



Building excellence in the cultural sector

A guide for client
organisations



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Foreword

Both Arts Council England and Design Council have a long history of working to create places and spaces of the highest quality. We have an in-depth understanding of the role architecture plays in improving our cultural infrastructure, creating pride of place and improving experiences of both creative and cultural practitioners and the public. Since 1994 Arts Council England has supported the development of over 800 cultural buildings with almost £2 billion, largely through the National Lottery.

In addition, both Arts Council England's and Design Council's strong stance on physical access continues to lead the way by setting standards above the minimum required by law. Inclusive design which considers both the physical and psychological needs of **all** a building's users is critical to creating welcoming spaces in which everyone can feel at home.

With this in mind, Arts Council England and Design Council are delighted to launch an updated edition of this guide. It is a practical example of how we can support cultural organisations in the development of inspiring and sustainable buildings for the future.

With the decline of the high street and the closure of so many shared community spaces from public libraries to public houses, cultural buildings play an increasingly vital role at the heart of our towns and cities in helping sustain communities as activity based gathering places. Bricks and mortar matter. The cultural offer is one of the key things which make people want to live and work in a place, important not just economically but socially too. And, in an increasingly volatile and uncertain world where digital technologies impact almost every aspect of our lives, it is crucial that places for people are planned with the flexibility to adapt to a changing future. In our post-pandemic world the safety of our buildings' users is set to become a key consideration.

As part of the Arts Council's 2020-2030 strategy *Let's Create*, capital investment remains an important tool in helping build cultural communities. This guide should help those setting out on construction projects to be informed and empowered clients. We hope that it will help you to raise aspirations by guiding you through the language and processes of the design and construction industry. Being more informed will allow you greater focus on the creative process. This will help you to achieve high quality design.

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The coming period will bring changes to how the construction industry responds to the environmental challenges facing our planet alongside a design response to the control of infectious disease. This guide highlights the issues that clients must discuss with their design team to ensure that both the construction of the building is sustainable and the design improves the performance and safety of the building over its lifetime.

The case studies in the guide highlight the role buildings play in expressing our 21st century culture through beautiful places that provide a context for the arts and culture in new and engaging ways.

We wish you luck and look forward to visiting your new and revitalised future buildings.

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An unprecedented number of building projects for the arts have been realised since the launch of the National Lottery, both as refurbishments, extensions to existing buildings and entirely new buildings.

There is a growing community of existing and former clients for arts and culture capital projects. Frequently this is a one-off, never-to-be-repeated experience. Some clients have asked, ‘why do we seem to be reinventing the wheel for every project?’ This guide is designed to capture and communicate the key points from this collective, but largely unpublished, experience and set them into the customary sequence of events in a building project.

This unfolding pattern is broadly similar for all projects, whatever their size and complexity. The intention is to empower and forearm clients to fully engage in the process. It’s your project. Design is the key and good design can transform prosaic problem solving into fundamental, transformational and life-affirming change for the good. But good design needs to be fuelled by a clear and convincing ‘vision’ to which all the stakeholders and users sign up. Great



HOME Photo © Chris Payne

projects enshrine and enhance their driving vision throughout the entire development process; the less successful dilute or lose theirs along the way.

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'A performance on a stage like this must have been something entirely different from, and far above, the petty everyday stuff that passes for theatrical art nowadays. And the feeling which led to the choice of a position like this and a building like this must have been something very unlike the modern idea, which puts lazy convenience and superficial elegance first. Things were great then, they are little now...'

Gunnar Asplund

at Taormina, Sicily, late February 1914



'In the less utilitarian buildings it is essential to evoke deliberately an emotional response from those who use and see them. A relevant example of this is the design of theatres, which, although they may have the latest technology, are failures when they have no magic.'

Peter Moro,

A sense of proportion: memoirs of an architect,
unpublished MS, 1990, p.76

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How to use this guide

This guide takes the reader step by step through the process of creating a cultural building. Each of the 10 chapters describes a different step of the building process.

To make the most of the guide and its navigational tools, you'll need to use the guide as a PDF on a computer. It has not been designed to be printed out.

The guide's 10 chapters take you through the four overarching stages of any building project:

1. Prepare
2. Design
3. Build
4. Use and maintain

These four stages are colour coded across the top of every page to help you see exactly where you are in the process. Use the contents page to navigate to the required sections of the 10 main chapters.

Alongside this four-stage structure, we recommend nine key principles for you to bear in mind throughout your project. These principles are described in some detail in the first section of this guide and if you read nothing else, these will provide a good foundation

for your project. Key points from the principles are summarised as 'takeaways' at the bottom of each section. Also included is a list of common pitfalls and how to avoid them.

Practical examples are provided throughout and there are nine fuller case studies thematically linked to the chapters to provide insight into some of the challenges and successes of 'real life' projects.

We've also provided a jargon-busting glossary and a bibliography for further reading.

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How construction projects are organised

The construction industry and its attendant designers, engineers and consultants work within a tightly structured, time-driven framework. It is rigidly sequential and there are penalties built into the system for disrupting this sequence. However, the process has a natural tendency to iterate as the various parties reflect on the emerging design. New design ideas may be generated rather later in the process than is desirable but generally, each stage needs to be completed, in sequence, to the satisfaction of the client and his/her advisors.

It is prudent to sign off each stage formally. Lack of clarity in this process creates ambiguity and confusion over the actual stage achieved within the various consultants' packages of work, and is a common source of difficulty. Precision in costing may not match the level of design detail achieved, and vice versa. Figure 1 shows the four principal stages around which this guidance is structured.

These principal work stages are formally organised within the Plan of Work 2013 devised by the Royal Institute of British Architects (RIBA). This is a sequential way of progressing through a capital project. The Plan identifies 8 key stages numbered 0 to 7. Iteration within the work stages is, within reason, useful and desirable. Various options may be developed which will require notional evaluation. Building projects take a surprisingly long time – five years from the first ideas to opening is not uncommon. It may all seem so distant that it may be difficult for the extended client body to generate the essential time and concentration in the critical early stages. Clear records should be kept of decisions and the arguments supporting them so that they can be rapidly rehearsed later in the process if necessary.

Figure 1: Four stages of a building project (The stages may overlap by different amounts in different types of procurement communication and consultation)



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The RIBA Plan of Work 2020 – work stages and core tasks 0 → 1 → 2 → 3 → 4 → 5 → 6 → 7

PREPARE	DESIGN	BUILD	USE AND MAINTAIN
0 Strategic Definition	2 Concept Design	5 MANUFACTURING AND CONSTRUCTION	7 USE
Client requirements, business case for feasible options including risks and budget, site appraisal, feedback from previous projects	Architectural concept, strategic engineering requirements, design reviews, design programme	Manufacturing, construction and commissioning including logistics, systems information, quality control and building manual	Implement facilities and asset management, post occupancy evaluation of building performance in use, verify project outcomes including sustainability outcomes
1 Preparation and Brief	3 SPATIAL COORDINATION	6 HANDOVER	
Prepare project brief including outcomes, sustainability outcomes, quality aspirations and spatial requirements, site surveys, programme and PEP	Spatially co-ordinated design aligned to updated cost plan, project strategies and outline specification	Building handed over, aftercare initiated and building contract concluded including defects rectification and light touch post occupancy evaluation	
	4 TECHNICAL DESIGN		
	Develop architectural and engineering technical design ie all design information required to manufacture and construct the project, prepare building systems information		

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Are cultural buildings different?

Cultural buildings (theatres, galleries, museums, libraries, artists studios, workshops) tend to be

functionally complex with exacting requirements. These might include the physical expression of a particular aesthetic contrary to normal building practice, the involvement of an artist within the envelope of the building, or issues related to quality of light, acoustic properties, sophisticated technical

Chester Storyhouse case study

Concerned about the long term health of the city centre Cheshire West and Chester Council were looking for solutions that would bring visitors to the city for leisure, retail, food and tourism. They set an ambitious vision for the role of culture, with a significant capital and revenue budget commitment. This allowed the 1930's Art Deco Grade II Listed Odeon cinema site to be refurbished and extended to house three theatres, the cinema and the re-located library service. Chester Performs became the operating company, working closely with the library service to maximise the value of their co-location particularly through the programme but also operational features such as longer opening hours. In fact, the two are not housed in separate parts of the building, but the design physically interweaves the elements. Since re-opening the building has become a focus for meeting and activity of all kinds for the local community, extending to a much wider range of people than previously.

Find out more



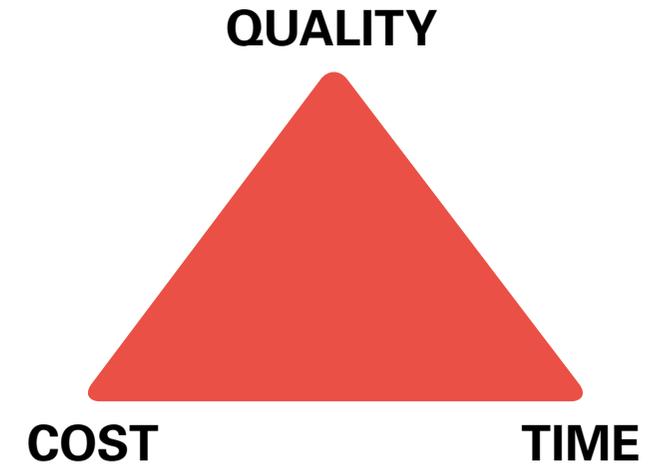
Storyhouse © Beccy Lane

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systems, stage machinery, or very particular environmental conditions. Cultural buildings tend to have many users and stakeholders to satisfy, with high expectations of design quality and 'impact'. They are almost always located within a community and their importance in place-making needs to be taken into account. They are often historic or landmark buildings for which local people have huge affection. Discussions and negotiations tend to be public, while progress, or the lack of it, is very evident. These buildings frequently demand a disproportionate effort compared with other familiar building types and everyone involved needs to be aware of this.

Decision-making will involve balancing quality against time against cost. Professional advice and interpretation will be essential in optimising the final mix. Case study histories show how priorities change through project stages, but it is essential to safeguard the essential 'vision'.

Figure 2: Quality, time and cost – getting the balance right



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Nine key principles to help deliver good design have emerged from all this accumulated experience of capital arts and culture projects. These should be kept in mind throughout your project:

1. A clear vision

2. Being informed

3. An excellent team

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5. Sustainability

6. Inclusive design and access

7. Realistic finances

8. Communication and consultation

9. A productive procurement route

1. A clear vision

It is vital to think through your situation and to broker, through meaningful consultations with all your stakeholders, a clear and unambiguous vision. It should inform all aspects of the process. This vision will relate not only to the building project but also to the immediate and long-term goals of the organisation. Consider your needs carefully. How will a building project help or hinder your organisation's development? What will be the operational implications? With this action the project really starts. This is the first critical stage of constructing the brief, encompassing your plan for your organisation's future, the strategy for delivering it and the role of the proposed building project in that strategy. Exactly what is the building project going to deliver?

Bear in mind you may not get back into your building for five or more years. Added to this is the increasingly volatile context in which you will be operating. The only certainty is that you will be dealing with change. You therefore need to design the building you will need in 10 years' time (with 30 years' use built in), not the one you want now.

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Some organisations formally rank their collective wish list, scoring each item against its importance in delivering the organisation's vision, the various funders' objectives and the public's expectations.

Formulating a vision is discussed particularly in section 1, which deals with both practical and conceptual issues. Holding on to the vision when it may be threatened in the course of design and construction is covered in sections 6.5 [page 89] and 8.4 [page 103]

Takeaways

- Design your building for longevity.
- Your business model will change.
- Vision and design quality will be under threat throughout the process.

2. Being informed

Immerse yourselves in contemporary architectural culture, visit similar buildings, talk to their owners and managers, ask them about their experience of the process and go to their events.

Understand the process and grow into the role – be demanding, expect to see alternatives with considered analysis of their relative merits and drawbacks, expect real engagement from your designers and consultants.

Reading this guidance is one way in which clients can become more informed, but the subject is dealt with particularly in sections 1.4 [page 30], 1.5 [page 34], 1.12 [page 46] and 4.2 [page 63].

Takeaways

- Visit similar buildings.
- Talk to others who have gone through a capital project.
- Become as expert as you can.
- Be demanding.

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3. An excellent team

The client has the central role in selecting the team. You may appoint professional advisors directly to work in your organisation and/or you may second and train up a colleague to be your project champion. You will find yourself obliged to select and appoint a range of designers, engineers, specialists, cost consultants and project managers.

There are recommended procedures for the fair and equitable selection of consultants from each discipline, and procurement where public funding is involved is governed by a raft of legislation.

An important decision is whether to select whole or partial teams who have worked together before to achieve successful projects. You can advertise for individual disciplines or a whole team.

Traditionally, cost consultants and project managers are appointed separately from the design team to avoid conflicts of interest in financial disclosure. Moreover, it is considered problematic for the project manager and the quantity surveyor to be from the same consultancy because conflicts of interest may emerge in the timely reporting of costs.

Good relationships and effective communication within your team and between you and your team are essential. The building process is difficult. Excessive iteration, for whatever reason, is expensive for everyone. Delays and disappointments in funding and gaining permits are frustrating and discouraging for consultants as well as for the client. Building trust and mutual understanding is essential for success.

Organising the internal client team is covered in section 1, and especially sections 1.3 [page xx] and 1.4 [page xx]. Choosing the design team is dealt with in section 4 [page xx].

Takeaways

- Select a project champion to lead your internal client team.
- Consider internal as well as external appointments but don't expect internal appointees to be able to do their existing job at the same time.
- Use specialist advisers and make sure this part of the budget is properly resourced.
- Good relationships and clear communication are key.

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4. Design quality

Delivering good quality design and construction is fundamental to policies on the built environment.

Advice on how to evaluate design and many case study examples can be found in CABE's publication series, *Design reviewed*.

Good design is not merely a question of an approved contemporary 'style'; it can confer greatly enhanced value to the finished project. By emphasising design quality you will challenge the members of the design team to use all their creative talent to deliver a design that offers more to the client, the users of the building, the wider community and the public realm. Good design can dissolve the public's natural 'Schwellenangst', as identified by Jennie Lee more than 50 years ago, that is, the fear of crossing the threshold into a public building. A more welcoming building can deliver wider and more diverse audiences and users.

There is more on design quality in section 1.8 [page 39] and considerations of quality also inform considerations of sustainability (1.11 [page 44]) and access/inclusivity (1.9 [page 40]). Maintaining quality in the face of value engineering is covered in sections 3 [page 55], 6.1 [page 83] and 8.4 [page 103].

Takeaways

- Design quality encompasses much more than aesthetic considerations
- Inclusive design helps ensure everyone can feel comfortable coming into a building and that it meets their needs
- Access, environmental sustainability and the quality of the user experience are critical
- Design quality is often compromised where projects run into financial difficulties

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5. Sustainability

Good design is sustainable design. Sustainable buildings can make a significant positive difference, from reducing impacts – through, among other things, using renewable energy, sustainable materials and nature-based solutions to creating space to sustain biodiversity – and demonstrating what is possible to audiences, visitors and local communities in terms of future-proofing investments through, for example, designing for greater resilience to flooding and water shortages.

Refurbishment and development of existing buildings is always a more sustainable choice than new build. The most sustainable building is the one which doesn't need to be built at all and a calculation of the embodied carbon in any buildings to be demolished should form part of any options appraisal. Retrofit should be the default option wherever possible.

Environmental sustainability must be integral to the vision for any capital project. It will not be enough to simply attach 'environmentally friendly' devices to a 'business as usual' design. Global and local drives towards zero carbon emissions mean fluid and ever more pressing legislative imperatives. It has become increasingly apparent that the world faces a climate emergency.

Careful thought should be given to minimising embodied energy in construction and materials, and most particularly to minimising life-long energy consumption, its cost and associated carbon emissions. Cooling is becoming more significant than heating in our warming environment. What will constitute comfort in your building? What will the acceptable temperature be in your auditoria, foyers, galleries and exhibition spaces? Passive, rather than mechanical systems may be more environmentally sustainable but naturally cooled or heated environments are less immediately controllable and tend to enjoy greater temperature fluctuations, although some argue that such environments are healthier and more stimulating.

Maintenance and replacement of equipment and materials also contribute to lifecycle costs and the overall carbon footprint. Floor finishes have been found to be particularly significant. Research has shown that quality in these areas is often threatened in budget reviews (value engineering), particularly in the later project stages as contingencies are expended and savings are sought.

As the State of Nature 2019 report illustrates, both urbanisation and new development can contribute to species decline, through the removal and

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fragmentation of habitats. How can you incorporate green spaces into building, spaces which protect or enhance nature and biodiversity and which can have additional benefits such as sound or thermal insulation and enhanced wellbeing of building users?

What specific climate change adaptation measures should you be considering, for example flood resilience, solar gain, sustainable urban drainage?

<https://www.culturaladaptations.com>

<https://juliesbicycle.com/resource-fftf-guide-2015/>

This subject is discussed in sections 1.11 [page 44], 6.3 [page 87], 7.4 [page 99], 8.4 [page 103], 10.4 [page 110] and appendices I [page 113] and II [page 119].

Takeaways

- The 'end game' for most governments in the developed world is a carbon neutral economy, a useful starting point for capital projects.
- Consideration of sustainability needs to be made across the entire project from initial options (is the development really necessary?), the construction process itself to ongoing building management and maintenance.
- The effects of climate change are already with us – what adaptation measures do you need to consider to mitigate or adapt to the risks of extreme weather incidents?

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6. Inclusive design and access

Inclusive design creates a level playing field, enabling people to make effective independent choices about how they use a building without requiring undue effort or separation. It creates environments which are convenient and enjoyable to use for everyone, enabling physical, intellectual and emotional access.

There are five key principles of inclusive design and these are discussed in more detail in sections 1.9 and 6.4.

Accessibility does not simply mean providing for disabled people according to the requirements of the relevant regulations. Questions of accessibility should inform all aspects of the design. The best buildings in this respect are those that are easy to navigate, both physically and conceptually, and that provide a rich and rewarding experience for all their users, young and old, disabled and non disabled, without separating the different constituencies.

This subject is discussed in sections 1.9 [page 40] and 6.6 [page 91].

Takeaways

- Inclusive design makes buildings easier to use for everyone.
- Consultation is key.
- Commitment to inclusion should be the starting point rather than the legislation.

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7. Realistic finances

Building is expensive. The sums of money involved are often of a different order of magnitude from those dealt with in the day-to-day running of an organisation.

Clients are often surprised by the sum remaining available for construction once VAT (where applicable), consultants' fees, fees for planning and building control applications, and allowances for inflation are deducted from the overall project budget.

Risks need to be identified and sensible sums set against them as the project proceeds. Careful consideration should be given to establishing 'contingency sums', the unspecified sums held in reserve to absorb unanticipated design and construction issues and events.

Some successful clients have asked their cost consultants to reorder their industry standard 'elemental' cost plans into 'shopping lists' of identifiable items relating directly to the strategy. Prioritising the shopping list calmly near the beginning of the exercise will give you a very sound basis for managing the almost inevitable editing of overall project costs.

The implications of the capital project on your organisation should be carefully explored. Will the project be phased to allow some of your accommodation to be in use throughout or will you need to close or decant? Will you need to restructure and reduce your staff as activities reduce/cease during building/rebuilding? What will the organisation look like when it finally moves into the completed building and will the business model need to change? Will the new accommodation demand more input, more expertise, more people, more money and more time?

See sections 2.4 [page 52] 9 [page 106] and 10.1 [page 109].

Takeaways

- The 'construction' element of the cost plan may be surprisingly small once other project costs have been factored in
- Project risks need to be identified and properly costed contingency sums allocated against these materialising.
- What will be the impact on operating costs and the business model during the build period and post re-opening?

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8. Communication and consultation

Within and around a healthy cultural organisation will be many people with a genuine interest in the project. Cultural buildings operate in a context and that context is generally a town or city with a community of users. These people will include staff as well as visitors from within and outside the area. The consultation process can either fully engage this broad constituency so that a sense of ownership has already been created when the building is complete, or it can unintentionally alienate significant numbers.

Effective and wide-ranging consultation with all relevant parties will almost certainly rack up aspirations beyond the attainable. Brokering these ambitions and managing expectations is a critically important process which you should record. It is sometimes very helpful to revisit these earlier discussions later in the process. You may also need to involve statutory consultees (for example Historic England or The Theatres Trust). A failure to consult widely from the outset is likely to lead to a compromised solution and additional costs.

It is essential to establish a decision-making structure, and appropriate lines of communication, internally within the organisation, and externally with the full consultant team. This may be formal, or perhaps more flexible in smaller projects.

The formality of ‘signing off’ the design at regular work stage intervals is useful. It has to be meaningful; all the necessary parties need to consider the proposals before agreeing to them.

These issues become even more acute when the project is contained within a much larger project proceeding at its own, commercially driven pace (see section 1.7 [page 36]).

There is more on consultation with users, staff and stakeholders in section 1.6 [page 34], while communication within the project team is dealt with in section 6 [page 83]. For communication with staff and users as the project progresses, see sections 8.5 [page 105], 10.1 [page 109] and 10.2 [page 109].

Takeaways

- Wide ranging consultation with stakeholders throughout the whole process is key to delivering a quality solution and ironing out potential objections.
- Lines of communication between the client, its stakeholders and the design team need to be established from the outset.
- Design sign off at each work stage needs to be formalised.

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9. A productive procurement route

The 'procurement route' – the contractual framework within which the construction project is realised – is important. In the 'traditional' route, all parties report to the client throughout the project. This gives the client full control but at a potential cost: the client bears much of the risk for the consequences of delays and alterations to the scope of works.

Establishing the level of additional costs often leads to some level of conflict which can, if not resolved quickly, ultimately escalate and be costly to adjudicate, destabilising your operational planning. More modern contracts, notably the new engineering contract, oblige the participants to resolve these issues quickly as the project proceeds. Various alternative routes (such as Design and Build) have been developed to reduce clients' exposure but, again, at a cost – the loss of design control. It is very important to secure the necessary advice and be clear about the implications of the different approaches.

There is more on procurement in section 5 [page 74].

Takeaways

- Consider your attitude to risk and your ability to access capital if costs increase.
- Consider your attitude to control over the design.
- Take advice on the most appropriate procurement route.

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Over-optimism

It is easy, in the excitement of developing a new building project, to get caught up in wild ambitions and infectious enthusiasm and to lose perspective and impartiality. This relates to all aspects of the enterprise including the amount of capital you can realistically lay your hands on and especially the amount of time it will take. It is not unusual for a large capital project to take five years from initial feasibility to reopening, and often much longer than this.

Particularly dangerous is over-optimism in relation to the post reoccupation operation. In order to justify the investment, business plans are often produced with vastly inflated revenue forecasts and unrealistically low costs, with no basis in market analysis. A capital project may also drain your organisation of its working capital reserves. How many capital projects in the public sector have been 'successfully delivered', only to close within a short time of reopening or require significant bail out or restructuring?

Tip: Remain circumspect and realistic and find evidence for your financial forecasts.

