Estimating and Tendering for Construction Work

Fifth Edition

Martin Brook

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Preface

My aims in this book are to introduce a practical approach to estimating and tendering from a contractor's point of view, and explain the estimator's role within the construction team. The book therefore differs from other textbooks in three main ways:

1. In general, it is assumed that it is the contractor who prepares estimates because in the majority of cases an estimate is produced to form the basis of a tender.
2. I have introduced many typical forms used by estimators to collate data and report to management.
3. The pricing examples given in Chapter 13 have been produced using a typical build-up sheet. The items of work to which the prices relate are given at the top of each page. Estimating data are given for each trade so that students will have a source of information for building up rates. I suggest that before pricing exercises are undertaken, the first part of Chapter 13 should be read and an understanding of estimating methods should be gained from Chapter 7. The first pricing example is for a 'model rate' that gives a checklist of items to be included in a unit rate. It should be noted that few estimators now build up prices using paper forms, which were replaced with spreadsheets and estimating software in the 1990s.

The estimating function has again changed since the last edition, which was published in 2008. It was envisaged that more duties would be fulfilled by estimating assistants. It seems that there are now fewer junior estimators employed by contractors because there are fewer clerical functions needed. There are no photocopying duties with the reduction in paper copies of tender documents and letters. Documents are now filed on common drives or in the cloud, and quantities are produced by outside practices or home-workers.

Estimators need to understand the consequences of entering into a contract, which is often defined by a complex combination of conditions and supporting documents. They also need to appreciate the technical requirements of a project, from tolerances in floor levels to the design of concrete mixes, and from temporary electrical installations to piling techniques.

The Chartered Institute of Building publishes a series of guides to good practice – the Code of Estimating Practice and its supplements. I have not duplicated their fine work in this book but hope that my explanation and examples show how the guidelines can be used in practice.

Contractors now assume an active role in providing financial advice to their clients. The estimator produces financial budgets for this purpose and assembles cost allowances for use during construction. Computers are universally employed, using a combination of general-purpose and specialist software. Computers have advanced estimating and cost planning, allowing estimators time to enjoy a greater contribution to the development of designs. Their skills need to be developed further to exploit exciting benefits of BIM (Building Information Modelling) systems.

The New Rules of Measurement – NRM1, 2 and 3 – are a leap forward in modern documentation and quantification for building work. With the introduction of NRM1, we now have firm guidance for the preparation of early cost estimates and cost plans. NRM2 provides rules of measurement for detailed bills of quantities and schedules of rates. NRM3 is a new approach to the quantification and description of maintenance works for estimates and cost planning. It also provides advice for costing maintenance and capital replacement works. The item descriptions in all these publications will not always align with the way estimators price work and it is recognized that there will still be 'contractors' billing', which is a hybrid form of measurement. Traditionally, bills of quantities were used as a fair basis for preparing and comparing tenders, but increasingly, with the widespread adoption of design and build contracting, the responsibility for quantities is being passed to contractors.

This fifth edition has been written to reflect changes in estimating since 2008. These include the following:

- A new Chapter 1 which explains new approaches to estimating brought about by the need for early cost advice and a large proportion of contracts using design-and-build procurement.
- References to PFI have again been reduced because the value of work carried out using this procurement route has fallen in the UK from a peak of about 14 per cent of government procurement to 7.5 per cent in 2012. On the other hand, the use of various forms of Public Private Partnerships are growing in international markets.
- The previous chapter written for tendering on the basis of cost plans has been split into two parts: Design to Cost and Tenders with Cost Planning. There is an increasing trend for contractors to prepare early cost models for their clients, and develop proposals according to 'design-to-cost' principles.
- Increases in labour and plant rates which affect rate build-ups (Chapter 12), daywork calculations (Chapter 16) and pricing notes (Chapter 13). Pricing sheets have been updated to reflect the NRM2 rules of measurement and correct some inconsistencies. The rates have been updated to levels found in the period 2015/16. Increases in the period 2008–2013 were held back by a recession across all market sectors. With that behind us, rates are again rising, particularly in the South-East region of the UK, where there is a shortage of skilled operatives and staff which continues to add to building costs. Across the UK, construction inflation continues to run ahead of the UK government measures of consumer-related inflation.
- Most tables and figures have been updated, and a number of figures have been enhanced to make them easier to read.
- Labourers and general operatives are both terms used in the text to mean workers who are not recognized for craft or skill rates under the working rule agreements in the construction industry.
- I have taken out processes based on hand-written calculations and notes, because manual reporting and scheduling has been replaced by estimating software or general-purpose software. Paper copies of tender documents are no longer issued – they are instead lodged in a data room on a collaborative website or FTP location.
- The introduction of BIM as a formal process throughout the life of a building.

