

# THE CURRENT PRACTICE OF DESIGN AND BUILD PROCUREMENT PROCESS IN MALAYSIA

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## ABSTRACT

*This paper discusses the design-build project delivery method which is becoming an increasingly viable alternative to traditional project delivery method in the public sector. This interest has led to dialogue among public sector agencies to establish and formalise understanding of the design-build process and its implementation. The process consists of six stages namely Project Definition, Request for Qualification, Request for Proposal, Proposal Submission and Evaluation, Contract Award, and Document/Construction. Therefore, this finding of Design-Build (DB) procurement process is on the improvement and understanding on an owner and contractor in practice and implementation in Malaysia.*

**Keywords:** *design/build, design/bid/build, advantage and disadvantage, procurement process*

## INTRODUCTION

Design and Build (DB) has become a popular alternative procurement method to Design-Bid-Build (DBB) in developing countries like Malaysia (Konchar & Sanvido, 1998). DBB is a project delivery method in which the owner enters into a contract, appoints an Architect/Engineer (A/E) firm for design services based on the requirements provided by the owner (Hale *et al.*, 2009). It is also proven of an inadequate expectation of finishing the project within the budget, completing within the stipulated time and satisfaction on quality by owner (Kartam *et al.*, 2000). As a result, alternative delivery methods, such as Design-Build (DB), Private Financial Intensive (PFI) and Build-Operate-Transfer (BOT), are introduced and being considered by public sector owners to overcome the lack in Design-Bid-Build (DBB).

The private sector in Malaysia has widely used the design-build delivery system with a great deal of success. However, in the public sector, design and build is still perceived to be subjective and complicated. It is because the owner is still sceptical and hesitant (Ndekugri & Turner, 1994). However, experience in the area of DB construction project is limited among public sector personal administering such programmers (Chan *et al.*, 2002). Therefore, there is a need to formalise the DB procurement process to improve its understanding and implementation in Malaysia.

## COMPARISON BETWEEN DESIGN-BID-BUILD AND DESIGN-BUILD

### Design-Bid-Build (DBB)

Design-Bid-Build (DBB) is a project delivery method in which the owner enters into a contract, appoints an architect/engineer (A/E) firm for design services based on the requirements provided by the owner. The designer prepares a design package, seeks approval from client and supervises the construction of the project through all stages of works. This includes obtaining planning permission, calling tenders, including contract document, and selecting the best contractor to undertake construction of the project as shown in Figure 1. This system is a common method used and is found to suit clients of all types, particularly government institutions (Ling *et al.*, 2004).

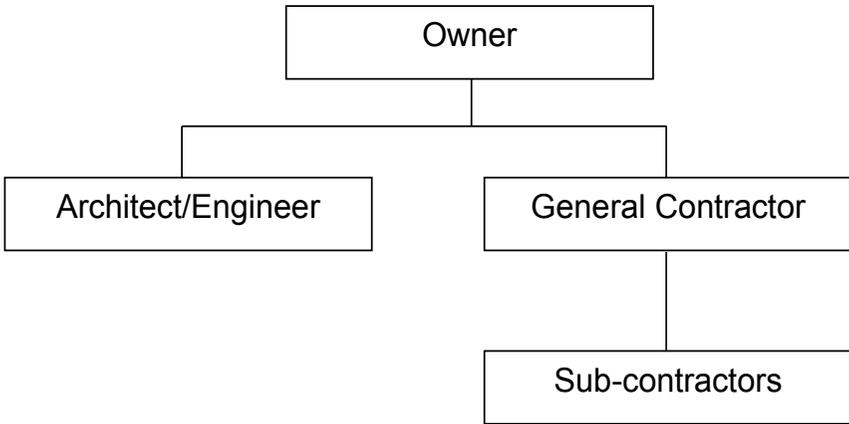
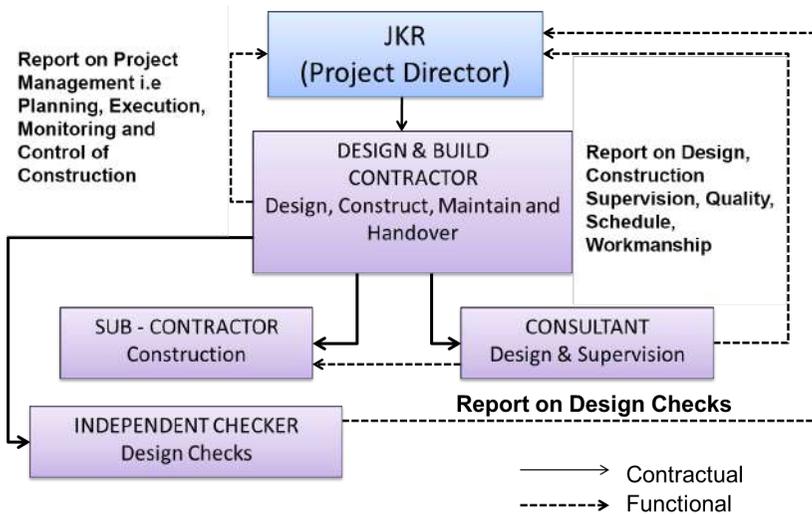


