CIOB
The Chartered Institute of Building

Construction Client Guide:

Leading Projects in the Built Environment

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CIOB 2025

“Under the leadership of our Head of Client Development, Linda Stevens, CIOB has been able to make progress at pace in the last two years on our work to support a key component of the construction community - clients and client-contractor relationships. When the first version of this guide was published, I noted that our Past President, Mike Foy, had championed the role of clients and chose it as the theme for his presidential year. I was pleased with his decision and delighted to support it.

The case that Mike made, saying that clients have the potential to help make huge positive change in the industry, is as true today as it was then. Arguably, it is even more urgent as the need for demonstrating competence and the delivery of high quality in the built environment comes under increasing scrutiny.

The progress we have made will continue, not least with the publication of this refreshed Client Guide, and it remains my goal that this work helps to drive positive change in all our big challenges as an industry and an institute.

I also want to take this opportunity to offer a special thank you to our supportive Client Steering Group and to all our Client Champions.”

Caroline Gumble, (Dr) BSc (Open), CMS, MCIPD, FRSA, MIEx, HonMCCM
CIOB Chief Executive

Foreword

Clients play a pivotal role in any construction project.

Being a construction client isn't just about creating the right building for the right price within the right time frame. It is also an opportunity to contribute to solving some of the biggest economic, social and environmental problems we face today.

Regardless of the kind of project, clients have ultimate responsibility for coordinating a complex web of resources, in some cases relying on many specialist consultants. With their projects potentially affecting thousands of people, often involving an enormous supply chain, and with a disproportionately high carbon footprint, clients must also consider their wider societal and environmental impacts.

Success depends on sound planning and good governance with, at its heart, an open, collaborative relationship between the client and its project team, including contractors. Along with growing expectations for public benefit outcomes from investors, industry professionals and end-users, the need to work better together has never been greater. This commitment to high-quality, responsible procurement starts at the top.

The determination and skills of clients' in-house teams are important, but great projects are more likely when the essential culture of those teams is aligned. Sitting at the head of construction projects and with the most control over their direction and finances, clients have a huge influence on not just their own projects but the culture of the built environment as a whole.

This Client Guide is primarily for construction clients running larger projects or programmes, but the principles apply equally to all clients regardless of project size.

You might work in government departments, universities, local authorities, or partnership arrangements associated with local delivery of public services.

Alternatively, you might be in the private or third sector – in utilities, in retail, in companies whose primary expertise is in the built environment, or in companies who exist for other purposes but who nevertheless need to develop and maintain built assets.

Either way, this guide is for you, especially if you are new to the process. It will help you to get the building blocks right from the start.

(Note that the guidance is not aimed at private domestic clients undertaking construction projects to build, alter, extend or renovate homes.)

The Client Guide is part of CIOB's continuing strategic focus on empowering construction clients with the knowledge and skills for success. Our aim is to capture and share learnings to encourage clients to collaborate more, make good decisions, avoid known pitfalls, and minimise waste.

Ultimately, we want to help clients achieve better project outcomes for them, the environment, and society at large.

This focus on support for clients will develop over time to include digital resources for knowledge-sharing, CPD, and toolkits on our website, **www.ciob.org**.

This new edition of the Client Guide continues our journey to becoming a trusted source of learning and helping you on the road to a better and more sustainable future.

Mike Foy OBE, MBA, FCIOB, FCMI, Past President of CIOB, Chair of CIOB Client Steering Group, Past President of CIOB, Chair of CIOB Client Steering Group

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Purpose of the guide

This guide is for you if you find yourself in the role of construction client. (Note, though, that it is not aimed at consumer construction clients who are building, altering, extending or renovating their homes.)

The guide explains how projects are generally structured and managed, and what to look out for along the way. The final section brings it all together in a handy stage-by-stage summary.

Drawing on CIOB members' experience, it highlights the things you can do to benefit your project. The focus is on best practice and guidance that can be applied within the commercial and regulatory context to improve outcomes and create more value.

The guide does not replace any legal or contractual obligations or documentation. CIOB strongly advises that you appoint local representatives when working in jurisdictions that are new to you and where relevant expertise cannot be provided from internal resources.

This guide is merely introductory. If you wish to learn more, consult the publications listed at the back of this guide, not least the CIOB's Code of Practice for Project Management for the Built Environment, 6th edition and the CIOB's Code of Practice for Programme Management in the Built Environment, Second Edition.

Acknowledgements

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Introduction

Introduction

This guide is for individuals in the pivotal role of construction client – you. You procure design and building work at every stage of a built asset's life cycle. You oversee its initial creation. You steer its ongoing physical expression, overseeing repairs, maintenance, conversions, extensions, and alterations. Finally, when the asset ceases to have a viable purpose, you oversee its retirement.

To do any of this, you must bring together a team to help. For example, for each project during the life cycle of an asset, you may need people to:

- secure finance.
- assess and manage costs.
- work out the business case.
- advise on legal issues and procurement routes.
- manage risks.
- underwrite risks.
- appoint consultants.
- understand the site and its planning constraints.
- design the asset.
- prepare the site.
- manufacture, install and build the asset.
- manage the build.
- commission and validate the build.
- maintain the asset.
- retire, recycle and repurpose the asset.

Even if you carry out some of these functions yourself, you can't do it all. You will still need others, and the resulting management burden, contractual arrangements and supply chains can be complex.

With a potentially very large team assembled that may never have worked together before, maintaining focus on your goal requires good leadership and collaboration. Keeping on top of regulatory compliance, quality, the programme, and the budget, all amid risk and socio-economic uncertainty, is challenging.

Doing it all not just well but, as is increasingly expected, responsibly and to best-practice standards is demanding.

In short, managing a construction project is difficult and, since you are its instigator and chief decision-maker, its success or failure depends to an important extent on you.

How projects are structured

How projects are structured

From first idea to completion, all construction projects go through the same generic stages. However, the complexity involved can lead the unwary and poorly prepared to inefficiency, delay, and unnecessary cost. This is caused by misunderstanding, miscommunication and misaligned expectations as the project team goes through the work in a different sequence or at different rates[1].

To mitigate these undesirable risks, the industry has over the years attempted to formalise the way things are done by imposing common project management methodologies. The CIOB's code of practice[2] has eight 'life cycle' stages, each using the verb that best sums up the activity that produces important milestones in the life of an asset. In order, they are:

1. **Identify**: this is when the need and ambition for the project are identified in broad terms
2. **Assess**: the project is assessed for viability, with options considered
3. **Define**: the preferred option is chosen and distilled into a project brief
4. **Design**: the detail of the project is worked out, with specifications and functionality agreed
5. **Implement**: the design is manufactured, assembled and built
6. **Validate**: the built asset is validated against the design to ensure that it works as intended and can start to be used
7. **Operate**: the built asset is used, maintained, and repaired
8. **Retire**: the built asset has reached the end of its life in its current form and is either demolished or repurposed

These stages are conceived as a closed loop (see Figure 1.0). In other words, the stages are sequential and the decision to demolish or repurpose at the 'retire' stage is always the start of a new project and so inevitably overlaps with the 'identify' stage, starting the cycle afresh.

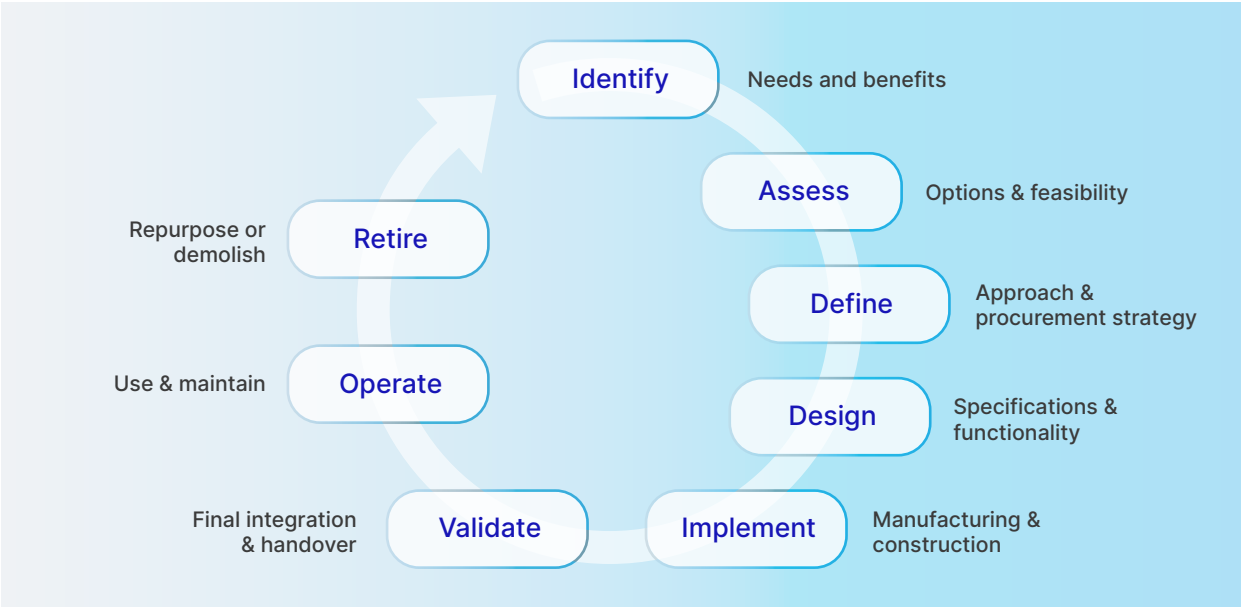


Figure 1.0 Project life cycle

[1] Developments in digital and advanced manufacturing technologies are attracting innovations on multiple fronts to tackle the construction industry's well-documented record of inefficiency and low productivity. For example, the UK Government's recent Transforming Construction challenge programme aimed to deliver projects 50% faster, reduce whole-life costs by a third; slash lifetime CO_2 emissions by half, and raise productivity by 15%: Transforming construction challenge – UKRI.

[2] Set out in the Code of Practice for Project Management for the Built Environment, 6th edition

Clearly, not all stages will be directly relevant to you: persons in the client role can cede the role – sell the asset – to different parties at any stage during its life cycle. Clients of listed historic buildings are unlikely ever to reach the 'retire' stage. Even so, considering the whole life cycle helps you to make responsible decisions in the light of the big picture, and makes any hand-over that much more straightforward.

You are likely to encounter alternative industry project management methodologies in your dealings with various construction professionals – see Table 1 below. Although they all share a strong family resemblance, the CIOB methodology differs from others because of its focus on activities to reach milestones.

<table>
<tr><th>6th Edition of CIOB Code of Practice for Project Management</th><th>Royal Institute of British Architects (RIBA) Plan of Work 2020</th><th>ISO 55000:2014 Asset Management Overview, Principles and Terminology</th><th>BS 6079:2019 Project Management - Principles and Guidance for the Management of Projects.</th></tr>
<tr><td>1. Identify: needs and benefits.</td><td>0. Strategic definition
1. Preparation and brief</td><td rowspan="3">Business case</td><td rowspan="2">Investigation</td></tr>
<tr><td>2. Assess: options and feasibility</td><td>2. Concept design (programming and planning)</td></tr>
<tr><td>3. Define: approach and procurement strategy</td><td></td><td rowspan="4">Development</td></tr>
<tr><td>4. Design: specifications and functionality</td><td>3. Spatial coordination
4. Technical design</td><td rowspan="3">Create or acquire</td></tr>
<tr><td>5. Implement: manufacture and construction</td><td>5. Manufacture and construction</td></tr>
<tr><td>6. Validate: integrate and handover</td><td>6. Handover</td></tr>
<tr><td>7. Operate: use and maintain</td><td>7. Use</td><td>Operate and maintain</td><td>Operation</td></tr>
<tr><td>8. Retire: repurpose or demolish</td><td></td><td>Dispose or replace</td><td>Upgrade, or disposal/ retirement/ withdrawal</td></tr>
</table>

Table 1: Comparison of stages of construction project management from different standardised templates

Funding and business case considerations

Funding and business case considerations

Construction projects are capital-intensive and resource-hungry and so you should only proceed once you've established the business case. There is much to do, from formulating a funding strategy and actually securing funds (including for cash-flow), to assessing the viability of the project through its life cycle and, in the worst case, being prepared to take difficult decisions if the investment can no longer be justified.

The work involved in establishing and maintaining a business case will vary depending on the size and character of your organisation and the nature of the project or projects in your portfolio. However, there are certain key issues that you should always consider, regardless of the specific context.

Funding

You may decide to fund the project from reserves (cash, or capital raised from shareholders in the form of rights issues or grants) or by borrowing (from investors or the market). Alternatively, you may involve a consortium of funders and funding instruments such as community or heritage funds.

During the 'identify' stage a single, privately owned organisation may well be able to start work without a definitive financial plan. As soon as other parties are involved, however, that flexibility will not be possible. Where you are a public limited company (PLC), or have multiple investors, or your funding is from grants or international investors such as the United Nations, a business case will be required from the start of the project, with regular updates to confirm ongoing viability.

In the UK, public-sector clients will often rely on direct investment by the Treasury as part of agreed borrowing plans and in line with overall spending reviews to allocate funding across multiple government departments and political priorities. This means that public-sector clients may only have a clear line of sight to the next significant milestone rather than for the whole project. Public-sector projects will sometimes raise funds from financing mechanisms such as public–private partnerships (PPPs) or other commercial models designed to prioritise investor interests such as social value, or meeting sustainability targets.

Regardless of the source of funds and as the project progresses, you must keep funders aligned and supportive, ensuring that the project has adequate cash-flow.

Investment appraisal

Investment appraisals make the economic case for a project, providing information on the forecasted return on investment (ROI) for funders. They estimate net cash-flows over time, including:

- The whole-life costs of the asset, i.e. costs in use as well as the design and build costs.
- Benefits that can be expressed in financial terms.

You will want to apply a discount rate (set by corporate finance) to enable the 'worth' of the project in the future to be assessed in 'today's money'.

Although very important, investment appraisals are just one part of the overall business case.

