Hospital Description Wycombe General Hospital Phase One

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for the Oxford Regional Hospital Board

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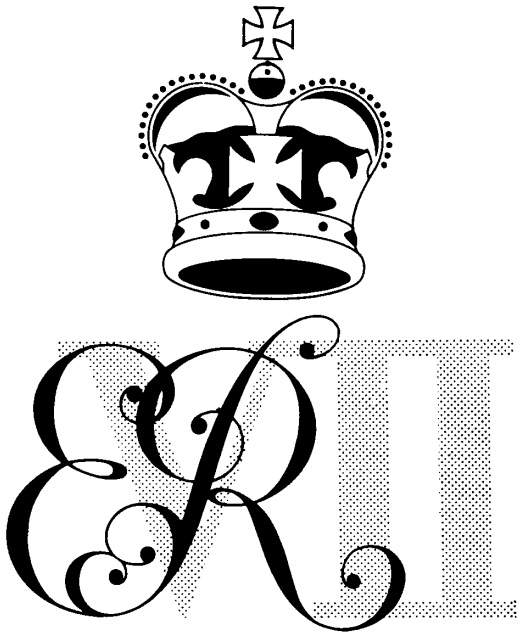

Hospital Description

Wycombe General Hospital

Phase One

Acknowledgements

This Hospital Description could not have been produced without the support of the King's Fund and the full cooperation of the Oxford Regional Hospital Board and their officers, in particular Mr George Watts, Secretary to the Board, Dr J O F Davies, Senior Administrative Medical Officer at the time of writing, Mr A L Arschavir, Regional Architect, Mr W S Williamson, Regional Engineer, Mr C R Poole, Treasurer and Miss I James, Regional Nursing Officer at the time of writing. Mr K G Walker, Secretary of the High Wycombe and District Hospital Management Committee was also particularly helpful, and thanks are due to the Ministry of Health for their encouragement.

The consultants concerned with the scheme were most helpful in providing information and I would like to thank particularly Mr Peter Skinner of Powell and Moya, Architects; Mr John Weeks of Llewelyn-Davies and Weeks, Consultant Architects; Mr A S Safier of Charles Weiss and Partners, Chartered Engineers (structural); Mr Ian Aitken of Brian Colquhoun and Partners, Consulting Engineers (mechanical and electrical services) and Mr D A Pritchard of E C Harris and Partners, Quantity Surveyors, for their contributions.

I would also like to thank the team involved in the various stages in the production of this book, particularly Miss Cecily Collier of the King's Fund whose editorial and production experience were invaluable, Mr John Osbourn for assistance with illustrations and Miss Susan Murphy for her research and secretarial work.

John Gainsborough

Preface

This Hospital Description seeks to establish a method of describing a new hospital and its planning which could be applied to any new hospital project. It is hoped that the description presents the project in a concise and readable form giving essential information about the hospital under the headings *Development, Design* and *Detail.* These headings follow the progress of the project and give a logical sequence of information from the general to the particular.

As a method of description it is no doubt capable of refinement and improvement, but if hospital boards could prepare similar descriptions for all new hospitals, or major extensions of existing hospitals, it would be possible to build up a useful library of reference information for the use of those concerned with hospital planning or research in this developing field, and for students.

It is not easy at the moment for hospital authorities to obtain comprehensive information on previous major hospital developments and this is the case not only between different regional boards, but even within a regional board's own organisation, because only rarely can all the information about a project be brought together comprehensively in a readily accessible form.

It is thought that Hospital Descriptions should be published as soon as possible after the completion of the project. As the evaluation of new buildings comes to be more generally practised it may be that a Hospital Description will be followed in due course by the publication of a Hospital Evaluation.

It was with these aims in mind that the King's Fund, encouraged by the Ministry of Health and with the cooperation of the Oxford Regional Hospital Board, undertook the production of this first Hospital Description.

Avant-propos

Cette Description d'Hôpital cherche à établir une méthode pour décrire un nouvel hôpital et le tracé de son plan qui pourra s'appliquer à tout projet similaire. Nous espérons que cet exposé qui présente le sujet d'une manière claire et concise, offre les informations essentielles concernant les hôpitaux.

En tant que méthode descriptive, il fera certainement l'objet d'améliorations et d'amendements, mais si les directions d'hôpitaux étaient en mesure d'établir des descriptions similaires pour tous les projets d'hôpitaux nouveaux ou d'agrandissements en perspective, il serait possible d'envisager la création d'une utile bibliothéque de référence à l'usage des étudiants et de tous ceux qui s'intéressent à la conception des hôpitaux et aux recherches dans ce domaine.

Il n'est pas facile pour les administrations hospitalières d'obtenir à l'heure actuelle des informations complètes relatives aux derniers perfectionnements accomplis dans le domaine des hôpitaux, et ceci est le cas, non-seulement entre les diverses administrations régionales, mais encore au sein même d'une seule direction, car il est rare que toutes les informations concernant un projet soient réunies dans un ensemble facilement accessible.

Il est estimé que les descriptions d'un Hôpital en cours de réalisation devraient être publiées dès l'achèvement du projet. Comme l'évaluation des nouveaux bâtiments devient la pratique courante, il se peut qu'une description soit, en temps utile, suivie par la publication de l'évaluation de l'Hôpital.

C'est avec ces objectifs en vue que le King's Fund, encouragé par le Ministère de la Santé et avec le concours de l'Oxford Regional Hospital Board, a entrepris l'élaboration de cette première description d'Hôpital.

Vorwort

Diese Krankenhausbeschreibung hat den Zweck, eine Methode zu finden, ein neues Krankenhaus und dessen Planung, die auf alle neuen Krankenhausprojekte Anwendung finden könnte, zu schildern. Es besteht die Hoffnung, dass die Beschreibung in knapper, lesbarer Form die wesentlichen Informationen über das Krankenhaus gibt.

Diese Schilderungsmethode könnte zweifellos noch verfeinert und verbessert werden, aber wenn alle Krankenhausverwaltungen ähnliche Beschreibungen für alle neuen Krankenhausprojekte oder grössere Erweiterungen bestehender Krankenhäuser ausarbeiten könnten, so würde es möglich sein, eine zweckdienliche Bibliothek einschlägiger Unterlagen aufzubauen, die denen, die sich mit der Planung von Krankenhäusern oder mit der Forschung auf diesem sich entwickelden Gebiet, sowie Studenten zur Verfügung stehen würde.

Es ist augenblicklich für die Verwaltungen von Krankenhäusern nicht leicht, umfassende Unterlagen über grössere, frühere Krankenhausbauten zu bekommen. Dies trifft nicht nur auf die verschiedenen lokalen Verwaltungsbehörden zu, sondern gilt auch für die interne Organisation einer lokalen Verwaltung, denn die gesamten Informationen bezüglich eines Projektes können nur selten umfassend in einer leicht zugänglichen Form zusammengestellt werden.

Es besteht die Ansicht, dass Krankenhausbeschreibungen sobald wie möglich nach der Fertigstellung des jeweiligen Projektes veröffentlicht werden sollten. Da die Gepflogenheit, neue Gebäude zu bewerten, mehr und mehr Platz greift, ist es durchaus möglich, dass Krankenhausbewertungen in Zukunft im Anschluss an Krankenhausbeschreibungen veröffentlicht werden.

Im Hinblick auf diese Bestrebungen hat der 'King's Fund', gefördert von dem Gesundheitsministerium, sowie in enger Zusammenarbeit mit dem 'Oxford Regional Hospital Board', diese erste Krankenhausbeschreibung unternommen.

Prólogo

Con esta 'Descripción de Hospital' se pretende establecer un método para esbozar un nuevo hospital y el trazado del mismo, el cual puede aplicarse en el proyecto de cualquier hospital nuevo. Se confía en que por medio de esta descripción, el proyecto quede presentado de una forma concisa y comprensible, dando información esencial sobre el hospital.

Como método de descripción, sin duda alguna deja lugar para que se pueda refinar y mejorar, pero si las juntas directivas de hospitales pudieran preparar descripciones similares tanto de proyectos para hospitales nuevos como para ampliaciones considerables de los ya existentes, sería posible de esta manera formar una biblioteca provechosa con información que sirviera de referencia para aquéllos cuya misión es la de planear hospitales o investigar en este campo de desarrollo, así como para estudiantes.

En la actualidad no es tarea fácil para las autoridades de hospitales el conseguir amplia información sobre importantes edificaciones anteriores de hospitales, y esto sucede no solamente entre diferentes juntas directivas de carácter regional, sino también dentro de la misma organización de una junta directiva regional, debido a que sólo es posible en algunos casos compilar comprensiblemente toda la información sobre un proyecto de tal modo que se tenga disponible sin dificultad.

Se estima que las 'Descripciones de Hospitales' deberían ser publicadas a la mayor brevedad posible, una vez se haya completado el proyecto. Como quiera que la evaluación de nuevos edificios se está llevando a la práctica cada vez más, puede ser que a la 'Descripción de Hospital' siga a su debido tiempo la publicación 'Evaluación de Hospital'.

Teniendo presente estas perspectivas el King's Fund, alentado por el Ministerio de Sanidad, y con la ayuda del Oxford Regional Hospital Board, se encargó de la publicación de esta primera 'Descripción de Hospital'.

Foreword

The Oxford Regional Hospital Board are very pleased to have been asked by King Edward's Hospital Fund to cooperate in the preparation of this first Hospital Description.

It is important that with the continuing expansion of the hospital building programme, information on major building schemes should be recorded and we hope it will become the practice to publish the details of other major building projects in the form suggested in this publication.

The buildings here described form only part of the development of Wycombe General Hospital. The second phase is now nearing completion and the planning of the third phase is well advanced. Further developments not mentioned in the original brief are also proposed, leading eventually to a District General Hospital of some 450 beds.

The authors emphasise the importance of evaluating new buildings once they are in use and the preparation of a Hospital Description, including a statement of the brief to the design team, forms an essential document as a basis for the subsequent evaluation.

March 1968

Isabel Graham Bryce
Chairman
Oxford Regional Hospital Board

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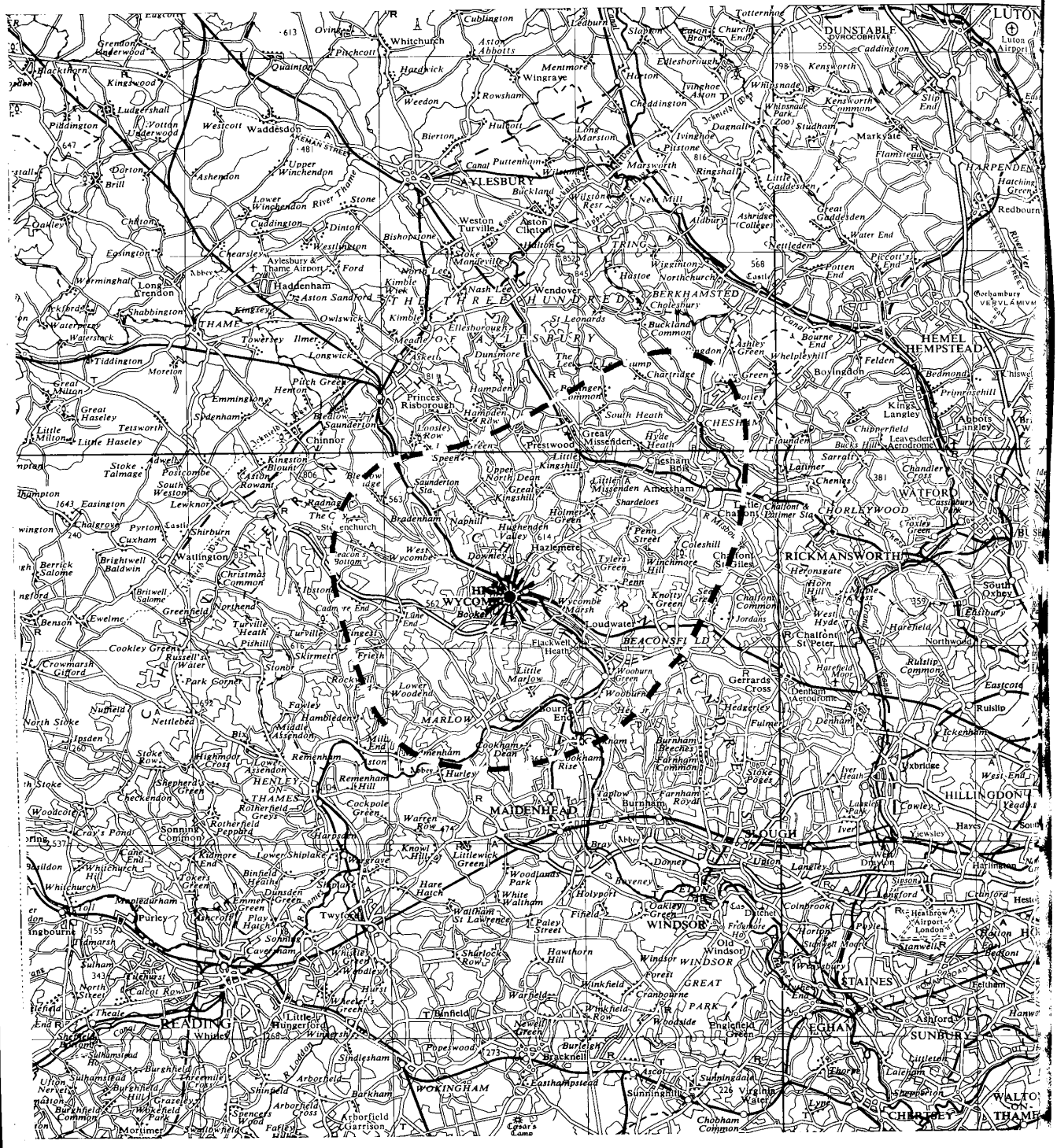
3 Detail: Engineering 70-87

Illustrations



1 Catchment Area Map (Reproduced from the Ordnance Survey Map with the sanction of the Controller of Her Majesty's Stationery Office. Crown copyright reserved.)

5 0 5 10 15 20 Miles 25

10,000 0 10,000 20,000 30,000 40,000 Yards

5 0 5 10 15 20 25 30 35 Kilometres

1 Development

Background

Hospital Group

The Wycombe General Hospital is one of eight in a group administered by the High Wycombe and District Hospital Management Committee. The area served by the group, see Illustration 1, is well defined to the north and west where it is bounded by a ridge of the Chiltern Hills, and to the south where it meets the River Thames. It is less well defined to the east where it adjoins the territory of the North West Metropolitan Regional Hospital Board.

The hospitals which constitute the group formed a pattern not unusual in the hospital service when it came into being with the establishment of the National Health Service in 1948: a small voluntary general hospital in High Wycombe expanded to about 100 beds during the last war by EMS hutted units (Emergency Medical Service), a larger public assistance institution at Amersham also with EMS hutted units which increased its bed state to 280, a fever hospital, three small general practitioner hospitals and two small maternity hospitals.

Catchment Area

The map, see Illustration 1, shows the approximate catchment area of the High Wycombe and District Hospital group. The total population of the local authority areas included in this area was approximately 200,000 in 1964, but shortage of hospital accommodation in the group and the relative nearness of other hospitals meant that many patients were treated outside the area.

It was estimated by the Oxford Regional Hospital Board that about 60–65 per cent of hospital treatment provided for the population of 200,000 was found in group hospitals. Additionally, some 16,000 people living in districts outside the area were served by the High Wycombe group. Taking these two factors into account, it was estimated that the population served directly by the group in 1964 was 130–140,000. The regional board's review of the hospital plan allows for this figure to be increased to 180,000 by 1981.

The services of the two general hospitals in the group – Wycombe General Hospital and Amersham General Hospital – are to a large extent complementary. The Wycombe General Hospital will be the major comprehensive hospital in the group but it is impracticable to arrive at a population figure which relates to this hospital alone. The population in the group's area looks to one hospital or the other in accordance with the range and nature of the medical services provided.

Need for Expansion

In the early days of the hospital service the Oxford Regional Hospital Board took the view that a new hospital should be built to serve both High Wycombe and Amersham and a site was earmarked

midway between the two towns. It soon became clear, however, that it would be many years before such a project could be undertaken and in the meantime many pressing needs had to be met. Thus the hospital services of the group developed along lines familiar to most hospital authorities – improvisation and upgrading, changes in use, piecemeal expansion of diagnostic and treatment facilities, improvements in amenities and improvements in equipment and standard of staffing. All this effort made a significant contribution to the hospital services of the area but a gradual expansion of population emphasised the need for capital development on a large scale.

Although it would be some years before major capital developments could be undertaken, the regional board in consultation with the hospital management committee and medical staff, continued to examine closely the problems of hospital development in the area. Finally it was agreed to abandon the idea of a new hospital and to plan instead a major development of the Wycombe General Hospital (known as the High Wycombe and District War Memorial Hospital until 1965), making the maximum use of other hospitals in the group to provide a satisfactory service for the area.

Scope

Group Development Plan

The two large hospitals in the group comprise the Wycombe General Hospital and the Amersham General Hospital.

Wycombe General Hospital would be extended in phases on its present site. The first phase of the development would extend the number of beds to 274, which figure includes those beds remaining in the old hospital building. The number of beds would be increased later by future phases of the development but the total bed strength when all phases are complete is not known at this stage.

Amersham General Hospital would be reduced to 220 beds, allowing for sub-standard wards to be abandoned. With full use of the smaller hospital units the group would be able to provide an adequate service for the area.

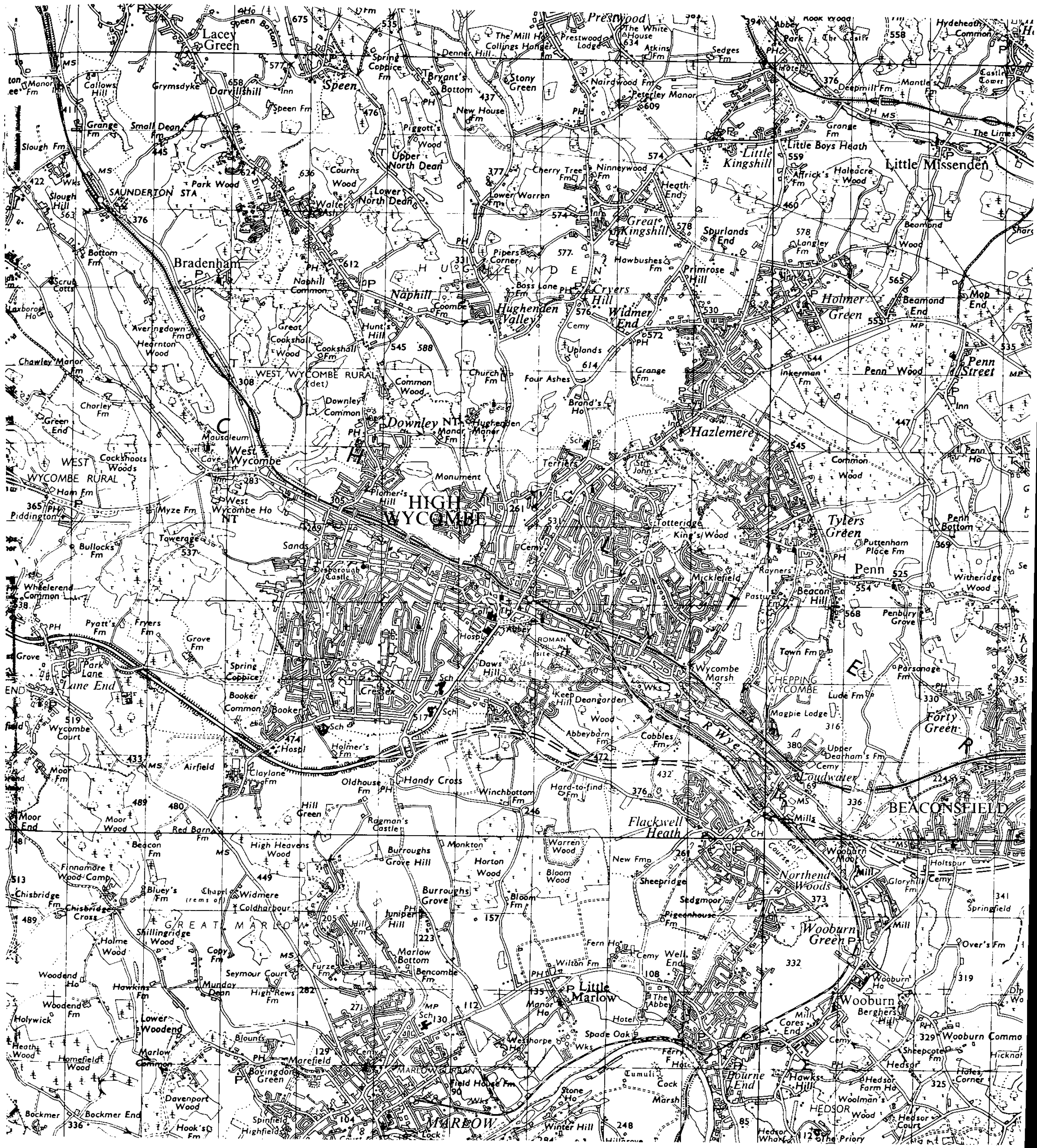
The main paediatric unit for the group would remain at Amersham General Hospital, obstetric beds would also remain there and at the Shrubbery Maternity Home in High Wycombe, ophthalmic beds would be provided in a sub-regional unit at Aylesbury; thus none of these specialties were included in the High Wycombe development. The Wycombe development would, however, include an acute geriatric sick unit, with long-stay geriatric sick beds at Booker Hospital in High Wycombe (formerly the fever hospital) and at Amersham General Hospital.

In April, 1956, The Minister of Health gave his approval in principle to the form of group development outlined above. Subsequently the development plan was amended so that the development of Wycombe General Hospital should include obstetric, gynaecological and paediatric beds to supplement the provision at Amersham.

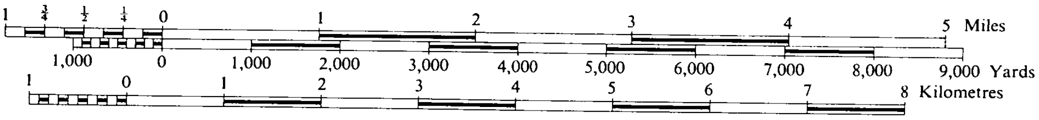
Hospital Development Plan

The development of the Wycombe General Hospital is planned in three phases with room for further future development. On completion the hospital will constitute the main District General Hospital for the catchment area shown in Illustration 1.

Phases 1A and 1B of the total project are dealt with in this description. Phase 1A comprises residential accommodation for



2 Access Routes to Hospital (Reproduced from the Ordnance Survey Map with the sanction of the Controller of Her Majesty's Stationery Office. Crown copyright reserved.)



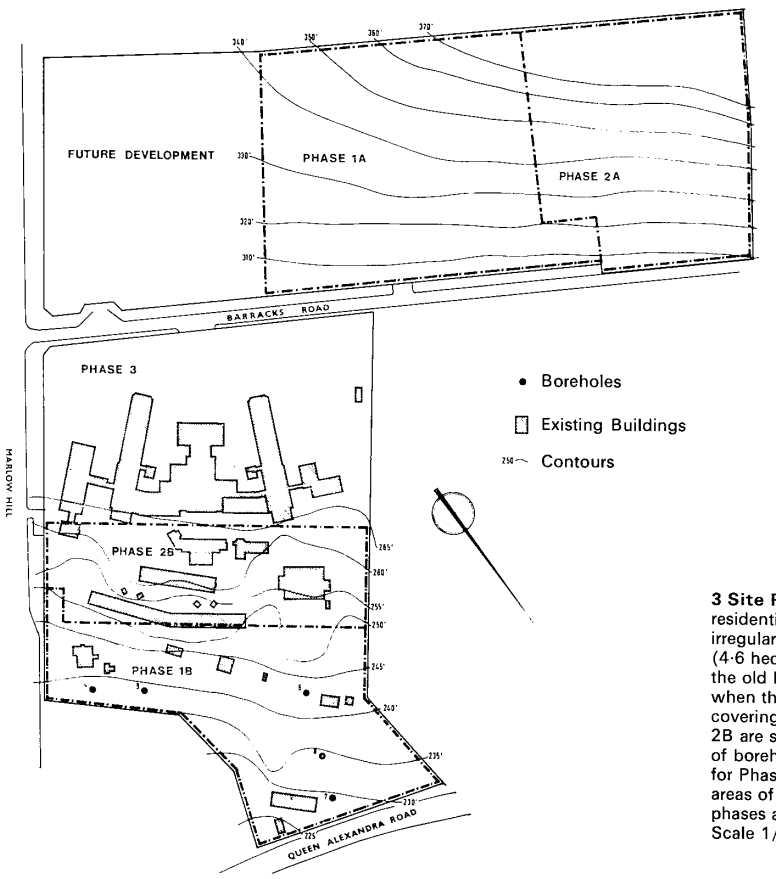
student and staff nurses in two hostel blocks and accommodation for medical and senior nursing staff in flats. Phase 1B comprises a hospital block of 224 beds for medical, surgical, orthopaedic, ENT, gynaecological and other specialties, together with an operating theatre suite, pharmacy and pathology department, CSSD, medical centre, chapel, and related services departments.

Phases 2A, 2B and 3 are not dealt with in detail in this description but it is intended that construction of the second phases should follow closely on completion of the first.

Phase 2A will consist of further residential accommodation for nurses, medical staff and some domestic staff, together with a training school for nurses. Phase 2B will consist of out-patient, x-ray, accident and emergency departments, together with a physiotherapy and rehabilitation centre and a records department.

The Phase 3 proposals envisage the demolition of the old hospital building and the construction of an 80-bed maternity and gynaecological unit, together with a 20-bed paediatric unit and a special care baby unit.

The brief for the phased development of the hospital outlined above will be considered in Section 2, *Design*, see page 23.



3 Site Plan The hospital and residential accommodation site is an irregular shape of 11·5 acres (4·6 hectares) and this plan shows the old hospital buildings on site when the job started. Contours covering Phases 1A and 1B, 2A and 2B are shown and the positions of boreholes taken prior to tendering for Phase 1B are indicated. The areas of site taken for the various phases are also shown. Scale 1/2500 feet.

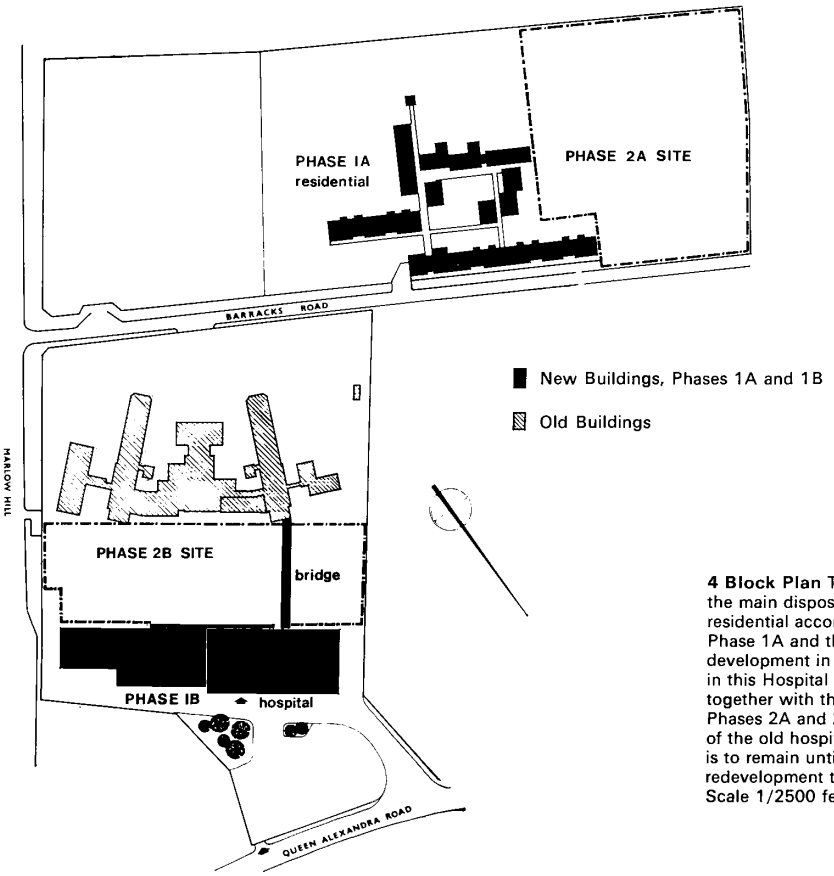
Site

Description

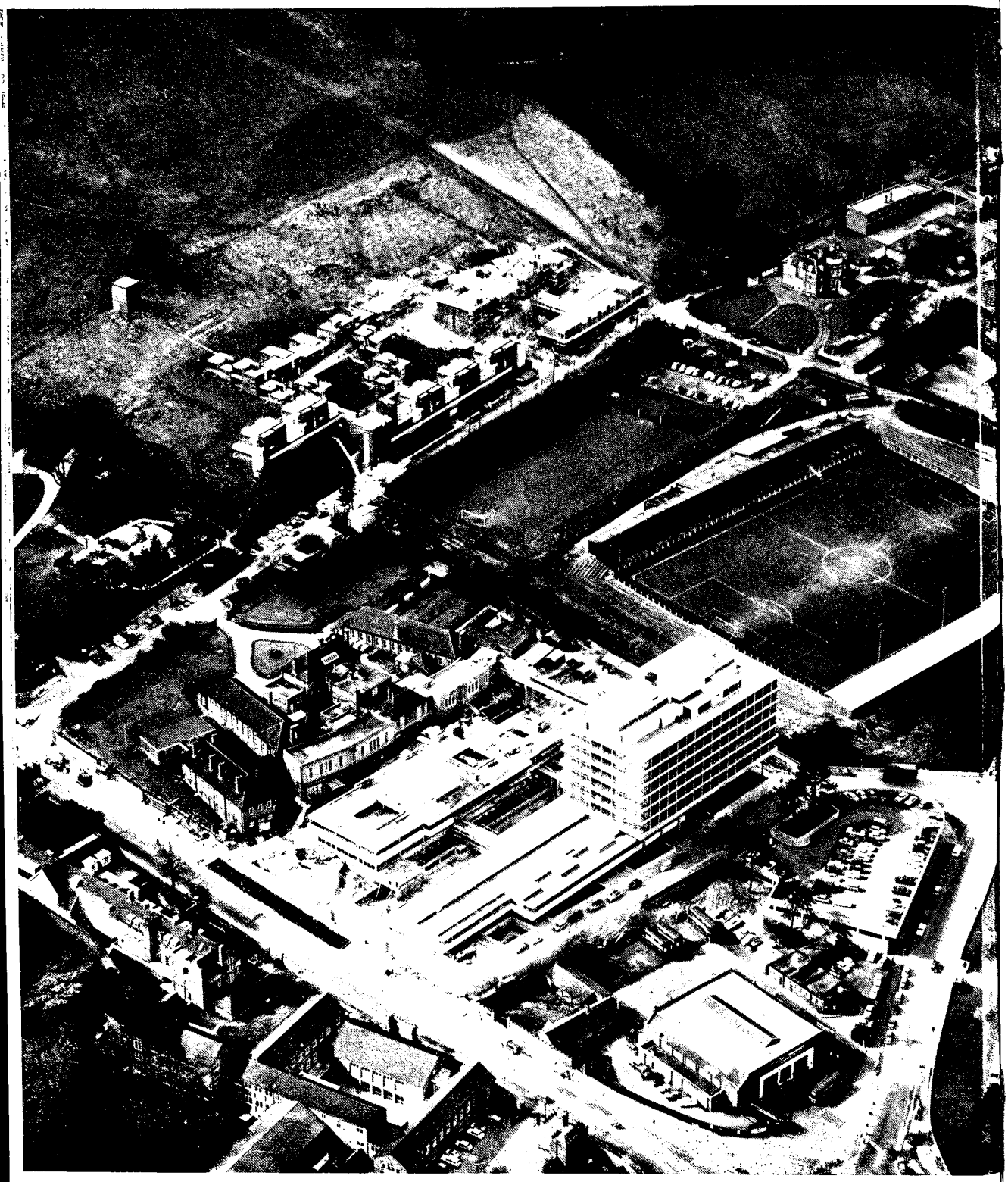
The hospital site is located within the Municipal Borough of High Wycombe, a quarter of a mile south of the town centre adjacent the main A404 High Wycombe – Marlow road, see Illustrations 2 and 3. Vehicular access to the site from Marlow Hill was not permitted by the planning authorities and was restricted to the short north boundary from Queen Alexandra Road, see Illustration 4.

The total area of the site available for hospital construction and staff accommodation, that is, Phases 1A and 1B, 2A and 2B, Phase 3 and unspecified future development, is 11·5 acres (4·65 hectares). Within this area 2·34 acres (0·92 hectares) was made available for the residential accommodation comprising Phase 1A and an area of 1·96 acres (0·79 hectares) in an irregular shape was made available for the hospital comprising Phase 1B.

As can be seen from the site plan, Illustration 3, the site for the hospital buildings proper falls 74ft (22·5 metres) from south to north and an average of 10ft (3 metres) from east to west. Marlow Hill, a trunk road, runs the full length of the east boundary, a bus station occupies the north-east corner and there is a football ground to the west. Before rebuilding started there were a number of small single storey structures in the area of Phase 1B. The



4 Block Plan This plan shows the main disposition of the residential accommodation in Phase 1A and the hospital development in Phase 1B covered in this Hospital Description, together with the area left for Phases 2A and 2B and that part of the old hospital building which is to remain until the Phase 3 redevelopment takes place. Scale 1/2500 feet.



5 Aerial Photograph from East Aerial view from east showing Phase 1B, bottom of picture, completed in October 1966 and Phase 1A, top of picture, completed in August 1964.

area for Phase 1A was virgin hillside rising almost 90ft (27·2 metres) to the southern boundary, a slope of approximately 1 in 5.

The site subsoil below 2–5ft (60–150 cm) of top soil consists of hard white chalk interspersed with flints. There is considerable subsoil variation over the site as can be seen from the borehole results in Illustration 46, see page 70. No water was encountered in these boreholes.

Development

The residential accommodation, Phases 1A and 2A, is built on a clear site separated from the hospital development proper by Barracks Road. There is a right of way along Barracks Road to other non-hospital property at the west of the site.

Development of the hospital accommodation, Phases 1B, 2B and 3, is taking place from north to south, this being the least disruptive to the existing hospital. As much of the old hospital building as possible is being kept in operation while reconstruction proceeds.

At the time of preparation of this Hospital Description, Phases 1A and 1B are complete, Phases 2A and 2B have started on site and are well advanced, and Phase 3, involving the demolition of the old hospital building built in 1923 and extended in 1929, has not yet begun, see Illustration 4.

Progress

The progress of events for Phase 1A and 1B of the Wycombe General Hospital was as follows.

1956

Definition of the scope of the project completed and agreed with Ministry of Health. Architects and other consultants appointed by regional hospital board.

1957–1961

Planning period: Phases 1A and 1B carried out in detail with future phases in outline.

1962

Phase 1A (Residential): main contractor started on site in August.

