Commissioning Hospital Buildings

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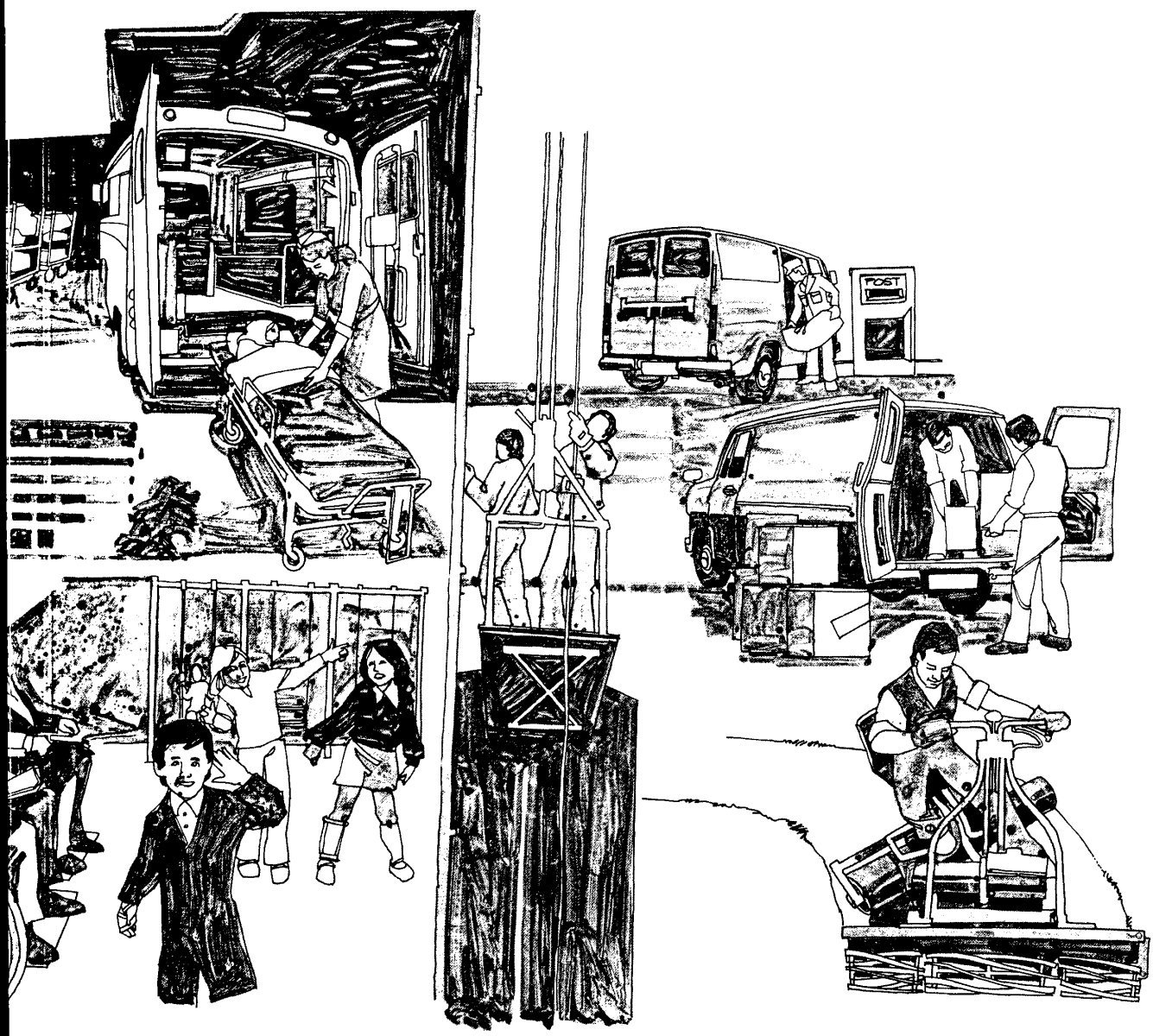

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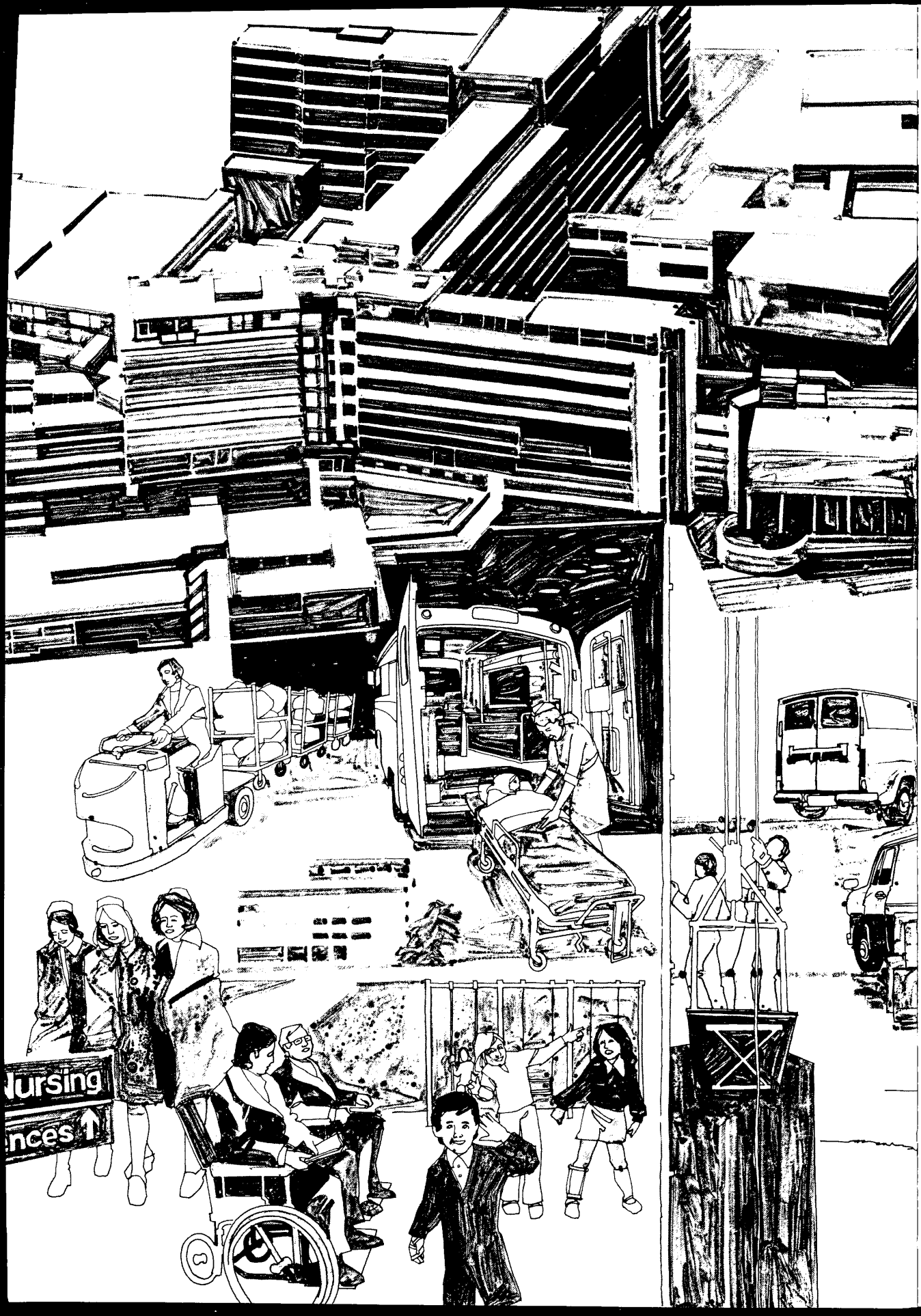
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Commissioning Hospital Buildings

A King's Fund report for staff in the health care services engaged in the complex task of commissioning new buildings

by Graham Millard

Foreword by Bryan A McSwiney
Chairman of the Working Party

Published by King Edward's Hospital Fund for London 1975

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Acknowledgements

Thanks are due to a large number of people who have contributed ideas and information for inclusion in this report. Administrators from many new hospitals have written to give accounts of their own experience. The Department of Health and Social Security has given advice from many of its sections. Special thanks are due to Roger Evans, assistant district administrator, North Hammersmith, for compiling the commissioning check list and to Carolyn Turnbull for her secretarial help.

Designed by Ken and Kate Baynes
Illustrated by Alan Chatfield
Printed in England by Alabaster Passmore & Sons Ltd
ISBN 0 900889 56 X

Chairman's Foreword

The first King's Fund report, *Commissioning New Hospital Buildings*[43], was published in 1966, and demand for it was such that it is now out of print. On the initiative of the King's Fund and with the encouragement of the Department of Health and Social Security, a working party was formed to prepare a second edition.

Because of the advances that have been made, this new edition is more than a mere revision of the first. It is a new book, not only developing the ideas in the original but also including much new material. Whilst written in the context of the National Health Service in the United Kingdom, it is hoped that it will be of use to those in other countries as much as was the first edition.

In the time which has elapsed since publication of the first edition, the hospital and health service building programme has increased virtually threefold. By any standards, this is a very large investment, but much of the effort and hard work of those who design new buildings can be thwarted if they are not used as intended. Thus patients may be deprived of the resources which should be available to them.

The successful commissioning of a new building can make a critical contribution to the task of transforming a new structure into a living organism. Although the hospital is perhaps one of the most complex of social systems, little attention has hitherto been given to this very difficult aspect of the commissioning function.

The working party has regarded the process of commissioning as a preparation for the move into a new house, the move itself, and the settling-in period after the move. If these tasks are achieved with ease and grace, the more quickly will occupation be completed and the full potential of the building realised. If the commissioning process is mismanaged, for example, with crises occurring through malfunctioning of engineering services, delay in delivery of equipment, or the emergence of unforeseen needs, the building will get a bad name which will take years to live down. The waste of money, facilities, and everyone's time is dreadful to contemplate.

A theme running throughout this new publication, with which the authors of the first agree, is that the managers of a new building are responsible for its commissioning. Commissioning is not a separate mystique and operational managers of whatever profession cannot duck their responsibilities for it. However, the commissioning of a large new district hospital may necessitate the creation of a team to assist the operational managers in post, especially when the latter are already responsible for the services of an existing hospital building.

Great skill and experience are acquired by these commissioning teams, but often these are allowed to go to waste as the team is disbanded on completion of the project. Opportunity now exists within the reorganised NHS to provide experience in the task of commissioning as part of the career structure of staff working on capital projects. It is the hope that this book will stimulate learning of the practice of commissioning.

Because commissioning devolves from the planning process and overlaps the management of the building project, some views are expressed in this report on planning and project management. It is remarkable how little literature there is on these subjects anywhere, let alone in the health field. The level and method of practice vary to extremes and it could be that a companion volume would commend itself, as we hope this book on commissioning will do.

The participation and presence of an observer from the DHSS have been of great assistance to the working party and we owe much to Mr Ray Brigden's advice.

All members of the working party join with me in expressing our gratitude to Graham Millard who was commissioned by the King's Fund to compile the information and prepare the text for publication. His ability to produce numerous drafts, his patience and tolerance with members' suggestions and criticisms, and his adherence to deadlines, have filled us all with admiration.

It only remains for me to emphasise that the views expressed in this report are entirely those of the working party. They do not necessarily represent current policy either of the DHSS or of the King's Fund.

Bryan McSwiney
London
1975

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Introduction

'Whereas New Things piece not so well. But though they help by their utility, yet they trouble, by their inconformity. Besides, they are like strangers; more Admired, and less Favoured . . . It were good therefore, that men in their Innovations would follow the Example of Time itself; which indeed innovateth greatly, but quietly, and by degrees, scarce to be perceived: For otherwise, whatsoever is New, is unlooked for: and he that is helped, takes it for a Fortune, and thanks the Time; and he that is hurt takes it for wrong, and importeth it to the Author.'

Francis Bacon: *Of Innovations*

The report, *Commissioning New Hospital Buildings*, edited by Brian Langslow and published by the King's Fund in 1966 has proved to be a valuable source of reference for all those engaged in major new hospital projects.[43] During the intervening years considerable experience has been gained in coping with this complex task, and many new problems have come to light, so much so that it became evident that a new report rather than a revision would now be helpful.

There are a number of important changes in content and in emphasis, of which these are particularly worth drawing attention to.

a This report examines the task sequentially wherever possible, defining the start of commissioning as being that stage of planning at which the site of the project has been officially decided and the functional content agreed. For the purposes of this report the termination of the commissioning process is that stage when the new

hospital has been fully operational long enough for its design and operational systems to be evaluated.

b Bringing a new hospital into use is a major event in the development of the health care services of a community. Those services are the responsibility of the local managers who consequently must be involved in and committed to the commissioning process right from the start. Commissioning is not a task that starts with the planners, is transferred to a commissioning team, and is then passed over to local managers.[53]

c In future much more thought needs to be given to the preparation of operational policies and operational systems. The combination of these determines design, choice of equipment, the numbers and categories of staff to be recruited, level of running costs and above all the quality of service provided for patients. Partial or complete failure to discuss, decide and document at the appropriate stage each aspect of the hospital's function and activity will in due course give rise to shortcomings for the staff working there and to the patients receiving its services.

It might be felt that emphasis entirely on hospitals is now inappropriate following the reorganisation of the National Health Service. This was fully considered by the working party. It concluded that, although new health authorities have responsibilities for commissioning buildings other than hospitals, for example health centres, the principles are the same, whether applied to new hospitals, new departments or redevelopments. The terminology of this report has therefore been simplified by referring throughout to new *hospital* buildings.

The way in which the commissioning process itself can best be managed will, of course, vary from place to place, depending partly on the size of the project. However, it cannot be stressed too much that there are certain principles and guidance based on experience that have

universal application to all commissioning tasks. It is hoped therefore that this report will be equally helpful to those engaged either in small or large projects. Clearly some of the proposals will be inappropriate for some schemes; in this respect the position has not changed since that which Brian Langslow summed up in the first report.

> 'Writing about commissioning is rather like writing about swimming – it is possible to set some principles and give advice but in the final analysis the only way to achieve proficiency is to jump in and do it!'

Phase I The Earliest Beginnings

1 Functional content of the project

Implications of new development on existing services; on their organisation and management

Too many schemes designed in the past have been conceived, constructed and commissioned in isolation from the services already provided in a particular community. It is important therefore that a clear and considered definition of the objectives of the building project is fully discussed, decided and documented before work starts on the functional and design brief. Moreover, these objectives will condition the management tasks of the new building when it becomes operational as well as the material structure. They have therefore a direct effect on the commissioning process and require the commitment of local management before an architect's plan is even drawn.

Examples are given below of three common situations in which the objectives of the project must be reflected in the commissioning programme.

1 If one of the objectives is to replace some existing small hospitals the earliest possible consideration needs to be given to plans for adjusting catchment patterns; assessing problems of staff transfer, redundancy or recruitment; the possibility or necessity of amalgamating some services; the compatibility of records and financial systems; the new role of the old hospitals, and so on.

2 If new and additional services (whether super-specialties or hostels) are part of the new project, what will be the practical effects on other, established services; the budgetary implications on completion; special problems of recruitment or of radically new methods?

3 If the project is a large, phased development, to what extent is it practical to take Phase 4 as the firm objective rather than Phase 1 or 2?

Objectives and their implications may be changed and modified over the years – sometimes months. Successful commissioning will depend upon

the definition of objectives at the earliest possible time

relating the entire system of operational procedures consistently to these main objectives

adapting policies and commissioning to changes in the objectives or in their implications.

The interaction of planning, commissioning and the ongoing task of local management must therefore be recognised at the very beginning.

The brief and the preparation of the schedule of accommodation

Fundamental operational policies are those decisions which provide answers to the questions which the architect's team will need to ask in order to produce a design suited to the functions required of the building.

A good brief depends in large measure on good operational planning. The requirements are summed up lucidly in an American report about commissioning new hospital departments.

> 'Before an architect can develop a hospital design that will best serve its functions, he must be provided a written program explaining in clear and precise terms the hospital's objective, plan of operation and operational policies, particularly those which must be related to the design of certain areas . . .
>
> 'The functional program should explain as fully as possible the services to be provided, the functions to be carried out, the methods to be used, the personnel needed, the working relationships to be developed, and the major equipment required.
>
> 'In addition to its function as a guide to the architect in designing the hospital, a written program can serve as a permanent record of the original planning and can help simplify the work in future operation. It can be used in orienting hospital administrative staff to the system of operation planned. It also furnishes a basic reference for selection of equipment that promotes the most efficient operation of the hospital, and for necessary continuing evaluation.'[49]

These policies should contain the objectives and an outline of the main methods of work for each department, together with estimates of workload on which the policies are based. Unless this is done, the design of the hospital might be such that when it opens it is seriously under or over provided with facilities; for example, to deal with the surgical caseload for the community. Mistakes made at this stage of a new project are invariably detected in due course by patients and staff once the hospital becomes operational. It is therefore as important to give careful attention to this part of the task as it is to the more detailed operational systems that absorb so much of the commissioning team's time later. The fact that the full time planning officers engaged in this aspect of the work might not be part of the management team in the hospital when it is finally complete makes it particularly important that, even at this early stage, there should be strong links between the officers of the planning authority and representatives of the authority eventually managing the hospital.

For this work to be successfully completed, the instructions to the design team must be as precise and unambiguous as possible. It is then up to the architect to translate this brief into an efficient, economical and attractive building. Due allowance needs to be made for the previous experience of the architect; he may be from within the authority's own department or a private consultant. The main requirements are

the nature of the services to be provided in each department and the methods to be used

operational policies

schedule of accommodation

what staff are involved

normal and peak work patterns

major equipment to be used

relationships between departments.

Too much information at this stage may produce a building good in detail but bad in general principle. With variability of functions so much a basic requirement of hospital design, it is important that the principles are sound, leaving ample scope for the users in years to come to make essential changes as patterns and needs of health care alter. This policy sometimes calls for tolerance from an individual user who might feel that, given this rare opportunity to help plan a new department, it is unreasonable to expect him to accept anything but the ideal for his immediate requirements.

The quality of advice needed to draw up the brief, therefore, has to be such that it will stand the test of time; parochial views sometimes have to give way to wider knowledge and more imaginative ideas. To determine who should give the advice can be a difficult task in itself, requiring diplomacy and judgment as to when to accept local views and when to seek help elsewhere. This is also the time to draw on experience of other new projects. So often mistakes are repeated either because evaluation of other buildings has not been undertaken at all or because there is a lack of systematic dissemination and use of information gained in this way.[2]

Sketch drawings stage

This is one of the most important stages in the planning of a new project. It consolidates all the work that has been

put into the preparation of the brief. It is the time to pause and consider four questions.

1 Does the design take account of all the requirements set out in the original brief?

2 Does the general plan include all the specifications set out in the schedule of accommodation?

3 Does it contain sufficient information to enable a realistic estimate of cost to be obtained?

4 Is it acceptable to the various authorities concerned?

Use of Building Notes and other technical guidance

The Department of Health and Social Security has published several series of notes and technical guidance to encourage an orderly approach to the planning of health service buildings. A list of these documents is included in the references.[11–26, 28, 30, 31, 33–35] In referring to them it is important to take account of two points.

Although these documents are revised from time to time, it is essential to ensure that they are used in conjunction with the latest information available from the DHSS.

The *Building Notes* are guidance material, *not* standards; it is the 'Capricode'[30] cost allowances, referred to in the next chapter, that set the standards.* Therefore, a lot still rests with the client and his architect to determine how much usable space suggested in a *Building Note* can be provided within the agreed cost limits.

*See page 22

2 Work of the project team

Work of the project team; important role of the project administrator

In addition to the design and construction teams there are usually two quite distinct teams needed to accomplish a major new development; a project team and a commissioning team. The latter is described in Chapter 3. An account of the work of the project team is needed to put the commissioning process into context, not of course to give a full account of how a major hospital building project is managed.

The project team carries the project forward from the original brief through the procedural stages and is responsible for ensuring that the plan for work is executed within the approved cost and predetermined time span. During the early stages, when it is particularly important to get off to a flying start, the team will be concerned with operational policies, schedules of accommodation, sketch designs and room layout drawings. Through working groups and other meetings there is an immense amount of detailed work to be done. Later there will be decisions to be taken on design and on various options within the cost limits. Subsequently the team's main task will be to control the organisation and financial management of the building programme.

Its membership at the outset will consist of representatives from the planning authority and from those ultimately responsible for the management of the building. The team should be led by a coordinator (usually an administrator) and should include a medical officer, nursing officer, architect, engineer and quantity surveyor. Other specialists such as a finance officer and a supplies officer should be coopted or consulted when the need for their advice arises.[3]

A project administrator is required to plan the work of the team, to organise and to participate in its meetings, to record and give effect to its decisions, and to personify the client in the important client-architect relationship. He should provide the driving force which ensures that all work to be done by the client is duly accomplished, particularly during all the following stages or processes

- assessment of need
- functional content
- preliminary appraisal of site and cost
- operational policies
- development control plan
- budget cost
- sketch plans (including engineering)
- final cost limit
- working drawings (including engineering)
- bills of quantity
- tender documents
- contract and construction
- final snagging and handover of buildings.

When construction work is under way, the project team has a vital responsibility to review building progress regularly, mainly to ensure that completion dates do not slip back unless exceptional circumstances make this inevitable. Representatives of local management require information throughout the commissioning period so that delays of any sort or, more important still, any *doubts* about completing the building on time, can be assessed and used to adjust, where necessary, other programmes of commissioning work. For example, a planned recruitment programme for all staff may need to be put back; delivery dates for equipment may have to be changed; there may be one particular senior appointment which it would be preferable to defer; or at the eleventh hour plans to admit patients may have to be cancelled.

The project administrator has another important role. Since he represents the client, he is the formal link

between local management and the architect (who in turn is the formal link with the contractor). Although good informal relationships between all those involved in the project are essential to bring about a successful conclusion, proper use of the formal administrative channels of communication is equally important. The project administrator therefore has a key responsibility to create an administrative structure which is properly used by all members of the team and which is seen to be effective in tackling what will always be a large, arduous programme of work, multiprofessional in every way, often made difficult with legal and contractual problems, and always involving large sums of capital money.

Obviously the work of a project team, its composition, whether it is accountable to a regional or an area health authority, will depend mainly on the size of the scheme. There will be some circumstances in which the work of a commissioning team and project team can be combined into one body. However, for large projects it would normally be appropriate for the RHA to set up a project team with responsibilities mainly for design and building. Subsequently, that is as soon as practicable, a commissioning team should be established within the organisation of the district concerned, with quite separate responsibilities.

Techniques of programming

Project and commissioning teams are usually reluctant to consider using critical path networks, partly because they appear to require the help of mathematical experts, which is probably not available, and partly because the teams fear that the unpredictable nature of commissioning will make the preparation of such diagrams a complete waste of time. Both these anxieties are understandable, the latter particularly so when huge diagrams completely wallpapering a project office are sometimes seen to be abandoned halfway through other people's projects!

More understanding is needed about the technique and advantages of network analysis. What are the benefits?

1 Critical activities are identified early.

2 If the first assessment of the time required to complete the project is unacceptably long, the network will show where additional resources need to be applied to reduce the overall duration.

3 The logical sequence of administrative work becomes clear.

4 It shows where delays are permissible and where they are not.

5 Essential deadlines become evident.

6 Changes to the programme and their effects can be dealt with more confidently.

7 The vast number of interdependent and complicated activities that make up the total task just cannot be put into an orderly programme without the help of a diagram of some kind.

8 Its most important benefit – it requires the project administrator to sit down at the outset of the job and plan it in a clear, lucid and logical way.

It is necessary therefore to give very careful consideration to the use of some sort of programming technique and to the possibility of having the help of an experienced programme assistant to devise the most appropriate system; for example, Gantt or bar charts, line of balance, network analysis or a combination of these techniques.

One system, simple to learn and easy to prepare if specialised programming help is *not* available, is called the 'cascade chart' (See Figure 1, pages 20-21). This is a bar diagram with the network logic shown on it. First of all the activities of the project have to be displayed in the form of a network; each activity has to be numbered and the duration for carrying it out has to be assessed. Once this has been done, the activities are listed numerically, the earliest first, the latest last. The logic of the network is then shown by connecting the activity bars with vertical lines in the form of steps running from top left to bottom right of the chart – hence the name 'cascade'. Its limitation is that it is only suitable for a short-term set of activities which are unlikely to change; it cannot be updated without being re-drawn. Gantt or bar charts are therefore best for planning and timing of tasks. Networks are required to relate a series of tasks together.

It is beyond the scope of this book to explain these techniques, but it is worth reminding administrators concerned with capital projects of the several publications which can help the newcomer learn enough to produce a useful diagram.[5, 8, 50, 57, 62, 65] It is unlikely that specialised help will be available except perhaps in very large projects.

Those responsible for major schemes clearly have to give early consideration to methods of project management and control. As programming forms part of this function, five principal points have to be observed.

1 A master programme, showing the most important 'milestones', is essential.

2 Subsidiary programmes related to the master programme are required to break down the task into manageable portions.

3 All programming involves forecasting, and all forecasting necessarily contains a probability of error. Therefore the consultative procedures from which information for the forecast is obtained must be carried out thoroughly. If, in practice, dates are determined by superficial guesswork, programmes are not really worth documenting at all.

4 Updating must be done at regular intervals based on the best available information.

5 The programming task is so complex, it is foolish to rely on a person who thinks it can all be done in his head!

Project financial control

Seven objectives are to be achieved to establish an effective system of project financial control.

1 Costs of the building and of capital equipment must be within the limits laid down by the DHSS.

2 A cumulative record of the capital budget must be maintained, updated as necessary, for the cost of variation orders, works instructions and fluctuations in wage rates and prices.

3 A cumulative record of value of completed works set against actual payments must be maintained to avoid overspending approved allocations.

4 Any actions or defaults which might cause delays and lead to the health authority becoming liable for financial claims by the contractor must be prevented.

5 It must be ensured that any variations are only approved once the financial consequences have been assessed and fully considered by the project team. A limit should be placed on the cost of variations that may be given without approval of the controlling authority.

6 The use of contingency monies must be controlled.

7 The final account should be audited before the final certificate is issued (or provision made for subsequent adjustment), without prejudice, of course, to the responsibility of the architect.

The cost control of building schemes falls into two phases, pre-contract and post-contract. There are two main objectives in the pre-contract phase.

1 A realistic estimate must be determined as early as possible to establish a budget cost within which the designers are required to work.

2 Acceptable tenders must be within the agreed cost limits.

It is at this early stage of project management that the decisions with the greatest influence on cost are taken; these are the content of the scheme, the site and the building shape. The economies achieved later in planning and construction may be significant in absolute terms, but marginal compared with the effect of these early decisions. Once the best and most economical solution has been found, a realistic timetable for going out to tender must be drawn up. It is essential to put back a planned start date rather than go to tender with an inadequately prepared scheme. Short cuts in planning often have serious consequences. The tenderer must have adequate information to enable him to tender accurately.

Post-contract cost control aims to ensure that the final account for the final contract sum is an accurate derivation of the original contract sum adjusted by permissible fluctuations due to cost increases of labour and material and other contractually payable sums. The written procedure for dealing with variation orders is particularly important, partly because the contractor may claim extra payment for expense incurred as a result of complying with an order. Once the contract has been signed, the contractor must receive step-by-step drawings and properly coordinated information. Delay in providing these is one of the commonest causes of contract delay, and of contractor's claims.

In turn, postponements of handover can necessitate extra expenditure on buildings due to be replaced and can waste revenue expenditure if recruitment programmes are so committed that staff appointments either have already been made or cannot easily be deferred. Loss of use of the investment in the new building is another expense, a factor often disregarded because there is no cash flow to measure.

Throughout the contract period there must be an effective system for keeping an accurate and up-to-date record of actual and predicted expenditure, and for advising the project team sufficiently early to ensure that overspending does not occur. The financial management of a major project clearly requires a formal procedure, with the respective roles of the architect, the project administrator and the regional treasurer clearly defined. It is part of the project administrator's role to ensure that information is provided regularly, and that matters requiring variation orders are carefully presented to ensure that financial consequences are properly assessed. The following definitions in simplified form may be helpful. They distinguish the various financial terms frequently discussed in project team meetings.*

Variations

A variation to the contract arises when instructions are issued which will alter in any way the plans and specifications which form part of the original contract documents. Some will lead to additional cost, others might make a saving. Careful recording and control of all variations is therefore essential.

There are two categories of variation.

1 Variations forced on the architect, engineer and client by circumstances which could not be anticipated by any normal test or examination and which are necessary to complete the work as far as possible as originally envisaged. These are *true* contingency variations, for example a geological fault not shown in trial hole borings before work began.

2 Variations where the client has freedom of choice. Basically these should not occur. If they are requested, an essential requirement is that they be deferred as post-handover modifications against which a capital reserve might be available quite independent of the contract. This is referred to again in the next section.

Prime Cost Sums (PC sums)

These are sums of money inserted in the bills of quantities to cover the purchase of item(s) from a supplier to be nominated, or the cost of supplying and fixing item(s) by a sub-contractor to be nominated.

In every possible case PC sums should be based on firm prices or quotations obtained as late as possible before going out to tender.

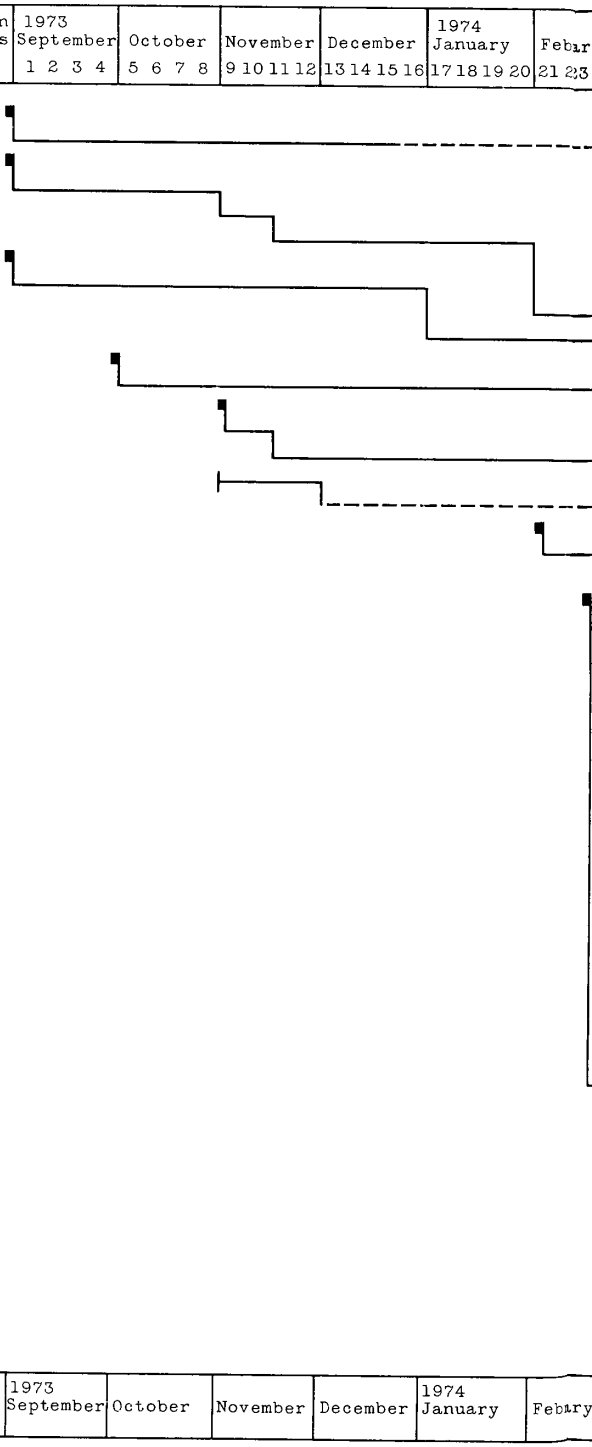
*These and other definitions are given in Appendix G, Glossary of Terms used in Hospital Building Cost Control, page 126.

Figure 1 Cascade Chart

Northwick Park Hospital – Stage 3 Commissioning

Cascade Chart – Precedence network for commissioning south wing wards, outpatient and accident departments.