During 2015 and early 2016 there were mixed messages about the uptake of BIM in design and construction teams. The UK government expected to see Level 2 BIM implemented for public sector schemes by April 2016; in practice this may loosely translate into, like the curate's egg, good in parts. People are on a journey and estimators have only just set out. There needs to be a greater

investment in establishing clear systems; and training needs to improve to enable the adoption of new processes.

Estimators have experimented with information readily abstracted from a 3D model, but have not considered this to be in the context of a COBie standard. Few estimators have been given access to real-time data.

Will BIM do the estimator's job for him? That is, automatically quantifying components on drawings, checking for errors and then attaching appropriate rates to work items. Currently, application software is being written to attempt this, but each project has unique technical and commercial challenges that are unlikely to be programmable. Nevertheless, change will happen organically by taking advantage of the information produced by 3D software.

A sample contractor's cost plan can be accessed on the Routledge website at www.routledge.com/products/9781138838062. This Excel workbook brings together many of the figures used in the book, showing a realistic example of a cost plan used in practice.

I recognize and support the role of women in construction and ask readers to accept that the use of the masculine pronoun is intended to refer equally to both sexes.

Martin Brook
2016

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I wish to acknowledge Dr Jane Brook for the new cartoons.

Abbreviations

3D	three-dimensional
ACA	Association of Consultant Architects
BCIS	Building Cost Information Service
BIM	Building Information Modelling
BMS	Building Management Systems
BPF	British Property Federation
BRE	Building Research Establishment
BREEAM	BRE Environmental Assessment Method
BS	British Standard
BSI	British Standards Institution
BWIC	Builder's Work In Connection *with engineering services*
CABE	Commission for Architecture and the Built Environment
CAWS	Common Arrangement of Work Sections
CD1	Competitive Dialogue stage 1
CD2	Competitive Dialogue stage 2
CDM	Construction (Design and Management) Regulations 2015
CEN	European Committee for Standardization
CESMM4	Civil Engineering Standard Method of Measurement Fourth Edition 2013
CI/SfB	Construction Index – Samarbetskommitten for Byggnadsfragor
CIOB	Chartered Institute of Building
CMA	Construction Management Agreement
COBie	Construction Operations Building information exchange
COEP	Code of Estimating Practice (published by the CIOB)
Conc	concrete
CPI	coordinated project information
CPI	Consumer Price Index
CPP	construction phase plan
CSI/CSC	US Construction Specifications Institute/Construction Specifications Canada
DBFO	design, build, finance and operate
EU	European Union
Exc	excavation
FF&E	furniture, fixtures (or fittings) and equipment
FIDIC	International Federation of Consulting Engineers

FM	facilities management *(or facility management)*
FTP	file transfer protocol *(internet protocol to transfer computer files)*
GIA	gross internal area
HSE	Health and Safety Executive
ICE	Institution of Civil Engineers
ICT	information and communications technology
IFC	Industry Foundation Classes
Inc	included
ISO	International Organization for Standardization
JCT	Joint Contracts Tribunal Limited
LA	local authority
M+E	mechanical and electrical installations/contractors
MEAT	most economically advantageous tender
MEP	mechanical, electrical and plumbing *(or public health)*
NAS	network attached storage
NBS	National Building Specification
ne	not exceeding
NEC3	A suite of contracts published by NEC, London
NRM1	Order of Cost Estimating and Cost Planning for Capital Building Works *(2nd edition 2012)*
NRM2	Detailed Measurement for Building Works 2012
OBC	outline business case
OFT	UK Office of Fair Trading
OGC	UK Office of Government Commerce
ONS	UK Office of National Statistics
PAS	publicly available specification *(BSI)*
PB	preferred bidder
PC	prime cost
PF2	Private Finance 2 (*UK government's new approach to PFI)*
PFI	Private Finance Initiative
PPD	preliminary project description
PPP	public–private partnership
PQQ	pre-qualification questionnaire
PQS	private quantity surveyor (consultant) – also project quantity surveyor
Prov	provisional
PSS	Public Sector Scheme
Quant	quantity
RIBA	Royal Institute of British Architects
RICS	Royal Institution of Chartered Surveyors
SMM	Standard Method of Measurement
SMM6	Standard Method of Measurement of Building Works: 6th edition 1978
SMM7	Standard Method of Measurement of Building Works: 7th edition 1988
TPI	tender price index
VAT	value added tax

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