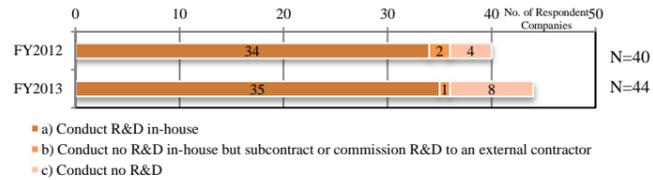


It is a unique feature of the Japanese construction industry in the world that Japanese general contractors, including the members of the Japan Federation of Construction Contractors, not only have the design division but also conduct R&D and possess sophisticated technologies. This survey has been implemented since FY2012, aiming to "improve the image of the construction industry by conducting survey on R&D activities of member companies and compiling the results in an easy-to-understand format for the general public to be widely informed and have some interest." This summary report is the compilation of FY2013 result.

**A. Basic Corporate Information**

Basic information about each member company was given in the reply. The result shows that of 44 companies responded, 82% (36 companies) conduct R&D.



R&D Implementation

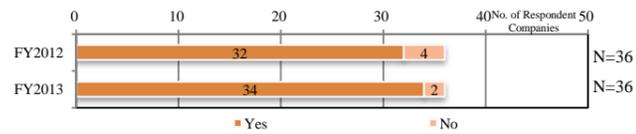
While the number of respondent companies increased by 4 from FY2012, they do not represent simple additions. There were companies which responded last year but not this year, and those responded for the first time; the difference between these is 4 companies. Based on this result, companies conducting R&D were examined under B onward.

[List of Items]

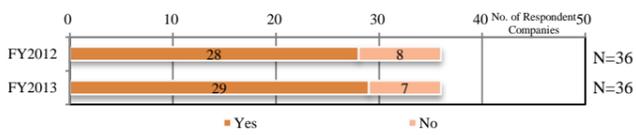
- A-1) No. of employees
- A-2) Sales volume
- A-3) Implementation of R&D

**B. Organization for R&D**

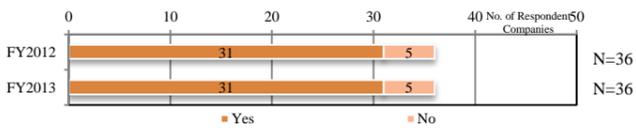
Among companies conducting R&D, 34 companies have a "dedicated R&D division," 29 have an experiment facility, 31 have a "division responsible for intellectual property (IP) management," and 26 have a "dedicated division for planning/management."



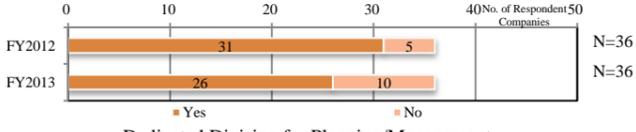
Dedicated Division for R&D



Research Institute with the Experiment Facility



Division Responsible for IP Management



Dedicated Division for Planning/Management

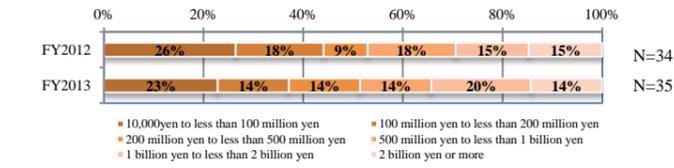
The newly added survey question of the "Role of the division for planning/management" revealed that in all 26 companies, which replied to have a dedicated division, it conducts collection and provision of technological and social information; and moreover, it plays a role of deciding the R&D policy, selecting the theme, and managing the budget in many companies.

[List of Items]

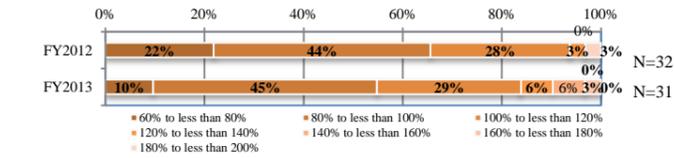
- B-1) Dedicated division for planning/management of R&D
- B-2) No. of researchers
- B-3) Experiment facilities
- B-4) Division responsible for IP management
- B-5) Dedicated division for planning/management of R&D (excl. IP divisions)
- B-5-a) Role of division for planning/management
- B-5-b) No. of employees for the above role

**C. R&D Expense**

As for R&D expense, about 75% of the companies spend 100 million yen or more, and about 34% 1 billion yen or more. Moreover, the ratio of total R&D expense to the total sales volume by the respondent companies is 0.58%. In comparison to that in the previous fiscal year, R&D expense decreased in 55% of the companies, but was on an increasing trend as a whole.