Creating the business case

In addition to the economic case, other matters are critical in the overall business case. They include:

- **The value to investors in non-financial terms.** Ideally, all benefits would be measured in pounds and pence but often this is inefficient or too uncertain to be reliable. Instead, you can consider non-financial benefits separately and weigh them alongside the economic case. For example, the well-being of occupants of residential property or the educational attainment of students in a school might be of critical importance to your business case. If so, you should find ways to account for them.
- **The risk profile for the project.** Market risks tend to be accounted for in the discount rate used in the investment appraisal, but of course there are many risks associated with implementation beyond that, not least securing planning consent (especially for buildings or places of historic significance). Again, they can be counted and their estimated impact weighed alongside other factors.
- **The strategic context of the project.** Sometimes projects only make sense in the bigger picture, where longer-term benefits make an investment worthwhile. Examples include:
    - the previous UK Government's 'levelling up' policy where it was hoped that public investment would prime the market for generational socio-economic uplift in neglected communities.
    - the desire for a private company to be first to market.
    - the intention to implement a key strategic imperative such as achieving net zero carbon.
- **Governance issues.** These are about the processes required to continually justify the investment to funders in the light of significant changes to the strategic context, or delivery performance.

Involving cost consultants in estimating the cost and viability elements of the business case and contractors to verify them can be useful. They tend to have the necessary detailed knowledge of the type of asset and maturity of the relevant supply chain.

Maintaining the business case

Early in the life cycle of an asset it is only possible to produce an outline business case. This is because the specific circumstances and context for your proposals are unique and so you can only compare it to roughly similar projects. Also, the detail is missing and so your plans are, at best, likely to be an informed estimate based on the best information available at the time.

As the project progresses, more is known and so you can improve the accuracy of the likely whole-life costs and non-financial benefits, allowing you to gradually adjust your business case for a better fit with reality.

Organisations require different levels of resolution in their business cases before a final investment decision is taken, which typically happens before the 'design' stage starts. At this point most expect the forecast return on investment to be within +/- 10% of the planned spend (including contingency), although the desired appetite for risk, and therefore estimating accuracy, will vary from client to client. As the business case develops through stages 1 (Define) to 3 (Assess), and by the time you get to 4 (Design)', you can be more confident that the finances are accurate, or within the percentages specified above.

Assuring the business case

Estimates and decisions associated with whole life costs and benefits are susceptible to decision biases such as sustained false optimism and groupthink. In your enthusiasm for the project, it is not uncommon to overestimate its benefits and underestimate its costs, especially early on in its conception.

Over-optimistic business cases run the risk of disappointing investors and other stakeholders as the project progresses, which of course is best avoided. You should ensure that levels of uncertainty are modelled in estimates to avoid misleading numbers and false confidence.

Beyond that there are many techniques that can help to assure your forecasts with benchmarks of various kinds. For example, you can refer to historic (i.e., actual) data about equivalent assets (from your own experience or from published sources such as **BCIS**), add an 'optimism bias' contingency, or engage independent experts to challenge your assumptions.

Roles, responsibilites and stakeholders

Roles, responsibilities and stakeholders

Generic roles and responsibilities

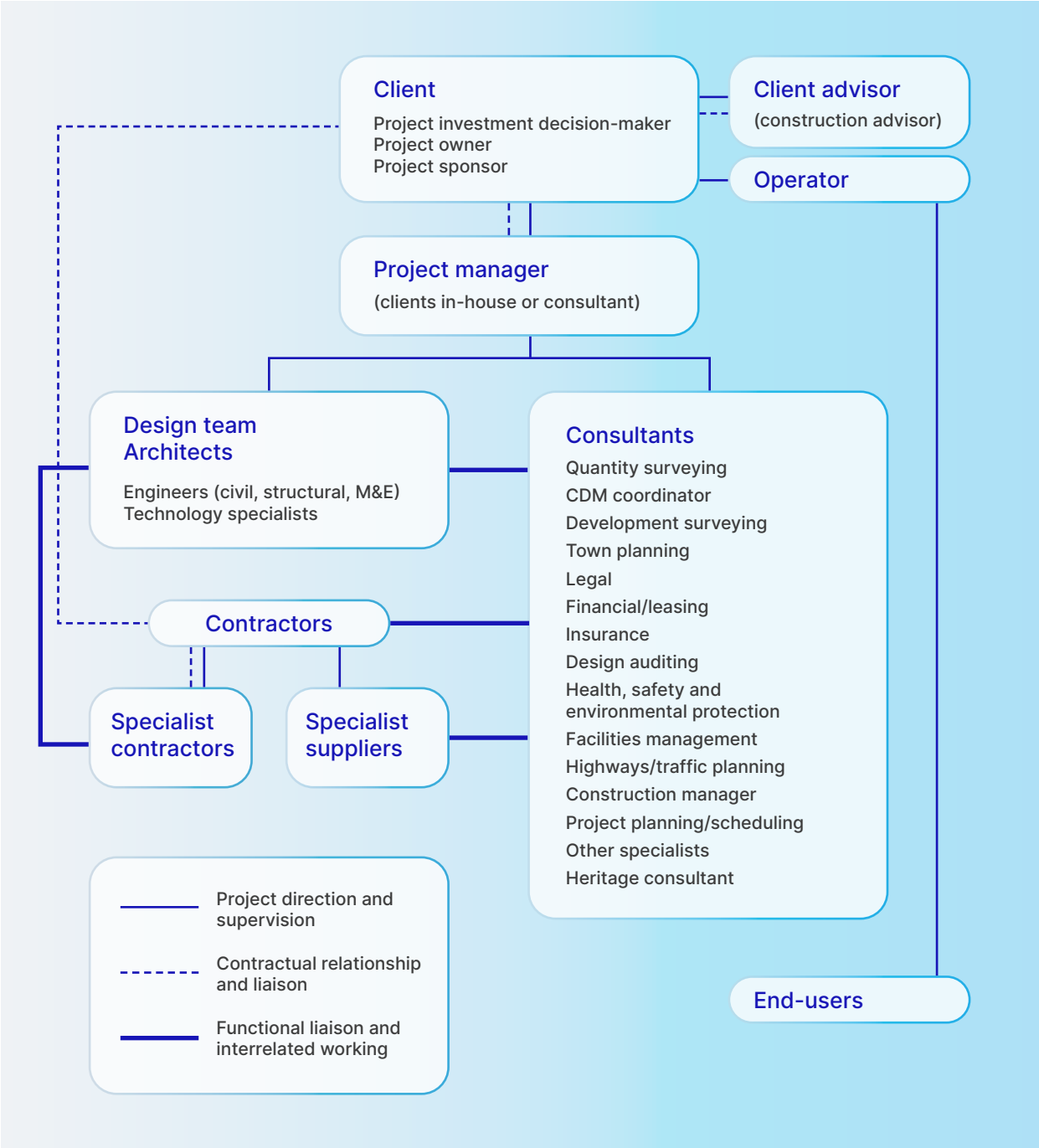
Since the role of construction client is rather onerous and requires a wide range of competencies, it is only rarely undertaken by a single individual. More often it is performed by a team within an organisation, perhaps even a team subcontracted to the head client.

This supply chain of consultants and contractors supporting you will vary depending on the relative size of your organisation and your project's scope of works. No matter how the wider client team is organised, individuals, departmental units, partner organisations, or subcontracted specialists in it typically take on roles with the following functions:

- The **client sponsor** is the chief decision-maker, accountable on behalf of the wider client organisation for achieving the beneficial outcomes of the investment. They should be in place from the start.
- The **client project manager** (sometimes known as the programme director or construction manager) is responsible to the client sponsor for achieving the defined project objectives and administering all contracts on behalf of the client organisation. Wielding significant influence, they should be appointed early in the life cycle, ideally during the 'identify' stage but definitely during the 'assess' stage to ensure that plans are in place to engage all relevant stakeholders.
- **Consultants** are specialist advisors to the client team, such as designers. Consultants may appoint their own project manager who reports to the client project manager for the contracted scope of work. They may also appoint their own consultants. The timing of their appointment depends on their function.
- **Contractors** are responsible for implementing the design, build or maintenance of the physical asset, in whole, or in part, in line with the contract(s) administered by the client project manager. Contractors will almost certainly appoint their own project manager who reports to the client project manager for the contracted scope of work. Contractors may also appoint their own consultants. The timing of their appointment depends on the build method selected; an off-site manufactured solution will require that they are involved comparatively early, probably during the 'define' stage.
- **Operators** are responsible to the wider client organisation for the operation and maintenance of the asset as designed and built on behalf of the client. In some situations, the operator can be the same entity as the end user and client organisation.

Note that although organisations may use different names for these functions, the functions themselves are unchanging. In all cases, you will want to assure yourself that the persons in your team are adequately competent for the task in hand. Indeed, the **Building Safety Act 2022**[3] now mandates that any 'person carrying out building work' – a term that includes the persons in your team – must be capable. Individuals must have the necessary skills, knowledge, experience, and behaviours to carry out their roles competently and businesses must have the requisite organisational capability.

[3] The Building Regulations etc. (Amendment) (England) Regulations 2023



Detailed structure for project organisation

Building and sustaining the extended team

Building and sustaining the extended team

Every project is different, and so you have choices about how to establish the right team to lead and deliver the work. Most projects will require you to appoint consultants and contractors (the rare exceptions being where you directly employ all the requisite expertise yourself).

There are many ways to organise project resources to deliver your objectives. As the scale and scope of projects increases, the need for more specialist resources also increases. This can provide significant managerial complexity for you, particularly if using a mixed 'make and buy' model with people from your organisation working alongside consultants and contractors in the supply chain, or where a special commercial delivery vehicle is used such as a joint venture or a public–private partnership.

The need to design the project organisation reflects the fact that you have choices to make about what work to perform in-house and what to contract, and what procurement and contracting strategy to use. Employing the wrong persons can have damaging impacts and so before you do so, you must know what skills you'll need and when they'll be required.

Delivery model and procurement strategy

There are many ways for you as the contracting authority to structure the delivery of your project. This should be decided in the 'define' stage as part of the intermediate business case.

Things to consider before deciding on the delivery model and procurement strategy will include but are not limited to:

- your appetite for risk.
- the nature of your project – new build, extension, refurbishment?
- the scope of works – unusual scope or logistical issues?
- the extent to which you control the project – who owns the design?
- accountability – do you want a single point or joint responsibility?
- appointment of a contractor – negotiation or tender or a combination of both?
- certainty of final cost – lump sum or reimbursable?
- start and completion times – do you need the project fast-tracked?
- restrictions – for example, are there security or noise issues?
- portfolio – can designs or supply chains be shared across wider programmes?
- marketplace – How is the supply chain structured, who does what, and how?

The Government Construction Playbook identifies several model approaches for public projects, which offer a high-level framework for thinking about your procurement strategy:

- **Transactional**: most suitable when the requirement is known and there are multiple qualified suppliers in the market who would take part in a competitive tender.
- **Hands-on leadership**: most suitable when the project has high socio-political complexity and the drivers are delivering outcomes and stakeholder satisfaction rather than lowest cost.
- **Manufacturing**: most suitable when the asset to be built will be repeated over time so learning and progressive improvement is possible.
- **Hands-off design**: most suitable when there is clarity of needs and benefits but many ways to solve the problem, so creativity and innovation are key.
- **Trusted helper**: most suitable when the client wants to retain control but needs to augment their own team with trusted support in an open, collaborative relationship.

Contractual options in procurement

To know how you want to contract with your suppliers, you must decide what type of relationship you want with them. This decision will be guided by what you're procuring, how critical it is to the overall project, the availability and reliability of its supply, and the risk appetite of your funders. Bear in mind that the form of contract adopted will drive supplier behaviour and so needs careful consideration.

Generally, the critical variable is in how risks are allocated. You might decide that all the risk should be with the supplier, which would suggest a 'lump sum' contract. Alternatively, you might decide that you should retain the risk, in which case a 'reimbursable' or 'time and materials' contract is more appropriate.

These options represent two ends of a spectrum; there are of course many in-between options where risks are shared. These are sometimes supported by integrated project insurance, which insures outcomes rather than causes, or single project professional indemnity insurance.

In a large and complex project, different delivery models might apply to different parts of the project life cycle so that assets are designed, built and operated by the right team and incentivised with the right performance metrics.

There are several other contractual options that extend beyond the validate phase. For example, you can agree that the supplier finances the building of an asset in return for a fee for operating it or, where you envisage a long-term relationship with a supplier to support your portfolio, you might enter into a joint venture.

Public clients often use or set up framework arrangements for parcels of related work. These are agreements to provide works, goods and services on pre-defined terms and conditions, usually with a known team of pre-qualified suppliers. Entering into a framework agreement provides some certainty and makes it comparatively straightforward to 'call off' services. Frameworks can also offer value for money by leveraging the collective buying power of multiple clients and increase efficiency through standardisation of procurement processes.

Best practice is to adopt the Government's published Gold Standard. It helps you to identify what questions you should ask when creating and implementing construction frameworks, what answers you should expect, and how you can make informed decisions. In all cases, you should aim for fair contracts that work for both you and your suppliers. Always pushing for better prices or terms in the name of good value runs the risk of backfiring as suppliers struggle to perform, often with serious knock-on consequences for the project as a whole.

Best practice in public procurement

Although procuring good value is far from straightforward, it is nonetheless possible. Recognising the Government's ethical duty and significant influence across construction procurement, it funded the Construction Innovation Hub to investigate best practice.

The result is the **Value Toolkit**, a practical, freely available resource for defining, procuring and measuring value in public procurement. The system emphasises the need for interaction, iteration and continuous review to ensure the desired social, environmental and economic outcomes from projects are delivered. (See also the section on Sustainability considerations.)

The UK Government also funded the **Outsourcing Playbook**[4] (updated in 2020) and the **Construction Playbook** (2020)[5]. The Construction Playbook in particular sets out the fundamental challenges that contracting authorities ought to address in the early life cycle of any public procurement.

Together with the **UK Government Green Book** (2020)[6], these free reference sources will help you in formulating your procurement strategy as part of the business case for a project.

Compliance in procurement

Any procurement strategy you adopt must account for matters of compliance, notably those that arise from the **Building Safety Act 2022**, which have implications for timings and the competence of those you appoint. For a fuller description of its impact, see the Health and Safety section on page 54.

If you are a publicly funded contracting authority, any procurement you undertake is also likely to be caught by the new **Procurement Act 2023**, which reforms the existing Procurement Rules. This new regime is due to come into effect in February 2025 and introduces important changes, including to:

- make public procurement more transparent, accessible, efficient and beneficial to both you and your suppliers.
- provide a clearer framework for decision-making.
- create a simpler, more flexible commercial system.

[4] The Outsourcing Playbook: Government Guidance on service delivery, including outsourcing, insourcing, mixed economy sourcing and contracting". Available at https://www.gov.uk/government/publications/the- sourcing and consultancy playbooks (accessed 11 May 2021).