Department	Section	Activity	Number	Duration Weeks	Days
Accident		Handover	1	0	1
Accident	Add.x-ray facilities	Commission	2	28	0
OPD	Extension	Handover	3	0	1
OPD	Extension	Commission	4	8	0
OPD	2 extra clinics	Operate	5	2	0
Accident	Fracture clinic	Operate	6	10	0
X-ray	4 extra rooms	Handover	7	0	1
X-ray	4 extra rooms	Commission	8	16	0
OPD	2 more clinics	Operate	9	10	0
X-ray	4 extra rooms	Operate	10	12	0
Switchboard	Extension	Handover	11	0	1
Switchboard	Extension	Operate	12	24	0
Catering	Dining room ext	Handover	13	0	1
Catering	Dining room ext	Commission	14	2	0
Catering	Dining room ext	Operate	15	13	0
Catering	2nd Ganymede belt	Commission	16	4	0
Catering	2nd Ganymede belt	Operate	17	28	0
Residences	Fleet House	Handover	18	0	1
Residences	Fleet House	Commission	19	4	0
Residences	Fleet House	Operate	20	3	0
Ward block	South Wing	Handover	21	0	1
Ward block	Eliot/Fletcher	Commission	22	3	5
Ward block	Eliot/Fletcher	Operate	23	0	6
Admin block		Handover	24	0	1
Admin block	Medical records	Commission	25	1	0
Admin block	Medical records	Operate	26	2	6
OPD	Extra clinic	Operate	27	6	0
OPD	Remaining clinics	Operate	28	29	0
Admin block	Group admin	Transfer	29	1	0
Admin block	Group admin	Operate	30	2	0
Acceident		Operate	31	37	0
Level 10 link	Staff health	Refurbish	32	5	0
	Staff health	Transfer	33	1	0
Residences	Cam House 4 rooms	Commission	34	3	0
Residences	Cam House 4 rooms	Operate	35	29	0
Admin block	Secretariat	Commission	36	2	4
Admin block	Secretariat	Operate	37	37	0
Residences	Esk House	Handover	38	0	1
Residences	Esk House	Commission	39	4	0
Residences	Esk House	Operate	40	37	0
Ward block	Dryden	Commission	41	17	0
Ward block	Dryden	Operate	42	1	0
Ward block	Herrick	Commission	43	11	0
Ward block	Herrick	Operate	44	1	0
Ward block	Jonson	Commission	45	7	0
Ward block	Jonson	Operate	46	1	0
Ward block	Kingsley	Refurbish	47	21	0
Ward block	Kingsley	Equip	48	16	0
Ward block	Kingsley	Operate	49	1	0
Wards/Accident/ OPD	ALL FULLY OPERATIONAL		50		



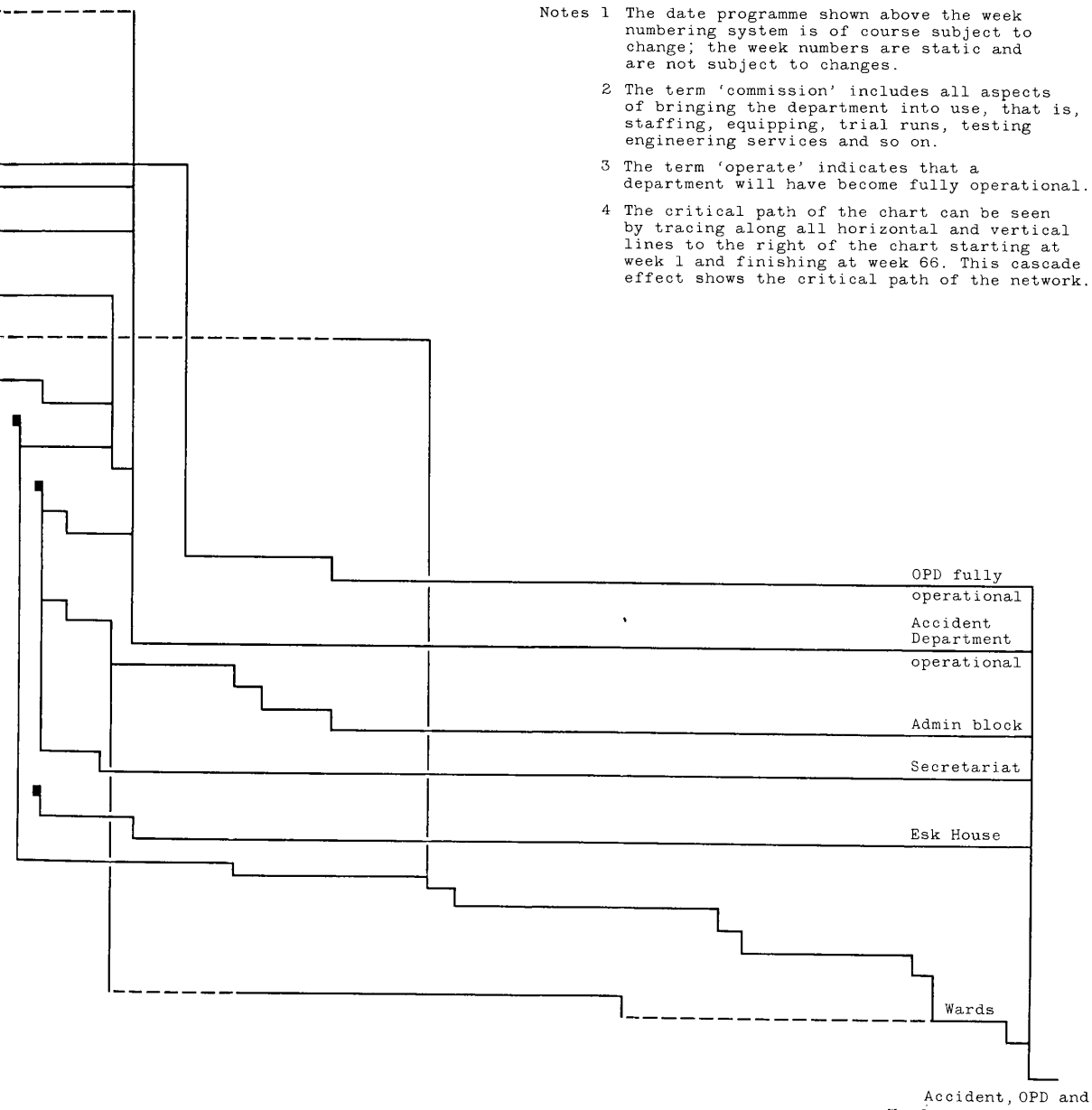
ary	March	April	May	June	July	August	September	October	November	December	1975 January
23 24	25 26 27 28	29 30 31 32	33 34 35 36	37 38 39 40	41 42 43 44	45 46 47 48	49 50 51 52	53 54 55 56	57 58 59 60	61 62 63 64	65 66

Notes 1 The date programme shown above the week numbering system is of course subject to change; the week numbers are static and are not subject to changes.

2 The term 'commission' includes all aspects of bringing the department into use, that is, staffing, equipping, trial runs, testing engineering services and so on.

3 The term 'operate' indicates that a department will have become fully operational.

4 The critical path of the chart can be seen by tracing along all horizontal and vertical lines to the right of the chart starting at week 1 and finishing at week 66. This cascade effect shows the critical path of the network.



ry	March	April	May	June	July	August	September	October	November	December	1975 January

Provisional Sums

These are sums of money provided in the bills of quantities against items which, at the time of preparing the bills of quantities, were known to be required but were not prepared in detail. These items should be kept to an absolute minimum.

Provisional Items

These are provisional sums or quantities in the bills of quantities for items, for example, foundations, which have at that stage been only provisionally measured. Re-measurement will take place during and at the completion of the contract and final costs agreed.

Proposals to change original brief

The long period from the earliest beginnings to completion, perhaps seven or more years, makes inevitable the many attempts to alter the original brief. Rapid developments in hospital practice, or 'progressive' managers and doctors taking over from their more cautious predecessors, give rise either to requests or, more frequently, determined pressures to make changes. The arguments and pleas are always the same: 'Unless changes are made before completion there will never be opportunities afterwards, and in any case it just will not work.'

The project team should be ready for these situations – they occur in all major schemes – and operate a firm policy. Changes during the contract period will almost certainly disrupt the contractor's programme and hence will be very expensive – the worst kind of variation order!

Once a policy has been firmly established it should be rigidly applied, leaving the door only slightly open for exceptional requests which probably will fall into one of two categories: alterations required for safety purposes, and alterations essential for the operation of the building.

To meet these eventualities, contingency sums should be set aside, and in all cases any request to be funded in this way should be scrutinised carefully by the full project team.

To help make this policy succeed, it is invaluable to have a small reserve of capital funds available to the hospital during the year following the expiry of the defects liability period.* This is rarely offered, mainly because competition for capital monies is so strong that it is usually felt the new hospital has had its full share and other new projects should now have the highest priority. This is an understandable policy. On the other hand, new hospitals bring with them new commitments, financial and others. By having such a reserve, pressures to make changes, some of which will be extremely important and fully justified, can be withstood until after handover. Hospital architects increasingly allow in their design for buildings to be capable of alteration or expansion so that subsequent changes are not too difficult to make. There is also the merit that the experience of running the hospital will have identified the real working needs more precisely, and priorities for using such a reserve can be assessed more equitably.

*See Chapter 13, Implications of the Defects Liability Period, page 66.

Health Building Procedure Notes (Capricode)

The Secretary of State has directed that any building or civil engineering works undertaken by RHAs or AHAs in England and Wales shall follow the building procedures laid down by the DHSS in the Health Building Procedure Notes 1 and 6 (commonly known as 'Capricode')[30] and any other instructions given by the DHSS.

The first note in the series, *HBPN1*, was issued in 1967 and updated in March 1974 in the light of general experience, and particularly the report of the hospital planning and design process by Herbert J Cruickshank.[9] *HBPN1* gives a detailed appraisal of the various interconnecting stages through which a project must pass, and indicates where responsibility lies for carrying the proposals forward from stage to stage. It describes the main considerations to be taken into account if proposals to provide buildings are to advance smoothly from inception to evaluation.

Appendix 2 of *HBPN1* contains a description of the work to be done at each stage of the procedure. The tasks to be undertaken by those concerned with the commissioning of new buildings are identified, especially those activities which must be undertaken well in advance of Stage 5, such as, during Stage 3, the campaigns for the phased recruitment of staff.

For ease of reference the main procedural stages are summarised.

Stage 1

1A outline project policy
1B briefing of project team
1C outline management control plan
1D assessment of functional content
1E site appraisals
1F cost and phasing
1G approval

Stage 2

2A management control plan
2B site selection
2C planning policies
2D building shape
2E development control plan
2F confirmation of functional content
2G budget cost

2H selection of contract method

2J approval

Stage 3

3A notional cost plan

3B design brief

3C sketch plans

3D equipment schedules

3E check on design

Commissioning activities may start

3F detailed design

3G summary cost plan

3H approval

3J tender documentation

Stage 4

4A contract

4B construction

4C engineering commissioning

Stage 5

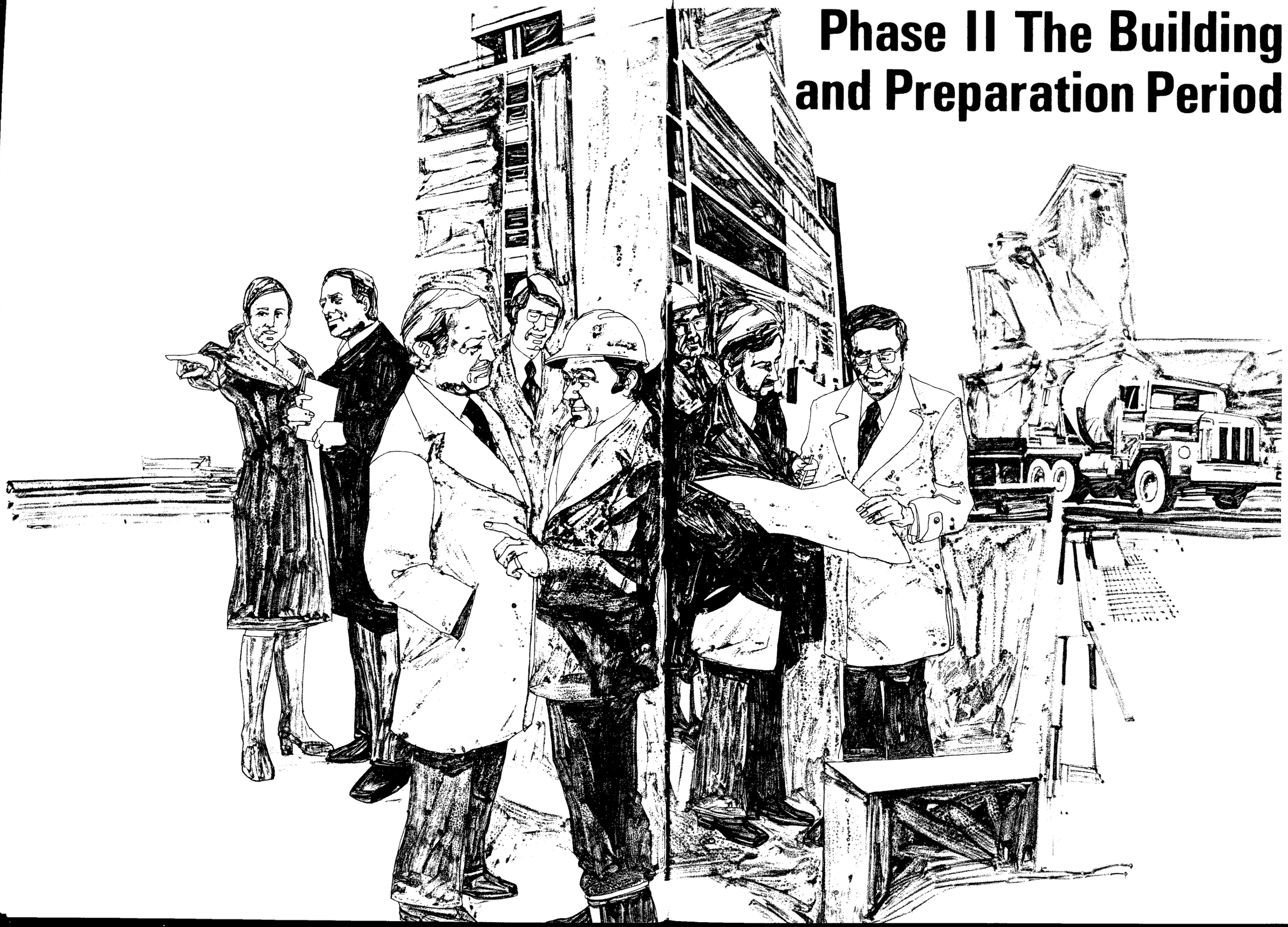
commissioning

Stage 6

evaluation

The code is an invaluable source of guidance. It is arguable that it might be improved by more mention of the role of local management. The working party defined commissioning as starting at the stage when the site has been officially decided and the functional content of the project has been agreed. Although Capricode indicates the start of commissioning at Stage 5, there is no reason why an earlier start should not be made.

Phase II The Building and Preparation Period



3 Management of the commissioning programme

Commissioning – a specialist task or part of local management?

The notion of commissioning as a specialised task requiring full-time effort separate from local management is an arguable one. Is commissioning a planning activity or a management activity? The secondment into the organisation of an experienced commissioning officer to coordinate the programme may be considered as one solution. Alternatively, a senior officer from within the district management team might be given responsibility for the whole job: in the past, for entirely new hospitals, the hospital secretary designate for the new organisation was the obvious person to take on this role. Those who have experienced commissioning with both kinds of organisation are likely to adopt the latter alternative and

hold firmly to the view that commissioning is part of the task of local management. The reasons may be summarised.

1 Commissioning is a phase in management.

2 However taxing the load of starting a new building and services, local managers must live with the results thereafter.

3 Commissioning is therefore more likely to be successful if local managers are involved and committed to the commissioning programme. The strength of this commitment is in proportion to the extent to which local managers are involved in the early planning and execution, and use the knowledge acquired in a better understanding (and thereafter better management) of those services after commissioning.

Commissioning a new building is one major incident in the continuing growth of health care services. Responsibility for managing change lies at all times with operational managers – all chief officers, heads of departments, nursing managers and supervisors. Responsibility for commissioning is thus contained within the general development responsibility of all effective managers.

How can commissioning be made a management responsibility? Two things ought to be done immediately when a new hospital is planned. First, the management structure should be reviewed; this ought to be done early in the life of the project. Second, either a senior officer should be newly appointed or an officer in post should be allocated as commissioning officer to programme and coordinate the commissioning activities of all departmental managers. Factors such as the size of the project, whether it is a completely new hospital or a major extension of an existing organisation, will mainly determine the choice between making a new senior appointment or absorbing the commissioning task within the existing senior administrative structure and merely supplementing this at junior level to cope with the additional workload. There is the further option to be decided between designating a person only to do commissioning or to allocate administrative responsibilities in such a way that commissioning and day-to-day managerial duties are combined, at both senior and junior levels. Working alongside the commissioning officer, it will probably be necessary in a large project for a nurse to be designated too, specifically to coordinate the commissioning task of nurse managers.

Once a commissioning officer has been appointed, he will need to embark immediately on the task of helping managers to understand clearly their responsibilities for commissioning or, in an entirely new hospital, to programme the appointment of new departmental managers in such a way that the requisite skills and managerial time are brought in at the right time. Soon he will require the support of a commissioning team whose work will start at this early stage and continue until the new building is fully operational.

Work of the commissioning team

Membership of the commissioning team should be based on the requirement to have regular meetings of those officers in the local organisation whose collective work will predominantly determine whether or not the hospital will open according to the predicted programme. Although too large a meeting generally tends to become ineffective, there is the exception when the presence of people involved only in certain parts of the task becomes justified because of the importance of their commitment to the total effort. Links with the project team of the planning authority and with senior representatives of the district management team are essential to its success.[3]

Membership will depend partly on the size of the project but the following example would be appropriate for a large hospital on a new site.

Permanent membership

commissioning officer

medical representative nominated by the district medical committee

nurse with special commissioning responsibilities nominated by the district nursing officer

personnel officer (or a senior representative from the district personnel department)

project administrator (or his representative) – by invitation

supplies administrator (concerned with the purchasing programme)

works officer (or senior officer representing him)

Coopted at different stages:

support services manager, finance officer, interior designer, district domestic services manager, head of portering services, site architect (if such an appointment has been made) and other departmental managers as required.

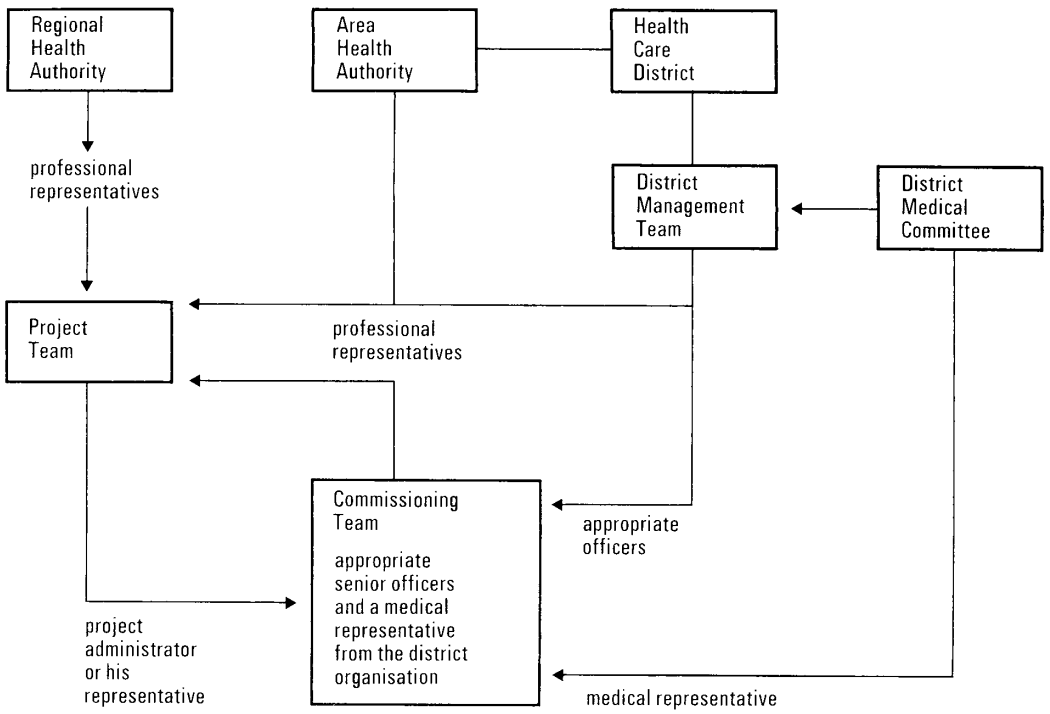
The chairman would be chosen by the team. It might be helpful to appoint a junior administrator as secretary.

The team's relationship to the district management team, and area and regional health authorities will vary considerably, depending on local management structures and on the size of the project. For a large project of an AHA where maximum delegation to the district is practised, the relationships shown in Figure 2 (overleaf) would provide a practical solution.

For smaller schemes delegated to AHAs it would be clearly appropriate for the work of the project team to be an area function. Whatever solution is determined, it is important to clarify the accountability of the commissioning team and its principal coordinating officer. Normally he should be directly accountable to the district administrator, but in exceptional circumstances it might be decided for him to be accountable to the area administrator. If this latter arrangement is made, great care must be taken to define his role and agree it explicitly with the district administrator concerned in order to ensure a smooth transition through commissioning into management.

To help its work, the commissioning team must have adequate secretarial and administrative support. The sheer volume of work involved in opening even a small hospital or new wing is often not appreciated until too late. Frequency of meetings will fluctuate: normally once a month will suffice but, as handover becomes closer, fortnightly or even weekly meetings will be invaluable. The formal terms of reference of the team can be defined, but in general it is regarded as an essential 'clearing house' for problems which, if not dealt with expeditiously, can prevent crucial deadlines being attained. It is the sort

Figure 2 Organisational Relationships of the Commissioning Team for a Large Building Project in the National Health Service



of meeting where 'any other business' can sometimes be the most important item on the agenda!

Terms of reference for a commissioning team

1 To provide a formal link between the project team and those responsible for commissioning the new buildings

2 To identify at the earliest possible time any serious difficulties which have to be solved if success is to be achieved

3 To prepare detailed estimates of expenditure attributable to the project and to the commissioning task itself*

4 To ensure that the district management team is kept fully aware of commissioning progress and that policy matters affecting the project requiring decisions are handled without delay

5 To maintain a collective impetus throughout the organisation that ensures that managerial deadlines are known and met

6 To help coordinate the interdependent activities of all departments concerned; in particular the equipment and recruitment programme

7 To keep the members informed at the earliest opportunity of any changes to the programme, or warn the team of any facts which might create delays in due course*

8 After handover, to bring to the attention of the site architect any defects which require urgent attention

9 To provide the administrator responsible for commissioning with support and advice throughout the project

10 To draw up operational systems for all departmental activities and procedures

Appendix C (page 114) shows the range of subjects discussed by a commissioning team during five years of intensive commissioning activity required for the major development at Northwick Park Hospital, London.

The existence of a team, vital as it is, does not of course detract from individual members' responsibilities for commissioning.

*Some of the headings of expenditure requiring careful attention are referred to in Chapter 14, page 67.

*More details of this part of the commissioning team's work are outlined on pages 30-31.

Roles of departmental managers, medical, nursing and other staff

At a very early stage, when construction work is about to start, it is necessary to consider what involvement of staff will be necessary to help develop the operational systems, compile equipment lists, advise on staffing requirements and, in due course, commission individual departments.[6, 34, 48, 55] A common weakness in so many projects has been the failure to achieve sufficient involvement, with the result that many things are likely to go wrong.

1 Senior staff, who are brought into the scheme too late are faced with the task of trying to rectify serious omissions, some of which are fundamental to the efficient running of a new department. In some cases it is too late to effect satisfactory remedies; instead, improvisation or making the best of a bad job are the only choices for the user.

2 There are serious delays to the opening of the new building because of the failure to identify sufficiently early requirements critical for opening; for example, recruitment of key staff, essential items of equipment that need to be ordered well in advance.

3 A long period of muddle during the final commissioning period, with damaging effects to morale and to staff relationships generally. The immediate reputation of the administration itself depends to a certain extent on its efficiency in carrying through the commissioning programme.

4 A disappointed public expecting high standards of service immediately after the new hospital opens.

5 An unsatisfactory organisational structure containing, perhaps, some serious mistakes that are difficult, or in the short term almost impossible, to change.

What then is required of staff so early in the commissioning task? How can the problem of obtaining this advice be reconciled with the danger of appointing senior staff too soon? Where a project is based on an existing organisation, should guidance be sought from senior staff already available when it is known that in some cases sufficient ability or the necessary forward-looking approach is missing? Would it not be preferable for policies, staffing schedules and equipment lists to be drawn up by a small commissioning team of officers and eventually appoint senior staff to work within what has been provided? Conversely, can systems be drawn up in isolation from the ultimate managers or are there certain matters which only the users (including, of course, clinicians and other specialists) can determine?

It is easy to pose questions; answers are difficult and complex. Although each scheme has to have its own solution, some guidelines may be helpful.

1 Where it is known that a particular person will be the manager of a new department, it is essential to involve him as early as possible, to use his knowledge, and take advantage of his managerial planning role. The size of the total task is such that the more it can be shared the better.

2 Certain medical policies must be determined early. The commissioning team must therefore have advice from doctors which, when the building becomes operational, is likely to be generally accepted by the medical users. This can be achieved partly with the help of a medical officer experienced in planning, but doctors representing the new hospital itself are essential if the new organisation, as distinct from the actual building, is to be commissioned successfully. Two medical representatives, often regarded as the right number, can share the workload of informal meetings which are a feature of commissioning work. By keeping the number small, communication and commitment are more effective.

3 Nursing policies, inevitably closely associated with medical policies, have to be drawn up early. These policies will normally be determined by the district nursing officer in consultation with specialist nursing officers. In a large project, it might be appropriate for a senior nurse to be allocated specific responsibility for undertaking this task of establishing broad policies before nurse managers are appointed for each of the new nursing departments.[60]

4 In addition to drawing up broad policies, for example the distribution of beds or determining the function of each ward, more specialised advice is also required early. The management of intensive care will need the guidance of a clinician; the inpatient and outpatient care of children and the proper facilities to provide it will need paediatric advice; systems to prevent or control infection will need the help of the microbiologist, and so on. Similarly, departmental systems in the 'hotel' and paramedical departments cannot wait until the buildings are handed over. Specialist help must be brought in at the appropriate time. If early appointment of senior officers is deemed to be extravagant or, more likely, such offers do not want to spend too long in the career step of planning rather than running a new service, the idea of making a number of proleptic appointments commends itself. This enables key specialists and departmental managers to become associated with the project on a part-time basis before fully terminating their present posts. Contractual details of such an arrangement are not difficult to overcome.

5 Once officers join the new hospital full time it is often necessary for the coordinator of the scheme to make sure that they remain fully occupied. The very nature of a commissioning programme gives rise to peaks of workload often followed by troughs, which need to be filled, sometimes ingeniously, perhaps by slightly widening the role of those taking part, to help complete the total task. For example, public relations activities can be shared by the whole commissioning team. Recruitment of staff benefits from an all-out effort by as many people as possible. There are other ways of supplementing early planning functions, including taking on temporary responsibilities in existing institutions or, for example, a catering officer providing a small but important supporting service for the team of staff commissioning the building before patient services actually start.

6 The contribution to be made by staff as a whole should not be neglected. If there are representative meetings, either departmental ones or a staff consultative council, full advantage should be taken of their views and ideas.

To summarise, it is clearly an important task in itself to consider what advice is needed during these early stages. At what point in the programme must each aspect of this advice be brought in to determine operational systems, equipment, recruitment or staffing schedules? Can this help be obtained from people unconnected with the project? Occasionally this is practicable. If not, are existing staff used or do new appointments have to be made? If new staff are brought in, is full-time involvement required or will a proleptic appointment for a few months provide all the help that is required?[4,7]

Commissioning officers fully immersed in their work sometimes underestimate the need to provide some guidance to new heads of departments as they take up their own commissioning responsibilities. Consultant medical staff too, if the task is new to them, welcome a lead as to how they can make the most effective contribution. The examples of check lists on pages 32–34, by no means comprehensive, may be of help to nursing officers, doctors and departmental managers, who, for the first and perhaps the only time in their careers, take on a commissioning role.

Coordinating role

Of all the management tasks in the health service, the job of commissioning is almost exclusively one of coordination. It is almost totally concerned with programming the work of numerous departments that are not directly accountable to the commissioning officer. In this enlightened era of job specification and careful selection techniques, it is important that those appointed to commissioning work are correctly chosen. An unsatisfactory appointment to this post will inevitably have an adverse impact on the entire programme and on the thoroughness required to make it a real success. It is worthwhile listing attributes that should be sought.

Capacity to keep in mind and bring together a wide range of interdependent activities into one cohesive programme

Creativity to pursue new ideas despite obstacles in order to bring into being a new thriving organisation

An analytical approach to ensure that important details are not overlooked

Capacity and firmness to cope with hard work and to keep it up over a long time

Flexibility to face the unexpected disappointment

Leadership to get others committed to the programme

Experience of knowing in depth the components that make up the complex organisation of a hospital.

No one person will possess all these qualities, but the point is that all the guidance set out in this report will be of limited help unless the right person is there to apply it.

Predicting the programme and reviewing it: critical factors

The components that make up the commissioning machine are numerous and vary in size. As in a vehicle, the small ones are often the most essential and the most expensive. Any damage to one link in the chain can bring the whole machine to a standstill. It is therefore imperative that the anticipated completion date of the building to which the whole of the commissioning programme is geared is calculated as accurately as possible. This is not easy; completion date is influenced by the efficiency of the contractor and subcontractors, weather conditions, unexpected site difficulties and delivery of materials. Experience has shown that the anticipated completion of large building contracts can be delayed by a year or more beyond the original forecast.

The value of programming techniques is expounded in Chapter 2 (page 17), but equally important is the availability of up-to-date information which might necessitate altering the programme.

Prediction of each element in the programme is an imperfect skill. It has to be done after consulting all those concerned with implementation, and then it has to be reviewed systematically throughout the project.[37–40,44] Appendix D (page 117) sets out a summary of unexpected problems that have led to last-minute delays in a number of commissioning programmes during the last few years. The obvious question is whether or not these delays could have been anticipated had there been better control or a better information system.

Examples of disruptions to the most carefully planned programme are listed below.

1 Handover dates were not met.

2 Essential staff, without whom services cannot open, was not recruited.

3 Essential equipment, without which services cannot open, was not obtained.

4 Essential engineering services did not work: for example, ventilation plant in theatre, lifts, power, water, telephones, steam, heating.

5 A building had no access.

6 Residential facilities necessary to recruit staff were not provided.

7 Key personnel was not recruited and appointed during the early commissioning period.

8 Unexpected 'industrial action' was taken – in a firm supplying materials for the contractor, or supplying equipment for the new building. There may also be a hold-up in construction or industrial action by hospital staff themselves.

9 A safety risk was identified at the last minute, which it was felt made it unwise to open a department either for patients or staff. Similarly, the lack of adequate

emergency back-up facilities could create an unexpected obstacle.

10 Suppliers failed to deliver according to the programme despite the fact that the purchasing officer had allowed what he thought would be ample time.

11 The impossibility of recruiting a large number of staff of the same category within a short period was not anticipated.

12 Equipment specifications were not completed in time to place orders within practicable delivery periods.

13 Operational systems were not completed in time for equipment scheduling and the start of the staff recruitment programme.

14 Too little time was allowed after handover for staff to be able to meet deadlines.

Troubles such as these can be faced more easily if the programme as a whole has not fallen behind. This requires constant vigilance to make sure that valuable time is never lost at any stage. If good fortune ever allows there to be time in hand, good use can always be made of it! The commissioning officer, therefore, needs to regard the task as a long distance race against the clock. Every lap makes demands on the team; some laps have to be taken at a faster pace than others and towards the end warning bells have to be sounded to make that effort for the final run-in.

Forecasting revenue consequences of a new project

Working from a secure revenue base at the earliest possible time for the eventual running of the new project is vital. Forecasting is often left much too late or is done too superficially, either of which can have unfortunate consequences. In assessing the revenue implications, the importance of early and detailed information about the operational systems to be used soon becomes evident. Operational systems determine in the main the numbers and categories of staff to be employed. Recurring revenue costs, other than staff, can also be calculated once it has been decided, for example, whether to use certain disposable goods in preference to nondisposable, or whether certain specialised work involving expensive overheads is to be done. Workload predictions are essential for assessing all sections of expenditure, particularly in investigational departments. Examining costs and workloads achieved in comparable hospitals and relating these to similar departments is an important part of the estimating task. The recurrent running costs so determined are normally expected to be contained within a gross global target figure calculated in accordance with the provisions of Capricode*, embracing the RCCS Estimating Procedure (revenue consequences of capital schemes). Under this procedure standard costs and workloads are derived from samples of existing comparable hospitals.

In view of the limitations inherent in any system based on averages, it is important that forecasts of expenditure are prepared thoroughly by carefully predicting workload of *all* departments, case mix, the requirements of any expensive department such as an intensive therapy unit or a subregional specialty, day-care work and any exceptionally high staffing cost attributable to the design or function of the project.

Revenue requirements need to be calculated particularly carefully for phased schemes when overheads for the final stage tend to distort the norms and averages which might otherwise be imposed on earlier phases. As well as forecasting annual revenue costs, additional expenditure is required for the commissioning task itself.*

Easily overlooked is the related work of calculating changes in expenditure patterns for hospitals nearby, whose workloads and staff requirements will alter as a result of opening the new hospital. There might be financial consequences chargeable to existing hospitals if, for example, the new hospital is to provide certain centralised services. In addition there are consequences for the community health service almost invariably left to chance in the past without any realistic assessment of additional cost. For example, there is little point in opening a 20-bed day-care unit unless the home nursing service can take on the extra commitment. In the reorganised NHS, all these implications including those for ambulance services and after-care nursing, must be worked out and in due course provided for if there is to be a smooth transition from the period before opening and the time when all the new services become operational.

Commissioning Check Lists

It is always essential to produce a set of check lists summarising the various tasks to be carried out during the commissioning process and when preparing this, to remember to refer back to the original operational policies. At first it appears to be a straightforward and interesting task, particularly if use is made of other people's efforts, for example the schedule set out as Appendix C, page 114. However, this can only be regarded as a first step. In all projects there will always be a wide range of matters peculiar to the local situation. Therefore, a detailed analysis of *all* functions has to be carried out before the list can be regarded as complete. Three examples might help to illustrate variations which will only apply to certain developments.

1 The work of a highly specialised unit.

2 Policies where there is a relationship with other local hospitals; for example, a new centralised service.

3 A subject such as the establishment of an ethical committee, or setting up a comprehensive personnel department, which may require some new managerial ground to be broken, even though it may not be essential to make such changes for opening the new building.

*See page 22

*See Chapter 14, page 67

Once the list has been produced in draft form it is wise to give it a wide circulation to other staff concerned with the project. No one person is likely to have the knowledge to compile such a list on his own. Others will have a useful contribution to make, particularly medical and nursing staff. Two examples of commissioning check lists, for newly appointed departmental managers and for consultant medical staff are given below.

The next major task is to plan the programme of work, making sure that deadlines that are set fit in to the overall programme *and are realistic.* Provided that the listing of tasks has been done at an early stage – unfortunately that is not always so – it should be possible to build up the commissioning team at appropriate stages during the programme in order to cope with the workload. The deadlines will help identify dates by which certain senior staff should have joined the project, or advice from other sources should have been obtained. It is also helpful to document the schedule of work in such a way that the planning of each activity is assigned to a specific officer.

