which there is an oversupply are retarding the disposal of non-performing loans, which is in turn hampering the flow of funds. As a result, both productivity growth and the expansion of growth frontiers are being held back. In response, the Government is pushing ahead with policies aimed at increasing supply side efficiency. Corporations appear to be resuming investment in new plants and equipment; however, as financial institutions struggle to clean up non-performing loans, small- and medium-sized businesses remain burdened with loan repayments and are unable to invest in new facilities. Regions of the country where the proportion of government-funded projects is high are being affected by the reduction in government expenditure.

2.1.2 Economy in the First Half of 2002

The real GDP announced on September 10, 2003 for the April to June period 2003 grew 1.0% from the previous quarter, resulting in the sixth consecutive quarter of positive growth. The major contributing

factors in the GDP growth were the recovery in corporate profits leading to increased capital investment and the positive consumer sentiment amidst the recent backdrop of rising stock prices. Another major factor was the resurgence of US-bound exports due to the early conclusion of the Iraq conflict, which had been a major area of concern for the previously sluggish US-bound export market.

Real capital investment by private corporations continued to increase steadily, resulting in the fourth consecutive quarter of positive growth. However, positive growth was enjoyed mostly by large corporations and manufacturing enterprises such as electrical firms, where the recovery in profits was spurred by overseas demand. However, non-manufacturing industries and small- and medium-sized businesses continued to struggle amidst a deflationary economy, resulting in constraints on new investments. Real private final consumption expenditure appears to be close to rebounding due to several factors including the recent rise in stock prices and the positive growth of employment rates during the April to June period 2003, which was the first positive increase in the last eight quarters. An additional factor is that incomes appear to have hit bottom and are beginning to recover. Net exports of real goods and services to the US and Asia were temporarily sluggish due to the Iraq conflict and SARS epidemic, but US-bound exports have rebounded due to the recovery of the US economy. However, real private residential and real public fixed capital formation decreased for the sixth and fifth consecutive quarters respectively, resulting in continued weakness in these two areas.

In summary, the upbeat growth in capital investment helped to prop up the Japanese economy in the first half of FY2003.

2.2 Five-Year Outlook for the Japanese Economy

Regardless of the difficult path ahead, the Government expects the economy to achieve an annual economic growth rate of approximately 2% by FY2005 or FY2006. In “Reform and Perspectives - FY2002 Revision” announced in January 2003, the government sets FY2006 as the target year for its reforms, and hopes to halve the present primary balance deficit (approximately -5%) around FY2007 and then achieve a surplus in the 2010’s. In this process, economic growth rates in FY2005 and FY2006 will close to at least 1.5% in real terms and 2.5% in nominal terms.

However, the outlook for the Japanese economy, even following these reforms, is by no means rosy. An aging society and shrinking population are expected to place constraints on the Japanese economy in the future. According to studies conducted by the National Institute of Population and Social Security Research, the population of Japan was 126.9 million in 2002 (National Census) and will increase at a moderate pace until reaching a peak of 127.7 million in 2006. After that, there will be a long-term population decline. At the same time, the aging of society will progress at an accelerated pace, such that the population of senior citizens (aged 65 and older) will rise from the current level of 22 million people to over 30 million by 2013, before rapidly increasing to 34.2 million by 2018. The shrinking population will decrease the scale of the Japanese economy, while the aging of society will inevitably increase the burden on working people in terms of taxes and social security. The savings rate is also expected to decline, thereby reducing the society’s overall resources available for investment. In 2010, the pace of population decline will still be moderate, but in the absence of technological innovations or increased productivity, the Japanese economy will face difficulties in

returning to a pattern of positive growth over the mid- to long-term.

As can be seen from the above, a more intelligent approach and increased diligence will be required if the Japanese economy is to continue thriving now that it has shifted from a growing economy to a mature economy.

2.3 Construction Industry Overview

2.3.1 Construction Industry Overview

Construction investment in Japan has continued to decline since fiscal 1997. It is estimated to settle at ¥54.2 trillion for fiscal 2003, having fallen all the way to only 65% of its 1992 peak.

Though private construction investment has been sluggish since the collapse of the bubble economy, public construction investment has remained at fairly high levels. This is because public works projects were actively promoted in successive economic policies enacted to achieve economic recovery. Since public works projects thus propped up construction investment, which had shrunk as a result of major decreases in private construction, a rapid decline in overall construction investment was averted.

However, as a result of ongoing dynamic fiscal investment over several years in an environment where the economic slowdown had produced a lack of financial resources, fiscal conditions drastically worsened. Local governments especially found themselves in a difficult spot, and though the national government had been promoting investment in public works projects to help improve the economic climate, it eventually became unable to follow through on these projects. Actually, the number of independent local projects implemented by local governments with their own funds continued to decrease over several years, and public projects funded by the national government reached their limit. It has become difficult to rely on national-government finances to sustain construction investment.

The figure below shows the trends in construction investment (nominal values), the number of licensed construction companies, and the number of workers in the construction industry since fiscal 1985. Construction investment continued to expand after FY 1985 until it reached ¥84 trillion in FY 1992. However, construction investment began to decline following the collapse of the bubble economy, and is expected to fall to ¥54 trillion in FY2003.The numbers of licensed construction companies and workers in the construction industry, however, have increased since 1990, with the number of licensed companies rising until the year 2000 and the number of workers rising until 1997. In recent years these numbers have started declining, but while construction investment is now at about the same as its 1986 level, the number of licensed construction companies is about 1.07 times (an increase of 35,000 companies) the 1986 level.

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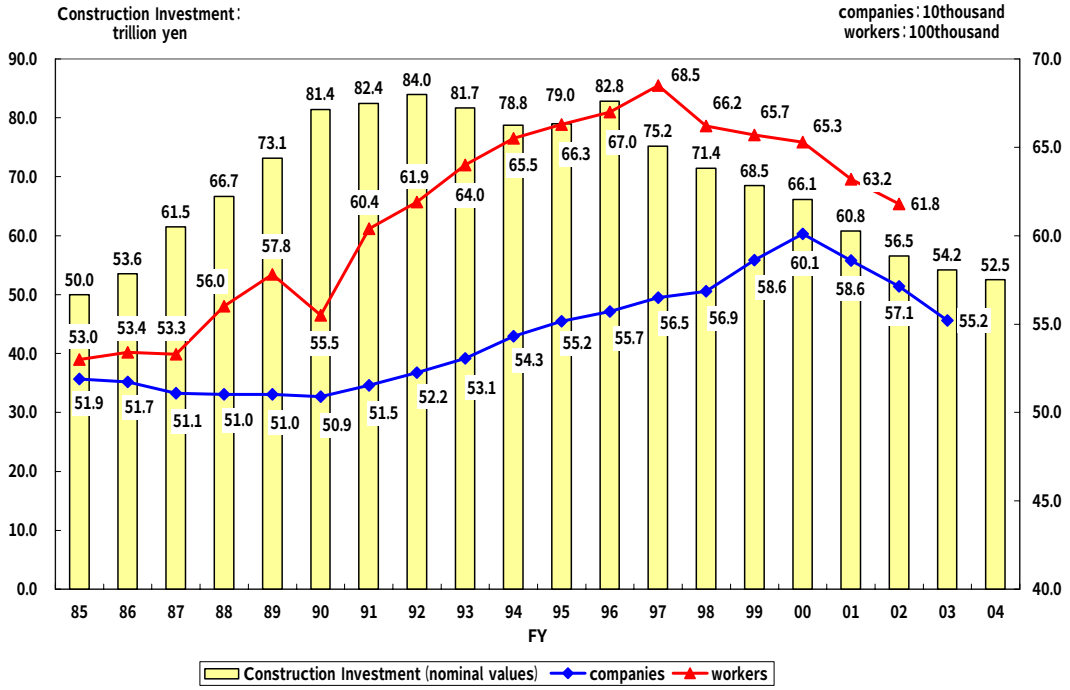
Figure 2-1 Trends in construction investment (nominal values), the number of licensed construction companies, and the number of workers in the construction industry



Sources: FY 2003 Construction Investment Forecast, Ministry of Land, Infrastructure and Transport; Construction Economy Forecast (Oct 2003), Research Institute of Construction and Economy; Survey of the Number of Licensed Construction Companies, Ministry of Land, Infrastructure and Transport; *Labor Force Survey,* Ministry of Public Management, Home Affairs, Posts and Telecommunications.

Notes:

1. Construction investment values are calculated based on figures published by the Ministry of Land, Infrastructure and Transport up through fiscal 2002. Figures after fiscal 2003 are based on estimates issued by Research Institute of Construction and Economy. Fiscal year basis.
2. Number of licensed construction companies: Figures as of the end of March for each year.
3. Number of workers in the construction industry: annual average.

2.3.2 The Real Estate Market

(1) Trends in Land Prices in Major Cities

According to the Posted Land Prices compiled by the Ministry of Land, Infrastructure and Transport, 2003 average land prices nationwide fell for the 12th consecutive year since the collapse of the bubble economy. The average price for residential land fell by 5.8% (5.2% in 2002), while that of commercial land fell by 8.0% (8.3% in 2002). There is no end in sight for the land price decline in either the major cities or smaller localities.

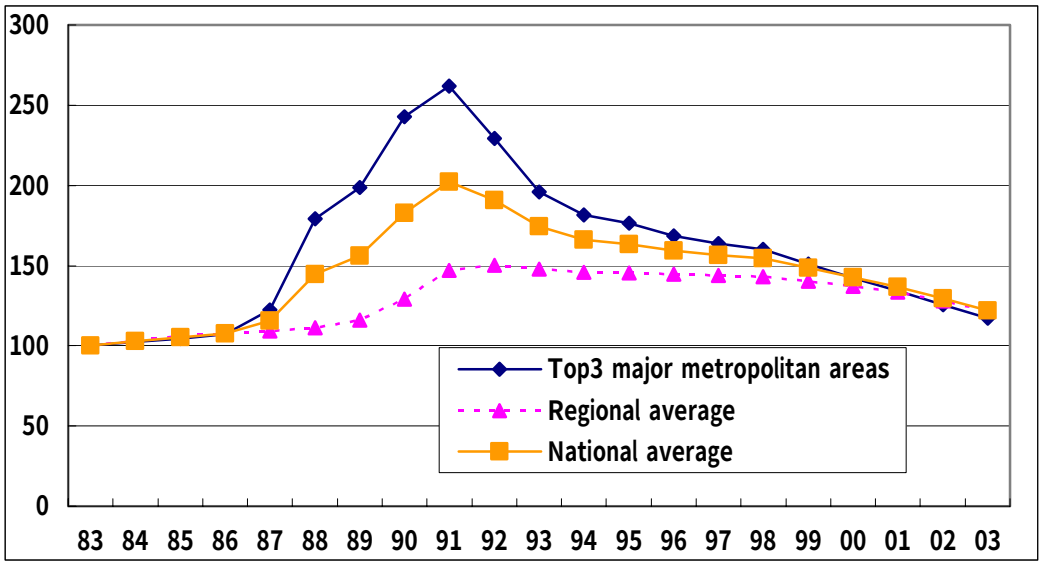
Table 2-2 Officially announced land prices since 1998

(Unit: % change from previous year)

Region	Land use	1998	1999	2000	2001	2002	2003
National	Avg. for all land uses	-2.4	-4.6	-4.9	-4.9	-5.9	-6.4
	Commercial land	-6.1	-8.1	-8.0	-7.5	-8.3	-8.0
	Residential land	-1.4	-3.8	-4.1	-4.2	-5.2	-5.8
Greater Tokyo	Avg. for all land uses	-3.9	-7.1	-7.4	-6.4	-6.4	-5.9
	Commercial land	-8.2	-10.1	-9.6	-8.0	-7.4	-5.8
	Residential land	-3.0	-6.4	-6.8	-5.8	-5.9	-5.6
Greater Osaka	Avg. for all land uses	-2.3	-5.9	-6.9	-7.4	-9.1	-9.1
	Commercial land	-6.8	-9.6	-11.3	-11.0	-11.3	-10.2
	Residential land	-1.5	-5.2	-6.1	-6.7	-8.6	-8.8
Greater Nagoya	Avg. for all land uses	-1.9	-4.9	-3.0	-2.8	-5.3	-6.1
	Commercial land	-6.2	-11.2	-7.3	-5.6	-8.1	-8.0
	Residential land	-0.8	-3.3	-1.8	-1.9	-4.4	-5.6
3 main metropolitan areas	Avg. for all land uses	-3.2	-6.4	-6.6	-6.1	-6.9	-6.8
	Commercial land	-7.5	-10.2	-9.6	-8.3	-8.5	-7.1
	Residential land	-2.2	-5.7	-5.9	-5.6	-6.5	-6.5
Non-metropolitan Japan	Avg. for all land uses	-1.7	-3.0	-3.4	-3.8	-5.0	-6.0
	Commercial land	-5.1	-6.8	-7.0	-7.0	-8.1	-8.7
	Residential land	-0.6	-1.9	-2.3	-2.8	-4.0	-5.1

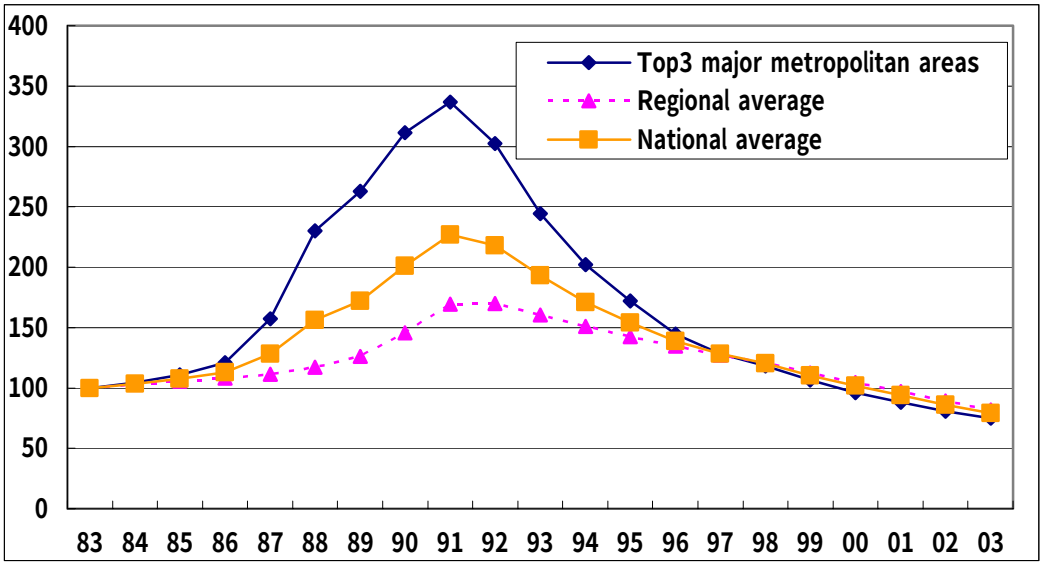
Source: Posted Land Prices, Ministry of Land, Infrastructure and Transport.

Figure 2-2 Trends in residential land prices (indexed)



Source: Posted Land Prices, Ministry of Land, Infrastructure and Transport.

