

The 20th

ASIA CONSTRUCT CONFERENCE

13-14 November 2014

Japan Theme Paper

PREPARED BY



RESEARCH INSTITUTE OF CONSTRUCTION AND ECONOMY

Address NP-Onarimon Building,
25-33,Nishishimbashi 3-chome,
Minato-ku, Tokyo 105-0003,Japan

TEL +81-3-3433-5011

FAX +81-3-3433-5239

URL

<http://www.rice.or.jp/english/index.html>

E-mail info@rice.or.jp

Hiroshi Kobayashi, Executive Fellow
Kodai Hayashida, Researcher

Theme Paper (Japan)

Construction Industry Moving to Secure Human Resources – Recent Policy Initiatives

Hiroshi Kobayashi, Executive Fellow

Kodai Hayashida, Researcher

Research Institute of Construction and Economy (RICE)

1 Overview

The declining trend in Japan's construction investment, which persisted after the peak of FY1992, finally came to an end in 2011, boosted by recovery and reconstruction demand following the Great East Japan Earthquake of March 2011, and shifted to positive since then. Subsequent full-scale implementation of emergency economic measures (FY2012 large-scale supplementary budget) brought about increases in public works, and combined with increases in private sector construction works driven by improved business confidence and employment, the construction industry is currently on the recovering trend.

Meanwhile, the construction industry in Japan, faced with the decline in construction orders and the intensification of competition, has drastically decreased skilled workers. The industry is now faced with rapid aging of employees and a decrease in the youth employees, and the shortage in skilled workers is currently the biggest concern.

If we overlook the current situation, there are concerns that serious problems will arise due to labour shortages, such as infrastructure maintenance and management, quality assurance and disaster response, and so on. Consequently, securing and nurturing a future workforce is recognized as the most urgent issue.

This report looks on the recent trends of construction industry employees¹, and then introduces the outline of the “Projections of Construction Industry Employees”, calculated by RICE² in October 2013. Finally, this report shows recent efforts of the construction industry and the Japanese governments for securing human resources.

¹ Numbers of construction industry employees are derived from the “Population Census” (Ministry of Internal Affairs and Communications (MIC)). The latest statistical materials are from 2010.

² The projection result was introduced by RICE at the “Construction Industry Revitalization Conference” in January 2014. The Chairman of RICE, Mr. Tadao Ogawa, is a member of this conference.

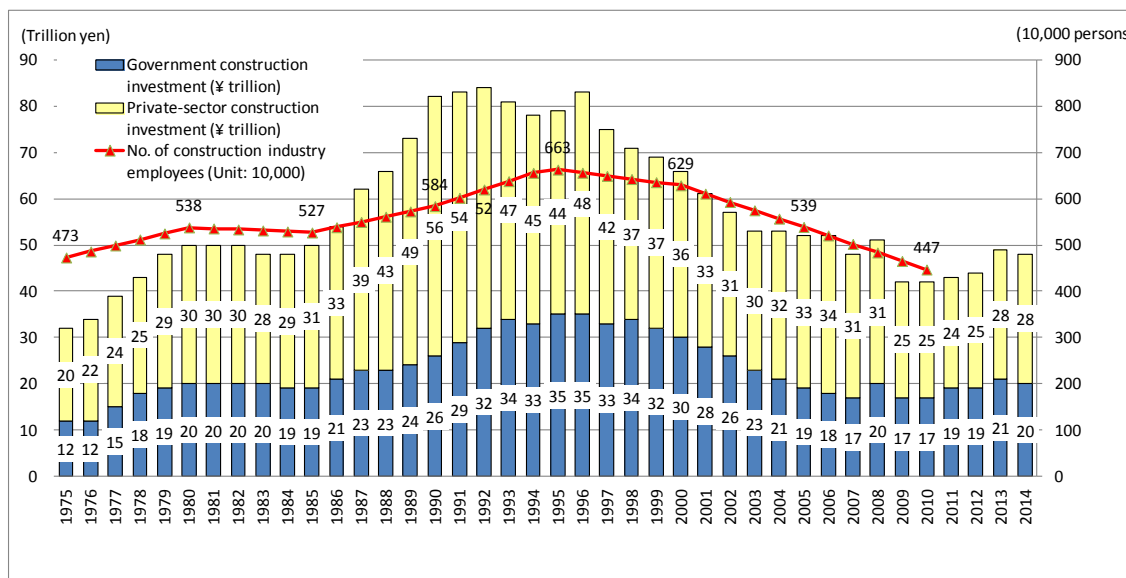
2 Trends in the Construction Industry and Employment

(1) Trends in Construction Investment and Employment

Figure 1 shows the trends in construction investment and construction industry employees. Construction investment continued declining from the peak of ¥84trillion in FY1992, decreased to the half amount of ¥42trillion in FY2010. Since FY2011, reconstruction works of the Great East Japan Earthquake combined with recovery of private construction works pushed up the total amount to ¥49trillion in 2013.

In parallel with the declining trend of construction investment, labour force in the construction industry constantly decreased to 4.5million in 2010, which is less than 32.6% of its historical peak of 1995.

Figure 1 – Trends in Construction Investment and Construction Industry Employees



(Source) Created by this institute based on “Construction Investment Forecasts” (MLIT) and the “Population Census” (MIC)

(Note) The “Population Census” was used for numbers of construction industry employees (statistical figures up to 2010)

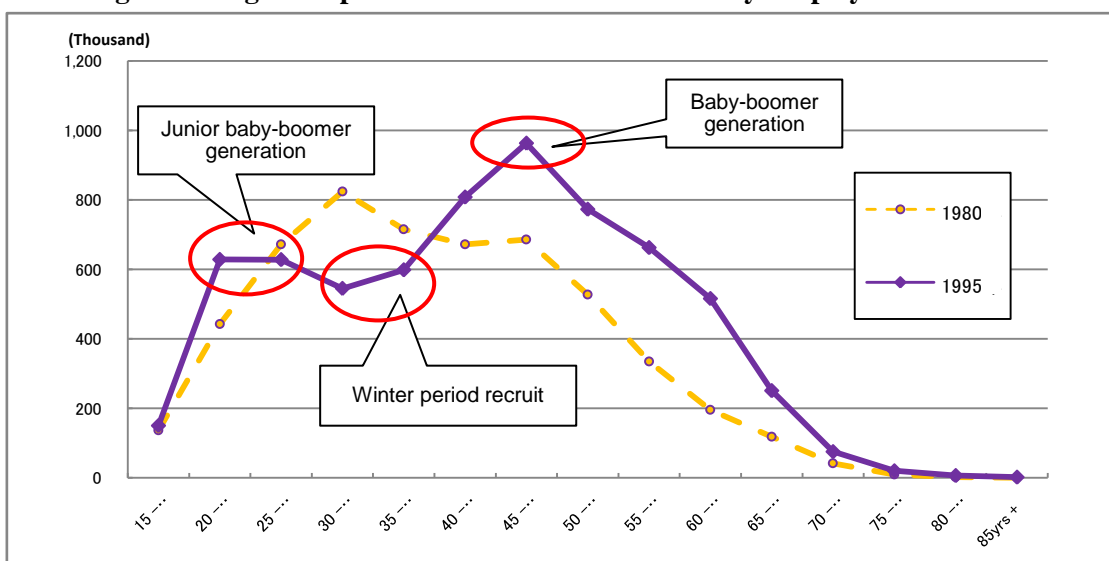
(2) Age Composition of Construction Industry Employees

① Changes between 1980 – 1995

By comparing that population census results between 1980 and 1995, we analyzed the shift in age composition of construction industry employees divided by five-year cohorts (by worker age group). The total number of construction industry employees was 5.38 million in 1980. Then the number increased significantly to 6.63 million in 1995. These changes correspond to the changes in construction investment (see Figure 1).

