

1 Setting up for project delivery

1.1 Introduction

A construction project is an organisation. The difference between a project organisation and a traditional business organisation is that a project is specifically designed to come to an end and finish, whereas a business organisation will – hopefully – continue in perpetuity. The people involved in the project know this and, unless the project is very large, will invariably be separately employed by the different organisations involved in the project.

Put simply, during the construction stage of a project (i.e. the project delivery stage), the organisation set up to actually deliver the facility must be able to concentrate on constructing the scope of work within the agreed time schedule and normally to a cost / budget set by the client. We can therefore adapt the traditional time–cost–quality diagram as shown in figure 1.1.

This chart illustrates that delivering the project scope, within the project schedule and to the project budget (and sometimes requiring a trade-off between the three), is carried out by the project team using project processes which have often been well tried and tested from previous experience and standard conditions of contract which have often been tested by courts of law. Unlike a traditional business organisation, a project is finite – so the scope, schedule and budget have been (or should have been) pre-defined before actual construction starts. This is not a textbook on project management, but it is necessary to understand that managing construction contracts is about creating a team to eventually work itself out of a job, or more accurately, to deliver the project and move on to the next. If the client gets the building or facility on time and within budget, they will be happy and satisfied with the interaction with the construction industry. If the contractor(s) – and any other project participants (such as professional consultants) deliver what the client wants and make a profit into the bargain, they will also be happy and satisfied. If all parties are satisfied with the project outcomes, future business opportunities are invariably easier to come by and negotiate. A good example of this is the Olympic Stadium project in London for the 2012 Games. Clearly, time is of the essence in a project such as this, so the client needs to make sure that the project will be delivered on time (priority 1) as well as fit for purpose (priority 2) and within budget (priority 3). What better way to do that than to employ the entire project team from a recent highly successful delivery of a similar project – namely the Emirates Stadium for Arsenal Football Club?

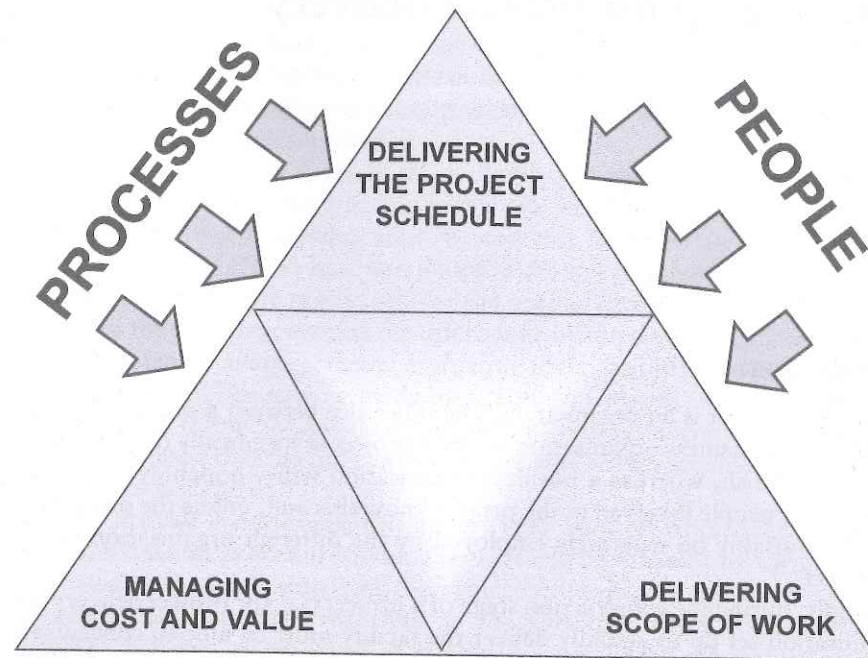


Figure 1.1 Delivering the project scope, schedule and cost.

1.2 Project personnel and procedures

1.2.1 Project personnel

A team can be defined as a group of people with a common purpose who are organised to work together interdependently and / or cooperatively to meet the needs of their customers by accomplishing the goals and objectives. Clearly, in construction projects, the project is a team of people, which is then made up of separate functional teams, all working towards delivering the scope of works, on time and within budget.

For any team to work effectively there must be both clarity and agreement on the expectations of what each team member will do as well as how they do it. This includes the duties, responsibilities and levels of authority of each one of the participants in the project team, which is normally set out within a project management plan (PMP) or project execution plan (PEP) for each individual project being executed. This is especially important for major projects which may take several years to complete and are complex organisations in their own right and with different people likely to undertake the various roles throughout the project's life cycle. As stated above, construction projects are by definition temporary organisations, which are designed and set up at the formulation or inception stage and normally disbanded at the completion of the project when the building or facility is finally handed over to the client for occupation or use. An exception to this would be when there is an ongoing operation and maintenance (O&M) requirements or facilities management (FM) obligation by the contractor, but even then, the facilities management team

is normally quite different from the construction team, so there is necessarily some form of hand over.

Additionally, unless the project is very large and requires full time effort by everybody working on the project, many of the people undertaking the various roles will be working on several projects at the same time, usually with different companies undertaking the project functions. As every company has different practices, procedures and cultures, it is clearly of critical importance to develop clear guidelines setting out how each project will be managed and delivered, in order to try to avoid ambiguities, contradictions, misunderstandings and mistakes. All of which can lead to the dreaded D-word – disputes.

For all contractors who tender for construction work, what they want to hear from their directors is 'OK guys, we've got the job now'. This, however, generates different and often contradictory thoughts and emotions – clearly there will be elation that all the work (and cost) which was put in during the estimating and bidding stages will not have been wasted; but on the other hand, if the company got the job by being the lowest tenderer, then what mistakes did we make? How close were we to the next tenderer? During the estimating and tendering stage, the contractor is doing exactly that – estimating what the work is likely to cost and how long each operation is likely to take. These particular chickens only come home to roost when the contract is awarded on a fixed price basis, which means that the contractor now has to deliver the scope of works for the price they have quoted and in the time duration stated in the tender documents. Oh, and hopefully make a profit while doing so.

So, the project therefore needs to be organised properly in order that the client can be confident that they will get the project on time, within budget and to a good quality; and the contractor can be equally confident that they will make a profit on the deal. This all requires confidence that risks and uncertainties have been allocated, assessed, managed and minimised, which in turn requires good management – i.e. planning and control procedures for people, processes, physical resources and costs required on the project.

Let us first look at the roles and responsibilities which are normally allocated in a construction project. Once these have been agreed and defined, the project planning and control will be discussed in Part B of this book. Clearly, there is a great deal of interaction between the two – for example, a design-build contract will have different roles and different project documentation from a more traditional single stage lump sum contract where design and construction are carried out separately but, in the vast majority of projects, there are different roles and responsibilities for those who are acting for the client and those who are acting for / employed by the contractor(s).

Figure 1.2 shows a simplified diagram of the hierarchy of roles on a project and is also intended to illustrate the day to day communications between the peer groups on each side. It is therefore clear to see why there has to be a robust and formal procedure for both communications between the project participants and also document control as letters, memos, drawings, minutes of meetings need to be fully structured and archived for possible later use in case of audit requirements or evidence in any disputes. Chapter 2 takes this issue further in discussing the move towards building information modelling (BIM) as a natural progression and bundling of computer aided design (CAD), coordinated project information and project collaboration software.

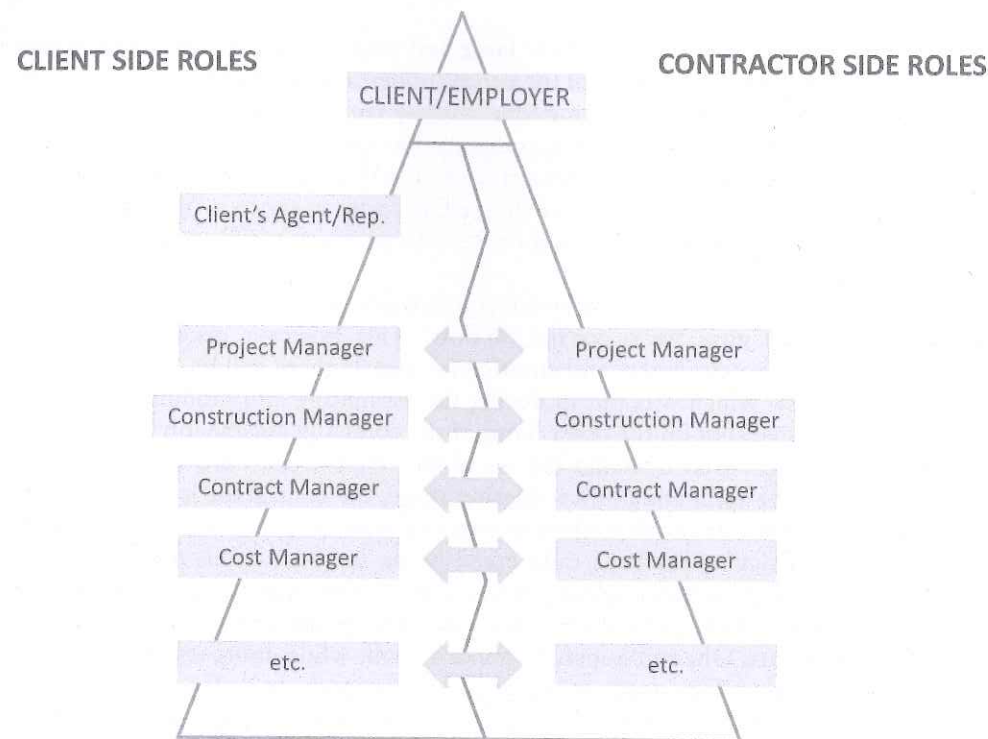


Figure 1.2 Client side and contractor side roles in a construction project.

