

HISTORIC BUILDING RECORD

AVRO SHED WOODFORD AERODROME STOCKPORT

Planning Authority: Stockport Metropolitan Borough Council

Site centred at: SJ 89549 81447

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EXECUTIVE SUMMARY

The site consists of a small single storey aeroplane hangar at the southern end of the airstrip at Woodford Aerodrome, Woodford, near Stockport, Greater Manchester, known as the Avro Shed due to 'A.V. Roe & Co. Ltd.' being painted across the principal elevation. It was recorded to a Level 3, as defined by English Heritage, following storm damage and in mitigation of its removal from the site ahead of development.

The Shed was believed to be one of the earliest buildings on site following the formation of Woodford Aerodrome in 1924. It was on a north-west to south-east axis, constructed of a steel frame clad in corrugated iron, and two and a quarter bays wide, consisting of two barrel-vaulted roofs divided by a central ridged roof section. The trusses supporting the barrel-vaulted roof spans were a hybrid of scissor- and bow-strung trusses.

The date of its original construction is thought to be either 1916, having been moved from Avro's previous location on Alexandra Aerodrome, Manchester, or c. 1930 and built specifically for Avro. Historic maps are only available to record its earliest presence at Woodford in 1938. It does not appear to conform to any apparent standard type of airfield building construction, and there are no known similar buildings of this design in Britain, although there are similar, but much larger, sheds from First and Second World War airfields in the United States. Consequently, it is possible that the Shed was custom-built for Avro (possibly in 1927).

1.0 INTRODUCTION

- 1.1 This report was prepared by Emily Mercer of CgMs Consulting for Harrow Estates, and presents the results of a programme of historic building recording carried out on a small double-span aircraft hangar, known as the Avro Shed, located in the south-west corner of Woodford Aerodrome, Greater Manchester.
- 1.2 The Avro Shed is centred at National Grid Reference SJ 89549 81447 (HER reference 16029.1.0) and is not listed or otherwise designated. For the purposes of this report 'the site' refers only to the building under consideration.
- 1.3 A planning application has been submitted for the development of the land at Woodford Aerodrome, Woodford, near Stockport. To accompany the planning application, a Heritage Assessment was undertaken of the Aerodrome site by CgMs Consulting (2013). As a result, and following consultation with Norman Redhead of Greater Manchester Archaeological Advisory Service (GMAAS) and in accordance with government policy (National Planning Policy Framework (NPPF)), a programme of archaeological investigation and building recording will be required as a condition of consent in mitigation of the development. Although consent is yet to be granted, an English Heritage (EH) Level 3 recording of the Avro Shed is necessary following storm damage during the winter of 2013/14 and prior to it being dismantled for storage before being rebuilt elsewhere.
- 1.4 The historic building recording accords with a Written Scheme of Investigation (WSI) provided by CgMs Consulting (2014 [Appendix 1]) and approved by Norman Redhead (GMAAS), who also consulted Paul Hartley (Conservation Officer, Stockport Metropolitan Borough Council).
- 1.5 The recording was carried out on 27th February 2014.

2.0 PROJECT SCOPE AND DETAILS

2.1 The detailed specifics of the projects aims, objectives and methodology were presented in the WSI (at Appendix 1) prepared by CgMs (2014). These elements are summarised here.

Aims and objectives

- The main aim of the project was to gain a better understanding of the building and to preserve it through record in mitigation against its loss during the redevelopment of the site, made more critical as a result of recent storm damage. Consequently, the deteriorating condition of the building necessitates the demolition and removal off site at this early stage in the proposed development in order that it can be reconstructed elsewhere.
- 2.3 The principal objectives of the project were to: 1) examine the Avro Shed building; 2) compile a Level 3 record (see below); 3) present the results of the record in an illustrated report; and 4) deposit the record with a recognised archive Greater Manchester Record Office.

