1500

EAST WING AND ASSOCIATED BUILDINGS
AT BROOMFIELD HOSPITAL
CHELMSFORD
ESSEX

HISTORIC BUILDING RECORD

Essex County Council

Field Archaeology Unit

OCTOBER 2005

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Client: Mid Essex Hospital Services
F.A.U. Project Ref. 1500
Site Code: BRHO 05
NGR: TL 702 113
Dates of Fieldwork: 25-26th May 2005

1.0 INTRODUCTION

A programme of building recording was undertaken by Essex County Council Field Archaeology Unit (ECC FAU) on the east wing at Broomfield Hospital, prior to demolition. The work was commissioned by Mid Essex Hospital Services and based on a brief provided by Essex County Council Historic Environment Management team (ECC HEM), who also monitored the work.

Copies of the completed report and archive will be supplied to the client and the Essex Historic Environment Record (former SMR).

2.0 BACKGROUND

2.1 Site location and description (fig.1)

Broomfield Hospital is one of the largest in Essex, offering a wide range of accident and care facilities typical of the large modern hospital. Located on the north side of Chelmsford, it comprises a core of late 1930s International Moderne style buildings within an ever-expanding mass of modern structures, few of which imitate the farmer's progressive design.

The east wing, together with its symmetrically-opposed west wing (demolished within the last twenty years), formed a significant part of the early hospital, providing accommodation for TB patients. Their design was based on the south-facing half butterfly plan, a common plan form of pre-war hospitals for infectious diseases. Through their angled south-facing position, the linear wards maximised the amount of warmth, air and sunlight to maintain the patient's general health, and help fight the disease which, at the time, was untreatable.

At Broomfield the half butterfly plan was combined with the international moderne style to create two streamlined flat-roofed rectilinear buildings with strip-windows in metal frames, curved walls and design in functional non-ostentatious materials.

2.2 Planning background

As part of an ongoing rationalisation of the hospital service, Mid Essex Hospital Services plan to demolish the east wing, and other, late 20th century buildings to the south, to accommodate the impending relocation of St. Johns Hospital to the site.

As a distinctive building very much of its time, the east wing is architecturally, historically and socially important. Because of this, and its unlisted status, ECC HEM placed a full archaeological condition on the planning permission to record the structure in its present condition, prior to demolition.

3.0 OBJECTIVES

The purpose of the historic building survey, as outlined in the brief, was to investigate and record the east wing before demolition. To achieve this, a written, photographic and drawn record was required. Lower level secondary recording was required of other, still in use, contemporary structures to place the east wing within its functional and architectural context.

Special attention was required to assess the function, internal layout, design features and original fixtures and fittings of the east wing. On a broader level, an assessment of phasing, architectural merit and an understanding of the context of the hospital within its contemporary landscape was required.

4.0 DESCRIPTION OF WORKS

The recording works focused upon the east wing, (RCHME level 3) but also considered contemporary buildings still in use (RCHME level 1 or 2 where possible) to form a holistic approach. A recent survey and original large-scale measured floor plans of the west wing dating to 1936 were supplied by the client. Plans from the recent survey are reproduced at scale 1:150 for ease of incorporation into the report. 1:100 scale versions can be found in the archive.

Documentary and cartographic material was examined at the Essex Records Office (ERO) and a contemporary photograph is included as Appendix 1 at the back of the report. An article from a contemporary architectural journal, *The Architect and Building News* of September 1940 has been included as Appendix 2 and the east wing first floor plan reproduced as fig. 3. The inclusion of Broomfield Hospital in this publication shows the esteem in which the design was held by its peers.

During the course of site recording, external and internal architectural descriptions were made and surviving fixtures and fittings relating to function were identified and located on the floor plans (figs. 3-5). A series of photographs (colour and black & white medium format, digital and 35mm black & white prints) were also taken internally and externally. Specific shots were taken of areas of important architectural detail, fixtures and fittings. The large scale of some buildings and limited area in which to take photograph meant that complete coverage was not always possible. A representative selection is reproduced at the back of this report as plates 1-33. The remainder can be found in the archive.

5.0 HISTORICAL BACKGROUND

5.1 Treatment of TB

Tuberculosis, or consumption as it was referred to in the 19th century, was a serious and infectious bacterial disease caused by unhygienic living conditions and manifested by fever and abnormal lumps on the body. It was caused by breathing in the Bacillus germ and was highly contagious. Of the two types, pulmonary tuberculosis was the most common and serious; potentially fatal. This infected the lungs, but could also affect the other organs, bones and skin (Swain 1995). Before antibiotics were discovered in 1943, treatment was based on keeping the disease at bay by improving the patient's general health, primarily through exposure to fresh air

and sunlight, but also through diet and organised exercise, rather than through specific treatments. Such methods had been successfully pioneered in Germany (Garwood 1999).

In the early sanatoria treatment blocks, built after the Hospital Isolation Act of 1893, fresh air was encouraged through open windows. During the following decades sanatoria design was based on maximising fresh air and sunlight. Thus wards were built facing the south-east, with large expanses of glazing, verandas with glazed canopies, sun balconies and 'butterfly wards', designed to trap sunlight. Large open sites were adopted to maximise light levels into the wards and landscaped grounds created for convalescence.

Most TB hospitals were constructed after the Public Health Tuberculosis Act of 1921, which made the Boroughs and County Councils responsible for their provision. Notable other examples of Essex TB hospitals were Thurrock (1893), Black Notley (1930) and Rochford (extended 1940). In terms of design, Black Notley was as advanced as Broomfield in utilising the half and full butterfly plan and verandas. The Samuel Johnson wing at Rochford Hospital was equivalent to Broomfield in its architectural treatment.

The instance of TB decreased as birth rates fell and after 1943 the disease became treatable with the discovery of the antibiotic Streptomycin. Since then, redundant to original function, the TB hospitals/wards have either been demolished or converted to other uses such as nursing homes (Garwood 1999).

5.2 Broomfield Hospital

Broomfield Hospital was built in 1938 by County Architect John Stuart F.R.I.B.A. as the central hospital for tuberculosis treatment in Essex. It was opened in 1940 (ERO T/P 530/10) comprising treatment block, recreation hall, and administration and kitchen blocks linked by a colonnade to the west, and centred around a quadrangle (fig. 2). The boiler house lay to the north, with ancillary buildings (garages and workshops) and nurses' home either side. At the opposite end of the site, lay the ward block and two wings. The west wing was demolished recently (exact date unknown) to provide space for modern treatment blocks and the east wing is the main subject of this report (fig. 2).

In its design, the ward block reflected contemporary views on the beneficial impact of ventilation and sunlight in treating infectious diseases such as tuberculosis. It also reflected modern design conventions. The structure was built to a symmetrical half-butterfly plan with circular sun-wards

and balconies, circular stair turrets either end and long balconies to its south-facing glazed outlook. In all, it accommodated 300 patients on three levels on six identical wards of 21 two-bed cubicles flanking three levels of 16-single-bed cubicles in the centre (Appendix 2).

Wards were numbered from 1-6, with up to 30 male patients on each ward, mostly from the armed forces (Swain 1995). Patients could stay for months or even years. Those in the single cubicles (in the ward block itself) were the most acute, known as 'bed absolute' or 'death row' and demanding constant attention (Swain 1995). The less severe, in the two-bed cubicles, could be up and out of bed for as much as for 6-8 hours a day. In the morning the porters took the beds through sliding folding glazed cubicle doors onto the balcony to receive air and sunlight, except in poor weather. The patients were taken back to the cubicles before blackout, but after 9.30pm the cubicle doors were re-opened onto the balcony. Stone hot water bottles were provided on very cold evenings (Swain 1995).

During their stay, patients were encouraged to be active and take an interest in day-to-day hospital issues. Each ward had its own patient's committee and chairman, meeting every month, providing opinions and advice to the Hospital Secretary. Short stories, cartoons and poems were contributed towards the in-house magazine, 'San Fairy Ann'. Swain (1995) even mentions a 'concert hall'. During the day, patients were encouraged to convalesce outside in the grounds, which were laid to lawn around mature trees. However, as part of the war effort, the south lawn in front of the butterfly wings later became a cabbage field (Swain 1995).

As the cases of TB dropped, in 1963 the sanatorium became a general hospital. Since then, numerous modern buildings have been added as part of its ever-expanding requirements and the increased centralisation of hospital services. Inevitably, over time, original structures have been lost, most notably the nurses home, workshops, administration block and ward block west wing. Others around the quadrangle remain much as they were built, while other parts, such as the treatment block have been engulfed by the spread of modern hospital structures.

In January 2005 the east wing was closed and has since remained unoccupied.

6.0 BUILDING DESCRIPTIONS (figs. 1-5)

The contemporary nature of the built late-1930s element is clear in its bold sweeping lines, austere monumental facades, curved bays, glazed projections and flat roofs. They share the same build materials: dark brown brick (in Flemish bond), concrete and glass. The east wing is in a poor state of maintenance, with paint peeling, rusty railings and dirty windows. All other buildings that continue in use are in good condition and continue to be well-maintained. These elements were recorded externally, so allowing the important day-to-day workings of the hospital to continue uninterrupted. All structures recorded belong to the same pre-war building phase, reproduced as Appendix 1.

6.1 East wing (1)

From the central ward block, the east wing stretches to the south-east from the sun-ward in a linear fashion, terminating in a circular stair turret (figs. 1 & 2). The structure is built onto a reinforced concrete skeleton topped by a flat pedimented roof. The south front is fully glazed. Each of the three levels is lit by original steel-framed windows manufactured by Crittall Manufacturing Ltd. of Braintree (The Architect & Building News 1940). The east and north sides are brick-built. Brick form and sizes are uniform to this period: a hard buff-coloured utilitarian brick with flint inclusions and frequent crease and kiss marks and colour variations from yellow to red hues. The standard size of brick is 6 x 11 x 22cm (2⅜ x 4⅜ x 8⅝"), laid in Flemish bond within a hard, lime mortar, probably with some cement added to the mix. The floors are constructed from reinforced concrete floor slabs (The Architect & Building News 1940) and the balconies laid in 12"-square, ¾"-deep, non-slip pre-cast concrete tiles.

A modern, post-1987, yellow bricked single-level square hipped-roofed building is attached to the south elevation (plate 1), ruining the view along the main façade. It was included on the recent architect's plans, but reproduced in fig. 4 only as an outline, owing to its recent date and in order to show the position of an original oriel opening more clearly.

6.1.1 South elevation (plates 1 & 2)

Light fills the building through the glazed south elevation, split horizontally by three long balconies, each divided into three equi-distant parts by oriel windows. The bottom two sets originally contained doorways out onto the veranda, but the second of these, to the east, now feeds into the modern appendage's corridor (fig. 4). At the east end is a bland-looking steel panel-encased bay, with an emergency fire exit at its base. Although a logical exit point, its

drabness compared to the vast glazed area suggests the panels were a later addition to a glazed area. At the end is the stair turret, built from brick in header bond. As it forms the entire east elevation, this is further discussed in section 6.1.2.

Original Crittalls glazing, which takes up so much of this frontage, and is such an important element of the building, is arranged in pairs of six-paned opening steel windows, with single fixed sections either side (plates 1 & 2). These are aligned with each of the original double cubicles (figs. 3-5). The two main panes have similar dimensions: 0.8 x 1m at base and 0.8 x 1.25m in the middle (2'7½" x 3'3½'" & x 4'1"), while those at the top are shorter, more vent-like, at 0.8m x 0.64m (2'7½" x 2'1"), becoming even shorter on the second floor (0.8 x 34m, plate 1). In the opening sections, the shorter ones at the top have a central pivoting opening mechanism, the central widows open as side-hung casements, while the bottom panes are always fixed. Glazed doors to the same dimensional specifications are an original feature of the western oriel and, on the upper levels, the panes match the surrounding windows.

