FOURTEENTH EDITION

WILLIS'S PRACTICE AND PROCEDURE FOR THE QUANTITY SURVEYOR

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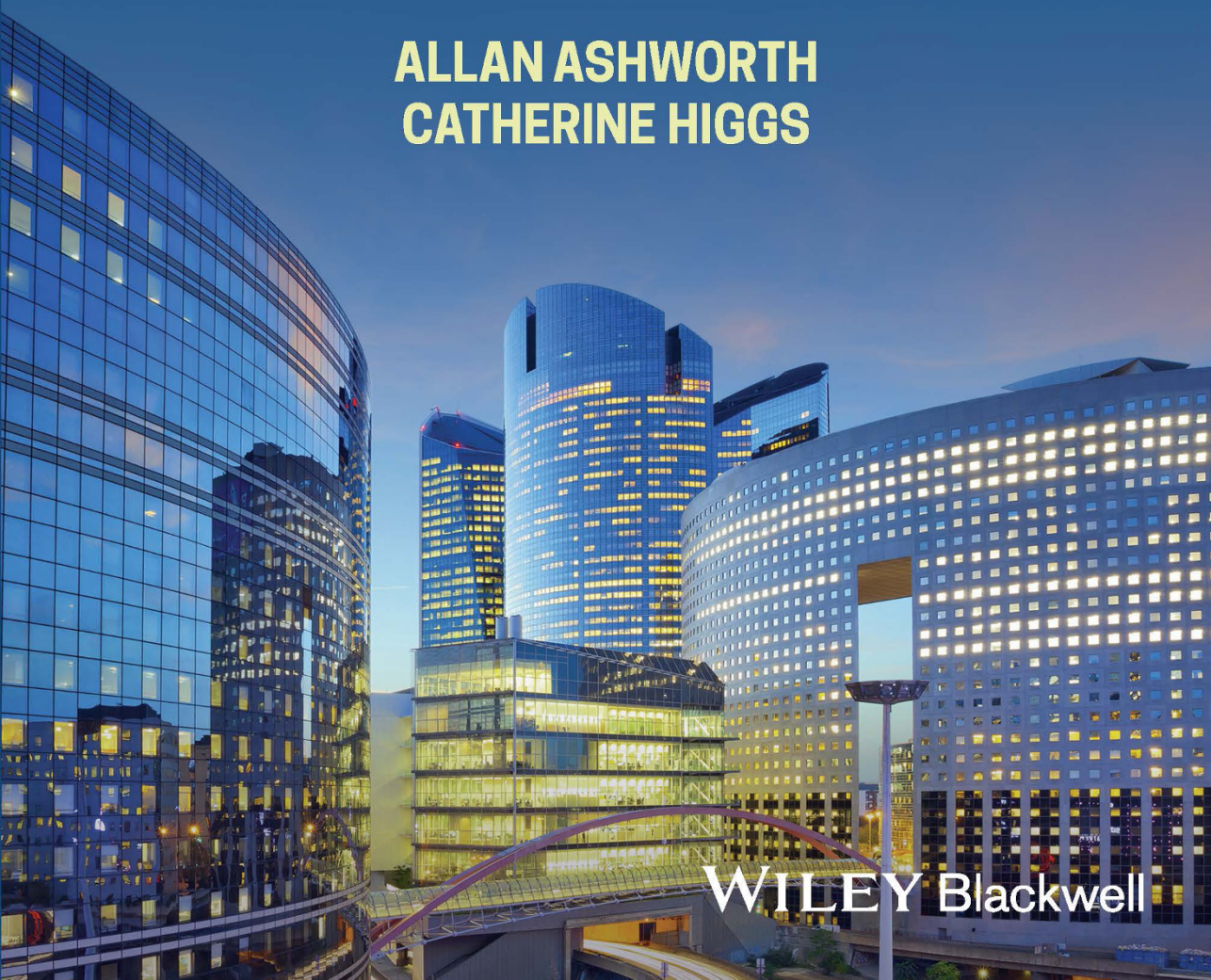
CATHERINE HIGGS



WILEY Blackwell

Willis's Practice and Procedure for the Quantity Surveyor

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Fourteenth Edition

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Preface

This book was first written by Arthur J. Willis, who became very well-known because of this book in particular. Hence, the current description is described as *Willis's Practice and Procedure for the Quantity Surveyor*. I am never quite sure whether the apostrophe is in the correct place since there were three generations of Willis and each at one time or another edited the book.