Commissioning check list for departmental managers

Phase I: Early planning

1 Prepare a commissioning check list of your own.

2 Visit new departments in other hospitals to learn from their experiences.

3 Plan operational systems in consultation with other managers. When these have been drawn up, document them as manuals.*

4 Assess ultimate workloads and the growth rate for achieving these Match these predictions with a timetable for recruiting staff.

5 Plan staffing requirements.

6 Prepare organisational structure of the department in consultation with the personnel department. When this is complete, prepare job descriptions for each post.

7 Discuss with other managers those systems which are interdepartmental and require joint planning.

8 Help with specification and selection of equipment.

9 Consider your own personal training needs and seek guidance from the personnel department as to how these might be met.

Phase II: Preparation period

1 Where departments already exist, whose work is to transfer to the new hospital, involve the staff wherever possible in planning the work of the new department.

2 Consider the detailed requirements for each room, particularly fittings and shelving. Find out what has been planned and draw attention to any serious omissions. (This task is often left to the last moment with the result that problems are identified much later than they should be.)

3 Draw up a list of all requirements for consumable goods (such as CSSD supplies and linen) and documents and forms.

4 Help with the work of multi-disciplinary working groups in drawing up policies and procedures.

5 Keep in touch with the supplies department about ordering and delivery progress.

6 Prepare for inservice training and trial runs.

7 Help with any major recruitment events.

8 Select new staff in conjunction with the personnel department.

9 Think about and try to anticipate problems which might create delays to the published programmes and keep the commissioning team informed of such difficulties.

Phase III: Climax - bringing the department into use

1 Induct and train new staff.

2 Keep staff informed about progress as a whole and of any difficulties causing delays. Take a close interest in the needs of staff transferring from an old department to a new one, and keep them informed about dates. Give

*See reference 42.

special attention to matters affecting staff morale.

3 If your department contains a lot of specialised equipment, help to check that the items are correct and undamaged at the time of delivery.

4 Immediately after handover, check throughout the department to ensure that all equipment and engineering services are functioning properly. Make lists of things that require attention.

5 Keep in touch with other departmental heads whose services interrelate.

6 Cooperate and provide help with public relations visits.

7 As soon as the service opens, maintain close supervision of all aspects of the department's work. Hold frequent discussions with staff so that their views can be obtained about any changes that appear to be necessary.

8 As soon as the department opens, the need for certain items of equipment, not originally listed in the equipment schedules, will come to light. There will also be similar operational problems associated with the accommodation and engineering services. Keep the administration informed about these problems and distinguish between requirements that are urgent and those that can wait and be assessed against other priorities.

9 Keep a record of building and other defects which in due course will be referred to the contractor.

10 Pass to the administration details of serious design problems so that these can be referred back to the planning authority or can be considered if there is to be an evaluation study. Technical problems affecting structure and engineering services will no doubt be reported by the district works officer to the health authority's works officer.

Commissioning check list for consultant medical staff

1 Use of clinical resources The medical staff as a whole, in consultation with nursing and administrative staff, need to be in agreement about the allocation of all clinical resources before the hospital is opened. This is a complex task which can only be completed if working groups made up of appropriate representatives are given a free hand. The main resources to be allocated are beds, theatre sessions and outpatient clinics. Some of the newly-appointed consultants will therefore also be helping with the work of these multidisciplinary working groups. All consultants will inevitably take part in the medical representative machinery (for example, the 'cogwheel' system*) which has to be used to the full if proposals are to gain general acceptance.

2 Discuss secretarial requirements with the appropriate departmental manager.

3 Examine any equipment schedules affecting the work of your own particular specialty. Draw attention to any items not already listed.

4 Consider the organisation of your own outpatient sessions. Discuss with the outpatient manager the appointments system most appropriate for your own clinics.

5 In 'cogwheel' divisions take part in discussions about policies affecting on-call and on-take arrangements. These will give rise to discussions about the organisation of duty rotas.

6 Once policies for allocating outpatient and theatre sessions have been decided, draw up your own weekly timetable of sessions, to include programme of ward rounds.

7 Take a share in providing medical staff representation on the multidisciplinary working groups that will be required to determine policies on matters such as admission, control

*See references 27, 29, 32.

of infection, day care, major accident procedures, management of intensive care, medical records, pharmacy services, resuscitation.

8 Determine junior medical staffing requirements. Draw up job descriptions for these posts. Consider in particular what inservice training will be provided routinely.

Problems of phased schemes

Phasing, a common feature of major projects, and the options available in a phased scheme, are not always given the careful thought they require. The nature of the site, recruitment rate predictions, the funding of the scheme, the local priorities for introducing new services, and the practicalities of having certain buildings ready before others, will all influence whatever is finally decided. For example, in some schemes residential and crèche facilities might be regarded as essential for recruiting sufficient numbers of staff to open new departments. Despite this apparent requirement, there might be good reasons why these cannot be the first buildings to be handed over. If this is so, management has to make temporary arrangements with local hotels or convert other accommodation for residential use. Another common feature of phased schemes is the need to provide temporary arrangements for certain groups of staff in earlier phases of the building until the permanent location is available. This task is sometimes called the 'decanting programme'* which, in itself, can become a complex administrative task, with implications for equipping, telephone services, signposting and similar matters of detail.

The community served by the new building will be particularly interested in the rationale behind phasing. For example, people will want to know why a certain long-awaited service has to be deferred until the last phase. They may have to endure for some time difficulties with car parking, or suffer inconvenience if patients have to be frequently transferred between the new and the old hospital until all the new wards are commissioned. Family practitioners will also have important views about phasing and these should be carefully considered before final decisions are made.

The speed of construction work will often influence decisions about phasing. Whereas certain temporary arrangements are acceptable for a short time, final decisions will depend very much on the period between the completion date of each phase.

Sectional completion, which in effect is an early handover within a phase, is sometimes arranged under the contract.† If this is done, careful thought has to be given to problems of accessibility, use of lifts in a multi-storey building, security and other contractual matters.

Reading architects' and engineers' drawings

An essential requirement for hospital staff engaged in commissioning is to be able to understand architects' and engineers' drawings. The Scottish Hospital Centre has produced an excellent reference pamphlet, *An Introduction to Reading Architects' Drawings,* which explains in its foreword the need for such a publication.

'At some time or other many people in the health service have to comment on the planning of a proposed new building or are concerned with the commissioning of new accommodation. If they are to do so with confidence, they must be able to come to some judgment from a study of architects' drawings. Many of these people, including nurses, doctors and administrators have little or no experience of reading drawings; it is no discredit to them but if they do not understand them, useful advice is lost to the architect.' [56]

This publication, supplemented with a training session for all staff concerned, would certainly benefit the work of most commissioning teams engaged in major projects. For those involved in smaller schemes reference to Appendix E (page 119) in this report may be of sufficient help.

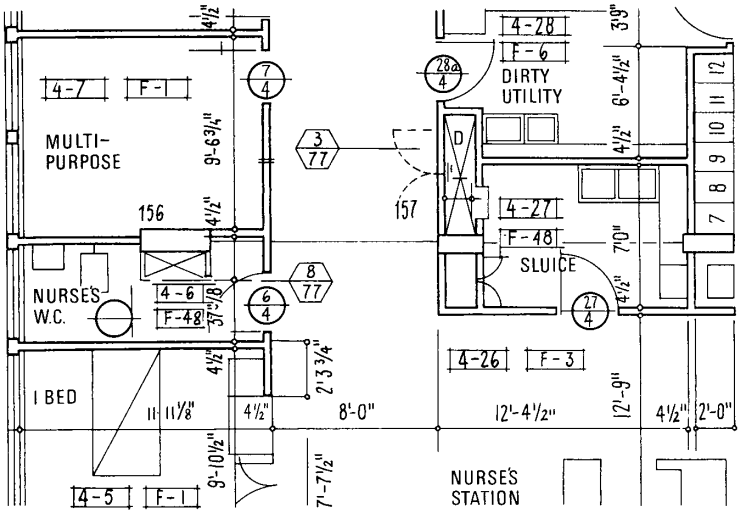
Establishing a project room

In some projects, in which it is evident that over a long period large numbers of staff will be referring to drawings, and will be considering in advance the activities to be carried out in individual rooms, the establishment of a project room has proved its worth. Drawings can be kept here in a systematic way, mock-ups can be arranged for special discussions, models can be displayed and help from the person in charge can often overcome the difficulties some people have in being able to visualise the outcome of a drawing.

Information for the project, centralised in this way, is particularly valuable for nurses, doctors and departmental managers whose involvement in the project is spasmodic and who therefore do not become expert in understanding drawings. Equipment lists, room data sheets, staffing schedules, operational systems manuals, minutes of meetings, networks – all the paraphernalia associated with the work of the commissioning team can be kept together. And the room can become a useful venue for team meetings and other working groups.

*See Chapter 14, Decanting, page 71, and Figure 10, Decanting Programme, pages 72–73.
†See also Chapter 11, page 61.

Figure 3 Example of an Architect's Drawing



4 Operational planning

The activities of a hospital can be grouped together into systems. Some of these are *management systems* in that they determine the operation of the hospital as a whole and will affect the activities of the departments, for example, control of infection, or personnel management. Others are *departmental systems* which affect only individual departments. Within these large systems, there will be subsets of small systems; for example, the tracer procedure in medical records, or staff records in personnel. Before a new hospital is designed, the systems to be used must be first planned in outline to show how the hospital will work. These 'operational policies' are given to the architect as a brief, and then developed into a series of detailed definitions and prescriptions for the day-to-day activities. These detailed prescriptions will constitute the programme of future operational systems.[55,60,61]

Figure 4 (opposite) shows the interaction of the different activities of operational policies, commissioning and operational systems. The terms in capitals are the stages of the project to which the activities shown beneath them most closely relate.

To ensure that operational planning is successful, three main steps should be taken.

First All operational systems must be planned comprehensively in detail and then coordinated. Planning must be comprehensive, embracing all the systems that are necessary to effective hospital management. To do this the hospital's activities should be analysed methodically within the framework of systems and subsystems described above. The interacting nature of the systems will then be seen. Such an analysis ensures comprehensive operational planning.

Since systems interact within the hospital, their presentation must be coordinated to ensure that they are compatible. If departmental systems are planned within overall management systems, and the interactive character of subsystems within the total systems is shown, systems should be consistent. Ensuring that systems are compatible is especially important when previously separate hospitals, each with its own systems, are integrated into one new building. Figure 5 (opposite) illustrates the relationship between the two kinds of operational systems; management systems shown as vertical bands and departmental systems as horizontal ones.

Planning must go into considerable detail. Because the work is very time-consuming and often tedious, the temptation simply to outline procedures is great. However, to do so invites difficulties on opening. Where systems are not sufficiently detailed problems will inevitably arise.

Second Particularly when separate hospitals are being integrated, planning for the implementation of operational systems should begin early. Beyond the prescription of operational systems, a great deal of work is required to prepare for implementation, particularly when systems used in separate hospitals have to be integrated. A good example is medical records. There may be more than one system being used in existing hospitals, perhaps three different numbering systems and three indices. Integration in the new hospital requires renumbering every current case note, according to the new system, and compilation of a comprehensive master index. This is a considerable task. Management needs to identify tasks of this kind when preparing the operational systems, and implementation should be planned early enough to allow any necessary work to be done. In some cases the resources of the regional management services units could be extremely helpful. Finally, progress should be monitored and enough resources made available to complete the systems before opening.

Third Since conditions may have changed between design and opening, the operational systems must be reviewed before implementation.*

To prepare operational systems, a programme of work must be shared between the administrative team, preferably in such a way that those ultimately

* More explanation on this is given in Chapters 14 (page 67) and 16 (page 76).

Figure 4 Interaction of Operational Policies, Commissioning and Operational Systems

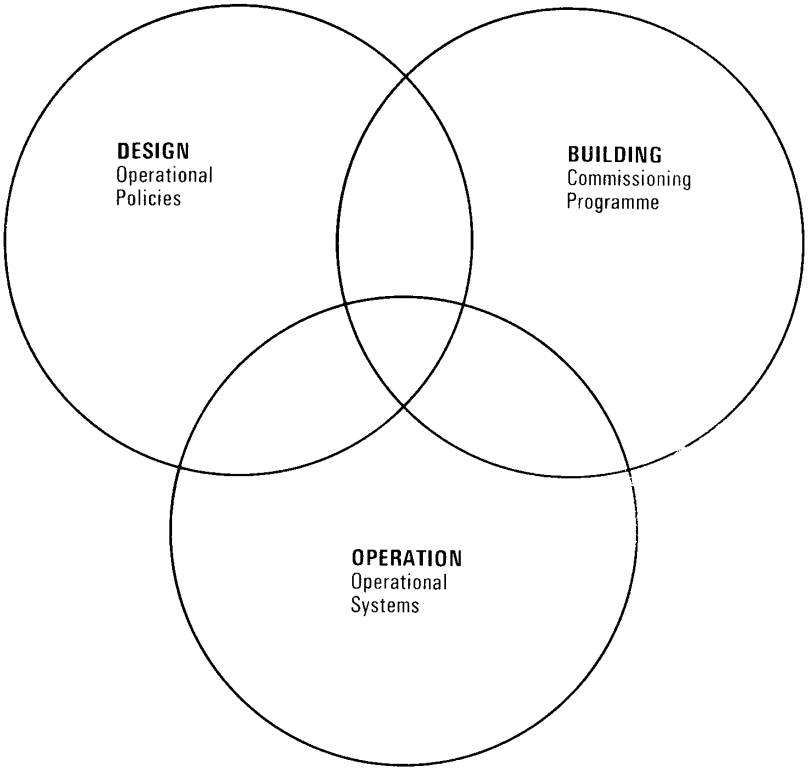
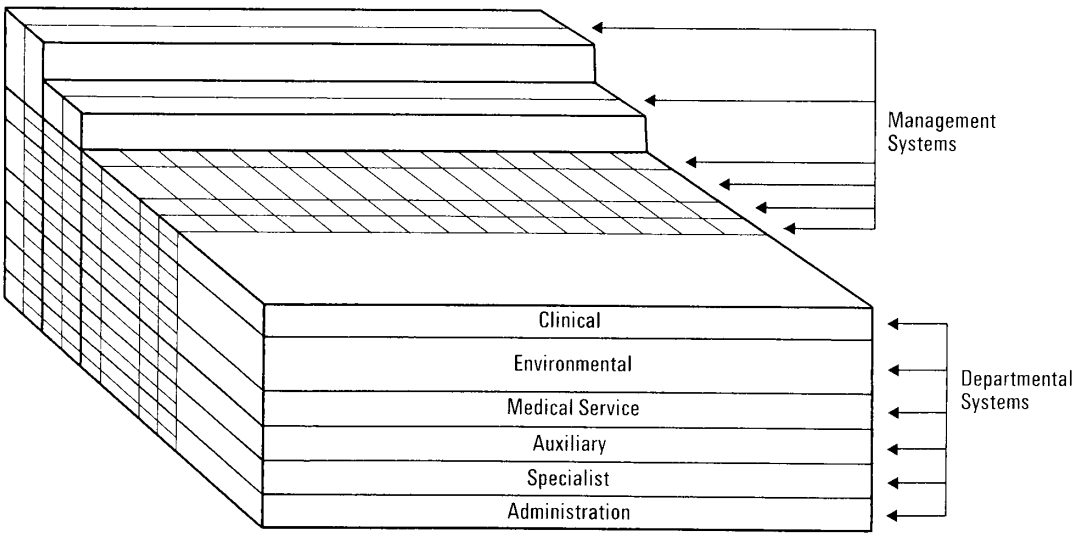


Figure 5 Relationship Between Management and Departmental Systems



accountable for a service are planning it. A period of research is needed to begin with. This in itself can be a demanding task, particularly if it seems advantageous to visit other organisations and/or to review systems in the existing hospitals directly affected by the project.

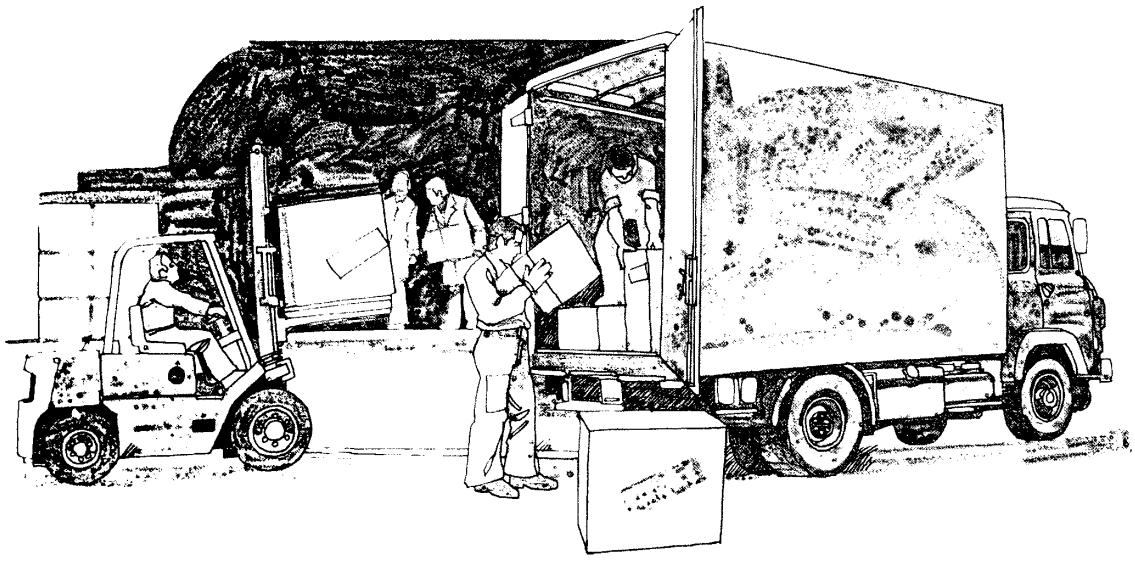
The next stage is to assemble ideas and embark on the time-consuming but essential task of consulting colleagues. Finally, when agreement has been reached about each system, each one must be documented in the form of manuals. These manuals, wherever possible, ought to be set out in a standard format with sections stating the objectives, the resources needed to fulfil them, and the methods to be adopted.

Good documentation has additional value in very large projects where there is a wide time span between start and finish. During this time many people (local managers, planning staff and members of the design team) will come and go. Continuity, essential but difficult to achieve, is helped if *all* aspects of the project are well-documented. By definition, operational systems are never complete, never static. Therefore, manuals should be published for other members of staff throughout the commissioning period – and thereafter when the hospital is operational – as soon as the policy and method for a system is coherent enough to enable senior officers and heads of departments to plan with confidence the fine details of the system. Additions to manuals, and perhaps some drastic alterations, will be inevitable, but the labour of making these amendments is a small disadvantage to set against the benefits of widely circulating good, current information on which staff can base their own work. 'Working assumptions', and documents referring to them, are particularly valuable when there is no existing hospital or sector organisation to provide either a framework or information about well-established departmental systems.

How many systems will there be? This cannot be defined precisely before a hospital opens, but it is probable that there will be one manual for every type of management system, such as, communications, public relations, accounting and personnel policy, and one for every department – in a large district hospital about 100 manuals in all.

This work on operational planning is crucial to success: total neglect or halfhearted effort will certainly lead to failure in the management of commissioning the hospital to the satisfaction of its staff and its first patients. These policies and procedures cannot be worked out by separate groups of staff in isolation. Joint working parties of medical, nursing, professional and technical staff, must be implicated in assisting the administration to draft detailed policies. In this way, the various groups of staff become fully committed to the decisions. And *only* in this way can it be certain that the new procedures will be implemented and a proper use made of the new building.

5 Equipment and supplies



Room data sheets: classification of equipment

Efficient design partly depends on knowing at the outset what equipment is to be used in each part of the building. The architect therefore needs to have very early information contained in room data-sheets which help identify

- items to be provided or fixed under the building contract
- items with space or load-bearing implications
- items that require engineering services for their operation.

Thoroughness in carrying out this task ensures that important points of detail are not overlooked.[55] Things so often missed or underprovided are shelves, hooks, mirrors and small items of fixed equipment. In the end they are required because without them the activities of each room cannot be satisfactorily carried out. The data sheet (two different examples are illustrated in Figures 6 and 7, pages 40 and 41) indicates just how much early thought must be given to the function of each room and the items of equipment provided. Precise dimensions of equipment must be specified and it is also important to adopt the national standard descriptions using generic terms where necessary in order to simplify the subsequent tasks of scheduling and summarising.[24]

The officer responsible for equipping should be closely involved from the start in the planning discussions on equipment, to advise on such questions as availability, descriptions, costs, supply and purchasing policies. This will include advice on many items of fixed equipment provided under the terms of the building contract, particularly where revenue consequences will be considered, for example, disposable bedpan systems.

The method for classifying equipment, outlined below, helps to distinguish equipment which is supplied by the contractor from that which has to be scheduled and purchased by the health authority, and identifies those items which need to be taken into account in design work.

Permanent equipment, that is, excluding supplies such as fuel, stationery and drugs, is classified under four groups.

Group 1 Items, including engineering terminal outlets, supplied and fixed within the terms of the building contract.

Group 2 Items which have implications on space, building construction or engineering services, and are fixed within the terms of the building contract but are supplied under arrangements separate from it. (These items usually have a permanent fixed location and are purchased by the health authority but fixed by the contractor.)

Group 3 As Group 2 but supplied and fixed, or placed in position, under arrangements separate from the

PLANNING AND ENVIRONMENT

Project | Sheet no

Room | | Ref

Department | Date

USE OF SPACE

SIZE (critical dimensions)

Height | Length

Width | Area sq ft

Time and Population

Relationship to other spaces

Lighting

Daylight

Artificial Day

Night

Limiting factors

Heating

Winter space temperature

Summer space temperature

Ventilation

Humidity

Air changes rate Natural

Artificial

Positive plenum

Negative plenum

Possibility of toxic vapours gases

Possibility of radioactive treatment

Acoustic

Quiet Area

Special Treatment

BUILDING ELEMENTS

Windows		
Doors		
Ceiling		
Walls		
Floor	finish	load in
Signs		
Fire		

GROUP 1 EQUIPMENT

GROUP 2 EQUIPMENT

GROUP 3 EQUIPMENT

GROUP 4 EQUIPMENT

FACILITIES

Telephones

Clocks (patients to staff

Call system (staff to staff

Alarms

Radio TV points

Pneumatic tubes ☐

Central vacuum cleaning ☐

Lift/Conveyor Disposal

Supply Incineration

SERVICES

HEATING OR COOLING

Comments on particular kind of heating or cooling (state limiting Hot Surface Temperatures)

PIPED WATER SERVICES

Hot water supply at

Cold water
from tanks
from mains
Demineralised
Distilled

MEDICAL GASES

	PIPED	LOCAL	PRESSURE
Oxygen			
Nitrous oxide			
Medical suction			
Compressed air			

ARTIFICIAL LIGHT

Fluorescent ☐ Tungsten ☐

Non-stroboscopic Colour

Fittings

Switching

Dim lights
Adjustable
Other lamps
Emergency

POWER

Socket Outlets

TYPE	No	LOCATION	flashproof	waterproof
30 amp 60 amp low voltage Razor sockets				

Screening

Earthing

Emergency

GAS

Town's outlet ☐ Manufactured ☐

Project | Sheet no

Room | | Ref

Department | Date

PLANNING AND ENVIRONMENT

Project | Sheet no

Room | | Ref

Department | Date

USE OF SPACE

SIZE (critical dimensions)

Height | Length

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Relationship to other spaces

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Daylight

Artificial Day

Night

Limiting factors

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Winter space temperature

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Humidity

Air changes rate Natural

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Positive plenum

Negative plenum

Possibility of toxic vapours gases

Possibility of radioactive treatment

Acoustic

Quiet Area

Special Treatment

BUILDING ELEMENTS

Windows		
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Ceiling		
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Floor	finish	load in
Signs		
Fire		

GROUP 1 EQUIPMENT

GROUP 2 EQUIPMENT

GROUP 3 EQUIPMENT

GROUP 4 EQUIPMENT

FACILITIES

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Socket Outlets

TYPE	No	LOCATION	flashproof	waterproof
30 amp 60 amp low voltage Razor sockets				

Screening

Earthing

Emergency

GAS

Town's outlet ☐ Manufactured ☐

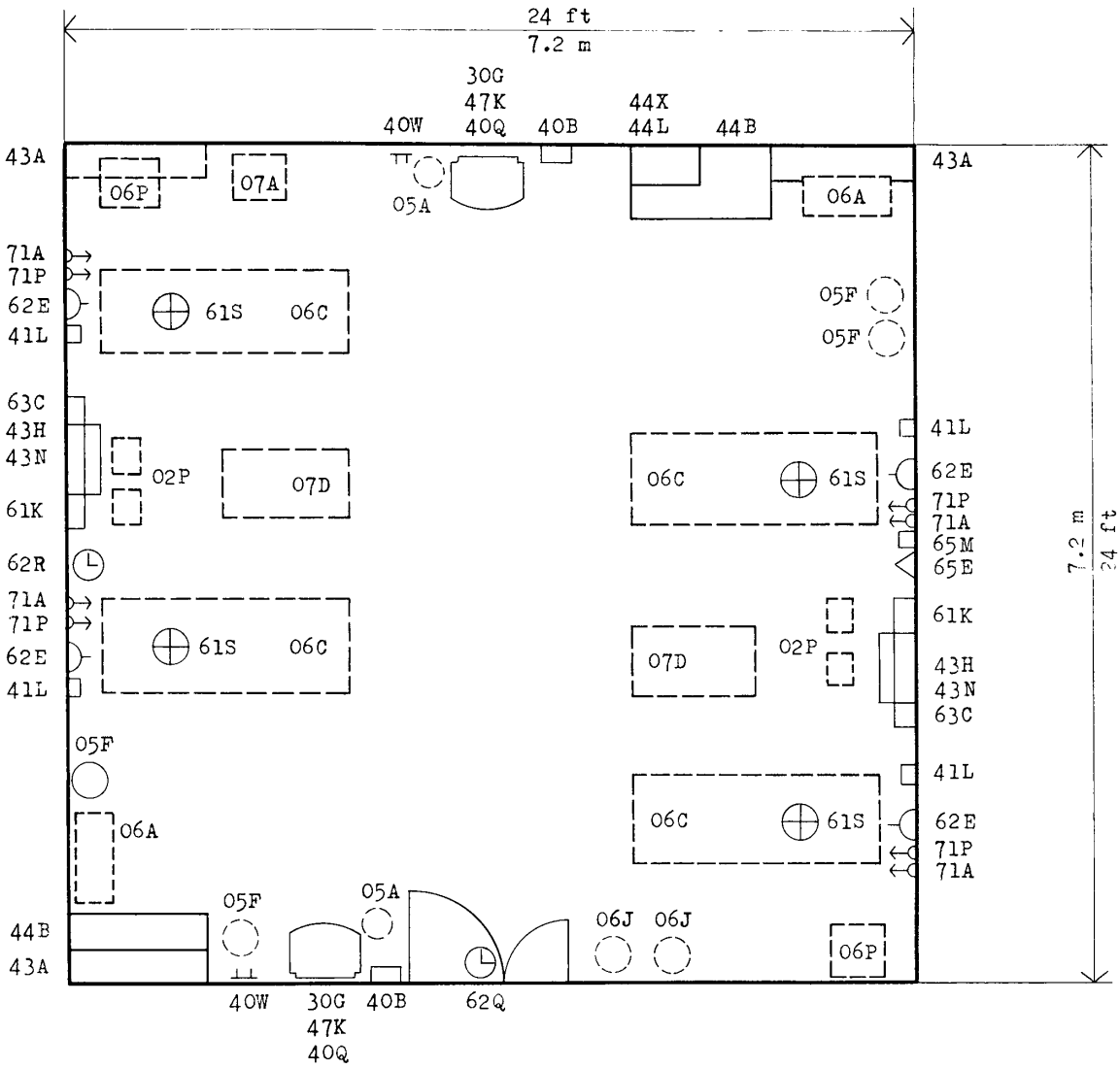
Project | Sheet no

Room | | Ref

Department | Date

Figure 6 Room Data Sheet

Figure 7 Room Data Schedule and Layout
Room Layout
Resuscitation Room – Accident and Emergency
Area: 576 sq ft
52 sq m



Room Data Schedule
Resuscitation Room – Accident and Emergency

To provide facilities for medical and nursing staff to assess and give immediate resuscitation and emergency treatment to seriously ill and injured patients Space provision for mobile x-ray

ACTIVITY	Code	Group	Quantity	EQUIPMENT Description
	30G	1	2	*Basin, medium, no plug
			2	Taps, mixer, wall mounted, elbow action
Handwashing by staff	47K	1	2	Splashback
	40Q	1	2	Dispenser, soap
	40B	2	2	Dispenser, paper towel
	05A	3	2	Bin, disposal, paper towel
Undressing staff coats	40W	1	2	Hook, double, wall mounted
	06C	3	4	Trolley, accident, x-ray translucent top
Examination/Treatment patients on accident trolley	02P	3	4	Stool, surgeon, adjustable
	61S	1	4	*Lamp, examination, adjustable, ceiling mounted
Technical Procedures	06A	3	2	Trolley, dressing/instrument, SS, 750 x 450, a/s castors
general procedures	06P	3	2	Trolley, dressing/instrument, SS, 450 x 450, a/s castors
	07D	3	2	Trolley, resuscitation
emergency procedures	71A	1	4	*Outlet, oxygen, wall mounted
requiring medical gases and suction	71P	1	4	*Outlet, suction, wall mounted
	07A	3	2	Anaesthetic apparatus, Boyle type
recording blood pressure	41L	2	4	Sphygmomanometer, wall mounted
x-ray procedures	61K	1	2	*Illuminator, x-ray, twin, wall mounted
requiring loose electrical equipment	62E	1	4	*Socket outlet, 13 amp, switched, double
Storage drugs and medicines	44L	1	1	*Cupboard, drug and medicine, with interior light
	44X	1	1	*Cupboard, dangerous drugs
clean and sterile equipment	43A	1	6	Shelf, adjustable, 1200 x 3300 (6)
			9	Wall mounting strip at 500 mm centres (9)
			18	Bracket, shelf, adjustable (18)
Workspace general purpose writing	44B	1	2	Worktop, melamine faced, and supports, 1200 x 600
	43H	1	2	Flap, writing, wall mounted, 600 x 300
	43N	1	2	Rack, stationery, wall mounted
Disposal holding for collection general waste and linen	05F	3	4	Holder, sack, freestanding, medium, foot operated
	06J	3	2	Trolley, soiled linen, single ring
Communications	65E	1	1	*Telephone outlet
telephone	63C	1	2	*Staff emergency light
staff call	62Q	1	1	*Clock, sweep second hand
clock	62R	1	1	*Clock, time elapsed
intercommunication	65M	1	1	*Intercom

DESIGN CONSIDERATIONS
Building elements door: accident trolley plus two persons width, with observation panel windows: screened for privacy if provided Hazards generated by room explosion: medical gases Noise: from patients

* Mechanical and electrical requirements

Room Data Schedule
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DESIGN CONSIDERATIONS
Building elements door: accident trolley plus two persons width, with observation panel windows: screened for privacy if provided Hazards generated by room explosion: medical gases Noise: from patients

* Mechanical and electrical requirements

building contract (that is, items usually fixed and placed by the health authority after handover).

Group 4 Items supplied under arrangements separate from the building contract, possibly having storage implications but otherwise having no effect on space or engineering requirements (normally smaller items of equipment purchased by the health authority).

A small detail at this stage of planning, with important consequences later, is the system of room numbering. It is not unusual for two numbering systems to emerge during a project, one by the architect, another drawn up by the commissioning team. Only one system is necessary, and it ought to form the basis of equipment scheduling and be used after handover to move and position equipment into its correct location.

Equipment scheduling

A vital function of the commissioning team is to ensure that the right equipment is available at the right time, in the right place, and at the right cost. To achieve this, account should be taken of the time required to prepare cost estimates and to negotiate acceptance of these within capital limits set by the DHSS. Much of the responsibility for this will devolve upon the equipment officer, who will either be a member of the district supplies organisation or will work in close conjunction with it.[61] Success is largely dependent on the systematic and thorough preparation of comprehensive equipment lists.

The DHSS publishes a series of *Health Equipment Notes*.[19] *Note No 1* gives guidance on the preparation of equipment schedules, other *Notes* list the normal expected requirements of individual departments. Use of this guidance should provide a satisfactory and acceptable level of equipping. The *Notes* also serve as check lists to ensure that smaller but essential items are not overlooked. Additional detailed information about individual equipment items is circulated to health authorities in the health equipment information brochures[21] and in various reports prepared by DHSS study groups.[31]

It is clear that the size of the task of compiling equipment schedules by room, by item, by expenditure head, makes it particularly suitable for some form of mechanical or computing aid. Scheduling can be undertaken manually but this becomes too laborious for large projects.

Use of computer facilities should be arranged to reduce the workload and to provide a more effective system of cost control. The DHSS has drawn up a system adapted from the one developed by the former Welsh Hospital Board. It is designed for use on ICL 1900 series computer installations and provides schedules of items in Groups 2, 3, and 4, but not those of Group 1 which are supplied as part of the building contract. A similar system is also available from the Hospitals Computer Centre for London for those health authorities using its service.*

* Hospitals Computer Centre for London, Renfrew Road, London SE11 4ND (01-735 0071/4861).

The DHSS system comprises a suite of programmes together with data tapes covering 26 hospital departments, 1500 types of rooms and about 2500 items of equipment, and three interrelated documents:

catalogue of equipment coded alphabetically and numerically with suggested prices

coded catalogue of types of rooms and spaces and departmental item lists with cost guides

suggested equipment lists for each room, coded, showing item prices and room cost guides.

The DHSS has facilities to update item prices, equipment lists and room cost guides.

In planning the equipment content for a scheme, commissioning teams using the DHSS system can develop their own computer files from the information provided. The system is sufficiently flexible to allow the content of rooms to be modified to meet local requirements.

The system will provide management with various printouts including information on

1 lists of equipment required for each space and room, together with cost guides for departments as a whole (This allows equipment lists to be compiled quickly within whatever cost limits have been set.)

2 consolidated schedule of equipment item by item for the project as a whole, showing quantities required and locations according to the architect's plans (This is a particularly useful reference document to help with the specification task and subsequently when equipment is eventually distributed to individual rooms.)