Not considering all the options

You may believe you have a unique perspective on all the difficulties you face with your current premises and that your solution to the problem is the right one, even the only one. It is not unusual for this to be the starting point for a project and for the subsequent options appraisal to make the case for the (already identified) preferred solution. It can be difficult to let go of this, but it is generally more productive to take a step back and, perhaps with the help of an external point of view, look at the problems more dispassionately and give genuine consideration to the full range of options, in particular the 'do nothing' or the 'do less' options. Meeting all the requirements of the 'wish list' can result in projects which are vastly over-ambitious or just not deliverable within the resources available.

Tip: Start with a genuinely blank sheet of paper.

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Failing to see the curve balls coming

In truth, there are very few risks which cannot be foreseen. Where there have been no site surveys undertaken for example, you must assume that asbestos, site contamination, archaeological finds and wildlife conservation remain a possibility, however unlikely you think they may be. Even risks such as the unexpected loss of a key member of the project team can be mitigated by structuring the project in such a way that it does not rely too heavily on one person. That said, there are things which will come at you out of the blue and you need to be ready, even for these. In five or 10 years' time the world will be a very different place. Your project itself is likely to change the behaviour of other people and organisations. If you start to draw more visitors to an area for example, this represents a commercial opportunity for someone else too, so don't assume your new income streams will remain unaffected by competition.

Tip: Develop a fully comprehensive project risk assessment with mitigating actions.

Failure to properly consult

This tends to happen where timescales for development of the project are too compressed. Failure to consult (with staff, statutory consultees, the local community or other stakeholders) can add delay or, in the worst case scenario, lead to the project being abandoned altogether, even after considerable spend on professional fees. Consulting people 'after the fact' is also likely to have a negative impact on the relationship between the organisation and the consultees, leading to cynicism and loss of good faith.

Tip: Consider consultation as an opportunity to listen to experts and improve the project, rather than just a process chore. Allow plenty of time for it.

Under-estimating the impact of a capital project on the organisation

A large capital project is likely to have a huge impact on the organisation in a wide-reaching number of ways. It will likely result in changes to the way the organisation operates both during the development and afterwards. These changes need

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to be planned at the outset. A new or revamped physical space is often the starting point for an organisation to make changes to its business model, structure, finances and communications strategy. Staff are unlikely to remain unaffected and it is important to communicate clearly and regularly about the plans and be transparent about likely changes, particularly if these result in organisational restructuring and redundancies. You will need co-operation and collaboration from other people and you will only get this if you are open and able to communicate the ways in which the project will impact their day-to-day working lives both in the near term and in the future.

Tip: Plan carefully for operational change and communicate clearly with all those affected including management, staff, volunteers and sub-contractors.

Under-resourcing on project management



Good project management is highly skilled and can be expensive. There will be phases of the project where it is very much a full time job. While professional project is desirable, not every project will be large enough to justify externally

contracted project management and any project can benefit from existing staff members learning to undertake this role. However, it is important to realise how time-consuming and intense it can be and to allow sufficient time for it. If someone is expected to carry out their existing role with project management as an 'add on', one or other of the roles will suffer depending on which demands the most attention at any point in time. They will also need the resource to document every aspect of the project, particularly at contract negotiation stage and during the build. The relationship between the design team and the contractors is particularly critical in terms of cost control and changes to scope. One of the most common reasons for a contractor to request an extension of time is because design information is not supplied in a timely fashion or is even the wrong version from an earlier design iteration. Accurate documentation is the key to being able to resolve such disputes and reaching financial settlement. Without evidence, the client will always pick up the tab for any cost increases. Limiting resource for project management is almost always a false economy.

Tip: Allocate the right amount of resource to managing the project.

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1 Identify vision

The process by which the content of a building project is decided is often known as 'briefing'. The term 'brief' is often used to refer to the document given by the client to the organisation, indicating its requirements in terms of important concepts or more detailed room allocations. Peter Barrett and Catherine Stanley's *Better construction briefing* (1999) usefully proposes a broader definition, by which the entire decision-making process falls within the term 'briefing', which therefore happens continually and in ever-greater detail and which leads to formal 'briefing documents'. The first steps are crucially important, as decisions made now will guide the whole project. Brokering a clear vision at this stage can lead to success later on when difficult decisions have to be made.

1.1 Identify and organise

Construction projects do not appear out of thin air. They are often born out of years of dreaming and planning, usually in response to a range of problems. Clarity in identifying and weighting the

project drivers is essential, commencing with a clear diagnosis of the organisation's situation. Drivers emerging from this 'cold shower' review may include:

- operational problems in existing spaces
- unfulfilled aspirations caused by lack of space, lack of the right type of space: too low, too high, too dark, too light
- poor technical facilities
- the threat of demolition through redevelopment
- economic viability threatened by low capacity
- opportunities arising within a larger development from planning gain, section 106 agreements, a regeneration initiative – the feel, look and/or condition of the existing space might disconcert and discourage visitors
- difficult, uncomfortable and undignified for disabled people to participate and attend. They may have to sit right at the front, or right at the back, or at the extreme edges of your space
- lifecycle energy and maintenance costs increasing annually at an unviable rate.

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Spike Island Artspace main entrance

The redevelopment of Spike Island Artspace in 2005-06 was prompted by an initial concern to address various basic issues, including poor heating in the artists' studios and a complex layout which made the building hard to navigate. In thinking about how best to deal with these issues, the client undertook a much wider review of the organisation's mission and ambitions. Both strands of thought informed the subsequent capital project, which not only tackled the practical issues, but also provided the organisation with a new, more flexible gallery space, and areas that can be let to commercial tenants.



Ioanna Marinescu/Caruso St John Architects

1.2 How much building do you need to do?

It is important to give yourself the time and space to confirm that a construction project is the right thing to do. Will some other action serve the same purpose and give equally good results? Retreating from a building project is cheap at this early stage but it gets increasingly expensive as time moves on. An initial formal document, 'a statement of need', on which the project is based will need to be agreed by the Board or appropriate senior members of the organisation. This is then the basis for rigorous examination of what the best course of action will be. Consider these fundamental questions:

- What are the problems with the current premises/situation?
- What would happen if there were no project?
- What alternatives are there to a building project?
- Could changes to the building or place be avoided by modifying your organisation's activities?

A wide-ranging options appraisal should be evaluated in terms of costs, benefits and risks.

Construction uses energy and resources at a phenomenal rate – cement, aluminium, steel, timber,

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plastics and more. The construction industry contributes to an estimated 40 per cent of the UK's carbon emissions.

'Where the choice is between demolishing to build new or retaining an existing structure, the default approach should be to retain and retrofit'

Emily Booth, *Architects Journal*, September 2019

Lighthouse, Poole

For the Lighthouse, Poole, the discovery that the organisation would be unlikely to receive as large a capital grant as it had initially planned for prompted a review of the proposed capital project. It was decided to spend the majority of the grant on the interior of the building, rather than adding to the centre or making major changes to the external envelope, in order to concentrate resources on the areas that would most aid and streamline the future development of the organisation's operation and the experience of the building for users. The refurbishment added new extensive facilities including a modern cinema, expanded concert hall and photography labs.

The Government's Green Book provides a useful template for evaluating different project options:

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/685903/The_Green_Book.pdf

What other impacts, both positive and negative, will a new building have on your operation in the short term (during fundraising and construction), and in the longer term (after completion)?



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1.3 Who is the client and how will they operate?

The term 'project champion' is often used to identify the 'lead client', the single point of contact (CABE's *Creating excellent buildings* terms this role the 'project sponsor'). One of their first tasks is to design and establish a relevant and sustainable, credible and transparent working structure. Some decisions will need to be taken quickly. Everyone involved should be absolutely clear about their own level of authority but, most particularly, the project champion, who must have the authority, or at least rapid access to the authority, to drive the project effectively. This can be a challenge in local authority run gallery spaces where the gallery director, while the obvious choice to take on the role, is not seen as senior enough

within the authority as a whole to have such a level of responsibility.

In smaller organisations, the champion may well be the chief executive officer or the owner. In larger organisations, a senior executive should be nominated. Whoever takes on the role should be skilled in:

- understanding and giving form to a vision
- brokering priorities
- organising the client side of a complex project
- financial control, assessing value and risk
- assembling a thorough and comprehensive brief
- team leadership and motivation.

Belgrade Theatre, Coventry

The Belgrade Theatre, Coventry, was extended and refurbished in a £14 million capital project between 2005 and 2007. An experienced member of the theatre management was seconded to lead the project, later working in a freelance capacity. Working closely with and representing the rest of the theatre management, including the artistic director, he provided a clear focus for the work.



Stanton Williams

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Financial input and organisational change may be required to give the champion the time to take on the role. If they are still working full time on their 'day job', this may be difficult.

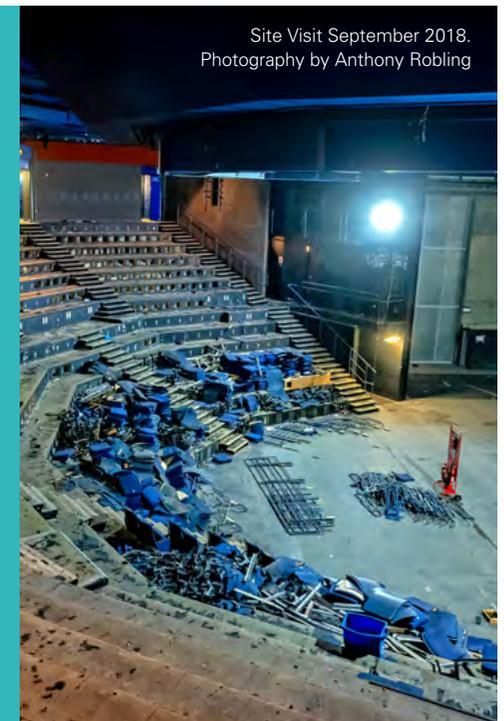
In some cases, an outside consultant, working freelance, may be appointed to assist with the more practical elements of the role. This can prove valuable in that such consultants may be able to bring their knowledge of similar projects to bear.

Leeds Playhouse case study

Leeds Playhouse and Leeds City Council (LCC) worked closely together to achieve the successful reconfiguration and extension of the theatre building which reopened in Autumn 2019. The two organisations shared an ambition to connect the theatre physically more strongly with the city centre, within a longer-term citywide ambition for culture within Leeds. LCC were the project client, with the Playhouse managing the project day to day, and governance in the form of a project board. The Playhouse benefitted from the skills, expertise, time, strategic connection and cashflow management that the arrangement brought whilst feeling ownership and agency within the decision-making process. Formal arrangements and continuity of personnel committed at the highest levels underpinned strong partnership working. The theatre was able to demonstrate its contribution to the city and citizens lives through a month-long opening programme

Find out more

Section 2.2.2 of CABE's *Creating excellent buildings* also refers to the desirability of having a 'design champion', particularly in larger projects. This person is responsible for maintaining design quality at every stage of the process. Such a role can be combined with the project champion role, especially in small organisations, with you, perhaps, as the lead client taking on this responsibility.



Site Visit September 2018.
Photography by Anthony Robling

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1.4 Be an organised client

Building projects seem to proliferate participants with different interests and skills that come into play as the work stages proceed. Throughout, it is necessary to assemble a project team progressively from within the organisation and from other stakeholders and specialists, and to be clear in allocating responsibility. The following table summarises roles that may be important in the early stages of your project.

Not all of these roles will be necessary, appropriate or indeed affordable in smaller projects, where the project champion may well take on several of the roles. In such cases, they will need to be safeguarded from an impossibly heavy workload.

Seven Stories, Newcastle upon Tyne

The founders of Seven Stories, Newcastle, appointed an experienced freelance consultant to assist with their project, which provided the organisation with its first purpose-built accommodation. He acted as a 'grounding force' for the visionary ideas of the founders, though without compromising their ambition.

GWK Architects



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Role	Contribution	Responsibility and authority
The board (essential)	<ul style="list-style-type: none"> the senior collective decision makers good to have wide spread of skills represented, including experience of the construction industry. 	<ul style="list-style-type: none"> strategic decisions on policy, expenditure and the vision appoints executives and, most particularly, the project champion.
Executive client (essential)	<ul style="list-style-type: none"> the officers who run the organisation, led by a chief executive. 	<ul style="list-style-type: none"> develops the vision, assemble the plan, propose and review options. The project will add considerably to their day-to-day workload.
Project champion/project director	<ul style="list-style-type: none"> leads the project for the client organisation represents the organisation champions good design. 	<ul style="list-style-type: none"> answers to the board may be sourced from the executives, often the chief executive.
Project steering group	<ul style="list-style-type: none"> focused advisors and specialists without day-to-day involvement in the project. 	<ul style="list-style-type: none"> monitors developments, communicates progress, reports to board.
Arts business team	<ul style="list-style-type: none"> internal financial officers may be supplemented by external arts business consultants. 	<ul style="list-style-type: none"> identifies the financial drives for the vision, establishes realistic model for growth, assesses risks and establishes their potential effects on the lifecycle health of the organisation.
Arts technical team (Theatre/gallery consultant)	<ul style="list-style-type: none"> internal staff may be supplemented by external consultants with prior knowledge of capital projects to assist in concept/detail development. 	<ul style="list-style-type: none"> technical and conceptual ideas will need to be quantified and brokered against other demands in achieving the vision.
Building management team	<ul style="list-style-type: none"> larger organisations may have a facilities manager, or building issues may rest with a member of the administration staff in smaller organisations. Continuity of knowledge and understanding will be critical to success, particularly in sustainable, low-energy buildings. 	<ul style="list-style-type: none"> includes a raft of compliance requirements, lifecycle maintenance and renewals, and ownership of the building management control system (BMS). There may need to be a more formal arrangement, sometimes outsourced, at a cost.

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Role	Contribution	Responsibility and authority
Client advisor/(external) project manager (essential)	<ul style="list-style-type: none"> • may be the internal appointment of a construction industry professional, someone with project management experience, particularly of capital arts projects. • may be an external appointment • either way the appointment should be formal and clear in its scope and length, and related to the project workstages. 	<ul style="list-style-type: none"> • a critical appointment • some independent advisors specialise in the arts • trust and good working relationships with the organisation at all levels are essential • advice on setting up the feasibility study and interpreting its outcomes, the choice of procurement route and the selection of consultants and the contractor.
Audience/visitors	<ul style="list-style-type: none"> • the existing and potential audiences form the key constituency but challenging to access for views on the emerging vision and design. 	<ul style="list-style-type: none"> • this constituency will make or break the 'project' • communication needs to be effective and the responses disseminated and integrated into the project
Public interest/ the community	<ul style="list-style-type: none"> • the wider community will be involved through the permissions process; its enthusiasm or otherwise can seriously affect the campaign. 	<ul style="list-style-type: none"> • the planning process is very much affected by public consultation. Elected councillors ultimately decide in committee. Planning officers may be able to decide for small projects.
Funders	<ul style="list-style-type: none"> • provide finance for capital spend. Likely to be several complementary funders 	<ul style="list-style-type: none"> • each funder will have its own national agenda and apply it to the project. Managing multiple expectations, conditions and protocols will be demanding.
Local authority	<ul style="list-style-type: none"> • planning and building control permissions will be required • may be a funder • may be the owner, freeholder of the building and/or site 	<ul style="list-style-type: none"> • multiple interests best gauged and brokered by regular meetings from earliest stage

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Role	Contribution	Responsibility and authority
Estate agents and valuers	<ul style="list-style-type: none"> advice on value of sites and buildings, locate potential sites and buildings 	<ul style="list-style-type: none"> respond to clear brief in terms of floor area and types of space, desired locations. Formal valuations of existing and proposed premises may well be required by funders
Statutory consultees The Theatres Trust, Historic England	<ul style="list-style-type: none"> in the case of theatres and listed buildings, these groups will have to comment on planning applications. Early, informal consultation may well prove to be beneficial 	<ul style="list-style-type: none"> offer advice, good practice guidance
Amenity groups eg Twentieth Century Society, Victorian Society	<ul style="list-style-type: none"> comment on planning applications 	<ul style="list-style-type: none"> able to offer specialist advice

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1.5 Become an informed client

‘You cannot manage sensibly a huge body of consultants and Contractors unless you are an intelligent client’

Felicity Goodey, project champion, The Lowry, in the film *Geometry and atmosphere: the conundrum of building for the performing arts* (2008)

Visit similar buildings and organisations, interview other clients, attend their events and immerse yourself in contemporary architectural design culture.

Identify sources of advice. Published books and articles may well offer useful insights and can be located by looking at the library catalogue of RIBA. Organisations including the Design Council, The Theatres Trust, the Visual Arts and Galleries Association, the Association of British Theatre Technicians, and others, may all be useful sources of relevant information.

CABE’s *Creating excellent buildings* offers an introduction in section 6.

1.6 Identify and consult with stakeholders

Identifying your users/audiences/visitors and other stakeholders

Potential and known stakeholders should be identified and their roles understood. You need to consider ‘place’ and the role of the building in its context. This is not an easy task as there will be multiple stakeholders with different needs, views and opinions. Your list might include a wide range of internal and external people who should be considered as partners in the successful delivery of the project. They might include:

- the wider client body
- the project team
- existing and potential audiences and users
- the public including neighbours and local residents
- funders
- the local authority
- groups specialising in disability including sensory and neurological conditions
- young people
- volunteer groups

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- other local and national stakeholders (includes public agencies, arts and cultural organisations, artists/crafts people, civic groups, business groups, schools and the academic community).

Consultation

Your consultation should be strategic in that it should both communicate and exchange information, identify priorities, values and needs and build a relationship with the proposed building.

Consultation should be effective, focused and balanced, and aim to explore a range of viewpoints and constructive points of view. Such consultation will help establish a shared vision among stakeholders and provide a range of values and facts to inform good design.

The most appropriate methods of consultation will depend on the nature of the groups concerned and their experience. Your campaign of consultation will vary in scope and detail. You could appoint professional facilitators. Typical methods include:

- public meetings and community consultations – supported by exhibitions, brochures and fliers
- newsletters – updating progress in design and fundraising

- well-designed and informative websites – crucial
- the media – especially local newspapers and radio stations
- questionnaire surveys – with carefully constructed questions, so as not to ‘lead’ the interviewees
- focus groups

Consultation should be designed to take place at a number of different stages in the project, but particularly at the pre-design stage and regularly as the design is developed.

Post consultation

Research has shown that findings from consultations are overridden or only interpreted in a limited way as a myriad of other pressures comes to bear. Arts capital projects in the 21st century really do need to embrace a detailed assessment of the needs, values and opinions of all stakeholders in order to be sustainable in the long term.

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Derby Museums case study

Derby City Council were keen to reopen the Derby Silk Mill which required substantial refurbishment after a period of decline. Work began to reimagine what the museum might be about, using a human centred design process. Consultation was more than a one-off input into thinking – it has been amplified to include coproduction; the refurbished museum is *being made* with the consultees. This includes the public, stakeholders from the local authority and business and manufacturing community, education and cultural partners and museum trust volunteers.

Find out more



Derby Silk Mill on the River Derwent © Derby Museums

1.7 Finding a site or building

If the clear decision is that a new space is required, the essential next step is to establish the amount and type(s) of space needed. This will require an outline brief, a broad fit of activities and spaces.

Don't forget that circulation, service and ancillary spaces can count for 30 per cent of the overall total floor area. Space costs money. Buildings are broadly costed by the square metre. The floor area, cost and quality are inextricably connected, particularly so at this very early stage when building costs tend to be estimated at square metre rates.

This will inform the brief for the site and building, which you can circulate to:

- local agents
- local organisations
- the local authority
- your colleagues, for a personal search through the desired locality

One option, likely to become increasingly common, is to occupy space created within a larger development, perhaps as the result of a 'planning gain' agreement in which a developer offers to provide infrastructure

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for the benefit of the wider community. This option poses particular issues for you, the client, such as the setting of clear limits on the amount and form of the space made available, timescales, procurement methods and choice of team. You and your advisors will need to negotiate with the developer of the larger project to ensure that all your needs are met to an acceptable level. In some instances the cultural building may be fully delivered by the private sector developer.

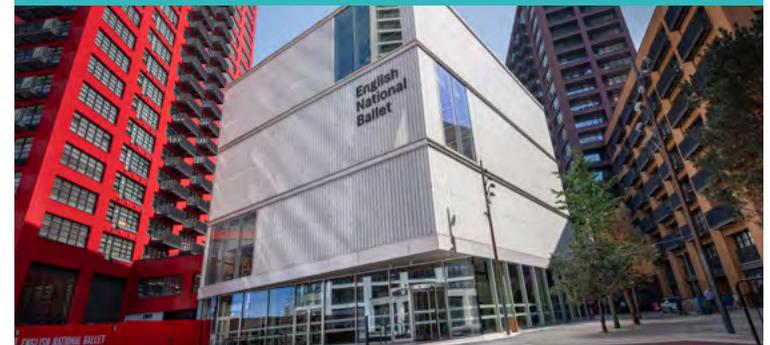
You should be aware that, in the case of a large masterplan for redeveloping an area, uncertainty might mean that not all the plan is delivered quickly. If your capital project is dependent on the completion of the greater masterplan for attracting visitors, you are advised to be cautious. Discussions with the developer, the local authority and local property agents will help gauge the likely timescale.

You will also need to know if your new facility will be located on a construction site for many years as adjacent areas are completed. If so, access, transport and security will be affected. Prior to signing an agreement with the developer, the conditions planned or anticipated for the rest of the site should be communicated and agreed between all parties. Should there be changes as the masterplan

English National Ballet case study

London City Island is the new home for English National Ballet (ENB) where it is a core cultural asset and a respected contributor to the wider masterplan for the area. This ambitious and fast paced new build capital project came about as a result of a trusting and respectful relationship established between ENB and the developer, Ballymore. Ballymore recognised the benefits that ENB could bring to the development, seeing these as going beyond simply making the residential element more attractive, to include creating the focus for a cultural zone in this once neglected part of East London. This has enabled the partners to work on a peer basis and has created a constructive and open relationship that will continue into the foreseeable future.

Find out more



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develops, there is then a clear way to decide how your situation differs from that initially envisaged as such changes – for example, to other parts of a building part-occupied by an arts organisation – may have an effect on operations.

Section 2.5. of *Creating excellent buildings* offers some helpful pointers, especially relating to planning gain agreements.

Mind the Gap, Bradford: Lister's Mill prior to conversion

Mind the Gap is an organisation based in Bradford dedicated to encouraging and supporting disabled and non-disabled artists. In the early 2000s, it began to seek a new operational base which would house rehearsal/training and social facilities and would also allow the artists to showcase their work. An initial study allowed the organisation to determine its current and likely future needs, expressed as a matrix.

Possible sites and buildings were then assessed against the findings of this study in percentage terms. As new sites came to the organisation's attention, they could be rapidly assessed on this basis. The option taken up by the organisation – a space within a refurbished Victorian mill within a larger mixed-use development – did not score so highly as other options. However, the fact that it would be substantially cheaper than other possibilities made it the preferred solution to the company's needs.



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1.8 Commit to design quality

Your commitment to design quality is fundamental to the success of the project from the earliest vision. CABE's publication series, *Design reviewed*, provides explicit guidance for clients in how to set up a project to achieve high quality in design.

Inspired and inventive design can transform a prosaic problem-solving exercise into an opportunity to realise new and unforeseen spaces which can lift your organisation's whole game.

