Chapter 9

Procurement and Contract Strategy: Risks allocation and construction cost

John Adriaanse and Herbert Robinson

1 Introduction

Significant investment is required for the development of construction projects. An appropriate procurement and contract strategy is therefore necessary to protect such investment and to achieve value for money for clients and investors who have a stake over the long-term use of such facilities. However, clients are often faced with the dilemma of how to procure construction projects and what type of contract to use to ensure that projects are delivered in the most cost effective and efficient, and most significantly to ensure that the facilities is fit for the purpose intended. In deciding what procurement strategy to adopt, it is important to understand the key drivers of change or factors that will or are likely to affect the particular sector or industry the project is operating in.

The central dilemma for clients is often how to select consultants and contractors (with an information advantage) that can act in their best interests in the project. This information asymmetry gives rise to two fundamental problems. The first is what is usually referred to as 'incomplete contracts', lacking sufficient precision to define the project, cover the entire scope of work including all possible risks. The greater the completeness of contract documentation, the lower the potential for dispute, abuse and opportunism but it is difficult to achieve this in real world contracts. Second, it creates the potential for abuse and mistrust in the relationships between various parties.

This chapter examines the link between procurement and contract strategy, the role of contracts in allocating risks, and the relationship between parties in various types of procurement as well as the implications for construction cost. It starts with an overview of the need for an effective procurement and contract strategy. The key risks in relations to the different forms of contract, mechanisms for the allocation of risks from traditional architect-led approaches to integrated fast-track methods of delivering projects are discussed.

2. Procurement Strategy and Contract Selection

Procurement strategy and the form of contract chosen can have a significant impact on the cost and time overruns in major projects. Procurement involves actors (public and private organisations such as design and construction firms) and the organisation of activities (from planning, design, construction to operation and maintenance) to deliver an asset (Howes and Robinson, 2005). The project stages are generally sequential but there are overlaps between certain activities such as design and construction and sub-activities or packages such as concreting and formwork. The degree of overlap depends on the choice of procurement method. For example, in

traditional procurement, there is very little overlap between the design and construction stages compared to ‘design and build’ where there is a significant overlap.

Within each stage of the procurement process, different actors involved have various expectations which can sometimes conflict, create risks with potential cost consequences. For example, whilst an architect might have a preference for an innovative approach which poses additional risks, the structural engineer’s proposed solution could affect the architect’s desired shape and form of the design and the appetite for risks. Similarly, the services engineer might have a preference for running service ducts in a particular way or direction but this could affect the work of the fit-out specialists in terms of patterns or space configuration. The nature of these interactions and the risks involved in the design process could also affect the construction cost or budget set by the quantity surveyor or cost engineer.

The nature of interaction of the key actors depends on the procurement option chosen which defines the actors involved, their role, at what stage they are involved in and the precise relationship between, for example, the client, architects, structural engineers, quantity surveyors and fit out specialists. In traditional procurement system, the builder and facilities management consultant has no input in design which could affect the way the building is constructed and operated. This is in sharp contrast to other approaches such as ‘design and build’ procurement with a major input on ‘buildability’ at an early stage or PPP/ UK PFI procurement system, where the facilities management consultant has a significant input in the design as a greater emphasis is placed on the functionality and flexibility of the buildings during use. There is a need to select an appropriate procurement and contract strategy to govern the relationships between key actors, clients and consultants, contractors and specialist subcontractors. It is important to ensure that these two elements are carefully considered as they are intrinsically linked. First, the procurement strategy provides the ‘direction and speed of travel’ and second, the selection of the appropriate contract forms reflects the client’s appetite for risk and ‘level of comfort in the journey’ to deliver a construction project. These are major decisions which the client cannot afford to get wrong as it will have significant implications on the costs and the time taken to deliver a project.

The key to a successful procurement strategy and contract selection is to identify the priorities in the client’s objectives and to plan a journey or path that will deliver the project on time, within budget and to the required specification. Procurement routes depend on a range of factors such as the type of project, expected project completion date, relationship between key parties and the allocation of risks. For example, it is widely accepted that the traditional procurement method places more risk on the client but the design and build approach allocates more risk to the contractor**.** The type of contracts also plays a key role in the allocation of risk to different parties. Selecting a construction contract is dependent on a number of criteria which include but are not limited to the type of work , value of work, expertise of client and amount of control required, programme requirements and importance of price certainty. The process of choosing a contract type should therefore satisfy the requirements of the project to ensure that risk allocation is appropriate based on the needs of stakeholders - clients, consultants, contractors and sub-contractors.

3. Wembley Stadium Case Study

In October 2000, Wembley stadium was closed and demolished in late 2002 for a major redevelopment of an iconic stadium. The aim of the Wembley project was to design and build a state-of-the-art national stadium to be the home of English football and to host large events such as cup finals and music events and athletics. The roof structure covers 11 acres, 4 acres of which are movable. The 90,000 seat capacity makes it the second largest stadium in Europe next to the Nou Camp in Barcelona with a capacity of 98, 000, but it is one of the largest in the World to have a covering roof. There are 310 wheelchair spaces and increased capacity for other physical impaired spectators. In addition, there are 400 media seats, 2,618 toilets and four banqueting halls, the largest of which can accommodate 2,000.