The personnel / roles required on the client side will include:

The client / employer

It is during the feasibility and design stages that the client should take the greatest care that their objectives for the project are likely to be satisfied by the decisions that are being made. As discussed above, these objectives are normally related to time, cost and quality and a much more comprehensive discussion can be found in the sister book *Introduction to Building Procurement*. When the project has reached the construction stage, the contractor will normally have a detailed scope of work, for which they will be paid the agreed contract price and are required to complete within the contract timescale. During the construction stage, the client must therefore withdraw slightly from the day to day management of the project and leave that to the professional team, although they will obviously retain a keen interest in how the project is progressing. In most projects, during the construction stage, the client's specific functions and responsibilities are to:

- provide the site and allow possession of the site to the contractor during the period of construction;
- appoint professional advisors to carry out functions on their behalf which are essential for the effective and professional administration of the project;
- give appropriate and timely instructions to enable the work to be carried out;

- permit the contractor to carry out the works without interference;
- pay for the work which has been properly carried out and in accordance with the agreed schedules.

As stated above, the client must not hinder the contractor in the progress of the work and must not interfere with any contractual powers of the professional consultants to issue certificates or instructions etc. This invariably does happen on many projects (particularly in international projects) and is the source of many disputes as the client often cannot resist interfering with the duties of the various parties or with the contractor's progress. In some cases, the client considers that they have the authority to issue 'instructions' themselves even though this is outside the normal contractual procedures. In these cases, contractors have a choice – they can either tolerate the interference by accepting it as a cultural norm (and maybe issue a notice requesting a formal Variation to Contract – VTC), or they can object to the interference on strict contractual grounds, thus creating more difficult working relationships, both on this project and possibly in the future.

The client's agent / representative

As most clients are not knowledgeable about the construction industry or its processes and procedures (why should they be, they may well be industrial companies or retail organisations?), then in order to administer the projects, they will appoint an agent or representative to help them or represent them in managing the project and administering the construction contract. This is the professional team mentioned above.

This client's agent or representative may be a person or company whose role is merely to attend meetings and inform the client of any matters which need to be brought to their attention. The client's representative does not normally have any powers themselves, although this will depend on the specific form of contract used on the project. It is interesting to note that under the design-build contract, this role is called the employer's agent but the management forms of contract term it the client's representative. Therefore we have an interesting semantic regarding the difference between an 'agent' and a 'representative'. Under a normal definition, a representative can make decisions without constant recourse to the person appointing them (a member of Parliament is a representative of their constituents and therefore makes the voting decisions themselves), whereas an agent has much more limited powers to merely negotiate on behalf of a client, with the final decisions being taken by the client themselves (e.g. an estate agent).

The project manager

It is becoming common for employers to engage a project manager on more complex projects. This title certainly has more bragging rights but may not, in reality, be more than the client's representative explained above. The project manager role should ideally include managing both the design and construction stages of a project and will therefore cover both the design team and construction team, although in many instances, they are not appointed until the construction stage. Some forms of contract, e.g. the New Engineering Contract (NEC) and most international forms of contract,

give the project manager powers to give instructions, take decisions etc. The CIOB Code of Practice for Project Management details the project manager's responsibilities during the construction stage as being:

- a to be the proactive 'driver' of the project;
- b to set the project objectives;
- c to ensure achievement of objectives;
- d achieving client satisfaction.

As stated in the Introduction, different standard forms of contract give different names to this role, as the 'engineer' under the FIDIC and ICC Conditions of Contract is effectively a project manager. Therefore, the abbreviation PM / Engineer is used throughout this book to denote the 'leadership' role in a project, whether a particular form of contract uses that term or not.

The design manager

The design manager is a relatively new role within the construction team, especially in the UK where the design-tender-construction system is still the predominant procurement route, so the design is substantially complete before construction starts and the architect or other lead designer has invariably taken on the role of managing the design process. However, where there is overlap between the design stage and construction stage, a design manager will be required to ensure that the deliverables of the design stage are achieved on time. In terms of the design, consultant(s) who produced the original tender or contract drawings and specifications are normally referred to as the designer(s) of record; and they will continue to provide the following design services during the construction stage:

- receive and respond to the construction contractor's requests for information (RFI), communicated from the contractor to the designer through the project manager. An RFI is a request by the contractor for clarification of the design intent of the drawings and specifications;
- review and recommend acceptance of any contractor submittals called for in the drawings and specifications with respect to the construction deliverables;
- review change requests from the original design;
- make periodic visits to the site to assure design compliance (in collaboration with the supervision consultants) and in some cases provide certification that the design has been achieved.

Supervision of the contractor / construction manager / site manager

The construction manager or site manager will be responsible to ensure the project runs according to the schedule or programme and that the works are constructed according to the specifications – i.e. to the required quality of materials and workmanship. Reporting to the project manager, the site manager can either be responsible for a part of the works or the whole site, depending on the size and value of the project. The site manager will be normally responsible for the management of health and safety requirements and to ensure a safe working environment for employees as well as the

general public. The CIOB Code of Practice for Project Management states that the role also includes:

- determining how the construction work should be split into packages;
- producing detailed construction schedules;
- determining when packages need to be procured;
- managing the procurement process;
- managing the overall site facilities (access, storage and welfare);
- supervising the package contractors' execution of the works.

Contracts manager

The contracts manager is responsible for the management and administration of the actual contracts within a construction project. This responsibility will primarily focus on the delivery or execution phase of a project, i.e. after the contract has been awarded. A contracts manager may be responsible for overseeing several contracts at the same time and must ensure that deadlines and budgets within the projects are controlled. The role also includes:

- the management of contractor involvement;
- preparation and negotiation of extensions of time and associated costs;
- ensuring that all insurances, bonds and guarantees are in place and valid;
- ensuring that sub-contracts are managed effectively;
- preparing and negotiating contract amendments and variations as necessary;
- managing the performance of contract administrators.

Cost manager

The cost manager's primary function is to plan, develop and supervise all cost functions on the project, which involves ensuring that all project cost activities such as data collection, estimating, productivity analysis and budget forecasting comply with company and client requirements. This position is responsible for the development and implementation of project cost standards and procedures. The cost manager will implement a standard costing structure to ensure that the project adheres to this standard. The cost department provides a support service to the project teams to assist and guide the establishment of the project budgets and project control tools.

HSE manager

Many employers prefer to appoint a person to take the role of championing their health, safety and environment (HSE) policy and procedures throughout the project life cycle. This role would comprise the following:

- HSE management of the contractor(s), who are expected to have approximately [x] persons on site in multiple locations;
- devising and operating quality control procedures to ensure that the appropriate high standards of construction work are achieved in HSE terms in accordance with client policy;

- undertaking high level risk assessments to identify problem areas for detailed follow-up with chosen contractors (in order to manage identified risk);
- establishing a plan for the reduction of hazardous building practice or materials;
- managing and reducing environmental risk;
- ensuring adequate onsite welfare provision is provided;
- reporting in a regular and timely manner to the client's HSE department on all HSE matters to ensure consistency, continuity and the use of best practice;
- keeping up to date with new initiatives and current world best practice.

Interface manager

An interface on a construction project is any point of connection between different entities working on the project, which could be:

<i>physical</i>	any physical interaction between components;
<i>functional</i>	any differences between functional requirements between systems;
<i>contractual</i>	interactions between client, contractor, consultants, sub-contractors and suppliers;
<i>organisational</i>	information exchanged between disciplines and between parties – see also document control and management in section 2.2;
<i>resources</i>	points of dependencies between equipment, material and labour suppliers.

Because these issues can be very complex and consist of hundreds of different instances, many large projects have a specific interface manager to ensure progress is as smooth as possible. The interface manager will oversee and monitor these interface activities and provide proactive support to nominated focal points within each discipline or organisation. Any particularly critical interfaces will be entered into an interface register and tracked to completion.

On the contractor side:

Contractor's project manager

A project manager employed by the contractor would tend to replicate the role of the client's project manager but with the responsibilities from the 'supply side' of the project rather than the 'demand side', which is the client's main priority. In many projects, the project manager also acts as the construction manager (see below) as both will come from a similar technical background. On larger and more complex projects, where there is a higher need to attend meetings, it would clearly be beneficial to separate the roles.

Contractor's construction manager

This role is mainly responsible for the actual construction carried out on the site and can also be described as site manager, site agent, contracts manager (in UK), building manager or simply construction manager. The role is basically to take responsibility for running and managing the construction site, or that part of it which is under the control of the particular contractor. It is invariably a highly stressful job but

very satisfying when everything goes smoothly. The construction manager is a highly regarded and professional position, which can usually only be achieved with substantial experience in the industry.

A construction manager's role typically involves:

- *preparing* the site and liaising with the design team and client's consultants before construction work starts;
- *developing* the programme / schedule of work and strategy for the project;
- *planning* ahead to prevent problems on site before they occur and to make sure that the delivery and storage of equipment and materials occurs in a timely manner;
- *making* safety inspections of the site when work is underway to ensure that all regulations relating to health, safety and the environment (HSE) are being followed;
- *overseeing* the running of several projects at the same time;
- *communicating* with a range of people including the client, sub-contractors, suppliers, the public as well as the workforce on site.

