

Developed Design and Build: Changing procurement landscapes

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Abstract

Calls to integrate design and construction in order to improve the effectiveness of the UK construction industry have played a central part in construction best practice advice over the last 70 years. The latest Government Construction Strategy repeats this call and harnesses a range of new procurement routes in order to meet this need (GCS, 2011). This research explores the nature of Design and Build in use in the UK construction industry. It finds that developed forms of Design and Build are becoming increasingly popular with a large amount of degree of pre-contractor design and specification development. The principal reason for this movement is risk transfer with various sub-categories that are explored in turn. It is argued that this move to more developed forms of Design and Build are counter to the prevailing calls for integration in the industry.

Keywords

Design and Build, Traditional Contracting, Procurement, Integration, Risk Transfer

1. Introduction

The UK construction industry's £122 billion output in 2011 (Smyth, 2012) is funnelled through a range of purchasing systems, or more aptly named, procurement routes. Design and Build can be considered an umbrella term for a range of popular procurement routes which are used to procure large amounts of this investment by a range of public and private clients. This study aims to investigate the current nature of Design and Build procurement in the UK in order to increase the effectiveness of this purchasing route. Whilst some literature (Akintoye, 1994; Bennett *et al*, 1996) recognises that different forms of Design and Build exist, including those differentiated by the amount of pre-contractor design and specification development, Design and Build is still widely portrayed as a form of procurement where the contractor is responsible for developing the design and specification from an early stage (CIOB, 1988; OGC, 2007).

2. The Design and Build Family

Traditional Contracting has been defined as ‘the procedure whereby a client engages an architect and other consultants to design and control a building project and the construction is carried out by a main contractor appointed after competitive tender (CIOB, 1988: p.viii)’. In its purest form, traditional contracting is the polar opposite of Design and Build procurement, which has been defined as ‘A building service where an organisation undertakes and accepts responsibility for both design and construction functions (CIOB, 1988: p.vii)’.

Design and Build can be considered 'a family of procurement options' characterised by their integrated approach, where one organisation is responsible, to differing degrees relative to the extremity of the

variant, for the design and construction of the project. The contractor (or contractors in competition), develop the design and specification (from scratch or from the initial scheme development carried out by the client's consultants), and the contractor takes responsibility for completing the design and constructing the project. Turner (1995), believes the key principle of Design and Build is that it 'simplifies the contractual position to that between employer and contractor, without mediating consultants' (1995:p. 15). This view differs from the cornerstone of most summations of Design and Build – that of the fusion of the design and construction processes. Design and Build has received much attention since its emergence as one of the most popular procurement routes in the UK over the last 40 years (Bennett *et al*, 1996). Masterman (1997) has collated much information from various government reports on the usage of different procurement systems over recent years and argues that there is a drought of reliable data. What can be established, however, is that Design and Build has gained in popularity owing to the perceived need for a dynamic alternative to the fractured conventional route. More recently, the industry has seen integration in another form, with large consultancies seeking to increasingly offer a one-stop shop service (see Middlebeck, 2012).

The concept of the responsibility for design and construction in Design and Build being assumed by one organisation is typically limited. This is due to three main factors: 1) The client needing advice from an impartial party, 2) the preparation of preliminary information to allow a tendering competition, and 3) the clients wish to develop the design and specification prior to contractor involvement. A client will typically employ consultants to help them develop the brief for the scheme, which leads to the production of outline drawings and a specification for the work, which are embodied in the Employer's Requirements. The contractor will then develop the design based on the Employer's Requirements and collate his response into the Contractor's Proposals.