On ground floor, the glazed frontage leads out onto an ultramarine-coloured shallow pavement made from 0.3m (1') square floor tiles behind a concrete slab kerb (plate 2). On the first and second floors, narrow 0.7m-wide balconies are restrained by 1.16m-high thin iron railings, pre-constructed from 1.4m-long sections comprising three flat central rails between fixed square-sectioned posts. At the top, sections are linked by a cambered top handrail that laps onto the next section to which it is screwed onto. The base is secured into the concrete slab floor of the balcony. Square-sectioned iron drainage gulleys are original fittings to the first and second floor balconies (plate 2).

Each level is accessed at two points: from the sun-ward to the west and internally from the staircase landing/corridor to the east.

6.1.2 East elevation (plate 3)

Divided into two bays, the east elevation shows the structures most striking feature: the stair turret, and adjoining service rooms (plate 3). The main feature, the semi-circular stair turret, breaks up the austere brick-built east and north elevations and lets the sunlight pour onto the stairs within. Header bond is used around the stairs and Flemish the rest. Beginning with the turret, the external glass rises from the landing between ground and first floor to the top of the second floor, curving around the first bay. Its frame is concrete-formed around thick, slightly green-coloured, 16cm square (6¼") frosted glass panes, divided by 6cm-wide glazing bars.

There appears to be a ventilation outlet at the base, which is an original feature (see first plate in Appendix 2).

The second bay, to the north, has a set of three-light steel-framed windows to each level (plate 3), like the north elevation. However, the top one was been replaced after 1938, by a ventilation grille when the plant room was introduced on this floor (plate 3). Curiously, the bottom windows, hinged at the base, are fitted with external, angled window rests, even though they open internally. The same is true of the north elevation (compare plates 3 & 4).

6.1.3 North elevation (plates 3-5)

It is easier to see that the building is divided into 26 bays from this side. Each bay has a vertical sequence of three windows with continuous concrete sills and lintels running as bands, tying them in from the western cubicles and finishing at the bathrooms/sluices in the four bays at the eastern end, where the windows are shorter (plates 3 & 4). Ground and first floor windows are identical, consisting of eight panes set in 2 x 2.15m-wide steel frames. The top three pairs rotate on a central axis (to admit plenty of air-good draught) while those on the bottom open internally on bottom hinges, despite the presence of external fixtures suggesting outward opening, perhaps now redundant earlier fixtures. Second floor windows are shorter, containing 6 panes without the top vented window (plate 4).

The rear entrance is located roughly central on the fourteenth bay from the west (fig. 4). A design piece of its time using basic geometrical forms, the door has a circular light and thick glass panels either side (plate 5) set in wooden surrounds. Those to the west are square, while the eastern ones are oblong, the top one of which is a vented window that opens outwards. The low wall-edging and path are more modern additions (plate 5).

6.1.5 Internal descriptions

Spatially, each of the three floors to both half-butterfly wings was designed identically. Much of the linear floor plan was devoted to the patients, accommodated within regularly-spaced double cubicles, two persons to each, facing out onto the balcony. In the centre were the linen stores and either end were sluices/cleaners rooms. Bathing and toilet facilities were located at the far end, close to the stairs. Their original layout survives only on the ground floor and all fixtures are modern.

Interestingly, the original master plan (fig. 3), suggests that major design changes were made between the planning and construction stages. The plan shows the cubicles with glazed fronts, but the balcony with no glazing at all, suggesting the latter glazing was an afterthought. Balcony glazing meant that although the patients could be wheeled out onto the balcony, they were not completely in the fresh air, in the normal manner. Another change was the omission of pavement lights on the balcony ceilings. Hand-written notes show the latter was omitted from the final works (see archive). A lesser change was that the built-in cupboards at either end of the double cubicles are in many cases fitted the other way to the original plan (fig. 3).

Originally there were three wards, one to each floor. They were numbered one to six (Swain 1995). Now with modern fire doors fitted, there are six. Each is painted a different colour to identify it.

The eradication of TB and change to a general hospital in 1963 brought new priorities. Partition walls between double cubicles were removed to produce four-patient mini-wards. Others were converted to treatment and staff rooms. Their number and arrangement varied from one level to another, thus changing the uniform layout. Glazing between cubicle and corridor was mostly removed, leaving the top vents only. New plaster-board partitions and other modern fittings and fixtures (fire doors, wash basins, radiators, etc.) were added; a process that continued to the present day in the maintenance of a modern hospital.

Before closure, the east wing was a patient ward, with staff rooms, medical stores and treatment rooms, producing a more varied collection of roles to its original form. These pre-closure functions are included in the floor plans (figs. 3-5) as a record, usually taken from door signs. As many of these are abbreviated, a fuller understanding of medical terms would be required to fully understand them all. After the west wing was demolished, this side probably took on some of its former duties. Before the survey, interiors had been stripped of valuable equipment, and beds removed with the patients. Generally, despite alterations and upgrades, some important original fixtures and fittings remain and are included in this report.

Furthest to the east is the stairs/stair turret, a major design feature, which is described under section 6.1.5.4.

6.1.5.1 Ground floor (wards B10 and B11) (fig. 4, plates 6-9)

Latterly the ground floor was divided into wards B10 and B11, separated by modern fire doors. B10 (plate 6) is a patient ward/area, divided into five four-bed two-bay cubicles that retain many original fixtures and fittings. It is the best preserved area of all. One such fixture is the floor, which comprises a herringbone-patterned varnished wooden (or wood-effect) floor (plate 7). The blocks that make up the floor measure 8 x 23 cm and are 2cm deep. On the original ground floor plans (see archive) the flooring is labelled as 'Korkoid' after the manufacturing company. 'Acme' blocks (Appendix 2 list of contractors) were laid in other parts of the hospital, but none were recorded in the survey. Each Korkoid block is stuck onto the concrete floor beneath, with a black resin, probably bitumen. The pattern is broken up in the centre, by laying them side-to side in a triple 'course'. This being where the original partitions once stood, it is tempting to think of this as a wall scar. However, from inspection of the plans, the pattern break is wider than the partitions and is therefore part of the design. In fact the existing three cubicle walls, up to the concave skirting have similar borders. Concave skirting is another original feature, albeit sporadically-surviving. The curved profile made for easier cleaning.

The built-in cupboards (shown singly in plate 7) are original and have a space-saving design. They are arranged in pairs, one for each patient, either between or either side of the cupboards in the adjacent cubicle (fig. 4). The outer pairs face the east and the inners face the west, so although they face each other, they are never directly opposite. On the original plans there are voids between the pairs (see Appendix 2) rather than at the ends, as in the recent survey. Inside is a clothes rail and basic wooden shelving. Fresh air was encouraged around the patient's clothes by providing each cupboard door with ventilation holes, top and bottom.

Wooden dado rails break up the walls between the cupboards, corridor and steel-framed windows (described in section 6.3.1). These windows have thick curved brass handles and catches (plate 7). Further shots are included in the archive

Any sliding and folding doors and fixtures onto the corridor/balcony were removed with the partitions, when the cubicles were altered, leaving no evidence. All that remains are the square pillars that defined the cubicle bays and the top section of glazing (plate 7), arranged in tripartite form with a centrally-opening oblong window in the middle and single fixed roughly-square panes either side, one set per cubicle. On other floors, including ward B11, the glazing is either partly- or wholly-obscured by a suspended ceiling, absent in B10. Modern fire doors divide

wards and stairs. Plain 6cm-diameter columns, bolted to the ceiling, divide the floor into bays; respecting the former cubicle layout.

Original Vinyl-surfaced, T-profiled iron-bracketed handrails are visible along the glazed wall, set at an angle against the slender columns (plate 6). The handrails are present in the upper floors too, but in ward B11 they have been removed, or else obscured by the tall modern radiators (plate 8). Few other original fixtures remain, except for towel-drying racks in the sluices at either end of the ground floor (fig. 4, east sluice plate 9).

6.1.5.2 First floor (wards B12 and B13) (figs. 3 & 5, plates 10-12)

The first floor (plates 10 & 11) is very similar to the ground floor, although more altered internally, with more office/staff room areas replacing former cubicles (fig. 5). Some remaining cubicles retain their original heavy cast iron radiators site below the windows of the rear wall (plate 12), but largely removed on other floors. Other original fixtures are the columns, again bolted to the ceiling, and handrails to the south, intact on this level (plates 10 & 11). The flooring is in terrazzo tiles, which was an original floor covering (see archive) However, their colour change (from grey in B12 to sea green in B13), where the wards later divided through inserted modern fire doors, makes this improbable. The blocked doorway in the stair well (fig. 5) represents a former bathroom entrance, before the east end layout to the first and, more noticeably the second floor, was altered in the modern period.

Plate 10 shows the original casement window fixtures evident on all floors. The top fixtures have long tapering curving handles. There are no contemporary catches at the base of the window, and it is likely they were designed to be fully-open when in use. In fact tiny steel stops are on the external fixed pane frames (plate 2) to protect the window glass. Therefore the windows were weighted to rest against the sides.

6.1.5.3 Second floor (day stay unit) (fig. 6, plates 13-15)

This floor (plates 13 & 14) has a more identifiable role as treatment and operations rooms. Modern partitioning has radically affected its original spatial layout. Only two four-bed cubicles and one two-bed cubicles remain (fig. 6). X-ray and other expensive equipment has been removed throughout (plate 15), along with parts of the suspended ceiling to pull out wiring. However, this has revealed the top cubicles vents.

There are no structural columns on this level, this being on the top floor with lesser load-bearing requirements. The rails on the south side are intact, and sit above slender (2cm deep, 28cm high and 3.9m long) radiators built low to the floor bolted on metal brackets (plates 13 & 14). These are likely to be another original fixture.

6.1.5.4 Stairs (figs 3-6, plates 16-18 & front cover)

The stairs are the most distinctive internal design feature of the building, with their clean curving lines fabricated in metal and concrete in the modern style. According to The Architect and Building News (Appendix 1) these, and some of the hospital balustrades, were manufactured by 'E. C. Blackmore Ltd'. Their form is the open-well dog-leg with half pace landing. Lit by distinctive curved glazed panels, they wind up the three floors around a pre-cast concrete newel (plate 16). Cast iron handrails run up the inside, formed from sections of rails and balustrades lapped and screwed in the same manner as the balcony railings and implanted in the concrete edging beneath. The railing on the outer side, against the left hand wall, begins on the ground floor as a simple piece of tubular steel (plate 17), but changes from the first floor landing to a vinyl plastic rail (plate 18). Judging by the coat hooks in plate 18, the first and second floor landings doubled as cloakrooms.

6.2 Contemporary structures (figs. 1 & 2)

The following buildings were recorded to RCHME level 1 standard for group value. All belong to the first phase of hospital buildings (fig. 2) and continue in use as part of the functioning hospital today. They were therefore recorded externally only, with the exception of east sun-ward (2), which was being partly-used as a builder's tearoom and store. Here limited internal inspection was undertaken.

6.2.1 Ward block (2) (plates 19-23)

The ward block contains the two distinctive semi-circular sun-wards to which the half-butterfly east and west wings were attached. The sun-wards were the patient's day rooms, and are linked by a horizontal corridor behind, that leads, by a long north-south passage, to the treatment block (fig. 2). The passage is now largely encased by modern buildings (fig. 1). On the opposite side, a modern corridor feeds northwards to modern facilities, making photography of the complete ward block façade impossible.

Set on three levels, the eastern sun-ward balconies extend out from the first and second floors, wide enough to contain beds. Above is the flat semi-circular roof, asphalt felted in recent years.

Crittalls glazing encases the sun-wards, with only a few modern PVC replacements. Ground and first floor have sets of long casement windows at the base and small square centrally-opening ones at the top, arranged in six lights on the sides and ten around the front curve (plate 19). The curving sections reach down to the floor and the middle sections open out onto the (original) paved area outside (plate 20). Second floor glazing is the same as that on the first, but with narrower vents and there are railings all round. Inside the ground floor day-room (plate 21) any original fixtures other than glazing have been removed.

