Theale Airfield Hanger Sheffield Bottom West Berkshire

Historic Building Investigation and Recording

Oxford Archaeology

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THEALE AIRFIELD HANGER

HISTORIC BUILDING INVESTIGATION AND RECORDING
TABLE OF CONTENTS

LIST OF FIGURES

PLATES

THEALE AIRFIELD HANGER

HANGER LANE, THEALE, WEST BERKSHIRE

HISTORIC BUILDING INVESTIGATION AND RECORDING

SUMMARY

Oxford Archaeology (OA) carried out an archaeological and historical analysis of Theale Airfield Hanger, Berkshire. This was undertaken as an archaeological condition of planning approval granted to Fishers Surfacing prior to the demolition of the structure. The hanger dates to the Second World War and is a 'T1' type hanger used to maintain and store military vechicles. It is constructed with a steel frame clad in corrugated iron and remains in a relatively good condition. A number of additional buildings, associated with the airfield, are located to the south west. These are all of a simple, standard design and structure. Therefore while the hanger and additional airfield buildings are of historical interest, they are representative of many other similar buildings built at this time, and are not unique.

1 INTRODUCTION

1.1 LOCATION AND SCOPE OF WORK

1.1.1 Planning permission has been granted to Denton and Gibson Limited for the major redevelopment at the site of Theale airfield hanger, Berkshire. This hanger forms part of the World War II Theale airfield and is to be demolished as part of this redevelopment. This report is required by West Berkshire County Council under planning policy guidance 15 (PPG15).

1.1.2 The structure covered by the current works (NGR SU 648 699) lies within the county of Berkshire and is situated three miles west of Reading. It is bounded by the Kennet and Avon Canal to the north and minor roads to the east and south. The remainder of the airfield site has been the subject of gravel extraction, and is now covered with large lakes.

1.1.3 The hanger dates from the Second World War and was used for the housing and maintenance of road vehicles for the airfield (Brooks 2000). It is set on a concrete base and clad entirely in corrugated iron supported by fifteen portal frames. The hanger is rectangular in plan although the north west corner is inset and a rectangular structure projects from this (Block G). Vehicular access is provided through two large sliding doors located on the north east and south west faces of the hanger. Several additional buildings are associated with the airfield; Block F is attached to the south east corner of the hanger and Blocks A, B, C, D & E lie independently to the south west of the hanger. These are simple brick build structures that are thought to have been used for stores or classrooms.

1.2 ARCHAEOLOGICAL AND HISTORICAL BACKGROUND

1.2.1 The First World War had established the importance of aviation in wartime although following this there was a decline in the industry. This changed with the fall of France and the evacuation of the British Expedition Force (BEF) from Dunkirk as there was a real and immediate threat of invasion. This led to a huge expansion of operational airfields so that between 1939 and 1945 the RAF spent £200m on the construction of home airfields. It is estimated that 600 new airfields were acquired in a wide range of structural variants, some of which were set aside for training (Dobinson 2000).

1.2.2 Theale is an example of an airfield that was built in the inter-war period that with the onset of war was expanded to meet the new demands. The origins of Theale airfield dates back to a simple landing strip laid out probably in the late 1930s and known as Sheffield Farm. It was requisitioned by the Air Ministry in 1940 for use by No 8 Elementary Flying Training School (EFTS) Woodley and initially just served as a relief landing ground to the nearby Woodley Airfield. In 1941 an Elementary Flying Training School was opened at the site and it was renamed Theale. At the end of the war Theale was among the first airfields to close and all flying ceased in June 1945 although the site was only de-requisitioned in 1948. The airfield structures once included two blister hangers, an office, store, officers mess and crew huts. The T1 hanger, and a few remaining airfield structures, are the only remaining features of the site (Brooks 2000).