The procurement system used for the development of the Wembley stadium project was design and build and the form of contract used was the guaranteed maximum price (GMP). According to Construction Manager (2006, pp.12), "*Politicians perceive GMP contracts as a panacea for all cost overrun".* The managing director of WNSL was certain that the project was well defined and was not going to be subject to many changes (Construction Manager, 2006, p.13). This type of contract was said to be good for clients who want to make sure they will spend no more money than they have budgeted for. In Feb 2000, some of the potential bidders such as Sir Robert McAlpine and Bouyges pulled out of the bidding process because of serious concerns about the form of contract proposed.

Key Parties

The client was Wembley National Stadium Limited (**WNSL**) and the architect employed was Foster and Partners and HOK Sport, one of the world's leading design firm and provider of project delivery services. They employ about 1,600 professionals across America, Europe and Asia. The main contractor was Multiplex Ltd, an Australian based contractor, part of a group employing over 2,000 people with established operations in Australia, New Zealand, United Kingdom and the Middle East. There were also a number of specialist subcontractors involved. The original steel sub-contractor was Cleveland Bridge but they were eventually replaced by Hollandia (designbuild-network.com 2006). The mechanical and electrical contractor was Emcor Drake & Scull and the building services engineering was carried out by Mott MacDonald. There were a number of other engineers and consultants involved.

Project Implementation

According to sportengland.org (2007), Multiplex had secured a design and build contract to build the new Wembley Stadium. The total construction cost was put at £326.5m but by the time the bid had been signed, the cost increased to £445m. In September 2000 just after Wembley Stadium Ltd had announced that it had chosen Multiplex Ltd as the contractor, there were delays as politicians argued over what Wembley should be used for. They also had trouble attracting investors, costs began to escalate and the design went back to the drawing board several times (Construction Manager 2006, pp.13). The initial target completion date was to May 2003, but work started in September/October 2002. The revised completion date set was March 2006 before the May 2006 FA Cup final, by which time the price of the stadium had risen to £757m. During the implementation, the relationship between Multiplex and its steel subcontractors, Cleveland Bridge, was problematic. As a result, Cleveland Bridge left

the site in 2004 because they did not believe they would be paid for materials and there were serious difficulties between the two parties (designbuild-network.com 2006). According to Construction Manager (2005, pp.19) both parties appeared in a court case on 26th April 2006. Cleveland Bridge claims that there were serious problems as a result of late and incomplete design which has caused cost increases and 50.5 week delay. According to designbuild-network (2006), the two companies sued each other for breach of contract. Multiplex sued for £45m and Cleveland Bridge sued for £22.5m. In *Multiplex Constructions (UK) Ltd v Cleveland Bridge UK Ltd & Anor* [2008] EWHC 2220 (TCC) Mr Justice Jackson (as he was then), found in favour of Multiplex. Of his long and comprehensive judgment he said that it was likely to have few readers.

In November 2005, the Construction Manager, under one of its articles titled "*more than a stadium"* had an interview with Mike Richardson of the Wembley Stadium. The tone of an unhappy client was cited as Mike Richardson said;

> "*We cannot tell them how to build a job or who to use. They've got a fixed price for this job……we are not a risk transfer organisation. Every time we change our minds they have the opportunity to say that wasn't in our original price. So the trick is not to change your mind too often"*

In 2006 multiplex had estimated losses rising to £106m according to Construction Manager (2006, pp. 13). Multiplex intended to claim £150 from WNSL for 560 design changes and according to Construction News (2006, pp.2) Multiplex confirmed that its losses on the Wembley contract was at £180 million. The stadium was completed in March 2007 and was ready for the 2007 FA Cup final. The final construction cost was £798m with an additional time overrun of 12 months.

3. Allocation of Risks and Forms of Contract

The construction of the new Wembley Stadium is a landmark project which has been controversial and fascinating but raises important issues about how to allocate risks appropriately. The parties were highly experienced and had access to high level legal advice. Despite this it spawned at least 25 cases and numerous adjudications. It raises important questions about the procurement strategy (design and build) and the secondary process of actual construction. It is imperative that the form of contract is used to support the procurement method ensuring that it is sufficiently detailed and clear to accommodate both the client and the contractor's appetite for risks. If appropriate decisions about risks allocation are not taken during the early stage of a project, it can have a significant impact on final cost and duration of a project.

Risks are varied in construction work. Some are known at the time of contracting. Examples are that the completion date which is crucial e.g. a supermarket or an Olympic stadium. In others the financial consequences of late completion is known: in *Masons (A Firm) v WD King Ltd & anor* [2003] EWHC 3124 (TCC), the parties knew that if the completion date was not met losses for the year would amount to £600K. In *Copthorne Hotel (Newcastle) Limited v. Arup Associates and anor* (1996) 12 Const LJ 402, the risk created by a medieval wall close to the site of piling meant all the piling subcontrcators inflated their prices to cover the risk.

There are other factors that can also affect the progress of the work. Chief of these are the unforeseen risks such as: (a) unexpected ground conditions (b) unpredicted

weather conditions (c) shortages of material and skilled labour (d) accidents, whether by fire, flood or carelessness and (f) innovative design that does not work or proves impossible to construct. As a result, the allocation of these risks is a very important part of the contract since these factors always result in additional costs being incurred. This inevitably raises the question of who should pay (Adriaanse 2010).

