

Design and Build Delivery Model

Construction Procurement Guidelines

October 2019

Overview

In the design and build delivery model, the main contractor takes on the responsibility for both the design and construction.

The client develops the functional and technical performance requirements for a facility and this information is used in the tender process, to invite contractors to submit proposals for design and construction. With the exception of relatively simple, straightforward projects, design and build projects typically require a comprehensive set of requirements documents to ensure that the completed facility meets the client's expectations.



Comprehensive set of requirements documents

These may include (this list is not exhaustive):

- site layout and plans showing functional relationships between spaces
- perspectives of facility to illustrate the aesthetic requirements
- schedules of accommodation (listing rooms and minimum areas to be provided)
 - room data sheets setting out the requirements of each specific room in terms of:
 - required function and number of people to be accommodated
 - floor, wall and ceiling finishes
 - power and data requirements
 - lighting levels and requirements
 - environmental performance requirements including:
 - acoustic performance
 - temperature and ventilation
 - natural daylight
- facility functional and technical performance requirements (output-based specification).



Describing performance requirements

A design and build specification provides a description of the requirements in output or outcome terms, concentrating on what is required rather than how it is to be delivered. Using air conditioning as an example, a design and build specification would typically define the performance requirements to be achieved e.g. intended design life, future maintenance parameters, temperature range and air change frequency.

Under a traditional delivery model, the specification would go much further than this in describing in detail the layout, size and extent of ducting, the exact type of heating and cooling equipment to be installed, the required capacity of the fans and all other details making up the system to be installed by the contractor.

If the requirements in a design and build contract were to be prescriptive, this could create issues in transferring design responsibility fully to the contractor, and limits the flexibility of the contractor to work with their design team and supply chain to come up with innovative design solutions.

Benefits of integrated design and construction processes

Design and build can provide certainty in cost, and cost benefits. Integration of the design and construction processes means value-for-money decisions can be optimised, since aspects of buildability will be key factors in design decisions. The design team can work with the contractor to consider the costs of constructing the range of proposed design solutions.

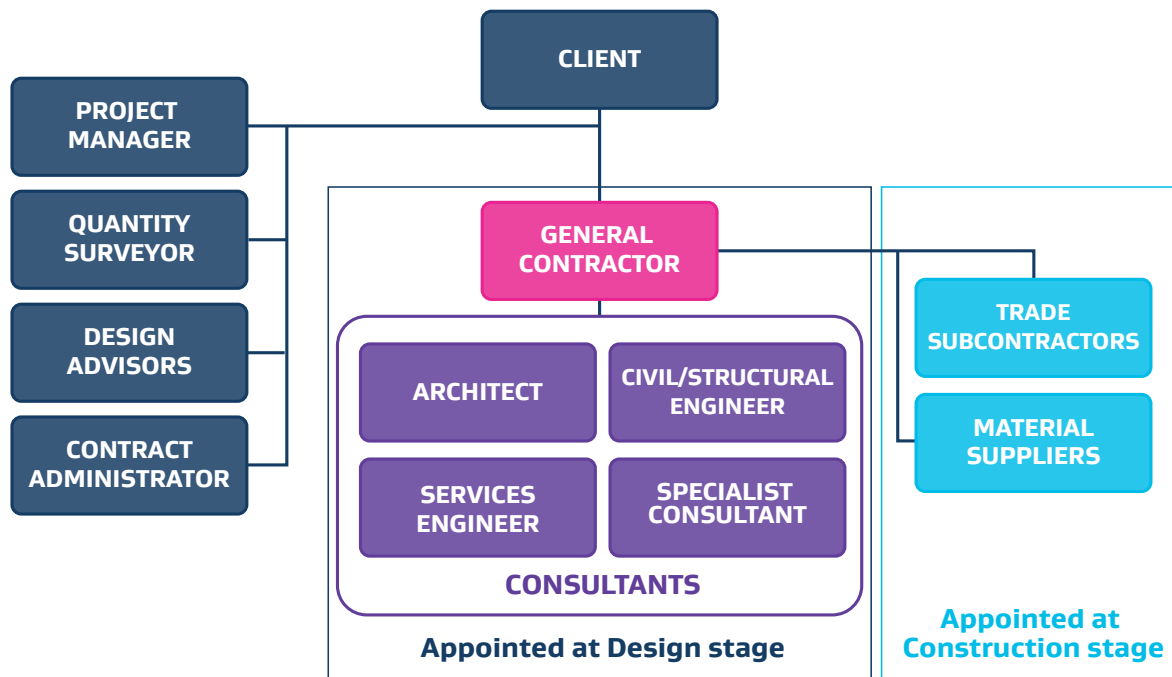
The contractor will also be able to bring their expertise, and that of the supply chain, to work with the design team in developing innovative design solutions that maximise project benefits. They may, for example, specify alternative products that meet the same performance requirements that the design team are looking to achieve, or source alternative products that have shorter lead times for delivery to speed up the programme.