Good design is much more than contemporary styling. Public buildings have a bigger role in contributing positively to the public realm; this responsibility is emphasised in *Planning policy statement 1: delivering sustainable development* (2005). It advises that good design should be the aim of all those involved in the development process and should be encouraged everywhere, whilst local planning authorities should reject poor design. This policy makes good design 'mission critical'.

Good design is challenging and taxing in time and effort. Your team must be committed to its delivery as a core element of the vision.

Seven Stories: toilets

A high level of design quality was central to the vision of the architects and client at Seven Stories, Newcastle upon Tyne, and is evident in the attention to detail even in such utilitarian areas as the toilets. These combine practical details such as a low-level sink for the children, who form one of the centre's core constituencies, with high-quality fittings and a sophisticated yet playful aesthetic.

GWK Architects



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1.9 Commit to inclusive design and accessibility

Inclusive design means design which removes barriers which may be experienced by different communities when using a building or space, including but not limited to people with physical disabilities, learning difficulties, mental ill health, sensory impairments or neurological conditions.

It incorporates five key principles (adapted from Design Council's *Principles of Inclusive Design*):

- 1) It has people at its heart
- 2) It acknowledges diversity and difference
- 3) It offers choice where a single design solution cannot accommodate all users
- 4) It offers flexibility in use and can adapt for changing needs and demands
- 5) It creates environments which are convenient and enjoyable to use for everyone

Designing for accessibility provides opportunities for creative thinking about how people will experience the completed project. This may include a process of considering the journey sequence by which people will arrive at the site, find their way to the entrance and negotiate the entrance doors. At this stage of the journey it will be necessary to consider

much broader aspects of accessibility and inclusive design than just the need for step-free access. For example, to obtain the information they require at a reception or information desk, people need to be able to see clearly the faces of the reception staff in order to talk or, if necessary, to lip-read. Meanwhile the acoustic environment should enable everyone to communicate with their companions or with staff, while illumination, surfaces and colours should enable everyone to see and navigate comfortably and without glare. As the journey continues through the building or environment, consideration of these wider issues of inclusive design will allow everyone to experience and enjoy the facilities and services provided. As has been demonstrated in many recent and successful arts projects, these considerations can result in highly innovative, colourful and stimulating buildings.

The development of the design proposals in consultation with an access consultant and representatives of D/deaf and disabled people can assist architects to understand how to respond sensitively and creatively to the needs of everyone in order to achieve projects that are both of high architectural quality and truly inclusive. In the best of these projects, inclusive design is so integral

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Merton Libraries case study

In 2019 Merton Libraries undertook a refurbishment of the children's sections of each of their 7 local libraries. Aware of weaknesses in their offer to children with special educational needs and disabilities and their families, they took inspiration from the sensory environments created by commercial visitor attractions to create a different theme in each library location such as the circus, jungle or forest with wall paintings, sound environments, light and specialist equipment. The library service took a holistic project approach – in addition to physical works, they devised a concurrent programme of training, stock replacement and events and activities to take place over 12 months. Delivered with almost complete continuity of service, early outcomes suggest a range of positive impacts for SEND and non- SEND children as well as knock-on and in some cases unintended benefits for their families, other library users and Merton Library service.

Find out more

to the underlying concept that, instead of being designed for disabled people, the scheme has clearly been designed to be used and enjoyed by all people. Design and access statements, which are required to accompany most planning applications and applications for listed building consent, should include a record and explanation of the decisions that were taken during the design process, including those about accessibility, inclusive design and emergency escape.

In due course, the project should also include a long-term commitment to inclusive management for the foreseeable future.

'By putting people at the heart of designs, and by understanding how a variety of different people perceive, use and experience buildings and spaces, designers are creating not just accessible buildings – places that we can enter and use, but where we may need assistance, or be directed to separate or segregated facilities – but are increasingly creating inclusive buildings – places where we can all have the same enjoyable, safe and comfortable experience, regardless of our personal circumstances.'

Julie Fleck, *Are you an inclusive designer?*, 2019

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Relevant legislation:

Building Regulations Approved Document M 2015
Access to and use of buildings Vol. 2 – Buildings other than dwellings

Building Regulations Approved Document K 2013
Protection from falling, collision and impact

Building Regulations Approved Document B 2019 Fire
safety Vol. 2 – Buildings other than dwelling houses

BS 8300:2018 Design of an accessible and inclusive
built environment. Part 1: External environment
Part 2: Buildings

Equality Act 2010, including the public sector
Equality Duty 2011

The policy of the Act is not a minimalist policy of simply ensuring that some access is available to disabled people; it is, so far as is reasonably practicable, to approximate the access enjoyed by disabled people to that enjoyed by the rest of the public.

Equality Act 2010 Statutory Code of Practice,
Services, public functions and associations

Arts Council England's publication *Building Access: A good practice guide for arts and cultural organisations* sets out best practice to support organisations in identifying and removing the barriers that may exist in their physical environment.

<https://www.artscouncil.org.uk/publication/building-access>

Mind the Gap, Bradford: entrance hall

As a centre dedicated to the development of disabled theatre artists, Mind the Gap, Bradford's new building, places particular stress on its users' needs, and the design emphasises inclusivity and accessibility right down to such details as the weights of the doors. The aim has been to deliver an environment that is easy to understand and navigate.



Allen Tod Architects

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1.10 The involvement of artists and crafts people

There are numerous examples of highly productive collaborations between artists/crafts people and capital project teams and clients.

Enhancement of the essential components of the building can be a wonderful way of characterising a contemporary public building, but this contribution will need to be embedded in the design and construction drawings and specifications.

You will find that achieving meaningful integration of an artistic contribution into the building fabric is demanding. It requires early planning and early selection and appointment of the artist. What the artist wishes to achieve will very likely have structural implications, particularly in relation to load bearing, light, power, access and long term maintenance. Without early involvement, the artist's vision and delivery will be compromised.

Artists and crafts people can be directly appointed by the client within certain types of building contract. Their involvement, particularly in relation to the logistics of installation, need to be carefully planned.



Seven Stories, Newcastle upon Tyne: main elevation showing the illustrations applied to the surface of the extension

Artists' involvement can add a rich new dimension to a building. In the case of Seven Stories, Newcastle, the façade of the entrance section added to the older warehouse building was treated as a children's book, with illustrations directly applied to the curving surface by children's artists.

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1.11 Sustainability

The legislative and policy framework

There is a range of policy frameworks designed to improve the environmental sustainability of building projects.

The UK is now committed to achieving net zero carbon emissions by 2050. The main priority areas under current Government policy relate to renewable energy production and decarbonisation. The UK Committee on Climate Change's Net Zero report focuses (for buildings) on low carbon heating and ultra high levels of energy efficiency.

Many of the damaging effects of climate change are already in evidence even in the Northern hemisphere, and government policies are now also being directed towards mitigating and countering these. The UK national climate change adaptation programme is a series of actions designed to help the UK adapt to the consequences of climate change including flooding, sea level rises and the destruction of natural capital (eco-systems, species, habitats, soil, water, air).

The policy of 'biodiversity net gain', introduced in the Environment Bill, will see new developments required to replace any lost biodiversity and provide an additional 10 per cent on top.

Building Regulations Part L also outline the requirements for the energy performance of new and existing buildings.

BREEAM (Building Research Establishment Environmental Assessment Method), first published by the Building Research Establishment (BRE) in 1990, is the world's longest established method of assessing, rating, and certifying the sustainability of buildings and is commonly required in buildings receiving investment from public funding. Other schemes include Level(s) and the UK Green Building Council's Net Zero Carbon Building framework.

There is no single definition of an environmentally sustainable building. The range and scope of possibilities is expanding all the time as technologies and values shift in response to environmental challenges, and buildings are hugely diverse. We can, however, identify some key characteristics:

- An environmentally sustainable building is designed for the long-term (at least 20 years), taking upfront, running and maintenance costs into consideration.
- It combines a mix of technological, behavioural and procedural solutions – the right fit for the size, scale, location and activities of the organisation using it.

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- It addresses a range of environmental impacts:
 - using low or zero carbon energy sources
 - making wise use of space, materials and natural resources
 - avoiding waste
 - conserving water
 - using healthy, non-toxic materials
 - curbing noise, air and soil pollution
- The environmental elements of the building support the wellbeing of those using it – staff, art, artists, audiences, communities and the natural environment around it.
- Those responsible for the building can easily track its impacts and performance.

Cultural buildings should aim to meet standards far higher than the minimum levels of energy conservation measures required by building regulations. Visitors and audiences expect high standards from showcase buildings, but in terms of energy use at least, the European Energy Performance of Buildings Directive requires all public buildings to reveal their energy use figures and will rate them on a scale from excellent to poor, relative to national norms. Building operators or owners will

be responsible for the environmental performance of their buildings long after the designers and contractors have moved on. All arts building operators are challenged by funding and resource issues, and excessive expenditure on utilities (electricity, gas, water) may affect programming and even the viability of the organisation. Ongoing costs need to be estimated and minimised through good design.

For further reading:

<https://juliesbicycle.com/news/greening-capital-projects/>

[Fit for the Future: Investing in Environmentally Sustainable Buildings](#)

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Dorchester Museum case study

Dorchester County Museum are undertaking a £15m project to make access and environmental improvements in a challenging town centre site, surrounded on four sides by historic buildings. The Museum, founded in 1845, grew organically to occupy a number of different buildings which were challenging to use, expensive to run and placed limitations on the visitor experience. The capital project involves a two-year closure, decanting the collection to temporary storage, demolition, rebuild and refurbishment. Rebuilding is allowing the museum to introduce features to reduce environmental impact (and costs) such as storing the collection underground with passive heating systems, photovoltaic panels on the roof and harvesting of grey water. Physical access routes will be transformed with the installation of lifts and level floors. The project's intent goes beyond 'making good' previous building deficiencies; the physical building works match a public programme and communications approach that signals a greater level of ambition for 'Tomorrow's Museum for Dorset'.

Find out more

1.12 The outline brief

An 'outline brief' should flow naturally from the initial assessments of business needs and should be expressed primarily in terms of the client's needs rather than specific built solutions. Appendix B of Peter Barrett and Catherine Stanley's *Better construction briefing* (1999) gives a generic checklist that may be helpful to you in developing the brief for your capital project. It divides up the project into 'key areas': overview; organisational concerns; individuals; physical environment; external influences; and specialist considerations, as detailed below. You should revisit these questions as the project progresses.

Overview

Stakeholders

- who are the major stakeholders within the client organisation?
- who else is involved in the project? Funders?
- how will the project management be structured?
- who should be consulted during briefing? Don't forget your audience and visitors
- who is authorised to make which decisions?

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Aims and background

- what does the client hope to achieve? What is your vision?
- why has this project come about? What are the negative and positive drivers?
- what are the fixed constraints?
- what decisions are fixed before briefing starts?
- what finances are available for the project? Which grants/donations are promised? Which are likely? What are the matching funding requirements?
- what is the intended time scale of the project?

Organisational concerns

Structure/culture

- what is the structure of the organisation? Does it need a new one?
- how will people interact with one another?
- will you expand your artistic activities?
- will people work in the building outside normal office hours?

Staff/audience/visitors

- how big will the permanent staff be? Don't forget part timers and volunteers

- is this likely to alter over time? Is there a strategy for growth?
- what is the demographic of your audience? Will it change?
- what mix of genders will there be?
- what image should the building present to the outside world, to existing and new audiences and visitors?

Individuals and work styles

Task analysis

- what exactly will everyone in the building do?

Environmental satisfaction

- what sort of work environment will permanent/part-time/volunteer staff require to do their activities in the arts?

Communication and adjacency

- who will communicate with whom?
- how, where, and how often?
- which people/groups will need to be located in close proximity?

Space, furniture and equipment requirements

- what equipment will be used in the building?

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- what furniture and equipment are necessary?
- how much space is needed for different activities?
- will existing equipment or furniture be reused?
Don't be over optimistic

Physical environment

Security

- which areas will require public access?
- which areas will need to be secure?
- what about after-hours access?

Circulation requirements

- is the building designed to be accessible for all?
- how will audiences and visitors move through the building?
- what are the requirements for lifts, staircases and ramps?
- how will equipment/sets/exhibits be moved around?

Transport and parking

- how many staff car parking spaces are needed?
- how many spaces are required by visitors?
- what is public transport like in the area?
- how often do deliveries take place?

Appearance

- how will you broker between preferences relating to the look of the building, eg scale, choice of materials, colour (both external and internal)? What are the external pressures, such as planning?

Inspirations, be an informed client

- what other buildings are used for similar purposes?
- are there any buildings for other purposes that may also provide inspiration?

External influences

Laws and codes

- will specific legislation need to be considered, other than that related to construction?

New technologies

- are changes likely to happen over the next few years that will impact on the way that the building is designed? What about the opportunities for new media or new performance styles?

Competitors and interested parties

- how do the proposals compare with competitors' buildings?
- are there any interested parties who may be able to provide useful input to the design?

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Specialist considerations

Environmental policies

- cultural buildings generally have a strong environmental imperative; how will it be manifested in yours?

Heating and cooling requirements

- are there any pieces of equipment/areas with specific heating/cooling requirements? Remember cooling is very energy intensive
- what does ‘being comfortable’ mean for you, your colleagues and visitors?

Acoustics

- arts and cultural buildings are very likely to have specific acoustic requirements; what are the implications for the design?

Lighting

- which areas require natural lighting?
- some cultural activities require very specific lighting. How will this be activated?

Contamination protection

- will any equipment/areas have specialist requirements, eg ventilation, humidity, protection against dust and dirt?

Loading requirements

- will there be any unusually heavy equipment or loads to deliver and move about?

Maintenance needs and running costs

Critical issues to be thought about at the beginning:

- what is the estimated lifespan of the building? The life required of its materials, structure?
- who will be responsible for maintenance?
- running costs are likely to be very important. Don’t forget insurance and maintenance agreements
- how will refuse be stored and removed?
- what areas will have specific cleaning requirements?

Digital and IT infrastructure, such as

- Type and capacity of internet connection
- Number and location of fixed network points
- Number and location of wireless network access points
- Location and size of secure server room
- Cyber security controls
- On-going support and maintenance of the IT infrastructure.
- Positions for any recording and/or projection equipment for digital content distribution

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2 Conduct feasibility study

The formal results of all the initial thinking may well be codified in a feasibility study, which will set out the proposed project's scope and which you may use to secure funding.

2.1 The feasibility study

The feasibility study will be an extremely important document. It will crystallise the implications of implementing the vision in basic architectural terms and may offer various different options. It will form the base for all subsequent project discussions with funders in terms of size, costs and timings.

The study will test your outline brief. It is important to cover the following issues:

- **technical** relating to the building or site and the prospects for achieving the necessary permissions
- **financial** including capital fund raising and subsequent organisational revenue cost implications
- **organisational** considering the ability of the organisation to carry out the project – will it need strengthening?
- **programme** timetable requirements of all parties, not least those of the likely funders

2.2 Who should conduct the feasibility study?

You are likely to need some technical support to carry out the feasibility study, depending on the expertise available within your organisation. Inputs may be needed from an architect, quantity surveyor, estate agent, cultural business consultant and/or technical consultants.

It is important that external advisors are clear about the scope of their appointment. Case study research has revealed that continuity between the team that undertakes the feasibility study and the subsequent project can be very helpful. Discontinuity in the composition of the external team can waste resources and time. Procurement rules enable clients to advertise for single appointments, or for a team for the initial study. If the successful team will be required to realise the project to completion in the event that it proceeds, this must be made explicit in the tender process and the contract. Otherwise, the work must be retendered.

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2.3 Typical contents of a feasibility study

The study should certainly include and consider:

- a diagrammatic configuration of spaces and their sizes, interconnections and basic characteristics
- whether this broad grouping of spaces physically fits within the existing building, an extended building, or site for a new building
- whether new space is really needed, or whether the existing space could be reorganised effectively and cheaply to deliver the vision
- how appropriate the selected site is for the proposed cultural activity, and whether it will contribute to or hinder the delivery of the business case
- might the site have hidden problems: poor ground conditions, inadequate utilities or access, inadequate expansion space?
- whether planning permission is likely to be granted
- will the project enhance and help regenerate the local area?
- whether there are other legal considerations
- what is the likely required construction budget?
- what is the likely overall project budget including

all organisational on-costs, relocation costs, interim costs, financing costs, fees, VAT and inflationary allowances?

- is this a viable order of cost in terms of realistic potential funding taking into account the current fundraising environment and your organisation's fundraising capacity?
- what is the order of lifecycle cost, and is this viable in terms of likely income?
- what is the priority order of the various elements and spaces? What is the minimum 'mission critical' provision? How are the projected new facilities interlinked in delivering the business plan?

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2.4 The business plan and the project budget

You should develop the business plan and the project budget in tandem throughout the life of the project. You will need good information from your cost consultants.

Section 2.3.4 of CABE's *Creating excellent buildings* describes the generic process of assembling a business plan. It should articulate the underlying purpose of the project and the basis for change in the intensity and type of cultural activities, alongside current and projected financial statements. The business case, or business plan, must evolve with the project. It should address:

- the various possible funding sources and their requirements
- realistic estimates of revenues resulting from increased visitor attendance and/or audience
- expectations of visitor spending patterns
- capital and revenue costs

'Sensitivity analyses' – studies varying key inputs like ticket sales, types of overhead or hoped-for grant income – will reveal which assumptions most expose the project to financial problems. If some assumptions are recognised to be over-optimistic the capital budget should be moderated. Over-optimism

was a recurring feature of early Lottery-funded projects and remains an issue for some projects. The analysis could consider the impact of small but unpredictable changes to key assumptions for targets and patterns of cash flow.

An outline project budget should be assembled by you and your advisors out of the preferred project scope and content. There may be options in terms of size and content and a notional phasing plan for delivering the full project. The outline project budget will act as a baseline throughout the project development. It should include the projected out-turn costs for at least the following:

- land acquisition
- construction cost, including phasing options
- fitting out and specialist equipment
- professional fees
- contingency sums, to be assessed with your cost consultants
- costs to the organisation of closure, redeployment, reduced operations, restructuring if necessary
- VAT, and whether any can be recovered
- financing costs for borrowing or hires
- inflation
- cost of the move itself including

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2.5 What happens to the feasibility study?

The feasibility study will retain its relevance in planning the early stages of the project, informing the emerging brief (see sections **1.12** [page 53] and **3** [page 55]) and the formal appointment of the design team (see section 4). It will often be used to establish the project budget, a figure you will subsequently find difficult to erase from the collective memory and will need to communicate to internal and external stakeholders.

'The architects of the feasibility study are often at a disadvantage when it comes to the selection process for the main commission, as none of their ideas seem as fresh as the other competitors'

'Don't feel constrained by the feasibility study: use the selection process to open up other ideas'

These two quotations, from David Beidas, who was capital projects director of the Belgrade Theatre, Coventry, illustrate well the 'feasibility study dilemma', in which the architects appointed to the main commission may well want to start afresh. You will need to safeguard your vision but interrogate it against new ideas and concepts for the building.

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Belgrade Theatre, Coventry: expanded foyer space and bar

The theatre sought an additional auditorium to complement its existing facility of 1958, together with new public areas and improved backstage spaces. The feasibility study explored various possible arrangements of these spaces, before the design contract was awarded to Stanton Williams Architects.



Morley von Sternberg/Stanton Williams

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3 Prepare formal design brief

A formal brief itemising requirements will gradually emerge from the broader 'briefing process', which can be used in making an architectural appointment for the main project. The brief provides a reference point for the client to create consensus on their needs and also for those involved in the design and realisation process.

In preparing this document, the outline brief (discussed in section 1.12 [page 53]) should be revisited and expanded in the light of the work done for the feasibility study.

A good brief is not necessarily a simple list of 'required spaces'. Reflecting all the client's thinking, it should clearly set out aspirations and fixed factors, whilst allowing scope for creative design solutions to emerge. Emerging designs and unsuspected options can drive the brief-making to some extent what John Worthington of design consultancy DEGW refers to as 'reverse engineering'.

The briefing process and the role of the formal brief is shown diagrammatically (see figure 3). For progress to be made, it is important that the client produces a clear statement of their requirements, emphasising what they want, but not necessarily

how it should be achieved. This leaves scope for the interaction with the design team to creatively produce solutions none of the parties could have initially imagined. The resulting statement of requirements and constraints, built up from the outline brief and the choices made through the feasibility study, is the formal basis for a whole set of relationships and contracts. It must be well researched and it must add up financially with the budget for not only the project, but also the broader ongoing business plan for the organisation as a whole.

As the design and construction proceed, unexpected problems and opportunities will arise and the formal brief should be amended if required; but it is important that any changes are carefully considered and clearly agreed, and in the process that the viability is tested and reflected in both the project budget and the business plan. In addition, these changes should be compared with the aspirations of the vision and the priorities established in the outline brief to ensure that critical features of the whole endeavour are not being incrementally lost, at least not without an explicit decision to do so. This becomes crucial when pressure suddenly emerges for cost cutting – a not uncommon occurrence.

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Figure 3: The formal brief



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4 Assemble team

Having established and tested requirements, you can make formal appointments for key team members for the project, subject to the availability of funding. We have indicated the roles that are essential to any project, and those that are highly recommended, though much is dependant on project scale.

4.1 The design, management and cost consultant team

Role	Contribution	Responsibility and authority
Architect (essential)	<ul style="list-style-type: none"> • becomes immersed in client organisation • helps give form to the vision • gathers detailed requirements and incorporates them into emerging design • lead role in obtaining permissions • may lead the whole design team depending on appointment. This would trigger sets of 'collateral agreements' with the client • deliver design quality • be present and attentive throughout construction as the contract requires (see the RIBA standard form of agreement, available from RIBA Publications). 	<ul style="list-style-type: none"> • early briefing stage: gives outline form to requirements, tests configurations of spaces, generates options • early design propositions can develop, coax the brief, a process known as reverse engineering • communication of the design to all stakeholders • responsible for generating adequate, coordinated and coherent information for the construction team • be proactive in 'managing value', reducing cost with minimal loss of content, critical to delivering the 'vision' • lead the co-consultants and specialists and direct the coordination of design and construction information.

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Role	Contribution	Responsibility and authority
Structural engineer (essential) Civil engineer	<ul style="list-style-type: none"> the design of the building's structure above and below ground, and possibly the below ground drainage civil engineering refers to more substantial infrastructure (see Institution of Civil Engineers (ICE) and Institution of Structural Engineers (IstructE) appointment conditions). 	<ul style="list-style-type: none"> considerable cost may reside in the structural skeleton of the building. provision may be required to comply with more recent legislation to do with partial collapse and fire integrity. Important to anticipate these complexities. important sustainability issues.
Traffic and highways engineers	<ul style="list-style-type: none"> traffic, transport, highways planning, road and junction design. 	<ul style="list-style-type: none"> may be required by planning process.
Mechanical & electrical engineers (environmental engineers) (essential)	<ul style="list-style-type: none"> design of the internal environmental conditions and the means to obtain them: light, ventilation, heat, 'coolth' (as in pleasantly low temperature), acoustics, fire safety, drainage, water supply and the electrical and mechanical systems infrastructure compliance with building regulations and guidance on energy performance, fulfilling renewable energy requirements (see ICE and Chartered Institute of Building Services Engineers (CIBSE) appointments). 	<ul style="list-style-type: none"> increasingly important role in delivering sustainable buildings more than specifying equipment, move to more conceptual role optimising the building's environmental performance at minimum carbon cost sophisticated simulation tools are more widely available to predict the performance of a design.
Acoustician (highly recommended)	<ul style="list-style-type: none"> design the appropriate acoustic and advise on its delivery counter productive to delay appointment if the acoustic is central to delivering the vision. 	<ul style="list-style-type: none"> the design intervention required may be fundamental, dictating volume, construction methods and finishes it may also require isolation, separation within the very structure of the building potentially an important cost item.
Interior designer	<ul style="list-style-type: none"> non-structural design of the interior, its surfaces and materials, its fixtures and fittings. 	<ul style="list-style-type: none"> may be part of architect's team.