Looking back over previous editions of this well-known book, it is clear that the world of quantity surveying has evolved and is vastly different today. In 1951, when the book was first published, quantity surveying could be summarised as approximate estimating, bills of quantities, and final accounts. Such changes should not surprise us, since they are common in all professions. Accountants do not just account, nor solicitors just solicit!

Even the name quantity surveying has changed as the profession emphasises different aspects of their work today. Many will argue that this name is out of date and restrictive. Many firms today use a vaguer term of management or construction consultant to attract wider and different commissions. Traditionally, quantity surveyors operated in the United Kingdom and most of the commonwealth since they adopted UK practices. But quantity surveyors have worked extensively, for example, in the Middle East for a long time. More recently many of the household names of some practices have been acquired by international consultancies that have their head offices in Europe and the United States. These obviously recognise the work that they do and the value that they can add to projects.

It was suggested some time ago that if there were no bills (of quantities), then there would be no fees and hence no quantity surveyors. How wrong this prediction was! If anything the profession is now busier than ever across even a fuller range of construction projects. There has always been a distinction between the large and small practices and the services that they could provide. Some small practices, for example, offer bespoke services in a limited but valuable aspect of how quantity surveying can be applied to a range of different problems today.

The introduction of computers and information technology forecasts a similar demise. There is no doubt that these brought about challenging times for quantity surveyors. This technology created a sort of revolution of what quantity surveyors did and how they did it. How to grapple with it and how to get it to work to the best advantage for both themselves and their clients? No one can doubt that much of the routine activities were removed and that the technology has allowed practices to work more efficiently and smarter rather than just working harder. There is a current focus on modern technologies such as building

information management (BIM) that will have extensive ramifications on the world of quantity surveying. Whether such technology will ever be fully effective is still a matter of conjecture, certainly when considered across the full range and type of construction projects today.

The preface to the ninth edition that was published in 1987 speaks of gradual changes to the profession, describing some of them as far reaching. All of these changes that were envisaged then are considered minor in our world today. Whilst the core skills of analysis and evaluation are the same to those days, their applications are much more far and wide ranging. Practices earn fees in a variety of different ways by being able to adapt their skills and knowledge for a wide range of applications. By the turn of this century a much greater emphasis was already being placed on cost and value management.

The previous edition of this book was published 10 years ago. Vast changes have occurred over these intervening years most notably in the areas of sustainability issues and the wider uses of information technology not only to analyse and evaluate building performance just for today but also to examine the implications and impact on project life cycles in attempting to future-proof design and construction.

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The Work of the Quantity Surveyor

KEY CONCEPTS

- The role of the quantity surveyor (QS)
- The Royal Institution of Chartered Surveyors (RICS)
- Skills, knowledge and behaviours of the QS
  - Ethical decision making
- QS education
- Life long learning

LEARNING OUTCOMES

After reading this chapter you should be able to:

- Understand the role of the quantity surveyor
- Understand the role of the RICS
- Appreciate the knowledge, skills, and behaviours of a QS
- Appreciate the need for life long learning to continual enhance knowledge and skills to meet the needs of industry.

COMPETENCIES

Competencies covered in this chapter:

- Ethics, Rules of Conduct and professionalism

Willis's Practice and Procedure for the Quantity Surveyor, Fourteenth Edition.
Allan Ashworth and Catherine Higgs.

Introduction

In 1971, the Royal Institution of Chartered Surveyors (RICS) published a report titled *The Future Role of the Quantity Surveyor*, which defined the work of the quantity surveyor as:

> '...ensuring that the resources of the construction industry are utilised to the best advantage of society by providing, *inter alia*, the financial management for projects and a cost consultancy service to the client and designer during the whole construction process'.

The report sought to identify the distinctive competencies or skills of the quantity surveyor associated with measurement and valuation in the wider aspects of the construction industry. This provides the basis for the proper cost management of the construction project in the context of forecasting, analysing, planning, controlling and accounting. Many reading this will reflect that this is no longer an adequate description of the work of the quantity surveyor.