[5] The Construction Playbook Government Guidance on sourcing and contracting public works projects and programmes". Available at https://www.gov.uk/government/publications/the- construction- playbook (accessed October 2021)

[6] The Green Book: appraisal and evaluation in central government". Available at https://www.gov.uk/ government/publications/the- green book appraisal and evaluation in central governent (accessed 17 May 2021).

- reduce barriers to public contracts for new entrants, particularly SMEs and social enterprises.
- relax its language so that non-financial value can carry more weight in tender assessments for better community benefits, and reduce incentives for unsustainably low pricing (or bidding).

It will be accompanied by a new digital platform to help you to find out about suppliers and advertise your tenders. It will also allow you to check suppliers' performance KPIs on major projects, and whether contractors are on mandatory or discretionary debarment lists due to non-compliance or poor behaviour.

The new regulations reinforce the need to treat all suppliers fairly and equally. There are new mechanisms for suppliers to challenge your award decisions, and you must adhere to new guidelines for managing the contract post-award. For example, you must pay your suppliers within 30 days.

Appointing consultants and contractors

Following decisions on procurement strategy and delivery model, the approach to the selection of different suppliers must be agreed, including decisions on whether to use competitive tendering, which could include some negotiation, or a direct negotiation approach.

Standard forms of contract exist to simplify the contracting process and build common understanding across supply chains. Examples include the Joint Contracts Tribunal suite of contracts (JCT)[7], the New Engineering Contracts (NEC)[8] suite of contracts, the Fédération Internationale des Ingénieurs-Conseils (FIDIC)[9] suite of contracts, and the UK government's Model Services Contract[10].

These contracts are designed to embed best practice in:

- appropriate allocation of risk
- allowable assumptions mechanisms
- key performance indicators
- dispute resolution

You may also wish to put in place or use existing framework agreements with select suppliers to enable fast 'call-off' of additional resources without committing to a binding agreement.

Behavioural procurement

It is increasingly common during procurement to consider the behavioural and cultural fit of your suppliers in addition to more traditional selection criteria.

Clients who have adopted this approach, for example the Environment Agency and National Highways, claim significant value is created, resulting in higher quality, faster delivery, lower costs – all enabled by a team that is collaborating and working towards a singular goal.

[7] The Joint Contracts Tribunal (JCT) (jctltd.co.uk)
[8] Contracts, Project Management and Procurement | NEC Contracts
[9] The FIDIC Suite of Contracts
[10] Model Services Contract - GOV.UK (www.gov.uk)

An advantage of assessing behavioural and cultural fit is that it provides a common language to then develop the team and monitor performance. This is consistent with the Construction Innovation Hub's **Value Toolkit**[11], which emphasises the importance of agreeing behavioural performance measures early in the life cycle to achieve social and environmental, as well as economic value. The Toolkit's process encourages organisational alignment by linking KPIs back to organisational policies ('strategic drivers') and to 'outcome drivers', thereby minimising mission creep and keeping the focus on the project's original vision.

Sustaining team performance over time

You play a key role in building the extended team and sustaining its performance over time. As people join and leave, the dynamics change. The client project manager, working with relevant leaders in supplier organisations, must ensure ongoing focus on the project's overarching vision. This includes emphasising the means of achieving the vision, and the ways of working that are valued, including the focus on health, safety and sustainability. You are uniquely positioned to create the 'brand' for the project, a compelling narrative that can be used to underpin project communications and secure commitment from the project team and other stakeholders over time.

Even before you create a brand for your project, you might want to check your suppliers for cultural fit. This can be achieved through early contractor involvement or project start-up events.

Team creation and motivation

The client project manager has overall responsibility for creating and developing this teamwork, although in practice much of the detailed work involved may be delegated to others in the consultant or contractor teams, perhaps using a **project charter**.

Given that the composition of the team changes over the life of the project, it will pay you to set common goals and emphasise good teamwork at every life cycle stage. Here are some of the key approaches to adopt regardless of whether people are working virtually or co-located:

- Clearly define areas of responsibility and lines of authority for each project team member, with deputies identified as needed.
- Ensure that everyone knows who else is in the team and what their roles are.
- Establish clearly defined and measurable project objectives. These objectives can be tracked through performance management reviews for your internal team and through contractually agreed reports for suppliers. This includes clear exchange information requirements (EIRs) – see chapter on Digital Information management on page 40.
- Encourage a spirit of partnership and sharing of ideas from the start by rewarding initiatives which ultimately benefit the project.
- Set out a clear understanding of risk management processes for all parties from the outset and how these can also be shared equitably alongside any incentives.
- Establish good communication protocols (particularly for electronic sharing of information) to keep everyone on the same page and up to speed.

[11] Construction Innovation Hub (2020) "The Value Toolkit". Available at: https://www.constructionleadershipcouncil.co.uk/wp-content/uploads/2020/07/CIH-Value-Toolkit-final.pdf [Accessed 17 October 2022]

- Emphasise learning and sharing lessons both during and after the project to improve outcomes and so that individuals can grow professionally.

As well as these hard technical aspects, you might want to consider some of the other dimensions of good partnerships. As the client you have an ethical responsibility for the physical and mental wellbeing of the teams you employ. The mental health of workers in the construction industry is often neglected. Showing awareness or even instituting safeguarding policies across the project team can help to improve productivity, raising the bar for procurement practice more generally[12].

Working with stakeholders

Construction projects affect many people outside of the immediate project team and, indeed, beyond any contractual tie. These groups or individuals are called stakeholders. The numbers involved will depend on the specific project, but you are either required by law to understand, engage and communicate with them or are strongly advised to do so to improve outcomes.

They fall into two main categories, including:

- those who you must proactively engage with for the project to be compliant and viable, such as planning authorities, regulators, funders and lobbyists.
- those who will be closely involved and should be engaged with to ensure that they are singing from the same hymn sheet as you. This group includes supply chain partners, end-users, and operators. The extent to which you engage with persons in this group will vary – see the stakeholder analysis matrix below. You should pay closest attention to those who are passionately interested and have the most power to affect the success of your project.

Stakeholder analysis

2 x 2 matrix: stakeholder power relative to interest.

[12] CIOB (2020) available at: https://www.ciob.org/industry/research/Understanding-Mental-Health-Built-Environment

Stakeholder engagement is best considered as a dynamic activity. First, you should analyse the stakeholders to your project. The objective of this analysis is twofold:

1. It helps you to understand the stakeholders' relative power or influence, level of interest and attitude to the project. Armed with this knowledge, it is possible to tailor your approach for engagement and communication with them for the best outcomes.
2. It helps you to understand the relationships between stakeholders. It is useful to know if separate parties are, for example, allied under a common cause. In this case you know to deal with them as a bloc when addressing their common cause.

The idea is of course to pre-empt any problems and win the stakeholders over to your side. Note, though, that the engagement should be two-way. You have as much to learn from them as they do from you, and the ultimate goal is to procure a better asset.

Stakeholder engagement and communication

The results of your analysis will suggest the best ways to engage and communicate with them. Some will only require periodic written updates. Others will need ongoing in-person engagement and perhaps negotiation to, for example, reconcile tensions and differences. There are countless tools available to you, including everything from face-to-face conversations and meetings through to more public and wide-reaching open days, newsletters or social media.

Allocating responsibilities to the right people for engagement is important to match the level of influence of the project leader with the stakeholder. The higher the stakes for the stakeholder, the higher the attention the project leadership should pay, either to keep the stakeholder 'on side' or to leverage their energy and support for wider benefit. It is typical for the client sponsor to be primarily focused on engaging with those stakeholders who are key to success – for example, funders or those who could influence planning decisions.

The client project manager should engage primarily with stakeholders whose influence will grow later on in the project's life cycle, such as supply chain partners, end-users, and the operator.

It is good practice to maintain a communications plan (also known as a relationship management plan) as part of the overall project execution plan (PEP) – see chapter on Creating and maintaining plans from page 25. This will help you to plan your communications campaign and to document all activity.

Creating and maintaining plans

Creating and maintaining plans

You should make detailed plans to control subsequent activities during the 'define' stage, building on information already gathered.

These plans should address scope, quality, time, resources, costs, risks, contingency provision and draw-down, the idea being to have a baseline against which progress and performance can be measured.

You should record these plans in various documents, including the project mandate, the project brief, and the project execution plan (PEP).

To avoid confusion, these documents should all record the title, the document version, and its distribution history.

The project mandate

The project mandate outlines the business case for the project, setting out the following information:

- Summary of the reason for the project, including any need, opportunity, or strategic imperative.
- Summary of the funding route.
- Summary of the governance arrangements.
- Outline of high-level requirements for success, including information on why those things are important.
- Benefits of the project, showing how value will be measured.
- Outline of the information management purpose and scope.
- List of any existing assets in scope that will be refurbished, repurposed or retired.
- Outline timeframes, including known parameters and assumptions
- Other relevant information known at the 'identify' stage.

The project brief

The project brief builds on the project mandate. It is key to your intermediate business case and typically will include the following information:

- Summary of the chosen project concept, outputs and deliverables. It should outline what work is intended, i.e., the scope of works. It is just as important to state what is not in scope. For example, you might choose to exclude fit-out works, the installation of specialist equipment, or security requirements from the project.
- Summary of the information requirements both during the project and for the asset on completion.

- Map showing the link between outputs, outcomes, benefits and your objectives.
- Summary of the governance arrangements.
- High-level project timeline, including your desired start and end dates, and any key milestones along the way.
- Resource requirements, including the types of resource (for example, labour, materials and specialist equipment) and likely availability and costs from the market. It is particularly important for your client project manager to monitor availability and costs of essential resources during challenging economic cycles.
- Assumptions and any known constraints or dependencies.
- Other relevant information known at the 'assess' stage.

The project execution plan (PEP)

The Project Execution Plan (PEP)[13] is a critical source of up-to-date information for the whole project team. Owned by the client project manager, it collects together all the up-to-date plans and protocols for carrying out your project.

The depth of information contained in the PEP should be proportionate to the complexity of the project. A core document prepared by the client project manager is often supplemented by other contractually agreed information supplied by members of the project team.

In most cases, the task of maintaining and developing the PEP will be contractually delegated to the party responsible for the 'implement' stage, who will do so on behalf of the whole project team, including all consultants and contractors. Even so, the client project manager must remain in overall control.

Note that, other than for the smallest projects, the PEP is unlikely to be a single physical document. It is more likely to comprise an organised and coordinated collection of digital information.

First signed off at the end of the 'design' stage, the PEP should be kept up to date throughout the project according to an agreed change control process.
Elements of the PEP that are subject to change control include:

- Statements of needs and benefits, including key performance indicators.
- Scope definition and breakdown.
- Quality plans.
- Health, safety and well-being protocols for all working on the project, either on or off site.
- Other protocols, as necessary, to guide the project team on ways of working, for example, to achieve sustainability targets.
- Dependency networks.
- Resourced time plans (schedules and programmes).

[13] Also sometimes known as the project management plan (PMP), the project initiation document (PID), or the project handbook.

- Procurement protocols and plans.
- Team structure, roles and responsibilities, delegated limits of authority, including parameters of empowerment, for example, to spend, approve changes etc, including for contractors and consultants.
- Budget and cost plans.
- Risk management process.
- Risk analyses (qualitative risk registers and any quantitative analysis).
- Contingency plans.
- Issue resolution and problem-solving records (which might include evidence from audits or other assurance activities – see chapter on Quality management).
- Stakeholder analysis and stakeholder engagement and communication protocols and plans.
- Process for and governance of controlling changes.
- Information management process, including for record-keeping, meetings and minutes.
- Heritage impact assessments.
- Decisions taken at stage gates and other key decision points identified in the plan.

You might also choose to include progress reports that allow you easily to track where you are against your original plans and to understand the justification for remedial actions.

The PEP is used throughout the project, for example to:

- Bring new team members on board.
- Communicate progress to stakeholders.
- Document an audit trail of information, from risk registers to change control decisions.
- Inform team members of their roles and responsibilities, key dates, and protocols.
- Assure that processes and procedures are being carried out satisfactorily.

Considerations for planning projects

The client project manager remains responsible for the adequacy and completeness of all plans even though some of the detailed work is completed as part of the scope of work of consultants and/or contractors. Setting the relative priority of scope, quality, time, cost, and so on remains your responsibility.

The key considerations are:

Scope

The scope identifies all the work for the project. To ensure that it is complete, list the project under the following headings:

- What product is required?
- What work is required to produce the product?
- How much will it cost to produce the product?
- How will the work be organised?

Quality

The quality of both the project's product and its process are important and should be adequately resourced. Considering quality in your planning will ensure that the standards targeted are understood and that the skills required are secured. Expectations for quality, including acceptance criteria for deliverables, should be stated explicitly. Smaller projects might be able to collect together plans for quality in one place. On larger ones, though, it is common for there to be separate plans that deal with discrete systems or elements.

Time

Time planning, variously called scheduling or programming, ensures that all the logical dependencies between activities are understood and accounted for. This determines the critical path or chain of activities and thus when it might be possible to complete the project. With critical activities accurately listed and milestones known, best practice is to estimate the time for all activities based on how much effort each will take. The estimate should consider best, medium, and worst-case scenarios, and plan for the most likely based on current information.

Common problems with scheduling include:

- Basing it on an incomplete scope.
- Missing or misrepresenting the logical dependencies between activities.
- Over-optimism, with the range between best and worst-case not wide enough, or estimates of what is most likely skewed to the best case.

Other pitfalls to watch out for are partial schedules that represent, for example, the work of the contractor without accounting for key client milestones or dependencies.

Resource optimisation for efficiency

The ideal time plan typically needs to be adjusted to account for resource availability. Resources include people, equipment, facilities, and other entities required to complete the work.

Ensure that resources are being used as efficiently as possible by 'smoothing' the resource profile to protect the end date of the project. If resources are likely to be constrained or otherwise in short supply, 'levelling' ensures that they are used optimally even though it inevitably extends the overall project duration. Be sure to record your assumptions. The result of this exercise is a resourced time plan, where the resources required over time can be visualised. In turn, this information helps to develop the project cost plan, i.e., the budgeted cost of the work scheduled.

If time is relatively more important than cost, this exercise also helps you to calculate the cost of accelerating the programme by bringing more resources to bear. Alternatively, if cost is more important than time, this exercise helps you to model the opportunities for reducing costs by re-programming.