1.2.3 Type 'T' hangers were introduced after 1940 and became the Royal Air Force standard design for temporary hangers during the Second World War. They were developed by the Air Ministry and Teeside Bridge and Engineering. A total of 906 were built for RAF stations at home and abroad in three main sizes. The T1 was 28.96 m span, the T2 was 35.05 m and the T3 was 19.81 m. The usual length was 73.15 m but the number of bays would be varied to meet local requirements. They were of standard steel-fabricated units of welded and bolted construction forming frames across the building. These were covered with galvanised corrugated iron with 22 gauge for the roof and 23-gauge for the walls. The original type A design had roof sheeting fixed with the overlapping portion cranked above its neighbour using angle-iron purlins and U-shaped bolts. This method was discontinued from 1942 in favour of fitting commercial corrugated sheeting with overlapping portion fitted flush using the same angle-iron (fitted the opposite way up) and hook bolts (Francis 1996). Corrugated iron was one of the most revolutionary building materials introduced in the 1820s. It was a cheap, light and non-flammable building material which allowed robust prefabricated buildings to be erected virtually anywhere in the world. In the 1830s galvanising made it more resistant to corrosion.

2 AIMS AND OBJECTIVES

2.1.1 The general aim of the building recording was to create for posterity a record of the hanger (and associated buildings) prior to their demolition concentrating on their structure, construction, history and use.

2.1.2 More specific objectives are to:

- Record the surviving features of the hanger and associated buildings to gain an understanding of their role within Theale airfield
- Identify and record evidence of earlier operations within the buildings
- To determine the phasing of the structures to appreciate the development of the site within an historical context

- To gain a basic understanding of the significance of the site within the history of England's defence strategy during the Second World War.

3 METHODOLOGY

3.1 SCOPE OF ANALYSIS

3.1.1 The building recording was undertaken at Level II as defined in the Royal Commission on the Historical Monuments of England (RCHME 1996). The structures were recorded in their current form before the start of demolition works, this consisted of three principal elements: survey plans, a drawn record, a photographic record and a written record.

3.2 FIELDWORK METHODS AND RECORDING

3.2.1 *The Drawn Survey*

3.2.2 Oxford Architects on behalf of Fishers Surfacing Ltd undertook the base survey for the present works. This provides the plan of the hanger and associated buildings (Fig 2). The plan of the hanger was enlarged to a scale of 1:200 and traced onto archivally stable permatrace and descriptive annotation added to indicate construction, structural breaks, evidence relating to the building's use and other features of interest. The recording followed IFA Standards and Guidelines using conventions outlined in *Recording Historic Buildings: a descriptive Specification* (RCHME 1996).

3.2.3 *The Photographic Record*

3.2.4 Photographs were taken using 35mm film (black and white prints, colour slides) and include general shots of structures (external and internal) and specific details. Flash lighting was used to illuminate dark interiors and a scale used where appropriate. All films included a chalk board indicating the film number and site code. Photographic record sheets where used to indicate the location and direction of each shot and any further detail.

3.2.5 *The Written Record*

3.2.6 Written descriptions of the hanger and associated buildings were made as part of the annotated drawings. Additional analytical and descriptive notes were taken as appropriate to compliment elements of the record.

3.2.7 In addition to the main site recording a short programme of historical research was also undertaken. This research was based on principal secondary sources as listed in the bibliography.

4 DESCRIPTION

4.1 GENERAL FORM

4.1.1 The hanger is roughly rectangular in plan measuring c. 22 m by 27 m. The building is inset at the north west corner where a narrow rectangular structure projects to the north west (Block G). The north west elevation is largely obscured by a modern structure along the remaining face (Plate 1). A further brick built Second World War structure lies adjacent at the south end of the hanger's south east elevation (Block F) (Plate 2). The hanger is set on a concrete base and is supported by 15 portal frames. The main access areas to the hanger are located on the north east and south west faces. These are large corrugated iron sliding doors,

operated on small wheels, that would have permitted vehicle access (Plate 3). Two smaller access doors are located on the south east elevation. Internally the hanger is a large empty space with few distinctive features.

4.1.2 Five blocks stand independently of the hanger to the south west which are all single storey brick built structures (Plate 4). These are all thought to be associated with the airfield; it is possible that these were used as store rooms or class rooms during operation. A rapid survey was conducted of the immediate area surrounding the hanger and no further archaeological features relating to the airfield were found. Works undertaken by Fishers Surfacing has meant that any evidence relating to the airfield has been largely demolished. The wider landscape surrounding the hanger has been subject to gravel extraction and therefore any further archaeological elements are no longer extant.