Figure 1: Design-Bid-Build of project delivery method

### Design-Build (DB)

Design-Build (DB) is a project delivery method in which the owner provides the requirements for a specific project and awards the contract to one contractor to carry out and to be responsible for the design and construction of the project. The contractor will employ an architect and engineer (A/E) firm to design the project based on the needs statement provided. This statement is generally referred to as “the client’s brief” as shown in Figure 2 (Ndekugri & Turner, 1994). However, due to various problems that have arisen, especially on the responsibility of the design work, another project delivery method that has emerged is the Design-Build (DB) method which has become more and more popular (Tsai & Yang, 2010).



**Figure 2: Design-Build of project delivery method (JKR, 2007)**

## ADVANTAGES AND DISADVANTAGES OF DESIGN-BUILD

Design-Build is defined as a project procurement method where one entity is contractually responsible for both design and construction. The direct contract between an owner and a contractor enables misunderstanding to be minimised by considering the advantages and disadvantages in design and build procurement method.

### Design-Build-Advantages

*Single point responsibility (Employer’s perspective):* As the contractor is responsible for the design and construction, the contractor is liable for both design problems and construction defects. The employer can recover directly from the contractor for deficiencies in either design or construction of the project. The employer also need not determine initially whether the defect was caused by an error in design or in construction. This is in contrast to the traditional method where the employer’s point of contact is the architect and engineer, so whenever there are problems, responsibility

may lie with any one of the parties, namely the contractor, the architect, engineer, quantity surveyor, and other consultants (Ling, 2004).

*Cost is lower (Employer's perspective):* Potential costs savings can be realised because it has high value engineering capabilities due to close coordination between the architect, engineer and the contractor. The contractor has direct and real experience with the cost of purchasing and installing materials and, in the DB project, it can share that experience directly with the design professional during the design phase of the project. This process has the potential to lower the cost in which savings can then be passed on to the employer (Xia *et al.*, 2012).

*Cost is certain (Employer's perspective):* The contract price is either fixed or lump sum and the cost for the project is certain. A change for variation to work is very slim unless the employer wishes to change the scope of work. This is important for the employer to arrange the financing (Xia *et al.*, 2012).

*Fewer variation orders (Employer's perspective):* A definite advantage of the DB project is that the employer can expect far fewer variation orders on a DB project. However, if the employer decides that he wants a design changed during the DB projects, and that change is not covered by the defined scope of the project, that would be considered an extra and variation orders will have to be granted (Oztas & Okmen, 2004).

*Shorter completion time (Employer's perspective):* By combining the appointment of the designer and a contractor into one step, the DB method eliminates time lost in the conventional Design-Bid-Build process. In addition, as some of the contracting activities overlap, the time from inception to ultimate completion of the project is shortened. For example, the design and construction stages can precede simultaneously allowing earlier commencement of work on site. Thus, the project can be completed within a shorter period of time since construction can begin before the entire design is completed (Lam *et al.*, 2008).

*Product "fit for purpose" (Employer's perspective):* This is one of the most significant features of a DB project. The finished work for a DB contract must be reasonably fit for their intended purpose. In practice, the contractor guarantees that the finished product is fit for its purpose, irrespective of

whether the faults are due to quality of materials or workmanship or design. In contrast, the conventional contracting method has the problem of lower duty of care by the architect/engineer (Gransberg & Molenaar, 2004).

*Shorter completion time (Contractor's perspective):* The project can be completed within shorter period as the designers are now working for the contractor. Hence, it will avoid the problem of deficiency of design, responsibility of design, and etc.

*Better profit (Contractor's perspective):* There are higher chances of value engineering and hence improve profitability. In addition due to less competition, profit margin will improve further.