<u>Methodology</u>

- 2.4 A Level 3 record was undertaken; the Levels of Record are defined by English Heritage (2006) *Understanding Historic Buildings: A Guide to Good Recording Practice*. Level 3 is an analytical record and comprises a descriptive internal and external record, combined with drawings and a detailed photographic record.
- 2.5 A site visit was undertaken to examine the buildings and compile the record. It was carried out over a single day on 27th February 2014. Conditions were good with clear skies and some bright sunlight.
- 2.6 Written records were made of the principal building elements, both internal and external, as well as any features of historical or architectural significance using pro forma record sheets. Particular attention was also paid to areas of the building where its development and any alterations could be observed. These records are essentially descriptive, although interpretation is carried out on site as required.
- 2.7 Architects 'as existing' drawings were annotated to produce plans of the building, together with principal external elevations, that show the form and location of

structural features and/or features of historical and architectural interest. Where necessary these drawings were manually enhanced using hand survey techniques. The hand-annotated field drawings were digitised using an industry standard CAD package to produce the final drawings (Figures 7-12).

- 2.8 The photographic survey was undertaken using a Canon EOS 5d full frame (35mm sized-sensor) digital SLR camera. Images were captured in Canon raw format (.crz files) and converted into exif-tiff and jpeg files using Canon Digital Photo Professional software. A number of lenses were used, including wide angle, telephoto and shift. The camera was attached to a tripod and levelled for all images.
- 2.9 A full photographic archive was produced, including record sheets, and pertinent images used for illustration purposes in this report. The photographic archive consists of general shots of the building, both internal and external; detailed internal and external scaled coverage of architectural and decorative features and/or structural detail.

Statement of limitations

2.10 There was limited access to the rear of the building, with access only via a locked gate on to the adjacent golf course. A limited time was allowed to photograph the rear, from which the descriptions were collated.

Further research

2.11 A desk-based assessment has previously been carried out by CgMs (2013) on the Woodford Aerodrome site. However, for the purposes of understanding the significance of the building, further research has been undertaken in accordance with a Level 3 record.

3.0 LOCATION, GEOLOGY AND TOPOGRAPHY

3.1 **Site location**

- 3.1.1 The site, comprising the double-span Avro Shed, lies in the south-west corner of Woodford Aerodrome (Figure 1, Plate 1). The Aerodrome perimeter fence lies immediately to the rear of the Shed (Plate 2), beyond which is a golf course. The Shed is located at the southern end of the approximate north/south airstrip. To its north-west is a corrugated and wooden clad green hut, of an appearance typical of a military-style workshop or store (Plate 3). To the north-east of the Shed and workshop is an area of sectional concrete hard-standing. To the south of the Avro Shed is a large overhead flood light (Plate 4).
- 3.1.2 The Aerodrome is approximately 205 hectares in extent and is bounded to the north by Woodford, to the north-east by the outskirts of Poynton, to the east by agricultural land associated with Hope Green and Sandy Hey Farm, to the south by Dairyhouse Wood, and to the west by agricultural land. The Aerodrome straddles the boundary between the local authority areas of Stockport Metropolitan Borough Council (MBC) and Cheshire East Council (Figure 1); the Shed lies within Stockport MBC.

3.2 **Geology**

- 3.2.1 The underlying solid geology of the study site comprises Sandstone and Conglomerate (Inter-bedded) of Permo-Triassic date. The superficial geology of the site comprises Sand and Gravel River Terrace Deposits in the east and Till-Diamicton (formerly classified as Boulder Clay) in the west. The Stockport/Cheshire East boundary acts as an approximate dividing line between the superficial geological deposits.
- 3.2.2 The soils in the west of the site are stagnogley soils of the Salop Association with slowly permeable sub-soils in reddish drift mostly derived from Permo-Triassic rocks. Soils in the east of the site are of the Blackwood Association. They are deep permeable sandy and coarse loamy soils overlying glacio-fluvial drift, which in turn is overlain by glacio-lacustrine clay or till.