Figure 2 shows age composition of construction workforce in Japan. An “M” shaped curve can be seen in the cohort composition of 1995 in Figure 2. The peaks for the baby-boomer generation at the time (45-49yrs) and the junior baby-boomer generation (20-29yrs) are distinctly higher, while a trough can be seen for the generation who entered construction industry around 1980. During this period, fiscal austerity and economic recession in the wake of the second oil shock brought stagnant construction investment. This period is called as the “Winter Period of the Construction Industry” in Japan, and the industry trimmed recruits significantly. This is the main factor for shaping the “M” curve of the age composition.

Figure 2 – Age Composition of Construction Industry Employees 1980 - 1995

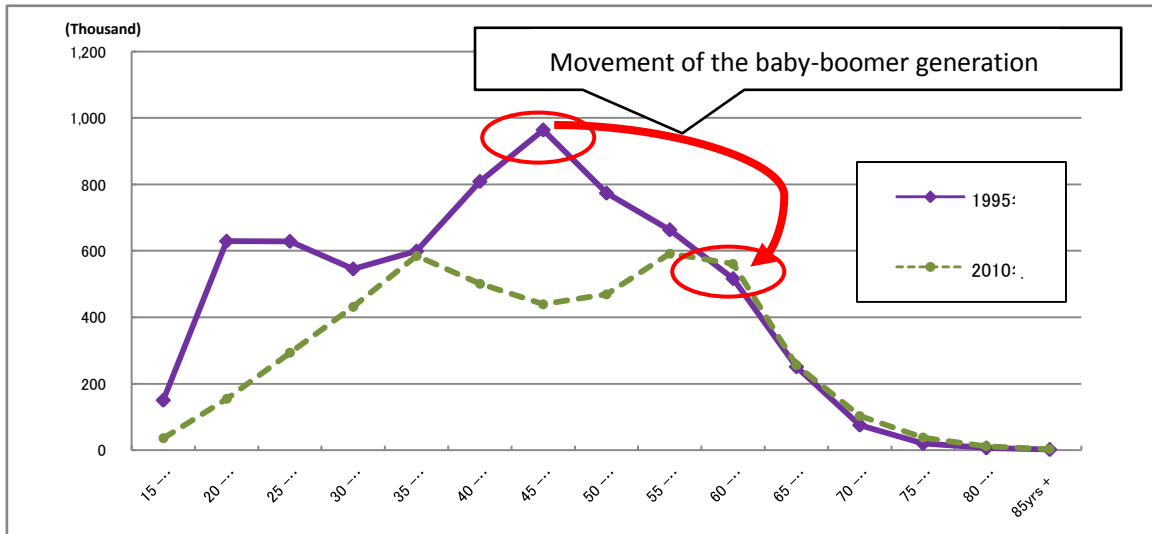


(Source) Created by RICE, based on the “Population Census” (MIC)

② Changes between 1995 – 2010

As seen in Figure 3, from 1995 onwards the “M” shaped curve shifted downwards as well as moved horizontally. This signifies the decrease in labor force for each cohort group during the period. Compared to the peak year of 1995, construction industry employees decreased significantly from 6.63 million to 4.47 million ($\Delta 32.5\%$) by 2010. Construction investment in this period consistently decreased and resulted in the decrease in the total number of construction workers. In addition, the baby-boomer generation which formed the peak of the age composition reached 60yrs of age by 2010. As a result of their retirement, the peak flattened significantly in 2010 although this generation still occupies dominant share.

Figure 3 - Age Composition of Construction Industry Employees 1995 - 2010



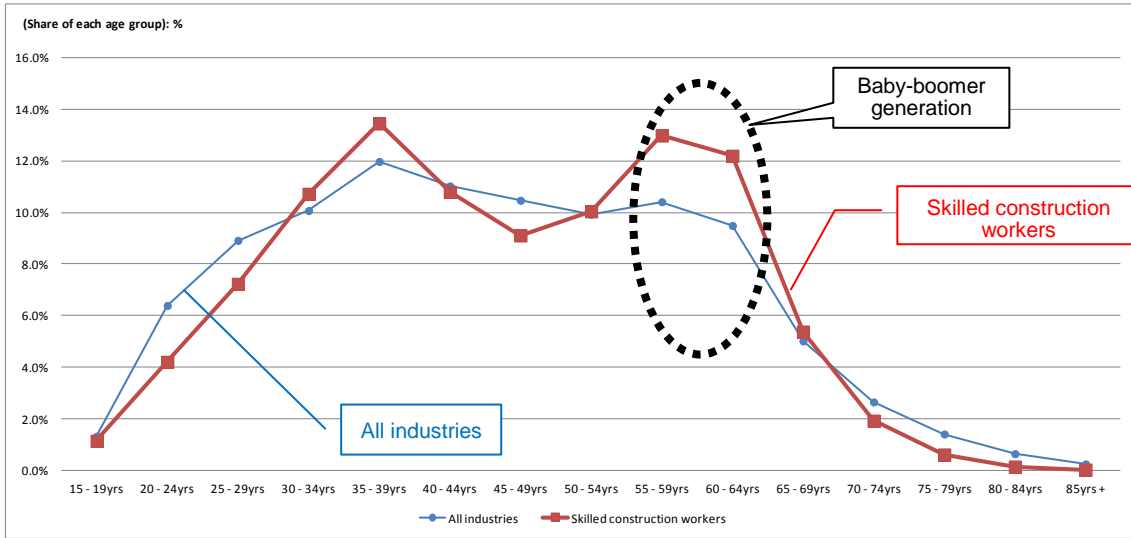
(Source) Created by RICE based on the “Population Census” (MIC)

(3) Rapid Aging of Construction Industry Employees and Decline in Youth Recruits

Figure 4 shows the age composition of the total employees in Japan and that of skilled construction workers in 2010.

The skilled construction worker graph shows a clear “M” shaped curve, and the peak for the baby-boomer generation (55-64yrs) is distinctly higher in comparison to that of the overall industries. It is clear that the baby-boomer generation still forms the mainstay of the construction industry workforce. However, they have already reached their 60yrs and eventually retire over the next few years, thus there are concerns that the shrinkage of construction workforce will accelerate in the coming years.

Figure 4 – Age Composition of Total Employees and Skilled Construction Workers (2010)

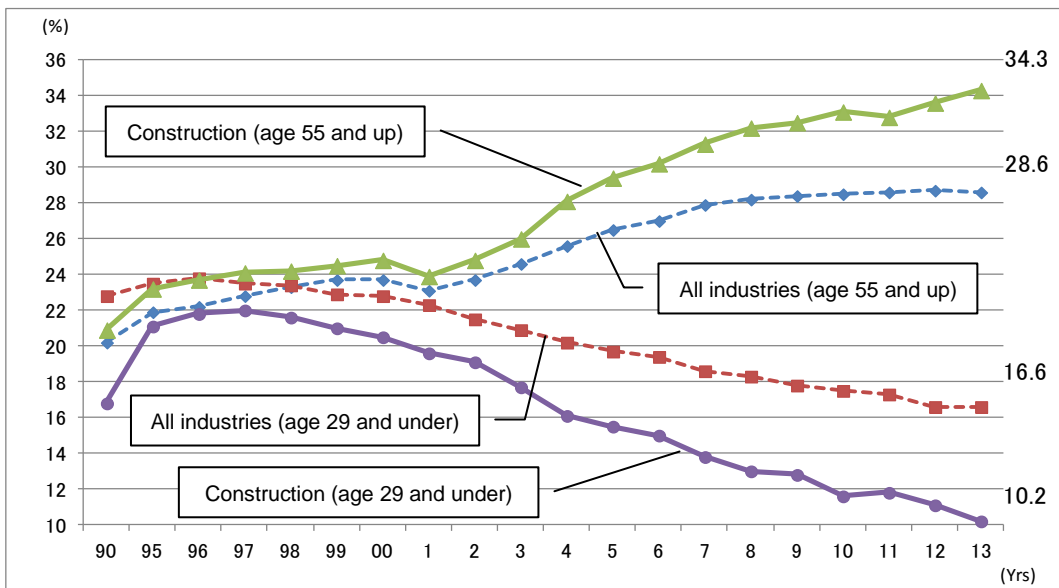


(Source) Created by RICE, based on the “Population Census” (MIC)

Figure 5 shows the trend of ratios for youth employees and senior employees in the past 20 years. In 2013, the share of employees 55yrs and over for all industries is 28.6%, while that of the construction industry is 34.3%, showing the construction industry depends more on senior workforce.