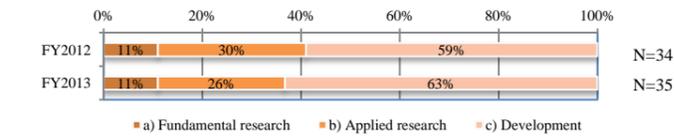


**R&D Expense Incurred for the Entire Company (Expense Publicly Announced\*)**  
 \*Excluding Companies Making No Announcement

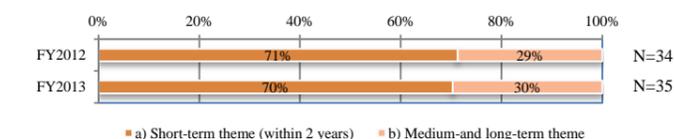


Ratio of R&D Expense to That in the Previous Year

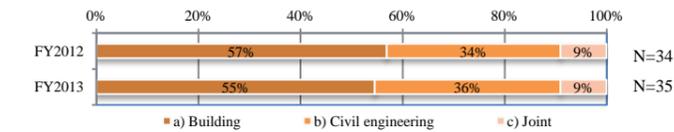
As the percentages of R&D expense, fundamental research accounts for 11%, applied research for 26%, and development for 63%, while short-term themes (within 2 years) accounting for 70% and medium-and long-term themes for 30%. Moreover, among themes, the ratios of construction, civil engineering, and joint are 55%, 36%, and 9%, respectively. These tendencies have not changed very much from FY2012 survey.



Ratio of Fundamental Research/Applied Research/Development



Ratio of Expense for Short-term Themes (within 2 years)/Medium-and Long-Term Themes

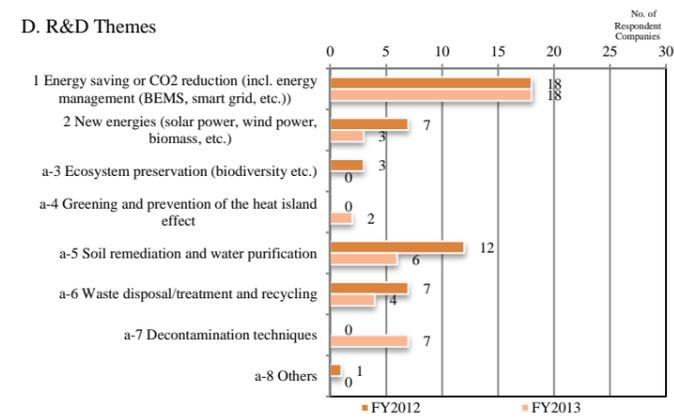


Ratio of Expense for Building/Civil Engineering/Joint

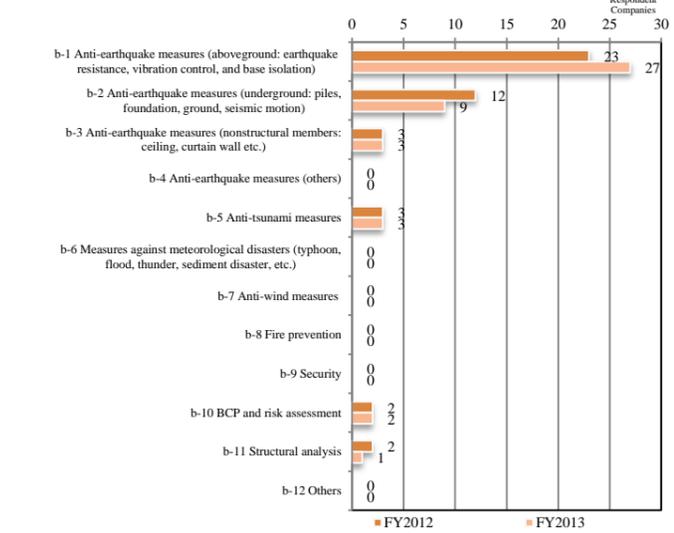
[List of Items]

- C-1) R&D expense incurred for the entire company (expense publicly announced)
- C-2) Ratio of R&D expense to sales volume
- C-3) Ratio of R&D expense to that in the previous year
- C-4) Ratio of fundamental research/applied research/development
- C-5) Ratio of expense for short-term themes (within 2 years)/medium-and long-term themes
- C-6) Ratio of expense for building themes, civil engineering themes, and joint themes