Linking the two sun-wards are the glazed single cubicles for the more seriously-effected (Swain 1995). These opened onto the veranda and are likely to be the same in form to those mostly removed between cubicle and balcony in the east wing. Their double tripartite fenestration includes an identical top section to those in the east wing. The single cubicle entered during the survey (plate 22), appeared to have sliding/folding doors. It is difficult to assess exactly how these worked, as external inspection was precluded by building materials. However, the two door sections to the left of plate 22 seem to be hinged, in order to fold back to the side. The third panel, to the right of the picture, may have slid back the opposite way.

The west sun-ward (plate 23) has exactly the same build, incorporating balconies and glazing. The point where the west butterfly wing formerly joined is now encased by a glazed modern steel stair case, which at least respects the materials used in the 1930s build.

6.2.2 Treatment block (3) (plates 24 & 25)

Originally, from here full access was gained to the ward block. Operating theatres, x-ray and other treatment rooms were probably housed in this block, although unfortunately no 1930s plans are included in Appendix 2 to show specific functions and internal layout. Today the east side links to the modern block and there are further modern appendages to the south-east (fig. 1). The west elevation is relatively unspoilt.

Built on a rectangular plan form of three bays and three levels and with flat parapet roof, the main façade (plate 24) faces north onto the quadrangle with a projecting central bay entrance. The portico has wide fluted square concrete pillars and a flat canopy, flanked by centrally-opening round windows. All other external fixtures, windows and door surrounds, are modern replacements. Concrete window sills and heads on the first and third bays are continuous, like much of the east wing north elevation, but not in the central bay.

A small open porch is situated on the west elevation which joins the beginning of the colonnade to Galbraith House (fig. 1). It is plain, with undecorated square pillars and a concrete-cast flat roof (plate 25). Much of the south elevation is enclosed by a corrugated iron-clad fire escape, but fixtures and fittings are as those on the façade. The same is true of the adjoining corridor to the south.

6.2.3 Medical Academic Unit (4) (plates 26-27)

This is on the east side of the quadrangle and was originally the recreation block (fig. 2), a slightly misleading title, containing various treatment and staff rooms (Appendix 2). Floor plans (Appendix 2) show this as three storeys, although externally it appears to be two. The present structure is dominated by modern large blue additions on the east and west sides, that may be laboratory associated with its latter research role.

The main (east) façade is three bays wide with a central stepped entranceway projecting beyond the colonnade that joins it to north and south (plate 26). The entrance is glazed in three units divided by square pillars. The units are probably original and follow a familiar pattern of double doors flanked by fixed panes either side with a centrally-operated window over. On either side are thick concrete-framed glazed panels of similar size to the stair turret in the east wing and a first floor railed balcony onto colonnade level. Unusually, the two brick bonds are different. The ground floor is built in the usual Flemish bond (normal here), while the first floor is in stretcher bond, despite the builds being contemporary.

The rear elevation (west) has modern twin blue plastic bastions either end and a horizontal projection at first floor level flanked by original short circular windows (plate 27). Circular windows based on the 'porthole' style are common to the complex, recorded in the treatment block portico and elsewhere and show how basic geometrical forms were used to provide decoration. Below, on ground level, are three sets of fixed steel-framed windows above heavy thick glazed panels (plate 27). Rectangular panels of glazed square panels represent another decorative feature within the complex reliant on basic, strong, forms. Elevations to the north and south contain original steel-framed fenestration (vents on first floor and casements on ground), but lack any significant architectural details.

6.2.4 Cafeteria/Galbraith House (4) (plates 28-30)

The cafeteria/kitchen block was originally built on an H-shape plan, which has now been split into two, with Galbraith House forming the north end. Galbraith House was formerly food stores

and sculleries to the kitchen in the central part, and may still serve the same role. It is three storeys high compared to the main part which is single-storied. Internally, at the front end former divisions between patient and staff dining areas have been opened-up and original fixtures and fittings removed.

Externally, much original character remains. The main façade, facing south onto the quadrangle, comprises the main block with wings extending forwards on either side, with veranda in between. The veranda is split into five bays by plain concrete columns that formerly stood in front of glazed doorways identical to those in the Medical Academic Unit, but have been replaced in PVC and the area partly-walled-in (plate 28). There are similar circular porthole windows here too on the wing terminals.

Service entrances of little interest line the west elevation. To the east there are steps leading to the re-fenestrated main (east) entrance (plate 29). Inside, former partitions have been removed and there are modern fittings throughout.

Galbraith House is rectangular in plan form with a pediment flat roof and side wings projecting north. The glazed corner sections of the side wings (plate 30) are some of the more interesting design features on the site, and light internal staircases in the same way as the turret in the east wing. The steel-framed windows are divided into four panes, with casements below vents.

6.2.5 Mortuary (6) (plate 31)

In the late modern period, a new boiler house (post-1960 and only recorded in the survey photographically) was built to the north, and the old one converted to the mortuary. The location of the mortuary before this is not known. This is a single-storey structure with wings to the south and a projection to the north that now abuts the modern boiler house (plate 31). Several small modern structures are attached to an unremarkable purely functional building. Photographs from the 1930s (Appendices 1 and 2) clearly shows the boiler house's tall, brick-built round tapering chimney, but the building itself is hidden. There are no internal plans in Appendix 2.

6.2.6 Staff/nursing bank offices (7) (plates 32 & 33)

This is an interesting structure, more of a 1930s design piece, with its sweeping bay to the west and balcony above (plates 32 & 33). The remainder of this small building is two-storied and flat-roofed. It was originally the Matron's house, impeccably placed to observe the nurses as they crossed the lawn from the nurse's home to and from work. Like many of the structures, it has

changed little externally. The main entrance is under a porch on the north-west corner and fenestration is provided by steel-framed vents and casements. Much arboreal growth around it now obscures interesting features such as the thickly-glazed stair light on the south elevation (plate 33) and parts of the curved west bay.

6.27 Garages (fig. 2)

Garages contemporary with the 1930s complex are positioned to the north-east of the site, away from the central area. They were identified after the survey by comparing recent and early mapping (figs. 1 & 2) and are clearly visible in the top right corner of Appendix 1.

Their plan form is linear, set on a north-west to south-east axis, with projecting central and side wings (fig. 2). Modern mapping (fig. 1) suggests infilling between the wings at the front, indicative of change in use. This probably masks the vehicle bays seen in Appendix 1, disguising 1930s characteristics.

7.0 DISCUSSION AND PHASING

The built group as a whole presents an interesting assemblage and all except the east wing appear to be in good condition through use and maintenance. Their design is based on principles of modern architecture, initially known as the 'international style', on reaching Britain from the continent in the inter-war years. Architects such as the mass-production advocate, Walter Gropius, the minimalist Mies van der Rohe and refugees from the closure of the Bauhaus, the influential German design school, defined an architecture set free from historical restraints (Buxbaum in West 2000). The international moderne style cast the building as a functional statement, built using utilitarian modern materials such as concrete and glass in a manner defying past conventions. Such designs were seen as monuments to the factory/machine age and designs reflected industry and speed. Thus they were built to a regular shape, with flat roofs, long streamlined and curving walls and a lack of unnecessary ornamentation. The shape of external fittings and decoration was based on basic geometric forms, such as the square and circle. The structures at Broomfield use glass as a design piece, but use brick walling rather than concrete on a reinforced concrete skeleton.

At Broomfield the building layout was planned, with the major buildings, treatment block, recreation hall, admin and kitchen block arranged around a central, landscaped, quadrangle

(Appendix 1). Auxiliary buildings, the boiler house, garages, workshops, and staff accommodation, were located on the fringes, in landscaped grounds. Many of these original elements of the complex survive, albeit increasingly lost amid the modern additions to the expanding hospital.

The east wing, the main subject of the report, provided double patient cubicles for recovery during and after treatment. Sunlight and air were provided through its glazed sun-facing south side in accordance with contemporary thought and practice. Patients were taken out of their cubicles to the enclosed sun balcony in the mornings and returned at night. The attached semi-circular sun-ward provided day rooms for those not bed-bound and wider balconies. For the more active, landscaped grounds aided convalescence. Treatment rooms (operating theatres, etc) were situated in the treatment and recreation blocks, linked to the wing by a basic system of corridor and colonnade. The whole system was geared to TB treatment, provided in accordance with contemporary thought and practice.

Judging by the account of a 1940s patient, Mr. Swain, patient morale was considered to be an important contributor to effective convalescence. Patients could take an active role in hospital committees, contribute to the magazine, or even attend concerts. This is indicative of the simpler, more paternal, society.

Each floor in the east wing was laid out identically, with double cubicles, sluice rooms at either end and baths, etc., toward the stair and linen room roughly central to the cubicles. The original plans vary from the constructed and existing layout by showing the balcony open, rather than enclosed by the south-side glazing and completely open to the stairs. This would have enabled the patients to be taken directly onto the balcony, up to the railings. On a lesser note, the cubicle cupboards are often orientated the ‘wrong way’, though all are original features.

Phasing appears to be fairly simple. Initially Broomfield was built as a planned TB hospital, providing all services on a new plot of land. TB was an infectious and potentially lethal disease and open rural plots were ideal locations for its treatment. The role of the hospital probably changed after 1943 when the disease was eradicated, but it was not until 1963 when the former sanatorium became a general hospital. The east wing cubicles were enlarged and internal glazing removed. Since 1963 some of the original structures such as the west wing have been demolished and replaced with large modern facilities. The small post-1987 building in front of the east wing is one of the later, but by no means the last, addition to the complex. The process

of modernisation continues and the closure and demolition of the east wing is another part of this.

8.0 CONCLUSION

Broomfield Hospital was constructed as a purpose-built sanatorium or TB hospital in 1938 and was opened in 1940. Tuberculosis had been a serious health issue since the late 19th century. The main treatment until its eradication in 1943 was to keep the patient in good health with plenty of light and air. Wards were arranged accordingly with wide balconies and glass fronts to provide these facilities, a plan form also adopted by late-19th century workhouses and mental institutions (Richardson 1998). Broomfield is a rare example of a purpose-built sanatorium that effectively adopts these measures without the encumbrance of existing buildings. Using a blank canvas and a generous amount of space, the architect, John Stuart, was able to create a functional complex based on contemporary thought and practice whose progressive, modern, design was recognised by contemporaries as significant (see Appendix 2). In particular, the east wing, with its glazed south face, long lines and curving east end, perhaps reflects the international moderne style best.

TB hospitals of this era were often designed on a south-facing butterfly or half-butterfly plan to maximise light, warmth and air. Most had direct access to open balconies. Significantly, the balconies at Broomfield were fenestrated, indicating a departure from normal design practice, whilst still able to enjoy light and air.

Broomfield was the only Essex hospital to mix the butterfly plan with cutting edge architectural design. The plan form had been employed earlier in Essex at the Black Notley Sanatoria in 1930, where the main part of the hospital, the pulmonary pavilions, were laid out on a butterfly plan around a central block with verandas. Expansion in 1937 produced a further three smaller butterfly blocks. However, although comparable in adoptive plan form, their single-storey pavilion-type design lacked the progressive style. The circular sunwards of the Samuel Johnson Isolation Wing at Rochford Hospital, although equivalent to Broomfield in the moderne style, were part of an arrow plan form rather than the butterfly plan form.

The survey at Broomfield Hospital was able to record the east wing before its demolition and also make a preliminary record of many other original 1930s hospital structures still in use.

Those buildings covered by the survey are the main ward block (sun-wards), treatment block, Medical Academic Unit, cafeteria/Galbraith House, mortuary and staff/nursing bank offices. In addition, another contemporary structure, the garages, was identified from map analysis. Several original structures have been removed over time, most notably the west wing, administration block, workshops and nurses home. Smaller but still significant structures, important to the group value of the site, have also disappeared: the weighbridge, offices and summer house.

The demands of a large ever-expanding hospital often impact on the smaller and older buildings that may be difficult to refurbish to modern standards. It is often easier to build new, but inevitably this alters the overall character and historic integrity of a complex. This survey provides a basis for a fuller external and internal future record of the historic site elements should they ever require demolition or significant adaptation. This would help form a record of the whole complex and further enhance the existing east wing record.