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Artists and crafts people (highly recommended)	<ul style="list-style-type: none"> • enhancement of the building fabric • specialist advice on how artists will use space. 	<ul style="list-style-type: none"> • potentially highly productive collaborations between artist/architect/interior designer.
Landscape architect (essential)	<ul style="list-style-type: none"> • design of all exterior spaces, approaches to the building, hard and soft landscape, design of internal landscape, planting schemes • deliver sustainable design, dealing with water run-off, facilities for pedestrians, cyclists and disabled people. 	<ul style="list-style-type: none"> • critical to the success of a high-quality design • close collaborations required with architect, mechanical and electrical engineers, lighting specialists, highways and traffic engineers and access consultants • costs often underestimated and/or reduced in final stages of project to save cost.
Access consultant (highly recommended)	<ul style="list-style-type: none"> • advises and assists the client on matters of health and safety in the design, construction and maintenance of buildings; coordinates health and safety aspects of design. 	<ul style="list-style-type: none"> • clients are obliged to appoint a construction design and management coordinator unless a project is too small to be notifiable. See the Construction (Design and Management Regulations) 2015 (CDM2015) approved code of practice – <i>Managing health and safety in construction</i> (Health and Safety Commission).

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Role	Contribution	Responsibility and authority
Project Manager (Essential)	<p>The project manager is responsible for day-to-day management of the project.</p> <p>The scope of the role can vary depending on the chosen procurement route. However, in brief it typically includes;</p> <ul style="list-style-type: none"> • Managing the professional team • Making sure the project delivers the required outcomes and benefits • Key conduit between the client and professional team and contractor • Procurement advice • Tender management / oversight • Risk management • Contract administration • Change control <p>An internal project director who may be the client advisor for the early stages before an external project manager takes over</p>	<p>trust and good internal relationships are key to successful construction projects – good communication and understanding of building projects are important</p> <p>previous experience of constructing for the arts can only help. Arts buildings do not necessarily present the same management challenges as construction projects in general.</p> <p>Responsible to the Client / Employer and take instruction from the same.</p>
Principal Designer (Essential)	<p>A statutory requirement assuming formal responsibility for health and safety.</p>	<p>If the client does not formally appoint an organisation to fulfil this function the legislation states that this defaults to the client who has specific duties under the legislation. Often the Architect, lead designer or principal contractor adopt this function, but the client must make an appointment in writing.</p>

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Quantity surveyor, cost consultant (essential)	<p>Overall responsibility for management of project costs and cashflow.</p> <p>Prior to entering into a building contract, the cost consultant will provide cost plans as the design develops. This may result in numerous iterations depending on the design development process.</p> <p>Cost consultants can produce a pretender estimate for the benefit of the client giving an indication of cost prior to testing the market through tender.</p> <p>Once a building contract has been entered into, the cost consultant will provide regular cost reports against the contract sum and any subsequent changes. Thus, providing the client with an update on anticipated outturn costs. The cost consultant will also review and analyse any costs presented by the contractor in connection with variations with a view to protecting client interests.</p> <p>Key role in pricing the risk register</p> <p>Royal Institution of Chartered Surveyors (RICS) provide information and guidance to help define scope of service and appointment documentation.</p>	<p>usually a separate appointment from the design team (unless a design and build contract)</p> <p>can only put costs to the design and overall project from the best information provided by the client</p> <p>wisdom and experience a critical element in judging likely outturn cost and sensible contingencies may lead value engineering/ value management exercises experience of arts projects helpful.</p> <p>Responsible to the Client / Employer and take instruction from the same.</p>
Arts management consultant (recommended)	advice on organisational/operational issues and associated costs market analysis and prediction.	gathering and assembling organisational and business costs, and risks, to be factored into overall business plan.
Theatre consultant/gallery specialist	brings prior experience of this kind of project: conceptual/technical knowledge and advice.	Assists in developing the vision and ensuring the resultant designs are fit for purpose

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Role	Contribution	Responsibility and authority
CDM Adviser	Advises client on discharging their duties under CDM legislation	Not required by law unlike Principal Designer and Principal Contractor but recommended if the client is a lay person and not familiar with the client duties defined under the CDM Regulations
Clerk of Works	The role is primarily to represent the interests of the client to ensure that the quality of both materials and workmanship are in accordance with the design information such as specification and to recognised quality standards.	The role is defined in standard forms of contract such as those published by the Joint Contracts Tribunal (JCT).
Fire Engineer (recommended)	Will undertake an assessment of fire risks and advise on mitigation through: design, construction, materials, use of buildings and layout Fire detection, suppression and control measures including communications systems and equipment	Will advise on meeting statutory and insurance requirements and may produce a fire strategy
Façade Consultant	Advises on materials and construction of façades including cladding	Should help the team reduce the risks related to fire safety as well as optimal performance for environmental sustainability

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4.2 Choosing the team

Become an informed client. Research and visit projects of a similar nature and talk to those clients about their experience of the process and of the professionals involved. Attend their events and experience new spaces.

Choosing the right designer is one of the most important decisions to be made during the project. Good client-architect relations are an important factor in achieving a good design solution. In view of the importance of the design team to the success of a project, it is worth making a particular effort to ensure that the team selected is not only skilled but also able to understand the client objectives in a good working partnership.

The chosen architect may help select engineers and landscape and/or interior designers. The different design professionals will have to work closely together, so it is important that they form an effective team. If the traditional procurement route is used, the designer may become the leader of the design team.

It is not appropriate simply to employ consultants because they are personally known to you and are local or have already undertaken work 'pro bono' on the project.

You must choose consultants and designers through a competitive process. You will need a well-structured procedure, clear timetable and transparent set of criteria by which the organisation/party will be selected, compliant with public sector procurement regulations as appropriate.

For some projects a pre-qualification questionnaire (PQQ) identifying eligibility criteria may be utilised for initial evaluation of consultant organisations which typically operate on a pass/fail basis. From the PQQ a shortlist of organisations can be selected to be invited to tender. Only tenders returned on time and fully complete should be considered and evaluated against a set of pre-determined evaluation criteria.

The relationship between the client and a consultant organisation is governed by legal agreements known as 'appointment documents' which set out roles, responsibilities and fees amongst other things. You are strongly advised to engage a suitably qualified and experienced legal advisor to prepare appointment documentation.

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4.3 Public procurement regulations

Public procurement in the UK and the European Union is governed by a number of Directives and Regulations. In some cases projects must follow the detailed procedural and timetable rules set out in the public contracts regulations 2015. If the project is large and you are either a public sector body, or receive 50 per cent or more of your funding from the public sector, you must provide notification of a proposed selection of designer, building contractors or other suppliers through the Official Journal of the European Union (OJEU).

Arts Council England funding qualifies as public funding so those organisations receiving this level of funding in total, from the Arts Council or other public sources, will need to follow these procedures. The applicable project size thresholds vary over time.

This guide does not consider public procurement legislation or the OJEU process in detail due to the complexity and extent of the requirements and changing context in the light of the UK's departure from the European Union. You can get advice from a specialist, or information on public procurement can be obtained from the gov.uk website

Best value

Best value, not lowest cost, should be your criterion at all stages of selection. If cost considerations are significant, as is often the case when selecting contractors, tenders must be based on a detailed set of requirements so that all tenderers are aware of exactly what they must deliver. This will reduce the likelihood of failure to meet the requirements as a result of cost constraints.

4.4 Competitive selection: the process

Whether or not public procurement rules apply, you must choose designers and contractors through a competitive process in order to identify the Most Economically Advantageous Tender (MEAT). You will need a well-structured procedure, clear timetable and transparent set of criteria by which the winning team will be selected.

For large projects a 'long list' of possible design practices should be drawn up on the basis of simple eligibility criteria.

This can be created by:

- asking professionals already used and trusted by the client group
- asking colleagues

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- asking trustees or board members
- asking people in other organisations who have recently been clients
- looking in the design professions' magazines
- asking the RIBA clients' advisory service
- advertising in suitable journals for expressions of interest
- using public procurement procedures if the project size deems it necessary

Key principles for all selection processes:

- candidates should be treated equally and fairly
- there must be a genuine intention to proceed
- every candidate should have adequate time to participate
- the information required for the 'qualification' stage should not be too onerous
- all candidates should be given the criteria for qualification
- all candidates should receive the same information
- all candidates should receive new information simultaneously

- all candidates should be given all the necessary procedures
- information from candidates must be treated in confidence
- unsolicited tenders should not be considered
- the process should be open to scrutiny
- the reasons given for the final choice should be recorded and auditable

You should then reduce the long list to a shortlist, from which the final selection will be made.

An intermediate round to reduce numbers to a maximum of 15 may be needed. To whittle down the list, those on the long list should be asked to provide information in a standard format. This may include:

- quality of their previous work and commitment to design quality
- size of firm – 'big' is not necessarily 'good' – sometimes smaller local firms will be more invested in your project as it gives them a high profile, bespoke public building which will enhance their reputation
- financial stability
- number of professionals

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- range of skills
- size and type of completed projects
- availability during the project period
- references from previous clients
- equal opportunity policies
- quality assurance procedures including environmental sustainability
- health and safety record and procedures

The shortlist, of not more than six to eight firms, should include only firms with which you believe you will be able to work productively. You may wish to visit relevant built examples of the work of the shortlisted architects. You should endeavour to select three or four firms for the final shortlist. Many clients find formal presentation at interview to be very helpful. Insist on meeting the actual individuals who will manage and deliver the work. This is as applicable to constructors as it is to architects and other professionals.

Holton Lee: proposed archive building

Holton Lee is an established charity offering a range of facilities for disabled people near Poole, Dorset. When the charity sought to commission a new archive building, it visited the offices of the shortlisted architects as well as their recent projects.



Sarah Wigglesworth Architects

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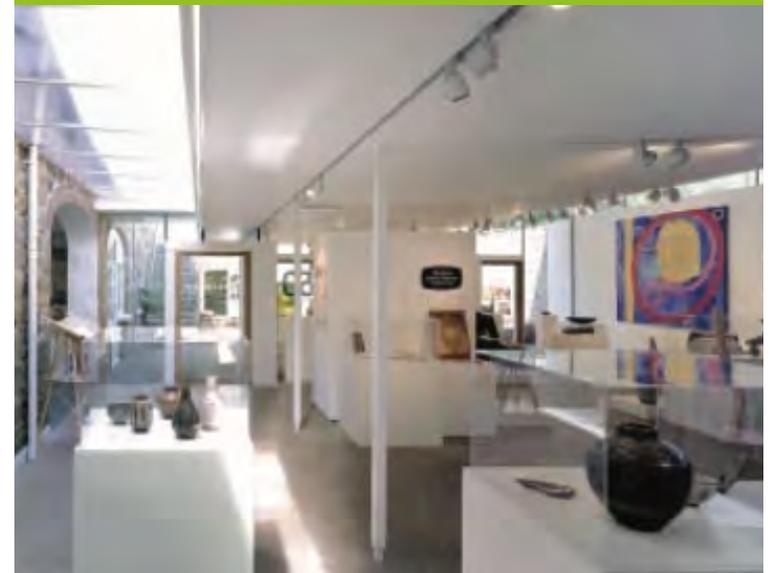
4.5 Making the appointment

There are various procedures by which you can appoint a design team, all or any of which must be implemented within public procurement rules if the project size is above the threshold. These include competitive interview (generally the preferred approach) and a full architects' competition. Both are discussed below. Under any model it is essential that you use your best endeavours to ensure that the competitive process is transparent and that all teams are given the same information and a level playing field.

Irrespective of the model used, the interview with the design team is of great importance, providing you with an opportunity to see what working together may be like over time. The objective in competitive interview is to look for a compatible team, with an intelligent and flexible approach, rather than for a potential building solution. Ask who will actually work on the project. Will the partners be involved, and if so, to what extent?

Riverside Mill, Bovey Tracey: interior of the new craft gallery added to Riverside Mill

When it came to extending and refurbishing its listed watermill in Bovey Tracey, the Devon Guild of Craftsmen put together a list of possible architects who were then invited to make a submission. The aim was to find a young, dynamic practice that would bring innovative thinking to the project, which provides the largest exhibition and sales space dedicated to the crafts in the South West.



Joe Burns/Softroom

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Seven Stories, Newcastle upon Tyne: education and activity room

True to the function of Seven Stories, Newcastle-upon-Tyne, as the national centre for children's books, the winning architect's submission comprised in part a children's book. The format of their entry, which was presented at interview, allowed the client to assess the commitment of the architect to the particular project, and the result was a productive working relationship.



Joe Burns/Softroom

Competitive interview

For many projects the competitive interview is the most effective process. It is particularly appropriate where the client does not have a tightly defined brief.

The main objective of the process is for the client to identify and appoint a team that will bring the appropriate skills, commitment to design quality and the most productive approach to the project. It is a cost-effective and efficient way to appoint a design team, which does not incur abortive design work.

The competitive interview process reflects the principles outlined in the OJEU process above:

- advertise for expressions of interest
- shortlist three to six teams
- issue brief to those shortlisted
- hold a briefing meeting with them all together to discuss the project and then visit the site

Competitors may well wish to return for a more measured look at your existing facilities and the proposed site. You should clarify how this might be accommodated, or not – shortlisted teams

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then submit proposals outlining their approach to delivering the project, in terms of quality, time and cost

- interview all shortlisted teams, giving them the opportunity to discuss their first responses to the site and the brief. Whilst not asking them to prepare designs, you will expect them to present what they believe to be the opportunities and constraints within the site and brief
- appoint the preferred design team
- inform those who were unsuccessful

Spike Island, Bristol: the new café acts as a social hub for users and visitors, adjacent to the centre's main entrance

Gut feeling is sometimes the best judge of potential design teams. In the case of Spike Island, Bristol, the winning architect's submission was felt to be best suited in terms of ideas, and attitude to the aspirations of the organisation. Having established a shared ideas base, a design could be collaboratively developed.



Caruso St John Architects

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Dance East, Ipswich: the dance company is being provided with space within a larger mixed-use development

In some cases, the appointment may be partly informed by practical factors. Dance East is a centre dedicated to dance performance in Ipswich. The choice of architect was motivated by the fact that the company's new premises are located within a building constructed as part of a larger mixed-use development, and so it made sense to appoint the architect of that development lest experience and knowledge be lost.



Caruso St John Architects John Lyall Architects

4.6 Architects' competition

The selection of the design team can also be made through a fully fledged, formal design competition to the Royal Institute of British Architects (RIBA) competition rules. Under this model several architects prepare designs and ideas in response to the client's outline brief. There are several types of design competition, depending on who is deemed eligible to enter and how many stages are required.

This approach tends to be a lengthier and more costly process and will only be really effective if you have already developed a fairly detailed project brief. However, on the plus side, it might reveal unanticipated opportunities latent in the site, the building and/or the brief. Concentration levels tend to be at their highest in competition.

A competition will give you opportunities for promoting the project to stakeholders and the wider public, perhaps through an exhibition and/or publication of the finalists' designs. Stakeholders may well be involved in briefing the design teams at the early stages of a competition although the opportunities for consultation will be restricted by the timescale and logistics. On winning, the successful team may use its winning scheme as a vehicle for

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more comprehensive consultation, but with the risk of discovering some fundamental mismatch or an unassailable constraint. It can be difficult to discard ideas conceived in energetic competition.

Here are some other points to bear in mind:

- Competition may add to the early costs, although the overall amount is small in relation to the rest of the project.
- The timeframe is usually extended a bit, though this may be of little consequence in the timeframe of the overall project.
- It may divorce the design team from the development of the client's brief, thus reducing the benefit that a good design team can bring to the project.
- Consultants' fees represent a small part of the project cost, and should not carry undue weight in the choice. Remember that, in effect, you are buying consultants' time and low fees may signal lower levels of engagement.

Process

In the case of a large project, the shortlisted design teams may be given the outline brief and asked to suggest their approach to the project. They should not be given too much time – two to four weeks is enough – as they should not prepare complex material.

It is good practice to offer a small fee or honorarium, at least to cover expenses. Designers can be asked to make a written statement which could include sketches or diagrams of their understanding of the requirements, and should say which staff members will be employed to meet the project timetable. They should then be invited to interview. For small projects under £500,000, the process should be shortened. Only four to seven practices may be considered on the long list and the statement of approach may be given during the interview.

The RIBA competitions office can provide advice: riba.competitions@riba.org

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4.7 Construction Design and Management Regulations (Health and Safety)

The Construction (Design and Management) Regulations ('CDM Regulations') place legal duties on you as a client. At the time of writing the latest update to the regulations was in 2015 but changes are made from time to time. The CDM Regulations apply to all projects that include construction work.

Many clients, particularly those who only occasionally have building work done, are not experts in construction. Although the role of the client does not typically require active engagement in the management of the work, the client can influence the way the work is carried out. As client, you make key decisions over who is involved in your project and how much money, time and resource is available.

The CDM Regulations are designed to encourage all involved in a construction project to work together to ensure health and safety by managing and reducing health and safety risks.

As a construction client, you will need to:

- appoint in writing a principal designer and a principal contractor where more than one contractor will be involved. If an appointment is

not made, the client must fulfil the roles. These roles must be accepted

- make arrangement for managing the project
- ensure that the principal designer and principal contractor comply with their duties
- provide pre-construction information to each designer and each contractor engaged by the client
- take reasonable steps to satisfy yourselves that those who carry out the work have the necessary skills, knowledge, experience and organisational capability to fulfil the role, and carry out the work in a manner that secures the health and safety of the persons affected by the project
- make sure that the principal contractor draws up a construction phase plan prior to the construction phase
- make sure that the principal designer prepares an appropriate health and safety plan

Principal designer

A principal designer is required to plan, manage and coordinate the planning and design work.

Principal contractor

A principal contractor is required to plan, manage and coordinate the construction work.

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Notifying construction projects

In some cases, your project will need to be notified to the health and safety executive before construction works start.

Under the CDM Regulations 2015, the criteria for notification are: work lasting more than 30 days with more than 20 workers at the same time or involving 500 person-days of work.

CDM client advisor

You may wish to appoint a CDM client advisor who can help you as the client fulfil your duties as defined under the CDM Regulations and other relevant health and safety legislation.

Take advice

Health and safety in construction projects is of paramount importance, particularly given the potential risk exposure. Serious breaches of health and safety legislation on your project could result in construction work being stopped by the health and safety executive and, in the worst cases, you could be prosecuted.

It is recommended that you seek specialist advice from the outset of your project to ensure compliance with the CDM Regulations and other health and safety legislation. Professional bodies can help you choose your design team.

Your principal designer and principal contractor will be able to advise you further on your duties.

Further information can be obtained from visiting the Health and Safety Executive website:

<https://www.hse.gov.uk/construction/index.htm>

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5. Choose procurement route for your principal contractor

5.1 Procurement routes

Procurement is the overall process of obtaining goods and services from external sources (such as a building contractor) and includes deciding the strategy on how those goods are to be acquired by reviewing the client's requirements (ie time, quality and cost) and their attitude to risk.

Possible routes for procuring construction projects have multiplied over the last few years. Traditionally, a client decided what was wanted, then appointed a designer, agreed the plans and selected a contractor to build the project against those plans.

Now, several non-traditional routes are available, all of which hand over some client and design responsibility to other parties in the quest for project processes that are less risky, more economical, and timely in their delivery.

Although cultural capital projects have not been delivered in this way, there are other forms of procurement, notably the private finance initiative (PFI) and public private partnership (PPP), which are widely used in the public sector and which give private

partners responsibility to manage and/or operate the facility for many years beyond initial construction. A relatively new and untested procurement strategy is IPI which entails early collaboration of the design team and construction team, where risks and rewards are shared and other risks are insured against. This model has been used by [Derby Silk Mill](#).

The procurement and subsequent appointment of a principal contractor to carry out the construction works is one of the most significant milestones in the project development process.

In order to arrive at a preferred procurement strategy, it is recommended that a set of objectives is identified in conjunction with your procurement advisor(s) which are weighted in order of importance to you as client. These can then be scored, resulting in an overall score for each option. It is important that a careful selection process is adopted as it is critical to the success of the project. There is a range of procurement options you may wish to consider that include but are not limited to the following:

- traditional (single or two stage)
- design and build
- management contracting
- construction management

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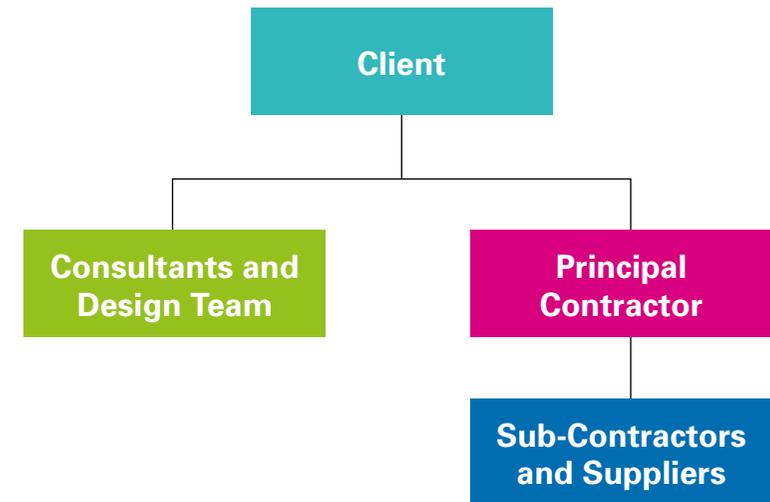
They differ in:

- the procurement of design and construction teams
- responsibilities of different parties
- risk allocation
- control over the certainty of the final cost of the project.

5.2 Traditional procurement

Competitive tenders are obtained on the basis of measured bills of quantities which have been prepared using fully developed and co-ordinated specifications and drawings provided by the design team. The successful contractor is appointed to carry out the construction works and any variations to the building design are valued on the basis of the tendered rates contained within the bills of quantities. Alternatively, tenders may be obtained solely on the basis of specification and drawings which restricts the mechanism for the pricing of variations.

A building contract let on a traditional basis has a segregation of responsibility for the design and construction of the building.



Key features of traditional procurement:

- Design responsibility is retained 'client side'
- Consultants (including designers) are employed by the client and retained for the duration of the project
- The client appoints a principal contractor who is likely to appoint sub-contractors/suppliers to complete discrete packages of work
- There is no direct contractual link between the client and sub-contractors. As a result, the client may choose to seek collateral warranties from the sub-contractors which creates a link between the parties and a direct right of action in the event of breach of contract.

