

Project procurement lifecycle the integrated process

Achieving Excellence in Construction Procurement Guide



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NAO endorsement

The NAO recognise that proactive client leadership and robust project management are prerequisites to the successful delivery of construction procurement.

They consider that procurement of construction should be on the basis of whole-life value for money and endorse the use of the good practice promoted by this suite of guides. They may investigate whether this good practice is applied in practice in any future examination.

Acknowledgements

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OGC would like to thank all who have contributed.

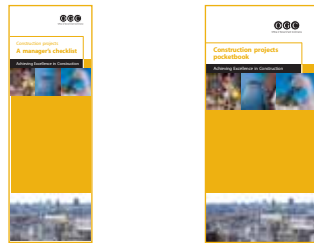
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The Achieving Excellence Procurement Guides

The *Achieving Excellence* suite of procurement guides replaces the *Construction Procurement Guidance Notes* series.

The new series reflects developments in construction procurement over recent years and builds on government clients' experience of implementing the *Achieving Excellence in Construction* initiative.

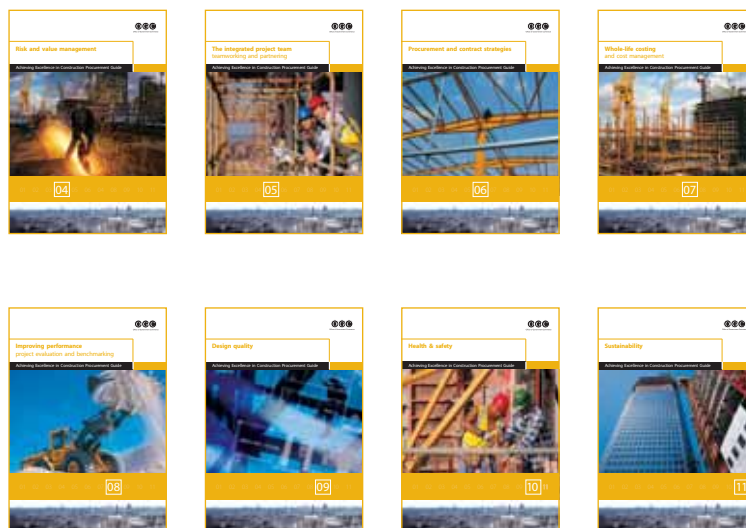
High level guides



Core guides



Supporting guides



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The main success criterion of a construction project is the value of the facility to the organisation over time. Successful delivery requires an integrated process in which design, construction, operation and maintenance are considered as a whole – together with an understanding of how the project will affect business efficiency and service delivery over the lifetime of the project. It also requires effective use of project management techniques such as risk and value management.

Introduction

This guide outlines the decision points and processes involved in the delivery of construction projects. It sets the project procurement process in the context of Gateway reviews, the design and construction stages and key supporting processes such as risk management, value management and quality, cost, time and change control. It describes the key outputs that are required at each stage.

Principles

Why project management is important

Effective project management helps to ensure that projects are delivered to the agreed quality, within budget and on time at best whole-life value. It requires a thorough understanding of the key stages in the lifecycle of a construction project that are critical to its success. There must always be:

- a sound business case
- success criteria for the project – that is, how the success of the project will be judged
- the right people or organisations, with the skills and competence to deliver the project
- a robust project structure with clear roles, responsibilities, reporting and communication lines, and appropriately delegated authority
- regular measurement and monitoring of progress against key milestones and the budget
- detailed knowledge and understanding of the risks relating to a specific project and reliable plans for risk allocation and proactive management
- a well thought-through design
- an up-to-date project execution plan, underpinned by sound project management.

The role of planning – the earlier the better

Good planning takes time, but the effort upfront ensures that time and cost are saved later and risks are minimised. It ensures that client requirements and organisational values are understood and provided for; helps to deliver better design; reduces waste; and enables the project team to cope better with risks as they occur, that could otherwise cause greater delay or increased costs. It involves:

- integrating design, construction and ongoing operation and maintenance of the facility
- risk assessment, allocation and management throughout the project
- value management and value engineering to eliminate waste and inefficiency
- performance measurement and reporting
- use of control mechanisms for quality, cost, time and change management.

It is important to note that investment in time at the start of the process, specifically in developing the project brief, will have the greatest impact on delivering a successful project to a realistic timetable.

Integrating the process

Ideally teams of designers, constructors and specialist suppliers should work together with the client through a series of projects, continuously developing the product and the supply chain, eliminating waste in the delivery process, innovating and learning from experience. However, there are also significant benefits from working as an integrated team for one-off projects, although the opportunity to benefit from past experience is limited to the next phase of the project – as opposed to the next project (see *AE5: The integrated project team for more information*).