Speed of delivery

Design and build can enable an earlier on-site start date and an earlier completion date when compared to a traditional delivery model, through overlapping design and construction activities. However, compared to a traditional delivery model, extra time will be needed at tender stage. This includes sufficient time allowances for tenderers to prepare proposals for the design, and sufficient time allowances for the tender evaluation team to review and evaluate proposals, and to seek clarifications from tenderers.

Design and build delivery model contractual relationships

This diagram shows a typical contractual arrangement for the design and build model.



Variations of Design and Build

Several variations of design and build exist as outlined in the table below.

Variation	Meaning...
Competitive	<ul style="list-style-type: none"> Several contractors prepare tenders to offer competition on both design and construction proposals. Usually according to an output-based specification that details the functional and technical performance requirements to be achieved.
Develop and construct	<ul style="list-style-type: none"> The client's consultants design the building to a partial stage, often referred to as 'scope design', then competitive tenders are obtained from a select list of contractors to develop (using their own in-house or external design consultants) and complete the design and construct the work.
Novation (sometimes referred to as 'design, novate and construct')	<ul style="list-style-type: none"> The client appoints design consultants to develop the design to a stage it feels comfortable to tender, with the intention of novation of (transferring) the consultants' appointments to the successful contractor, who will complete the design and carry out construction. The design team's continued involvement in the project provides continuity in the design process, but after novation they take instruction from the contractor on all design matters. The client needs to consider appointing an independent design consultant to monitor contractor outputs, to ensure the design meets contractual requirements. Novation can be useful in an overheated market, where design development costs would result in contractors being reluctant to tender.

Level of design information provided at time of tender

The level of design information provided to the contractor at the time of tender will influence the contractor's ability to realise the benefits a design and build delivery model is intended to bring. Tendering near-completed designs is not good practice. It limits opportunities for innovation and is likely to result in significant risk pricing as the contractor seeks to cover its risks for taking on responsibility for a design developed by others. Clients that use the design and build delivery model in this way are primarily using it as a way of transferring most of the project risk to the contractor, while limiting the contractor's scope to manage this.

At a glance – Design and Build Delivery Model

Guidelines for use

This model is best used when:

- functionality is more important than achieving the highest possible design quality
- there is a need for a high degree of cost certainty at the time of contract award
- the result sought by the client is clear in terms of stakeholder requirements, and the required functional and technical performance standards can be clearly defined at the time of tender
- the client does not want to take on design risk and/or the client requires a single point of responsibility for design and construction
- there is good capability in the market for design and build to be adopted for the type of project
- there is a need to improve integration of the design and construction process, to improve constructability outcomes.)

Potential benefits

- Construction can commence shortly after contract award, in advance of all detailed design packages being finalised. This makes an earlier start on site possible, and can result in an earlier completion compared to traditional methods.
- The design has high potential for innovation, resulting from the input of the contractor and its supply chain into constructability and flexibility in identifying optimum materials and construction methodologies.
- There are potentially fewer disputes and more effective management of any design-related issues, due to having a single point of responsibility for both the design and construction work, and minimising design/construction interface risk.
- There can be a high degree of cost certainty where functional and technical performance requirements are clearly defined at tender.
- The contractor generally warrants the design's fitness for purpose, although this should be clearly defined in the contract. For example:
 - The client may accept the risk that the layouts and relationships of spaces within a facility as defined and agreed in the contract are appropriate for meeting their operational output needs.
 - The contractor may accept all technical risks around ensuring that the facility achieves the performance requirements as defined in the contract.

Points to note

- Projects that are complex in terms of their design requirements, or require exceptional quality, are less suited to design and build. The nature of design and build is that there will always be choice for the contractor in determining the final selection of systems and materials to meet the performance requirements.
- Sufficient time is needed in the tender period for contractors' design proposals to be prepared. Sufficient time is also needed for assessment of designs alongside the construction programme, methodology and price.
- The cost of tendering is generally higher than under a traditional delivery model, attracting a smaller pool of tenderers (novated approaches can help reduce this cost).
- Clients should consider reimbursing some or all of the contractors' bid costs, to encourage good competition and innovation (design costs comprise a small part of the overall whole-of-life cost).
- The designer's primary duty is to the contractor; therefore the client will need to consider appointing its own design consultants to act as advisors in monitoring the design outputs of the contractor, to ensure they meet the requirements of the contract.
- Be clear about any elements of the design that may need to be confirmed post-contract (eg, colour and texture of finishes). The contractor can be requested at tender stage to provide some flexibility in providing a range of options

Guidelines for use

that can be decided upon later on.

- Quality outcomes of the project will reflect the client's specified performance requirements, so it is critical that these are carefully specified in the tender documents, to ensure high-quality outcomes are delivered.
- It may be difficult for the client to exert any significant level of control over the design process, and any significant design changes required post-contract are likely to prove costly.