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Project Procurement Methods

A CLIENT GUIDE

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epm
projects pty ltd

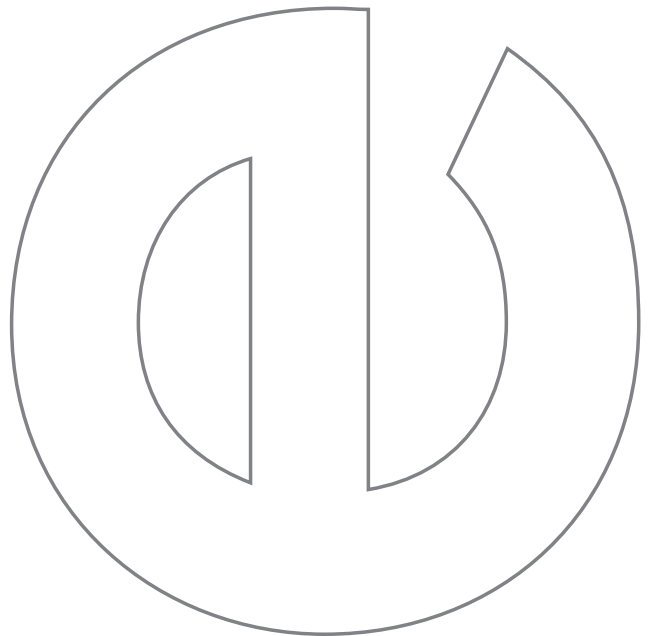


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INTRODUCTION

This client guide describes the most common methods for procuring building projects. It serves to assist clients of EPM to make informed decisions and thereby provide clients the opportunity to make their projects a success. It considers the strengths and weaknesses of each method, important matters in selecting a method, and key elements for managing the selected method. It concludes with a summary of seven guiding principles. It reflects almost 100 years of collective experience of EPM Projects management team in project management.

CHALLENGE

Property development is unquestionably risky business. How then does the project procurement method influence this risk? Answering this question before selecting a procurement method should set the project on a course for success.

STRUCTURE

This guide is structured in five parts as follows:

PART 1 - Project Procurement Methods

We explain the most common methods for procuring projects.

PART 2 - Strengths & Weaknesses of Procurement Methods

We discuss the strengths and weaknesses of, and risk mitigation measures for, each of the methods discussed in Part 1.

PART 3 - Selecting the Preferred Method

We discuss our view about the principles that should guide the selection of a method.

PART 4 - Risk Allocation Considerations

We discuss our view of the principles of risk allocation as this relates to selecting a preferred method.

PART 5 - Project Administration Considerations

We discuss our view about matters that should be considered when managing projects and administering contracts under the various procurement methods.

DISCUSSION

PART 1 - Project Procurement Methods

Successful project delivery depends on deliberate and careful management and administration of the selected procurement method. It demands an appropriate focus on the areas that give rise to the greatest risk, a clear understanding of the procurement method, and the reasons it was selected over other methods.

The Procurement Practice Guidelines published by the NSW Government Procurement Office point to ten methods that are used by the government to procure construction projects. In our experience, the four most common of these methods used by private enterprise are:

1. Construct Only
2. Design Finalisation & Construct
3. Design & Construct
4. Managing Contractor

What do these mean, and in what context do they work best?

To understand these methods, it is first necessary to understand the meaning of the following terms.

• **Concept Design** – The initial high-level response to a project brief, used to test whether the requirements are likely to be able to be feasibly achieved.

• **Developed Design** – This stage of design moves beyond being conceptual or schematic to a greater level of detail. It illustrates how the design might respond to various constraints and opportunities. The process is often iterative, with each iteration leading to further development of the design.

• **Documented Design** – Once a developed design is agreed it must be documented suitable for use by external parties. Ordinarily it would satisfy one or more of three purposes – tendering, construction, and/or certification. The documented design shows the components of an object or building element. It shows how the components fit together. Documented design includes a corresponding commentary or set of instructions (commonly referred to as a specification).

• **Construct** – The Oxford Dictionary defines the word “construct” to mean “build or make (something, typically a building, road, or machine)”. While this may seem obvious, a clear understanding of the meaning of this term is important in managing risk associated with selecting and administering project delivery methods. This will become clearer later in this guide.

Constructing includes procuring all the components in the shape, size and composition depicted in the documented design, having regard to the instructions (specifications). When arranged in the ways shown in the documented design, the components form a true physical representation of the documented design and thereby meet the intentions of the designer.