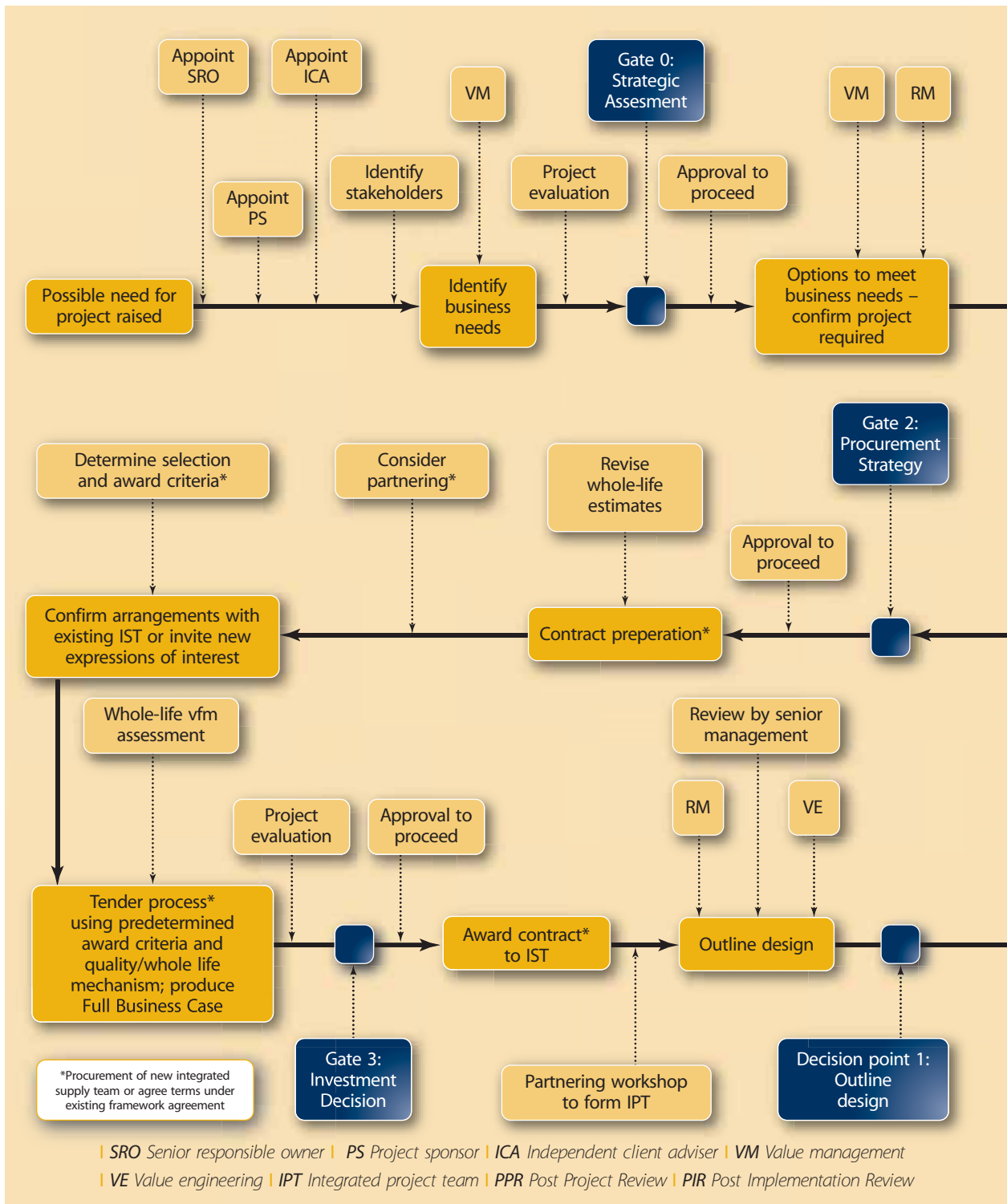
The integrated process involves:

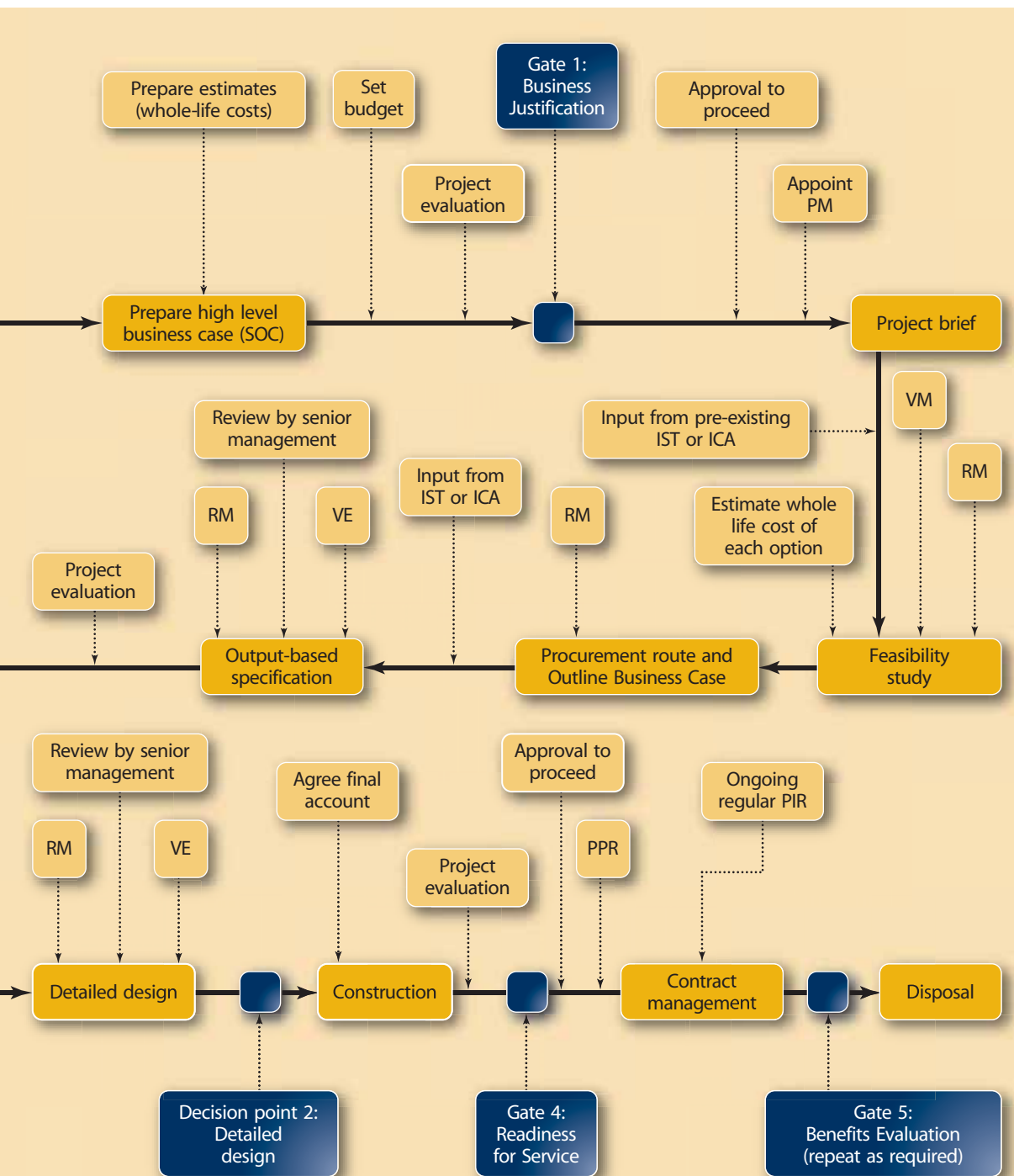
- leadership of an integrated supply team of designers, constructors and specialist suppliers dedicated to successful delivery of the project
- common processes, measurement of performance and continuous improvement to improve quality and eliminate waste
- development of design and the selection of components to achieve product performance targets as described by the output specification
- pre-planning of manufacture, construction and commissioning phases to ensure sufficient time is allowed for each task
- assembly of components and sub-assemblies off-site and commissioning of the completed project to ensure successful delivery
- training and development of all participants to drive improvements in performance
- learning from experience and feedback into the project delivery process.



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1 Framework for construction procurement





| RM Risk management | SOC Strategic Outline Case | PM Project manager | IST Integrated supply team



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Process

This section describes the construction procurement process step-by-step and explains the everyday project management tasks, together with a brief outline of project reviews.

Overview of a framework for construction procurement

Figure 1 sets out the generic integrated construction procurement process. The steps are described in detail below. The framework should be tailored to suit the needs of individual departments and different procurement routes; it should not be used in a mechanistic way. Sound judgement, constant questioning of what is being done, while trying to ensure that nothing is left to chance, are essential factors for achieving success.

The framework is underpinned by the business case, which is maintained throughout the life of the project to check that there continues to be a business need for the facility and that it is being met (for guidance on developing a business case go to www.ogc.gov.uk/documentation_and_templates_business_case.asp).

OGC's Gateway review process identifies points along the project planning route, beyond which the project should not proceed without specific management and funding activities having been completed. At each decision point, the investment decision maker should evaluate the business case and investment proposals and, if justified, give approval for the project to proceed. Recommendations from Gateway reviews may need to be addressed before the next stage of the project is approved. See *Achieving Excellence in Construction: A Manager's Checklist*.

It is important to note that for construction projects there are two additional major decision points between Gates 3 and 4. These are:

- Decision point 1: Outline design, after which no client change should be made
- Decision point 2: Detailed design, when the team must have reached time and cost certainty against the required quality. At this point there is a commitment to build.

In addition, there may be a requirement to repeat Gate 3, if there is a two-stage investment decision (such as for contract award and then for the construction price).

Before construction project inception: client leadership

The main steps in the framework are described in detail below. Fundamental questions have to be addressed before going ahead with the project. These challenge the need for construction:

- is there a need for the project at all?
- what are the options for meeting the need other than with a new facility – such as refurbishment or rationalisation of existing facilities, leasing or perhaps by changing the way that the business need can be met?
- if a new facility is the only sensible way forward, how does the estimated whole-life cost compare with the broad cost of other facilities constructed for a similar purpose?
- if the cost of this proposal is more, how is this justified?

Clients must have a clear understanding of their business needs, their wider responsibilities (such as health and safety and sustainability) and what the finished facility must deliver. They should also understand what value means in terms of their project, so that there is no uncertainty leading to changes during the project. However, they should keep an open mind to possibilities for improving value in the project that may be identified by independent client advisers or the integrated project team (see *AE4: Risk and value management*).

The framework step-by-step

The table below shows the key steps, together with a brief description of each step, the relevant Procurement Guides for further information and the roles involved in each step.

The table also highlights the key decision points and the points at which risk management, value management and value engineering take place.

