

## Modification of Public-Private Partnership in Japan

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**Abstract:** Procurement system of public construction projects in Japan is changing with diversity in rapid pace. The quality assurance and risk management of construction projects should be more certain as the projects are turning into larger scale and more complexed. The clients in the public sector will want to make the relation of responsibility among the client, the designer (architects and engineers), and contractor clearer in terms of role and risk. Public-Private Partnership (PPP) is one of the methods for collaboration of the public sector and the private sector in public construction projects where the public utilizes the ability and suggestion of the private. Private Finance Initiative (PFI), Design-Build-Operate (DBO), market testing, designated manager system, outsourcing of tasks in local governments are well-known as examples of PPP in Japan. Indeed, there is an obvious trend that Design-Build (DB) is adopted in public construction projects in many countries including Japan. In this paper, the public construction projects in various procurement systems are surveyed and analyzed. They are not limited within the traditional procurement, Design-bid-Build, a separate order system of design and construction. Design-Build or PFI are adopted. In particular, contract by wide range including maintenance of equipment can be found. On the other hand, modification from originally typical PFI is taking place, such as concept design and project finance are removed from the roles and the tasks of the special purpose company (SPC) in PFI. Standard roles and tasks in a construction project are modeled in this paper.

**Key words:** paper guidelines, instructions, paper length, format, maximum five

### 1. INTRODUCTION

Procurement system of public construction projects in Japan is changing with diversity in rapid pace. The quality assurance and risk management of construction projects should be more certain as the projects are turning into larger scale and more complexed. The clients in the public sector will want to make the relation of responsibility among the client, the designer (architects and engineers), and contractor clearer in terms of role and risk.

Public-Private Partnership (PPP) is one of the methods for collaboration of the public sector and the private sector in public construction projects where the public utilizes the ability and suggestion of the private. Private Finance Initiative (PFI), Design-Build-Operate (DBO), market testing, designated manager system, outsourcing of tasks in local governments are well-known as examples of PPP in Japan. Indeed, there is an obvious trend that Design-Build (DB) is adopted in public construction projects in many countries including Japan.

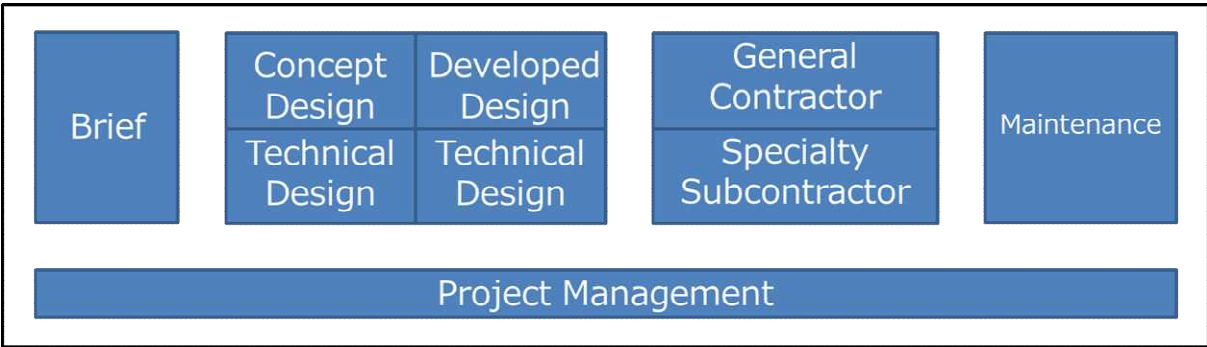
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## 2. ROLES AND TASKS IN A CONSTRUCTION PROJECT

Standard roles and tasks in a construction project are modeled as shown in Fig.1. The project process of building construction in public sector can be divided into brief, design, construction, and maintenance. Project management should be required through all the process.