So, how do each of the four methods work? Moreover, how do they differ from each other?

Method 1 - Construct Only

Under this method, someone other than the party that has the responsibility to construct, undertakes the documented design. Typically, the project owner procures the design and then engages a builder to construct the design.

While the industry uses the term ‘construct only’, this does not mean that a contractor does not have any design responsibilities. This is because there is inevitably an element of design that can only be undertaken by a builder in consideration of the specific circumstances at the time. For example, a builder is required to prepare drawings for the manufacture of windows or joinery. These ‘workshop drawings’ as they are commonly known, are used to reflect the manufacturing process, materials and systems used in that particular building element. Workshop drawings incorporate design and yet are the responsibility of the builder.

Nevertheless, the inference is that under the Construct Only method, the design should be sufficiently documented (or detailed). This enables a competent and experienced builder to interpret the design in a manner that enables it to construct. The risk for errors and omissions in the design rests primarily with the party that is responsible to procure the design, generally not with the builder.

Method 2 - Design Finalisation & Construct (DF&C)

Here, the responsibility to procure the design (that is a concept or scheme) is distinct and separate from the responsibility to procure the developed design, the documented design and then to construct. These latter phases rest with the builder under this method.

This method substantially shifts the risk relating to errors and omissions in design to the builder. However, to the unsuspecting, this method also creates a different dimension of risk which will be considered later in this guide.

Method 3 - Design & Construct (D&C)

Under a D&C arrangement, the responsibility to develop design based on a concept, document the design and to construct resides with the builder. Typically, the concept or scheme reflects what are commonly referred to as 'user' or 'project' requirements. This is a written statement, communicating the performance standards and requirements to be met by the completed building. This is normally prepared by, or on behalf of, the client and accompanies the concept design.

This is one of the most common methods used to shift risk associated with property development to the builder. While not criticising this method, in our experience it has the potential to create more risk than it solves. This is particularly so in circumstances where ownership and operation will remain in the same hands (e.g. a school, or an aged care facility).

Method 4 - Managing Contractor (MC)

This works under an arrangement where the builder is responsible to manage the procurement of the concept or scheme, the developed design, the documented design and to construct. However, unlike other methods where the builder has responsibility to procure design, in this case the builder generally does not take any risk associated with the suitability of design. Similarly, the builder does not take responsibility for many of the other risks that are usually associated with "contracting" (e.g. price, delays, subcontractor performance, industrial disputes and inclement weather).

PART 2 - Strengths & Weaknesses of Procurement Methods

There are inherent risks with each procurement method. No one method will suit every circumstance. This means that it is important to understand the strengths and weaknesses of the various methods before deciding a preferred method. The table in Appendix 1 sets out our experience-driven view about the strengths and weaknesses of each method. We also show ways in which to mitigate risk.

PART 3 - Selecting the Preferred Method

Time, cost and scope are the three essential elements in decisions about project delivery methods. In our experience, one will eventually be compromised to obtain the other two. Consider the following examples;

Cost & Scope before Time

A new building can be constructed within one year at a cost of \$15.0 million. If, however, the owner wanted to reduce the cost while maintaining the same scope, they would need more time to investigate alternative building materials and source alternative quotes. Thereby trading off time to meet cost and scope objectives.

Time & Scope before Cost

The owner wants to bring forward the completion date while maintaining the same scope. This would incur additional cost for overtime labour, in this case trading off cost to meet time and scope objectives.

Cost & Time before Scope

If the owner wanted to bring forward the completion date without increasing cost, they would need to reduce the scope of the project, thereby trading off 'scope' for 'cost' and 'time'.

Clearly there are strengths and weaknesses of each delivery method. No single method is right in all circumstances. Therefore, it is important to decide the priorities first before choosing a procurement method. This is because the chosen method will largely determine the extent of your control over time, cost and scope.

The diagram in **Figure 1** below serves as a general guide to the preferred method in consideration of the priorities.