2 Notes for construction procurement framework

Step	Description	Further information	Responsible role
Identify possible project	Possible need for project brought to attention of the investment decision maker (IDM) – the role responsible for making investment decisions on behalf of the business; typically the management board or similar senior group.		IDM
Appoint senior responsible owner (SRO)	A senior manager in the business unit that requires the project, appointed by and reporting to IDM. The senior responsible owner (SRO) owns the project and is personally accountable for its success.	AE2	IDM
Appoint project sponsor	The project sponsor (PS) should have an understanding of the culture business of the client department. SRO to provide terms of appointment for PS.	AE2	SRO
Consult independent client advisers	Experts in the relevant subject (for example, business strategy, legal, financial, construction, design, etc) to advise on options to meet the business need, including whether a construction solution will best meet the client's needs.	AE2	PS (or SRO if required earlier)



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Step	Description	Further information	Responsible role
Identify stakeholders and obtain their commitment	The PS, in consultation with the SRO, should identify the stakeholders for the project. Stakeholders may be internal (eg Heads of Division, users etc) or external (eg members of the public as customers, pupils, patients).	AE2	SRO/PS
Identify business needs	Carry out a value management (VM) study to identify business/stakeholder needs, both short and long term. Set objectives, including Health & Safety, sustainability and design quality (using Design Quality Indicators – DQIs), agree priority and agree on performance indicators to show that these are being met. Note that the success of the project will be measured against objectives/KPIs.	AE4 + AE8	PS/independent client adviser (ICA)
Investigate high level options	Explore high level options for meeting the business need and assess in principle their affordability and achievability. Identify time-related factors – that is, an optimum timespan for the life of the facility. Be prepared to revisit initial thinking on high level options, to ensure that all appropriate opportunities are given full consideration. Carry out high level risk assessment and capture in a risk register; include the risk of the optimum timespan being incorrect.	AE4	PS/ICA PS/ICA
Identify lessons learned from similar projects	Research previous similar projects and identify appropriate lessons to apply to the project.	AE8	PS/ICA
Prepare project brief and outline project execution plan (PEP)	Prepare project brief and outline PEP to inform strategy and control of project, including roles and responsibilities. (Note that responsibility for maintaining the PEP passes to the project manager when appointed.)	AE3 (this guide)	PS/ICA
Project Evaluation	Establish strategic fit of project with key business objectives.	AE8	PS/ICA
Gate 0: Strategic assessment Address issues raised by from Gateway review.			
Confirm project evaluation	Approval to proceed.		IDM/SRO
Confirm strategic assessment and budget in principle	Approve project brief and funding in principle.		IDM/SRO

Step	Description	Further information	Responsible role
Options to meet business needs. Confirm project still required	Carry out a VM study to investigate in more detail and evaluate options to meet business needs. Such options may include non-project or 'prior options' and Private Finance Initiative. Confirm that a project is required. Risk management to identify risks with each option and updating of risk register.	AE4	PS/ICA
Investment appraisal – ICA to assist where PS lacks expertise	Investment appraisal followed by approval for project to proceed, following principles set out in HM Treasury's <i>Green Book</i> .		PS/ICA
Prepare high level business case (SOC – Strategic Outline Case)	Set out business needs as identified by VM study. Describe objectives of project and alternative options to meet them. For each option set out base estimate, carry out risk analysis and calculate allowances for identified risks, all on a whole-life cost basis, including treatment of the asset at the end of the contract. Ensure that the optimum lifespan for the facility is part of the business case. Update risk register.	AE4 + 7	PS/ICA
Set budget	Use base estimate and total risk allowance (based on average risk estimate) to set the budget for the project. Consider funding strategy – capital and whole-life/revenue costs.	AE7	PS/ICA
Project evaluation	Ensure objectives reflect business needs, risks are identified and are reflected in estimate. Confirm project is affordable.	AE4 + 7	PS/ICA
Gate 1: Business justification Address issues raised by Gateway review.			
Confirm project and approval to proceed	Confirm availability of budget and likelihood of meeting business need.	AE7	IDM/SRO
Appoint project manager (PM)	PS appoints project manager.	AE2	PS
Project brief	Link the project brief to the strategic and decide quality and performance levels.	AE3 (this guide) + AE5	PS/PM
	PS to develop project brief with support as required from independent client advisers. PM to develop brief for option/feasibility study.		PS/PM