Since the report there have been major drivers for change across the construction sector and quantity surveyors now balance the traditional skills of cost expertise with responding to the changing demands in the sector. The needs of clients have changed markedly over the last 50 years. The large regular-procuring clients of the construction industry are increasingly pursuing innovative approaches to the way in which their projects are planned, designed and delivered to facilitate their business strategies. They tend to work more closely with a smaller number of organisations and more closely with their supply chains to maximise value and achieve continuous improvement in performance both of their construction processes and buildings when in use. Advances in digital technologies have had a profound impact on how quantity surveyors operate, their function and the scope and breath of the services they provide. Large practices have responded to the needs of a global market and, over the last decade, there has been an increase in both multidisciplinary and multinational surveying organisations. Quantity surveying practices have diversified in response to government strategies; the most influential being those that address reducing greenhouse gases and improving efficiency within the industry. Pre-2020 these drivers of change were relatively steady, but the global pandemic has accelerated these changes. This chapter seeks both to show how the quantity surveyor role has evolved and the need for continuous enhancement of knowledge and skills.

Characteristics of the construction industry

The total value of the construction new work output in the UK is in the region of 5% of GDP or £116 bn per annum of expenditure (Office for National Statistics 2021). The industry offers direct employment to around two million people and to others in supporting occupations. In addition, many UK firms and practices, including quantity surveyors, have an international perspective through offices overseas or through associations with firms abroad. There has, for example, been an increasing and expanding role of activities on mainland Europe. Approximately 80% of the UK workload is on building projects as

distinct from engineering and infrastructure works. New construction projects account for about 64% of the workload of the industry (2022). The repair and maintenance sector will remain an important component for the foreseeable future as clients place greater emphasis upon the improved long-term management of such major capital assets.

The industry is characterised by the following:

- The physical nature of the product
- The product is normally manufactured on the client's premises, i.e. the construction site
- Many of its projects are one-off designs in the absence of a prototype model
- The traditional arrangement separates design from manufacture
- It produces investment rather than consumer goods
- It is subject to wider swings of activity than most other industries
- Its activities are affected by the vagaries of the weather
- Its processes include a complex mixture of different materials, skills and trades
- Typically, throughout the world, it includes a small number of relatively large construction firms and a very large number of small firms

Construction sectors

Quantity surveying offers a diverse range of employment opportunities, within the construction industry, both within the UK and globally. Quantity surveyors are involved in the following four main areas of work.

Building work

The employment of the quantity surveyor on building projects today is well established. The introduction of new forms of contract and changes in procedures continue to alter the way in which quantity surveyors carry out their duties and responsibilities. They also occupy a much more influential position than in the past, particularly when they are involved at the outset of a project.

Quantity surveyors are the cost and value experts of the construction industry. Their responsibilities include advising clients on the cost and value implication of design decisions and the controlling of construction costs. Great importance is now attached to the management of costs in relation to whole life costing. Work within this sector not only relates to new work but to refurbishment of the existing building stock.

Building engineering services

Whilst building services installations are very much a part of the building project, it has tended to become a specialist function for the M & E quantity surveyor, especially on large complex projects. As greater consideration is given to the energy efficiency of systems and alternative sustainable technologies the professional advice from quantity surveyors in this sector will become increasingly influential in project design decisions. Quantity surveyors employed in this discipline have had to become more conversant

with the science, technology and terminology of engineering services in order to interpret engineering drawings correctly.

Civil engineering

It is difficult to define the line of demarcation between building and civil engineering works. The nature of civil engineering works often requires a design solution to take into account physical and geological problems that can be very complex. The scope, size and extent of civil engineering works are also frequently considerable. The problems encountered can have a major impact on the cost of the solution, and the engineer must be able to provide an acceptable one within the limits of an agreed budget, in a similar way that buildings are cost planned within cost limits. However, because of their nature, civil engineering works can involve a large amount of uncertainty and temporary works can be considerable, representing a significant part of the budget.

Civil engineering projects use different methods of measurement and different forms and conditions of contract are also used. These to some extent represent the different perception of civil engineering works. The work is more method-related than building works, with a much more intensive use of mechanical plant and temporary works. Bills of quantities, for example, comprise large quantities of comparatively few items. Because much of the work involved is at or below ground level, the quantities are normally approximate, with a full remeasurement of the work that is actually carried out.

Quantity surveyors working in the civil engineering industry provide similar services to those of their counterparts working on building projects.

Heavy and industrial engineering

This work includes such areas as onshore and offshore oil and gas, petrochemicals, nuclear reprocessing and production facilities, process engineering, power stations, steel plants and other similar industrial engineering complexes. Quantity surveyors have been involved in this type of work for a great number of years, and as a result of changing circumstances within these industries a greater emphasis is also being placed on value for money. In an industry that employs a large number of specialists, quantity surveyors, with their practical background, commercial sense, cost knowledge and legal understanding, have much to offer.