ACKNOWLEDGEMENTS

Recording, illustrations and photography were undertaken by the author on behalf of Mid Essex Hospital Services. Andrew Lewsey of ECC FAU prepared the illustrations. Thanks are due to Malcolm McKillop for facilitating the recording works and to Wayne Everitt for assistance with access and for providing the recent survey and copies of extant historical material. The work was monitored by Pat Connell on behalf of ECC HEM.

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Ware, D. and Beatty, B.	*1946*	*A Short Dictionary of Architecture,* George Allen & Unwin Ltd, London

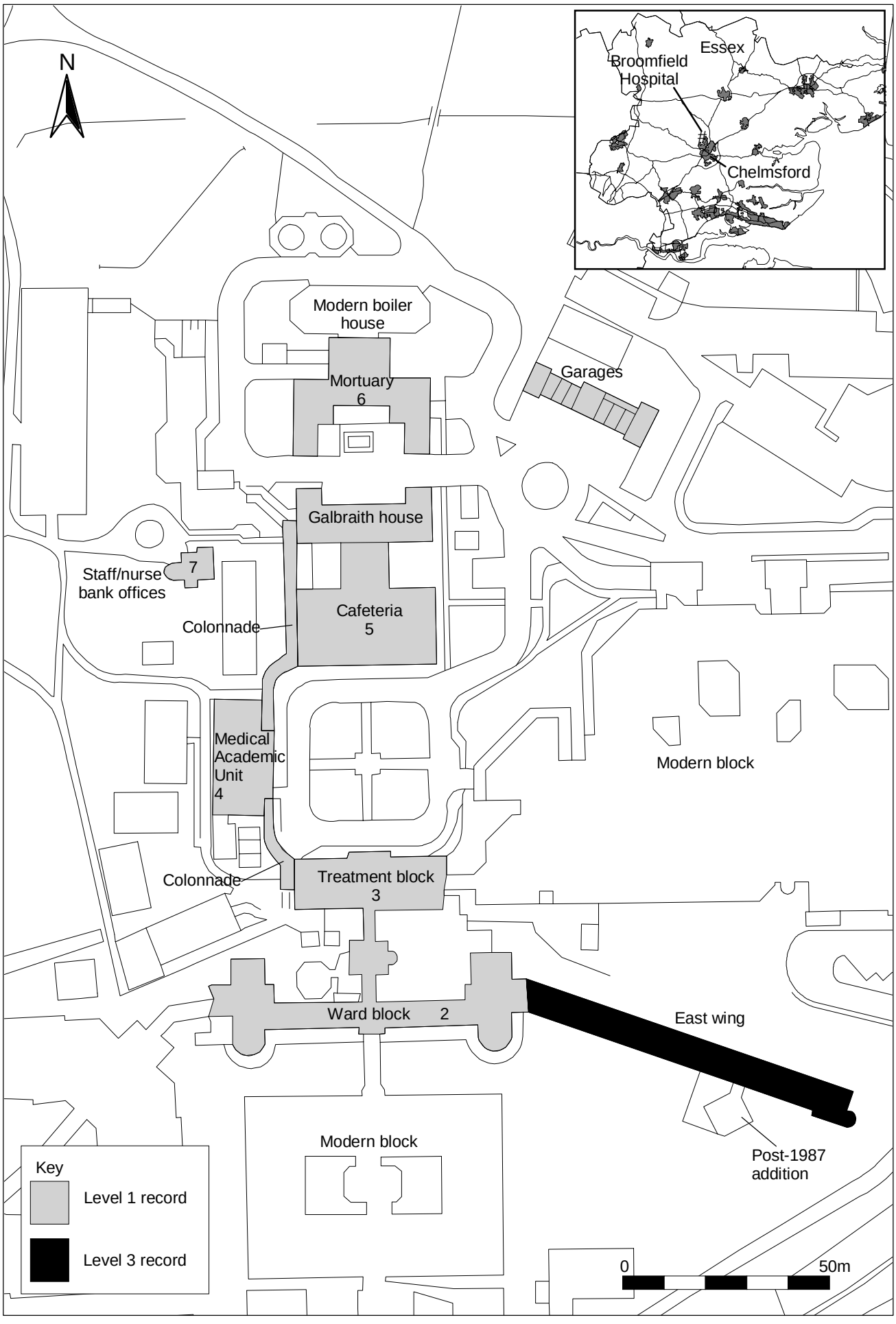


Fig.1. Site location and block plan

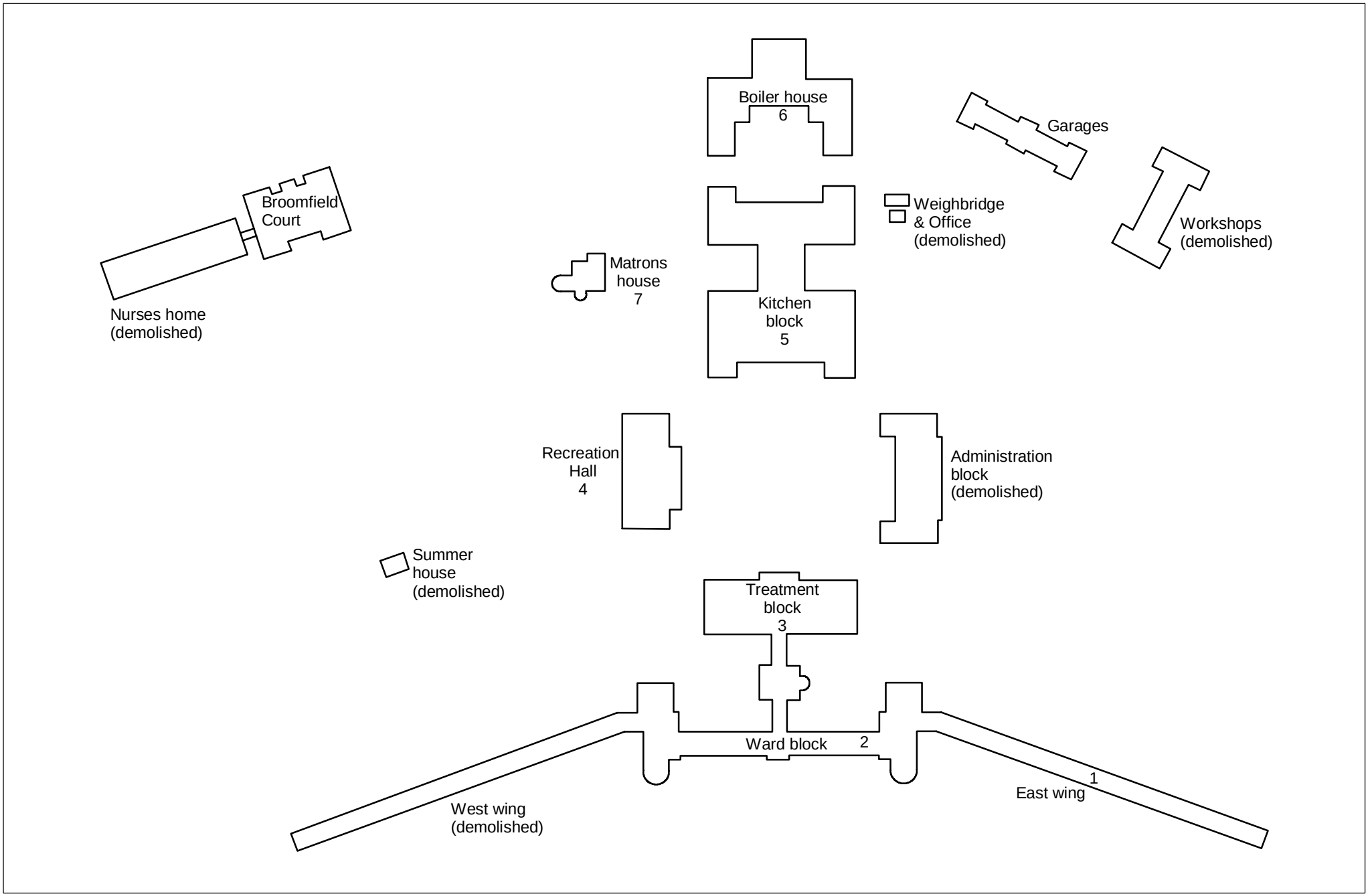


Fig.2. 1938 Block plan

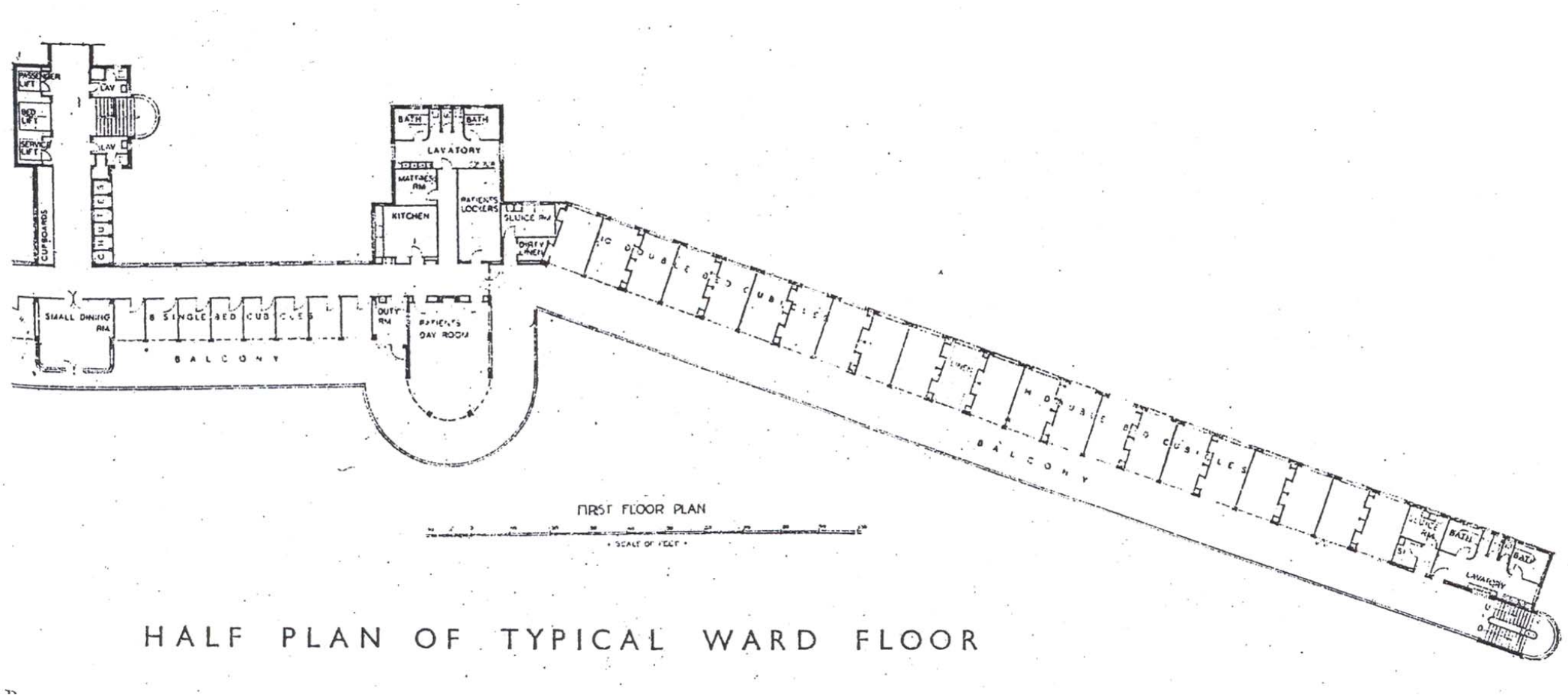


Fig. 3 Original first floor east wing plan (scale approx. 1:450)