When looking at the percentages of employees 29yrs and under as of 2013, the figure for all industries is 16.6% while that of the construction industry is 10.2%. The gap becomes larger as year goes by, indicating that the decrease in youth workers is particularly pronounced in the construction industry.

Figure 5 – Ratios of Workers Aged 29yrs and under/55yrs and over

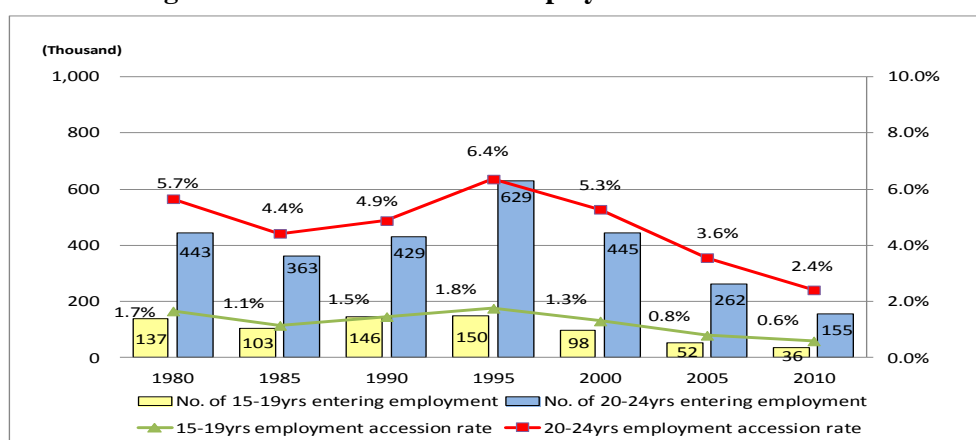


(Source) “Labor Force Survey” (MIC)

In recent years, construction industry is faced with sharp decline in youth recruits. Figure 6 shows recruits accession rate for construction sector (Number of youth population entered the construction industry ÷ Total population of the same age cohort).

The figure shows that accession rate has significantly declined since its peak of 1995. In 1995, 6.4% of the 20-24yrs population entered construction industry, but in 2010 only 2.4% of the youth did, a decline of almost 60%. The demographic structures of Japan shows an overall reduction in the youth population due to low birthrate and aging population³. Combined with this, the construction industry will be faced with further decline in youth employment, unless this trend is reversed.

Figure 6 – Number of Youth Employment and Accession Rate



(Source) Created by RICE, based on the “Population Census” (MIC)

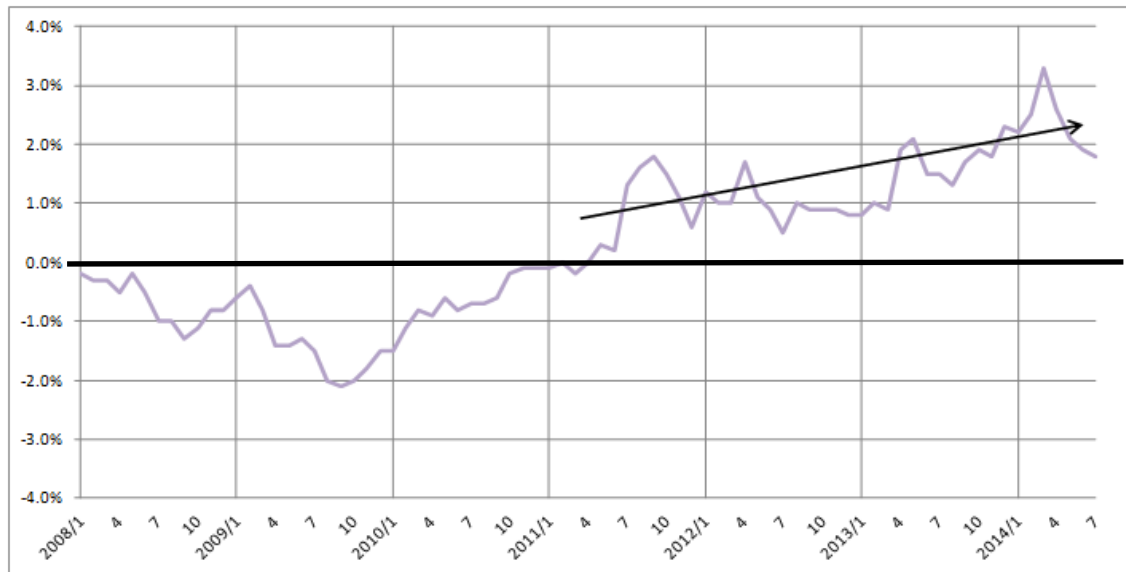
(4) Skilled Construction Worker Shortage

As previously mentioned, since its peak in 1992, construction investment in Japan fell to about half by 2010. During this period, skilled worker employed in the construction industry decreased significantly. However, after the Great East Japan Earthquake, construction investment was on recovery trend and in recent years it reached around ¥50trillion, 20% increase from FY2010. This market expansion resulted in workforce gap in the industry, and the shortage of skilled construction workers has become a serious issue.

Figure 7 shows the shortage rate of skilled construction workers from 2008 up to the present day. There is a watershed in spring 2011. Before that the survey shows surplus in labour market of the construction industry, but just after the Great East Japan Earthquake in March 2011, the trend turned upward (which means labour shortage), and since then the shortage of skilled construction workers is intensified.

³ According to the “Population Census”, youth population (15-24yrs) was 9.43 million in 1995. This figure had decreased to 6.38 million by 2010 (Δ32.3%).

Figure 7 – Shortage Ratio of Skilled Construction Workers



(Source) Created by RICE, based on the “Construction Labor Supply and Demand Survey (8 Job Types)” (MLIT)

3 RICE Projections of Construction Industry Employees

Construction industry employees in Japan are getting older every year, and in the near future, after the complete retirement of baby-boomer generation, the industry may suffer more serious skilled worker shrinkage.

This chapter shows the outline of our projection on construction industry employees based on cohort analysis method.

(1) Cohort Analysis Method

In simple terms, a cohort analysis is used in a projection, by assuming the rate of change of population cohorts during certain two periods continue in future. Figure 8 shows an example of the cohort analysis. First, we calculate a change ratio of a certain cohort. For example, the 645 thousand employees aged 30-34yrs in 2005 shifted to 35-39yrs cohort group by 2010, while the number of employees decreased to 585 thousand, thus we get the rate of change as $\Delta 9.3\%$. We assume subsequent cohorts will decrease at the same ratio when they reach the same age stage. Based on the assumption, we aggregate the result of each age cohort and get the projection results.

Figure 8 – Cohort Analysis Example

	15 - 19yrs	20 - 24yrs	25 - 29yrs	30 - 34yrs	35 - 39yrs	40 - 44yrs
2 0 0 5	52	262	468	645	565	501
2 0 1 0	36	155	293	432	585	501

(2) Results of Projection

① Overview of the Projection

Figure 9 shows the aggregated results of estimates on construction industry employees, based on the assumption that rates of change from 2005 – 2010 will continue into the future. The results of estimates show that the 5,392 thousand workers in 2005 will decrease to 2,405 thousand by 2025 ($\Delta 55.4\%$ from 2005), a shocking result indicating a decrease by half.

Figure 9 – Results of Projection using 2005-2010 Rates of Change

Year	2005	2010	2015	2020	2025
No. of construction industry employees (1,000)	5,392	4,475	3,639	2,945	2,405
Rate of decrease (2005 comparison)	—	$\Delta 17.0\%$	$\Delta 32.5\%$	$\Delta 45.4\%$	$\Delta 55.4\%$

(Note 1) Figures for 2005 and 2010 are actual figures from the population census. Figures in the grey columns are estimates from the projection.