Private and contractors quantity surveyors

As well as specialised by project type, quantity surveyor's role can have either a client focus or work for a contracting organisation. Those working in the public or private sector on behalf of clients are known as Private Quantity Surveyors, referred to as a 'PQS' or the clients QS and those working for a main contractor or subcontractor are Contractors Quantity Surveyors, a 'CQS'. The role of the PQS is primarily covered in this book. The role of the CQS is somewhat different from that of the client's quantity surveyor with a focus on commercial management and the supply side of the sector, in that they consider costs from the contractor's perceptive maximising cash flow and ensuring the project stays within

budget These activities could include estimation, financial management, site costing and bonusing, contract management, negotiation with suppliers and subcontractors, interim certificates and payments, contractual matters and the preparation and agreement of claims. Further consideration of the role is given within the relevant chapters.

The quantity surveying profession

The origins of the role

The origins of quantity surveying as a distinct activity are hard to trace back in time much further than the Great Fire of London. However, in the New Testament, there is a story about counting the cost before you build (Luke's Gospel, chapter 14). Perhaps quantity surveyors can trace their roots back to more than 2000 years ago! The building activity that followed the Great Fire of London in 1666 encouraged the emergence of the architect and the growth of the single trades, contracting for their own part of the building work.

The measurers had to be invented if they did not already exist. There was a real need for someone to ensure impartiality between the proprietor and the workmen. The rest is history. In 1834, the fire that destroyed the Palace of Westminster was partially responsible for the use of the quantity surveyor on a major scale. Charles Barry won the competition to replace it and was asked to prepare an estimate of cost. Although detailed drawings were not yet prepared, a quantity surveyor, Henry Hunt, came up with an estimated cost of £724,984. Whilst this figure was basically accurate, changes made by Parliament resulted in a final cost closer to £1.5 m.

The name 'quantity surveyor' conjures up a variety of different images in people's imaginations. For some, the term 'quantity surveyor' is an outmoded title from the past. It certainly no longer *accurately* describes the sole duties that are performed as will be discussed later in the chapter. When the term was first applied to the profession, the work of the quantity surveyor was vastly different from that now being carried out and anticipated in the twenty-first century. New titles for the role, over time, have been debated, and it is common to find those offering current quantity surveying services describing themselves as cost consultants.

The Royal Institution of Chartered Surveyors (RICS)

The Royal Institution of Chartered Surveyors was formed in 1868 and offices were leased at 12 Great George Street, which is still part of the RICS Headquarters building today. The Institution of Surveyors, which later became the Royal Institution of Chartered Surveyors (RICS), has evolved into a renowned international organisation with approximately 134,000 members working in 146 countries. It was granted its Royal Charter in 1881 and in 1922 the Quantity Surveyors Association amalgamated with it. In 1930, the then Institution of Surveyors became the Institution of Chartered Surveyors. In 1946, it was granted the title Royal to become the Royal Institution of Chartered Surveyors. The RICS coat-of-arms with its motto *Est modus in rebus* (There is measure in all things) was adopted.

The RICS is organised around 18 professional groups of which one is designated as Quantity Surveying and Construction. There are a number of other groups to which quantity surveyors are also likely to belong. These include Dispute Resolution, Facilities, Management Consultancy and Project Management.

The RICS's objective as a professional body, as outlined in the Charter, is to secure the advancement and facilitate the acquisition of that knowledge, which constitutes the profession of a surveyor, and to maintain and promote the usefulness of the profession for the public advantage in the United Kingdom – and in any other part of the world (RICS 2022c).

Working with key stakeholders of UK governments, the RICS as a leading expert within the sector informs government policy. Through the promotion of the expertise of chartered surveyors, the RICS's professional standards are adopted within the industry. Key activities in 2021 were advice provided for the UK's recovery from the pandemic, and the long-term value of sustainable development and management of the built and natural environments (RICS 2021a). In addition, the principle purposes of the RICS are:

- a global professional, standards and regulatory body
- existing to secure the advancement and usefulness of the profession for the public advantage
- focused on setting standards and assuring these standards are in the public interest delivering support that is valued by RICS members and their employers
- developing members' professional skills and knowledge and
- expanding opportunities for members to apply those professional skills. (RICS 2022c)

Other quantity surveying bodies

Whilst the RICS remains the premier institution for quantity surveyors, they may also be members of other industry bodies. This may be influenced by the sector they work in, for example quantity surveyors employed by contractors are likely to be members of the CIOB, or by the country in which they are located. The Pacific Association of Quantity Surveyors (PAQS) is an international association of quantity surveyor organisations located in the Asia and Western Pacific region. The membership of PAQS is shown in Fig. 1.1.