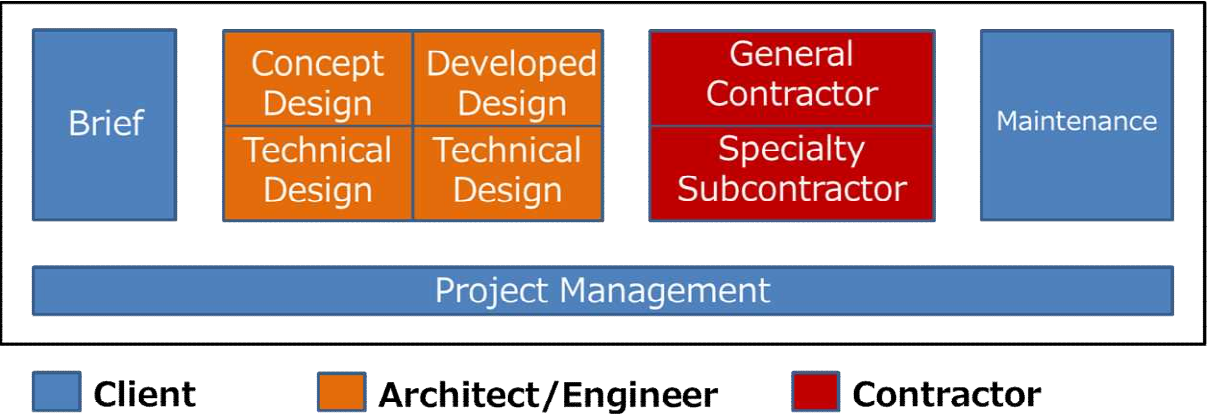
Design phase are also divided into concept design and developed design. They consist of architectural design and technical design that includes structural design, air conditioning and mechanical ventilation, plumbing, and electric equipment.

In construction phase, general contractor and specialty subcontractors cooperate to complete the construction works.



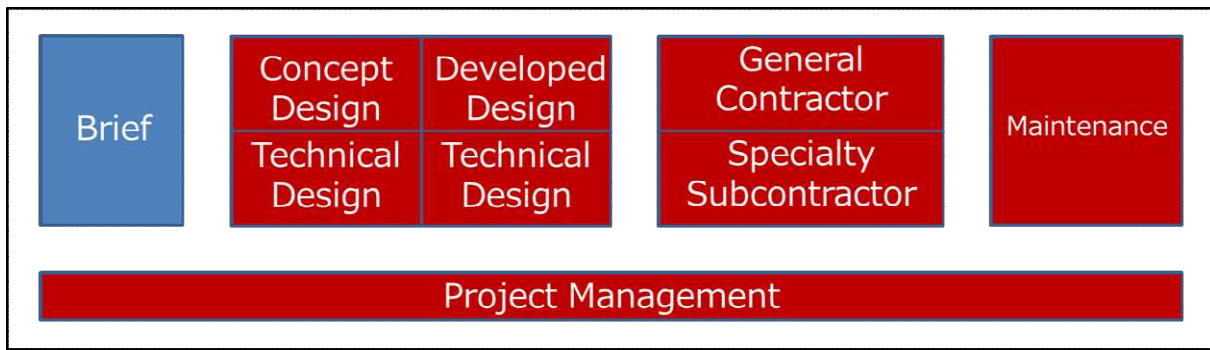
**Fig.1.** Roles and tasks in a construction project

Using the model and format shown in Fig.1, roles and tasks in a traditional Design-bid-Build project are shown in Fig.2. In traditional Japanese public project, the design phase is covered by the architect firm and the construction phase is operated by the general contractor. After design is completed, a general contractor is selected by competitive bidding. Therefore, design and construction phases are clearly divided.



**Fig.2.** Roles and tasks in a traditional Design-bid-Build project

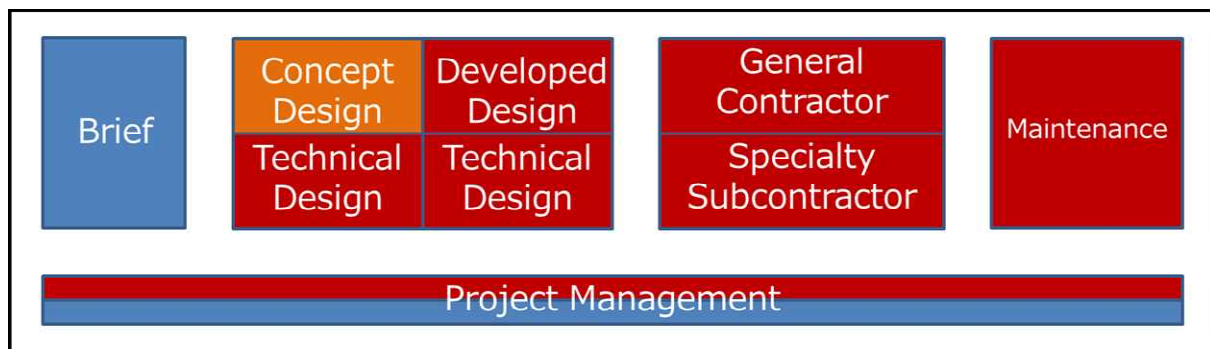
Roles and tasks in a typical PFI project are also shown in Fig.3. In PFI, the special purpose company is in charge of almost all tasks other than brief



■ Client      ■ Special Purpose Company (SPC)

**Fig.3.** Roles and tasks in a typical PFI project

In Japan, roles and tasks are modified from the original PFI into the new PPP style, based on the experience and the feedbacks as shown in Fig. 4. This will be discussed through a case study.