② Correction of Scenarios

The above-mentioned projection was calibrated on the cohort charge rate of 2005-2010 periods, which is influenced by serious economic downturn. The 2005-2010 period experienced large cuts in investment affected by the overall economic pullback of the “Lehman shock”, and this peculiar background is considered to be a major causal factor from the big decline in the 2005–2010 ($\Delta 17.0\%$).

However, after the bottom of 2010, private and public investment made a significant recovery (Figure 1). In addition, a variety of measures were hammered out by the MLIT, the Ministry of Health Labour and Welfare, and also the construction industry showed concerted efforts to improve worker conditions and recruits promotion. Also, with the decision for Tokyo to host the 2020 Summer Olympics and Paralympics, a long-term perspective is now positive for the construction industry.

In view of these circumstances, work force projection based on the rate of change for the 2005-2010 periods should be revised. As shown in Figure 10, other scenarios are presented, with some positive corrections to the rates of change.

Figure 10 – Positive Corrections and Revised Scenarios

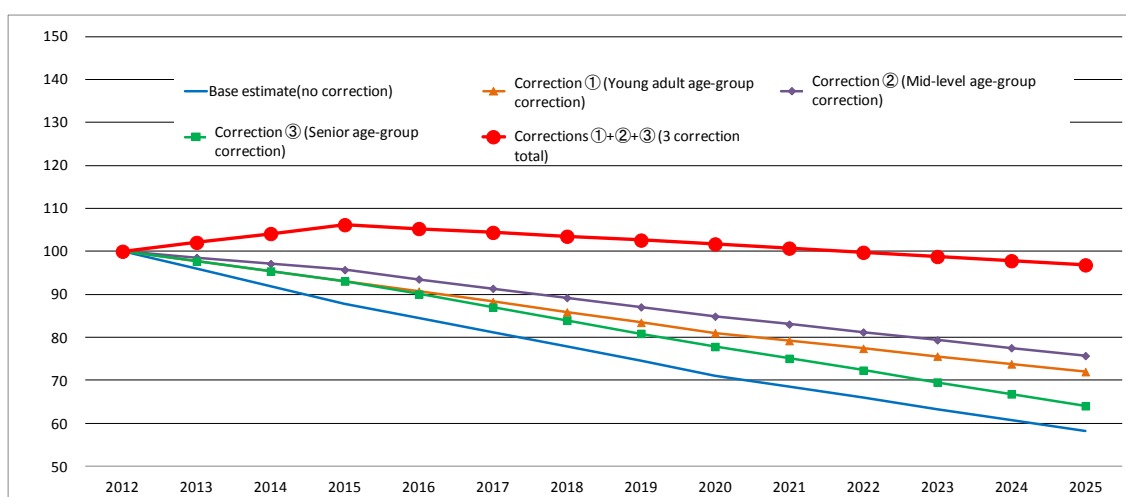
① Young adult age group correction	Recovery of youth accession (15–24yrs) rate to year 2000 levels.
② Mid-level age group remain in the sector	Reduction of mid-level age group employees (25–59yrs) stops, and they will remain in the industry.
③ Senior age group postpone retirement	Senior workers (60–69yrs) postpone retirement, resulting in a 50% reduction in the number of retirees during this age period .
Correction ①+②+③	Total of all assumed corrections for ① – ③

(3) Result of Corrected Projections

In Figure 11, revised projection results of construction industry employees are presented, as the Index values of base year 2012⁴. In comparison to the base estimate (no correction) which assumes a continued rate of decrease equivalent to that of 2005-2010, the corrected projections shift upward in the order of ,

③senior age-group < ①young age-group < ②mid-level age-group < total of three corrections.

Figure 11 – Employee Projections on Different Scenarios (2012=100)



⁴ The number of construction industry employees for 2012 was calculated through equal interval interpolation between the figure of 4.47 million given in the 2010 population census and the figure of 3.64 million calculated under future estimates for 2015.

Figure 12 shows the projection in 2025 and comparison with base year of 2012. The results show that even when all three corrections are achieved (optimistic correction), the total employees will still be smaller by 131 thousand ($\Delta 3.2\%$) in comparison to 2012 levels, indicating an unavoidable decrease in the number of employees.

Figure 12 – Projection Results on 2025 and Comparison with 2012

Year/Case	No. of construction industry employees (1,000)	2012 comparison (Change)	2012 comparison (Rate of change)
2012 (Base year)	4,140	—	—
2025 Base estimate (no corrections)	2,405	$\Delta 1,735$	$\Delta 41.9\%$
2025 ① (Young adult age-group correction)	2,980	$\Delta 1,160$	$\Delta 28.0\%$
2025 ② (Mid-level age-group correction)	3,135	$\Delta 1,005$	$\Delta 24.3\%$
2025 ③ (Senior age-group correction)	2,652	$\Delta 1,488$	$\Delta 35.9\%$
2025 ①+②+③ (3 correction total)	4,009	$\Delta 131$	$\Delta 3.2\%$

(Note) In principle, calculated figures are rounded off, so fractional values will not match totals.

We interpreted the projection results as follows;

“Projections show a decrease in the number of employees even when such optimistic positive corrections are made, implying that the manpower shortage in the construction industry is a long-term structural issue and not a temporary phenomenon⁵”.

The projections above mentioned highlighted the urgent need for the industry to take actions for securing and nurturing human resources in order that the industry becomes sustainable in the future.

4 Recent Movements to Secure Human Resources

(1) Construction Industry Revitalization Conference

In January 2014, Construction Industry Revitalization Conference was established from the members of the two government ministries (Ministry of Land, Infrastructure, Transport and Tourism, Ministry of Health Labour and Welfare), industry organizations, educational institutes and research institutes, where the chairman of RICE participated as a conference member. The aim of the conference was to address important labour issues including the enhancement of working

⁵ For example, the assumption that youth accession rates will suddenly recover more than double to the level in 2000 is optimistic enough (2010 rate 2.4% → 2000 rate 5.3%).

conditions, and undertook a series of discussions on short-term and medium/long-term policy measures.

In June 2014, an Interim Report was published after six months of intensive discussions. The Interim Report set forth about 80 specific measures to secure and nurture workers for the construction industry. These are the main points of their recommendations;

- ① Improvements in the working conditions of skilled workers
- ② Pride (promotion of young adults)
- ③ Working environment that offers a view of future prospects
- ④ Enhanced vocational education and training
- ⑤ Greater involvement of women workers
- ⑥ Labor-saving innovations and sophistication of construction production systems.

(2) Policy Measures for Securing Human Resources

① Improvements in Skilled Workers' Benefits

A. Increase in workers payment for public works

- Significant improvements in standard skilled worker wages for public works in April 2013, for the first time in 16 years, followed by additional rise in February 2014.
April 2013: +15.1%
February 2014: +7.1%
- Request from the MLIT to major construction industry organizations for paying proper levels of wages and allowances toward skilled workers.
- Utilization and promotion of “sliding price clauses” to accommodate prompt rises in labor costs after contracts are entered.

B. Enrollment in social insurance and other social benefits

- Necessary statutory social welfare costs were reflected into wages of the contractors for public works.
- From September 2013, submission of estimate sheets from sub-contractors to prime contractors was formalized, showing clear breakdowns of statutory welfare expenses based on the standardized cost estimate sheets of each special sub-contractors organization.
- From August 2014, the MLIT required prime contractors of public works to limit sub-contract orders toward companies with enrollment records of social insurance.

② Women Workers Participation

- In order to promote labour participation of women across the board, Japanese Cabinet adopted overall initiatives for “Promoting Active Participation by Women” in June 2013, under the “Japan Revitalization Strategy.”
- In August 2014, the MLIT and five major construction industry organizations drafted the

“Action Plan to Promote Greater Active Participation of Women in the Construction Industry”, and announced their plan to double the number of women engineers and skilled workers within five years.

These are the main points of the action plan for woman workers participation in the construction industry.