### **Design-Build-Disadvantages**

*Limited input from employer:* The employer's input on the detailed design will be limited as the contractor is now responsible for the design. Thus, the finished structure might not be exactly as the employer envisioned. In addition, the employer has no direct control on how the work is done so long as at the end of the contract period, the contractor completes the work as per employer's needs statement (Seng & Yusof, 2006).

*Rigid and inflexible:* This method of procurement is very rigid and not flexible. If the employer makes any changes in his requirements, it opens the door to claims for extension of time and the direct loss and expenses.

*Clear definition of scope:* In order for the project to be successful, the employer must define the scope of work and needs adequately and precisely. The employer must establish definitive design criteria identifying the project requirements and to state these clearly in the needs statement. If the requirements are not clear or imprecise, this will lead to variation in orders and extra cost (Adnan, 2008).

*Compromise on quality:* As the design professionals are employed by the contractor they are under instructions from the contractor to design down to meet a lower cost. As the employer has no architect/engineer to supervise and to ensure the quality of the works, thus the quality of the work may be compromised. In addition, the contractor may use the cheapest

materials and methods of construction as long as they meet the employer's needs statement. The employer may need to employ a project manager or independent professionals to monitor the construction and this will increase the cost to the project (Adnan, 2008).

## **IMPORTANCE OF CONTRACTOR SELECTION FOR PROJECT SUCCESS**

Pre-qualification for Design-Build (DB) projects is normally project specific, and the focus is to identify competent contractors who are interested in submitting bids. The pre-qualification exercise is to evaluate the capabilities of tenderers in terms of criteria such as financial capabilities, management capabilities, track record, equipment resources, and human resources. Potter and Sanvido, (1994) introduced a structured Design-Build pre-qualification system. Potter and Sanvido (1995) discussed various aspects of implementing the Design-Build pre-qualification system.

As the efforts and cost involved in bid preparation and bid evaluation are enormous, the number of pre-qualified, short listed bidders for Design-Build projects is limited and the preferred range is between three and five. Hence, a comprehensive and detailed analysis of contractor information is essential for pre-qualification and short listing is to avoid any subsequent contractor failure and other risks (Holt *et al.*, 1995).

## **PROCUREMENT PROCESS IN DESIGN-BUILD (DB) PROJECT**

The following steps of the DB procurement process could be part of any procurement process in Malaysia. This is a general guideline and overview of the typical process for DB.

### **Programme Definition**

Owners' competencies that affect DB project success include their capability in managing DB projects, understanding of DB project scope and ability to clearly articulate end-users' needs. It is important to the

owner to establish the project requirements in the project brief such as well-defined scope, established budget, adequate owner staffing, standard design specification, type of contract, owner's risk aversion, owner's construction sophistication, established completion date, availability of design/builders, willingness to forgo design input, size of project, technologically advanced, current state of the market, alternative financing options, etc. (Songer & Molenaar, 1997).

DB project delivery is more labour-intensive and technically demanding for the owners than DBB. For owners who do not possess any knowledge of the construction industry, the DB route may not be advisable. This is because owners would face many problems if they are not experienced enough to produce a brief that is clear and comprehensive (Ndekugri & Turner, 1994). It is advisable that the requirements are clearly and precisely defined so as to avoid any potential variation to the contract during construction.

### **Request for Qualification (RFQ)**

In the selection of contractors and awarding of contracts in the construction industry by those in the public sector, the practices and procedures remained relatively unchanged since the 1940s. The bid evaluation is dominated by the principle of acceptance of the lowest price. This is one of the major causes of project delivery problems when the bid evaluation concentrates solely on bid price. This implies the automatic selection of the lowest bidding contractor is risky, a fact that the owner would change this process (Watt *et al.*, 2010).

Nowadays, with the method of selecting contractors for competitive bidding, many countries, including Malaysia have introduced modification, involving clearly defined procedures for bid evaluation. As is in most traditional procurement system, selection of contractors for Design-Build (DB) projects also follows pre-qualification, short-listing and bid evaluation procedures. Generally, three and not more than five most qualified contractors firms are short-listed (Holt *et al.*, 1995).

The "best value" procurement is one that is structured to consider price and other relevant factor in making the bid selection to provide the greatest

“value for money” to the client. The best methods are the ones that allow the entire team to be selected based on capabilities, experience, professional competency and qualification, not merely on low price (Hwang *et al.*, 2011).