Figure 2-3 Trends in commercial land prices (indexed)



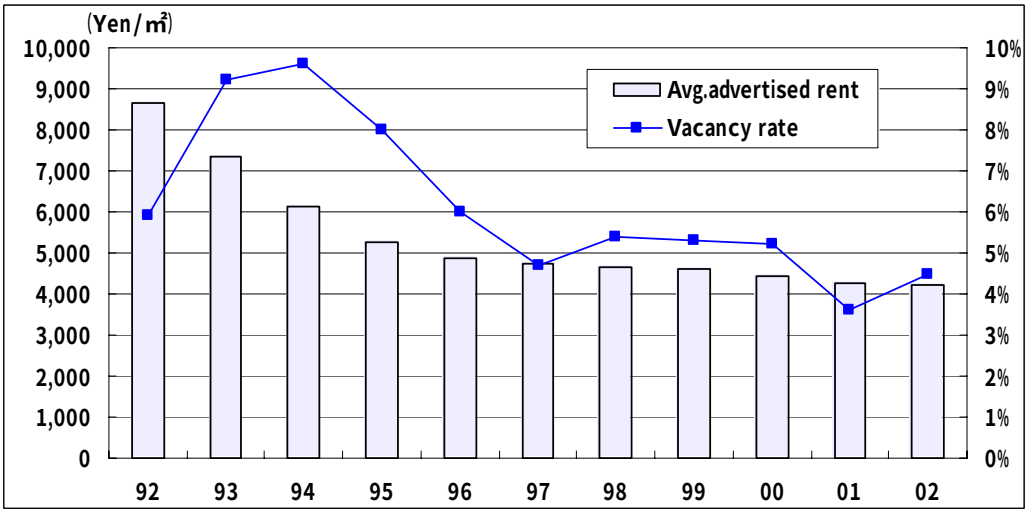
Source: Posted Land Prices, Ministry of Land, Infrastructure and Transport.

(2) Trends in Rents in Major Cities

The office vacancy rate in Tokyo's 23 wards was 6.1% as of March 2003, an increase of 1.6 percentage points over the same year-ago period. Due to the uncertain future of the economy overall and people who are waiting to rent in anticipation of future supply increases, projected increases in office demand have not materialized. Average advertised rents fell by 1.6% from the previous period to ¥4,167/m^2 and rates are still falling at a moderate pace.

Movements in office demand have been slow, with vacancy rates having deteriorated by 1.1 points versus the year ago period in Osaka, and by 1.9 points in Nagoya. Average rents are continuing to fall as in the past.

Figure 2-4 Office vacancy rates and average advertised rents (23 wards of Tokyo)



Source: Office Market Report (Ikoma/CB Richard Ellis).

Table 2-3 Office vacancy rates and average advertised rents

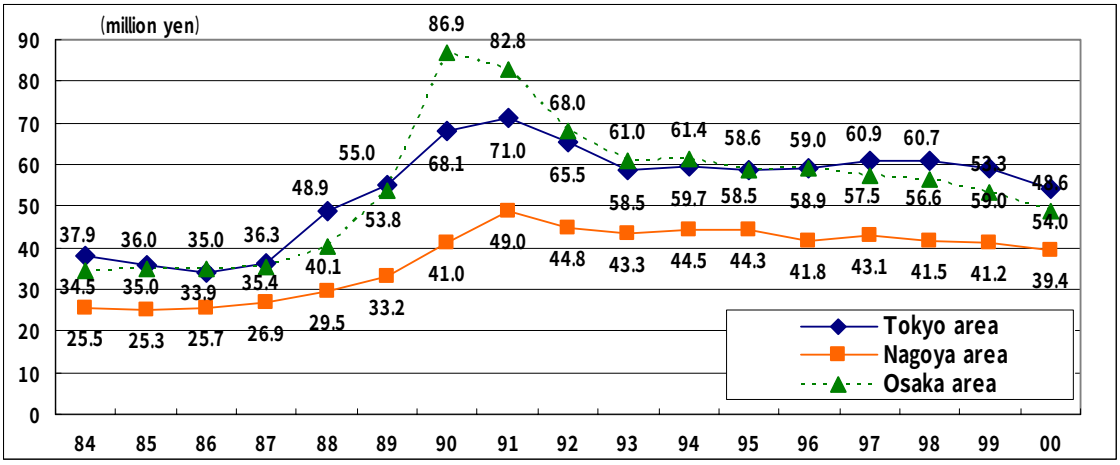
		1997	1998	1999	2000	2001	2002	2003
Tokyo	Avg. advertised rent (yen/㎡)	4,730	4,648	4,627	4,418	4,279	4,233	4,167
	Vacancy rate (%)	4.7%	5.4%	5.3%	5.2%	3.6%	4.5%	6.1%
Osaka	Avg. advertised rent (yen/㎡)	3,555	3,485	3,445	3,391	3,255	3,064	2,979
	Vacancy rate (%)	5.7%	7.3%	7.5%	8.9%	8.5%	9.4%	10.5%
Nagoya	Avg. advertised rent (yen/㎡)	3,197	3,188	3,139	3,112	3,082	3,018	3,024
	Vacancy rate (%)	3.7%	4.8%	5.1%	5.8%	6.1%	6.4%	8.3%

Source: Office Market Report (Ikoma/CB Richard Ellis).

(3) Housing Prices

After falling from their bubble-period peak in 1990 and 1991, prices of built-to-order houses and condominiums had remained fairly stable, but began to drop again in 2000.

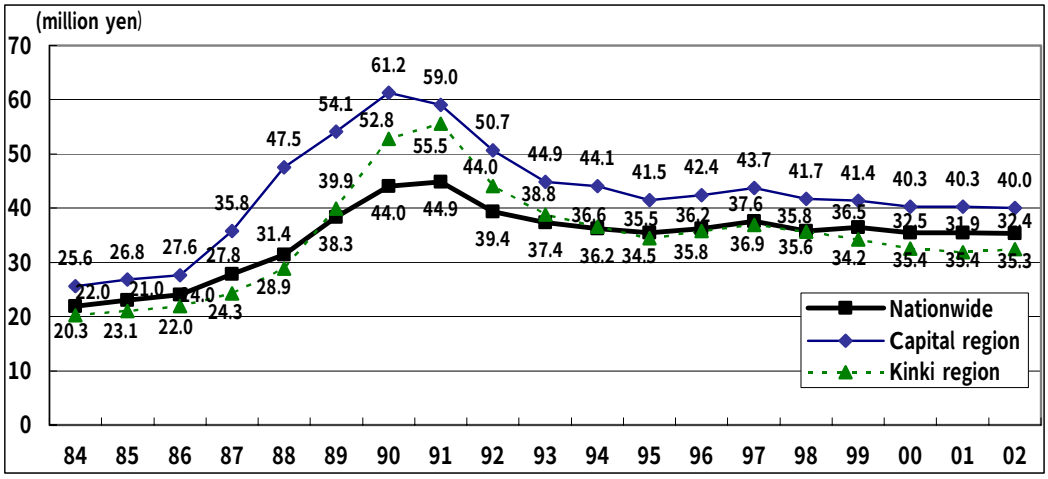
Figure 2-5 Trends in average prices (built-to-order houses)



Source: Report on the Residential Land and Structure Supply Performance Study, Urban Development Association.

Note: The regional breakdown is as follows:
Tokyo region — Tokyo, Kanagawa, Saitama, Chiba, Ibaraki, and Tochigi Prefectures.
Nagoya region — Aichi, Mie, and Gifu Prefectures.
Osaka region — Osaka, Hyogo, Kyoto, Nara, Shiga, and Wakayama Prefectures.

Figure 2-6 Trends in average prices (condominiums)



Source: Nationwide Condominium Market Trends, Japan Real Estate Institute.
Notes: 1.The regional breakdown is as follows:
Tokyo region - Tokyo, Kanagawa, Saitama, and Chiba Prefectures.
Kinki region - Osaka, Hyogo, Kyoto, Nara, Shiga, and Wakayama Prefectures.
2.Does not include resort condominiums.

2.3.3 On Consultants, Contractors, Material and Machinery Suppliers, Professional and Technical Personnel and Workers

(1) Consultants

The number and value of contracts in fiscal 2002 for the major construction consulting (civil engineering), surveying, and land quality assessment firms are shown below. With further cooling in the market, both the number and value of contracts are suffering. However, while the land area for which designs were actually launched, as reported by architectural design firms, grew significantly in fiscal 1999, double-digit rates of decline from the previous year were reported in both fiscal 2001 and 2002.

Table 2-4 Trends in the number and value of contracts of land quality assessment firms

	FY 97	FY 98	FY 99	FY 00	FY 01	FY 02
No. of contracts	30,327	30,575	30,246	29,177	25,203	23,575
Growth vs. previous year (%)	-9.4	0.8	-1.1	-3.5	-13.6	-6.5
Contract amount (million yen)	139,206	144,809	139,191	124,525	105,955	99,803
Growth vs. previous year (%)	-13.6	4.0	-3.9	-10.5	-14.9	-5.8

Source: Survey of Trends in Construction-Related Industries, Ministry of Land, Infrastructure and Transport.
Note: These results are based on a survey of 50 selected land quality assessment firms.

Table 2-5 Trends in the number and value of contracts of surveying firms

	FY 97	FY 98	FY 99	FY 00	FY 01	FY 02
No. of contracts	36,513	33,462	30,002	33,993	34,349	30,353
Growth vs. previous year(%)	-9.0	-8.4	-10.3	13.3	1.0	-11.6
Contract amount(million yen)	127,446	126,704	112,776	109,539	93,587	91,112
Growth vs. previous year(%)	-11.1	-0.6	-11.0	-2.9	-14.6	-2.6

Source: *Survey of Trends in Construction-Related Industries*, Ministry of Land, Infrastructure and Transport.
Note: These results are based on a survey of 50 selected surveying firms.

Table 2-6 Trends in the number and value of contracts of construction consulting firms (Civil Engineering)

	FY 97	FY 98	FY 99	FY 00	FY 01	FY 02
No. of contracts	45,410	46,875	45,432	48,210	52,467	53,133
Growth vs. previous year(%)	-4.5	3.2	-3.1	6.1	8.8	1.3
Contract amount(million yen)	484,146	506,773	465,843	466,852	445,133	411,588
Growth vs. previous year(%)	-6.2	4.7	-8.1	0.2	-4.7	-7.5

Source: *Survey of Trends in Construction-Related Industries*, Ministry of Land, Infrastructure and Transport.
Note: These results are based on a survey of 50 selected construction consulting firms.

Table 2-7 Trends in the area of designs actually implemented by architectural design firms (Unit: 1,000m^2)

	FY 97	FY 98	FY 99	FY 00	FY 01	FY 02
Area of designs actually implemented	29,995	25,045	27,420	26,884	22,302	19,461
Growth vs. previous year(%)	1.1	-16.5	9.5	-2.0	-17.0	-12.7

Source: *Survey of Trends in Construction-Related Industries*, Ministry of Land, Infrastructure and Transport.
Note: These results are based on a survey of 90 selected architectural design firms.

(2) Trends in the number of registered consulting firms

The number of registered land quality assessment, surveying, and construction consulting (civil engineering) firms is increasing over time (see Table 2-8).

Table 2-8 Trends in the number of registered consulting firms

	FY 95	FY 96	FY 97	FY 98	FY 99	FY 00	FY 01
Boring surveying	1,040	1,103	1,147	1,209	1,238	1,297	1,334
Growth vs. previous year(%)	4.6	6.1	4.0	5.1	2.4	4.8	2.9
Land surveying	12,913	13,310	13,689	14,003	14,325	14,427	14,626
Growth vs. previous year(%)	2.9	3.1	2.8	2.3	2.3	0.7	1.4
Construction consulting	2,720	2,893	3,076	3,277	3,426	3,686	3,914
Growth vs. previous year(%)	3.9	6.4	6.3	6.5	4.5	7.6	6.2

Source: Ministry of Land, Infrastructure and Transport.

(3) Certification Systems for Construction Professionals

1) Licensed Surveyors

To maintain the accuracy of basic surveys and public surveys, Japan's Land Surveying Law establishes a certification system for technicians (licensed surveyors or licensed assistant surveyors) engaged in the planning and implementation of surveys, and aims to maintain and improve surveying techniques. The number of licensed surveyors and licensed assistant surveyors comes from records of those who passed the required exam. Annual trends are shown below.

Table 2-9 Trends in registered licensed surveyors and assistant surveyors

	FY 95	FY 96	FY 97	FY 98	FY 99	FY 00	FY 01
Licensed surveyors	2,042	2,434	5,020	5,000	7,408	6,142	5,301
Licensed asst. surveyors	13,100	14,100	13,700	12,800	13,500	12,800	12,848

Source: Ministry of Land, Infrastructure and Transport.

2) Licensed Architects

The act on Architects sets out the qualifications for engineers engaged in the design and construction supervision of buildings. Trends in the number of licensed architects are shown in Table 2-10.

Table 2-10 Trends in the number of licensed architects (based on registration)

	FY 51	FY 70	FY 85	FY 92	FY 93	FY 94	FY 95
Level1 licensed architects	15,819	152,017	197,507	243,906	250,688	257,466	264,398
Level2 licensed architects	16,199	407,203	469,136	531,840	541,256	553,999	566,791

	FY 96	FY 97	FY 98	FY 99	FY 00	FY 01
Level1 licensed architects	271,231	278,184	285,255	292,620	299,247	303,844
Level2 licensed architects	581,261	595,836	610,686	625,719	637,850	649,946

Source: Ministry of Land, Infrastructure and Transport.

3) Technical Certification

To raise the level of building construction skills, the Construction Industry Law requires that workers in the building construction industry be certified annually. The types of technical certifications and the number of certified personnel are shown in Table 2-11.

Table 2-11 Number of workers passing the technical certification

	Construction machinery projects (FY 1960)		Civil engineering project management (FY 1969)		Pipe construction project management (FY 1972)		Landscape project management (FY 1975)		Architectural project management (FY 1983)		Electric works project management (FY1988)	
	Level 1	Level 2	Level 1	Level 2	Level 1	Level 2	Level 1	Level 2	Level 1	Level 2	Level 1	Level 2
1996	794	6,514	21,064	39,888	6,046	15,568	6,189	7,141	9,831	24,890	10,049	4,714
1997	991	6,700	21,641	46,072	6,952	13,408	4,566	7,882	10,321	35,850	6,559	5,439
1998	922	6,566	18,970	39,798	6,642	16,512	4,670	6,802	7,078	23,881	6,533	5,398
1999	871	6,839	23,896	49,495	5,511	28,370	3,835	5,993	10,809	20,414	5,798	6,059
2000	867	5,671	25,312	45,640	9,073	22,302	5,310	6,925	7,939	31,890	8,558	6,755
2001	1,143	5,348	27,348	40,247	5,201	15,340	5,849	5,631	5,569	10,037	9,242	4,109
Total number of licensed workers after system implementation	17,333	114,137	491,956	1,159,007	112,185	307,933	83,968	143,211	175,989	316,853	128,897	166,945

Source: Ministry of Land, Infrastructure and Transport.

Note: Years shown in parentheses are the years in which each system was established.

(4) Mutual Recognition with Foreign Countries on Technical Certification

In recent years, the internationalization of Japan's construction market, including construction consulting services, has proceeded at a rapid pace, and has been marked by reforms to the bidding and contracting system for public works projects and the issuance of a new WTO Agreement on Government Procurement. Even within the APEC region, which includes Japan, studies are being conducted on a framework for mutual recognition of certification systems and on the specific procedures and institutions that would be required for that purpose.

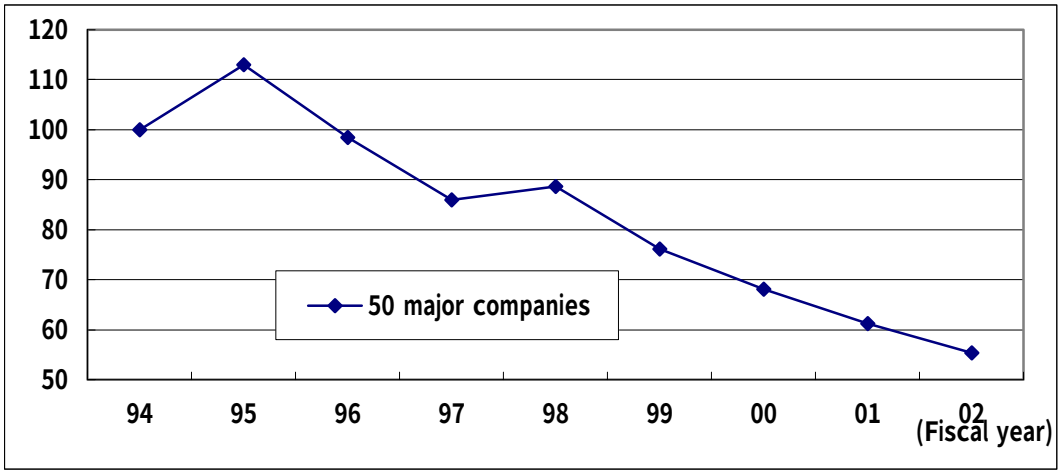
Establishing a mutually recognized system of technical certification that is internationally acceptable and that could assess technicians on some sort of common basis is important from the perspective of maintaining the quality of construction consultants working on public projects, as well as in terms of facilitating the overseas activities of Japanese construction consultants.

