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# Determining the Procurement and Pricing Structure

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This paper highlights the 2 main concerns that requires determination by an Owner / Developer of a construction project namely the procurement / contractual structure and pricing structure.

This paper also offers an insight on the partnering concept as an alternative to the traditional procurement / contractual structure.

This paper is also a continuation of the concept of risk management elaborated in the author's other papers entitled "Risk Identification and Allocation – A Necessary Step" and "Technology – A Risk Prevention / Mitigation Tool".

## ***The Contractual Structure***

Part of the process of identifying the risk commences with the choice of procurement of the project or the choice of the contracting relationship. This particular choice in itself requires an exercise of assessing to what degree the developer/owner can manage its own risk. This would then determine the procurement approach and will clearly dictate the cost budget for the project.

In deciding on the choice of procurement or contracting relationship, a developer/owner must consider 2 main issues namely the design function and the supervision and co-ordination of the construction works function. The determination of where the risks related to both these items ought to be placed, will then dictate the contractual relationship chosen.

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A design risk placed on a contractor may not result in an increased cost simply because the contractor has an opportunity to design a structure which can be built more cheaply and quickly.

There are also other considerations such as funding or financing or a need for a fast completion (military project) that may require a completely different structure to the contractual relationship with its dictated ensuing risk allocations.

Local conditions such as the experience and technological ability of the contractors or sub-contractors will also be a factor for consideration.

Therefore the developer/owner will have to consider the various options stated:

### ***Traditional Structure***

Most commonly known as the pure construct or build contracts, where the developer/owner appoints its own designer who, based on the conceptual requirements, produces a set of design drawings that ought to be sufficient for construction.

Within this structure, there can be instances where these designs are not sufficiently advanced (fast track projects) and the contractor is asked to take responsibility over some aspects of the detailed design.

There are also instances where there is an options for alternative or altered designs suggested by the contractor and accepted, renders these aspects of the design as wholly within the contractor's responsibility.

However, the essence of these traditional structures is that normally the developer/owner is responsible for the design vide his agent, the designer, and is also responsible for the supervision and co-ordination of the project. Generally the designer or the group of consultants would carry out the project supervision, guiding

and controlling the contractor during the progress of works and most importantly supervising the interface between the design and the construction.

There are some distinct factors that generally have to be considered in deciding whether to adopt this structure namely:-

- (i) is it a specialized project with a specialized concept that requires the input of professional and independent designers;
- (ii) further, is it a project where a contractor's technical capacities may not correspond with the type, complexity and standards required;
- (iii) is the developer/owner uncertain of what concept is required and seeks to settle this issue first before deciding to construct;
- (iv) is the design concept settled but time is not of the essence;
- (v) is the design concept settled but time is of the essence. If this is the case, then having a distinct design phase from the construction phase, and requiring a contractor to familiarize itself with the design and technological requirements may prolong the entire process.

If such a structure is to be implemented in a project, it is wise to consider carefully the effective role of the designer and the duties and obligations of such persons in correlation to the contractor. This is because there are various separate and distinct risks that arise from the traditional structure due to the involvement and interaction between the contractor and the consultants.

### ***Single v Multiple Contractors***

Upon deciding to use the traditional structure, the developer/owner must consider whether it is preferable for him to split the clearly distinct items of work and award the same to multiple contractors.

The tendency is for the developer/owner to utilize specialist sub-contractors for specialist areas of the works using the nominated structure and to use different contractors for the sub-structure and super-structure works, where applicable. However, the extent of the distinct items of work that can be divided up is dependent on the type of project and the complexity of the interface between the distinct items of work in terms of the design, the temporary works and time.

There are some distinct factors that generally have to be considered in deciding, whether to adopt this structure namely:-

- (i) the cost benefit by contracting directly with the specialist and various trade contractors. If the design is not complex in certain areas and the supervision and management teams are considerably experienced, then the cheaper utilization of domestic or local contractors may be possible;
- (ii) the direct control over the actual contractors who are involved at site (rather than the control exercised by the main contractor over the various sub-contractors). This in turn will result in direct control of the quality of materials, the interface between the design and the construction process and the problems faced at the site vis-à-vis the actual contractors at the site;
- (iii) the onerous responsibility of identifying the distinct packages and contractual needs;
- (iv) the onerous responsibility to co-ordinate the various contractors and packages including their schedules, and temporary works;

- (v) the onerous responsibility to interface the design of the differing items of works especially if there has been any defects or variations and any clashes discovered;
- (vi) therefore the need to appoint an extremely experienced and pro-active management and supervision team, normally from the consultants/designers to carry out (iii), (iv) and (v) above, with its ensuing reduction in the cost benefit gained. There can also be appointment of engineering procurement and construction management (EPCM) to carry out these services;
- (vii) the major risks of increased and varied claims from the various contractors.