This simplistic view can be considered the veneer on an extensive range of procurement options. For example, Akintoye (1994) notes six types of Design and Build, which can be considered extensive, except perhaps for the often-included Design, Build, Finance and Operate (DBFO) variety. The six types include: 1) Traditional Design and Build – Contractor fully responsible for the design and construction, 2) Package Deal – Model buildings altered to the client's requirements, 3) Design and Manage – The contractor is responsible for the design and supervision of subcontractors, although unlike traditional, they are paid a management fee for their services, 4) Design, Manage and Construct – Similar to the above, the difference lies in their inclusion in the actual construction activities, 5) Novation – The client employs the services of a design consultant, who on appointment of the contractor, is assigned to them. This means that the original contract between the consultant and client is terminated in place of the new one between contractor and consultant, 6) Develop and Construct – The client employs a design consultant to stage D of the RIBA scale (scheme design). Once appointed, the contractor completes detailing and construction of the project.

The term Design and Build and its usage has led to much confusion in the industry (Chevin, 1993), with commentators differing on their views of what the term is applicable to. The different types of procurement route that are included under the design and build umbrella, differ between authors. For example, Janssens (1991) sees two main subdivisions, these being employer-led and contractor-led. At the extreme of the employer-led continuum, Janssens (1991), Masterman (1997) and Akintoye (1994) include Develop and Construct, a variant where the employer's consultants carry out almost complete design prior to the contractor becoming involved. Turner (1995) refutes its inclusion under the Design and Build umbrella: *'This is hardly design and build in concept and could lead to confusion of responsibilities...'* Interestingly, Akintoye (1994) in his survey of 52 UK construction contractors, found that develop and construct was favoured by contractors, although the management-based versions were not favoured by contractors.

Later work by Akintoye and Fitzgerald (1995), which surveyed architects' perceptions of Design and Build, found similar results on the popularity of Develop and Construct, and the unpopularity of the

management-based versions. Bennett *et al* (1996) conducted a large-scale review of Design and Build, and similarly incorporated Develop and Construct within their definition of the procurement route. They found that it was a major part of the Design and Build market, representing over 20% of the £1.25 billion of new construction work procured using Design and Build at the time. Turner's refutation would seem to hinge on the lack of a significant proportion of contractor design input in the case of Develop and Construct. Develop and Construct type derivatives of Design and Build, by limiting the dialogue and co-development between client and contractor, diverge from the reasons for adopting Design and Build, integration of design and construction and early involvement of the contractor.

The way in which the term 'Design and Build' is still used without further consideration of the nature of the specific arrangement blunts initiatives to increase the efficiency of this important procurement route. Indeed, this debate is impeded by the way in which the specific procurement arrangement is often hidden behind the contract utilised. For example, RICS Contracts in Use Survey (2010) refers to Design and Build contracts, but fails to look behind this label to the specific nature of Design and Build. This study aims to investigate the current nature of Design and Build procurement in the UK construction industry in order to increase the effectiveness of this purchasing route.

3. Methodology

The research methodology employs a qualitative approach in its use of Grounded Theory. The use of GT in construction management research follows a well-trodden path as evidenced by its use in numerous studies (Dainty *et al*, 2000; Hunter *et al*, 2005). This research utilises individual face-to-face semi-structured fully transcribed interviews. Through theoretical sampling, the interview sample size expanded throughout the research programme until 65 participants had been formally interviewed. A theoretical approach to sampling has been utilised based on: 1) Purposeful Selection and 2) Theoretical Saturation.

The interview analysis process effectively consists of fracturing data, via the assignment of code words or tags, followed by analytically reassembling the data in such a way that prominent themes, properties and dimensions are accounted for. The stages of analysis were guided by the use of open, axial and selective coding which are an intrinsic part of GT (Corbin and Strauss, 2008). The research utilised Computer Aided Qualitative Data Analysis Software (CAQDAS) in the form of Numerical Unstructured Data Indexing Searching and Theorizing (NUD*IST) software (Version 5).

4. The Rise of Developed Design and Build

Despite a range of approaches being recognised in the literature, (Janssens, 1991; Turner, 1995; Akintoye, 1994), there is still an overriding tendency for Design and Build to be characterised as the contractor providing a single-point design and construction service (CIOB, 1998; Ashworth, 1996, OGC, 2007). This traditional view of Design and Build is characterised as incorporating much more complex tender mechanisms, owing to the requirement to differentiate between different contractor's tender submissions which include their own scheme proposals. However, the data from this study suggests that Detail-Developed forms of Design and Build, which incorporate significantly developed design and specifications prior to contractor involvement, is increasingly being used in practice.