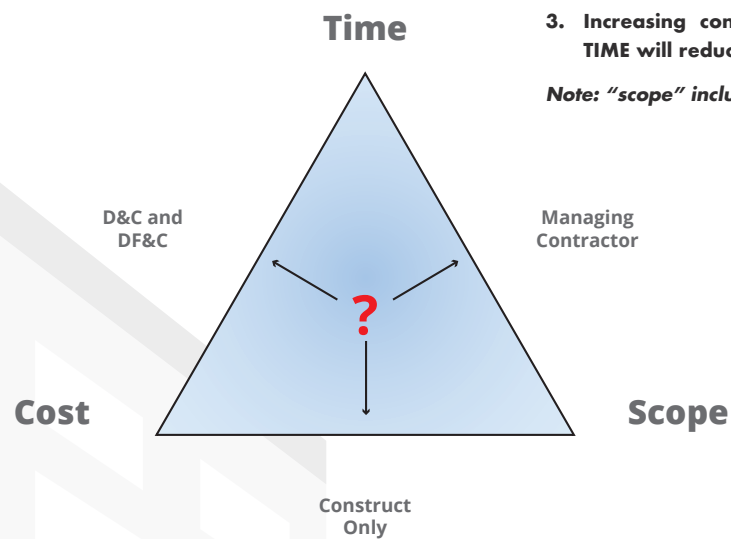
Figure 1 – Guide to Method Selection

The contracting method should be selected having regard to your priorities.

General Selection Principals

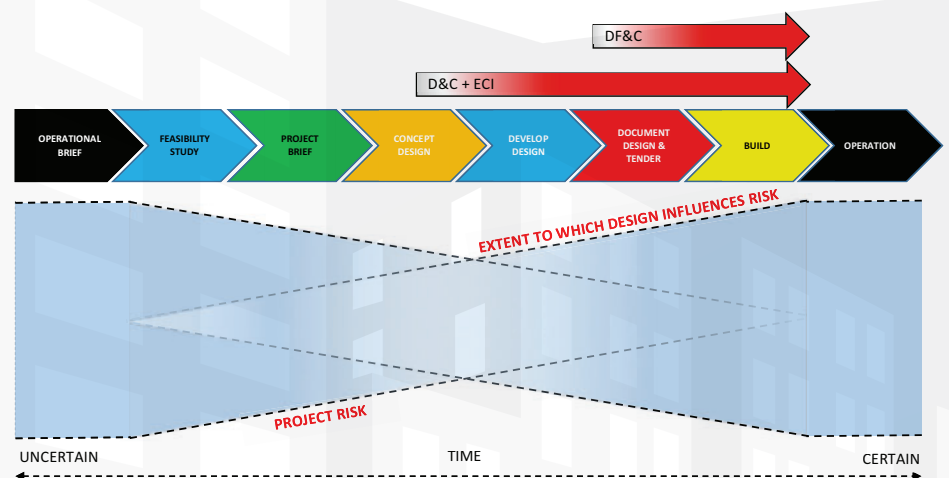
1. Increasing control over **COST & TIME** will reduce control over **SCOPE**
2. Increasing control over **COST & SCOPE** will reduce control over **TIME**
3. Increasing control over **SCOPE & TIME** will reduce control over **COST**

Note: “scope” includes “quality”.



The diagram in **Figure 2** below shows the point in the project lifecycle at which each method is typically introduced relative to the risk in the project at that point.

Figure 2 – Project Lifecycle



The foregoing diagram demonstrates that risk diminishes as certainty increases over the course of time. Importantly, the diagram also demonstrates that the extent to which design influences risk (project and operational) increases as the project moves through the project lifecycle.

PART 4 - RISK ALLOCATION

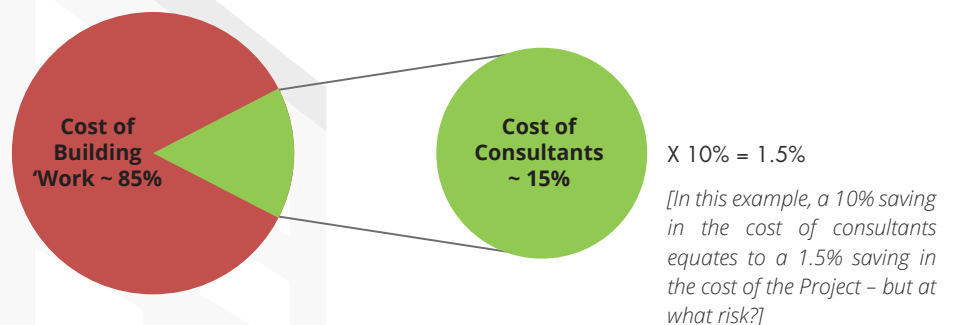
We hold the view that risk should be managed by those who are best placed to manage it. It follows that transferring risk to someone who is unable to manage that risk will place them in a position where they are highly likely to fail.

If scope (or quality) is one of the two priorities that should not be compromised, then we question the wisdom in a method that makes the builder entirely responsible for design (at any point). In our view, selecting such a method would simply be incongruous with the priorities for the project.