### ***Management Contracting***

There is one other general variance to adopting the multiple contractors structure namely, management contracting. This is by way of appointing one lead contractor with the largest portion of the works who is then placed with the obligation to administrate and ensure the co-ordination between the various contractor schedules and to interface between their respective temporary works. This effectively means that a lead contractor will be required to coordinate and manage the project.

In fact within the management contracting structure there are a number of possible further variances. This includes placing all the other sub-contractors under nominated packages and making the management lead contractor responsible for the time, cost and quality control of these other contractors. It is unlikely however that in this situation the lead management contractor would be considered responsible for the workmanship or any design input from the other contractors unlike in the turnkey structure.

The role of the lead management contractor can vary as can its mandates or rights;

A further variance to this structure is to involve the lead management contractor in the tendering process for the other contractors and thus arguably making him responsible for the other contractors' workmanship or design input.

There are some factors that generally have to be considered in deciding on whether to adopt this structure namely:-

- (i) to ensure that the management contractor's fee is normally based on target pricing which is pegged to the decrease in the price or cost to the employer. It is therefore an incentive for him to control price by running an efficient and tight site;
- (ii) alternatively, the appointment of the management contractor only to co-ordinate between all contractors;
- (iii) there is also the risk that the lead contractor may not be able to effectively co-ordinate especially if the other contractors are also competitors and the risk of the lead contractor being partisan to only its needs.

### ***Design and Build or Turnkey***

This form of contracting places the duty to design and construct solely on the contractor and generally the traditional turnkey contracting structure is mainly based on an entire design and entire construct concept.

There can also be what is termed as partial turnkeys, where various contractors are actually appointed on separate design and build requirements. This is however not advisable as the interface problems do not only relate to that between the works and the designs, but also the design to design which may result in a technical nightmare.

The other hybrid is the part turnkey, part traditional structure. This is especially where in a particular project there may be a requirement for a complex equipment

system or complex civil requirement within the entire design concept. If the project is only limited to 2 sets of contractors, and if the works are actually distinct in time or space, the interface problems may be reduced and therefore this hybrid system may be workable.

In the traditional turnkey type of contracting structure, the consultants are merely involved in the tender and possibly the supervision of the work (or through project management company) and this may include providing them with some control over the designing and construction process depending on the developer/owner's requirements.

This contractual structure is normally tendered out on a lump sum firm price basis.

There are some factors that generally have to be considered in deciding on whether to adopt this structure namely :-

- (i) the entire responsibility and risk is with the contractor, other than those caused by the actions of the employer which ought to be minimal;
- (ii) the general contracting dangers to the developer/owner in respect of hidden allocation of risks are normally avoided;
- (iii) the design will correspond with the contractor's technical capacities;
- (iv) the efficiency created out of a fast track project may potentially reduce the price of the project;
- (v) the danger that the design is sacrificed at the expense of the cost of construction (under-design);
- (vi) the developer/owner's control of the project is minimal;
- (vii) the developer/owner or his consultants must be clear and precise as to their design concept and requirements at the tender stage as otherwise, there will be

extensive variation issues and obviously the ensuing delay issues. There have been instances where the design has been advanced by the developer/owner and his consultants before placing it on a turnkey structure in order to ensure there is no under-designing (joint design turnkey).

### ***BOT (Build, Operate and Transfer) – PFI Structure***

This structure normally applies to public sector projects or concessions.

The contractor is required to source its own project financing and recover the same as well as profit from operating the project for an agreed period.

It is one of total responsibility and total risk, where the contractor effectively designs, constructs, finances and has to ensure that the project is completed on or before time and is free of defects so that the contractor may be able to operate it immediately.

Thereafter, the contractor has the added risk of the profitability of the operation and has to maintain the facility over the number of years agreed.

For the purposes of the construction, the BOT contract structure is usually based on the turnkey form of contract as the differences between both structures of contracting do not relate to the actual construction and responsibilities but are different in terms of the financing, the operation upon completion and the maintenance.

The transferee will have the opportunity to verify the quality and the output capacity of the project whilst it is being operated by the contractor;

The incentive to the operator must be maintained especially as the operation period draws to an end as otherwise the maintenance of the project may be jeopardized. Some conditions of contracts require a limited period for defects and maintenance liability even after the transfer has occurred.