Contractor's contract manager / procurement manager

The contract department of a main contractor will differ considerably from that of a consultant as the main contractor must manage the supply chain for the project, i.e. all the different manufacturers, suppliers and sub-contractors who will supply services, goods and materials to the project. In many cases the contracts manager will deal with the main contract and therefore negotiate with the client and its consultants, whereas the procurement manager will face the other way around and deal with the supply chain as identified above. The role of each or both typically involves:

- setting up a process of review for all contracts, supplies and suppliers to ensure that maximum value for money to the contractor is achieved through supplier rationalisation and by developing a list of approved suppliers;
- encouraging effective contract management across the business with regular reviews, development of service level agreements (SLAs) and key performance indicators (KPIs);
- building and developing good relationships with key suppliers to ensure best value for money and client satisfaction with services provided. This is especially important with regular first tier sub-contractors and suppliers;
- ensuring that all areas of concern are identified and addressed, with remedial action taken as early as possible;
- engaging with benchmarking activities to ensure that value for money and economies of scale are used to the contractor's benefit, where appropriate;
- monitoring trends in the markets for the various materials and services and proposing / implementing plans to respond to such trends;
- ensuring that a central procurement register is maintained and updated.

Contractor's HSE manager

The contractor's HSE manager is responsible for actually carrying out the HSE policies of the company, the client and the project, and must have skills in the following areas:

16 Initiating the construction stage

- HSE leadership and commitment
- HSE policy and strategic objectives
- organising the responsibilities and resources for HSE requirements
- HSE risk management framework
- HEMP for all significant risks (Hazard Effect Management Programme)
- safe systems of work and personal safety
- HSE performance management
- incident classification investigation and reporting
- HSE audits
- HSE management reviews.

1.2.2 Project procedures

On commencement of the construction stage of a project there are certain processes and procedures which will need to be put in place by the project management team, many of which will be virtually identical for every project irrespective of the location and size. A quick glance through the chapter headings of Part B of this book will show what these processes and procedures are designed to do, i.e.:

- 1 How is the contractor's performance to be supervised to ensure time, schedule and quality compliance?
- 2 How is the contractor to be paid?
- 3 What happens if the scope of work needs to be changed?
 - a adding extra items required by the client;
 - b deleting items now not required by the client;
 - c amendments required by *force majeure* – i.e. not within either party's control;
 - d amending the design following value engineering procedures – i.e. better performance at less cost.
- 4 How to deal with sub-contractors and others who are contributing to the project and therefore require access.
- 5 How to make sure the project costs remain under control. From the client's point of view, the costs should still remain within the approved overall budget (see figure 1.3) and from the contractor's point of view, that the required profit margin is still being attained.
- 6 How is the work to be accepted by the client? Will this involve separate approval of materials, goods and services (this procedure is normal in international contracts), or will acceptance and approval only take place at particular milestones during construction?

1.3 The project execution / management plan (PEP / PMP)

The project execution / management plan (PEP / PMP) is the governing document that is developed at the beginning of a project and establishes the means to execute, monitor and control the project. The plan serves as the main communication vehicle to ensure that all parties to a project are aware and knowledgeable about the project objectives and how they will be accomplished. The plan is therefore the primary agreement between all the parties and they should all have signed off

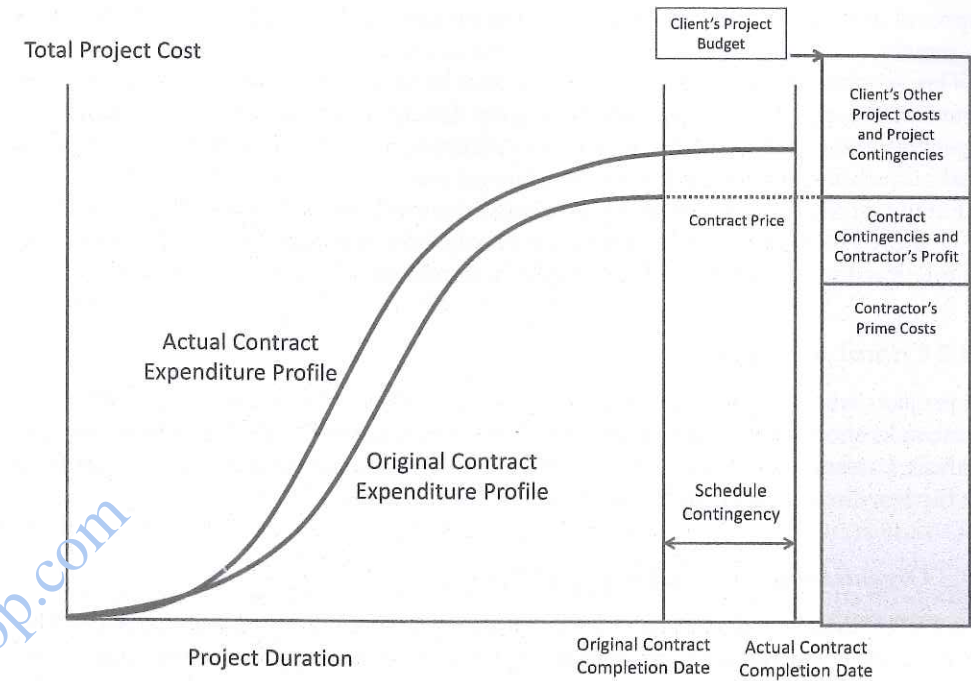


Figure 1.3 Project cost and time.

the document to show this agreement and to 'buy-in' to the proposal. The PEP or PMP should be developed and approved as early as possible in the project and therefore should be well developed by the time that the construction stage is reached. The plan is not a static document and therefore should be regularly updated by the project manager to include current and anticipated future processes and procedures.

Typically, the PEP / PMP will include the following elements:

1.3.1 Project objectives, purpose and priorities

This section will cover the main purpose for which the project is required and include the over-arching project details such as project particulars and key elements from the client's business case where these are necessary to refer back to when changes or variations are contemplated. All too many projects veer away from their intended objectives during the construction stage when a multitude of variations are being applied, so having a baseline statement or cornerstone is critical in keeping the project on track. The business case would include details of funding sources: approved budgets and the project initial programme / schedule (often termed 'baseline schedule'). The defined objectives in this section may not just refer to financial or quantitative benefits as the project may also have non-financial or qualitative benefits, such as community employment, skills development etc.

4 Supervising the contractor's performance

4.1 Introduction

This is possibly the most important aspect in effective contract management / contract administration. The contractor clearly needs to perform efficiently and effectively for the project to be successful for both themselves and the employer and management control on this performance can be viewed as a circular activity or a 'loop' as seen in figure 4.1. At the commencement of the construction stage there is the original plan, set out in the contract documents, which has been agreed by the employer as what they want to be built, by when and for how much. All subsequent activity in the project should be directed at achieving these requirements. The project team and especially the contractor 'performs' the works which is supervised and controlled by the PM / engineer together with the project management and supervision teams. This is all fairly straightforward and obvious, and what this chapter covers is the tools that have been developed to control the contractor's performance and ensure it achieves the original requirements of the employer as amended by subsequent variations and changes.

The PM / engineer's staff responsible for the supervision of the contractor will include technical engineers and construction managers to oversee the progress of the work on a daily basis. As far as this book is concerned, i.e. contract administration, the main tools for control are regular progress reports and regular progress meetings. The 'Control' box in figure 4.1 gives a list of these reports and meetings which should occur.

The various reports required in order to monitor and control the progress of the project should be set out in the Pre-start / Kick-off Meeting and will include:

- Inception Report (by the PM to the employer)
- Pre-start / Kick-off Meeting
- Project Progress Reports (usually monthly and / or quarterly)
- Project Progress Meetings
- Updating the project programme / schedule
- Construction Completion Report(s)
- Performance Report(s) on Contractor(s)
- Service Contract Completion Report.

4.2 Inception Report

An Inception Report is typically required to be produced by the project manager as part of their contract with the client and normally submitted within three months of

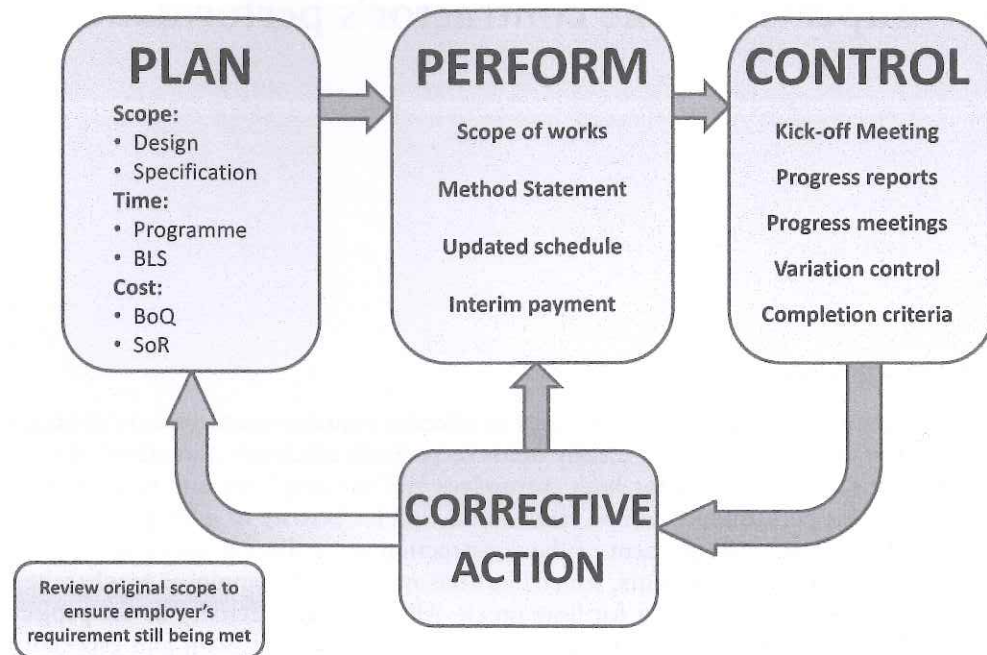


Figure 4.1 Construction project control loop.

commencing the project management services. The format and detail of the Inception Report will depend on the requirements of the particular client and an example / template is given in table 4.1. The main purpose of the Inception Report is to demonstrate the project manager's understanding of the project, by describing the start-up actions and plans to fulfil the client's project objectives. In general the Inception Report should:

- summarise the project background, objectives and status;
- summarise the background and purpose of the PM's Service Contract;
- provide a proposed project organisation showing reporting lines and interface between the various parties, i.e. Funding Institution(s), Client, Consultants, Subconsultants, site offices and contractors;
- describe the PM's mobilisations of project staff, facilities and equipment (to date and projected to anticipated demobilisation);
- describe the PM's activities (to date and projected) until the end of the project;
- summarise the status of preparations for or execution of the Works Contract(s);
- provide a Project schedule for the Works Contract(s) and the PM's activities.