Cost

Initial cost estimates for the project are likely to have been made 'top-down', using available historic data from your own experience or in reference to published cost data. Before the final investment decision, however, you should make 'bottom-up' estimates, including for the cost of time-dependent effort (as described above) and for costs that are not dependent on time. Exceptions will be where delivery of part of the scope is contracted in the supply chain on a fixed or lump sum basis.

Understanding the cost profile over time allows you to manage the project's finances, for example, by forecasting and tracking liquidity and milestone payments to suppliers.

Key questions for you include understanding what the expected out-turn cost of the project is, how much work has gone into the estimates, and what options are available to reduce costs.

Risk analysis and contingency planning

Projects are inherently uncertain and risky, subject to many factors beyond your control, including everything from the weather to political announcements. Estimates of effort, time and cost are therefore all risk based.

Risks may be threats (downside impact on objectives) or opportunities (upside impact on objectives). They can change over the course of a project and, of course, can occur simultaneously, sometimes with devastating consequences. As far as possible, therefore, it is wise to anticipate their potential impact through risk analysis and plan accordingly.

The first steps are to identify the risks and describe them. For the descriptions to be useful, they must clearly separate out three parts:

- The objectives at risk.
- What is known (facts, issues or assumptions held to be true).
- What is uncertain (things that could happen).

Next, identify possible consequences by assessing the risks' likelihoods and magnitude of impact. You might also consider the risks' proximity (in time), velocity (how quickly the consequences might occur) and urgency (your window of opportunity for mitigating the consequences).

This analysis can be carried qualitatively by looking at best, medium and worst-case scenarios, and factoring in the potential for optimism bias – see chapter on Funding and business case considerations on page 10.

For best practice – especially where large investments are at stake - you will get better intelligence if the analysis is carried out quantitatively.

Quantitative risk analysis combines the effects of all estimating uncertainty and risk events on the project's business case, whole-life cost, capital budget and timeline. Requiring many inputs, these calculations require expertise and are usually carried out by proprietary software. The outputs are generally processed further in, for example, a Monte Carlo simulation, and then validated.

Once plans have been made reflecting scope, quality, time, resources and costs, and in the light of the estimating uncertainty and specific risks to project objectives, you must decide how much contingency to hold.

Generally, your prioritisation of risks will have allowed you to focus in on the most likely and/or most impactful risks, which will be targets for contingency planning. There are many ways to treat risks, and risks' impact can be controlled through preventive and corrective measures. The idea is to bring your exposure to risks into a range that you can tolerate.

Contingency plans are usually expressed in financial terms. The overall budget is typically split into the provision for known scope, the provision for known risks (often called the risk budget), and a further provision for any unidentified/unknowable risks (often called the management reserve).

A crude way to size a contingency is to add a percentage based on a combination of experience and the perceived risk in the plan. A more sophisticated method – only possible using quantitative methods - is to model the combined effects of estimating uncertainty and specific risks identified by the team so that confidence levels can be expressed for particular out-turn times and costs. For example, a P50 cost is the value where there is a 50% chance of meeting the timeline and/or budget, whereas a P80 cost where there is an 80% chance.

Risk modelling is specialist work. The key for you is to be able to interpret and challenge the data. You should know which estimating uncertainties (e.g. productivity rates) or specific risks have the biggest impact on the end date, budget and quality at completion. Also, you should know if any class of risk (e.g., very low likelihood risks) has been excluded from the analysis, and why.

Controlling the project

With plans agreed and a baseline set, your client project manager can monitor progress against that baseline, capturing data on actual performance and making assessments and forecasts for future performance. Combined with analysis of any changes arising in the external project context, this internal exercise helps you and your fellow decision-makers on governance boards to take corrective action where necessary.

Considering what you want monitored and reported is a key part of planning – so the baseline plans must contain all the relevant information. Best practice involves 'earned value analysis' which tracks:

- the schedule performance (productivity) – the work achieved compared to plan
- the cost performance (efficiency) – the work achieved for the actual and accrued spend

Other aspects of performance that you might want to track include:

- Health and safety performance.
- Environmental performance.
- Quality performance.
- Benefits realisation.
- Stakeholder satisfaction.

Controlling the project spans actions that pro-actively anticipate risks and actions that reactively correct issues and problems as they arise. Having a clear view of roles, responsibilities, and delegated authorities of the project team, which is an important feature of the PEP, helps you to understand how risks should be mitigated and who should resolve problems.

Quality management

Quality management

A concern for time and cost should not be at the expense of quality. Good quality is defined in many different ways, but at the very least it is about delivering the project safely, to the right standards and specification as well as on time and to budget.

The cost of losing track of quality is high. It can lead to expensive re-work and regulatory breaches, putting the safety and well-being of people at risk and damaging confidence in the project.

You can avoid these risks by managing quality through inspection and testing (known as quality control), audits (quality assurance), and continual improvement at all stages but especially at the 'validate' stage, when the asset is commissioned and handed over into use.

Quality control

Quality control has always been important but is even more so in the wake of the Building Safety Act 2022 – see page 54. It is about verifying that the work meets required standards, most often through inspection and testing using a clerk of works, site engineer or as an additional scope for the design team. Inspection and testing regimes are designed to prevent defects being passed on to the next 'customer' in the chain of activities.

Ideally, you would inspect and test everything but that is impractical. There is a cost to it all, and it would be inefficient to check everything in all circumstances. Some work – a weld, for example – cannot be inspected without destroying it. Also, inspection and testing consume specialist resource and take time.

How far you take quality control is about balancing costs and practicality against risks and making use of all the tools available to you – for example, non-destructive testing regimes, or only testing and inspecting representative samples. Quality control is sensible but the extent to which you use it should be proportionate to the risks.

Quality assurance

If quality control is about ensuring bad quality is not passed on, quality assurance is about building good quality in.

Quality management systems help you to set the standards for your organisation's culture, approach to collaboration, attention to compliance, and continual improvement. Organisations that run quality management systems give confidence that the services they provide or products they produce are fit for purpose and right every time. This is especially true if the organisations have been externally certified to conform to published standards (such as BS EN ISO 9001:2015[14]) by independent certification bodies.

In response to well-publicised quality failings in the built environment (not least Grenfell Tower, which suffered a tragic fire that led to the Building Safety Act 2022), a new standard – BS 99001:2022[15] was published in 2022 to complement the generic BS EN ISO 9001: 2015.

[14] ISO 9001:2015 Quality management systems – Requirements: ISO - ISO 9001:2015 - Quality management systems — Requirements

[15] BS 99001:2022 Quality management systems. Specification for the application of BS EN ISO 9001:2015 in the built environment sector: BS 99001:2022 | 31 Jul 2022 | BSI Knowledge (bsigroup.com)

This new standard helps with quality assurance matters specific to construction projects, such as ensuring building materials are fit for purpose, and managing off-site pre-fabrication activities.

There are other generic quality management standards for issues that are relevant to the built environment, such as the standard for environmental management (ISO 14001 series of standards) and safety management (ISO 45001 series of standards).

As part of your due diligence when appointing your project team, and if the project demands it, you can give yourself considerable peace of mind by contracting with those who run recognised quality management systems, especially if they are third-party certified.

Continual improvement

A cornerstone of quality management for more than 50 years, the idea of continual improvement requires a focus on incremental learning. Japanese management practices are commonplace in this area, with approaches such as 'six sigma' and 'lean manufacturing' used effectively to eliminate waste in factory processes and systems.

Rather than waiting for quality control to identify actual problems, or for quality assurance audits to highlight management system failures, continual improvement is a 'bottom-up' activity. It engages the people doing the work, empowering them to collaborate and find improved ways of working that make sure that products and processes meet requirements.

Although different to mass production work (where the same activities are performed many times over), project-based work can nonetheless benefit from the principles of continual improvement both during a single project (for repeated elements) and especially if a team remains together over multiple projects.

Quality during commissioning and handover

When assets have been built and the project is at the 'validate' stage, there is a particular focus on checking that the asset works as intended.

First, each individual system in the asset – for example, the heating and ventilation system – must be commissioned and validated as fit for purpose. Then, all the systems must be validated together to ensure that they work harmoniously, i.e., are effective, safe, don't conflict with each other, and are capable of being maintained as a whole. It is at this point that the soft landings process (from page 45), which is in theory started during the 'design' stage, bears fruit. The early focus on ensuring that the brief accommodates the operator's future needs is time well spent.

Many assets will require so-called 'seasonal commissioning', i.e., adjustment to account for the changing seasons, and validation during operation. Where this is the case, responsibility for operating the asset will only be handed over on completion of such work.

Sustainability and ethical considerations

Sustainability and ethical considerations

Planet Earth is facing an environmental crisis. By 2023, six of the nine planetary boundaries that regulate the stability and resilience of the Earth system had already been breached. This included the boundaries relating to climate, biodiversity, freshwater, land use, and pollutants. Crossing these boundaries increases the risk of generating large-scale abrupt or irreversible environmental changes. The boundaries mark a critical threshold for increasing risks to people and the ecosystems we are part of.

The built environment is responsible for about 40% of global carbon emissions[16], with 11% arising from construction projects. It uses roughly half of the raw materials extracted and creates around a third of the world's overall waste. Hard infrastructure is also thought to be the second largest driver of man-made pressure on biodiversity.

Because environmental sustainability is a pressing issue for the construction industry, it must respond to these challenges and address its impact on the environment.
As a construction client, you are critical to this transition. By acknowledging and wielding your influence from the earliest stage of a project, you can play a crucial role in setting and achieving low-carbon targets, improving the entire supply chain's performance for the benefit of society. Reduce carbon footprints through retrofit. Reuse existing buildings where possible. Demand that materials and products are sourced and supplied sustainably. Commission low-energy buildings that respect the planet. Insist on repurposing and recycling construction waste.

As the CIOB's Guide to Embodied Carbon in the Built Environment notes, "Clients and their main contractors have the most significant impact on promoting low-carbon practices in construction projects. Clients can set and drive ambitious low-carbon targets as part of the project brief and ensure that contractors and suppliers, including numerous SMEs, adopt low-carbon strategies to fulfil them. By prioritising the reduction of embodied carbon emissions in project briefs, clients can [also] boost demand for low-carbon materials and methods throughout the supply chain." (**Rakhshanbabanari, 2024**[17]).

The wide-ranging concept of sustainability has over the years been increasingly regulated and so parts of it are now a matter of compliance. However, there is still a gap between what is required in legislation and what is expected of you by your funders, your end users, your markets and even your project team.

Since the built environment accounts for around 40% of global carbon emissions (to say nothing of its impacts on resource consumption, material waste, habitat loss, water conservation, pollution, and social equality), responsible construction clients will go beyond the letter of the law to invest in best practice. You are encouraged to think beyond the end of the project to the whole-life of the asset, from completion to retirement.
It is worth noting that the financial value of property portfolios is at risk from the growing potential for stranded assets. This refers to properties that will not meet future energy efficiency or wider sustainability standards, and as a result are increasingly likely to face early obsolescence.

Exactly what you do is down to you. You must consider your organisational objectives and the degree to which driving social and environmental as well as economic value from your investment is important to you. Your conclusions will inform the design and implementation of the sustainability strategy for your project.

[16] Built for the Environment report (architecture.com)

[17] Rakhshanbabanari, K., 2024, Guide to Sustainability in the Built Environment, CIOB. Publication Date 11/11/24

The publications listed below will help your decision-making:

- 'Circular economy guidance for construction clients: How to practically apply circular economy principles at the project brief stage - Together with its members[18]', UKGBC has produced a circular economy guidance for construction clients, which provides comprehensive practical guidance to support construction clients who want to ask for circular principles in their project briefs for non-domestic built assets.
- The LETI (London Energy Transformation Initiative) Client Guide for Net Zero Carbon Buildings pulls together key details from numerous LETI documents and publications, which cover the ways in which briefing, designing, procuring, constructing, occupying, managing and valuing buildings must change.
- The CIOB Guide to Sustainability in the Built Environment provides a comprehensive reference for stakeholders in the buildings and construction sector, introducing sustainability principles, offering tools for addressing climate, nature, and social challenges at organisational and project levels, and outlines the benefits of adhering to relevant standards and environmental certifications.
- The CIOB Guide to Embodied Carbon in the Built Environment highlights the role of clients in addressing the embodied carbon of buildings and the use of contractual clauses to propel requirements down the supply chain, as well as providing some useful case studies to illustrate this.
- International New Construction Technical Manual SD233[19] and New Construction Non-Domestic Buildings Technical Manual SD5078[20] Published in 2016, the Building Research Establishment's (BRE) technical manuals on new construction offer guidance on sustainable materials. These were followed up in 2018 with advice on practices for non-domestic buildings in the UK.
- **The Construction Industry Council's Constructing for Sustainability**: A Clients Guide aims to summarise the key aims and objectives relating to sustainability, setting out what you need to know and why.
- The UK Net Zero Carbon Buildings Standard has been created to enable the construction industry to robustly determine whether built assets are net-zero Carbon and in line with the UK's climate targets.

CO_2nstruct Zero (a Construction Leadership Council initiative) has called upon infrastructure clients in the UK to act with the launch of its Five Client Carbon Commitments. This outlines practical steps that organisations can take to show how they are reducing their carbon emissions and by when. It provides the consistent language and terminology needed to help the industry collaborate on the common goal of delivering net zero.

The five commitments are:

1. Procure for low carbon construction and provide incentives in contracts.
2. Set phase-out dates for fossil fuel use.
3. Eliminate the most carbon-intensive concrete products.
4. Eliminate the most carbon-intensive steel products.
5. Adopt PAS 2080, Carbon Management in Infrastructure, as a common standard.

[18] CIOB is a member of UKGBC

[19] Building Research Establishment (2016), "International New Construction Technical Manual SD233" BRE Global.

[20] Building Research Establishment (2018), "UK New Construction Non-Domestic Buildings Technical Manual SD5078" BRE Global.

The strategic drivers for sustainability are increasingly compelling and clients need to decide the degree to which responding to them is mission-critical.

Sustainability certifications can play a fundamental role by setting benchmarks for environmental performance and recognising projects that meet these standards. They provide a framework for assessing and improving the environmental impact of construction projects (Doan et al., 2017[21]) and are designed to encourage you and your project teams to prioritise low-carbon practices. Key certifications include Building Research Establishment Environmental Assessment Method (BREEAM), Leadership in Energy and Environmental Design (LEED), WELL certification, and Living Building Challenge.