The BOT structure can become very complex due to the parties involved and the financing aspects. There may be various parties in a consortium obtaining the concession who in turn may contract with another set of parties for the design and construction whereby these said parties may also separately finance the design and construction. The concessionaire may then appoint a separate party to operate and maintain the facility and the margins are then split between the concessionaire, the contractors and the operators. When financiers get directly involved in the contracts, the structure very often takes a different shape and becomes highly complex and demanding as they will seek to demand an implementation of a contractual scheme that protects their investment and risk; and

This structure however becomes highly attractive when public funding is inadequate or when private management is seen as far more efficient and therefore beneficial.

### ***The Price Structure***

There should also be a decision on the price structure intended, as part of the process of determining who and how far a party is to be responsible for the design uncertainties or certainties.

There are generally 3 possibilities but variances within each structure are quite common.

### ***Lump-Sum***

This structure fixes the price regardless of the contractor's as-built cost and therefore places substantial risk on the contractor build-ability and assessment of the works involved from the specifications and drawings. The tendering cost for the contractor is normally higher due to the extensive assessments that have to be made.

This structure normally translates to a higher tender price unless, the contractor is claims-orientated and the contract conditions, specifications and drawings are weak in their drafting or preparation.

There are circumstances where the price may change but generally the risk of the quantities involved and the works that are indispensably necessary to complete and build lies squarely with the contractor.

It is common to require a breakdown of the lump sum prices along with a schedule of rates for the variation works.

Payments are usually in the form of stage payments or milestone payments;

The developer/owner would however have to compile and transfer sufficient information on the design and any other factors that may affect the contractor's buildability so that a realistic lump sum price may be formulated.

Despite providing some of this information affecting the buildability, normally as a measure of protecting the developer/owner, the more crucial elements of the information presented may carry provisos requiring further investigation by the contractor or be deemed to have been further investigated by contractor and the accuracy or veracity of the information is normally expressly excluded so as to avoid liability arising therefrom.

### ***Cost reimbursable***

In this structure, the contractor is paid for the cost incurred plus a pre-determined margin of profit, which can be fixed or fluctuating.

If the fluctuating fee is dependant upon the cost of the project, then in order to provide an incentive to cost efficiency, the developer/owner may introduce a target

cost which if exceeded may incur a decrease in the profit or fee earned. The fee disincentive may likewise be pegged to the completion date.

This pricing structure is normally used where it is impossible for parties to fully assess the construction cost because there are numerous uncertainties, such as in tunneling projects.

It should also be used in fast-track projects where the design is being developed as the construction work is proceeding as it allows the overlapping of design and construction processes.

It should also be used where there are non-financial objectives, ie. early completion is the imperative objective.

Another method that may limit the eventual cost of such a form of pricing is to apply a “reasonably expended” standard.

### ***Unit Price or Priced Bill or Re-measured***

This price structure establishes prices fixed by the contractor for various units or items of work involved and described in the bill of quantities and such prices are usually deemed to include the cost of materials and labour.

The risk as to the quantities and the take-offs from the drawings are placed with the developer/owner but normally the risk of a change in the cost elements related to any given unit of work priced vis-à-vis the rate in the bill of quantity is with the contractor although some structures allow a formulative increase for a percentage increase in quantities (where the quantities increase or decrease by a +/- %). These are commonly referred to as rates with escalations.

This method is extensively used as it is one of the most commercially viable form of contracting for the contractor especially with the open-ended valuation provision

applicable in most standard forms where in certain circumstances, even the risk of the increased cost comparative to the rate can be dislodged.

The advantage of using this pricing structure is that the contractor will more likely than not keep to the specifications, as there is no interest in cutting cost.

### ***The Owner's Objectives***

A simple table has been set up to show how the general effect of cost, time and quality risk co-relates to a developer/owner or to a contractor based on the procurement and price mechanism structure as discussed above. This is seen attached as Addendum 3.

A proper risk assessment therefore becomes the first step in the determination of the duration of the project.

The developer/owner would generally have to bear in mind the following objectives and project parameters in determining the contractual and price structure<sup>2</sup>:-

- Is cost control a major consideration;
- Does the owner wish to control the contingencies;
- Is a bid competition required;
- Is there to be maximum owner involvement;
- Is there to be minimal owner involvement;
- Does the owner have oversight capabilities;
- Is there to be a single source responsibility;

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<sup>2</sup> Paper delivered by Golloway, P and Nielsen K, at the 2<sup>nd</sup> Civil Engineering Conference in the Asian Region at Tokyo 2001

- Does the owner require the contractor to provide project funding;
- Are the project design, scope and specifications clearly defined;
- Are the complexities in the design and the details clearly defined;
- Are the quantities certain;
- Is there minimal scope changes expected;
- Is there a potential for large scale variations;
- Is the schedule tight;
- Is the project environment volatile or stable;
- Is it a large, complex project;
- Does the project involve primarily new technology.