- Welcoming further active participation of women throughout the construction industry.
- Setting of numerical targets by the construction industry and companies and drafting of behavioral guidelines, etc.
- Statement of construction industry appeal and fulfilment through collaboration in the classrooms (Elementary, junior high, high schools and universities, etc).
- Preparation of women friendly working environments, such as separate lavatories and locker rooms, etc.
- Preparation of women friendly working environments in terms of working systems such as reduction of long working hours, taking planned leave, etc.
- Active introduction/utilization of systems that allow work and family life to stand together.
- Presentation of model construction works in which women workers can take an active role, creation and dissemination of information on good practices of construction sites, promotion of construction teams with women in leading roles.
- Implementation of vocational training in which women can easily participate, and rewards for active women workers.
- Dissemination of information through a specific portal site.
- Support for the activities of local networks that support the active participation of women.

③ Utilization of Overseas Human Resources

- The “Emergency Measures Related to the Utilization of Overseas Human Resources in the Field of Construction” was approved by the Cabinet in April 2014. As an emergency and time-limited measure for the temporary increase in construction demand related to the 2020 Tokyo Olympic and Paralympic Games, the utilization of industry-ready overseas human resources is being promoted.
- Extension of stay period from 3 years to 5 years (temporarily up to 2020).
- Past trainees who have completed training programs in Japan may re-enter Japan for construction works under employment contracts (temporarily up to 2020).

5 Technical Innovations and Productivity Improvement in the Project Delivery

Apart from the efforts to secure and nurture the next generation of technicians and skilled workers, the construction industry in Japan has undertaken a variety of approaches for technical innovation such as the adoption of TQC (Total Quality Control) and VE (Value Engineering), the development of new technologies and construction methods.

In this section, we will introduce some of the innovative technologies recently developed by Japan's construction companies in order to meet labour shortage issues.

(1)Material-Transportation Robots (Obayashi Corporation)

The Obayashi Corporation utilized material-transportation robots on the construction site of the skyscraper “Toranomon Hills”, which recently opened in June 2014. This was the first attempt in the Japanese construction industry to use robots on actual construction sites. The use of the robot allowed Obayashi to reduce the number of personnel needed for material transportation half, from four to two persons per item. Obayashi state that they could reduce the cost of on-site transportation works about 30% compared to conventional ones.

Obayashi is planning to expand the use of the material-transportation robots on other construction sites such as factories and commercial building, and are planning to apply this innovative delivery method at 10-20 sites a year.

Figure 13 – Material-Transportation Robot



(Source) Obayashi Corporation

(2)Un-manned construction system (Taisei Corporation)

In July 2014, Taisei Corporation conducted verification tests on their next-generation un-manned construction system, in which the machinery itself makes judgments and proceeds with work accordingly. In this test, an “autonomous method” was applied in which heavy machinery equipped with sensors make judgments of the site condition automatically and process necessary jobs. This system does not require constant remote operation or any supporting machinery.

In the verification test, an 11-ton vibrating roller was used. Parameters were entered into a PC such as the range of compaction, the number of compaction times and overlap width, and the roller machine entered into operations accordingly, The heavy machinery commenced roller-compaction work under this “autonomous method”, while using its own sensors to maintain an awareness of position, attitude, speed and surrounding conditions, etc. Afterwards, the machinery returned to a pre-designated location, sent work completion notification to the operator and then switched itself off. Taisei announced that the effective functioning of this new technology had been confirmed.

Based on this verification test, Taisei aims to apply this technology to severe construction sites such as earthquake recovery/reconstruction sites, and other sites as well through the further enhancement of the technology.

Figure 14 – Verification Tests of un-manned Machinery



(Source) Taisei Corporation website

6 Conclusions

Construction industry in Japan has endured decreasing investment demand for almost two decades, and intensifying competition with deterioration in workers' condition, aging of employees and sharp decline in the youth enrollment. If this trend continues, structural deterioration of the construction industry is inevitable.

In the “projection of construction industry employees” implemented by RICE, striking shrinkage of workforce was forecast by 2025, even when some optimistic corrections were added. It is feared that further shrinkage of the construction workforce might cause inadequate maintenance of regional infrastructure, poor disaster response and so on. Revitalization of the construction industry by securing and nurturing a future workforce is therefore the most important issue.

In January 2014, the “Construction Industry Revitalization Conference” was established, and a unified public-private approach was discussed to save the construction industry. In June 2014, an Interim Report set out a series of policy measures to secure and nurture workers, such as enhanced treatment of skilled workers, enrollment of skilled women workers, implementation of more efficient production systems, and the enhancement of vocational training facilities.

Recent media news frequently talk on “manpower shortages” in a variety of industries such as service industries, retail sectors and elderly care sector, apart from the construction industry. When looking at the demographic movement in Japan, further shrinkage of labour force is unavoidable, and even more intense competition to secure human resources is expected among various sectors.

Construction industry is still influenced by the trauma of recent economic downturn, and top managers still express their concerns that they “cannot invest in human resources, because after the reconstruction works from the Great East Japan Earthquake and the special demand generated by the 2020 Tokyo Olympic and Paralympics Games, it is likely that there will once again be a surplus of construction industry employees.” The RICE projection shows that the labour force shrinkage of construction sector is demographically structural, and it is highly likely that skilled worker shortage will be worse if no serious actions are taken. Steady efforts to secure and nurture human resources are urgently needed .

Recent efforts by the construction industry and governments to secure workers for the medium and long term through a unified public-private approach will be rewarded in the future. We strongly hope that the construction industry will restore respect among the youth, and regain its strength.

Construction Industry Moving to Secure Human Resources —Recent Policy Initiatives