Thus, the Ministry of Land, Infrastructure and Transport established a Technician Certification Investigation Committee to study ways of implementing and policies for using a system of mutual recognition of technician qualifications.

(5) Contractors

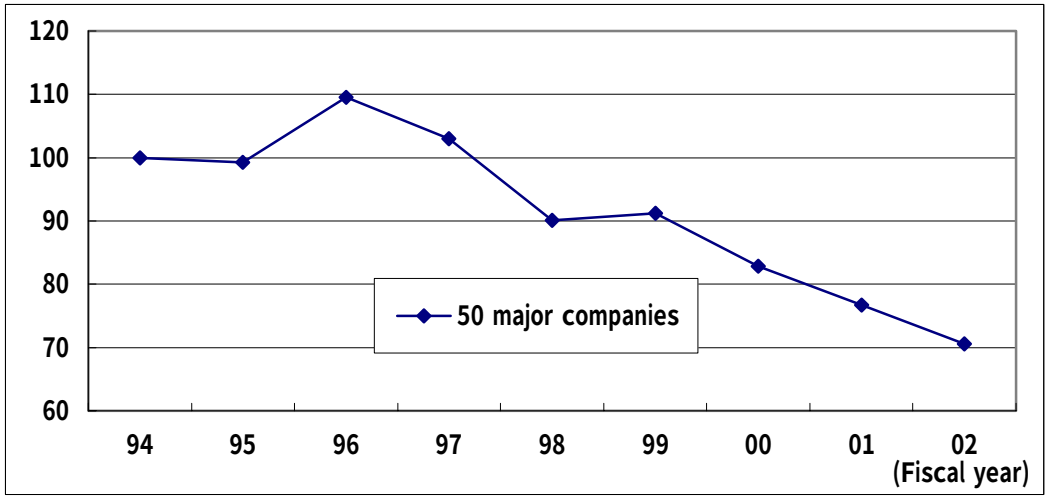
Orders placed by the 50 major companies show a decline in both public and private sector construction projects, creating an especially tough environment (see Figure 2-7 and the table in Annex A5).

Figure 2-7 Trends in public sector construction orders received by the major construction companies



Source: 50 major companies of *Orders Received,* Ministry of Land, Infrastructure and Transport.
Note: 1994 = 100.

Figure 2-8 Trends in private sector construction orders received by the major construction companies



Source: 50 major companies of *Orders Received,* Ministry of Land, Infrastructure and Transport.
Note: 1994 = 100.

(6) Material and Machinery Suppliers

Demand for all major construction materials fell in fiscal 2002 from the previous year due to the contraction of the construction market. Also, the liquidation values and number of pieces of key construction equipment both fell significantly from the previous year.

Table 2-12 Domestic demand for key construction materials

		Unit	FY 97	FY 98	FY 99	FY 00	FY 01
Cement	(Sales volume)	1,000 t	76,573	70,719	71,515	71,435	67,811
Ready-mixed concrete	(Shipment volume)	1,000m^3	167,621	153,310	151,167	149,501	139,968
Lumber	(Shipping volume, lumber product)	1,000m^3	21,103	18,924	18,369	17,282	15,196
Common steel	(Orders from construction firms)	1,000 t	28,642	25,715	26,863	28,024	26,004
Asphalt	(Sales to construction firms)	1,000 t	4,117	3,777	3,823	3,804	3,580

Source: Ministry of Land, Infrastructure and Transport.

Table 2-13 Key construction equipment: Output value and unit production

	FY 95	FY 96	FY 97	FY 98	FY 99	FY 00	FY 01
Output(by value)of key construction equipment	1,422,078	1,540,982	1,386,055	1,022,382	1,024,149	1,045,933	871,799
Output(by of unit)of key construction equipment	432,768	464,172	403,633	310,150	326,380	323,184	270,244

Source: Japan Construction Equipment Manufactures Association.

(7) Professional and Technical Personnel and Workers

The numbers of construction industry workers, specialized technicians, and laborers have been falling in recent years.

Table 2-14 Trends in the number of workers and technical workers/laborers in the construction industry

(Unit: 1,000 people)

	95	96	97	98	99	00	01	02
No. of workers in the construction industry	6,630	6,700	6,850	6,620	6,570	6,530	6,320	6,180
Growth vs. previous year (%)	1.2	1.0	2.2	-3.5	-0.8	-0.6	-3.2	-2.2
1. No. of specialized technicians	430	430	410	430	420	420	390	370
2. No. of workers	4,380	4,420	4,550	4,340	4,320	4,320	4,150	4,140
The ratio of 1. and 2. to the no. of workers in the construction industry (%)	66.1	66.0	66.4	65.6	65.8	72.6	71.8	73.0
No. of workers in all industries	64,570	64,860	65,570	65,140	64,620	64,460	64,120	63,300
Ratio of workers in the construction industry to workers in all industries (%)	10.3	10.3	10.4	10.2	10.2	10.1	9.9	9.8

Source: Annual Report on the Labor Force Survey, Ministry of Public Management, Home Affairs, Posts and Telecommunications, Statistics Bureau.

2.4 Five-Year Outlook for the Construction Industry

2.4.1 Outlook for the Construction Market

Table 2-15 Trends in construction investment

Construction investment

(unit:local currency at **current** price) (100million yen)

	1999	2000	2001	2002	2003 *1	2004*1
Residential Construction(A)	217,955	212,473	195,200	187,400	187,100	185,200
public	10,717	9,717	9,400	8,100	7,500	6,900
private	207,238	202,756	185,800	179,300	179,600	178,300
Non-residential Construction(B)	128,580	123,716	112,900	104,400	103,700	106,100
public	34,725	30,287	26,700	22,700	21,900	19,800
private	93,855	93,429	86,200	81,700	81,800	86,300
Civil Engineering Construction(C)	338,504	325,231	300,200	273,400	251,300	234,100
public	273,937	259,628	241,700	218,700	198,200	183,100
private	64,567	65,603	58,500	54,700	53,100	51,000
Total construction investment(A+B+C)	685,039	661,420	608,300	565,200	542,100	525,400
Total public	319,379	299,632	277,800	249,500	227,600	209,800
Total private	365,660	361,788	330,500	315,700	314,500	315,600

*1 2003,2004 are forecast

(unit:change at local currency at **constant** price)

	1999 (%)	2000 (%)	2001 (%)	2002 (%)	2003 *2 (%)	2004 *2 (%)
Residential Construction(A)	4.7	-2.5	-8.1	-4.0	-0.2	-1.0
public	-12.0	-9.3	-3.3	-13.8	-7.4	-8.0
private	5.8	-2.2	-8.4	-3.5	0.2	-0.7
Non-residential Construction(B)	-6.6	-3.8	-8.7	-7.5	-0.7	2.3
public	-3.7	-12.8	-11.8	-15.0	-3.5	-9.6
private	-7.6	-0.5	-7.7	-5.2	0.1	5.5
Civil Engineering Construction(C)	-6.3	-3.9	-7.7	-8.9	-8.1	-6.8
public	-5.0	-5.2	-6.9	-9.5	-9.4	-7.6
private	-11.7	1.6	-10.8	-6.5	-2.9	-4.0
Total construction investment(A+B+C)	-3.1	-3.4	-8.0	-7.1	-4.1	-3.1
Total public	-5.1	-6.2	-7.3	-10.2	-8.8	-7.8
Total private	-1.3	-1.1	-8.6	-4.5	-0.4	0.3

*2 2003,2004 are forecast

Recent trends and forecasts for construction investment based on the Construction Investment Outlook Using a Construction Economy Model issued by the Research Institute of Construction and Economy (RICE) show that in fiscal 2003, total construction investment will be ¥54.2 trillion, showing a decline of 4.1% from the previous fiscal year. Government construction investment is forecasted to decrease by 8.8% due to the continued cutbacks in spending at both the national and local levels, and in spite of the availability of funds carried forward from the supplementary budget approved at the end of FY2002. Private residential investment is forecasted to increase slightly for the first time in four years in FY2003, by 0.2%, although this increase is expected to be temporary as a result of last-minute housing starts triggered by home loan tax cuts. Private non-residential construction investment is forecasted to decrease by 1.3%. Despite an increase in the square footage of new construction projects triggered by the recovery in corporate profits, it is expected to take some time for the investment figure to increase.

In FY 2004, total construction investment is forecasted to decline by 3.1% from the previous fiscal year to

¥52.54 trillion, which would result in the eighth consecutive year of negative growth since FY 1996. Government construction investment is forecasted to decline by 7.8%, taking into account the 3.0% decline in public works project expenditures mandated by the national government's budget proposal for FY 2004. This decline also takes into account policies to reduce independent local projects in local government budget proposals by 5% annually until FY 2006, and also factors in the past performance. Private residential construction investment is forecasted to decline by 0.7% due to the current absence of any notable factors that would affect the environment for potential homeowners. However, private non-residential construction investment is forecasted to increase by 2.1% due to increasing new capital investments by corporations, which would result in the first positive growth in four years.

These construction investment forecasts do not predict what will happen beyond fiscal 2005, but further declines in the construction investment are inevitable over the next five years, in large part due to the effect of the decline in public works projects. Further contraction is also inevitable over the mid-term, due to negative factors such as fiscal constraints, an aging society, and a shrinking population.

2.4.2 Outlook for the Restructuring and Revitalization of the Construction Industry

(1) Local Construction Companies: Management Strategies Aimed at Survival

If the numbers of construction companies and construction workers are inevitably going to be reduced, then companies that focused on public works projects during the favorable business environment of the 1990s will be especially hard hit in the future, and will have to adopt business strategies aimed at survival.

1) If businesses want to survive, they will have to move into construction and construction related fields outside of the public works sector. If they hope to be able to expand, they will have to carve out a path in industry fields with growth potential.
2) A merger may be a potential growth strategy for survival. Specifically, a company could negotiate a merger with a company in a construction field or business area that would provide mutual benefits to both parties. One option would be to negotiate a merger with a company that focuses on private construction projects.

The budget for the "Project to Support Construction Company Movement Into New Fields," which was established in the fiscal 2002 revised budget, is expected to do a great deal to help construction companies move into other fields.

(2) Top National Construction Companies: Review Business Focus and Range and Reexamine Organizational Strategies

Amidst the anticipated contraction of the construction market, the major construction companies are naturally reviewing the focus and range of their businesses and considering such options as alliances with other companies. In the long term, however, they may be left with little choice but to develop their businesses through mergers, sales, and acquisitions.

Under these conditions, some companies may select an aggressive merger or sale as part of its strategy, while others may be forced into this course of action by external factors.

1) When the merger or sale is selected as a business strategy

a) For top-ranking general contractors such as super general contractors, a full-scale merger may not be feasible. Still, to strengthen certain fields that they consider to have growth potential as they review the organization of their own corporate groups, these contractors will have to give careful consideration to eliminating or selling off unnecessary divisions while strengthening or buying companies in their growing divisions. However, even the five leading companies reported that the sales of their subsidiaries account for only about one-fourth of their total sales. This shows that the construction industry has a structure centered on the parent company. Corporate groups also have the option of downsizing as the construction market contracts, but if they want to try to maintain or expand their corporate group as a whole over the mid- to long term, they also have the choice of actively incorporating divisions where future growth is expected, regardless of their connection to construction.

b) Middle and lower ranking companies (companies in the middle and lower levels of the 50 major companies which have faced or are soon likely to face difficulties in sustaining their businesses at the national level due to declining sales in recent years, and which have had problems sustaining their top rankings in the public works sector) have two choices: (1) downsize their businesses and transform themselves into local companies, or (2) continue to develop on a national scale. Araigumi is an example of a company that chose to do the former. If, however, a company wants to continue to develop on a national scale, they need to pursue mergers or acquisitions. The merger between Nitto Daito Kogyo and Mitsui Fudosan Kensetsu in April 2002 was actually chosen as a strategy to help both companies, whose sales individually were less than ¥100 billion, to develop their business on a national scale. The merger of Mitsui Construction and Sumitomo Construction in April 2003 falls into the same category.

2) When merger or sale is necessitated by external factors

As mentioned above, the major construction companies covered by this institute's "Financial Analysis" were reduced by three in both fiscal 2001 and 2002 due to legal measures, leaving 45 companies. Some companies have been replaced, but five companies reported a consolidated capital ratio (to total capital) of less than 1% (three of which reported a negative ratio) at their fiscal 2002 interim closing. As sales continue to decline and construction gross profit rates fall, some companies will find themselves in a difficult position come fiscal 2005 when changes will be introduced in the way companies report the value of tangible fixed assets. At the initiative of the main banks, downsizing or mergers were made a condition of eligibility for support (in the form of debt purchases) from the Industrial Revitalization Corporation of Japan (IRCJ), which was officially launched this April. To be eligible for support, a company's profitability, stability, and soundness indices have to approach the average level of the major construction companies. However, as long as fixed asset prices remain high and asset-impairment accounting is being applied while companies rebuild their businesses (a near certainty), capital ratios and fixed asset ratios can be expected to worsen. Thus, if companies are to fulfill the conditions for receiving support, their main banks are going to have to write off their debts. Improved profitability is also a condition of receiving support, a condition which is especially difficult to meet while the

construction market is contracting. Companies are going to have to make further cut-backs and reduce costs or, despite the difficulties involved, develop businesses that shift their focus to new high profitability growth industries.

(3) Foreign Construction Companies and Investment Banks/Funds to Watch

1) Foreign Construction Companies' Business Developments and Investments in Japanese Construction Companies

Large mergers and acquisitions in Europe and the US by global European and Australian construction companies occurred in the years leading up to 2000. Since then, however, these companies have taken a break from large-scale mergers and acquisitions, and instead have made notable moves into Hong Kong and other Asian countries in recent years. Japan, the world's second-largest market, has become the next target for their expansionist efforts. However, with Japan's major general contractors currently struggling with overemployment, nonperforming assets, and excessive debt, they are unlikely to be purchased in their entirety. Even if the enactment of the Corporate Reorganization Law might have made such purchases easier, there is little likelihood that a foreign company would attempt to acquire the management rights of the Japanese general contractors which still retained its traditional Japanese corporate culture. Foreign construction companies are not likely to make simple acquisitions (acquisitions of management rights) of major general contractors while Japan's entire construction market is shrinking, but instead can be expected to aim toward developing businesses in sectors they haven't traditionally explored in other countries, that is, to make "well-aimed advances" into potential growth fields. The fields where growth is expected to occur are not in the traditional construction work sector, but are first those areas in which Japanese general contractors have little experience, such as construction and project management (CM/PM), and efforts to provide comprehensive services that include everything from design to maintenance, including funding arrangements (such as PFIs). Second, as foreign companies can be expected to move into high-growth sectors such as telecommunications, fine clothing, supermarkets, and auto production, with ongoing globalization, global design and construction standards are required. Foreign companies are likely to make efforts to develop businesses that can meet these needs.

2) Investments by Foreign Investment Banks/Funds Through the Industrial Revitalization Corporation of Japan (ICRC)

One of the purposes of the ICRC is to attract capital investment from foreign investment banks/funds, making developments in this area likely. In fact, Araigumi already received a 5% investment from US investment bank Goldman Sachs at the end of last year.

Chapter 3 Administration and Regulation for Construction Industry

3.1 Administration of the Construction Industry: Its Structure and Role

3.1.1 Construction Administration in the National Government, Local Governments, and Construction-Related Organizations

Administration of the Construction Industry

The national government body responsible for supervising the construction industry in Japan is the Ministry of Land, Infrastructure and Transport (MLIT). As part of the central government restructuring that was implemented in January 2001, the MLIT was established through an integration of the Hokkaido Development Agency, National Land Agency, Ministry of Transport, and Ministry of Construction, and was given the responsibility for the comprehensive and systematic use, development, and preservation of Japanese land, the consistent handling of social funds for that purpose, and the promotion of transportation policies. The MLIT is comprised of its own internal departments (the Minister's Secretariat, Policy Bureau, etc.) as well as the Regional Development Bureaus (including the eight Regional Development Bureaus and the Hokkaido Regional Development Bureau) and various other institutions (such as the Policy Research Institute for Land, Infrastructure and Transport).