3 financial control system showing the difference between actual costs, quotation prices, estimates and the DHSS cost guides

4 schedules of predicted delivery dates, reminders on when to order equipment, actual dates when the goods have been received and reminders for those items not received by the due date

5 costed list of Group 2 items, with locations, to be purchased by the hospital authority for fixing by the builder

6 lists of items which require staff training or planned maintenance to be arranged

7 equipment to be transferred from another hospital

8 lists of items requiring temporary storage before transfer to final location.

The DHSS issues a user's manual, systems manual and operations manual for guidance on the use of the system.[14]

In developing and completing the equipment schedules, account must be taken of the need to keep within the budgeted cost limits. Guidance on acceptable capital costs of equipment for individual departments is given in

the equipment cost allowance guide issued to health authorities and regularly updated by the DHSS to take account of price changes.

Although equipment scheduling relates to permanent rather than consumable goods, it is also essential to draw up comprehensive lists of consumable requirements well in advance. Some of these items will be determined during the planning and design stages, as policy decisions are made (for example, relating to the use of disposables), whereas others might be associated with the selection of capital equipment (for example, materials required for technical equipment). They should be listed as relevant decisions are made.

Delivery periods for some of these supplies are no shorter than for capital equipment, and forecasts of demand for some items will be needed for inclusion in the quantities tendered for under regional and area supply contracts. Ordering and specification work have to be equally well planned to fit the overall programme. In other words, the entire task of equipping has to be tackled in such a way that no single item is overlooked, regardless of whether it should be contained in the capital schedules or not. A list of examples might perhaps be a useful reminder of items which are essential to buy but which, borne out by experience in many new projects, are often dealt with inadequately.

- supplementary directional signs (not originally included as Group 1 items)
- door cards, no smoking and other warning signs
- bed numbering systems
- disclaimer notices
- dispensers
- adequate fire fighting equipment
- disposal sack systems
- resuscitation equipment
- notice boards
- information boards in lifts
- protective clothing
- medical disposable goods
- documents of all kinds (which often require detailed design work before printing) and all paper products

It is anticipated that the equipping of major projects will increasingly be conducted with the aid of computing facilities and be undertaken by specialist teams of supplies administrative staff. It is an intricate task that is made easier if staff are not doing it for the first time. Automated systems, use of standardised equipment lists and repetition of work transferred from one scheme to another are valuable as long as the individual nature of each project is properly recognised by those compiling the lists. For this reason, it is important that those responsible for this work identify themselves with the project as a whole and become an integral part of the commissioning team.

Specification and selection of equipment

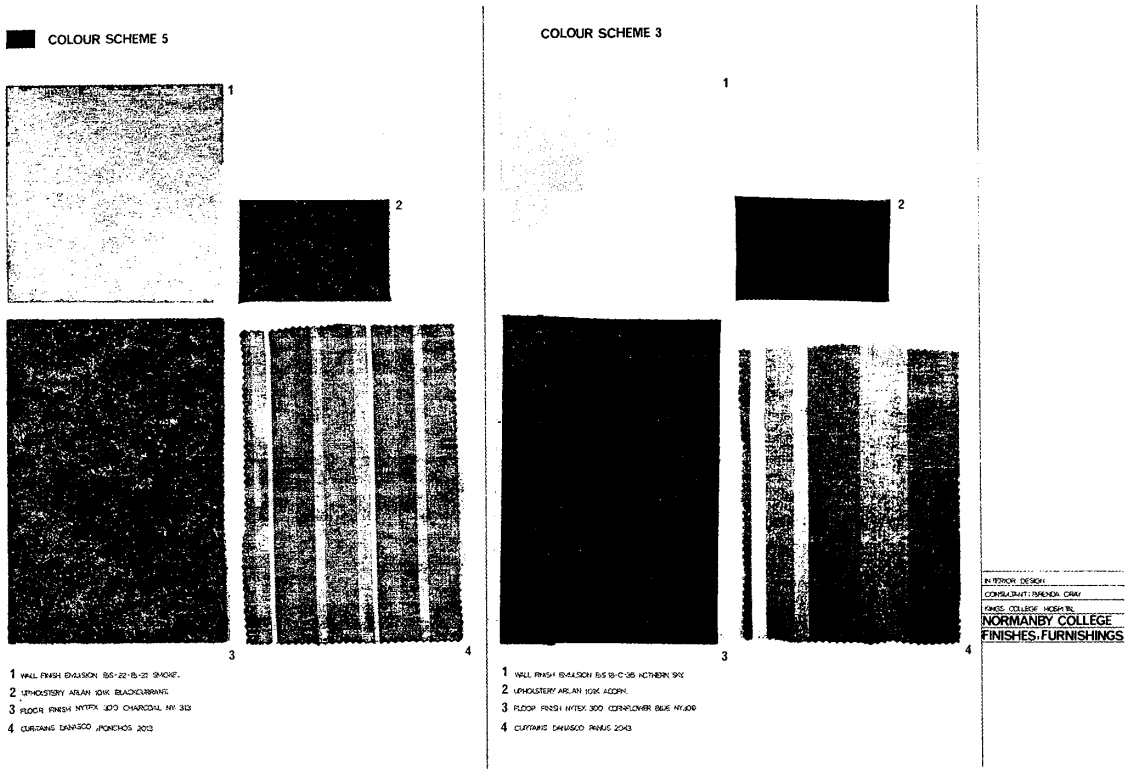
The specification and selection of equipment are multidisciplinary activities in which the supplies officer responsible for purchasing will play an organising and coordinating role. Functionally, equipment must conform to the requirements of operational policies, and in dimensions and construction, must be compatible with the accommodation in which it will be used, and with the engineering services provided.[49] Primary specifications with this limited objective should be agreed early in the design process.

Detailed specification work should not be attempted by commissioning teams: instead it is useful at an early stage to draw up separate lists of common-user items of equipment and of special equipment relating to particular departments, and to arrange for specification and selection to be undertaken by teams representative of the users. The role of the interior designer is particularly important in helping these teams decide between options available to them. The teams need to be kept small, and representatives attending meetings must be given authority to reach a conclusion amongst themselves within the approved financial allocation. It is at this stage that the understandable enthusiasm of individuals has to be controlled by drawing attention to the financial realities of cost limits! The DHSS has published specifications developed by its own working parties for quite a wide range of equipment, and this in many instances has resulted in such equipment being available on central supply. It is useful therefore to take full advantage of this guidance to save valuable time.[19, 21, 31]

For clinical and other specialist equipment, the requirements of the professional users will be paramount, subject to financial constraints and to any relevant national or regional policies. At a very early stage, departmental heads and medical consultants are often not available; as a result, the temptation is to hold out until their expertise or, in some cases, their personal preferences are forthcoming. Waiting for these senior staff can, on the other hand, be made an excuse for leaving things to the last minute. The supplies officer in charge of this work must therefore distinguish between choices which cannot wait from those which can or must, and persevere in keeping to programme. Too much reliance in the past has been placed on local opinion when identical advice is readily available elsewhere.

Use of interior designers

Care in selecting equipment, creating a colour scheme, matching furnishing with paintwork and varying the light fittings to take account of the use of a room, require effort, skill and, above all, patience. The involvement of the architect in this work varies considerably. Some architects feel that the artistic solution to the design of a new building should involve them in the specification of complete room layouts, whereas others leave the task of equipping entirely to the client. In some schemes, it is felt that the users themselves should play a leading part in



An example of a colour scheme chart produced by an industrial designer

selecting equipment. In others, it has been decided as a matter of policy that an interior designer be employed to specify colour schemes, help plan room layouts, and choose equipment, together with the users and purchasing officers.[1, 51, 55] The services of an interior designer are very desirable if furnishing schemes are to be successful aesthetically and functionally. There needs to be a total design plan: everything that the eye sees in each individual room needs design coordination.

Most regional health authorities now employ their own design teams who can provide this balance of creativity and functional experience. This aspect of interior designing is often misunderstood to the extent that the employment of a designer is sometimes regarded as a luxury, liable only to lead to extravagant ideas. In fact, one of his skills is to produce the most attractive and functional scheme within the budget available. It is important at this point to stress that the proposals of an interior designer can be as inexpensive as those of the most cost-conscious client!

A leading interior designer has put forward firm views.

> 'With so much emphasis on flexibility in the use of new buildings, it is increasingly important for designers to plan a strategy where changes to the use of rooms do not lead to a hotchpotch of unrelated colour and design. It is therefore wise to retain the characteristic colour and pattern for each room in the walls, floors, and curtains, which do not move, with movable furniture chosen in colours which will fit in with any scheme within one department. If different colours are used from one department to another, these variations can act as a colour code to prevent furniture straying. Hardpressed staff are no respecters of decor.'[10]

The interior designer usually achieves such aims first of all by presenting ideas at small exhibitions to which departmental staff are invited or at meetings of the selection team referred to earlier.* Illustrations of colour and pattern schemes or a range of equipment loaned from manufacturers, give users the opportunity to express preferences. Experience in many new hospitals has proved that the collaboration of professional designers in the selection of non-clinical equipment and furnishings is preferable to the less expert and uncoordinated choices likely to be made by hospital staff themselves.

To summarise, the interior designer ought to be used in:

the earliest beginnings to become identified with the original objectives of the scheme so that he is aware of any unusual or overriding design features

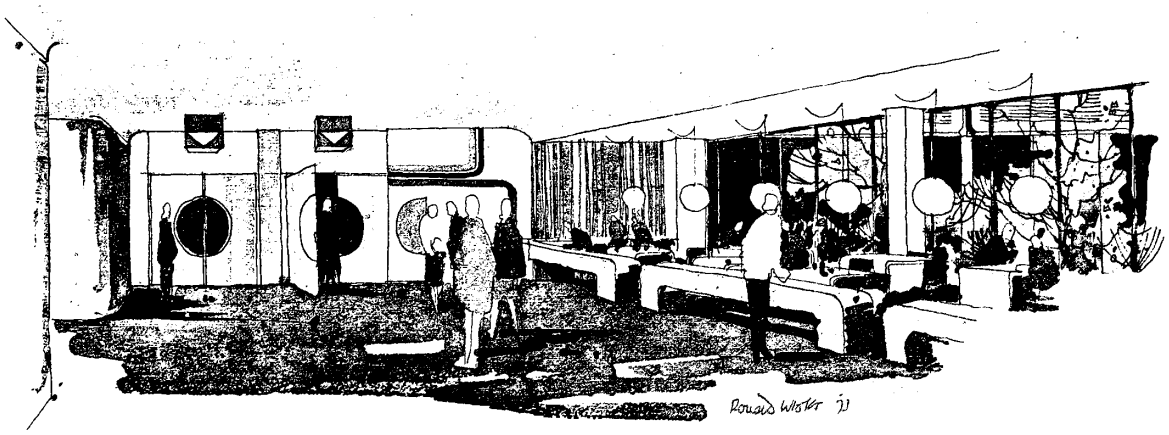
* See previous page

room data stage	to help determine environmental conditions of each room and play a part in deciding things such as lighting (a feature often disregarded and also often overprovided)
	to help advise on the use of nonflammable and nontoxic gas producing materials
sketch plan stage	to assist in the preparation of room layouts and to determine overall colour strategy
equipment specification stage	to recommend colour schemes and help specify non-clinical equipment
	to press for the inclusion of works of art, plants, and so on, which otherwise are regarded as extras to be provided only if additional funds become available after handover

Ordering and receiving equipment

The supplies officer will need to plan his purchasing operation to ensure that all equipment has been delivered, inspected, tested, and installed in position, by the time demanded in the commissioning network or control plan.[49] He should be a party to the setting of target dates relative to his function in the plan, and in his contribution to drawing up the programme should make due allowance for unpredictable market conditions affecting delivery dates. This is difficult because the unpredictable cannot be predicted! On the other hand, it is not difficult to list in advance those items of equipment which must be there for the opening, and without which last minute improvisations would be difficult to arrange. Items of this kind need to be considered for early delivery, allowing a generous reserve period to absorb any exceptional delays. This is a difficult aspect of commissioning which is often neglected. There is a temptation to keep adjusting opening dates as new delivery dates are notified and blame suppliers for the delay to the programme. Systems have been devised for major projects whereby a new hospital has opened with almost every item of equipment delivered and in place. The Royal Cornwall Hospital (Treliske) Truro, for example, opened in 1965 with only six consignments missing. In more recent years, guarantees of delivery by a certain date have become very difficult to obtain, so much so that it is no longer possible to have complete confidence in any programme, however well organised. The problems and uncertainties make it the more important to *plan* the equipping task and not to leave it until too late, or to accept the delays as inevitable. Those responsible for purchasing need to work backwards from the predicted handover date and be in a position to start placing orders from 18 to 12 months in advance.[4, 41] If this is achieved, allowances can be made for those items known to have long delivery periods. Orders for most items should have been finally placed not later than nine months before they are required. This allows adequate time for suppliers and enables the chasing of less reliable firms to start well in advance of the date on which delivery is due.

Group 2 items required for fitting by the contractor will need to be obtained in accordance with his work programme. In view of the difficulties facing those responsible for the equipment programme, three important objectives should be set.



The design for the reception area in a new hospital. (Reprinted from *Hospitals for People,* King Edward's Hospital Fund for London, 1975.)

1 Listing *and specification* ought to be completed 15 months before handover.

2 Purchasing staff should have enough time to embark on an intensive period of 'chasing' all suppliers six months before handover.

3 Storage space should be available in advance of handover, by making good use of any spare space in other local hospitals or hiring warehouses. This must be arranged if there is to be any hope of bringing services into use within a reasonable period after handover. Warehousing adds costs and this has to be evaluated against other factors in the programme, but it can become particularly attractive where more than one scheme can be associated with such accommodation.

Alternatively, early handover of a suitable section of the building is a convenient solution. Unless equipment can be delivered beforehand, muddle and uncertainty are inevitable right up to the time the hospital becomes operational. All these methods require double handling but this is a small price to pay for the reassurance of knowing the equipment has arrived and that the overall commissioning programme is being kept to.

It is most important that any areas used for temporary storage of furniture and equipment are adequately heated and locked.[1, 4, 38] Additional security staff are necessary if there is a risk of theft and vandalism. Cleanliness, good lighting and space for sorting are desirable. Any fire hazards must be eliminated. Access to the storage area, if this is in the building and taken over in advance, must be planned; use of corridors and lifts, for example, must be agreed with the contractor.

Such arrangements which make possible the reception of furniture and equipment before handover of the main building obviously reduce the period required to make the building operational. The fitting-out stage becomes more of a porterage exercise and, given an adequate number of temporary staff, can be completed in weeks instead of months. It also spreads the load for the receiving section of the supplies organisation and provides opportunity for all items to be labelled with their room numbers while in store.

It is a good plan, if possible, to designate a room in which items of technical equipment can be held until inspected and certified correct by the specialist officer concerned. There must, however, be no delay in checking goods for both quality and quantity if discounts for prompt payment are not to be lost.

If it becomes realistic to be able to rely on a large proportion of suppliers' delivery dates, it is sometimes a good plan to arrange deliveries in a series of fortnightly periods, since large consignments can often monopolise portering staff for a few days. There are other items, for example those requiring fixing, assembly or testing, which should be listed for special early delivery arrangements by working to a predetermined delivery period. Other departments concerned with this particular commissioning task can prepare their work commitments accordingly. Planning the delivery periods, staggering the workload in this way, and relating the sequence to the overall commissioning programme, will give rise to an orderly system and reflect credit on the work of the supplies department.

The final part of the equipment task is to make satisfactory arrangements for equipment to be distributed to its place of use. This is referred to later in Chapter 11*, which elaborates on the work to be carried out immediately after handover.

*Page 61

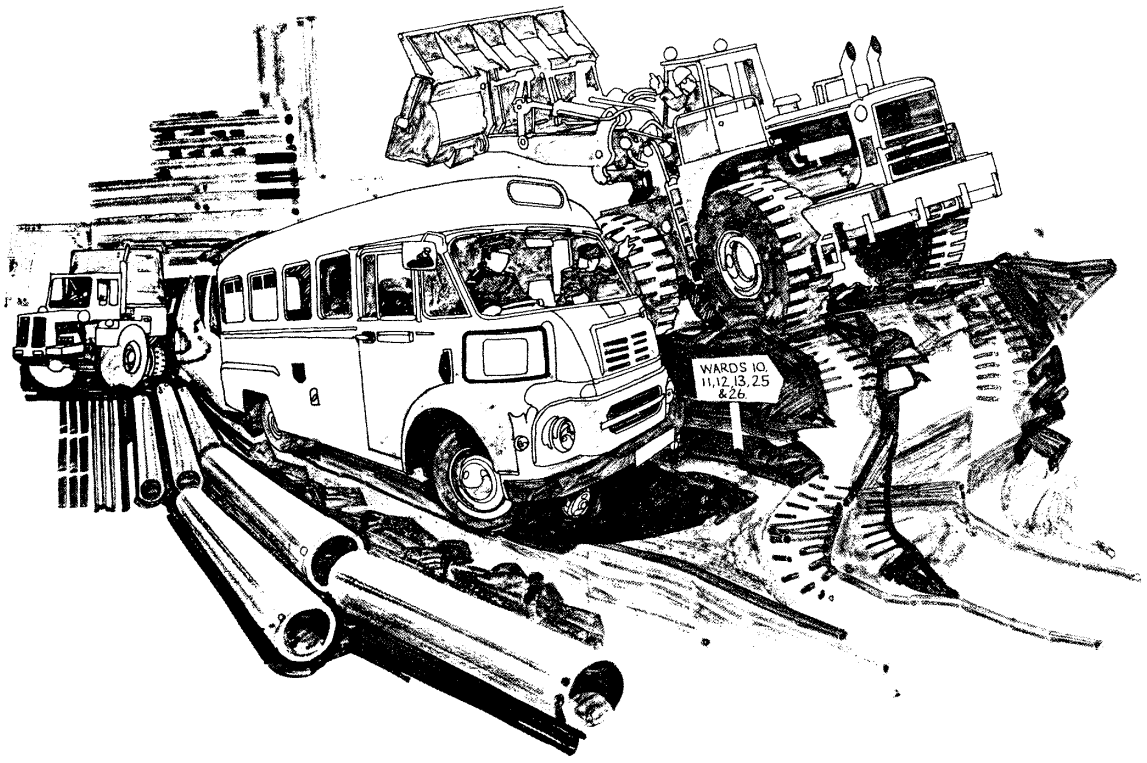
6 Use of the site

Contractual and organisational implications

Staff members are often unclear, unless they are intimately involved with a new project, that there are strict procedures to be observed about access to the site. It is important, therefore, for them fully to realise that the *contractor has possession of the site* and, thereby, sole and untrammelled right of access to it. Any reduction in this freedom, unless specified in the contract, is a breach of the contract and the contractor may act accordingly. This means that no member of the hospital staff may go on to the site without the contractor's permission. This is the situation to the date of handover. On that date, the contractor's responsibility for and, consequently, insurances upon the building end and the health authority's responsibility starts. Up to this moment there must be a strict protocol about any site visits. Any arrangements must be made by the architect (the site architect if there is one) who is the official link between client and contractor.

The best procedure is to create one single channel of communication between the architect's office and the commissioning team. The project administrator or the commissioning officer is the most appropriate person for this liaison. Hospital staff wanting to look round buildings before completion must make arrangements with him.

The dangers of allowing pre-handover visits at all are well known. Certainly they should be kept to the absolute minimum but, if permitted, their timing and purpose should be carefully considered. In no circumstances should there be any encouragement to identify features of the design which users, dissatisfied in some way, then attempt to have changed within the contract period. Inevitably, users see some things which disappoint or even alarm them. It is up to the commissioning officer to channel these views into the right forum for discussion. Similarly, and equally important, after completion the



contractor should observe the same protocol if access is needed to hospital property.

Practical problems arising from joint use of site

When building work first starts on large new projects the contractor often has the site to himself. More frequently, with phased schemes or with new buildings replacing old ones on the same site, the site has to be shared and there has to be a clear understanding between the hospital administration and the contractors about arrangements for sharing it. Use of roads (jointly or separately), security, fire precautions, tidiness of the site, specific signposting for the contractor, location of site offices, car parking, earth moving, storage of materials, right of access to each other's buildings, are all matters which should be provided for contractually before going out to tender. Both parties usually have to face inconvenience. It is clearly important that proper regard be given to the needs and responsibilities of both the hospital and the contractor. The architect can do much to promote understanding by each party of the other's problems. In some projects it has been found that a good way to achieve this liaison is for a representative of the hospital to attend the architect's progress meetings with the contractor. But it must be understood that the hospital's representative is there by invitation, not by right. A more preferable way is to establish this essential liaison through the site supervisory staff for minor matters, and to deal with the architect for more important affairs.

A number of practical problems arise which often require considerable diplomacy. Noise from contractor's work can disturb resident staff trying to sleep, patients trying to rest, surgeons operating or consultants seeing patients in outpatient clinics. It is not merely a matter of asking the contractor to stop work; each case has to be dealt with on its merits. Sometimes, if there are excellent relationships between the site agent and the hospital authority, due warning of excessive noise will be given. Sometimes, the contractor will rearrange his work to suit the hospital. But any request to vary the contractor's programme will usually cost money and can give rise to serious contractual difficulties.

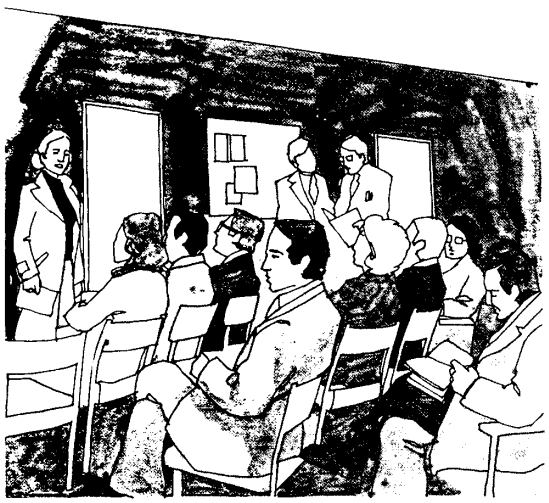
Engineering services may be disrupted when connecting or disconnecting requires a temporary shutdown of water, power or steam.

Fire prevention and security must be given very careful consideration. They pose particular problems because no one person is responsible for the entire site.

The very fact that the site is shared, means that a large number of people without any check of identification have free access to it, and this creates serious difficulties of control. The remedies are by no means foolproof, but preventive measures by both kinds of user, and extra efforts to train staff, are essential if damage and losses are to be kept to a minimum.

Coexistence is part of the commissioning officer's coordinating role. It requires his tact – and often his time, usually at short notice.

7 Personnel management



Preparing personnel policies

In a project in which the entire organisational structure is being newly established, it is essential to set up a comprehensive personnel department about two years ahead of handover. The tasks of obtaining all the staff necessary to open, and preparing staff to work in an entirely new organisation, are such that only by having a personnel department can there be any confidence of success. The district personnel officer may wish to take on the role himself, or there may be a case for appointing an officer specifically to help commission the new building.

The first responsibility is to prepare employment policies. The personnel officer has to distinguish between those policies which need to be considered in detail before new employees are appointed in large numbers, and other policies which at the outset need only preliminary thought. There will be wider discussion of all policies once most of the departmental managers and nursing officers are in post.

Some of the subjects to be considered before the major part of the recruitment programme gets under way are:

representative machinery, to be determined before handover if practicable

staff health service policies

staff induction and staff handbook

transport – improvements to public transport, if necessary, and the possible need for additional hospital transport

disciplinary, appeals and grievance machinery

changing accommodation systems – centralised and departmental facilities

on-site 'shops' – including hairdressing, library and bank services and a general store convenient for resident staff

staff accommodation – including policies for management and use of residences and liaison with the local authority over schemes to help health service staff

staff information – use of regular bulletins

parking – policies for staff cars

secretarial and records systems in the personnel department

shift systems and rotas – policies to have been decided

name badges – specification and policy for use

industrial relations policies – liaison with trade unions and staff associations and the provision of facilities for them

staff social club organisation

day nursery requirements

staff uniform and protective clothing – specification and local policies.

Organisational structures

The personnel department's help in drawing up organisational structures for each department is important. The significance of this task is often overlooked. Not only is it necessary for establishing the grading structure itself at managerial, supervisory and operational level, it also sometimes identifies the need to start early negotiations on the grading of certain posts, or on behalf of individual employees who are likely to transfer and whose salary or conditions of service might be affected in some way. Once each department has a definitive organisational structure, a start can be made on the task of drawing up job-descriptions and job-specifications.

Assessing the number of staff to be employed

This will be an early task of the personnel officer. A preliminary estimate will have already been made on the approximate running costs and, at the earliest planning stage, on the amount of residential and changing accommodation to be provided.

Criteria for each department will vary. In some cases, estimated workload can be calculated fairly accurately; for example, the size of the building will be the main factor for determining the number of staff for the domestic services. Other staffing requirements can be partly assessed according to certain norms or regional formulae. But these will only provide starting points to be refined to take account of operational systems and forecasts of work. Turnover predictions, numbers of operations and outpatient attendances, have obvious staffing implications for a number of departments. Operational policies agreed at the planning stage will have many staffing implications. For example, the nurse-staffing needs of a surgical floor could vary depending on the method of grouping beds. Progressive patient care methods or separation of emergency beds from elective surgery may require a nursing complement different from that required in older methods of using the same number of beds.

If systems and workload predictions form the basis of staffing requirements, these must be completed before estimates of staff can be realistically made. The tendency to play safe and overestimate staffing requirements can be obviated to a certain extent if the administration can create a financial reserve to be available as soon as the hospital becomes operational, so that genuine, urgent requests for extra staff can be met.

Once the total staff complement has been calculated and approved, further thought has to be given to the estimated proportion of full-time to part-time employees. Unless this is done the number of staff eventually employed might be considerably higher than the predictions giving rise to a shortage, for example, of changing and residential accommodation. It is also important to anticipate reductions to the standard working week which, over a period of a few years, can lead to a substantial increase in the total staff complement.

Staff recruitment

The intricacy of commissioning as a whole can be illustrated in no better way than by considering the complexity of the recruitment programme.[6] Factors to be taken into account include:

1 When is each senior member of staff required to be in post? Sometimes this should be assessed to the nearest month.

2 What is the local employment situation? To what extent will recruitment draw on local staff?[4, 44] What efforts will be needed to recruit from further afield? Will it be necessary to advertise abroad?

3 Do some of the gradings of managerial posts require special negotiations before advertising? If so, allowance of 4–6 months should sometimes be made.

4 When is the optimum time to have each category of staff in post? It is essential to avoid appointing a large number of staff too soon. This can give rise to serious problems of boredom to the extent of actually losing staff before the hospital even becomes operational.

5 With large scale projects, prior consideration will have been given by the various statutory bodies concerned to the need to establish a school of nursing. If approval has been granted, the school of nursing should be operational in advance of the opening of the hospital.[40]

6 Some staff are difficult to obtain. It may be necessary to advertise more than once before a satisfactory appointment can be made.

7 Would it be desirable to appoint groups of staff by a certain date so that some appropriate training can be arranged?

Success in recruitment requires a generous advertising budget and an all-out effort using all recruitment techniques: leaflets and brochures drawn up and circulated at the most appropriate time, imaginative advertising, talks, visits and exhibitions all require tremendous effort by the personnel department. It might be worth mentioning in passing – planners please note – that in the past the siting of new hospitals has not always taken enough account of long-term recruitment difficulties. Personnel departments have expertise in obtaining and retaining staff, but the staffing adequate enough to provide a satisfactory service in all departments, is as dependent on location, public transport and residential accommodation, as it is on pay or an enlightened recruitment policy.

Consultation with staff

This has to be considered throughout the commissioning programme. The personnel department must not overlook the importance of referring certain matters to trade unions and staff associations, particularly if some staff are to transfer from a hospital nearby or even on the same site. Development of staff consultative machinery should also be given careful consideration. To some extent staff form their own representative structures, but encouragement from the personnel department can help establish valuable representative systems early. This is essential if staff are to participate in developing effective working systems as services start up.

Induction, orientation and training

The personnel department has a major contribution in ensuring that induction and training programmes are ready at the appropriate time.[4,45] Some of these will cost money and due allowance should have been made for this.

The programmes fall into eight categories.

1 Induction – for all new staff whatever the grade. Many hospitals have found that considerable benefits accrue from a regular morning session one day a week to which all starters for that week are invited. This also helps all categories of staff to mix together at a time when it is essential not to encourage attitudes of departmentalisation

2 Senior management conferences – essential throughout the commissioning programme

3 Training supervisory staff

4 Job training – including trial runs and explanations of operational systems

5 Orientation courses – for staff transferring from other hospitals nearby

6 Professional, technical and craft training – in liaison with colleges of further education

7 Special training opportunities – for individual departmental managers requiring to develop new skills or greater knowledge of new systems

8 Back-to-nursing courses

Staff transferring from the old hospital to the new one

If commissioning the new hospital is to involve closure of old buildings, and consequent transfers or amalgamations of staff, the personnel policy must be worked out as early as possible and all members of the staff fully informed of the way in which they will be personally affected.[1.4] The distance to the new hospital might in itself be important. With advance planning it should be possible to avoid redundancies. The factors which will most surely depress the morale of staff are uncertainty and lack of information on what is going to happen. The aim should be to achieve complete integration of the staff transferring with those newly recruited.

Major organisational change, such as that entailed in commissioning a new building, commonly generates great anxiety. Managers who are themselves excited and enthusiastic about the project may find it difficult to appreciate the extent of concern and resistance that many of their staff feel. To alleviate anxiety, every member of staff should be consulted and informed about what his job will be in the new building, where he will be doing it and under whom he will be working. As a result of thorough training, staff should then feel confident about their ability to meet the demands which will be made on them.

8 Information

Letters to the Editor

Sir—Now that it seems to be probable that the new hospital is to be built on Turf Moor, would it be impertinent to ask the Health Authorities if they have given any thought as to where the saff might come from? As Managing Director of the largest labour force in this area, struggling at all times to maintain a full work force, I fear the prospects of a brand new building being built only to be left half used through lack of staff. On the other hand it would be nice to think that there might be some collaboration going on behind the scenes to at last provide this area with adequate public transport services. Perhaps our local railway line might even be re-opened as a way of bringing employment to this town.

I am sorry to ask such a basic question but clues from experiences elsewhere in the country where I understand new wards remain unused lead me to enquire.

Yours faithfully,

H. Porter.

Managing Director,
Oakwood Furniture Ltd.

Sir—I have heard a rumour that preliminary discussions have been entered into by the Regional Health Authority for using the southern section of Turf Moor Golf Course for hospital development purposes. We live in an area already seriously short of recreational facilities and parkland. Moreover we already have our Memorial Hospital which is providing a marvellous service to this community. Who are these crazy hospital planners, and when can we expect to be asked for our opinion on this proposal?

Yours faithfully,

Colonel Fitznorman.

Chairman,
Turf Moor Golf Club.

Sir—At last we can see this monstrosity taking shape, austere, impersonal and difficult to get to. And now its going up we now hear that it is the Authority's intention to close the casualty department in the Memorial Hospital. I made some enquiries about this, thinking this could not possibly be true. To my dismay I was told that "it is no longer policy to retain small uneconomic casualty departments and that it is preferable for patients to be taken further away to specially equipped accident departments". Does that mean we will have to travel 12 miles with a crying child who has just fallen down the stairs?

Yours faithfully,

Councillor Harry Targitt.

Sir—I have just spent the last two months as a patient attending the new £10m. hospital, first as an out-patient and then as an in-patient. I cannot speak too highly of the attention I received; the food was marvellous and all the facilities were equal to a first class hotel. What a pity though when I went back last week for a check-up that I had to wait nearly two hours to see the doctor. Is it too much to hope that one might have modern appointments systems to match the modern equipment and friendly atmosphere which so impressed me on the wards?

Yours faithfully,

Joan Peterson (Mrs.).

49 Raymill Court Drive.

Information to the public

The planning, construction and opening of a major hospital development is an important series of events in the life of a community. Sometimes information required by the public is simply news of its progress; but there are also controversial matters for which it is invaluable to make good use of the local news media to clarify the situation. Talks to local organisations, before the public has opportunities to visit the hospital, help to identify the hospital with its community and to assure people about the standards of service that are being aimed for. Frequently there are fears that friendliness, individual attention and kindness will be less in the new hospital than in the old one. These fears need to be allayed.

To provide this information requires thought, imagination and administrative effort. Contact must be maintained with local journalists.[53] Publicity material, in general terms to prevent it becoming out of date too quickly, must be produced. Opportunities to exhibit plans and a model should be taken, not only to inform the public but also to generate interest in recruitment and offers for helping the hospital voluntarily. Talks to local organisations ought to be offered rather than waiting for individual requests to come in. To cope with a programme of talks it is useful to have a panel of speakers, including some departmental heads, who can draw up amongst themselves a framework for a general talk about the new hospital, with the help of a set of slides. Different members of the panel can then share what otherwise can become extremely demanding for one or two principal officers.

In the reorganised service the community health councils should be an asset in communication with the general public.