Criteria in the pre-qualification process also include reviews of the credentials and experience of the various design/supervision consultant proposed by the various contractors. The submission also include evaluation of the selected consultant’s qualification and reputation in order to gain further assurance of professional conduct (Hwang *et al.*, 2011).

### **Request for Proposal (RFP)**

Where owners have to procure projects using the Design-Build (DB) procurement method, the owners and their project managers need to prepare the Request for Proposal (RFP) document that describes the owners’ needs. The RFP should include well defined comprehensive scope of work, which is shown as the success factor in Design-Build (DB) project (Songer & Molenaar, 1997). The scope of work is determined by the owner’s brief. It should specify in detail, aesthetic and performance criteria such as technical, functional and workmanship quality. The quality management plan and risk management plan are also required to be included in RFP (Songer & Molenaar, 1997).

### **Proposal Submission and Evaluation**

The Design–Build pre-qualification process represents the initial stages that an owner should employ once a management decision to deliver a project using design/build delivery has been made. It allows an owner to review and determine appropriate prequalification criteria for use in evaluating Design–Build teams. The process enables an owner to differentiate between the attributes of the competing teams, thus pre-qualifying the team that best meet the owner’s needs (Al-Reshaid & Kartam, 2005).

Selection of an appropriate DB contractor is important because the success of a DB project depends very much on contractors’ characteristics. Competent design–builders have knowledge in design development, innovative techniques and materials, capability in project management and a thorough understanding of the design process (Chan *et al.*, 2001).

Compared to DBB projects, it is more difficult to evaluate DB tenders because of the need to evaluate both price and design. DB tenderers offer different systems and services, and provide limited amount of information for evaluation. Great difficulty can be experienced in evaluating tenders if the owner's brief is ambiguous and does not communicate his precise needs to the contractor (Songer & Molenaar, 1996).

In the public sector, owners are constrained to select the lowest bidder, except in exceptional cases. This approach may be valid in simple and straightforward situations, where a clear idea of costs and conditions has been established due to the repetitive nature of works and similarity in working environments. However, it may be invalid in most situations, because the award of a contract to a bidder based on lowest price alone may result in a "false economy" (Songer & Molenaar, 1996).

Owners also need to evaluate whether consultants engaged by DB contractors are acceptable, in particular the quality of designers. Criteria for evaluation include consultants' financial capacity, level of expertise, and experience in design skills and track record in DB tenders (Gransberg & Molenaar, 2004).

## **Contract Award**

The DB contract is awarded; the construction manager (i.e. project manager representing the DB contractor) has many important roles to play which he normally does not have in traditional DBB projects. He has to be responsible for both the design and construction and their integration (Ling, 2004).

Besides technical capability, team work among project team members is important so that DB projects can reap the advantages of good coordination and ease of decision making. Teamwork engenders good relationships which could lead to team integration.

Design decisions are sometimes inappropriately influenced by contractors, who in some cases are not familiar with design issues. In some projects, DB contractors have failed to provide care and attention to understand owners' requirements (Xia *et al.*, 2009). Communication is sometimes a problem because once the DB contract is awarded, owners may be out of the loop and all design and construction decisions and trade-offs

are internal to the design–build team and do not involve owners. Owners and design–builders need to have a good, proper and comprehensive checking and communication system to ensure design is coordinated and construction complies to brief (Chan *et al.*, 2005).

### **Document/Construction**

The loss of control is mainly due to the lack of overall design and construction supervision from the owner in a DB contract. One solution to resolve this is for the owner to appoint at least one consultant. Meanwhile, the owner’s representative will be appointed to provide certain input in communication and control of the design and construction of the works.

The standard of service experienced by owners during the construction stage of DB projects has been found to be less than satisfactory (Takim *et al.*, 2013). Contractors may have failed in some instances to deliver what they have promised, and their service quality performance did not meet owners’ expectations (Al-Reshaid & Kartam, 2005).

## **CONCLUSION**

This paper is to formalise the DB procurement process to improve the understanding and implementation in Malaysia. Design-Build is a project procurement process where one entity is contractually responsible for both design and construction. The process consists of six stages namely Project Definition, Request for Qualification, Request for Proposal, Proposal Submission and Evaluation, Contract Award, and Document/Construction. Public sector owners must be particularly careful in preparing proposal requests and selection procedures to ensure fair and consistent evaluation. Developing consistent pre-qualification procedures will promote a highly cohesive team, satisfy public scrutiny, and ultimately contribute to project success.

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