4.2 EXTERNAL LAYOUT

4.2.1 The hanger at Theale is clad in galvanised corrugated iron, painted red to resist corrosion. The hanger is constructed from large sheets of corrugated iron that are held together with iron bolts. The exact dimensions of the individual sheets vary and in some areas have been replaced with modern plastic clear sheeting (Plate 5).

4.2.2 The corrugated iron exterior walls meet a concrete base (depth 0.12 m) (Plate 6). Along the south east elevation this projects c. 0.20m from the base of the walls (it was not possible to confirm this measurement throughout the entire building due to restrictions with access).

4.2.3 The roof of the hanger is also of corrugated iron and at a height of 9.3 m at the ridge. Typically Type T hangers used 22-gauge for the roof although due to health and safety restrictions it was not possible to confirm whether this was used at Theale. The T1 hanger by design had special cranked and punched roof sheeting. An example is at Babdown Farm, Bibury, Long Newton (Francis 1996).

4.2.4 A drainage channel runs along the perimeter of the concrete base which is visible along the south east elevation. This presumably once ran along the north west elevation although due to the modern development this is not possible to confirm (Plate 7). The earth drainage channel rises to a height of c.0.80 m to meet a levelled area to the south east of the hanger. Both metal and iron drainage pipes are visible along the section of the drainage channel. The levelled area has a concrete base and is thought to have been used as an area in which vehicles were parked prior to entering / departing the hanger (see Plate 2).

4.2.5 The north west elevation of the hanger is obscured by a recent extension that appears to be a series of garages or storage units (see Plate 7). It is constructed from breeze blocks with five rolling garage doors and five wooden doors. It is probable that this elevation is of the same for as the south east elevation as such military buildings are commonly of a standard form. Internally there are no features to suggest that the north west elevation reflects an unusual form.

4.2.6 The main access areas for the hanger are at the north east and south west elevations. The sliding doors are constructed from corrugated iron and the height to the top of the doors is 6.4 m. The north east and south west elevations consist of 6 doors that slide to the east and west so that the full length of the faces is open. This would have permitted the access of large vehicles for maintenance. Each door consists of 2 equal divisions (5.6 m by 2.51 m) with iron bracing running horizontally and diagonally providing the support for the construction of the doors (Plate 8). The corrugated iron panels are attached to the iron bracing by iron bolts (Plate 9). The doors are shut with a large iron clasp and bolt and an iron handle is used to open the

door. This construction is typical of type T hangers and a similar design can be found on the T2 hanger at Tarrant Rushton (Francis 1996).

4.2.7 The doors operate on a sliding mechanism through the use of small iron wheels that are visible internally (Plate 10). Iron bars hold these on either side of the wheel at the base of the door and run along an indent in the concrete floor. Externally, above the doors there is a horizontal iron casing that houses the overhang mechanism for the sliding doors. These extend 3.8 m beyond the width of the hanger to the east and west (Plate 11). The overhang mechanism consists of iron rails on which the doors are able to slide back. This construction is supported by iron bars arranged in a triangular formation which are used to hold this mechanism in place (Plate 12).

4.2.8 There are a further two doors providing access along the south east elevation. The first door is located towards the north end of the elevation (Plate 13). This is constructed from corrugated iron and incorporated into the construction of the hanger. The door has an iron frame and measures 2.07 m by 0.77 m, thus allowing individual not goods access. It is hinged, opens externally and is secured with a locked latch. The second door is a larger plain iron door (2.41 m by 2.22 m) that is secured in the centre by an iron bolt (Plate 14). This doors is raised from the ground on a concrete base to a height of 0.27 m. It is likely that this door allowed access for equipment associated with the maintaince of the vehicles.

4.2.9 There are a total of three crittal windows within the hanger. One window is located along the south east elevation measuring 1.83 m by 0.75m (Plate 15). This has an iron frame with two end lights (now boarded) encasing three internal panels of lights. Two further windows are evident along the north west elevation. These are located between block G and the modern addition running along the remaining north west elevation. The more northern of the two windows measures 3 m by 1.10 m and has three lights contained within three sections. The second window measures 2 m by 1.10 m and has three sections containing three lights. Both windows are at a height of 1.70 m from the base of the hanger and have iron frames, wood sills and glass panes. It is possible that additional windows once existed on the north west elevation that are no longer extant. Such windows are common in second world war buildings of this type although the number of windows is usually limited due the risks these would have entailed. Glass windows are also likely to shatter as a result of vibrations created by the movement of aircraft.