1963

Phase 1B (Hospital): main contractor started on site in November.

Phase 1A: first 31 residential units completed in November.

1964

Phase 1A: remaining residential units completed in August.

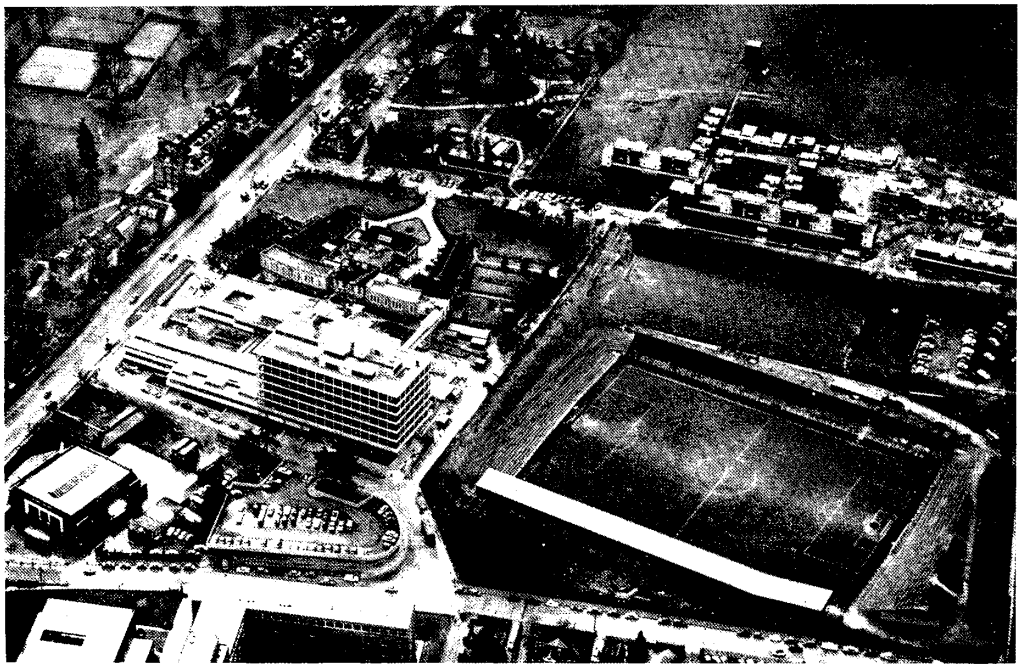
Phase 1B: hospital construction continued.

1965

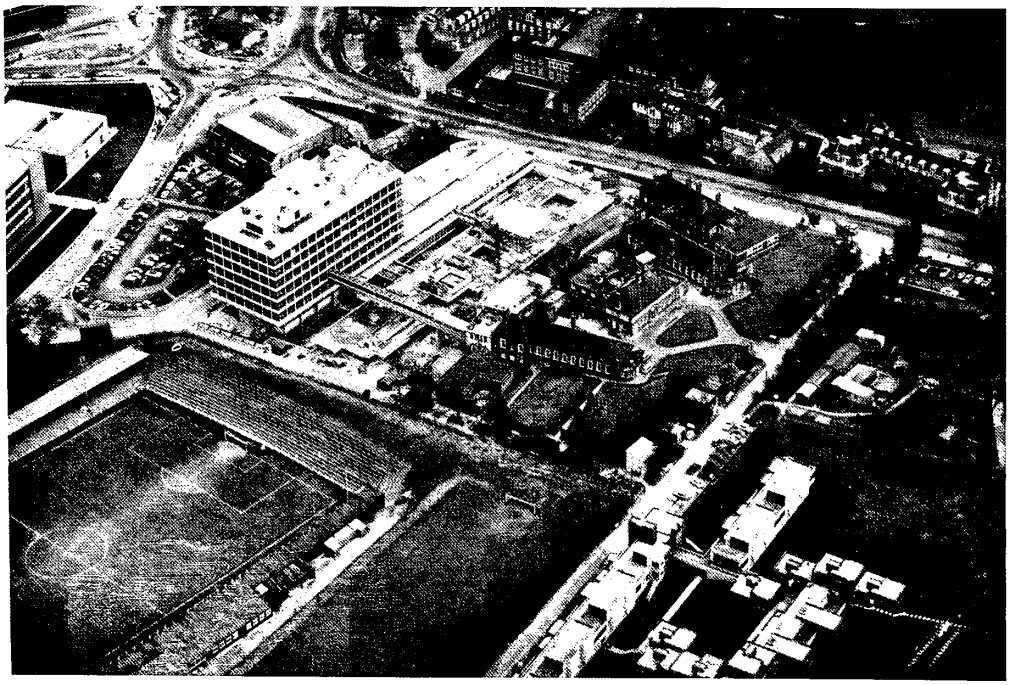
Phase 1B: pathology and pharmacy completed and handed over in November.

1966

Phase 1B: bulk stores, workshops, mortuary and post-mortem area completed and handed over in January. Remainder of contract reached practical completion in October and the first patients were admitted to wards in November.



6 Aerial Photograph from North Aerial view from north showing Phase 1B, bottom left, and Phase 1A, top right.



7 Aerial Photograph from West Aerial view from west showing connecting bridge to old hospital building.

2 Design

The main requirements of the brief were determined during the course of discussions and outline planning over the two years following the appointment of the architects, discussions in which the Ministry of Health, regional hospital board, hospital management committee, medical staff, officers and architects, were all closely involved. As was to be expected in a scheme of this complexity, the minutiae of the brief and operational policies only reached finality during the detailed planning period. Thus there was no formal briefing document available when planning started. The briefing details which emerge from the recorded minutes and associated documents are described below. It will be recognized that these details do not represent a comprehensive brief. Variations from the brief have been noted in italics. These were the result of revised decisions made by the planning team as the design work proceeded or for other reasons which are stated.

Brief for Phase 1A: Residential Accommodation

The following accommodation should be provided for resident staff.

Student Nurses and Staff Nurses	75 bed-sitting rooms with related common rooms, toilet and service areas
Medical and Nursing Staff	14 flats comprising living/dining room, kitchen, bathroom and 1 or 2 bedrooms
Warden	1 flat

The accommodation for nurses should be arranged in groups of 4 or 6 bedrooms, each group having its own kitchen, bathroom and toilet. Of the 75 units of accommodation to be provided, 60 will be for student nurses and 15 for trained nurses. The trained nurses will have larger bed-sitting rooms. There will be a warden's flat associated with this accommodation.

The accommodation for medical and senior nursing staff will consist of 12 flats each having a living room with dining recess, one bedroom, kitchen and bathroom. Two larger flats will have similar accommodation except that 2 bedrooms will be provided. All bedrooms and bed-sitting rooms should have a built-in wardrobe.

Provision should be made in a central position for common rooms for senior and junior staff, a television room, quiet room and visitors' room. These rooms should be served by two small kitchens for the preparation of breakfast and light meals. Two public telephones should be provided in the entrance hall. It is desirable

that resident staff should have covered access to the common room facilities.

Brief for Phase 1B: Hospital

The following units are required within the Phase 1B development.

Wards	Beds
General Medicine	40
General Surgery	40
Traumatic and Orthopaedic Surgery	40
Ear, Nose and Throat	22
Dermatology	14
Hostel Ward	26
Private Patients	10
Psychiatry	20
Gynaecology	12
Total	224

On completion of the development of Phase 1B, the old hospital building will accommodate the following beds.

Geriatric and Long-stay Orthopaedic	40
Children: Accident	4
Children: Isolation	1
Sick staff	5
Total	50

Related Departments
Operating Theatre Suite
Pathology
Pharmacy
Central Sterile Supply
Main Entrance Hall, Reception and Administration
Medical Centre, Library and Chapel
Service Area
Engineering Services

Wards

General Medicine and Surgery There should be three standard wards (one medical and two surgical), each having 40 beds sub-divided into two groups of 20 beds. Each 20-bed group should be provided with sluice, washing and wc cubicles and bathroom, but both groups will share one kitchen, an 'assisted' bathroom, day space, treatment room, clean and dirty utility rooms, staff cloakrooms, waiting area and other ancillary rooms, the use of which will vary according to the specialty served. *In the event two 'assisted' bathrooms were provided.*

In each ward, 32 of the 40 beds should be in 4-bed or 6-bed bays, with the remaining 8 in single rooms, that is, 20 per cent of the beds in single rooms. Day spaces should be planned to be used by relatives staying over night.

The ward should be planned so that food, linen and other stores can be delivered into the service core of the unit without the need

for porters to pass through the nursing areas. Disposal of soiled linen should be by means of a 2ft (60 cm) diameter chute to basement level where a sluicing machine for foul linen should be installed. A screened bay should be provided on each floor for the storage of used dressings and kitchen refuse, pending collection. *In the event this bay was not provided – instead a cupboard was provided adjacent the service lift.* Paper sacks will be used for refuse.

The nurse-call system should include two-way speech between nurse and patient. Dangerous drug cupboards should be in the nurses' stations.

There should be means of eliminating sun glare in all ward spaces. In the ward used for general medicine, there should be a blackout provided in the treatment room. Where window curtain rails are fitted in wards, they should be at the same height and of the same type as the rails for the bed curtains to facilitate easy removal and to make interchange possible between window and bed curtains. *In the event this was not carried out as the window and bed curtains were of different types.* Acoustic ceilings should be provided in ward corridors.

Traumatic and Orthopaedic Surgery One of the standard wards described above will be used for traumatic and orthopaedic surgery. This ward requires a ceiling rail to take an exercise harness in the corridor. Two of the single rooms should be planned so that they can take a bed with balkan beam attachment.

ENT and Dermatology One ward will be shared between dermatology and ENT. The ENT department will require the sole use of a clean and dirty utility room and will need an audiometry room. It should also have a special play space for children.

The dermatological ward will need a treatment room with good ventilation. It should have a tiled floor with gulley. There should be a couch provided in the centre of the room with fitting above for ultra-violet machine on pulleys. There should be a bathroom close to the treatment room. This ward will need a special examination room with a changing cubicle adjoining which will be used as a hot cubicle, having a temperature of approximately 100°F (37·7°C). Both the treatment room and the special examination room must be capable of being darkened. Minor operations will be undertaken in the special examination room.

Hostel Ward This 26-bed ward will be for the care of patients who do not need the full facilities of an acute bed and who are ambulant, needing no special nursing care. Beds should be mainly in 4 and 6-bed groups. The planning and arrangement of services will be on similar lines to the general ward but fewer single wards are required. *In the event none were provided.*

Oxygen and suction services should be provided with the outlets sealed off. No treatment room need be provided, but a dirty utility and sluice room should be retained. The day space should include a dining area with a cafeteria service. As the hostel ward will not be staffed at night, provision should be made for the nurse-call system to be switched through to the adjoining private patients' ward.

Private Patients This unit should contain 10 single rooms each having a wc and bathroom. Two of the rooms should be large enough to take a bed with a balkan beam attachment and, if necessary, the bathrooms could be omitted in these two rooms

to provide the additional space required. The unit should have a sluice room, 'assisted' bathroom, kitchen, clean utility room and rooms for sister and doctor. The doctor's room will also be used as an examination room.

All rooms should have a telephone socket, an extra electricaloutlet and a permanent shelf for flowers. Doors with glazed panels should be fitted with blinds which can be operated from inside. All rooms should be capable of being blacked out. There should be a short overhead rail to take an exercise harness in the corridor outside four of the rooms and an overhead beam over each bath.

Psychiatry This should be a 20-bed unit consisting of two 8-bed bays and one 4-bed bay which can be used to give flexibility between male and female patients. There should be an adjacent treatment unit with a 5-bed recovery ward. *In the event the following provision was made: two 6-bed bays, one 4-bed bay and 4 single rooms of which one is a 'protected' room, and a 4-bed recovery ward.* The floor area of the psychiatric ward should be about two thirds that of a standard 40-bed ward floor, the remainder of the floor being used for gynaecology. The ward kitchen can be common to both specialties. *In the event separate kitchens were provided for the psychiatric ward and the gynaecological ward.*

All doors should open outwards and window openings should be restricted. Storage should be provided for patients' private possessions, preferably in separate wardrobes, supplemented by a store kept under the ward sister's control.

Gynaecology This should have 12 beds, provided in one 6-bed, one 4-bed and two single rooms. An electrically powered hoist will be needed in the 'assisted' bathroom. Clinically sterile bedpans will be needed and these will be provided by the CSSD. *In the event this arrangement was not made.*

Operating Theatre Suite

The suite will comprise three operating theatres, all of which will be available for use by any specialty, an 8-bed recovery ward and ancillary accommodation. One of the three theatres must be suitable for orthopaedic surgery with a plaster room and dark room adjacent and with an overhead gantry to take an x-ray machine. A compressed air supply will be required in the anaesthetic rooms in addition to suction, oxygen and nitrous oxide.

Planning should be based on recommendations contained in the bulletin, *Operating Theatre Suites,** and the report, *Studies in the Functions and Design of Hospitals,*** except that provision should be made for the sterilisation of all instruments in the central sterile supply department. The three operating theatres and their directly related ancillary rooms comprising the operating zone should be separated from the entrance and staff changing areas of the suite by a 'clean' corridor.

Recovery Ward An open 8-bed recovery ward should be provided within the operating theatre suite. The nursing station of this ward should be centrally placed and should be provided with full services and a double x-ray viewer. The ward lighting should not be too intense but additional illumination for examination purposes should be provided between each bed by a pendant inspection lamp.

* Ministry of Health, *Hospital Building Bulletin No. 1 Operating Theatre Suites,* HMSO, 1958 (out of print).

** Nuffield Provincial Hospitals Trust, *Studies in the Functions and Design of Hospitals,* Oxford University Press, 1955.

A bell-push at the head of each bed will communicate with an alarm bell positioned in the 'clean' corridor of the operating theatre suite. Buffer rails to prevent damage by beds would be similar to those provided in the wards.

Intercommunication Set A special intercommunication set with nine stations will be required within the theatre suite. The loud-speaker units in the operating theatres must be waterproof; an indicator light must show when lines are being used and the calls must be preceded by an audible warning.

Ventilation of the theatres will be provided by filtered air entering each theatre at high level, passing across the table at 50ft (15 metres) a minute and being extracted at low level as recommended in the report of the Medical Research Council.* The ventilation system should incorporate a modified system of refrigeration as a a means of reducing air temperature when required. *In the event refrigeration was provided for only two of the three theatres for reasons of economy.*

Lighting Operating theatre lamps should be of the type which can take a camera, and the background lighting in the theatres will be provided by tungsten fittings. *In the event the three operating theatre lamps provided were not of the type which can take a camera.* All operating theatres should have an efficient blackout.

Supplies With sterilisation of instruments and dressing packs taking place in the CSSD, delivery of sterile instruments and packs should be by hoist directly to the theatre supply room serving the lay-up area of each theatre. After use instruments and packs should leave the operating theatre through the sluice area and 'dirty' corridor to the sorting room and wash-up area of the CSSD.

The hoist to the theatre supply room should be capable of taking a trolley with instrument trays, size 30in × 18in (76 cm × 46 cm). The trolley will remain in the supply room with the trays required for the operating list and will in effect form one of the cupboards provided in this room. A warmed cupboard for the storage of lotions must be provided and should be kept at blood heat, electrically operated and thermostatically controlled.

Frozen Sections and Pathology Specimens A frozen section recess should be provided in the vicinity of the theatres. It should have a worktop with cupboards above and an electric point for a microscope. Other specimens should go from the theatres to the pathology department by way of the 'dirty' corridor. *In the event specimens are passed through a hatch in the wall between the 'clean' corridor of the operating theatre suite and the pathology department. A bell in the pathology department notifies staff of the arrival of specimens for examination.*

Pathology

The pathology department should have separate laboratories for bio-chemistry, histology, bacteriology and haematology. It should also contain the hospital blood bank.

The patients' reception office and examination rooms should be on the same level as the main entrance hall and out-patient department with easy access to these areas.

* Medical Research Council, *Design and Ventilation of Operating Room Suites for Control of Infection and for Comfort,* The Lancet, 10 November, 1962, p.945.

The mortuary and post-mortem room should have direct access to the service yard and entrance. The mortuary should have an independent access for relatives and visitors. It should be remembered that bodies being taken to the mortuary must not be moved through the public corridors of the hospital.

Provision should be made for mechanical ventilation to this department as its probable proximity to Marlow Hill will preclude natural ventilation.

Benches in this department should have teak tops with an applied seal. These benches should be generally 3ft (90 cm) high except in histology where they should be at a height of 2ft 6in (75 cm).

Pharmacy

The pharmacy should be closely related to the main entrance hall so that facilities for dispensing to out-patients are conveniently placed for them. The accommodation in the department must include a preparation room and dispensary, a chief pharmacist's office, a general office, pre-packing and storage facilities, a bottle-washing room and sterile preparation room. There should also be an aseptic room and a spirit store.

The department requires direct access for the delivery of drugs by road and good access to the CSSD. Planning should allow for an easy work flow from pre-packing to storage and preparation, and then to issue to wards and out-patients.

There should be a waiting area for at least ten people adjacent the out-patient counter. If the main entrance hall could be planned adjacent the department, this hall could provide additional waiting space should the need arise. The out-patient counter requires a glass baffle and a lock-up flap.

A separate counter should be provided for issuing goods directly to hospital staff. Ward issues will be in baskets. Open racks for 24 baskets should be provided in the dispensary. Trolleys will be brought into the dispensary by porters two at a time and loaded with baskets for issue, approximately one basket for 20 beds. A trolley park in this area is not required.

It is not anticipated that mechanical ventilation will be required in the department but there should be a fresh air input to provide plenum ventilation to the aseptic room and possibly extract hoods over some items of equipment. Piped suction will be required in the preparation and sterile preparation areas, together with a town gas supply.

Sterile water will be provided in flasks by this department for the operating theatre suite.

Central Sterile Supply

This department should be designed to provide a full service of sterile dressings and instrument packs to all departments of the hospital including the future Phases 2 and 3, together with some services to other hospitals in the group. The department will also supply sterile dressings and packs to the operating theatre suite. Planning should allow for the rapid delivery of instrument packs direct from the sterile store of the CSSD to the operating theatre supply rooms and the return of dirty instruments to the CSSD by means of electric hoists.

It is desirable that plant in the CSSD, and the operating theatres to which it must be linked, should be serviced without maintenance

staff having to enter either department.

The CSSD equipment will include a rapid cooling fluids autoclave with a 21cu ft (0·60 cubic metre) capacity and a standby solutions steriliser.

Main Entrance Hall, Reception and Administration

The main entrance hall will provide access to the hospital for in-patients, out-patients (excluding accident and emergency cases), visitors and some of the staff. There will be another staff entrance in the service area for the use of staff whose changing rooms are at this level and whose times on and off duty are recorded.

With regard to car parking, provision should be made if possible for 148 cars. *In the event it was only possible to provide 137 spaces.* Three garages should be provided with the residential accommodation, Phase 1A. *In the event no garages were provided.*

In addition to general waiting and circulation space, the main entrance hall should contain an enquiry counter, patients' reception office and counter, medical secretaries' offices, medical social workers' offices, a tea bar, shop and two public telephones. The main records office will be provided with the out-patient department in Phase 2B but planning should allow for it to be placed immediately adjacent the patients' reception counter. *In the event the patients' reception office and counter and medical secretaries' offices were not provided in Phase 1B and are to be provided in Phase 2B.*

Offices for the hospital administrative staff, nursing administrative staff and secretarial staff should be easily accessible from the main entrance hall.

Lifts and stairs to the wards should be planned in a central position in the main entrance hall.

Medical Centre, Library and Chapel

These should be provided on the top floor of the hospital block. The medical centre must include a lecture theatre, a library for medical and technical staff, and a common room. This centre will be made available to local medical societies and similar associations. The lecture theatre and the chapel should form a combined unit with the sanctuary area of the chapel so planned that it can be isolated from the lecture theatre when required.

Service Area

The service area should be at lower ground floor level so that the service departments, with their own entrances for vehicles and staff, are at a different level from the public circulation. The service departments should be planned around the base of the hospital block with good vertical communication to the wards above. A service yard, large enough for big vehicles to enter and turn round, will have its entrance from Queen Alexandra Road. As far as possible loading and unloading of stores should take place under cover. The reception of all goods, including kitchen stores, will be controlled from one point.

The oil storage tanks should adjoin the yard entrance with a lay-by for oil tankers in order to avoid obstructing other service traffic.

Main Stores The main stores should be planned near the service entrance, allowing for a smooth flow of stores through reception, storage and issue, either to the hospital generally by means of a service corridor to the main lifts, or to the main kitchen which is to be on the same level as the stores. Stores will include bulk dry

food, bedding and linen, stationery, bulk pharmacy and CSSD goods, engineering and cleaning materials. A special store in an independent structure should be provided for inflammable materials.

Main Kitchen The main kitchen should be designed to cater for a peak load of 600 to 650 meals and will include a diet kitchen. It should be placed at the service level, allowing for convenient delivery of provisions from the main store and for the direct delivery of perishable goods from suppliers. The design should facilitate a smooth flow from store to preparation, from preparation to cooking area, and from cooking area either to the staff dining room servery, or to the Ganymede equipment which will be used for the service of food to patients.

In the kitchen stores area no separate milk room need be provided. There should be provision for an extension of refrigeration facilities at a later date. There should be facilities for checking and washing potatoes before they go into the potato peelers. In the fish and meat preparation area there should be an overhead rail for suspending the occasional carcass of meat. An ice-making machine to meet the needs of the whole hospital should be included. Patient food service will be by the Ganymede system. Trays for all main meals, complete with crockery and cutlery, will be set up on the conveyor then taken to the wards in tray trolleys. Subsidiary meals will be served from the kitchens on ward floors.

On completion of meals in the ward unit the ward maid will collect trays and return them to the main kitchen area where dirty crockery and other incidental items will be taken to the central wash-up area; replacement items being collected by the maid to replenish the ward kitchen store. This will involve larger stocks of glassware and crockery in ward units than would normally be provided.

The central wash-up area will include a large washing-up machine and two pairs of standby sinks. One of each pair will be a sterilising sink.

Dining Room A small separate dining room will be provided for medical staff. All other staff will use the main dining room which will have a cafeteria service. *In the event a separate dining room for medical staff was not provided because of Ministry of Health policy.* A separate room will be provided for those who wish to bring their own sandwiches. *In the event this room was not provided.* A staff lounge must be provided in the vicinity of the dining room.

Staff Changing Rooms A number of staff changing rooms for men and women – nursing, domestic and other staff – should be provided adjacent the staff entrance. Each changing room should include changing cubicles, shower and toilet accommodation, and provision of lockers for clothes.

Central Linen Service A soiled linen collection room with a washing machine for foul linen must be provided at the base of the linen chute serving the wards. The collection room should be placed so that there is good access from the service yard for loading linen into the laundry collection van. The clean linen section will be accommodated in the old hospital building.

Waste Disposal Waste materials will be collected in disposable paper bags, held in suitable containers which will be provided in dirty utility rooms, sluice rooms and ward kitchens, prior to

dispatch to the central incinerator.

Some refuse will be collected by the local authority and will consist as far as possible of materials which are not offensive or perishable. A refuse collection point will be planned near the entrance to the incinerator.

Waste disposal units will be provided in the central wash-up area and in ward kitchens to deal with food waste.

Engineering Services

Boiler House The boiler house should open off the service yard in a central position. Boilers will be oil fired but the installation should be designed to allow for conversion to solid fuel, should this prove to be necessary.

Emergency Electricity Supply A diesel generator will provide emergency power supply for the operating theatre suite, CSSD plant rooms, telephone exchange, blood bank, one lift and limited emergency lighting on all ward floors.

Telephone System A PABX (private automatic branch exchange) telephone system with 200 extensions will be used for both internal and external telephone communication. Some extensions will be barred to outgoing calls and all extensions will be barred to trunk calls, except through the hospital exchange.

Staff Location A staff location system, with personal receivers and VHF transmitter, will be required for staff location.

Pneumatic Tube Carrier System A pneumatic tube carrier system with sixteen sending/receiving stations will be required in this phase. Provision should be made for later extensions.

Lifts and Hoists An adequate number of passenger/bed lifts and service lifts should be provided. The passenger lifts should have automatic group control, but arrangements should be made so that one or all of these can be switched to independent operation when required. An adequate number of service hoists in the operating theatre suite and CSSD area should be provided.

Brief for Future Extensions

Although not described in detail the proposed content of Phases 2A, 2B and 3 is included here to put Phases 1A and 1B in context. It was intended that building operations on Phases 2A and 2B should follow closely on the completion of Phases 1A and 1B. This, in fact, has been the case.

Phase 2A: Extensions to Residential Accommodation

Accommodation should be provided for a further 38 student nurses, 17 trained staff, 1 senior nurse, 1 junior medical officer and some domestic staff. *In the event quarters for domestic staff were not provided.* Accommodation will be provided for a training school for nurses. It will not include an enrolled nurse training school as this will be based at Amersham General Hospital. *In the event it was agreed with the General Nursing Council that the enrolled nurse training school should be based at Wycombe General Hospital.*

Phase 2B: Extensions to Hospital

Accident and Emergency Department Two entrances are required leading to two distinct circulations, one for walking patients and the other for the seriously injured. A central work space should serve both sides of the department. A resuscitation room for two patients is required near the ambulance entrance. There will be

two operating theatres, nominally 'clean' and 'dirty', with shared anaesthetic room, sluice and other ancillary rooms. A 4-bed recovery ward should be provided adjacent the theatres. The plan should allow for the addition of an 8-bed day ward.

Out-patient Department The consulting and treatment facilities will consist mainly of standard consulting/examination rooms of 170sq ft (16 square metres). Fracture and orthopaedic clinics will be held in the department, using the plaster room facilities of the accident and emergency department. Chest clinics will also be held here. No special facilities are required for the VD clinic except that provision for a separate waiting space should be made. The department will contain a minor operating theatre suite.

X-ray Department This should have easy access to the accident and out-patient departments and to the lifts serving the main hospital block. Changing cubicles will be detached from the x-ray rooms and will be associated with a forward waiting space. It should be noted that film development will be by an automatic processing unit.

Physiotherapy and Rehabilitation Centre This department should have a separate external entrance for patients but should connect with the diagnostic departments.

Records Department The reception office, counter and medical secretaries' offices are provided in Phase 1, therefore Phase 2B will provide the remainder of the accommodation for the records department. As a general principle all clinical records will be kept centrally and provision should be made for ten years' records to be kept in the central department. *In the event the reception office and counter and the medical secretaries' offices were not provided in Phase 1B.*

Phase 3: Further Extensions to Hospital

The proposals for this phase are tentative. The Phase 3 extension will probably comprise an 80-bed obstetric and gynaecological unit, a 20-bed paediatric department, a 20-cot special care baby unit, ante-natal and post-natal clinics and a midwifery training unit. These extensions will supplement the existing gynaecological and paediatric services at the Amersham General Hospital.

It is considered that the combination of departments proposed for Phase 3 will be advantageous for staffing. The medical team responsible for both obstetrics and gynaecology will be readily on call for each department. The proximity of the maternity department to the paediatric department will ensure that specialist advice is easily available for mothers and babies in the special care baby unit.

Within the obstetric and gynaecological unit itself a functional grouping of accommodation is proposed. There will be an **acute area** for patients in labour or in need of special care, labour being conducted in comfortable single rooms equipped for normal deliveries with adjacent toilet facilities. There will be no separate admission or first-stage rooms. Patients requiring anaesthesia will be treated in an adjoining maternity theatre.

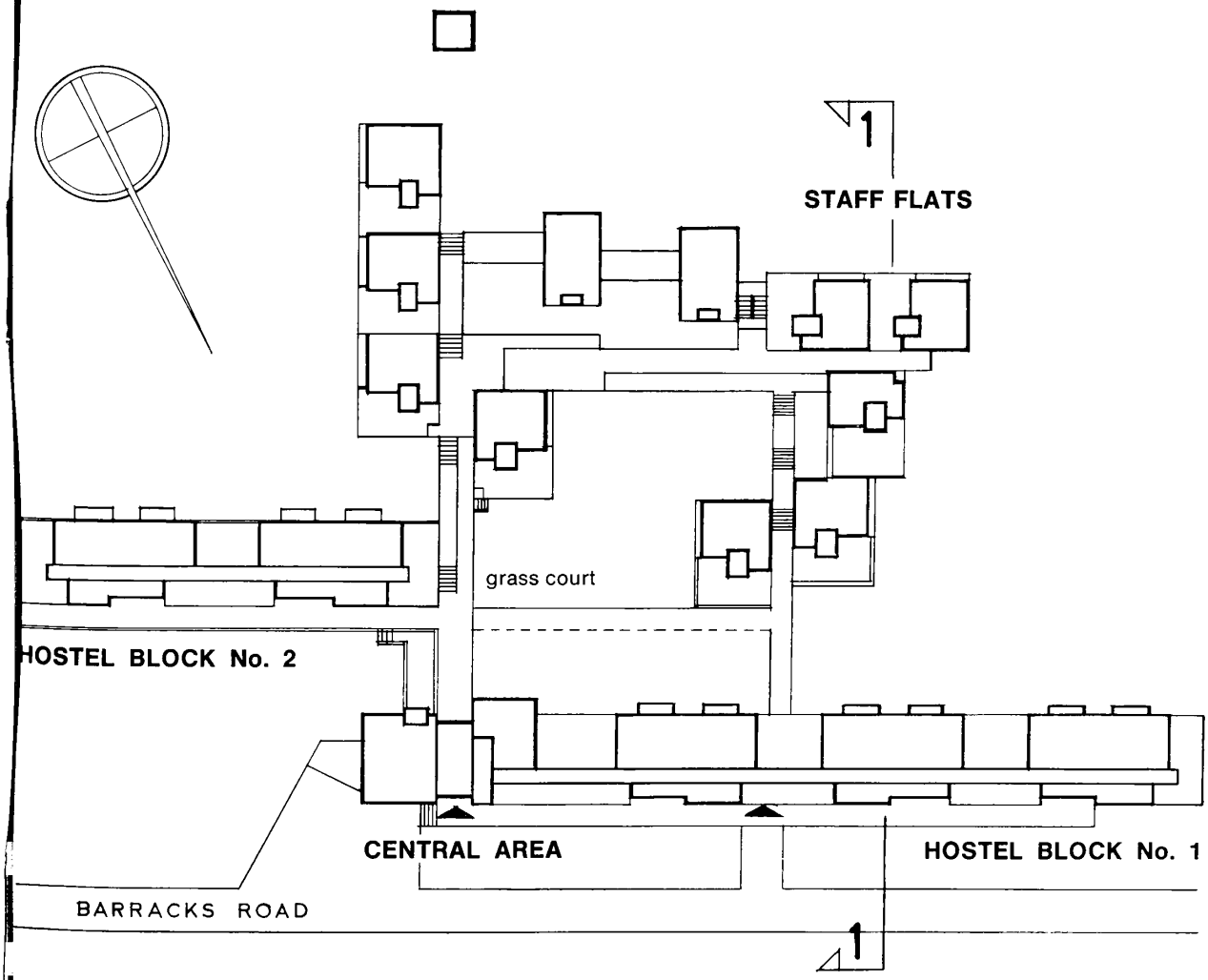
The proposed **bed area** for ante-natal, post-natal, and gynaecological beds should be provided on as large a floor as possible for ease of nurse supervision and control and it is intended that the floor should be planned to give flexibility in bed usage. Space for cots should be provided in close association with the bed groups so that observation and care of babies can be given by mothers who are fit

and it is not proposed to provide large separate nurseries. In a similar way the **special care baby unit** will provide special nursing facilities for premature babies and ill neonates without, it is hoped, depriving mother and baby of their close relationship.

Within the **ante-natal and post-natal clinics** it is intended that staff and facilities will be brought to the patient in individual consulting/examination rooms and patients will not be asked to move about the clinics for the different stages of their consultation.

Plans for Phase 1A: Residential Accommodation

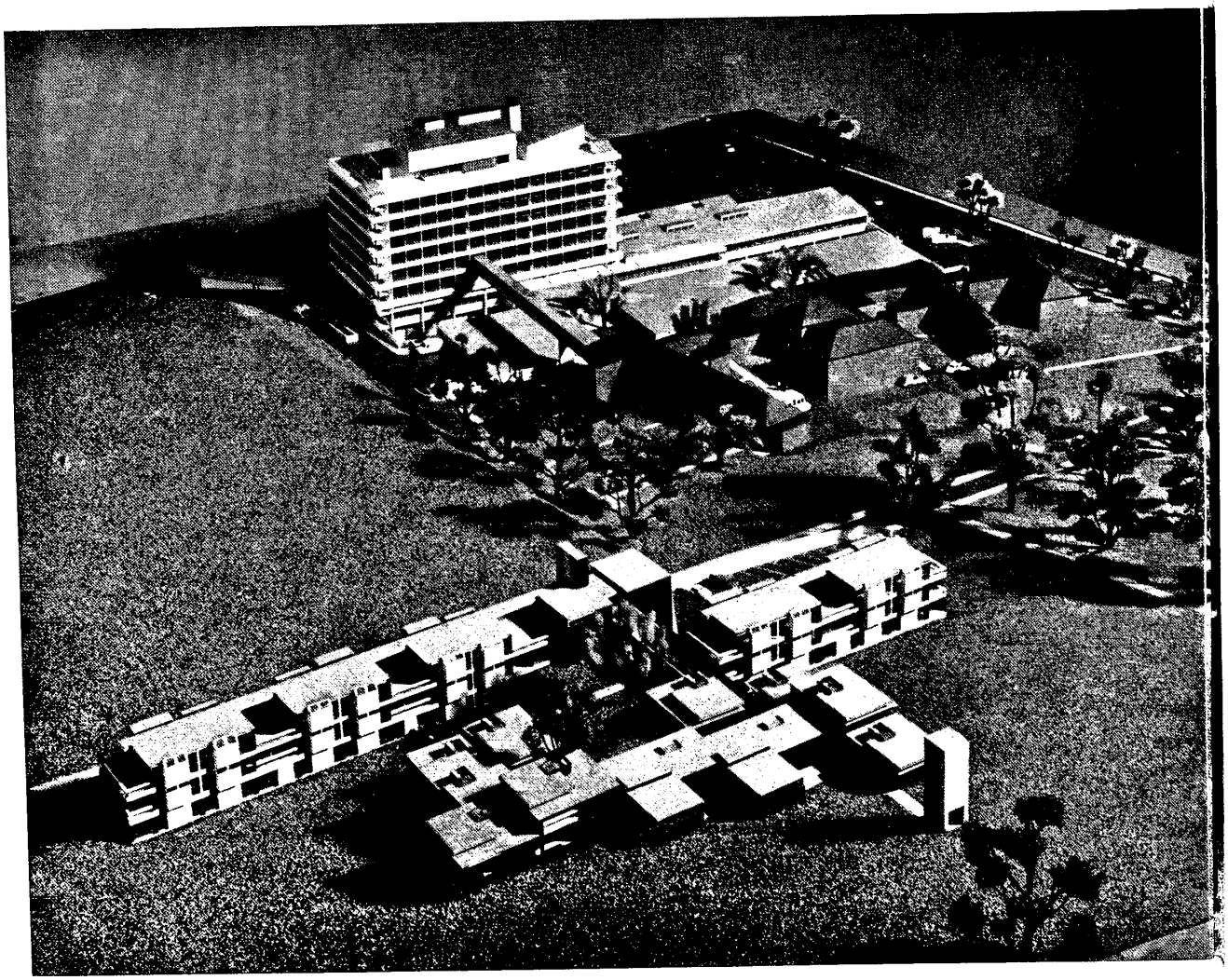
The site for the residential accommodation is one of the few remaining grass slopes enclosing High Wycombe. It has the advantage of being close to, but separate from, the hospital itself. Town planning regulations required that this residential accommodation should be arranged low on the hillside and



8 Block Plan of Phase 1A Scale 1/500 feet

that the buildings should not interfere with the horizon when viewed from the town.

