1

Introduction

The concept of engaging a single organisation to carry out both the design and construction for a project is nothing new. In various subsets within the engineering and construction sectors, the concept is regularly adopted, used to varying extents, and continues to evolve to suit the prevailing market conditions.

This book examines the methods of what we now know as 'design and build' by considering how works are procured under three of the UK's standard forms of building contract. The book begins with a general introduction to 'design and build' and construction contracts in Chapters 1 and 2. Part One (consisting of Chapters 3–9) looks at how these contracts are intended to function in their unamended form throughout each stage of a project, from bidding to the project's conclusion. Part Two (comprising Chapters 10–12) examines how those procedures have changed in recent years, who brought about these changes, and the effects these changes have had on employers, contractors, and consultants (such as designers and those with responsibility to certify matters under the building contract).

1.1 Some Types of 'Design and Build'

The terminology for engaging a single entity to design and construct the works can be varied and depends upon (i) the nature of the works themselves and (ii) the extent to which the employing party is involved. For projects within what can be described as the 'construction sector' (such as constructing commercial buildings and residential construction by a non-housebuilder), this type of procurement is usually called 'design and build'.

For projects of a more 'engineering' nature, such as civil engineering infrastructure or process plant projects, terms such as 'engineering, procurement, and construction' (EPC), 'design, build, operate' (DBO), and 'turnkey' may be used. The EPC and DBO terms usually apply where the employing party retains an element of control over the design. However, 'turnkey' is often used where the employer has little involvement with the project until its completion, when he or she takes possession of the finished works to 'turn the key' to begin their operation.

Design and Build Contracts, First Edition. Guy Higginbottom.

1.2 The Nature of Design and Build

Any project, whether its nature is construction or engineering, can be procured in a number of ways. All projects begin with a concept, and depending upon their nature, the 'initial brief' will vary in form, length, and detail. The initial brief may consist of no more than an idea, and it may never even be written down. All projects must be designed. The extent of the design can range from a general idea of what to build to a design that's fully developed, specified, and coordinated for each of its constituent elements.

To understand the nature of 'design and build' as a concept, it is useful to compare the project stages at which the employer engages the design team and the contractor under more 'traditional' procurement. 'Traditional' procurement is often used to describe projects for which the employer firstly obtains the design and then engages the contractor to construct that design but without being responsible for it. The Royal Institute of British Architects (RIBA) publishes its *Plan of Work*, which divides a project into distinct stages. Its most recent version was published in 2020 and divides the work into eight stages as shown in Table 1.1.

For each stage, RIBA's 2020 plan of work describes the common activities under the following headings:

- Stage Outcome
- Core Tasks
- Core Statutory Processes
- Procurement Route
- Information Exchanges

It seems appropriate to refer to the 2020 plan of work for two reasons. Firstly, the 2020 version is substantially the same as its predecessor (from 2013), and it is likely that the building contracts referred to in this book were drafted with the plan of work in mind. Secondly, the Institute of Civil Engineers' *Civil Engineering Procedure* (7th ed., 2015) contains key references to RIBA's 2020 *Plan of Work*, so it has obvious applications to both construction and engineering projects.

Initially (through RIBA Stages 0, 1, and 2), the employer develops the project's general requirements – often with a design team comprising an architect, engineer, and possibly a cost consultant (such as a quantity surveyor). Subsequently, and following the latter

Table 1.1 Project stages in the 2020 Royal Institute of British Architects' *Plan of Work*.

General description	Project stage(s)
Initial brief	'Strategic Definition' and 'Preparation and Briefing' (Stages 0 and 1)
Design	'Concept Design', 'Spatial Co-ordination' and 'Technical Design' (Stages 2, 3, and 4)
Construction	'Manufacturing and Construction' and 'Handover' (Stages 5 and 6)
Operation	'Use' (Stage 7)

design stages (RIBA Stages 3 and 4), a contractor is selected; this is done either following negotiations, such as a pre-qualification process, or in a competitive tender. The contractor's involvement usually starts at this point and will normally be formalised by entering into a building contract just before the start of RIBA Stage 5 (Construction). The employer remains responsible for the project's design and bears the risk if the design is incorrect, uncoordinated, or causes delay if it is not provided to the contractor on time. The employer firstly will have to assess and pay the contractor for any rework and overruns and must then take action against the offending member (or members) of the design team.

For design and build projects, the contractor's involvement may begin at any point between RIBA Stages 0 through 5. Depending upon their detail, the employer's requirements may be finalised at any point between RIBA Stage 1 (Preparation and Brief) and Stage 5. The contractor reviews the project's requirements (normally called the 'employer's requirements') and then develops proposals for carrying out the works. The contractor's proposals normally include any contractor's design, the specification for the works, a method statement, and health and safety information. The extent of design provided by the contractor will depend upon the extent of design provided by the employer's requirements. This may simply be 'filling in the gaps' in cases where the employer's requirements are quite prescriptive, but it may include a more detailed design if the employer's requirements are fairly brief.