The Construction Industry Division and Construction Industry Promotion Division of the MLIT's Policy Bureau are responsible for the administration of the construction industry, and positions responsible for the administration of the construction industry have likewise been established within the Regional Development Bureaus. The Policy Bureau, for example, is involved in the following kinds of construction industry supervisory activities:

Comprehensive and basic policies for the ministry as a whole, land expropriation, the environment, public property, project coordination, transportation planning, the construction industry, labor resources, construction project implementation, the real estate industry, housing, international construction activities, IT introduction, surveys and statistics, promotion of restructuring in the construction industry, the planning and introduction of bidding systems that are both highly competitive and transparent, the removal of poor or unqualified companies.

Construction Industry Administration as a Buyer of Construction Services

Public institutions that purchase construction services, including the MLIT (local governments, construction-related organizations) administer construction companies insofar as they are buyers of those companies' services. Like the central government, the 47 prefectural governments (including the prefectures of Tokyo and Osaka), the 678 city governments (including Yokohama, Nagoya, and Kyoto), and the approximately 2,500 town and village governments (as of August 2003) each have personnel in

Construction Administration Coordinator positions who administer the nation's approximately 552,000 construction companies (as of May 2003) by evaluating them and certifying whether they are qualified to participate in competitive bidding procedures. Construction-related organizations, including quasi-governmental agencies (such as the Japan Highway Public Corporation) and regional public corporations perform their own administration by evaluating companies and certifying whether they are qualified to participate in competitive bidding, but the supervisory and evaluation practices employed by the MLIT (Business Evaluation and competitive bidding applications) are often used as the basis for the practices employed by the local governments and construction-related organizations (see Annex 5 for information on the Business Evaluations).

These kinds of national and local supervisory institutions penalize construction companies for legal violations in their transactions and construction practices, and handle worker safety issues by suspending the business of or revoking the licenses of construction companies when major damage is inflicted by accidents or other incidents.

3.2 Regulating Entry into the Construction Market

3.2.1 Regulations Governing Construction Permits and Licenses

In Japan, regulations regarding business licenses for the construction industry are based on the Construction Business Act. Any person or company who wants to operate a construction business, with the exception of contractors who engage only in simple construction work, must obtain a license issued by the prefectural governor (when establishing offices within a single prefecture) or by the Minister of Land, Infrastructure and Transport (when establishing offices in two or more prefectures). Licenses must be renewed every five years.

Licenses are divided into Special Construction Licenses and Ordinary Construction Licenses, and are issued for 28 different construction work classifications, such as civil engineering, general building, etc.

Special Construction Licenses are governed in many areas by more stringent regulations than Ordinary Construction Licenses in order to protect subcontractors and to ensure that construction work is done properly. Operators that accept direct contracts must obtain a Special Construction License if the work is valued at ¥45 million yen or more for general building work or at ¥30 million or more for other types of construction.

Licensed construction companies, regardless of whether they are contractors or subcontractors, must employ a full-time engineer when working on a contracted construction project who can manage all the technical aspects of the project on site. When the total value of the subcontracts that a Special Construction License holder who accepts direct construction orders from buyers concludes to complete the construction project exceeds ¥30 million (or ¥45 million in the case of general building work), a project manager must be employed, instead of a full-time engineer, who can manage all of the technical aspects of the project on-site (see Chapter 5 and Annex 5 for information on the requirements for foreign companies that wish to obtain a construction license in Japan).

3.3 Management System for Public Works and Government Construction Projects

3.3.1 Project Management Organization

In public works projects, the project management organization is the body that commissions the construction work, such as the national government, local government, or quasi-governmental agency (national or local). These organizations evaluate and register construction companies before they can bid on projects those organizations commission and manage. This evaluation process for prequalifying competitive bidding participants is conducted once every two years by the MLIT or other major institution. The commissioning organization evaluates the applying construction company's size and performance, technological capabilities, and business status, and only grants permission to those it deems qualified for the work it wants performed to participate in the bidding process. The commissioning organization assigns a ranking to the companies that pass the evaluation process based on their size and performance, and that rank determines the size of projects the company is permitted to bid on. Construction projects commissioned directly by the MLIT (general civil engineering and general building) are divided into five levels, A to E. The Business Evaluation performed by the MLIT or prefectural government is used as the basis for evaluating companies (see Annex 5 for information on the Business Evaluation).

Because companies that accept contracts for public works projects are required by the Construction Business Act to undergo a Business Evaluation, most construction commissioning organizations use the ranking of construction companies based on this evaluation. Consequently, construction companies, even those that have been licensed in accordance with the Construction Business Act, generally have to prequalify to bid on a construction project commissioned by a particular organization. They do this by submitting an application to participate in competitive bidding and undergoing an evaluation.

3.3.2 Bidding Systems

Bidding Systems

Japan's Accounts Law stipulates that the bidding system to be used for public works projects is, in principle, general competitive bidding. However, until recently, designated competitive bidding was often used. Recognizing the trend toward economic liberalization as symbolized by the WTO, however, general competitive bidding was adopted in the mid-1990s for WTO projects, and its use is expanding, especially among local public organizations. Those organizations are also accepting new bidding methods such as the value engineering (VE) system in which technical proposals for construction methods and other elements of the project are accepted during the bidding process, and the integrated evaluation bidding system in which the function and quality of the proposed structure are comprehensively evaluated during the bidding process (see Appendix 5 for details regarding bidding methods).

In February 2001, the Act for Promoting Proper Tendering and Contracting for Public Works was enacted to secure the national citizens' trust toward public works and to promote the sound development of the construction industry that performs public works projects commissioned by the national government, quasi-governmental agencies, and local governments. The act is based on (1) ensuring transparency in the

tendering and contracting procedures, (2) promoting fair competition between bidders, (3) completely eliminating improper behavior, and (4) ensuring that public works projects are performed properly — and makes it compulsory for commissioning organizations to (a) announce their projected orders each fiscal year, (b) announce information related to tendering and contracting procedures, (c) establish measures to eliminate improper behavior, and (d) establish proper construction systems. The act was applied to tendering and contracting procedures starting in fiscal 2001.

3.3.3 Quality and Safety Management Systems

(1) Quality Management

Significant changes are taking place in the public works environment, as tendering and contracting procedures are being reformed, globalization is progressing in the construction market, the need to reduce construction costs is rising, and companies are responding to global environmental problems. Given these conditions, many efforts are being taken to raise and maintain product quality at ever higher levels. The MLIT is investigating ways to apply management systems, such as the ISO9000 series of international standards for quality management systems and the ISO14001 series of international standards for environmental management systems (EMS), to public works projects. Aiming to further improve the level of quality assurance in public works projects starting in fiscal 2000, the government took a step further in its pilot projects and decided to try testing the effectiveness of a system of implementing ISO9000 series compliant construction, in which ISO9000s certification was established as a competitive bidding prequalification criterion, to a certain range of construction projects. Since the rate of ISO9000s certification among companies prequalified by the MLIT in fiscal 2000 increased overall from fiscal 1999, the MLIT decided to expand the projects to which the trial implementation of ISO9000 series compliant construction would be applied to 155 construction projects and 21 service projects in 2001. The government also decided to use the results of its study to promote further investigation into how the responsibilities for improving the efficiency of supervisory activities and other tasks should be divided between the construction company and the buyer. In the area of environmental management systems, the government's perspective is that efforts must be taken on the part of the company to fulfill their social obligations, and that the construction work buyers, who are comprised of organizations that commission public works, must actively contribute to those efforts. From this perspective, the MLIT began implementing ISO14001 model projects in fiscal 1997 in 12 of the construction projects that fell under its direct administration. In addition to developing more model projects thereafter, the MLIT plans to conduct empirical studies to ascertain the effects of and problems involved in introducing EMS in public works projects. Also, the enactment of the Construction Material Recycling Law in May 2000 legally requires companies to recycle their construction project waste. This has become increasingly significant given the tide of global concern for the environment.

(2) Safety Management

The MLIT has made aggressive efforts in the area of safety. In 1992, it issued the Construction Safety Policy Rules for Ordering Public Works Projects, and then later built the Accident Database System, issued the Safe Construction Techniques Guidelines, and conducted investigations on safety education. As a result, the number of fatalities and injuries caused by occupational accidents in the construction industry fell by a massive 40% in the 10 years prior to 2002. However, significant changes are taking place in the construction site environment as construction conditions grow more complex and workers grow older, and the construction industry continues to account for nearly 25% of all occupational fatalities and injuries, and nearly 40% of all fatalities.

Thus, the Construction Work Safety Measures Investigation Commission and Construction Work Accident Policy Investigating Committee were established in fiscal 2000 to analyze the causes of accidents and to advance the study of safety measures. By enabling the order-placing institution to enter accident reports over the Internet, the MLIT has made it possible to conduct analyses and research on accidents using IT, and is now building a system to prevent repeat accidents.

Construction companies engaged in actual construction work established the Japan Construction Safety and Health Association in 1964 and have built systems to enable industry participants to work together to promote safety. They periodically hold safety conferences and training sessions that are attended by construction contractors and specialized construction companies, and make efforts to ensure that all workers are thoroughly trained and have a full knowledge of safety issues. Individual work sites also take measures to maintain a constant awareness of safety among workers, including posting banners with safety slogans around the site and implementing call-out confirmation procedures.

3.3.4 Project Inspection and Acceptance System

The inspection of completed public works project is governed by the Public Works Standard Contract Agreement. When a project is completed, the contractor notifies the buyer. The buyer has 14 days from the day of notification to inspect the completed project in the presence of the contractor and to notify the contractor of the inspection results. If the project passes inspection, the buyer must take delivery of the finished structure. If the project does not pass inspection, the contractor must correct the deficiencies and have the project reinspected.

Inspection methods are stipulated in the design documents. National government contracts require that an inspection report be created following the inspection, but this is not always legally required of local government organizations. According to the Accounts Law, there are two kinds of inspections: inspections during construction and inspections of completion that are needed to initiate the payment process. The former are inspections of construction materials while the latter constitute completion inspections and inspection to confirm that certain portions of the construction have been completed so that payment for those portions can be made. According to the Public Works Standard Contract Agreement, the former are conducted by an inspector while the latter are conducted by the buyer.

Once the project has passed inspection and completion has been confirmed, the contractor can offer the delivery of the finished structure to the buyer. Once that notification is received, the buyer must

immediately take delivery of the structure. If the contractor does not make an offer of delivery even though the buyer has confirmed the project completion, the buyer may ask the contractor to deliver the structure when the final payment is made.

3.4 Risk Management for Construction Projects

3.4.1 Surety for Construction Projects

To ensure the quality of construction, it is necessary to avoid various risks, such as delays due to the failure of the construction company or other problems. Several policies have been enacted in the Japanese construction industry to avoid these risks.

The prepayment guarantee system is a system in which the partial payment of construction fees paid in advance to the contractor by the organization commissioning a public works project (usually about 40% of the contract amount) is guaranteed by a guarantee company. Specifically, if the contractor fails to complete the work in accordance with the terms of the contract, or the performance of guaranteed obligations is requested by the construction completion guarantor, the guarantee company will reimburse the losses up to the amount prepaid by the buyer. Because the funds used for public works projects are especially valuable public funds that come from taxes and other public sources, and thus need to be guaranteed accordingly, the Law Concerning Advance Payment Guarantee Undertakings for Public Works was enacted. Guarantee companies (eastern Japan, western Japan, and Hokkaido) are authorized to act as advanced payment guarantee companies. A guarantee company, in addition to accumulating guarantee capital that can be used to pay settlements, is required to strictly manage the use of the prepaid funds to ensure that they are used appropriately for the construction work to which they have been allocated. The advantages of this system are that the buyer can expect the construction work to be completed as planned because the advance payment necessary to implement the work has been paid, and the contractor does not have to worry about start-up capital for the project because they have access to the needed funds up front.

The performance guarantee system is a way of ensuring that construction contracts are carried out properly. Japan’s Accounts Law and Local Government Law require that contractors pay a contract deposit, but negotiable securities such as government bonds, the guarantee of a guarantee company, or performance bonds may be offered in place of the contract deposit. Guarantees under the performance guarantee system can be categorized as “cash guarantees” in which losses due to contractor’s nonperformance of the contract are reimbursed to the buyer in cash, or “labor guarantees” in which a guarantee is made to complete the construction work. The contract deposit constitutes a cash guarantee, so if the contractor fails to complete the work in accordance with the terms of the contract, the guarantee company will pay the buyer the amount needed to cover the parts of the contract that were not fulfilled, up to the amount of the deposit. The contract deposit is set up as a special inclusion in the advance payment guarantee contract, and the work to which it applies is limited to the work for which the advance payment is to be made.

The MLIT is also in the process of studying the introduction of new guarantee systems, such as bid bonds, which require companies participating in the bidding process to obtain the guarantee of a financial institution in advance.

3.4.2 Insurance for Construction Projects

The primary insurance systems that are pertinent to construction projects are described below.

(1) Workmen's compensation insurance

Established by the Workmen's Accident Compensation Insurance Law, this is a system that provides insurance benefits to workers when a "work-related accident," as defined by the Labour Standards Law, occurs. It is compulsory insurance that must be obtained on a project-by-project basis.

The Labour Standards Law stipulates that employers are responsible for compensating workers for work-related accidents. This insurance system ensures that workers will receive the compensation to which they are entitled even if the employer is unable to pay.

Under this system, unlike other insurance systems, the burden for the full compensation amount is not on the worker, but on the employer (who hires the worker).

(2) Comprehensive workmen's compensation insurance

In some cases, depending on the type of accident, the compensation granted under the workmen's compensation insurance system is inadequate. Employers (who hire workers) can voluntarily subscribe to this insurance to cover additional costs.

(3) Contractor's all risks insurance

This is insurance for contractors to cover additional costs involved in recovering losses sustained due to the effects of fire, burglary, or lightning and rain storms on buildings under construction, construction materials, and temporary buildings set up for use during construction (including on-site offices and accommodations), as well as due to design, construction, or material defects or work-related errors.

(4) Third-party liability insurance

This is insurance for contractors to cover the costs of compensating a third party for damages caused by incidental work-related accidents. Contractors can voluntarily subscribe to this insurance.

(5) Product liability insurance

This is insurance for contractors to cover the costs of compensating third parties for incidental accidents resulting from their products or work after a building or structure is transferred to another party or after the subcontractor has finished their work. Contractors can voluntarily subscribe to this insurance. Since the Product Liability Law was enacted in July 1995, the number of subscribers has increased.

Chapter 4 Enhancement and Development of the Construction Industry

4.1 Productivity

4.1.1 Value-Added Per Employee

Table 4-1 Value-added per employee

	1997	1998	1999	2000	2001
Construction (million yen)	7.52	7.48	7.00	7.11	6.90
Year-on-year change (%)	-1.31	-0.53	-6.42	1.57	-2.95
Manufacturing (million yen)	8.01	7.65	7.50	7.81	7.74
Year-on-year change (%)	-0.87	-4.49	-1.96	4.13	-0.90
Services (million yen)	5.97	5.70	5.87	5.72	5.88
Year-on-year change (%)	2.75	-4.52	2.98	-2.56	2.80
All industries (million yen)	7.34	7.12	6.94	7.02	6.95
Year-on-year change (%)	0.00	-3.00	-2.53	1.15	-1.00

Source: *Monthly Economic and Fiscal Statistics*, Ministry of Finance.

4.1.2 Physical Measurements of Construction Productivity

Table 4-2 Physical measurements of construction productivity

(Unit: m^2/person-day)

	1995	1996	1997
Residential	0.361	0.351	0.363
Commercial	0.316	0.372	0.401
Industrial	0.613	0.525	0.277

Source: Cost Analysis Information for Building Works, Management Research Society for Construction Industry.