4.2.10 Two ventilation slots (1.09 m by 0.34 m) are built within the construction of the hanger, along the south east elevation, at a height of 1.70 m from the base (Plate 16). The corrugated iron has been moulded so that it overhangs the slots preventing water from entering the hanger internally. These ventilation slots also serve in illustrating the benefits of corrugated iron as it is possible to manipulate the material to incorporate such additional features. It is probable that two further ventilation slots were once evident on the north west elevation although these are now obscured by the modern structure.

4.3 INTERNAL LAYOUT

4.3.1 Internally, few extant features survive providing information as to the working mechanics of the hanger. It is a large open space with a flat concrete floor that is lipped at the north east entrance to facilitate vehicle access. The corrugated iron elevations directly meet the concrete floor (Plate 17). The hanger houses 15 steel portal frames spaced at 3.4 m increments. Five iron bars extend horizontally along the length of the corrugated iron elevations (Plate 18). These are evenly spaced from the base of the elevation to the roof at 1.7 m intervals and are 0.6 m in thickness. Each vertical girder is bolted to the iron bar and these in turn are attached to the corrugated iron by small iron hoops that pass through the corrugated iron at 0.38 m

intervals. The corrugated iron roof sits on the portal frame trusses and is secured by iron supports extending in a V shape from either side of the frames (Plate 19).

4.3.2 Electricity was used in the lighting of the hanger and internally and externally cables remain extant. Externally, these are visible running from the horizontal overhang of the door along the south east elevation and are held by wooden cable fittings. Internally, electrical light cables run horizontally in alignment with the iron bars (4.3.1). The first of these is at a height of 3.5 m and the second at 5.2 m. Several fuse boxes and light switches are housed within the hanger and a number of lights are still extant. These are located along the south east and north west elevations, as well as suspended from the roof of the hanger. Such electrical lighting was needed as the hanger contains limited windows that would have permitted natural light.

4.3.3 Two doors are extant along the southern end of the west elevation. The more southerly of the two is a wooden door with a frame measuring 2 m by 2.18 m (Plate 20). A concrete ramp extends up to meet the area of the door which would have facilitated the transportation of equipment. The second door is a sliding wooden door with a brick surround and located between trusses 8 and 9. It measures 3.26 m by 3 m and slides back within the construction of the hanger and therefore is at the same alignment as the corrugated iron elevation. The brick surround is built onto the corrugated iron which meets the trusses on both sides. These doors would not have permitted vehicular access but were large enough to allow for the transportation of equipment relating to the vehicles. There is no internal door linking block G to the hanger. An iron door remains extant providing access to block F.

4.3.4 Two features provide evidence of the working operations of the hanger. Firstly, a number of pumps remain extant along the south east elevation which are attached to an iron pipe. This runs in a north east to south west orientation at a height of 1.71 m from the base of the hanger. It is likely that this pipe was once filled with air and the pumps were used for the inflation of vehicular tyres during maintenance.

4.3.5 The second feature of note are eight pulley wheels which are attached to the portal frames. Four are located at the north east and south west of the hanger, two on the south east parameters of the roof and two on the north west. A further four are located below these on the vertical steel girders. Various iron mechanisms are evident on the frames which are thought to relate to this pulley mechanism (Plate 21). It is thought that these once held ropes or chains that were used to hoist heavy equipment. At the south western end of the hanger these are found on truss 13 and in the same alignment as the iron door. It is likely that these were therefore used to facilitate the transportation of equipment through these doors.

4.3.6 The hanger houses two internal breeze block buildings that relate to a different phase of construction. These presumably were inserted at a recent date by Fishers Surfacing. The first is located in the north - west corner of the hanger and measures 2.58 m by 3.59 m (Plate 22) and the second is located in the south west corner. It was not possible to gain the measurements of the latter structure as a large truck stationed in front of the structure meant that this was impossible (Plate 23).

