1 The client team

Clients are not unitary bodies but need to be considered as a team comprising (in-house or out-sourced) individuals, internal departments and external entities organised to deliver clients liabilities and obligations. Client teams have a collective goal of determining a need (normally encapsulated in a business plan), arranging finance and organising the processes that result in the delivery of building projects to satisfy their requirements. There are many different ways of categorising client types according to the particular nature of the building project. Figure 1.1 describes these based on their financial motivation and the beneficiary of their efforts.

The performance of client teams affects the quality, cost and progress of the construction on site. Client teams need to establish structures and protocols to deliver their responsibilities and obligations with respect to legal, contractual and financial matters, facilities management, and project management to support and interface with the construction team.

By the time construction starts clients will have determined the procurement route that informed the nature of the design work, method of selection of construction team, established how work is authorised, financed, programmed and commissioned. They should also have planned for the ultimate disposal of finished building projects once their need for them has expired – this may be by demolition or sale. At any stage, and certainly at the key decision point prior to starting construction, clients should review their business case plans before deciding whether to proceed as is, proceed with modifications or to stop a project.

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1.1 Client team functions

Client team functions comprise:

- ***Legal***: As well as operating their entity within the law with respect to employment of staff, taxation and disclosure of information, clients have to fulfil certain legal requirements to take reasonable steps to

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Figure 1.1 Types of clients

ensure that arrangements related to health and safety matters for all building projects they procure are in place and properly managed;

- ***Contractual***: These can be categorised as either non-contentious or contentious. Non-contentious roles cover the legal aspects of setting up equitable contracts, contract administration and dealing with claims; for example, dealing with claims relating to delays to the completion of a project or requests for additional payments. Contract law becomes 'contentious' when something goes awry; for example, projects run late, over budget or terms of the contract have been broken and resolution cannot be mutually agreed. However, the contracts, when drawn-up, should set out how any disputes should be dealt with, and usually (in an effort to minimise costs and to promote better relationships) the preferred route to resolution is through conciliation, or arbitration if necessary, rather than via the courts;
- ***Financial***: This involves developing financial models and sourcing the necessary finance. This may be by self-investment, borrowing on a repayment basis, accessing grant funds, or by means of special purpose vehicles (SPVs). It also involves ensuring the finance is available, at the right time, and distributed in accordance with the terms of contracts;

- ***Facilities management***: This includes the operation and maintenance all the building services engineering systems, including the information communications technology (ICT) infrastructure systems. Ideally, this involves client participation during the design phase to impart information regarding the operation and maintenance of the existing facilities and to recommend improvements. During the construction phase the facilities management function should continue to be involved, particularly during commissioning, where the building services engineering systems are set up in readiness for building occupation. It also includes ensuring that the information generated during the construction phases is appropriate for the occupants, business operational needs and asset management of the completed building project.
- ***Project management***: Client teams need to interface with the construction team to provide information and make decisions concerning residual design issues, programming matters, quality assurance requirements, risk management and value management. Client team representation needs to be organised to articulate its particular desires and wishes as required such that they can be understood and addressed in a useable way by the construction team. There may be more than one group of end-users that needs to be represented; for example, in a healthcare environment there are different types of patients, staff and visitors that must all to be considered as end-users.

There may be a single point of contact (SPOC) between the client's team and the construction team. The SPOC may, depending on the particular contract, be called the clients' representative, client project coordinator or even just project manager; despite the name, on larger projects the SPOC role may be allocated to more than one individual. This book uses the term client-side project manager. Depending on the client's skill set and capabilities, this role may be undertaken using in-house staff or out-sourced to an independent project management organisation, a design or quantity surveying entity (with in-house project management capabilities) or a combination of these. Some procurement routes are such that the contractor also effectively acts as the client-side project manager.

Client-side project managers are primarily concerned with ensuring that the project delivers the benefits set out in the business case and should be mindful and react to any circumstances that necessitate a change to the business case. When building projects are active on-site part of this role may be taken up by a clerk of works, who acts as the client's representative on site – either on a full-time or visiting basis.

1.2 Client's liabilities and obligations

Client teams need to establish a structure and protocols to deliver their responsibilities and obligations.

Health and safety

Clients have a legal obligation to ensure that any contractors appointed by them have the necessary competencies and resources to carry out the construction work safely. Clients must provide relevant pre-construction information to those undertaking or affected by the construction works and make the required statutory appointments for advisors in respect of construction health and safety risk management matters.