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5.3 Two stage traditional procurement

Two stage traditional procurement is typically used when the client or employer is not necessarily interested in securing the lowest price for the works but considers that the early involvement of a contractor with specialist knowledge and expertise would benefit the development of the project.

Stage one

During stage one, the client tenders the project on a competitive basis, based on an outline design prepared by the employer's design team. The tenderers are asked to provide a proposed construction programme, price for preliminaries and a percentage for contractor's overheads and profit by way of tender response. Tenders are then assessed against pre-determined evaluation criteria and a preferred contractor is identified to move forward to stage two. The preferred contractor is often appointed for stage two using a Pre-Construction Services Agreement (PCSA) which governs the relationship between the parties so that roles, responsibilities and obligations are defined.

Stage two

The preferred contractor works collaboratively with the client and the design team to develop the design, and firm up the construction programme and cost associated with the works. This approach facilitates financial scrutiny through extensive engagement with the contractor as the costs are prepared. Stage two concludes with the production of a contract sum for carrying out the project and negotiation in connection with the terms of the building contract. Subject to legal drafting, the PCSA arrangement typically does not place an obligation on the client to proceed into contract if costs and/or terms cannot be agreed. However, if agreement cannot be reached at the end of stage two, there is a risk of additional cost and programme delays should an alternative contractor need to be found.

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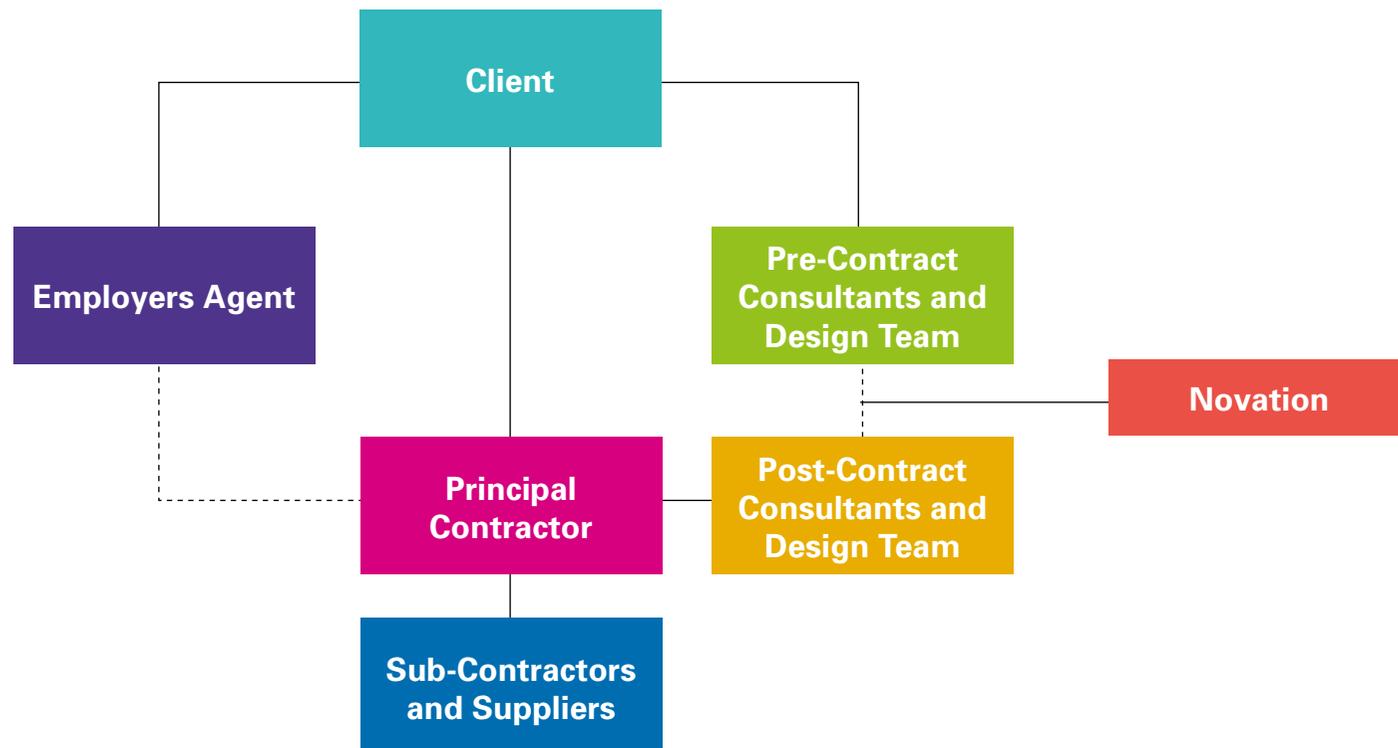
Bibliography

5.4 Design and build procurement

Competitive tenders are obtained on the basis of a detailed statement of employer’s requirements. The employer’s requirements can be based upon as little information as a performance specification and sketch scheme drawings or on as much as full working drawings with a requirement that the

contractor employs the client’s own professional team (excluding the employer’s agent) for the construction phase. The tenders obtained are fixed lump sums which will only vary if there is a change in the employer’s requirements.

A building contract let on a design and build basis offers single line responsibility for the design, construction and cost of the building.



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Key features of design and build procurement:

- The client appoints a consultant team (including designers) to develop a design.
- A contractor is appointed and takes responsibility for both the design (pre and post contract) and construction works, thus, de-risking the client's position.
- Typically, members of the client's design team are 'transferred' or 'novated' to the contractor at the point of entering into a building contract. Typically, this will include the architect and structural engineer.
- The client is represented by an employer's agent who fulfils a dual role of project management and cost management. They are also responsible for administering the building contract.

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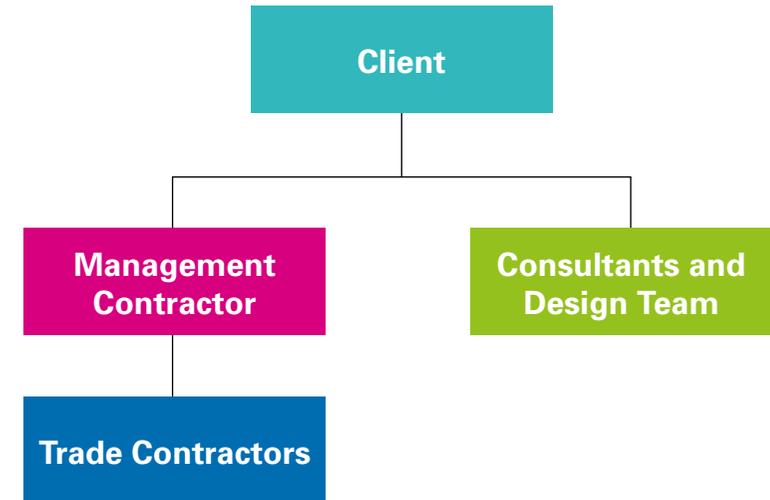
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5.5 Management contracting

With management contracts, the client appoints a management contractor who is responsible for managing the works and appointing the trade contractors who are contractually accountable to the management contractor.

Key features of management contracting procurement:

- The client appoints a management contractor and the consultants including designers (unless design and manage variant as described above).
- The management contractor is a specialist contractor who manages the process of construction but does not carry out the works itself.
- The management contractor takes responsibility for appointing trade contractors to carry out the works together with the liability for individual contracts.
- There is no direct contractual link between the client and the trade contractors and therefore each trade contractor provides a collateral warranty to the client.



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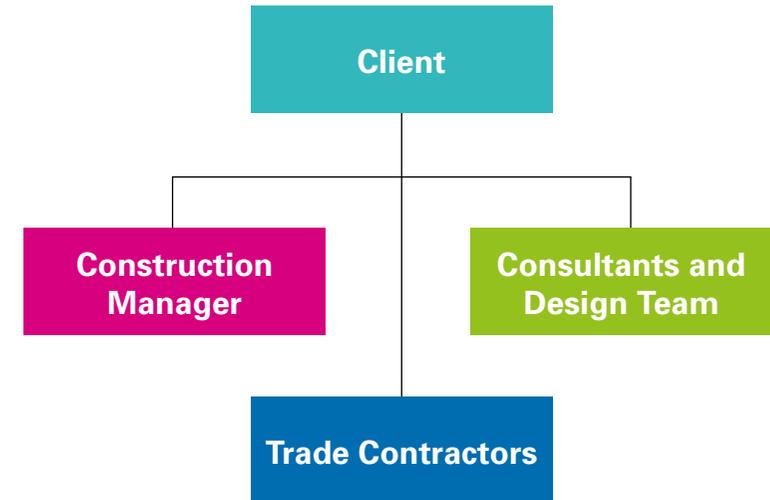
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5.6 Construction management

With construction management contracts, the client appoints a construction manager who oversees the work, but it is the client who enters into trade agreements with the trade contractors.

Key features of construction management procurement:

- The client appoints a construction manager and the consultant team (including designers).
- Construction managers are specialist consultants who arrange the appointment of individual trade contractors, but it is the client who enters into trade contracts with individual trade contractors. (This is a key difference between management contracting and construction management).
- The construction manager will oversee and manage the trade contracts on behalf of the client, but the construction manager is not responsible for design.



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5.7 Procurement strategy

Choosing a procurement route can be influenced by a number of factors which include those listed below and the decision will be a function of the relevant importance you as client place on these factors:

- contract particular requirements
- programme for development
- a procurement route to maximise market interest
- timely start on site
- required completion date
- degree of completeness of design and ownership
- size and complexity of the project
- degree of cost certainty required
- degree of competitiveness of price required
- apportionment of risk between the client and contractor

The procurement of a contractor, as with a design team, is influenced by public procurement legislation which governs the use of public funding, which may include the Official Journal of the European Union (OJEU). This is the publication in which all tenders from the public sector which are valued above a certain financial threshold according to EU legislation must be advertised.

It is recommended that specialist advice is sought from suitably qualified and experienced professionals to advise on and, where appropriate, to oversee and manage your procurement strategy and implementation.

The table below summarises some of the advantages and disadvantages of the different procurement routes.

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Procurement type	Advantages	Disadvantages
Traditional: <ul style="list-style-type: none"> client appoints design team and takes responsibility for its performance, then appoints contractor. 	<ul style="list-style-type: none"> procedure well known competitive fairness satisfactory public accountability. 	<ul style="list-style-type: none"> contractor not involved in design or planning potential for poor buildability adversarial.
Design and build: <ul style="list-style-type: none"> client appoints design and build contractor, which in turn appoints designers and sub-contractors. 	<ul style="list-style-type: none"> single point of contact inherent buildability early firm price possible. 	<ul style="list-style-type: none"> excellent briefing and specification skills needed mid-stream requests for changes can be expensive client needs to commit before design is complete.
Management contracting: <ul style="list-style-type: none"> client appoints main contractor and consultants on fee basis contracts are let as work packages trade contractors are contracted to the main contractor. 	<ul style="list-style-type: none"> clarity of roles parallel working is inherent so typically a fast-track programme late changes can be accommodated provided affected packages not yet let. 	<ul style="list-style-type: none"> need for a good-quality brief reliant on good-quality team, otherwise can become just a post-box system poor certainty of overall price.
Construction management: <ul style="list-style-type: none"> client employs design team, plus a construction manager who coordinates the work packages direct contractual relationship between client and trade contractors. 	<ul style="list-style-type: none"> clarity of roles, risks and relationships among participants late changes relatively easily accommodated direct contact between client and trade contractors may result in lower prices. 	<ul style="list-style-type: none"> no cost certainty at outset needs informed client and good-quality brief relies on good-quality team and good information control.

For a fuller account of the different procurement routes see [appendix 1 \[link\]](#)

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6. Develop design

6.1 How will the design come to life?

RIBA Workstage 2, 'concept design' (RIBA *Plan of Work 2020*) refers to 'implementation of the design brief' and 'preparation of additional data'.

It envisages very outline, strategic, structural, mechanical and electrical proposals, an outline specification (a written account of proposed materials, forms of construction and performance standards for the building envelope and its key spaces), and a preliminary cost plan.

Designers work in different ways. The concept design will be expressed more fluidly in these early stages than at later stages:

- in economical diagrams to explore likely options
- in evocative concept sketches
- 'inside-out' concept of the new Leicester Theatre
- in elementary models
- in more formal plans, elevations and sections.



Sarah Wigglesworth Architects

Conceptual location sketch by Sarah Wigglesworth for Holton Lee



Rafael Viñoly

Exploratory sketch by Rafael Viñoly exploring the 'theatre inside-out' concept of The Curve, Leicester



Caruso St John Architects

Model by Caruso St John Architects showing part of the ground floor at Spike Island, Bristol

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You and your colleagues may be unfamiliar with architects' drawings and their conventions. Do not hesitate to ask for explanation. Models can be very effective, not highly polished presentation pieces (those may be needed later on for fundraising purposes) but working models that can be cut apart and adjusted quickly. This is the work stage in which to explore all the likely and perhaps some less likely options. Design work can release unanticipated options and enhance and even change the brief.

In some cases, 'mocking up' a proposed space as the design emerges in wood or plastic sheets has been very effective, particularly when the project involves making alterations to an existing building.

This approach allows users and other stakeholders to get a 'feel' for the new space at full scale. 'Mock up' spaces can also be piloted for specific activities with future building users, such as practical workshops in proposed activity spaces. This approach tests the space against the requirements of the activity it is designed for. Contributors to the process will feel that they have participated in the design process and an ownership of the finished space.

Towner Art Gallery, Eastbourne: mock-up of a workshop

Mock-up spaces of the new building were used to conduct artist-led workshops with primary and secondary school groups. These sessions were documented to explore how different groups interacted with the space. The findings were used to inform the architects of the spatial needs, location of doors, windows, sinks, lighting, storage and fixed furniture.



Towner Art Gallery

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6.2 Design development

The RIBA Plan of Work 2020 defines stage 3 as ‘Spatial Coordination’ which includes the following core tasks:

- Coordinated and updated proposals for structural design, building services systems and outline specifications
- A Stage 3 Cost Plan is developed by the cost manager in conjunction with the design development process

During this stage the concept stage is further developed, and the process may require a number of iterations as the design is considered by the client and key design disciplines. The developed design needs to be aligned with the project budget set by the client.

Stage 3 culminates in a full set of information to support a detailed planning application. Concurrent with this design development process, tasks such as the following may also be undertaken:

- review and update sustainability, maintenance and operational handover strategies, risk assessments
- review and update the project execution plan
- review and update construction and health and safety strategies

Change control procedures should be utilised at this stage to capture changes from the concept design. This will ensure that all changes are considered in full by relevant stakeholders and signed off.

Several formalised processes can be used to help assess design. CABE’s *Design reviewed* provides some useful ideas about questions the client should ask themselves at key stages in the process about design. There is the opportunity to submit the design to CABE for consideration by its design review committee. Design review cannot look at every scheme submitted to it; the team is guided on which schemes to review by criteria set out by the government. If a scheme is to be reviewed, this should be done in advance of submitting a planning application, if possible, along with early discussions with the local planning authority and other key organisations, eg Historic England, or The Theatres Trust’s planning and architecture advisor. If appropriate, a design review should consider:

- the site, the context and the contribution to the public realm made by the project
- access, landscaping and orientation
- how well the organisation will be able to function in the new spaces

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- sustainability/energy efficiency considerations
- whole-life costs, energy, maintenance and replacement
- visual impact
- adaptability to different uses

Design quality indicators have been developed by the Construction Industry Council and may be useful overall. There are other frameworks relating to particular aspects. BREEAM, for example, reviews how many environmentally responsible measures have been put in place. It considers whether the building adequately considers transport, fuel economy, waste and pollution, and environmental diversity.

Planning applications are typically made using the stage 3 output. A planning authority will want to see images of the proposed building/rebuilding set in the public realm. Other quantitative data will be required about the proposed building (for approvals). All this suggests that the design will be quite specific, at least to the scale required, customarily 1:100 for planning application general arrangement drawings, and perhaps larger scale detailed drawings of the envelope and its materials if historic buildings approvals are required and/or the building is in a conservation area (see section 6.7 on approvals).

National Centre for Writing case study

Norwich had achieved UNESCO City of Literature status in 2011. The National Centre for Writing (Writers' Centre Norwich as it was then known) was looking for more space to be able to carry out its work and a stronger physical presence in the city, as part of its ambition to be a cultural centre for Norwich. They were offered Dragon Hall, a medieval trading hall in the City Centre and conceived a scheme to extend and refurbish so that a twenty-first century cultural operation can run successfully from the heritage building. The plans needed to improve the quality of the visitor, writer and learners' experience, as well as the scope for generating income through hires and the digital distribution of their courses and programme.

The fifteenth century building has a flexible, and in places portable, digital infrastructure as well as refurbished accommodation for writers, visitors and education groups. The team ascribe project success to the quality of their eight year fundraising strategy, the recruitment of a highly experienced team and robust business and project planning.

Find out more

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6.3 Design for sustainability

Environmental features of sustainable buildings

The design of sustainable buildings should consider measures to:

- reduce energy consumption and associated emissions of carbon dioxide
- minimise the use of resources such as water and construction materials
- reduce the release of pollutants
- maximise the use of sustainably sourced and recycled materials (eg timber)
- promote sustainable travel choices through public transport and cycling provision
- conserve, or enhance, biodiversity

In terms of the design:

- the shape, form, orientation of the building, and the sizing, positioning and design of openings should make maximum use of natural forces such as daylight and wind, and minimise the need for applied energy

- the building fabric should be highly insulated and well sealed to prevent unwanted heat losses by conduction and by unwanted air infiltration including draughts
- the placing and quantity of glass in the external walls should be carefully considered in terms of avoiding excessive heat gains in summer and heat losses in winter
- global warming, magnified by the urban heat island effect in London and other cities means that design assumptions about external temperatures should be carefully reviewed
- however, mechanical cooling and air conditioning are very energy intensive and costly to run, so investigate passive options
- use efficient lighting, heating and ventilation technologies, complete with control and metering systems that encourage and support efficient energy and environmental management practices and minimise consumption of fuel, power and water
- components, materials and systems should be chosen to minimise environmental impact and protect biodiversity.

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The focus needs to be not just on the initial capital costs, but on so-called ‘whole-life value’ – that is, looking beyond the initial capital cost to take into account future maintenance and running costs. To do so will involve winning commitment from all stakeholders, including funders, designers and contractors. Those responsible for managing and maintaining the building need to be able to measure its environmental impacts and make changes to reduce these.

Delivering sustainable buildings in practice requires focus and determination. Designs should be careful not to over-estimate the expertise available on completion to manage the building services. A building management computer-controlled system that demands the operator have a degree in engineering may be unsuited to an organisation that has access to the services of a part-time caretaker to run it. Simple systems that automatically switch off when not needed are often best.

Consideration should be given to an environmental sustainability accreditation. Further advice and guidance can be sought from an accredited professional or organisation and the Building Research Establishment (BRE).

Sustainable measures are often the victim of budget-cutting exercises. **Hang on to your vision.** See [Appendix 2](#) [page 119] for a more detailed checklist

6.4 Design for access and inclusion

Addressing access and inclusion from the outset can help avoid costly delays at planning and building control stage as the scheme is more likely to meet building regulations and local planning standards. The Construction Industry Council publishes useful guidance in *Essential principles for creating an accessible and inclusive environment for clients, developers, and contractors*: <http://cic.org.uk/projects/project.php?s=essential-principles-guide-for-clients-developers-and-contractors>

When seeking listed building consent it is important to provide information about the architectural and historical significance of the building and to assess the likely impact of the access proposals in relation to this, thus establishing that a balance is being struck between conservation and access. Guidance is available from Historic England in *Easy access to historic buildings*: <https://historicengland.org.uk/images-books/publications/easy-access-to-historic-buildings>

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6.5 Cost and risk management

Risk lies in the unknowns at each stage of the project. In the earlier design stages, informed assumptions will need to be made by the professional team before accurate information is generated. Risk declines as the project progresses and the 'unknowns' become 'knowns'.

Judgements will need to be made as to when to commission surveys and investigations and appoint more specialised consultants.

Accurate surveys of the chosen site and/or building with levels, existing services and drainage lines are indispensable beyond the earliest conceptual stage. The present establishment of land ownership and rights of access, rights of light, wayleaves and other 'mission critical' legal and physical givens should also proceed as soon as possible to avoid abortive work and delay.

Archaeology at St George's Bristol

Music venue St George's Bristol built a new extension over the burial ground adjacent to the church. It was known at the outset that this would entail the exhumation and reburial of human remains, requiring a Ministry of Justice licence. However, what was not anticipated was just how many people were buried here. In total 383 bodies were unearthed during the main excavation phase and a further 3-4 during the construction phase. The initial costs of the archaeology were £170,221 with a likely further £7,000 for reburials. In addition, St George's needed to factor in the costs associated with the planning condition relating to ongoing study of the remains and were required to contribute £40,000 towards the analysis and report. The original figure was approximately £120,000 but the archaeological services consultants agreed to undertake the work pro bono as a contribution to the project's costs.'



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- Risks lurk below ground in soil conditions, hidden voids, sewers and services such as electric cables, fibre optic cables, gas mains and water mains. Foundation and substructure proposals are speculative until soil investigations are undertaken. Structural engineers also collect historical information about former development on or adjacent to the site. Contamination may be an issue. An asbestos survey is essential for existing buildings. Legislation and insurance requirements pretty much demand the keeping of an asbestos register.
- There may be confusion between the client and design team over objectives, particularly their prioritisation. For example, effort may be expended in making clear span spaces but value to the client may reside in the redistribution of that cost.
- New materials and new technologies may still be in development. Check working, installed examples.
- Planning policies, particularly city centre policies, governing the development of additional floorspace need to be recognised and interpreted. Early discussions with the local authority may avoid abortive work and delays.
- Acousticians, technical systems consultants, energy specialists, fire engineers, traffic engineers, landscape architects and ecologists may well have a significant contribution to make, adding cost to the construction and requiring design changes.

Contact Theatre, Manchester

Contact Theatre (like many city centre sites) is located where there are multiple data and power cables in the ground. When designing the foundations for the new extension their team studied available plans, commissioned a Ground Penetrating Radar (GPR) survey and dug inspection trenches. However it wasn't until preliminary excavation when the contractor was already on site that the full extent and exact route of the cables was known. This caused a long delay and significantly increased costs. Contact's advice is to do as much ground investigation as you can and if possible relocate any cables/pipework (especially any utilities) before your contractor is on site.

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Acoustic design is potentially much more than the application of absorbent finishes to a complicated space. Isolation of spaces from each other and the public realm can involve structural separation of parts of the building, at a cost.

- The clients may be too overcommitted with day-to-day responsibilities to study the scheme adequately and spot unsatisfactory elements early enough.
- Friction may develop between the team and client or within the team. The project champion and the project manager, if one is appointed, will need to exhibit real leadership skills. Friction arises from non-performance, mistakes or changed instructions or fundamental strategic disagreements.
- The emerging scheme may be too ambitious, or too costly for the funds available. Successive reiterations may not reduce cost adequately. Robust value engineering or value management, its broader and more optimistic relative, may well be required at some stage in most projects.