Environmental, social and governance

At an organisational level, the B Corp Certification[22] is a designation that shows that a business is meeting high standards of verified performance, accountability, and transparency on factors from employee benefits and charitable giving to supply chain practices and input materials. Such certification demonstrates your commitment not just to the beneficial owners of the organisation but to non-shareholding stakeholders too, all of which is attractive to – and increasingly demanded by – funders and your market of end-users alike.

Indeed, environmental, social and governance (ESG) drivers can no longer be ignored. According to Howard-Grenville (2021)[23], "Around the globe, a third of all professionally managed assets, or roughly $30 trillion, are now subject to ESG criteria ... an increase of more than 30% since 2016."

Sustainability isn't just about environmental considerations. It is also about social impacts. In the built environment, this includes the impact on end-users and the people who will be involved in operating the asset over its working life.

Just as environmental values are enshrined in law, many social values are too, for example, to prevent modern slavery and uphold workers' health, safety and well-being standards. Equally, just as environmental law only goes so far, the same is true of the laws surrounding social values. Going beyond them is a matter of ethical and responsible choice.

Governance – the 'g' in ESG – is about acting transparently and with integrity, and being sure to account for a representatively diverse range of voices and points of view in your business. How you govern a construction project is important, too, affecting your contracts or other arrangements to design, build, operate and maintain aspects of your built asset. Many organisations have diversity targets for gender, ethnicity and people who are differently abled either physically or cognitively. At their best, these targets reflect a genuine desire and conscious intent to listen and be socially inclusive. The businesses that adopt them understand that value comes from difference and there is a business case for diversity.

[21] Doan, D.T., Ghaffarianhoseini, Ali, Naismith, N., Zhang, T., Ghaffarianhoseini, Amirhosein, Tookey, J., 2017. A critical comparison of green building rating systems. Build Environ 123, 243–260. https://doi.org/https://doi.org/10.1016/j.buildenv.2017.07.007

[22] Certified B Corporations, or B Corps, are companies verified by B Lab to meet high standards of social and environmental performance, transparency and account ability.

[23] Howard-Grenville (2021) ESG Impact is hard to measure but it's not impossible https://hbr.org/2021/01/esg-impact-is-hard-to-measurebut-its-not-impossible[accessed 11 June 2022]

Other key governance issues to consider may include where sustainability and net zero sit within your risk register, the impact of climate change on your supply chain, how you will include sustainability within your wider reporting, and how to embed sustainability into your business continuity planning.

Having a robust ESG strategy can help you increase your long-term profitability, build a more resilient, risk-proofed organisation, demonstrate leadership and good will to your stakeholders, address ethical considerations, and be more attractive not just to investors and your market, but also to your employees.

Digital information and its management

Digital information and its management

Adopting digital approaches to creating and managing information about both the project and the resulting asset – frequently enabled by BIM (building information modelling) or just plain 'information management'[26] – has substantial benefits for you, especially if you have an interest in the asset's management over its whole life.

Advantages of digital information

Digital information has numerous well-known advantages over hard copy. Its storage, ability to be shared, searchability, and retrieval are easier, faster, and more flexible (especially when using the cloud), making its management more cost-effective. Also, digital technologies allow you to avoid duplicating effort by capturing information once but re-using it many times, which of course is useful, for example, when coordinating design information developed by different teams of people.

To take full advantage of these benefits requires careful planning (especially information requirements and how they will be delivered) and agreement on standards between relevant people on the project team and wider stakeholders. For example, to enable painless sharing, there should be an agreed format and structure for project data, and you should have protocols in place to record versions and to control when information is issued.[24]

A standard structure and format for your data allows it to be interrogated and checked by different software applications, addressing the challenge of interoperability. This has immeasurable value during a project and beyond. Provided information handed over on completion is properly structured and formatted, it has the potential to be automatically imported into your facilities management and asset management systems, benefitting future users who are far removed (technically and/or contractually) from the project supply chain. This, of course, will minimise your and future owners' ongoing operating and maintenance costs and use of resources.

There is a cost to organising project information into standardised data structures and so there must be a trade-off: not all information generated merits that treatment. Digital information that sits outside these structures – as pdfs or image files, for example – is certainly less useful but still much more so than if they only existed as hard copies.

Another advantage of adopting a digital information management strategy is that it facilitates unambiguous audit trails. Digital systems can automatically record all the steps and exchanges that led to the final versions of project information, invaluable to project managers for many reasons, not least for resolving disputes about who was responsible for what and when.

The case for open standards and open-sourced platforms

Open standards and the platforms that support them are vital for enabling interoperability and collaboration across the lifecycle of construction projects. By ensuring that project data can be shared seamlessly between different tools and systems, open standards reduce inefficiencies, enhance decision-making, and future-proof information for long-term use.

[24] According to the relevant ISO 19650 standards, information management is about getting benefit through better specification and delivery of just the right amount of information concerning the design, construction, operation and maintenance of buildings and infrastructure and using appropriate technologies.

One example is OpenBIM[25], which promotes the use of non-proprietary, neutral data formats like Industry Foundation Classes (IFC). While IFC facilitates the technical exchange of data – including geometry, metadata, and performance characteristics – OpenBIM provides a broader framework for collaborative working. This combination ensures that all project stakeholders, regardless of their chosen software, can access and contribute to a shared pool of information. Supported by buildingSMART International[26], OpenBIM and IFC standards are widely recognised as industry benchmarks for fostering open collaboration.

You must understand the distinction between open standards and open-sourced platforms, as both play a critical role in enabling interoperability and innovation:

- **Open Standards** are universal guidelines or formats (such as IFC) that ensure data compatibility across various software platforms. They enable seamless collaboration by removing technical barriers and reducing reliance on proprietary file formats.
- **Open-Source Platforms** are software tools whose source code is openly available for use, modification, and distribution. These platforms allow for customisation, adaptability, and cost-effective integration into specific project workflows.

Note, however, that proprietary platforms can still support open standards without being open-sourced. Many proprietary systems are designed to read and write data in formats like IFC, enabling interoperability with other tools that also adhere to these open standards. This allows you to choose proprietary solutions while still benefiting from the flexibility and collaborative potential of open standards.

By adopting open standards, you can avoid being locked into specific vendor ecosystems, retain full control of your project data, and support better outcomes during the design, construction, and operational phases. For example, many public infrastructure projects in the UK now mandate the use of OpenBIM standards to ensure transparency and interoperability across complex supply chains. Furthermore, open platforms foster innovation by enabling the integration of emerging tools and technologies, such as digital twins and AI, into existing workflows.

The adoption of open standards is not only a technical decision but a strategic one, offering you flexibility, transparency, and the ability to adapt to future industry developments. These practices also align with broader organisational objectives, such as improving supply chain transparency, meeting sustainability targets, and enhancing long-term asset performance.

To maximise the benefits of open standards, you should establish clear information requirements, specify the use of open formats in contracts, and ensure that all project stakeholders are equipped to work with these standards. While this approach may involve higher upfront effort, the long-term benefits of reduced costs, enhanced collaboration, and greater resilience far outweigh the initial investment. By embracing open standards, you are not just ensuring project efficiency but also contributing to a more sustainable and innovative construction industry.

[25] Rather than invent project-specific standards, you are encouraged to adopt the formal, internationally agreed and published ISO 19650 family of standards.
[26] https://www.buildingsmart.org/about/openbim/

Implementation of a digital information approach

Successfully applying a digital information management approach depends on certain prerequisite conditions to do with you and your project team's existing capabilities and competence. Getting everyone up to speed will require an investment of time and money in some or all of the following:

- Upskilling to acquire knowledge and understanding about digital techniques, the appropriate management processes, and how they affect project management in general.
- Documentation standards to define the processes and procedures that project teams will need to use to produce, share, deliver and check digital information successfully.
- Information technology to have the necessary hardware and software available not just to your team but throughout the supply chain. This includes the technologies to store and manage the information as well as to produce the information.
- Time to allow you and the supply chain to properly consider the range of information that needs to be produced, and to plan in detail how, when and by whom it will be developed.

If it makes sound strategic sense for information produced during your project to be reused in your asset's operational phase then you must ensure close collaboration between your eventual facilities and asset management team and your project management team. (See also chapter on Design management and soft landings on page 45).

The future of information management

The long-term industry goal for information management is for critical data about both the process of producing the asset and especially the asset itself to be seamlessly reusable, interoperable, and up to date, from the 'identify' stage through to the 'retire' stage. This ambition is summed up in the 'golden thread of information' concept coined by Dame Judith Hackitt in her report[27] on regulations and safety in the construction industry.

The principles and practices of creating and maintaining the golden thread are enshrined in the ISO 19650 series of standards[28] for managing information over the whole life of the built asset. These standards place key accountabilities on project clients and asset owners/operators, including to establish information management resources for the project team and to define the contractual information requirements against which their supply chains will deliver.

The ISO 19650 series is being adopted across the world, not least in the UK, where, for example, it sits at the heart of the UK BIM Framework[29] This Framework is an example of best practice, which is why its use is stipulated in the Information Management Mandate[30] and heavily referenced in the Government's Construction Playbook.[31]

[27] Hackitt, J. (2018) 'Building a safer future: independent review of building regulations and fire safety'. Crown Copyright.
[28] Published by British Standards Institute, the ISO 19650 series concerns the organisation and digitisation of information about buildings and civil engineering works, including building information modelling (BIM):
- Part 1 is about the design phase
- Part 2 is about the delivery phase
- Part 3 is about the operational phase
- Part 4 is about information exchange
- Part 5 is about information security

[29] The UK BIM Framework is a national industry campaign to implement BIM using the ISO 19650 series: UK BIM Framework – BIM Standards, Guides & Resources
[30] The Information Management Mandate is part of the influential Transforming Infrastructure Performance: Roadmap to 2030. See Transforming Infrastructure Performance: Roadmap to 2030 - GOV.UK (www.gov.uk)
[31] The Construction Playbook sets out key policies and guidance for how public works projects and programmes are assessed, procured and delivered: The Construction Playbook - GOV.UK (www.gov.uk)

Although beyond the scope of this guide, the field of digital information technology is full of potential benefits for you and well worth exploring further. Originating from the UK Government's Transforming Construction Challenge[32], examples include digital twin technology, where a digital model communicates with its physical twin for better monitoring and pre-emptive risk avoidance, and digital tools to help with regulatory compliance.

Artificial Intelligence

Artificial Intelligence (AI) is playing an increasingly significant role in how digital information is managed across construction projects. Its role is to support the creation, organisation, and use of digital information, helping project teams to work more efficiently and deliver better outcomes throughout an asset's lifecycle. By enhancing traditional practices, AI offers practical support in organising, analysing, and utilising project data more effectively.

AI simplifies repetitive tasks such as clash detection or compliance checks, automating these processes to save time and reduce errors. Its ability to analyse large datasets also supports better decision-making, identifying patterns and risks that may not be immediately apparent to project teams. This predictive capability is particularly valuable for planning and risk management, helping to keep projects on track. For instance, AI can flag areas of a construction schedule prone to delays or suggest more efficient resource allocation based on historical data.

To fully harness the potential of AI, a strong foundation is required. Quality data is paramount; without accurate and well-structured information, even the most advanced AI tools cannot deliver reliable results. Teams must also invest in understanding AI's capabilities, ensuring they are equipped to interpret and act on its outputs. This involves training not only in the technical aspects of AI tools but also in ethical considerations, such as ensuring transparency and accountability in AI-driven decisions.

As a client, the use of AI in digital information management should be seen as a way to complement – not replace – human expertise. You should consider incorporating AI into digital information management where it adds value, such as in data integration, lifecycle management, and risk mitigation.

The CIOB Artificial Intelligence (AI) Playbook 2024[33] is a valuable resource for organisations seeking to integrate AI into their operations, providing structured guidance on leveraging AI's potential while navigating associated challenges.

Responsibilities for information management

You are accountable for information management and for accepting information management deliverables. However, you will likely want to appoint specialists to help you to fulfil these duties.

If you opt to apply the ISO 19650 series for managing information on your project, the best outcomes arise if it is used across all the project's life cycle stages.

Each time you issue a tender or request for proposal for a new appointment, you should document the detailed information management requirements (typically called exchange information requirements or EIRs) for that appointment. That way you will be able to assess responses on comparable grounds.

[32] Transforming construction challenge – UKRI
[33] CIOB (2024). Artificial Intelligence (AI) Playbook 2024 https://d8.ciob.org/industry/research/AI-Playbook

Design management and soft landings

Design management and soft landings

The 'design' stage includes many activities other than conventional design that help you to avoid problems later. It pays to be aware of the pitfalls and consider ways to avoid them during your planning and in your choice of partners to work with.

Integration with information management

Your information management systems should ensure that the design is fully documented to the extent that not only the construction of the asset but also its commissioning, handover, use, maintenance and subsequent refurbishment, repurposing or retirement can be managed safely, efficiently, and effectively. (Indeed, these considerations have now been made mandatory for any building work on so-called higher risk buildings under the Building Safety Act using the golden thread of information. For more on this, see the section on the Building Safety Act on page 54).

For it to work, though, the information you require from the project team must be clearly specified before work starts, and controls put in place to validate that requirements have been met at relevant points (see the chapter on Digital information and its management on page 40). You are always accountable for this work.

Integration with Design for Manufacturing and Assembly (DfMA)

It is increasingly common for built assets to be created using a delivery approach incorporating off-site manufacture and on-site assembly of some items with onsite construction of others. These techniques are referred to as 'modern methods of construction' (MMC), and have the potential to bring significant safety, time, cost, and sustainability benefits.

Because largish elements of the build are made off site, they must be designed with that in mind. This concept is wrapped up in the shorthand 'design for manufacture and assembly', or DfMA. Unlike conventional design, the focus of DfMA extends to efficient manufacturing, eliminating waste, and ease of assembly.

Design considerations for DfMA include:

- Using common parts and materials
- Reducing the quantity of component parts
- Reducing carbon footprint
- Simplifying part design
- Designing within known capabilities for assembly
- Mistake-proofing assembly (impossible to assemble incorrectly)
- Reducing flexible parts and interconnections
- Manufacturing for modular assembly
- Adopting automated assembly where practicable
- Manufacturing for modular assembly
- Adopting automated assembly where practicable

Soft landings

'Soft landings' is a concept in design and construction concerned with 'starting with the end in mind.' The idea is to focus on use, maintenance and eventual retirement of the asset rather than just the build. This has countless practical benefits, and of course again complements both the golden thread of information idea and society's ambitions for environmental sustainability. It therefore holds great promise for your business case. Applying it depends heavily on leadership from the most important decision-maker on any project – the client. If you want the design to work as designed, you must involve the end-users and eventual operators early on. After all, their needs, wishes, and practical insights are not necessarily evident to designers at the start of a project.