However, *Cost Analysis Information for Building Works* is no longer being published, so statistics are only available through 1997.

Note: The “Residential” category comprises multiple-unit apartment buildings and dormitories that companies provide for their unmarried employees. The “Commercial” category comprises office buildings and retail stores.

4.2 Construction Cost

4.2.1 Unit Construction Cost by Building Type

Table 4-3 Unit construction cost by building type

(Unit: 1000 yen/㎡)

	Residential	Offices	Stores	Industrial sites and factories	Schools
1998	167	193	115	116	218
1999	165	205	112	108	216
2000	162	187	100	104	202
2001	159	197	116	103	205
2002	160	180	103	97	201

Source: Monthly of Construction Statistics, Ministry of Land, Infrastructure and Transport.

Note: Construction unit cost = Value of construction by investors reported per unit of area.

4.2.2 Average Construction Material Price

Table 4-4 Average construction material price

(Unit: yen)

	Cement in bulk (per ton)	Steel bars (per ton)	Aggregate (per m^3)	Sand (per m^3)	Ready-mixed concrete (per m^3)	Precast concrete piles (per pile)
1998	8,850	29,700	4,190	4,710	12,000	32,100
1999	8,730	25,100	3,900	4,560	11,700	31,140
2000	8,880	26,300	3,700	4,350	11,700	29,000
2001	8,650	26,800	3,640	4,150	11,600	28,850
2002	8,170	29,400	3,450	4,020	11,200	29,000

Source: Prices of Construction Materials and Wages, Construction Research Institute.

Note: All prices are for materials procured in Tokyo.

	Types and specifications
Cement	Regular portland cement
Steel bars	D19 deformed bars (SD295A)
Aggregate	5-20 mm crushed stone for concrete
Sand	Coarse, washed
Ready-mixed concrete	Regular concrete (nominal strength: 18N/mm^2; slump: 18cm; maximum coarse aggregate size: 25mm)
Precast concrete piles	PHC piles (type A, ϕ350×10m)

4.2.3 Construction Industry Salaries and Wages

Table 4-5 Construction industry salaries and wages

(Unit: yen)

		1998	1999	2000	2001	2002
Class I chartered architect (monthly salary)		443,900	471,000	451,000	430,600	416,800
Skilled worker (daily wage)		15,060	14,640	14,550	14,620	14,250
Unskilled worker (daily wage)	Common laborer	13,010	12,910	12,840	12,860	12,760
	Laborer, heavy	15,940	14,760	13,810	13,440	13,940
	Laborer, light (male)	10,810	10,770	10,850	10,650	10,440
	Laborer, light (female)	7,780	7,550	7,720	7,670	7,490

Sources: 1.Figures for class I chartered architects are based on the average monthly salaries listed in the *Basic Wage Structure Report,* Ministry of Health, Labour and Welfare.

2.Figures for skilled worker, common laborer, laborer (heavy) and laborer (light) are based on the *Classified Outdoor Labor Wage Survey ,* Ministry of Health, Labour and Welfare.

Note: The “skilled worker” category includes carpenters, scaffold workers, masons, plasterers, electricians, plumbers, painters, truck drivers, sheet metal workers, welders, machine operators, steel workers, steel frame workers, drilling workers, blasters, tile setters, bricklayers, cement and concrete finishers, form builders, joiners, roofers, caisson workers, and boring machine operators.

4.2.4 Average Sectoral Wages

Table 4-6 Average sectoral wages (per month)

(Unit: yen)

	1998	1999	2000	2001	2002
Construction	374,424	377,894	380,209	370,278	355,339
Manufacturing	371,437	366,793	371,881	368,200	365,640
Services	378,320	371,942	369,572	366,366	360,600
All industries	366,481	353,679	355,572	350,009	343,120

Source: Compiled from the total cash wages paid to full-time employees by companies with five or more employees, based on the full-time employees reported in the *Monthly Labor Survey,* Ministry of Health, Labour and Welfare.

4.3 Building Quality

4.3.1 Improving Quality Assurance

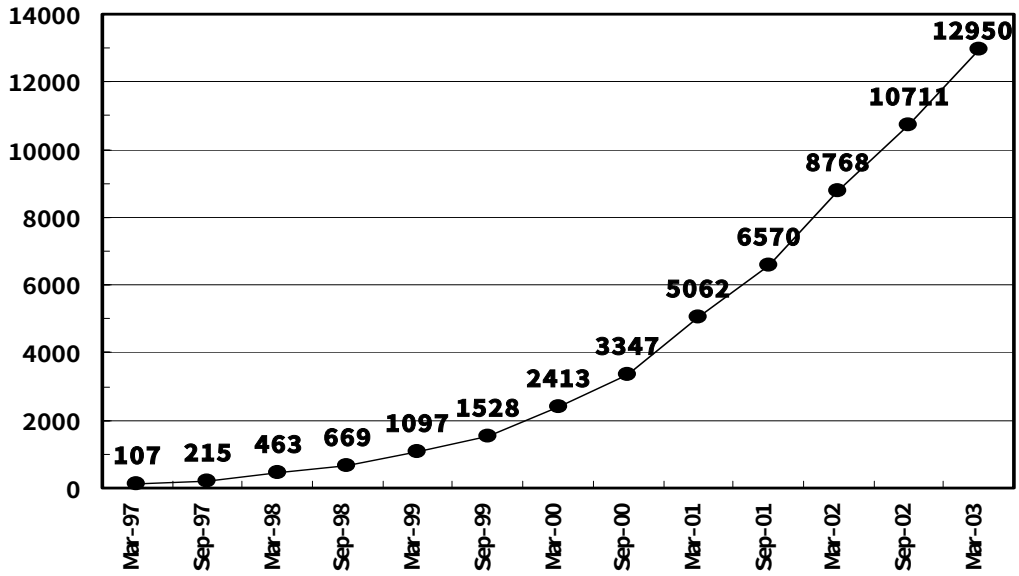
(1) Improving quality assurance through ISO9000 series compliance

The Ministry of Land, Infrastructure and Transport (MLIT) has been working since 1996 on about 50 pilot projects to promote a better understanding of the ISO9000 series, and to engage a wide range of interested parties in a discussion concerning the benefits and problems associated with the application of ISO9000 standards to public works projects. As a result, the MLIT has determined that there is a high potential for the application of ISO9000 series standards to effectively serve as a means of improving quality assurance standards on public works and other construction projects. In fiscal 2000, in light of its findings, the MLIT is attempting 35 ISO9000 series compliance projects that require project bidders to obtain ISO9000 series certification, primarily projects with an especially high degree of difficulty. Based on the results of this attempt, the MLIT has been expanding the range of construction projects that require ISO9000 compliance since fiscal 2001, increasing the efficiency of supervisory activities, and simplifying the documents that have to be submitted.

(2) ISO9000 series certification

Japanese construction companies first began working in 1995 to achieve ISO9000 series certification. Since then, the number of certified companies has risen rapidly. As of March 31. 2003, 12,950 construction companies have registered with the Japan Accreditation Board for Conformity Assessment (JAB) for certification in the construction sector. Most large and medium-sized general contractors have already obtained certification, and now more local general contractors and specialty contractors are also obtaining certification.

Figure 4-1 Registrations since March 1997



4.3.2 Enhancing the Skills of the Workforce

The Ministry of Health, Labour and Welfare has implemented a skill assessment system for the purpose of improving workers' skills and their interest in skill acquisition. This system comprises a four-level skill assessment for 37 types of construction-related jobs such as rebar work, and workers are assigned to a skill level based on their ability to pass both written and hands-on exams.

The Ministry of Land, Infrastructure and Transport is also working to develop training programs for "multi-skilled workers" who can work in several different sector of construction, as well as for "core workers" who can devise efficient construction methods for contracting engineers (supervisors) and who can coordinate work with the managers of other sectors. In April 1997 the MLIT opened the Cross-Technique Training School to further these goals. To promote the training of core engineers, the MLIT is supporting the establishment of a system for evaluating them, and plans to investigate evaluation systems for companies that utilize core engineers, such as the public evaluation system, the "specialized construction companies strength index."

Also, the Ministry of Land, Infrastructure and Transport is conducting a preliminary training program for new hires in the construction industry for small and medium-sized companies and specialized construction companies who hire few new people and thus cannot efficiently implement their own independent training programs. It is also planning to join construction companies to enhance construction skill training by providing industrial high schools with tools and materials, teachers, and volunteer lecturers.

4.3.3 Improving Supervisory Skills

Improving the skills of supervisors is largely being pursued through private instruction. Each company holds its own regular technology exchange meetings, provides quality control and safety and sanitation education, and has safety and sanitation coordinators conduct construction site safety patrols. In recent years, an increasing number of companies have been striving to elevate their technological capabilities by actively supporting the certification training various levels of construction managers and professional engineers, and by sharing construction techniques that use information technology.

4.3.4 Improving Construction Safety

Aiming to ensure the safety of construction work though public-private sector cooperation, the Ministry of Land, Infrastructure and Transport established the Comprehensive Safety Policy Project in May 1992. The basic aim of this project was to move away from promoting stronger regulations to emphasizing the importance of having each and every person involved in the construction industry, from those who order and manage work to the on-site skilled workers, be responsible for paying attention to safety issues. Its main policies were to coordinate the placement of responsible engineers through the improvement of construction system record keeping, to bolster education for construction workers using educational videos and other materials, and to offer seminars for engineers on relevant safety topics.

To further promote the causal analysis of worker accidents and to develop accident prevention measures, the MLIT announced plans in May 2000 to continue the performance of effective safety control activities at construction sites, to promote proper safety education for supervisors and on-site workers, and to construct an information exchange network on safety activities. It is also working on analyzing the causes of disasters attributable to human error and drafting measures to prevent such incidents.

A growing number of companies are now performing safety management in accordance with theOccupational Health and Safety Management System (OHSMS).

Table 4-7 Accident frequency rates (construction industry)

	General contractor	Specialty contractor, Plant and Equipment contractor
1998	1.32	0.84
1999	1.44	0.74
2000	1.10	0.76
2001	1.61	0.81
2002	1.04	0.46

Source: *Survey of Occupational Accidents and Injuries*, Ministry of Health, Labour and Welfare.

Note: The "frequency rate" is the frequency of accidents, expressed as the number of deaths or injuries from work-related accidents per one million labor hours

4.4 Development of New Technologies in the Construction Sector

Table 4-8 New construction technologies

Brief Description of New Technologies	Developer
Takenaka's new packaging technology, "Miryoku Saisei" of Building Retrofitting for Upgraded Functionality This project will redevelop a dilapidated, unattractive tenant building into a facility on a par with new construction and suitable for a 21st century office building, but at a lower cost than would be required to replace the building. The redeveloped building will have an energy-efficient air conditioning system, seismic features such as seismic reinforcement and anti-vibration floors, a renovated interior and exterior, improvements in the interior spaces to accommodate advanced information technologies, and other features to attract good tenants and thereby make it possible to increase the profit on the project.	Takenaka Corporation
Tunnel Wall Tapping Sound-Resonating Diagnostic System A system for automatically diagnosing the soundness of a tunnel lining using the SonicMeister, a wall tapping sound-resonating diagnostic device. This device allows more accurate operations at 3-5 times the speed of conventional methods by manpower. Diagnostic results can be immediately confirmed on the spot, and the recorded data can be saved for use in diagnosing deterioration over time.	Taisei Corporation
Shimizu Advanced Substructure Construction System This is a construction method which enables underground and above ground construction work to be performed simultaneously by constructing the first floor first. Getting an early start on the above ground work shortens the construction period for the whole project. Using the floor of the first floor for earth retaining support and as a work floor reduces the temporary structures and materials needed for underground excavation. Also, since the floor of the first floor covers the majority of the underground portion of the work, this construction method has such benefits for	Shimizu Corporation

the surrounding area as noise reduction.	
"OBAYASHI-BIMA system", Energy Self-sufficient Organic Waste Treatment System The total system mainly consists of BIMA digester as methane fermentation and biogas co-generation system. The BIMA digester reduces volume of the organic waste which is kitchen waste, manure, sewage sludge, etc. and produces methane gas, which features unique mixing mechanism by produced gas. The biogas co-generation system generates source of energy such as electricity, steam and hot water by using the methane gas. Some of the generated electricity is utilized by the treatment system itself and the rest is sold to the power company.	Obayashi Corporation
WATAR (Wave Trapping Artificial Reef) Construction Method A method of constructing breakwaters submerged in the ocean, WATAR is a method of controlling waves and combating shoreline erosion. In contrast to other artificial reefs, WATAR is more effective at reducing wave height and offers lower construction costs because of its compact structure. Because part of the structure can be prefabricated, construction times can be shortened. Also, because it is a submerged breakwater, it does not interfere with the coastal scenery.	Nishimatsu Construction
Parent-Child Shield Construction Method By allowing cross-sectional changes, this shield construction method is a technology for economically and efficiently building tunnels that can be adapted to the tunnel's purpose. One shield can excavate different tunnel radiuses. There is a child-to-parent method, in which, after excavating with the child shield, the parent shield is attached to continue excavation, or a parent-to-child method, wherein the child shield is attached to the parent shield ahead of time, and then once excavation with the parent shield is finished, the child shield is taken off before continuing with excavation work.	Sato Kogyo
Rapid Construction Method for High Seismic-Resistance Bridge Piers (REED Construction) This is a structural shaping and construction method for reinforced-concrete complex-structure bridge piers that uses studded H-shaped steel (that can withstand tension) and a prefabricated high-durability form (that can withstand compression). As a result, this method enables fast-paced construction through the repetition of simple tasks, improved earthquake resistance through the use of highly rigid H-shaped steel, and enhanced beauty and durability through the use of pre-cast form.	Maeda Corporation
Free-Plan Housing with Superreinforced Concrete-Frame Skyscrapers Eliminating the need for any pillars or beams beside those used in the periphery of the building, this is a flexible construction system that allows the size of a space to be adjusted to accommodate the changes taking place in society by making it possible to move the walls between housing units. By making it easy to change interior elements and fixtures, this system achieves a "versatile home" that extends the social life span of the structure. By combining the Superreinforced Concrete-Frame method and HiRC method, this method can be applied to plate-type skyscrapers.	Kajima Corporation
Ashcrete This is a new type of concrete. Instead of the standard components of normal concrete, Ashcrete uses fly ash, a high-volume by-product of coal fired power plants. Because of its added strength under water, durability, and water-retarding properties, it has all the properties necessary to make an ideal material for undersea applications. Ashcrete also has a wide range of applications because its added volumes of metal slag enable adjustable specific gravity.	Hazama Corporation
Digital Camera Earth Transport Volume Measurement System This is a system of automatically measuring soil volumes accumulated in soil transport barges with a stereo image measurement device that uses two digital cameras. While offering a high level of measurement precision, this system is much less expensive that conventional mechanical methods. Also, because the parts that comprise the system are sold on the market, the system is inexpensive and easy to maintain. Absolutely no additional equipment is needed on the soil transport barge.	Penta-Ocean Construction

Table 4-9 Level of prefabrication

	Portion of total sales by domestic cement firms accounted for by finished cement products (%)
1996FY	14.5
1997FY	14.6
1998FY	14.1
1999FY	13.9
2000FY	13.6
2001FY	13.2
2002FY	13.1

Source: Cement Handbook (2003 edition), Japan Cement Association.

4.5 The Use of IT in Construction and Related Policies

The major general construction companies are trying to use information technology in the construction industry for electronically procuring materials over the Internet, electronically collecting bids from project companies, sharing data (CAD, project information), using extranets with cooperating companies, and increasing distribution efficiency.

The Ministry of Land, Infrastructure and Transport established the Construction CALS/EC Action Program in June 1997, and aims to achieve construction CALS/EC in the projects under its direct jurisdiction by 2004. The major goals of the construction CALS/EC are as follows:

- Use of electronic procurement for all projects.
- Contracting through EDI (Electronic Data Interchange).
- Online submission of applications and bid notification for all public projects.
- Creation of a comprehensive database of project information.
- Information linking and integration using GIS (Geographic Information System).