The taller blocks of nurses' hostels are, therefore, set low on the site with the single and double storey staff flats approached up the hill by ramped paths and steps. The architects have made use of the slope and avoided long flights of steps. This has given an irregular pattern to the layout, although the dwellings are basically the same in plan. The layout is domestic in scale which contrasts agreeably with that of the buildings in the working part of the hospital, see Illustration 9.



9 Model of Phases 1A and 1B from West This shows residential accommodation in Phase 1A, foreground and hospital, Phase 1B in background with connecting bridge to old hospital building.

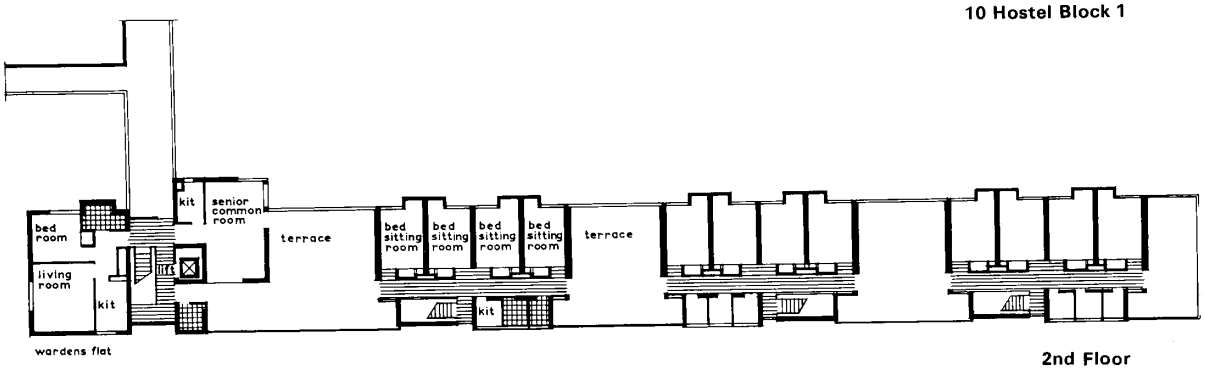
Layout Plans Illustrations 10–13 are simplified plans reproduced to a scale of 1in to 32ft. They show the general layout and disposition of rooms. Doors have been omitted for clarity. The key is shown below.

 Main circulation corridors

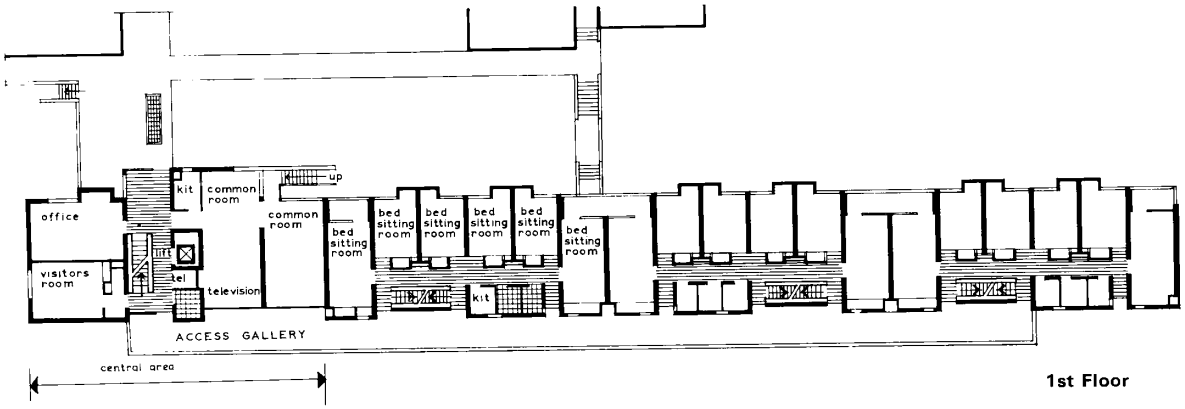
 Toilet areas

 Stairs

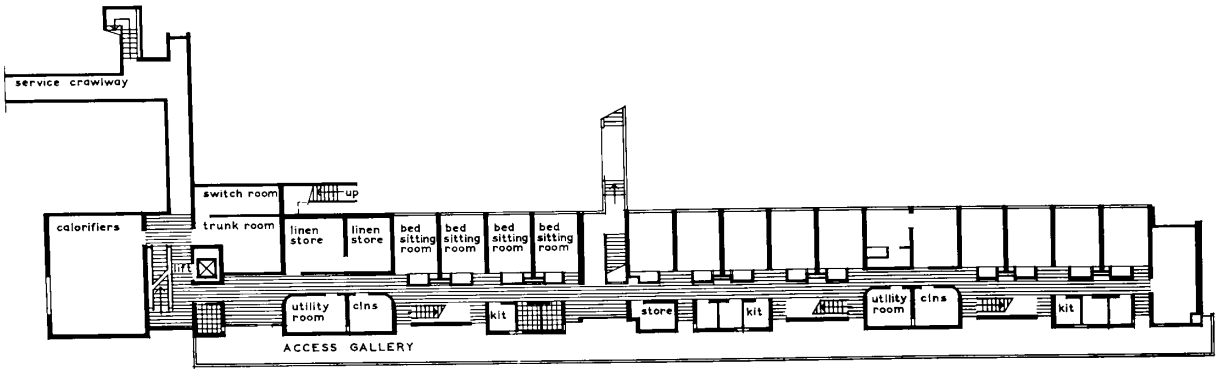
10 Hostel Block 1



2nd Floor

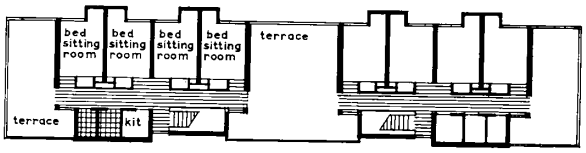


1st Floor



Ground Floor

11 Hostel Block 2



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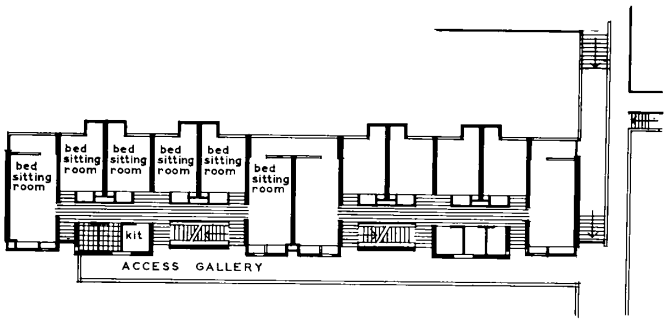
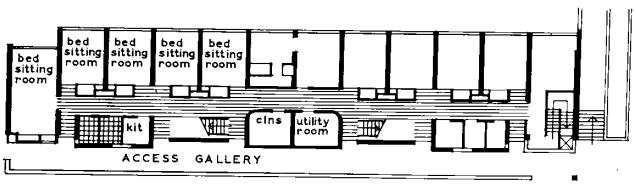


1st Floor



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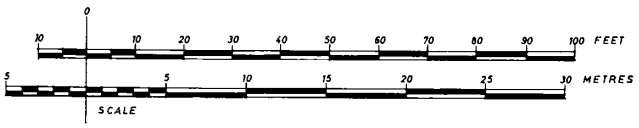
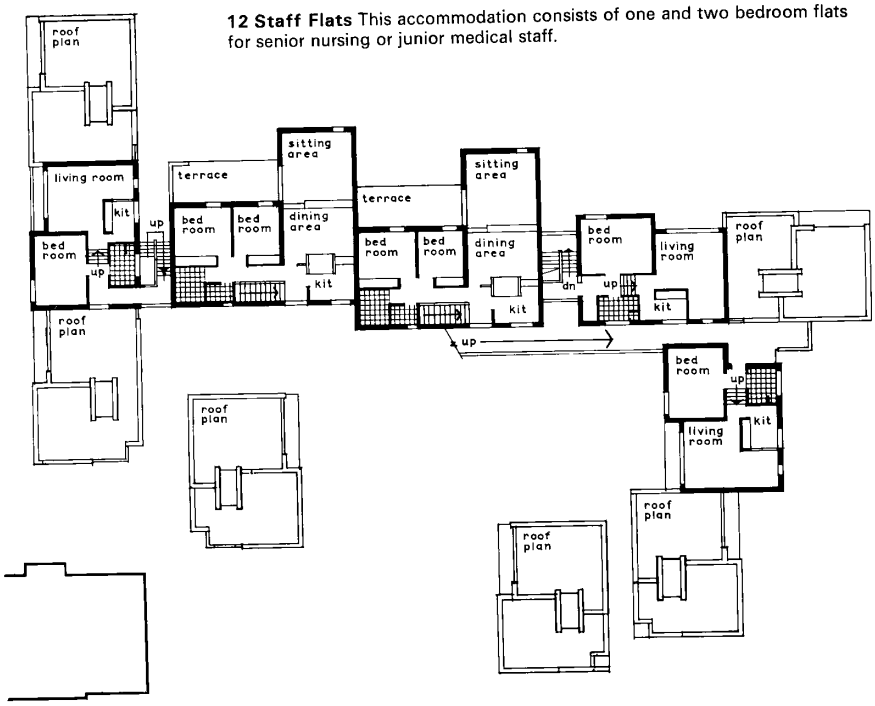
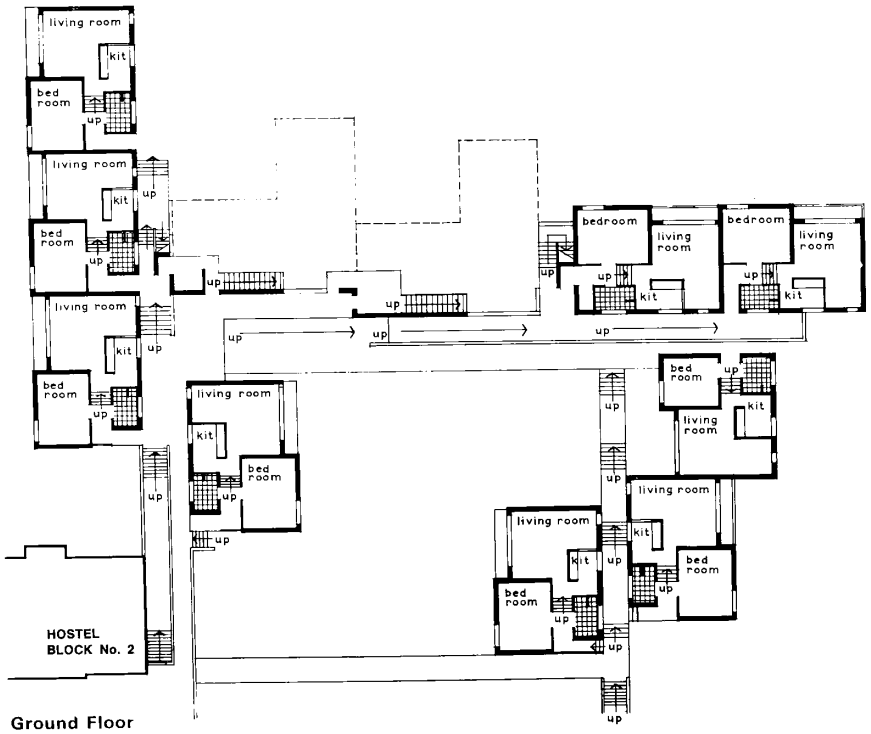


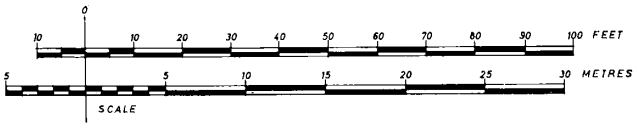
12 Staff Flats This accommodation consists of one and two bedroom flats for senior nursing or junior medical staff.



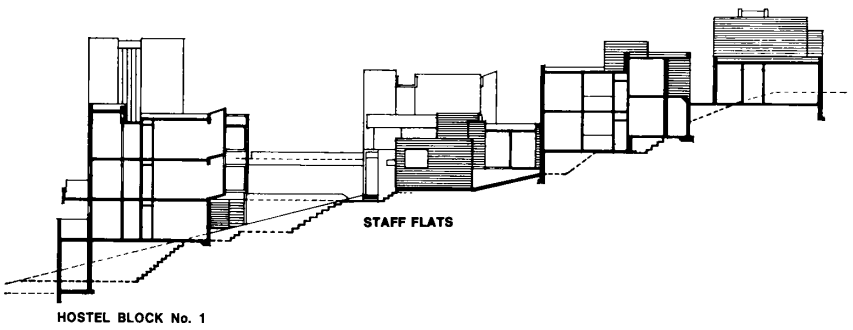
1st Floor



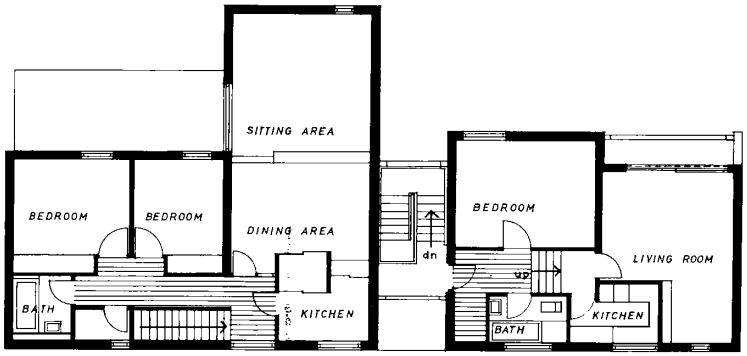
Ground Floor



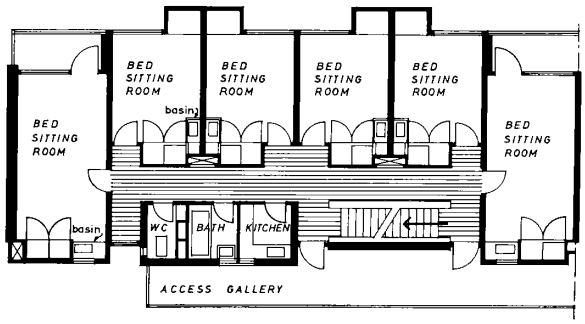
13 Section 1—1 Through Residential Accommodation



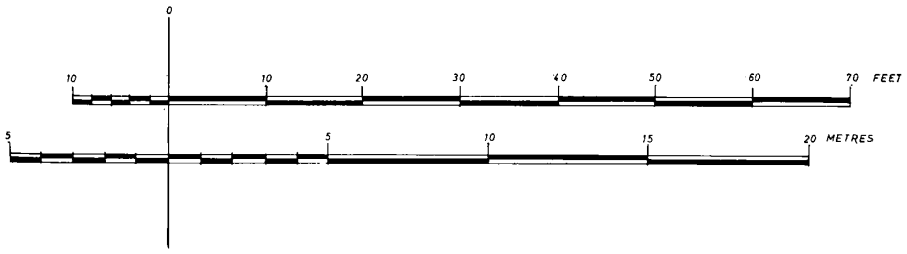
Detail Plans Illustrations 14 and 15 show certain areas to a larger scale and in greater detail than the preceding plans. These plans are reproduced to a scale of 1in to 16ft.



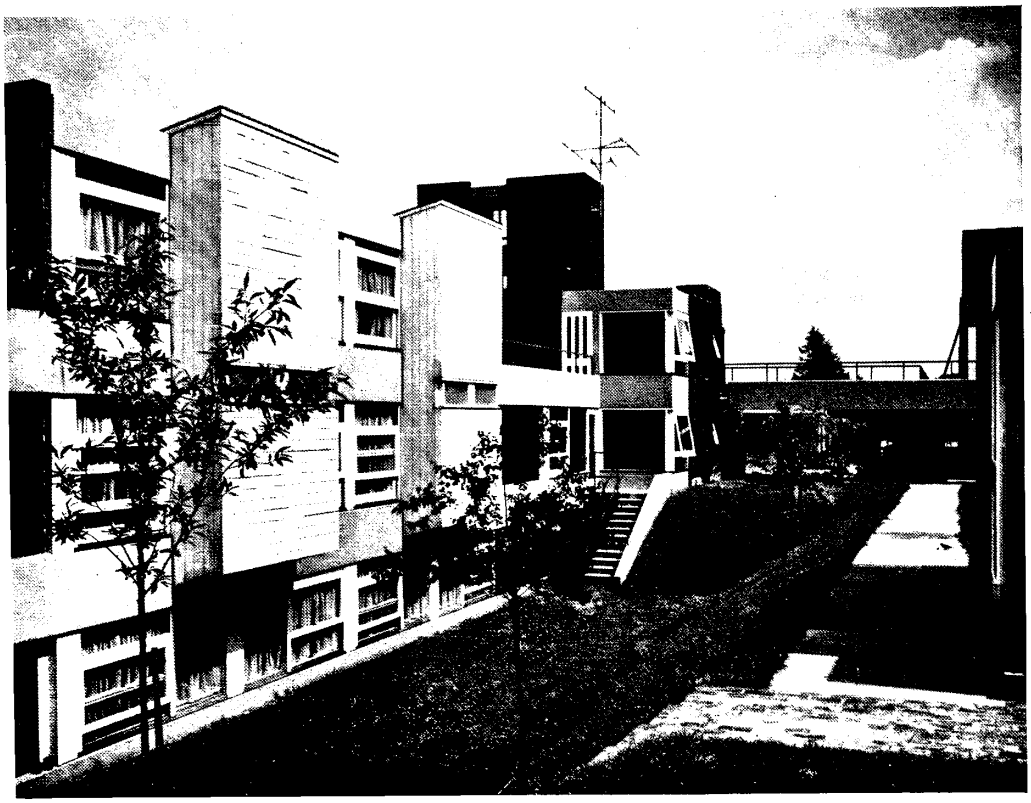
14 Two Typical Flats



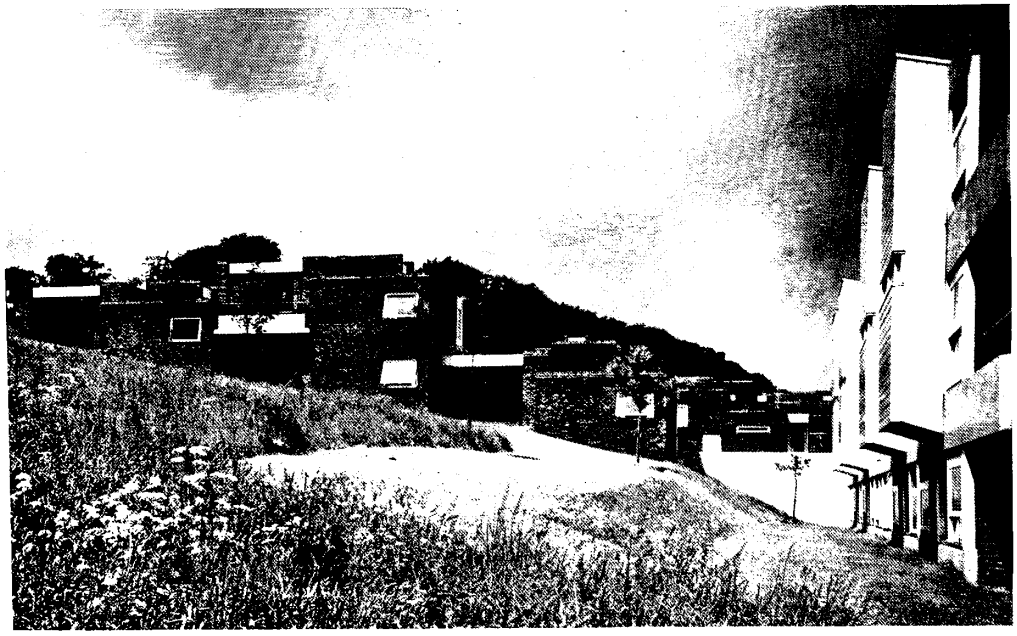
15 Typical Accommodation for Nurses



Photographs of Phase IA : Residential Accommodation



16 Hostel Block 1 The nurses' hostel expresses a domestic character in its architecture.



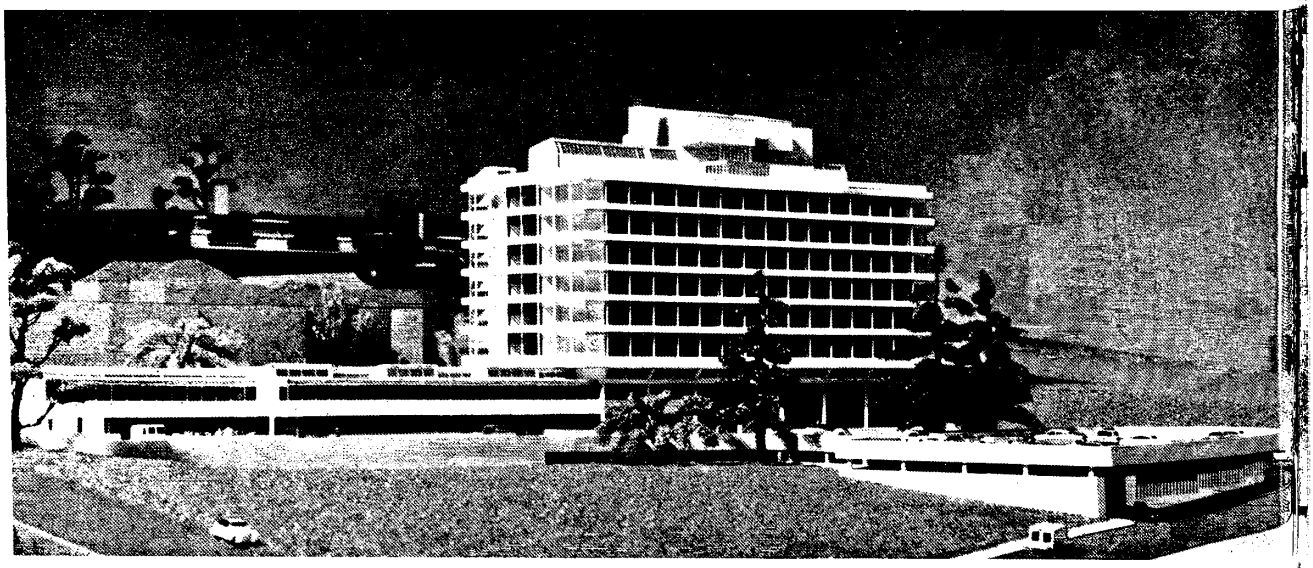
17 Flats and Hostel Block 2 View of residential accommodation from south-east showing flats for junior medical staff and senior nurses in centre and nurses' hostel block 2 on right.

18 Typical Bed-sitting Room for Nurses

Plans for Phase 1B: Hospital

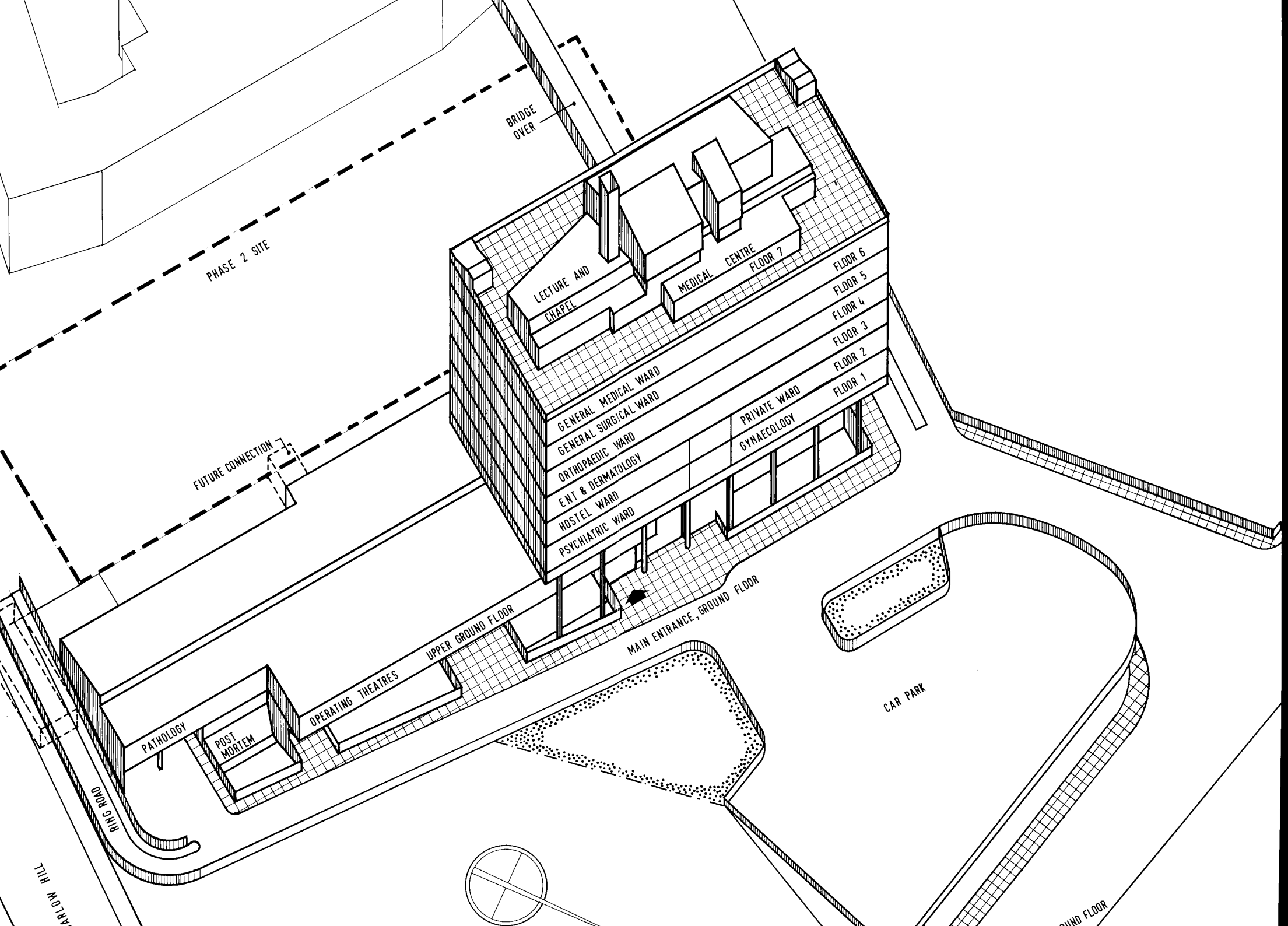
The order in which the Phase 1B hospital development took place had to be related to the urgency of local needs and the fact that the old hospital building had to be retained in use until a later phase in the development. This restricted planning on a difficult site, for while a sloping site usually helps a building architecturally, it complicates the circulation problems. The development of Phase 1B was made more difficult because at the time planning started the content of future phases was not decided. Phase 1B had to be planned to link with later phases up the hill some of which, like the diagnostic and out-patient departments in Phase 2, share facilities provided in Phase 1B. The diagnostic departments in the old hospital building had to be retained until the completion of new accommodation in Phase 2. This meant a covered footbridge had to be provided linking Phase 1B with the old hospital building, see Illustrations 4 ,7 and 9.

It was considered that the planning solution should be such that both immediate and future circulation routes should be kept simple and short, involving no more than single lift journeys. As far as possible hospital traffic, including services, supplies and staff, has been kept separate from public traffic, that is, patients and visitors. The only repetitive units in Phase 1B are the wards and, because of the narrow site available, the architects adopted a compact block with a 'race track' plan for them. It has been possible to provide a majority of the beds on elevations other than north and because of the open planning a high percentage of patients can enjoy sunshine. The outside form of the ward block was strongly influenced by the desire to combine the attractive characteristics of generous windows with privacy and protection from excessive sunlight. This has been achieved by means of recessed windows, balconies and vertical tinted glass sun screens. In the design of this hospital, see Illustrations 19 and 20, the aim has been to create buildings which not only satisfy functional requirements but which are also welcoming and have an atmosphere of an hotel rather than that of an institution.



19 Model of Phase 1B from East This shows the car park and service entrance from Queen Alexandra Road on the right. The operating theatres are to the left of the ward block.

20 Diagrammatic View of Phase 1B from East This shows the disposition of the main departments within Phase 1B.


BRIDGE OVER
PHASE 2 SITE
FUTURE CONNECTION
LECTURE AND CHAPEL
MEDICAL CENTRE
FLOOR 7
FLOOR 6
FLOOR 5
FLOOR 4
FLOOR 3
FLOOR 2
FLOOR 1
GENERAL MEDICAL WARD
GENERAL SURGICAL WARD
ORTHOPAEDIC WARD
ENT & DERMATOLOGY
HOSTEL WARD
PSYCHIATRIC WARD
PRIVATE WARD
GYNAECOLOGY
MAIN ENTRANCE, GROUND FLOOR
UPPER GROUND FLOOR
OPERATING THEATRES
PATHOLOGY
POST MORTEM
CAR PARK
RING ROAD
HARLOW HILL

Layout Plans

Illustrations 21–32 are simplified plans reproduced to a scale of 1in to 32ft. They show the general layout and disposition of rooms. Doors have been omitted for clarity. The key is shown below.