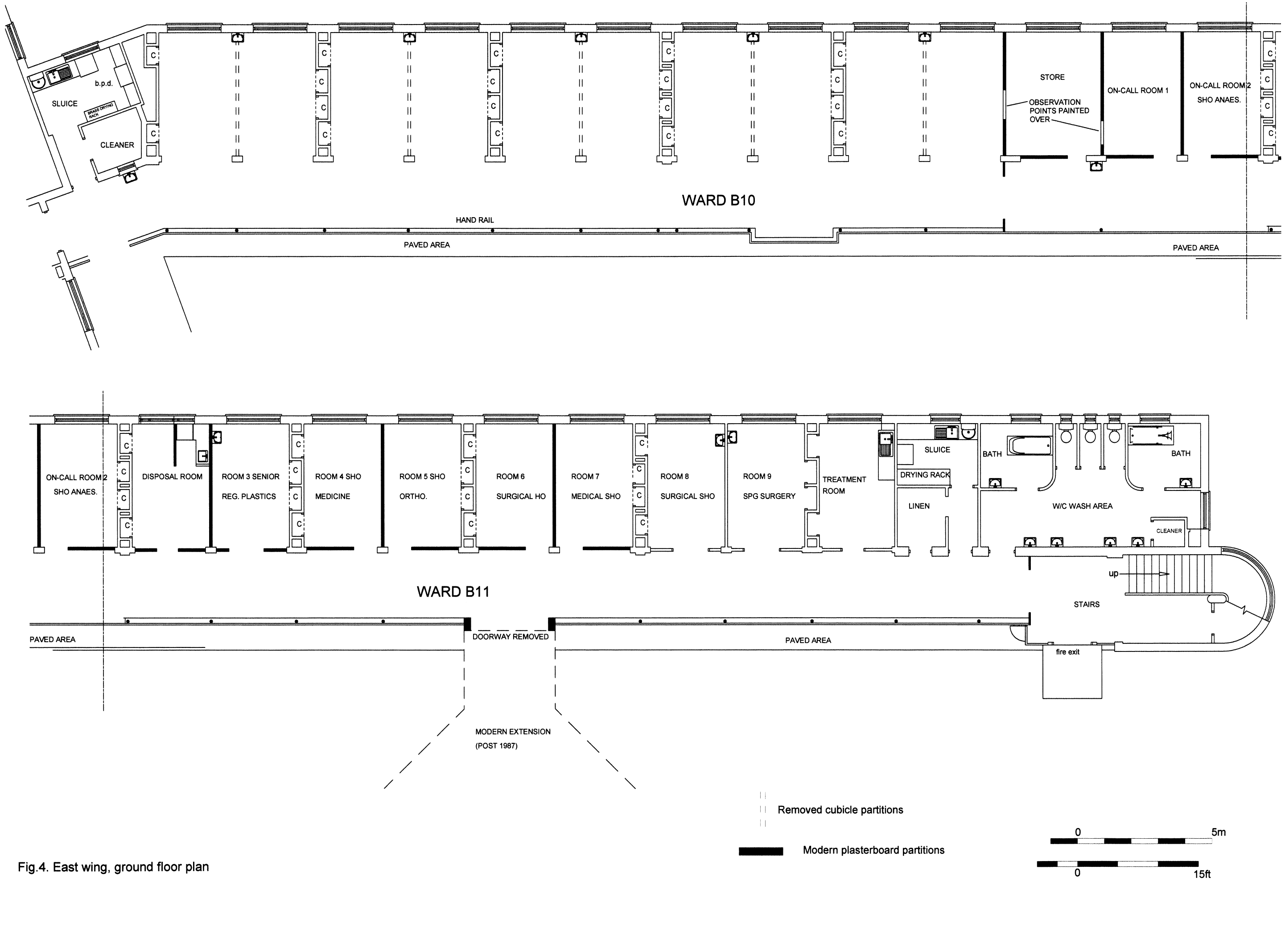


Fig.4. East wing, ground floor plan

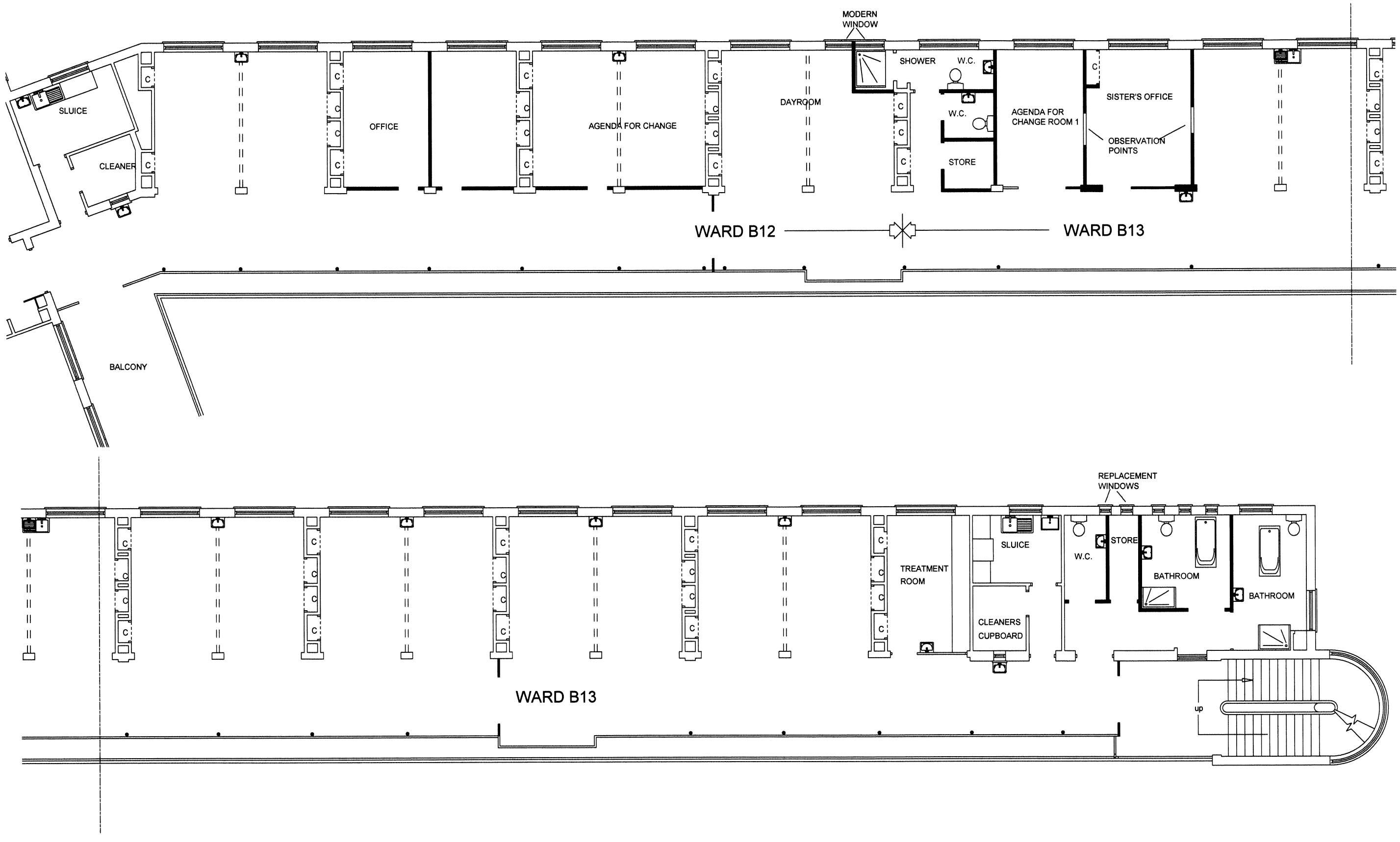


Fig.5. East wing, first floor plan

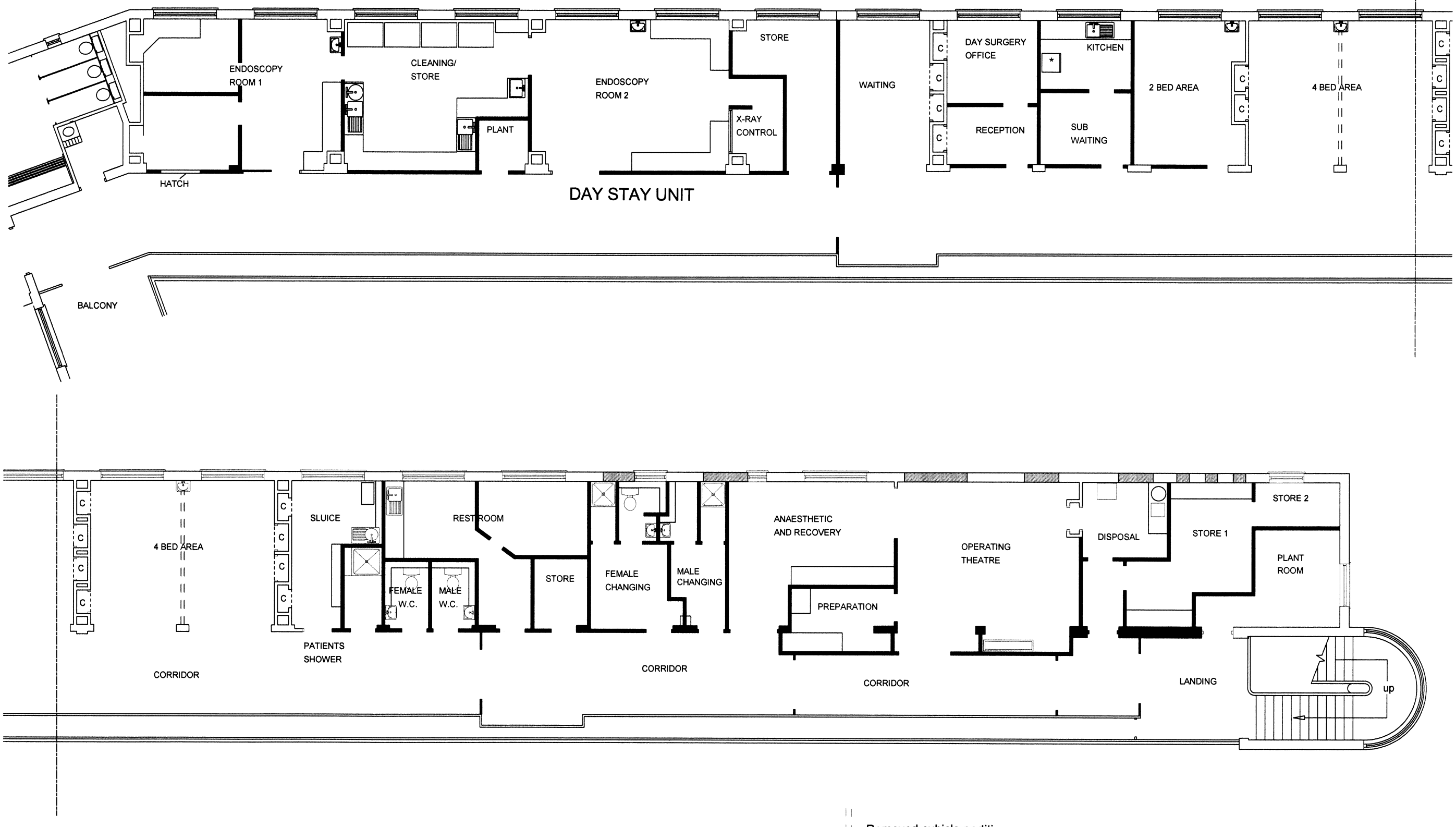


Fig.6. East wing, second floor plan

Plate 1 South elevation viewed from east sun-ward

Plate 2 Detail of glazing on south elevation

Plate 3 North and east elevations of east wing

Plate 4 North elevation of east wing, viewed from north-west

Plate 5 North entrance to east wing

Plate 6 Ward B10 (ground floor) viewed from west

Plate 7 Typical four-bed cubicle in ward B10 showing ‘Korkoid’ floor

Plate 8 Ward B11 (ground floor) viewed from east

Plate 9 Drying rack in west sluice

Plate 10 Ward B12 (first floor) viewed from east

Plate 11 Ward B13 (first floor) viewed from west

Plate 12 Typical four-bed cubicle on Ward B13 (first floor)