An Inception Report also provides the opportunity to identify:

- changes in project objectives, scope or plans since the PM's original quotation / proposal;
- anticipated problems which could affect PM's scope and/or schedule of services.

Even though an Inception Report may not be formally required by the employer, it is still good practice to prepare one for internal use or possibly as the first Project Progress Report – i.e. giving the baseline situation. An example of a table of contents for an Inception Report is given in table 4.1.

4.3 Pre-start / Kick-off Meeting

The Kick-off Meeting is the first official meeting of the project team who will be working together on the realisation of the project. The agenda usually covers introductions, statement(s) of mission, and how the project will be organised, in terms of teams or working-groups and the timetable of subsequent project meetings will be set here. The meeting is also called a Start-up Meeting or Pre-start Meeting, or Pre-commencement Meeting depending on the country of the project. The meeting should take place just after issuing the Notice of Commencement Date so that all parties are aware that the clock has started ticking. It is essential that formal minutes are taken at this meeting, which are often referred to later in the project if (or when) there are any disputes or disagreements between the parties. See table 4.2 for a standard agenda of a Kick-off Meeting.

4.4 Project Progress Reports

At the start of the project the PM / engineer should prepare the template for the Project Progress Report (see table 4.2) and, as the project leader, will have full responsibility for the reports as they are produced. On large, multi-contract projects where there may be resident engineers for each Works Contract, the project manager should require each resident engineer to prepare a draft of the sections of the report relating to their particular section, following the established standard report format. The project manager will, however, still retain editorial privilege to amend and mould the draft sections into a consistent and coherent report for the overall project.

However, although the PM should have ownership of the Project Progress reports, the information and data will come from the contractor(s) and the majority of the standard forms of contract require the contractor to submit periodic (usually monthly but also weekly) progress reports. For example, FIDIC now requires the contractor to submit monthly progress reports within 7 days after the last day of the period to which each report relates. The detailed requirements are quite thorough and can be summarised as:

- charts and description of progress, including design, contractor's documents, procurement, manufacture, deliveries to site, construction, erection and testing, and works of each subcontractor;
- photographs showing the status of manufacture and progress on site;
- for each main item of manufacture: the name and location of manufacturer; percentage progress; actual or estimated dates of commencement of manufacture; contractor's inspections, tests, shipment and delivery to site;
- records of contractor's personnel, plant and equipment;
- copies of quality assurance documents, tests results and certificates for materials;
- list of notices of any claims;
- safety statistics; including details of all hazardous incidents;
- comparisons of actual and planned progress; including details of events or circumstances which may jeopardise completion in accordance with the contract, including any measures to overcome the potential delays.

Table 4.1 Contents of a Project Inception Report

PROJECT AT [PROJECT HOME] FOR [EMPLOYER NAME]	
INCEPTION REPORT	
1	PROJECT BACKGROUND <i>Purpose, scope and objective of the project, details of employer and any funding institutions.</i>
2	PRECONSTRUCTIONS ACTIVITIES ALREADY CARRIED OUT <i>Design, statutory approvals and permits, land acquisition, preparatory site works, preparation of tender Documents, prequalification of contractors, preparation of Tender Documents etc.</i>
3	BACKGROUND OF CONTRACT FOR PM / SUPERVISION <i>Prequalification, Requests for and submission of proposals selection.</i>
4	CHANGES TO PM SCOPE OF WORKS / TERMS OF REFERENCE AND PROPOSED STAFFING <i>Necessary changes to SOW / TOR arising from changed project circumstances since proposal submission and / or signing of PM services contract and proposed changes to project staffing and schedule of services (if any).</i>
5	PROJECT ORGANISATION <i>Description of how project will be organised, preferably with organisation chart in Appendix.</i>
6	PROJECT SCHEDULE <i>Gantt chart of main project / Contract phases with identification of critical activities and deliverables.</i>
7	CONSULTANT'S MOBILIZATION <i>Current and planned mobilisations as Gantt chart.</i>
8	CONSULTANT'S PROGRAMME AND ACTIVITIES <i>Description of Consultant's required project activities, for example:</i> <ol style="list-style-type: none"> 8.1 Prequalification of contractors 8.2 Format of Tender documents 8.3 Scope Works Contract No. 1 8.4 Tender documents for Works Contract No. 1 8.5 Scope Works Contract No. 2 8.6 Tender documents for Works Contract No. 2 8.7 Environmental considerations 8.8 Land acquisition and Utility relocations 8.9 Materials source surveys 8.10 Economic Evaluation
APPENDICES	
A	PROJECT ORGANISATION
B	PROJECT SCHEDULE
C	CONTRACT MOBILISATION

Table 4.2 Agenda items for a Project Kick-off Meeting

PROJECT AT [PROJECT NAME] FOR [EMPLOYER NAME]	
AGENDA ITEMS FOR KICK-OFF MEETING	
1	The role and authority of each entity participating in the Contract.
2	Appointment of the 'Engineer' and or 'Engineer's Representative' (as appropriate).
3	Appointment of the 'Contractor's Representative'.
4	Where the Contract provides for delegating duties and authorities to persons, these should be clearly established.
5	Status of availability for 'Access to and Possession of site'.
6	Requirement and procedures for obtaining 'Construction License'.
7	Status of availability for 'Issuing Drawings'.
8	Status of contractor's 'Performance Security' and 'Advance Payment Security'.
9	Status of contractor's 'Insurance'.
10	Agreed 'Commencement Date'.
11	Requirements for 'Safety, security and Protection of the Environment'.
12	Requirements for 'Quality assurance and control'.
13	Status of the 'Works Programme', Key dates for information and submissions, periods for approval, long delivery periods and special problems.
14	Requirements for consent and approvals of any subcontractors.
15	Works or materials to be provided by the Employer.
16	Procedures for measurement, notices, instructions, submissions and responses.
17	Procedures for interim valuations, certifications and payments.
18	Procedures for monitoring the progress of the works.

Previous versions of many of the standard forms of contract gave the PM / engineer little power to require the contractor to submit records of personnel, plant and equipment and / or monthly reports. However, later versions do provide these powers and some (e.g. FIDIC) allow the engineer to withhold an Interim Payment Certificate until the contractor has submitted the appropriate progress report.

Therefore, the PM / engineer should, at the beginning of the contract, remind the contractor that:

- Monthly progress reports are to be submitted for each calendar month within 7 days after the last day of the month to which the reports relate.
- The first monthly progress report is to be submitted within 7 days after the last day of the first full calendar month following the commencement date. The period to which this first report relates shall be the period commencing from the commencement date. (For example: if the commencement date is 15 April, the first report, covering the period 15 April to 30 June, is required to be submitted by 7 July.)

- Interim Payment Certificates in respect of the Contractor's Statements will be withheld until the contractor has submitted a monthly progress report for the period to which a Contractor's Statement relates.

Should the PM / engineer disagree with any facts of the contractor's monthly reports, this must be promptly recorded in writing to the contractor, copied to the employer, promptly notify such disagreement in writing to the contractor in an attempt to obtain the contractor's agreement to submit corrected records.

In the event that the contractor fails to justify his submitted records and disagrees to amend them, confirm the engineer's disagreement and the engineer's records to the contractor (copied to the employer).

The term Project Progress Report does seem a bit dated in this fast moving internet age, so the analogous concepts of 'dashboards' and 'scorecards' appear to be more *de rigueur* and required by current fashion and practice. An advantage of dashboards and scorecards is that the major items of performance can all be shown together in one view, which makes remedial action easier to put into effect – much like a car dashboard is to the driver.

As included in the Appendices for the monthly progress reports, *Progress Photographs* should convey an overall impression of works progress. Pictures looking down manholes may be technically interesting to some but do not convey an adequate overall picture of the project progress.

The main purpose of the reports is to record progress, not defects: although pictures of defects might sometimes be appropriate to support narrative within the reports dealing with such issues. Pictures should be taken from the same vantage points each month to illustrate progress. The contract documents may also require the contractor to submit monthly progress photographs, from which a selection of the best quality may be chosen for inclusion in the regular progress reports.

The reports may also include minutes of meetings and any selected correspondence during the reporting period. As the main purpose of progress reports is to inform the client of day-to-day progress and to keep a record in case of future claims, the inclusion of minutes and significant correspondence will ensure it is a more comprehensive insight.