In our experience, a better way to manage the risk in the quality of design, is to appoint an experienced and well-resourced team of consultants. They should be properly (and expertly) briefed and managed and given the time to appropriately finalise the design.

The cost of consultants typically ranges between 10% and 15% of the overall cost of a project. This investment will significantly determine the risk in the project. Saving (say) 10% of the cost of consultants at the expense of good quality design conflicts with the priorities of a project where scope (quality) should not be allowed to be compromised. This is illustrated in Figure 3 below:

Figure 3 – Cost of Consultants



We believe that an investment in good quality design will assist to manage the risk in construction. Making a builder responsible for design does not necessarily minimise such risk.

Over the last decade, a method that is referred to as 'Early Contractor Involvement' (ECI), has gained prominence in an effort to maintain a client's control over scope while minimising the risk that arises out of poor quality design. ECI is a hybrid of Construction Management combined with Design Finalisation & Construct. The table in Appendix 2 describes the view of EPM about the strengths and weaknesses of ECI.

In the experience of EPM ECI, like any other method, should be selected having regard to the priorities of the project. It should not simply be an attempt to shift risk to the builder if the builder is unable to manage the risk.

PART 5 - Project Administration Consideration

In our view consideration should be given to the following matters when administering a project under any of the previous methods:

1. Principal's Project Brief – A client should articulate the requirements for the project and the design of the buildings from the outset. When asked to offer an opinion about design, our general response is to ask "... does the design meet your requirements in terms of function and form? Is it likely that it can be constructed within your budget"? Surprisingly, few clients can answer this question with confidence, one way or another.

We generally recommend that the client's architect is made responsible as the lead design consultant to coordinate all elements of design. We also recommend the preparation of a "Design Brief" (in the case of a Construct Only method, before progressing beyond the concept and design phase), or a "Statement of User Requirements" (in the case of a "Design and Construct" method). There is a subtle difference between a Design Brief and a Statement of User Requirements. The former will be more prescriptive about how something is to be designed. The latter will provide "performance criteria" to be satisfied by the design thereby giving greater opportunity to achieve the design objectives through any one of a number of ways.

2. Consultant Services Brief – In the case of a Construct Only method, it is critical that designers are clear about the requirements for the design of the buildings, and the services that they are to provide. We believe consultants are often poorly briefed, sometimes by no more than a two line email requesting a proposal for design work without any proper accompanying services brief. In such cases, it is not surprising that design is also of poor quality.

Consultant Services Briefs should clearly set out the scope of the required services, and integrate. The average building project commonly requires upward of 15 to 20 consulting disciplines. This means that the coordination of all of the services offered by these consultants is a good starting point for good quality design. Good quality design will be relatively free of errors, omissions, inconsistencies, ambiguity and discrepancies. This will lead to more reliable pricing by the builder, minimising delays and claims for variations during building. It will also minimise disagreements and disputes and improve the overall quality of building work.

3. Time to Design – Irrespective of the delivery method, design requires time to "get it right". This is a case where the phrase "more haste, less speed" rings true.

When using a method that involves a builder in design, it is important to establish the following rules:

- **Design Reviews** – Regular joint reviews of design with the builder and its design consultants.

- **Design Approval Gateways** – Don't permit design to proceed from one phase (or stage) to another until the builder has demonstrated that the design complies with the Principal's Project Requirements (PPRs) or Statement of User Requirements.

When using a method that involves a builder in design, it is important to verify that the requirements for the project are in fact achievable, particularly in a Design Finalisation & Construct arrangement where the client may be responsible for a portion of the design.

4. Design to a Cost – A builder that has responsibility for design will be highly motivated to 'design to a cost'. Unfortunately, this is where many projects delivered under a Construct Only method fail. The reason for the failure is that, rather than 'designing to a cost', the delivery team 'costs a design'. That is, the design is not engineered to a price. Often it's not until receipt of tenders (market prices) that the cost is properly understood. At this point it is difficult to make changes without affecting time and quality. It is important for the design team to actively engage with cost consultants in an endeavor to design to a cost. At the least, this will enable the project owner to make choices and plan for their impact on its business and the project. Designing to a cost increases the prospects for successful delivery of the project.

5. Careful Administration – It is often said "... let's just put the contract in the bottom drawer" or "let's not be contractual". To us, that would be like saying "... let's just put the drawings in the bottom drawer". Irrespective of the chosen delivery method, diligent and careful administration of the contract by the client, the project manager and the builder, coupled with clear communication, is fundamental to successful project delivery.

