

FEATURES OF DESIGN & CONSTRUCT

J McMullan, 1996

There are a number of observations which might be made in relation to design and construct contracts generally:

1. Importance of Design Brief

The Design Brief is a document which is attached to the Design & Construct Contract. That document describes the works which are to be constructed for the Contract Sum.

The design brief is a technical document which includes some or all of the following:-

- (a) schematic drawings of the proposal;
- (b) general specifications of the proposal and performance criteria for the works when complete;
- (c) site information;
- (d) any other technical details which impinge on the Works which are to be constructed.

The preparation of the Design Brief is a matter for the Principal. Usually that function will be performed by the Principal's design consultants. The Design Brief is not intended to be a detailed design, merely that it is sufficiently detailed to express exactly what it is that is to be designed and constructed by the Design & Construct Contractor.

The Design & Construct Contract obliges the Design & Construct Contractor to produce a detailed design, to comply with the requirements expressed in the Design Brief, and to obtain the approval of the Principal (usually the Principal's design consultants who prepared the Design Brief) prior to commencing construction. Claims usually arise, at this point, between the Principal (on the basis that the detailed design has produced is low quality, or does not adequately perform the function which is described in the design brief) and the Contractor. It is critical, therefore, for the Design Brief to be adequate in describing the works which are to be constructed and the functions which they are to perform.

The types of documents/technical information which might be expected on a civil engineering project would include any or all of the following:

- site information
- demographic information
- civil engineering quality/quantity inputs
- preferred (or permitted) treatment methods
- output criteria

The information to be included may seem, at first glance, to be reducing the design input which was being hoped for from the design and construct contractor. The level of information provided to, and restrictions placed upon, will vary depending on the project. There will always be a minimum level of specification which will be necessary from, and in fact should be desired by, the Principal. Further, in some cases, there will be political restraints on a particular project.

Such matters are, contractually, necessary to be included in the Design Brief.

2. "Buildability"

The principal advantage of a design and construct contract is that it allows the construction contractor to bring his construction expertise into the design process.

There is a view that the ability of the construction contractor to design the works with the convenience of construction in mind will result in cost savings to the Principal at the time of tender.

The design and construction contractor is able, in producing the detailed design, to incorporate certain design criteria which may suit the contractor for ease of construction. Accordingly, the tender price is likely to be lower (taking into account the cost of the actual design work) than where a Construction Contractor was pricing works which had been designed by others, with no regard to the "buildability" of that design.

It is yet to be seen whether this will be true in the civil engineering sector. It would have little relevance, for example, if the design complexities mean that construction contractors simply engage or joint venture with pure design professionals.

Further, the capacity of any contractor to incorporate notions of "buildability" into a particular project design is directly related to his previous experience in design and construction. It seems unlikely (at least initially) that local contractors will have a great deal of experience in the civil engineering sector (compared to, for example, the construction of roads or buildings)?

Perhaps, therefore, we will now see the arrival of experienced large Australian and international contractors at the same time as more complex project delivery systems (as occurred in the recent Sydney Civil engineering Board projects).

The incorporation of construction expertise in the design process is certain, it seems to me, to result in substantially more efficient designs and lower tender prices.

3. Single Point of Responsibility

There are a number of potential situations in traditional style contracts where the boundaries of the responsibility of the designer for design and the construction contractor for construction may become unclear.

There is potential for dispute as to responsibility, where the works as constructed fail to perform in accordance with the specifications (for example, leaking, cracking, discolouration ...). In such instances, the Construction Contractor might assert that the problems are a design flaw, whereas the designer might assert that the design was adequate but the works as constructed did not comply with that design. Where the Contractor has responsibility for both the design and construction, this problem does not arise.

There are several such potential areas of overlapping responsibility. For example:

1. claims sometimes arise in traditional contracts (where the detailed design has been performed by the Principal prior to entering into the Contract) where the Contractor is asserting that the design cannot (or cannot conveniently) be constructed;
2. where the Works, as constructed, do not perform the required function in accordance with the specifications, and/or are defective, a difficulty sometime arises where the Contractor is asserting that the problem is a design fault, and the designer is asserting that the problem is a construction fault;
3. claims sometimes arise where the construction contractor is delayed by the designer during the construction phase (for example, in waiting for asserted errors or ambiguities in the design documents to be resolved).

In each of those instances, the Principal would be faced with the designer and the construction contractor blaming each other and denying liability to the Principal.

Contractors often assert that the Principal and/or the Principal's design consultants have failed to take into account whether or not the works as designed by the Principal are able to be built, and whether construction cost savings could have been achieved if the design were other than as produced at the time of tender.