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Step	Description	Further information	Responsible role
Feasibility study	Carry out feasibility study. Note that advice could be given by existing integrated supply team or ICA.	AE3 (this guide) + AE5	PS/PM
Options appraisal	Apply VM to refine and evaluate options that satisfy project brief and objectives. Assess design opportunities for each option. Identify risks for each option, cost of managing them (through avoidance, design/reduce, accept, share or transfer). Liaise with statutory authorities. Select best option. Revise risk allowance. Develop whole-life cost models.	AE4	PS/PM
Procurement strategy	Identify risks for each procurement route (PFI, PDS, Leasehold, Crown build). Assess alternative funding options and risk allocation strategies. Select best procurement option (best suited to meeting project objectives, while providing value for money).	AE6	PS/PM/ICA
Outline Business Case	Develop Outline Business Case on basis of recommended procurement strategy and budgetary estimates.		PS/ICA
Review whole-life cost model	Review of risk management (RM) and VM approaches to assess contribution to meeting objectives. If necessary, request additional studies. Review whole-life cost model. If total estimate greater than budget, reconsider the decision to invest or revise scope of project and ensure that revision still meets the brief/stakeholders' needs. Set revised budget.	AE4 + 7	PS
Contract strategy	Determine appropriate contract strategy. Recommended integrated contract strategies for a Crown build are Prime Contracting and Design & Build.	AE6	PS/ICA/PM
Output specification	Develop output-based specification, using VM. Review and update risk register and revise base estimate and risk allowance. Appoint Planning Supervisor to ensure Health & Safety Plan is prepared.	AE5 + 9 AE10	PS/PM/ICA
Determine and implement correct procedure within EU Procurement Rules	Check whether the requirement falls under Works, Services or Supplies Directive; whether the estimated contract value exceeds the relevant threshold for OJEU advertising (bearing in mind aggregation rules); Restricted or Negotiated procedure (limited circumstances, including PFI); prepare draft OJEU notice if required. Determine selection and evaluation criteria. Produce tender documentation if this is a new procurement.		PS/PM

Step	Description	Further information	Responsible role
Project evaluation	Review approval for project to proceed. Review acceptability of retained risks. If estimate exceeds budget, revise design or revise scope of project, while ensuring that revised design or scope still meets brief/stakeholders' needs. Reassess affordability of project. Revise budget if required. Update risk register.	AE3 (this guide)	IDM/SRO
Gate 2: Procurement strategy Address issues raised by Gateway review.			
Confirm project evaluation; approval to proceed	Confirm stakeholders needs, are being met. Confirm affordability and availability of funds.		IDM/SRO
Contract preparation	Adopt standard form of contract where possible. Ensure allocation of risks to parties best able to manage them and arrangements to monitor risk allocation over the project lifecycle, including the extent to which risk is transferred. Consider use of incentives. Confirm contract documentation reflects business needs. Compare revised estimate against budget.	AE6	PM/PS
Invite expressions of interest (including OJEC where appropriate)	Where an integrated supply team is not already in place, determine and apply selection and award criteria, minimum quality thresholds, quality/whole-life cost mechanisms. Consider use of incentives. Prepare long list, select suitable bidders on basis of quality, select short list and agree a tender list. Prepare pre-tender estimate (or target cost).	AE6	PS/PM
Tender process	Where integrated supply team is not already in place, issue invitation to tender/negotiate, evaluate bids on basis of whole-life cost and quality.	AE6	PS/PM/ICA
Full Business Case	Completion of Full Business Case, including tender assessment (where integrated supply team is not already in place) and comparison of proposed contract value with approved budget and pre-tender estimate. Where integrated supply team is in place, confirm the target price in line with existing agreement.		PS/ICA
Project evaluation	Review approval for investment decision. Review business case benefits realisation. Review procurement route. Review stakeholder support.		PS/ICA



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Step	Description	Further information	Responsible role
<p>Gate 3: Investment decision (Note that there could be more than one Gate 3 review depending on the procurement route – eg two-stage Design & Build. Where there is an investment decision there is a Gate 3 review.)</p> <p>Address issues raised by Gateway review.</p>			
Confirm project evaluation; approval to proceed	Confirm availability of funds. Confirm business case and procurement route.		IDM/SRO
Appoint IST	Where integrated supply team (IST) is not already in place, award contract to tenderer offering best VFM. Appoint IST.	AE5	PS/PM
IPT partnering workshop	Hold workshop with senior management from parties in IST and the client to form integrated project team (IPT) and agree partnering charter. Agree common goals, detailed criteria for sharing of benefits, dispute resolution process, performance criteria, partnering champions and risk managers; confirm delegations (financial and decision making).	AE5	IPT
Outline design	Carry out value engineering (VE) study to optimise whole-life design quality and cost. IPT to assess buildability of options. Review by IPT senior management to address major issues arising. Identify residual risks and continue to manage risks and risk allowance. Ensure stakeholders understand and accept design proposals and initiate planning for occupation use. Agree joint risk management approach. Ensure that operator and maintainer of facility are fully involved in design development.	AE4, 5, 9	SRO/PS/PM
Project evaluation	Review outline design and for project to proceed to detailed design. Consider affordability.		IDM/SRO
<p>Decision point 1: Outline design</p>			
Confirm project evaluation; approval to proceed	Approval of outline design.		SRO

Step	Description	Further information	Responsible role
Detailed design	Approve outline design; no further client changes. Produce construction phase Health & Safety Plan. Check detailed design drawings, materials and equipment against specification; accept or request re-submission. Identify any long-lead items.		SRO
	Ensure planning consent and other statutory approvals (Building and Fire Regulations) are in place before construction.		IPT
Project evaluation	Review detailed design and for project to proceed to construction. Consider affordability, including provision for spend on specified risks. Commit funds for construction.	AE8	IDM/SRO
Decision point 2: Detailed design			
Confirm project evaluation; approval to proceed	Approval for detailed design and for project to proceed to construction. Confirm affordability, including provision of risk allowances. Commit funds for construction.		IDM/SRO
Construction	Construction begins.	AE3 (this guide)	IPT
	Ongoing regular review by IPT senior management to address major issues arising.	+ AE4, 5, 10	
Progress monitoring and performance measurement KPIs	Monitor and report on progress against contract programme; issue monthly project progress reports.	AE8, AE3 (this guide)	PS/PM
Quality control	Check work against specification; test materials. Ensure implementation of quality assurance system.		PS/PM
Cost management	Manage expenditure of risk allowance; maintain latest estimated cost and cash flow; initiate action to avoid overspend; issue monthly financial status reports; submit high level reports to senior management.	AE7	PM/PS
Payment	Ensure payments are made in line with contractual arrangements. Note: for PFI and PDS projects, payment does not begin until facility is ready for use.	AE7	PM/PS