6.6 Value engineering and risk management

Clients have achieved success through the careful and informed prioritising of all the elements comprising the total project. Priority order is derived from the contribution each element will make to delivering the vision and the business plan that supports it, by the various funders' priorities and objectives, and by other stakeholders' objectives. One client attached numerical weightings to each element so that when required to reduce the scope of the project, their decisions had already been argued through.

Cost information needs to be intelligible to the client, and organised into meaningful elements, which relate to recognisable pieces of the project.

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Shell	600,000	6	9	8	1
Link	50,000	5	3	8	1
Dressing Rooms	100,000	3	1	4	3
Timber infill to stairs	5,000	0	0	4	1
M & E Services	inc in shell	1	2	8	1
Seating, stage lighting & fitting out	50,000-200,000	6	3	9	5+
Landscaping	25,000	0	0	0	7
Theatre technical systems	100,000	7	2	9	1
2 Wessex Hall	893,000				
Staging	25,000	6	4	6	5
Seating	250,000	10	10	10	1+
Acoustic enhancement	58,000	3	10	8	1
Disabled access/Balcony works	25,000	0	5	0	5
Theatre technical systems	485,000	3	0	9	1
General re-decoration	50,000	9	9	9	1

Part of the Lighthouse's 'priority matrix'

When faced with a smaller than expected capital award, the management of the Poole Lighthouse went through every aspect of the proposed scheme, itemising every element in operational and political terms on a numeric scale. This allowed the client to make rapid decisions when faced with the need to omit or scale back aspects of the project in order to keep within the tight budget.

**The Devon Guild of Craftsmen, Bovey Tracey: exterior of the extension to Riverside Mill**

Deciding what to omit is not always a straightforward process and ideally avoids compromising the main intent of the project: the 'core vision'. In the case of the Devon Guild of Craftsmen, it was decided to omit the proposed education space from the capital project on the basis that funding could be sought at a later stage in conjunction with other groups in the town. The loss of storage areas from the project has had more practical implications, and some of the display rostra find a temporary home in the management's garages when not required for use.

Joe Burns/Softroom

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Risk register

Risks can be formally identified and assessed in terms of the severity of the consequences if the risk occurs, perhaps from 1–5, and the likelihood of the risk occurring, again, perhaps, from 1–5. Overall scores can be calculated for each risk, mitigating actions devised and the consequent reduction in risk quantified. Sums from the project budget can be set aside proportionally against the catalogue of risks, called contingency sums. The contingency should be 5–10 per cent of the overall budget where possible, in order to allow for maximum flexibility later. As the likelihood or possibility of each risk recedes or subsides completely, the contingency can be diminished or absorbed back into the main budget. Either the quantity surveyor or project manager will keep the risk register and revisit it with you and the full team as required. Perhaps the most fundamental potential problem is confrontation arising between the client and the contractor or other team members. In complex funding or shared use situations there is also a potential problem that the objectives of the funding or partner organisations are not fully compatible with each other, or not capable of resolution in the same timeframe. A firm understanding of all the funds and client group

identities at the outset is an essential component in risk reduction. Systematic risk management can help you to:

- deal with unforeseen circumstances
- minimise damage caused by identified problems
- identify and prioritise objectives
- identify and prioritise constraints on the project
- inform decisions
- enable more efficient cost management
- improve accountability

You can minimise risks by adopting some of the following rules:

- put time and energy into appointing advisors
- obtain and consider objective advice, even if unwelcome
- put time and energy into defining the brief
- accept realistic targets
- keep abreast of progress reports
- avoid changes and keep to ‘signed off’ decisions
- apply best value assessment, balancing quality and cost

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6.7 The approvals process

Building projects are also governed by a range of legal procedures – these are known as approvals. You will need several different approvals typically, some of which are simple and straightforward, but others lengthy, risky and capable of crippling the viability of the project if approval is withheld.

The standard approvals necessary, with timescales for preparation of documentation and decisions, depending on size of project, are as follows:

Approval	By whom	Typical minimum decision time	Who should prepare
Planning permission	Local authority planning department (with advice where necessary from, for example, The Theatres Trust)	Eight weeks (or 13 weeks for larger scale building)	Design team and client
Listed building consent	Local authority and Historic England	Eight weeks	Design team and client
Landlord approvals	Landlord	Variable	Client champion
Building regulations	Local authority building control team	Throughout construction, signed off at the end	Design team
Fire certificates	Local area fire officer	Variable	Design team

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Other approvals specific to particular buildings and sites are sometimes needed such as:

- party wall agreements with adjoining owners. (The client may need to engage a party wall surveyor to carry out this work)
- changes to roads agreed by highways authorities
- environmental plans with local authorities
- tree removals where there are preservation orders

Subsequent to completion of the project, you may need various operating permissions, such as licences for entertainment, provision of alcohol and food, cinematography etc.

You should consider your responsibilities in each of these areas:

- planning permission
- rights of adjoining owners and the public
- recompensing for injury to persons or damage to property belonging to others
- accepting responsibility to pay all those working on the clients' behalf
- accepting responsibility for setting up a health and safety strategy for all involved in construction and subsequent maintenance of the building (construction, design and management – CDM)

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7 Detailed technical design

7.1 Technical design

RIBA Workstage 4 is all about precision and rigour as the proposed building work is accurately defined in larger scale general arrangement drawings, customarily at 1:50 scale, big enough to visualise whole spaces and furnish them. It will include all architectural, structural and building services information.

To some extent the various engineers' drawings and written descriptions of their work, and their specifications, follow on from architects' grand arrangement drawings. Invariably, the proliferating numbers of consultants and specialists find themselves working on slightly different versions of the overall project. It is important to allow time for engineers' drawings and specifications to become harmonised and to realise that changes required in this stage resonate through interlinked packages of information.

It is important to have the full contribution of necessary specialists at this stage, so that they have 'room' in the programme and budget to contribute effectively.

Value engineering and value management are critically important at this stage. The consultants need to keep pace with the emerging scheme so that the cost implications of the emerging design are apparent.

Under traditional type contracts, contractors and sub-contractors are not much involved at this stage. But in more modern contracts there are various ways in which the people who will build the building are able to contribute to the development of its construction information.

As the design becomes very specific, it is essential that it is audited for compliance with the various pieces of legislation described earlier, principally health and safety, and access.

Ultimately at this stage the sustainable elements of your new building will be cast. How much of the original strategy survives? As the likely cost of the project becomes clear with the input of the specialists, what will be lost? This is where having a clear vision and list of priorities can be invaluable.

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7.2 Sustainability – technical issues

Delivering genuinely sustainable construction will require you and your design team to consider:

- the essential construction elements – windows, doors, insulation, air-tightness
- the origin and properties of the materials chosen
- the components you buy, particularly the light fittings and their controls
- heating and ventilation and their controls
- the use of water

See **Appendix 3** [page 123] for a more detailed checklist of sustainable technical construction considerations.

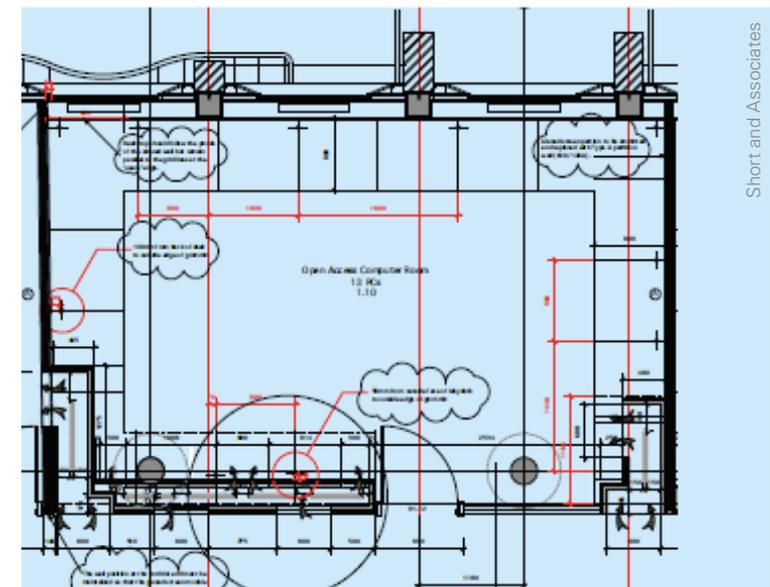
7.3 Tender documentation

Tender documentation should enable the contractor to scope and quantify the work required in sufficient detail so that costs can be applied to generate a tender sum.

You will need to assemble and coordinate selected technical information from all the consultants and descriptive and measured scope of work from the cost consultant into a full tender package. The coordination of all the design information across all the consultants is rarely wholly complete at this stage.

This can lead to problems throughout the contract so ask your designers how they propose to make a seamless description of the work. Do they need a little more time to double check everything? Clients rarely seem to review these documents before tender but you are strongly advised to read through them to check for inconsistencies. They are surprisingly intelligible.

Contractors are not remunerated for bidding work under traditional contracts and time is limited, normally to four to six weeks.

Example of workstage 3 drawing

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Much of the information will be broken down by 'trade' and dispatched to sub-contractors for quotation. Few main contractors employ direct labour to any great extent. They source, coordinate and manage sub-contractors to complete the work, trade by trade.

Even small buildings seem extraordinarily complicated when deconstructed into their constituent components, and each building, of course, is different. Details are often drawn at 1:5, 1:2 and even full size. Many manufacturers help designers now by issuing type details for building their products into different types of construction.

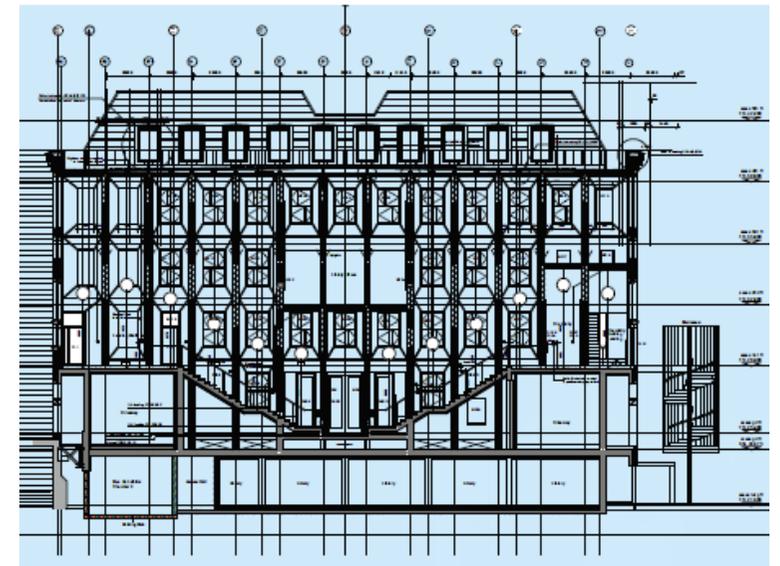
Although potentially time-consuming, it is very interesting for clients, compelling even, to follow the myriad choices of component from window frames, roof coverings and gutters to door handles and heating and sanitary fittings. Electric socket outlet positions, light fittings and light switches, heating elements and control points are worth spending as much time on as possible, since they will seriously affect the usefulness of your new space.

How will you control your environment in each space? Will you be opening windows or pressing buttons? How will the lighting controls work, or will

the lights go on and off at their own position? Or can you override the controls, or do you control them? The lock 'suiting' is very important. Who will have access to which spaces?

You will be asked to sign off stage 4 information. Study it carefully and ask questions. Try and inhabit the spaces.

Example of workstage 4 drawing



Short and Associates

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7.4 The tendering process

Tendering is an important phase in an overarching procurement strategy, but involves more than simply obtaining a price. Tendering includes the bidding process with a view to obtaining a price and the process and form of agreement for the appointment of a consultant and/or contractor.

Implementation of robust tendering techniques can harness positive tender results through accountability, auditability and parity.

The tendering process needs to be structured appropriately, allowing adequate time for:

- interviews with potential tenderers to inform your shortlist
- design development and detailing
- buildability input
- early contractor engagement

Potential contractors need sufficient time to respond to tenders and develop their response and an overly contracted timeline will limit the number able to submit a bid. It is not unusual for the tendering process to take up to 12 weeks.

Typically, the process involves:

- design of the tender process and tender reporting
- development of the tender pack
- advertisement
- Pre-Qualification Questionnaire (optional but recommended)
- assessment of PQQ returns and invitation to tender
- assessment of tender returns and shortlisting
- interviews
- final assessment of tender returns
- notification to tenderers
- contract negotiation
- appointment

Competitive bidding

It is very important to be completely fair and transparent. The code of practice for single stage selective tendering explains the necessary protocols.

- Any additional information, or change in the information, must be communicated to all tendering contractors simultaneously.

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- It is good practice, and usually very illuminating, to interview the competing contractors and allow them to describe how they plan to go about the construction process.
- Insist on meeting the actual people who will manage and organise your project. This successful bidder may have to deal with both the public and your own colleagues regularly, dealing with noise and deliveries.
- Health and safety are paramount. There may be assumptions in the contractors' minds that are simply not acceptable.
- It is good practice to score the competitors formally by various criteria so that your decision-making is auditable – this is vital if you are using public funding.
- The tenders must be returned by a set date and time at a given location and in the prescribed format and opened a little later.
- The results may not be obvious. Tenderers may have priced for different programme lengths and different options.
- The cost consultant will check and analyse the bids and report to you, with a recommendation. Ensure that the appointed cost consultant

provides a formal tender report that documents the process of appraising the tender returns and the methodology of arriving at the tender recommendation. This can prove to be an important reference point and audit trail, particularly in the case of an appeal by one or more bidders.

You need not be held to the lowest, particularly if it seems unfeasibly low, which usually prefigures financial disagreements later in the project, but if you have carefully selected a contractor for your shortlist, it is difficult to then reject his/her bid if it is the lowest.

If a tender is considerably lower than others it may just be a misinterpretation of the tender requirements. Consequently, it may be worth raising tender clarifications with the tenderer as part of the process of tender analysis before drawing a conclusion.

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**Design
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8 Construction

8.1 Mobilisation and construction

As soon as the successful contractor is appointed there will be intense discussion between the project manager, the cost consultants, the design team and the contractor about the actions necessary to allow the contractor to take possession of the site, your site. From that moment the contractor has jurisdiction over the site and you will need permission to enter and view progress, which may seem a little peculiar.

It can be useful to host a pre-start meeting at which key project details can be discussed, involving representatives of the client organisation, client professional team and principal contractor.

If the work is to your existing premises and you are remaining in part of them, as many arts organisations find themselves doing, you will need to be closely involved in planning for protection and isolation of ways in and out of the building, deliveries and fire escape routes.

Modern Art Oxford case study

Modern Art Oxford (MAO) is based in a 19th Century converted brewery storehouse, owned by Oxford City Council. The building has been adapted in a piecemeal style over the years and has suffered from a lack of significant investment in maintenance. The capital project focused on improving the fabric of the building, and its thermal performance as well as upgrading lifts, internal services and the technology infrastructure. Although investment in digital systems was a small part of the overall expenditure it has acted as a catalyst for new ways of working and there has been a significant improvement in the quality of the working environment with positive impacts on staff morale and well being.

Find out more



Carter Jonas Oxford March 2019
Photographer Aurelien Langlais

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These may change sequentially if the project proceeds through several phases. Main services may need to be switched off periodically.

You need to be fully informed of the cycle of payments to be made against certificates confirming the amount of work completed to date. The cost consultant will be able to provide you with predicted cash flow and brief you on payment terms. The payment process in the construction industry is informed by the Construction Act which your cost consultant should be able to advise you on. The rate of spend will not be constant and gives a good indication of real progress on site. If you are three quarters of the way through the programme but only 25 per cent spent on your budget, this may indicate a problem.

8.2 Consultation

Your staff and colleagues need to be kept up to date about the physical works and disruption, changes in plan, and progress.

Physical reconstruction is often associated with organisational restructuring, either voluntary or involuntary. New spaces require new business models. Everyone with a stake in the organisation will be anxious.

8.3 The construction programme

The preparation and status of the programme can be contentious. Additional payments to the contractor can be argued for but the grounds for doing so are usually defined within the contract terms. A contractor can try and make the case for failing to deliver to the pre-agreed programme and for associated costs by claiming the delay was client-induced in some way (known as 'extensions of time' or EoTs). A spirit of over-optimism quite often inhabits construction programmes until close to the end date.

Within the programme, certain sequences of work will be essential in order to achieve progress. It is possible to identify them and connect them into a 'critical path'. Construction programmes can become very complex, even for relatively small projects, and the construction industry was one of the first to adopt computerised planning programmes to accommodate this complexity. Ask for an executive summary organised for your needs, the completion of phases and the return of refurbished spaces, within which activity can restart.

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8.4 Value management

It is custom and practice to produce monthly cost reports for the benefit of the client. These will be assembled by the cost consultant typically on a monthly basis.

There will be a prediction of out turn cost which will take into account the original contract sum, together with any contract variations (additions and omissions) in the cost of works to date, the release of those contingency sums held in reserve and the expenditure of other specified sums reserved for particular pieces of work on unknowns at the time of tender.

The professional team's skill, and that of the project manager and project champion in particular, is how to respond to trends in the cost reporting and when to take action. Value engineering during construction can be problematic. Everyone has to be clear about the consequences of omitting pieces of work. Will the work simply need to be put back in again later in the day? Will revenue costs increase and what impact does this have on the business plan?

Funders will normally take a keen interest in the cost reporting, and their representatives – or 'monitors' – will take a view. There is really no point in being anything other than wholly transparent.

Experience has shown that even what might appear to be a relatively modest change in the design during construction can attract what may appear to be disproportionate costs. This can be driven by the impact on the planned sequence of the works and the consequential changes the contractor may be required to make to accommodate a change.

Are your consultants delivering construction information fast enough to fuel the contractor's progress? Given that 'late information' is one of very few mechanisms for receiving additional payments, it has been known for the flow of information to be misrepresented. Some modern contract variants require claims and counter-claims to be resolved quickly, as they happen, rather than wait, unresolved and escalating until completion or for many months afterwards.

Unresolved claims make it much more difficult to be confident about the final out-turn cost and to manage value on the way. Construction is exciting and your many project stakeholders, and the community in general, will want to see progress. With good planning, not least in health and safety, it should be possible to tour the site once or twice during the process. Webcams can be used to produce live site progress and time-lapse film of the construction process, available on the organisation's website.

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Although this is rarely done, there is probably everything to gain from giving the building team a tour, physically or virtually, of your organisation's work, its raison d'être, your vision for lifting its game and the role the new building will play in realising it.

Increasing communication, understanding and empathy can only help. But remember that whereas this may not be first and foremost on your agenda, the construction industry always works towards making a profit. Relations deteriorate when this is threatened. Omissions can have cost and time implications.

During the course of construction at Spike Island, Bristol, it was decided to omit various items from the main contract. The client would then procure these separately. At a busy time, it is essential that a client undertaking to proceed in this way actually has the time to devote to the issue.

Belgrade Theatre, Coventry: the new second auditorium added to the theatre in 2007

Faced with rising costs during the capital project, the management of the Belgrade Theatre, Coventry, decided to break apart the contract for their capital project. The fit out of the new auditorium was let as a separate design and build contract, and the refurbishment of the original 1958 theatre was procured under a further separate contract.



Morley von Sternberg/Stanton Williams

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8.5 Communications

It's vital to maintain communication within the construction team and with staff and other stakeholders.

- Programme regular meetings with your project team to keep you as client informed, usually after the monthly cost report is completed.
- Walk the site regularly.
- Resist the temptation to change the design unless it is essential, and investigate the consequences carefully with your consultants before they instruct 'variations'.
- Listen to any negative comments from senior people in the organisation, from donors, sponsors and the press, and explain your vision again.
- Be available if rapid response is needed.
- Monitor the programme timetable, expenditure and build quality through your professional team.
- Let staff, and other user groups, if relevant, know how the project is going.
- Communicate any significant changes to relevant people in your organisation.
- Enjoy the process of seeing the project come to fruition.

- Help create good spirits for the whole project team and the contractors.
- Invite the construction team to your organisation's events.
- Send out press releases to local newspapers and radio/TV stations, and trade journals at key stages of the process.
- Stage events, for example the 'topping out' ceremony, with press coverage.
- Arrange completion events for the project team and contractors before the formal opening.

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9 Prepare for handover

The end of the process, when responsibility is transferred to the client, is a critical stage. This is when the best information will be available about exactly what the new building comprises, how to maintain it and what transformations it may be capable of over time.

The contract should have required that a full set of 'as built' plans, health and safety files and operation and maintenance manuals for the building and its equipment and services are given to you. These need to be in a handy, manageable form for everyday use, as well as in large tomes or computer programmes. The project manager should set up systems to ensure that all information is stored correctly, for example health and safety files and records of drawings.

Snagging – ensure that you and the design team walk the building and identify any areas of the building that need rectification or are unfinished (even very minor items). These should be documented in a snagging list and shared with the principal contractor.

'Commissioning' contemporary buildings – testing or making sure all its environmental and technical options work – is a major exercise. It is about much more than spotting where a coat of paint is missed.

Often the programme under-provides for it and/or the time runs out. However, the occupants can really suffer from this in the early period of occupation.

The drive towards sustainable construction is partly met by more and more sophisticated controls responding to more and more input data on likely scenarios, acceptable temperatures and changes in the weather. You, or someone in your organisation, needs to understand this. There will be suggestions to enter into maintenance agreements, at a cost, and perhaps protracted discussion about whether an installation is ever fully 'completed', so that 'maintenance', strictly speaking, cannot yet start. Discuss 'commissioning' with your project manager and project champion and decide in advance what you will do if the works are delayed and the commissioning time allowed for is eaten into.

9.1 Practical completion and defects liability

The contract administrator will decide, and you should not influence him or her, exactly when the project is complete and can be 'beneficially occupied' by your organisation. Inevitably, work will remain to be finished, but not of a magnitude to prevent you occupying it and resuming your activities. This is a critical contractual moment because it releases the contractor from any obligation to pay damages

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to you for further delay, perhaps reimbursing you for additional rental payments or cancelled events. Work remaining is described on 'snagging lists' and experience has shown that often finishing all the items is a protracted and frustrating business.

Occasionally, it may be possible to partially reoccupy the premises. The terms under which these arrangements take place should be carefully documented. Health and safety will be paramount.

Initially the design team will carry out inspections. However the client team needs to participate to learn what will need to be reviewed over time. There is a period, usually a year, set down as a condition of the building contract, when the contractor is required to put right any failures that occur – this is called the defects liability period.

It may be appropriate to address ways of providing incentives to the contractors to deal with these final issues, or disincentives to them not being completed effectively and speedily. This may include financial incentives or penalties. For example, the client can withhold a proportion of the total contract value for the defects liability period. This sum, referred to as 'retention', may be in the order of 2.5 per cent.

The client should seek advice about this from their project manager or quantity surveyor.

9.2 Final touches, fitting out

At this stage in the project, the detailed management routines for the facilities management team can be planned and the installation of additional items, such as small art works or planting can be selected and installed. If outside organisations will be operating facilities, such as catering or a shop, their contractors will need to see the site as soon as it is sufficiently complete for them to do so. Site visits need to be planned so that they do not disrupt the construction process.