More information on soft landings can be found in 'Soft Landings Framework[34]: six phases for better business' published by the Building Services Research and Information Association (BSRIA) and in Guidance Note 10 in the 'Code of Practice for Project Management for the Built Environment, 6th edition'.

Design

You must be aware of the fundamentals of good design and ensure they are achieved. They include:

- **Safety**: designing in compliance with relevant regulations, including but not limited to CDM 2015 and the Building Safety Act 2022 – see chapter on Health and Safety on page 49.
- **Meeting the brief**: design management is not just about a competent design process but about designing to deliver the best outcomes possible for the investment. You should encourage your project team to challenge the brief constructively for better solutions or ways of working.
- **Whole-life perspective**: when reviewing designs, you should keep in mind the needs of the building over its entire life beyond completion by putting yourself in the shoes of the end-users and eventual operator, which of course might be you.
- **Innovation**: innovation leads to better outcomes, but only if the opportunities are captured early and the risks are managed – late changes lead to delay and expense.
- **Design once – use many times**: repeating features in a build (such as doors in a hospital) are an opportunity to achieve economies by reusing a standardised design rather than designing each one afresh. This does not mean that repeated features should not vary but if they do, the variation should be properly justified.
- **Information**: information is the currency of any project, especially during the design stage. Ensure that you specify and control the delivery of all information assets.

[34] Agha-Hossein, M. (2018) "BG54 Soft Landings Framework: six phases for better buildings" Building Services Research and Information Association. See more at https://www.bsria.com/uk/consultancy/project-improvement/soft-landings/

Design control over time

Once the design has been signed off, ensure that any changes or variations are strictly controlled. This will safeguard mission-critical factors such as quality, time, cost, benefits and/or stakeholder alignment. (Note that working on higher-risk buildings means that you are required to control changes, and some of these changes must be approved by the Building Safety Regulator – see the section on the Building Safety Act on page 54). Good practice is to agree a formal change management process on all kinds of project before works commence, which can then be stored as an annexe in the PEP.

For change control to be effective, all pieces of information (for example, reports, drawings, or models), and every version of those pieces, must be uniquely identified so that there can be no confusion during change evaluation.

Aware of the potential for error and rework in allowing late changes, some clients prefer not to change a design once it has been completed and signed off. This has the added benefit of emphasising the need to get an agreed set of requirements in early, which is especially important when designing for offsite manufacture. The only changes that would be approved in this scenario would be where there is a safety or other regulatory issue to resolve.

Of course, there are downsides to this approach. It closes down opportunities to add value in response to changing externalities that affect your business case, for example.

Health and Safety

Health and Safety

Clients are accountable for managing the project and making decisions about how health and safety matters will be managed.

Most of your decisions regarding health and safety require compliance with regulations and their accompanying guidance, including (in the UK) the Construction (Design and Management) Regulations 2015 (CDM 2015), the Health and Safety at Work etc. Act 1974, and the Management of Health and Safety at Work Regulations 1999.

This chapter focuses specifically on two pieces of legislation that impose duties and requirements on you for health and safety in construction projects: CDM 2015 and the Building Safety Act 2022 (BSA). Where the project is being undertaken in a jurisdiction outside of England, you should, of course, seek advice on how to comply locally.

CDM 2015

The main piece of legislation affecting the management of health and safety on construction projects is CDM 2015[35]. Regulated by the Health and Safety Executive (HSE), it aims to improve health and safety in the construction industry by helping you to:

- Sensibly plan the work so the risks involved are managed from start to finish.
- Have the right people for the right job at the right time.
- Cooperate and coordinate your work with others.
- Have the right information about the risks and how they are being managed.
- Communicate this information effectively to those who need to know.
- Consult and engage with workers about the risks and how they are being managed.

Accountability

Under CDM 2015, people in the client role (e.g., you) have regulated duties. Although you can engage a competent professional to carry out the day-to-day tasks associated with your duties, ultimate responsibility for carrying them out remains yours.

The extent to which you delegate authority for compliance must be specified in the contracts between you and the people you appoint to help, such as a delivery partner, project manager or CDM advisor. It is also helpful to record these arrangements in a CDM Plan or Project Plan – as part of the PEP, perhaps – for assurance purposes.

Managing and documenting multiple clients

Where there is more than one client for a project (as sometimes happens), you all must agree in writing who is to adopt the client role for the purposes of CDM 2015. This person (i.e., individual or organisation) is then responsible for discharging the client duties. Note, however, that those clients who have not been identified as the client for the purposes of CDM 2015 still have duties to:

[35] Construction - Construction Design and Management Regulations 2015 (hse.gov.uk)

- Provide any information in their possession that may be relevant to help the nominated client to pull together the Pre-Construction Information
- Cooperate with other duty-holders involved in the project. (Other duty-holders include designers, contractors, and the principal dutyholders - CDM principal designer and CDM principal contractor.[36])

Notification of the project to the Regulator

For larger projects (more than 30 working days and with more than 20 workers working on the site simultaneously or involving more than 500 person-days), you are required to notify the Regulator (i.e., the HSE) using their online F10 notification form.

Notification must be made early, certainly well before the construction phase begins, and updated periodically, as necessary.

You must display an up-to-date copy of the F10 notice in the construction site office so it is accessible and easily understood to everyone working on the site. You can either do this yourself or ask the CDM principal contractor or contractor to do so on your behalf.

Suitable arrangements for managing projects

The duties apply to projects. In most cases it will be clear what is meant by 'projects'. In others, it may need to be defined. For instance, a routine programme of maintenance work could be classed as a project rather than a series of separate projects.

General requirements

One of your key duties is to make 'suitable arrangements' for managing your project. These arrangements need to be confirmed in writing. A possible technique is to establish a CDM Plan for the project. While it is not specifically required by CDM 2015, it is nonetheless a practical means of demonstrating compliance for audit and/or assurance purposes.

Suitable arrangements

You must make the following arrangements:

- Assemble the project team by appointing designers (including, if necessary, a CDM principal designer)[37] and contractors[38] (including, if necessary, a CDM principal contractor).
- Ensure the roles, functions and responsibilities of the project team are clear – this is usually defined in the contracts between the client and the project team and often clarified in a RACI[39] matrix and in the 'roles and responsibilities' section of the PEP.
- Ensure sufficient resources and time are allocated for every stage of the project.
- Ensure effective mechanisms are in place for members of the project team to communicate and cooperate with each other and coordinate their activities – this could be in progress meetings and by sharing contact details.

[36] Both the CDM 2015 and, since the BSA came into force, the Building Regulations (BR) have principal dutyholder roles, and the two sets of roles are distinct and different. To avoid any confusion, it is wise to differentiate the two sets of roles by their parent regulations, i.e., as CDM principal dutyholders or BR principal dutyholders.

[37] A CDM principal designer is a designer who is an organisation or individual (on smaller projects) appointed by the client to take control of the pre-construction phase of any project involving more than one contractor.

[38] A CDM principal contractor is the contractor with control over the construction phase of a project involving more than one contractor. They are appointed in writing by the client (commercial or domestic) to plan, manage, monitor and coordinate health and safety during this phase.

[39] RACI stands for 'responsible, accountable, consulted, informed'; a RACI matrix is a handy way to clarify project team obligations.

- Take reasonable steps to ensure that the CDM principal designer and CDM principal contractor comply with their separate duties – This could take place at progress meetings or in written updates.
- Set out the means to ensure that the health and safety performance of all designers and contractors on the project is maintained throughout – This could take place at project progress meetings or in written updates.
- Ensure that the contractor or CDM principal contractor provides site workers with suitable welfare facilities for the duration of construction work – A written confirmation from them is adequate.
- Establish the expected standards for health and safety (including for safe working practices) and the means by which these standards will be maintained throughout – This could be by requiring compliance with specific procedures for the site/s in question.
- Establish what the steps designers must take to ensure as far as reasonably practicable their designs manage foreseeable risks during the construction phase and when maintaining and using the structure once it is built. This is generally achieved by asking designers to provide a written strategy for eliminating, mitigating or accepting risks in line with the Principles of Prevention[40].
- Set out specific arrangements for operatives working on or about your project work site.
- Set out procedures for handing over the site to the CDM principal contractor so that building work can start.
- Establish the arrangements for commissioning the new structure and handing it over to the client.

Client Brief and reviewing arrangements

A client brief provides useful means of communicating these arrangements to other dutyholders both as part of the appointment process and during the project. You must review your arrangements throughout the project to ensure that they remain relevant and are updated where necessary.

Pre-construction information

You must produce the pre-construction information (PCI)[41], which must be provided as soon as practicable to every designer (including the CDM principal designer) and contractor (including the CDM principal contractor) that is bidding for work on the project or has already been appointed.

For projects involving more than one contractor, the CDM principal designer must help the client to compile the PCI and provide it to the designers and contractors involved (including the CDM principal contractor). Before the CDM principal designer is appointed, however, you must prepare initial PCI, which the successful appointee then develops.

Construction phase plan

You must ensure that a construction phase plan (CPP) has been prepared before the construction phase begins. The CDM principal contractor must prepare the CPP unless there is only one contractor on the project, in which case that contractor is responsible.

[40] https://www.legislation.gov.uk/uksi/1999/3242/schedule/1/made

[41] Pre-construction information is information relevant to the construction work and is of an appropriate level of detail and proportionate to the risks involved. It includes information about the planning and management of the project, any health and safety hazards, and information in any pre-existing health and safety file.

Clearly, the earlier you appoint them, the more time they have to plan and prepare the CPP.

Health and safety file

You must ensure that a health and safety file (HSF) has been prepared by the CDM principal designer. The HSF is only required on projects where a CDM principal designer has been appointed (i.e., on projects with more than one contractor).

For significant projects with only one contractor involved, you must arrange for an HSF to be prepared – particularly if the information is required for your asset management system. Where a CDM principal designer's appointment finishes before the end of the project, you must make sure that they pass the HSF to the CDM principal contractor so that they can revise and add to it during the remainder of the project.

Welfare facilities

Before construction works starts, you must confirm that the contractor or CDM principal contractor has provided welfare facilities, as set out in CDM 2015 Schedule 2. If the CDM principal contractor included welfare facilities in the CPP, that would help to give you peace of mind that appropriate welfare facilities are being provided.

Appointment of the principal duty-holders

Where more than one contractor is involved (or is likely to be involved) in your project, you must appoint persons to the roles of CDM principal designer and CDM principal contractor – the CDM principal duty-holders – in writing. If no appointments are made in writing, you take on the roles by default, and their duties become your responsibility.

You must secure acknowledgment of both appointments. This will clarify who is responsible, minimising the potential for disputes later.

Satisfying yourself that CDM principal duty-holders have sufficient skills, knowledge, experience and organisational capability

External appointments

You must take reasonable steps to satisfy yourself that the CDM principal duty-holders on your project have the competence (i.e., skills, knowledge, experience and behaviours) and, where they are an organisation, the organisational capability to carry out the work in a way that secures health and safety. You must also check that your CDM principal duty-holders have enough experience and a good track record of managing the risks involved in projects. 'Organisational capability' means having the policies and systems in place to set acceptable health and safety standards which comply with the law, and the resources and people in place to ensure the standards are delivered.

If you have procedures within your own safety management system, you may use them to satisfy yourself of your CDM principal duty-holders' competence and organisational capability. Alternatively, you can use the standard pre-qualification questions in the Government's Procurement Specific Questionnaire, use suppliers certified to the Common Assessment Standard,[42] or check that CDM principal duty-holders are appropriately certified on the Safety Schemes in Procurement (SSIP)[43] website.

[42] The Government's Procurement Specific Questionnaire is suitable for contracting authorities. Build UK's Common Assessment Standard (CAS) can be used to certify suppliers' competence and/or organisational capability to work on public projects.

[43] SSIP is a body for mutual recognition of all the different types of relevant certifications in the construction industry. You can accept a valid certification based on an assessment by any of the SSIP Forum Member Schemes as having met the core criteria. You should not then require any further evidence at the prequalification stage.

Internal appointments

You might choose to take on the CDM principal duty-holder roles yourself. If so, you must satisfy yourself that you have sufficient competence and organisational capability to undertake the role on that project using the same assessment criteria as you would for external appointments.
You must document your assessment and confirm your decision in writing.

Appointment of the CDM principal designer

You must appoint a CDM principal designer as early as possible, preferably at the 'define' stage. This will help you to compile the pre-construction information and identify key risks that are capable of being avoided, eliminated, or reduced early.

The duration of the CDM principal designer appointment must last until the project is handed over to the operator. This is because the CDM principal designer is responsible for the HSF as well as for ensuring all design changes are competently assessed and adopted.

Note that it is possible to replace your CDM principal designer mid-way through the project, should the need arise.

Appointment of the CDM principal contractor

In procuring a contractor, you should specify that the selected organisation will be required to take on the CDM principal contractor role, assuming they are assessed as competent and organisationally capable for the project in question. This information helps the organisation tendering for the work to understand the full scope of the work, assess their competency, and price for that work.

The CDM principal contractor must be appointed early enough in the pre-construction phase to help the client to meet their duty to ensure a CPP is drawn up before the construction phase starts. This also gives the CDM principal contractor enough time to plan their work.

Handover arrangements from the CDM principal contractor to the client

As the project reaches completion, you must review arrangements for formal handover. In some cases, the handover process will be phased, allowing you to accept and take responsibility for parts of the asset before it is wholly completed.

In the event of a phased handover, you must ensure that agreed controls and arrangements are in place to secure the health and safety of people occupying areas that have been handed over.

Building Safety Act 2022

Whereas the introduction of CDM 2015 was about protecting health and safety during a construction project, the Building Safety Act 2022 (BSA) was about ensuring that the design and construction of buildings protect the health and safety of future occupants. The BSA's origins can be traced back to the 2017 Grenfell Tower fire, which precipitated a root and branch rethink of the way we protect the safety of the people who use buildings.

Led by Dame Judith Hackitt, the rethink found (among many other things) that the existing Building Regulations 2010[44] (BR), one of the main objectives of which is to protect people in buildings, had significant shortcomings. For example, her report found that:

- The people carrying out design and building work, and those checking it, did not always appear to be adequately competent to ensure that projects they work on comply with the BR.
- The systems used to assure compliance in design and building work appeared to fall short of satisfactory standards.
- The penalties for breaches were not enough of a deterrent to discourage non-compliance.