Risk and uncertainties are part of construction work regardless of the size of the project. The selection of a particular form of contract can affect the balance of risks or can shift particular risks towards one of the stakeholders. There are various forms of contracts which define the relationship of the parties in a construction contract and risks allocation through contract clauses and conditions. For example, there are clauses relating to modification of design or quality where circumstances in which the work is carried out changes and the consequences for such changes, valuation of the cost consequences due to design variations, claims where contractors are entitled to additional payments, dealing with unforeseen events, interim payments for regular work progress, extension of time, and the cost implication of extension of time which are all essential in contract management to ensure the smooth running of construction projects. The precise wording of the clauses is also important as they are potential sources of conflicts between different parties involved and can lead to delays and cost overruns.

An appropriate contract form is therefore required to work in conjunction with the chosen procurement method. The selection of the procurement route will directly affect the contract options available. There are numerous standard forms of contract available. However, the most commonly used contracts are the Joint Contracts Tribunal (JCT) and the New Engineering Contract (NEC). The International Federation of Consulting Engineers (FIDIC) which is similar to the ICE contract is used mostly on international projects. Contracts can also be bespoke or tailored to the specific requirements of the parties but can be costly and time consuming process compared to utilising the standard forms.

4. Risks and Construction Costs

There are number of approaches used to deal with the problems of risks. For example, by choosing a particular form of contract, incorporating special provisions in a contract or by creating or increasing the contingency funds available. Care has to be taken when considering bespoke amendment to standard forms of contract. They are usually drafted by a committee drawn from the industry and as such represent a consensus on the allocation of risk. Amendments need to be made sensitively on order not to disturb that allocation.

At the heart of the standard form is the doctrine of privity of contract and ways of dealing with it. At tender stage provisions need to be inserted to provide protection for the employer and third parties. For the employer, direct warranties are needed to allocate rights against subcontractors and suppliers (these are additional to that owed by the contractor to the employer). The JCT family of contracts also allows for the provision of Collateral Warranties or the use the Contract (Rights of Third Parties) Act 1999). These also provide protection against contractor insolvency by providing ‘step-in’ rights for the developer or client should this occur. In addition it provides for termination of the employment of the contractor for specified defaults and most

important for the financial consequences that follow. The contractor is also required to take out joint insurances to provide cover against construction activities causing damage to third parties.

There are other types of risk indirectly affecting a project such as disruption to third party business (e.g. traffic, noise, business closure etc), industry risk which might affect the entire industry (e.g. national strike involving building workers) and corporate activities of the design and construction firms involved in a project which may have serious business consequences.

Risks should be examined at an overall project level as well as a detailed level looking at specific clauses of a contract. At a project level, if a client is interesting in price certainty, the lump sum (fixed price) contract would be the most appropriate as the final cost is determined prior to start of the construction. This contract can be agreed either 'with quantities' or 'without quantities'. Regardless of the agreed lump sum cost for the works, any variations to the project will result in additional costs. There is also the option of using 'measurement contracts' where the client retains the risks as the final contract sum is not agreed until the project is completed. This type of contract is often used in projects, particularly refurbishment projects, where the extent of the work cannot be quantified or is not clearly defined at the tender stage. The client takes the risk regarding the final quantity. If this increases substantially then the agreed rate for the works would result in a considerable cost increase to the client. Cost reimbursement (sometimes called cost plus) contracts are also used based on the cost for labour, plant and materials and an agreed overhead and profit percentage is added to this amount. This type of contract places a high level of risk on the client to pay for construction work without sufficient or detailed knowledge of the true cost which can sometimes provide little or limited incentive for the contractor to keep construction costs down. There is an alternative incentive based contract such as guaranteed maximum price (GMP) contracts or pain-gain sharing sometimes called target cost contracts to provide an incentive for contractors to keep costs down by sharing the savings made during construction with the client.

Risks should also be examined at the detailed level looking at specific contract clauses which can affect project performance, design quality and the budget of a project. Risks can sometimes be eliminated by a complete re-design of schemes or elements of the design by client's architect, minimised by choosing a traditional design rather an innovative design solution, transferred, for example, through design and build contracts or passed on to specialist sub-contractors. The options to manage risks will consider the potential costs for risk transfer, containment and risk reduction policies such as insurance. In practice, the distribution of risk is analysed through a comprehensive risk matrix or register and appropriate project costs are allowed for or added (value of risks) during the estimating process. Examples of risk may include design errors, inaccurate cost estimates, inflation, poor site and ground conditions, variations in weather, labour availability, hidden defects and quality of materials. Risk response strategy and appropriate mitigating instruments will be required (see examples in Tables 1 and 2).

Table 1: Examples of Risk Response Strategy

Risk Strategy	Examples
Eliminate/Avoid	Eliminate potential threats to project e.g. review design processes, change design, adopt alternative construction technique or use new materials
Distribute/Share	Introduce a pain/gain sharing mechanism e.g. Guaranteed Maximum Price (GMP) contract,
Transfer	Does not reduce criticality; move to another party best able to manage it e.g. contractual provisions or insurance Use lump sum (transfer to contractor) or cost plus contracts (transfer to client)
Accept/Retain/Reduce	Other options are undesirable, uneconomical or impossible e.g. can reduce risk by in-depth site investigation

Risks should be analysed in an organised and systematic way considering the full impact on programme time and cost overruns. Too often risks are dealt with in an arbitrary way or ad hoc fashion by simply adding a percentage for contingency on the estimated project cost. Irrespective of the type of contract chosen (whether fixed price, cost plus or guaranteed maximum price), there will always be a need for the client or contractor to avoid cost and time overruns in construction projects. Adopting a systematic risk management approach to itemise and quantify all the risks involved, whether it is in the form of measured works in the bill of quantities or special conditions of contract, is essential to manage project time and cost effectively.