4.4 ADDITIONAL SITE STRUCTURES

4.4.1 Blocks A - E are located to the south west of the hanger and are all brick built (see Plate 4). With the exception of blocks C and D these are all Second World War airfield structures which are likely to have been used as training, administration or storage rooms during this period. They are all of a simple and functional nature that was common for airfield structures built during the war. It was decided at the outset

of the expansion programme that a policy of standardisation or 'type' design should be applied to the fullest extent possible.

4.4.2 Block A is rectangular in plan, single storey with small buttresses to the external face of the walls (Plate 24). It has a gabled roof, concrete floor and three simple metal trusses (Plate 25). The windows are crittal type and sloped tiles extend to the window sills (Plate 26). Two sets of double doors and one singular door provide access (Plate 27). The building has two internal divisions and a sink and it therefore seems likely that its use was as a training room or some type of administration office.

4.4.3 Block B is single storey with distinctive buttresses to the outer face (Plate 28). It has crittal type windows with sloped tiled sills (the same as block A), two doors and a wide opening which has been incorporated into the original wall. Block E is a later addition to the north of Block B although it is still thought to date to the Second World War. A secondary door has been added linking the two structures. It is of a similar construction, also with crittal windows and appears to be the used as a toilet block. Block C is a brick and concrete block extension to Block B and thought to be post World War two in date (Plate 29).

4.4.4 Block D has corrugated iron metal cladding with a single pitched roof supported by a frame of pylons that are tied together. It has roller shutters to the north end.

4.4.5 Block F is single storey with crittal windows, a pitched corrugated iron roof and buttresses to the exterior (Plate 30). It was not possible to gain access to the building although it was evident that it has softwood purlins. There are footings from other structures in front of it although these are not planned.

4.4.6 Block G is constructed from corrugated iron and the roof has been rounded into an arch formation (Plate 31). The elevations are bolted onto a breeze block base (0.50 m in height). The structure has one smaller corrugated iron north east facing door set in a wooden frame. A larger corrugated iron door faces to the north west that opens to the full extent of the elevation providing a large access area. The door is divided into four hinged sections each measuring 1.30 m in length and 3.56 m in height. Above the door is a diamond shaped plaque on which 'Main' is written. The structure has two crittal windows and a concrete floor. It is thought that it also relates to the world war two construction phase and is contemporary with the construction of the hanger. There is no entrance to this building from the hanger although the two buildings are connected by a breeze block structure (Plate 32). It was not possible to gain access to the block G at the time of inspection.

5 DISCUSSION AND INTERPRETATION

5.1 The hanger at Theale is of a standard design and construction and therefore while it is of historical interest, due to it being representative of other buildings, it is not unique. Likewise, the associated blocks described are also of a simple functional design and form and therefore while they are significant they are not uncommon. Also, as the remaining structures in the airfield are no longer extant the broader context has now been lost.

5.2 The hanger stands in good condition and is largely complete. Internally, the hanger is largely an open space with little surviving evidence suggesting the workings of the structure. Two archaeological features offer some insight; firstly there are a number of extant tyre pumps evident along the south east elevation. Secondly, there remains a pulley mechanism used to hoist heavy equipment during the maintenance of vehicles. Two recent structures have been added internally to the building

although these did not hinder in the understanding of the structure. The exact function of the blocks lying to the south west of the hanger is uncertain. They house no distinctive archaeological features and provide little additional information regarding the working operations of the airfield.

5.3 Theale is an example of an old airfield that was adapted and expanded to meet the demands of the second world war. It serves in illustrating how the war required all resources to be utilised so that by the 1945 Britain had a total of 740 airfields (Dobinson 2000). It shows how the RAF utilised old airfields and new as the threat became more immediate. Aviation grew increasingly important during the war and training airfields such as the one at Theale were vital to Britain's success.

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7 SUMMARY OF SITE DETAILS

Site name: Theale Airfield Hanger
Site code: THAIR04
Type of evaluation: Building Analysis
Date and duration of project:
Location of archive: The archive is currently held at OA, Janus House, Osney Mead, Oxford, OX2 0ES.