The Quantity Surveying International (QSi) was formed in 2004 as a professional body solely for those operating in the commercial aspects of construction and the built environment. Its objectives are very similar to the RICS, except they are fully focussed on quantity surveying.

The role of the quantity surveyor

Traditional role

The traditional role of the quantity surveyor has been described elsewhere and in previous editions of *Willis's Practice and Procedure for the Quantity Surveyor*. This traditional role, still practised by some and especially on small- to medium-sized projects, can be briefly

Full Members

- Australian Institute of Quantity Surveying (AIQS)
- China Cost Engineering Association (CCEA)
- The Hong Kong Institute of Surveyors (HKIS)
- Royal Institution of Surveyors Malaysia (RISM)
- Institution of Surveyors, Engineers and Architects, Brunei (PUJA)
- The Building Surveyors Institute of Japan (BSIJ)
- Canadian Institute of Quantity Surveyors (CIQS)
- New Zealand Institute of Quantity Surveyors (NZIQS)
- Singapore Institute of Surveyors and Valuers (SISV)
- Institute of Quantity Surveyors Sri Lanka (IQSL)
- Philippine Institute of Certified Quantity Surveyors (PICQS)
- Ikatan Quantity Surveyor Indonesia (IQSI)

Associate Members

- Fiji Institute of Quantity Surveyors (FIQS)
- Korea Institution of Quantity Surveyors (KIQS)

Observer Member

- Association of South African Quantity Surveyors (ASAQS)

Fig. 1.1 Members of the pacific association of quantity surveyors.

described as a measure and value system. Approximate estimates of the initial costs of building are prepared using a single price method of estimating (see Chapter 5), and where this cost was acceptable to the client then the design was developed by the architect. Subsequently, the quantity surveyor would produce bills of quantities for tendering purposes, the work would be measured for progress payments and a final account prepared on the basis of the tender documentation (see Fig. 1.2). The process was largely reactive, but necessary and important. During the 1960s, to avoid tenders being received that were over budget, cost planning services were added to the repertoire of the duties performed by the quantity surveyor employed in private practice (PQS). The contractor's surveyor was responsible for looking after the financial interests of the contractor and worked in conjunction with the PQS on the preparation of interim payments and final accounts. On occasions, contractors felt that they were not being adequately reimbursed under the terms of the contract and submitted claims for extra payments. This procedure was more prevalent on civil engineering projects than on building projects, although the adversarial nature of construction was increasing all the time.

The distinctive competence found in quantity surveyors relies heavily on their analytical approach to buildings and this stems directly from their ability to measure construction works. Furthermore, the detailed analysis of drawings leads to a deep understanding of the design and construction which enables them to contribute fully to the process. This intimate knowledge of projects is at the root of the contribution made by the quantity surveyor to the value of the client's business through the provision of the services shown in Fig. 1.2.

- Single rate approximate estimates
- Cost planning
- Procurement advice
- Measurement and quantification
- Document preparation, especially bills of quantities
- Cost control during construction
- Interim valuations and payments
- Financial statements
- Final account preparation and agreement
- Settlement of contractual claims

Fig. 1.2 Traditional quantity surveying activities (circa 1960).

Evolved role

In response to the potential demise of bills of quantities, quantity surveyors began exploring new potential roles for their services. Procurement, a term not used until the 1980s, became an important area of activity, largely because of the increasing array of options that were available. Increased importance and emphasis were also being placed upon design cost planning as a tool that was effective in meeting the client's objectives. Whole life costing (Chapter 6), value management (Chapter 7) and risk analysis and management (Chapter 8) were other tools being used to add value for the client. As buildings became more engineering services orientated, increased emphasis was being placed on the measurement, costs and value of such services. Quantity surveyors had historically dealt with this work through prime cost and provisional sums, but in today's modern buildings to describe the work in this context is inadequate. Other evolved roles have included project and construction management and facilities management (see Fig. 1.3). Because of the inherent adversarial nature of the construction industry they are also involved in contractual disputes and litigation.