Table 2: Examples of risks mitigating instruments

Risks	Mitigating Instruments
Design	Professional Indemnity Insurance
Cost Overruns Inflation	Standby Credit Contingency Funds Contract Clauses
Delays	Liquidated Damages
Hidden Defects	Contractual Arrangements
Force Majeure	Insurance

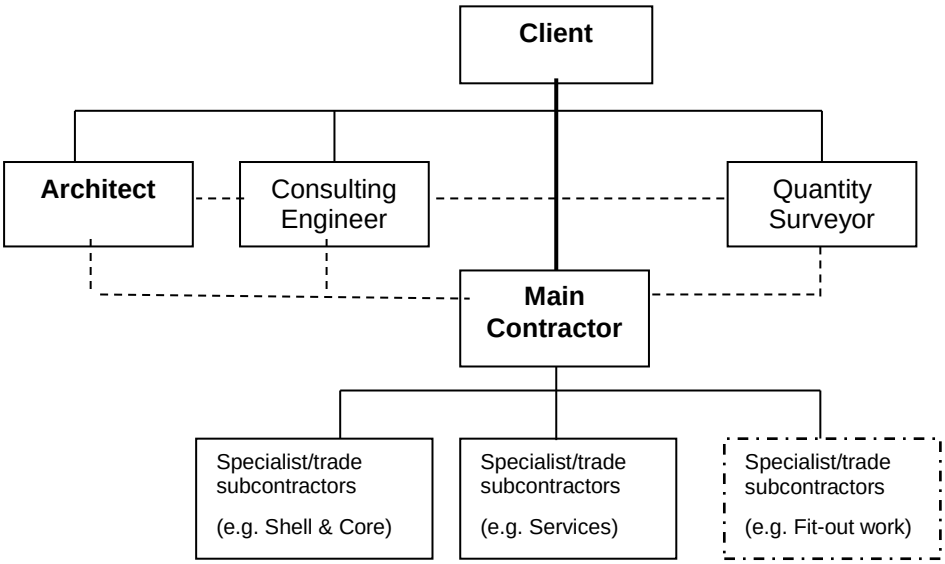
5. Procurement systems and Contract Issues

5.1 Architect-led or traditional system

In the architect-led or traditional system, contractors are invited to tender on the basis of complete drawings, specification and other contract documents defining the scope of the work. Competitive tendering is based on complete design such as key design drawings, specification, bills of quantities. Co-ordination by the architect or lead designer is absolutely critical in relations to specialist contractors responsible for the building structure (core and shell), services, and the fit -out work or configuration of

spaces and building elements. Co-ordination only links at the design level are shown in dotted lines below and the other lines reflects the contractual and co-ordination links.

Figure 1: Traditional System



The contractor is selected based on price, and other technical factors such as time for completion, sustainability, health and safety strategy and project programme. The lowest tender or best value bid is traditionally accepted, provided all other technical requirements are met. This process of not involving the contractor until a later stage removes the benefits of the builders input to the design. The design teams may not be able to effectively maximise cost and programme savings because the majority of the design is complete.

The JCT Standard Form contract (SFC 11) now provide for the provision of a 'Contractor designed Portion'. This allows the employer to place design liability on the contractor for specified work. In allowing for this, part of the criticism made above is addressed.

Changes in the work scope (variations) and employer delay are the substantial drivers in unexpected costs. The SFC JCT 11 deals with delay caused by the employer and its consequences, as well as delay due to variations, in the same way. Delay due by the contractor is dealt with by levying Liquidated Damages. The scheme to protect the right to such sums is provided by the provision of 'relevant' events (clause 2.29), which enable the contractor to make a claim for an extension of time. These are events which should they occur is at the expense of the employer. What this should mean in practice is the likelihood of the risks occurring is borne by the employer and should attract a lower price from the contractor who has not to price for it. In addition, the contractor is entitled to claim for costs arising which are not covered by any other provision in the contract. Clause 4.24 lists the relevant matters that entitle the contractor to these costs. Keating states that it difficult to conceive of circumstances where the employer under a JCT contract could lose its right to Liquidated damages. As the Privy Council stated in *Phillips Hong Kong v the Attorney General of Hong Kong* (1993) 61 BLR 41 'in building contracts...parties should know with reasonable

certainty what their liability [for damages] ***is*** under the contract'. The scheme for dealing with damages in construction contracts has been comprehensively analysed by Adriaanse (Bear 08) in the rule in Hadley v Baxendale (1854) and the standard forms of contract

The approach taken by the NEC3 contract is radically different to that usually found in other construction contracts. For a start The Engineering and Construction Contract (NEC 3) in its Secondary Option clause: Option X7 provides for the employer to opt to levy Delay (Liquidated) Damages (instead of relying on its common law rights). Delay and its consequences is managed through 'compensation' events. A compensation event is one that arises through no fault of the contractor. It compensates for any *delay not* caused by the contractor (a potentially wide exposure to risk). Clause 60.1 comprises nineteen events, and unlike other contract such as the JCT 11, deals with the consequences of the delay and the costs associated with it at the same time. Quite substantial workload is caused by the operation of the procedure required to operate the system. In addition the compensation event can also involve the requirement to give early warning (clause 16) and risk reduction meetings required by clause 16. Compensation events require:

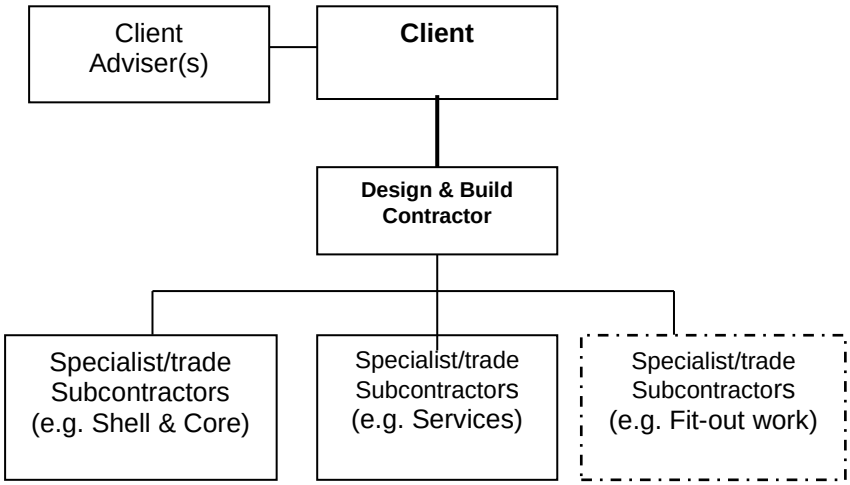
1. Notification of the event
2. Submission of alteration to the accepted programme together with quotations for carrying out the work
3. Preparation and submission of quotations (also time and money under clause 63)
4. Implementation of the Compensation events clause 63

Limiting the design liability in the JCT 11 is done by limiting the contractors' design liability to that of a professional person and the limiting of consequential loss arising from such a failure is limited to a sum fixed in the appendix. The NEC 3 also adopts the same approach.

5.2 Design and Build

Design and build sometimes called 'package deal' is a significantly different from the traditional system. The approach involves a significant overlap between design and construction activities. The client appoints a 'design and build' or 'develop and construct' contractor so there is a single point of responsibility and more significantly crucial construction input is provided at an early stage, unlike the traditional approach.

Figure 2: Design and Build Approach



If the design is carried out by the contractor, it limits the client's responsibility for design defects by transferring risk from the client to the principal contractor and their consultants. The client must determine whether the additional cost spent on the contractor taking the additional risk can be offset by the potential savings. The variant termed 'develop and construct' is where the client has a concept or scheme design which is completed by the contractor. The use of this variant of D&B procurement method whereby clients use consultants to design a project up to a particular stage and then have contractors price the project is sometimes criticised as it can create complex issues.

Some clients may not wish to become too involved in the design process. The key in the early stages of a design and build project is to appoint an adviser to develop appropriate briefing and design concepts to ensure that flexibility in design is achieved through better coordination of structure, services and equipment, fit-out and space planning elements. If an adequate brief and a statement of client's requirements are prepared, design and build could offer an integrated package to ensure good co-ordination between the design and construction teams. The D&B contractor is usually appointed on the basis of pre-qualification and negotiation leading to the agreement of a guaranteed maximum price (GMP) for a finalised design and specification. Alternatively, the appointment can be made on the basis of competitive bids usually consisting of design proposals and lump sum prices. This procurement method does not offer so much flexibility compared to that of the traditional approach and changes after the design has been agreed are usually more expensive to incorporate. Often the client is exposed to the risk of receiving a finished product that satisfies the Contractor's Proposals (CPs) in the contract but does not give the client the desired end product originally anticipated.

Design & build contracts are available for the D&B procurement route. The JCT Design and Build contract Form contract D&B11, also provide for 'Changes' in Section 5.These are variations in the traditional contract. Changes in the work due to employer delay are as pointed out above, the main drivers in unexpected costs. Delay due by the contractor is dealt with by levying Liquidated damages. The scheme to

protect the right to such sums is provided by the provision of 'relevant' events (clause 2.26). These are events should they occur is at the expense of the employer. What this means is that the *risks* of these is borne by the employer and should attract a lower price from the contractor who has not to price for it. In addition the contractor is entitled to claim for costs arising which are not covered by any other provision in the contract. Clause 4.20 lists the relevant matters that entitle the contractor to these costs.

A key issue here is design liability. In the Traditional contract, the interface between design and workmanship is called the 'fuzzy edge'. Placing design liability on the contractor is meant to resolve this issue. In practice, the contractor whether employed under as traditional contract or under a D&B contract neither designs nor builds but instead manages the process (Adriaanse, CIB World Conference). A view confirmed by HHJ Lloyd who said in *Birse Construction Ltd v Eastern Telegraph Company Ltd* [2004] EWHC 2512 (TCC) that :

'on virtually all building contracts of any magnitude, the role of the contractor is to use his management know-how not only to procure the requisite skills but also to know whether and to what extent they are being provided adequately to meet the requirements of the contract.'