3.3 **Topography**

- 3.3.1 The Aerodrome occupies gently undulating terrain in a transition zone between the Cheshire Plain to the west and the foothills of the Pennines to the east. Levels across the airfield are between 97 m and 77 m Above Ordnance Datum (AOD). The southern part of the site is slightly lower-lying where the ground dips gently to the Red Brook, a tributary of the River Dean.
- 3.3.2 The Aerodrome dates back to 1924 and, as a result, parts of it have been levelled and are now occupied by factory structures, and elsewhere levelling and terracing to create suitable gradients for the airstrip is assumed.
- 3.3.3 The site of the Avro Shed slopes from the front downwards to the back of the building on the southern end, necessitating the raising of ground level at the rear (Plate 2).

4.0 RESULTS OF THE RECORD

Historic background

4.1 A more detailed historic background of Woodford has been provided in the Heritage Assessment produced by CgMs (2013) which should also be referred to in order to avoid unnecessary repetition.

General background to the establishment of Woodford Aerodrome

- 4.2 Alliot Verdon Roe, or A.V. as he was known, was one of the pioneer aviators in Britain. At the age of 29 he resigned from his job as a draughtsman for the motor car industry to devote his time to aviation. He made history in 1909 by undertaking the first flight in Britain of a British designed aircraft powered by a British engine.
- 4.3 A.V. Roe and Company was formed in 1910, a partnership between A.V., as the enthusiast, and his brother, Humphrey, the businessman. It was the world's first company to be registered as an aeroplane manufacturer and was based in Manchester. The aeroplanes were manufactured in the basement of Humphrey's company, Everards, in Brownsfield Mill in Ancoats, with A.V. based at Brooklands Aerodrome in Surrey, where he tested aircraft and also ran a flying school.
- 4.4 The First World War and the demand for aircraft saw an increase in production at the company. The facilities in Manchester were expanded and Avro built its own large factory at Park Works, Newton Heath. The field next to the works was used for flying, but this was risky in a highly industrialised and populated area.
- In 1917, Aircraft Acceptance Parks (AAP) were being established nationwide to receive aircraft from sub-contracted manufacturers, where they would be assembled on site by the manufacturers and then flight-tested by the Aeronautical Inspection Department of the Royal Flying Corps (RFC). They would be equipped according to operational purposes before delivery to units within the country or overseas. AAP No. 15 Manchester was established at Alexandra Park in 1918 by the War Department for the acceptance of aircraft from Avro and from the National Aircraft Factory (NAF) No. 2, run on behalf of the War Department by Crossley. AAP No. 15 was located due to its road and rail network, receiving dismantled aeroplanes from Avro and NAF No. 2 by rail, and by road from other sub-contractors.

- 4.6 Avro rented a hangar at Alexandra Park in order that it could assemble its aeroplanes prior to their test-flight. AAPs were designed with large numbers of sheds, with the standard being the triple-span General Service (GS) Shed, two of which were at Alexandra Park amongst a number of store sheds (Plates 5 and 6).
- 4.7 Following the end of the First World War, Avro remained at Alexandra Park from where, in 1919, it ran scheduled pleasure flights to Blackpool and Southport between May and September. Avro were joined in 1922 by Daimler Airway who ran flights to Croydon, near London, and then by the Lancashire Aero Club, who formed in 1922 at the Alexandra Park Aerodrome.
- 4.8 At the end of the lease, in 1924, Alexandra Park closed and was disbanded at auction. Avro was forced to look for a new flying field. A large pasture field with the potential for expansion was found at New Hall Farm at Bramhall, approximately 15 miles from Park Works at Newton Heath, with good road access, close to a railway, and relatively level topography. The new airfield was named Woodford after the adjacent village (HER 162026.1.0). Avro purchased hangars at the auctioning off of Alexandra Park Aerodrome, although there is some confusion in the sources as to which hangars and how many. It has been postulated that the Avro Shed was one of the hangars, together with at least Hangar No. 1 and/or a Bessonneau hangar.
- 4.9 Woodford Aerodrome also became the home of the Lancashire Aero Club, which used a converted farm building as a clubhouse and a 'Dutch-barn' style steel-framed hangar built for Avro in 1927.
- 4.10 During the Second World War, two runways were built at Woodford Aerodrome, which had also increased the number of hangars during the 1930s in accordance with its capabilities. The aircraft chiefly associated with Woodford Aerodrome, the first production Lancaster L7527, first flew from the airfield in 1941. The main components were constructed in Avro's main factory at Chadderton on the outskirts of Manchester and assembled at Woodford Aerodrome.
- 4.11 Woodford was closed as an active airfield in 2011, when it was owned and operated by BAE Systems.