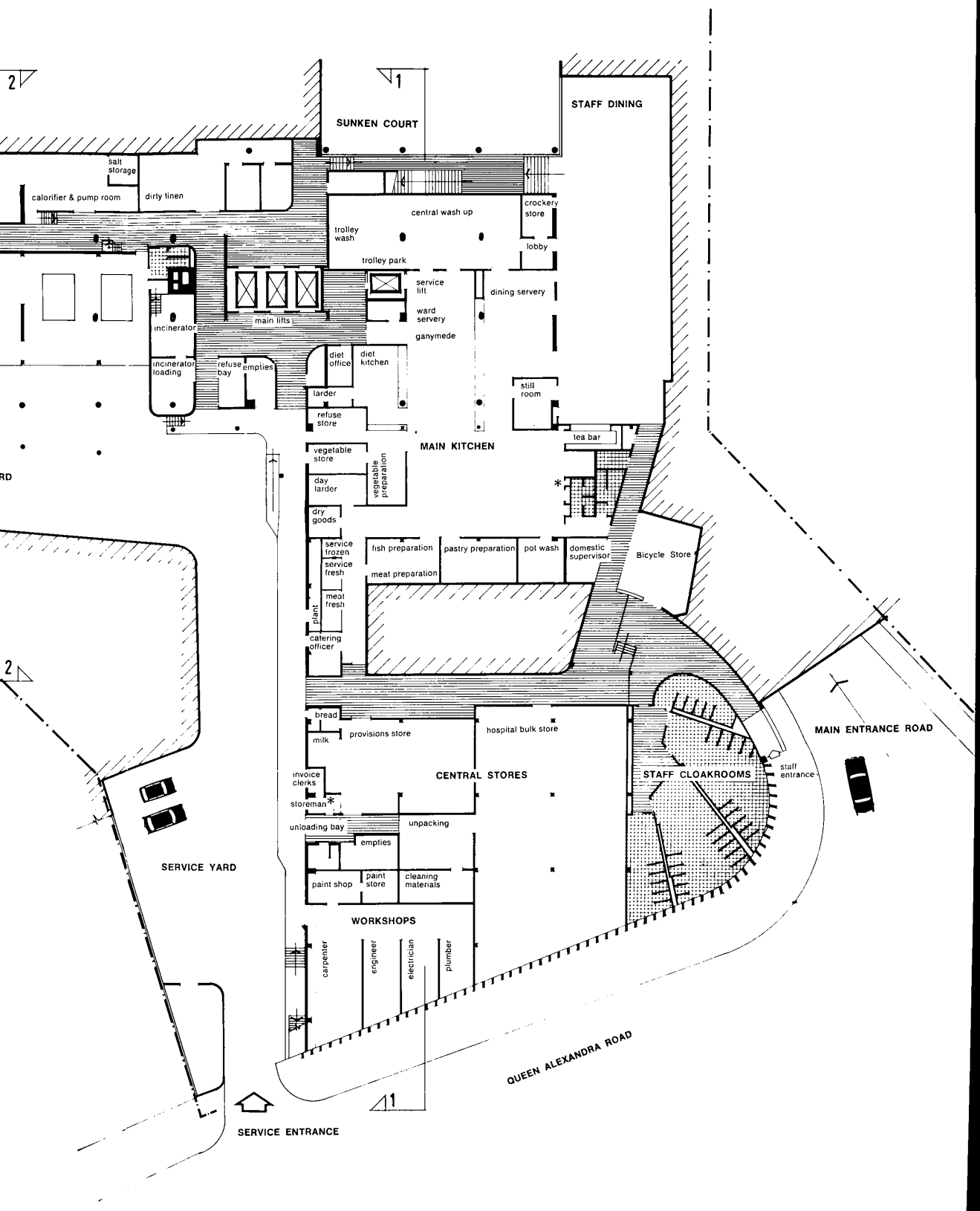
Main circulation corridors

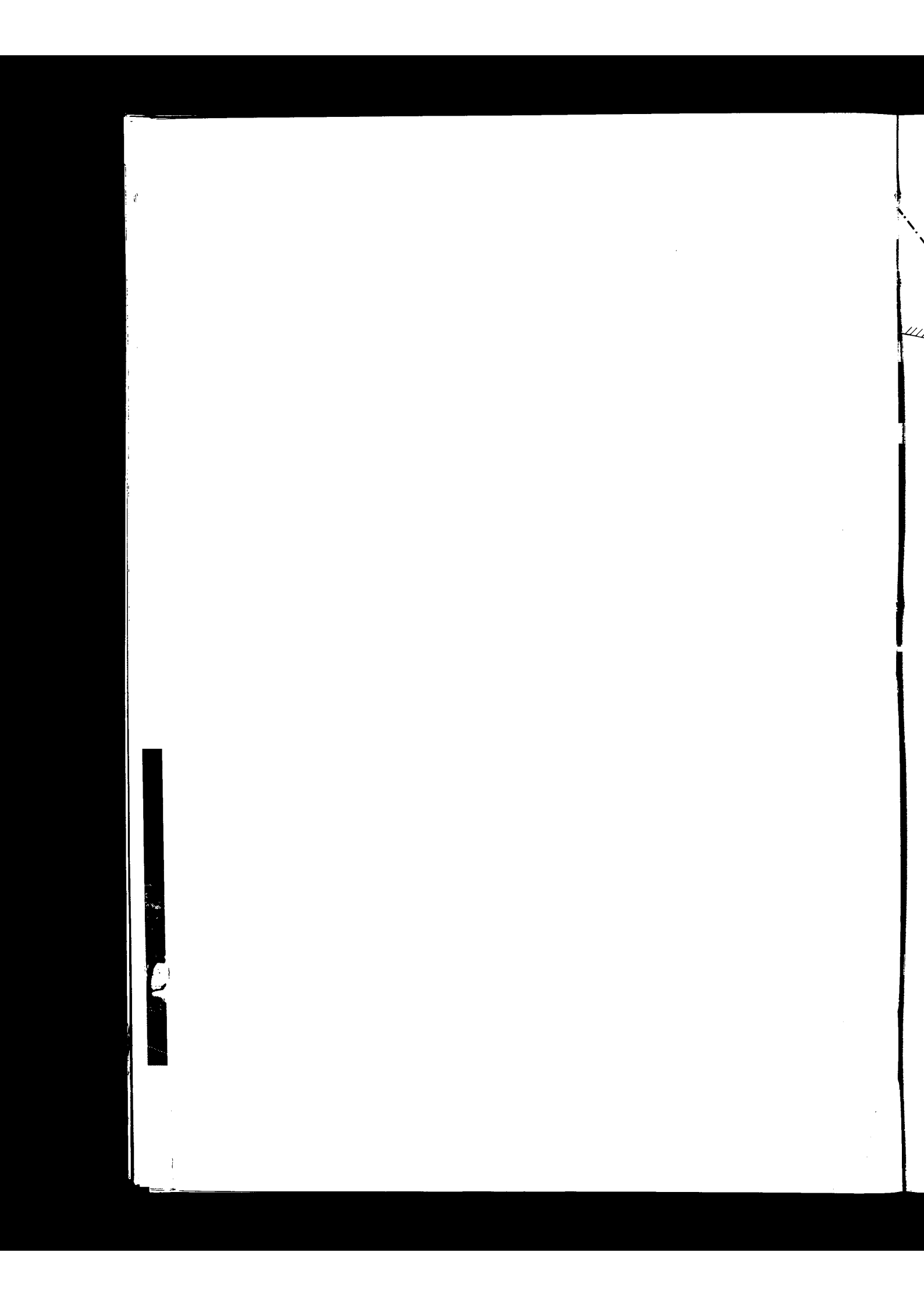
Toilet areas

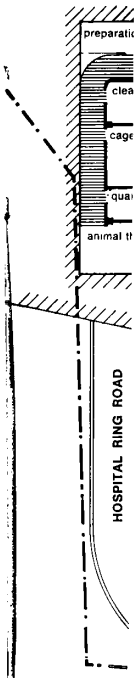
Stairs

* Pneumatic tube stations

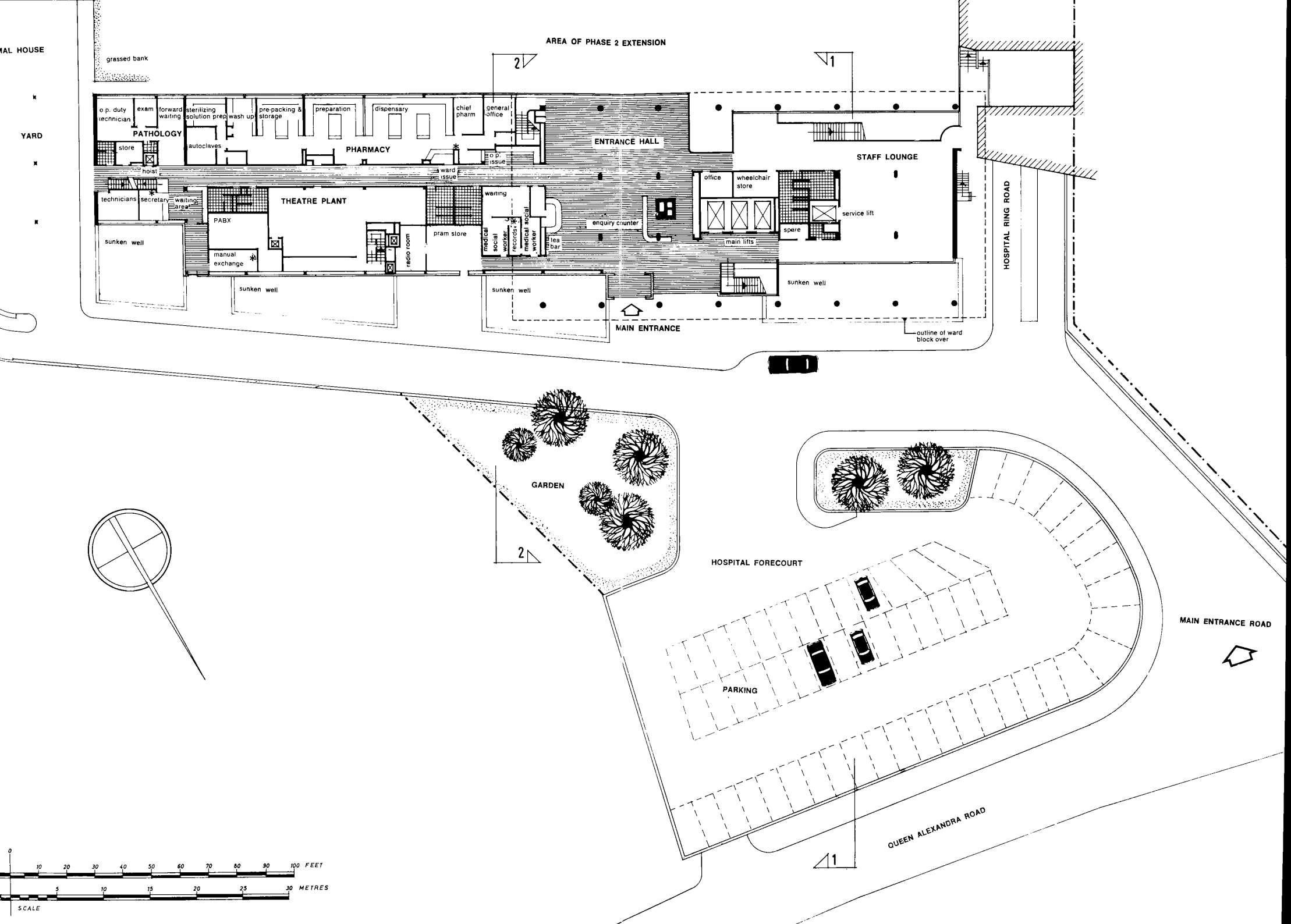
21 Lower Ground Floor: Service Area This plan shows the main service area of the hospital at the base of the ward block. The stores, workshops and service yard are all below the main car park and entrance to the hospital. The service entrance for deliveries and disposals is at this level off Queen Alexandra Road and there is a special staff entrance adjacent the main entrance road. The arrows noted 1-1 and 2-2 show the section lines for the building sections shown in Illustrations 31 and 32. Detailed plans of the kitchen area and the CSSD on this level are shown in Illustrations 33 and 34.


2
1
SUNKEN COURT
STAFF DINING
salt storage
calorifier & pump room
dirty linen
central wash up
crockery store
trolley wash
lobby
trolley park
service lift
dining servery
ward servery
ganymede
incinerator
main lifts
incinerator loading
refuse bay
empties
diet office
diet kitchen
larder
still room
refuse store
tea bar
MAIN KITCHEN
vegetable store
vegetable preparation
day larder
dry goods
service frozen
service fresh
fish preparation
pastry preparation
pot wash
domestic supervisor
Bicycle Store
meat preparation
meat fresh
plant
catering officer
2
bread
milk
provisions store
hospital bulk store
MAIN ENTRANCE ROAD
invoice clerks
CENTRAL STORES
STAFF CLOAKROOMS
staff entrance
storeman
unloading bay
unpacking
empties
SERVICE YARD
paint shop
paint store
cleaning materials
WORKSHOPS
carpenter
engineer
electrician
plumber
QUEEN ALEXANDRA ROAD
1
SERVICE ENTRANCE

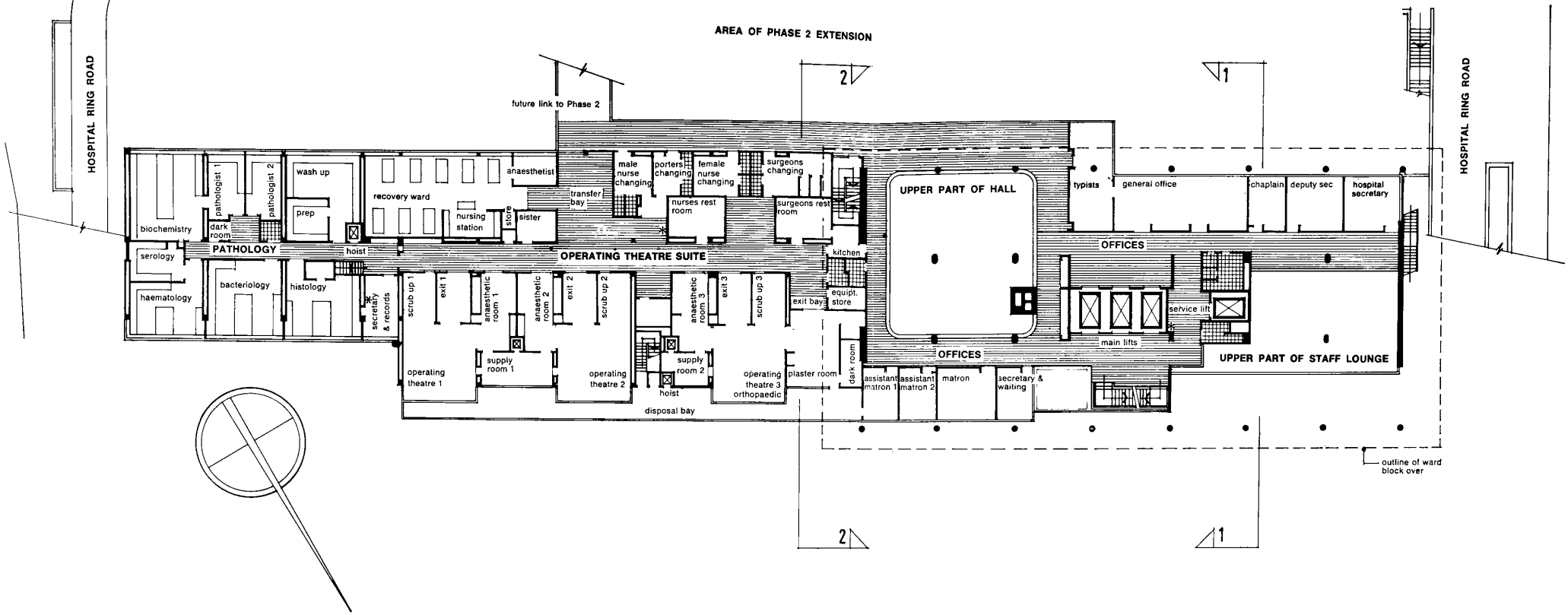


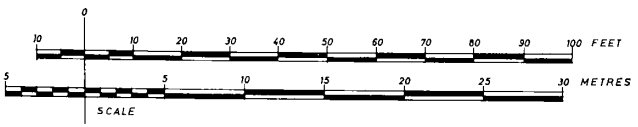


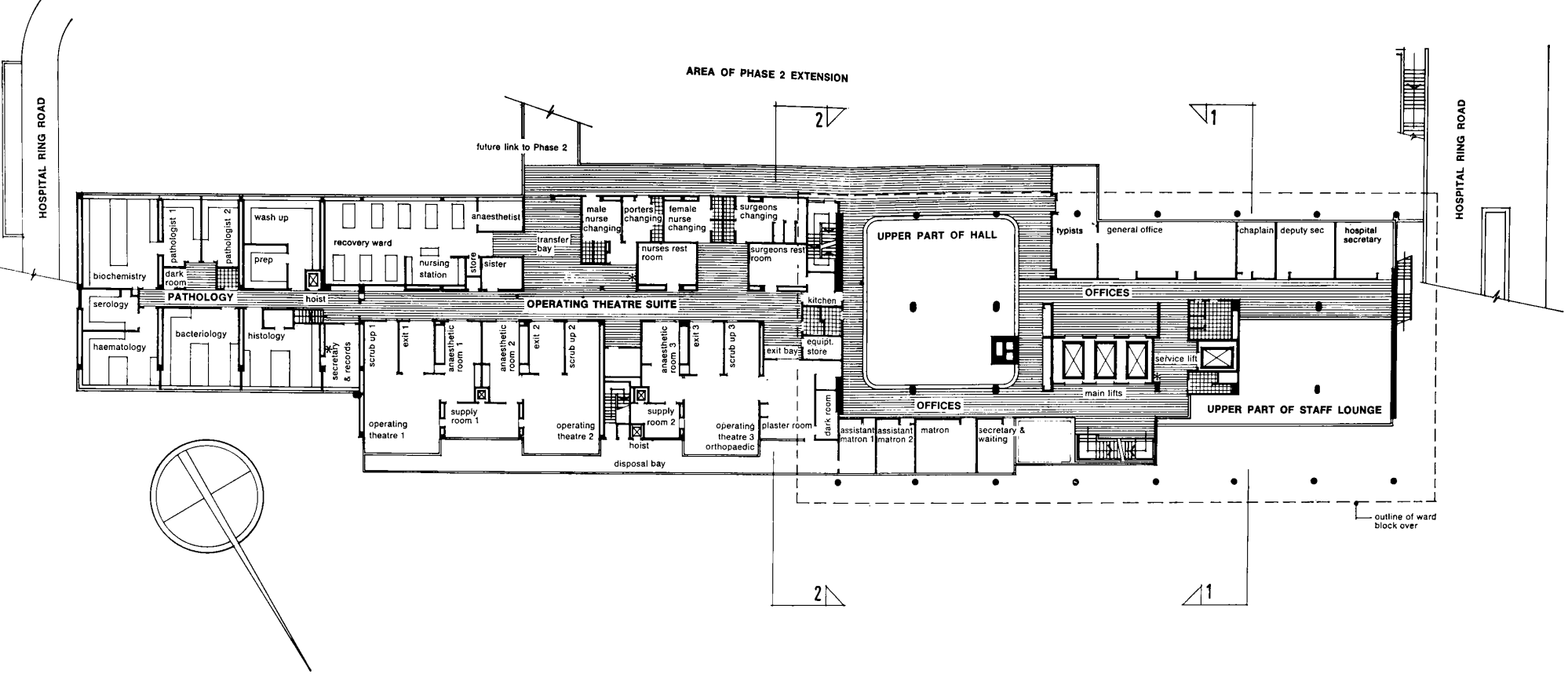
22 Ground Floor: Main Entrance, Pathology and Pharmacy This is the main entrance level and all patients (except accident and emergency cases) and visitors enter here past the enquiry counter. The entrance hall is to be extended south in Phase 2. The parking area extends over the stores, workshops and service yard of the lower ground floor. The plant room on this floor serves down to the CSSD on the lower ground floor and up to the operating theatre suite on the upper ground floor.


AREA OF PHASE 2 EXTENSION
grassed bank
o p. duty technician
exam
forward waiting
sterilizing solution prep
wash up
pre-packing & storage
preparation
dispensary
chief pharm
general office
PATHOLOGY
store
autoclaves
PHARMACY
o.p. issue
ward issue
hoist
ENTRANCE HALL
STAFF LOUNGE
office
wheelchair store
service lift
spare
main lifts
technicians
secretary
waiting area
THEATRE PLANT
PABX
manual exchange
radio room
pram store
waiting
medical social worker
records
medical social worker
tea bar
enquiry counter
sunken well
sunken well
sunken well
sunken well
MAIN ENTRANCE
outline of ward block over
HOSPITAL RING ROAD
GARDEN
HOSPITAL FORECOURT
PARKING
MAIN ENTRANCE ROAD
QUEEN ALEXANDRA ROAD
0 10 20 30 40 50 60 70 80 90 100 FEET
0 5 10 15 20 25 30 METRES
SCALE

23 Upper Ground Floor: Operating Theatres, Pathology and Administration This plan shows the location of the pathology department adjacent the operating theatre suite. A detailed plan of the operating theatre suite is shown in Illustration 35. The plan also shows how the hall and staff lounge extend up through two floors, and the extent of the ward block above has been indicated.


AREA OF PHASE 2 EXTENSION
HOSPITAL RING ROAD
HOSPITAL RING ROAD
future link to Phase 2
2
1
2
1
PATHOLOGY
biochemistry
pathologist 1
pathologist 2
dark room
wash up
prep
serology
haematology
bacteriology
histology
hoist
secretary & records
recovery ward
anaesthetist
nursing station
store
sister
transfer bay
OPERATING THEATRE SUITE
male nurse changing
porters changing
female nurse changing
surgeons changing
nurses rest room
surgeons rest room
scrub up 1
exit 1
anaesthetic room 1
anaesthetic room 2
exit 2
scrub up 2
anaesthetic room 3
exit 3
scrub up 3
operating theatre 1
supply room 1
operating theatre 2
supply room 2
hoist
operating theatre 3 orthopaedic
plaster room
exit bay
disposal bay
kitchen
equipt. store
UPPER PART OF HALL
OFFICES
dark room
assistant matron 1
assistant matron 2
matron
secretary & waiting
typists
general office
chaplain
deputy sec
hospital secretary
OFFICES
service lift
main lifts
UPPER PART OF STAFF LOUNGE
outline of ward block over

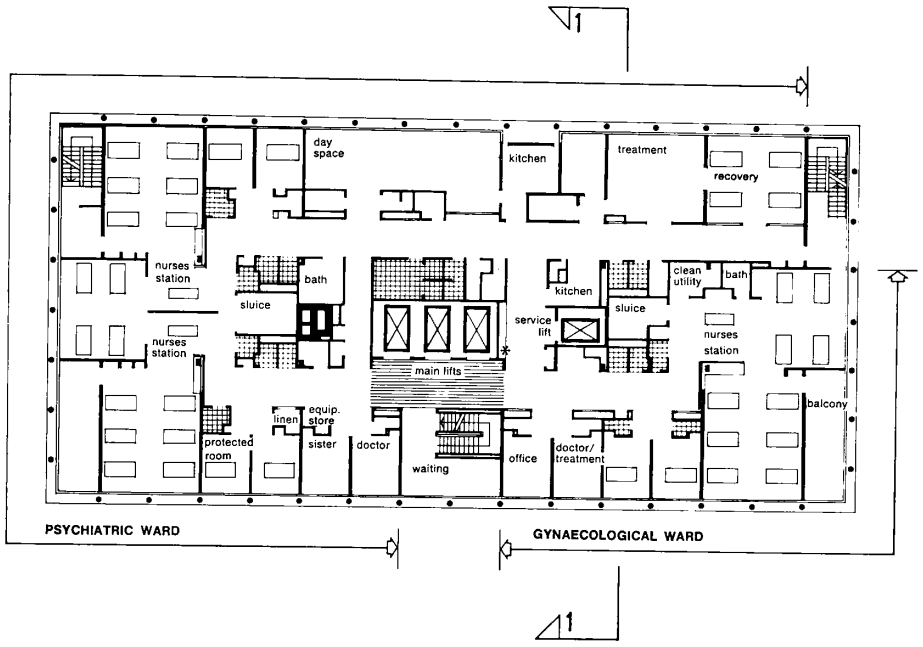

0
10 10 20 30 40 50 60 70 80 90 100 FEET
5 5 10 15 20 25 30 METRES
SCALE

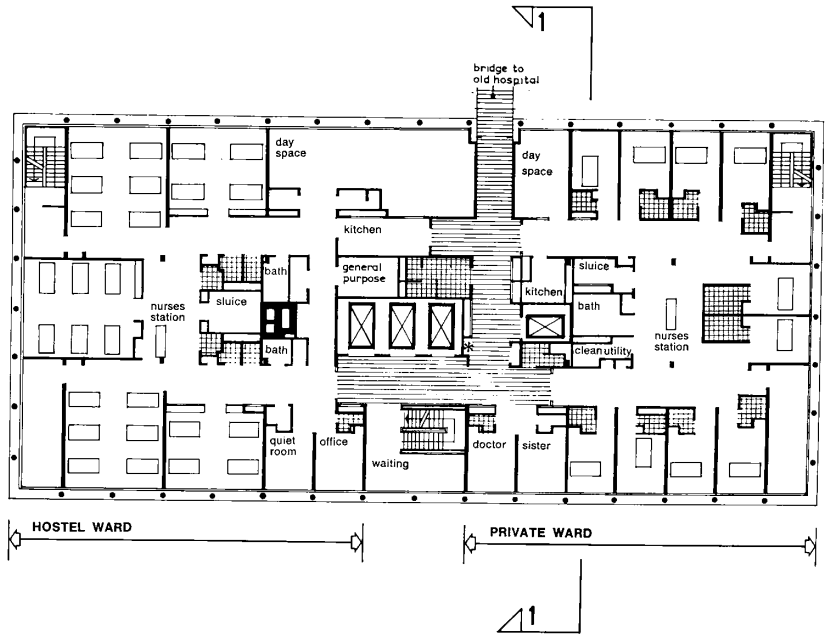

AREA OF PHASE 2 EXTENSION
HOSPITAL RING ROAD
HOSPITAL RING ROAD
future link to Phase 2
2
1
2
1
pathologist 1
pathologist 2
wash up
prep
recovery ward
anaesthetist
nursing station
store
sister
transfer bay
male nurse changing
porters changing
female nurse changing
nurses rest room
surgeons changing
surgeons rest room
biochemistry
dark room
serology
haematology
bacteriology
histology
PATHOLOGY
hoist
secretary & records
OPERATING THEATRE SUITE
scrub up 1
exit 1
anaesthetic room 1
anaesthetic room 2
exit 2
scrub up 2
anaesthetic room 3
exit 3
scrub up 3
exit bay
kitchen
equipt. store
operating theatre 1
supply room 1
operating theatre 2
supply room 2
hoist
operating theatre 3 orthopaedic
plaster room
dark room
disposal bay
UPPER PART OF HALL
OFFICES
assistant matron 1
assistant matron 2
matron
secretary & waiting
typists
general office
chaplain
deputy sec
hospital secretary
OFFICES
service lift
main lifts
UPPER PART OF STAFF LOUNGE
outline of ward block over

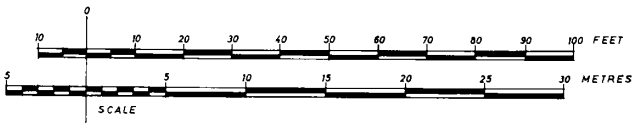

0
10 20 30 40 50 60 70 80 90 100 FEET
5 10 15 20 25 30 METRES

24 1st Floor: Psychiatric and Gynaecological Wards This is the first ward floor proper. The ward units are disposed round the central core of main lifts, service lift, stairs and ancillary rooms. There are two escape stairs in the top right (west) and top left (south) corners of the plan. The central core and escape stairs run up in the same way through all floors of the ward block although the disposition of the ward units varies around this core. A detailed plan of the general surgical ward floor to a larger scale is shown in Illustration 36.

25 2nd Floor: Hostel and Private Wards The hostel ward is for convalescent patients prior to discharge and for those patients who do not need the full services of an acute ward. It has a large day space and a quiet room. The private ward has only single rooms with individual toilet facilities.

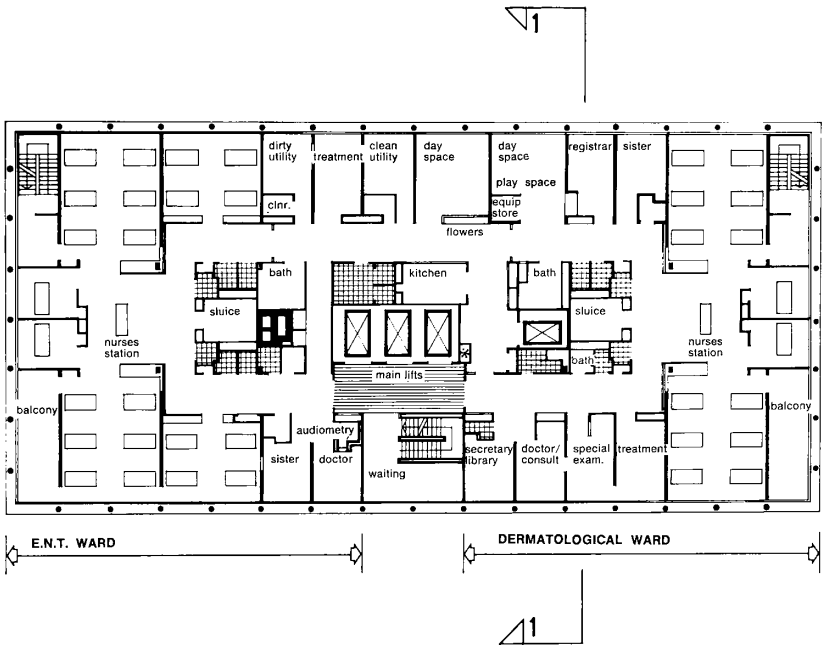

1
day space
kitchen
treatment
recovery
nurses station
bath
sluice
kitchen
clean utility
bath
service lift
sluice
nurses station
nurses station
main lifts
balcony
linen
equip. store
protected room
sister
doctor
waiting
office
doctor/ treatment
PSYCHIATRIC WARD
GYNAECOLOGICAL WARD
1

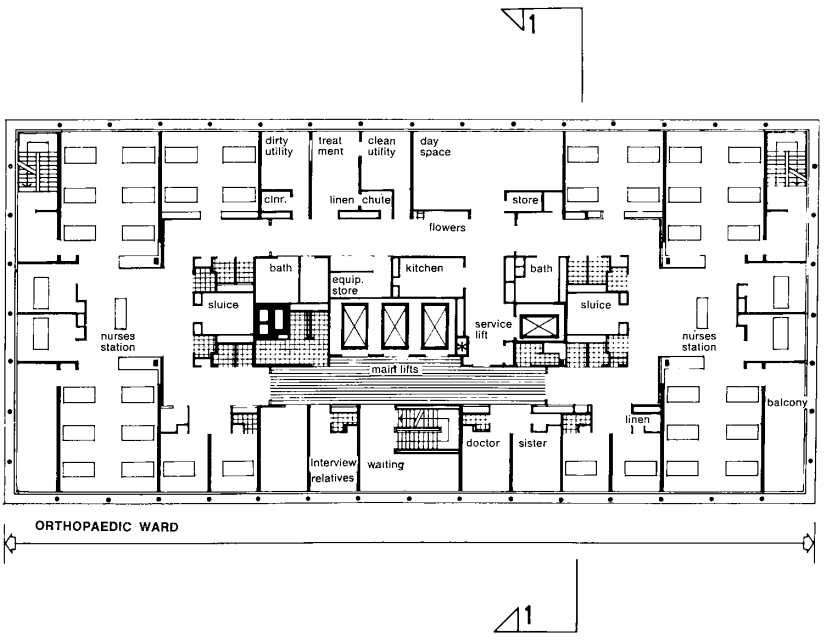

1
bridge to old hospital
day space
day space
kitchen
general purpose
bath
sluice
nurses station
sluice
kitchen
bath
clean utility
nurses station
bath
quiet room
office
waiting
doctor
sister
HOSTEL WARD
PRIVATE WARD
1

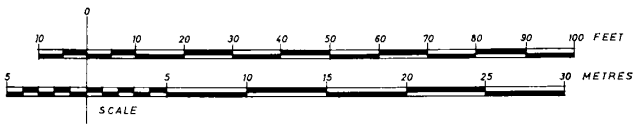

0
10
10
20
30
40
50
60
70
80
90
100 FEET
5
5
10
15
20
25
30 METRES
SCALE

26 3rd Floor: ENT and Dermatological Wards The day space on this ward floor is divided into two rooms, one being for children. The floor has, in addition to the usual treatment suite, a special treatment room in the dermatological ward and an audiometry cubicle in the ENT ward.

27 4th Floor: Orthopaedic Ward This is the first of three very similar wards showing the disposition of two 20-bed ward units round the central circulation and ancillaries core. The floor has a shared treatment suite and day space.

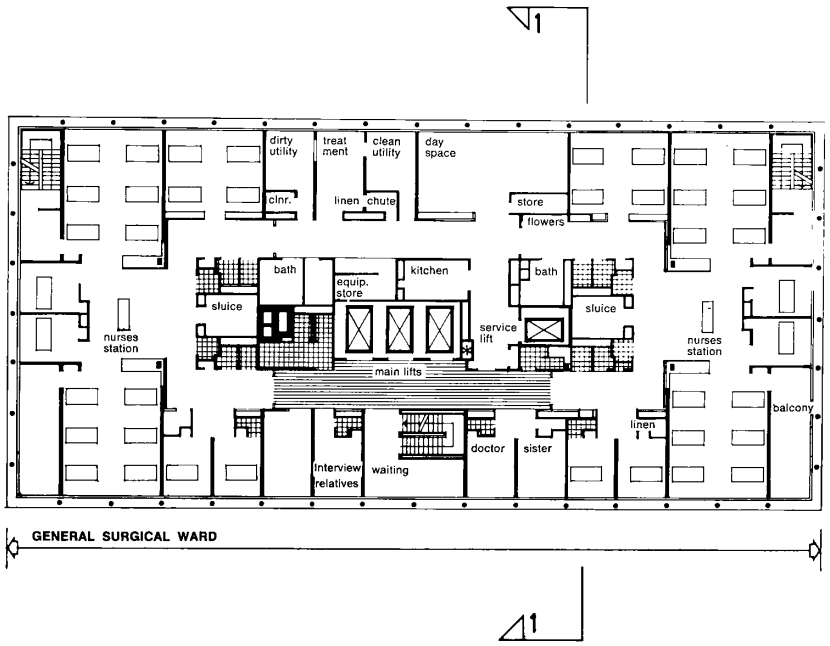

1
dirty utility
treatment
clean utility
day space
day space
registrar
sister
play space
equip store
clnr.
flowers
bath
kitchen
bath
sluice
sluice
nurses station
nurses station
bath
main lifts
balcony
balcony
audiometry
sister
doctor
waiting
secretary library
doctor/ consult
special exam.
treatment
E.N.T. WARD
DERMATOLOGICAL WARD
1

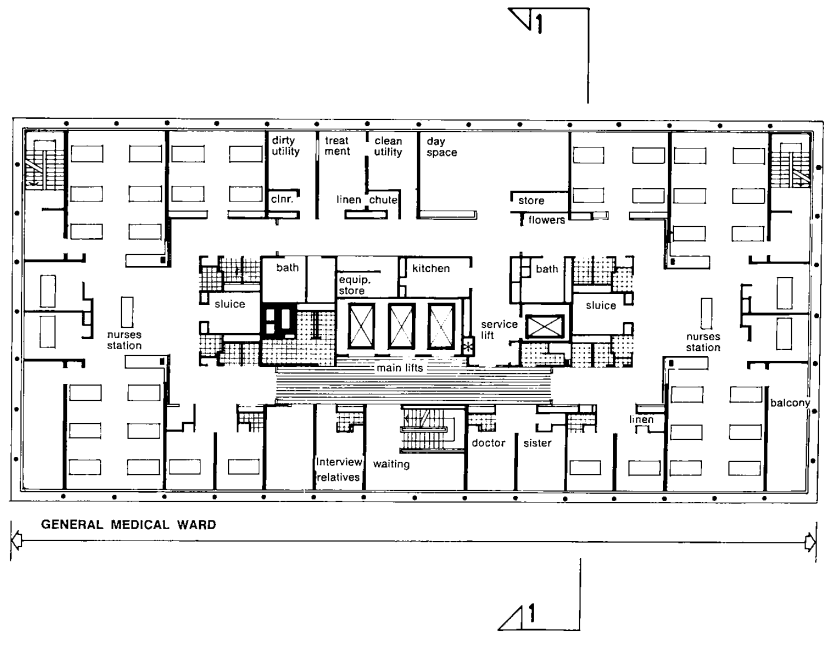

1
dirty utility
treat ment
clean utility
day space
clnr.
linen chute
store
flowers
bath
equip. store
kitchen
bath
sluice
sluice
nurses station
service lift
nurses station
main lifts
balcony
linen
doctor
sister
interview relatives
waiting
ORTHOPAEDIC WARD
1

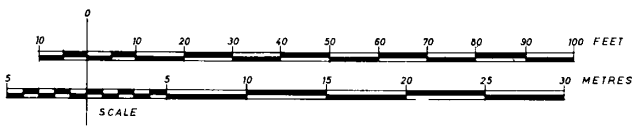

0
10
10
20
30
40
50
60
70
80
90
100
FEET
5
5
10
15
20
25
30
METRES
SCALE

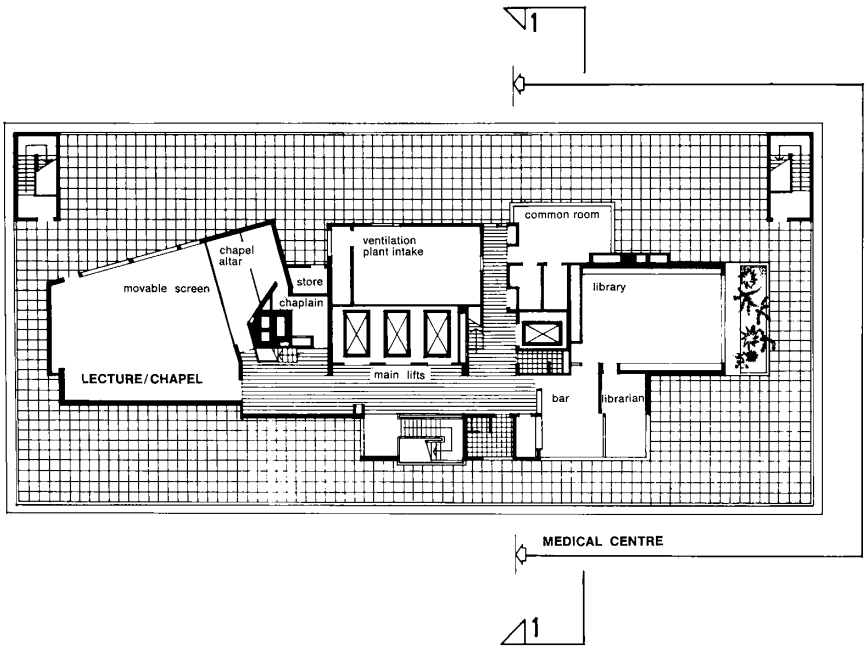
28 5th Floor: General Surgical Ward This floor is similar in disposition to the orthopaedic ward on the 4th floor.

29 6th Floor: General Medical Ward This floor is similar in disposition to the general surgical ward on the 5th floor with two 20-bed ward units which share a treatment suite, kitchen and day space.