Information to staff

Fluctuations in the progress of a major project, problems of staff morale which can afflict new hospitals before they even open, assembling so many new staff in such a comparatively short time, an enthusiasm to belong to the new hospital as a whole rather than a narrow identification with an individual department, a sense of pioneering and a general aim to weld the organisation together from the outset – all these require a good staff information system. Information bulletins, staff journals, good communication within and between departments, all have a part to play. Most people attracted to work in a new hospital expect to gain some job satisfaction from setting up something new, but many staff will be unaware of the frustrations which go hand in hand with commissioning. Management may have done everything possible to prevent delays or disappointments, but however well prepared the programme, some unexpected difficulties will arise. Staff need to be kept informed so that the cause of delays is understood and the consequent changes to the programme can be fully discussed.[42]

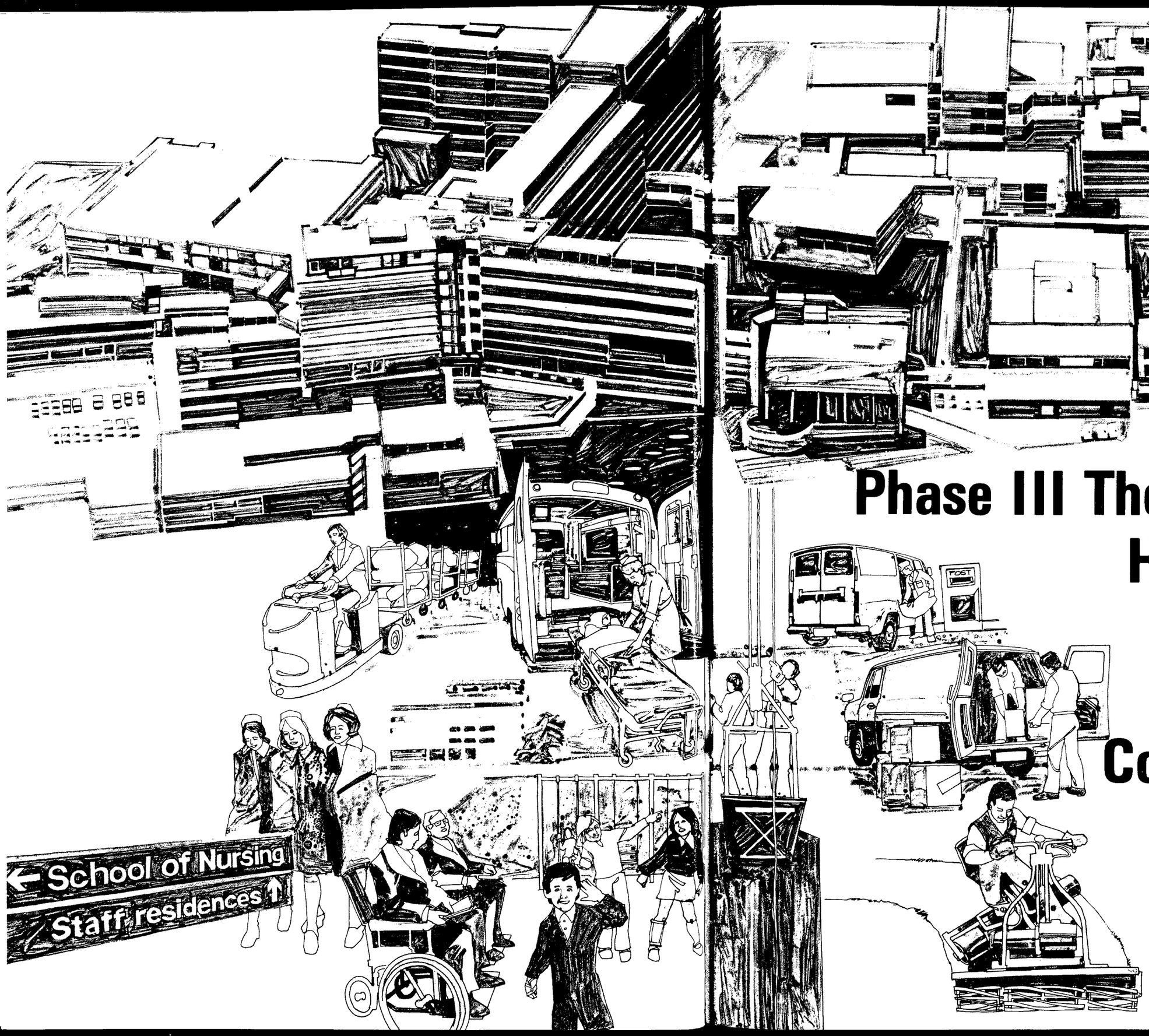
Information to others affected by the project

The effects of building a new hospital on other services

are often underestimated. Family practitioners, public transport services, voluntary organisations, neighbouring hospitals, Department of Employment offices, ambulance services, social services and other local authority departments, are affected by the advent of a new hospital development.[53] The reorganised structure of the NHS is designed to facilitate communication of essential information among a number of these services, but to supplement formal links through area health authorities requires considerable efforts by those officers commissioning the building and those responsible for providing dependent or related services. In the past essential links have often been left too late. Information should be available at an early stage to enable joint planning to be undertaken. Once liaison has been established, progress reports should be given so that the development of related services can keep in step with the commissioning timetable.

This part of the commissioning process is sometimes so badly dealt with that it would not have been exceptional in the past for negotiations with the local bus company, for example, to start only a month before the hospital is due to open!

Phase III The Climax: Handover, Opening and Completion



9 Prehandover activity

Nearing completion of the building

Final snagging

As the date for practical completion approaches, the clerk of works, directed by the architect, should prepare 'snag lists' which detail those items not satisfactorily completed according to specification. This is to expedite and assist the contractor's management and so reduce the number of items remaining on the snag lists by the date of practical completion and handover.[55]

The architect should insist on a determined effort to reduce the lists as much as possible before the health authority takes over the building. Contractors are generally more ready to act quickly to remedy defects before the building has been taken over than afterwards, when the tendency is to try to leave all outstanding matters to be dealt with together at the end of the defects liability period.

Commissioning of engineering services

This crucial part of the prehandover period is discussed in more detail in the next chapter.

Extension of time

Occasionally, extension of time is granted to the contractor. This is a contractual matter on which the architect has sole discretion to act; in no circumstances can the client intervene.

Authorised extension of time does not as such justify the contractor making a claim for financial reimbursement. Assessment of any claims lies solely with the architect. The client should, of course, ensure that his acts or omissions do not contribute to a claim to extend time.

Coordinating the final effort

The period from just before handover until the hospital becomes operational is one of intense activity. New staff are settling in and people are looking forward to working in their new departments. There are setbacks, and their effects on morale have to be overcome. Equipment has to be placed; suppliers have to be chased; crises have to be faced. Works, portering and domestic staff are busy trying to cope with the needs of all departments, hoping, but not necessarily realising, that somebody is programming their workload. Staff, the public, the press and related services all require information. Deadlines which were real suddenly appear unrealistic. All at the same time there is muddle, uncertainty, enthusiasm and expectation.

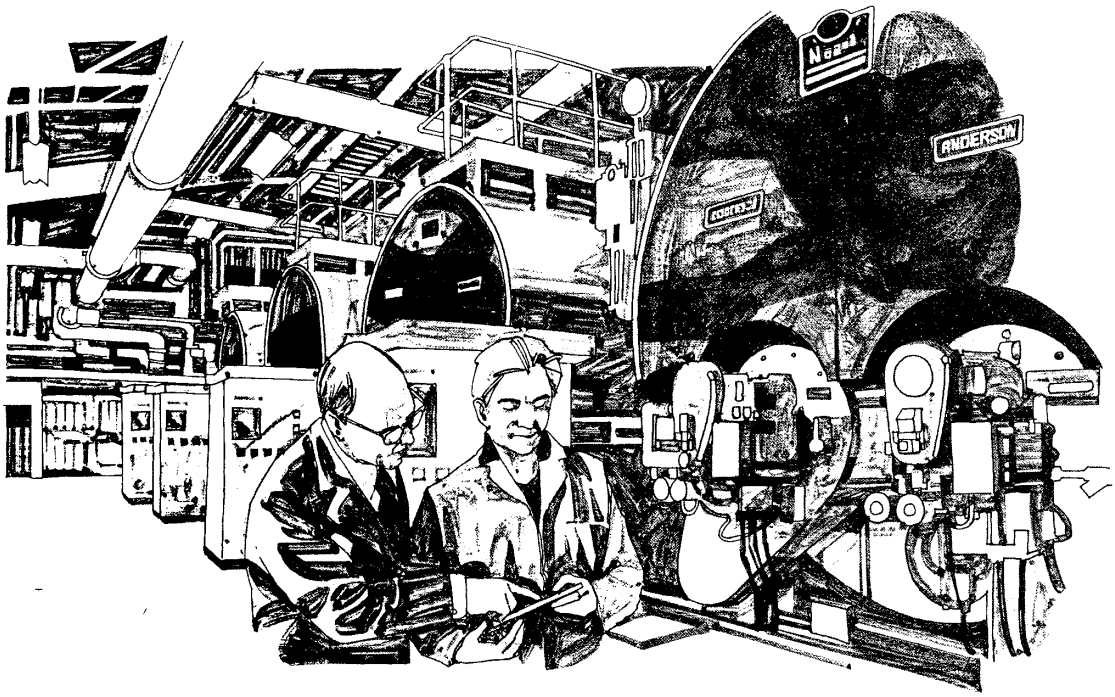
Somebody has to coordinate this final effort, yet it is collective effort that is really required. The most effective way is to make full use of the commissioning team. It will meet more frequently, fortnightly at least, perhaps weekly during the last two months. Coopting new members and inviting departmental managers along for specific agenda items are necessary not only to discuss inter-departmental problems but also to create the teamwork which is essential at this time. Staff can reach breaking point if it is not seen that everybody is under the same pressure.

10 Commissioning of engineering services

This substantial and crucial element in the total commissioning exercise is in the main a precompletion task, the success of which depends largely on two main factors. Firstly, the quality of the original brief, specification and design and, secondly, clarification of managerial accountability of each person concerned with the various activities of the total task.

Engineering commissioning can be described as a comprehensive set of activities undertaken from planning to evaluation; it includes design, manufacture of components, construction, setting to work, acceptance testing, final adjustments, and the process of converting the installations from a static to a working condition.

Many problems already experienced by new hospitals



have, on the face of it, been due to poor contract specification, which has ultimately resulted in the contractor not having enough time for commissioning. Consequently, completion dates have been approached before engineering services have been properly checked. This gives rise to uncertainty about handover, with pressures to take over the building competing with the engineer's advice to postpone it until final testing is satisfactory.

If, on the other hand, enough time has been allowed, there might still be prehandover difficulties if attempts are made to reduce the period for commissioning work as a means of recovering any time lost due to delay in other parts of the contract. Pressure to take short cuts of this kind ought to be resisted to prevent serious problems being postponed until after handover, because when this happens, it often leads to contractual difficulties and delays in getting the remedial work finished.

The entire engineering commissioning programme, therefore, needs to be planned and implemented with the same thoroughness as other aspects of the commissioning task. It must be fitted into the contractor's programme of work in such a way that it will not interfere with the logical sequence of work for various finishing trades. Certain tests of a special nature, for example seasonal tests, need to be planned particularly carefully. The methods and extent of the commissioning procedures required by the client must be defined and included within the specifications so that the contractor is fully aware of his obligation when the tender is being prepared.

There are, inevitably, some engineering tests that *exceptionally* have to be done after handover. For example, there are tests which depend on seasonal conditions, or which cannot be completed until staff are working in a department and coping with normal operational conditions. To carry out such checks after handover, engineers require access to parts of the hospital already in use and the cooperation of the staff in the departments concerned. To achieve the best results, special efforts have to be made to explain the reasons for the testing and to organise the programme of work well in advance so that necessary adjustments to the normal work of the department can be planned properly.

The complexity of the overall task is such that it is essential to clarify the accountability of all the engineering personnel involved.

Design engineer

The normal duties of the design engineer include the preparation of the detailed designs, the engineering drawings, the specification and documentation of the contract; and subsequently ensuring that the installation is carried out by the contractor in accordance with the terms of the contract. In conjunction with the client's commissioning engineer, he prepares commissioning manuals for the services he has designed, and ensures that the site supervisory staff complete the manuals as inspections of the work are undertaken during construction. He also has to ensure that the results of tests recorded in the commissioning manuals meet the specified requirements before the certificate of completion is issued.

Another objective of the design engineer is to provide accessible facilities for monitoring the plant while still running, so that test readings can be taken and recorded without dismantling the plant. Only in this way can commissioning be properly carried out. At the same time, plant layout and access to equipment, such as valves, are inherent parts of the design function which, if not carried out properly, can create difficulties during the commissioning process.

As already indicated, one of the important functions is to specify the content of testing explicitly so that the contractor can make allowance for it within the contract.

Commissioning engineer

The DHSS publication, *Hospital Technical Memorandum No 17, The commissioning of hospital engineering services* [22(17)], introduced two new concepts.

1 The appointment of a commissioning engineer to the client.

2 The use of commissioning manuals which have been prepared by the DHSS and cover the majority of engineering services.

The appointment of a commissioning engineer is essential for major projects. His job, using the manuals for guidance, is to carry out spot checks during construction work, to monitor the witnessing of all engineering tests, to check the documentation on the details of the plant and the acceptance tests applied to it.

In due course, these documents are handed over to the user's operational and maintenance staff to ensure that they are properly briefed.

Appropriate duties for a client's commissioning engineer are set out in a letter issued by the DHSS in August 1974.

'**1** Contributing to the design engineer's brief on the provision to be made for commissioning in the design and documentation (This will involve liaison with client's specialists who prepare the engineer's brief.)

2 In consultation with the client's specialists, monitoring of the design to ensure that adequate provision for the commissioning is being made

3 Advising on programming of commissioning activities

4 Monitoring the preparation of commissioning documentation including check lists (preferably before tenders are invited)

5 Monitoring tender documents to ensure that provision is made for commissioning, particularly programming

6 Monitoring tenders in respect of commissioning matters

7 Advising on the adequacy of the site staff requirements proposed by the engineer, and monitoring the completion of commissioning documentation

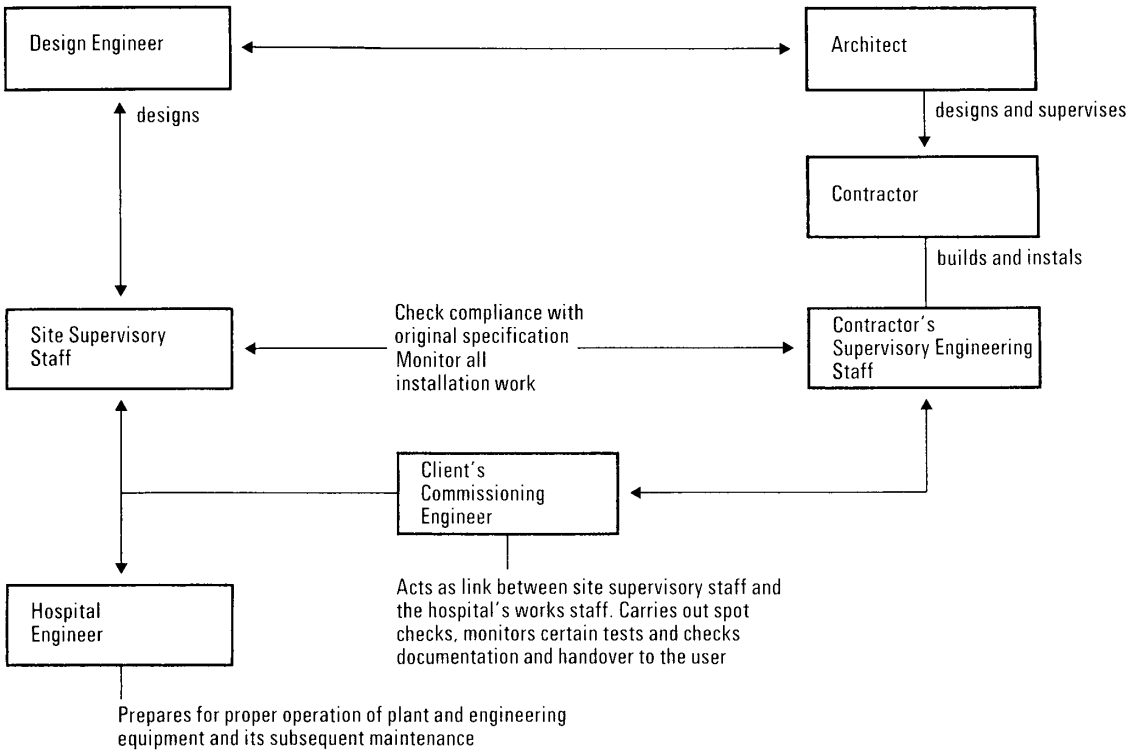
8 Monitoring the engineer's arrangements for site staff and the engineer to witness acceptance tests at works and on site

9 Inspecting, in collaboration with client's specialists where necessary, procedures for acceptance tests (see 1)

10 Monitoring issue of certificates of practical and sectional completion

11 Informing the client (or his representative) where the engineer reports disagreement with the contractor on the state of completion which has been reached and advising on the appropriate action

Figure 8 The Engineering Team



12 Monitoring any final adjustments and additional work required by the engineer following inadequacies of his design being revealed

13 Advising the client on the engineer's responsibilities in relation to complaints by the users

14 Advising on any remedial measures, following 13, and the consequent action

15 Liaison with engineers in dealing with users' complaints on performance of the services or plant

16 Liaison with the engineer responsible for operation and maintenance of the works

17 Evaluating the design in association with client specialists after the system has been in use for a period.'

Site supervisory staff

Site supervisory staff, who in no way absolve the contractor from providing his own supervision, work under the direction of the design engineer. They have to check to ensure compliance with the specification and drawings, witness acceptance tests to ensure that contractual requirements have been met, complete the appropriate sections of the commissioning manual, and witness the final balancing of the system at the end of construction. Occasionally, after handover, they provide help by adjusting equipment, giving assistance to the hospital's own works department, dealing with defects and any work outstanding at the time of practical completion.

Hospital engineer

The works officer of the health authority has to ensure that the operation and maintenance of the building can be properly carried out immediately after handover. This requires a long period of preparation, by gaining during the construction period detailed knowledge of the plant and services, and setting up programmes of planned maintenance. Experience has shown that it is prudent to appoint the hospital's own engineer well in advance and to associate his work with the design team and the site supervisory staff. He then becomes committed to the total commissioning programme; he can ensure that he receives all the documentation he needs about the plant and the acceptance tests applied to it, and gradually he becomes thoroughly familiar with all the detail of pipework, ductwork, cable systems and so on. In the past, the DHSS has not always been easily convinced of the arguments for early appointment of the hospital engineer and many new hospitals have not had the benefit of such

appointments. However, the case for appointing the engineer early is so strong that it should be pressed.

After handover, one important job for the hospital engineer is to make sure that departmental managers fully understand the proper use of equipment. It is becoming more sophisticated and complicated to operate. The job, which is made easier if explanatory leaflets are prepared, should be incorporated in the initial period of trial runs and staff training. Otherwise equipment can easily be mishandled and put out of service prematurely.

Figure 8 (on previous page) summarises in very simplified form, the relationships of the people involved in this complex and vital part of the commissioning task.

11 Handover

Taking-over procedure

Taking over a completed contract is a technical and legal procedure. For most capital projects in the NHS this is defined in the Standard Form of Building Contract (Local Authority Edition (With Quantities)): Articles of Agreement.* This states clearly that the only person authorised to carry out the final inspection of the work is the architect nominated in the contract. He could, therefore, be a consultant architect working for a health authority, or a RHA architect. He takes over the work from the main contractor on behalf of the client.

Efficient takeover of a contract is essential, to ensure that the works have been completed entirely in accordance with the contract drawings and specification. The acceptance of the building by the architect has considerable legal and financial implications, including the issue by the architect of the final certificate. The issue of the certificate of practical completion enables the client to take possession of the building and site, and also authorises payment to the main contractor of one half of the retention monies. On the date stated on this certificate the building is the user's.

* Available from the Royal Institute of British Architects (RIBA), 66 Portland Place, London W1.

Phased or sectional completion

If the client wishes to take possession of any part or section of the building before total completion this provision must be incorporated by design and description in the bills of quantities prior to receipt of tenders and entered in the appendix to the contract conditions. On behalf of the client the architect should take over that portion of the work, issuing a certificate stating his estimate of its approximate value, and that the practical completion shall be considered to have taken place. The defects liability period will start from the day on which the client takes possession.* Sectional completion of parts of the building that are practically complete can also be accomplished within the terms of the contract by agreement with the contractor.

The contractor will be relieved of his responsibilities for the insurance of that part of the works which he has handed over, and will be entitled to the payment of one half of the retention monies on the part of the work handed over.†

Handover meeting with the client

At the handover meeting, the architect is the sole arbiter of whether the contract building can be accepted.

Normally, arrangements will be made by description in the tender documents for the client's maintenance and operations staff to familiarise themselves with the buildings and plant so that there is a smooth transition from contractual to client responsibility.

The handing-over process should ideally include a detailed tour of the buildings and site, the handing over of the keys, operational manuals and record drawings, and agreement on the procedure for reporting and attending to defects. Availability of drawings is not always given its due priority at handover. The clients should be provided with scale plans, elevations and sections, a block plan showing the main drainage runs and connections to sewers, together with 'as fitted' drawings of mechanical and electrical services. Similarly, manuals on plant and fixed equipment should be handed over.

A typical handing-over meeting would be attended by the contractor's representative, the employer's contract management team (architect, engineer, quantity surveyor, site inspectorate), and representatives of the user organisation (usually members of the commissioning team and any principal departmental managers directly concerned). It must be emphasised that if the works comply with the contract requirement, they are to be taken over – that is the sole criterion.

* See Chapter 13, Implications of the Defects Liability Period, page 66.

† This relates to Cl.18 (10) and Cl.19 in the Standard Form of Building Contract.

12 The task immediately after handover

Immediate action after handover

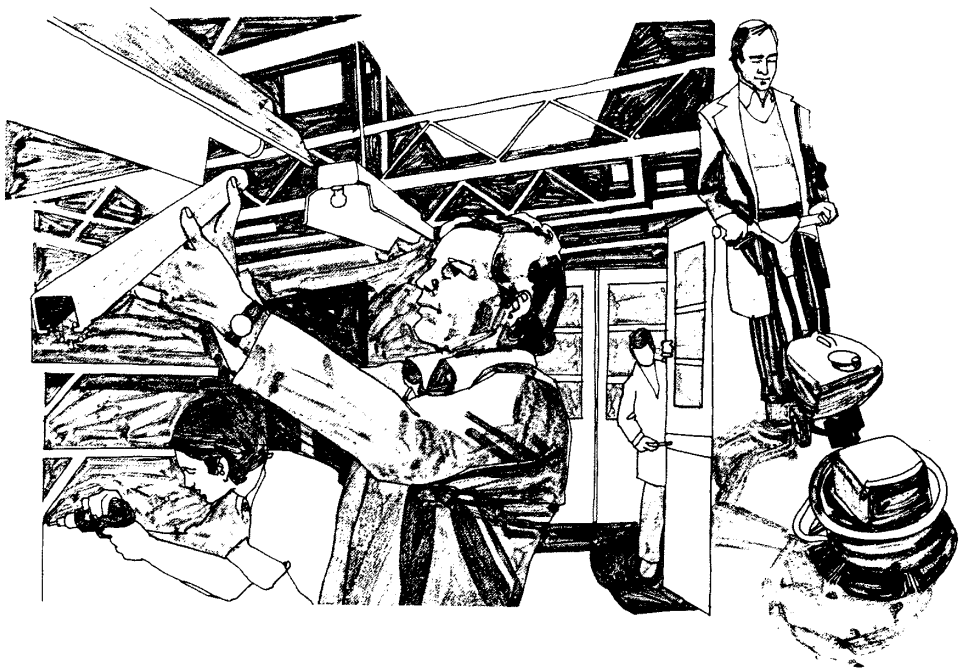
Suddenly the building changes hands. The handover certificate has been completed. The tasks for commissioning the departments have been listed. The staff are ready for action. What should happen now?

Security

First steps include making sure that keys are available to effect security. A system to deal with locking up and custody of keys should have been drawn up in advance of handover.

Cleaning

There may be an immediate need to give the building a general clean, enough for it to be habitable, without overdoing it.[44] The domestic services manager will not want to duplicate effort by sending in cleaning teams throughout the time equipment is being moved in. On the other hand, floor sealing is quite often an important first job.



Checking services

Theorists will say there should be little need to check services if pre-handover tests have been carried out properly by the contractor. Unfortunately, experience shows that a comprehensive survey of all electrical, water, piped gas and other engineering services has to be carried out by the hospital's own works department to identify minor faults requiring immediate adjustment or even repair. This check must be done straightaway to give enough time for remedial work to be carried out by the contractor. It is not always as easy for him to have the work carried out quickly to fit in with the programme as it might be by using hospital staff.

Fittings and other installations

Immediately after handover, carpenters are usually busy putting up shelves and fixing things to walls. Telephone engineers will probably be around unless all requirements, including the *precise* location for telephone instruments, have been contained in the contract. Carpet-laying, curtain-hanging, clock-adjusting, signposting and dispenser-fitting all have to be included in the programme of work. For electrically-operated equipment there have to be safety checks, and plugs require fitting. Electricians, like everybody else, become heavily engaged in the programme of work.

Protecting the building

Moving vast amounts of equipment from place to place can cause considerable damage unless efforts are made to train staff to be particularly careful, and measures are taken to protect lifts, doors and vulnerable corners. It is worth taking trouble over this; otherwise signs of wear and tear appear prematurely.

Equipping

The system for delivering and installing equipment will have been drawn up well in advance. In small departments, it might be best to deliver all equipment to one central point and rely on the head of department to distribute it to individual rooms. For wards and large departments it is better to have equipment labelled with individual room numbers so that the porters can deliver items to their ultimate location. The need to provide portering staff with enough trolleys and proper lifting equipment should not be overlooked. In addition to permanent items of equipment, departments require a wide range of consumable goods: stationery, special forms, cleaning materials, sterile supplies, linen, crockery, provisions and so on.

In an entirely new hospital, the preparatory work necessary to have these things ready needs to be considered well in advance, particularly documents which require meticulous design work often related to an operational system, before going through the various stages of printing. The work of preparing forms and other documents is time-consuming and must be programmed as part of the total equipment programme.

Similarly, staff uniforms, if new styles have to be selected, must be ordered well in advance.

To coordinate these efforts to provide a department with its entire needs, departmental managers should have comprehensive lists of all their requirements so that items can be checked off as they are delivered, or can be 'chased up' if they do not arrive on time. In schemes where some equipment is transferrable from an old department, plans and the timetable have to be prepared in fine detail to reduce to the minimum any disruption of patient services.

Staff training and trial runs

Some staff training will have taken place before handover. Training and staff induction are ongoing processes and do not relate merely to a particular period of time before opening a new hospital.[44, 60] The needs of new staff in the future will be very similar to those of this particular period. On the other hand, there is opportunity and incentive to make special effort during the final phase of commissioning, partly because staff can be brought together more easily without disrupting services, and partly because the significance of training is clearly recognised as a prerequisite for establishing efficient services in all departments. Regrettably, the need for this kind of training is not so apparent when hospitals are fully operational.

New systems, new equipment (some of which might be quite sophisticated), new attitudes, setting high standards, require the back-up of training. Equipment associated with engineering services, for which operational manuals will have been provided, will require training sessions not only for maintenance purposes but also for staff using the equipment day by day. The task, therefore, is such that all categories of staff will benefit from training of some kind; it must be provided if a smooth start is to be achieved.

Staff transferring within the hospital or from one nearby, will need re-orientation programmes. They tend to regard a new hospital or department as merely a new environment in which present methods and procedures will continue. In many cases they will have become conditioned to outmoded and inefficient procedures which they have been compelled to adopt because of their former out-of-date accommodation. These staff will need the expertise of training officers if they are all to be persuaded to operate their new department in the way it was designed to be used. Trial runs of complex systems or of new equipment which might have serious problems to begin with will often require the help of manufacturers and suppliers and, if several departments are concerned, coordination by the commissioning officer.[3] Time must be allowed for things that go wrong to be put right. On the other hand, full trials involving all new staff must be left as late as possible to prevent staff being unoccupied too long before the patients arrive.

Consultation with staff and associated services

At a time when there is so much to do it is easy to overlook the importance of consulting and communicating with staff and other people whose services impinge on the work of the hospital.

For staff, the use of a duplicated information bulletin is the simplest, cheapest and most effective way of keeping everyone informed about progress, about some of the difficulties and the steps being taken to overcome them, and of re-stating the target dates. Departmental meetings are a valuable supplement to written information. They can be used to identify problems at an early stage, to gauge morale and to exchange views about the operational systems that have been drawn up earlier and are now to be put to the test.

It is difficult enough to maintain high standards of communication with hospital staff. It is even more difficult to make the effort to keep properly informed other people and organisations whose work will be affected by the opening of the new hospital. The following list illustrates the importance and the size of the problem:

ambulance services

community health councils

community health services

Department of Employment

general practitioners

fire and police services

neighbouring hospitals

other local authority services

social service departments

trade unions and staff associations

transport services

voluntary organisations

All these people, services and organisations have to plan ahead for any developments affecting their operation. They need adequate notice and, in many cases, precise dates about opening hospital departments.

Public relations between handover and opening

The period between handover and opening provides the best opportunity for the local people to see round their new hospital.[1] The organisation of a public relations week, with some sessions booked for local organisations and others for open viewing by the general public, is yet another large task to fit into the overall commissioning programme. It has to be planned several months in advance, with local press publicity to invite organisations to write in to book their visit. The best time to arrange the programme is probably about two weeks before patients are to be admitted. By then, most of the equipment should be in position and there will be several members of staff who can be briefed to help take the visitors round. The 'open' sessions can present something of a risk because numbers are unpredictable. However, local knowledge is usually sufficient to guess what the response will be.

If on the other hand it is decided not to leave things to chance, a system of asking people to write in for tickets can control the number of visits to suit the availability of couriers and the competing demands on 'commissioning time'.

Hospitals that have arranged such a programme, perhaps involving over 5000 people during one or two weeks, have usually found that the following objectives have been achieved.

1 To let the community see ***their hospital,*** and so help to take away some of the apprehension of any subsequent visit as a patient.

2 To let people know that voluntary help is welcomed, either in the form of personal service or organisations helping towards the cost of amenities.

3 To let people know the employment opportunities available at the hospital.

4 To concentrate the visits from local organisations into one programme, which otherwise would take place week by week throughout the year.

5 To show at first hand the problems of phasing.

In addition to visits by the general public, it is important to use the help of the local press and radio to publicise the

final commissioning activity. It is not difficult, for instance, for the local press to lose interest before the completion of the building if they have been too often told that 'it will be finished next month'. The object should be to bring interest to a head at a time which coincides with the start of the hospital's advertising campaign for staff, that is, about four months before the date of handover of the building, and to sustain it until the time when the first patients are admitted. It is a good plan to invite the local press to visit the hospital shortly after it has been equipped and staffed and is ready to receive patients. Additionally, a national press day is appropriate for projects of major importance.

13 Implications of the defects liability period

Definition of the defects liability period

This is the amount of time stated in the contract (normally six months for building works and twelve months for engineering works), starting from the day of practical completion of the works. The contractor is required to make good, at his own expense, any defects, shrinkages or other faults which appear during this period which are due to materials or workmanship not in accordance with the contents of the contract. The architect will provide a schedule of defects and deliver it to the contractor not later than fourteen days after the expiration of the defects liability period. The architect may issue instructions whenever necessary to remedy defects within the defects liability period. An example of a schedule of defects is given in Appendix F, page 124.

Faults identified by users

It is therefore for the users of the building to contribute to the identification of any faults which appear. Room-by-room visits by the architect or his representatives are not always sufficient to spot all the shortcomings in materials and workmanship which, over a period of time, users are likely to have identified.[55] It is in the interests of the hospital for departmental heads to maintain records of defects as they are noticed and pass these over the architect at the time of the final inspection.

Issue of the final certificate

Subject to the defects having been made good to the satisfaction of the architect and engineer, the architect may issue to the contractor a certificate to this effect, and authorise the release of the remainder of the retention monies at the end of the defects liability period for building works. The engineering sub-contractor will be required to execute an undertaking with the main contractor to make good defects on engineering works arising during a further period, normally six months, until the end of the defects liability period on engineering works.

Moratorium on alterations affecting the terms of the defects liability period

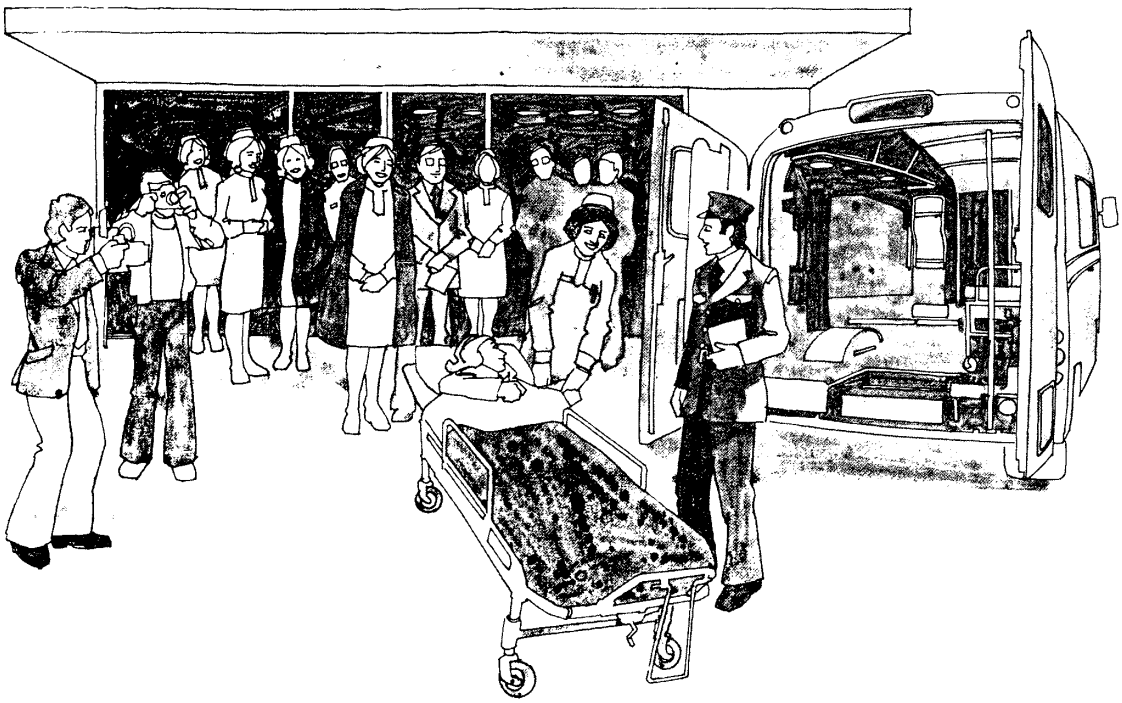
Immediately after handover, users are often tempted to embark on a number of alterations to the building, particularly if their views on design differ widely from those of the planners and architects. It is important that any changes contemplated are deferred until after the defects liability period has expired if their implementation is likely to allow the contractor opportunity to escape from his responsibilities. In some projects it is important, if not almost essential, that certain work be started at the earliest possible opportunity after handover. In such circumstances the advice of the architect must be sought in case contractual implications of any alterations need to be negotiated with the contractor.