Since October 2001, electronic bidding was used primarily for the large projects under the direct control of the Ministry of Land, Infrastructure and Transport, while in fiscal 2003 it is being used for all projects under the direct control of MLIT. Electronic delivery of documents has been enforced in part of projects since April 2001, and will be expanded for all projects under that ministry's direct control by fiscal 2004. The Ministry of Land, Infrastructure and Transport has enacted the Regional Development Action Program (National Version) to promote positive efforts toward the implementation of construction CALS/EC by local governments, and plans to have completed the full dissemination of construction CALS/EC to all the institutions that order public works projects by 2010.

4.6 Research and Development

4.6.1 Earthquake Resistance Reinforcement Methods Using New Materials

These methods provide outstanding earthquake resistance by affixing new materials to or using new materials to encase structures that have sustained earthquake damage, or the existing RC portions of old dilapidated structures. These methods have rapidly gained widespread acceptance in recent years because of their ease-of-use and low cost, their role in eliminating dust and noise pollution, and because they can be implemented while the building is still occupied, thereby eliminating the need to move occupants during construction. New materials include carbon fiber sheets and aramid fiber sheets.

4.6.2 Thermal Storage Technologies

These are technologies for storing extra heat energy to be used at a later time when needed. Used in the air conditioning systems in buildings, these technologies are expected to be very useful in facilitating the effective use of heat energy. The most common technique is to create and store cold water, hot water or ice during the night when electricity costs are low using ice thermal storage technologies that utilize latent heat, and then to use that cold water, hot water or ice to provide air conditioning during the day. In the past, the required thermal storage tanks were installed in building basements, but technologies are now being developed for structural thermal storage using residential floors or walls, and for thermal storage at great depths, which are effective in large regional heating and cooling systems. An example of their use on a regional level can be found in the Minato Mirai 21 (MM21) area of Yokohama.

Table 4-10 Research and development

	Total investment in research and development (billion yen)	Construction sector investment (billion yen)	Percentage of total construction investment (%)
1996	10,058.4	224.5	0.27
1997	10,658.4	225.2	0.30
1998	10,800.1	176.7	0.25
1999	10,630.2	199.5	0.29
2000	10,860.2	189.3	0.28
2001	11,451.0	138.3	0.23

Source: Survey of Research and Development, Ministry of Public Management, Home Affairs, Posts and Telecommunications; *Forecast of Construction Investment,* The Ministry of Land, Infrastructure and Transport

4.7 Environmental Conservation

4.7.1 Environmental Policies Pertaining to the Construction Industry

(1) Environmental Impact Assessment Methods

Japan's environmental impact assessment system used to be left to the discretion of government officials based on the Cabinet's Guidelines Concerning the Performance of Environmental Impact Assessments, but since the process of establishing the Basic Environment Law and the Basic Environment Plan revealed the need for revisions to this system, the Environmental Impact Assessment Law (Environmental Assessment Law) was enacted in 1997.

All businesses over a certain size are automatically required to conduct studies, provide estimates, and perform, at their own expense, assessments of the impact of their business activities on the environment before engaging in those activities. Companies must then use the results of those studies to take the relevant environmental issues into consideration in carrying out their business.

The new law marks a watershed in the history of environmental conservation because it requires that the assessment procedures include mechanisms for ensuring that the views of local residents are reflected in the assessment.

Table 4-11 Key environmental legislation in Japan since 1967

1967	Enactment of the Basic Law for Environmental Pollution Control.
1968	Enactment of the Air Pollution Control Act; Noise Control Act.
1970	64th Session of the Diet (the so-called "Pollution Session") passes 14 measures dealing with pollution, including the Law concerning the Handling of Pollution-Related Disputes, the Water Pollution Prevention Act, etc.
1971	Environment Agency is established. Enactment of the Agricultural Land Soil Pollution Prevention Law; Offensive Odor Control Law.
1973	Enactment of the Chemical Substances Control Law.
1979	Enactment of the Law concerning the Rational Use of Energy (Energy Conservation Law).
1984	Cabinet Resolution, "Concerning the Performance of Environmental Impact Assessments."
1988	Enactment of the Law concerning the Protection of the Ozone Layer through Control of Specified Substances and other Measures.
1991	Enactment of the Law for Promotion of Utilization of Recyclable Resources (the Recycling Law).
1992	Enactment of the Law for the Control of Export, Import and Others of Specified Hazardous Wastes and Other Wastes.
1993	1992 Earth Summit issues the Rio Declaration. Japan responds by formulating the Basic Environment Law.
1994	The Basic Environment Plan is adopted by Cabinet Decision.
1995	Enactment of the Law for Promotion of Sorted Collection and Recycling of Containers and Packaging.
1997	Enactment of the Environmental Impact Assessment Law.
1998	Cabinet Resolution regarding the Law concerning the Promotion of Measures to Cope with Global Warming.
1999	Revisions made to the Law concerning the Rational Use of Energy (Energy Conservation Law).
2000	Enactment of the Basic Law Promoting the Formation of a Recycling-Oriented Society, the Revised Waste Disposal Law, Building Construction Materials Recycling Law (Construction Recycling Law), Law Promoting the Effective Use of Resources (Revised Recycling Law), Law Promoting the Reuse of Recycled Food Materials, and the Green Purchasing Law.
2001	Enactment of the PCB Special Measures Law and the Fluorocarbons Recovery and Destruction Law
2002	Enactment of the Soil Contamination Countermeasures Law and the Basic Law on Energy Policy Making

(2) Other Legislation

The Japanese government has designated the year 2000 as the “first year of the recycling-oriented society” and has decided to enact legislation regarding a basic framework toward that end. The government has thus compiled the Basic Law Promoting the Formation of a Recycling-Oriented Society which sets out the basic principles of recycling policies, such as regulations regarding waste disposal and the collection responsibility of producers.

It has also enacted the Revised Waste Disposal Law which requires waste disposal companies to ensure final waste processing and the Building Construction Materials Recycling Law (Construction Recycling Law, enforced in May 2002.) which systematizes the registration of demolition companies and requires the recycling of concrete, asphalt, and lumber.

Construction waste accounts for about 20% of total industrial waste, about 40% of the volume of final processed waste, and about 90% of illegal dumping, thus making the promotion of construction waste recycling an extremely important issue.

While new laws have been introduced to promote the proper disposal and recycling of waste, such as the Basic Law Promoting the Formation of a Recycling-Oriented Society, Revised Waste Disposal Law, and the Building Construction Materials Recycling Law (Construction Recycling Law), the construction industry is being urged to undertake active environment-oriented efforts and to achieve stringent goals.

It is essential that recycling plans be implemented if the construction industry is to be viewed favorably by the general public as an industry that makes an important contribution to society.

4.7.2 Efforts to obtain the ISO14000 series

The number of companies in Japan obtaining certification under the ISO14000 series of international standards for environmental management systems is rapidly increasing.

Many companies in the construction industry are moving forward with preparations for obtaining certification for such purposes as fulfilling their corporate mission (social demand), preserving the global environment, improving their corporate image, bolstering their company’s stature, or establishing an environmental management system.

The statistics on ISO14000s certified companies compiled by the Japan Standards Association as of May 2003 indicate that a total of 12,274 companies have obtained certification. Of those, 898 are general construction companies (7.3%) and 197 are plant and equipment construction companies (1.6%).

4.7.3 Prospects for Eco-Businesses

Though the construction market in Japan is now in a period of contraction, steady increases can be expected in some sectors, such as maintenance and repairs, welfare, and information. The environment is another industry where growth can be anticipated, and the construction industry has started to become active in “eco-businesses,” the gateway to the environmental sector.

The definition and structure of an eco-business was explained in the OECD manual published by the Organization for Economic Co-operation and Development. The Environment Agency has calculated and released information on the current status and future prospects of the eco-business market in Japan based on the OECD manual (see Table 4-12).

Table 4-12 Current status and future prospects of the eco-business market

Eco-Business	Market size (billion yen)		No. of employees	
	1997	2010	1997	2010
A. Environmental pollution prevention	14,214.0	18,843.0	31,125.8	34,035.0
Manufacturing of devices and materials for preventing pollution	1,347.5	1,786.0	2,234.6	2,189.3
1. For air pollution prevention	305.2	366.0	482.6	428.6
2. For wastewater processing	982.4	1,082.8	1,555.0	1,259.3
3. For solid waste processing	8.9	38.7	20.1	61.1
4. For purifying soil and water (including ground water)	1.5	240.8	2.4	296.2
5. For noise and vibration prevention	14.2	10.4	25.4	14.5
6. For environmental measurement, analysis, and assessment	35.2	47.3	149.1	129.5
7. Other	--	--	--	--
Services	8,609.8	10,360.7	24,600.5	25,613.9
8. Air pollution prevention	—	—	—	—
9. Wastewater processing	956.9	1,211.1	857.5	799.1
10. Solid waste processing	7,390.4	8,520.2	22,617.4	23,149.6
11. Soil and water purification (including groundwater)	35.6	322.5	129.0	522.3
12. Noise and vibration prevention	--	--	--	--
13. Environment-oriented research and development	--	--	--	--
14. Environment-oriented engineering	--	--	--	--
15. Analysis, data collection, measurement, assessment	219.7	218.6	951.7	946.9
16. Education, training, information provision	2.1	34.8	13.3	80.6
17. Other	5.1	53.4	31.6	115.4
Installation of buildings and equipment	4,256.7	6,669.4	4,290.6	6,231.8
18. Air pollution prevention equipment	0.0	5.9	0.0	7.2
19. Waste processing equipment	3,394.2	5,788.4	3,051.5	5,204.0
20. Waste processing facilities	719.6	642.1	1,110.7	786.8
21. Soil and water purification equipment	--	--	--	--
22. Noise and vibration prevention equipment	142.9	259.9	128.5	233.7
23. Environmental measurement, analysis, and assessment equipment	--	--	--	--
24. Other	--	--	--	--
B. Technologies and products that reduce the environmental burden (Device manufacturing, technologies, materials, services)	225.6	546.4	351.6	877.4
1. Energy-efficient technologies and processes that reduce that the environmental burden	0.0	250.0	0.0	574.7
2. Energy-efficient products that reduce that the environmental burden	225.6	296.4	351.6	302.7
C. Effective use of resources (Device manufacturing, technologies, materials, services, installation of buildings and equipment)	10,303.1	20,704.9	38,037.1	51,788.3
1. Inside air pollution prevention	--	--	--	--
2. Water supply	28.8	105.1	33.7	171.0
3. Recycled materials	3,745.1	8,850.6	8,708.1	16,911.9
4. Facilities that use recyclable energy	169.0	710.9	630.2	1,194.6
5. Energy conservation and energy management	756.0	2,494.9	1,261.9	2,577.7
6. Sustainable agriculture and fishing	--	--	--	--
7. Sustainable forestry	--	--	--	--
8. Natural disaster prevention	--	--	--	--
9. Eco-tourism	--	--	--	--
10. Other (nature conservation, ecology and environment, biodiversity, etc.)	5,604.1	8,543.4	27,403.2	30,933.0
Total	**24,742.6**	**39,844.3**	**69,514.5**	**86,126.0**

Source: Ministry of Environment.

Notes:
1. In some cases it is difficult to differentiate between “Manufacturing of devices and materials for preventing pollution” and “Installation of buildings and equipment.” Thus items that are ordered only in units of individual devices are categorized under “Installation of buildings and equipment.”
2. Data is unavailable for items marked with a dash (-).
3. In some cases some data from 1996 was used to calculate the market size in 1997.

According to this data, the eco-business market was valued at ¥24.7 trillion in 1997 and is expected to grow to ¥39.8 trillion by 2010. This corresponds to an expected average annual growth rate of 3.7%. Businesses that will sustain the recycling-oriented society, such as those involved in waste disposal and recycling, accounted for 50% of the market in 1997, and are expected to have about the same 50% share in 2010.

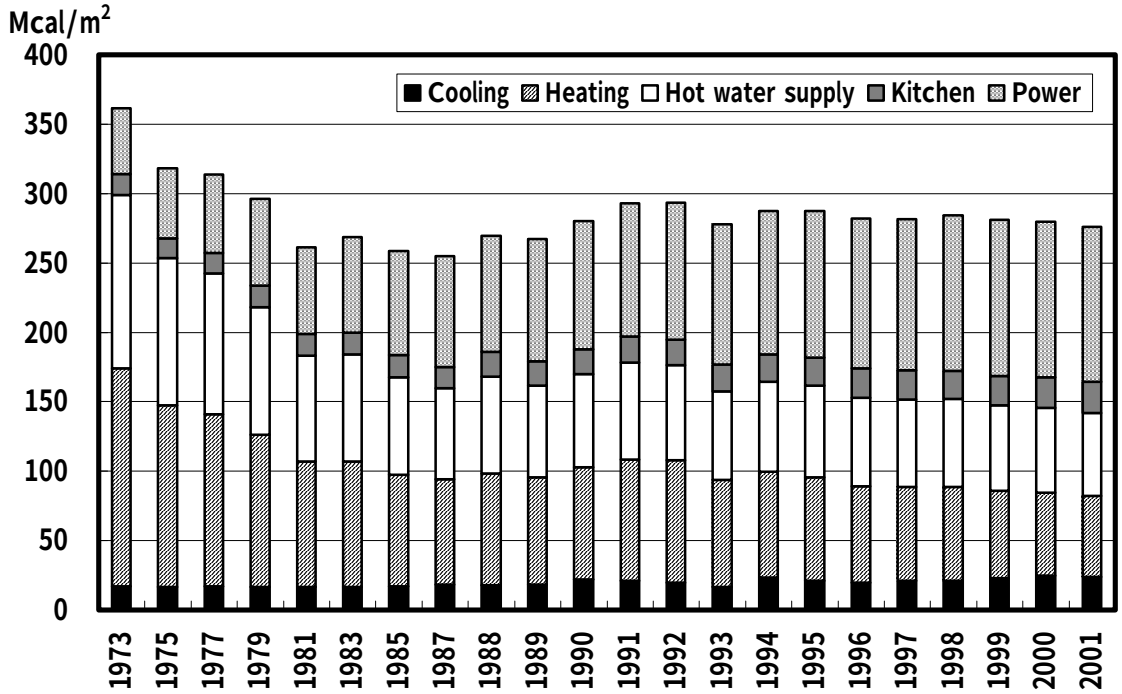
4.7.4 Energy Consumption

(1)Energy Consumption Per Unit of Area for Industrial (Non-Residential) Buildings

Energy consumption per unit of area for industrial buildings is shown in Figure 4-2. In the past, a great deal of energy was consumed for heating and hot water, but in recent years more energy has been spent on providing power.

Energy consumption per unit of area (m^2) has been in the range of 250-300 Mcal/m^2 since the 1980s.

Figure 4-2 Energy consumption per unit of area for industrial buildings (1973-2001)



Source: 2003 EDMC Statistics on Energy and the Economy.

(2)Revisions to the Law Concerning the Rational Use of Energy (Energy Conservation Law)

Carbon dioxide accounts for 90% of global greenhouse gases, but most of that is emitted from necessary energy consumption in everyday living and business activities.

The national government thus developed the Outline for the Promotion of Efforts to Prevent Global Warming in June 1998 as a global warming policy to be urgently promoted with a target date of 2010. The goal of these principles was to establish a core strategy for combating global warming that called for the reduction of carbon dioxide emissions through the increased efficiency of energy use and the elimination of wasteful energy consumption.

The Law Concerning the Rational Use of Energy (Energy Conservation Law) incorporates various measures for achieving “the efficient use of energy” and “the elimination of waste,” issues that need to be addressed. The law was revised in June 1998 to strengthen its provisions, and the revised law was enacted in April of 1999.

The Law Concerning the Rational Use of Energy (Energy Conservation Law) is a comprehensive law for promoting the efficient use of energy and eliminating wasteful consumption. It has been in effect for about 20 years since it was enacted in 1979, and has contributed much to the efficient use of energy in Japan, said to have the highest levels of energy efficiency in the world.