1
dirty utility
treat ment
clean utility
day space
clnr.
linen chute
store
flowers
bath
equip. store
kitchen
bath
sluice
sluice
nurses station
service lift
nurses station
main lifts
balcony
linen
doctor
sister
Interview relatives
waiting
GENERAL SURGICAL WARD
1


1
dirty utility
treat ment
clean utility
day space
clnr.
linen chute
store
flowers
bath
equip. store
kitchen
bath
sluice
sluice
nurses station
service lift
nurses station
main lifts
balcony
linen
doctor
sister
Interview relatives
waiting
GENERAL MEDICAL WARD
1

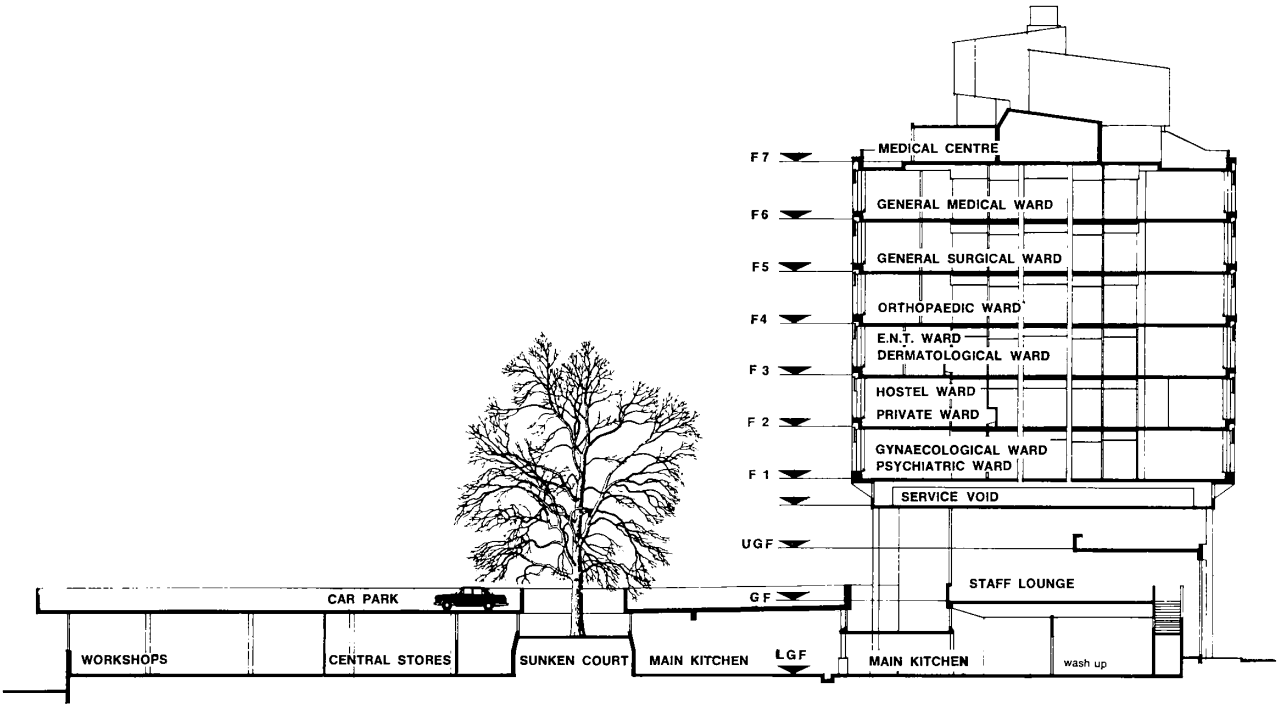

0
10 10 20 30 40 50 60 70 80 90 100 FEET
5 5 10 15 20 25 30 METRES
SCALE

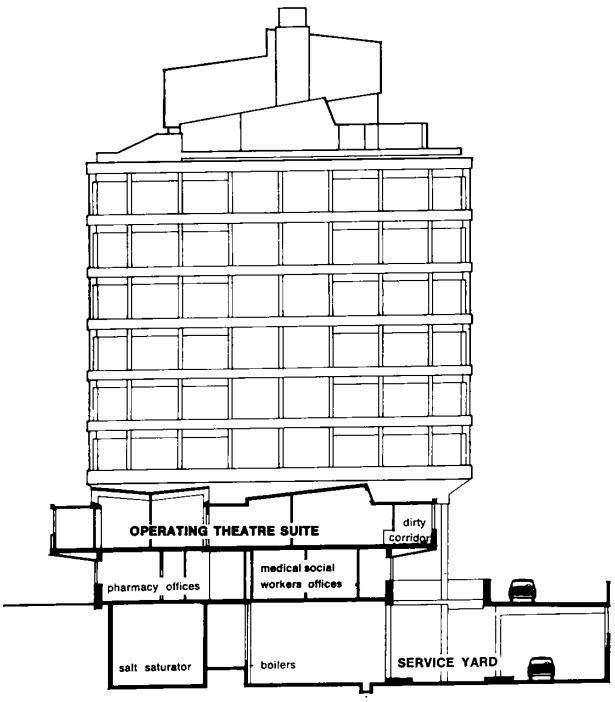


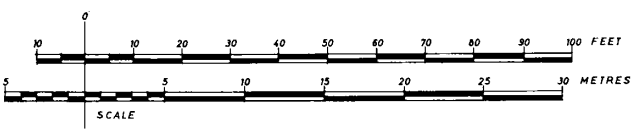
30 (above) 7th Floor: Medical Centre, Library and Chapel The medical centre on this floor is for the use of both hospital staff and medical practitioners in the area. The chapel can be used as a lecture room by moving the screen which encloses the altar. The roof acts as a viewing terrace. The fresh air intake for the ventilation plant is also located on this floor.

31 (top right) Section 1–1 through Hospital Block The section is taken through the ward block and service area. It indicates how the car park is planned over the stores and workshops, isolating these noisy areas from the wards. The position of the light well can be seen permitting natural light to penetrate to the kitchen and other areas on the lower ground floor.

32 (bottom right) Section 2–2 through Operating Theatre Suite and Service Area This section looks west in the opposite direction to Section 1–1. The position of the internal road over the service yard is shown and the clerestory lighting to the operating theatres can be seen (see also Illustration 42).

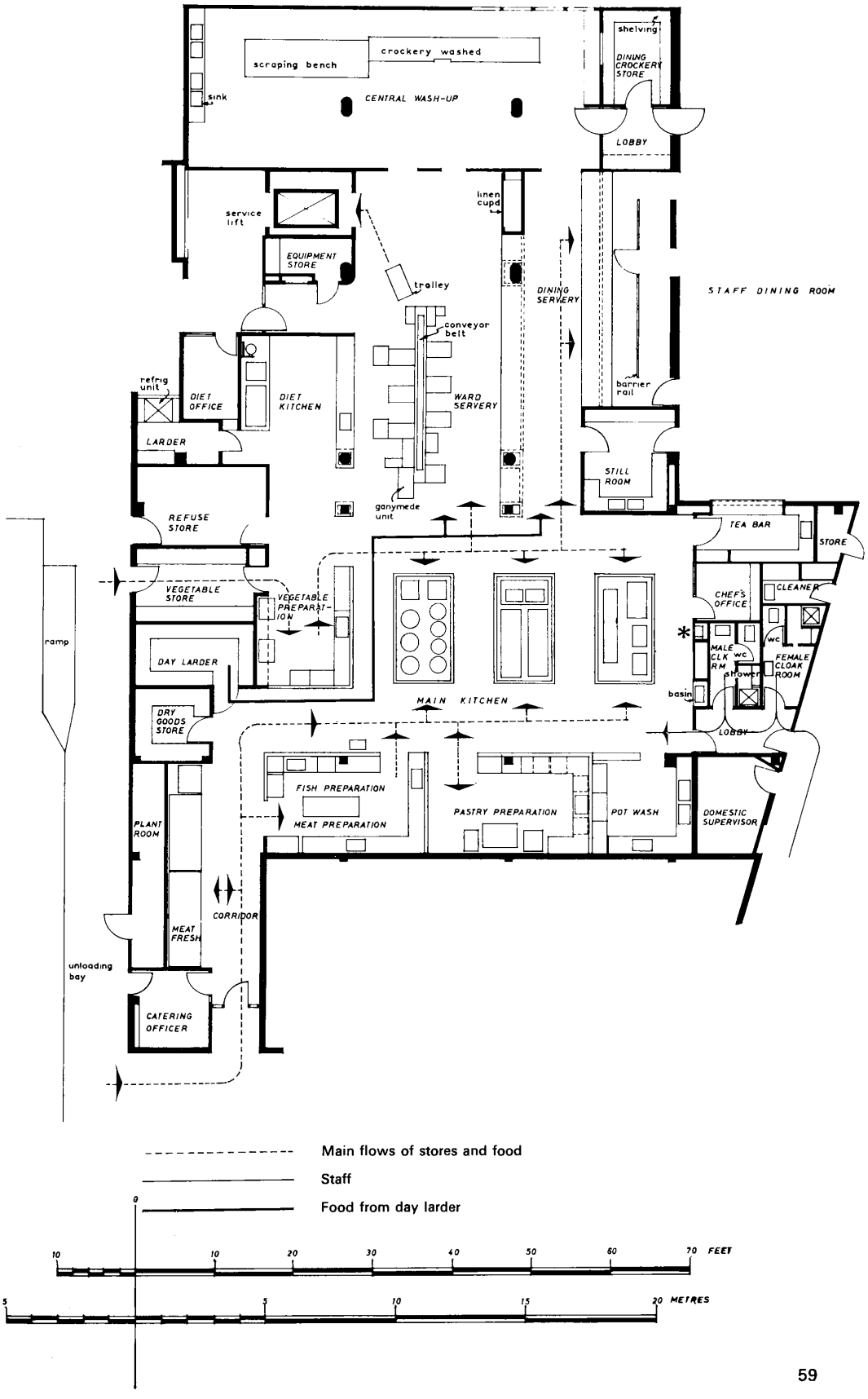

F 7
MEDICAL CENTRE
F6
GENERAL MEDICAL WARD
F5
GENERAL SURGICAL WARD
F4
ORTHOPAEDIC WARD
E.N.T. WARD
F 3
DERMATOLOGICAL WARD
HOSTEL WARD
F 2
PRIVATE WARD
GYNAECOLOGICAL WARD
F 1
PSYCHIATRIC WARD
SERVICE VOID
UGF
STAFF LOUNGE
CAR PARK
GF
WORKSHOPS
CENTRAL STORES
SUNKEN COURT
MAIN KITCHEN
LGF
MAIN KITCHEN
wash up

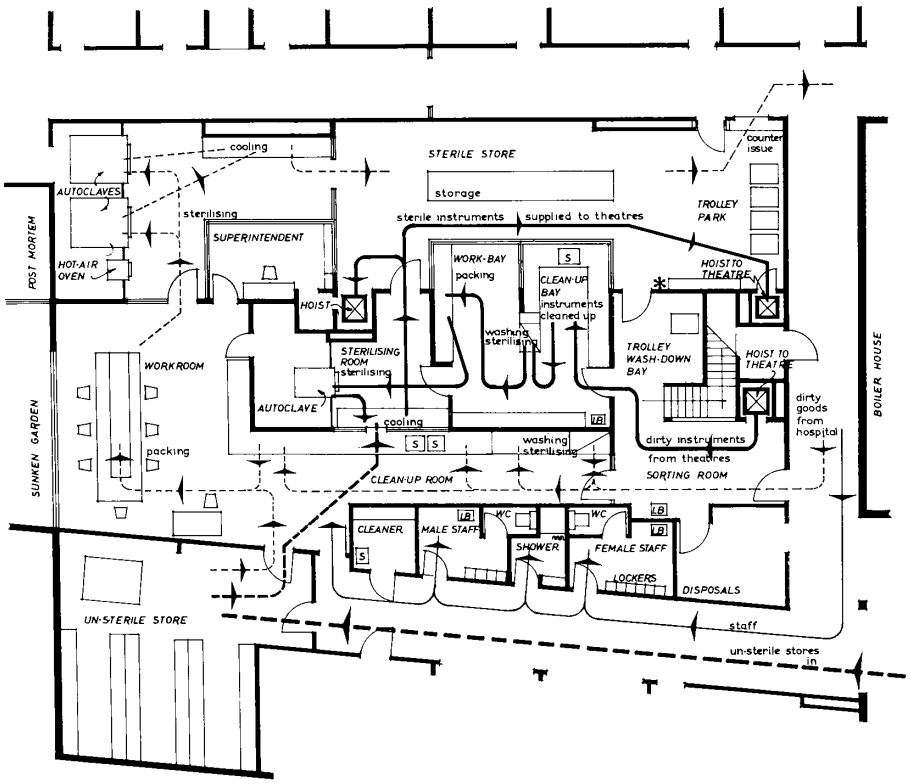

OPERATING THEATRE SUITE
dirty corridor
medical social workers offices
pharmacy offices
salt saturator
boilers
SERVICE YARD


0
10 10 20 30 40 50 60 70 80 90 100 FEET
5 5 10 15 20 25 30 METRES
SCALE

Detail Plans Illustrations 33–36 show certain areas to a larger scale and in greater detail than the preceding plans. These plans are reproduced to a scale of 1in to 16ft and show all doors and the major equipment. Where appropriate, circulation routes are shown in a different colour and these are keyed on each plan.

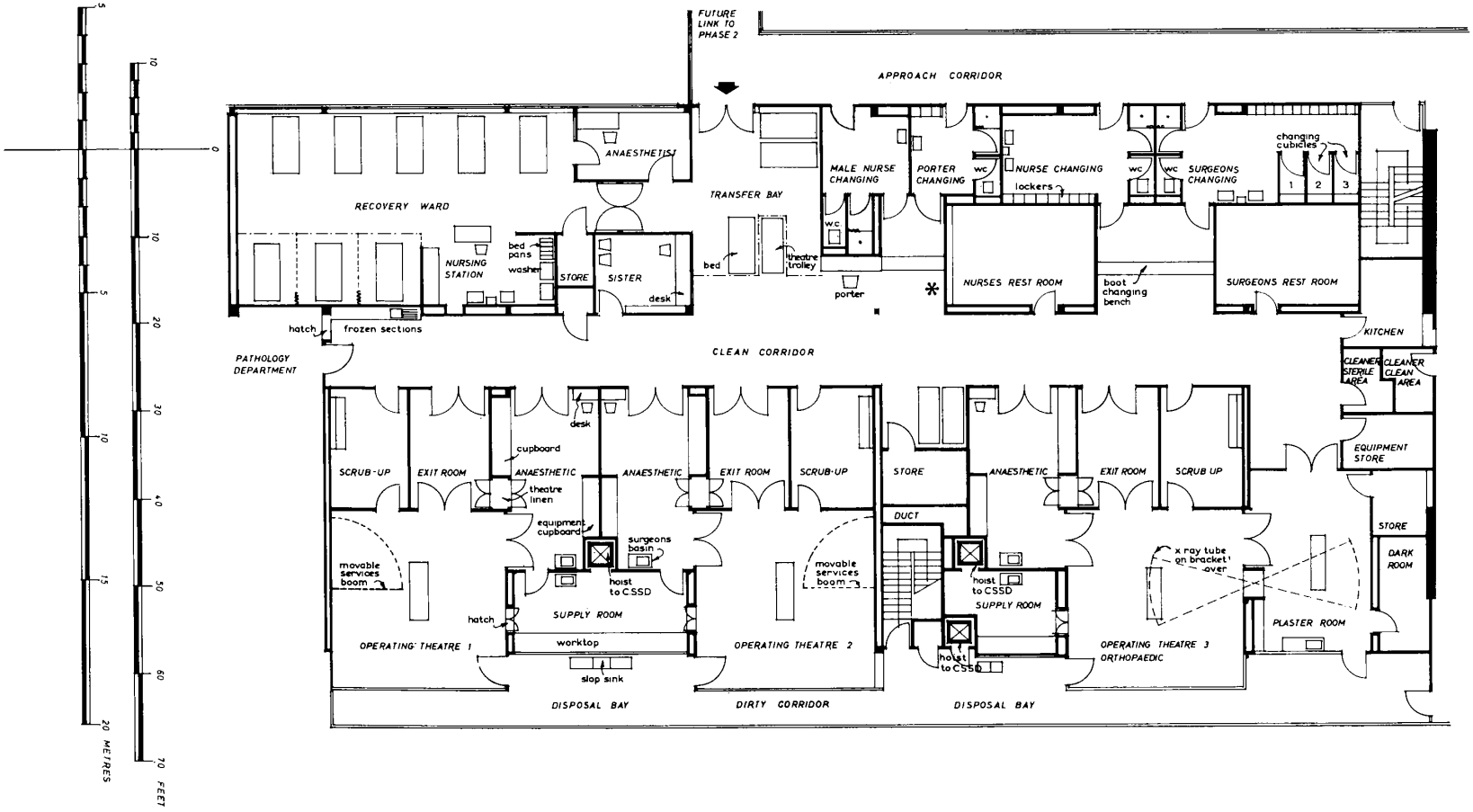
33 Kitchen Area (showing circulation) The storage and cooking area of the kitchen (on the lower ground floor) is conventional for a kitchen serving up to 650 meals a sitting. Food service for patients is carried out by the Ganymede system where individual plates are prepared for each patient on a conveyor belt. The food is then conveyed to the wards in trolleys by the service lift. Crockery from all the wards is washed up centrally in the large washing-up machine. Food service to the staff dining room is by cafeteria service.


scraping bench
crockery washed
sink
CENTRAL WASH-UP
shelving
DINING CROCKERY STORE
LOBBY
service lift
linen cupd
EQUIPMENT STORE
trolley
DINING SERVERY
STAFF DINING ROOM
conveyor belt
refrig unit
DIET OFFICE
DIET KITCHEN
WARD SERVERY
barrier rail
LARDER
STILL ROOM
ganymede unit
REFUSE STORE
TEA BAR
STORE
VEGETABLE STORE
VEGETABLE PREPARATION
CHEF'S OFFICE
CLEANER
ramp
DAY LARDER
MALE CLK RM
wc
shower
FEMALE CLOAK ROOM
basin
MAIN KITCHEN
DRY GOODS STORE
LOBBY
FISH PREPARATION
MEAT PREPARATION
PASTRY PREPARATION
POT WASH
DOMESTIC SUPERVISOR
PLANT ROOM
CORRIDOR
MEAT FRESH
unloading bay
CATERING OFFICER
Main flows of stores and food
Staff
Food from day larder
0
10
10
20
30
40
50
60
70 FEET
5
5
10
15
20 METRES

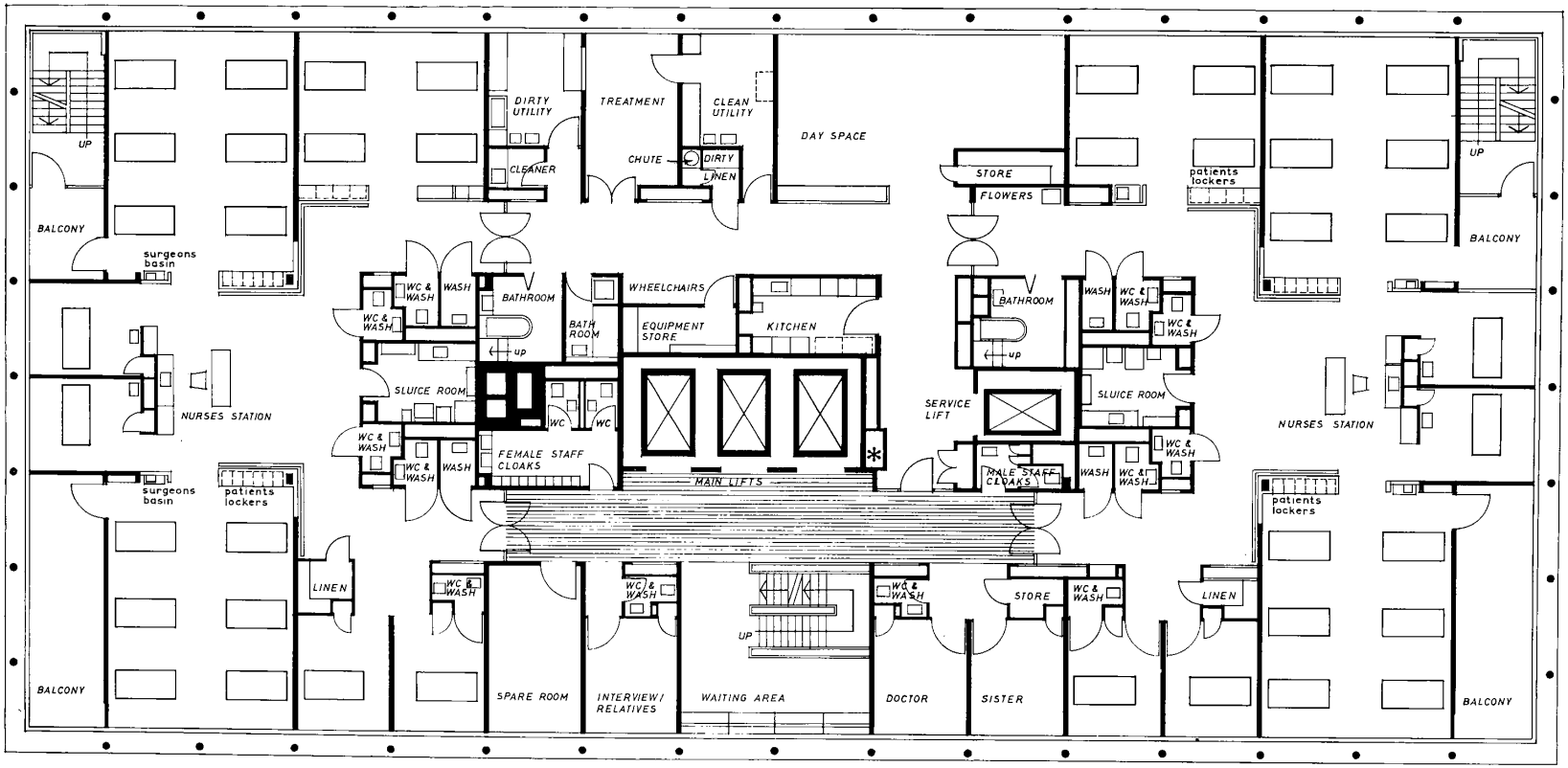


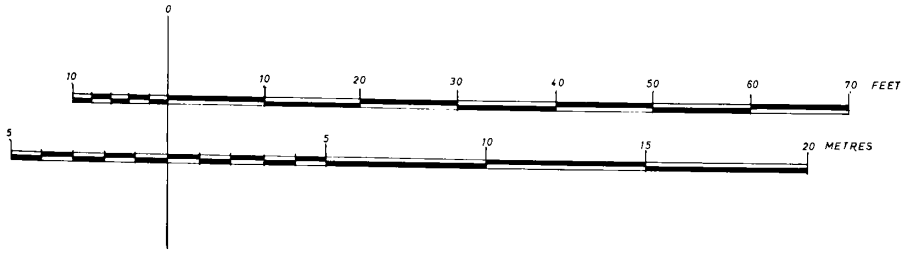
34 (above) Central Sterile Supply Department (showing circulation) Two separate circulations are provided for in the CSSD (on the lower ground floor), one for the operating theatre supplies transported directly by hoist to the operating theatre suite and the other for hospital sterile supplies despatched by means of the service lift to the wards and other departments. The CSSD is fully mechanically ventilated.

35 (opposite) Operating Theatre Suite Staff access to the operating theatre suite (on the upper ground floor) from the approach corridor is through the changing rooms and the boot changing bench to the 'clean' corridor of the suite. Patient access is from the approach corridor through the transfer bay. Within this bay, the patient is transferred to a theatre trolley and then taken to the anaesthetic room. On return, the patient is transferred in the bay from a theatre trolley to a recovery ward bed and wheeled into the recovery ward. It can be seen that the hoists from the CSSD below serve directly into the theatre supply rooms. The hoist in the 'dirty' corridor serves directly down into the CSSD. The recovery ward is open, has eight beds and a fully equipped nursing station.


FUTURE LINK TO PHASE 2
APPROACH CORRIDOR
ANAESTHETIST
RECOVERY WARD
TRANSFER BAY
MALE NURSE CHANGING
PORTER CHANGING
wc
NURSE CHANGING
lockers
wc
wc
SURGEONS CHANGING
changing cubicles
1
2
3
bed pans washer
NURSING STATION
STORE
SISTER
desk
bed
theatre trolley
wc
porter
NURSES REST ROOM
boot changing bench
SURGEONS REST ROOM
KITCHEN
hatch
frozen sections
PATHOLOGY DEPARTMENT
CLEAN CORRIDOR
CLEANER STERILE AREA
CLEANER CLEAN AREA
desk
cupboard
SCRUB-UP
EXIT ROOM
ANAESTHETIC
ANAESTHETIC
EXIT ROOM
SCRUB-UP
STORE
ANAESTHETIC
EXIT ROOM
SCRUB UP
EQUIPMENT STORE
theatre linen
equipment cupboard
surgeons basin
DUCT
STORE
DARK ROOM
movable services boom
hoist to CSSD
movable services boom
hoist to CSSD
x ray tube on bracket over
hatch
SUPPLY ROOM
SUPPLY ROOM
PLASTER ROOM
OPERATING THEATRE 1
worktop
OPERATING THEATRE 2
OPERATING THEATRE 3 ORTHOPAEDIC
slop sink
hoist to CSSD
DISPOSAL BAY
DIRTY CORRIDOR
DISPOSAL BAY
0
5
10
15
20 METRES
10
20
30
40
50
60
70 FEET

36 General Surgical Ward Two 20-bed ward units on this floor (5th floor) are disposed round the central vertical circulation and ancillaries core. The ward unit consists of two 6-bed bays on either side of the nurses' station, one 4-bed bay and four single rooms in two separate groups of two. There are staff cloakroom facilities outside the wards in the core, and deliveries and disposals are by means of the service lift. Dirty linen disposal is by chute. The treatment suite, kitchen, day space and equipment store area are shared by the two ward units.


UP
BALCONY
surgeons basin
NURSES STATION
surgeons basin
patients lockers
LINEN
BALCONY
DIRTY UTILITY
CLEANER
TREATMENT
CLEAN UTILITY
CHUTE
DIRTY LINEN
DAY SPACE
WC & WASH
WASH
WC & WASH
BATHROOM
up
BATH ROOM
WHEELCHAIRS
EQUIPMENT STORE
KITCHEN
SLUICE ROOM
WC
WC
WC & WASH
WC & WASH
WASH
FEMALE STAFF CLOAKS
MAIN LIFTS
WC & WASH
WC & WASH
WC & WASH
UP
SPARE ROOM
INTERVIEW/ RELATIVES
WAITING AREA
STORE
FLOWERS
patients lockers
BATHROOM
up
SERVICE LIFT
SLUICE ROOM
WASH
WC & WASH
WC & WASH
MALE STAFF CLOAKS
WASH
WC & WASH
WC & WASH
DOCTOR
SISTER
STORE
WC & WASH
LINEN
UP
patients lockers
NURSES STATION
BALCONY
BALCONY


0
10
10
20
30
40
50
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70 FEET
5
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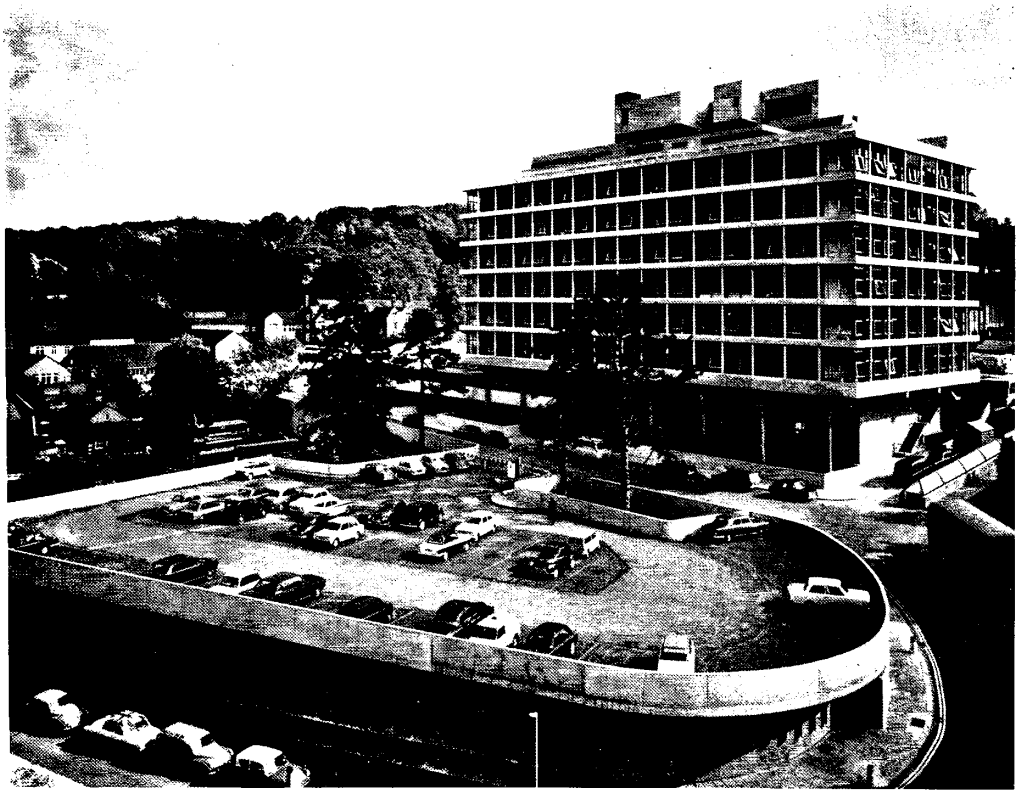
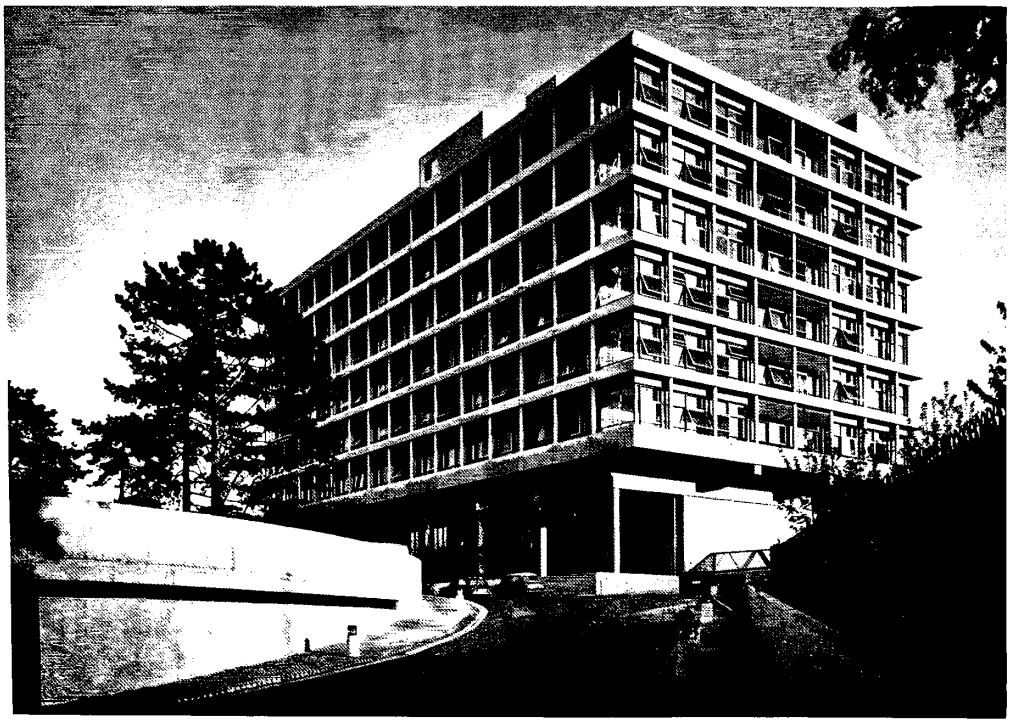
20 METRES