14 Introducing the new services: implementation of operational systems

Coping with likely problems

As operational systems are put to the test and new services start up, a wide range of difficulties will come to light. Some of these will be regarded as crises and will need managerial intervention straightaway. Others will come to the administration's attention gradually through complaints from patients or informally from doctors, nursing officers and other senior staff. If too many organisational weaknesses occur at the same time, standards of service or morale will drop.

To cope with these problems, a number of which will arise inevitably however well prepared the systems, there must be good communication between all departments and with the administration. Representative machinery in individual departments is particularly helpful in bringing to the surface practical problems which otherwise might not become evident for some time. This



is a period when staff are under considerable pressure in new surroundings. Not all staff respond to a pioneering role and therefore outlets to involve them and hear of their difficulties should be an essential part of the organisation at this critical stage. It is the period when reputations begin to be made; it is important therefore that the administration, as well as other departments, should get off to a good start.

Sequence for opening wards and departments

This is the stage when systems documented in manuals are translated into practice. Each department will grow at a different pace. Some will have the advantage of ample time whereas others will be hurried into action. Some

Figure 9 Ward Commissioning Programme – Stage 3, Northwick Park Hospital

Date	Nurse recruitment predictions			Cumulative number of additional day nursing staff	Total number of new beds to open (cumulative)	Wards to open	Designation* of beds to open (excludes separate programmes for commissioning paediatric, obstetric and psychiatric beds)
	Total expected to be recruited	Replacement predictions	Additional nurses				
Feb 1974	18	8	10	10			
March	18	8	10	20			
April	18	8	10	30			
May	18	8	10	40	60	Eliot Fletcher	30 orthopaedic 15 medical 15 surgical
June	20	8	12	52	85	Dryden	25 geriatric
July	16	8	8	60	-		
August	16	8	8	68	115	Gray	15 medical 15 surgical
September	16	8	8	76	135	Galen	20 investigational
October	20	8	12	88	-		
November	20	8	12	100	165	Jonson	15 gynaecological 15 surgical
December	14	8	6	106	195	Herrick	15 respirology 15 medical
Jan 1975	19	9	10	116	215	Byrd	20 isolation
February	21	9	12	128	-		
March	21	9	12	140	231	Kingsley	16 private

*It is suggested that during the early commissioning period all beds should be used very flexibly.

departments have to get under way before others; for example, portering, telephone, cleaning and works services are needed early. Others, although not operational until patients' services start, have protracted commissioning tasks and must also make an early start. For example, the central sterile supply department (CSSD) will require bacteriological checks and lengthy trial runs. The installation and calibration of x-ray machinery is a long job and must be programmed accordingly. The best sequence for opening departments should have been planned well in advance; this will have determined both the week-by-week recruitment timetable and the equipment delivery programme. There is a logic to it which will vary depending on the circumstances of each project. A typical order would be:

- engineering service (electrical installation, ventilation plant and boiler house)
- security and portering
- stores
- residential accommodation
- telephones
- domestic services
- catering services
- central linen service
- CSSD (for trial runs)
- x-ray (for trial runs)
- theatres (for trial runs)
- medical records
- paramedical departments
- pharmacy
- outpatient services
- wards

Each department should have a published programme setting out predicted takeover dates, starting dates for positioning equipment, deadlines for having all equipment in place and in working order, and a forecast operational date.

As far as possible, wards should be opened one after the other over a period. Inpatient and outpatient services should not be opened at the same time. Since the greatest demands on diagnostic services and records are made by admissions, the volume of admissions during the first weeks should be planned with particular care. If the availability of nursing staff is likely to be the critical factor for opening beds then it is worthwhile predicting in detail the number of nurses likely to be available month by month and the number of beds such numbers can adequately staff. If the project is a major extension of an existing service it is important that these estimates take account of current turnover rates because newly appointed staff will not all be additional. Another factor which makes this a complex task is the specialisation of nursing which prevents all new staff being regarded as interchangable for opening each of the new wards. This exercise in prediction has to be discussed with medical staff since choices will have to be made to decide the precise sequence of opening each ward. This programme, which in a large project might take more than a year to complete, will clearly often influence the growth rate of other departments' workload, for example, the operating theatres. It will also have important implications on the recruitment timetable for appointing other staff, for example, junior medical staff. Figure 9 (opposite), which sets out the sequential plan used at Northwick Park Hospital, illustrates the practical benefits of such a programme.

Procedure for monitoring the rate of admissions and outpatient attendances must be thoroughly prepared and ready for implementation as soon as the new building opens. Informal and decentralised arrangements may have worked satisfactorily in the old hospital, but the first months of work in the new hospital will be a time of flux and the system may oscillate quite violently. Strong organisational mechanisms for discussing trends and controlling them are essential.

Developing the new services without interruption

Opening a new hospital building often presents several objectives with different time requirements:

- the need to use all the facilities as soon as possible to maximise the return on investment
- the need to maintain district services without interruption
- the need to take sufficient time to overcome 'teething' problems.

Management has to achieve a balance that creates the best combination of these. It needs planning in consultation with medical staff and senior officers to reach agreement about opening dates and the optimum rate of growth.

As bringing the new service into use should be staggered, so should the timing and sequence of associated closures or change of use. Arrangements for managing these need to be considered early. Sharing the district service burden by continued use of an existing facility during the initial operating period will, if feasible, provide a valuable 'breathing space' for the new building. If possible, facilities located at a distance from the new hospital should be closed first to make management problems easier. During the critical later stages – when the remaining activity in units to be closed is falling off and activity in the new building is approaching a peak – staff should be concentrated as far as possible within a limited area. They may then be deployed flexibly between old and new units as relative levels of activity change from day to day.

The task of transferring resources has to be prepared rather in the manner of a military exercise. It is usually necessary to restrict any break of service to the absolute minimum. Detailed preparation of all that has to be done,

fully consulting all staff involved, is the *only* administrative method that will succeed.

Closure, even of an individual department, makes early discussions with the community health council as well as with staff organisations essential, if it amounts to a substantial variation in the provision of the health services within the meaning of Regulation 20(1) of the CHC regulations.

Financial consequences of commissioning

It is easy to under-estimate the financial consequences of commissioning, as distinct from the ordinary revenue costs of running a new hospital which, from experience, tend to be higher than their older counterparts. Rather than elaborate in detail on commissioning costs which will vary from scheme to scheme, it is probably sufficient to set out the main items of cost.

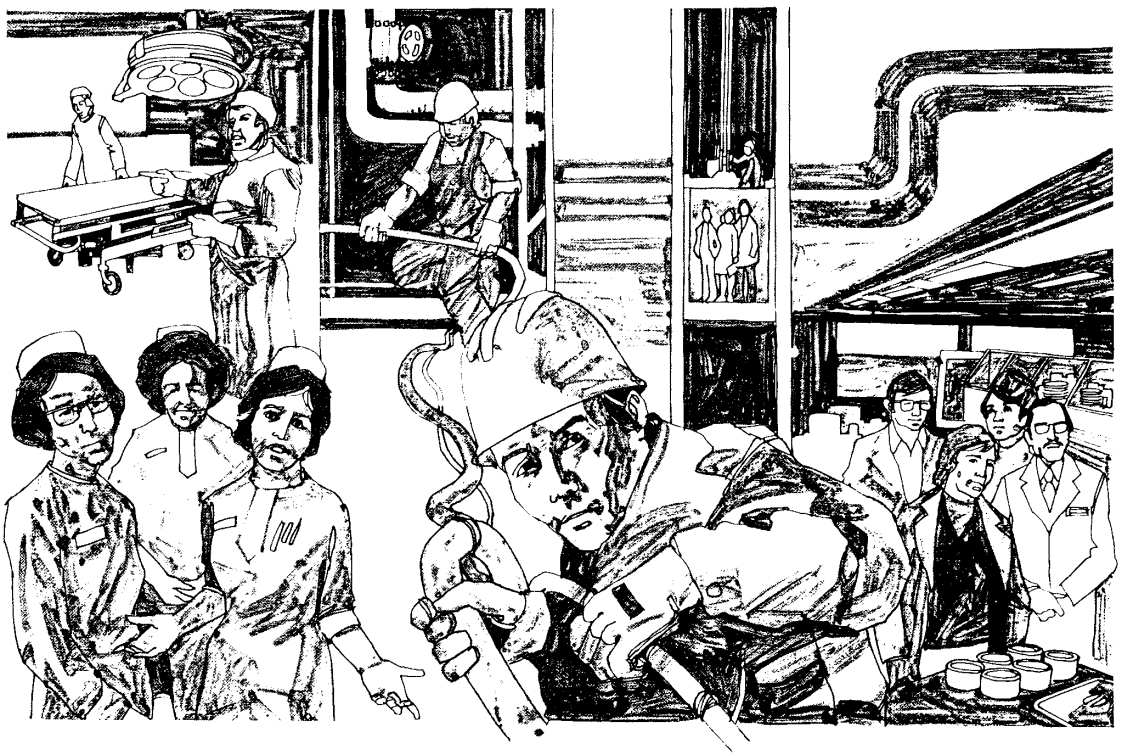
Advertising
Special allowances must be made for the big recruitment programme and the need to adopt more imaginative advertising methods during the most intensive period.

Publicity
Special brochures and display material for recruitment and public relations are expensive.

Installation Work after Handover
Maintenance staff, often with the help of extra contract staff, have a large task in putting up fittings and installing equipment. Levels of staffing during this period may have temporarily to exceed the final approved establishment.

Alteration Schemes
Assuming that strict control during construction has prevented any changes to the original design, after handover there will be an accumulation of justifiable small schemes for improving the functional design of departments. Some of these will be essential, others highly desirable, with a third category of important but not essential schemes which in due course will probably join the minor capital programme. A special financial allocation, to be termed a 'commissioning budget', is required to put some of these finishing touches to the building.

Opening Ceremony
A unique event of this kind needs to be matched with adequate funds.



Administrative Costs
On considering all the work explained in this book, it will be apparent that the size of the task justifies generous administrative and personnel staffing levels, perhaps higher up to the time the hospital opens than will be required when the organisation has settled down. Financial allowances for this must be made. Extra expenditure must not be regarded as administrative 'empire building'.

Removal Expenses and Interview Expenses
It has often escaped the notice of those providing the

money that the recruitment programme gives rise to extraordinary demands for expenses for interviews and removal. It is quite probable, for example, that a 100 or more staff will be eligible for removal expenses.

Training
The intensive training activity will often require the help of training organisations for which extra costs will be incurred.

Temporary Residential Accommodation
Many new hospitals have had to enlist the help of neighbouring hotels to provide temporary accommodation.

Temporary Storage
Warehousing to receive equipment in advance of the building being handed over can be an unexpected extra commitment.

Equipment Reserve
In a large scheme some important items of equipment will inevitably have been overlooked and not ordered. A financial reserve is required to provide items urgently needed.

Staffing Reserve
Predictions of workload will have determined staffing levels for each department. Accuracy of these forecasts will vary so much that some departments might exceed their estimates of work and require additional staff. This should be allowed for by reserve funds to enable extra staff essential to maintain services to be appointed above levels originally approved.

Decanting (relevant in phased schemes)

The term 'decanting' describes the task of moving sections or complete departments into temporary accommodation and transferring them later to their permanent location. This is a feature of phased schemes in which it is impossible to expect the use of accommodation in each phase to coincide exactly with its final function. Temporary moves have to be contrived, sometimes quite ingeniously, often requiring expenditure to make the temporary use satisfactory. The task of decanting needs to be carefully prepared since it will relate to the staffing and equipment programmes and will require good administrative control. One hospital authority found it useful to establish an 'accommodation group', a multidisciplinary advisory meeting which helped to arbitrate in making the best use of accommodation and, by carrying out its work in this way, ensured that all changes to the use of rooms, temporary and permanent, were properly documented. Figure 10 (overleaf) shows the complexity of decanting, and indicates the cost implications as well as the need to keep all staff well informed about the dates of temporary moves.

Figure 10 Decanting Programme
Note: This schedule sets out all known accommodation changes and transfers associated with stage 3 and the construction of the new office block (termed stage 4) which will require refurbishing, alterations or additional equipment above that included in the stage 3 capital programme. Existing accommodation in stage 2, for which no changes are planned, are excluded from this schedule.

Source: Northwick Park Hospital – (Stage 3 and beyond) 1973-74

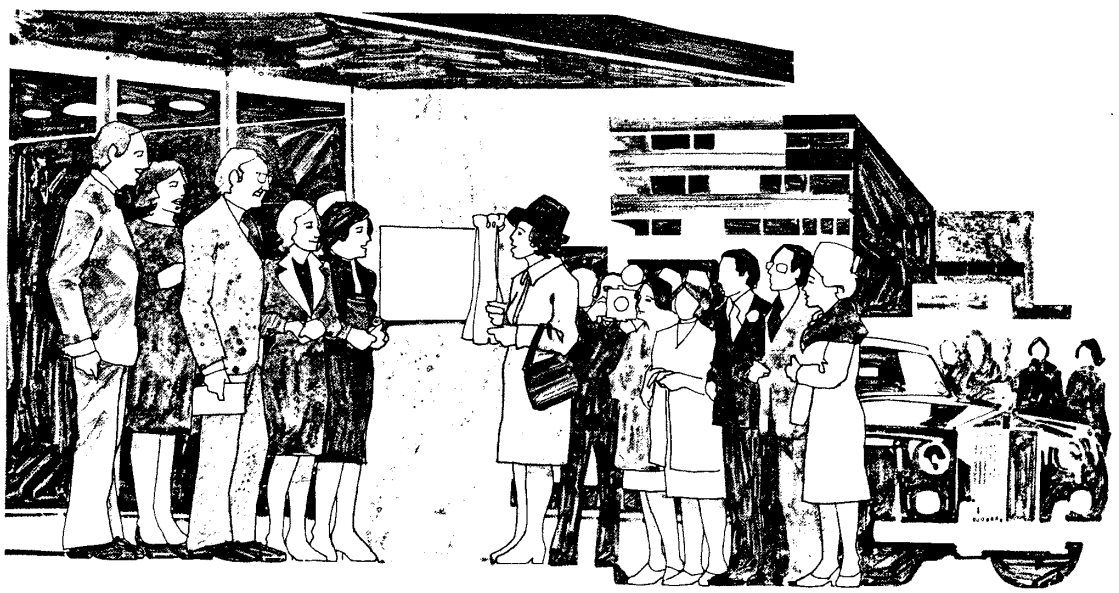
Stage 4 Use	Stages 2/3 Use
Accident Department	
Interviewing room	unit matron
Examination cubicles: new rooms	under construction
exam/treatment	fracture clinic
X-ray room	under construction
Clinic 8 (fracture)	outpatient clinic
Theatres Level 4: Theatre 1	treatment area
Theatre 2	ECG
Observation ward (admissions)	observation/admissions/ day cases
Interview room	fitters' room
Offices:	
assistant secretary and his secretary	assistant secretary and his secretary
consultants' room	records study room
doctors' room	rest room
Rest room	admission cubicle
Not yet allocated	PRO/voluntary services
Fitters' accommodation	admissions cubicle
Treatment room	exam cubicle (clinic II)
Outpatient Department (Level 4)	
ECG	MSW secretaries
Dietitian	laboratory
Phlebotomy	sisters' and dietitians' office
MSW rooms a	speech therapy
b	MSW use
c	MRO
New MSW office	under construction
Ambulance office	x-ray storage open plan
Clean utility	x-ray storage
Treatment room	Dietetic rooms
Clinic 3	outpatient clinic (3)
Outpatient corridor	PIC storage
Clinics 4-7; 1 and 2	under construction
Waiting area	PIC and waiting

Transfer Dates		
Vacated	(Re)opened	Refurbishing Wards and Other Comments
March 1974	March 1974	change of use
-	March 1974	remove doors and fit curtain runners
January 1974	March 1974	break through: build wall and doors
December 1973	December 1973	change of use
February 1974	March 1974	cleaning: allow good time to carry out engineering checks and re-equipping
	March 1974	new home for records study room required
-	change of use March 1974	day cases to cease until Level 5 day case unit available
April 1974	May 1974	
no change	no change	
March 1974	March 1974	temporary accommodation for accident
change of use	change of use	consultant: dictating point required
March 1974	May 1974	
December 1974	December 1974	future use not yet confirmed
March 1974	May 1974	
December 1973	March 1974	change of use
January 1974	February 1974	partitioning scheme
under construction	December 1973	change of use only: partition and door
change of use	December 1973	change of use only: construct door
April 1974	April 1974	may need some refurbishing
no change	no change	
March 1974	March 1974	redecoration
-	December 1973	formerly planned as dermatology room
March 1974	May 1974	partitioning scheme to create office
March 1974	March 1974	redecorate and equip
December 1973	January 1974	re-equip from capital
no change	no change	
March 1974	March 1974	remove shelves: make good
-	February 1974 onwards	gradual opening of extra clinics: six x-ray viewers, sphygmes, shelves and lamps
March 1974	March 1974	remove counters: make good floor redecorate: provide more furniture

15 Opening ceremonies

All the work that goes into planning and commissioning a new hospital deserves recognition by a special event of some kind. This can usually be achieved by an opening ceremony provided that sufficient care is given to choosing the most deserving people to be invited, and to the ways in which as many staff as possible can be involved.[52] The greater the part played by the staff of the hospital and those who have planned it the better. There have been some formal occasions when staff have been noticeable by their absence. A blend of formality and gaiety should be created to make an occasion which all those present will enjoy and look back on with pleasure.

The organisation of such an event often appears to become more complex than that of opening the hospital itself. It certainly has to be planned well in advance and the workload must be allowed for. Timing is crucial, particularly if there is a lot of uncertainty about the contractor's programme for completing the building.



Fixing the date is usually a choice between either waiting until the hospital has been opened a few months or holding the event immediately before the first patients are admitted. The first choice has a lot of merit. It allows more time to absorb any delays which might otherwise create serious difficulties. It also allows the hospital to be brought into use and, as a result, staggers the work required to hold an opening ceremony. But perhaps most important of all, it ensures that the hospital is operationally alive with patients and staff on an occasion when many distinguished guests will be touring the building. They will prefer to see the hospital at work rather than dormant.

It is sometimes the practice for a service of dedication to form part of the proceedings. But as time is usually limited and many of those present are not closely associated with the work of the hospital, it is probably

better to hold a separate dedication service at some other time.

Arrangements for the opening ceremony will vary, depending on who is to perform the ceremony and the sort of occasion that the health authority considers appropriate. It is not intended to go into too much detail here since there already exists a comprehensive review of this subject.[52] It is important to appreciate that the ceremony requires meticulous care in preparation. All the time and thought given to the planning of every detail will be repaid by the smoothness of the operation on the day.

Overall organisation

Decide who is to open the hospital and find out convenient dates for the event.

Appoint one person to coordinate the preparation but spread the responsibility for each detail to as many senior people as possible.

Determine cost.

Set up an 'operation room' to run the event on the day.

Work out the precise timing of the programme of events in advance.

Arrange for floral decoration of the hospital.

Security

Press, radio and television coverage

Preserve a record of the event; photographs and tape recordings.

Consider how patients can be involved.

Adjust the running of the hospital for the day: alternative lunch arrangements, alterations to car parking, diverting certain external calls to specific extensions and so on.

First Aid

Guests and the opening ceremony

Compilation and printing of a brochure to mark the occasion

Careful preparation of the invitation list

Form of ceremony: precedence and protocol

Seating arrangements: seat reservation system

Special staging: amplification, flowers, music

Additional accommodation for guests (marquees)

Special signposting to the hospital

Planning the official tour and releasing it beforehand

Refreshments for guests

Arranging tours for guests after the official ceremony

Alternative 'wet weather' programme

Car parking: reception and escorting arrangements

Involvement of staff and community

Ensure that as many staff as possible are involved in the day's proceedings. Use contract caterers, for example, so that hospital catering staff can enjoy the event. Do not overlook the interests of night staff and others working shifts.

If possible avoid pay day!

Provide a guard of honour representing different categories of staff.

Arrange various viewing points on the tour with pre-arranged groups of staff able to watch from these locations.

Give special thought in remembering to invite people who perhaps very early in the project made a significant contribution. It is easy to overlook those who have played an important part but are not actively involved at the final stages of commissioning.

Arrange 'fringe' activities; for example, a special dance for staff during the evening to round off the event. This often ensures that those who, through limitation of numbers, cannot take part in the formal proceedings, can be invited to enjoy the informal part of the day.

Consider viewing arrangements for friends and relatives of staff.

Involve the community; voluntary organisations and school children.

16 Consolidation: review of operational systems

Once the hospital is fully operational there is a temptation, managerially, to relax after the intensive commissioning period and rely on a system of 'management by exception' to deal with serious problems. The need to settle down and give the organisation some stability is undeniable. On the other hand, operational systems will have been drawn up by managers as theoretical documents before most of the staff were appointed; in practice some of the systems will not have worked out. The question is: How should operational systems be reviewed?

Some aspects of the systems will have been ironed out during the trial runs, or as soon as a department has opened. The staff themselves will have contributed ideas for improving systems and many changes will have been implemented straightaway. There will, however, have been some undesirable changes which will have occurred through lack of training or bad supervision. Short cuts will have been taken if approved staffing levels have not been attained.

To check the effectiveness of all systems, they must be reviewed one by one in a systematic way over a period of a few months. Meetings between the administration and each departmental manager, together with staff consultative meetings, should be arranged so that the whole organisation is scrutinised. Operational manuals can then be revised so that they are useful to refer to and can be regarded as current practice rather then the pipe dreams of the early planners.

17 Evaluation of the design-in-use

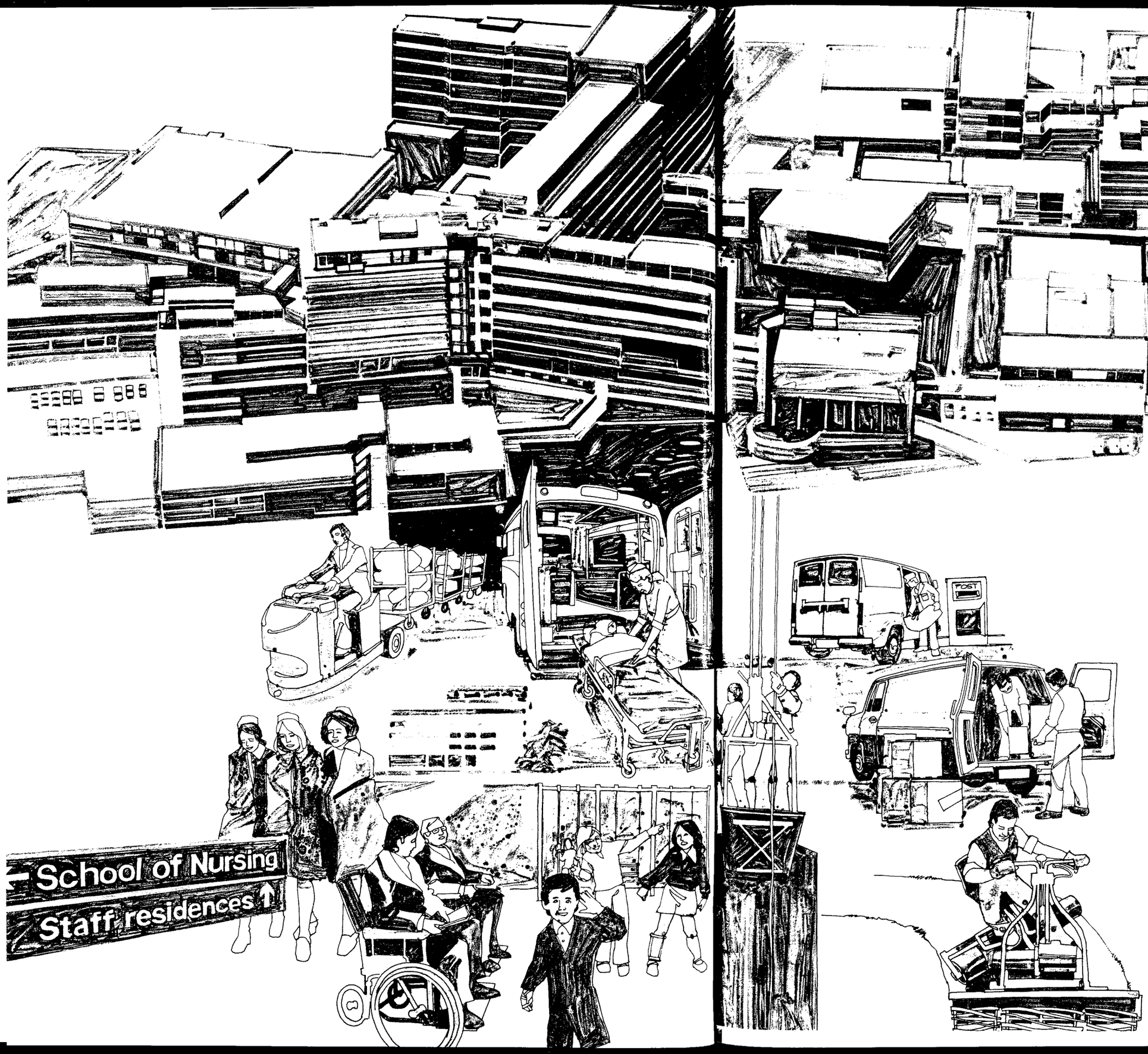
An evaluation study examining the operation of the hospital in relation to the original brief and to the architect's design is valuable, mainly for other similar projects not yet started, provided that the planning authority makes a determined effort to learn from other hospitals' experiences. Evaluating design-in-use is a fascinating task but there are dangers that it might merely lead to the production of a report superficially read and then filed.[2]

The extent of any evaluation exercise has to be defined; the study is likely to be selective in some way. For the hospital being evaluated there is a price to pay because it will require a lot of work by departmental managers.

The study should aim to achieve a balance between what is particularly good from a user's point of view and what in practice has proved troublesome. It is equally valuable to design teams for other new projects to learn about successful features as well as shortcomings. If staff are convinced that other new projects will benefit from the study, support for it is likely to be forthcoming.

With increasing demands on the use of staff and difficulties of recruitment, it is particularly helpful to look at those design features throughout the hospital which help conserve time.

It is beyond the scope of this book to discuss methods of evaluation, but it is an appropriate subject on which to end. The commissioning process from start to finish, like design, never attains perfection. All that one can hope for in future is that new hospitals, in their planning, design and commissioning, will continue to benefit from those who before them, have had to face the same complex, demanding, but exciting task.


School of Nursing
Staff residences

Appendices

Appendix A Commissioning check list

This schedule is intended as a guide to the tasks that have to be carried out in order to establish good working systems and to commission new departments efficiently. It is based on the requirements of a **major** capital scheme; the detail may therefore need to be interpreted differently for smaller schemes.

For each department the tasks are outlined with suggestions on when operational planning should start and finish **in relation to the target opening date.** The symbols 's' and 'f' indicate the suggested start and finish dates; 's-c' indicates the start of what will be a continuous task.

Months Before Opening Date							
24	18	12	9	6	3	1	
							ACCIDENT AND EMERGENCY
							Equipment/Supplies
		s			f		equipment ordered
			s	f			forms – agreed
				s	f		– ordered
s		f					schedule agreed
							Operational Systems
							Admissions
	s		f				admissions arrangements in the hospital as they concern accidents and emergencies
			s		f		ambulance delivery arrangements agreed
	s		f				catchment area defined
			s	f			documentation arrangements agreed
			s	f			persons responsible for dealing with emergency admission requests from general practitioners and bed bureau decided
							Liaison Arrangements with Other Clinical Departments, Hospitals and Other Outside Bodies Agreed
			s		f		anaesthesia
			s		f		communicable diseases
			s		f		coronary care unit
			s		f		dental surgery
			s		f		ear, nose and throat
			s		f		general medicine
			s		f		general practitioners
			s		f		general surgery

Months Before Opening Date							
24	18	12	9	6	3	1	
			s		f		gynaecology
			s		f		intensive therapy unit
			s		f		neurology/neurosurgery
			s		f		operating theatres
			s		f		ophthalmology
			s		f		orthopaedics
			s		f		paediatrics
			s		f		psychiatry
			s		f		social services
							Major Accident
					s-f		practice exercise takes place
			s			f	procedure manual drawn up
							Patients' Property
				s	f		deposit recording arrangements agreed
							Police
				s	f		policy agreed for divulging information on patients
				s		f	specimen collection facilities and arrangements agreed
							Public Relations
							Opening Arrangements
				s	f		general public opening campaign agreed
						s-f	general public opening function implemented

Months Before Opening Date							
24	18	12	9	6	3	1	
					s-f		staff/GP social functions agreed
						s-f	staff/GP social functions held
							Press Relations
				s	f		arrangements for dealing with press enquiries decided
			s	f			person designated to receive press enquiries
							Radiology
				s	f		radiographer on-call arrangements agreed
			s	f			referral/transfer arrangements agreed
				s	f		reporting system agreed
			s		f		x-ray storage and disposal arrangements agreed
							Staffing
	s	f					management structure agreed
							Medical
				s	f		duty rotas drawn up
s	f						establishment agreed
						s-c	induction and training
					s-c		recruitment and appointment procedures
							Medical Records
s	f						establishment agreed
						s-c	induction and training
				s-c			recruitment and appointment procedures

Months Before Opening Date							
24	18	12	9	6	3	1	
			s-f				working hours agreed
							Nursing
		s	f				deployment agreed
	s	f					establishment agreed
					s-c		induction and training
					s-c		recruitment and appointment procedures
							Porters
s	f						establishment agreed
			s-c				induction and training
			s-c				recruitment and appointment procedures
							ACCOMMODATION
							Operational Systems
			s		f		compilation of estate terriers
		s-f					conference room bookings arrangement agreed
	s			f			hospital room list drawn up
		s		f			procedure for considering change of use agreed
							ADMINISTRATION
							Equipment
		s				f	equipment ordered
	s	f					schedule agreed

Months Before Opening Date							
24	18	12	9	6	3	1	
							Operational Systems
			s		f		accidents to patients, staff, visitors: recording arrangements
	s	f					departmental filing system agreed
		s		f			duplicating and copying arrangements agreed
			s	f			notice board and notices policy
				s-f			pictures and paintings: policy and availability
				s	f		staff bulletin: policy and content agreed
							Staffing (departmental)
s		f					establishment agreed
s-c							induction and training
			s	f			on-call arrangements agreed
s					f		recruitment and appointment procedures
s						f	staff in post
s		f					structure agreed
		s	f				working hours agreed
							CATERING
							Equipment/Supplies/Purchasing
	s		f				buying and contractual procedures decided
			s	f			delivery recording arrangements
			s		f		equipment ordered
	s		f				equipment schedule agreed
				s	f		issuing arrangements drawn up
					s	f	swill contract arranged

Months Before Opening Date							
24	18	12	9	6	3	1	
							Operational Systems
							Delivery and Service
				s	f		liaison with nursing staff on serving arrangements and menus
				s-f			staff beverage arrangements
				s		f	ward delivery arrangements drawn up
							Dietetics
	s	f					relationship between catering/dietetics defined
							Financial Arrangements
		s		f			provisions budget agreed
				s	f		staff meal costs and payment methods agreed
							Kitchen Organisation
		s		f			systems decided
							Menus
					s-f		facilities for visitors decided
			s	f			arrangements for patients' ordering drawn up
			s	f			special diet arrangements agreed
				s	f		staff menu policy agreed
							CENTRAL STERILE SUPPLY
							Equipment
		s				f	equipment ordered

Months Before Opening Date							
24	18	12	9	6	3	1	
s		f					schedule agreed
							Operational Systems
		s	f				delivery arrangements agreed
	s	f					intra-departmental systems agreed
			s	f			issuing procedures agreed
							Staffing
s	f						establishment agreed
					s-c		induction and training
				s	f		possible incentive bonus scheme considered
			s-c				recruitment and appointment procedures
	s	f					structure agreed
	s		f				working hours agreed
							CHAPLAINCY
							Equipment/Supplies
				s	f		equipment ordered
		s	f				schedule drawn up
							Operational Systems
				s	f		chapel dedication service arrangements decided
				s	f		dangerously ill patients: arrangements agreed
					s	f	arrangements for relaying services to the wards agreed
				s	f		religious services: times agreed

Months Before Opening Date							
24	18	12	9	6	3	1	
							Staffing
					s-c		appointment procedures implemented
	s	f					establishment decided
							CLINICAL RESOURCES
							Operational Systems
	s			f			allocation of beds between consultants agreed
	s			f			allocation of outpatient clinics agreed
				s	f		allocation of theatre sessions agreed
				s		f	information systems agreed
	s	f					procedure for allocating and considering use of resources agreed
							DEATH ARRANGEMENTS
							Operational Systems
					s	f	autopsy arrangements agreed
					s	f	body preparation arrangements agreed
					s	f	certification procedure agreed
			s		f		coroner's arrangements agreed
			s		f		mortuary organisation drawn up
				s	f		notification to relatives: arrangements agreed
				s	f		registration arrangements agreed
				s	f		viewing facilities for relatives agreed

Months Before Opening Date							
24	18	12	9	6	3	1	
							DOMESTIC
							Equipment
		s				f	equipment ordered
s		f					schedule agreed
							Operational Systems
		s	f				cleaning schedules drawn up
	s	f					materials issuing system agreed
	s	f					window cleaning contract arranged
							Staffing
	s	f					deployment of staff agreed
s	f						establishment agreed
				s		f	incentive bonus scheme considered
			s-c				induction and training
	s	f					management structure agreed
			s-c				recruitment and appointment procedures
							INTENSIVE THERAPY/CORONARY CARE UNIT
							Equipment/Supplies
		s			f		equipment ordered
				s		f	equipment tested
s	f						schedules agreed
						s	supplies delivered
			s	f			delivery arrangements agreed