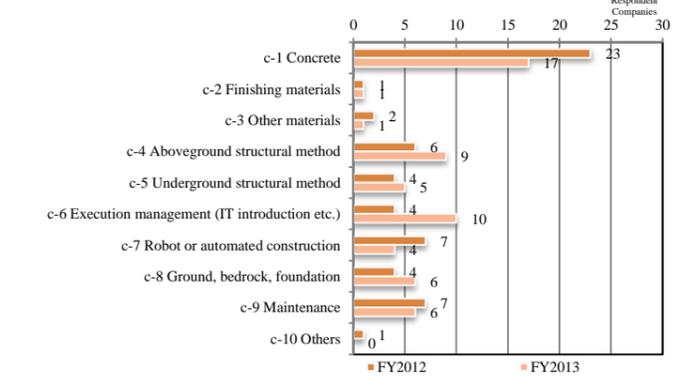
**D. R&D Themes**



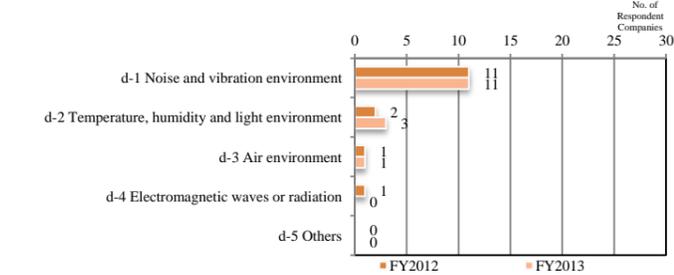
Fields of Particular Interest a) Global Environment



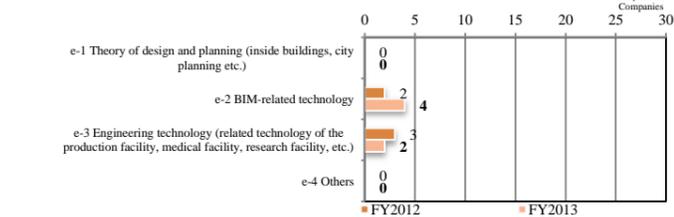
Fields of Particular Interest b) Safety and Security



Fields of Particular Interest c) Quality and Productivity Improvement



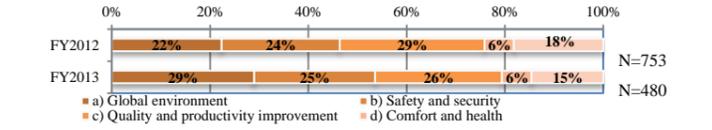
Fields of Particular Interest d) Comfort and Health



Fields of Particular Interest e) Others

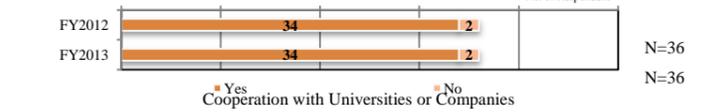
Among the items of particular interest in each field cited by member companies, "b) Safety and security: anti-earthquake measures (aboveground) comes with the largest number of 27 companies, followed by "a) Global environment: energy-saving and CO2 Reduction" with 18 companies, and then "c) Quality and productivity improvement: Concrete" with 17 companies. In the result of FY2012 survey, anti-earthquake measures (aboveground) and concrete came with the same number; however, in FY2013, an overwhelming number of companies cite anti-earthquake measures (aboveground) as an area of particular interest.

With R&D expense, while many companies had invested in two core areas of Safety & Security and Quality & Productivity Improvement, Global Environment was added as a field of particular interest.



Releases by Area in the Past Year

94% (34 companies) of companies conducting R&D responded they were cooperating with universities or companies such as joint research or contract research.



[List of Items]

- D-1) Total number of R&D themes
- D-2) Ratio of R&D themes by the field
- D-3) Ratio of (Total) R&D expenses by the field
- D-3) Ratio of (each company's) R&D expenses by the field
- D-4) Fields of particular interest
- D-4-a) Global environment
- D-4-b) Safety and security
- D-4-c) Quality and productivity improvement
- D-4-d) Comfort and health
- D-4-e) Others
- D-5) R&D themes on restoration from earthquake disaster
- D-6) No. of information releases issued by the field in the past one year
- D-7) Major R&D results in the past one year
- D-7-a) Global environment
- D-7-b) Safety and security
- D-7-c) Quality and productivity improvement
- D-7-d) Comfort and health
- D-7-e) Others
- D-8) Cooperation with universities or companies such as joint research or contract research
- D-9-a) Joint research
- D-9-b) Contract research

**Conclusion**

The survey revealed the valuable information on R&D of the member companies, including the scale of R&D activity, the way they conduct R&D, or their fields of particular interest. The survey results are summarized in this report. We intend to disclose the results widely to the general public through the website of JFCC and news releases.

For FY2012, the draft report was prepared at the end of the fiscal year, and the report was released in September 2013, while the English version was made public in December 2013 in order to disseminate information broadly to the world. Moreover, from FY2013, this "Summary Report" was prepared by adding graphs to the summary of each chapter in of Chapter 4 "Conclusion." Furthermore, we will contribute to Ace on the current status of R&D activities of the construction industry by adding information from various statistics etc. to the contents of this survey.

Going forward, in addition, we intend to implement the survey every year, while reviewing the contents by adding changes over time of fundamental items, survey items for each year, etc. We will also review and improve the method of information dissemination to make it more effective.