The Standard forms of contract (JCT/NEC) limit the liability of the contractor, in design to that of the exercise of reasonable care and skill. By contrast the design liability of a contractor at common law is that of fitness for purpose. In practice the contractor will subcontract the design and construction to either professional consultants or specialist design subcontractors' (who will in turn employ professional consultants). The result is that the fuzzy edge is pushed down the chain. The consequence is best summed-up by *Cliffe (Holdings) Ltd v Parkman Buck Ltd* (1997) 14-CLD-07-04, HHJ Wilcox QC, OR observed that:

> the contractor may supplant the architects in some of their traditional roles as exemplified under a full (JCT) agreement. In particular, involvement in the choice and the co-ordination of the specialist systems and sub-contractors, the integration of those systems, the approval of all drawings and site supervision. The result may achieve economies and render the tendering contractor more economic. It does however put a premium upon the strength of the organisation and experience of the contractor in the enhanced role it plays in such a contract. Merely by employing an architect in a restricted role, such in this case, can it expect the architect to compensate for the shortcomings of the other sub-contractors.

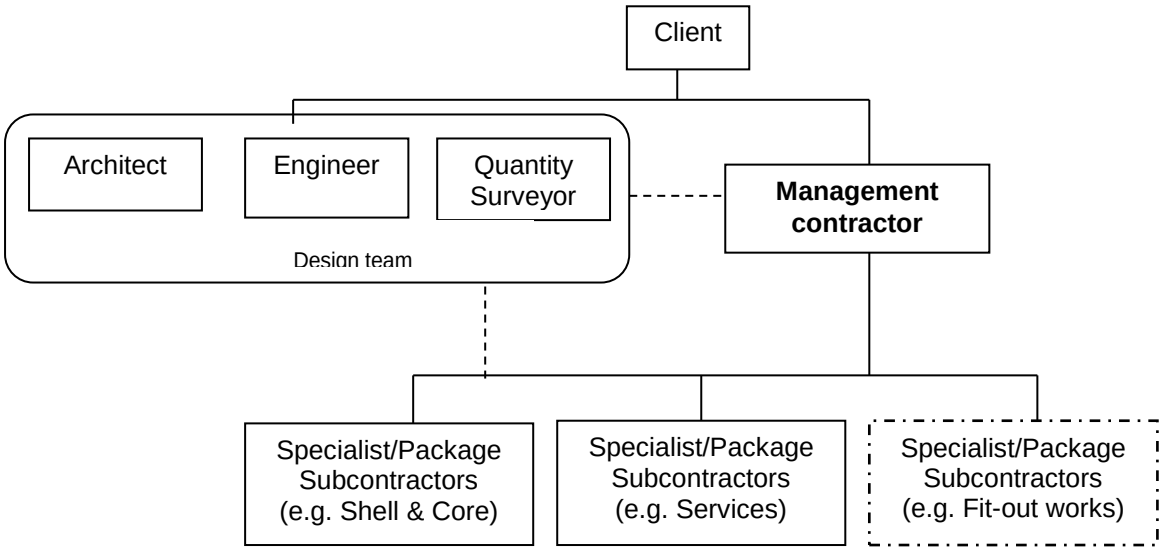
The employer in fact has to balance what it is receiving in its procurement system from what it *thinks* it is receiving. If parties are aware of the risk allocation, they will price their risk and exposure better. This may well mean that the client could abandon the project. In the well known case of *Pacific Associates Inc and anor v Baxter and ors* (1988) 44 BLR 33, hard materials in the underlying soils were not found during the site investigation. Although the contractor won damages in the resulting

arbitration its losses far exceeded its winnings. Had the client known the true nature of the site it might well have decided to abandon the project at the start.

5.3 Management contracting

Management contracting is also a slight variation from the traditional system. In this method, the design process is separated from the construction work but there are overlaps to speed up the procurement process. The client appoints a design team and also appoints a 'manager' often called a management contractor as a professional consultant at an early stage of the project usually a contractor who is paid a fee for co-ordinating the work of subcontractors split into packages.

