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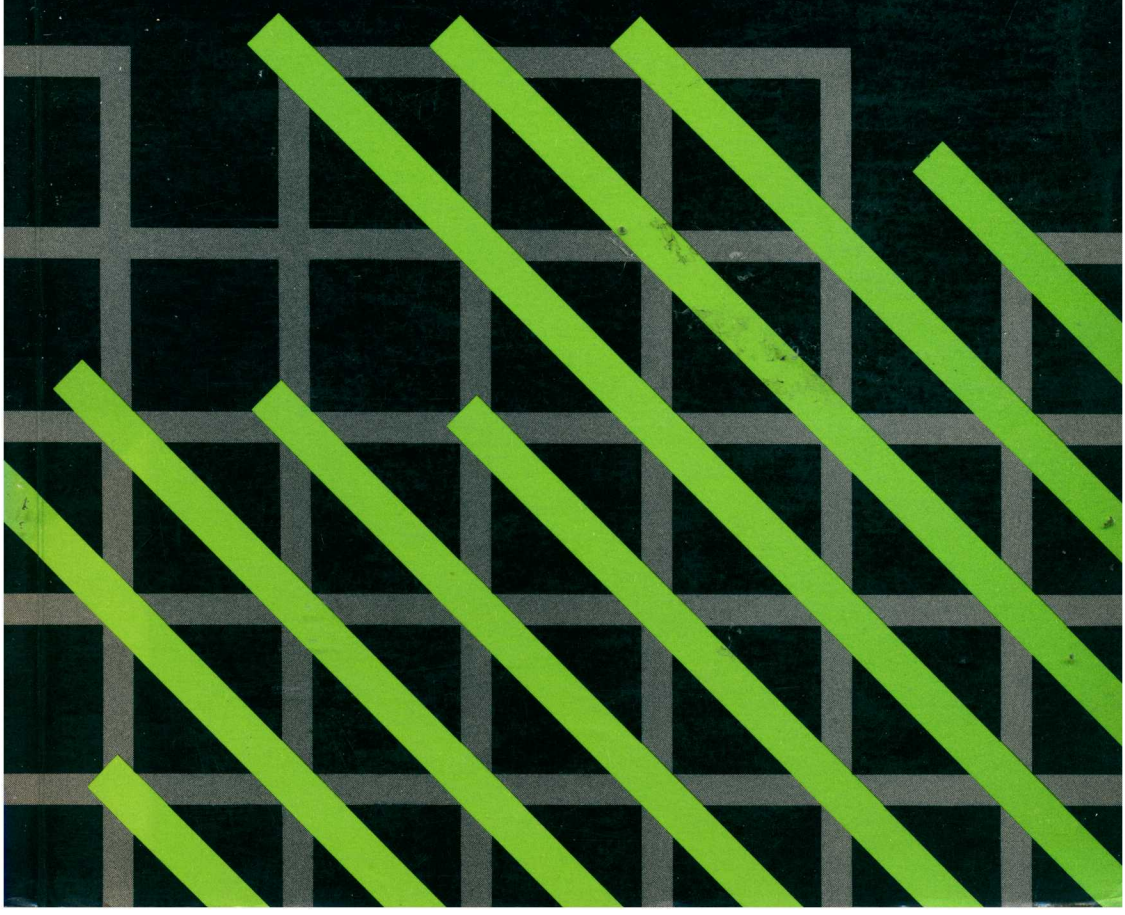
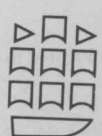


Construction management in practice

Richard Fellows, David Langford, Robert Newcombe and Sydney Urry



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Construction management in practice

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Building: The Process and the Product, *D. R. Harper*
Practical Site Management, *G. Hedley and C. Garrett*
Production and Planning Applied to Building, *R. J. Hollins*
Critical Path Analysis, *D. A. Paice*
Project Management and Construction Control, *G. Peters*

Preface

This book is concerned with the practical application of management principles and techniques in the construction industry. It is intended primarily for students in universities, polytechnics, and colleges who are following courses in building, civil engineering, quantity surveying, and architecture but it will also be of value to those who are practising in these fields. The standard is that of university and CNAA degrees and the examinations of professional institutions such as the Chartered Institute of Building and the Royal Institution of Chartered Surveyors.

We have aimed to present the concepts as succinctly as possible and to show their relevance to the day-to-day problems of the industry. To this end we have included many illustrative examples in the text and review questions at the ends of chapters. References and bibliographies are provided for those readers who may wish to study particular topics in greater depth.