9.3 Commissioning and handover

You must have arrangements at handover for:

- procedures for reporting defects and giving contractors pre-arranged access
- maintenance of all systems
- insurances for building, equipment and contents
- transfer of meters to new owner after final reading
- obtaining certificates of compliance with regulations
- obtaining guarantees and warranties
- taking over loose equipment including keys
- obtaining construction record information
- health and safety files

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mechanical and electrical systems, and the controls that govern them. Constructional elements such as opening windows and solar shading devices may also require commissioning.

The Log Book

The design team should assemble systematically all material relevant to a building in a log book and the operating and maintenance (O&M) manuals. The preparation of a log book for new buildings or buildings where significant changes have been made is now compulsory under part L of the building regulations. The log book should give a summary of the facility and purpose of the building services, the zoning arrangements, the location and features of the relevant plant and equipment, and a schedule of the building's energy supply meters and sub-meters including their location, fuel type, and how to read them. The log book should also describe the operational and control strategies of the energy-consuming services, and provide instructions on how to achieve the specified performance including the actions required daily, monthly, seasonally and annually. Information should also be provided on how to calculate the energy performance of the facility from the individual metered energy readings and compare it with published good practice

benchmarks. Operating and maintenance manuals need to include:

- makes and model numbers of all significant items of plant and equipment together with manufacturers' contact details
- manufacturers' instructions for all significant items of plant and equipment, with clear indications of the equipment actually installed in the building and all maintenance and servicing schedules and requirements
- schematic diagrams of the building services
- commissioning records, including demonstration of compliance with specified energy efficiency standards, for example, for specific fan power

Finally consider 'sea trials' at handover

Is the design team committed to providing support, including on-site training and advice to the facilities management team and occupants after handover – and to remaining available to ensure the building is operating as planned? Most buildings have systems for lighting, security, heating and ventilating that, even after initial testing, will need to be fine-tuned to give optimal performance in use.

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10 Occupation

10.1 The first stages

The client must plan for occupation. The new project may need new staff, and changes to the working lives of existing staff members. This will have a number of potential impacts.

- Recruitment and job training will be needed at appropriate stages, and training for the use of a new building can be considered at the same time.
- Security systems are likely to have been modernised, and catering or public areas may have been totally changed.
- Staff will need information about all aspects of the new building and location. The new working rules should be explicit. Will new delivery arrangements have to be planned with existing suppliers?

A staff user group, able to help sort out which issues will need explanation or training, may be helpful.

Visits of groups of staff to the site may help to highlight issues that need clarification. It is best not to wait until move-in day to hand out information about changes. Early information can forestall speculation and misinformation.

10.2 The opening and launch

The success of a new cultural space and its economic viability can be shaped in part by a successful launch. Where a launch, rather than a simple opening, is to happen, this must be planned with as much precision as the construction project.

Specialists may need to be drawn in to prepare for the occasion, especially if it will be a very public opening by a celebrity or member of the royal family, or if press information needs to be spread nationally and internationally. The project budget should plan for this stage of the project from inception. The launch should not take place too soon after handover if there may be construction defects to put right, new equipment to understand or changed use patterns to get used to. There may be scope for a wide variety of opening events that needs to be planned well in advance, such as:

- soft launch to test staff routines
- private previews of the building, particularly for project funders
- press launches
- staff previews
- events for the project delivery team
- related arts and culture launches – new plays, book launches, special exhibitions or a special week

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10.3 Evaluation

No project is perfect on day one. The first few weeks are the time to iron out any obvious problems, while giving staff and visitors the chance to settle into the new facility. After the initial period of familiarisation, users should be asked to report back on how well the facility is functioning, and to identify any improvements that might be needed or can easily be achieved.

'Post occupancy evaluation' simply means evaluation of the new building's performance in the key areas after moving in and occupying the building. For large projects, a full post occupancy evaluation should be undertaken one year after project completion. The results should be made available to the funders, the building users and the project team. Any general lessons learnt should be summarised and shared for the benefit of future projects.

Early commitment by the whole team to the need for feedback about the project process and the outcome have a role to play in creating a good design and a building for which feedback will be generally good.

10.4 Management practices (sustainability)

Operating a building sustainably is about much more than the systems you specify in its designs. Consider a range of different management practices to maximise its sustainability in use:

- appoint a person to be responsible. Has a person been given the responsibility to manage energy and water use, and other aspects of environmental sustainability?
- monitoring and targeting. Has a routine been established for reading meters regularly and analysing energy and water use in a spreadsheet? This will enable benchmarking against typical buildings of the same type, and the identification of unexpected changes in the pattern of consumption, together with their probable causes. Ideally, stringent but realistic targets for reducing consumption will be set.
- good energy housekeeping practices. Have good housekeeping practices been identified that prevent unnecessary waste of energy and water? Have these been drawn together into a walk-round energy checklist and staff training material?

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- energy walk-round. Is a periodic tour undertaken of the premises at different times of day (and night) with the energy checklist to identify sources of energy waste, such as heating, lighting or ventilation operating when it is not required?
- staff awareness and training. Are new staff introduced to good housekeeping practices? Are good housekeeping practices routinely promoted through staff awareness campaigns? Has a poster or similar competition been considered to promote energy-saving practices and/or identify new opportunities?
- celebrating success. Are staff efforts recognised and celebrated when energy and water use targets are met?
- new technologies. Are periodic inspections undertaken to look for opportunities to improve efficiency through investment in energy-saving technologies?
- catering energy. Are kitchens provided with space heating to avoid catering equipment being used to keep staff warm? Is the size of equipment well matched to catering needs? Do white goods meet the highest efficiency standards of the energy labelling scheme? Are cooking appliances well insulated? Do catering appliances have heat

recovery where appropriate? Are the controls on catering equipment clearly visible and do they indicate when the equipment is switched on or running? Does equipment have an economy setting? Are electricity, gas and water supplies to catering facilities sub-metered, as this is essential for benchmarking and diagnosing usage? Submetering is also helpful if catering services are sub-contracted out as caterers can be re-charged for the supplies they use, providing an incentive for them to use energy wisely.

10.5 The future

New buildings seem to boost morale amongst their occupants if the first experiences of occupation are broadly good. It is worth going to great lengths to make this happen. Buildings with problematic early days attract a kind of weariness and distance amongst their occupants and users, which is to be avoided. It will take a big effort and you may be exhausted by this stage, but the new building has received a tremendous amount of careful consideration in its design, construction and successful completion. It is at this stage of course that the real story starts.

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Turner Contemporary case study

The Turner Contemporary (TC) and Kent County Council (KCC) are committed partners in a long-term strategy that puts culture at the heart of place-making in Margate, Thanet and Kent. The gallery has achieved major success since it opened in 2011. In fact, visitor numbers exceeded targets considerably and Margate has seen positive impacts for the local economy such as increases in the number of new residents and new businesses, particularly start-ups. TC and KCC are now working on a new project to catch up with the effects of its success. Their aim is to strengthen TC so it can continue to play key part in addressing some persistent local challenges in areas such as educational attainment, employment opportunities, health and wellbeing. The current £1.7m project focuses on improving the quality of visitor experience, resolving some operational problems and improving long term economic viability. The plan includes changes to the entrance & retail areas, addressing wear and tear from high usage, increasing toilet provision, upgrading catering facilities and means of servicing hires, and introducing enhancements to the digital facilities and environmental sustainability.

Find out more



Turner Contemporary Photo Credit – Carlos Dominguez

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Appendix 1 – Procurement contract strategies

Ref	Criteria	Traditional	Design and build	Construction management	Management contracting
(a)	(b)	(c)	(d)	(e)	(f)
1.	Competition	A: Competitive fairness, as all contractors price the same project.	A: Competitive fairness in that all contractors tender on same information. D: Does not make use of competitive bidding where prospective builders bid on the same design.	A. Each work package let competitively.	A. Each work package let competitively.
2.	Bids	A: Bids easy to compare, as all based on the same information.	D: Bids are difficult to compare since each design programme and cost will vary.		
3.	Design management		D: Few contractors fully understand their responsibility to manage and co-ordinate design.		

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Ref	Criteria	Traditional	Design and build	Construction management	Management contracting
4.	Contractual relationships	<p>A: Employer has direct contracts with all consultants as well as contractor – gives control.</p> <p>D: Large number of contractual relationships, as discrete contracts required for all consultants and the contractor – increasing risk to employer.</p>	<p>A: Employer has direct contract with only the design and build contractor.</p> <p>D: Employer has no direct relationship with the design consultants, or the work package contractors and it is, therefore, difficult for the employer to recover costs if they fail to meet their obligations.</p>	<p>A: Employer has direct contracts with all consultants, the contract manager and all work package contractors. Consequently, the employer makes all payments to them.</p> <p>D: Need informed proactive employer in order to operate procurement method.</p> <p>D: Relies on very good quality team.</p>	<p>A: Employer has direct contracts with all consultants as well as the management contractor.</p> <p>D: Employer has no direct relationship with the design consultants, or the work package contractors and it is, therefore, difficult for the employer to recover costs if they fail to meet their obligations.</p> <p>D: Relies on very good quality team.</p>
5.	Design liability	<p>A: Design liability rests with the employer, with the exception of any portion of the design carried out by the contractor (eg contractor design portion or contractor designed works)</p>	<p>A: Design liability rests solely with the contractor.</p> <p>D: Design liability is limited by the contract conditions.</p> <p>Note: Contractor contracts to design to the same standard 'as would an architect if the employer had engaged one direct',</p>	<p>A: Design liability rests with the employer.</p>	<p>A: Design liability rests with the employer.</p>

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Ref	Criteria	Traditional	Design and build	Construction management	Management contracting
6.	Quality	<p>A: Design-led, facilitating high level of quality in design.</p> <p>D: Over use of unclear performance specifications can undermine design quality.</p>	<p>D: Difficulties can be experienced by employers in preparing an adequate design brief (ie employer’s requirements.)</p> <p>Note: It is very important, therefore, that the design brief and performance/ quality specifications (ie employer’s requirements) for important requirements in the project are fully and unambiguously defined before inviting bids.</p> <p>D: There is no design overview unless separate consultants are appointed by the employer for this purpose.</p>	<p>D: Need for good quality design brief from employer.</p>	<p>D: Need for good quality design brief from employer.</p>

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Ref	Criteria	Traditional	Design and build	Construction management	Management contracting
7.	Price Certainty	<p>A: Reasonable price certainty.</p> <p>D: Often abused when design is not complete, resulting in less price certainty (eg over-use of provisional sums to address shortcomings of consultants' design).</p>	<p>A: Price certainty is obtained before design is completed and construction commences.</p> <p>Note: Provided that the employer's requirements are adequately specified and changes are not introduced.</p>	<p>A: There is some evidence that this procurement method results in lower prices because of improved cash flow certainty (ie the employer makes payments direct).</p> <p>D: No price certainty achieved until the last work package has been let.</p> <p>Note: Administrative burden to the employer of processing large numbers of payments (extra administrative costs may be incurred).</p>	<p>D: No price certainty achieved until the last work package has been let.</p>
8.	Changes	<p>A: Relatively easy to value when pricing strategy based on bill of quantities.</p>	<p>D: Can be expensive (when compared to other procurement methods).</p>	<p>A: Can be accommodated, without paying a premium, provided that work packages affected have not been let and earlier work packages let are not too adversely affected.</p>	<p>A: Can be accommodated provided that work packages affected have not been let and there is little or no impact on those already let.</p>

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Ref	Criteria	Traditional	Design and build	Construction management	Management contracting
9.	Buildability	D: No buildability input by contractor (except for aspects of contractor designed work).	A: Buildability potential is inherent.	A: Buildability potential is inherent.	A: Buildability potential is inherent.
10.	Time (programme)	D: Overall programme is likely to be longer than for other strategies, as there is no parallel working (ie overlap of design and construction).	A: Reduced overall programme possible due to overlapping of design and construction.	A: Time saving potential for overall project time due to overlapping of design and construction – ie parallel working is inherent. D: Time and information control is required.	A: Time saving potential for overall project time due to overlapping of design and construction – ie parallel working is inherent.
11.	Relationships	D: Potentially adversarial.		A: Breaks down traditional adversarial barriers (as contractor part of the employer's team).	A: Breaks down traditional adversarial barriers. D: Management contractor may become no more than a 'post box'.
12.	Accountability	A: Satisfactory in terms of accountability.	A: Satisfactory in terms of accountability.	A: Satisfactory in terms of accountability.	A: Satisfactory in terms of accountability.

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Ref	Criteria	Traditional	Design and build	Construction management	Management contracting
13.	Risks	<p>D: Limited opportunity to transfer risks to contractor.</p> <p>D: Strategy often abused as a result of incomplete design, resulting in an inordinate number (and value) of provisional sums and the inherent risks associated with them.</p>	<p>D: Inadequate design brief and performance/ quality specifications (ie employer’s requirements).</p> <p>D: By transferring design liability to the contractor, the employer loses some control over the project.</p> <p>D: Employer required to commit to a contract before the detailed technical design of the project is completed.</p>	<p>A: Clarity of roles, risks and relationships for all participants.</p>	<p>A: Clarity of roles, risks and relationships for all participants.</p> <p>D: Management contractor often acts no more than a post box.</p>

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Appendix 2 – Sustainable design checklist of issues to consider

- **Travel plan** – Transport to arts facilities may be a major source of environmental impact. Has a travel plan been prepared to encourage more sustainable forms of transport? Will information be provided to staff and users about bus routes and other sustainable forms of transport? Will financial incentives be used to encourage staff to cycle to work?
- **Cycle paths and safe routes** – Is the facility accessible by safe cycle paths? And/or are quiet streets that give access to the facility adequately signposted, and are there road markings and cycle-friendly road layouts to encourage users to cycle to the facility?
- **Measures to encourage cycling** – Will simple measures to encourage cycling to the facility by staff be provided, such as covered cycle parking and the provision of one or more staff showers?

Site appraisal and renewable energy

- **Site features and potential** – Has the site been assessed for its ecological value and its microclimate to ensure the shape and planning of the building make best use of daylight, solar gains, wind and landscaping to enhance building performance, reduce reliance on mechanical services for heating, lighting and ventilation, and provide sheltered entrances?
- **Exploiting neighbouring opportunities** – Are there opportunities to connect to a local district heating scheme or share the outputs from a combined heat and power plant with other adjacent buildings?
- **Nature based solutions** – UK Green Building Council research has shown that nature-based solutions can improve the climate resilience of buildings and infrastructure, for example by using tree canopies to cool rather than air conditioning, or flood defences are built using trees and wetlands rather than engineered structures. See:

<https://www.ukgbc.org/news/ukgbc-unveils-sector-ambition-for-climate-resilience-and-nature>

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- **Wind power** – Has the feasibility of using wind power to generate electricity been examined?
- **Photo-voltaic panels** – Has the potential of photo-voltaic panels been examined?
- **Solar-thermal panels** – Have solar thermal panels for pre-heating hot water been studied for their feasibility?
- **Ground source heat pumps** – Has the feasibility of using heat pumps to extract heat from the ground been examined?
- **Rainwater harvesting and use of grey water** – Has the feasibility of rainwater harvesting been investigated? Can grey water be filtered, treated and recycled?
- **Conserving water run-off** – Has surface water run-off been designed in ways that help to conserve water and follow best practice for sustainable urban drainage systems (SUDS) – for example by channelling water from paving, roofs and pitches to soakaways, balancing ponds or existing watercourses?

Protecting and enhancing biodiversity

- **Assessing plants and wildlife** – Have statutory and non-statutory nature conservation organisations been consulted? Have specific surveys of plants and wildlife been undertaken by an appropriately qualified ecologist and at different times of the year to assess the likely impact of the proposed development on species, habitats and/or site features that have biodiversity value?
- **Avoiding harm to existing biodiversity** – Have all precautions been taken to reduce harm to existing flora and fauna on the site? If harm cannot be avoided to existing biodiversity, have specific features been added to compensate for unavoidable impact?
- **Enhancing existing biodiversity** – Where the site has limited biodiversity value, have opportunities been taken to create features that can enhance existing flora and fauna?
- **Ecological management plan** – Has an ‘ecological management plan’, either independently or as part of the ‘landscape plan’, been prepared, setting out good practice guidelines for the management and maintenance of biodiversity features?

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- **Giving priority to native species** – Has priority been given to specifying native tree and plant species, which usually offer better habitat opportunities for wildlife than introduced or exotic species?
 - **Drought-resisting plants** – To reduce the need for watering, have plants that are known to be drought-resistant been chosen?
 - **Retain topsoil** – Have all possible efforts been made to retain and re-use existing topsoil on the site, rather than importing it from elsewhere? Poor quality topsoil can be improved by the addition of peat-free compost, or plants chosen that do not require high-quality topsoil.
 - **Use peat-free composts** – Many composts are made from peat, which comes from sensitive ecological wetlands and whose removal is unsustainable: have peat-free composts been specified?
 - **Protecting landscape features during construction** – Have precautionary measures been taken to ensure existing trees, hedgerows and all other significant landscape features are adequately protected during construction work? Tree felling should be done only when absolutely necessary and after ascertaining that no tree preservation orders are in force.
 - **Planting schedule** – Has a landscape plan been prepared showing proposals for trees, shrubs and other plants, including the time of year when each is to be planted, and complete with a maintenance schedule?
- ### Building design
- **Building shape and form** – Has careful use been made of orientation, plan form and three-dimensional shape to reduce heat losses, to exploit natural light and ventilation, and to reduce artificial lighting, heating, cooling and ventilation loads, while avoiding glare and overheating?
 - **Location of offices** – Have offices been located on external walls to allow daylight and views over the approach to the building?
 - **Space planning** – Have spaces requiring intensive servicing, such as auditoria, been located adjacent to plant rooms to minimise ducting and increase the potential for heat recovery?

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Climate change adaptation measures

The impacts of climate change include increased air temperature, sea level rises and flooding. Your building design needs to take account of these effects through including, for example, flood resilience measures and cooling mechanisms.

- **Design for maintenance** – Does the plant room layout allow adequate space for safe inspection, maintenance and upgrading or replacement of equipment and plant? Is there external access to ensure minimum disruption?
- **Zoning** – Have high temperature zones been grouped together with low temperature zones used as buffer spaces, reducing heat losses to the exterior? Has the adjacency between spaces been considered to minimise unwanted transfer of heat or humidity?
- **Design for management sub-metering** – Have electricity, gas, oil and water sub-meters been provided to encourage effective monitoring and management, particularly for: areas of high-energy intensity (such as auditoria and kitchens) and larger usage plant items (air handling units and humidifiers)? Ideally, sub-metering should be at plant item or motor control centre/panel level, and

linked to a building energy management system (BEMS) if installed. Sub-metering is particularly relevant where, for example, management of a cafeteria may be contracted out; it will allow energy costs to be monitored and re-charged.

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Appendix 3 – technical issues

Construction elements

- **Window design** – Have windows and rooflights been positioned and sized to make best use of daylight while minimising unwanted solar gains and glare?
- **Glazing and frame specification** – Has double or triple glazing been specified for windows and rooflights with window frames at least as well insulated as the glass?
- **Fabric insulation** – Have high or very high levels of fabric insulation been specified?
- **Infiltration** – Has unwanted air infiltration been minimised by attention to detailing, specification and site quality control, particularly at junctions between components?
- **Draughts** – Have revolving doors or draught lobbies been specified to reduce unwanted draughts and heat losses?

Low environmental impact materials and components

- **Consider environmental profiles** – Materials and components need different energy inputs during their extraction, their transport to be processed, their manufacture and their eventual transport to site. Have materials and components been selected after comparing their environmental profiles?
- **Local materials** – Have locally produced materials been used wherever possible, reducing road-miles and helping the local economy?
- **Avoiding hazardous materials** – Have hazardous materials been avoided wherever possible including paints, adhesives and coverings that release volatile organic compounds (VOCs) or semi-volatile organic compounds (SVOCs) into the atmosphere during construction and in use?
- **Green alternatives** – Have ‘green’ materials (such as those made from recycled and/or recyclable materials, from solid timber rather than composites) been properly evaluated and selected wherever possible?

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- **Using recycled materials or components** – Have opportunities for using recycled materials or components been taken wherever possible (subject to avoiding re-use of hazardous materials)?
- **Specifying materials suitable for recycling** – For components needing replacement over the lifetime of the facility, have these been chosen on the basis that their materials can be recycled at the end of their useful life thus reducing waste going to landfill?
- **Sustainable timber** – Has timber been specified that comes from sustainable and legal sources and where suppliers provide independent certification?
- **Robustness and low maintenance** – Have materials been chosen that are robust and durable in use, decreasing the need for costly maintenance and replacement? And are vulnerable components adequately protected?
- **Low ODP refrigerants** – If there is air-conditioning or refrigeration, is the refrigerant used of 'zero ozone depletion potential' ('zero ODP')?

Lighting

- **Exploiting daylight** – Have all opportunities for using daylight been exploited, including light wells, light pipes, rooflights and general design of windows?
- **Light interior finishes** – Have light-coloured finishes been chosen internally, where appropriate, to improve internal reflections?
- **Quantity and quality of lighting** – Have appropriate standards for illumination levels been selected that provide the required quantity and quality of light consistent with the minimum energy demand? Over-lighting should be avoided, and areas of special need should be met locally.
- **Efficient lamps and fittings** – Have intrinsically efficient lamps together with reflectors and fittings been selected that make maximum use of the light output, including in overlooked areas like corridors and WCs?
- **Responsive lighting controls** – Have occupancy sensing controls, daylight-linked controls, and/or time-switch controls been considered for all areas where lights may otherwise be left on both internally and externally?

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- **Positioning and labelling of light switches** – Are switches in accessible locations where it is obvious which lamps they operate? Are lamps switched in banks to encourage those not required to be switched off? Are switches labelled clearly?
- **Key-operated light switches** – Are fishtail switches used that can be operated only by staff using a key to prevent unwanted tampering?
- **Efficient and controlled exterior lighting** – Have efficient exterior lights been selected? Do they direct light to where it is needed for circulation and security, and reduce stray light into the sky? Are they switched by daylight-linked controls that ensure they are not left on during daytime? Have self-contained solar-powered lamps been considered to reduce the need for mains connections?
- **Access for cleaning and lamp replacement** – Has consideration been given to access to allow light fittings to be cleaned and maintained and lamps changed?
- **Power factor correction** – Power factor is the ratio of kW to kVA in AC electrical circuits relating useful power to reactive power. Values below unity may attract a financial penalty from the

electrical supply company. Power factor correction can save money, although it does not reduce electricity use.

Heating and ventilation systems

- **Heating system and pattern of use** – Is the heating system, including the heat source, the type of emitters and the control system, well matched to the pattern of use, for example, to cope with intermittent use efficiently?
- **Zoning of building services** – Have the services been zoned according to the patterns of use and the heating and ventilation requirements of particular spaces?
- **Intrinsically efficient plant** – Has intrinsically efficient plant been specified, for example, condensing boilers that extract latent heat from flue gases, or modular boilers that reduce inefficiencies associated with frequent on-off switching?
- **Heat recovery systems** – Have heat recovery systems been considered?
- **Decentralised plant** – Where loads are small, have separate local systems been considered, for example independent water heaters with time

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controls, in preference to long pipe runs from central plant?