The BSA responded to these shortcomings, opening the way for a piece of secondary legislation – The Building Regulations etc. (Amendment) (England) Regulations 2023[45] – to fix them. It does this by amending the BR to:

- Introduce new dutyholder roles with accompanying duties.
- Insist that these dutyholders have adequate competence.
- Impose new procedures to mitigate risks to the safety of building users.

What are the new dutyholder roles?

The changes to the BR identify new dutyholder roles, including:

- Client.
- Designer.
- Contractor.
- BR principal designer.
- BR principal contractor.

Although they have the same names as dutyholder roles under the CDM 2015, they are distinct and different.

It is possible for one person to take on more than one BR dutyholder role at the same time. For example, BR principal dutyholders do just that: they have designer or contractor duties, with additional principal dutyholder obligations on top.

BR clients

A 'client' – i.e., you – is 'any person for whom a project is carried out.'

[44] SSIP is a body for mutual recognition of all the different types of relevant certifications in the construction industry. You can accept a valid certification based on an assessment by any of the SSIP Forum Member Schemes as having met the core criteria. You should not then require any further evidence at the prequalification stage.

[45] https://www.legislation.gov.uk/primary+secondary?title=Building%20Safety%20Act%202022%20

You cannot escape the BR client duties. Indeed, if you fail to appoint others to dutyholder roles, or if other dutyholders' contracts come to an end before the project has concluded, you may find yourself responsible for carrying out other duties on top of your own.

Other BR dutyholders

The other BR dutyholders all have a general duty to cooperate and comply with relevant requirements, which of course helps you in meeting your duties.

They all have a mutual obligation to help each other to meet their duties, which should ensure that important responsibilities and obligations are less likely to fall through the gaps. After all, the primary objective is compliance, not catching people out.

In a bid to assign accountability for compliance, the BR now require you to identify one designer and one contractor to be responsible for signing off on, respectively, all the design work and all the building work. The collective name for these persons is 'principal dutyholders'.

BR principal dutyholders are your best friends, the persons you should be able to rely on to help you to comply, secure a completion certificate from the relevant authority, and thus manage your ongoing liabilities for the safety of users in your buildings.

A BR principal designer takes on additional duties on top of their duties as designers. To do so, they must have 'control over the design work.'

A BR principal contractor takes on additional duties on top of their duties as contractors. They must have 'control over the building work.'

Although there can only ever be one of each principal dutyholder in post at one time, it is of course possible to replace them mid-project.

The kinds of building project affected

The kinds of projects affected are those described in the BR. Although there are exemptions, this group includes almost everything from comparatively small alterations and renovations to large multi-million-pound projects. The list includes higher-risk buildings, for which there are special provisions and a new regulatory regime – see below.

Clients' statutory duties under the BR

Your chief duty is to make suitable arrangements for planning, managing and monitoring your project so that it complies with all relevant requirements. This includes allocating enough resources (e.g., time and, presumably, money).

Your arrangements are 'suitable' if:

- they ensure not just that the design work is carried out so that the building work to which the design relates, if built, would comply with all relevant requirements, but also that the building work is carried out in compliance with all relevant requirements.
- they enable the designers and contractors to cooperate with each other to ensure

compliance with all relevant requirements.

- they provide for periodic review of the design and building work to identify whether it is work relating to a higher-risk building (HRB). (There are special provisions for HRB work – see below.)

Once these arrangements are in place, you must:

- ensure that they are maintained and reviewed throughout the project.
- provide information about the building to every designer and contractor on the project as soon as practicable.
- cooperate with other persons working on or in relation to the project such that other BR dutyholders can fulfil their duties or function.

Situations where there is more than one client

Where there is more than one client on a project, you must agree between you in writing who is to take on the BR client role.

The other clients still have some duties under the BR, though. They are:

- The duty to provide information to the extent that it is in the possession of the client or which is reasonably obtainable by or on behalf of the client.
- The duty to cooperate with other dutyholders.
- The duty to make suitable arrangements to ensure that designers and contractors know that they are working on an HRB.

Appointments generally

When appointing any dutyholder, you must take all reasonable steps to satisfy yourself that the prospective appointee is:

- competent to plan, manage and monitor its work so that it complies with all relevant requirements.
- able to fulfil its general duty to plan, manage and monitor. This is different to being competent: it means having the requisite capacity.

Checking competence and capacity are not straightforward. Fortunately, you are in theory helped in this duty by would-be BR dutyholders' reciprocal duty to not take on roles that they are not competent or able to fulfil.

Even so, you should look for appropriate qualifications[46], current certifications[47], experience, and references as evidence. (Since CIOB members are highly qualified and work to a code of professional conduct, they are a good bet as contractors and especially principal contractors.)

[46] For BR Principal Contractor competence, look for people who have undertaken CIOB's training: https://www.ciobacademy.org/product/principal-contractor-competence-and-legal-duties/

[47] The RIBA operates a certification scheme for BR Principal Designers for their members: https://www.architecture.com/knowledge-and-resources/knowledge-landing-page/riba-principal-designer-register-for-architects.

Similarly, you should review your standard questions when appointing contractors and designers to elicit evidence of their competence[48].

Appointment of BR principal dutyholders

As well as meeting the general requirements for all appointments, you must meet additional requirements when appointing BR principal dutyholders.

In particular, you must take all reasonable steps to satisfy yourself that a prospective BR principal dutyholder has appropriate competence. This means:

- The prospective principal dutyholder must have control over the design or, as the case may be, the building work.
- Where you are appointing a business, the business must have both the appropriate organisational capability and be able to designate an appropriately competent individual to manage the function.
- Where you are appointing an individual, he or she must have appropriate skills, knowledge, experience and behaviours. 'Behaviours' here include refusing work which is beyond the individual's competence, refusing to carry out work that would not comply with the BR, and cooperating with other persons in relation to the work.

You must identify principal dutyholders for your project before the construction phase begins.

If a principal dutyholder's contract with you ends before the project completes then you must appoint a replacement, failing which the principal dutyholder's duties default to you.

This is far from trivial: taking on these duties exposes you to considerable liability if you are not suitably competent or don't have the requisite capacity, and so you should replace departing principal dutyholders quickly or plan to keep them for the duration of the project.

Generally speaking, since principal dutyholders are so pivotal to demonstrating compliance, and since balls are more easily dropped when responsibilities are handed over, you are wise to avoid switching principal dutyholders mid-project, if possible. This means treating the vetting process carefully.

Where there is more than one contractor

Where there is (or is likely to be) more than one contractor on your project, you may identify a BR principal contractor in one of two ways:

1. You can appoint them directly. If so, it must be in writing.
2. Alternatively, you may certify in writing that the CDM principal contractor is also contracted to the BR principal contractor role.

Where there is just one contractor

Where there is (or is likely to be) only one contractor, BR principal dutyholders are assigned either by default or without your involvement.

[48] If you work in the public sector, you can check competence and/or organisational capability by using a supplier that has been certified to Build UK's Common Assessment Standard (CAS). Otherwise, contracting authorities may use the Government's Procurement Specific Questionnaire to pre-qualify bidders.

Despite not being involved in these assignments, you should nonetheless check that the assignees are competent and confirm with the sole contractor and sole/lead designer that they understand their obligations as BR principal dutyholders.

What happens after a client appoints a principal dutyholder

After you appoint a BR principal dutyholder at any time after an application for building control approval is made or a building notice is given, you must give notice to the relevant authority.

Someone can do this on your behalf, but if so, the client must sign it off with an appropriate statement.

What you can expect from the BR dutyholders you appoint

BR dutyholders must provide information to assist you to comply with all relevant requirements.

Similarly, BR dutyholders must all be satisfied that you understand your duties under the BR.

You have the right to expect help from contractors and designers on certain matters beyond their automatic legal duties. For example, if you ask them to notify you when any of the work is higher-risk building work, they have a statutory duty to do so.

You also have the right to ask BR principal dutyholders to assist you in providing information to other dutyholders, and they have a statutory duty to do so.

Finally, you should be able to count on BR principal dutyholders to make sure that other dutyholders cooperate with you.

Higher-risk buildings

One of the biggest changes introduced by the BSA was to identify a new category of building: higher-risk buildings (HRBs) which are subject to a new building control regime overseen and administered by a new Building Safety Regulator (BSR).[49]

The new regime includes rigorous stop-go gateways likely to add significant amounts of extra time to any schedule and extra resources to manage the so-called golden thread of information and control changes. It also adds extra jeopardy insofar as the BSR has the power to stop construction and withhold final approval. All this has serious implications for your procurement strategy, programme and, ultimately, your business case.

On the upside, the increased oversight stops you from rushing in before you have fully considered your construction plans, improving your chances of avoiding risks to safety. This has other theoretical advantages: working things out properly up front and avoiding late changes tends to keep costs and delays to a minimum and helps to mitigate risks in relation to your long-term liability.

Overall, the durations of BSR's approval processes and the risks that they might stop you in your tracks highlight the importance of investing time up front to make your plans as comprehensive, well-organised, and fixed as possible before the initial application and to maintain them for the duration.

[49] https://www.hse.gov.uk/building-safety/regulator.htm

What are HRBs?

In England, an HRB is any occupied building that is at least 18 metres in height or has at least seven storeys and contains at least two residential units.

Inconveniently, descriptions of types of buildings included, and the definitions of terminology (such as the building's height and what counts as a storey) are set out separately, the former in the BSA, the latter in The Higher-Risk Buildings (Descriptions and Supplementary Provisions) Regulations 2023[50].

Since these definitions and descriptions have the potential to confuse, the government published **useful criteria**, which greatly clarifies the detail. Note, however, that the definition is subject to change.

Which projects are affected?

You must follow the new regime if your project is in England and you:

- plan to build a new HRB.
- create an HRB through change of use.
- plan to undertake building work to an existing HRB.

Additional client duties

Working on HRBs means that you have additional duties as the client on top of the ones set out above.

You must make suitable arrangements to ensure that:

- designers and contractors know the project is for an HRB.
- you furnish them with information about the nature of the HRB work.

These arrangements must include periodic reviews of the project's HRB status and the nature of the HRB work. Information about any changes must be passed on to all contractors and designers (including the BR principal dutyholders) on the project.

The 'Gateways' concept

Under the new regime, there are three Gateways, each policed by the relevant authority:

1. Gateway one, unrelated to the BSA, is for planning consent.
2. Gateway two is where you secure building control approval from the BSR. You must not start construction work until then (although you may start some enabling works).
3. Gateway three is where you secure a completion certificate, again from the BSR. The building affected by construction work must not be occupied until then.

To proceed through gateways two and three, the BSA and its associated procedural regulations insist that work stops until the BSR has approved plans (Gateway 2) and occupation is delayed until they have issued a completion certificate (Gateway 3). The BSR also has the power to stop parts of the construction work if it diverges from the agreed plan.

[50] https://www.legislation.gov.uk/uksi/2023/275/contents/made

Ultimately, approval depends on BSR seeing evidence that your project complies with relevant requirements, is likely to be well managed, and creates, maintains, and hands over the golden thread of information.

What is the golden thread of information?

The 'golden thread of information' is one of the chief innovations under the new regime.

Ethically inspired, it is any secure digital system[51] capable of accurately capturing and sharing all the information about the design and construction work needed for the building's future management and maintenance. Used and updated responsibly, the hope is that this information will minimise health and safety risks for occupants.

The idea is that there is one lasting repository for all this information that can easily be accessed, understood and used by the building's future occupants (and people in other new dutyholder roles called accountable persons and principal accountable persons), and easily shared with those who need it, including residents and emergency responders. It is also intended to be used by project teams when subsequent construction work is carried out.

While establishing the golden thread of information seems onerous at first sight, it has significant upsides. In being forced to think about occupants' safety needs from the very start of your project, you are more likely to identify and thus have the chance to avoid related risks, with the advantage also of avoiding unforeseen delay and cost during construction and reducing your long-term liabilities.

BSR relies on the golden thread of information procedurally. It is an essential element in a package of information that assures them that your initial application and application for a completion certificate are valid and provide sufficient evidence to decide on your applications.

You are ultimately responsible for ensuring that arrangements for the golden thread of information are in place and operate effectively. Of course, you are likely to want to formulate and agree them in consultation with relevant actors in your project team. (Indeed, your BR principal dutyholders have specific duties to help you in that regard.) You are also responsible for resourcing suitable digital systems for storing it.

What are the new building control procedures?

Procedures for the new building control regime are set out in The Building (Higher-Risk Buildings Procedures) (England) Regulations 2023, which are summarised below.

How does BSR assess applications?

The BSR's HRB building control role is carried out, in exchange for various fees, through a multi-disciplinary team. They must have time to carry out their regulated role, which includes liaison with statutory consultees.

[51] For full up-to-date guidance on the golden thread of information, see Delivering the Golden Thread issued by the Construction Leadership Council: https://www constructionleadershipcouncil.co.uk/wp-content/uploads/2024/08/CLC-Golden-Thread-Guidance.pdf

Unlike the old regime, the new regime requires you to have refined your design and worked out your processes comprehensively before you apply. In the application, this must be evidenced in many documents that BSR will depend on to approve your project. Since no construction work can start before approval and refusal could add delay and cost, you should focus on ensuring not just that you have ticked all the information-supply boxes but that the information is clear and easy to understand.

While you must approve the overall approach taken in your application, you are very likely to depend on your appointed dutyholders for the technical detail in this package of information. This emphasises the importance of appointing competent people to these roles.

All applications must go directly through the BSR. You may not use private sector approved inspectors.

At Gateway Two

At Gateway Two, BSR requires you to submit the following:

- Competence declaration.
- Drawings and plans.
- Building regulations compliance statement.
- Change control plan, including a change control log.
- Construction control plan.
- Fire and emergency file.
- Mandatory occurrence reporting plan.
- Partial completion strategy (optional).

During construction

You may start enabling works (e.g., site set-up, demolition works, stripping out, excavation of trial holes) without building control approval from BSR.

However, you must have that approval and give BSR five days' notice before you start any permanent construction work.

You must ensure that your project team:

- completes work in accordance with your plans and the conditions of the approval. Documents related to managing and monitoring the project submitted in your application to BSR must be kept up-to-date and accurate.
- reports qualifying safety occurrences using your mandatory occurrence reporting system.
- records 'controlled' changes in your change control log. This means changes that involve carrying out construction work other than as set out in the current plans, and/or departing from the strategies, policies and procedures described in current documents.