JAPAN



Researcher , Kodai Hayashida
Research Institute of Construction and Economy

Table of Contents

1. Trends in the Construction Industry and Employment

2. RICE Projections of Construction Industry Employees

3. Recent Movements to Secure Human Resources

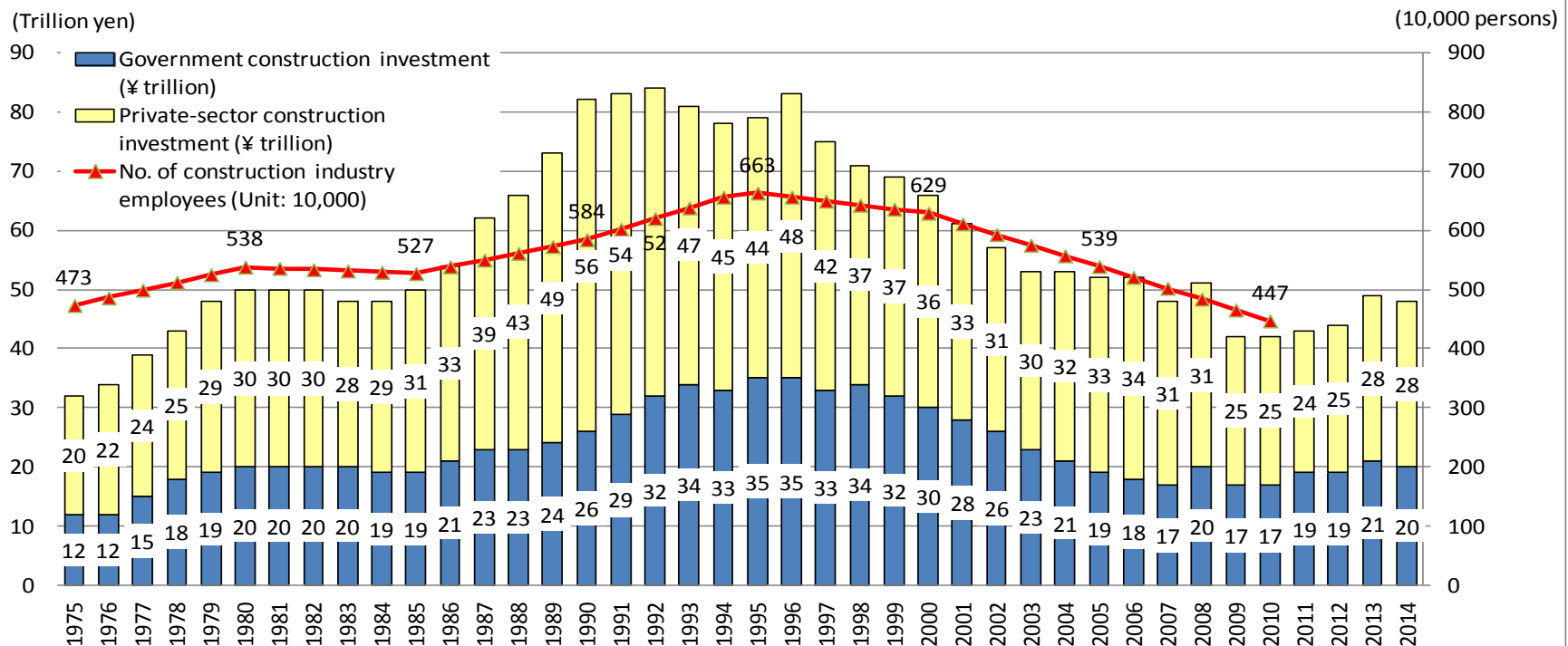
4. Labour Saving Innovations

1 . Trends in the Construction Industry and Employment

1 - 1 Trends in Construction Investment and Employment

Construction employment

6.6million(1995) ⇒ 4.5million(2010) Δ32.6%

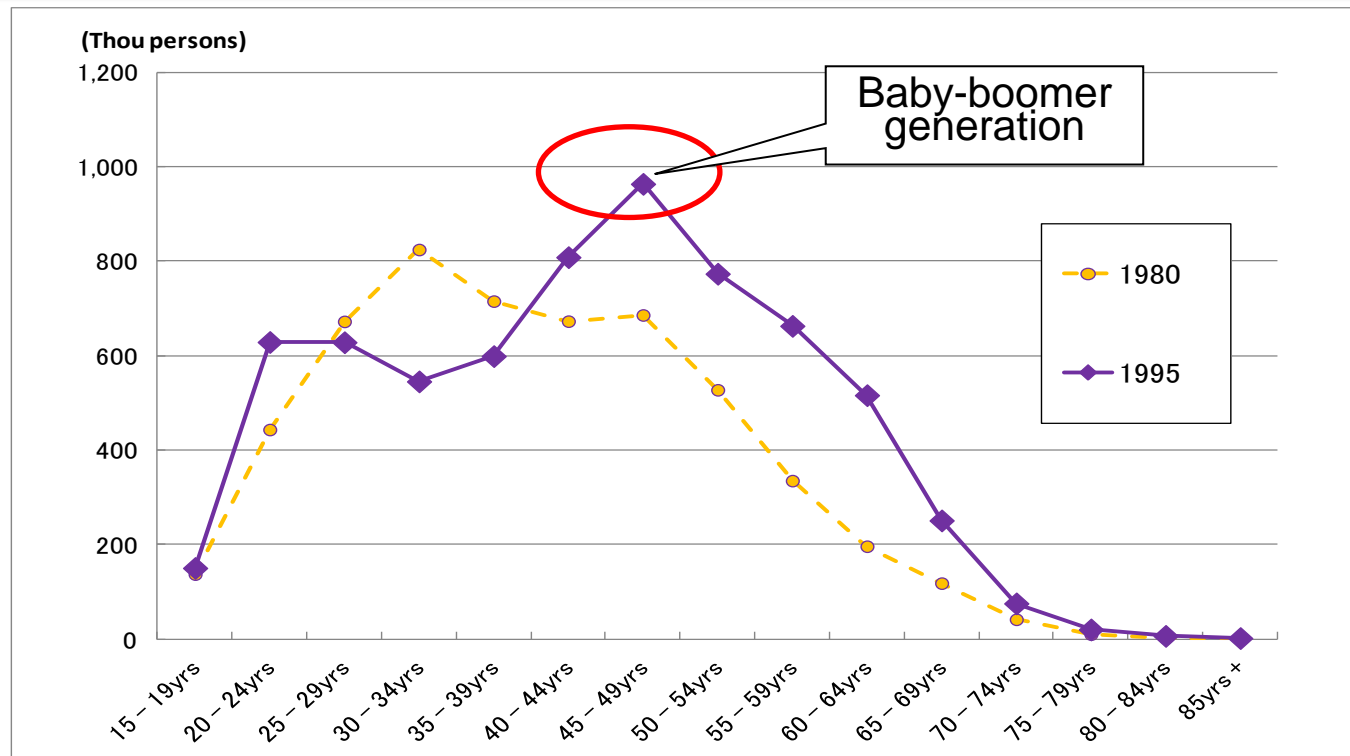


(Source) Japan Meteorological Agency

1 - 2 Age Composition of Construction Industry Employees (1980 – 1995)

1980 – 1995

- Aging of total employment in construction industry.
- Two peaks of age cohorts : baby-boomers and juniors.



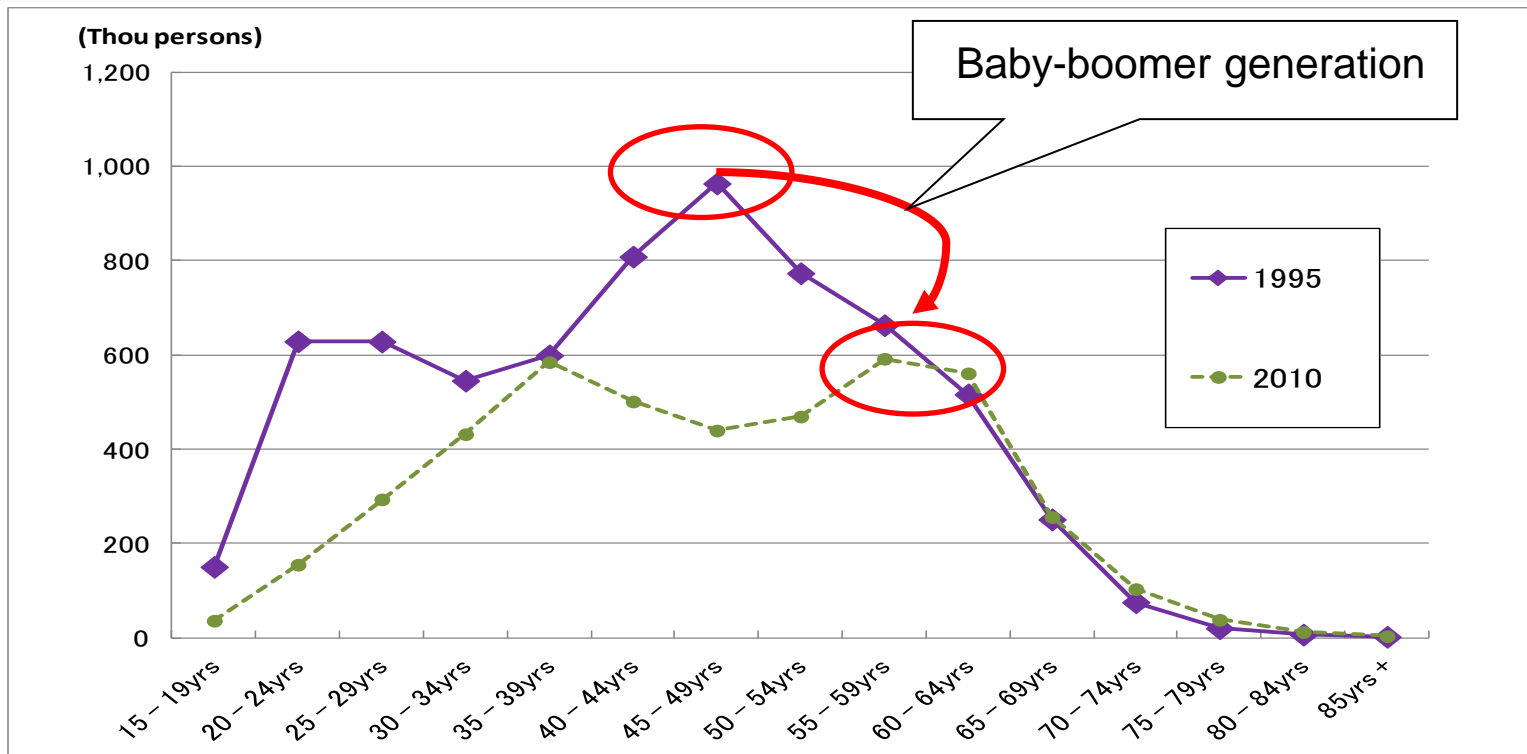
1 - 3 Age Composition of Construction Industry Employees (1995 - 2010)