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Step	Description	Further information	Responsible role
Dispute resolution	If required, use alternative dispute resolution procedures agreed in partnering charter to resolve disputes. See OGC guidance on alternative dispute resolution.	AE5	IPT
Record keeping	Maintain records of site activities; daily diary; site instructions; inspection and test results.		PM
Organise commissioning	Establish commissioning team; carry out commissioning programme at the earliest opportunity in the construction phase and during the course of the work, rather than just before handover; check programme and coordinate with overall programme; confirm/witness commissioning. Prepare for handover and operation, including 'decant' as appropriate.		IPT
Inspection and testing	Check quality of work, defects, completeness and performance. Record results; and fix any defects.		PS/PM
Other deliverables	Ensure that all specified deliverables (such as operating and maintenance manuals, health and safety file) are delivered by IPT and fit for purpose.		PS/PM
Certificates	Issue certificates required on completion.		PM
Deliver project	Review the acceptability of the completed project. Aim to agree final account as close completion as possible. Handover to client (unless ongoing management of facility under contract).		IPT
Project evaluation	Confirm that construction is complete in accordance with the contract. Confirm that the facility is ready for service; confirm the client's readiness to take on the facility.		SRO/PS
Gate 4: Readiness for service Address issues raised by Gateway review.			
Confirm project evaluation; approval to proceed	Approval for facility to be used.		SRO/PS
Confirm acceptance of project	Confirm acceptance of project to meet need; confirm spend to date against approved budget.		IDM/SRO
PPR	Carry out post project review to establish how well the project was managed. Complete Clients' Charter KPIs.		PS

Step	Description	Further information	Responsible role
Use of facility	Use facility. Ongoing contract management (where appropriate), including performance measurement.		
PIR of benefits achieved and lessons learned	Confirm business benefits and budget. Carry out post implementation review (also known as post occupancy evaluation) – compare with original project objectives. Set out lessons learned. Seek supply team comments to improve future projects. Note that there may be several PIRs. Assess suitability of project in satisfying business needs. Assess effectiveness of whole-life design. Provide feedback for future projects or improvement in ongoing contract management.	AE8	IDM/SRO PS
Contract management	Ongoing contract management where appropriate; management of separate FM contract where relevant.		FM
<p>Gate 5: Benefits evaluation (repeated through the life of the facility as required)</p> <hr/> <p>Address issues raised by Gateway review; act on feedback and recommendations.</p> <hr/> <p>Disposal.</p>			

Scheduling and progress monitoring

This section describes the everyday activities for managing the project, together with supporting processes such as change control. The schedule may also be known as the time plan or programme.

The project sponsor, through the project manager, is responsible for scheduling and monitoring progress. A programme, in the context of construction projects, is a schedule that identifies the work to be carried out as a series of activities and plots the time periods required to execute and complete each activity and the interdependencies between each activity.

It also plots resources required and their availability. It is important to be aware of potential risks or problems. The project sponsor should review the scheduling against progress achieved in order to understand where identified risks or other difficulties are likely to arise and to establish what alternative courses of action could be taken to reduce their impact.



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The project sponsor must be able to identify clearly those tasks that lie on the critical path, that is, the shortest possible time based on assumptions about the tasks to be carried out and the resources available – which should be clearly marked on the schedule. Time for the approval processes must be included as specific activities in the schedule for the project – these may lie on the critical path. The schedule is an estimate that is based on considered assumptions on issues such as likely risk. Some assumptions may prove to be incorrect; some deviations should be expected but these will be acceptable if the critical path is not affected and the project is achieved on time.

Techniques to help with progress monitoring include bar and Gantt charts (which set out a simple view of activities against timescales) and network planning (which links dependent activities in a logical sequence). Network planning is particularly useful for complex projects and helps to provide rapid answers for changes in basic assumptions such as:

- what is the likely effect of a specific delay?
- what is the probable impact of an identified project risk occurring?

The project sponsor should insist that the final schedules on which decisions are to be made (and against which performance of the integrated project team is to be monitored) should be simple and straightforward, however sophisticated and comprehensive the networks of activities and the interrelationships between them. They should be capable of being rapidly understood by the project sponsor. Colour-coded bar charts are widely used as management control documents.

Schedule planning tasks

The project manager reports to the project sponsor on schedule planning on behalf of the integrated project team. The main schedule planning tasks are to:

- produce a work breakdown structure, which defines the work content of the project in terms of basic elements, work packages, generic tasks and detailed tasks
- show how these elements affect each other
- define the activities, using standard lists and adding additional elements until all the requirements have been covered
- establish the logical relationships of the activities, showing which activities must happen first and which must follow
- determine the work content (or duration) of each activity
- make assumptions of resource availability (labour/effort, plant, materials, staff, equipment and related items that create time dependencies)
- determine the critical path
- optimise the plan by resource levelling (comparing the calculated requirements with those actually available and recalculating the network to spread resources more evenly).