Architect's duty to inspect

Many clients often have the expectation that the architect (or engineer) will supervise and inspect the work to ensure that the contractor carries out their duties properly and may also expect the architect to be responsible if the contractor fails to perform properly. The exact nature of the inspection duties clearly depends upon the terms of the professional services contract between the architect / engineer and the client, but will invariably include an inspection clause such as:

Architect (Engineer) shall visit the site as required in order to monitor the progress and quality of the portion of the Work completed and to determine if the Work is being performed in accordance with the Contract Documents.

Therefore, if the contract requires the architect or engineer to periodically visit the work site and inspect the works, this inspection must be performed in a professional manner. If a defect is not noticed that would have been discovered through a reasonably diligent

Table 4.3 Contents of a Project Progress Report

PROJECT AT [PROJECT HOME] FOR [EMPLOYER NAME]	
MONTHLY PROJECT PROGRSS REPORT	
SECTIONS	
1	Project Data sheets (Names of parties, Commencement Date, Expected Completion Date, Project Budget etc.)
2	Brief description of the project (multilingual if required on international projects)
3	Progress of the works (descriptive and in numbers)
4	Delays, claims and contractual issues (raised, pending approved, rejected, resolved)
5	Submittals (Shop drawings, materials samples etc.) and quality issues
6	Variations and Change Orders (submitted, reviewed, approved, rejected)
7	Invoices and payments (Submitted, reviewed, approved, released)
8	HSE issues
9	Any other outstanding issues
10	Project risks (raised, assessed, allocated, resolved)
11	Comments and summary by PM
12	Conclusions
APPENDICES	
A	Progress photographs / multimedia files
B	Layout plans and updated project programme / schedule
C	Contractor's staff, labour and equipment
D	Material and equipment approval log
E	Shop drawing approval log (if appropriate)
F	Payments log
G	Claims log
H	List of approved sub-contractors
I	List of correspondences

inspection, the architect may be deemed responsible and consequently held liable in the tort of negligence.

Another issue that arises in this context is whether the architect can be held liable for safety violations. In other words, does the architect who is engaged to provide ordinary site services have any responsibility for injuries to people or property when the primary cause of the harm is contractor or sub-contractor negligence? The unsatisfactory answer to that question is maybe, as the court decisions on design professionals' liability arising from contractor errors are inconsistent at best and the outcomes can be very case-specific which makes it difficult to predict results. Still,

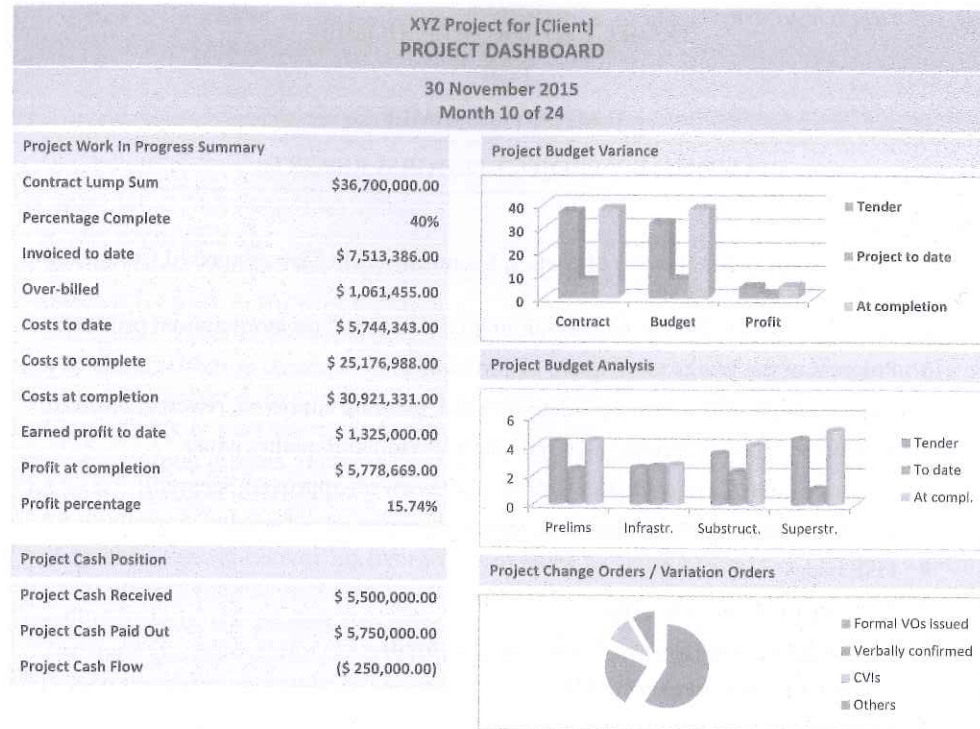


Figure 4.2 Contents of a project dashboard.

the prudent design professional will pay close attention to the detailed provisions of their services contract and if site visits are not to be made, all contracts (including the owner-contractor agreement), should be revised accordingly. Where even limited site services are contemplated, the agreement should precisely describe the limited services and the frequency of the visits.

Therefore, the contract terms may not exonerate the design professional in all situations and any legal analysis will always begin with an examination of the contract terms and the contract language. For that reason, architects and engineers should review contract provisions regarding inspection and observation duties with legal experts to ensure the language does not place undue risk on the design professional.

4.5 Project Progress Meetings

During the construction stage, the PM / engineer will hold regular formal Project Progress Meetings (normally monthly) attended by the contractor(s) and all relevant consultants, plus the employer or employer's representative. As these meetings will be required to make decisions affecting the project, it is important that all attendees have sufficient seniority within their own organisations to make these decisions; otherwise valuable time will be lost as they go back to their own organisations for authority, potentially leading to project delays.

Project Progress Meetings are an opportunity to:

- a receive progress reports from the contractor, which are often a synopsis of their own internal progress meetings with sub-contractors;
- b receive progress and cost reports from the project consultants;
- c receive records of all labour on site;
- d receive progress photographs – taken by contractor and client if appropriate;
- e discuss actual progress against planned progress;
- f approve appropriate testing procedures and schedules;
- g approve any mock-ups, if necessary, including off-site fabrications;
- h discuss any quality and HSE issues;
- i record weather reports for the project location;
- j highlight any issues with neighbours, such as noise, vibration, right to light, access, safety etc.
- k look ahead to the next period, if there are any issues which could affect progress.

Minutes of the meetings should be prepared immediately after each meeting and should be signed and accepted by all parties, so that it becomes a true record of progress on site. This true record is vital if there are any disputes or disagreements later in the project, especially regarding delays.

Table 4.4 gives a standard comprehensive agenda for a construction Project Progress Meeting.

4.6 Updating the project programme / schedule

When the contractor is issued with the Notice to Proceed (NTP), they are normally contractually required to supply the PM / engineer with a construction programme / schedule, termed the Baseline Schedule in many international contracts. Therefore, throughout the construction period, the contractor and PM / engineer will update this baseline schedule to reflect the actual progress on site.

4.6.1 Establishing the initial construction programme / baseline schedule

Depending on the conditions of contract, the contractor will either submit their programme within a stipulated time, or the PM / engineer may schedule a planning meeting to review the requirements of the contract concerning the schedule or to discuss any project-specific issues required for preparation of the schedule. In some cases, it may be preferable for this schedule to be mutually agreed and developed by the PM / engineer and contractor, so that both sides agree and have ownership of the programme, but in the majority of contracts, the contractor will submit their programme for approval / acceptance / endorsement by the PM / engineer: more different terms for effectively the same concept.

Upon receipt of the contractor's progress schedule submittal, the submittal will be reviewed within the time limit allowed in the contract to ensure that the Baseline Schedule is established in a timely manner. As the project progresses through the construction stage, the contractor's progress schedule submittals will be reviewed by the PM / engineer and compared against the initial programme / baseline schedule.

Table 4.4 Comprehensive agenda for a Project Progress Meeting

PROJECT AT [PROJECT NAME]						
FOR						
[EMPLOYER NAME]						
MONTHLY PROJECT PROGRESS MEETING						
INTRODUCTION AND GENERAL ISSUES						
1 All project meetings start with acknowledgement of the parties present and a short welcome by the PM.						
2 Corrections to / Approval of minutes of last progress meeting.						
3 Outstanding issues – see suggested log of outstanding issues below.						
Outstanding Issues Log						
Initial Date	Resolution Date	Description	Required Action	Action by	Time of Resolution	
					Planned	Actual
4 HSE Issues						
CONSTRUCTION PROGRESS AND TIME ISSUES						
5 Work in Progress						
a Main contractor's work (to date and look ahead)						
b Sub-contractor's work (to date and look ahead)						
6 Progress Schedule						
a Current schedule update and milestone summary						
b Critical path activities						
c Current expected completion date						
d Manpower and resources issues (planned v. actual, Actual this period, Cumulative actual, variance and justification)						
e Next schedule update						
7 Critical delays (i.e. items on critical path)						
a Any delays since last meeting						
b Current known delays (excusable / non-excusable / concurrent)						
c Potential future delays (excusable / non-excusable / concurrent)						
8 Non-critical delays (i.e. items NOT on critical path)						
a Any delays since last meeting						
b Current known delays / Potential future delays						
9 Extensions of time						
a Requested by contractor						
b Compensable (already granted – pending assessment)						
c Non-compensable (already granted – pending assessment)						

SCOPE OF WORK ISSUES

- 10 Testing of materials and equipment
 - a Tests conducted including results
 - b Non-conformance reports including corrective actions required
- 11 Shop drawings and submittals (if appropriate)
 - a Under review
 - b To be submitted (including dates)
- 12 Environmental issues
 - a Regulated materials including waste
 - b Work permits and licences
- 13 Variation order status
 - a Submitted, reviewed, approved, rejected, pending
- 14 Requests for Information (RFI)
 - a Outstanding, expected

COMMERCIAL / FINANCIAL ISSUES

- 15 Estimates and Cost Projections
- 16 Contractor payments
 - a Submitted, reviewed, approved, returned, pending
- 17 Value engineering change proposals
 - a Submitted, approved, rejected, pending
- 18 Agreement on final quantities and rates

DISPUTES

- 19 Items in dispute
- 20 Claims – submitted, reviewed, accepted, rejected, referred

For this reason, the initial programme is also referred to as the Schedule of Record (SOR) which acts as a benchmark against which any claims for delay, disruption and extensions of time will be compared. It is also useful for establishing the control systems for the purpose of monitoring and assessing progress, managing the day-to-day operations and for coordinating all work required to complete the project.