1995 - 2010

- Retirement of baby-boomers
- Low accession of young workers



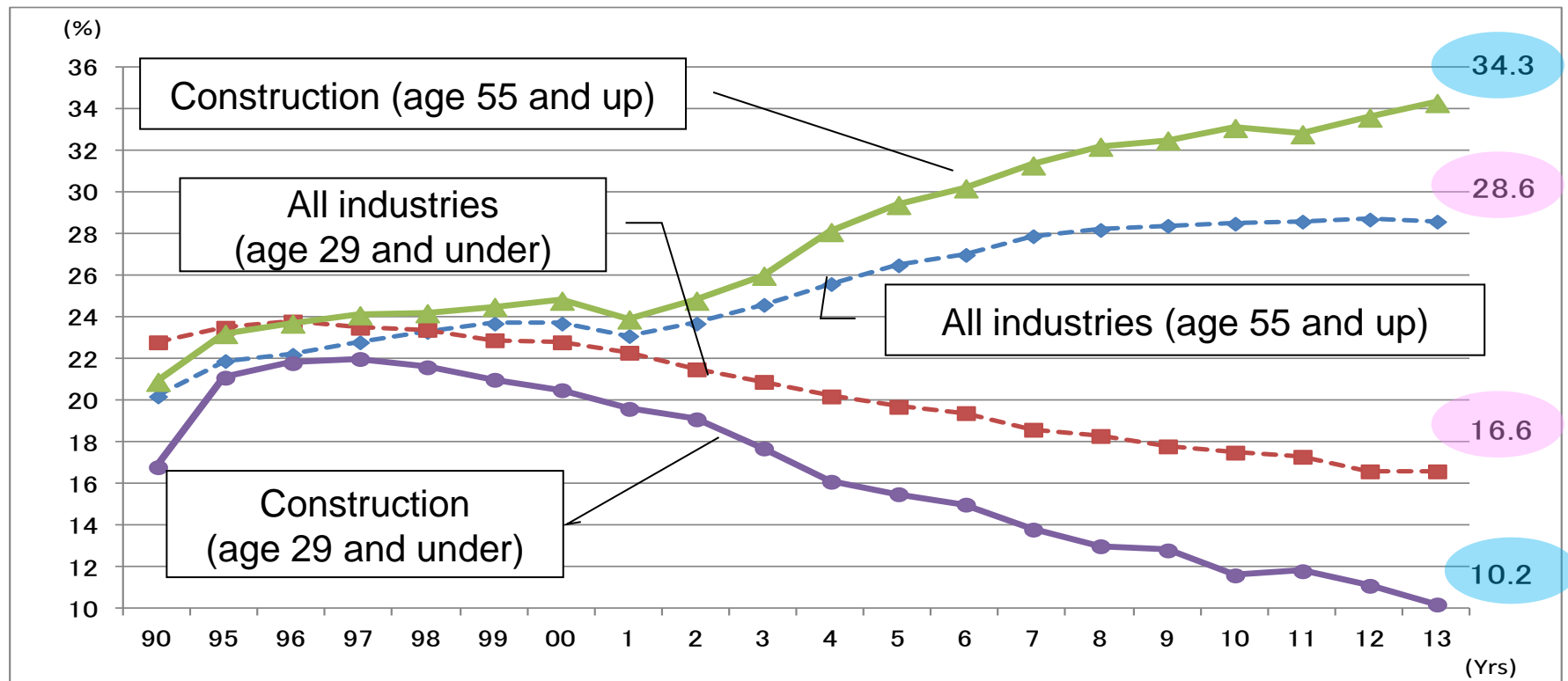
workforce shrinkage



1 - 4 Ratios of Workers Aged 29yrs and under/55yrs and over

- Rapid aging : 34.3% are 55+ yrs
- Fewer youth : 10.2% are 29- yrs

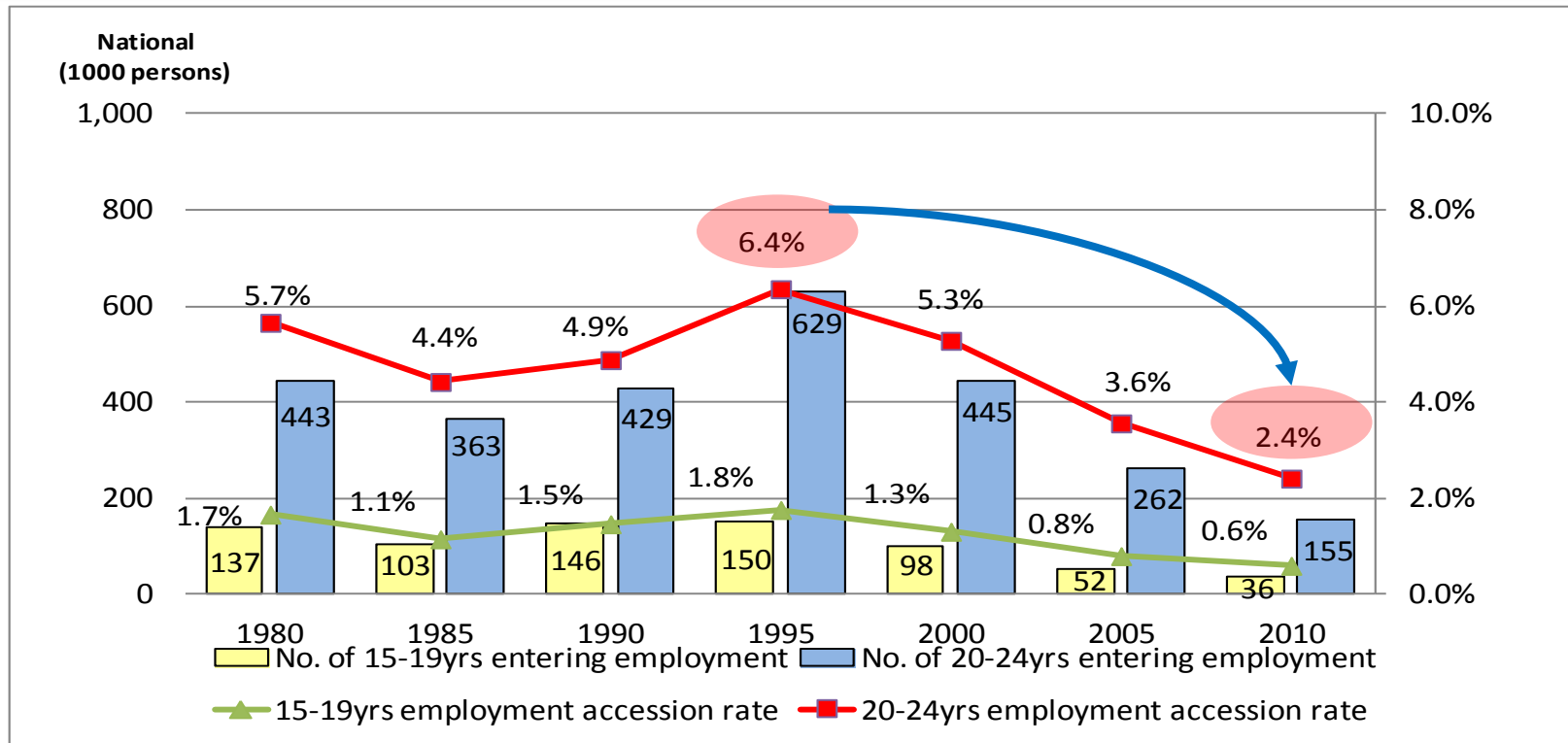
(2013)



1 - 5 Number of Youth Employment and Accession Rate

Failure to attract younger generation

accession rate (20~24yrs) : 6.4% (1995) ⇒ 2.4% (2010)