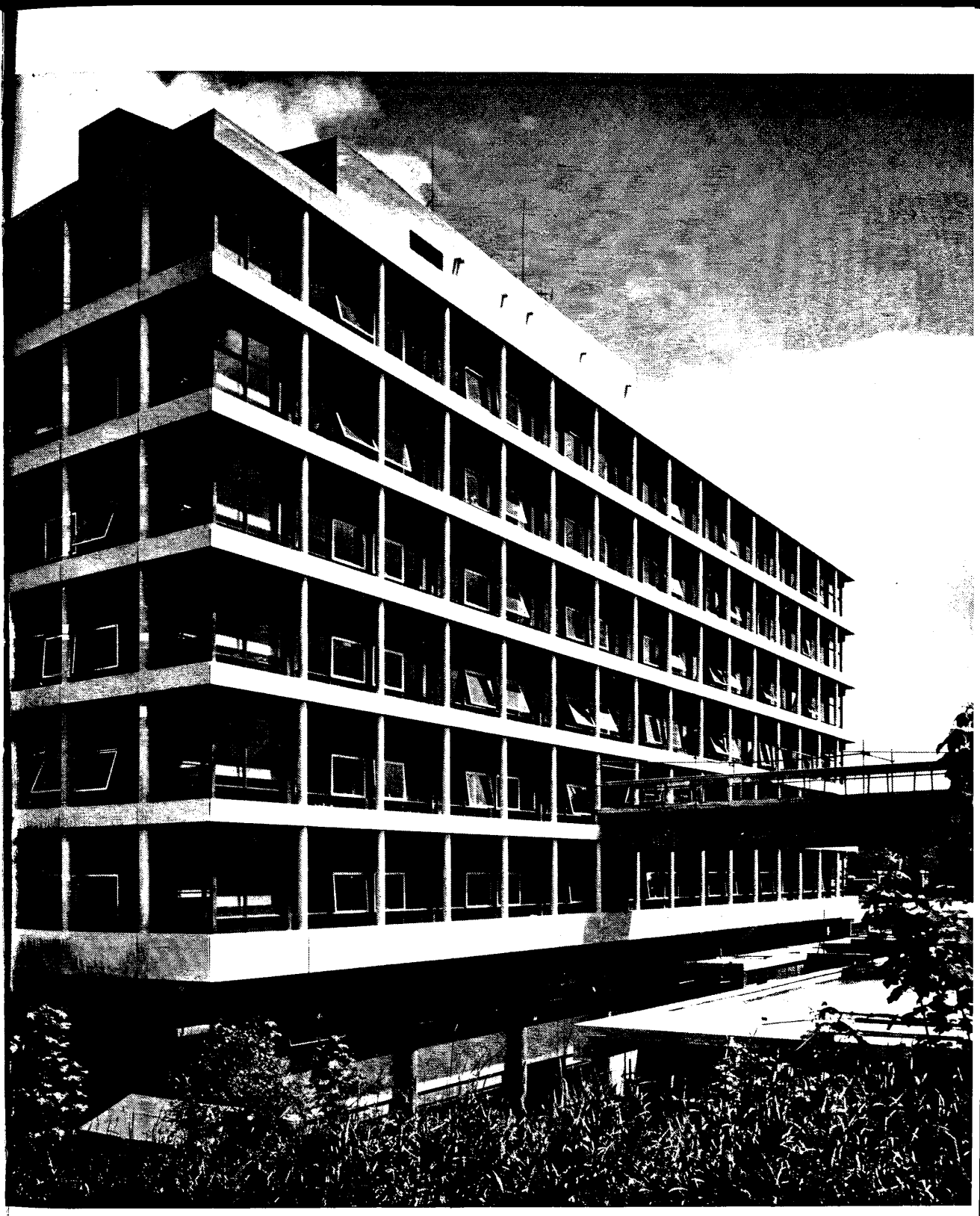
Photographs of Phase IB : Hospital



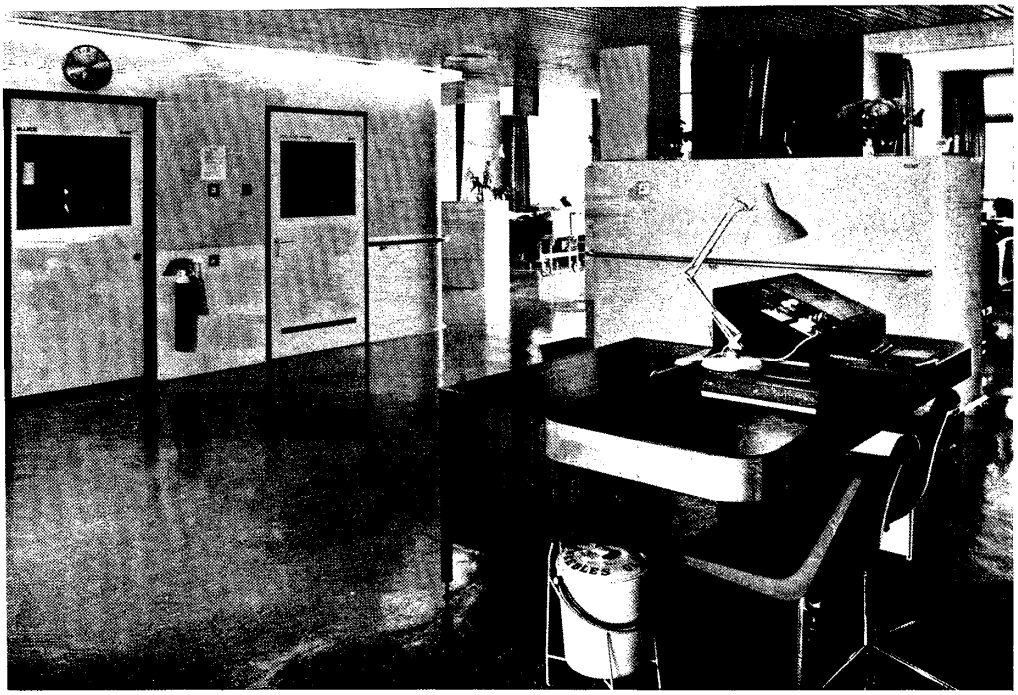
37 View of Phase 1B from North



38 Main Approach to Phase 1B from Queen Alexandra Road

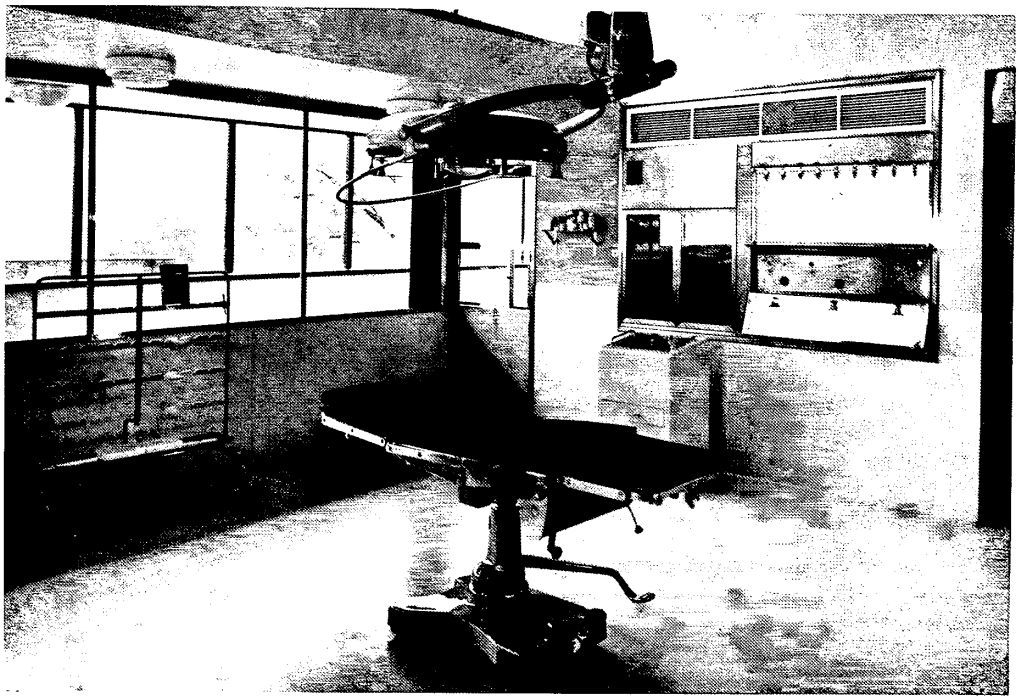


39 Detail of South-west Elevation showing Bridge to Old Hospital Building

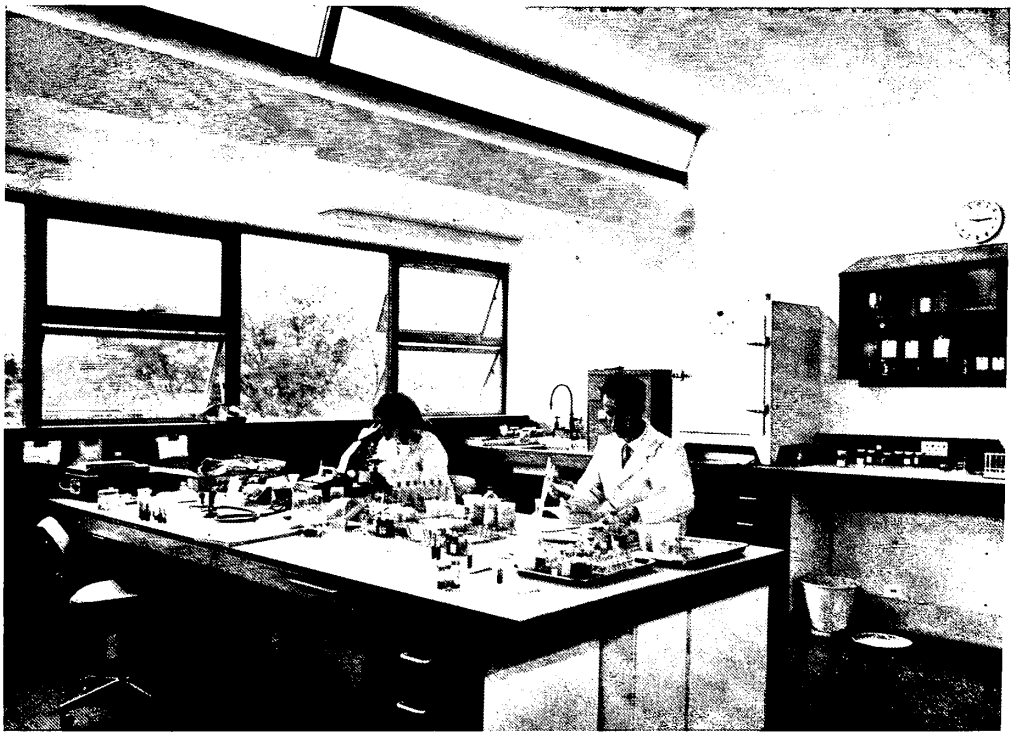


40 Ward Nurses' Station Typical nurses' station on ward. The nurse-call system indicator is on right of the desk. The storage units are behind the desk and not shown in the photograph.

41 Pharmacy



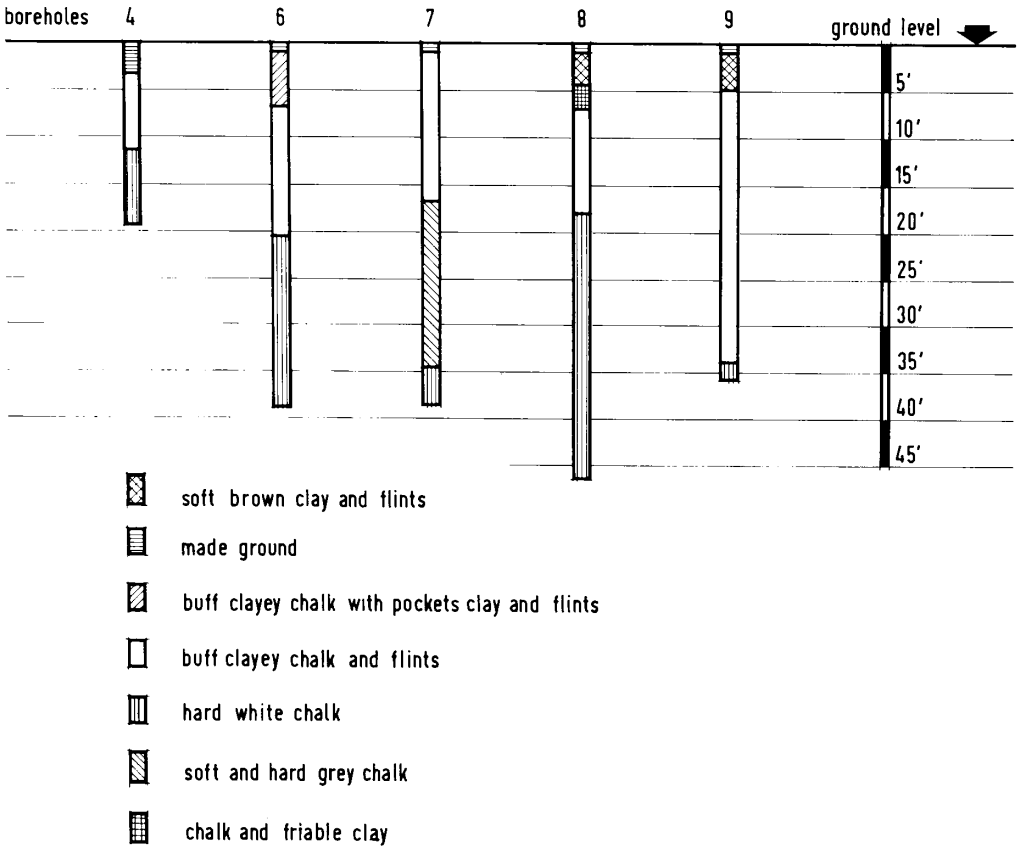
42 Operating Theatre Typical operating theatre looking towards disposal bay showing double glazed clerestory lighting.



43 Laboratory in Pathology Department Laboratory (on the upper ground floor) with clerestory lighting.

44 Medical Centre Library

45 Staff Lounge



46 Borehole Results

3 Detail: Engineering

Structural

Geology

The chalk hills around High Wycombe are part of the Cretaceous formation of the Mesozoic period; they form part of a geological range running north-east from Hampshire to the Wash. The upper chalk layers around High Wycombe are of considerable depth and consist generally of a white chalk interspersed with flint. They are encountered immediately under a thin layer of top soil.

Site Investigation

A comprehensive site investigation was carried out in the early summer of 1960. To ascertain the bearing capacity of the subsoil nine boreholes were drilled to depths of 13–48ft (4–14·5 metres) below surface level, see Illustration 46. The findings showed that, below a layer of top soil, the subsoil consisted of hard white chalk interspersed with flint but in some areas softer chalk with pockets of clay was found. Soil samples were taken for chemical analysis, triaxial compression and consolidation tests in the laboratory. Penetration tests were carried out on site.

The tests indicated considerable variations in the consistency and consequently in the bearing capacity of the chalk. The permissible bearing pressures were assessed at 1½ tons/sq ft (1·5 kg/sq cm) on the softer clayey chalk and 5 tons/sq ft (5 kg/sq cm) on the hard white chalk, the upper value reducing to 3 tons/sq ft (3 kg/sq cm) for narrow foundations less than 3ft (90 cm) wide, to prevent high edge shear stresses in the subsoil.

It could be seen that pockets of soft chalk might be encountered anywhere on the site at varying levels. The design ground bearing pressures were therefore reduced to 3 tons/sq ft (3 kg/sq cm). The building loads are carried on pad and strip foundations, generally these foundations being integral with the ground bearing slabs.

Excavations

Approximately 30,000 cubic yards (23,000 cubic metres) of chalk had to be excavated for the construction of the basements and foundations. Investigations were carried out by the contractor to find the best method of excavation for the deep basements. It was found that, provided the excavations were protected from heavy rains, the sides could stand up almost vertically during construction obviating the need for shoring and thus speeding the work considerably.

Phase 1A: Residential Accommodation Structures

The residential buildings on the south side of Barracks Road are mainly constructed in load bearing brickwork. This form of construction is eminently suitable and economic where comparatively thick walls are required at close centres to provide sound insulation between hostel rooms. The 9in (23cm) thick brick wall required for sound insulation was adequate to carry the loads of the three to

four storey buildings.

The foundations and substructures are entirely of *in situ* reinforced concrete and comprise a large number of retaining walls, necessitated by the steeply sloping site. The floors are also of *in situ* reinforced concrete, 5½in (14 cm) thick. The concrete floors are cast on Ribmet, an expanded metal mesh acting as shuttering and reinforcement. After striking the temporary support to the Ribmet, a ⅝in (16 mm) thick sand and cement render was applied to the soffits providing corrosion protection for the Ribmet.

Phase 1B : Hospital Structures

The hospital complex comprising Phase 1B has been built as three distinctly separate structures : the main ward block ; the adjacent laboratories, pharmacy, operating theatre suite and boiler house ; and the connecting footbridge which links Phase 1B to the old hospital building. The kitchen and service area with car park over have some special features which are also described. Besides blinding concrete and mass concrete, two structural concrete mixes have been used, one for the waterproof concrete below ground with a specified crushing strength of 3,750 lb/sq in (260 kg/sq cm) at 28 days and the mix for the whole of the structure above ground level with a specified crushing strength of 6,000 lb/sq in (420 kg/sq cm) at 28 days ; the only exception to this being the structure of the service area built throughout in waterproof concrete of 6,000 lb/sq in (420 kg/sq cm) crushing strength.

Ward Block Due to the steep slope of the site, on average 1 in 5 from south to north, the three lower floors of the ward block become basements on the south side. This meant excavating up to a depth of 30ft (9 metres) in the chalky soil, see Illustration 47. The retaining walls to the basements were constructed in waterproof reinforced concrete 12in (30 cm) thick and where possible use was made of these walls to support the columns above. The ground bearing slabs were also constructed in waterproof reinforced concrete with pvc waterbars to all joints.

The structure of the ward block is *in situ* reinforced concrete except for the external columns from the first floor upwards and the gutter units, which are of precast concrete finished in bush-hammered white calcined flint aggregate concrete.

The peripheral columns are spaced at 20ft (6 metres) centres up to service floor level. (The service floor is 5ft 6in (1·75 metres) high and interposed immediately below the first floor ward. It accommodates the horizontal service runs.) Within the building further columns, spaced to suit the floor layout, and the lift shafts support the 8in (20 cm) thick floor slabs.

The building widens out at the service floor where short cantilevers on top of the peripheral columns support a prestressed concrete ring beam, see Illustration 48, 3ft 2in × 2ft 9in (96 × 84 cm) wide. This ring beam carries the loads of the upper floor precast columns which are spaced at 10ft (3 metres) centres. The structure and height of the service floor have been utilised to balance the forces resulting from the eccentric loading of the ring beam. These forces are resisted by tension members in the first ward floor and by using the reinforced concrete floor slab of the service floor as a compression member. The tension members in the first ward floor also support the precast lightweight concrete Siporex slabs of the floor. The Siporex slabs were used as they are easy to pierce should openings be required in this floor for additional services. On all other floors the structural floor comprises an 8in (20 cm) thick

47 Excavations for Phase 1B No shoring was used for the deep excavations in chalk for Phase 1B. The old hospital building is seen above the excavations.

48 Corner of Prestressed Concrete Ring Beam Corner of the prestressed ring beam at 1st floor level during stressing.

49 Supporting Precast Column Underside of typical ward floor parapet and cill showing supporting precast concrete column.

in situ reinforced concrete slab integral with an upstand parapet wall cranked horizontally outwards to form the window cills and bearing on the precast columns, see Illustration 49. Within the building the floor slabs are supported on *in situ* reinforced concrete columns, lift shafts and service ducts. Hot water heating coils are cast in panels in the underside of the floor slabs and form the heated ceiling for the ward immediately below.

The erection of the external precast columns on the periphery of the upper floors was carried out as follows. The 10in (25 cm) diameter precast columns contain a 1in (25 mm) diameter longitudinal duct. A $\frac{5}{8}$in (16 mm) diameter mild steel rod, threaded at both ends, was inserted through the duct and the column positioned by crane on a prepared $\frac{1}{4}$in (6 mm) thick mortar bed. The lower end of the rod was screwed into a cast-in socket at ring beam level and coupling nuts on the upper floors. The columns were stressed nominally using a torsion wrench applied to the coupling nut at the column top. After this nominal stressing, the column was released from the crane hook and no further support was required to stabilise it during erection. Reinforcement projecting from the top of the column was then cast into the *in situ* cills thus ensuring the efficiency of the joint. On completion the ducts in the columns were pressure grouted with a colloidal cement grout.

The 10ft long $\times$ 4ft high ($3 \times 1{\cdot}2$ metres) precast cladding panels

are provided with a longitudinal nib on the rear upper part of the panels. These panels are hung on the *in situ* cills by the nib, bedded on a sand cement mortar and secured by cast-in dowels, rather like outsize wall tiles on battens.

The motor rooms and tank rooms at roof level are cantilevered from the lift shafts and cast in white reinforced concrete with a calcined flint aggregate.

Sliding expansion joints are provided at the junctions of the ward block with the surrounding lower buildings. At these junctions the floors and roofs of the lower buildings take support on the ward block structures.

Laboratories, Pharmacy, Operating Theatre Suite and Boiler House This structure is of *in situ* reinforced concrete slabs and beams. The 8in (20 cm) thick floor slabs span up to 25ft (7·75 metres). The structure is clad, to cill level, in precast concrete panels finished in calcined flint aggregate, lightly bush hammered. The cladding panels are secured in position by bolts screwed in sockets cast in the floors and preloaded with a torsion wrench.

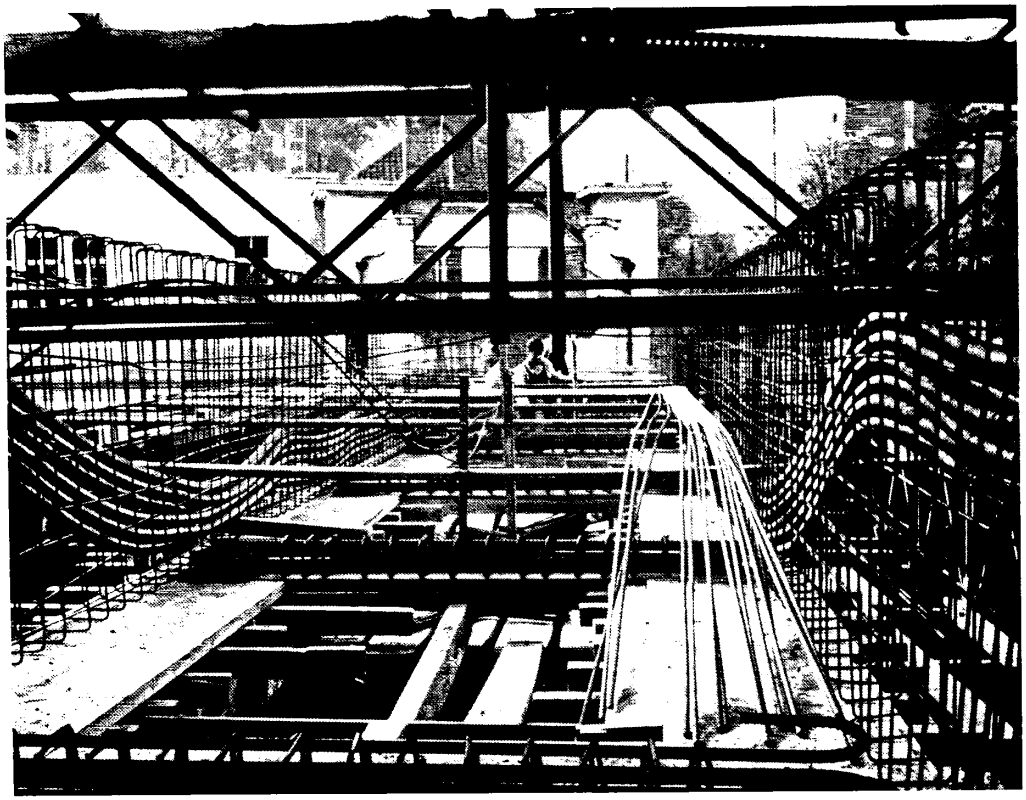
A $\frac{3}{4}$in (19 mm) diameter Neoprene tube, cast in one end of each panel, was compressed during erection, ensuring the water-tightness of the vertical joints between the cladding units.

Footbridge This bridge joins the second floor of the ward block to the ground floor of the old hospital building and had to be constructed over the existing chest clinic whilst in use and without interfering with its normal function. The bridge was designed so that it could be erected by using self-supporting welded reinforcement from which the shutters were to be hung. An alternative design in prestressed concrete, using a Bailey bridge to support the formwork, was also prepared. The contractor in fact elected to construct the bridge using the Bailey bridge to support the formwork.

The footbridge constructed in prestressed concrete is 8ft (240 cm) wide, has a span of 124ft (38 metres) adjoining the new ward block and a cantilever span of 30ft (9 metres) at the end connecting to the old hospital building. The parapet walls of the 124ft (38 metres) span are prestressed with six $7 \times \frac{1}{2}$in (12·7 mm) diameter strand cables each, see Illustration 50. These concrete parapet walls are self-finished on the outer face showing the shutter board marks. In order to reduce to the minimum the construction loads on the temporary false work the floor of the bridge is in lightweight reinforced concrete.

At the new ward block end the bridge is supported on Neoprene bridge bearing pads which permit a rotation of $\frac{1}{3}°$. Rolling or sliding bearings were not provided, since the high support pier near the old hospital building is sufficiently flexible to allow for the expected movement. The stressing force used in each of the bridge cables was 181,000 lb (82,000 kg). The bridge is cambered over its main span to allow for the expected deflection. The bridge roof structure is in light galvanized mild steel window frame sections.

Kitchen, Service Area and Car Park The kitchen and service area fronting on to Queen Alexandra Road is a single storey structure below the entrance level of the main ward block and accommodates the car park at roof level. The approach road rises along the eastern



50 Prestressing Cables in Footbridge Prestressing cables in the footbridge during construction with old hospital building seen in background.

side and on to the roof of the service and kitchen area serving the main hospital and ambulance entrance. A service road on the west side at lower ground floor level leads under the car park to the stores and the boiler house. (See plans of lower ground floor, Illustration 21, page 45, and ground floor, Illustration 22, page 47.) The structure of the service area is a reinforced concrete flat slab supported on 9in (23 cm) square columns at 20ft to 24ft (6–7 metres) centres.

Reinforced concrete beams spanning up to 56ft (17 metres) at 20ft (6 metres) centres support the car park deck above the service road. These beams are supported and restrained at the east by columns forming part of the service area enclosure wall and bear at the west on stub columns protruding from the retaining walls adjoining the bus garage.

On the Queen Alexandra Road elevations the car park slab is supported on precast concrete mullions at approximately 5ft 6in (165 cm) centres and cantilevers 5ft (150 cm) over the pavement. The precast columns were erected similarly to the ward block columns described previously.

The roof of the service area is designed for private car park loading and the main entrance road to Ministry of Transport highway loading, thus permitting access for heavy fire engines.

Mechanical

Because of the small site and the compact plan form adopted to meet the site conditions, it was necessary to have mechanical ventilation throughout the central core of the ward block and in other departments, as well as air-conditioning in the operating theatre suite. In addition to the normal mechanical services, other services include a pneumatic tube carrier system throughout Phase 1B and a centralised piped gases system.

Boiler Plant

Three wet-back Economic type boilers provide steam generated at a gauge pressure of 120 lb/sq in (psig) (8·4 kg/sq cm). Each boiler has an evaporative capacity of 9,000 lb/hour (4,000 kg/hour), from and at 212°F (100°C), and is fired by an automatic rotary-cup oil burner. The oil fuel, which has a viscosity of 3,500 seconds (No. 1 Redwood), is supplied from heated storage tanks with a total capacity of 45,000 gallons (205,000 litres) and is pumped to the burners through a pre-heater and a trace-heated ring main. The flue gases discharge into a common main flue leading to a chimney which rises through the fabric of the building to discharge above the roof of the ward block. The chimney is provided with three internal flues. Two of these are used for summer and winter conditions of boiler plant operation respectively, while the third flue serves an incinerator.

Most of the water fed to the boilers is derived from returned condensate, made up as necessary from a water-softening plant. Water delivery into the boilers is effected by two motor-driven centrifugal pumps, with a steam-driven reciprocating pump as standby. The feed water is conditioned by injection of a chemical solution into the feed line. All the principal instruments associated with each boiler are mounted on a central instrument panel for convenient reference, thus facilitating efficient control.

Steam is delivered from the boiler house at 120psig (8·4 kg/sq cm) for supply to the heating and hot water calorifiers; to sterilising equipment in the CSSD, pharmacy and pathology; to certain items of equipment in the main serveries; and to two low-pressure steam generators which feed humidifiers associated with the ventilation of the three operating theatres. Steam is delivered also through a reducing valve at 15psig (1·05 kg/sq cm) to steam-heated equipment in the kitchen, to water stills in the pathology department, to a bottle-washing plant in the pharmacy, and to other equipment. All condensate available from steam-using equipment is returned to a hot well in the boiler house, either by gravity or by pumped systems.

An external steam-distribution system at 120psig (8·4 kg/sq cm) and a corresponding condensate-return system serve the old hospital building and the residential accommodation, Phase 1A.

The associated pipework is housed in an underground walkway tunnel which runs from the kitchen to Barracks Road and thence to the residential accommodation. This walkway tunnel also houses other pipework, electrical and communication services, leaving adequate space for future services which will be associated with later phases of the development.

Space Heating

Phase 1A: Residential Accommodation Water is heated in a local non-storage steam-to-water calorifier with a rated output of 865,800 BTU/hour provided with a condensate cooler. This calorifier is connected to a two-pipe accelerated heating system which supplies radiators in the various rooms of the hostels and flats

throughout the area. The system provides for compensated temperature control as for three of the heating zones in the hospital block.

Phase 1B: Hospital A low-pressure hot water heating system is installed throughout the hospital block to supplement the heating facilities provided by the ventilation systems described later. The hot water heating system is of the two-pipe accelerated type and is designed for a flow temperature of 180°F (82°C) and a return temperature of 150°F (65·5°C). The water is heated in three large non-storage steam-to-water calorifiers, each provided with a condensate cooler. Two of the calorifiers have a heat output rating of 3,200,000 BTU/hour while the third has a rating of 4,200,000 BTU/hour.

The distribution of heat is divided into five zones: two zones cover plenum heating batteries associated with ventilation plant while the remaining three zones cover radiators, convectors, ceiling and wall panels and other heating equipment under a compensated temperature control system which responds to the operation of an outside thermostat in such a manner that the flow temperature of the water rises when the outside air temperature falls and *vice versa.*

Wards are heated by low-temperature ceiling panels of the embedded invisible type, supplemented by Solray wall panels under the windows of all wards and perimeter rooms. Gilled tubes under window seats provide background heating in waiting areas. Heating in all laboratories, and in some offices, is by natural-draught convectors while fan-assisted convectors are used in the entrance hall and staff lounge.

Hot Water Supply

Phase 1A: Residential Accommodation The hot water supply service is derived from two local steam-heated storage-type calorifiers, each of 650 gallons (2,850 litres) capacity and with a rated output of 250,000 BTU/hour.

Phase 1B: Hospital The hot water service within the hospital block is supplied from three vertical steam-heated storage-type calorifiers, each of 750 gallons (3,400 litres) capacity with a rated output of 430,000 BTU/hour, designed to operate at a flow temperature of 150°F (65·5°C) and a return temperature of 130°F (54·5°C). The cold water feed is taken from softened-water storage tanks at roof level and has a controlled hardness value of 4°Clark. The hot water is kept in continuous recirculation by means of accelerator pumps throughout the distribution system, which is subdivided into three zones.

Cold Water Supply

The incoming mains water supply is branched from an 8in (20 cm) bore street main in Barracks Road where a meter, complete with emergency valved bypass, has been installed. The branch supply main runs through the external services duct to the hospital where it rises above the roof of the ward block. There the main is connected to a reducing valve for delivery to: two raw-water storage tanks, each of 5,000 gallons (25,200 litres) capacity installed above roof level; drinking water services throughout the hospital; a 350-gallon (1,600 litres) storage tank for supply to two undercounter water-boiler sets for beverages served at ground floor level; a feed-and-expansion tank associated with the heating calorifiers; make-up water supplies for the cooling tower and the chilled-water refrigerator units associated with the air-conditioning installations.

Water is delivered from the raw-water storage tanks to a Permutit

base-exchange water softener situated in the calorifier room. The water is pumped through the softener and a controlled bypass to two softened-water storage tanks above the roof of the ward block. The softener is a fully automatic unit complete with brine tank, salt-saturator tank, chemical-mixing tank and injection pump. A mains water feed from the storage tanks is also given to the two steam generators which supply low-pressure steam to the humidifiers in the operating theatre suite. The two softened-water storage tanks are each of 11,750 gallons (53,462 litres) capacity and they deliver into a header from which the following services are run: ward block softened-water services; boiler feed water supply; cold feed to the calorifiers associated with the hot water supply services.

Ventilation and Air-conditioning

Central Core The central core and corridors throughout the six ward floors are fully mechanically ventilated from a composite air-conditioning unit equipped with separate heating and cooling batteries, a supply fan driven by a two-speed motor, a standby motor and a silencer. This unit draws clean air through an automatic high-efficiency filter and the conditioned air is delivered at a controlled temperature through ducting to the various supply grilles and diffusers. The rate of air delivery can be reduced at night. A similar composite unit, with an additional filter, supplies clean conditioned air to all clean utility rooms. In each case the air passes through a pressure-release damper to the adjacent treatment room, thence through a second pressure-release damper to the adjacent dirty utility room. The air temperature within the central core of the building is thermostatically controlled to maintain a pre-selected internal air temperature; the system supplies heated air under winter conditions and cooled air under summer conditions. In the psychiatric ward a separate electric booster-heater maintains, when required, an internal air temperature of 80°F (26·5°C) under automatic thermostatic control.

Wards Ventilation in the wards is mainly natural through regulated window openings but a certain degree of supplementary mechanical ventilation is derived from the supply and extract grilles in the adjacent corridors.

Extract Ventilation An independent extract ventilation system has been installed in the ward block to draw vitiated air through grilles into ranges of ducting equipped with volume and fire dampers, delivering to an extract fan driven by a two-speed motor. This extract system works in conjunction with the main air supply system with which it is automatically linked.

Main Entrance At the main entrance to the hospital block a recirculating system is employed to maintain a hot air 'curtain' during cold weather conditions. The associated plant includes a filter and heating battery on the intake side of the supply fan and the heated air is delivered through an elongated discharge grille in the ceiling immediately behind the entrance doors. The air intake to the system is located at floor level directly below the discharge grille and is also in the form of an elongated grille. The temperature of the discharged air is automatically controlled from a selector at the enquiry counter.

Operating Theatre Suite and Related Departments The various ventilation systems which serve the operating theatre suite and related departments all take their air from a large intake chamber provided with banks of filter units, each of which comprises a primary fixed sectional filter supplemented by an automatic

continuous-mat filter. The filtered air passes through outlet louvres to supply: the operating theatre suite; the CSSD and pathology department; the refrigeration plant room. Two separate ventilation systems are provided to serve the operating theatres, one supplying heated or cooled air as required to theatres 1 and 2 while the other supplies heated air only to theatre 3 and the plaster room. The former system is based on a composite air-conditioning unit equipped additionally with a steam-jet humidifier and an after-heater. In the case of the system serving theatre 3 and the plaster room, similar equipment has been installed, except that the cooling battery has been omitted. In each case the temperature and humidity of the air delivered are automatically controlled. Non-return dampers are fitted between adjoining rooms, so that air may pass only from the supply points to the extract points, in an attempt to inhibit cross-infection.

The cooling batteries associated with the air-conditioning units which serve the wards and the operating theatre suite are supplied with chilled water from refrigeration plants adjacent the respective ventilation plants. The water for the cooling condensers of the water-chilling plants is circulated through a cooling tower installed on the roof of the ward block. These installations operate automatically.

Central Sterile Supply and Pathology are each served by a separate ventilation system based on a composite unit comprising a heater battery, a motor-driven supply fan and a silencer connected through distribution ducting to air supply grilles. The temperature is thermostatically controlled. A separate extract system works in conjunction with each air supply system and is automatically linked to it.

Recovery Ward The preparation rooms and recovery ward associated with the operating theatres are served by a similar composite unit, but an additional heater battery has been provided in the supply ducting to the recovery ward to enable the air temperature there to be automatically held at a higher level when required. This system also has an extract system working in conjunction with and automatically linked to it.

Post-mortem Area The refrigeration plant room, associated with the body store in the mortuary and the cold room in pathology, is served by independent supply and extract systems which cool the condensers of the two refrigeration plants installed. The separate ventilation system which serves the post-mortem room is provided with a filter and heater battery, and the temperature of the air is thermostatically controlled. An 'ozone and negative-ions' generator is operated as and when required. A separate extract system works in conjunction with and is automatically linked to this air supply system.

Extract Systems An independent extract system serves the staff and visitors' toilets on the ground floor. All the extract systems to the operating theatre suite, CSSD, pathology and ground floor toilets are arranged to discharge through non-return louvres to a common extract duct carried above roof level. Separate extract ventilation systems have also been provided for the staff cloakrooms, the incinerator and refuse bay, and the workshop and engineer's stores.

Kitchen and Dining Area The kitchen and staff dining room are independently served by separate ventilation systems which take their air from a common clean-air chamber provided with an

automatic intake filter. Each plant includes a heater battery, a motor-driven supply fan and a silencer, and is connected to distribution ducting leading to the various discharge grilles. The air temperature delivered from each plant is automatically controlled at a pre-selected value. Two separate extract systems work in conjunction with and are automatically linked to these supply systems.

Stores and Offices in the perimeter service area (lower ground floor level) are supplied with clean air by a plant comprising a filter and a supply fan connected through ducting to special diffuser outlets. In this case there is no corresponding extract system as the vitiated air is discharged through window openings.

Foul Air Extract A continuously operating foul air extract system serves the various dirty utility rooms, the dirty linen room, the medical gases manifold room and certain stores and plant rooms (lower ground floor level). The ductwork includes exhaust grilles and volume and fire dampers and connects to an extract fan which discharges above the roof of the ward block.