Avro Shed

- 4.12 There is confusion in the sources as to the original date of the Avro Shed. The Greater Manchester Historic Environment Record (HER) (16029.1.0) dates the Shed to the 1930s. However, Holmes (1993) dates the building to 1916, having been brought from Alexandra Park following its closure, although Alexandra Park was not established until 1918. Most sources generally agree, however, that it was one of the first structures on Woodford Aerodrome (Plates 7 and 8).
- 4.13 The first available map, following the creation of the airfield at Woodford in 1925, to show the Avro Shed is the Ordnance Survey 1938 edition (Figure 2), which also shows two large hangars to the south-east. Therefore, it is not possible to establish the date of construction of the Avro Shed at Woodford through cartographic evidence.
- 4.14 Neither the Shed or the hangars are shown on the Ordnance Survey map of 1954 (Figure 3). This is due to map censorship imposed during the Second World War when Ordnance Survey maps were restricted from showing any military airfields, although civil airfields were mapped. This continued through to the late 1960s in some places and were only included generally as and when the maps were reconfigured at a scale of 1:50,000.
- 4.15 The Ordnance Survey map of 1972 shows the Avro Shed in more detail (Figure 4). The six-span store abutting the north-west facing elevation of the Avro Shed seen in Plates 7 and 8 is still in existence. However, by the 1992 edition Ordnance Survey map (Figure 5) the six-span store had been demolished and removed and the green military-style workshop (Plate 3) had been constructed.
- 4.16 The Avro Shed is a double-span GS-type Shed. Hangars were known as 'sheds' in the early years of aviation, except in the case of tents which were known by the French aviation term as 'hangars' (for example the Bessonneau hangar), and were of a fairly standard construction. In 1912, the RFC standard form of permanent hangar was a large wooden shed with gabled front and sliding doors. As the RFC expanded a larger permanent hangar became necessary, the result being the 1916 GS Shed, which was a bow-strung truss end-opening shed. The subsequent 1917 pattern GS Shed was larger still due to the use of the Belfast wooden truss method of supporting the roof in which the lattice bracing the bowed upper chord member and the lower chord member was arranged as

interlocking fans. This was known as the 'Belfast' and was developed during the 1920s and 1930s to produce numerous standard types. It enabled large endopening sheds, and multiple spans.

Site description

General Description

- 4.17 The Avro Shed is a symmetrical steel-framed structure, almost entirely clad in corrugated iron, bolted onto the frame. It measures approximately 20m wide by over 13m in depth, and a maximum height of approximately 5.3m. It is painted green, except for the rear elevation. It consists of two barrel-vaulted roofed sections, divided by a central pitched roofed section (Plate 9). It is rectangular in plan, single-storey and the axis is on a north-west to south-east orientation (Figures 7 and 8).
- 4.18 At the rear of the Shed is an integral lean-to extension (Plate 10), with a monopitched roofed section that covers the full width of the building (Figures 9 and 10). A brick outshut is located on the north-west corner of the north-west facing elevation of the Shed (Figure 10).
- 4.19 The main access is from the principal elevation via four horizontally sliding hangar doors (Figure 8). An additional access is provided on the north-west facing elevation (Plate 11).
- 4.20 The main structural internal frame of the Shed is entirely visible, painted yellow (Plate 12), and is of a steel I-beam construction. Other supporting members of the internal frame are angle iron and timber, including the roof trusses of both the barrel-vaulted and ridged roofs (Figure 12; Plate 13). All members are bolted together.