SUMMARY OF GUIDING PRINCIPLES

This guide can be summarised in the following seven guiding principles:

1. Decide and communicate your priorities early.
2. Carefully consider the strengths and weaknesses of each delivery method.
3. Take care when attempting to shift risk through a selected procurement method that you do not create more risk than you solve.
4. Make sure there is a clear and detailed statement of the requirements of the project owner for the project.
5. Carefully brief the design consultants.
6. Allow as much time in design, in order to spend less time in construction and minimise risk.
7. Adopt diligent and careful contract administration practices.

ABOUT THE AUTHOR

Andrew Graham is the CEO of EPM Projects Pty Ltd. Andrew's project management experience includes work in a range of organisations including Leighton Contractors, the Sydney Organising Committee for the Olympic Games and Optus Communications. It includes a large number of projects across the commercial, education, and aged care sectors. A portfolio of the work carried out by Andrew and his team at EPM can be found at www.epmprojects.com.au. Andrew can be contacted by email at agraham@epmprojects.com.au or by telephone +61 2 9452 8300 or on mobile phone at +61 419 732 021.

Strengths & Weaknesses of Procurement Methods

Method	Advantages	Disadvantages	Mitigation
1. Construct Only <i>The project owner procures design that is suitable for obtaining statutory development and construction.</i>	1. Greatest level of control by project owner over design throughout project. 2. Greatest opportunity to change design prior to construction with the least impact on the cost of the project. 3. The builder's price includes the lowest risk margin in comparison to all other methods other than Managing Contractor. 4. Enables the most accurate comparison of construction prices on a 'like-for-like' basis.	1. Significant up-front investment by the project owner prior to certainty about the feasibility of the project. 2. Design may not be as "buildable" (cost efficient) as should be the case with the other methods. 3. Setting aside "early works packages" (which present an opportunity to accelerate the project but create risk of design coordination errors) construction cannot commence until documentation is complete. 4. The risk of errors and omissions in design documents leading to delays and variations rests predominantly with the project owner. 5. The risk for compliance of design with statutory development standards and codes rests predominantly with the project owner.	1. Thorough "feasibility study" that is based on a concept design that is based on a clear 'User (project owner) Brief'. 2. Stakeholder consultation process, particularly in the early stages of design to minimise project owner-led design changes during construction. 3. An experienced cost consultant who is integral to the development of design, cost plans and value engineering at key points through the development of design. 4. Experienced, well-resourced and properly briefed consultant team who produce good quality documentation that is "complete, accurate and coordinated".
2. Design Finalisation & Construct (DF&C)	1. Involves less upfront investment in design in comparison to the	1. There is an increased risk of disputes arising out of ambiguity in the division of	As per "Construct Only" plus: 1. Good quality 'Statement of Principal's

APPENDIX 1

Strengths & Weaknesses of Procurement Methods (continued)

Method	Advantages	Disadvantages	Mitigation
Typically the project owner procures design to a standard that is suitable for obtaining statutory development approvals while the builder is responsible to document the design from that point for construction.	Construct Only method in order to gain greater up-front certainty about the probable cost of the project. - In contrast to the Construct Only method, the risk for compliance of design with statutory development standards and codes can be shared or transferred entirely to the builder. - In contrast to the Construct Only method, the risk of delays to the project and cost impacts brought about by design can be shared or transferred entirely to the builder. - In contrast to the Construct Only method, this method gives opportunity for innovation in design arising out of the experience of the builder. It can make the design more buildable and potentially less costly in a shorter period of time. - In contrast to the Construct Only method, this method gives opportunity for the builder to inform design priorities, building methods, materials selection, construction details, and advise on early procurement.	The responsibilities for design in comparison to the Construct Only and Managing Contractor methods. - There is an increased risk that design does not meet the requirements of the project owner in comparison to the Construct Only and Managing Contractor methods. - Changes in the requirements of the project owner may be more costly in comparison to the Construct Only and Managing Contractor methods. - There is a risk that construction work that is undertaken before the whole of the design has been documented will be uncoordinated leading to quality issues. - The builder prices risk that he may not be best placed to manage and that unnecessarily loads the cost of the project in comparison to the Construct Only method.	(project owner's) Requirements' that is informed through stakeholder consultation. - Clearly defined process for an obligation on the builder for procuring design and obtaining client approvals at prescribed milestones. - Novation of consultants to the builder to ensure mutual recourse by the project owner and builders to consultants throughout project and beyond. - Project owner engages separate consultants to review design documentation produced by the builder. - Require approval of 'designers' engaged by D&C subcontractors. (to facilitate Advantage No.6) the development consent must include the ability to issue multiple (staged) CC's (or equivalent).