Town Gas System

Two distribution pipework services have been installed, each separately metered, for supply of town gas to the main kitchens and for general purposes. The former serves ranges, proving ovens, pastry ovens, grills, a frying range and a shallow frying pan. The general gas supply system serves the pharmacy and the pathology department, the incinerator and the workshops.

Incinerator

The gas-fired incinerator has a loading capacity of 220 lb/hour (100 kg/hour) and is designed for continuous burning of all hospital wastes. The flue gases pass through a damper control to the main chimney flue which discharges to atmosphere above the building.

Medical Gases and Suction Systems

These services are derived from plants situated on the lower ground floor and comprise oxygen, nitrous oxide and compressed air supplies together with a medical suction system. All these services are available in the operating theatre suite while the wards are served by the oxygen and medical suction services. In the case of the oxygen and nitrous oxide services, separate pipework distribution systems convey these gases at a pressure of between 60 and 70psig (4·2 and 4·9 kg/sq cm) with branches terminating at surface-mounted outlet boxes. A special boom assembly provides convenient access to all gas and medical suction services in each operating theatre and in the plaster room.

Oxygen Supply The oxygen supply is derived from a gas manifold connected to two banks, each of eight cylinders – of 240cu ft (6·9 cubic metres) capacity per cylinder at atmospheric pressure – complete with a control panel which includes a pressure-regulating device to effect an automatic change-over to the reserve supply of cylinders when one bank becomes exhausted. The control panel gives visible indication of running conditions and a repeat indication and alarm of each change-over operation is transmitted to the central instrument panel in the boiler house.

Nitrous Oxide Supply The nitrous oxide supply is derived from a gas manifold connected to two banks each of three cylinders – of 320cu ft (9 cubic metres) capacity per cylinder at atmospheric pressure. The system includes a control panel similar to that for oxygen and also provides similar indicating and alarm facilities.

Compressed Air Supply A separate pipework distribution system provides a compressed air supply at a pressure of 100psig

(7 kg/sq cm) with branches terminating at surface-mounted outlet boxes. The air compressor is of the air-cooled reciprocating type, driven by an electric motor, and has a rating of 25cu ft/minute (0·70 cubic metre/minute) of free air, delivered at 100psig (7 kg/sq cm). The compressor unit is mounted on a horizontal air receiver of 19cu ft (3 cubic metres) capacity which is connected to the distribution system through a silica-gel air drier and filter unit. Visible indication and alarm of failure of the service is given at the boiler house instrument panel.

Medical Suction Another separate pipework distribution system provides a medical suction service at a vacuum level of 24in (600 mm) mercury with branches terminating at surface-mounted outlet boxes. The system is based on duplicate motor-driven vacuum pumps which are automatically controlled and associated with a common vacuum tank assembly. The exhaust terminates in an aerobic septic chamber outside the building. Visible indication and alarm of any failure of the service is given at the boiler house instrument panel. Each vacuum pump is electrically driven and has a rating of 45 cubic metres/hour at 27in (675 mm) mercury suction.

Pneumatic Tube Carrier System

A fully automatic Dialled Dispatches pneumatic tube carrier system has been installed for the conveyance of documents and other material within the hospital block (including administration offices and service areas) with provision for extensions to other buildings to be constructed later. Initially, 16 sending/receiving stations have been provided, related to a total of 24 selective carrier codings, since certain stations serve more than one user. In the case of the wards, selective signalling is provided by indicator lamps at each sending/receiving station, also at the relevant nurses' station on each ward floor where each sending/receiving station serves two wards (three wards in the case of the 1st floor). Selective signalling at user points has also been provided for the administration offices. In all cases, indication by lamp is given at the sending/receiving stations. Positions of the stations are shown in Illustrations 21–36.

Fire-fighting Services

A dry-riser fire main has been provided in the ward block adjacent the main staircase. The inlet connector is located outside the building at ground floor level adjoining the main entrance. Outlet hydrants are provided at each floor level from the ground floor to the 7th floor. A separate 4in (10 cm) bore fire main is connected to the high pressure 8in (20 cm) bore water main in Barracks Road and terminates at a twin hydrant on one side of the entrance road to the hospital. From this main a branch is taken into the ward block where a separate distribution system connects this high pressure water supply to twenty hose reels of the Norsen recessed type, suitably dispersed throughout the building. A piped foam fire-fighting system has been installed in the oil tank chamber terminating at special spray nozzles. The inlet connection for foam tender of the fire brigade is in the nearby service road.

Sterilising Plant

Equipment installed in the CSSD includes: one high-speed, high-vacuum autoclave of 14·2cu ft (2 cubic metres) capacity, with automatic cycle and power-operated door; one similar autoclave provided with an alternative rapid-cooling fluids cycle; one similar autoclave provided with equipment for manual formaldehyde injection; two washer sterilisers, each 20in (51 cm) diameter × 36in (91·5 cm) long, with automatic operating cycle; one electrically heated hot air sterilising oven with thermostatic temperature control and temperature recorder. There is a further high-speed, high-vacuum autoclave of 14·2cu ft (2 cubic metres) capacity in the

pharmacy, provided with rapid-cooling fluids cycle. As in the case of the CSSD autoclaves, this unit has a power-operated door and the operating cycle is automatic.

Kitchen Equipment

The equipment in the kitchen is designed to handle the daily preparation and service of all regular meals, breakfast, lunch, afternoon tea and supper. Its capacity is a total of 600/650 midday meals for both patients and staff.

Ganymede System The equipment includes a Ganymede conveyor belt installation by which up to 280 patients' meals can be set out on separate trays, according to pre-selected choice, before leaving the kitchen. Special devices keep individual dishes hot or cold, as required. The main element of the Ganymede installation is a conveyor belt which is driven by an electric motor. The speed of the belt is variable between 6·4 and 57·6ft/minute (3 and 17 metres/minute). When a meal is to be served to patients, the required number of mobile bain-marie units, duly loaded with prepared food, together with mobile heated auto-lift units loaded with plates and their associated bases and covers, also electrically heated ovens which dispense the heat-retaining slabs called pellets, are all strategically disposed at intervals adjacent the conveyor belt attended by the requisite number of serving personnel. As a tray passes along the belt the corresponding patient's individual menu card and the required cutlery are first placed on the tray, followed by the appropriate dishes including the necessary pellets, then the food portions themselves, served from the bain-marie units, according to the patient's pre-selection. At the terminal end of the belt each tray is checked, covers are added and the tray is loaded into a trolley in which trays are transported by service lift to the wards. Hot dishes remain hot and cold dishes remain cold for at least twenty minutes. *

Main Cooking Equipment The top surfaces of all working units in the kitchen such as sinks, bench tops, drainers, centre tables and wall benches, are of stainless steel. The main cooking equipment is assembled on three islands, each covered by an overhead stainless steel vapour hood with grease filter connected to the ventilation extract system. These cooking islands are equipped as follows.

No 1 one gas-heated tilting shallow fryer
two gas-heated grills
one gas-heated 3-pan fish fryer
one gas-heated 3-tier oven

No 2 two wet-steaming oven units (one with three ovens and one with two ovens)
one steam-heated bain-marie unit
two gas-heated single oven ranges with open flame hotplates
two gas-heated single oven ranges with solid top hotplates

No 3 seven steam-jacketed boiling pans (three of tilting type) with capacities ranging from 10 to 30 gallons (40–135 litres)

Bain-marie Equipment Ten mobile stainless steel bain-marie units, each arranged for electric heating when required, are available to transfer prepared food from the cooking islands and from cold food preparation tables to the Ganymede installation where patients' meal trays are set up. When this operation has been completed for a particular meal the same bain-marie units

*King Edward's Hospital Fund, *The Ganymede Tray Service in Hospital,* 1966.

are employed to transfer prepared food to the staff dining servery.

Preparation Equipment The pastry preparation equipment includes a mixing machine and a pie-and-tart machine with gas-heated proving oven, pastry oven and boiling table. The vegetable preparation equipment includes two electrically operated potato peeling machines, a chip cutting machine and a vegetable slicing machine. The meat preparation equipment includes a fat press and a bacon slicer.

Diet Kitchen The diet kitchen adjoins the main kitchen and is equipped with an electric mixing machine, two gas-heated oven ranges respectively fitted with open flame and solid top hotplates, a steam-heated 5-gallon (22·5 litres) tilting kettle, a Rotapan and a hot cupboard. A stainless steel vapour hood, over the cooking equipment, is connected to the ventilation extract system.

Central Wash-up A dishwashing machine has been installed in the central wash-up area of the kitchen. The dishes and trays are placed on a moving endless conveyor which travels through various individual sections of the machine: first through a pre-rinse to remove most of the surplus food on the dishes, then through a detergent wash, a hot water wash, a final spray rinse at 190°F (374°C) and a hot air drying section.

Staff Dining Room The servery operates on the cafeteria principle. Food is served direct from the bain-marie units to the individual dishes. In the doctors' section of the staff dining room a fixed bain-marie unit is provided with a grill/hotplate unit on an adjoining stainless steel table. The tea bar has a steam-heated combination café set and a refrigerated squash dispenser.

Electrical

Incoming Supply and Distribution

The main incoming electricity supply is derived from the Southern Electricity Board's 11,000-volt power distribution network. Two 750-kVA air-cooled transformers provide the hospital with a 240/415-volt, three-phase, 50-cycle supply. Electricity supplies to distribution boards on the three lower floors are obtained from strategically placed sub-main boards. On the ward floors the distribution boards are fed direct from a bus-bar rising main. Distribution boards are fitted with miniature circuit breakers to facilitate rapid restoration of supply in the event of a local circuit fault.

Additional protection has been provided in the circuits which supply lighting and socket outlets within the operating theatre suite. The sub-main supply to this area is taken through a 70-kVA isolating transformer with which is associated an earth leakage alarm device to give immediate indication of a fault in the wiring or equipment being used within the suite.

Standby Generator

A 250-kVA standby diesel-alternator set has been installed to provide continuity of electricity supply in certain selected areas in the event of failure of the incoming mains supply. This enables lighting and power services to be maintained for the operating theatre suite, the CSSD, the boiler house, all plant rooms, the telephone exchange, the blood bank, all piped gas systems, certain equipment within the pathology department, limited lighting on all ward floors and one passenger lift.

Lighting

Artificial lighting throughout the hospital is provided by both tungsten and fluorescent fittings. Generally, tungsten fittings have been provided in those areas which call for lower levels of illumination. Where higher levels of illumination are required fluorescent tubes were justified because of their economy coupled with a reduction of heat emission. The fluorescent tubes are generally of warm-white type but where accurate colour rendering is of importance, such as in certain laboratories, special double-coated tubes have been provided.

Operating Theatre Tungsten lighting was preferred throughout the operating theatre suite, by the medical staff, for purposes of assessing skin tones when observing the condition of patients during operations. The parallel requirements of a high level of illumination and minimum glare to both staff and patients were important considerations when designing the scheme in this area. The lighting level is 30 lumens/sq ft at 36in (90 cm) above finished floor level. The special scialytic lamp fittings over the operating tables are provided with an emergency battery system to ensure continuity of supply at all times.

Wards The ward floors required special design consideration in view of the deep plan adopted. Each floor is divided into three areas for purposes of lighting control: the central core comprising utility and sluice rooms, bathrooms, washing and wc cubicles, and ward kitchen, none of which receive natural daylight; the continuous corridor surrounding the central core which receives a limited amount of borrowed daylight from perimeter rooms; the multi-bed wards and single rooms, day spaces, treatment rooms and offices around the perimeter which receive direct natural daylight.

It was obvious that the central core and surrounding corridor would require artificial lighting at all times and that, if illuminated to generally accepted intensities, these areas would contrast unfavourably with the natural lighting of the wards, particularly on a bright day. A specially graded system of lighting was devised, therefore, to permit the eye to acclimatise when going from wards and other perimeter rooms to rooms within the central core or *vice versa*. This system is also adjustable to suit evening conditions when the reverse situation obtains.

As a further contribution to the graded lighting effect, the corridor is illuminated from the ceiling by a continuous line of concealed fluorescent tubes located adjacent the inner wall of the corridor so that the wall is illuminated to a higher intensity. Therefore, bearing in mind that this wall is faced when leaving any perimeter room or ward, the effect of a supplementary transition in illumination intensity is obtained.

Night lighting in wards and adjacent corridors is by means of low-level flush-mounted wall lights.

Telephone System

A GPO private automatic branch exchange (PABX 200 × 18 exchange lines extendible) has been installed to provide automatic dialling facilities between departments and to deal with outgoing local calls. Outgoing trunk calls and all incoming calls are dealt with at the three-operator manual switchboard. Jack points are provided in wards to allow the use of portable public telephones by patients.

Staff Location System

A Multitone VHF radio staff location system has been provided

whereby each staff member using the system has a small pocket-type personal receiver. The initiation of a call from the staff location control panel in the hospital telephone exchange causes the call signal to be emitted only from the receiver of the selected person. Maximum facility for the location of staff is afforded since the system operates not only within buildings but also externally within the hospital grounds and residential area as well as for some considerable distance beyond.

Loudspeaker Intercommunication System

A specially designed Transcall loudspeaker intercommunication system has been installed in the operating theatre suite, enabling direct two-way speech communication to be maintained between theatres as well as from each theatre to other rooms within the suite and to the CSSD and pathology department. The system is controlled from a panel in each theatre with key switches. Two-way speech is possible in the case of all stations but in some cases only the theatres can call the remote station. There are five two-way calling circuits:

theatres/work bay in CSSD
theatres/sterile store in CSSD
theatres/histology department in pathology
theatres/recovery ward
theatres/surgeons' rest room

There are four one-way calling circuits:

theatres to CSSD superintendent
theatres to porter
theatres to anaesthetist
theatres to sister

Nurse-call System

Each ward of the hospital has been provided with an independent nurse-call system. Calls can be initiated from any bed position, bathroom or wc, and all calls are registered by signal lamps on a mimic diagram located at the appropriate nurses' station as well as on suitably located corridor indicators. Further indication of a call is given in sluice rooms and in ward kitchens. Two-way speech communication is provided between bed positions and the appropriate nurses' station. Once a call has been initiated its cancellation can only be effected at the position from which it was made.

The equipment provided at each bed position comprises a fixed wall-mounted unit incorporating the nurse-call cancel button, an indicator light, a radio socket, a bedlight control switch and a power-supply socket outlet. Connected to the wall-mounted unit by flexible cable is a separate control unit which can be held in the hand or placed in a purpose-made clip on the bedside locker. This portable control unit incorporates a combined microphone and loudspeaker for nurse-call speech and for radio, also a bedlight control switch, a radio programme selector switch and an associated volume control.

Radio and Television

The system of radio reception at each bed position provides for four (initially three) programmes including facilities for relaying recorded music, services from the hospital chapel, or special events from an external source such as the local football field. The radio receiving equipment is housed in a specially designed control console which is installed in a separate room on the ground floor. This room is equipped to serve as a local broadcasting studio and full facilities are provided on the control console for relaying speech as well as recorded music.

This permits organising a programme of record requests for patients.

Television reception is catered for by the provision of aerial outlets in all day spaces and in certain selected multi-bed wards where conventional television receivers, slightly modified to mute the internal loudspeaker, can be connected. In the wards the television sound output is fed to the patients' bedhead units, and in the day spaces the sound can be transmitted through an induction loop to cordless headsets. With these arrangements patients who are otherwise occupied are in no way disturbed and complete freedom of movement is possible in the day spaces due to the absence of trailing flexible leads.

Clocks

A silent-impulse clock system is provided throughout the building with the majority of the slave dials actuated at half-minute intervals. In the operating theatres and treatment rooms the dials are fitted with centre-sweep second hands and these dials operate at one-second intervals. The operating theatres also have elapsed-time dials to record the duration of an operation, complete with controls for stopping and resetting to zero.

Fire-alarm System

A comprehensive fire-alarm system has been installed. The buildings are zoned and any calls initiated are registered on a mimic diagram in perspective form located in the hospital telephone exchange from which there is a direct telephone line to the local fire station. The sounding of a fire alarm in any zone is controlled from the telephone exchange. Alarm is generally given by suitably positioned bells but these are substituted in the ward areas by red indicator lights to avoid distressing non-ambulant patients.

Lifts and Hoists

One 3,500 lb (1,600 kg) Platt-Schindler passenger/goods lift running at 200ft/minute (60 metres/minute) is installed in the ward block to convey food and equipment from the kitchen and stores areas to the ward floors. In addition, three 5,000 lb (22,500 kg) passenger/bed lifts, also running at 200ft/minute (60 metres/minute), operating under a common group collective system, provide for floor-to-floor movement of staff, patients and visitors. These three lifts are of a size to allow for easy transportation of a bed which has been fitted with an attachment such as a balkan beam.

Although arranged for automatic push-button control when in normal use, any one of the three lifts may be disconnected from the automatic group-control system by means of a key-operated switch on the internal control panel; it may then be operated independently by an attendant while the remaining two lifts continue to operate automatically on the group-control system. One lift can be disconnected by a fireman's switch at the ground floor entrance in case of emergency. Free-car and homing-car facilities are also incorporated to reduce waiting time to a minimum. In the event of a breakdown, operation of an alarm switch on the internal control panel automatically sets up circuits for two-way speech communication between the lift car and the hospital telephone exchange.

Four Platt-Schindler goods hoists running at 70ft/minute (21 metres/minute) are provided within the operating theatre suite, pathology department, CSSD and post-mortem department, for the transport of equipment, supplies and disposables.

4 Detail: Contracts and Cost Analyses

Phase 1A: Residential Accommodation

Work on this contract was started in August 1962 and was completed two years later in August 1964. The contract sum was £188,136.

The contract was fixed price and the contract form RIBA (Local Authorities with Quantities 1939 revised 1957).

Cost Analysis

Floor area: 28,994 square feet (2,694 square metres).

Element Ref as Building Note No 2	Element	Cost per Square Foot	Cost per Square Metre	Cost
No		s d	s	£
1	**Preliminaries and insurances**	12 11¼	139·28	18,761
2	**Contingencies**	2 0¾	22·27	3,000
3	**Work below ground floor level** Strip reinforced concrete foundations of varying widths Isolated pier bases Reinforced concrete walkway duct 6in fabric reinforced waterproofed concrete floor slab on hardcore	11 1¾	120·01	16,166
	Structural Elements			
4	**Frame and structural internal walls** Reinforced concrete columns and beams Cross walls generally in fletton bricks, small proportion of reinforced concrete cross walls	6 3¼	67·48	9,089

Element Ref as Building Note No 2	Element	Cost per Square Foot	Cost per Square Metre	Cost
No		s d	s	£
5	**External walls** Hollow wall construction generally with facing brick (pc 402/6 per 1,000) outer skin, 2in cavity and fletton brick or solid partition block inner skin Certain areas have softwood V-jointed boarding on battens Mild steel guard railing to roof terraces	8 7¼	92·51	12,461
6	**External doors and windows** Softwood glazed doors to staff flats Steel glazed screens and doors to hostel entrances generally but certain external doors framed, ledged and braced Windows generally in softwood	8 3	88·89	11,973
7	**Roof construction** 5in reinforced concrete slabs	4 9½	51·60	6,950
8	**Roof coverings** Three layer bituminous felt roofing on screeds generally Asbestos cement insulating tiles to roof terraces Cork insulation Patent glazed rooflights	2 1½	22·82	3,074
9	**Upper floor construction** 5in reinforced concrete floor and balcony slabs	5 3½	56·90	7,665
10	**Staircases** Reinforced concrete staircases and landings Mild steel balustrades and handrails	1 7¼	17·33	2,334
11	**Internal partitions** Fletton brick and 4in solid partition blocks	2 6½	27·27	3,673
12	**Internal doors** Flush doors generally	4 8	50·15	6,755
	Total of structural elements **44/1¾**		**474·95**	

Element Ref as Building Note No 2	Element	Cost per Square Foot	Cost per Square Metre	Cost
No		s d	s	£
	Finishes and Fittings			
13	**Wall finishes** Plastered walls generally, fair faced walls to corridors and staircases Wall tiling to bathrooms	2 11½	31·82	4,286
14	**Floor finishes** Asphalte paving on screed to balconies Screeds to receive carpets (not in contract) to bed-sitting rooms and corridors Granolithic paving to service staircases Vinyl asbestos tiles on screed to bathrooms and wc cubicles	2 5¾	26·71	3,598
15	**Ceiling finishes** Plastered ceilings generally	1 6	16·07	2,164
16	**Decorations** Whitening generally to ceilings Washable distemper generally to plastered walls, emulsion paint to fair faced walls Woodwork painted	3 3½	35·35	4,761
17	**Fittings** Duct access panels, window seats, shelving, curtain tracks	1 1½	12·11	1,631
18	**Furniture and furnishings** Kitchen cupboards Built-in wardrobes, etc in bedrooms not in contract	7¾	6·86	924
	Total of finishes and fittings 12/– 128·92			
	Services			
19	**External plumbing** Cast iron rainwater pipes and fittings	5¾	5·23	704
20	**Sanitary fittings and wastes** White glazed fireclay fittings generally, stainless steel sink units Copper overflow and waste pipes Cast iron soil and ventilating pipes	3 11	42·28	5,695

Element Ref as Building Note No 2	Element	Cost per Square Foot		Cost per Square Metre	Cost
No		s	d	s	£
21	**Mechanical engineering** Space heating and hot water services from oil-fired boilers Cold water services in copper	20	6	220·60	29,716
22	**Electrical engineering** Lighting and power installation, clocks and fire alarm system (lighting fittings not in contract)	5	8¾	61·65	8,304
23	**Fixed equipment** Fire-fighting equipment		1¼	1·11	150
24	**Lifts** No 1 passenger lift	2	0½	21·96	2,958
25	**Builder's work in connection with mechanical, electrical and lift installations**	1	4	14·42	1,943
26	**Drainage** Cast iron drain pipes under building Glazed stoneware pipes outside building No 29 manholes and No 3 soakaways **Total of services** **37/10¼ 407·57**	3	9	40·32	5,432
27	**External works** Precast concrete and brick pavings, quarry tile paving to terraces to flats, reinforced concrete bridge and tunnel between blocks, retaining walls and steps, tarmac access road	5	5	58·22	7,843
28	**External engineering** Water and electrical mains, road lighting	1	5¼	15·60	2,101
29	**Builder's work in connection with external engineering services** Reinforced concrete water tank tower, trenches and reinforced concrete service ducts, temporary boiler house and connecting duct	2	6½	27·28	3,675
30	**Site layout and planting** Site clearance, site works, demolition and horticultural work		2¾	2·60	350
		129	9¼	1,396·70	£188,136

Phase 1B: Hospital

Work on this contract was started in November 1963 and was completed (to the point of practical completion) three years later in November 1966. The contract sum was £1,351,571.

The contract form was the RIBA (Local Authorities with Quantities 1963) with fluctuations clauses.

Cost Analysis

Floor Area: 167,762 square feet (15,585 square metres).

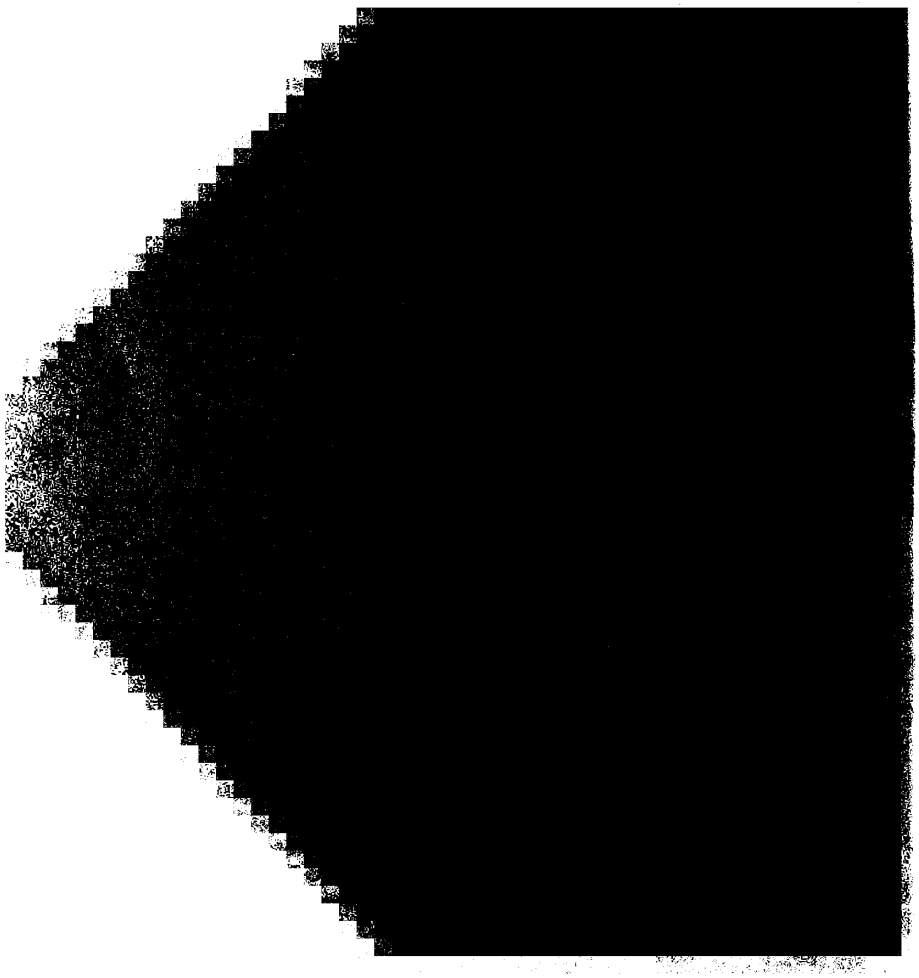
Element Ref as Building Note No 2	Element	Cost per Square Foot		Cost per Square Metre	Cost
No		s	d	s	£
1	**Preliminaries and insurances**	8	3¼	88·94	69,308
2	**Contingencies**	4	9¼	51·33	40,000
3	**Work below ground floor level** Bulk excavation into chalk hillside Isolated reinforced concrete column bases Reinforced concrete service ducts Fabric reinforced waterproofed concrete floor slab on concrete blinding bed Waterproofed reinforced concrete retaining walls Basement fuel store	6	2½	66·86	52,101
	Structural Elements				
4	**Frame and structural internal walls** Reinforced concrete columns and beams, certain columns finished fair Precast concrete circular columns, white cement finish and bush hammered externally to ward block Reinforced concrete cross walls	5	11¼	63·92	49,809

Element Ref as Building Note No 2	Element	Cost per Square Foot		Cost per Square Metre	Cost
No		s	d	s	£
5	**External walls** Precast reinforced concrete wall cladding units generally above ground floor, white cement finish and bush hammered Reinforced concrete dwarf walls, sawn board finish generally to ground floor Reinforced concrete walls to roof buildings above ward block, certain areas white cement finish and bush hammered	3	4¼	36·02	28,073
6	**External doors and windows** Aluminium glazed screens and doors generally Windows generally in hardwood	9	1¾	98·42	76,698
7	**Roof construction** Reinforced concrete slabs	2	5	26·12	20,358
8	**Roof coverings** Asphalte roofing on cork insulation generally Paropa paving on screed to roof of ward block	1	3¼	13·72	10,694
9	**Upper floor construction** Reinforced concrete floor slabs generally, but lightweight precast concrete floor units over services crawlway space at base of ward block	7	4½	79·56	61,994
10	**Staircases** Reinforced concrete staircases and landings Steel balustrade and handrails	1	1	11·63	9,062
11	**Internal partitions** Fletton brick and solid partition blocks Glazed screens in hardwood	3	4½	36·34	28,317
12	**Internal doors** Flush doors generally, approx 60% plastic faced Hardwood glazed doors to corridors, etc Hardwood frames throughout	5	2¼	55·74	43,435
	Total of structural elements 39/1¾ 421·47				

Element Ref as Building Note No 2	Element	Cost per Square Foot	Cost per Square Metre	Cost
No		s d	s	£
	Finishes and Fittings			
13	**Wall finishes** Plastered walls generally, terrazzo dado linings to corridors to ward block Wall tiling to kitchen Timber wall panelling in staff dining room	4 9¼	51·36	40,022
14	**Floor finishes** Vinyl asbestos tiles on screed generally Terrazzo on screed to staircases and parts of surgical and pathology area Quarry tile paving to kitchens and stores Skirtings in hardwood or terrazzo generally Insulation quilt under screeds to all upper floors	6 7½	71·39	55,632
15	**Ceiling finishes** Stove enamelled metal suspended ceilings generally Plaster on expanded metal suspended ceilings to operating theatres	3 5¼	36·95	28,794
16	**Decorations** Emulsion paint on walls and plastered ceilings generally Anti-condensation paint to kitchens and bathrooms Paint on cupboard doors Lacquer finish to hardwood internally Polyurethane varnish to hardwood externally Silicone solution to concrete externally PVC spray finish to parts of ward block	2 9½	30·01	23,383
17	**Fittings** All general fittings except cupboards and mirrors	7 0½	75·74	59,024
18	**Furniture and furnishings** Cupboards and mirrors	1 11	20·70	16,128
	Total of finishes and fittings 26/7 286·15			

Element Ref as Building Note No 2	Element	Cost per Square Foot	Cost per Square Metre	Cost
No		s d	s	£
	Services			
19	**External plumbing** Cast iron rainwater pipes and fittings	6¼	5·54	4,319
20	**Sanitary fittings and wastes** White glazed fireclay fittings generally Copper overflow and waste pipes Cast iron soil and ventilating pipes	3 7¾	39·25	30,585
21	**Mechanical engineering**			
	Heating services	5 8¾	61·69	48,071
	Hot water services	1 9½	19·29	15,035
	Cold water services	1 8½	18·34	14,295
	Steam distribution	1 4½	14·72	11,467
	Ventilation	5 11½	64·16	49,999
	Refrigeration plant to ward block and operating theatres	1 5½	15·72	12,247
	Pneumatic conveyance system	2 1¼	22·60	17,609
	Medical gases and compressed air	1 6¾	16·82	13,105
	Town gas	1¾	1·48	1,154
	Water softening plant	7¾	7·02	5,473
22	**Electrical engineering** Main switch gear, lighting and power installation including lighting fittings, transformers, standby diesel alternator, patients' and staff call systems, radio and television, fire alarm system, clocks, PABX switchboard equipment	16 1¾	173·79	135,423
23	**Fixed equipment**			
	Kitchen equipment	4 11½	53·26	41,500
	Hospital equipment for wards, pathology, operating theatres, pharmacy and central sterile supplies department	3 5¼	37·08	28,895
	Sterilising equipment	2 0	21·62	16,851
	Fire-fighting equipment	1¾	1·63	1,268
24	**Lifts** No 3 passenger lifts No 1 passenger goods lift No 4 goods lifts	7 5	79·81	62,192
25	**Builder's work in connection with mechanical, electrical and lift installations**	2 2¼	23·66	18,437

Element Ref as Building Note No 2	Element	Cost per Square Foot	Cost per Square Metre	Cost
No		s d	s	£
26	**Drainage** Cast iron drainage throughout No 29 manholes and No 7 soakaways	1 6¾	16·85	13,127
	Total of services 64/6 694·33			
27	**External works** Precast concrete pavings, tarmac to roads on reinforced concrete slab, asphalte damp-proof membrane retaining walls, steps and railings	3 9¾	41·00	31,949
28	**External engineering** Water and electrical mains Road lighting No 3 oil-fired boilers	5 0¼	54·14	42,185
29	**Builder's work in connection with external engineering services** Trenches and reinforced concrete service ducts	4	3·52	2,746
30	**Site layout and planting** Site clearance, site works, demolitions and horticultural work	4¾	4·24	3,300
31	**Alteration works to existing hospital buildings**	7¼	6·42	5,000
32	**Connecting bridge to old hospital building** Reinforced concrete suspended structure, timber room construction, hardwood windows, vinyl asbestos floor tiling	1 5¾	16·05	12,507
		161 1½	1,734·45	£1,351,571



Appendices

Appendix A Client, Consultants and Combined Planning Team

Client

Oxford Regional Hospital Board
Old Road
Headington
Oxford

Consultants

Architects
Powell and Moya
90 Tottenham Court Road
London W1

Consultant Architects
Llewelyn-Davies and Weeks
141 Euston Road
London NW1

Structural Engineers
Charles Weiss and Partners
139 King Street
London W6

Mechanical and Electrical Engineers
Brian Colquhoun and Partners
18 Upper Grosvenor Street
London W1

Quantity Surveyors
E C Harris and Partners
7–12 Tavistock Square
London WC1

Combined Planning Team

The planning of the hospital was the responsibility of the consultants together with a combined planning team made up of officers of the regional board and officers of the hospital management committee. Full consultation took place during the whole of the planning and commissioning of Phases 1A and 1B between the board and the committee

Regional Hospital Board

G Watts OBE FHA *Secretary*
J O F Davies CBE MD MRCP DPH QHP *Senior Administrative Medical Officer*
C R Poole FIMTA FACCA *Treasurer*
Miss I James SRN *Regional Nursing Officer*
W J Jobson ARIBA *Regional Architect (until July 1965)*
A L Arschavir Dipl Arch ARIBA DipTP AMTPI *Regional Architect (since July 1965)*
W S Williamson CEng MIMechE MIHVE AMInstF MRSH *Regional Engineer (since April 1965)*
A L Jones ARICS *Chief Quantity Surveyor*

Hospital Management Committee

K H Taylor MB BS FRCS *Consultant Surgeon (served until March 1964)*

Barbara Wilkinson MD MRCS LRCP *Consultant Pathologist (served until October 1964)*

E H Seward DM MA FFARCS *Consultant Anaesthetist (served from April 1964)*

D H Garrow BM BCh MRCP *Consultant Paediatrician (served from October 1964 to July 1965)*

A G Kilcoyne BSc MB BCh BAO FRCS DLO *Consultant Ear, Nose and Throat Surgeon (served from July 1965)*

Miss R Rowell SRN SCM *Matron*

F T Naylor BA FHA *Group Secretary (until May 1965)*

K G Walker MA FHA *Group Secretary (since May 1965)*

Appendix B Contractors, Sub-contractors and Building Suppliers

Main Contractors Phase 1A

H. J. & A. Wright Ltd., High Street, Great Missenden, Buckinghamshire.

Main Contractors Phase 1B

Ford & Walton Ltd., Walton House, Warton Road, London, E15.

Sub-contractors Phase 1A

Work Executed	Firm	Address
Curtain Track	Murrays Ltd.	White Hart St, High Wycombe, Bucks.
Electrical Installation	T. Clarke & Co. Ltd.	Stanhope House, 110 Drury Lane, W.C.2.
Lift Installation	Platt-Schindler Lifts Ltd.	Wellington House, Upper St. Martin's Lane, W.C.2.
Mechanical Installation	F. G. Alden Ltd.	6 Aristotle Lane, Kingston Road, Oxford.
Metal Windows and Screens	Crittall Manufacturing Co. Ltd.	210 High Holborn, W.C.1.
Temporary Boiler House	Boulton & Paul Ltd.	Riverside Works, Norwich.
Water Connection	Bucks Water Board	Mill End Rd, High Wycombe.
Water Storage Tank	Horseley Bridge Ltd.	Tipton, Staffs.