Plate 13 Second floor viewed from west, middle section

Plate 14 Second floor viewed from east

Plate 15 Stripped-out operating theatre on second floor

Plate 16 Glazed stair turret and stairs from second floor

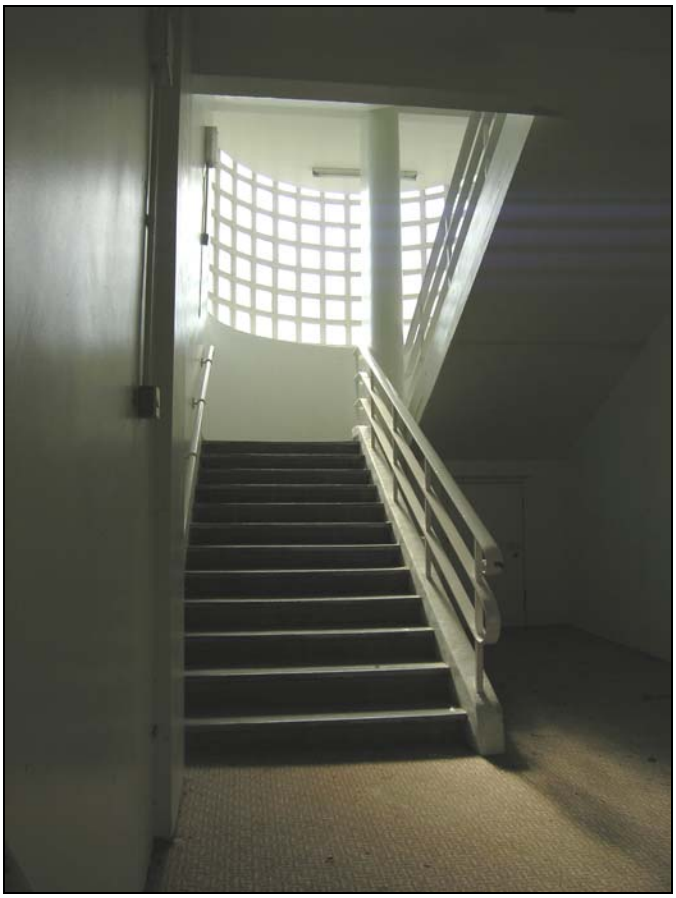


Plate 17 Tubular steel stair rail fixture on ground floor

Plate 18 Stairs on first floor level, showing later vinyl handrail

Plate 19 Eastern sun-ward viewed from south

Plate 20 Sun-ward balcony looking west

Plate 21 Inside patient day-room in east sun-ward (ground floor)

Plate 22 Single cubicle in balcony range

Plate 23 West sun-ward, viewed from south

Plate 24 Treatment block (3) main façade on south side of quadrangle

Plate 25 Treatment block (3) east elevation

Plate 26 Medical Academic Unit (4) main façade

Plate 27 Medical Academic Unit (4) east elevation, viewed from south-east

Plate 28 Cafeteria (4) main façade with colonnade to left

Plate 29 Cafeteria (4) with Galbraith House to right

Plate 30 Galbraith House (4) viewed from north-west

Plate 31 Mortuary viewed from south-east with modern boiler house to left

Plate 32 Staff/nurse bank offices viewed from north-west

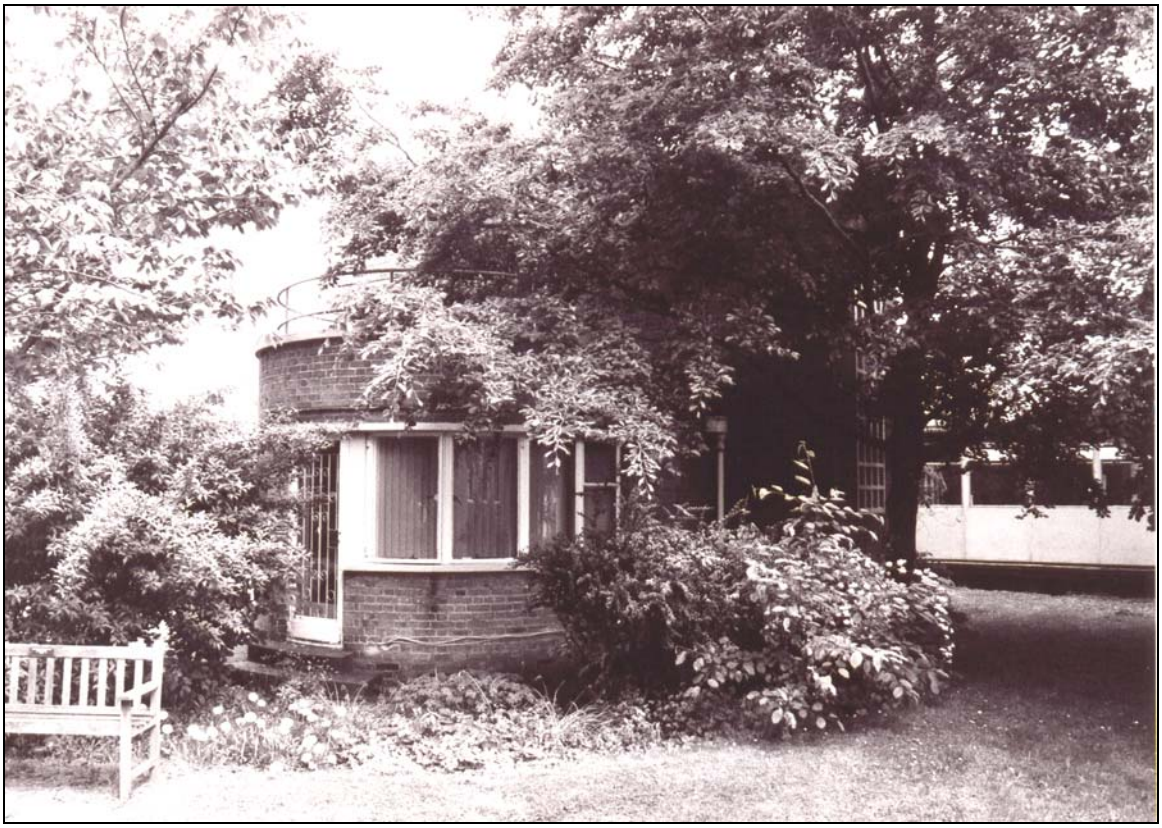
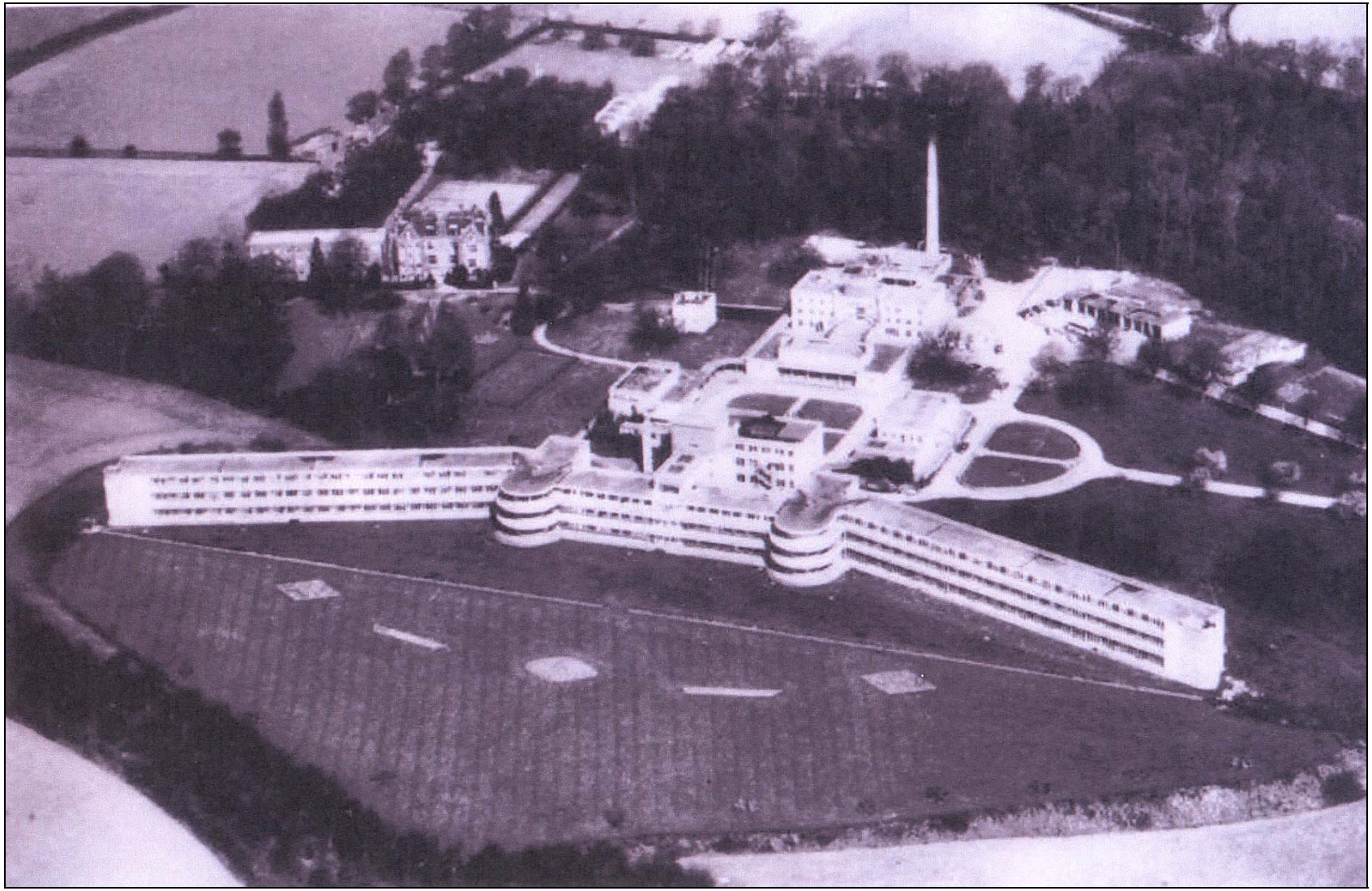
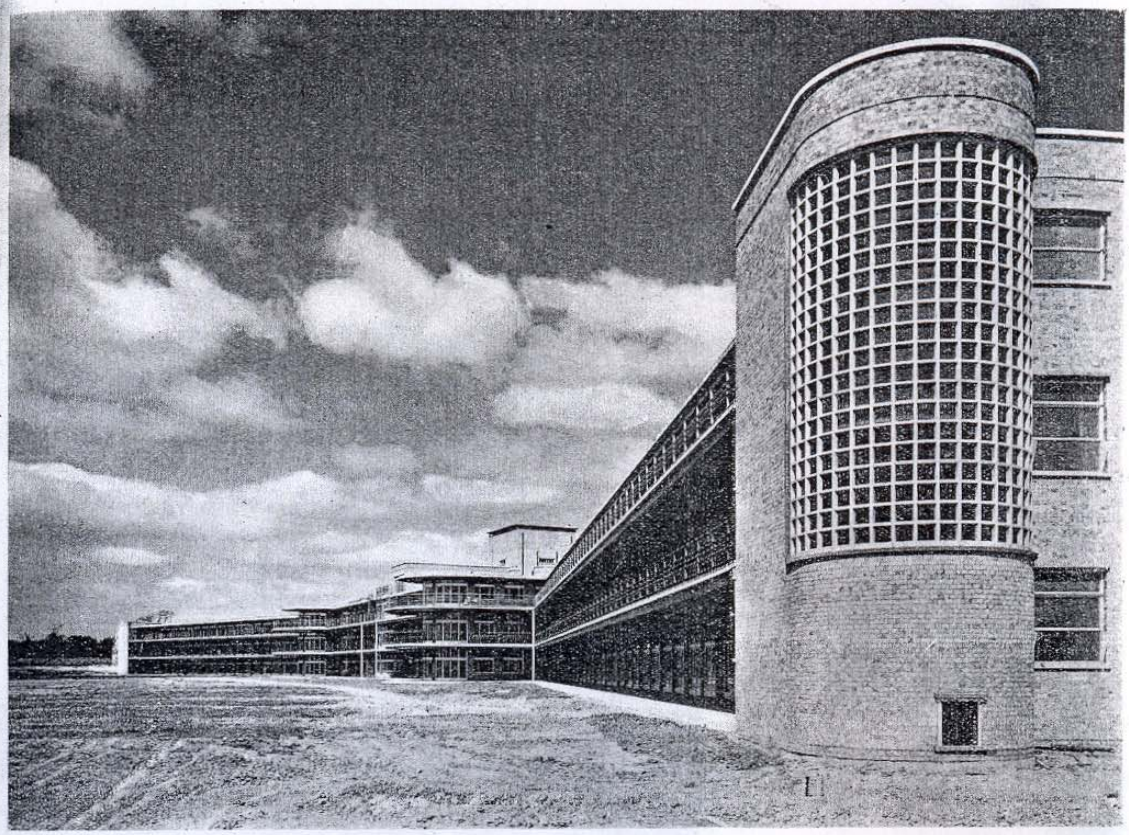