Figure 3: Management contracting approach

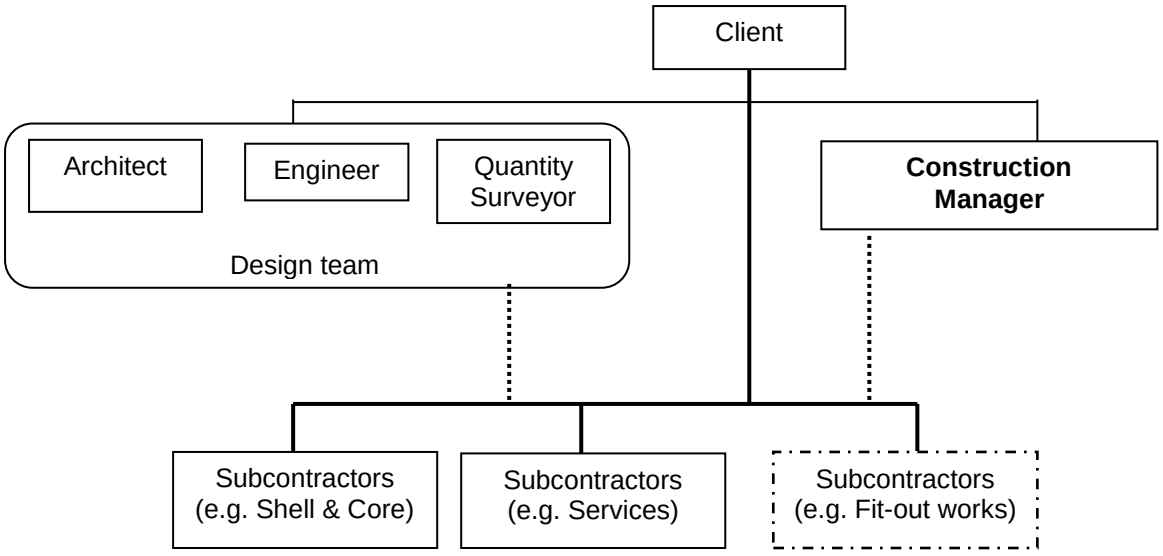


The management contractor supports the client's design team with construction expertise to improve the design solutions and the 'buildability' of the scheme. The management contractor is expected to appoint works contractors to undertake discrete packages of work. The contractual arrangement will be between the management contractor and the works contractor, however it is important to realize that the client is duty bound to reimburse the management contractor for all costs incurred. Under this arrangement, the client mainly carries the risk. A major criticism of this approach has been the risk aversion by some clients attempting to unload significant risks to the management contractor. One way of doing this is by insisting that the reimbursement of package subcontractors will be subject to a maximum tender figure, hence any cost overrun, other than agreed variations, will be the responsibility of the management contractor. This has led to adversarial relationships, which has affected the popularity of this route in recent years. This procurement route has therefore largely fallen out of favour with some clients in the global construction market, but where conditions are right it may provide an appropriate solution.

5.4 Construction management

This is a form of procurement which is similar to management contracting. The main difference is that the client places *direct contracts* with each of the specialist contractors and suppliers.

Figure 4: Construction management approach



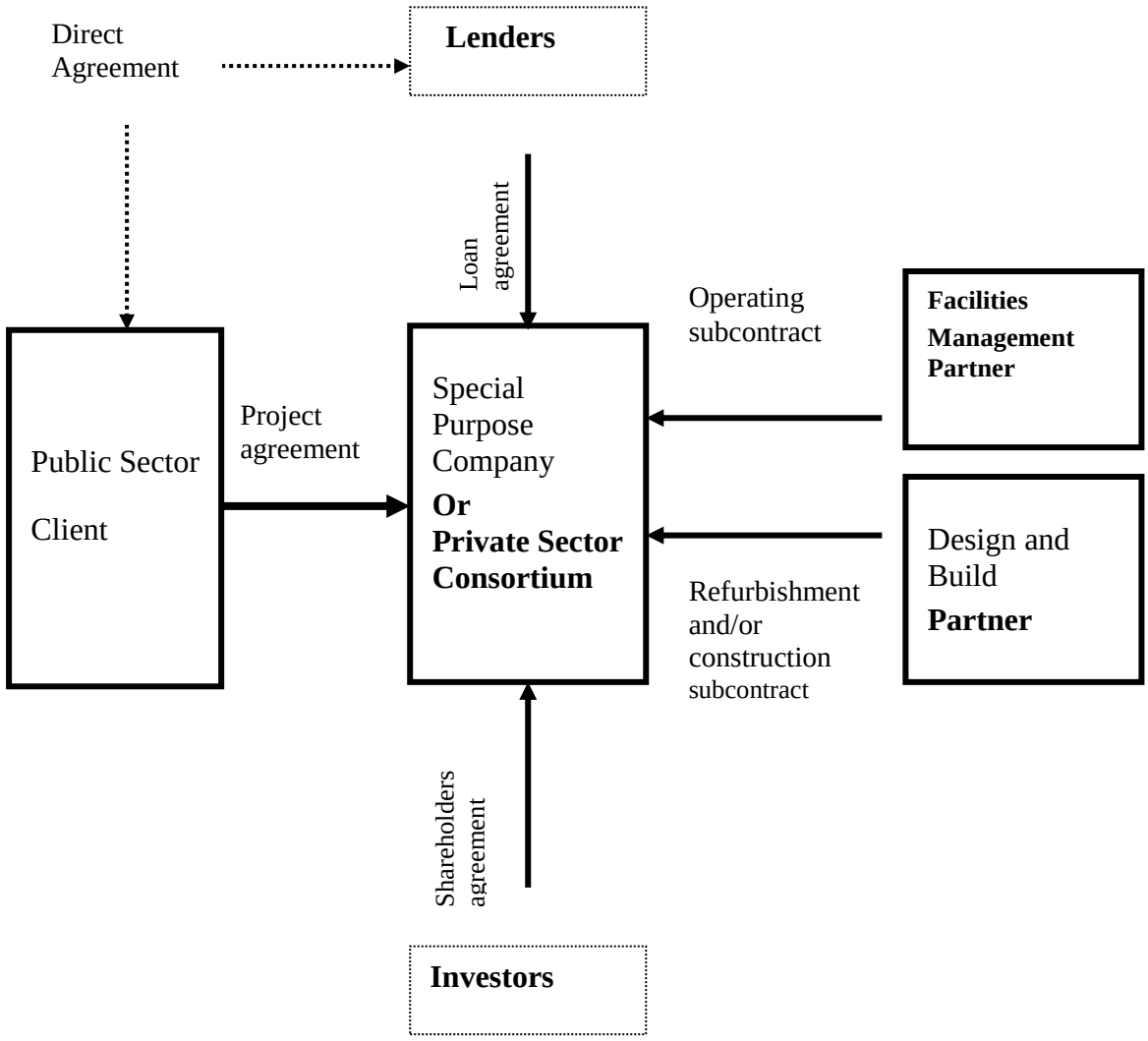
The expert construction management specialist is appointed as a consultant whose task is to effectively manage and control the construction process, as well as integrating the design team. In this manner the client has more direct control over works contractors and this helps to mitigate the risk associated with management contracting. This implies that the client is familiar with construction and has a close relationship with the professional team. The expert construction manager is therefore appointed as a consultant whose task is to facilitate the integration of the design team and effectively manage and control the construction process. Overriding influences in the selection of this route concern the complexity of the project and the strength of the risk involved.