4.6.2 Monitoring the work and assessing progress

As soon as the project gets underway, accurate as-built schedule information will be recorded to create a historical record of the project. The as-built schedule information will be used for reviewing the contractor's monthly progress update schedules for accuracy and for performing periodic schedule analysis to identify any deviations from scheduled performance to determine if and when corrective actions are necessary for timely completion of the project. The as-built information will also be used to update the schedule when carrying out any impact analysis in order to evaluate the effects of variations and other time-related changes in the work or work plan.

6.6 Summary and tutorial questions

6.6.1 Summary

Variations and changes are a fact of life in all construction contracts. Therefore in order to maintain management control of the project – i.e. effective construction contract management – any required changes to either the original contract or the original scope of work must be assessed and evaluated before being formally issued to the contractor.

There are many causes of variations and changes required to the scope of works of a contract, as the works will be done in the future, so unforeseen events happen, new products appear on the market and employers can have a fickle habit of changing their minds about what they want to be included in the project. Whatever the cause of the variation, the process of amending the contract documents and incorporating the changes needs to be rigorously controlled in order to maintain control of the overall project. This involves change identification and analysis, change proposal, change evaluation, change instruction and, finally, change implementation. In many ways, this replicates the principles of configuration management used in the IT and process engineering industries.

As most construction standard forms of contract include appropriate rules for variations and changes, there are certain rules laid down for the valuing of the changes, which would either be by the application of rates for the work needed for the variation, or by the contractor giving a quotation which the PM / engineer will accept or not. The NEC contract uses the term ‘Compensation Event’ and the contractor’s quotation is expected to include all direct and overhead costs, plus all other impact costs, such as delay and disruption caused by the variation. This means that the contractor will not be able to issue a separate ‘claim’ for these delay and disruption costs, which effectively reduces the potential for disputes as it puts the delay costs where they should be – on the variation.

Whatever, the method of valuing the variation, the amounts will be included in the Interim Certificates when the work has been carried out and accepted and also included in any financial statements given to the employer to advise the eventual final outturn costs.

6.6.2 Tutorial questions

- 1 Discuss the essential difference between variation to the contract and variation to the works.
- 2 Discuss the ways of reducing the various causes of variations and changes to a construction project.
- 3 What are the main factors to be considered during the design stage to reduce the possible number of variations in the construction stage?
- 4 Outline the procedure to be adopted to control variations in the construction stage.
- 5 Discuss the requirements of each stage in the procedure for issuing Variation Orders.
- 6 Outline the main methods of valuing variations.
- 7 Discuss the advantages and disadvantages of including the delay and disruption costs with the direct costs of the variation.
- 8 What should be included in the ‘impact cost’ of a variation?

7 Sub-contracting

7.1 Introduction

A main contractor may engage another company in order for that firm to undertake a specific part of the main contractor’s scope of works. Whilst this concept of sub-contracting is not new, it has become more prevalent in the modern construction industry, due to the complexity and specialisation of the technology and the greater efficiency of operations that specialised companies can offer the project, thereby hopefully reducing the project costs. There is consequently a wide variety of specialist firms, together with non-specialist but local firms operating as sub-contractors within the construction industry in all parts of the world. A further reason for the use of sub-contractors is the increased flexibility afforded to main contractors who do not need to invest in the specialist plant and equipment needed for every aspect of construction operations. However, this flexibility must be weighed against the need to select, manage and control appropriate sub-contractors; therefore consideration must always be given to both the benefits and risks associated with sub-contracting.

These issues may of course be settled in the contract between the main contractor and the sub-contractor and there are a variety of general principles applicable to sub-contractor relationships. First, the main contractor remains responsible to the employer for all aspects of the sub-contract; so the main contractor is still responsible for time, quality and payment in accordance with the contract between the main contractor and sub-contractor regardless of any issue that could arise between the main contractor and the employer. This will of course depend upon the terms of the contract between the main contractor and a sub-contractor, and may also depend on the terms of the contract between the employer and main-contractor. However, they are nonetheless two separate contracts in law and the matching or integration of ‘back-to-back’ provisions and obligations can create their own problems and will often prove difficult to manage in practice.

7.1.1 Privity of contract

As can be seen from figure 7.1, there is normally no direct contractual link between the employer and the sub-contractor through the standard contractual supply chain. In a simple contractual relationship (i.e. with no complex terms and conditions), the main contractor does not act as the agent of the employer to any sub-contractors, and conversely the employer’s rights and obligations are in respect of the main contractor only.

There is therefore no formal direct legal relationship between the employer and sub-contractor.

The employer therefore cannot take legal action themselves against the sub-contractor if the sub-contractor's work is defective, lacking in quality, or causes delay to the works. On the other hand, the employer is only obliged to pay the main contractor and so sub-contractors cannot take legal action against the employer for the sub-contract price even if the main contractor defaults or becomes insolvent. These concepts arise because of the general principle that there is no privity of contract between the employer and a sub-contractor; however, the employer, main contractor, sub-contractor and supplier relationships are rarely this clean cut in practice.

The employer may wish to influence the choice of a sub-contractor to be employed on the project, or indeed the terms on which a sub-contractor or supplier is engaged. An employer may also wish to use a specific firm or insist on the main contractor choosing from a list of 'approved' firms to which the main contractor may or may not add further names. The main contractor may only be prepared to sub-contract work on particular terms, or may wish to limit the main contractor's risk or payment obligations. In respect of payment, the main contractor may further wish to limit their exposure by part-paying sub-contractors or sharing the risk of the employer's insolvency. The contractor is therefore normally liable to the employer for any default of the sub-contractor. When a contractor engages a sub-contractor they are simply delegating the performance of the works to someone else and this delegation, together with the management and control procedures, must be clearly outlined in the sub-contract documents to avoid doubt and ambiguity during the construction stage.

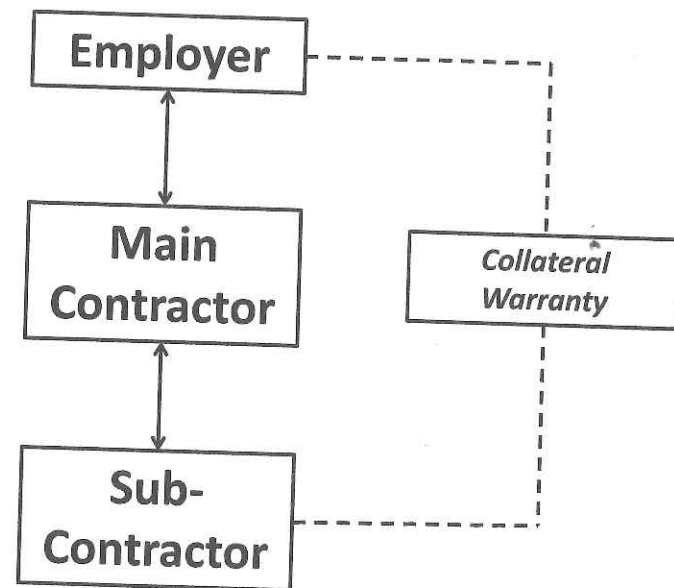


Figure 7.1 Simple contractual relationships between employer, main contractor and sub-contractor.

7.1.2 Personal or vicarious performance

Some contractual obligations are clearly impossible to delegate, and an example could be wishing to have your hair cut by a particular hairdresser, or purchasing a ticket to see a particular singer or entertainer. In these cases, if the particular hair stylist or particular entertainer is not available, then the contract is void, even though the salon is still in business or the concert still takes place. Unfortunately, this is rarely the case in the construction industry and in most cases it will be possible to sub-contract some (or all) of the work so that the contractual obligations are effectively being performed vicariously.

Further issues that arise include the incorporation of the main contract terms into the sub-contract ('back-to-back' provisions as mentioned above), which is often carried out with limited success. Sub-contract terms themselves are often incorporated unwittingly or due to time pressures, which can result in the concept known as the 'battle of the forms' where the terms of a sub-contract or supply of goods and materials are printed on the back of the last form to be sent or received – i.e. the 'offer' which is then 'accepted' by the issue of a Purchase Order. A further issue is the incorporation or otherwise of the dispute resolution procedure, in particular arbitration, which may not have been in the minds of both parties at the outset.

7.2 Relationship between main contractor and sub-contractor

A distinction is often made in the construction industry between 'domestic' sub-contractors and 'nominated' sub-contractors. This distinction is taken to mean that a domestic sub-contractor is totally selected and employed by the main contractor, for whom the main contractor is solely and entirely responsible, whilst a nominated sub-contractor is one selected by the employer but employed by the main contractor. If a sub-contractor is nominated then the employer usually retains some liability and responsibility and this has caused major legal problems in the past, so that most modern standard forms of contract do not include any provisions for employer nomination of sub-contractors. In addition, some standard forms of contract, notably the JCT Intermediate form have created a further category – that of 'named' sub-contractors.