Developers/owners must be willing to review and revise their actions in order to not only reduce their own risk but to also obtain the best price and at the same time avoid placing the project at risk by placing the contractor at too much risk. The steps to be taken ought to include:-

- Reviewing the contract documentation before giving out to tender and testing them against the checklist of the risk allocations;
- Making more information, even for soil conditions, known to the contractor. This is despite there being exclusions of liability. Alternatively, ensure that the serious tenderers do carry out soil investigations or obtain further information before commencement;
- Carrying out construct-ability reviews to ensure design is cost efficient;

- Utilizing real time dispute resolution procedures (temporary finality – adjudication, references to experts or the dispute review boards);
- Establishing realistic contract performance period;
- Budgeting and having the funds for contingencies;
- Planning for communications or aspects of partnering;
- Pre-planning for permits and authority approvals;
- Accepting that soil and site conditions are risks best undertaken by the owner otherwise cost of the bid would escalate or risk of non-performing contractor becomes real. Empirical research has shown that generally there is no increased cost due to claims by allowing a provision for reasonably unforeseen soil conditions claim<sup>3</sup>;
- Delegating decision making authority to owner’s representative;
- Allowing for pre-defined formulae-based adjustments of value for variations;
- Pre-defined procedures for claims and substantiation;
- Realization that consultants and determiner SO can waive strict procedural requirements and can assume liability through conduct and to provide protection for the same (unauthorized acts);
- Considering or seeking advice on new risk sharing practices or clauses.

It is to be noted that a completely over-optimistic duration will either lead to fewer tenderers of a doubtful nature, higher cost or a delayed project with its ensuing financial repercussions, which the owner/developer would have to endure before

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<sup>3</sup> DW Halligan, WT Hester & H R Thomes, “Managing Unforeseen Site Conditions”, Journal of Construction Engineering and Management, American Society of Civil Engineers [1987]

seeing any possible recovery from a contractor. As such, there is now suggestion that developer/owners should also utilize tools that have traditionally been used by contractors in pre-planning and scheduling their works when considering the overall duration of the project.

### ***Partnering***

One of the traditional criticisms and the cause of a lack of interest in public sector projects used to be the fact that the Government and its consultants refused to assume any risks. In 1990, the Risk Allocation Subcommittee of a Joint Working Party of the Australian National Public Works Conference and the National Building and Construction Council noted in their analysis paper :-

*“the private sector should expect to assume a higher level of risk than a normal construction bid but the public sector cannot assume a zero risk posture as this will not allow a properly priced financial proposal and will discourage participation and subsequent privatization opportunities.”*

The new millennium has seen the U.S., U.K., Australia and even Hong Kong implement the new concept “partnering” relationship for public sector projects so as to manage cost and time overruns. This concept is also a positive step towards the elimination of a claims culture, where productivity is tied in with rewards with time spent moving forward in a project and not postulating or looking for loopholes and bickering at the site in order to enhance a claim. Even JKR is venturing to draft a partnering or alliance contract.

What is partnering? In essence it is:-

- A maturity of realising that value is in the long term relationship obtained by trust and openness where the long term goal is for profitability of all involved;
- All parties are encouraged to openly address problems because each party realizes that no one benefits when there is exploitation;
- Innovation is encouraged;
- Each party is aware of the others' needs and weaknesses and serves to work together to achieve a win-win;
- The project benefits, the overall performance is improved, the reputations are enhanced and the profitability of the project is increased thus allowing a sharing of this benefit;
- It is not however an excuse to compromise the quality or to introduce variations without cost;
- There is no guarantee that disputes will not arise or that the budget will not be exceeded.

Partnering makes use of a collaborative approach between contracting parties where 2 or more organisations work together to improve performance through agreeing mutual objectives, devising a way for resolving any disputes (“nipping problems in the bud”) and committing themselves to continuous improvement, measuring progress and sharing the gains<sup>4</sup>.

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<sup>4</sup> Definition extracted from Sir John Egan’s report “Rethinking Construction”



Teamwork and good faith underscore the relationship between parties where timely completion and cost reduction becomes the all-pervading mutual contractual objective. However, there must be a partnering culture within the management of the parties involved.

A successful partnering solution can only occur if there are commitments on 2 levels :-

- (a) the senior management, where the tri-partite commitment arrived at during “brainstorming sessions” is often embodied in a written document termed as a “Partnering Charter”. It is to be noted that at this stage there is no dispute or any view that one party is the enemy and as such, the commitment to solving problems rather than disputing them is usually forthcoming; and
- (b) the staff level where the commitment begins with teambuilding workshops in which goals, open communication, trouble shooting and internal dispute resolution processes are agreed upon. The workshops continue throughout the project.