Plate 33 Staff/nurse bank offices viewed from west

Appendix 1: Aerial view of Broomfield Hospital c.1940



Appendix 2: Article from *The Architect and Building News* magazine, Sept 1940



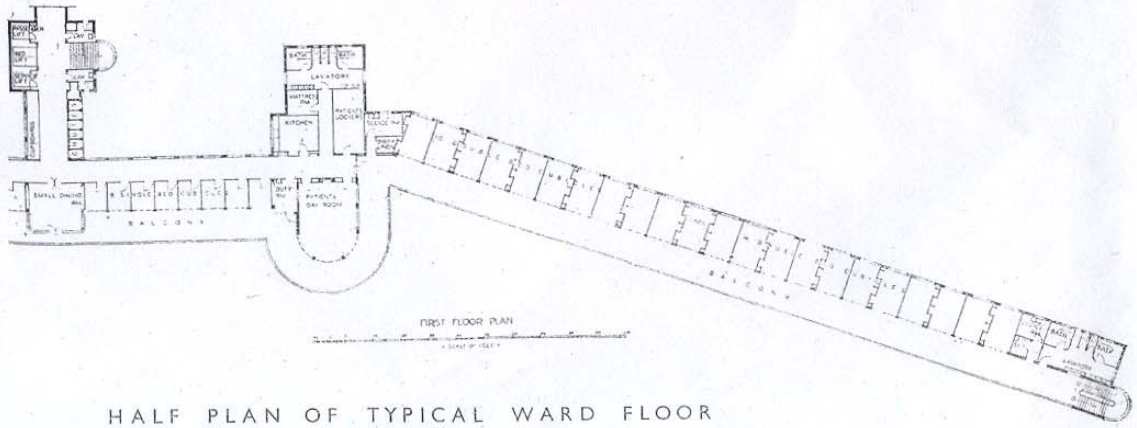
A general view of the ward block. The balconies, 12 feet wide, run the whole length of the building forming a solarium on to which all cubicles open through sliding folding glazed doors. There is no internal corridor, see plan below.

THE ESSEX COUNTY HOSPITAL

County Architect: J. Stuart, F.R.I.B.A.

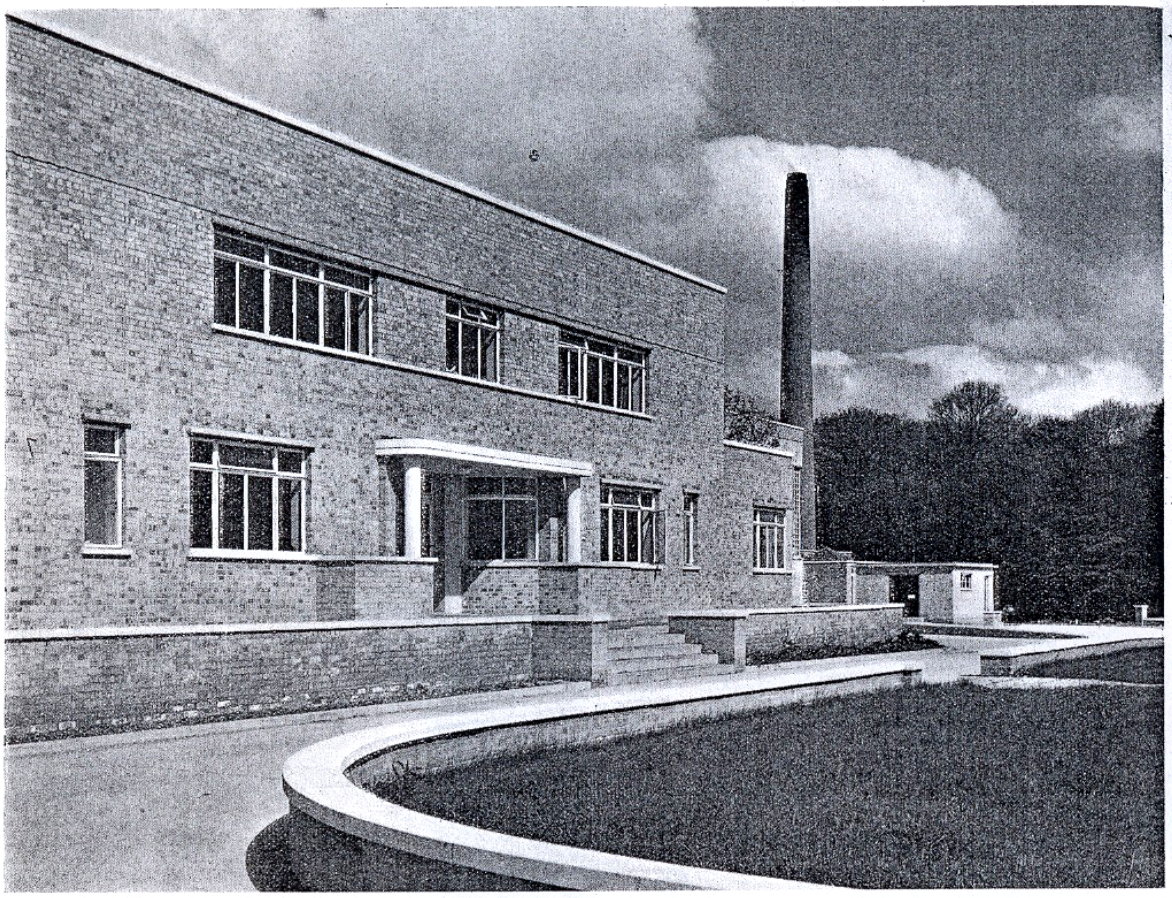
This is a tuberculosis hospital with accommodation for 300 patients in six identical ward units each comprising 21 two-bed cubicles and 8 single-bed cubicles. In addition to the ward block there is the treatment block, the administration block, the kitchen block, the recreation hall, nurses' home and boiler house. A half plan of a typical ward floor in the ward unit is given below.

The ward units are contained in a three-storeyed symmetrical building. In the central section there are 16 single-bed cubicles on each floor. At each end of the central portion is a patients' day room. The balconied ward wings on either side are inclined to the south to secure maximum sunlight and cross ventilation. The walls generally are of cavity brick carried on a reinforced concrete skeleton. Floors are of reinforced concrete slabs.

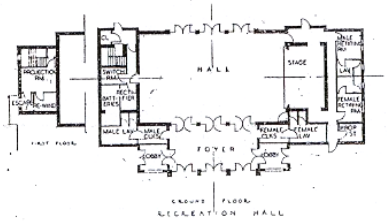


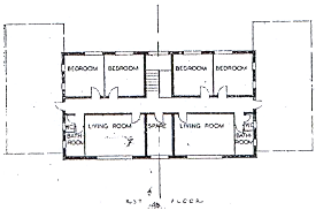
HALF PLAN OF TYPICAL WARD FLOOR

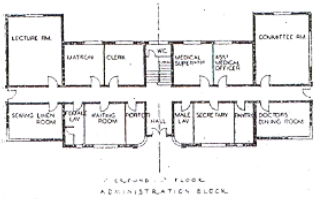
THE ESSEX COUNTY HOSPITAL

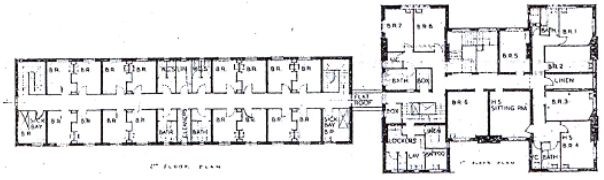


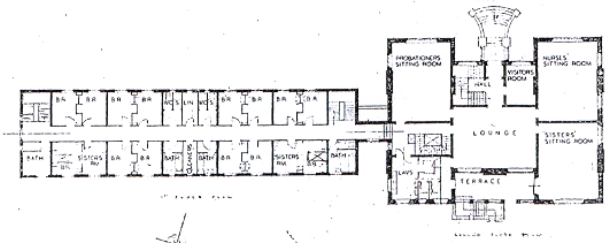
The administrative entrance. Below, left, plans of the administrative block and right of the nurses' home.

