

The Design and Construction of Pacific Century Place, Marunouchi

Michael MOIR

Managing Director, Infrastructure of Pacific Century CyberWorks

1. Introduction

Pacific Century Place, Marunouchi (PCP) is located in the heart of Tokyo's financial and business district. Being adjacent to Tokyo Station, the transportation hub of the city where the subway system and the train network converges, Pacific Century Place is easily accessible from the entire metropolitan area and Narita International Airport is just an hour away. The building is a 31-storey steel and concrete composite structure with a glass curtain wall. There are 24 floors of office above a 5-star boutique hotel with 57 rooms, and 2 levels of retail. Pacific Century Place is 150m tall and it is built to the highest seismic and IT standards. The hotel will be operated by Four Seasons.

The Architect of this project is PCP Design Team, a joint venture formed by Nikken Sekkei and Takenaka Corporation. Takenaka Corporation took the lead in the construction. Construction works began in August of 1999, and was completed and handed over to the owner on 20th Nov. 2001, the date shown on the project schedule at the commencement of construction. The building was delivered within budget and to a high quality, meeting the expectations of the owner.

2. The Site

The site, with an area of 4,854 m², was acquired in a Japan Railway Settlement Corporation (JRSC) open tender held in March 1997. In August 1997, the owner, Pacific Century Group Japan (PCGJ) reached an agreement to integrate the adjoining site of East Japan Railway (JRE). The combined site area is 6,382 m². The site is zoned for office/commercial development with a restriction to keep 1,500 m² as "open space."

3. Architects

Nikken Sekkei is the largest design firm in Japan with over 800 registered architects, and has been involved in the design of numerous grade A office buildings in Tokyo.

After the purchase of the site, PCGJ worked with Nikken Sekkei to develop conceptual schemes for the project. Conceptual schemes were also undertaken by Takenaka on a speculative basis. The tender scheme was finalized by Nikken Sekkei in late 1997. The construction contract for the project was awarded to a joint venture led by Takenaka in the summer of 1998. Since then, architects and engineers from both firms (Nikken Sekkei and Takenaka) worked in a joint venture, PCP Design Team, with designers from Takenaka responsible for the detailed design work as well as the conceptual design.

4. Contractors

The construction work is undertaken by a joint venture between Takenaka (70%) and Kajima (30%). Takenaka Corporation is a privately held company with almost 400 years of building experience in Japan. They employ over 9,000 employees and are involved only in building works. Takenaka has their own team of architects, designers and engineers. About 50% of their contracts are design and build contracts and most of them are awarded without competitive bidding to clients with whom they have developed long-term relationships.

Kajima Corporation is a public company involved in both civil and building works. Established in 1840, it has over 11,000 employees, and is the second largest contractor in Japan.

5. The Project

At the end of 1997 PCGJ invited five construction firms to tender based on Nikken Sekkei's preliminary design and specifications. In order to reduce the construction cost significantly, these firms were encouraged to include value-engineering (VE) schemes that would not affect the original design intent in their tender packages. The result of the tender analysis showed that based on Nikken's original scheme, Takenaka's bid was the second lowest (5% higher than the lowest bidder.) However, after adjustment of all the acceptable VE items from each respective firm, Takenaka's bid was the lowest. Their VE proposals amounted to savings of over 20%. A large portion of the savings came from proposals on the reconfiguration of the basement layout, a parking system, curtain wall, air barrier system along the curtain wall and the lighting system.

In July of 1998, PCGJ and Takenaka executed a memorandum (pre-contract agreement) with basic specifications, in which Takenaka agreed to deliver a building that would meet the basic specifications. It was also stated in the agreement that items/ details not specified in the basic specifications are to be of "Prime Grade A" standard, which would be assessed independently by Nikken Sekkei. For example, there were no specifications on the manufacturers of M&E equipment or the country of origin for materials like granite, plaster boards, metal panels etc., in the basic specifications.

In an ordinary "turn key" contract (i.e. design build arrangement for a lump-sum amount), the designers and the builders are of the same company. In theory this arrangement will facilitate the development process, particularly, the coordination between the designer and contractor, and attain a fast track programme. The designers are also able to obtain a more accurate cost estimation from the construction team at the initial stages of the project, so that the original budget set by the owner is more realistic. These benefits are apparent in our project.

However, conflict of interest can arise in a design build arrangement, where the design or the quality of the building is sacrificed to protect the design and build contractor's profit margin. In this project the owner's interest was protected by the involvement of Nikken

Sekkei, where all the specifications and changes had to be assessed and accepted by Nikken Sekkei. To be fair, there were no indications of collusion of Takenaka's design team and construction department. In fact, in numerous occasions Takenaka's designers were able to negotiate a lower cost for a variation order than Nikken Sekkei, because of their experience in construction and relationship with the construction department.

The designers of the design and build contractor, Takenaka, were the key to us ending up with a quality product, within budget. Takenaka was initially selected although their bid on the original scheme by Nikken was not the lowest, because they were able to come up with ingenious VE schemes. Designers of a design and build contractor have extensive knowledge of the construction process, and Takenaka's involvement in the detailed design work ensured that the designs are not only aesthetically pleasing and functional, but also economical to construct. When a design modification was required, Takenaka's construction team would also be able to arrive at a more accurate costing and again we had Nikken Sekkei to verify if the cost was reasonable.

The design and build function of Takenaka also helped in maintaining the budget and schedule of the project despite about 260 owner initiated variation orders. However, it should be noted that completing projects on time, meeting the original construction schedule to the day, is industry practice in Japan.

Since Takenaka was responsible for the design and construction, they would be held accountable for the delay to the project. Architects and construction supervisors of a design build company are also more understanding of each other's role, and more cooperative in working together in delivering a quality product as their company's reputation is at stake. In the worse case scenario, if the project is delayed and the owner is to claim liquidated damages, the process would also be more straightforward and less time consuming for the owner. If the designer or the contractor is responsible for the delay, the liability is with the design and build contractor. Only if the client has ordered very major changes will the client be liable for the delay, and under these circumstances the design and build firm will be able to come up with a more accurate estimate of the delay and the cost.

6. Conclusion

This was my first experience of a large-scale design and build contract and I am convinced that it brought enormous benefits to the owner of the building. However, the effectiveness of this approach resulted mainly from the design capabilities in the contractor's organization and the culture of the Japanese construction industry. Contrary to popular belief, building construction in Japan is not excessively expensive. The construction cost of PCP was a little less than an equivalent building in Hong Kong but the quality was significantly better and the on time and within budget delivery was a feature rarely achieved in Hong Kong. A notable feature is the absence of a Quantity Surveyor!

In a difficult economic climate the building is now 80% leased, a testament to its outstanding quality of design and construction. Both Nikken Sekkei and Takenaka provided first class service to PCGJ through the design and construction period.

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