Achieving statutory health and safety requirements may include responsibilities for notifying the relevant authorities of impending building projects, contributing to and producing the required relevant documentation and, via the construction team, ensuring that the appropriate project management arrangements are in place and being correctly maintained. Although the responsibility for health and safety on site is transferred to contractors, clients may still have responsibilities, which will be dependent upon:

- The proximity of the construction works to the client's employees and business operations that is if it is remote or completely isolated it poses no threat.
- If it is vital for clients to keep business operations live during the construction works, which may expose the contractor to risk.
- If clients have determined how contractors undertake particular aspects of the works.

Depending on their particular ethical and moral stance, possibly incorporated into their Corporate Social Responsibility (CSR) policies, clients may choose to extend their minimum legal obligations beyond those directly responsible for the construction of their building project; that is they may assume obligations to materials and equipment suppliers, the suppliers to materials and equipment suppliers … and so on down the supply chain.

Allied to health and safety is occupational health. This considers the physical and mental well-being of employees in respect of the effect work could have on employees' health, and what effect employees' health may have on work. Some aspects of occupational health, for example medical surveillance concerning dealing with hazardous materials, such as asbestos, lead and compressed air, are mandatory. Other aspects of an occupational health programme, for example advice on healthy eating and back care, free eye tests and blood pressure measurements, are not mandatory but may be made available.

Migrant worker welfare and accommodation

Developing countries may be reliant upon migrant workers to help with their construction programmes. At the same time, these developing countries may not have the same approach to health and safety and occupational welfare as developed countries.

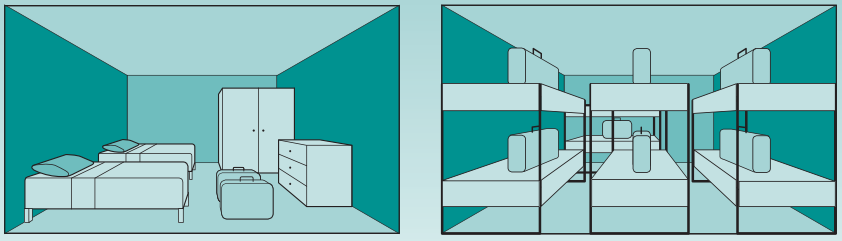

Figure 1.2 Migrant worker accommodation (ideal vs. non-ideal)

An example of extended occupational health and safety responsibility is illustrated in Figure 1.2, where reasonable quality welfare and accommodation are provided for migrant workers although there is no in-country legislation necessarily requiring it.

Awarding the contract for construction

Clients are responsible for formalising the appointment of the construction team in contractual terms to meet their requirements. Depending on the procurement strategy (Chapter 3.2) this may require the appointment of a single entity or a number of separate entities. The construction team contract(s) may include requirements for design, operation and financing of the projects as well as the actual construction. This reflects clients' attitude to quality, time, costs and risks, as well as their scope of control and funding for a project.

Clients require contractors to provide performance bonds to provide themselves with a third-party guarantee of the construction teams' performance. This protects them with monetary compensation against contractors failing to fulfil contractual obligations for them, for example due to poor performance or bankruptcy.

Handover to contractor of the site

Clients are responsible for handing over possession of the site to the construction team. As well as the actual project site this may also include stores areas, material lay-down areas and designated parking areas. Clients will need to advise any working restrictions for the site area; for example, working hours' and noise criteria.

With respect to utility services within the site area, clients are responsible for undertaking isolations, disconnections or removals of equipment, and providing the record information to confirm this. Besides the gas, water and electricity services, this may include medical gases, telecommunications, TV aerials, fire alarm cables and condensate lines. Notwithstanding this, contractors should verify all information claimed to confirm either the absence of or the location and status of any utility services; for example, there may still be unidentified services that are still live, which either need to be worked around, isolated or isolated and removed.

If clients are providing utility services (typically electricity and water) to the site for use in the construction process, then, at handover, meters should be read, or installed if not already in place, and a tariff agreed for repayment.

In the case of refurbishment projects, issues related to continued occupation of any part of the existing building, for example health and safety, impact of noise, site lighting, dust and access for personnel and vehicles, need to be informed by clients.

Providing information to the construction team

Clients must provide all relevant information already in their possession or reasonably obtainable concerning the site in a timely manner for the construction team. This includes:

- A description of the construction works planned, including important dates such as handover of site to the contractor, time allowed for planning and preparation for construction work before the construction phase, interim and final completion dates.
- Appointments for the design team already in place.
- Information directly relating to the existing site, such as record information of any existing utility services and/or building services engineering systems installed, asbestos and other hazardous materials registers, and all existing health and safety information.
- Information pertaining to the eventual use of the building as a workplace.
- Any site specific hazards and risks identified that will affect those carrying out the construction work.
- Client requirements such as health and safety goals and aspirations, participation in voluntary codes and practices schemes, site rules, emergency procedures.
- Residual design information.
- Disclosure in respect of decisions to change design criteria. Buildings are constructed from a set of client requirements that define client's aspirations. In reality, changes to the clients' original requirements are inevitable. Reasons for changes may be due to changing business requirements, or simply a change of heart, or due to a value engineering process.