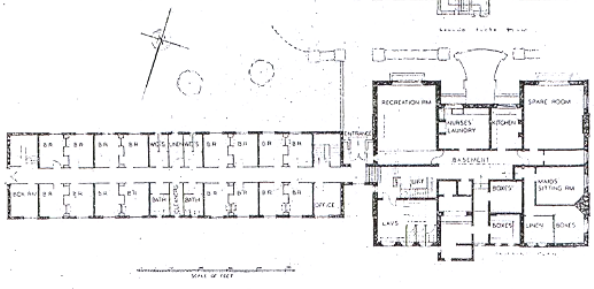




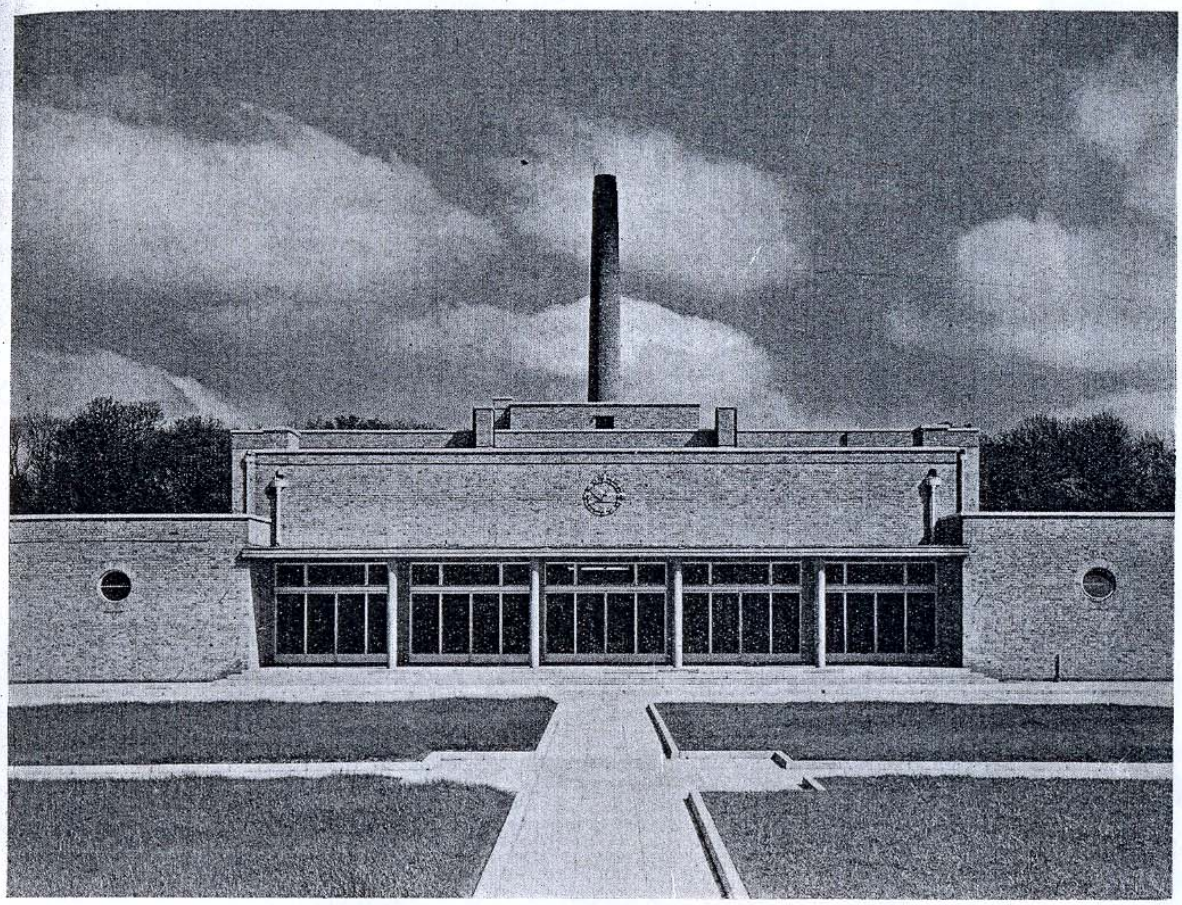


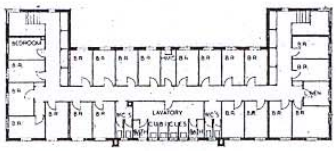


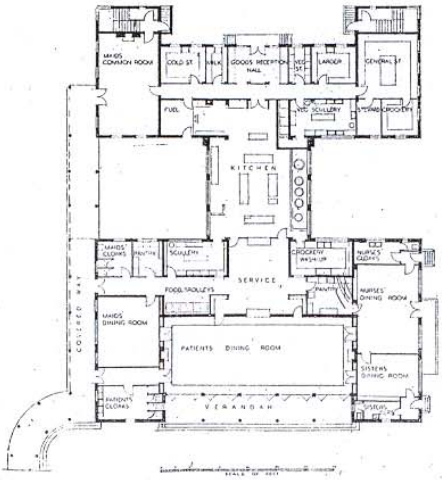




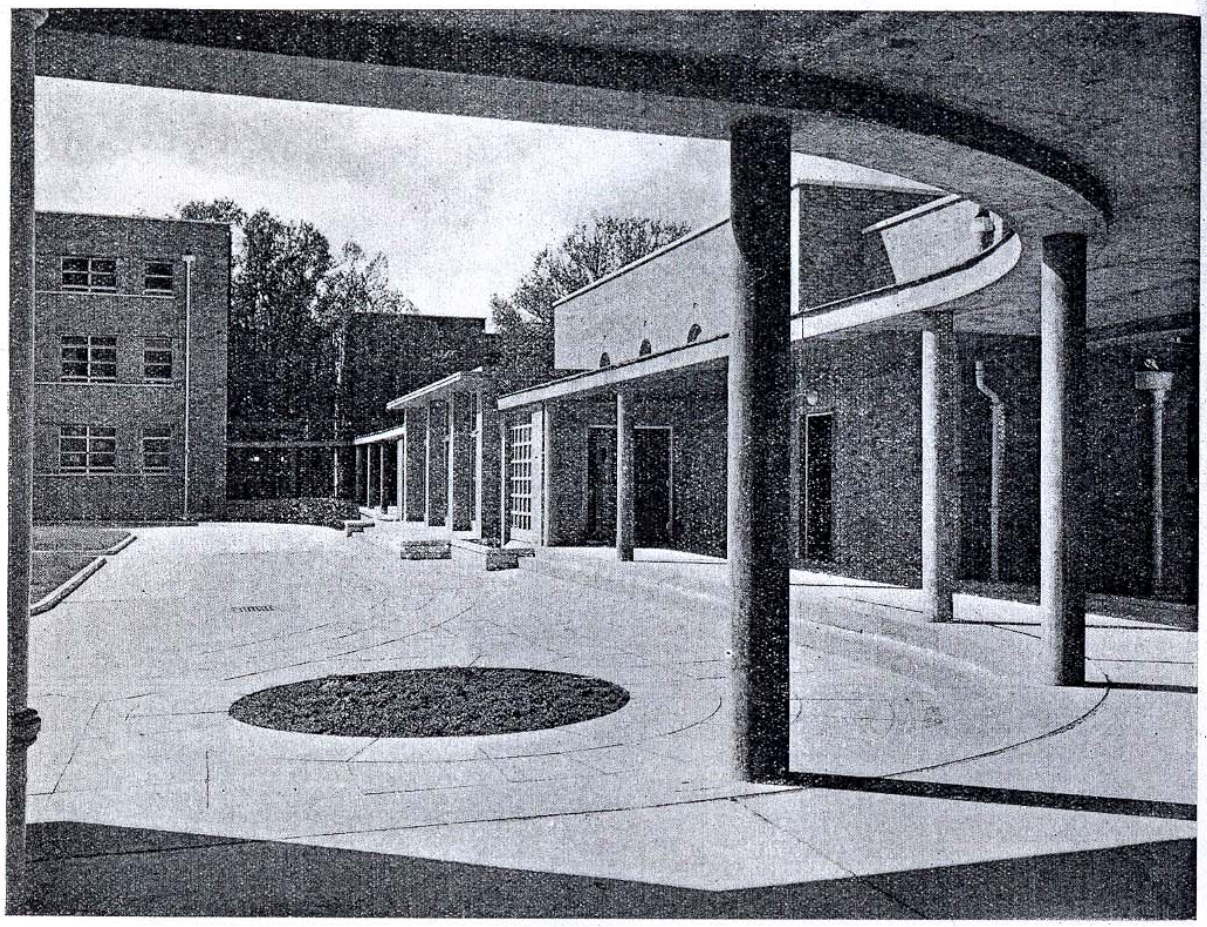
ESSEX COUNTY ARCHITECT: J. STUART

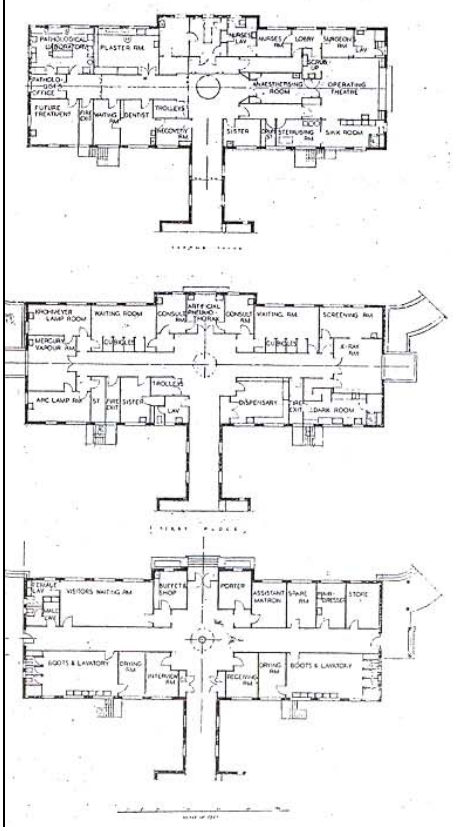






Left, plans of the patients' dining room and kitchen block. Above is a general view of this unit and below a detail of the verandah. The bricks throughout are sand faced of primrose colour.





Above, a view of the recreation block taken from one of the covered ways on either side. Plans of this unit are given left.

Sub-Contractors and Suppliers:

PAROPA ROOFING
Frazzi Ltd.

CHIMNEYS
The Reading Boiler Setting Co., Ltd.

RECONSTRUCTED STONE
The Patent Victoria Stone Co.

METAL WINDOWS
Crittall Manufacturing Co., Ltd.

CONCRETE WINDOWS AND ROOF LIGHTS
J. A. King & Co., Ltd.

GLAZING
Aggee Ltd.

ASPHALT COVING
Limmer & Trinidad Lake Asphalt Co., Ltd.

LIFTS
Marryat & Scott, Ltd.

ROLLER SHUTTERS
Haskins.

ELECTRICAL INSTALLATION
F. R. Skeels.

WIRELESS INSTALLATION
Standard Electrical Engineering Co.

AUTOMATIC TELEPHONE EQUIPMENT
Automatic Telephone & Electric Co., Ltd.

HEATING INSTALLATION
The Wathin Heating Co.

PLUMBING
Joyce Brothers.

BOILER AND PUMP ROOM PLANT
Walter Cowen, Ltd.

LEVELLING OF SITE
Doe & Sons.

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TILING, WALLS AND FLOORS
Carter & Co., Ltd.

VERANDAHS
Decorstone, Ltd.

TERRAZZO FLOORS
The Standard Pavements Co.

CEMENT GLAZE DECORATIVE FINISH
Hoyle, Robson, Barnett & Co., Ltd.

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Limmer & Trinidad Lake Asphalt Co., Ltd.

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KORKOID FLOORS
Korkoid Decorative Floors.

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KITCHEN EQUIPMENT
Aveling-Barford, Ltd.

WINDOW BLINDS
J. Avery & Co.

WEIGHBRIDGE
Avery & Co.

PAINTING AND DECORATING
N. Harriss & Sons.

THE ESSEX COUNTY HOSPITAL

County Architect: J. Stuart.

Appendix 3: Contents of Archive

Copy of report, pdf-formatted

Photographic register

Photographic record (120mm colour & monochrome prints and negatives, 35mm monochrome prints and digital photographs)

Floor plans at scale 1;100

Historic plans, articles and photographs

Site notes

Appendix 4: Essex Historic Environment Record Summary Sheet

Site Name/Address: Broomfield Hospital, Chelmsford, Essex	
Parish: Broomfield	***District:*** Chelmsford
NGR: TL 702 113	***Site Code:*** N/A
Type of Work: Building recording	***Site Director/Group:*** A. Letch, ECC FAU
Date of Work: 25-26th May 2005	***Size of Area Investigated:*** N/A
Curating Museum: N/A	***Funding Source:*** Mid Essex Hospital Services
Further Work Anticipated? None	***Related EHCR Nos.:*** None
Final Report: Summary in EAH	
Periods Represented: 1938 to present	

SUMMARY OF FIELDWORK RESULTS:

Broomfield Hospital was constructed in 1938 and opened in 1940 to treat the infectious disease, tuberculosis. Using a virgin site, the complex, by county architect John Stuart, utilised contemporary models and modern influences and materials to produce a fully-functional, progressively-designed architectural statement. Its architecture was largely influenced by the international moderne style, whose influence had spread from the continent in the inter-war period. Modern design was appropriate for large institutional buildings with specific though basic requirements. Its philosophy intentionally removed it from the constrictions of the past, aided by modern materials such as pre-cast concrete and steel-framed glass, to experiment and manipulate the technology of buildings.

The modern style is exemplified at Broomfield best by the east half-butterfly wing, originally one of a pair that spread either side of circular sun-wards. The south-facing butterfly and half-butterfly plan form was used primarily in hospitals for infectious disease to maximise the amount of light and air to patients through sun balconies. The design of the east wing, with its basic linear plan form, flat roof, fenestrated balconied façade and curved end stair turret offers a significant example of a building type no longer surviving. Before demolition, a RCHME level 3 record was required of the existing structure, which identified original floor layouts and surviving fixtures and fittings, the most notable being the end stairway, whose bold curves are a fine example of modern design.

A lower, level 1 record, was made of surviving elements of the original complex (the main ward block/sun-wards, treatment block, Medical Academic Unit, cafeteria/Galbraith House, mortuary and staff/nursing bank offices) to place the east wing in its architectural and historical context. An additional contemporary structure, the garages, was identified through map analysis, but not recorded during the survey.

Previous Summaries/Reports None	
Author of Summary: A. R. Letch	***Date of Summary:*** 20th October 2005