■ Client      ■ Architect/Engineer      ■ Contractors' team

**Fig.4.** Roles and tasks in a modified PPP project

### 3. CASE STUDY

As a case study, 6 real projects are selected. Roles and tasks of each player in every project are analyzed according to contract forms and interviews.

#### 3.1. Selected projects

All 6 projects targeted for analysis were cases conducted in Japan. Among them, Project 1 through Project 4 are kinds of Build-Transfer-Operate (BTO) systems where the ownership of the facility is relocated to the public at the point of facility maintenance. Project 1 and Project 2 are the government buildings of the local government, and Project 3 is a hospital ordered by local public entities. Project 4 is an education and research facility of a national university. Projects 5 and 6 are not in PFI, but projects that are not traditional procurement and contracting schemes.

The fact data were extracted from the published material in public domain.

#### 3.2. Results

Results of the case study are shown in Table 1.

There is public-private reversal at the interest rate which is the cost of financing. Here PFI is disadvantageous compared with the traditional procurement from the view of value for money.

If there are engineer staffs in the public owner and the user is another department of the owner, the owner intends to go through its concept design in-house.

**Table 1.** Case study of projects

Project 1	Project 2	Project 3	Project 4	Project 5	Project 6
October 2009	January 2015	July 2014	In progress	In progress	In progress
PFI	Design-Build	PFI modified	PFI modified	Design-Build	Design-Build
Act on PFI	Act on PFI	Act on PFI	Act on PFI	Act on Promoting Quality Assurance in Public Works	Act on Promoting Quality Assurance in Public Works
Typical PFI	Changed from PFI to Design-Build-Maintenance Financing by the local government	Financing by the local government	Concept design outsourced by the owner other than SPC	Operation by staffs in the local government	Strictly controlled by the owner's specification
Cost reduction by 7%	Cost reduction by 5%		Short term User satisfaction	Maintenance of the machinery	Short term
Owner has in-house engineers	Owner has in-house engineers	No in-house engineers	Owner has in-house engineers	Owner has in-house engineers	Owner has in-house engineers

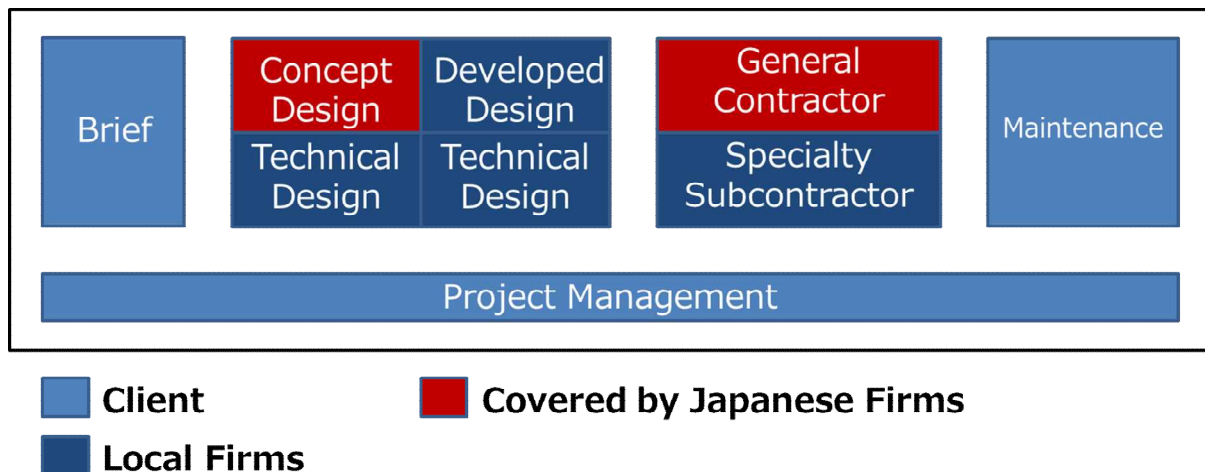
Nonetheless, when the owner requests shortening of the construction period or technical proposal, a procurement method including design will be adopted.