Both the management contracting and construction management methods of procurement are in use but their use has declined due to the risks not being clearly allocated. In management contracting, the employer engages the management contractor to partake in the project at an early stage. Normally an experienced builder, the contractor is employed not to undertake the work but to manage the process. All the work is subcontracted to works contractors who carry it out. Construction management differs from management contracting in that the employer enters into a direct contract with each specialist. The employer engages the construction manager to act as a 'consultant' to coordinate these contractors. It is the legal uncertainty and the exposure to unexpected costs that has made these unattractive to employers.

6. Alternative Forms of Procurement

The procurement approaches discussed in the previous sections have limitations in terms of the durability of the relationships between clients, consultants and contractors. For example, in a traditional procurement, the liability of the contractor for rectification of defects after practical completion is normally restricted to a shorter period, usually 12 months. There has been a trend towards other types of procurement and forms of contract that fosters long-term collaborative relationships and transferring operating risk for a much longer period during the operational stages of the facilities or assets (Robinson and Scott, 2009). In long-term procurement approaches such as public private partnerships (PPP) or the UK PFI model, the contractor is liable for the delivery of the assets and a wide range of hard and soft facilities management (FM) services as well as the associated operating risks during the performance period spanning 25-35 years.

Figure 5: Contractual relationship and agreement between parties in PFI/PPP



The public sector client and private sector consortium (SPV) need to have full range of skills to complete a PFI/PPP contract. Legal, technical and financial advisors are

appointed by the public sector to help define business requirements, develop the business case, deal with risk transfer, cost and affordability, payment stream, managing the procurement process, and to negotiate the best contract for the client.

Gruneberg et al (2007) argued that 'if a supplier has a responsibility for how something performs, then his or her contractual liability must extend into the performance period'. This approach has clearly shifted and increased the risks on the PFI contractor as 'liability is inevitably extended under performance-based contracts' (Gruneberg *et al*, 2007). The PFI process involves exploring risk allocation and the value of risk transfer compared to the traditional route. There are various risks associated with planning and design development, construction, and operation of PFI/PPP projects. For example, design and construction risks are retained by SPV/contractor but such risks are transferred to the 'design and build' subcontractor where it is a separate firm. Operational risks relating to life cycle costs, innovation and technological changes are transferred to FM companies/subcontractors. Table 3 shows a simple example of how risk of cost overrun is valued based on the probability and the cost of the event. The project estimated construction cost is £ 200 million and the likelihood of cost overrun reflecting various risks is shown to amount to £17 million.

Table 3: Value of risk in PFI/PPP projects

Scenario:	**Probability of event (A)**	**Cost of event (B) (£ million)**	**Value of risk (C) = (A) x (B) (£ million)**
Projected completed below budget by £10 m	0.10	- 10	- 1.0
Project completed on budget	0.20	0	0.0
Project overrun by £20 million	0.40	+ 20	+ 8.0
Project overrun by £30 million	0.20	+ 30	+ 6.0
Project overrun by £40 million	0.10	+ 40	+ 4.0
Risk Adjustment to Project Cost			**+ 17.0**

Risk is valued based on (A) the probability of the event occurring and (B) the costs should the event occur. For each risk event, the process is repeated to arrive at an estimate of the cost or financial consequences. Typically, PFI projects seemed to value risk transfer at around 30-35% of construction costs (ACCA, 2004).The UK PFI model is seen as a durable procurement approach as the responsibility for long-term use and flexibility of the building is transferred to the private sector based on the output requirements of the client. The implications are significant for the way design, construction and operating risks are managed which has created challenges for some and opportunities for others such as facilities management firms.

7. Concluding Remarks

The building of Wembley stadium used a D&B approach to design and construction. It is therefore a typical example of a 'modern' contract. One that shows how outmoded the traditional contract is when it comes to modern methods of procurement? The disputes

that occurred were lower in the contractual chain rather than between the employer and the contractor. It was still a very costly exercise for all parties. The employer also lost revenue. Perhaps all it demonstrates that fully prepared scope of work will always be superior to making it up as you go along. No matter the method of procurement, having a design prepared will always be better than finding out your costs as you go along. A good example is *Plymouth & South West Co-Operative Society Ltd v Architecture, Structure & Management Ltd* [2006] EWHC 5 (TCC). The parties operated with no clear means of monitoring their costs. This resulted in an overspend of at least £2m in excess of the Society s estimate of about £6.3m. Knowing who takes the risk matters. The Wembley project was mired in dispute about delay and the resulting costs. Ensuring the parties who carries the risk and who has priced for it is a key to a successful project. As Professor Uff said in the 90th Thomas Hawksley Memorial Lecture citing Godfrey: 'a full identification of construction risks and their management...is part of the management process'.

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