Progress monitoring

Progress monitoring includes reviewing monthly progress reports produced by the project manager with others in the integrated project team. It should focus on critical activities rather than the detail and alert the SRO's attention to these in good time if action needs to be taken. The project sponsor will want to understand the overall rate of progress and be able to judge the realism or otherwise of the forecast completion date. Measures of progress include:

- percentage completion of an activity in terms of cost and time
- planned progress against actual progress
- work in progress (taking account of relative importance of key activities)
- any impact on critical path
- payment progress
- overall work content (where work content, resources deployed and progress achieved are linked by productivity – especially useful for staff-intensive activities such as design and site construction)
- outstanding requirements (resources etc) planned/still required.

The process of time control is an important part of progress monitoring. A time control system can cover:

- time budget – the overall project duration as fixed by specific constraints in the contract strategy; the period which, once fixed, becomes a key parameter for management of the project
- time plan – a division of total time into interlinked time allowances for readily identifiable activities with definable start and finish points; the overall project programme
- time checking – monitoring actual time spent on each activity against the allowance in the time plan; reporting divergence as soon as identified for critical activities.

If the time taken for an activity on the critical path exceeds its time allowance there are essentially only two forms of corrective action available:

- the re-sequencing of later activities
- shortening the time allowance for future critical activities by increasing the resources to be made available for them (this option will normally result in extra costs).

If neither is done, the overall schedule will be exceeded and the project will finish late.

The project sponsor must recognise that time control is as important during the planning stages of the project as the construction stage. The integrated project team should work to a series of deadlines where different elements of the design must be agreed (that is, frozen) if costs and the overall schedule are to be kept under control.



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The project sponsor must take account of the relationships between quality, cost and time:

- any change to the overall timescale for a project will generate additional costs. Who carries such additional costs depends on the detailed contractual arrangements between the parties and the reason for the extension; it is likely that some of them will be borne by the client
- making up lost time by re-sequencing later activities may compromise quality, including health and safety, and could result in extra costs.

Progress reports

Progress reports have the following important functions:

- to keep the project sponsor informed of the project status. They identify problems and options for their resolution, and provide the information to enable the project sponsor to take key decisions promptly, based on the most appropriate information
- to demonstrate that the integrated project team are carrying out their responsibilities satisfactorily; and that the necessary management processes, procedures and controls are in place and are operating effectively
- to provide a discipline for the whole project team and establish a time reference for progress meetings and plans
- to provide a communication tool in a simple, comprehensive and consistent format that can be distributed to the project team
- to permit external monitoring and the gathering of statistics by the department
- to report back on performance measurements of the IPT
- to identify best practice and support achievement of continuous improvement in performance.

Supporting processes

Change is handled most effectively through sound project planning and review. Where there is a possibility of change for whatever reason, it should be treated as a project risk and addressed in the risk management plan. A robust change control procedure incorporating value for money criteria should be adopted to evaluate and manage change if it occurs.

Change Control

Changes to design, especially after contract award, are one of the major causes of time and cost overruns and poor value for money. Changes arise mainly as a result of unclear or ambiguous project definition, poor communication, inadequate time spent in project planning and risk management, or changing circumstances.

The need for changes should be minimised by:

- ensuring that the project brief is comprehensive and has the stakeholders' agreement
- taking account of current and proposed legislation (where known about)
- having early discussions with key stakeholders to anticipate their requirements
- undertaking site investigations and condition surveys early in the project
- ensuring that designs are adequately developed and coordinated before construction plans are committed (which requires clear leadership)
- proactive project management, including forward planning
- identifying and managing risks.

A change control procedure should consider all of the following factors for each proposed change before approval is given for the change:

- the reasons for the change
- its source – that is, who is responsible for requiring the change
- the full quality, cost and time consequences of the change, including health and safety aspects
- the risks associated with the change and their impacts
- properly evaluated alternatives to the proposed change
- proposals for avoiding or mitigating time overrun
- source of funding of any cost overrun
- deadline by which the change must be instructed without further impact on quality, cost or time
- client approval for the change, taking account of any impacts.

Approval for the change should normally be given by the SRO when a detailed evaluation of the change shows that it provides value for money and any impacts are acceptable to the client. Where additional funding is required that exceeds the amount allowed in the risk allowance, approval for the change should be obtained from the investment decision maker.

Cost control

Details of cost control of projects are covered in *AE7: Whole-life costing and cost management*. With an integrated project team there should be open book accounting, which shows actual costs plus agreed margins and benchmarking of costs. Cost management should ensure, throughout the project, that:

- the latest estimate is compared with the previously approved budget and pre-tender estimate and does not exceed it without fully reasoned justification
- the latest estimate is made up of the base estimate and the average risk allowance
- the risk allowance is for identified risks only (not an assumed contingency provision)
- the project is affordable
- funds are available for planned expenditure.



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Risk and value management

Details of these processes are covered in *AE4:Risk and value management* and are carried out together throughout the project. Risk management is critically important to project success; it involves identifying and assessing risk, assigning the right risk owners and continually managing, monitoring and reporting on key risks. Value management checks that the project will deliver value to the business by probing the assumptions on which the project is based and seeking opportunities to add value.