It was only a little thing…

Whilst clients are entitled to change their mind, they need to be mindful that even a seemingly innocuous change may have significant impact on an already designed scheme; for example, if a client decides it wants to change from having electric to gas cookers in a new apartment block project (Figure 1.3), there may be a greater impact than just an exchange of equipment. The change may necessitate:

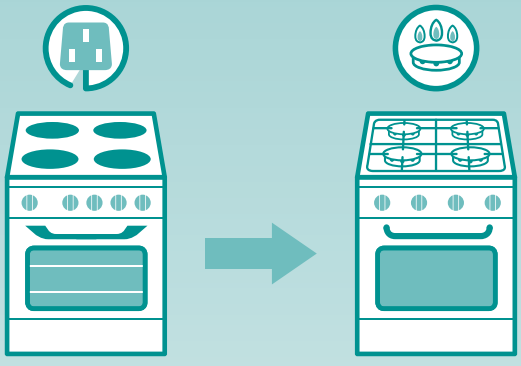

Figure 1.3 Changing from electric to gas cookers

- Omission of electrical distribution system associated with supplying the cookers. The design of the remaining electrical distribution system will need to be reviewed with respect to load analysis, discrimination, allowances for spare capacity, cable and distribution equipment sizes, containment sizes and location of final outlets. This may result in spare space in the building.
- Addition of a larger, or even new, gas supply. The design work will require a load analysis, pipe and equipment sizing, consideration of the distribution of the gas pipework in suitably ventilated routes Also, consideration of interfaces with the fire detection and alarm system with respect to gas shut off valves, gas leak detectors linked to an alarm system.

There will be additional costs associated with the redesign work, not just for building services engineers but also probably for architects, interior designers and quantity surveyors.

Furthermore, the construction team may be due costs and additional time. Even if the new gas distribution system and cookers have not yet been installed there may have been much 'invisible' work associated with the procurement – arranging and appraising quotations, raising the paperwork to place the order for equipment, perhaps effort spent chasing those orders, if it is delivered to site arranging for inspection and receipts, arranging for storage and making final payments.

Whilst it may be possible to get monies back for equipment bought, often this is not the full amount and as described there are further costs borne by the design and construction team which are entitled to be claimed for.

Changing client requirements are one of the principal factors that contribute to delays and budget overruns of building projects and, consequently, result in claims, disputes and construction team dissatisfaction. Contractual claims can be made against clients for extensions of time and

money (loss and expense) and for the cost of changes to the works due to such changes or variations. Costs may be associated with finance charges, loss of profits, general disruption and abortive management time.

Change management procedures should be included in the construction contract to ensure that such changes are handled through a properly coordinated and controlled process that is visible, traceable and auditable.

Discharging residual design decisions

There may be residual client decisions and information not available during the design stage required which need to be advised to the construction team.

Final selection of FF&E

Furniture, fixtures and equipment (FF&E) ranges in nature but typically includes ICT/telephony, audio visual equipment, signage, catering appliances and specialty equipment required to support the buildings functions. FF&E may be built into the building fabric or stand alone. Typically, the building services engineering design would have made a notional allowance in terms of the size, location and interface arrangement with the building services engineering systems. Delaying the final selection of FF&E to the construction stages allows clients to choose the most up-to-date equipment, albeit that this may necessitate modifications to the design. During the construction phase it is necessary to consider the actual equipment selected to ensure it coordinates in all respects with the building design.

FF&E may require connections to the building services engineering systems, power, air, water, drainage or telecommunications connections. The size, location and interface arrangement allowed for in the notional design may need to be amended; for example, what was envisaged to be a plug and socket arrangement for connecting a piece of electrical equipment may need to be changed to a directly wired fused connection unit. Also, the heat gains derived from the finally selected piece of equipment need to be checked against the notional allowance, as the heating and cooling system designs may need to adjusted.

FF&E may not require connections to the building services engineering systems or utility services, that is stand-alone equipment, but its presence may affect the building services engineering design; for example, the location of cupboards or shelving may impact on the position of socket outlets, grilles, taps, telephones and so on.