This type of arrangement can be categorised as a particularly well-developed form of Develop and Construct as conceptualised by Akintoye (1994). A director of a large-scale nationwide contracting organisation outlines the situation:

What the clients do is develop the scheme to such an extent that it is almost completely drawn, it's completely specified and what they are actually saying is "we want this work for a lump sum,

we want you to take the risk on the coordination element and actually make it 100% work and we want you to take the responsibility for the late information and all the things that go wrong with Traditional contracting” and most of the Design and Build that comes out is of that type

The contractor’s role at tender stage in this type of Design and Build is often limited to pricing the project on a lump sum fixed price basis. Many respondents likened this type of Design and Build to Traditional Contracting, which has been subsumed under a Design and Build contract, in order to allow clients to transfer all of the risk to the contractor. These types of Design and Build limit the ability to integrate design and construction, which paradoxically was the reason why so many high profile UK construction best practice reports advocated the readoption of this procurement route (Emerson, 1962, Latham, 1994; Egan, 1998). Various reasons were identified in the data to explain the move to more detailed forms of Design and Build. Risk transfer can be considered a central theme in the findings (as shown in figure 1.0) and explored in turn below.

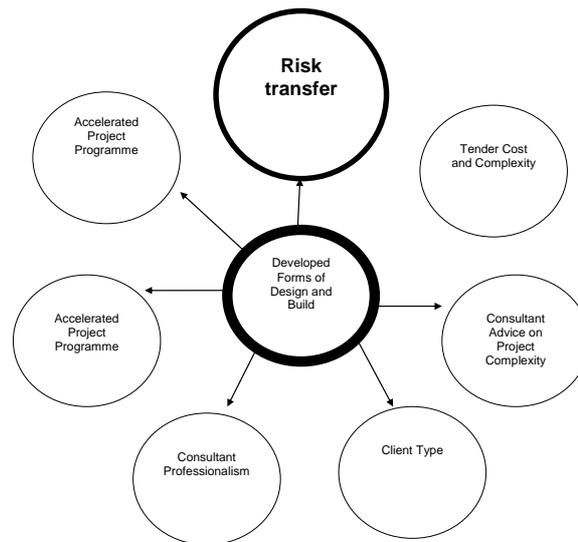


Figure 1.0 Reasons for Use of Developed D&B themes

4.1 Risk Transfer

The ability to transfer the risk for design and construction, to contractors, by using a Design and Build contract is increasingly driving the decision to utilise developed variants of the procurement route. Participants involved in the study forwarded this reason as their principal decision when choosing which procurement route to use. Effectively aping Traditional Contracting, developed types of Design and Build ultimately incorporate a different risk profile, which leaves the client able to offload much more of the risk for the construction project to the contractor. An interview participant, a senior Quantity Surveyor working for a large nationwide contractor, outlines a typical view of why Detail-Developed Design and Build is being used for risk transfer purposes, by making reference to a particular project:

because the client had already concluded the design. All they were trying to do was button down the responsibility for both construction and design and any variations that would ensue from the design being incomplete or in error would be absorbed as a risk by the contractor, unlike a Traditional Contract, where the design responsibility lays with the client and his designer. What the client is trying to do is take away the risk inherent in employing a designer because it’s very rare that a client will sue their designer unless it’s a serious breach. On the other hand, it’s quite clean and tidy for all the responsibility to lie in one camp and there’s no need to sue anybody, you just say “well it’s your problem, solve it” to the contractor, so they’re using Design and Build for risk transfer

This transcript excerpt is particularly interesting as it draws attention to how it is not just the client's design risk that is reduced in Design and Build. The client's cost risk is also reduced as the tender price should, in theory, equate to the final account sum (the final price paid to the contractor to complete the works), in situations where the client does not initiate design changes.