Usually such claims do not arise until after the execution of the Construction Contract (because they were not perceived until that time).

Where the Design & Construct Contractor has responsibility to produce the detailed design, this type of claim will not arise.

4. Perceived fast tracking

There is a view that a Design & Construct Contract increases the possibility for "fast tracking" of the Project.

Some minor improvements in the programming of capital works can often be achieved through the Design & Construct model. The pre-tender phase is likely to be shorter than for a traditional contract (because it is only necessary to prepare the Design Brief, rather than the detailed design which would take substantially longer) prior to inviting tenders. The detailed design work is able to be performed after

execution of the Design & Construct Contract, and during the early stages of construction, in a staged manner.

However, the timing benefits of this process may be illusory. At the point of commencing construction, at least the stage 1 building approval is required for the foundations. Accordingly, at that point, the design of the structural matters must be complete to the point where the foundation details are known. The detailed structural issues, and the architectural detail, may be able to be produced later to then obtain subsequent staged building approvals.

Further, in relation to capital works within the civil engineering sector, it is likely that the perceived advantages of fast tracking would be negligible for a number of reasons:

1. the lengthy lead times to acquire the site and/or obtain planning and EPA approvals make minor time improvements largely irrelevant;
2. the complexity of obtaining political support for a particular is, typically, a higher priority than minor time improvements, #9;6 Contract Administration

Under the Design & Construct Contract, the parties may or may not have a third person in the role of Superintendent/Architect. (This is equally true of traditional contracts.)

Usually the person in the role of Superintendent under a traditional contract is also the designer. To the extent that the construction of the Works is not consistent with the original design philosophy, there is still some control able to be exercised over the construction Contractor. Under a Design & Construct Contract, there would still be a Superintendent, he is merely not the (detail) designer.

For the same reasons that a civil engineering authority is likely to err on the side of conservatism in assessing whether to have the contractor's detailed design independently reviewed, it seems to me that the Principal would usually insist on a comprehensive administration of the contractor's obligations under the contract. Accordingly, I would expect to see the use of a superintendent on such projects.

7. Potential for Dispute

The unique area for dispute arising in design & construct contracts, rather than traditional contracts, arises at the time of the proprietor's review of the contractor's detailed design.

The Contractor must design the Works in accordance with the requirements of the Design Brief. By definition, however, the Design Brief will be descriptive rather than detailed and will rely, in most instances, on defining function and performance criteria, rather than specific design elements.

The Contractor will, naturally, be inclined to use lesser quality materials to reduce cost (the Contract Sum having already been agreed). The Principal, on the other hand, would usually have a higher impression of the degree of quality which was intended within the Design Brief.

Accordingly, there is always a possibility (in practice, it seems a probability) of substantial dispute as to the exact materials and/or construction criteria which are required pursuant to the Design Brief.

Further, in many instances, the dispute will be a technically esoteric dispute as to the likely performance of materials and/or workmanship which have not yet been incorporated into the Works.

To the extent that a proprietor does not adequately describe, in the Design Brief, the materials and/or workmanship which is to be performed under the Contract, there is potential for this type of dispute.

This is likely to be a critical issue for the civil engineering sector.

The Design Brief is complex on any project. On civil engineering treatment projects it is likely to be particularly complex for a number of reasons:

1. the technical complexity of input data of civil engineering quality and quantity, and the desired output quality, will be hard to adequately specify, and hard to contractually enforce (in a traditional the difficulty is still present, but the Principal and/or the design consultant design the plant and the contractor merely constructs whatever is described in the plans and specifications);
2. the design Brief may necessarily include matters which go beyond mere technical criteria (for example, political constraints);
3. the Design Brief may sometimes be based on "in principle" planning/EPA approvals, resulting in "final" approvals being necessary on completion of the detailed design (accordingly, the detailed design may may need to subjected to a final approval by third parties on grounds other than mere compliance with the Design Brief).

This complexity is probably warranted on bigger projects, where the "buildability" advantages are likely to be worthwhile. The preparation of the Design Brief on civil engineering projects, however, is likely to be a non-trivial task.

8. Potential Design Conflict

A potential conflict for the contractor may arise in designing the Works under a Design & Construct Contract.

The Contractor, having contracted to construct the Works for the Contract Sum, and to the extent not expressly prescribed within the Design Brief, will be required, as any designer must, to make a number of design decisions.

On the one hand, the Contract Sum having been agreed, the Contractor will be inclined to keep costs to a minimum. On the other hand, the Contractor, also being the designer, would wish the materials and/or workmanship to result in a constructed product which performs adequately (at least in accordance with the Design Brief).