Approval of samples and mock-ups

These are provided by the construction team and comprise representative portions of the final specified items that may be necessary to satisfy aesthetic, performance or public relations requirements. They may be physical (with a degree of functionality varying from nothing to fully

functioning) or may comprise virtual images and models. The purposes range from reviewing materials, colours and finishes, making final selections from a range of possible items. They may be full size or to scale. In addition, samples and mock-ups may be retained as benchmarks for use in project quality control.

Handback from contractor to client

At the end of projects clients take back responsibility for the buildings and become building operators. This means they assume the responsibility for operation and maintenance, utility services, arranging the necessary insurances and licenses to operate.

Operation and maintenance

To protect the significant capital investments in equipment and systems, the building services engineering systems need to operate and maintain uttermost efficiency, without unplanned outages of service, such that harm and discomfort to the occupants is avoided and the right environment for the processes that occur in the building are provided. During the construction phase, clients should assign appropriate facilities personnel and allow them time to participate in contractor's testing and commissioning activities, including coordination and planning meetings, attending on and off-site demonstrations of operations of systems, and also to receive training in operation and maintenance of building services engineering systems. This may involve ensuring there is adequate in-house staff or procuring appropriate contracted services. If the skills required to support the installed building services engineering system need enhancing, training will need to be provided.

The responsibility for ensuring buildings are used as per the design parameters applied to the building also passes to clients as building operators; for example, this includes:

- Ensuring occupancy rates in spaces is within the range allowed for in the design – otherwise the ventilation and cooling systems will not function as designed, giving rise to poor indoor air quality and overheating of the space.
- Ensuring all portable electrical equipment is tested (Portable Appliance Testing) before being connected to (plugged into) the fixed electrical wiring system causing nuisance tripping out of electrical circuits.

Utility services agreements

Clients will need to arrange for taking over the utility services agreements, agreeing appropriate tariffs and making payments – otherwise the contractor may continue to receive the bills.

Arranging insurances

Clients will need to arrange for the appropriate insurances ready for the occupation of a building. These typically include:

- Buildings insurance against damage to the buildings structure (walls, windows, roof etc.) as well as permanent fixtures and fittings, such as sanitary ware and kitchen fixtures, and contents insurance for loose equipment. Depending on the particular policy this may cover the insured against fire, lightning strike, explosion or earthquake, theft or attempted theft, riots or vandalism, storms or flooding, subsidence, falling trees, moving objects (such as a vehicle impacting the building) and escaping or leaking water, oil or other fluid.
- Employer's liability insurance to cover the cost of compensating employees who are injured at or become ill through work.
- Public liability to cover for accidental injury and property damage by non-employees, for example customers and visitors.

Other insurances that may be required due to the particular nature of an organisation include:

- Professional indemnity insurance against claims of negligence for entities delivering design advice and services.
- Fleet vehicle insurance.

Compensation is often normally for direct material damage only and does not necessarily cover business continuity. The provision of insurance services is nearly always out-sourced. However, in some cases, for example if the client is an insurance entity, clients may decide to self-insure. Historically, government or parastatal body clients self-insure, but this is now changing.

Obtaining licences to operate

Clients are responsible for obtaining any necessary licences and statutory approvals needed for building occupancy and operation. These may be licences and permits associated with the type of business, for example, animal boarding, nursing home or nursery schools, or the operation of specific function, for example, different categories of laboratories, selling alcohol, certain research and testing activities, storage of hazardous materials and handling of controlled materials and goods.

Client's fit-out

After buildings are handed back, clients may arrange for further work to be undertaken to fit-out spaces so they are suitable for occupation by their end-users. This may include extending building services systems into a tenant's areas. This is maybe general office areas or more

specialist areas such as restaurant/dining areas, reception areas, spas and so on. This may done in conjunction with the provision of raised floors, ceiling and demountable partitions.

Summary

Clients have business, operational and human requirements that they will want to ensure are manifested in the completed buildings. The performance of client teams affects the quality, cost and progress of the construction on site. Client teams need to establish structures and protocols to deliver their responsibilities and obligations with respect to legal, contractual and financial matters, the operation and (facilities) management of the completed project and client representation to the project management process. Thereafter, the client teams need to discharge their responsibilities with respect to health and safety matters, awarding the contract(s) for the construction works, handing over the site, providing information to the construction team, discharging residual design responsibilities and accepting the finished site back from the construction team. The building project will either be ready for immediate occupation or will require a degree of fitting out.

Feedback questions

1 If a client has no record information relating to the existing underground utility services on a particular site, discuss the risks to the project (in financial, programme and quality terms) and the options available to address the issues.
2 Discuss the particular work-related illnesses (not injuries) that construction workers have a higher risk of developing than non-construction workers? Discuss how these are related to the particular environment and nature of construction sites and what strategies clients may use to manage them.