Months Before Opening Date							
24	18	12	9	6	3	1	
				s	f		supplies stock levels agreed
	s		f				staff uniform design agreed
							Operational Systems
			s		f		admissions arrangements agreed
			s		f		cardiac emergency procedures: agreed
						s	practice runs
		s		f			control of infection arrangements agreed
							services from other departments agreed:
					s-f		catering
					s-f		chaplaincy
			s	f			CSSD
				s	f		domestic
				s-f			ECG
					s-f		pathology
					s-f		pharmacy
				s	f		portering
				s-f			x-ray
				s	f		visiting arrangements agreed
							Staffing
s	f						establishment agreed
				s-c			induction and training
	s	f					management arrangements agreed
			s-c				recruitment and appointment procedures

Months Before Opening Date							
24	18	12	9	6	3	1	
							MAINTENANCE
							Equipment/Supplies
s	f						departmental equipment schedule agreed
		s			f		equipment ordered
	s	f					maintenance store organisation agreed
			s-c				materials ordered
							Financial
		s		f			maintenance budget agreed
				s	f		job costing scheme agreed
						s-f	tool allowance agreed
			s	f			works development procedure agreed
							Operational Systems
		s		f			intra-departmental organisation agreed
					s	f	planned maintenance programme agreed
			s	f			works requisitioning arrangements agreed
							Staffing
s	f						establishments agreed
					s	f	incentive bonus scheme considered
				s-c			induction and training
s		f					management arrangements agreed
			s-c				recruitment and appointment procedures
			s-f				working hours agreed

Months Before Opening Date							
24	18	12	9	6	3	1	
							MATERNITY
							Equipment/Supplies
		s			f		equipment ordered
s	f						schedules agreed
			s		f		supplies, delivery and receipt arrangements agreed
				s	f		supplies delivered
				s	f		supplies stock levels agreed
	s	f					staff uniforms design agreed
			s-f				staff uniform ordered
							Operational Systems
							Ante-natal Clinic
				s	f		appointment times agreed
			s	f			clinic allocations agreed
	s	f					programme for opening agreed
			s	f			reception and medical records arrangements agreed
							Delivery Suite
			s	f			admission notification and reception arrangements agreed
			s		f		blood bank supply arrangements agreed
			s	f			consent arrangements agreed
			s	f			control of infection arrangements agreed
				s	f		flying squad arrangements agreed
	s	f					GP access policy agreed

Months Before Opening Date							
24	18	12	9	6	3	1	
							services from other departments agreed:
			s	f			catering
					s-f		chaplaincy
			s	f			CSSD
					s-f		dietetics
				s	f		domestic
	s		f				domiciliary midwives
	s		f				general practitioners
		s	f				medical records
			s	f			pathology
					s-f		pharmacy
				s	f		portering
		s	f				registrar births and deaths
				s	f		secretarial
				s	f		social services
				s-f			x-ray
							Special Care Baby Unit
			s	f			control of infection arrangements agreed
		s	f				medical records arrangements agreed
				s	f		paediatricians' bed allocations agreed
							Wards
	s		f				obstetricians' bed allocations agreed

Months Before Opening Date							
24	18	12	9	6	3	1	
							patients' day programme drawn up including:
				s	f		baby feeding times
				s	f		drug rounds
				s	f		meal times
				s	f		visiting times and policy
				s	f		waking times
					s	f	ward rounds
							Staffing
s	f						establishment agreed
			s-c				induction and training
	s	f					management structure agreed
			s-c				recruitment and appointment procedures
			s	f			working hours agreed
							OPERATING THEATRES
							Equipment/Supplies
	s				f		equipment ordered
		s		f			forms drawn up and ordered
s	f						schedules agreed
				s	f		supplies delivery and receipt arrangements agreed
				s	f		supplies stock levels agreed
							Operational Systems
				s	f		clean/dirty zone arrangements agreed

Months Before Opening Date							
24	18	12	9	6	3	1	
			s		f		intra-departmental organisation agreed
				s	f		operating sessions allocated
		s		f			patients' consent arrangements agreed
			s		f		patients' movement arrangements agreed
			s	f			recovery arrangements agreed
		s		f			safeguards against wrongful operation and labelling procedures agreed
							Staffing
s	f						establishments agreed for nurses, porters, technicians and anaesthetists
				s-c			induction and training
	s	f					management structure agreed
			s	f			on-call arrangements agreed
			s-c				recruitment and appointment procedures
							OUTPATIENTS
							Equipment/Supplies
	s			f			equipment ordered
	s			f			request forms drawn up and ordered
s	f						schedule agreed
						s-c	supplies delivered to department
		s	f				supplies delivery/OPD receipt arrangements agreed
			s	f			supplies stock levels agreed
							Staffing
s	f						establishments agreed

Months Before Opening Date							
24	18	12	9	6	3	1	
			s-c				induction and training
	s	f					management structure agreed
					s-f		on-call arrangements agreed
			s-c				recruitment and appointment procedures
			s	f			student training programmes agreed
							PERSONNEL
							Equipment (departmental)
		s			f		equipment ordered
s				f			forms drawn up and ordered
s	f						schedule agreed
							Operational Systems
		s	f				disciplinary procedures agreed
	s	f					hospital staff appointment programmes agreed
s		f					hospital staff establishments agreed
	s-c						induction programmes
					s	f	Industrial Relations: available facilities for trade unions, staff associations and hospital representatives agreed
		s		f			trade union relationship and recognition policies agreed
s		f					Residences: allocation policy agreed
	s			f			equipment ordered
s	f						staffing structure agreed
s	f						systems within residences agreed

Months Before Opening Date							
24	18	12	9	6	3	1	
					s-f		Staff Health: department opened
			s	f			equipment ordered
s	f						policy agreed
			s	f			sickness notification/sickness arrangements agreed
	s	f					staffing structure agreed
	s	f					staff record systems agreed
s	f						staff recruitment procedures agreed
					s	f	staff representative consultative systems agreed
					s	f	Staff Social Club: facilities to be made available decided
				s	f		policy for establishing club agreed
	s		f				staff handbook completed: printing arranged
					s	f	Staff Training: budget agreed
		s		f			policy agreed
			s		f		procedure agreed
		s		f			staff changing accommodation policy agreed
	s	f					Staff Uniforms: designs and policy agreed
			s		f		issuing procedure agreed
				s	f		name badge policy agreed
			s	f			uniforms ordered
s		f					total hospital management structure agreed
							Staffing (departmental)
s	f						personnel department staffing structure agreed
	s-c						personnel staff appointed

Months Before Opening Date							
24	18	12	9	6	3	1	
							PHARMACY
							Equipment/Supplies
					s-c		drugs ordered
			s	f			drugs purchasing policy agreed
		s			f		equipment ordered
				s-f			prescription forms ordered
s		f					schedule agreed
				s	f		ward/department stock levels and issuing arrangements: agreed
						s-f	explained to users
							Operational Systems
					s	f	arrangements for seeing representatives agreed
				s	f		drug delivery arrangements: agreed
						s-f	explained to users/operators
			s		f		intra-departmental working arrangements agreed
					s	f	night issue arrangements: agreed
						s-f	explained
					s	f	policy for drug trials agreed
					s	f	policy of issues to outpatients agreed
				s	f		prescription payment arrangements agreed
							Staffing
	s	f					establishments agreed
s		f					management structure agreed
			s-c				recruitment and appointment procedures
			s		f		student training arrangements agreed

Months Before Opening Date							
24	18	12	9	6	3	1	
							PORTERING SERVICES
							Equipment
		s			f		equipment ordered
	s	f					schedules decided
			s	f			storage facilities decided
			s-f				uniforms ordered
							Operational Systems
			s	f			deployment of transport staff for OPD, ward, departments agreed
			s		f		entrance/reception arrangements agreed
			s	f			messenger/postal service arrangements agreed
	s		f				night patrol arrangements decided
s		f					policy on division between transport and security functions agreed
							Staffing
s	f						establishments agreed
				s		f	incentive bonuses considered
		s-c					induction and training
	s-c						recruitment and appointment procedures
	s	f					uniform policy agreed
s	f						working hours agreed

Months Before Opening Date							
24	18	12	9	6	3	1	
							PRIVATE PRACTICE
							Operational Systems
							Inpatients
	s		f				bed allocation agreed with DHSS
		s			f		booking arrangements agreed
			s		f		contracting and accounting arrangements agreed
			s	f			specific available beds agreed
							Outpatients
			s		f		appointment arrangements agreed
		s		f			available facilities agreed with DHSS
			s		f		contracting and accounting arrangements agreed
							PSYCHIATRY
							Equipment/Supplies
		s			f		equipment ordered
	s			f			forms agreed and ordered
	s	f					schedule agreed
							Operational Systems
	s		f				catchment area agreed
				s-f			catering arrangements: agreed
						s-f	explained to staff
		s				f	clinical concepts and policies agreed

Months Before Opening Date							
24	18	12	9	6	3	1	
				s	f		consultation arrangements with accident and emergency wards: agreed
						s-f	explained to users
			s		f		discussions with GPs on admission/discharge procedures
			s			f	discussion with social service departments on community implications
				s		f	drugs issuing arrangements agreed
						s-f	Mental Health Act: 'managers' nominated
						s-f	procedures and requirements of the Act explained to staff
			s		f		patients' brochure compiled and ordered
				s	f		visiting hours agreed
							Staffing
s	f						establishments agreed
				s-c			induction and training
s		f					management structure agreed
			s-c				recruitment and appointment procedures

REHABILITATION

GENERAL

Operational Systems

				s	f	ambulance arrangements: booking policy agreed
					s-f	delivery point agreed
	s	f				management structure agreed

Months Before Opening Date							
24	18	12	9	6	3	1	
				s	f		portering arrangements: agreed
						s-f	explained to users/operators
			s	f			reception arrangements: agreed
						s-f	explained to users/operators
			s	f			therapy requisitioning arrangements agreed
				s-f			use of accommodation reviewed
							CHIROPODY
							Equipment/Supplies
			s		f		equipment ordered
		s		f			request forms agreed and ordered
	s	f					schedule agreed
							Operational Systems
					s	f	record-keeping arrangements agreed
				s	f		referral system agreed
							Staffing
s	f						establishment agreed
					s-c		induction and training
				s-c			recruitment and appointment procedures
							OCCUPATIONAL THERAPY
							Equipment/Supplies
		s			f		equipment ordered
		s		f			request forms agreed and ordered
	s	f					schedule agreed

Months Before Opening Date							
24	18	12	9	6	3	1	
							Operational systems
					s	f	goods selling policy agreed
		s		f			intra-departmental working arrangements agreed
					s	f	materials issue arrangements agreed
				s	f		note keeping arrangements agreed
							Staffing
s	f						establishment agreed
				s-c			induction and training
	s	f					management structure agreed
			s-c				recruitment and appointment procedures
				s	f		student training arrangements agreed
							PHYSIOTHERAPY
							Equipment/Supplies
		s			f		equipment ordered
		s		f			request forms agreed and ordered
	s	f					schedule agreed
							Operational Systems
		s		f			intra-departmental working arrangements agreed
				s	f		note keeping arrangements agreed
							Staffing
s	f						establishment agreed
				s-c			induction and training
	s	f					management structure agreed

Months Before Opening Date							
24	18	12	9	6	3	1	
				s	f		on-call arrangements agreed
			s-c				recruitment and appointment procedures
				s	f		student training arrangements
							SPEECH THERAPY
							Equipment/Supplies
				s	f		equipment ordered
			s	f			request forms agreed and ordered
	s	f					schedule agreed
							Operational Systems
			s		f		intra-departmental working arrangements agreed
				s		f	record keeping arrangements agreed
				s	f		referral system agreed
							Staffing
s	f						establishment agreed
					s-c		induction and training
				s-c			recruitment and appointment procedures
				s	f		student training arrangements agreed
							SECRETARIAL
							Equipment/Supplies
			s-c				equipment ordered
		s	f				policy for purchase of electric typewriters agreed
s		f					schedule agreed

Months Before Opening Date							
24	18	12	9	6	3	1	
							Operational systems
		s		f			deployment of clinical secretaries agreed
			s	f			system for dictating clinical information agreed
							Staffing
	s	f					establishments agreed
s		f					management arrangements agreed
			s-c				recruitment and appointment procedures
							SUPPLIES/STORES
							Equipment/Supplies
	s					f	consumable supply needs agreed
s	f						departmental equipment schedule agreed
			s-c				forms drawn up and ordered
	s					f	equipment ordered
	s					f	hospital equipment ordered
	s		f				stock levels agreed
	s-c						supplies ordered
							Operational Systems
s	f						arrangements for clearing invoices agreed
	s	f					equipment approval arrangements agreed
	s	f					intra-supplies and stores organisation agreed
			s	f			requisitioning arrangements agreed
	s	f					stores layout agreed
	s		f				supplies issuing arrangements agreed

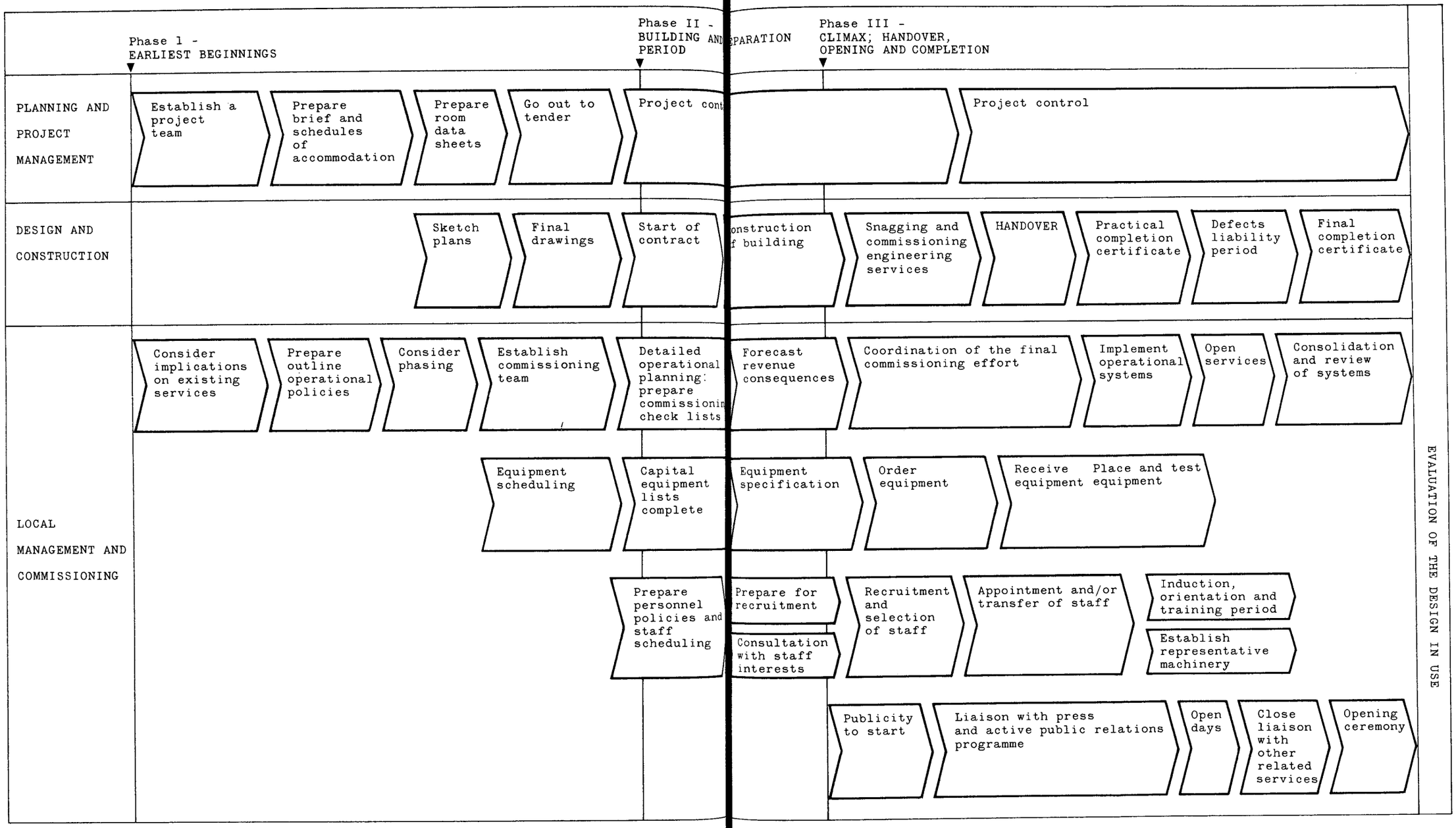
Months Before Opening Date							
24	18	12	9	6	3	1	
							Staffing
s	f						establishment agreed
			s-c				induction and training
	s	f					management arrangements agreed
		s-c					recruitment and appointment procedures
							TELEPHONE SERVICES
							Equipment
		s		f			directory compiled and issued
	s-f						equipment ordered
s	f						schedule agreed
							Operational Systems
	s-c						allocation of extensions
	s-f						staff location system agreed
				s-f			staff location system in use
							Staffing
s	f						establishment of telephonists agreed
		s-c					induction and training
		s-c					recruitment and appointment procedures
							WARDS
							Equipment/Supplies
			s		f		equipment ordered
	s	f					equipment receipt arrangements agreed

Months Before Opening Date							
24	18	12	9	6	3	1	
s	f						schedule agreed
						s-c	supplies delivered to wards
			s	f			supplies delivery/ward receipt arrangements agreed
			s	f			supplies stock levels agreed
							Operational Systems
			s		f		admissions procedures on ward
					s-f		chapel service times
		s		f			consent to operation
				s	f		doctors' ward rounds
				s	f		hairdressing facilities
				s	f		library facilities
				s	f		meal times
					s	f	organ transplant
			s		f		property receipt and recording
						s-f	services - check in particular: bed pan disposal chutes
					s-f		disposal chutes
	s		f				nursing practices agreed
					s-f		oxygen and vacuum supply
				s	f		shop facilities
				s	f		social services
				s	f		television facilities
			s	f			visiting hours and number of visitors
			s		f		working times

Months Before Opening Date							
24	18	12	9	6	3	1	
							Staffing
s	f						establishment agreed
			s-c				induction and training
		s-c					recruitment and appointment procedures
		s	f				working hours agreed
							X-RAY
							Equipment/Supplies
		s			f		equipment ordered
				s		f	equipment tested
				s-f			request forms/registers ordered
	s	f					schedule agreed
							Operational Systems
			s	f			film and report delivery arrangements: agreed
						s-f	explained to users/operators
			s	f			intra-departmental patients' waiting arrangements agreed
				s	f		patients' appointment arrangements agreed
				s-f			patients' movement arrangements: agreed
						s-f	explained to users/operators
				s	f		radiation protection arrangements agreed
						s-f	silver recovery arrangements agreed

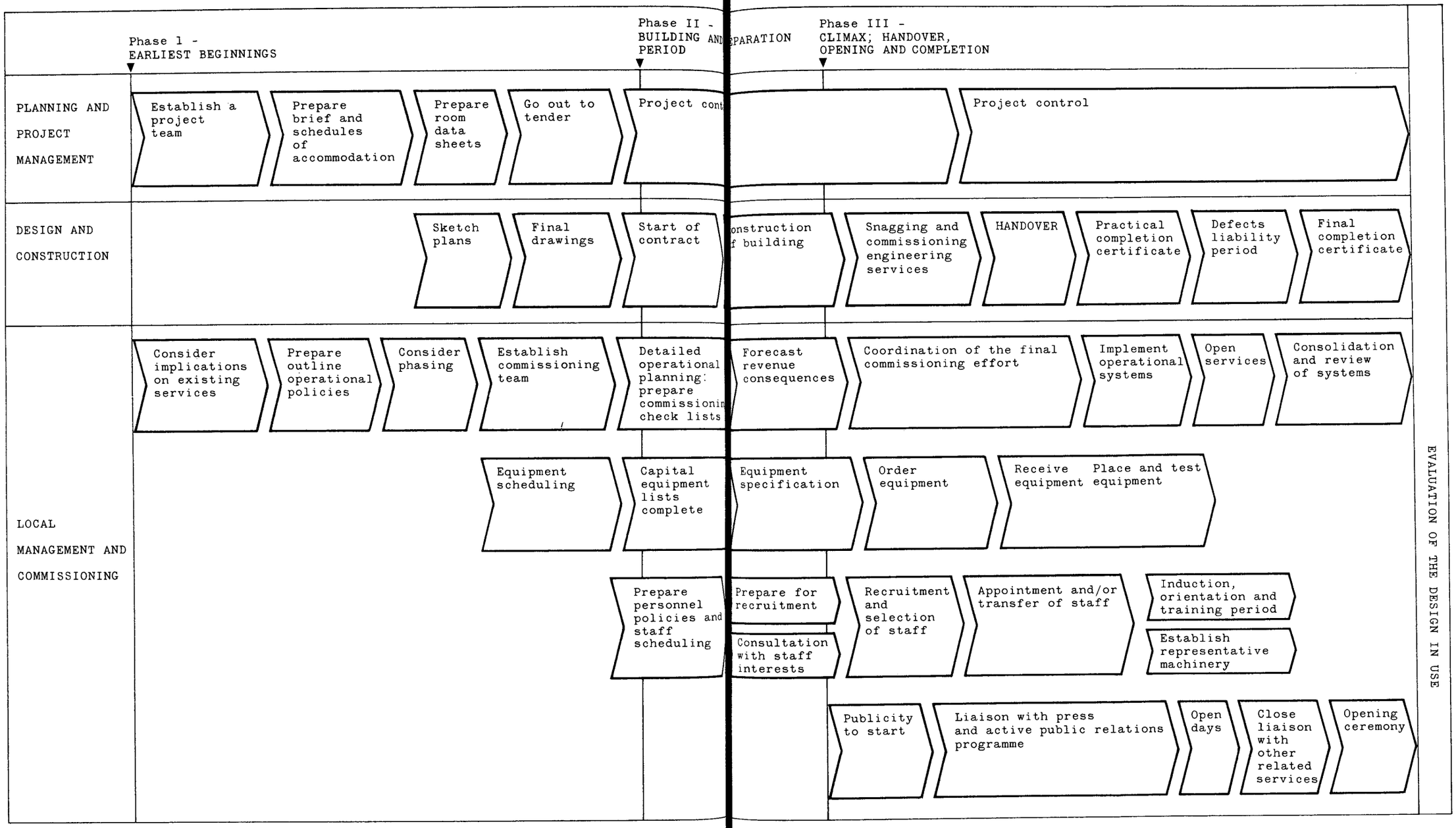
Months Before Opening Date								
24	18	12	9	6	3	1		
			s	f			x-ray requisitioning policies and procedures agreed:	accident and emergency
			s	f				GPs
			s	f				inpatients
			s	f				outpatients
							Staffing	
	s	f					establishments agreed	
	s	f					management structure agreed	
				s	f		on-call arrangements agreed	
			s-c				recruitment and appointment procedures	

Appendix B Outline commissioning programme



Note: This diagram is only a guide to the sequence of the main elements in a commissioning programme. There are limitations to a diagram of this kind in as much as many of the tasks will in practice overlap one another.

Appendix B Outline commissioning programme



Note: This diagram is only a guide to the sequence of the main elements in a commissioning programme. There are limitations to a diagram of this kind in as much as many of the tasks will in practice overlap one another.

Appendix C Work schedule of the commissioning team

This schedule might be of interest to newly-formed commissioning teams. It is an alphabetically listed analysis of topics discussed by the Northwick Park Hospital commissioning team over the five-year period, 1969–1974. Meetings were normally held monthly, but for peak periods of activity, fortnightly or even weekly meetings were often necessary.

Accident services
Address: exact address and early entries in directories
Admission policies
Advertising policies
Appliance office arrangements
Approved path to hospital: lighting by local authority
Audiometry service

Banking services
Bed allocation: temporary and permanent designations
Bed numbering system
Blood bank alarms
Blood transfusion services
Boiler house: early handover and commissioning
Bus services: siting of bus stops

Car parking policies
Carpet-fitting programme
Cashier's room: additional security (strengthened glass and stronger door added)
Catering services
Centralised dictation: policies, specification and special wiring
Changing accommodation: policies
Chaplaincy services: dedication ceremony
Clock system: commissioning
Commissioning budget
Compressed air system: commissioning procedure
Consultants' offices (not originally provided)
Consumable goods: to be listed in good time before opening
Contract cleaning: possible use to supplement direct labour
Coronary care unit: location (on its own or in a medical ward?)
Crèche (not provided: possibility of improvised scheme)
CSSD services
Curtain hanging programme
Curtain specification

Day care unit
Decanting programme during the three phases
Defects liability period: implications for making alterations
Delivery of equipment: procedures

Demineralised water requirements
Dental services
Design consultants': appointment and role
Dietetic services
Directional signs
Disclaimer notices
Disposal of radio-active and foul solvents
Disposal of rubbish: detailed policies
Distilled water supply for pharmacy
Domestic services
Door cards
Door numbering system
Duplicating and photocopying policies
Dust contamination from ventilation system

Electrical safety: local policies
Electricity charges for tenants of houses
Emergency generator: trial runs
Equipment marking policies
Equipment scheduling by computer

Fire alarm system and fire fighting equipment
First Aid boxes
First patients: arrangements for first admission
Fixings in new departments (listed in advance of handover)
Floor level numbering system
Floor tile specification in residences (changed from black)
Fruit and flower shop (not originally provided)

Gymnasium: policies (including those for staff recreation)

Hairdressing: patients and staff
Hazards to patients: holes: access to places dangerous for children and others
Heat gain problems: various engineering solutions drawn up to overcome intolerable working conditions
Heating system: balancing programme
Hydrotherapy pool

Incinerator capacity
Indoor plants
Intensive care unit policies
Interference on telephone lines
Isolation department: policies for using beds and for admissions
Isolation policies

Junior medical staff common room (not originally provided)

Landscaping
Laundry arrangements for residents
Lifts including numbering systems and lift signs
Linen supplies – marking early deliveries
Locks and keys
Long mirrors (not originally supplied in residences)

Major accident procedures
Mat wells
Medical gases: commissioning programme
Medical records service
Milk supply for residents
Mortuary: temperature

Naming wards and residential blocks: policy and choice
Newsletter for staff
Night lighting on wards: certain areas too bright
Night nurses: where should they sleep?
Noise interference from contractor's work
Noises in pipes disturbing patients at night
No-smoking signs
Notice boards: policy and control of use
Nurse-call system – early troubles
Nurses' station: layout: precise details of cupboards and shelving positions
Nurse training: prehandover training course

Occupational therapy services
On-call rooms
Opening ceremonies
Overflow pipes in lavatories

Paper sack holders
Paper towel dispensers
Patients' booklets
Patients' library service
Patients' property system
Personal hygiene units: policies and provision

Petrol and diesel supplies: official checks and commissioning
Pharmacy services
Physiotherapy services
Planned maintenance
Plant room ladders
Postal services
Psychiatric services
Public relations and publicity material

Radiochemistry department
Recruitment: brochure and other publicity
Recruitment: progress reports throughout commissioning period
Registration of births and deaths
Residential accommodation: allocation policy
Resuscitation policies
Road cleaning
Room numbering system
Royal opening

Sealing floors: specification and programme of work
Secretarial services
Security: use of contract firm for building handed over early
Shelving: schedules
Signposting: from railway stations and main traffic routes
policies: use of temporary signs
precise wording of main entrance sign
Site security: joint responsibility
Sluicing foul linen
Smoke tests theatre and isolation rooms
Soap dispensers
Social club formation
Special baby-care unit policies
Speed restriction on internal roads: policy, signposting and ramps
Staff hairdresser
Staff health service policies
Staff induction
Staff location system
Stationery requirements: all forms listed and specified in good time
Sun blinds: policy and specifications

Taxi policy
Tea bar policy
Telephone services: directory entries
capacity of switchboard
keeping operators informed of new staff
Television sets for wards and residences
Terrazzo floor damage: remedial work
Theatre services
Tidiness of the site
Training courses: short programmes tailormade for most departments
Transfer of equipment from neighbouring hospitals
Trespass by contractors into hospital property
Trial runs: programmes for catering, TSSU and x-ray
Trolley shop policies
Tugs and trolleys: early delivery

Uniforms: policies (also protective clothing) requirements

Valuation of flats and houses
Vending machine policies: for staff and patients
Ventilation problems in most departments, particularly theatres
Visits to site during early stages of contract
Voltage fluctuations affecting x-ray machines
Voluntary service: setting up

Wall finishes
Ward assistants: employment policies and job descriptions
Ward commissioning programme: sequence for opening beds
Ward kitchens: precise use, equipment needs
Ward offices for junior medical staff
Wardrobe keys in residences (not originally provided)
Water leaks
White coat policy
Window blind specifications
Window cleaning
Windows: safety devices to prevent patients accidentally falling out

X-ray equipment selection

Appendix D Schedule of unexpected problems

(based on experiences of new hospitals)

Opening ceremony booked weeks in advance had to be postponed because of delays to the handover of buildings.

New wards could not be opened because adequate numbers of staff had not been recruited.

New departments were opened in a makeshift way with borrowed equipment.

Newly-recruited staff left before services had even started due to serious delays to the commissioning programme.

Opening operating theatres was delayed because major engineering faults were, first of all, not identified before handover, and then not expeditiously put right. It was particularly difficult to get the subcontractor back to the site to help deal with a major engineering problem.

Employees refused to move from old hospital to help staff the new buildings.

Opening a department was delayed at the last minute because an essential piece of equipment had not been delivered on the date promised.

Industrial action within a firm supplying essential goods caused unexpected disruption to the equipment programme. For example, carpet-laying in residences was postponed at the last moment.

Consignments of supplies were damaged by water coming through the ceiling.

Lack of documentation of early planning decisions created confusion amongst newly-appointed departmental heads who were anxious to understand the background to the project as soon as possible after taking up appointment.

Serious problems of morale resulted from the frustrating experience of opening a new department for which there had been a long-standing need, only to have to close it again after a short while because major alterations had to be carried out.

The opening ceremony had to be rearranged because a prominent politician invited to perform the ceremony lost office at a general election.

Industrial action by staff, in the form of non-cooperation, made it necessary to revise completely the sequence of opening new departments.

The introduction of new fire regulations between design and completion required extensive alterations to the corridor ceilings of a geriatric ward after handover and caused considerable delay to commissioning.

The lack of joint operational planning with the ambulance authority caused serious difficulties over the need to maintain ambulance services on bank holidays to provide continuity of psychiatric day care.

Additional commissioning work for certain departments created complex problems for staff who were working within a clearly-defined bonus scheme.

The task of simultaneous transfer of patients and equipment from an old to a new hospital proved to be a nightmare because it had not been planned down to the last detail.

Bankruptcy, fires, flooding, vandalism and bomb hoaxes put back the commissioning programme by about a year.

Insufficient thought to policies on the allocation of residential accommodation to staff resulted in rooms not being available for certain essential staff who could probably have been recruited if residence had been offered. Policy had to be altered and some staff had to be persuaded to look for accommodation elsewhere.

It had been assumed during planning that the central sterile supply department would only provide a local service, whereas it subsequently became evident that a wider service was needed.

There was an unexpected delay in obtaining approval to equipment schedules. Not enough time had been allowed in the commissioning programme for a number of joint discussions about the justification for the original equipment submissions.

Public relations visits were disrupted by the need to conserve electricity. Some tours had to be cancelled.

The failure to predict accurately the rate of growth of workload resulted in staff being unable to cope. Problems of morale immediately set in.

Some senior managers and consultants were unwilling to accept the inevitable need to change to new ideas and systems.

Too many departments during the important weeks immediately after handover needed domestic and portering help at the same time.

Serious operational problems became evident at too late a stage, arising from the division of a new and an old hospital providing a joint service from two different sites.

Many staff were unprepared for the major upheavals affecting their daily work which suddenly confronted them.

Not enough time had been allowed to plan the organisational structure of a department in time for the advertising campaign and for the preparation of job descriptions required by applicants.

It took almost a year to get approval for certain medical staff appointments. Manpower planning constraints caused disruption to the planned growth of new services.

Appendix E Reading architects' and engineers' drawings

It is inevitable that members of staff who become involved with planning find that they are using drawings instead of words as a way of developing, expressing or communicating their ideas. There are great advantages in this because, in many ways, drawings are better than words when it comes to describing something which will one day exist as a three dimensional reality. Qualities such as volume, space and layout are elusive when translated into words. It is no accident that the only really effective way to express something like a spiral is to make either a gesture or a sketch. Words would be longwinded and imprecise. But it is also true that most people have little experience in using or 'reading' drawings and that many confusions arise because the architect's drawings are misinterpreted. The following brief notes are an attempt to suggest ways in which some of the problems can be avoided.

Perhaps the most important point to be clear about is the function of any particular drawing or set of drawings. Are they, for example, intended only to demonstrate the general principles of a future building or do they, instead, give precise information about already agreed details of layout and appearance? The answers to questions of this kind are normally fairly clear from the appearance of the drawings but the viewer does not always appreciate the difference in terms of what is expected from him. It is worthwhile to be certain about what decisions relate to what drawings and to ask how they are intended to help in decision making. If this is done it should be possible to relate successive sets of drawings to the commissioning programme and to move in an orderly way through a hierarchy of drawings and decisions. This will normally proceed from the general and rather ill-defined to the particular and better defined. At a final stage the drawings will begin to change from being tools to help in decision making to being instructions to the contractor about how he should construct the building.

Scale is an element which can be specially confusing to the layman. It is hard to make the transfer from a relatively small, flat piece of paper to a room or building of a quite different size. It is, therefore, worthwhile to make a deliberate effort to come to a good understanding of the scale of any drawing that may be under review. Perhaps the only really effective way of doing this is to set up various means of comparison. The size of a room, for example, will become easier to envisage if typical pieces of furniture (drawn to the same scale) are located in it, or if it is compared with an existing space of a similar size. The adequacy or inadequacy of a car park or access road is more easily foreseen if the movement of cars and lorries is played out in miniature on the drawings. Comparison of the known with the unknown provides a means of evaluating something which will exist in the future.