For example, in designing the Works, a Contractor might be inclined (remembering that the Contract Sum has already been agreed) to use lower quality materials (where they have not been specified in the Design Brief) irrespective of the design life of those materials. The Design & Construct Contractor may conclude that his contractual obligations cease at the end of the Defects Liability Period (this is not strictly correct, however problems of proof may make this practically so) and, therefore, there is no reason for the Design

& Construct Contractor to prefer more expensive materials to less expensive materials, provided that the less expensive materials would last at least to the end of that Defects Liability Period. The Principal, on the other hand, would prefer the more expensive materials in order to reduce long term maintenance costs.

(This is an example of the type of detail which should be included in the Design Brief.)

This issue would usually arise at the stage of approval, by the Principal, of the detailed design as prepared by the Contractor. The issue will turn on what has or has not been specified in the Design Brief (there is some limited opportunity to assert implied terms, but difficulties in relation to the implication of terms, generally, limit the practical effect of implying terms into the Contract).

Accordingly, the Contractor in performing his design role, will have a conflict between the proper performance of that design role and the desire to keep costs to a minimum.

In the financial analysis of proposed capital works in the civil engineering sector, the operating costs are far more critical to the viability of the proposal than, for example, on buildings.

There will be difficulties in tender assessment. An authority would want tenderers to take the competing capital cost/operating cost issues into account when submitting their design proposals in their tenders. The assessment of such tenders will be more complex, the more flexible the Design Brief.

There will be further difficulties at the time of approval by the Principal of the contractor's detailed design. At that point, the Principal and the contractor (the Contract Sum already being agreed) will have competing interests in relation to the operating and maintenance costs of the Works as designed, the only reference being the matters set out in the Design Brief.

9. Choice/Quality of Designer

The design & construct tenderer, when bidding on the tender documents, will usually be required to disclose the identity of the detail designer. The Principal will usually wish to have some control over the choice of designer (whether the Principal has a particular preference or whether the Principal is merely interested to have a suitably competent designer).

On complex projects, the Principal may require the engagement by the Contractor of a suitable firm of professional design consultants. In this manner, the Principal will have remedies against the Contractor in contract and/or against the professional consultants in negligence should the (detailed) design ultimately prove to be inadequate. (The Principal will also wish to ensure, in that instance, that the particular design consultants have adequate professional indemnity insurance.)

(A possible method of addressing this issue is to require the successful Design & Construct Contractor to "novate" the Principal's existing professional services contract with the original designers. This form of "novation" contract has other consequences which should be considered, beyond this short discussion of Design & Construct. In any event, however, it is probably unnecessary for the Principal to insist on the choice of one particular firm of design consultants over another, especially if, in fact, that would result in higher tender prices).

The perceived disadvantage as to choice of designer, when weighed against issues of "buildability" and single point of design responsibility, may be illusory.

2.10 Contract Administration not by Original Designer

There is a perceived disadvantage in having the administration of the construction contract performed by a person other than the original designer.

It is correct that the original design philosophy is likely to be more adequately addressed by the original designer, in the administration of the construction contract, than by a professional who did not perform the ultimate design. It may be, however, that, again, this disadvantage is illusory. The likelihood is that, subject to the choice of a suitable person for the role, any professional contract administrator would have regard to the design philosophy in superintending the construction of the works.

It seems to me, in the civil engineering sector, that it will be the Principal or a professional engineering superintendent, rather than the designer per se.

2.11 Risk Allocation under the Design & Construct Contractor

The allocation of risk under a Design & Construct Contract is slightly more complex than under a traditional contract.

Under a traditional contract, the adequacy of the design (with all of the consequences which flow from inadequate design in respect of both the Works, and/or delay or additional costs caused to the Contractor) rests with the Principal. The Principal may or may not have adequate remedies against the original designer pursuant to their (separate) professional engagement agreement.

This is likely to be a major factor (in favour of using the design/construct model) for civil engineering authorities.

Unlike the traditional contracts, the responsibility for detailed design rests with the Contractor. There are a number of risk areas for the Contractor in this role:

- (i) compliance with the Design Brief;
- (ii) adequacy of the design generally;
- (iii) design approval by the relevant building authorities.

Each of these matters need to be properly addressed in the Design & Construct document.

In addition, there should be a process whereby the detailed design is ultimately submitted to the Principal for the Principal's approval prior to construction. Again, this is a risk area for the Contractor, and also for the Principal. This is the point at which major dispute as to the adequacy of the detailed design will usually arise. This area of risk is not present in a traditional contract.

In all other respects the risk allocation under a Design & Construct is similar to that which one might find under a traditional contract. It is a matter for the parties to negotiate the allocation of those risks.