You must tell BSR about two types of controlled changes:

1. Major changes, i.e., ones that undermine the basis upon which building control approval was granted. You must not allow your project team to implement a major change until you have applied to the BSR and secured their approval for it. The default timescale for BSR to respond is six weeks. However, they may take longer, if necessary, in which case they must agree a new deadline with you in writing.
2. Notifiable changes, i.e., ones that affect compliance with relevant requirements in the building regulations. You must notify BSR first but otherwise do not have to wait for their approval before making the change.

Note: BSR has the power to reclassify changes and so you cannot completely rely on your own team's assessments. This introduces some unwelcome jeopardy, emphasising how important it is to avoid changes on site as far as reasonably practicable and, if a change is unavoidable, to err on the side of caution when assessing its impact.

At Gateway Three

Occupants cannot move into a newly built HRB until they have secured a completion certificate.

Once the work is complete and before you apply for the certificate, you must first:

1. Secure statements from the dutyholders on your project team that the work satisfies the functional requirements of the Building Regulations 2010.
2. Send copies of all the relevant information to the relevant person (e.g., the Accountable Person), who must confirm in writing to you not only that they have received and can read copies of all the information, but that it is sufficient to allow them to understand, operate and maintain the HRB and its systems.

Your application must demonstrate that you built the HRB according to the approved design and that it meets all relevant requirements.

As well as the statements from your dutyholders and the person you are handing over to, the package of information, which must be stored in the golden thread of information, must include:

- Information about the HRB, including 'as built' plans and drawings.
- Final versions of all documents that featured in the initial application.
- The final version of the change control log.
- Information captured during construction.
- Information captured during commissioning.
- Information captured during final functional inspections.

Transitioning from design and build to use and maintain

Transitioning from design and build to use and maintain

As your project transitions from design and build through the 'validate' stage and into the 'operate' stage, the focus changes to readying for handover to you and your asset management team. The process will go more smoothly if you have adopted a 'soft landings' approach – see page 45.

(If your project is for a higher-risk building, you will have considered soft landings principles in the asset's golden thread of information. You may also have legal duties under the Building Safety Act if you are an accountable person or the principal accountable person[52].)

Tracking performance

Your project team will have compiled a Health and Safety File for the assets. It defines the specification, maintenance requirements, and expected performance of the asset(s) as designed and built. Your client project manager will hand over the performance monitoring baseline and data from commissioning to the operator, along with outstanding requirements for seasonal commissioning. This information is likely to include performance measures relating to:

- business performance, e.g., user satisfaction, operating costs and benefits realisation.
- design evaluation, e.g., maintenance costs, energy and water usage, effectiveness of space planning, lighting, and aesthetics.

In short, the information should include data on the key aspects of the asset that matter to stakeholders, and should allow you to track the asset in use against the estimates for operational costs and benefits realisation in the original business case. Any lessons learnt from these post-occupancy evaluations should be shared and exploited for continual improvement.

Performing maintenance

There are two ways to maintain an asset: reactively in response to things needing resolution, or preventatively according to a plan. You will need both.

Preventive tactics range from something as simple as keeping stocks of spare parts through to purchasing maintenance agreements with third-party contractors.

Plans for preventive maintenance must minimise disruption to operations by ensuring resources are ready to carry out the work efficiently and effectively, and is justified when the risk of relatively high-impact and/or high-cost breakdowns on balance outweigh the cost of preventive measures.

Knowing what to do requires you to understand what can go wrong, the frequency and/or regularity of such breakdowns, and the impact of the breakdowns on asset performance.

[52] To find out more about these legal dutyholder roles, see the government's guidance at https://www.gov.uk/guidance/safety-in-high-rise-residential-buildings-accountable-persons

Monitoring obsolescence

When your best maintenance strategy can no longer keep up with user needs, there is a risk that the asset is becoming obsolete.

The gap between user needs and asset performance can arise in several ways. It isn't just to do with physical condition. It can also be related to users' physical or psychological well-being, the asset's environmental performance, or economic factors such as running costs or productivity.

You can minimise this gap to some extent by adjusting your maintenance strategy but, particularly where sociological and technological factors are at play, the adjustment may not be enough. Another strategy is to upgrade the asset by investing further capital and so extend its working life. However, the business case for this upgrade might not stack up, in which case it might be time to retire the asset, either by selling it or changing its use. You should monitor this performance gap and have a plan in place to identify when your maintenance strategy or capital investment might be triggered. Similarly, where appropriate, you should have a plan for the end of the asset's life.

Bringing it all together

Bringing it all together

As this guide shows, construction projects have many moving parts and require considerable management over the entire life cycle of the asset.

Your influence is most relevant in the early stages of the project when decisions are being made about needs and benefits, and when deciding on the feasibility of options and the chosen option to invest in.

However, you remain accountable throughout the life cycle for all decisions. Your client project manager, working with the supply chain of consultants and contractors, and with representatives of end users, is responsible for ensuring that realistic and resourced plans are in place for each stage of the life cycle. They are also responsible for ensuring that performance is monitored against those plans so that suitable decisions can be made within each stage before moving on to the next.

Overall, you have enormous influence on the success of outcomes and so the better you engage, the better the result.

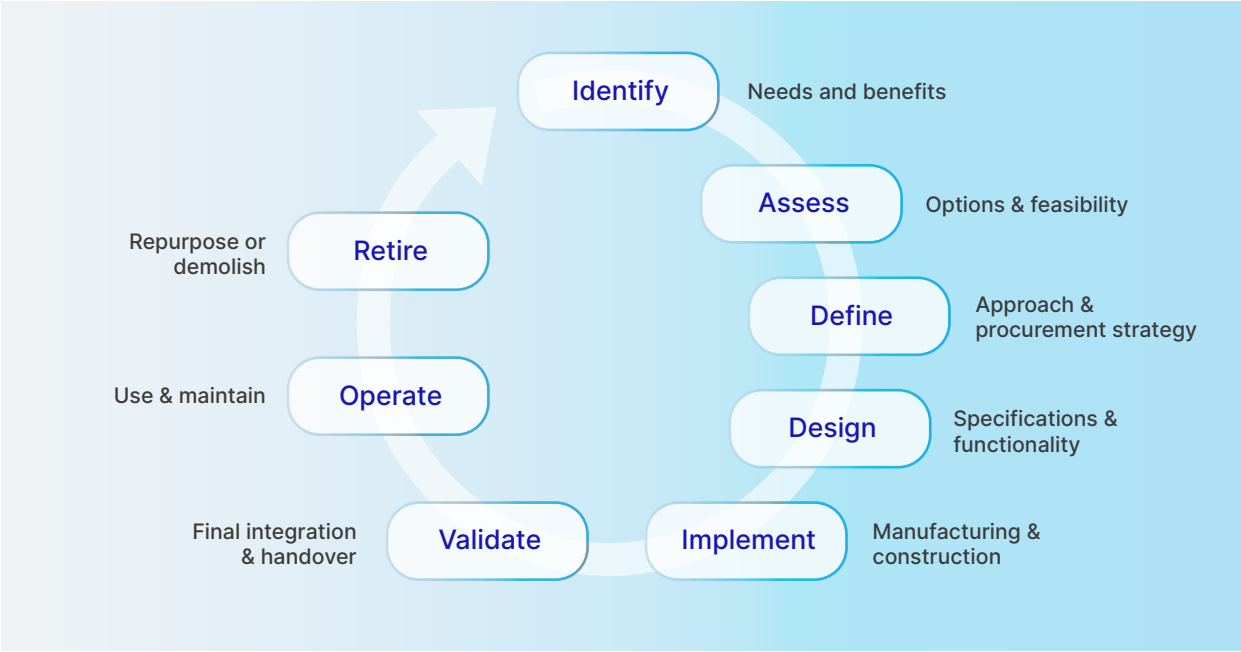


Figure 1.0 Project life cycle

To help you to bring it all together, here is a handy summary of the decisions you own as the project progresses from stage to stage.

Before moving from 'identify' to 'assess'

Ensure that the following are recorded in writing:

1. Your appetite for risk in strategic, regulatory, commercial and reputational objectives.
2. The needs of key stakeholders, noting that for some projects this information may be informed by a wider programme or portfolio.

3. Which existing assets are to be modified or retired – whether in whole or in part – by your new project.
4. Your key governance targets and priorities, combined with a responsibility matrix.
5. What funding is in place for the next stage, with a clear line of sight and heads of terms between contracted entities, of how the whole project will be funded.
6. Known external dependencies, constraints, and risks in the wider context, for example, matters related to planning consents.
7. Principles and strategies for quality, health and safety, sustainability, innovation, leadership, supply chain collaboration, information and knowledge management, and risk management.
8. Agreed scope of work and contracted resources for the 'assess' stage.

Before moving from 'assess' to 'define'

Ensure that the following are recorded in writing:

1. The options you considered and the reasons they were rejected.
2. Stakeholder support for the chosen option spanning funding and implementation.
3. Known external dependencies, constraints, and risks in the wider context for the intermediate business case.
4. Specific criteria and priorities for quality, health and safety, sustainability, innovation, productivity, leadership, supply chain collaboration, information and knowledge management, and risk management.
5. Agreed scope of work and contracted resources for the 'define' stage.

Before moving from 'define' to 'design'

Ensure that the following are recorded in writing:

1. The delivery approach and procurement strategy, reflecting market availability of resources and desired levels of collaboration and risk-sharing.
2. The project execution plan (PEP) for the design phase in detail and rest of project in outline, ensuring specific criteria and priorities for quality, health and safety, sustainability, innovation, productivity, leadership, supply chain collaboration, information and knowledge management, and risk management are addressed.
3. The intermediate business case reflecting the PEP.
4. Detailed process and controls for considering, justifying, and documenting variations from the approved business case and PEP.
5. Engagement and communication plans for stakeholders.
6. Agreed scope of work and contracted resources for the 'design' stage, noting that the team size will significantly increase at this point and that design activities are regulated by the current version of the CDM 2015 and secondary legislation under the Building Safety Act 2022.

Before moving from 'design' to 'implement'

Ensure that the following are recorded in writing:

1. How the asset as designed will meet your needs and secure the targeted benefits in accordance with all relevant internal policies and strategies and external standards and regulations.
2. Verification of the correctness, completeness, and consistency of design information.
3. Changes to the PEP and business case to reflect the design and any implications for the rest of the asset's life cycle.
4. Any changes to your appetite for risk or financial contingencies arising.
5. Verification of engagement and effective communication with stakeholders.
6. Agreed scope of work and contracted resources for the 'implement' stage, noting that the team size will increase further at this stage and that construction activities are regulated by the current version of the CDM 2015[53] and secondary legislation under the Building Safety Act 2022.

Before moving from 'implement' to 'validate'

Ensure that the following are recorded in writing:

1. The asset as built is complete and implements the design, conforms to all current and relevant internal policies and strategies and external standards, and complies with regulations.
2. Verification of the correctness, completeness, and consistency of information from the 'implement' stage.
3. Updates to the PEP and business case to reflect the build, the work needed to integrate systems and handover to operations, and the implications for the rest of the asset's life cycle.
4. Any changes to your appetite for risk or financial contingencies arising.
5. Verification of engagement and effective communication with stakeholders.
6. Agreed scope of work and contracted resources for the 'validate' stage.

Before moving from 'validate' to 'operate'

Ensure that the following are recorded in writing:

1. The asset as built and all associated information are validated and perform as designed, meeting the needs and benefits of the client, operator and end users.
2. The need for any seasonal commissioning or post-occupancy evaluation.

[53] Health and Safety Executive (2015), The Construction (Design and Management) Regulations 2015. Available at http:// www.hse.gov.uk/construction/cdm/2015/index.htm [accessed 17 October 2022].

3. Requirements for operating the asset, noting that the client may operate the asset themselves directly or via a third party, or may divest the asset.
4. Changes to the PEP and business case to reflect the build and any implications for the rest of the life cycle.
5. Any changes to your appetite for risk or financial contingencies arising.
6. Verification of engagement and effective communication with stakeholders.
7. Agreed scope of work and contracted resources for the 'operate' stage.

Before moving from 'operate' to 'retire'

Ensure that the following are recorded in writing:

1. The condition of the asset and confirmation that further investment cannot be justified and the asset needs to be retired.
2. Verification of the correctness, completeness, and consistency of asset information from operations.
3. Agreed scope of work and contracted resources for the 'retire' stage, noting that this will likely trigger a new project, either to change the asset's use or to demolish, dispose of or divest the asset. Note, however, that this is unlikely to apply to listed or otherwise protected historic assets.

Additional reading

- CIOB (2024). Artificial Intelligence (AI) Playbook 2024 https://d8.ciob.org/industry/research/AI-Playbook
- CIOB (2022). Code of Practice for Project Management for the Built Environment, 6th edition
- CIOB (2024). Code of Practice for Programme Management in the Built Environment, 2nd edition
- RIBA Plan of Work 2020 https://www.architecture.com/knowledge-and-resources/resources-landing-page/riba-plan-of-work

The Chartered Institute of Building is the world's largest professional body for construction management and leadership. It has a Royal Charter to promote the science and practice of building and construction for the benefit of society. Members across the world work in the development, conservation, and improvement of the built environment.

Images

Front cover: Millsike Prison (MoJ, CIOB Client of the Year 2024 – credit MoJ)

Page 7: How projects are structured (Gleeds)

Page 10: Funding and business case considerations (Gleeds)

Page 14: Roles, responsibilities and stakeholders (LSE Great Hall, Marshall Building – credit Ed Reeve)

Page 17: Building and sustaining the extended team (LSE Marshall Building – credit Ed Reeve)

Page 25: Creating and maintaining plans (Gleeds)

Page 32: Quality Management (Gleeds)

Page 35: Sustainability and ethical considerations (LSE Centre Building – credit Maria Moore)

Page 40: Digital information and its management (Bath & North East Somerset Council. Bath Quays Development - credit Timothy Soar)

Page 45: Design management and soft landings (Bath & North East Somerset Council. Bath Quays Development - credit Timothy Soar)

Page 49: Health and Safety (LSE Student commons, Centre Building)

Page 64: Transitioning from design and build to use and maintain (Argent Kings Cross - credit John Sturrock)

Page 67: Bringing it all together (Argent Kings Cross GS Fountains - credit John Sturrock)

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