2. RICE Projections of Construction Industry Employees

2 - 1 Cohort Analysis Method

(Thousand)

F Y	15 - 19yrs	20 - 24yrs	25 - 29yrs	30 - 34yrs	35 - 39yrs	40 - 44yrs
2 0 0 5	52	262	468	645	565	501
2 0 1 0	36	155	293	432	585	501



rate of change as $\Delta 9.3\%$

2 - 2 Results of the Baseline Projection

Year			(Projection)		
	2005	2010	2015	2020	2025
No. of construction industry employees (1,000)	5,392	4,475	3,639	2,945	2,405
Rate of decrease (2005 comparison)	—	△17.0%	△32.5%	△45.4%	△55.4%

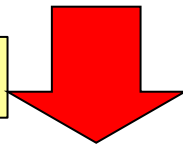
(Thousand)

2 - 3 Corrections to the Baseline Scenario

Reasons for Correction

- 2005-2010 : “Lehman shock” period.
Construction investment plunged ⇒ **sharp decline in employees ($\Delta 17.0\%$)**
- 2010— : Recovery of investment
+ Positive prospect for 2020 Tokyo Olympic

Positive Corrections to Parameters

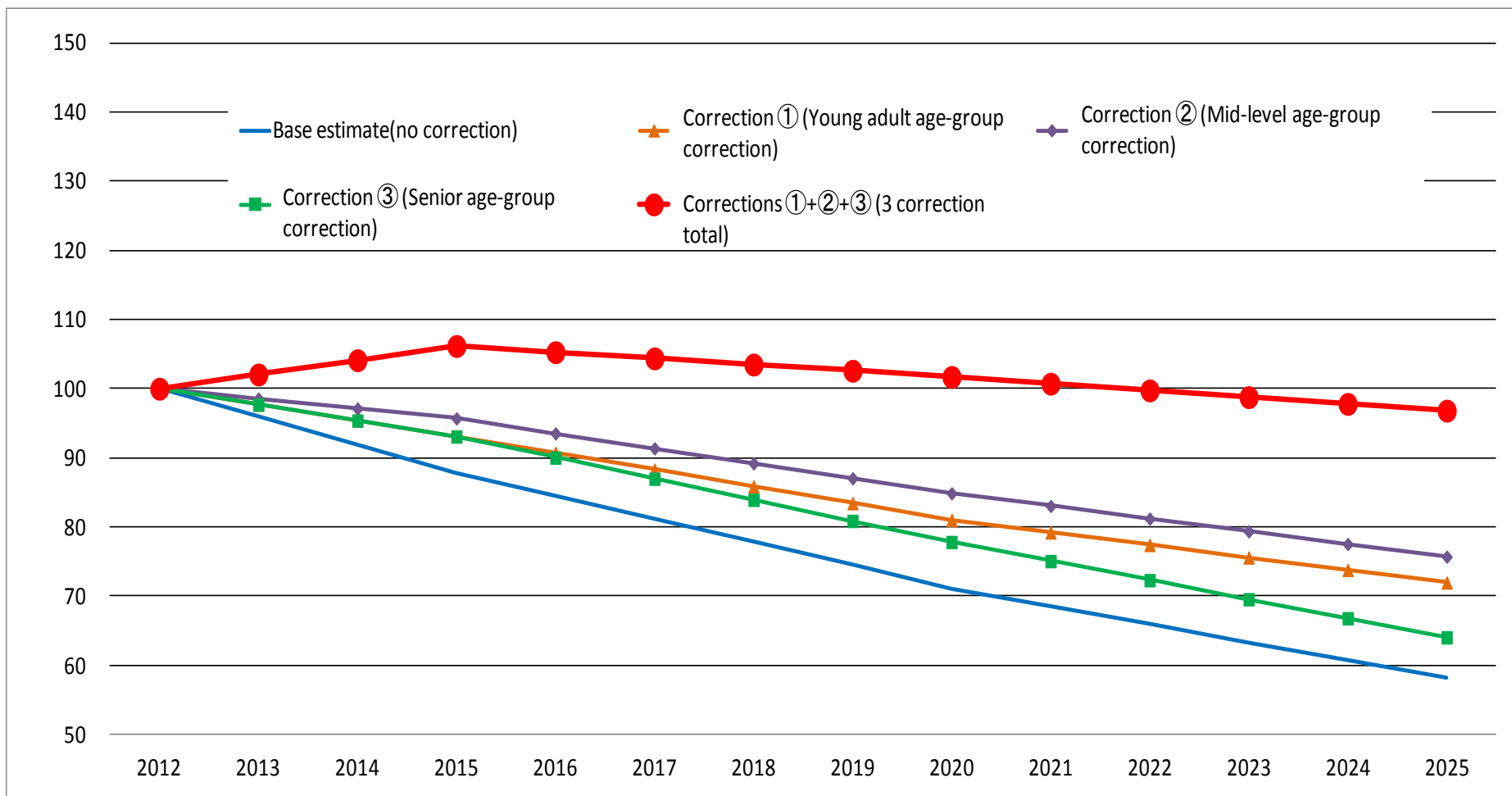


- Youth Accession Rate
- Job Retention Rate
- Retirement Age

2 - 4 Positive Corrections and Revised Scenarios

	Corrections for rate of change
① Youth Accession Rate	Recovery of youth accession(15-24yrs)rate to year 2000 levels.
② Job Retention Rate	Mid-level age group employees(25-59yrs) will remain in the industry during their carrier.
③ Retirement Age	Seniors (60-69yrs) postpone retirement, resulting in a 50% reduction in the number of retirees during this age period.
Correction ①+②+③	Total of all assumed corrections for ① - ③

2 - 5 Employee Projections on Different Scenarios (2012=100)



2 - 6 Projection Results on 2025 and Comparison with 2012

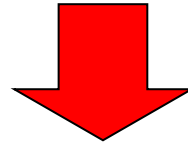
Year/Case	No. of construction industry employees (1,000)	2012 comparison (1,000)	2012 comparison (Rate of change)
2012 (Base year)	4,140	—	—
2025 Base estimate (no corrections)	2,405	△1,735	△41.9%
2025 ① (Young adult age-group correction)	2,980	△1,160	△28.0%
2025 ② (Mid-level age-group correction)	3,135	△1,005	△24.3%
2025 ③ (Senior age-group correction)	2,652	△1,488	△35.9%
2025 ①+②+③ (3 correction total)	4,009	△131	△3.2%

3. Recent Movements to Secure Human Resources

3 - 1 Construction Industry Revitalization Conference

Construction Industry Revitalization Conference

Policy Recommendations(2014.6)



- ① Improvements in the working conditions of skilled workers.
- ② Pride (promotion of young adults).
- ③ Working environment that offers a view of future prospects.
- ④ Enhanced vocational education and training.
- ⑤ Greater involvement of women workers.
- ⑥ Labor-saving innovations and sophistication of construction production systems.

3 - 2 Policy Measures for Securing Human Resources

① Improvements in Skilled Workers' Benefits

- Increase in workers payment for public works.(Feb 2014)
- Enrollment in social insurance and other social benefits.(Aug 2014)

② Women Workers Participation

- “Action Plan to Promote Greater Active Participation of Women in the Construction Industry”.(Aug 2014)

③ Utilization of Overseas Human Resources

- “Emergency Measures Related to the Utilization of Overseas Human Resources in the Field of Construction” approved by the Cabinet.
(Apr 2014)

4. Labour Saving Innovations

4 - 1 Material-Transportation Robots (Obayashi Corporation)



4 - 2 Un-manned construction system (Taisei Corporation)



Conclusions

- Construction industry in Japan has endured decreasing investment demand for almost two decades, which resulted in deterioration in workers' condition, aging of employees and sharp decline in the youth enrollment. If this trend continues, structural deterioration of the construction industry is inevitable.
- In the “projection of construction industry employees” implemented by RICE, striking shrinkage of workforce was forecast by 2025, even when some optimistic corrections were added.
- Steady efforts to secure and nurture human resources are urgently needed and Japanese government and private sector are implementing holistic policy measures to tackle this problem.

Thank you for your attention !!