Allied to the proposals, the contractor will normally set out a price for the works in a separate document. Typically, this provides far less detail than in bills of quantities, with the price simply being broken down into building elements (such as substructure, superstructure, etc.). Importantly, and unlike traditional procurement, the contractor assumes responsibility for the adequacy, accuracy, completeness, and consistency of the design. If it has any shortcomings, including an undue delay in its development or coordination, then the contractor will have to bear the cost of putting this right. The main advantage to the employer is that he no longer carries the design risk, as this is now held by the contractor. For example, if the design contains errors, isn't properly coordinated, or takes longer to develop, this remains the contractor's problem. The employer only has to manage dealing with the contractor (and not a design team), which is called 'single point responsibility'.

In the past, many contractors marketed their design and build expertise by claiming it added 'buildability' to a project. This term implied that the contractor would optimise the design so it became more practicable and would avoid design that was unnecessarily complicated and difficult to construct. Whilst the concept of 'buildability' may have originated from a desire for more efficient construction, it also provided the contractor with opportunities to increase profits by adopting a cheaper design. If the employer's requirements did not set out a precise specification or standard, contractors were often able to reduce their build costs by using cheaper materials and products, whilst still complying with the contract and remaining entitled to the same contract sum. Many employers soon countered this by ensuring their requirements contained specific quality standards. They also sought continuity of design from pre-contract (RIBA Stages 0–4) into construction (RIBA Stages 5 and 6), by transferring the employment of its pre-contract design team to the contractor for the construction phase. This concept is called novation and remains very popular.

1.3 A Brief History of Design and Build Contracts

Standard forms of building contract in the UK have been around for some time. The Institute of Civil Engineers (ICE) published its first contract in 1945, and the Joint Contracts Tribunal (JCT) published its standard form of contract in 1963 (JCT 1963). Both of these were contracts for 'traditional procurement', and since then both have been subject to many revisions. ICE produced a further six editions (up to the seventh edition in 1999) before becoming the Infrastructure Conditions of Contract in 2014, when ICE began to solely concentrate on publishing its suite of New Engineering Contracts (NEC). JCT 1963 was revised in 1980, and this was subject to around 18 amendments up to 1998, before JCT adopted its modern format (nine sections of clauses) in 2005. JCT's standard building contracts underwent further revisions in 2011 and 2016.

Design and build contracts, as we now know them, did not appear until 1981 when JCT published the 'with Contractor's Design' contract (CD 1981). This followed the format of the 1980 edition of JCT's standard building contract. CD 1981 was revised in 1998, and again (adopting the nine-section format of the standard building contract) in 2005, 2011, and 2016. This has become one of the most popular contracts for procuring construction projects in the UK.

Since 1943, government and public sector procurement used the CCC/Works/1 contract, until the General Conditions of Contract for Building and Civil Engineering (GC/Works/1) were published in 1959. In 1977 and 1989, second and third editions followed, and soon after, a 'GC/Works/1 (Edition 3) Single Stage Design and Build Version' was published in July 1993. Ultimately, three versions called GC/Works/1 (1998) were published in 1998, which included the single-stage design and build version. However, since then, use of the NEC contracts replaced GC/Works/1 (1998) as the preferred route for public procurement.

For engineering projects (such as civil and process engineering), contracts published by ICE and FIDIC are very popular. ICE published the first edition of its 'Design and Construct' contract in 1992. A second edition followed in 2001 – each edition being based upon the sixth and seventh editions of what was then known as the ICE Conditions of Contract. ICE did not publish any subsequent versions, as it chose to concentrate on the NEC suite of contracts. The Association for Consulting Engineers took over publication, and in 2011, issued a revised 'Design and Construct' contract – re-badged as the Infrastructure Conditions of Contract.

The NEC contracts were first published in 1993 and contained provisions for a contractor's design. These provisions remained largely unchanged in NEC2 (published in 1995) and NEC3 (issued in 2007 and revised in 2013) and, although slightly expanded, remain in the current NEC4 contracts that were published in June 2017. NEC contracts have been adopted for use by public bodies, for many high-profile projects such as the 2012 Olympic Games and Crossrail. They have largely replaced the previous suite of government contracts – GC/Works/1.

The newest version of a design and build contract was developed by FIDIC (the Federation Internationale des Ingenieurs-Conseils) when it published its *Conditions of Contract for Plant Design-Build* (Yellow Book) in 1999, with a second edition following in 2017.