The Partnering Charter is then defined as a Contract Document as therefore the agreed processes must be implemented in the spirit of the Partnering Charter. The success of partnering also depends on many of the same personnel staying on throughout the process from the non-aggressive conditions of the pre-contract stage till the project is completed. A copy of a sample of the partnering charter is in Addendum 4.

Amongst other projects<sup>5</sup>, the Andrews Oilfield project involving BP has been referred to as a successful partnering process where there were brainstorming processes for

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<sup>5</sup> Also the House of Commons Project in 1999, the Thames Water supply project, the 3Com office and research facility project, the Bleak Hill School for St. Helens MBC , 2 R&D centers for Nortel Networks,

one year between BP and contractor and both sides came to a viable plan within BP's original budget of GBP 370 million (which was initially found not economically viable as the cost was estimated to be GBP 450 million) and the timescale. They executed an additional alliancing agreement. The project was completed under budget at GBP 280 million and early and both parties shared the success. All the additional costs which arise from distrust procedures normally implemented in a project ie. duplication of inspectors, certifications checking processes, were cut out.

The end result was that the contractor gained more through a profit sharing scheme where it received a bonus of GBP45 million, over and above its cost plus payments.

Partnering suits projects that are of high value and high risk where the pricing structure tends to be a cost reimbursable type contract or a guaranteed maximum price type contract ("GMP"). The partnering charter's or agreement's philosophy must be reflected in the construction contract as well.

The interesting legal elements normally adopted in a partnering process can include the involvement of the contractor in the design process, the adoption of good faith requirements with the uncertainty of how the courts would interpret the same, the construction cost treated as a prime cost with an undertaking to have an open book basis for the cost incurred and the GMP is the benchmark, a lessening of the severity of the LAD by attaching milestones with grace periods for catch up or setting of LAD against costs savings and bonuses, a reconsideration of the need for retention sums or defects liability periods and a much more amicable dispute resolution process being made compulsory.

In England, despite the partnering charter not being incorporated into the Contract Documents, judges were willing to consider the intention of the parties derived from

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the Roko Leisure Health and Fitness Club in Portsmouth, Monmouth Sports Hall in Monmouthshire, the Brownfield regeneration scheme for Ealing Family Health Authority, UK, all referred to by Sir Michael Latham in a conference in Kuala Lumpur on 26.2.2002.

the charter as a basis to construe rigidly or flexibly a particular ambiguous clause in the conditions of contract<sup>6</sup>.

In Malaysia, it is likely that a well-drafted partnering contract will be construed as effectively a project partnership defined by the contract where concepts of fiduciary duties and a duty to use best endeavours to ensure the success of the venture will encapsulate good faith principles<sup>7</sup>. However, there must be clear drafting to limit any excessive construction of the fiduciary principles within partnership, which may not be suited even for a partnering concept.

So why partnering:-

- Reduces real cost<sup>8</sup>;
- Improves predictability;
- Meets the end users' needs (especially public projects);
- Improves on quality and safety;
- Avoids hostilities and the possibility of one party (which could be any party) being left with a loss<sup>9</sup>;
- There should be projects where reputations are made whilst no one loses;
- Avoids the time wasted on claims and avalanche of accusations and correspondence without solutions;

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<sup>6</sup> as per Judge Humphrey Lloyd QC, *Birse Construction Limited v St. David Ltd* [1999] BLR 194

<sup>7</sup> as per Gopal Sri Ram JCA, *Hartela Contractors Ltd v Hartecon JV Sdn Bhd & Anor* [1999] 2 CLJ 788

<sup>8</sup> According to Sir Michael Latham's project examples it would seem that partnering averages a 10% to 15% cost savings. In the USA it is reported to save up to 5% of the cost, per Heale Andrew J, "Construction Partnering : Good Faith in Theory and Practice", *Const Law Journal* 1999

<sup>9</sup> Sir Michael Latham describes this proposition as "why change, didn't we do okay?" resistance to change and the short answer is, "no we didn't do okay, or if we did, someone got kicked and sometimes it was us"

- Time for the industry to change and companies to become successful in construction technology and experience rather than a few rich men!
- Margins may not be as great as the “good” jobs but you have a chance at avoiding the “bad” ones;
- The negatives tend to be the trust factor amongst people at management (at site it sometimes is seen) and the bad guys won’t let it happen. Shouldn’t this change?

The current available standard forms for partnering are the PPC 2000 and the NEC Partnering Option 2001.