Drawings call for the exercise of imagination. Apart from problems that may be caused by the misinterpretation of specific symbols, the real challenge to somebody involved in planning is to make an attempt to know what it will be like to live and work in the proposed structures. Quite simple exercises can be practised to assist in developing this kind of understanding. It is useful to try to imagine what a walk through the building would be like: what would be seen from the entrance; from the reception desk; who would be where at any particular time of day; how would it be at night; would it be easy to find the lavatories; what would those big windows look like on a wet day? – and so on through the drawings, attempting to interpret them from the point of view of a future patient or member of staff. A similar approach can be taken to the more detailed plan of individual rooms: imagine what it would be like to be in the rooms, to look out of the window; pretend to carry out the work which the room is supposed to make possible. After only a little experience, such an approach to drawings becomes almost automatic, but in the early stages it may be useful to go through the necessary steps quite formally. The aim is to make the drawings come alive and work for you as a way of improving understanding. The overlays on the illustrations that follow are an attempt to express this idea in graphic terms.

Terminology

At a planning course held in 1964 at Leeds University, Jake Brown BA RIBA, of the then South West Metropolitan Regional Hospital Board, gave a lecture on *Aids to Understanding Architectural Drawings*. He has given the King's Fund permission to use an extract from his talk. After offering a useful classification of functions of various types of drawings, his notes defined some of the terms in common use:

'Reading' a Plan This means the interpretation or understanding of a plan through knowledge of the conventions employed.

Plan A 'plan' itself is a diagram or drawing to a consistent scale showing the arrangement of rooms, circulation space, furniture and equipment in a building. The convention employed is one of having cut the building through horizontally and then looking down directly on to the disposition of walls and partitions. All openings such as windows are normally indicated whether at high or low

level. A basic working drawing plan can contain a great range of information: for example door numbers, room numbers, room names, floor finishes, lighting and service point, wall finishes, window type, dimensions.

Section A 'section' is a vertical cut through a building showing floor heights, thickness of structure and the interior faces of rooms. These cuts may be staggered and the place at which a 'section' is taken is shown by a line on the plan. Various types of line are adopted, but in all cases some indication of which way one is looking onto the section is given.

Elevations The term 'elevation' describes the drawing of the outside sides or faces of a building showing windows, doors and external materials, and relationship to other buildings. The drawing can be a simple diagrammatic statement, or elaborately shaded and coloured to increase its effect. Elevations are differentiated from each other by orientation: an elevation facing south is a south elevation. Alternatively, one can say front or back elevation or 'elevation to High Street'.

Detail and Detailing A detail is a large scale drawing showing exactly how minor elements such as window sections, handrails, balustrades, joinery fitments, of a building must be fabricated.

Axonometric: Isometric: Perspective These are terms applied to drawings which represent ways of presenting the building or room 'in the round' or in three dimensions. The first two are geometrical methods showing all dimensions drawn to scale but, with the 'horizontal' lines all drawn either at 30° (isometric) or 45° (axonometric) to the base line. Thus the object is shown tilted toward the 'spectator'. A perspective is a sketch varying in elaboration and degree of finish, which may be freehand or more formal in that it employs a 'vanishing point' and is set up by geometrical means.

Shadow Projection This describes the use of projected shadows to give an apparent depth and volume to two dimensional drawings. It may be employed on block plans to differentiate a tall block from a lower building, or on elevation to show the projection of a balcony or similar feature.

Drawings in more detail

It is not possible in the context of this publication to go into more detail about the specific signs, symbols, scales and abbreviations used in preparing architectural and engineering drawings. Beyond a certain point it is a topic that requires a textbook of its own. It is suggested, in any case, that in a commissioning team, architects and engineers have a considerable responsibility to explain their drawings clearly and to help their colleagues to understand what it is that is to be built. Other members of a commissioning team should not be embarrassed to ask questions even if they turn out to be, in fact, answered in the drawings. It is up to the team to probe the drawings and to ask for whatever explanations are necessary to enable them, with their very various specialist backgrounds, to understand the architectural proposals.

The illustration opposite shows a floor in the new York District General Hospital. It is reproduced by courtesy of the architects, Llewellyn-Davies, Weeks, Forestier-Walker and Bor. Here is their description of this part of the building:

'The main operating theatre suite contains ten theatres. Designed in pairs, each pair shares a 'special purpose' room whose function can be determined later. A Theatre Sterile Supply Unit serves the department and, in the initial years, will also provide packs for the remainder of the hospital until the city Central Sterile Supply Depot is complete. Patients will be transferred in a reception area and wait in a holding area nearby until the theatre staff are ready to receive them. The recovery area is in the centre of the clean zone. A disposal corridor exists for convenience, and may also be used during the training of nurses. They can view the theatres through glazed panels. Changing facilities are at ground level and the plant rooms are above, so that trunking and damper controls are minimised.'

This is a relatively small-scale layout plan showing a floor in a large hospital. The kind of questions which it can appropriately clarify are, therefore, to do with broad issues such as circulation, the relationship between rooms and the effectiveness of the conception as a whole.

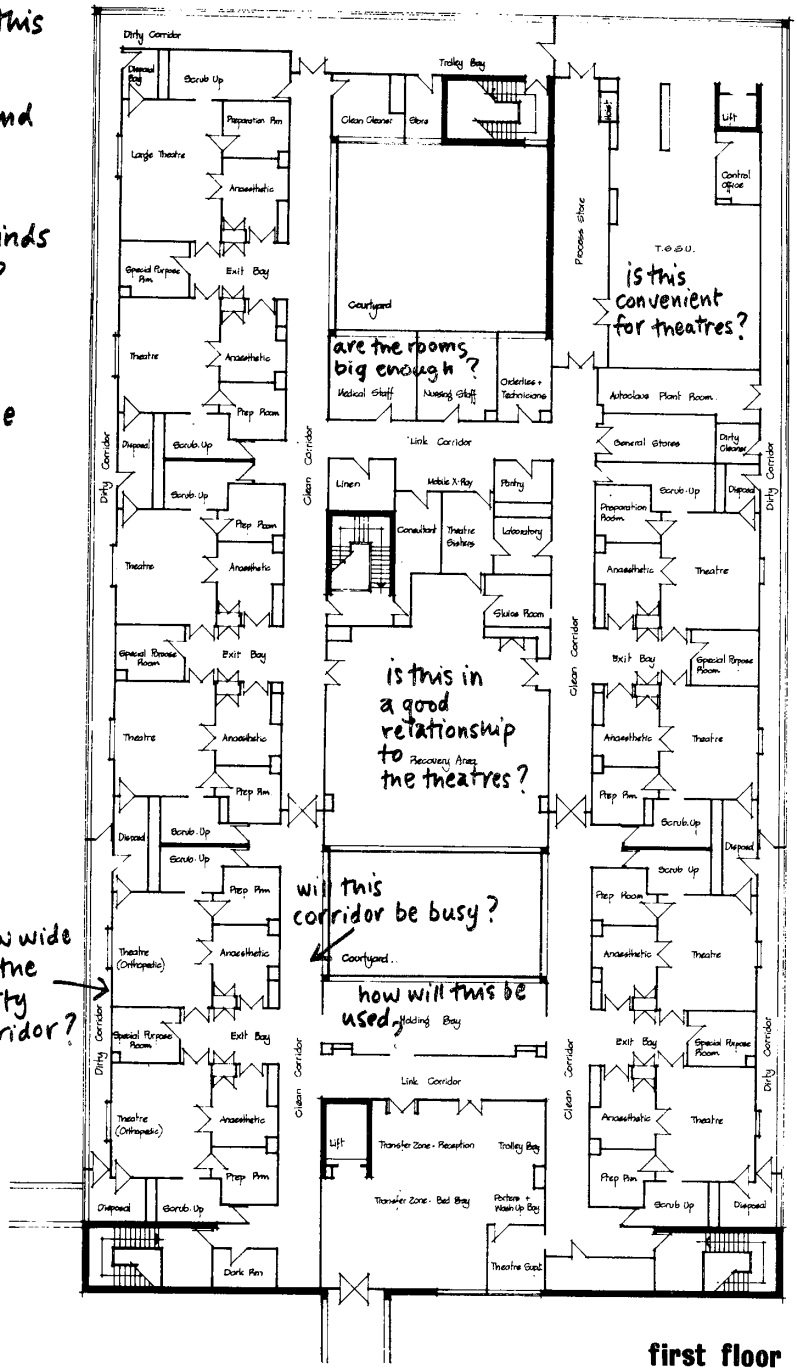
Is the general layout of this floor satisfactory?

Will the flow of people and supplies run smoothly?

Are there likely to be points where various kinds of traffic will conflict?

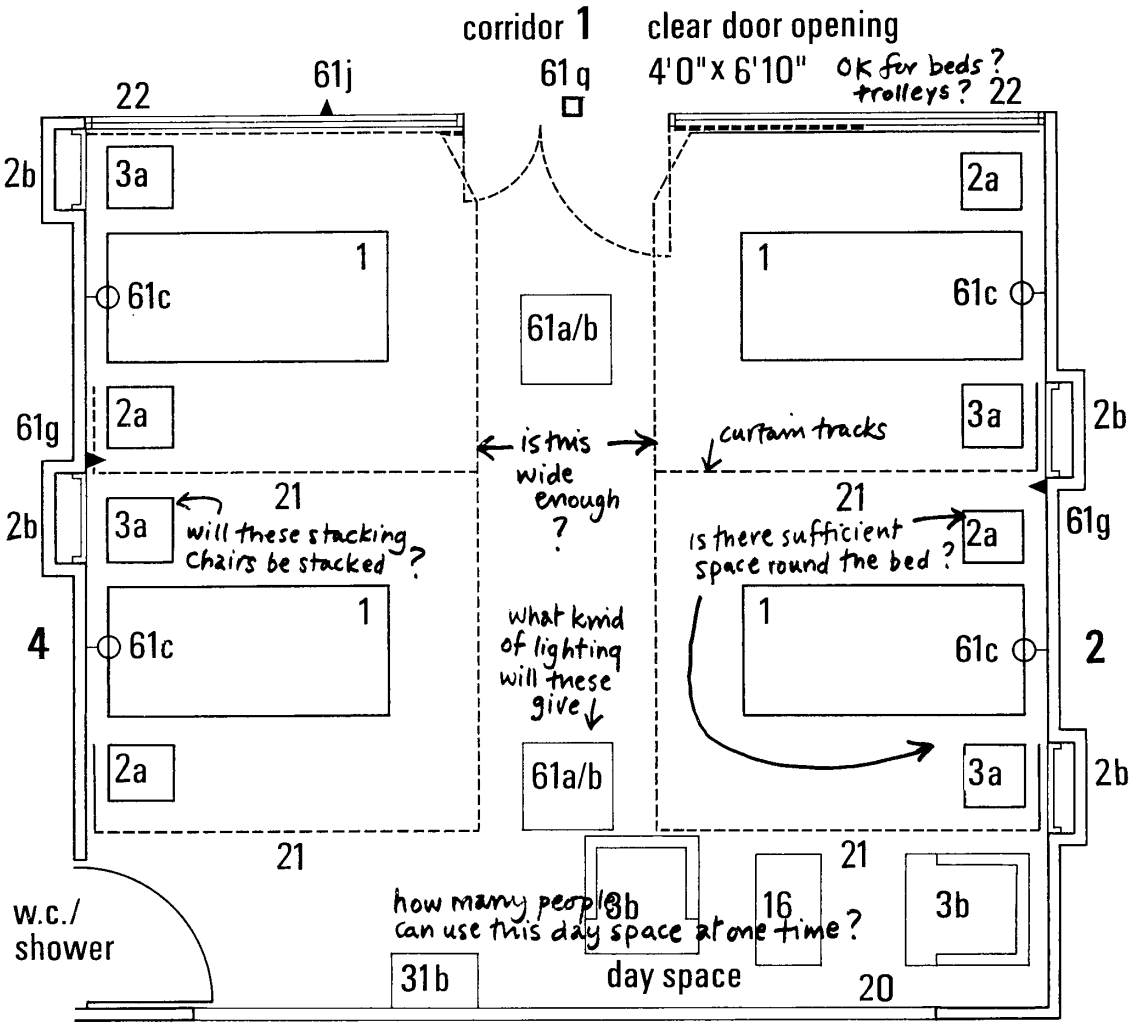
Has each suite the necessary facilities?

Does the plan answer the brief?



first floor

OPERATING THEATRES



How will this ward work in detail?

Will it accommodate the necessary nursing procedures?

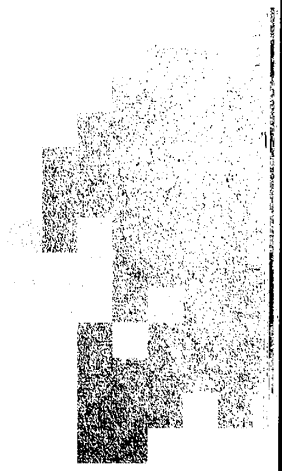
Can meals be served easily?

What about privacy?

Does it answer the brief?

Number	Item
1	Bed 6′ 9″ x 3′ 0″
2a	Locker, bedside/overbed table
2b	Locker, clothes, with removable lining, hat shelf and hanging rail
3a	Chair, stacking
3b	Chair, easy/certain areas with tray
16	rest (small)
20	Curtains and track or venetian blinds/outside windows
21	Curtains and track/bed cubicle/top 2′ 0″ mesh ventilation
22	Curtains and track/observation panels
26	Oxygen point/one per bed in intensive care areas
27	Suction point/one per bed in intensive care areas
31b	WHB 22″ x 17″ with wrist action taps, height from floor 2′ 7″
41	Paper towel dispenser
42	Paper towel disposal bin (pedal)
50	Protection strip/12″ deep on walls and doors: omit on window wall
61a	Light, general
61b	Light, night
61c	Light, bedhead
61g	Socket outlet 13 amp/4 between two beds in intensive care areas
61j	Socket outlet 30 amp x-ray within 30ft of beds/in corridor
61q	Nurse-call system indicator and reset
61v	Telephone external/patients' use
62	Bedhead unit
62a	Socket outlet 13 amp
62b	Shaver outlet
62c	Call system patient/nurse
62d	Radio control
62e	Bed light switch and dimmer

The illustration opposite shows a large-scale layout plan showing a four bed ward in considerable detail. It is possible to use such a drawing to clarify a great variety of points in connection with the day-to-day functioning of the proposed design.



Appendix F Example of a schedule of defects

Clacton District Hospital
Geriatric Day Unit
Ref 19B/38

Final Defects Liability Period
Inspection was held on 27 June 1974.
Present: Mr B E Claydon
Mr S Barnett

Outstanding defects are listed below.

External Work

a Sealastic pointing to window cill, and back door frame required.
b Adjust soffit at rear RWP.
c Two coats of varnish paint to the roof air inlets required.

Internal Works

Laundry Room

a Clean off efflorescence and decorate wall.
b Decorate ceiling with white emulsion paint over stained Artex.
c Paint recently repaired mains cold water supply (colour to match existing).

Staff Toilets

a Fill in cracks in the corner wall and make good to match existing.
b Re-fix toilet roll holder.
c Fix covered plates over ceiling call system.

Sluice

a Fill in crack between skirting and wall and make good to match existing.

Consulting Room

a Fill in small cracks to wall and ceiling and between window cill and frame.

Patients' Toilets

a Fill in crack between architrave and wall, also small wall crack.

Examination Room

a Fill in wall crack under convector heater.

Men's Toilet

a Fill in crack to wall and make good to match existing.
b Replace faulty WC pan.

Bathroom

a Fix No 2 quadrants to door frame.
b Tighten toilet seat.
c Remove existing curtain rail and re-fix from the corner to the flank wall as required by the HMC.

Assisted Bathroom

a Fix No 1 quadrant to door frame.
b Fill in crack to wall.
c Re-fix H and C rail.
d Adjust thermostat and supply water system to the medic bath.

Reception Room

a Fill in crack to ceiling and make good to match existing.
b Fix properly fluorescent light to the ceiling.

Therapy Office

a Supply and fix extra shelf brackets.
b Fix No 1 quadrant to door frame.
c Fill in crack to wall near convector heater.
d Adjust lock.

Hairdressing Room

a Fix No 2 quadrant to door frame.

Kitchen

a Adjust external door lock.
b Fill in cracks between door frame and wall.
c Fix fluorescent light to the ceiling.
d Fill in crack between tiled window cill and window frame.

Servery

a Adjust cupboard doors.
b Fill in cracks to wall.
c Fill in gap to door stops.

Corridor

a Fill in fine cracks to walls.

Day Room

a Fix No 2 quadrants to door frames between existing ward and new geriatric unit.
b Fill in cracks to sluice door frame.
c Re-fix a few floor tiles at the screen and at main entrance.
d Adjust screws to handrail in corridor.
e Fill in cracks above electrical trunking.
f Fill in crack between metal column and window frame.
g Make good to the ceiling aluminium edging at the laminated timber beam.

General Item

a Fill in all cracks occurring between window frame and plaster.
b Fill in and make good to all window cills and frames.

Appendix G Glossary of terms used in hospital building cost control*

*Published by the Department of Health and Social Security September 1974.

ABNORMALS Exceptional building and/or engineering factors arising from special site difficulties or constraints and known to the parties before the commencement of the works, for example, difficult soil conditions, demolition works or alterations to existing buildings, or air conditioning due to building on a restricted site or to high densities. They form part of the *on-costs* (qv).

ADDITIONAL ENGINEERING Special engineering works or services required by the client in addition to those normally allowable for a department.

ADJUSTED ACCEPTED TENDER The sum of the main and principal sub-tenders, after any necessary adjustments, which the regional team of officers (RTO) (or, for selected schemes, the DHSS) is prepared to accept and to designate as the *approved sum* (qv) for the contractual authorisation of a scheme.

APPROVED SUM The limit of *works cost* (qv) approved by the RTO (and, for selected schemes, by the DHSS) for financial control purposes at various stages of design and construction, commencing with the *budget cost* (qv). At tender stage a new approved sum will be based on the adjusted accepted *tender* (qv) and further substitutions authorised from time to time to take account of financial changes arising from contractual liabilities (excluding *fluctuations* (qv)).

ARCHITECT'S/ENGINEER'S INSTRUCTION An instruction approved and signed by the architect or engineer responsible for supervising the job which may clarify or amplify the *contract* (qv), correct inadequate execution of the works, or authorise the contractor to make a change in the execution of the works or services such that the contract is varied. In the latter case the AI/EI is identical with the *variation order* (qv).

BILLS OF QUANTITIES A set of detailed statements which fully describe and accurately represent the work to be executed, a prime purpose of which is to enable the tenderers to tender on the same basis and conditions.

BRIEF Initially, the client professions' statement of their requirements. Subsequently, the basis agreed between the client professions and the designers for the design of the project or scheme. (See HBPN 1 p. 36, paragraph 4 et seq.[30])

BUDGET COST The sum allowed for the works cost of a scheme or project compiled from departmental cost allowances and other approved cost guidance, plus the on-costs measured and valued from the development control plan, which, when approved, becomes the cost control figure for the subsequent design stages.

CAPITAL PROGRAMME The planned capital activity of a regional health authority in one year (including activities financed from capital sums allocated by them to area health authorities) on new large schemes (according to the definition laid down from time to time by the DHSS) identified separately, plus block expenditure on

small schemes, and excluding schemes whose cost is met entirely from funds other than the normal allocation. For an RHA acquisition of land is also included.

CLAIM Any unsolicited request by the contractor or sub-contractor for monies not provided for in the contract sum arising either within or outside the terms of the *contract* (qv), which may or may not be recognised as justifiable by the nominated architect/engineer/quantity surveyor.

CLIENT The RHA (or, where specifically delegated, the AHA) is the client during the whole building process from the outline planning stage through to the bringing into use of the completed health service building; the project team is an agent of the client and will act formally through its coordinator.

COMMISSIONING The bringing of a building, plant and equipment to a state of readiness for operational use. This is a separate function from *engineering commissioning* (qv).

CONTINGENCIES Unforeseen and unforeseeable circumstances requiring work occurring during the contract period, for example, flooding caused by exceptionally heavy rain.

CONTINGENCY SUM Sum set aside to cover *contingencies* (qv). It is not intended to cover increases in specifications or changes in the client's wishes.

CONTRACT An agreement binding at law between client and contractor, covering the works to be done and the consideration to be given for them.

CONTRACT BILLS The fully-priced *bills of quantities* (qv) which form part of the *contract document* (qv).

CONTRACT DOCUMENTS All papers pertaining to the signed *contract* (qv), and any further documentation arising therefrom.

CONTRACT PERIOD The period stated in the *contract* (qv) for the execution of the works (see also *duration of works*).

COST ANALYSIS A systematic method of examining and of comparing the cost of buildings, using the standard form of cost analysis as issued by the DHSS.

COST CHECKING An estimate of the probable cost of the developing design in comparison with the cost included in the *cost plan* (qv).

COST CONTROL A continuous process of monitoring throughout the duration of the project or scheme from initial brief to payment of the final certificate to enable expenditure to match specific defined targets. It can be considered in two parts.

1 cost control during design, the object of which is to make the tender equal to the updated *budget cost* (qv)

2 cost control during execution, the object of which is to make the *final account* (qv) equal to the adjusted accepted tender.

COST PLAN Distribution of the total estimated cost of a building between its various constituent elements.

COST PLANNING The process of controlling the cost of a *project* or *scheme* (qv) during the design stage in order to ensure that the tender will not exceed the cost limit or *pre-tender estimate* (qv).

DATE OF ACCEPTANCE The date of handover of the building or part of the building to the commissioning team. It is coincident with *practical completion* (qv).

DAY WORK Variations to the *contract* (qv), the work content of which is not equitable to value at contract or analogous rates, and which are therefore charged on a labour and materials costs basis with an addition for overheads and profit, as pre-determined in the contract.

DEFECTS LIABILITY PERIOD The period of time stated in the *contract* (qv) and starting from the date of *practical completion* (qv) of the works, during which the contractor is liable for making good any defects attributable to workmanship or materials not having been in accordance with the contract.

DEPARTMENTAL COST An estimate of the cost of hospital departments and associated accommodation in the project or scheme normally governed by departmental cost and area guides calculated on the basis of the cost of the type and scale of *functional content* (qv) plus necessary building and engineering works, or, where functional costing is inappropriate, on a square metre rate derived from the cost of similar accommodation in other building projects. Also, in relation to a scheme, the aggregate cost of the departmental accommodation.

DEVELOPMENT CONTROL PLAN A series of drawings showing the areas, volumes, engineering services network and operational relationships of the immediate phases, and how the subsequent phases fit in with the overall concept of the project; all having regard to the building shape, communications and character of the site.

DURATION OF WORKS Time from the actual date on which work started on site to that on which the certificate of *practical completion* (qv) is issued.

ELEMENT A grouping of building or engineering components in broad classes common to most buildings and fulfilling the same function or functions irrespective of design, specifications or construction; for example, external walls, internal partitions, roofs, ventilating systems.

ENGINEERING COMMISSIONING This comprises

three main activities which are defined in more detail in HTM 17[22(17)].

1 acceptance testing and setting to work in accordance with the *contract* (qv)

2 final adjustments to the system, which are additional to the *contract*

3 design evaluation including consequential additional work.

ENGINEER'S INSTRUCTION See *architect's/ engineer's instruction.*

EXTERNAL WORKS All building and engineering works external to the outer wall of the building but forming a necessary part of the *project* or *scheme* (qv) and included in the *on-costs* (qv) if not otherwise allowed for.

FINAL ACCOUNT The final remuneration due to the contractor under the terms of the *contract* (qv).

FINANCIAL STATEMENT Statement prepared at intervals during the *contract* (qv) showing the cumulative value of work executed up to the date of compilation of the statement, and the balance in relation to the contract sum, with an estimate of the eventual total cost of the *scheme* (qv).

FLUCTUATIONS Those net increases or decreases occurring in wage rates, material prices and other defined expenses after the tender date which are admissible under the *contract* (qv) and are paid to or allowed by the contractor.

FUNCTIONAL CONTENT The capacity of a hospital department measured in terms of functional units, for example, for a ward the number of beds, for kitchens the number of meals prepared.

LETTER OF INTENT A declaration of the intention, in certain circumstances, to enter into a *contract* (qv).

MANAGEMENT CONTROL PLAN The overall plan of execution of the work related to time, money and other resources, based upon a comprehensive analysis of the work content and timing in each sub-area of work, contributing to the whole; for example, the plan of work for the briefing team, design team, equipping and commissioning team and the contractor's organisation. It will normally be expressed in some diagrammatic form; for example, a network or bar chart.

NOTIONAL/OUTLINE COST PLAN A statement of the design team's preliminary proposals for the broad cost allocations of the major portions (that is, groups of *elements* (qv)) of each building in the *scheme* (qv). This plan is an estimate prepared in conjunction with the outline design drawings, having regard to the design criteria and conforming to the approved *budget cost* (qv) for the scheme (that is, cost limit or target cost).

ON-COSTS A term denoting costs other than *departmental costs* (qv) consequent upon the placing of the particular design upon the particular site.

PACKAGE DEAL An arrangement between a client and a contractor or developer where the main design and construction services of the building *project* or *scheme* (qv) are collectively administered, managed and executed.

PARALLEL WORKING A method of working which seeks the cooperation and contribution of the contractor with the client and the building professions during the pre-contractual design and information production stages of a *scheme* (qv). It would normally lead to a progressively agreed *contract* (qv) in which the quantity surveyor and the contractor's estimator will play an important part. Under this arrangement, the contract may be signed and construction may begin before design is completed.

PHASE The order and timing of a part of the projected work comprising one or more *schemes* (qv), which, when completed, will usually be capable of being brought into immediate use.

PRACTICAL COMPLETION (CERTIFICATE OF) Document certifying that a *scheme* (qv) or a specified part of a scheme is, in the architect's view, available for client occupation; the date of this certificate marks the commencement of the *defects liability period* (qv) (maintenance period) and of the period of final measurement for the purposes of the *final account* (qv).

PRELIMINARIES That part of a *contract* (qv) which relates to management overheads and site services and administration, throughout the execution of the work.

PRE-TENDER ESTIMATE The anticipated cost of the *scheme* (qv) assessed from the *bills of quantities* (qv) and other tender documentation immediately prior to obtaining tenders.

PRIME COST SUM An estimated sum included in the *contract* (qv) for works or services to be executed by a nominated sub-contractor, a statutory authority or a public undertaking, or for materials or goods to be obtained from a nominated supplier.

PROJECT The complete development work envisaged in relation to any individual hospital or health service site, whether or not some parts of the work fall outside the scope of the programmes covering a forward period, and comprising one or more *schemes* (qv) and one or more *phases* (qv).

PROVISIONAL SUMS A sum included in the *contract* (qv) for work or for costs which cannot be entirely foreseen, defined or detailed at the time the tendering documents are issued.

RETENTIONS Sums of money, the amount and payment of which is defined in the *contract* (qv), held by the client against the satisfactory completion of the

contract up to the end of the *defects liability period* (qv).

SCHEME Work, which may be a part or the whole of the *project* (qv), which is planned to proceed straight through design to construction in one continuous operation and which will normally be the subject of a single contract operation. A *scheme* and a *phase* (qv) may often be identical in work content.

SITE WORKS ORDER A document normally issued by the clerk of works giving instructions on minor practical points arising from the day-to-day conduct of the works; it should subsequently be endorsed by an *architect's/ engineer's instruction* (qv).

TOTAL COST The whole cost of the *project, scheme* or *phase* (qv), including pre-contract work, design or other professional fees, works cost and all equipment (including groups 2, 3 and 4 equipment*) but excluding salaries of health authorities' staff.

VALUATION (CERTIFICATE OF) Certificate certifying the cumulative value of work properly executed and materials properly on site at a particular date, including *fluctuations* (qv) so far incurred, less *retention* (qv) monies as set out in the conditions of *contract* (qv).

VARIATION ORDER A written order from the architect or engineer to the contractor, authorising a change of whatever nature to the design, quality or quantity of the works specified in the *contract* (qv); this may be identical with an *architect's/engineer's instruction* (qv).

WORKS COST The sum of the cost of the building and engineering work; that is, *departmental cost* (qv) including group 1 equipment*, and *on-costs* (qv).

*See page 39

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3. The district general hospital. 1961.
4. Ward units. 1968.
5. Superseded by hospital building note 35 (see below).
6. Diagnostic x-ray department. 1968.
7. Superseded by hospital building note 24 (see below).
8, 9. Superseded by interim design guidance (see reference 18).
10. Kitchens. 1965.
11. Dining rooms. 1963.
12. Out-patient department. 1961.
13. Central sterile supply department. 1961.
14. Training school for nurses. 1964. (out of print)
15. Pathology department. 1973.
16. Boilerhouse and steam boiler plant. 1965.
17. Deep plan (race track) ward unit. 1963. (out of print)
18. Administrative department. 1966.
19. Department of medical photography and medical illustration. 1965.
20. Mortuary and post-mortem room. 1969.
21. Maternity department. 1963. (Amplified by interim design guidance, see reference 18).
22. Accident and emergency department. 1969.
23. Children's ward. 1964.
24. Residential accommodation for staff. 1967.
25. Laundry. 1964.
26. Operating department. 1967.
27. Intensive therapy department. 1970.
28. Dental department of the out-patient department. 1970.
29. Pharmaceutical department. 1973.
30, 31, 32. Superseded by hospital building note 35 (see below).
33. Rehabilitation centre for psychiatric patients. 1966.
34. Works department for district general hospitals and teaching hospitals. 1973.
35. Department of psychiatry (mental illness) for a district general hospital. 1973.

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8. Safety code for electro-medical apparatus. 1969.
9. Pneumatic tube communication systems. 1963.
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11. Emergency electrical services. 1974.

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15. Patient-nurse call systems. 1966.
16. Fire precautions. 1969.
17. Commissioning of hospital engineering services. 1967.
Supplements:
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2. Miscellaneous components. 1970.
3. Boiler plant. 1970.
4. Communications services. 1970.
5. Sterilisers and disinfectors. 1970.
6. Electrical installations. 1970.
7. Heating. 1970.
8. Kitchens. 1970.
9. Laundries. 1970.
10. Lifts and escalators. 1970.
11. Fire service systems. 1970.
12. Hot and cold water services. 1970.
13. Workshops. 1970.
14. Mechanical and electrical medical plant. 1970.
15. Medical gases and suction systems. 1970.
16. Sewerage and drainage. 1970.

18. Facsimile telegraphy: possible applications in district general hospitals. 1967.
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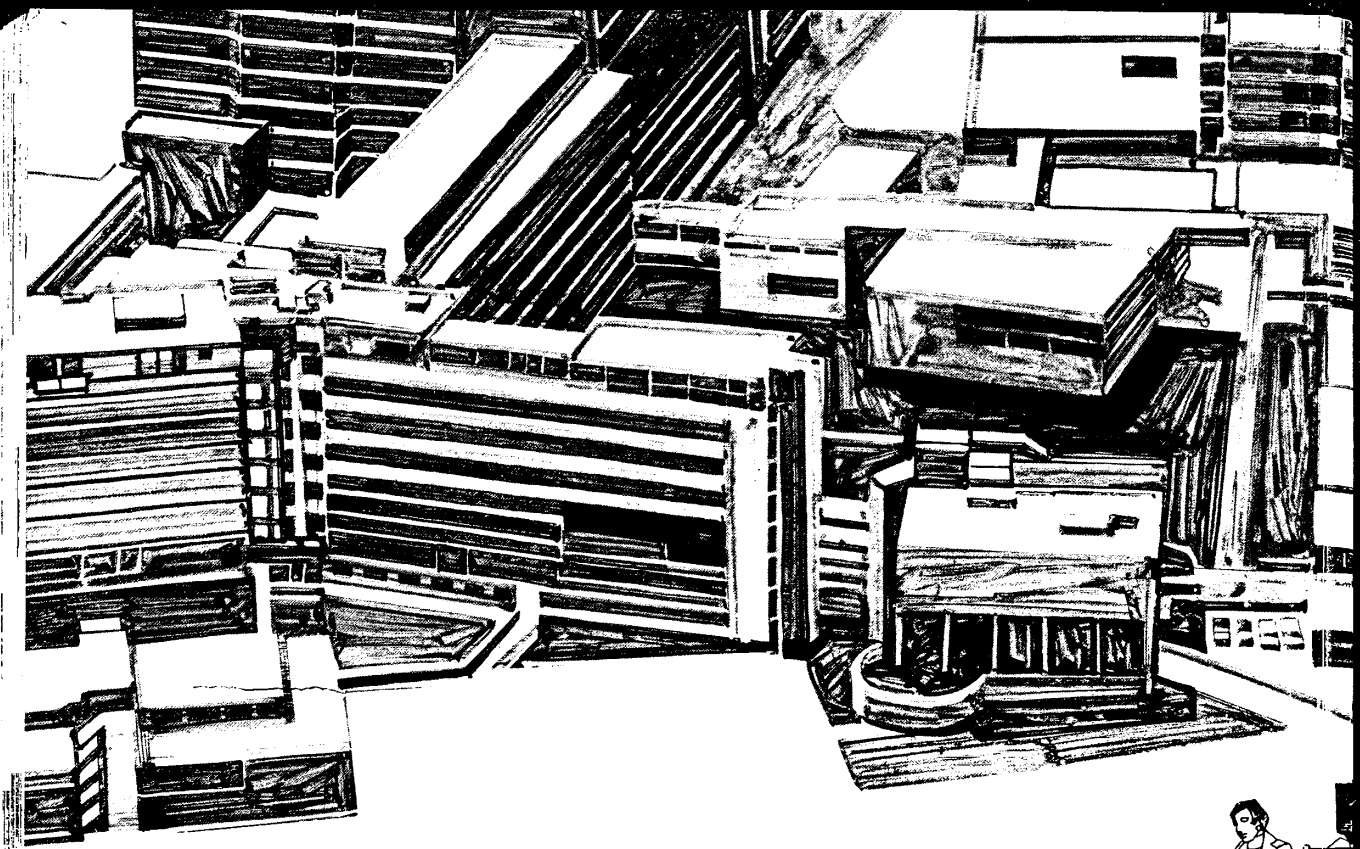
Note: Page references preceded by the letter G refer to Appendix G, Glossary of terms used in hospital building cost control.



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