Sub-contractors Phase 1B

Aluminium External Doors	Ajax Aluminium Ltd.	Gloucester Trading Estate, Gloucester.
Aluminium Windows	Crittall Manufacturing Co. Ltd.	210 High Holborn, W.C.1.
Asbestos Spray Ceiling Finish	Turners Asbestos Cement Co. Ltd.	Turnall House, Sutton Park Rd, Sutton, Surrey.
Blinds	Accordo Blinds Ltd.	4a St. Michael's Road, West Croydon, Surrey.
	Stilsound Vertical Blinds Ltd.	776 High Rd, North Finchley, N.12.
	Northampton Sun Blinds Co. Ltd	Carey Street, Northampton.
Cement Glaze Wall Finish	Cement Glaze Ltd.	508 Ridgeway Rd, S.W.9.
Dirty Linen Chute	Lamson Engineering Co. Ltd.	7 Hythe Road, N.W.10.
Electrical Installation	T. Clarke & Co. Ltd.	Stanhope House, 110 Drury Lane, W.C.2.

Gas Connection	North Thames Gas Board	162 High Street, Uxbridge.
Internal Metal Screens	The Wessex Guild	Manton St, Swindon, Wilts.
Kitchen Equipment	Allied Ironfounders Ltd.	Falkirk Iron Works, P.O. Box No. 4, Falkirk. Stirlingshire.
	Moorwood Vulcan Ltd.	7 Rathbone Place, W.1.
Laboratory Benches	Baird & Tatlock Ltd.	Freshwater Rd, Chadwell Heath, Essex.
Lift Installation	Platt-Schindler Lifts Ltd.	Wellington House, Upper St. Martin's Lane, W.C.2.
Main Entrance Hall Joinery Fittings	Wiltshire Joinery Co. Ltd.	Marstone Rd, Wootton Bassett, Wilts.
Mechanical Installation	Taylor Woodrow Construction Ltd.	345 Ruislip Rd, Southall, Middx.
Metal Entrance Gates	The Wessex Guild	Manton St, Swindon, Wilts.
Mobile Storage Units	Asteroid Ltd.	132 Carpenters Road, E.15.
PABX Telephone Equipment	Reliance Telephone Co. Equipment	Turnalls Mill Lane, Wellingborough, Northants.
Patent Glazing	Crittall Manufacturing Co. Ltd.	210 High Holborn, W.C.1.
Plate Glass Doors	James Gibbons Ltd.	Walkden House, 3 Melton Street, N.W.1.
PVC Spray Finish to Walls and Ceilings	R. A. Brand & Co. Ltd.	Works Rd, Letchworth, Herts.
Refrigerated Appliances	York Shipley Ltd.	North Circular Road, N.W.2.
Seating Units	Flairline Organisation Ltd.	49a Brittannia Road, S.W.6.
Sliding Gates	Bolton Gate Co. Ltd.	Turton Street, Bolton, Lancs.
Steel Structure to Bridge	The Wessex Guild	Manton St, Swindon, Wilts.
Steel Structure to Metal Screens	M.L.H. (1957) Co. Ltd.	11 Bath Road, Cranford, Hayes, Middx.
Suspended Ceilings	Anderson Construction Co. Ltd.	Cambridge Road, Twickenham, Middx.
	S.G.B. Contracts Ltd.	Blundell Street, N.7.
Terrazzo Flooring and Wall Linings	Marbello & Durus Ltd.	Sadler Rd, Brownhills, Walsall, Staffs.
Vinyl Floor Tiles	G. C. Flooring Co. Ltd.	53 London Rd, Twickenham, Middx.
Water Connection	Bucks Water Board	Mill End Rd, High Wycombe, Bucks.
Window Opening Gear	Teleflex Products Ltd.	Christopher Martin Rd, Basildon, Essex.

Building Suppliers (Group 1 Equipment) Phase 1A

Goods Supplied	Firm	Address
Kitchen Units	E. & H. Grace Ltd.	125a Hamilton Rd, S.E.27
Rooflights	Quicktho Engineering Ltd.	Western Road, Wymering, Portsmouth.
Sanitary Fittings	Finch-Froy Ltd.	Belvedere Works, Sherwood Rd, Ilford, Essex.

Building Suppliers (Group 1 Equipment) Phase 1B

Aluminium Roller Shutters	J. Taylor (Syston) Ltd.	Syston, Leicester.
Display Shelf	The Wessex Guild	Manton St, Swindon, Wilts.
Flush Doors	Veneercraft Ltd.	18 Bedford Square, W.C.1.

Formica Faced Bench Tops	Buchboard Co. Ltd.	Princeway, Team Valley, Gateshead 11.
Hardwood Windows	H. Tyson Chambers Ltd.	194–5 Bedford Ave, Trading Estate, Slough, Bucks.
Ironmongery	N. F. Ramsay & Co. Ltd.	6–8 Charlotte Square, Newcastle-upon-Tyne 1.
	Alfred G. Roberts Ltd.	235 Southwark Bridge Rd, S.E.1.
Liquid Soap Dispensers	Izal Ltd.	Thorncliffe, Sheffield.
Louvred Door Panels	Steel's (Contractors) Ltd.	The Glass Works, Stamford Road, N.1.
Mesh Screens to Lift Shaft	F. W. Potter & Soar Ltd.	2 Phipp Street, W.C.2.
Metal Doors	The Wessex Guild	Manton St, Swindon, Wilts.
Metal Louvres	Greenwood Airvac Ventilation Ltd.	Regal House, London Road, Twickenham, Middx.
Metal Shelving to Cold Store	John Wilkins Equipment Ltd.	10 New Fetter Lane, E.C.4.
Metal Work Bench	The Wessex Guild	Manton St, Swindon, Wilts.
Perspex Hood to Reception Counter	William J. Cox Ltd.	The Bothy, London Rd, Tring, Herts.
Photographic Processing Unit	Kodak Ltd.	Kodak House, Kingsway, W.C.2.
Precast Concrete Cladding Units	Trent & Hoveringham Concrete Companies	298 Preston Rd, Harrow.
Precast Concrete Columns	Charlton Concrete Co. Ltd.	Woollard Lane, Bristol 4.
Precast Concrete Lighting Bollards	W. & C. French Ltd.	50 Epping New Rd, Buckhurst Hill, Essex.
Sanitary Fittings	Dent & Hellyer Ltd.	11 Emerald Street, W.C.1.
Stainless Steel Scrub-up Units	The Wessex Guild	Manton St, Swindon, Wilts.
Stove Enamelled Paper Towel Dispenser Casings	The Wessex Guild	Manton St, Swindon, Wilts.

Appendix C Suppliers for Mechanical and Electrical Services

Equipment	Firm	Address
Air Cooling Plant	Carlyle Air Conditioning and Refrigeration Ltd.	1 King Street, S.W.1.
Air Filters	Ozonair Ltd.	1 Longmore St, S.W.1.
Autoclaves	Drayton Castle Ltd.	Bridge Works, West Drayton, Middx.
Batteries	Chloride Batteries Ltd.	Clifton Junction, Swinton, Manchester.
Battery Chargers	Legg (Industries) Ltd.	Merridale Street, Wolverhampton, Staffs.
Bedhead Lights	Thousand & One Lamp Co. Ltd.	386 Lee High Road, London S.E.12.
Bedpan Warming Cabinets	Sumerling & Co. Ltd.	212 Acton Lane, London N.W.10.
Bedpan Washing Machines	Sumerling & Co. Ltd.	212 Acton Lane, London N.W.10.
Boilers	Daniel Adamson Ltd.	Dukinfield, Cheshire.
Boiler Controls	Ronald Trist Controls Ltd.	Bridge House, 181 Queen Victoria Street, E.C.4.
Boiler-feed Pumps	G. & J. Weir Ltd.	Albany House, Petty France, S.W 1.
Boiler-feed Treatment Plant	I.C.I. Ltd.	Imperial Chemical House, Millbank, S.W.1.
Boiler House Instruments	Cambridge Instrument Co. Ltd.	19 Grosvenor Place, S.W.1.
	Elliots Process Automation Ltd.	Abbey Road, N.W.10.
	George Kent Ltd.	103 Kingsway, W.C.2.
	K.D.G. Instruments Ltd.	Manor Royal, Crawley, Sussex.
	Photain Controls Ltd.	Randalls Rd, Leatherhead, Surrey.
Booster Pumps	Sumo Pumps Ltd.	Submersible Electric Pumps, 93 Shaftesbury Avenue, W.C.2.
Bottle Washing Machine	Dawson Bros. Ltd.	406 Roding Lane, Woodford Green, Essex.
Buffet Equipment	Jackson Boilers Ltd.	42 Lambs' Conduit Street, W.C.1.
	W. M. Still & Sons Ltd.	106 Saffron Hill, E.C.1.
Bus-bars	Power Centre Ltd.	P.O. Box 18, Brookside, Newtown, Wednesbury, Staffs.
Cables	British Insulated Callender's Cables Ltd.	21 Bloomsbury St, W.C.1.
	Enfield Standard Power Cables Ltd.	Esterbrooke St, S.W.1.
	Pryotenax Ltd.	Portland House, Stag Place, S.W.1.
Cable Racks	British Insulated Callender's Cables Ltd.	21 Bloombsbury St, W.C.1.

Cable Trunking	Lemmer Engineering Ltd.	9 Nielsons Estate, Creek Road, East Molesey, Surrey.
Calorifiers	Hartley & Sugden Ltd.	54 Regent St, W.1.
Centrifugal Fans	Air Control Installations Ltd.	Chard, Somerset.
	Keith Blackman Ltd.	Mill Mead Road, N.17.
Cill-line Heaters	Hunt Heat Exchangers Ltd.	Temple Chambers, Temple Avenue, E.C.4.
Clocks	Synchronome Co. Ltd.	34 Palfrey Place, S.W.8.
Cold Water Services	Ford & Walton Ltd.	Walton House, Warton Rd, E.15.
Compressors	Broom & Wade Ltd.	High Wycombe, Bucks.
Convectors	Dunham Bush Ltd.	Fitzherbert Rd, Farlington, Portsmouth, Hants.
Cooling Tower	Thermotank Ltd.	60 Rochester Row, S.W.1.
Dampers	Fairitt Engineering Co. Ltd.	24 Worple Road, S.W.19.
	Zest Equipment Co. Ltd.	1351 London Rd, S.W.16.
Diffusers	Fairitt Engineering Co. Ltd.	24 Worple Rd, S.W.19.
Dishwashing Machines	Dawson Bros. Ltd.	406 Roding Lane, Woodford Green, Essex.
Distribution Boards	Dorman & Smith Ltd.	125 High Holborn, W.C.1.
Electric Motors	Bull Motors (E.R. & F. Turner Ltd.)	125 Strand, W.C.2.
	Crompton Parkinson Ltd.	Crompton House, Aldwych, W C.2.
Executive Indicators	Sterdy Telephones Ltd.	3 Furlong Road, N.7.
Expansion Joints	Engineering Appliances Ltd.	147 Chiswick High Road, W.4.
Fans	Brooks Ventilation Units Ltd.	Trafalgar House, 2 Bedford Park, Croydon.
	Fenton Byrn & Co. Ltd.	Armfield Close, West Molesey, Surrey.
	Woods of Colchester Ltd.	Braiswick Works, Colchester.
Fire Alarm System	Trans-Call Ltd.	Maylands Avenue, Hemel Hempstead, Herts.
Fire Hose Reels	Dunford Fire Protection Services Ltd.	49a Park Hall Road, S.E.21.
Flue Dampers	Metroflex (Oil Firing) Ltd.	Metroflex Works, 14 Earl Cotts, Earl Road, S.E.1.
Gas Incinerator	John Thompson Industrial Constructions Ltd.	Tavistock House East, Woburn Walk, W.C.1.
Generating Set (Standby)	Auto Diesels Ltd.	Braby House, Smithfield Street, E.C.1.
Grilles	Greenwood Airvac Ventilation Ltd.	Regal House, London Road, Twickenham, Middx.
	R.C.M. (Air Distribution) Ltd.	South Way, Wembley.
	Waterloo Grille Co. Ltd.	Manor Trading Estate, Church Rd, Thundersley, Essex.
Heater Batteries	Air Control Installations Ltd.	Chard, Somerset.
Heating Panels	Comyn Ching & Co. (London) Ltd.	15 Shelton Street, W.C.2.
Hot Well Tank	Carty & Sons Ltd.	Harders Road, S.E.15.
Illuminated Direction Signs	S. L. R. Electric Ltd.	Cranborne Rd, Potters Bar.
Invisible Heating Panels	Z. D. Berry & Co. Ltd.	16 Regency Street, S.W.1.

Kitchen Equipment	Allied Ironfounders Ltd.	28 Brook Street, W.1.
	Benham & Sons	307 Merton Rd, Wandsworth, S.W.18.
	Crypto Ltd.	North Circular Rd, N.W.10.
	Hobart Manufacturing Ltd.	Hobart Corner, N.11.
	Moorwood-Vulcan Ltd.	7 Rathbone Place, W.1.
	James Stott & Co. (Engineers) Ltd.	Vernon Works, Oldham, Lancs.
Lamps (Fluorescent Tubes)	A.E.I. Lamp & Lighting Co. Ltd.	1 Stanhope Gate, W.1.
	Philips Electrical Ltd.	Century House, Shaftesbury Avenue, W.C.2.
Lamps (Tungsten)	A.E.I. Lamp & Lighting Co. Ltd.	1 Stanhope Gate, W.1.
Lighting Fittings	A.E.I. Lamp & Lighting Co. Ltd.	1 Stanhope Gate, W.1.
	Courtney Pope (Electrical) Ltd.	Amhurst Park Works, Seven Sisters Rd, N.15.
	Falks Ltd.	9 Farringdon Rd, E.C.1.
	Frederick Thomas & Co.	Everton Buildings, Stanhope Street, N.W.1.
	Harris & Sheldon Lighting Ltd.	46 Great Marlborough St, W.1.
	Holophane Ltd.	P.O. Box 36, Bond Avenue, Bletchley, Bucks.
	Merchant Adventurers Ltd.	231 Tottenham Court Rd, W.1.
	Osram (G.E.C.) Ltd.	Brook Green, W.6.
	Rotaflex (Great Britain) Ltd.	241 City Road, E.C.1.
	Simplex Electric Co. Ltd.	Wharf Estate, Ealing Rd, Wembley.
	S.L.R. Electric Ltd.	Cranborne Rd, Potters Bar.
	Thousand & One Lamp Co. Ltd.	386 Lee High Road, S.E.12.
	Troughton & Young Lighting Ltd.	Wansdown Place, S.W.6.
	Walsall Conduits Ltd.	18 Chapter Street, S.W.1.
Lighting Switches	Wandsworth Electrical Manufacturing Co. Ltd.	Portman Chambers, 7 Baker Street, W.1.
Main Cables	A.E.I. Ltd. (Cable Division)	1 Stanhope Place, W.1.
Main Switchgear	Dorman & Smith Ltd.	125 High Holborn, W.C.1.
Motor Starters	Allen West & Co. Ltd.	Lewes Road, Brighton, Sussex.
Nurse-call System	Trans-Call Ltd.	Maylands Avenue, Hemel Hempstead, Herts.
Oil Burners	Associated British Combustion Ltd.	East Street, Porchester, Hants.
Oil Tanks	Hunt's Mill Steelworks Ltd.	Abbey Road, West Ham, E.15.
Operating Theatre Control Panels	Field & Grant Ltd.	Kent Street, Birmingham 5.
Operating Theatre Inter-communications Systems	Trans-Call Ltd.	Maylands Avenue, Hemel Hempstead, Herts.
Operating Theatre Scialytic Lighting Fittings	Drayton Castle Ltd	Bridge Works, West Drayton, Middlesex.
Oven Sterilisers	Charles Hearson & Co. Ltd.	68 Willow Walk, S.E.1.
Ozone Generator	Tack Industries Ltd.	Tack House, Longmoore St, S.W.1.
Piped Medical Gases	British Oxygen Gases Ltd.	Medical Dept, Hammersmith House, W.6.
Pneumatic Tube Communication System	Dialled Dispatches Ltd.	The Green, Gosport, Hants.

Pressure Control Dampers	Thermocontrol Installations Co. Ltd.	2 Valentine Place, S.E.1.
Pressure Control Valves	Sir W. H. Bailey & Co. Ltd.	Selinas Lane, Dagenham.
	Drayton Controls Ltd.	Bridge Works, West Drayton, Middlesex.
Pumps	Holden & Brooke Ltd.	105 Fulham Rd, S.W.3.
	Rhodes, Brydon & Youatt	45 Leman Street, E.1.
	Sumo Pumps Ltd.	Submersible Electric Pumps, 93 Shaftesbury Av, W.C.2.
	Varley F.M.C. Ltd.	Ferry Lane, Brentford, Middx.
Radio Relay System	Trans-Call Ltd.	Maylands Avenue, Hemel Hempstead, Herts.
Refrigeration Equipment	Pressed Steel Co. Ltd.	409 Halifax Rd, Greenford, Middx.
	York Shipley Ltd.	North Circular Rd, N.W.2.
Sluicing Machines	Tullis Industries Ltd.	Thorncote Green, Sandy, Beds.
Socket Outlets	M.K. Electric Ltd.	Shrubbery Road, Edmonton, N.9.
	A. Reyrolle & Co. Ltd.	Imperial House, Kingsway, W.C.2.
	Walsall Conduits Ltd.	18 Chapter Street, S.W.1.
	Wandsworth Electrical Co. Ltd.	Portman Chambers, 7 Baker Street, W.1.
Staff Location System	Multitone Electric Co. Ltd.	12 Underwood Street, N.1.
Standby Generating System	Auto Diesels Ltd.	Braby House, Smithfield St, E.C.1.
Steam Traps	Spirax-Sarco Ltd.	41 Curzon Street, W.1.
Stills	Manesty Machines Ltd.	44 Stewarts Road, S.W.8.
	Townson & Mercer Ltd.	101 Beddington Lane, Croydon.
Television Aerial System	Trans-Call Ltd.	Maylands Avenue, Hemel Hempstead, Herts.
Thermostats	Thermocontrol Installations Co. Ltd.	2 Valentine Place, S.E.1.
Transformers	Foster Transformers Ltd.	Morden Road, S.W.19.
	Hackbridge & Hewittic Co. Ltd.	Hersham, Walton-on-Thames.
	London Transformer Products Ltd.	L.P.T. Works, Cobbold Estate, N.W.10.
Treatment Lamps	Major Equipment Co. Ltd.	18 Gorst Road, N.W.10.
Underfloor Trunking	Key Engineering Co. Ltd.	Larkfield, Maidstone, Kent.
Waste Disposal Machines	Haigh Engineering (Sales) Co. Ltd.	2 South Audley St, W.1.
	W. & G. Sissons Ltd.	St. Mary's Road, Sheffield 2.
Water Softening Plant	Permutit Co. Ltd.	Permutit House, Gunnersbury Avenue, W.4.

Appendix D
Suppliers of Furniture and Equipment

Anaesthetic Equipment

British Oxygen Co. Ltd.
Medical Department,
Hammersmith House, W.6.

Cape Engineering Co. Ltd.
The Cape, Warwick.

H. G. East & Co. Ltd.
Cowley, Oxford.

Formaflow (London) Ltd.
Medical Sales Dept,
Stanhope Road,
Camberley, Surrey.

Garthur (London) Ltd.
Maids Moreton House,
Buckingham.

Genito-Urinary Manufacturing
Co. Ltd.
28a Devonshire Street, W.1.

Longworth Scientific Instrument
Co. Ltd.
Radley Rd, Abingdon, Berks.

Medical & Industrial Equipment Ltd.
10–12 New Cavendish Street, W.1.

Oxygenaire Ltd.
Basingstoke, Hants.

Bedding and Linen

Anglo-Irish Linen Co. Ltd.
Dominion House,
Bartholomew Close, E.C.1.

Celairic Ltd.
Whitley Willows Mill,
Lepton, Nr. Huddersfield.

Duke & Lowson Ltd.
Victoria Works,
Forfar, Angus.

Highams Ltd. Linen Manufacturers,
Wood Nook Mills,
Accrington, Lancs.

M. D. Kinloch & Co. Ltd.
37 Birch Hall Lane,
Manchester 13.

Bedside Lockers

W. H. Deane (High Wycombe) Ltd.
Wooburn Green,
High Wycombe, Bucks.

Bedsteads

Hoskins & Sons Ltd.
Neptune Works,
Upper Trinity Street,
Birmingham 9.

Carpets

Ministry of Public Building & Works,
Southbridge House,
Southwark Bridge Road, S.E.1.

I. & C. Steele & Co. Ltd.
The Carpet Mill, Bloxham, Oxon.

Carpets Made and Laid

Murrays (High Wycombe) Ltd.
White Hart Street,
High Wycombe, Bucks.

Central Sterile Supply Department Equipment

Asec Ltd.
4a Orwell Road,
Liverpool 4.

Capecraft Ltd.
The Cape, Warwick.

Hospital Metalcraft Ltd.
Ashton Vale Rd, Bristol 3.

Chapel Furnishings etc.

Brendons Ltd.
Burkes Parade,
Beaconsfield, Bucks.

Contract Interiors Ltd.
Manufacturers & Contract Furnishers,
203 King's Road, S.W.3.

Harper-Wycombe Ltd.
Station Works, Amersham Hill
High Wycombe, Bucks.

Inter-Varsity Fellowship of
Evangelical Unions,
39 Bedford Square, W.C.1.

S.P.C.K.
29 Tufton Street, S.W.1.

H. Tyson Chambers Ltd.
Trading Estate, Slough, Bucks

Curtain Materials

Danasco Ltd.
6 Golden Square, W.1.

Ploeg Fabrics Ltd.
31 Connaught Street, W.2.

Stevenson & Son Ltd.
208a Regent Street, W.1

Curtains Made Up and Hung

Murrays (High Wycombe) Ltd.
White Hart Street,
High Wycombe, Bucks.

Doormats

Bodigan & Co. Ltd.
Montague Mills,
52 Boismoor Road, Chesham, Bucks.

Engineering Equipment

Buck & Hickman Ltd.
2 Whitechapel Road, E.1.

Consolidated Pneumatic Tool Co. Ltd.
232 Dawes Road, S.W.6.

A. Douglas & Co. Ltd.
Engineering Suppliers,
Lincoln Road,
High Wycombe, Bucks.

Instruments Electrical Co. Ltd.
107 Newington Causeway, S.E.1.

Isaac Lord Ltd.
202–4 Desborough Road,
High Wycombe, Bucks.

Mills Scaffold Co. Ltd.
Winchester House,
53 Uxbridge Road, Ealing, W.5.

Norland Service (Builders Merchants) Ltd.
Clarendon Road,
Borehamwood, Herts.

Rownson, Drew and Clydesdale Ltd.
Leigh Street,
High Wycombe, Bucks.

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Appendix E
Staff Establishment

The figures below are the approved establishment of the Wycombe General Hospital as at 1 November 1966, excluding consultant medical staff and medical assistants. In the case of nursing staff the establishment included the staff required for Booker Hospital, High Wycombe, a 55 bed geriatric unit which for nursing purposes is linked with the Wycombe General Hospital (274 acute beds).

There is a contract with a commercial firm for domestic cleaning at Wycombe General Hospital: a note against the domestic establishment shows what additional staff would be required if direct labour was employed for cleaning services.

Staff numbers are expressed as whole-time, the hours of part-time workers being aggregated and divided by the basic hours of duty for the grade.

Category	Grade	No	
Medical Staff (Excluding consultants and medical assistants)	**Registrars**		
	General Medicine	1	
	General Medicine and Dermatology	1	
	General Surgery	1	
	Orthopaedic and Accident	2	
	Anaesthetics	1	
	Psychiatry (based at St John's Hospital, Aylesbury)	1	
	Geriatric (based at Booker Hospital)	1	
	Senior House Officers	9	
	House Officers	5	
	Clinical Assistants	9	(working a total of 20 sessions a week)

Nursing Staff
(Including nursing staff for Booker Hospital 55 geriatric beds)

Senior Matron	1
Assistant to the Senior Matron	1
Assistant Matrons	3
Sister Tutor	1
Night Superintendents	2
Night Sisters	6
Admin Sister	1
CSSD – Asst Matron	1
Departmental Sisters	12
Ward Sisters	21
Staff Nurses	57
Senior Enrolled Nurses	7
Enrolled Nurses	32
Pupil/Student Nurses	110
Nursing Auxiliaries	58
Ward Orderlies	24·5
Cadet Nurses	15
	382·5

Note

The staff establishment (including night duty) for a typical 40-bed standard ward unit in the new block is as follows:

Sisters	*2*
Staff Nurses	*4*
State Enrolled Nurses	*2*
Pupil/Student Nurses	*8*
Nursing Auxiliaries	*4*
Ward Orderlies	*1·5*
	21·5

Administrative and Clerical Staff

Hospital Secretary	1
General Administrative	3
Higher Clerical	5
Clerical	20·75
Personal Secretaries	10·5
Shorthand Typists	3
Supervisor	1
	44·25

Departmental Staff

Chest Clinic	Shorthand Typists	2
Professional and Technical X-ray Department	Superintendent Radiographer	1
	Senior Radiographer	1
	Radiographers	4
	Dark Room Technicians	2
		8
Pathology Department	Chief Technician (II)	1
	Chief Technicians (I) (special responsibility)	2
	Senior Technicians (II)	2
	Senior Technician (I)	1
	Junior/Student Technicians	13
		19
Pharmacy	Chief Pharmacist	1
	Senior Pharmacist	1
	Pharmacists	2
	Pharmacy Technicians	2
		6
Others	Occupational Therapists	2·5
	Senior Social Worker	1
	Social Worker	1
	Chiropodist	·5
	Orthoptist	·5
	Lip Reader	·25
	Speech Therapist	·5
	Dietitian	·5
	Physiotherapists	3
	Remedial Gymnast (senior)	1
	ECG Technician	1
	CSSD Supervisor	1
	Deputy CSSD Supervisor	1
	Psychiatric Social Worker	1
	Medical Photographer	·25
		15
	Chaplains (part-time)	3

Ancillary Staffs

Works and Maintenance	Hospital Engineer	1
	Assistant Engineer	1
	Fitters	3
	Painters	4
	Carpenters	2
	Electricians	3
	Stokers	5
	Labourers	2
		21
Gardens	Gardeners	2·5
Catering	Catering Officer	1
	Kitchen Superintendent	1
	Head Cook	1
	Assistant Head Cook	1
	Cooks	6
	Assistant Cooks	4
	Dining Room Supervisors	2
	Senior Waitresses	3
	Catering Assistants	17
	Porters	2
	Diet Cooks	2
	Assistant Diet Cooks	1·5
		41·5
Domestic and Portering	Head Porter/Supervisor	1
	Operating Theatre Attendants	6
	Mortuary Porter	1
	Storesmen	2
	General Porters	23
	Cleaners	5
	Foremen	2
		40

Note

The following additional staff would be required if cleaning were to be carried out by direct labour:

Domestic Superintendent	*1*
Ward Orderlies	*3*
Domestic Supervisor	*1*
Forewomen	*4*
Cleaners	*30*
Porters	*2*
	41

Homes	Warden	1
	Assistant Warden	1
	Domestic Assistants	10·5
	Housekeepers	2
		14·5
Other	Telephonists	4
	Drivers	3
	Linen Room Domestic Assistants	3
	Seamstresses	3
		13

Appendix F
Production Method for Hospital Description

The method of production used for this Hospital Description was based on a consideration of the following factors.

1 The cost (and therefore the selling price) should be reasonable.

2 The book should be based on material that would normally be available at the completion of a hospital building.

3 The method of production, balance of content and general style of the book should be such that others could use them as a model for similar publications in the future.

The organisation of the text posed some problems and the sequence adopted here was only arrived at after considerable discussion. It does seem to present a logical framework, and to allow the reader to move from the general to the particular in a time sequence parallelling the actual development of the project. We hope that the progression from development to design and on to detail, followed by factual appendices, will be considered appropriate for other hospital descriptions and provide a convenient and coherent system of standardisation.

Early on in planning the book it was decided to use an A4 format. This is convenient for presenting plans and illustrations, and is also an international standard for architectural and technical literature. Its use means that the open book gives a large horizontal area which can, as on pages 43–49, be supplemented by using a fold-out to increase the available space. The fold-out also makes it possible to print large plans without having to split them where the book is bound.

Visually, the main problem in presenting a hospital in book form proved to be that the buildings are usually so large that drawings of them reproduced to a very small scale become difficult to read. This exercise is one of miniaturisation and the presentation of drawings in a clear sequence. In principle, the approach demonstrated here has been to display first of all the total three dimensional shape of the building, and then to take it to pieces in the form of plans and sections to show what goes on inside.

To enable the plans to be assimilated easily, both by architects and non-technically minded readers, it was thought essential that the drawing scales should be as consistent as possible. The scales we chose are a compromise, if the scale had been too small the plans would have been illegible, if the scale had been too large it would not have been possible to include a large enough area on a single or double page spread. It was also obviously desirable to use a scale which would allow complete departments to be

represented as whole units. Most of the plans and sections are reproduced to 1/32 inch scale and 1/16 inch scale and were actually drawn at twice these scales, that is, 1/16 inch and 1/8 inch respectively. The drawings were kept as simple as possible and in line only, both for clarity and because line is cheaper to reproduce and print. It was thought essential for readability to label all rooms on the actual plans, and not to use a system of keyed references. Some lettering is by stencil, some has been typeset and then pasted on to the plans before reproduction. It is hard to choose between the two methods, but where a great deal of small labelling has to be accommodated, it is probably better to use the typeset lettering.

Our own choice of printing method was in favour of letterpress, but making such decisions for other hospital descriptions will depend on a variety of factors – for example, what printing facilities are available within the publishing organisation, and what useful links already exist with printers. A fundamental factor is the number of copies of the book that are required. It should be remembered that the *more* copies that can be ordered the cheaper *each* copy will be though the *total* bill will be greater. The ideal solution is to order just about the maximum possible number that can be sold or will be needed, but estimating this is a tricky business and even professional publishers with years of experience can make costly bad guesses. In our case we have guessed at 3,000 copies of which approximately 800 will be given away through various channels. These figures are about average for a King's Fund publication, and the selling price (which represents only production and distribution costs) has been subsidised by revenue from advertising.

At about 3,000 copies letterpress is an economical printing method, but below 2,500 it begins to be expensive per book because many of the costs involved come from preparatory work that is necessary regardless of the number of copies which are to be printed. Where less are needed, it is worth considering one of a number of methods using typewritten originals and offset printing. Most of these methods are capable of reproducing plans efficiently, though there will be difficultues with some photographs. It is only when very large numbers are involved, say more than about 15,000 copies that big-scale offset printing becomes economical.

Study of this and other pages will show that we developed a layout based on three columns of equal width. Sometimes the two right-hand columns are used together with the remaining left-hand column used for marginal headings, sometimes all three columns are used as a unit (see the cost analysis section, pages 89–97), sometimes each column is used separately as in a newspaper (see pages 110–114). Illustrations and plans follow the same general pattern but we have deliberately not applied the rules rigidly. Margins and headings are consistent throughout, so is the type (Univers) though it is used in various sizes and weights.

The aim of all this is to give a structure which is flexible but consistent. The reader is disturbed by a multiplicity of unnecessary changes of type and style, but bored by complete sameness. Because it is fundamentally bad design to have to mutilate the given material simply to fit some pre-conceived typographical idea, the details of layout in the present book are presented as a model only with the very greatest diffidence. Different hospital buildings will undoubtedly call for different forms of presentation. Any book of this complexity is likely to need its own designer and the

general principles we have used – flexibility, clarity and simplicity – are definitely of more importance than particular details. It is hoped, however, that the A4 format will become a standard for hospital descriptions, in order to build up a consistent library of this information.

It may be useful finally to suggest the sequence of events that would be necessary in putting together any new hospital description. What we give here is not a blow by blow account of the work involved in the present book – we had special problems in that we were trying to arrive at a pattern which others could follow. The sequence is, however, based on considerable experience with publications of various kinds.

1 The first stage is to assemble all the material that is available on the development, design and detail of the new building. It is important to be clear about the original brief for the building and any changes that were subsequently made to it.

2 The second stage is to see what gaps there are in the material, and to set about filling them. Here there is a choice of two methods. Articles written by the specialists involved (architects, engineers, cost accountants), or articles written by a separate author based on interviews and documents. A compromise between the two will probably work. It is almost essential to have the main texts specially written, but material on costs and on some technical subjects may appropriately be communicated in tabular or list form and these can be supplied by the appropriate specialist. It is important to recognise the large amount of work that is likely to be involved in this stage. It will undoubtedly be hard for the author to sort out a common terminology; key decisions may have gone unrecorded; even with a freshly opened building there will be gaps in people's recollection of events and all this will mean research. It will also be hard to decide what material to include and what material to leave out.

3 The third stage is the preparation of the illustrations. Plans will have to be redrawn from the architect's originals (in the case of the present book this took 72 man-days of work) and photographs will have to be assembled or specially taken.

4 The fourth stage is editing. This is one of the most vital stages and one that is most easily neglected. The editor's job is easy to define – he is the reader's advocate, and it is his role to test the consistency and structure of the texts, their relationship with the illustrations, and every detail of the book from the entries on the contents page to the photographers' credits on the inside back cover. Experience has shown that it is very hard indeed for an author to edit his own book efficiently. In fact, author, editor and designer form a team and they should work together smoothly and to mutual advantage, but it is the editor who needs to have ultimate responsibility for a book of this kind.

5 While the editing is in progress, it will be necessary to gather advertising if this is to be included. In deciding whether or not advertisements are worthwhile, it should be remembered that although their revenue is attractive, obtaining advertising involves a great deal of work.

6 The sixth stage is design. Here the designer should work closely with the author and editor; in a book like the present one every page will involve detailed decisions about the positioning of a

caption or the layout of tabular material. It is the designer's job to obtain quotations for printing and to supervise the whole physical production of the book.

7 The seventh stage is marketing. It is no use publishing an important book if it remains in the publisher's store cupboard. Copies will have to be distributed for review to the general and professional press. It may be worth holding a press conference. It may also be worth inserting one or two classified advertisements in the professional press. Plans will have to be made for the procedure under which ordered copies will be sent out and invoiced. Certainly the publication of a hospital description will have great public relations potential, and this should be exploited to the full.

The above notes have been prepared mainly to show the scope of the work involved in publishing a hospital description. No attempt has been made to suggest who should do what in terms of hospital administration. It is recognised that a hospital may well wish to commission consultants to carry out a large part of the work, and there are a number of organisations admirably equipped to do this. What is important, however, is that the hospital itself should have a clear picture of what it is likely to have to provide, and a clear conception of the proper content of the book that it is sponsoring.

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The installation of the mechanical services for Phase IA of Wycombe General Hospital was carried out by our Mechanical and Engineering Division.
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