External Description

- 4.21 The following description outlines the visible external appearance of the Avro Shed, commencing with the principal elevation (Figure 8).
- 4.22 The principal elevation faces north-east onto the main runway. It is two and a quarter bays wide. It houses the main doorway, consisting of four steel-framed

sliding hangar doors clad in corrugated iron, one of which (at the north end) had blown off in a storm prior to the site investigation. Each of the four doors operates individually via a simple roller system (Plate 14), running on a steel rail set into the concrete (Plate 15) and guided by a similar rail at the top. Protecting the top mechanism of the sliding doors is an overhang constructed of timber (Plate 16).

- 4.23 Visible above the sliding hangar doors are the gables of the vaulted and pitched roofs. These are painted with the name 'A.V. Roe & Co Ltd.' in distinctive yellow paint. This is believed to have been applied to the Shed in the 1980s by the then Production Manager, Mr Charles Macefield. There appears to be evidence of an earlier phase of lettering, particularly on the north gable, but this is difficult to decipher. An external electric light is positioned on the pitched gable. Two timber-channelled lead-lined gutters provide drainage from the roof (Plate 17). No other rain water goods were visible.
- 4.24 The south-east facing elevation (Figure 9) is plain and consists of overlapping horizontal sections of corrugated iron (Plate 18). The eaves of the southern barrel-vaulted roof project slightly over the elevation. Below the eaves two beam ends are visible, projecting through the corrugated iron.
- 4.25 The ground level drops away to the rear of the Shed, which has necessitated the levelling up of the ground (Plate 19). Bricks have been used to make up the level beneath the ground floor slab which are visible at the left-hand (west) side of the elevation (Plate 20). This underlies the extension at the rear of the Shed.
- 4.26 On the right-hand (east) side of the south-east facing elevation is a vertical steel trunking for an electrical cable (Plate 21). This would have probably supplied electricity to an outshut abutting the elevation, seen on the aerial view of the Shed from 1939 (Plate 8), and is connected internally to the general electricity supply described in paragraph 4.41, below.
- 4.27 The rear south-west facing elevation (Figure 10) consists mainly of the rear extension to the Shed (Plate 22). Above the extension the opposing identical sides to the three gables described in paragraph 4.23 above are visible. The corrugated iron cladding on the southern gable has been partially blown off, revealing one of the trusses.

- 4.28 The rear elevation is plain and unpainted, unlike the three other elevations. The mono-pitched roof section (also corrugated iron clad) is visible (Plate 22). Two wide windows are visible (c. 30m in width), consisting of opaque fibre-glass corrugated panels 3.1m in length.
- 4.29 As with the south-east facing elevation (paragraph 4.25, above), on the right-hand (south) side of the rear elevation bricks and stone can be seen making up the level beneath the ground slab on which the frame of the Shed sits (Figure 10).
- 4.30 At the left-hand (north) side of the rear elevation is a brick outshut which measures c. 1.65m x 2.75m. This has a timber and felt roof. The bricks are laid in a Scotch bond, with every eighth course being a header course, and cement mortar. The brick is degraded in places. At the base of the wall are two apertures (Plate 23), presumably for a flue outlet: the uppermost is square and measures 0.31m x 0.31m; the lower one is rectangular and measures 0.9m x 0.43m.
- 4.31 The north-west facing elevation of the Shed (Figure 11) also comprises the north-east and north-west facing elevations of the brick outshut (Plate 24). The brick outshut projects 1.63 m from the north-west facing elevation of the Shed. The main Shed elevation is similar in appearance to the south-east facing elevation described in paragraph 4.24, above, with two beam ends also visible. An exception in similarity is a doorway on the left-hand (east) side which appears to have been inserted later (Plate 26), it is assumed to access the six-span stores. The green paint has worn off most of the elevation.
- 4.32 A horizontal scar is visible running the full length of the elevation and also corresponds with a scar on the north-east facing elevation of the brick outshut. Above this are a number of vertical scars spaced equidistant, at the top of the elevation. Two surviving brackets can be seen beneath the main horizontal scar on the main elevation (Plate 26), with evidence of a third. These were fixed to the internal columns through holes cut into the cladding and are likely to have supported the roof structure to the six-span stores seen on the photographs of 1938 and 1939 (Plates 7 and 8) and the Ordnance Survey map of 1972 (Figure 4). However, this had been removed prior to the 1992 edition of the Ordnance Survey (Figure 5). A vertical scar on the right-hand (west) side of the main northwest facing elevation is also visible, with three cut-throughs in the cladding to the steel frame. This is presumably also associated with the abutting six-span stores.