List of Archived Items:

Two films of 35mm photographic negatives (black and white prints)
Two sets of black and white photographic prints (contact sheets)
Two films of 35mm colour slides
A copy of the current report
Original site drawings to permatrace
Descriptive notes

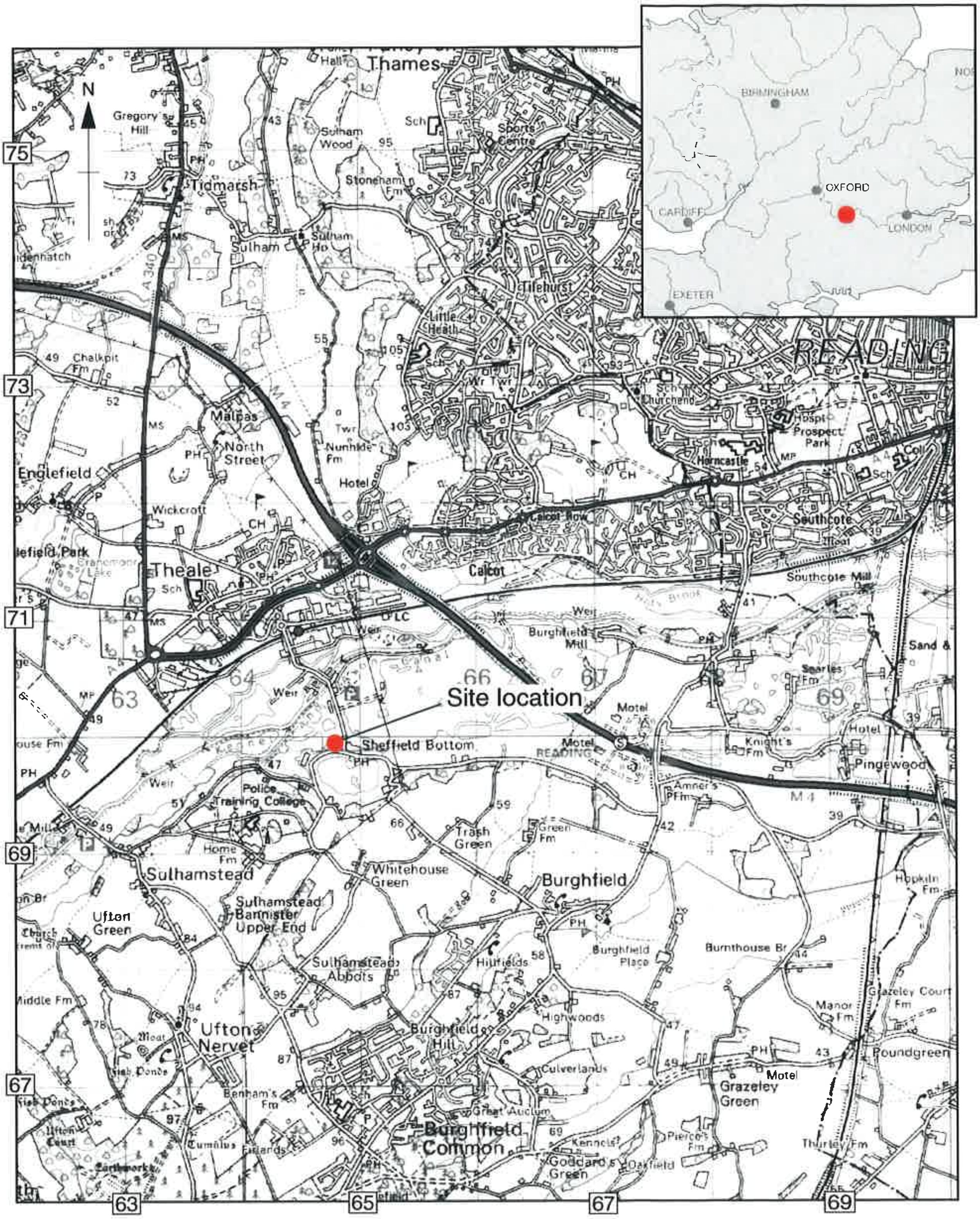

Figure 1: Site location

Reproduced from drawing no. 10, job no. 02102. Oxford Architects, Oxford

Figure 2: Site plan

Plate 1: West view of site

Plate 2:South-east elevation showing Block F

Plate 3: North-east elevation of hanger

Plate 4: General east view of external blocks

Plate 5: North-east elevation showing construction detail

Plate 6: North-east view of north-east elevation

Plate 7: General north-west view of north-west elevation

Plate 8: Sliding doors, north-east elevation

Plate 9: Construction detail of sliding doors, north-east elevation

Plate 10: Rolling mechanism of sliding doors, north-east elevation

Plate 11: Sliding doors, south-west elevation

Plate 12: Overhang structure of sliding doors, south-west elevation