- **Variable speed fans** – Have variable speed fans and an appropriate controller been considered for auditoria ventilation to minimise the quantity of ventilation air consistent with adequate supply of fresh air and removal of contaminated air?
- **Localised heating** – Have gas-fired radiant tube heaters been considered for multi-purpose halls; compared with warm-air convective systems, air temperature can be kept lower for the same comfort level so less energy is used?
- **Effective controls** – Have central, zone and room controls been designed to ensure that heating and ventilation are provided to occupants only when, where and to the extent needed? Are controls readily accessible and appropriate to the skills of site staff and maintenance contractors?
- **Status indicators** – Have status indicators been specified to indicate the status of plant so that checks can be made that it is operating in compliance with design intentions, for example, that heating and ventilation are not in conflict.
- **BEMS** – Well designed electronic building energy management systems (BEMS) can be very

powerful in large buildings or estates as a means to good management. In smaller buildings, BEMS must not be too complicated for the level of management skills available.

Water conservation measures

- **Leak detection** – Is water leak detection installed for all mains supplies?
- **Water conservation measures** – Have water conservation measures been adopted, such as tap restrictors, spring-loaded taps, PIR sensors operating automatic taps, shower-regulators, push-button shower controls, urinal flush controls, and/or low-flow WCs?

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Many terms are specific to the construction industry, or used differently from other contexts. Some have been used and explained in the course of this manual and are not repeated here. Others have not been referred to but are included here in

case they are encountered in the course of a project. Definitions are not set in stone. In some cases slightly different terms may be used instead of those below, or slightly different meanings may be ascribed to them. This glossary is drawn from several sources that are included as references.

Access consultant

Access consultants are specialists in design to enable access by all, without discrimination against those with any form of physical or mental disability.

Access statement

An Access Statement, usually prepared by an architect or a planning consultant, describes access provisions for a proposed development and generally forms part of a planning application.

Access audit

Generally conducted by an independent access consultant, an access audit seeks to analyse access provision for a building either planned or built, looking at every aspect of the customer journey from initial enquiry/information seeking, travel and premises use. It will identify relevant legislation and will make recommendations for improvements in line with legislation and best practice.

Architect (See also Designer)

Architects design buildings and must be registered with the Architects Registration Board (ARB) in the UK in order to use this term. They are expected to understand the importance of user requirements and may have specialist skills, eg historic buildings, refurbishment or particular building types. In traditional contracting the architect often leads the design team, although bigger projects also use project managers who work directly for the client.

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Area measures

Several area measurements are used in building. The Royal Institute of Chartered Surveyors has a set of accepted definitions, of which the most common are: gross internal area (GIA), the area enclosed by the inner surface of the exterior walls; net

internal area (NIA) is GIA less internal structure, vertical circulation (stairs and lifts), plant, WCs; net useable area (NUA) is equivalent to the area that can actively be used and is NIA less horizontal circulation routes.

Articles of agreement

Details of a contract and the agreement it sets out.

Asset lock

A legal clause that prevents the assets of a company being used for private gain rather than the stated purposes of the organisation. Asset locks may be incorporated into the formal structure of a community interest company or charitable organisation.

Best value

The value that is represented by considering all aspects of quality and lifetime costs as opposed to price of construction alone. The term is also applied to a specific government programme that recognises the achievements of local authorities.

Bill of quantities

List of the costs of a project based on a 'standard method of measurement' where the amount of labour and materials needed are calculated using architects' drawings and specification. It is usually a contract document. If planned works are changed they are remeasured to calculate the change in cost.

Brief – see design brief

Buildability

How far a design has taken into account the ease of construction, the best and cheapest way to build the finished design.

Building envelope

External walls, windows and roof that form the building 'skin' to keep out the weather.

Building regulations

Statutory requirements to which buildings must conform, aimed primarily at safety and public protection.

Building surveyor

Surveyor with training in building construction and law, and sometimes costing, often used as the design team leader where alterations to an existing building are needed rather than new design work.

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Business plan

The business plan examines and articulates the underlying purpose of an organisation – its mission, aims and objectives – its activities, and the basis for a change in the level and nature of these activities in order to provide detailed current and projected financial statements.

Capital grant

Grant towards purchasing – including constructing – a building, as opposed to a revenue grant that will be spent on costs of owning and running it, which may include rent, rates and maintenance as well as staff costs.

CDM

The Construction (Design and Management) Regulations (CDM 2015) are the main set of regulations for managing the health, safety and welfare of construction projects. CDM applies to all building and construction work and includes new build, demolition, refurbishment, extensions, conversions, repair and maintenance.

Certificate and interim/final certificate

Formal document issued by the contract administrator to say that a particular stage of a project has been reached. Usually the basis for payment. The

final certificate confirms that the builder has done all that was demanded in the contract.

Circulation

Passages, corridors, stairs and lobbies that allow people to move from place to place in a building. A maximum distance for protected exit routes is required for fire escape purposes. The minimum width of circulation routes is dependent on the number of people using the building.

Clerk of works

A clerk of works – also known as a site inspector, construction inspector or building quality inspector – inspects the workmanship, quality and safety of work on a construction site and reports their findings to the client.

Client

Person or group that ‘owns’ the building. The client initiates the project, employs the design and construction teams and finds the resources to make it a reality. The client is sometimes referred to as the ‘employer’, ‘champion’ or ‘manager’. The executive client is the name sometimes given to the most senior person in the client organisation. The lead client is the name of the senior person on the client project team.

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Client design advisor

Independent expert with knowledge of construction and understanding of the business needs and objectives of the client and users. Employed very early in the project to give impartial advice on the best way to proceed.

Client representative

Agent employed by the client to act on their behalf with limited powers – sometimes also acts as project manager.

Collateral warranties

A form of guarantee from the sub-contractors which creates a link between the client and the sub-contractors (they are normally accountable only to the principal contractor) and a direct right of action in the event of breach of contract.

Commissioning (in relation to new or newly refurbished buildings) Testing and making sure all its environmental and technical aspects work properly.

Competitive interview

Process to select a member of the team, particularly the designer, on the basis of performance at interview, track record, credentials and proposed approach, rather than on a specific design or stated solution for the project.

Construction costs

Costs of the construction only, not including items such as land acquisition and legal costs, financing costs, professional fees or VAT. Professional fees and VAT can be 40 per cent or more of the hard 'bricks and mortar' construction costs.

Contingency

Provision of time or money for unforeseen circumstances, which may occur in some form because of uncertainties at the start of a construction project. The size of the contingency should be related to the degree of uncertainty and can reduce as the project proceeds and uncertainty is reduced.

Contract administrator

Also called the 'supervising officer'. The person, usually an architect, surveyor, or engineer, named in the contract with the builder who will give instructions to the builder and manage the contract for the client.

Cost consultant

Consultant, usually employed by the client, to estimate, monitor and sometimes control project costs.

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Community Asset Transfer

Community Asset Transfer is the transfer of management and/or ownership of public land and buildings from its owner (usually a local authority) to a community organisation (such as a Development Trust, a Community Interest Company or a social enterprise) for less than market value – to achieve a local social, economic or environmental benefit.

Community Land Trust (CLT)

A not for profit corporate body set up and run by members of a community to develop and manage homes as well as other assets. CLTs act as long-term stewards of community assets, ensuring that they remain genuinely affordable and serve the needs of the community.

Cost in use

Part of the assessment of the real costs of investment in an asset through an analysis of how much it costs to run. For example, a piece of equipment may be cheaper to buy but more expensive to run than something more expensive to buy initially because it is less energy efficient and therefore costs more in the long term.

Critical path

Shortest sequence of activities to complete the project sets the critical path. A delay in any activity 'on the critical path' will delay the overall timetable. Delay in other activities has less impact. Typical activities on the critical path prior to start of construction are raising funds, receiving planning approval, preparation of production drawings and information.

Design brief

Document describing the 'problem' for which a design provides the 'answer'. It is the 'demand' which the 'supply' team – advisors, designers and building contractors – must satisfy. It should be written to allow more than one answer to be suggested. It should describe the organisation's aspirations, priorities, culture, the values they wish the project to support, the financial and partnering constraints, and the deadlines.

Design champion

Person appointed to provide leadership, generate enthusiasm and commitment to design quality and safeguard design quality on behalf of the client. Ideally a senior manager or board member.

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D&B – design and build

Method of construction. The contractor is responsible partly or entirely for design development, its quality and delivery.

Defects liability period

Period, usually 12 months, during which faults that appear in a building as a result of construction processes (eg cracking of plaster as it dries out) are the responsibility of the contractor to remedy.

Designer (See also Architect)

May have one of many design roles – engineering, landscape, etc. The term is often used to describe the person who designs the building overall.

Design team

The team responsible for designing the building. Covers a range of professionals including architects, landscape architects, engineers and property and cost specialists.

Development

Context of this word is all-important. In the construction environment the term ‘development’ has several meanings: the process of moving a project from feasibility to design; or the actual process of building; or the extent or type of building

on a site, as expressed in ‘over-development’. In the charitable and supported sectors, development often means fundraising.

Domestic sub-contractor

Sub-contractor employed directly by the main contractor. The contract administrator has the right to approve these in standard forms of contract.

Economic impact

This refers to the effect of a project on the local economy. This is taken into account in the funding of capital projects in the arts. Specialist input should be sought for a business case that needs to predict the economic impact.

Embodied energy

Energy used during the entire life cycle of a product including for its manufacture, transportation and disposal.

Employer

Term used in standard forms of contract, to refer to the client.

Employer’s Agent

In a design and build contract, the person responsible for administering the contract, sometimes the architect or quantity surveyor. The role can be

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carried out by someone from the client organisation such as an in house project manager or may be an independent person. The role includes liaison with the contractor, issuing instructions, change control and ensuring contract compliance.

Employers' requirements

Client's brief – often an outline brief.

Enabling works

Building works that are necessary to allow a project to start, but which are not part of the project itself, for example, constructing a site entrance.

Energy efficiency

Refers to the amount of fuel required for a building to heat, cool, light and run it, compared with standard comparators.

Engineer

See Services engineer, Structural engineer.

EoTs

Extensions of time. Where a construction contract runs beyond the programme originally agreed, the contractor will seek 'extensions of time', ie a formal agreement to an extension to the contract by the client for which they agree not to claim damages and to meet the additional costs. This is generally for

items which are beyond the control of the contractor (eg weather) or changes to the brief by the client.

Equality Act

The Equality Act provides a legal framework to protect the rights of individuals, advance equality of opportunity for all and promotes a fair and more equal society.

Facilitation, facilitator

May be used early in a project to help an organisation to articulate its own perspective and its internal channels of communication, and become familiar with the role it will need to take on for the project. It is sometimes preferable to use this approach before seeking a client advisor or other advice from construction professionals.

Facilities manager/management

Person who will manage the operation of the finished building. The activity, also known as FM, is facilities management.

Fast track

Describes a project using techniques to speed up the work to meet tight time requirements. Frequently achieved by overlapping design and construction, or prefabricating large components off site.

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Feasibility study

Reviews objectively whether a set of proposals is likely to fulfil the organisation's objectives. It is not a fundraising document. It is needed very early in the process.

Final account

Agreed contract sum for the project once built, adjusted to take account of all changes and any remeasured work that was not priced in the original tender documents.

Fitting out

Last part of a construction project when the fittings and furniture, such as carpets, seating, lighting and rigging, are installed. The cost of supply and installation should be estimated at the same time as the construction cost, and that part of the budget needs to be protected from erosion.

Funders

Bodies that provide finance for capital expenditure. Many publicly funded projects have more than one funder or funding body. Funders are likely to impose conditions on a project and are important stakeholders.

Handover

Formal moment at which responsibility for the completed building is passed from the contractor

to the client. A full check is needed to ensure that everything promised under the contract has been fulfilled. Insurance and management responsibilities are transferred to the client at this point.

Heating, ventilating, air conditioning (HVAC)

Services designed and installed by specialists. Air conditioning is a system to control the temperature, cleanliness and humidity of the air delivered within a building. If no air conditioning is needed, mechanical 'air handling' or natural ventilation through openable windows will be used.

Integrated process

Collaborative techniques to unite the client, designers and builders with the aim of increasing efficiency and harmonising processes. Joint decision between separate groups about the integration of IT systems or software is an example. In construction projects this refers to a variety of design and build approaches where design benefits from early input by the contractor.

IPI

Integrated Project Insurance. A relatively new procurement model whereby the whole design team and construction contractors and subcontractors work together collaboratively in order to deliver a project. Risks and rewards are shared through the

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contract. Some risks are insured. At the time of writing, the model remains not widely used and is largely untested.

Latent defects

Building defects that appear after the building is finished, after practical completion, are covered by limitation acts. The client may be able to prove the design or construction team is responsible and must remedy the defects at their expense.

Liquidated and ascertained damages (L&AD)

Realistic estimate of the losses that the client believes will ensue as a result of delay in completing the project. They are usually described in the contract as a sum of money per week. Damages cannot be claimed from the contractor if the delay is caused by something outside the contractor's control.

Lump sum contract

Contract for a sum that includes all costs, which can be calculated only on a finalised and fully detailed design and specification.

M&E – mechanical and electrical services

Includes lighting, air conditioning, humidity control, plumbing and drainage. It is often used to distinguish it from structural engineering.

Nominated sub-contractor

Specialist sub-contractor chosen by the client, who must be used by the contractor.

Novation

Transfer of contractual rights and obligations from one team to another. Commonly refers to the transfer of a design team and their work from the client to a design and build organisation. Novation is intended to preserve designs approved by the client by committing the builder to an accepted design.

OJEU – The Official Journal of the European Union

Daily journal advertising the need for services for construction projects. Publicly funded projects over a certain size must advertise for both professional teams and builders.

Options appraisal/analysis

Process whereby different ways to meet a specific set of organisational aims are analysed and ranked in order of preference. Methods for weighting different factors according to their importance are usually needed. It should not be used to justify post hoc decisions, but to bring out all the priorities that may be expressed by different parties. It is often at this stage that it is realised that a building project may not be the best way to achieve the stated objectives.

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Organisational capacity

Shorthand way of describing the ability of an organisation to plan and complete a capital project. Areas of capacity that may be very stretched are strategic management, financial control and executive leadership.

Outturn costs

Total cost, or projected cost, of a project – including land acquisition, construction cost, fitting out, professional fees, contingencies, disruption costs, VAT, financing costs and inflation. This is the total sum the budget must cover.

Practical completion

Certificate is generally issued by the architect, certifying satisfactory completion of the construction. It normally allows the contractor to invoice the client for all but a small portion of the contract sum. The outstanding portion is called the retention.

Private finance initiative (PFI)

Describes a particular procurement route in which a private sector supplier takes over, constructs and manages a building for use by the public sector who then leases the facility with interest on the private sector investment. Twenty to 30 years is a typical operating period. The contractor needs to be brought into the process at a very early stage.

Planning permission

Permission that must be obtained from the local authority before a design can be built. Features that are controlled are the uses to be accommodated, the site coverage and bulk, site access, design features that relate to neighbouring properties and conformity with existing local plans. If permission is not granted, an appeal may be heard by a public inquiry and determined by a planning inspector. The secretary of state for the environment makes the final decision.

Planning supervisor

Competent person or organisation appointed by the client under the CDM regulations to coordinate health and safety issues during the planning and design phases of a project and to coordinate the production of the health and safety file.

Post-project evaluation

Assessment at the end of a project about how well it has gone, and what could be improved. It can be done soon after handover to review the handling of the project, and at a later stage, sometime called 'post occupancy evaluation' to see how well the building does in fact fulfil the aims and objectives of the client.

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Pre-Construction Services Agreement (PCSA)

An agreement which governs the relationship between the client and principal contractor so that roles, responsibilities and obligations are defined.

Prelims, preliminaries

Preliminary clauses in a cost document or a tender that set out general conditions that apply to the whole project and that may have implied costs associated with them. They could cover, for example, standards to be used, or the times when site access is possible.

Pre-qualification

Sometimes called qualification. The process by which a contractor or design team is deemed competent to be placed on a shortlist for possible selection for a project. The conditions for suitability should include assessment of competence as indicated by track record, size, staff qualifications and financial record.

Pre-Qualification Questionnaire

A questionnaire sent out to interested bidders in order to establish whether they meet the minimum requirements to be included on the shortlist for selection (see above).

Prime contractor

Design and build contractor with a supply chain of reliable suppliers of quality products. The key suppliers in the supply chain can be integrated into the design process. The prime contractor coordinates and manages all activities throughout the design and construction period.

Principal designer

(Formerly the planning supervisor or CDM co-ordinator). A requirement under CDM regulations – 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. Principal designers have an important role in influencing how risks to health and safety are managed throughout a project. Design decisions made during the pre-construction phase have a significant influence on ensuring the project is delivered in a way that secures the health and safety of everyone affected by the work.

Professional indemnity (PI) insurance

Insurance that professionals must have to cover them against alleged negligent behaviour that causes defects to the building, delays in the programme, or injury.

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Procurement

Name for the method by which the building contract and related services are tendered. Procurement routes range from traditional to PFI with many variations in between.

Project cost management

Includes resource planning to work out what resources of people, equipment, materials and time will be needed and when, cost estimating and cost control to ensure that changes do not invalidate the cost plan.

Project Execution Plan (PEP)

A document which details how a project will be managed in terms of strategic and operational control. It generally contains details of the project to be delivered and lists the professional individuals and teams employed, the organisational structure and levels of responsibility and authority. It is a live document which requires regular review and updating throughout the project to reflect any changes.

Project integration management

Process whereby alternative objectives or methods are traded off against each other with a view to getting the optimum result. It may follow from option appraisal.

Project champion/sponsor

Individual charged with representing the client, carrying out client responsibilities, communication within the client body and between the client and other players, to ensure that the client's needs are communicated and met. This person is the repository of people's faith in the project.

Project manager

Has day-to-day control of the building team. The client's project manager has the responsibility of safeguarding the client's interest at all times. The role involves coordination of a project to ensure that timely information is passed to the right people, and that the project is completed within budget, on time and to the right level of quality.

Project team, project delivery team

Entire team, including both design and construction, and any specialists who are working to design and deliver the project for the client.

Public realm

External urban spaces which are publicly accessible including streets, walkways, squares and parks. The qualities of the public realm are integral to its use and this consideration shapes the practice of placemaking. Public realm works are generally the

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responsibility of the local authority, although cultural construction projects often have an impact on the public realm or vice versa and collaboration/co-ordination becomes necessary.

Qualification

Process whereby a contractor or design team is deemed competent to be placed on a shortlist for possible selection for a project. The conditions for suitability should include assessment of competence as indicated by track record, size, staff qualifications, but not availability or price.

Quantity surveyor

Specialist in all aspects of the costs of construction, providing information on the likely cost of a project at every stage. Such specialists are rarely used outside the UK and former British colonies. In other countries cost information is provided by the design team.

Retention

Percentage of the construction cost, usually around 2 to 5 per cent, that is retained for a period following handover. This obliges the contractor to rectify small construction defects that appear as the building is used.

Revenue cost

Covers the costs of using and running a building, including rent, rates, insurance, utilities, maintenance and staff costs. A grant is sometimes available to cover these costs.

Room data sheet

List of requirements for a given room, including furniture, equipment, power and telecommunications cables, finishes and fittings.

Royal Institute of British Architects (RIBA)

Professional institution for architects which provides them with services, including advice to clients in selecting suitable designers.

Risk assessment/risk management

Identification, analysis and response to potential project risks. The process of addressing risks needs to be documented to demonstrate project accountability.

Schedule of rates

Contractors commonly provide tender prices using rates for particular building tasks, known as a 'schedule of rates', for example a rate per square metre for laying floor tiles. The schedule is commonly included as part of the contract.

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Section 106 agreements

Agreements whereby planning permission is granted subject to the developer/client fulfilling certain conditions, eg local road improvements or contribution to a local housing scheme or cultural project.

Sensitivity analysis

As part of the business case, different assumptions may be tested to see their effect on the 'bottom line'.

Services engineer

Engineer who determines the integrity of material and services in order to measure and maintain operational reliability. Has responsibility for ensuring that all services conform with established specifications and standards.

Shell and core

Description of a building completed only to the stage where the outer shell and the core (plant and vertical circulation) are provided. This allows the client to subdivide the space and put in finishes to suit specific requirements. The ceiling and floor finishes, basic lighting and services may be included in some shell and core projects.

Signing off

Process of formally recording the client's approval of briefing statements or design proposals.

Snagging

Construction projects always end with some defects that need to be checked and remedied. This process is called snagging. The programme should always allow time for snagging before move-in. Some items, such as an air handling system, can only be fully tested after running through all seasons of the year.

Specialist sub-contractor

Organisation employed to handle a specialised aspect of the building, such as ductwork or foundations, and which usually has a role in designing, supplying and fixing the elements in which it specialises.

Specification

Technical description used to set the standards of materials and type of construction.

Stakeholder

Fashionable description of people and groups who are affected by, or have a financial or practical interest in, the outcome of a project. Their interests must be protected throughout the project.

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Structural engineer

Engineer specialising in the design of building structures. Decisions about the type of structure are integral to the design and should be taken with the architect. The engineer is responsible for ensuring that the structure has the appropriate strength and flexibility.

Suited locks

System that allows a building owner/manager to issue keys to individuals with different levels of authority and access.

Supply chain

This is made up of all the parties responsible for delivering a specific product or service. There may be a number of specialised supply chains and the members of each should be accustomed to working together as a fully linked chain.

Surveyor

Measures and maps out various aspects of land and buildings, for example in relation to dimensions, costs and construction.

Sustainable

Implies that the resource employed will not be used up. For example, timber from renewable forests is sustainable while that from slow growing tropical hardwoods is not.

Tender process

Process of inviting organisations to submit a proposal, with costs, to carry out a piece of work. It covers the preliminary invitation to tender, formal invitation to tender and the actual form of tender.

Value management/value engineering

Formalised approach to managing a project through its whole life seeking to achieve best value for money. It often uses multidisciplinary workshops with a facilitator to discuss at appropriate moments whether better value solutions are possible within the constraints of the brief and the project.

Variation

Instruction from the contract administrator to the builder to change the works described in the contract.

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Vision statement

Simple statement of main objectives, needed for early consensus to be able to start the feasibility and budget checks and as a constant reference point throughout the project. The vision develops alongside a 'statement of need' and design quality needs to be part of it.

Wayleave

Access to property granted by a landowner for payment, for example, to allow a contractor access to a building site.

Whole-life costs/lifecycle costs/costs in use

Full cost of all the parts that make up a building, including initial capital costs, replacement costs and maintenance and repair costs.

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This bibliography highlights key texts on which this guidance has drawn and others which may be of use to you during the course of a capital project. Some may well need to be revisited as the project progresses and you may want to create a small library of resources on which you and other members of your organisation can draw. Articles can be obtained via the British Library.

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Building Excellence in the Cultural Sector – a guide for client organisations is a resource for anyone procuring cultural buildings, from minor remodelling projects through to entirely new buildings. It is a step-by-step guide to the procurement process, which shares the experiences of cultural clients, illustrated with examples and case studies along the way. Designed to be used online, this guide will equip building project clients with the knowledge required to make informed choices, helping them achieve a high-quality project. It is published jointly by Design Council and Arts Council England.

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