Quality control

The final quality of the project is governed, progressively, by:

- the project brief – a clear statement of the standards of quality required, which must cover the contribution to and impact on the surroundings as well as functional and building requirements
- output specification – the conversion of the quality standard demanded by the project brief into clear requirements for the finished built asset; the setting out of the criteria against which the standard of the finished work will be judged, such as by reference to standards or codes of practice; testing requirements to verify compliance with the specification
- the design – the adequacy of the components selected; the interface between related components and systems; the integration of mechanical and electrical systems into the overall design; buildability; the development of design before construction starts
- quality control – setting up control mechanisms to apply to the execution of the work on site; the detailed ongoing supervision by the integrated project team; the schedules for testing; the procedures for rectifying defective work. Key aspects of quality control on site are:
 - a clear specification of the testing and verification regime that is required, as a minimum, to provide assurance of compliance with the specification
 - confidence in the quality control activities carried out by the integrated project team
- inspection testing and verification of the integrated project team's work, with the supply chains taking responsibility for each aspect as appropriate and access to their records for audit as required.

Independent inspection, testing and verification are a means of providing confidence in the integrated project team's quality control system but should not be used to replace it.

Quality assurance is useful for maintaining quality standards. There should be a detailed review of any quality system before it can be relied on to provide sufficient assurance about the quality of a specific activity. (See *AE9:Design quality*.)

Annex A: Project brief

The purpose of the project brief is to provide a firm foundation for the initiation of the project. It is a formal statement of the objectives and functional and operational requirements of the finished project. It should be in sufficient detail to enable the integrated project team to execute the specification and detailed design of the work and is therefore an essential reference for the team. It is a key component of the project execution plan (overleaf).

Questions to ask about the quality of the project brief:

- does the project brief accurately reflect the requirement for the project?
- does it form a firm basis on which to initiate a project?
- does it indicate how the client will assess the acceptability of the finished product(s)?
- does it take account of health and safety, sustainability and design quality issues?

Suggested contents

The following is a suggested list of contents, which should be tailored to the requirements and environment of each project:

- executive summary
- background
- project definition, explaining what the project needs to achieve. It will contain:
 - project objectives
 - project scope
 - outline project deliverables and/or desired outcomes
 - any exclusions
 - constraints, including budget and timescale
 - interfaces with other projects
 - Strategic Outline Business Case (high level business case)
 - a description of how this project supports strategic objectives
 - the reason for selection of this option
- client's quality expectations (including health and safety, sustainability and design quality)
- acceptance criteria
- any known risks
- key milestones
- key stakeholders and other stakeholders.



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Annex B: Project execution plan (PEP)

The project execution plan is the key management document governing the project strategy, organisation, control procedures, responsibilities and, where appropriate, the relationship between the project sponsor and the project manager. It is a formal statement of the user needs, project brief and strategy agreed with the project manager for their attainment. The scope of that statement will depend on the size and nature of the project. It is a live active management document, regularly updated, to be used by all parties both as a means of communication and as a control and performance measurement tool. The most effective way of ensuring the currency of the PEP is to make it available electronically on a project intranet.

Preparation of the PEP is a key responsibility of the project sponsor, although the project manager will make a significant contribution. Its content may be roughly divided into two areas: matters relating to organisation and responsibilities within the client organisation and those of the integrated project team. Broadly, the project sponsor will develop those elements relating to the client organisation and establish and define the roles and responsibilities of the key personnel involved. Except where preliminary versions are issued before appointment, the project manager has the primary role in developing those elements relating to the project team's activities and the project execution strategy.

The project sponsor must be satisfied that the PEP represents a viable and realistic plan for implementing the project and achieving its objectives. The project sponsor must review it in detail with all parties to the project to ensure that they understand both the plan as a whole and their own responsibilities, and that they have the capability and the resources to discharge their responsibilities.

For guidance on the production of a PEP go to the OGC website at:

www.ogc.gov.uk/documentation_and_templates/project_execution_plan_.asp

The PEP's scope will depend on the size and nature of the project. CIB Code of Practice *Briefing the team* (ISBN 0 7277 2541 6) provides further advice on the PEP and project brief (referred to as the strategic brief before being developed fully).

Annex C: Project reports

These are regular reports issued to the project sponsor; they are prepared by the project manager on the basis of personal knowledge, data and reports received from the integrated project team.

Their purpose is to report formally to the project sponsor the current status of the project, key issues and/or problems requiring resolution and the steps being taken to resolve them. The project sponsor will normally forward summaries of them to the SRO for information and will draw the SRO's attention formally to any matters of serious concern to the department.

Project reports should have three sections:

- a short (one page) executive summary confirming the general status of the project and listing the key issues and/or problems currently requiring resolution
- the general text of the report, reporting fully but concisely on the project status, issues and problems, using graphical presentations where appropriate; and
- appendices containing detailed information on which the report has been based.

Typical project report format

A typical format is outlined below. It is provided as an aide memoire of what could be included rather than a list of everything that should be included. Main headings are:

- executive summary
- health and safety
- quality
 - design
 - sustainability
- time
- cost
- changes
- project manager's statement
- appendixes including risk register.





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