Despite careful checking, some errors may remain and any criticism or correction will be gratefully acknowledged.

RFF
DAL
RN
SAU

Uxbridge, March 1982

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Abbreviations used in text

Organisations

ACAS	Advisory, Conciliation and Arbitration Services
ASP&D	Amalgamated Society of Painters and Decorators
ASW	Amalgamated Society of Woodworkers
AUAW	Amalgamated Union of Asphalt Workers
AUBTW	Amalgamated Union of Building Trades Workers
AUEW	Amalgamated Union of Engineering Workers (Construction Section)
BAS	Building Advisory Service
BCIS	Building Cost Information Service (of the RICS)
BDA	British Decorating Association
BDC	Brick Development Association
BICS	Building Industry Careers Service
BRE	Building Research Establishment
CBI	Confederation of British Industry
CCA	Cement and Concrete Association
CECCB	Civil Engineering Construction Conciliation Board
CIOB	Chartered Institute of Building
CIMB	Construction Industry Manpower Board
CITB	Construction Industry Training Board
CRE	Commission for Racial Equality
DHSS	Department of Health and Social Security
DoE	Department of Employment
ECA	Electrical Contractors' Association
EEF	Engineering Employers' Federation
EIU	Economist Intelligence Unit Ltd.
EEPTTU	Electrical, Electronic, Plumbers, Telecommunications Trade Union

FCEC	Federation of Civil Engineering Contractors
FMB	Federation of Master Builders
FTATU	Furniture, Timber and Allied Trades Union
GMWU	General and Municipal Workers' Union
HSE	Health and Safety Executive
ICFC	Industrial and Commercial Finance Corporation
JCT	Joint Contracts Tribunal
MAC	Mastic Asphalt Council
MSC	Manpower Services Commission
NAS	National Association of Shopfitters
NEB	National Enterprise Board
NEDO	National Economic Development Office
NFBTE	National Federation of Building Trades Employers
NFPDE	National Federation of Plumbers and Domestic Engineers
NFRC	National Federation of Roofing Contractors
NJCBI	National Joint Council for the Building Industry
NWRA	National Working Rule Agreement
OCPCA	Oil and Chemical Plant Constructors' Association
PCA	Plant Contractors' Association
RIBA	Royal Institute of British Architects
RICS	Royal Institution of Chartered Surveyors
STAMP	Supervisory, Technical and Administrative, Management and Professional section of UCATT
TGWU	Transport and General Workers' Union
TRADA	Timber Research and Development Association
TSA	Training Services Agency
TUC	Trades Union Congress
UCATT	Union of Construction Allied Trades and Technicians
UDC	Urban Development Corporation
UDG	Urban Development Grant

Terms

ACT	Advance corporation tax
AE	Annual equivalent
APA	Amount per annum
ASF	Annual sinking fund
BQ	Bill of quantities
CCA	Current cost accounting
CPM	Critical path method
DCF	Discounted cash flow
ERI	Effective rate of interest
FIFO	First in first out
GDP	Gross domestic product
HCA	Historic cost accounting
IRR	Internal rate of return
LIFO	Last in first out
ME	Monetary expectation
NPV	Net present value
PPC	Probable profit contribution
PQS	Private quantity surveyor
PV	Present value
PW	Present worth
RI	Rate of interest
RT	Rate of tax
SF	Sinking fund
SMM	Standard Method of Measurement of Building Works, 6th edn
UMA	Union membership agreement
USM	Unlisted securities market
YP	Years purchase

Contents

Construction management in practice

This book is concerned with management in the context of the construction industry, and this industry possesses a number of features that distinguish it from others. As a result, construction management practice differs from that observed in other industries. In this first chapter, therefore, the following topics will be discussed:

1.1 Characteristics of the construction industry
1.2 The nature of construction management
1.3 Managing a business
1.4 Managing people
1.5 Managing money
1.6 Management techniques.

1.1 Characteristics of the construction industry

A study of construction company profiles published in *Building* during the last decade confirms the impression, gained by reading Order XX of the Standard Industrial Classification entitled 'Construction', of an industry comprising a group of heterogeneous and fragmented firms. Not only are there large differences *between* firms in terms of size and scope of work, but *within* firms there is often a great diversity of activity. Typically, a large construction company may be engaged in activities ranging from general building and civil engineering to materials manufacturing, property development, trade specialization, and even open-cast coal-mining. In addition, there are the design consultants – architects, engineers, quantity surveyors, etc. – many of whom now practise in multidisciplinary firms. Peripheral services such as materials supply and plant hire, and the newly emerging project management firms, contribute to a complex industrial structure.