In this case, the employer names one or more preferred companies and the main contractor may add further companies to a sub-contract tender list. The work is then tendered to this overall list and a sub-contractor is selected by the main contractor using their standard selection procedures. The sub-contractor is therefore treated as a domestic sub-contractor thus avoiding the employer liability disadvantages of nomination, but giving the employer some element of involvement in the selection process. The obligations between the sub-contractor and main contractor will be set out in the terms and conditions of the domestic sub-contract and each family of standard forms of contract (JCT, NEC, FIDIC etc.) will have standard conditions of sub-contract for use with their main contract conditions.

As stated above, the contract between the sub-contractor and the main contractor is a completely separate legal agreement from the main contract between the employer and main contractor, although standard forms of sub-contract only tend to be used on relatively large projects and where the sub-contractors have the appropriate commercial skills to be able to understand them. Sub-contracts are usually formed by way

of an exchange of letters, or more frequently by the main contractor issuing a Purchase Order (PO) or Letter of Award (LoA) to the sub-contractor. This PO or LoA then seeks to incorporate the terms of the contract, often by reference to some standard terms and conditions printed on the back of the PO or attached to the letter. This can be a very tricky position for both the main contractor and sub-contractor and may lead once again to the 'battle of the forms' to decide which terms and conditions were, or should have been, contained in the offer and which in the acceptance. Good work for construction lawyers.

7.2.1 *Incorporation of main contract terms*

Far more interesting questions arise when the main contractor attempts to incorporate the main contract terms into their sub-contracts – the 'back-to-back' arrangements mentioned above. A total replication of the main contract terms is, of course, likely to cause a wide range of problems, but the main contractor will wish to ensure that there is full coordination in the supply chain for at least the following issues:

- bonds, warranties, guarantees and insurances – to ensure there is full cover and no unnecessary duplication;
- retention percentages – to ensure the sub-contract retention is at least the same percentage as the main contract percentage;
- payments terms – to ensure that the main contractor only pays the sub-contractor after receiving the funds from the employer – this is not the same as a 'pay when paid' clause which is illegal in the UK.

Delay

An issue relating to the incorporation of terms into a sub-contract is about who takes the risk in respect of any project delays. It may sound common sense that a term should be implied into the sub-contract to the effect that the sub-contractor should be able to organise their work in an efficient and profitable manner (similar to the main contract that the contractor should progress with the works 'diligently'). Therefore, if the main contractor is issued with an extension of time for a relevant event in the main contract, then the sub-contractor should also benefit from the extension of time if the delay also affects the progress of their works.

Dispute resolution

As the contracts between the main contractor / sub-contractor and the main contractor / employer are quite separate legal agreements, the dispute resolution procedures incorporated into the contracts need not be the same. For example, the main contract may include an arbitration clause, but a sub-contract might not, as the scope of the sub-contract may not have the technical or commercial complexity requiring such a major procedure. If the sub-contract does include an arbitration clause, the main contractor may seek to pass on the dispute to the client, thus requiring two separate arbitration proceedings and the consequent increased legal costs. Not a happy state of affairs, especially as the different arbitrators may reach different decisions. Fortunately, the main contract and most sub-contracts are likely to fall with the remit

of the Construction Act (if located in the UK or based on English law), therefore adjudication will be the first point of call for any dispute resolution. However, in countries and jurisdictions where there is no requirement for statutory ADR, the dispute resolution procedures for sub-contracts should be considered very carefully to ensure they are appropriate to the main contract terms and can be resolved quickly to avoid any unnecessary delays to the project.

Name borrowing

A related problem area in dispute resolution is that of name borrowing. This procedure allows a nominated sub-contractor to commence arbitration proceedings against the employer, by 'borrowing' the main contractor's name, which can cause some difficulties with both privity of contract and whether both main and sub-contracts contain arbitration clauses. There have been some significant legal cases in this area where a sub-contractor sought redress from the employer by borrowing the name of the main contractor to take the legal action under the main contract. The precise legal nature of name borrowing is fraught with legal difficulties and clearly outside the remit of this book.

A licence to be on the site

The access rights to the site for the sub-contractor should be covered within the sub-contract in the same way that the main contractor's access to the site is covered in the main contract. This is to ensure that the main contractor can retain control over the number of companies on site at any given time. In the absence of any express terms, there will be an implied licence that a sub-contractor will be afforded such reasonable access as will enable that sub-contractor to carry out and perform their sub-contract work. This also applies to all welfare, canteen, toilet facilities etc. on site which will be covered by both the main contractor's and sub-contractors' preliminaries.

Withholding payment, Pay Less, set-off and abatement

'Set-off' is the procedure whereby the main contractor is able to deduct money from sub-contractor A in order to pay sub-contractor B for any acts or omissions of sub-contractor A. In general, a main contractor can only do this by the use of very clear wording in the sub-contract, and in the UK, consideration must also be given to the Construction Act if an appropriate Withholding Notice or Pay Less Notice has been given. This requires that a notice be served within a stipulated period before the final date for payment, or in default 7 days before the final date for payment. The notice must state that an amount or amounts are to be withheld and the grounds for withholding the amount as appropriate. See Chapter 5 for further discussion of this issue.

7.2.2 *'Pay-when-paid' and 'pay-if-paid' clauses*

The further you travel down the contractual chain, then complaints about the ability to receive payment increase proportionately. Payments to sub-contractors is a regular theme in the technical press and not only concerns the sub-contractor's ability to be

paid, but also to protect themselves against insolvency of those above them in the contractual chain. Also discussed regularly are such issues as 'pay-when-paid' clauses, 'pay-if-paid' clauses, the ability to recover retention monies from the main contractor and lengthy payment periods (so the main contractor holds on to the funds for longer thus relieving their own cash flow).

Pay-when-paid clauses mean that the sub-contractor will only be paid by the main contractor when the main contractor themselves receive the appropriate payment from the employer. This is now illegal in the UK (the legal term is that the clauses are 'not effective' – meaning they cannot be enforced in court, unless it is due to the employer's insolvency) although they do find their way into sub-contract conditions in other parts of the world. In this case the sub-contractor will have a commercial decision to make – do they accept the clause and run the risk of delayed (or non-) payment, or challenge the clause and risk future relationships? There have been several legal cases around the world that have sought to show that a pay-when-paid clause is actually a pay-if-paid clause, since if the cheque doesn't arrive from the employer, the main contractor clearly hasn't been paid, so cannot pay the sub-contractor (i.e. pay *when* paid). The courts have generally rejected this argument saying that the debt still exists under the sub-contract.

However, a pay-if-paid clause has more certainty in that the main contractor will only pay the sub-contractor *if* they receive payment from the employer. Clearly, there also needs to be some indication of time as well – how long after payment has been received from the employer will they pay the sub-contractor?

In the United States, a similar clause has been construed as merely postponing payment for a reasonable time. The clause does not mean that a sub-contractor is not entitled to payment because of (say) the employer's insolvency.

7.3 Relationship between sub-contractor and employer

In addition to the particular day to day issues arising from sub-contracting, whether as a domestic or nominated sub-contractor, it is worth separately considering the potential liability of a sub-contractor towards the employer. There may be some form of contractual relationship between the two parties – a direct contract, or collateral warranty, or an implied contract, as well as a liability in tort. These issues are now considered below.

7.3.1 *Sub-contractors liability to the employer – collateral warranties*

A collateral warranty is a direct contract normally between a sub-contractor and the employer – see figure 7.1 above. This procedure is quite common in the construction industry and refers to the warranties (usually executed as deeds) that sub-contractors are frequently required to provide in favour of employers and other third parties such as end-users, tenants and funding institutions. A collateral warranty is normally a formal written document, which is enforceable in court and many of the standard forms of contract (e.g. JCT) include templates for sub-contractor collateral warranties documents.

Alternatively, as it is a contract a collateral warranty may be formed in a more informal way, perhaps in correspondence or even orally, as long as the usual legal requirements for a contract are satisfied. In other words, there must be a clear offer

which has been accepted, certainty as to the subject matter and an intention to create legal relations, together with consideration. The requirement for valuable consideration creates the greatest difficulty in this scenario. However, in practice valuable consideration exists where the employer insists upon the main contractor entering into a sub-contract with a particular sub-contractor after the warranty has been given by that sub-contractor to the employer. In that situation the employer will be able to sue the sub-contractor or supplier for any loss caused by breach of the warranty. Clearly, care must be taken with correspondence during the negotiating and tender period for sub-contractors.

Duty to warn

Many contracts include a duty to warn as an express requirement of the contractor (a major obligation under the NEC contract), and even if there is no express term, this duty may still exist in tort. A specialist sub-contractor may have a duty to warn where, for example, the design of their portion of the works is defective, and the specialist nature of the sub-contractor's work is such that they ought to recognise the defect. Any contractor, being an expert in their field, would normally have an implied duty to warn against issues within their specialisation.

7.3.2 *Employer's liability to sub-contractors*

In the good old days, when sub-contractors could be nominated by the employer, the standard forms of contract provided for direct payment from the employer to the nominated sub-contractor in certain circumstances and this right was only available where it was expressly set out in the contract, i.e. there was no implied right to direct payment. The reason for direct payment provisions was to protect the nominated firm in case the main contractor became insolvent or ceased payments to the sub-contractor for other reasons. The main purpose for this facility was that nominated firms usually dealt with critical parts of the work and the employer may lose much more money if the main contractor becomes insolvent and the work ceases. The replacement of a main contractor is an expensive business and can also cause significant delay to the project. However, the replacement of a specialist nominated sub-contractor can also cause considerable delay and expense to the employer, so in the event of the main contractor's insolvency it will invariably be in the employer's interest to make a direct payment in order to keep nominated sub-contractors working whilst the main contractor is being replaced.