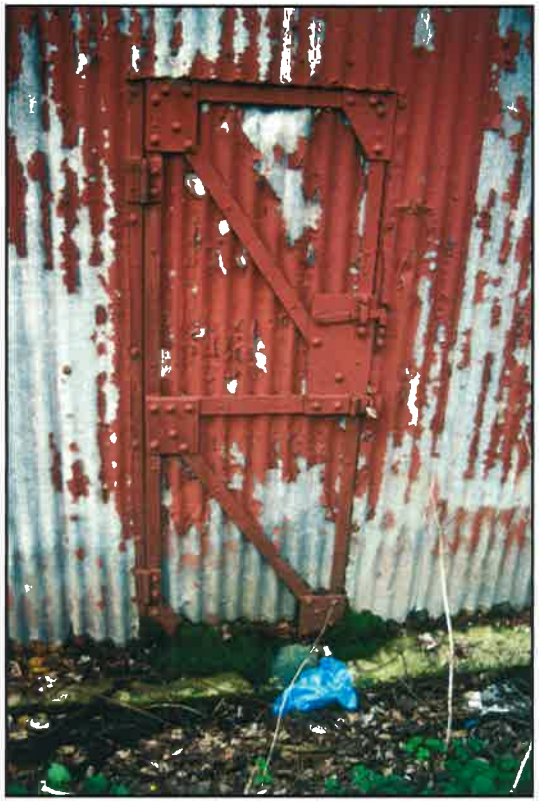

Plate 13: Doorway 1, south-east elevation

Plate 14: Doorway 2, south-east elevation

Plate 15: Window, south-east elevation

Plate 16: Vents, south-east elevation

Plate 17: Roof truss, detailing base of post, south-east elevation

Plate 18: Roof truss, south-east elevation

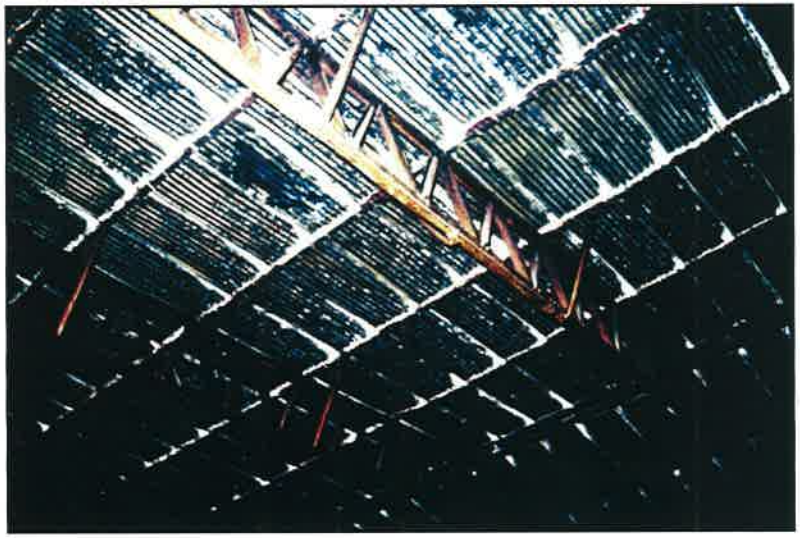

Plate 19: Internal west view of roof

Plate 20: Internal bay and door, north-west elevation

Plate 21: Detail of internal pulley mechanism, south-west corner

Plate 22: Modern internal structure, north-west corner

Plate 23: Modern internal structure, south-west corner

Plate 24: South view of blocks A, B and C

Plate 25: Internal south view of block A

Plate 26: Internal windows, west elevation, block A

Plate 27: Internal door, east elevation, block A

Plate 28: South elevation of blocks B and E

Plate 29: South view of block C

Plate 30: East view of block F

Plate 31: North-west elevation showing block G

Plate 32: Structure joining hanger and block G

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