If there are only administrative staffs, not engineer staffs in owners, they should adopt PFI, or concession. The owner should concentrate on the use of the facility.

#### 4. JAPANESE FIRMS IN OVERSEAS PROJECTS

The procurement and contracting methods of construction projects in overseas countries are rapidly diversifying. Under these circumstances, Japanese firms need to contribute to the country by winning international competition especially in Asia and the Middle East region. Quality assurance should be ensured with proper risk sharing.

The roles and tasks played by Japanese firms in public projects in the Asian region are shown in Fig.5. Japanese firms have contributed mainly to concept design and construction. However, its budget and authority tends to shrink. As a result, many Japanese firms began to post losses in overseas construction projects. Therefore, Japanese firms will not develop new markets, and the growth strategy will be limited.



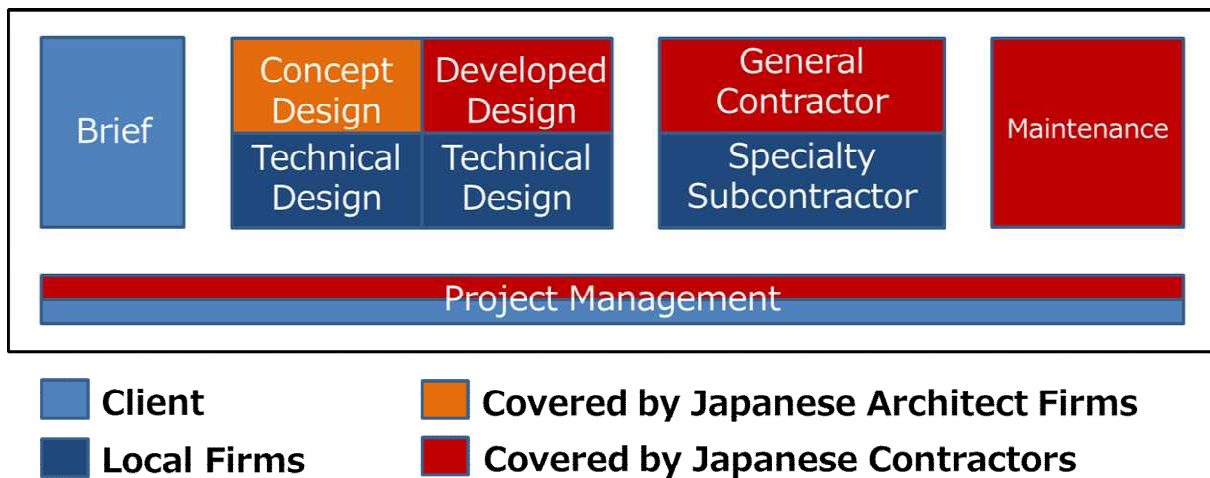
**Fig.5.** Roles and tasks in an overseas project

PPP/PFI is accompanied by country risk and political problems. We do not think that this will become an alternative area of lump-sum contract immediately. However overseas, localization from all angles, such as M & A of local firms, long-term collaboration with local partner companies, long-term development and securing of local human resources is considered indispensable.

In the future it is important to make use of the strengths of Japanese firms as follows: design adjustment ability, construction performance responsibility, financing ability, quality control ability, etc. New roles and tasks “to be” covered by Japanese firms are shown in Fig.6.

Concept design can be handled by the Japanese architect firm. The design should be advanced using BIM with high versatility to improve the efficiency of work.

Also, the general contractor in Japan will be able to demonstrate the design adjustment ability in the developed design. Japanese general contractors are also good at financing, risk management, construction completion management. It is important to appeal the owner to correctly evaluate that Japanese general contractors are proceeding well with construction management such as quality control. Japanese firms can also contribute to maintenance and repair plans for plants, equipment, etc.



**Fig.6.** Roles and tasks to be covered by Japanese firms in an overseas project

## 5. CONCLUSIONS

In Japan, many public projects pursuant to the act on PFI are carried out in BTO. As for the DBO, there are cases where SPC is made to comply with the PFI method even if public funds are raised. The owner can level payments without violating the law on public procurement. In other words, installment payment can be adopted.

Also, the more roles and responsibilities of private enterprises, the fewer companies participate in bidding. As a result, the bid has become sluggish or the content of the proposal is poor. We think these are the disadvantages of using public-private partnerships by public ordering parties. Conversely, when the public side is to bear the fund procurement and basic design, the number of companies participating in the bidding will be large. We hope to make use of the merits of public-private partnership method and overcome disadvantages.

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