APPENDIX 1

Strengths & Weaknesses of Procurement Methods (continued)

Method	Advantages	Disadvantages	Mitigation
	Builder can also assist with developing information to support applications for statutory approvals. 6. In contrast to the Construct Only method, this method gives opportunity for construction to commence before design has been fully documented.		
3. Design & Construct (D&C) <i>Typically the builder is responsible to develop design for all purposes for which it is required based on a concept and a statement of the project owner's requirements prepared by the project owner.</i>	1. Involves even less upfront investment in design in comparison to the foregoing methods in order to gain even greater up-front certainty about the probable cost of the project. Otherwise as with 'Design Finalisation & Construct' except that: 2. In contrast to the foregoing methods, the risk for compliance of design with statutory development standards and codes is usually borne entirely by the builder. 3. In contrast to the foregoing methods, the risk of delays to the project and cost impacts brought about by design is usually borne entirely by the builder.	1. As with DF&C except that the risk that design does not meet the requirements of the project owner are even greater.	1. As per Construct Only Items 1 and 2 and as per DF&C Items 1, 2 and 4. 2. Detailed design programme identifying timing for required client input and / or approval.

Strengths & Weaknesses of Procurement Methods (continued)

Method	Advantages	Disadvantages	Mitigation
4. Construction Contractor (Incl. Construction Management) <i>The builder works collaboratively with the project owner and its consultants during the design process, and arranges and manages the trade contractors.</i>	- Is the most collaborative method between the project owner, designers and builder to manage time, cost and quality. - Provides the greatest incentive for a builder to provide innovative ways in which to deliver the project without cutting corners. - In contrast to the Construct Only method, this method gives opportunity for construction to commence before design has been fully documented.	- The probable cost and timing of the project at the commencement of building work is less certain than in all other methods. - The risk of the performance of a supplier or trade contractor rests with the project owner including the risk consequent to a supplier or trade contractor becoming insolvent. - The risk that costs that should be borne by the builder because they are overheads become trade costs borne by the project owner.	- Require the builder to contract directly with trade suppliers and contractors. - Ensure that overheads that are included from in the builder's fee are clearly defined. Also consider an arrangement whereby the builder is engaged under a lump sum price that initially comprises the builder's management fee, a lump sum for margin and overheads, and provisional sums for trade works, and that provisional sums are progressively substituted with agreed lump sums as and when the trade works are let (referred to as "Progressive Lump Sum").

Early Contractor Involvement

Early Contractor Involvement (ECI) – A builder is appointed by the project owner to work with the project owner and its consultants to identify ways in which the design can be made more efficient (buildable). It is more commonly associated with a DF&C method.

Advantages	Disadvantages
1. If done properly, should make the design more efficient (buildable) than design that is not informed by a builder and trade contractors. 2. If done properly, should minimise costs from variations arising out of errors and omissions in design procured by the project owner.	1. Depends on a builder giving up its IP. This in turn depends on an up-front commitment by the project owner that the project owner will not 'shop' (seek competing prices for) the ideas of the builder. 2. Depends on a corresponding, up-front commitment by the builder to selected trade contractors that may compromise the ability of the builder to obtain competitive pricing for trade works. 3. The earlier in the project time lifecycle that a builder is asked to price its margin (preliminaries, overheads and profit), the greater the risk to the builder and hence the more likely that the margin will be inflated or qualified in a way that in itself gives rise to risk that the project owner that it was hoping to avoid. 4. If the builder's margin is not agreed up front (which is difficult for the reasons set out in Item 3 above), then the project owner may form the view that the price is uncompetitive. This may force the project owner to seek competing prices. This could be difficult if the project owner is under time pressure or has made a commitment to the builder for the reasons set out in Item 1 above. 5. The builder will naturally be motivated to make it work while maintaining its profit targets. This may motivate the builder to promote methods and materials that are less than ideal in the short term and long term (causing maintenance issues). 6. If after all the effort to make it work, the project owner is not satisfied that the price is right, it may find it difficult to obtain competing prices from the market as by that time there may be a perception in the market that the project is troubled.

There are ways to mitigate the foregoing risks. However, these need to be worked through with the project team in consideration of the priorities and specific circumstances of the project.



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