The current role of the quantity surveyor reflects a more outcomes led approach by clients. Today's construction is not just about the provision of a building, but the performance of an asset in terms of the client's business outcomes. Client's environmental, social and digital agendas, influenced by the wider changing external political drivers, are having a greater influence on the design and use of buildings. The quantity surveyor's expertise in cost, value and managing risk has therefore increased importance in the 'whole life' success of a project. Whilst many of the services related to consultancy and project delivery offered, a decade ago, are similar, the use of technologies has meant that these services have become more integrated internally within the quantity surveying organisation, but crucially more integrated with the services provided by other built environment professionals using collaborative information platforms. The ability to automate some services has led to enhanced practices in benchmarking, scenario testing and risk analysis. The last decade has seen many quantity surveying mergers with other professions to offer more comprehensive and integrated services and an increase in the offer of post occupancy services. Such services include auditing, benchmarking, and information modelling to advise

- Investment appraisal
- Advice on cost limits and budgets
- Whole life costing
- Value management
- Risk analysis
- Insolvency services
- Cost engineering services
- Subcontract administration
- Environmental services measurement and costing
- Technical auditing
- Planning and supervision
- Valuation for insurance purposes
- Project management
- Facilities management
- Administering maintenance programmes
- Advice on contractual disputes
- Planning supervisor
- Employer's agent
- Programme management
- Cost modelling
- Sustainability Advisor

Fig. 1.3 Evolved role (circa 2012).

on business success. Quantity surveyors also offer specialist skills such as Capital Allowances and Alternative Dispute Resolution services.

Global strategies to support a sustainable future, such as *2030 Agenda for Sustainable Development* and UK legislation to support the sector's trajectory towards meeting net zero, are key drivers informing the client's sustainability objectives and organisational practices. As a result, clients are becoming increasingly aware of the need to consider whole life costs, environmental impact assessments and evaluation of carbon emissions. The impact on the quantity surveying services is discussed in Chapter 18.

Skills, knowledge and understanding

In 1992, the Royal Institution of Chartered Surveyors published a report titled *The Core Skills and Knowledge Base of the Quantity Surveyor*. The report developed earlier themes from reports published by the RICS and others. These included *The Future Role of the Quantity Surveyor* (RICS 1971), *The Future Role of the Chartered Quantity Surveyor* (RICS 1983), *Quantity Surveying 2000* (Davis, Langdon and Everest 1991) and *Quantity Surveying Techniques: New Directions* (Brandon 1992). The *Core Skills* report examined the needs of quantity surveyors in respect of their education, training and continuing professional development. This reflected the requirements in the context of increasing changes and uncertainties in the construction industry and, more importantly, within the

profession. The RICS report identified a range of skills that the profession would need to continue to develop if it wished to maintain its role within the construction industry. The report identified a knowledge base that includes:

- Construction technology
- Measurement rules and conventions
- Construction economics
- Financial management
- Business administration
- Construction law

and a skill base that includes:

- Management
- Documentation
- Analysis
- Appraisal
- Quantification
- Synthesis
- Communication.

All of these remain valid requirements 30 years later, indeed they are the core of many quantity surveying courses, although their relative importance has changed to suit changing needs and aspirations, as evidenced when comparing the QS activities listed in Figs 1.2 and 1.3 above.

Quantity surveying, like each specific surveying discipline, has developed its own repertoire of techniques. Skills occur in respect of the levels of ability required to apply these techniques in an expert way. The different array of skills is assimilated with the knowledge base through education, training and practice. Whilst there is a general agreement about the skills and knowledge base required, different surveyors will place different emphases upon the relative importance in practice. Skills and knowledge requirements are also not static but must be updated to reflect an ever changing environment.

The RICS Futures Report 2015 *Our Changing World: let's be ready* identified that both the skills needed by surveyors and the work roles were changing, due to the growing complexity of the sector, major skills gap in sustainability and technological advances (Fig. 1.4).

Current Skills	Future Skills
Outcome focus	Sustainability
Communication	Data analysis
Integrated programme and cost management	Maximising resource productivity
Skills for greater complexity	Risk management
Interdisciplinary working	Leadership
Advisory services	Client focus
Understanding technology	Collaboration
	Ethical behaviour

Fig. 1.4 2015 Skills gap analysis (*Source:* Gray et al. 2016).