The JCT design and build contract provided the most comprehensive procedures for a project with the contractor's design. The contract documents consist of the 'Employer's

Requirements' and the 'Contractor's Proposals' (this terminology is also adopted by the FIDIC Yellow Book), and the price for the works (Contract Sum) is shown in the 'Contract Sum Analysis'. The conditions also deal with design matters such as the contractor's liability for design, resolving discrepancies, divergences and inadequacies, the employer's approvals, design changes and their valuation, along with the rights of the employer (and third parties) to retain and use the contractor's design. Almost every version of JCT's standard forms of contract now contain some kind of design and build provisions. These are either provided in 'with design' versions of contracts (such as the Intermediate or Minor Works contracts) where the entire works will be contractor designed, or as options where the contractor is only designing part of the works under the JCT Standard Form of Building Contract.

The FIDIC Yellow Book contains some procedures analogous to those in the JCT design and build contract, but NEC's design and build procedures are far more comprehensive. NEC contracts do invite some adaptations by providing for 'Additional Conditions of Contract' (the Z clauses), and it is fairly common to find design and build procedures added here. Owing to the relative decline in use of the ICE and GC/Works/1 contracts, many of their specific provisions are now inserted as Z clauses. Indeed, some Z clause amendments have also been seen to introduce JCT-style design and build provisions into NEC contracts.

1.4 Recent Developments in Design and Build

On five occasions since 2012, RIBA Enterprises' NBS Limited has published its *National Construction Contracts and Law Survey*, with the latest edition arriving in July of 2022. These surveys have shown a number of trends in the UK, the following two of which are particularly pertinent:

- Between 2012 and 2018, the use of design and build contracts increased from an average of 30% to around 40%, whereas the use of traditional procurement declined from 60% to just over 40%.
- Between 2015 and 2018, the use of JCT contracts rose sharply (from below 60%) to 70%, whereas the use of NEC contracts has dropped by almost 15% (decreasing from 53% to 39%). Whilst there was a slight increase in FIDIC contracts in 2015 (to around 18%), their usage has returned to around 10%.
- From 2018 to 2022, the use of JCT contracts (both design and build and traditional procurement including a CDP) increased slightly to 71%. The usage of NEC contracts fell by 8% (from 39% to 31%) and the use of FIDIC contracts fell by 4% (from 10% to 6%).

These trends may be partially explained by the changing economic climate over the last 10 years. When UK construction felt the effects of the global financial crisis around 2010, there was a decline in privately funded development. Many contractors and consultancy firms adapted by taking on more work in the public sector. This may explain the growth in NEC usage from 2012 to 2015. Private sector developers and funders became more risk-averse, so this may explain the increase in design and build procurement, seemingly at the expense of 'traditional' procurement, and the private sector's preferred vehicle remains the JCT design and build contract. Not only does this offer the employer 'single point responsibility' and the most comprehensive procedures, but by introducing bespoke

amendments, employers can reduce their risk even further. The relative reduction of design carried out by the contractor and the transfer of risk away from the employer have often led to design and build being called 'risk and build' and 'design and dump'! However, these developments do not come free of charge. Commercially astute contractors will include added risk contingencies within their pricing, and depending upon the prevailing market, contractors may be prepared to reduce their price in return for the employers accepting a greater share of risk.

Perhaps owing to the Covid-19 crisis from 2020 to 2021, RIBA did not commit to a further survey until July 2022. Their 2022 inclusion of CDP elements within the published figures for 'traditional' procurement is unfortunate, as it does not allow a consistent comparison with the data from 2012 to 2018. It therefore remains to be seen if design and build has overtaken traditional procurement to a significant degree. Furthermore, with the publication in 2017 of NEC4 and FIDIC's second edition contracts, it is difficult to predict whether the increasing trend in using JCT contracts will be maintained. However, given that JCT design and build procedures are often adopted even if the JCT contract itself is not, it seems likely that JCT will remain an influential force in design and build procurement – for both construction and engineering projects.

1.5 How to Use This Book

This book attempts to bridge the gap between how design and build is meant to be operated under the standard forms of contract and how it is now commonly operated in practice. It may be more accurate to suggest that there are two bridges to overcome. Firstly, as a concept, design and build is not widely taught in universities at the undergraduate level, as most construction courses focus on traditional procurement. In the event that design and build overtakes its traditional counterpart, it is increasingly likely that employers, consultants, and contractors will not be able to select candidates who are familiar with what may become the UK's most popular construction procurement method.

Secondly, the way design and build is widely practiced is very different from how it may be taught if the student purely studies the standard forms of contract and how they were originally intended to operate. For example, neither JCT, NEC4, nor FIDIC contracts provide for the novation of designers – a common and widespread practice. In another example, and as briefly described above, a contract may state 'design and build' on the front cover, but there may be little design for the contractor to undertake. He or she will just be 'building', but subject to a very different allocation of risk to that set out in an unamended design and build contract.

This book is not intended to provide purely a clause-by-clause commentary on particular forms of design and build contracts, as there are far more comprehensive texts available to the reader which provide precisely that for the JCT, NEC, and FIDIC forms of design and build contract. This book's principal focus will be on appropriate procedures at each stage of the project from a practical perspective (following the RIBA Plan of Work) and will reference particular contracts and their clauses where applicable.