Chapter 5 Globalization of Construction Services

5.1 Liberalization Policies

The construction industry in Japan has not traditionally discriminated against foreign entrants in terms of its requirements for obtaining construction business licenses and other measures. In 1994, however, in response to the growing movement toward international construction market liberalization evidenced by ongoing negotiations to revise the WTO Agreement on Government Procurement (GPA), reforms of Japanese bidding and contracting procedures were enacted with the Cabinet's approval of the Action Plan on Reforms of Bidding and Contracting Procedures of Public Works (hereafter the "Action Plan"). This plan aimed to ensure the high quality of public works projects, improve the transparency, objectivity, and competitiveness of bidding and contracting procedures, and make it easier for foreign participants to become familiar with Japanese bidding and contracting practices. This Action Plan was enacted before the GPA went into effect in 1996, and incorporated other independent government measures aimed at market liberalization. The major components of the plan are as follows:

- Projects valued over a standard amount set out in the agreement are subject to open and competitive bidding, and design/consulting work is handled through either the Public-Invitation Proposal Procedure or Public-Invitation Competitive Bidding.
- Expansion of the criteria by which foreign companies are evaluated.
- Establishment of procedures for handling claims.

The GPA went into effect in 1996. A comparison of the Action Plan and the GPA reveals that while the Action Plan applies to projects and design/consulting services of the national government or organizations affiliated with the national government, the GPA also applies to projects of the prefectures and designated cities. Also, while the Action Plan is applicable to construction as well as design/consulting services, the GPA applies again more broadly to the procurement of goods and other services.

In addition to liberalization efforts primarily via the WTO, there has been a growing movement in recent years aimed at revitalizing commerce through free trade agreements (FTAs) such as the Japan-Singapore New Age Economic Partnership Agreement concluded in November 2002. In fiscal 2004, the MLIT is planning to develop a Basic Strategy for Economic Partnerships for promoting strategic negotiations on FTAs in the construction industry. Thus, the government is developing an integrated approach to construction industry issues.

5.2 WTO Regulations

5.2.1 Construction Services

According to the WTO Agreement on Government Procurement, Appendix 1, Annex 5, a construction services contract is a contract which has as its objective the realization by whatever means of civil or building works, in the sense of Division 51 of the Central Product Classification (CPC).

5.2.2 Design and Consulting Services

The WTO Agreement on Government Procurement, Appendix I, Annex 4 includes architectural, engineering and other technical services related to construction services, but a note is provided to indicate that services not related to construction services are not included. The note also indicates that final design services of architectural design services and other design services when procured independently are not included.

Table 5-1 Yen conversion of standard amounts in the WTO Agreement on Government Procurement

		Government	Quasi-governmental agencies	Local Government
Construction Services		4.5mil SDR	15mil SDR	15mil SDR
	1994.04.01～1995.12.31	730mil yen	2430mil yen	2430mil yen
	1996.01.01～1996.03.31	750mil yen	2500mil yen	2500mil yen
	1996.04.01～1998.03.31	650mil yen	2160mil yen	2160mil yen
	1998.04.01～2000.03.31	720mil yen	2430mil yen	2430mil yen
	2000.04.01～2002.03.31	750mil yen	2500mil yen	2500mil yen
	2002.04.01～2004.03.31	660mil yen	2220mil yen	2220mil yen
Design and Conslting Services		0.45mil SDR	0.45mil SDR	1.5mil SDR
	1994.04.01～1995.12.31	73mil yen	73mil yen	250mil yen
	1996.01.01～1996.03.31	75mil yen	75mil yen	250mil yen
	1996.04.01～1998.03.31	65mil yen	65mil yen	210mil yen
	1998.04.01～2000.03.31	72mil yen	72mil yen	240mil yen
	2000.04.01～2002.03.31	75mil yen	75mil yen	250mil yen
	2002.04.01～2004.03.31	66mil yen	66mil yen	220mil yen

5.3 Rules and Regulations for the Participation of Foreign Contractors and Professionals

5.3.1 Legal Systems and Procedures for Establishing a Business Office

When a foreign corporation establishes a local office in Japan, it need not obtain any licenses or permits, nor must it register with the Legal Affairs Bureau. When a foreign corporation establishes a branch office (or sales office) or corporation in Japan, it is required to: a) register the branch office (corporation) in accordance with commercial laws, b) submit reports or documents in accordance with the foreign exchange and international trade laws, and c) submit various documents to the tax authorities.

5.3.2 Obtaining a Construction Business License

A company operating a construction business in Japan must obtain a construction business license in accordance with the Construction Business Law. A permit is not required if the company is only a subcontractor for a minor construction project as defined by government ordinance. But if the company engages in any other kind of construction work, it is required to obtain a construction business license regardless of whether it is a domestic or foreign firm. One condition for obtaining the license is that the company employ a person with management experience in Japan, but special approval may be obtained from the Minister of Land, Infrastructure and Transport for persons with the equivalent degree of experience in a foreign country if the Minister recognizes that person as having an equal or higher level of capabilities as that needed to fulfill this requirement. Likewise, the requirement of employing specialized engineers with certain qualifications or with actual work experience in Japan may be able to be met by a person with qualifications or actual work experience overseas authorized by the Minister of Land, Infrastructure and Transport.

Ten Asian companies (8 from South Korea, 1 from Singapore,1 from Philippine) had obtained a Japanese construction business license as of March 31,2003.

For details regarding construction business licenses, see Appendix A5, section (1) Construction Business Licensing System.

5.4 Foreign Participation in the Domestic Market

Table 5-2 Number of foreign corporations and foreign-capitalized Japanese corporations that have obtained construction business licenses

Country	Foreign companies	Foreign-capitalized Japanese companies	Total	By permit	
				Minister of Land, Infrastructure and Transport	Prefectural governor
U.S.A.	12	20	32	10	22
South Korea	6	2	8	1	7
Germany	0	8	8	1	7
Holland	0	6	6	1	5
Switzerland	0	4	4	2	2
United Kingdom	0	3	3	0	3
Sweden	0	4	4	0	4
France	0	2	2	2	0
Finland	0	1	1	0	1
Singapore	0	1	1	0	1
Canada	0	1	1	0	1
Luxemburg	0	2	2	1	1
Philippines	0	1	1	0	1
Denmark	1	0	1	0	1
total	19	55	74	18	56

Source: Ministry of Land, Infrastructure and Transport.

Notes: 1.As of March 31, 2003.

2.Foreign corporations: Companies whose entire (100%) capital comes from a foreign firm.

3.Foreign-capitalized Japanese corporations: Companies whose majority (50% or more) capital comes from a foreign firm.

5.5 Impact of Liberalization under the World Trade Organization

Since the Action Plan on Reforms of Bidding and Contracting Procedures of Public Works was enacted in 1994, the number of public works projects undertaken by foreign firms has steadily increased. The increase in the number of orders received by South Korea has been especially remarkable since it became a party to the WTO Agreement on Government Procurement in 1997.

Table 5-3 Public works orders received by foreign firms
(Unit: million yen)

	Fiscal year	FY1996	FY1997	FY1998	1999 (Apr.-Nov.)
Orders received by foreign firms	Construction work	9,798	13,736	16,213	10,766
	Design and consulting	491	256	261	327
	Total	10,289	13,991	16,474	11,093

Source: Ministry of Land, Infrastructure and Transport.

Note: Includes orders planned by third sector public institutions as well as national government institutions and local public organizations.

5.6 Strategies Towards Cooperation in the Asian Construction Market

5.6.1 ODA Technological Cooperation Projects

Japan is the world's second largest economy and the world's top ODA donor. In addition to helping raise the level of trust and respect that other countries have for Japan, the Japanese government grants ODA with the basic understanding[1] that it helps promote the national interests of Japan, a country that is dependent on world peace and stability and that relies on the international community for resources, energy, and food.

The Asian region is a major target of Japanese ODA, and in 2001, 56.6% of Japan's bilateral ODA was distributed to Asia.[2] ODA is provided in such forms as grants-in-aid, technological cooperation, yen loans, and investments in and contributions to international institutions. Yen loans have been used to develop much social infrastructure, such as roads, bridges, and telecommunications facilities. In light of this knowledge, technological assistance projects which utilize Japanese firms and take advantage of the experience of specialists at universities, think tanks, local governments, and private companies, and which

[1] "Mid-Term Policies Concerning Government Development Assistance," August 10, 1999.
[2] ODA White Paper 2002.

aim at transferring useful technologies and managerial skills, are one of the most important means through which Japan provides overseas aid.

Various technological cooperation programs are already underway in the construction sector in areas such as construction materials development (Indonesia), new housing technology research (China), and increasing construction productivity (Philippines).

5.6.2 Cooperation with Local Firms through ODA Projects

Overseas contract amounts for Japanese construction companies were valued at ¥758.4 billion for fiscal 2002. A breakdown of orders reveals that ¥498.5 billion were placed with Japanese companies (branches or sales offices), and ¥259.9 billion were placed with local subsidiaries of Japanese companies. There is a large gap between the value of orders received from Asia, Japan's leading overseas source, whose overseas contract value of ¥501.8 billion accounts for 66% of its overseas contracts, and those from the second runner-up, North America, with ¥93.3 billion.[3] By undertaking projects in Asia, Japanese construction companies operating as main contractors or joint venture participants are able to form close cooperative relationships with local subcontracting firms and other joint venture participants. They are also able to engage in technology transfers in such areas of construction as process management, quality control, and construction methods. As a result, they not only help improve the technological capabilities of the local companies with whom they share a cooperative relationship, but also raise the overall level of the construction industry in the countries in which they operate.

[3] Overseas Construction Association of Japan. Totals for the 48 member companies.

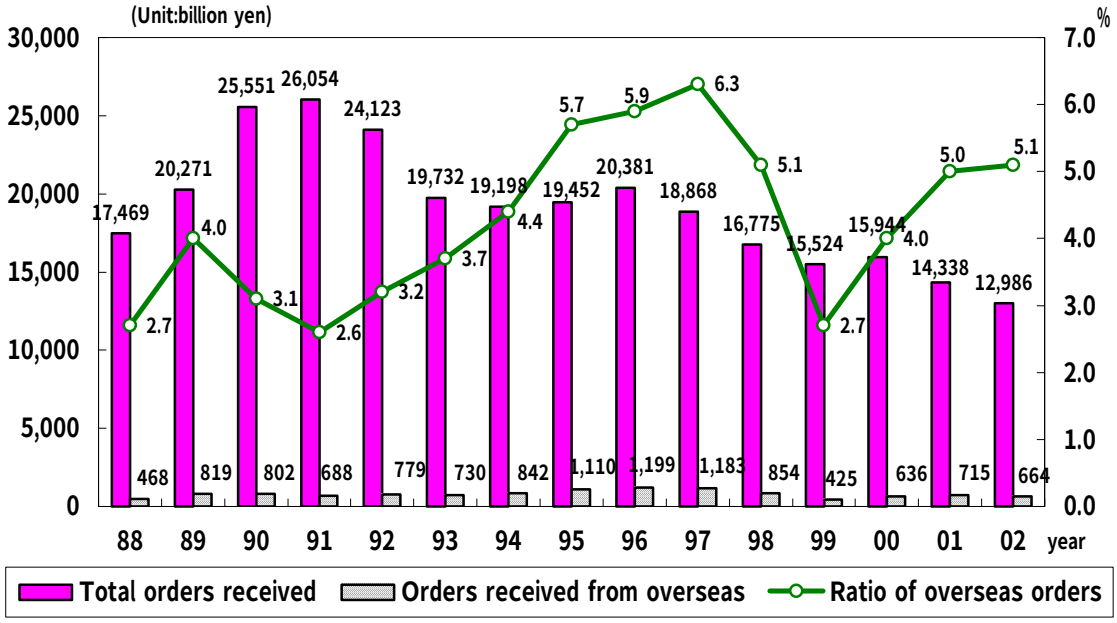
Annex

A1 Overseas Construction Orders Received by Domestic Construction Firms and Orders for Construction in Japan Received by Foreign Construction Firms

(1) Overseas Construction Orders Received by Domestic Construction Firms

Overseas construction orders received by major construction firms and order ratios by region are shown below.

Trends in overseas construction orders received by the big 50 general contractors (1988-2002)

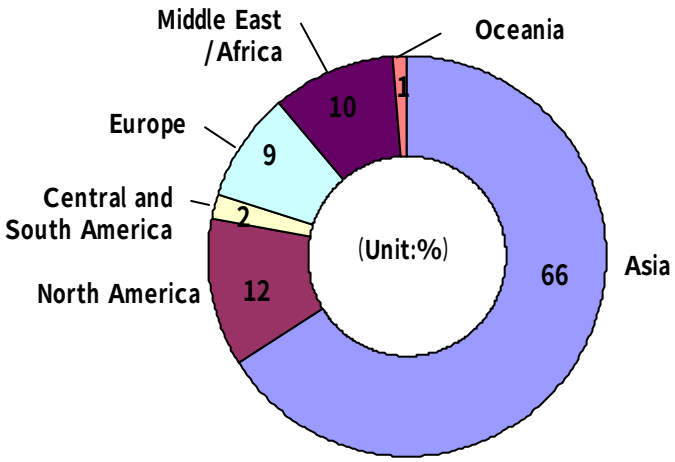


Source: Survey A of Orders Received, Construction Research and Statistics Division, Information and Research Department, Policy Bureau, Ministry of Land, Infrastructure and Transport. Survey conducted among the big 50 general contractors.

Notes: 1. The number of overseas construction orders does not include those received by local corporations.

2. Figures shown here differ from figures reported by the Overseas Construction Association of Japan due to differences in the companies surveyed.

Overseas construction contracts in fiscal 2001 (ratio of order values by region)



Source: Overseas Construction Association of Japan. Totals for the 46 member companies.

(2)Orders for Construction Work in Japan Received by Foreign Construction Firms

Public works orders received by foreign firms

(Unit: million yen)

	FY 1996	FY 1997	FY 1998	1999 (Apr.-Nov.)
Construction work	9,788	13,736	16,213	10,766
Design/consulting	491	256	261	327
Total	10,289	13,991	16,474	11,093

Source: Office for Construction Market Access, Construction Industry Division, Policy Bureau, Ministry of Land, Infrastructure and Transport.

A1.1 Contracts for Overseas Construction Orders by Country

The Ministry of Land, Infrastructure and Transport conducted a survey of business activity at the end of the most recent accounting period and for the interim accounting period among Japan's big 56 domestic construction companies (36 general contractors, 20 plant and equipment construction companies) that operate internationally. The countries and territories from which the companies have received the most overseas construction orders as well as those with whom they want to expand their business (respondents could give up to 5 answers) are shown below.

Countries and territories with large numbers of construction orders last year

(Unit: companies)

2002 Survey Countries and territories with large numbers of construction orders	Primary service seekers			
	Japanese firms	Other private organizations	Public organizations	Total
1. Singapore	8	13	4	25
2. China	13	2	5	20
3. Taiwan	7	3	4	14
4. Thailand	6	1	7	14
5. Philippines	5	3	6	14
6. Indonesia	8	0	6	14
Others	25	21	45	91
Total	72	43	77	192

Countries and territories with whom expanded business is desired

(Unit: companies)

2002 Survey Countries and territories with large numbers of construction orders	Primary service seekers			
	Japanese firms	Other private organizations	Public organizations	Total
1. China	21	2	5	28
2. Thailand	10	3	8	21
3. Taiwan	6	4	8	18
4. Philippines	4	5	8	17
5. Singapore	5	7	5	17
6. Vietnam	3	1	10	14
Others	25	13	52	90
Total	74	35	96	205

Source: 2002 Construction Activity Performance Survey, Construction Research and Statistics Division,Information and Research Department, Policy Bureau, Ministry of Land, Infrastructure and Transport etc.

A2 Breakdown of Construction Companies by Size (Number of Employees)

About 95% of all licensed general contracting firms are small firms with less than 50 employees.