The contractor's single point responsibility, and contractual undertaking in Design and Build, allows the client to avoid the unsatisfactory risk profile associated with Traditional Contracting. Developed forms of Design and Build enable the client to develop the scheme using their own consultants in the same way as they would in Traditional Contracting. As stated, Turner (1995) does not believe detail-developed forms of Design and Build should be included within the Design and Build family.

4.2 Tender Cost and Complexity

The increased complexity, and associated higher tender costs, of tendering for less well developed forms of Design and Build, was also uncovered in the data as a reason for the popularity of Detail-Developed Design and Build. The higher tender costs particularly affect contractors who, depending on the nature of the Design and Build tender competition, can expect to incur substantial tender costs which they are at risk of not being able to recoup, should they not be awarded the contract. A participant gives an example of the type of costs that main contractors incur when involved in 'purer' forms of Design and Build.

...we had external fees, and these were at cost from a multi-disciplinary practice for architects and engineers' fees, they were £30,000. Now if you added in our internal fees, we had spent £100,000 and this doesn't seem to me to be an effective use of everyone's time and the degree of costs seems out of proportion to the reward available for the project

In this type of Design and Build, the contractor develops a design solution to meet the client's needs whilst still in competition with other contractors. This highlights how a number of contractors, in this situation, incur significant costs leading to substantial overall tender inefficiency and resulting price inflation. Such high costs are important considerations for contractors who are asked whether they wish to tender for Design and Build projects. Reducing the inefficiency of the tender process has been a recurrent theme in construction best practice discourse as highlighted in the literature (Simon, 1944; Banwell, 1964; Latham, 1994; Egan, 1998). The costs which contractors incur during tendering must ultimately be recouped through their successfully secured construction projects. This means that the cost of inefficient tender competitions can lead to upwards price inflation in the industry.

4.3 Consultant Advice on Project Complexity

Architects often take the role of the client's advisor, providing them with a range of different services including advice on which form of procurement route to use. The data suggests that architects often advise their clients to use more developed forms of Design and Build for complex projects. Interestingly, such advice contrasts with the findings of Bennett *et al* (1996), who found that Design and Build led to better quality when compared with Traditional Contracting for innovative and complex schemes. One architect outlines his views on developed forms of Design and Build:

I think the further one can go before you tie yourself down with Design and Build, the better. If the client is really keen on the advantages of D&B, then you will certainly try and push him down to not going out to tender until you've done stage E for example or G, but that allows more to be done than a performance specification, unless he's just doing a simple shed. I mean, we would really try and urge him away from it at stage C because we think it foolish

The architect is keen to develop the design in isolation of the contractor until a late stage for complex buildings. This is perhaps not surprising, as architects benefit from more guaranteed work where they

develop the project to more advanced stages. A private practice quantity surveyor who explained that he often advised his clients to use Design and Build, despite the client's architect's advice to use Traditional Contracting or Detail-Developed Design and Build, highlights the point about architect's fees:

...a number of architects who we work with will push clients to use a certain procurement route because of fees

Many contractors were acutely aware of architects' strong views on this issue, and how these views were regularly repeated to the architect's client base. Contractors were keen to point out that many of the benefits associated with Design and Build were lost where clients followed their consultant's advice, and postponed contractor involvement until scheme development was already well advanced. For contractors, the architect's advice was often based on an inability to accept their changing role under Design and Build, where they ultimately report to the contractor as opposed to the contractor reporting to them, as was the case with Traditional Contracting.

4.4 Client Type

Another factor closely related to project complexity is the type of client using Design and Build. The data suggests that end users, who are clients intending to occupy and use the finished construction facility, are more likely to use prescriptive specifications. The logic employed is that as the client is interested in the ongoing operation and maintenance of the facility, and its whole life cost as opposed to capital cost, they are keen to use prescriptive specifications which mirror their lifecycle aspirations. However, this logic fails to take account of the way that contractors often have significant experience of ongoing operation and maintenance issues, particularly where their business encompasses facilities management departments.