The size of the industry is impressive, both in terms of output and employment. Construction currently produces approximately 6 per cent of GDP and employs around 2 million people, 7–8 per cent of the total workforce.

The industry exhibits other characteristics which, taken individually, are shared with some other industries but which, in combination, create unique conditions calling for a unique management approach. Some of the more

important characteristics of the building construction industry which influence management practice are outlined below.

(a) Size of firms

Construction is essentially a large industry of small firms. *Housing and Construction Statistics 1978* show that of the 91,520 firms recorded, 85,362 or 93 per cent employed less than 25 people and could arguably be classified as small. Conversely, only 54 firms, 0.06 per cent, employed more than 1,200 people. The small firms were responsible for 27 per cent of the work carried out in 1978 and the large firms for 16 per cent of the total. No single firm or group of firms has a monopoly. This size profile has obvious implications for construction management practice, which will be discussed in later chapters.

(b) Construction projects

The industry is a project-based industry. Firms undertake a range of discrete projects of relatively long duration, constructed outside and geographically dispersed and fixed. The majority of such projects are tailor-made to a client's requirements, designed upon prescribed fee scales and built for a price established through the competitive tendering system which operates extensively in the industry. This system creates an unusual situation in which the product, i.e. a building, is sold before it is produced – a reversal of normal manufacturing practice. Individually, such projects frequently constitute a significant proportion of a firm's workload with serious consequences if things go wrong.

(c) Workforce

The operatives are predominantly young, male, and casually employed, with a strong craft tradition. In recent years there has been a distinct increase in the practice of subcontracting in all trades in response to fluctuating demand and employment legislation; this has to a large extent frustrated unionization of labour. Building production managers and staff have traditionally come from this craft background but the trend is towards staff from technician and degree courses. The professions – architects, engineers, and quantity surveyors – have, in the last 100 years, developed quite a sophisticated system of registration and training.

(d) Ease of entry to the industry

While the design consultants have an effective form of registration and control over members, there are few constraints to setting up a building contracting business. Voluntary registration schemes have largely failed to attract membership and the long-standing problems of consumer protection remain, particularly for private clients. The system of interim payments during construction projects, coupled with extensive credit concessions for materials purchasing and highly developed plant hiring facilities, mean that firms have minimal capital requirements; this has encouraged an influx of hopeful entrepreneurs. Sadly, their demise has often been equally easy, though much more painful for their clients, creditors and staff who are left, respectively, with broken contracts, little redress, and unemployment.

(e) Separation of design and production
The traditional separation of design and production in the building industry, and the consequent difficulties that can arise during the construction projects, have been described in several major reports (Emmerson 1962, Banwell 1964, Wood 1975). Economic pressures in times of recession have weakened this dichotomy with design and production organizations seeking to diversify their operations by offering a wider service. The decline in public sector building, with procurement methods which largely fossilized this separation, and the relaxation of the RIBA Code of Conduct, are two important agents of change.

(f) The nature of demand
The demand for construction projects is essentially what economists call 'derived' demand. It is derived from the need for buildings in which to live, to manufacture or store goods, or in which to operate various services. Building is thus strongly related to the state of health of the general economy and to the level of interest rates and business activity in particular. The fact that buildings are capital items make them natural targets for expenditure cuts by both government and the private sector. This has led to the characteristic fluctuations in demand which are familiar to construction firms and to the more permanent downturn which occurred in the mid 1970s.

(g) The Government's role
Successive governments have generally exacerbated these demand fluctuations by using the industry as a regulator for the economy. This has been achieved by direct intervention as a major client for the industry, and indirectly through the manipulation of interest rates to control private sector building demand. In addition, there has been the increasing regulation of building standards and land-use through building regulation and planning legislation. Technical innovation (e.g. industrialised building) and procedural changes (e.g. in competitive tendering arrangements) have also been foisted onto the industry from time to time.

Each of these factors can be found in other industries but together they form a unique combination. As a result, the practice of management in the construction industry differs in many respects from that found elsewhere.

1.2 The nature of construction management

1.2.1 The components of construction

The components of every commercial transaction are a *customer* who wants a product, the *product* itself and a *firm* which designs, makes and/or sells the product. The construction industry is no exception. The principal components in any construction situation are the *client*, the *project*, and the *firm*.

The *client* may be defined as the sponsor of the construction product or service. The client may come from the private or public sector of industry, commerce or