Company Size	FY2000 (No. of companies)	FY2001 (No. of companies)	Share of total in 2001
Fewer than 5	78,848	75,212	25.9%
5-49	203,573	199,502	68.8%
50-99	8,481	8,561	3.0%
100-299	4,974	4,604	1.6%
300-999	1,526	1,429	0.5%
1000+	628	619	0.2%
Total	298,030	289,927	100.0%

Source: Annual Report on the Construction Works Survey, 2000 and 2001, Research and Information Division, Economic Affairs Bureau, Ministry of Land, Infrastructure and Transport.

Note: These figures are based on a sampling of Japan's construction firms. Sample data was extrapolated to obtain an approximation of the total numbers.

A3 Sales and Number of Employees by Sector for 15 Major General Contractors (FY 2001)

Firms	Sales(million yen)				No. of employees
	Total	Building Construction	Civil Engineering	Real estate, etc.	
Kajima Corporation	1,458,086	970,337	393,094	94,654	10,380
Shimizu Corporation	1,286,803	980,487	282,780	23,535	9,524
Taisei Corporation	1,240,060	899,615	321,348	19,097	9,640
Obayashi Corporation	1,202,173	833,211	337,906	31,056	10,418
Takenaka Corporation	851,849	823,079	19,432	9,338	8,246
Nishimatsu Construction	503,065	314,286	174,380	14,399	4,453
Toda Construction	498,757	366,350	127,524	4,882	4,393
Kumagai Gumi	443,539	256,701	174,172	12,666	4,167
Maeda Corporation	413,073	262,203	150,869	0	3,733
Tokyu Construction	367,830	235,671	125,452	6,706	2,581
Haseko Corporation	365,242	319,342	16,696	15,006	1,891
Mitsui Construction	358,490	245,671	110,091	2,727	2,644
Penta-Ocean Construction	347,176	136,512	206,779	3,884	3,121
Hazama Corporation	325,178	172,661	146,981	5,535	2,861
Okumura Corporation	305,384	173,350	129,530	2,502	2,662

A4 Turnover and Number of Employees for Top 10 Foreign Construction Companies

No Data

A5 Classification of Construction Industry Workers by Job Type

(1) Classification of Construction Industry Workers by Job Type

Two-thirds of construction industry workers are skilled on-site workers. The reduction in workers is extremely small compared to the reduction in construction investment, but the number of workers in all job types fell in 2002.

Breakdown of construction industry employees

(Unit: 1,000 people, avg. per year)

Type of work	1995	1999	2000	2001	2002
Specialists and technicians	430	420	420	390	370
Management staff	350	340	330	340	290
Clerical staff	930	940	930	910	870
Sales staff	290	320	340	330	320
Workers	4,380	4,320	4,320	4,150	4,150
General laborers	90	80	70	80	70
Others	150	150	140	120	110
Total	6,630	6,570	6,530	6,320	6,180

Source: Annual Report on the Labor Force Survey, Ministry of Public Management, Home Affairs, Posts and Telecommunications.

(2) Employment Situation at Major General Contractors

According to a survey conducted by the Ministry of Land, Infrastructure and Transport among the leading 36 general contractors, the number of full-time workers fell in all types of work, and the totalnumber of workers declined 6.3% from the previous year(the eighth consecutive year since 1994 that the number has fallen).

Trends in number of employees by job type

	Administrative work	Technical work	Skilled work	Other	Total
1995	59,735	117,979	4,751	3,871	186,336
1996	57,909	116,500	4,403	4,360	183,172
1997	55,831	114,768	4,371	3,408	178,378
1998	50,093	112,907	3,751	2,803	169,554
1999	49,053	104,732	3,732	2,068	159,585
2000	46,182	100,369	3,135	2,198	151,884
2001	44,341	94,165	2,884	2,603	143,993
2002	39,688	90,291	2,849	2,072	134,900
（2002 change from prior year）	-10.5%	-4.1%	-1.2%	-20.4%	-6.3%

Source: 2001 Construction Activity Performance Survey, Ministry of Land, Infrastructure and Transport.

Note: Years are generally the fiscal year ended in March.

A6 Construction Business Licensing System, Corporate Capability Assessment System, Methods of Selecting Public and Private-Sector Contractors (Contract Award Procedures) and Contract Types

(1) Construction Business Licensing System

Trends in number of construction business license holders (1975-2003)

	Total		Permit from Minister		Permit from governor	
	No. of companies	Growth rate	No. of companies	Growth rate	No. of companies	Growth rate
1975	350,817		6,331		344,486	
1980	488,520	39.3%	7,465	17.9%	481,055	39.6%
1985	518,964	6.2%	8,337	11.7%	510,627	6.1%
1990	508,874	-1.9%	8,944	7.3%	499,930	-2.1%
1991	515,440	1.3%	9,022	0.9%	506,418	1.3%
1992	522,450	1.4%	9,124	1.1%	513,326	1.4%
1993	530,665	1.6%	9,332	2.3%	521,333	1.6%
1994	543,033	2.3%	9,619	3.1%	533,414	2.3%
1995	551,661	1.6%	9,871	2.6%	541,790	1.6%
1996	557,175	1.0%	10,062	1.9%	547,113	1.0%
1997	564,849	1.4%	10,485	4.2%	554,364	1.3%
1998	568,548	0.7%	10,742	2.5%	557,824	0.6%
1999	586,045	3.1%	10,815	0.7%	575,230	3.1%
2000	600,980	2.5%	10,899	0.8%	590,081	2.6%
2001	585,959	-2.5%	10,877	-0.2%	575,082	-2.5%
2002	571,388	-2.5%	10,909	0.3%	560,479	-2.5%
2003	552,210	-3.4%	10,630	-2.6%	541,580	-3.4%

Source: Ministry of Land, Infrastructure and Transport.

Note: Numbers of companies are as of the end of March in each year.

1) License Categories

There are two types of construction licenses, national licenses granted by the Ministry of Land, Infrastructure and Transport, and prefectural licenses granted by prefectural governors. There are also two types of construction firms, special and ordinary construction firms.

A single construction firm cannot simultaneously hold both a national and prefectural construction business license, nor can a single firm be categorized simultaneously as both a special and ordinary construction firm.

2) Difference between a National License and a Prefectural License

When a company intends to establish offices and do business in two or more prefectures, it must obtain a national construction license. If a company intends to establish an office and do business in only one prefecture, it must obtain a prefectural license from the prefecture that has jurisdiction over that location.

3) Difference between Ordinary Construction Licenses and Special Construction Licenses

All construction firms—both general contractors and subcontractors—must obtain an ordinary construction license unless they only intend to perform extremely small jobs. A special construction license, however, must be obtained to engage in general contracting where contracts worth ¥45 million or more are received directly from the end client, or to engage in subcontracting involving contracts worth ¥30 million or more.

The special construction license is part of a system designed to protect the interests of subcontractors and to ensure that projects are carried out properly. The required qualifications for a special construction license are more stringent than those for an ordinary license.

(2) Corporate Capability Evaluation System

The principal system used in Japan for evaluating a construction firm's capabilities is the Business Evaluation.

For construction firms that receive direct contracts for public works projects, business evaluations are carried out by the Minister of Land, Infrastructure and Transport or a prefectural governor. These evaluations entail an examination of a specifically formulated list of objective criteria for evaluating the business of a construction firm. The evaluation results are used to assign the company a point score, which is publicly disclosed (see the table below).

Organizations that place orders for public works projects assign each prospective contractor a ranking, taking into consideration their score on the Business Evaluation (objective evaluation) as well as the results of the organization's own evaluation of the contractor's construction performance (subjective evaluation).

Total points on the Business Evaluation (P) = 0.35X1+0.10X2+0.20Y+0.20Z+0.15W

		Evaluation criteria
Scale of operation	X1	Average annual construction revenue,classed by type of project
	X2	Shareholder's equity,number of employees
Business condition	Y	Ratio of revenues to operating profit;Ratio of capital to ordinary profit;Ratio of cash flow to revenue;Ratio of require working capital to monthly turnover;Ratio of account receipt and work in process to annual sales; Ratio of accounts receivable to monthly turnover;Equity ratio;Ratio of interest-bearing debt to monthly turnover;Net interest payments ratio;Ratio of shareholder's equity to fixed assets;Ratio of fixed assets long-term capital;Ratio of value-added output to fixed assets
Level of technical expertise	Z	Number of technical employee,classed by type of business
Other evaluation criteria	W	Non-wage benefits;Working days per year;On-site safety record;Number of construction industry accountants on staff

The criteria for the subjective evaluation include construction performance, history of instructions to halt work, history of legal violations of the Construction Business Act, awards for outstanding construction projects, ISO9000 series certification, etc.

(3) Procedures for Selecting Contractors by Public and Private-Sector Clients (Contract Award Procedures)

How Public-Sector Clients Select a Contractor

The main features of the bidding and contracting system for public works projects in Japan are as follows:

1) Open and competitive bidding procedure

The organization ordering the project places a public advertisement describing the construction project that is open to competitive bidding, and considers all those who wish to participate in the bidding process. The contract is concluded with the company that bids the lowest price.

In this type of general competitive bidding, the qualifications of those who want to participate in the bidding process are examined ahead of time, and only those who meet the specified criteria are eligible to participate. The WTO Agreement on Government Procurement (GPA) requires that this method be used for construction projects ordered by the national government, institutions affiliated with the national government, prefectural governments, and designated city governments. It is used for:

- Many large-scale projects.
- All contracts worth more than ¥660 million (4.5 million SDR) that are issued by the national government; or
- All contracts worth more than ¥2.22 billion (15 million SDR) that are issued by: (1) institutions affiliated with the national government; (2) prefectural governments; or (3) designated cities.

Bidding eligibility

- The point score assigned to the company on the basis of the Business Evaluation must be above a certain threshold.
- The company must have experience with the same type of construction project.
- The company must have qualified technical personnel available for the project.

A survey conducted by RICE in fiscal 2001 shows that more than half (32) of the 59 prefectures and designated cities were engaging in open and competitive bidding practices for contracts less than the amounts stipulated in the GPA.

Minimum contract amounts for which open and competitive bidding is being used

	Prefectures			Cities designed by a Cabnet order			Total		
	FY2001	FY1999	FY1998	FY2001	FY1999	FY1998	FY2001	FY1999	FY1998
beyond 2.5 billion yen	20	20	23	7	7	8	27	27	31
under 2.5 and beyond billion yen	8	9	12	0	1	1	8	10	13
under billion yen	18	18	12	5	3	3	23	21	15
others	1	0	0	0	1	0	1	1	0
Total	47	47	47	12	12	12	59	59	59

Source: Figures for FY 2001 are from the Survey of Tendering and Contracting Systems for Public Works Projects in Prefectures and Designated Cities, RICE. Figures for FY 1999 and 2000

are from the Survey of Tendering and Contracting Procedures of Local Public Organizations, Ministry of Public Management, Home Affairs, Posts and Telecommunications and MLIT.

Notes: 1. This applies to general civil engineering and general building, and the items that apply to the range of the lowest amount including the attempt were extracted and totaled.
2. In FY 1999, figures were divided at ¥2.43 billion (construction subject to WTO).

2) Highly competitive selective bidding procedure

a) Public-Invitation Designated Competitive Bidding

Under this contracting system, the institution ordering the work confirms a company's intent to participate in bidding on each public works project, and requires companies to submit simple technical documents, which it then uses to ascertain whether the company has the technological capabilities needed for a particular public works project.

It is usually used for:

- Projects with a contract value of ¥200-660 million by the Ministry of Land, Infrastructure and Transport.
- Projects that require more specialized construction technologies than those for which "Project Interest Registration Designated Competitive Bidding" is used.

b) Project Interest Registration Designated Competitive Bidding

When undergoing their qualification assessment, construction companies register the types, sizes, and locations of construction projects in which they are interested. The institution ordering construction work takes this information into consideration, requests registered firms to provide technical documents, and then selects a contractor based on an assessment of the technical documents submitted.

- Used primarily for projects with a contract value of ¥100-200 million by the Ministry of Land, Infrastructure and Transport.

3) Designated competitive bidding

Under this system, the institution ordering construction work conducts a preliminary qualification assessment of companies that wish to place bids, and creates a list of qualified companies. Before ordering a particular project, the ordering institution then selects several qualified companies on that list that meet certain standards in terms of such criteria as the grade of the construction project, technical capabilities, and geographical conditions.

This system is usually used for:

- Small-scale projects.
- Projects ordered by clients who do not have staff that are qualified to review the bids submitted in an open and competitive bidding procedure, and by clients who require a construction firm with some special construction technology.

4) Negotiated contract system

Under this system, clients do not use a competitive bidding process to select a contractor, but select a particular company to perform the work needed. This system is used primarily (1) for projects that must be done by a particular firm due to the fact that the require special technologies, equipment, or machinery; or (2) when severe time constraints make it impractical to carry out the competitive bidding process.

5) Other bidding systems

a) Design-build system

This is a method in which client institutions accept design and other technical proposals at the time of the bidding, and contract both the design and construction work together.

On some projects that require advanced or specialized technological capabilities and for which there is considerable development of construction technologies, it may be better to combine special design and construction technologies developed by separate companies than to use the design and construction technologies developed separately.

(In FY 2001, this system was used for 14 projects under the direct supervision of the Ministry of Land, Infrastructure and Transport.)

b) Value engineering (VE) system

There are two types of value engineering (VE) systems: a bidding VE system, where technical proposals on construction methods are accepted in the bidding stage, and a post-contract VE system, in which technical proposals on construction methods are accepted in the construction stage.

The VE system can be utilized in conjunction with either open or designated competitive bidding, or a negotiated contract system (such as by the Ministry of Land, Infrastructure and Transport, local housing supply corporations, and local public works organizations).

There are plans to expand the post-contract VE system by making it applicable to all construction projects using open and competitive bidding and public-invitation designated competitive bidding.

c) Integrated Evaluation Bidding System

In addition to bid price, the client using this system also calls upon bidders to submit technical proposals, which the client then evaluates from various perspectives, including quality, speed, design, and safety, before selecting a winner.

(In FY 2001, this method was used for 34 projects under the direct supervision of the Ministry of Land, Infrastructure and Transport.)

d) Management Technology Application Method

A contracting system wherein some of the various management tasks that were previously performed by both the buyer and the contractor (such as order planning, contract management, construction monitoring, quality management, etc.) are performed by a third-party agent.

(Implemented on four projects under the direct supervision of the MLIT in FY 2001.)

e) Private Finance Initiative (PFI)

The Private Finance Initiative (PFI) Law was enacted in July 1999, and the Basic Guidelines based on that law were released in March 2000. Under this system, contractors usually are chosen by open competition, and those selected use their own funds, managerial capabilities, and technological capabilities to construct, maintain, manage, and operate public facilities.

f) Construction Management (CM) Method

In December 2000, the Ministry of Land, Infrastructure and Transport established a CM Method Research Group (secretariat: RICE) comprised of academic experts, private sector businesspeople, and local government representatives, thereby continuing an investigation into the possibility of implementing construction management in Japanese public works projects, and an examination of the challenges that would arise from its implementation. The CM Method Guideline was established in February 2002.

How Private-Sector Clients Select a Contractor

Private-sector clients most often select contractors by means of the mission method (a decision is made after price negotiations with a single company) or by getting estimates from several companies. The contract systems generally used are the blanket construction-only contract system, the design-build system, and the design-bid-build system, and the predominant method of contract payment is gross price contracting (lump-sum contracting). Examples of Construction Management (CM) and Project Management (PM) contracting have also arisen, but their use remains quite limited.

In addition, electrical power companies have begun to use the VE system, and real estate developers have begun to use direct contracting (in which major real estate developers dispense with general contractors and award contracts directly to specialized contractors).

A7 Exchange rates between the Japanese yen, U.S. dollar, and Australian dollar

(Unit: yen)

Year	1US$	1A$
1999	113.91	73.49
2000	107.77	62.48
2001	121.53	62.88
2002	121.12	68.13
2003	118.70	72.05

Source:Overseas Economic Data, July 2003, edited by Director (for Overseas Economy) under the Director-General for Economic Assessment Policy Analysis, Cabinet Office.

Note: Figures for 2003 are the average from January through June. All others are annual averages.