Similarly, the data suggests that in instances where the client requires a new project to fit closely with existing buildings, they are more likely to develop the specification, to ensure a closer match with their existing buildings for ease of operation and maintenance. A senior surveyor working directly for a client with a large property portfolio, matching this profile, discusses his views on the matter:

I think we've got it right in that we know what we want to tell them and that's fairly clear what we want. We've carried out work to a large part of the estate already and obviously it's sensible for consistency for maintenance purposes and general appearance of the site and durability and the way the site stands up in use and that what's built matches, what's already here and that's what we've set out

4.5 Consultant Professionalism

Linked to the previous point, the data suggests that some clients are choosing to use developed forms of Design and Build as they offer many of the benefits of Design and Build, yet allow them to develop the scheme with architects, who they believe work more professionally than clients. Clients adopting this approach often do so on the basis of their consultant's advice. An architect involved in the study gives an indication of the type of advice his clients are likely to receive:

The trouble is you know contractors are obviously more commercially led than we are, not always, but there is always a risk with Design and Build that you are going to get lassoed by the contractor's profit rather than his desire to maintain reputation

However, it would seem that this is an issue which strongly splits opinion; whilst some consultants take this view, many clients and contractors strongly disagree. These clients and contractors support their view by drawing on the fact that many contracting staff are members of professional bodies and are required to

adhere to their ethical and moral codes of practice. A director of a large-scale contracting organisation raises this issue when discussing his beliefs about how contractors should be more centrally involved in projects:

There are very traditional architects who think “we are the professionals, we do the drawings, you work to those drawings” and they have a very jaundiced view as to what we can offer. I think contractors today have been the university route and we’ve all got equivalent qualifications and for every one contract that an architect places, we will place at least 30, so who’s better at placing contracts?

Approaching Design and Build in the spirit of integrating design and construction will enable better use to be made of what is intended to be a procurement route able to integrate design and construction.

4.6 Accelerated Project Programme

Design and Build is known for its ability to offer overall accelerated timeframes (CIOB, 1988; RICS, 1996; Bennett *et al*, 1996). Where clients are particularly keen to specifically condense the *total time* contractors spend working on site, such as in retail and education environments, they often choose to increase the amount of design and specification development work which takes place prior to the contractor becoming involved. This is in contrast to the use of two-stage Design and Build tendering, which can be used to develop the scheme with one contractor to an advanced stage prior to starting on site.

The ability to work in a condensed period on site should not be confused with the benefits of actually *getting started on site earlier* in the overall project cycle which purer forms of Design and Build allow. Exceptions to using Detail-Developed Design and Build to condense the time spent working on site, include framework type Design and Build, which often takes place in an education environment. This type of work, which falls outside the scope of this study, often incorporates very pure forms of Design and Build, where a limited number of contractors develop projects from a very early stage.

5. Concluding Remarks

Many examples of Design and Build were uncovered where the design and specification development, carried out prior to tender, was so great that the projects could be likened to Traditional Contracting. The significant difference being that the developed forms of Design and Build were legally administered using Design and Build forms of contract where the risk, for design and construction, is passed to the construction contractor. This is a significant finding as it means that many projects labelled ‘Design and Build’, actually considerably diverge from what is traditionally understood as the original maxim of Design and Build; integrating design and construction through centrally involving the contractor.

It is argued that the broad and expansive rationale for using developed forms of Design and Build, uncovered in the study, illustrates how ingrained the use of this type of Design and Build has become. This is an extremely significant finding, as developed forms of Design and Build inhibit the effective transition of the client’s value system at tender stage and stand in stark contrast to current prevailing calls to integrate design and construction (GCS, 2011). Further quantitative studies are called for to explore the extent and depth of the move to developed forms of Design and Build.

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