7.3.3 *Employer's instructions to sub-contractors*

Due to the concept of privity of contract, the employer has no right to issue instructions to sub-contractors to carry out any specific work. Also, the PM / engineer or contract administrator has no authority or power to instruct the sub-contractor, unless this is specifically included in both the main contract and the sub-contract agreement. However, if the employer does instruct the sub-contractor to carry out any works, this could be construed as a separate contract, based upon an express or implied promise to pay the sub-contractor. It is therefore easy to see how complications can arise if this separate contract interferes with the progress of the sub-contractor's

scope of work for the main contractor and will lead to all kinds of difficulties, of which a claims conscious main contractor will undoubtedly seek to take advantage. Conclusion – employers should not issue instructions direct to sub-contractors.

A further problem relates to the rule against preferences arising from insolvency legislation. It is not normally possible for an employer to make a direct payment to a sub-contractor as a result of insolvency and at the same time withhold money from the (insolvent) main contractor's account, especially when the payments should be processed through the main contractor, even though these funds may not find their way to the sub-contractor. The problem, therefore, for the employer is that they may end up making the payment twice. Once to the main contractor (to be added to the assets distributed to preferential creditors under the rules of *pari passu*) and then again to the sub-contractor if they want the sub-contractor to finish the work. Generally speaking, most if not all unsecured creditors to insolvent construction companies receive little, if anything, in the way of payments. Otherwise they wouldn't be insolvent.

However, this rule does not apply where there is a direct contract between the employer and sub-contractor (which also means they are not technically a sub-contractor) such as partnering agreements or when the employer has guaranteed payment to the sub-contractor before they agreed to work for the main contractor. Under French law, for instance, sub-contractors are protected against non-payment by the main contractor and can, in certain instances, claim against the employer for amounts due under sub-contracts. The employer would therefore normally require the contractor to obtain a payment guarantee bond in favour of the sub-contractor. The effect of this law is also important for international contracts where the parties choose French law, as this rule will automatically apply. So, a sub-contract being carried out in another country (other than France, but subject to French law) will still benefit from this provision.

7.3.4 Control mechanisms for the employer

A variety of control mechanisms may be used by the employer or PM / engineer in a main contract in order to attempt to control the extent of sub-contracting. These include:

- Prohibition clauses
- Approval procedures.

Prohibition

The main contract may contain a prohibition or limitation on the main contractor's ability to sub-contract. For example, the JCT Standard Building Contract requires the contractor to obtain consent before sub-contracting, in order to provide some level of control by the employer in respect of the portions of the works that are sub-contracted. In addition, it also provides the employer with an opportunity to identify which elements of work are being sub-contracted and to whom.

The PM / engineer (architect / contract administrator in JCT contracts) or employer may wish to withhold consent where they have had some particularly bad experience with a sub-contractor, or given the particular circumstances and

nature of the works it is unreasonable or impractical to sub-let a particular part of it. The assignment of a contract, however, is normally prohibited without the written consent of the other party.

Approval procedures – 'or other approved'?

Many contracts still contain the outdated and dangerous provision that materials or components are to be obtained from 'Company X or other approved' although this is now much less common following competition laws and anti-trust regulations in many countries. The term 'or other approved' does not provide the contractor with any additional rights and the employer or its representative is usually within their rights to refuse consent to use materials or components other than those specified. However, on the other side of that coin is that if the specified supplier fails to deliver and causes delay to the project, the contractor may have cause for a claim against the employer. If the project contains a process for 'materials approval' by the supervision consultants then great care must be taken that this consent procedure does not generate delays.

Negligence

In common law jurisdictions, a sub-contractor may have a duty of care to the employer or indeed future occupiers and / or owners of the building in respect of personal injury and property damage to other property for any negligence on their part, although this will usually extend only to physical damage and not economic loss (such as loss of profits) unless the employer or future occupier has a contractual relationship with the sub-contractor via a collateral warranty. Of course, nothing is ever this clear cut and a sub-contractor (especially one with a particularly specialist product or service which they are engaged to carry out) may have a higher duty of care to the employer and the bar to what is considered to be negligence is consequently increased. Given all this, and to be absolutely sure, it is still in the employer's interests to create a contractual relationship with sub-contractors via collateral warranties.

There is a general principle in many legal jurisdictions that a contractor may discharge their duty of care to an employer by delegating it to an independent sub-contractor and this principle would be even stronger if the employer appoints the independent contractor separately or they are a nominated firm. However, it is fairly obvious that the contractor must select the sub-contractor carefully to ensure that the firm has the appropriate capabilities and there may also be some non-delegable duties which the main contractor is not permitted to pass on to others.

7.3.5 Rights of third parties

If there are no collateral warranties, then as we have seen, the doctrine of privity of contract means that a contract cannot confer rights nor impose obligations arising under it on any person except the parties to the contract. The general rule comprises two factors: the first is that a party cannot be subject to an obligation by a contract to which they are not a party, and secondly, a person who is not a party to a contract cannot claim any of the contractual benefits. This principle has been slightly amended now, especially in the UK with the Contracts (Rights of Third Parties) Act 1999,

which attempts to give contractual benefit to appropriate third parties (such as tenants, end-users etc.) but only in certain circumstances. This principle has since been taken up by other countries and jurisdictions with similar common law system – most notably Singapore and Hong Kong.

For a third party to be able to sue for losses requires the following points must be proved:

- 1 that the loss was foreseeable, and the contractor's original breach would cause loss to later owners;
- 2 that the contract must prevent an assignment;
- 3 that a third party must have no other cause of action (for example, a collateral warranty) and;
- 4 that 'substantial damages' had been incurred by and will be for the benefit of the third party subsequent owner.

7.4 Sub-contracting v. assignment

Assignment relates to the total transfer of rights and obligations in a contract from the 'assignor' to another party, the 'assignee'. Virtually all standard forms of contract specifically prevent the contractor from assigning the contract to another party. For example, the FIDIC Red Book prevents either party from assigning the contract without the prior agreement of the other party and this principle is mainly mirrored in the other major standard forms.

What then does 'assignment' actually mean and what is the difference compared with merely sub-contracting? As contracts legally are an exchange of value, they must therefore contain both benefits and burdens to both parties. In construction projects, the burden on the contractor is an obligation to complete the work and their benefit is the right to receive payment. The burden on the employer is to pay and the benefit is to receive the completed building or facility. See table 5.1 in Chapter 5

The fundamental principle of assignment is that a benefit or burden is handed over to another party, whilst the contract is still in existence. This of course would require yet another contract – a deed of assignment – and it is that which requires the consent of the other party. So, a contractor cannot assign their ability to complete the works and a debtor cannot be relieved by simply assigning the burden of payment to someone else.

A contractor may however assign the benefit of receiving future income (e.g. retention money) in order to obtain credit from suppliers, or immediate cash from a funding institution, but this does not relieve them of the responsibility to complete the works or remedy any snags during the defects correction period.

7.5 Design by sub-contractor

Where an employer requires a specialist sub-contractor to carry out work, one of the reasons for this is that the sub-contractor will invariably have the skills in designing the particular work as well as its construction or manufacture. Therefore, the sub-contractor will be performing a specialist design function in addition to the actual carrying out of the works on site. In these circumstances, the design work performed by the specialist sub-contractor is the normally subject of a direct warranty from the

specialist sub-contractor to the employer or end-user to ensure that it is fit for purpose and achieves the desired functionality. If the carrying out of the work on site is sub-contracted by the main contractor to the specialist firm, the extent to which the main contractor is liable for defects in the workmanship of the sub-contractor will depend on the precise terms of the various contracts. Therefore great care must be taken that specialist firms which take responsibility for both design and construction are clear to whom they owe the warranty.

This warranty also includes a specialist firm's development of design started by others, as sub-contractors are often required to produce 'shop drawings' or 'installation drawings', i.e. to take the original designer's concept design and produce detailed working drawings to enable the components to be manufactured and installed.

Because of the specialist nature of their expertise, it is likely that there will be some design development required from the concept design provided to them. If there is any element of design development, then any further drawings are usually considered part of the original design unless there is a specific requirement on the sub-contractor to contribute to or complete the design. In other words, the original designer retains professional responsibility, unless expressly provided for in the contract.

On a more general level, the usual concepts of satisfactory quality, fitness for purpose, diligently progressing with the works etc. will be implied into a sub-contractor's work unless specifically included as express terms in the contract conditions.

7.6 Summary and tutorial questions

7.6.1 Summary

Almost all construction projects of any reasonable size include sub-contractors to cover specialist or highly technical aspects of the scope of works. The reasons for sub-contracting can range from employing specialist companies with lower unit costs, thus reducing the overall costs to the employer, to employing technical specialist organisations with expertise in, say, HVAC (heating, ventilating and air conditioning) installations. In the latter case, the expert companies will also be able to design the systems or installation based on the employer's requirements.

In terms of contract administration and management, there is no direct contractual relationship between the employer and sub-contractor, therefore all instructions, variations etc. will need to be processed through the main or principal contractor, who also has the responsibility to achieve the overall programme. In order to provide such a contractual relationship, a collateral warranty will be created between the sub-contractor and employer, although these do not affect the contract administration procedures.

Main contractors will clearly wish to replicate the main contract terms and conditions in the sub-contracts, so that any risks and obligations they have accepted will be passed direct to the sub-contractor for that portion of the works. This includes obligations for quality, time and payment.

As far as the employer is concerned, they will want to ensure that, whoever does the actual work, they or the PM / engineer has the same level of control as well as recompense if the work is not up to an acceptable standard.