4.33 The north-east and north-west elevation of the brick outshut is as described in paragraph 4.30 above. The north-west facing elevation has a pedestrian doorway measuring 0.93m x 2.1m) with a concrete lintel but no door or any apparent fixtures or fittings for a door (Plate 27).

Internal Description

- 4.34 The internal layout of the Avro Shed is very simple, with two rooms: Room 1 is the large main open space within the Shed, with no internal partitioning or dividing walls, and no evidence for there having been any previously; Room 2 is the internal space of the brick outshut.
- 4.35 Room 1 is utilitarian in appearance, with the internal frame entirely visible, together with the rear faces of the external corrugated iron cladding (Plate 28). The floor is flat laid concrete.
- 4.36 The internal frame consists of eight vertical I-beam stanchions set into the concrete floor, upon which two main longitudinal beams rest. A third beam, c. 2.9m above the ground level, supporting the pitched roof of the lean-to extension rests on two smaller vertical I-beams and vertical angle-iron stanchions (Plate 29) along the rear south-west wall of the Shed. The roof trusses sit on four cross-beams approximately 3.8m above ground level.
- 4.37 The lateral aspects of the elevations are also visible, formed of simple frames with upright stanchions and horizontal angle-irons, with no bracing (Plate 30). The frames to the main sliding hangar doors, which are also visible (Figure 12), are similar but with the addition of cross-braces (Plate 31).
- 4.38 The barrel-vaulted roof spans are clearly visible internally, measuring approximately 8m in width, and consist of alternatively arranged panels of corrugated iron cladding (Plate 32). Both barrel-vault has three identical trusses, approximately 5m apart, that appear to be a hybrid of scissor- and bow-strung trusses (Figure 12; Plate 32), equating to approximately 1.8m in depth. The upper bow chord is small-section angle-iron. The truss behind the principal elevation of the southern barrel-vaulted roof is braced with a timber supporting frame (Figure 12; Plate 33)

- 4.39 The roof of the central pitched section has three simple A-frame trusses, approximately 3.8m in width and 1.5m depth, with larger section tie-beams (Figure 12; Plate 13). Timber purlins and timber wall plates support the corrugated fibre-glass roof, identical to the rear elevation windows.
- 4.40 The roof of the extension to the rear of Room 1 is supported on angle-iron rafters, along which is a longitudinal beam, centrally placed, on which the lighting is fixed (Plate 29).
- 4.41 Other internal features are mainly electrical fixtures and fittings (Plates 34 and 35), and include trunking for cables, fuse boxes, circuit breaker switch in the south-east corner, petrol pump isolator switch on the south-east wall, four-gang light switch on the central main rear I-beam stanchion, and lights (Figure 7). A small number of these were clearly modern, with the majority being from around the mid 20th century, and possibly pre-World War II.
- 4.42 The heating ducting that passes through to the brick outshut (Room 2) is visible in the north-west corner (Plate 36). Other features include a bracket for the wind sock located on the south-east corner of the building (Plates 4 and 37), and a bracket for the external electrical light attached to the principal elevation (Plates 13 and 17). A sliding pulley bracket is also visible that runs along the second cross-member from the south (Plate 38). Brackets for presumably shelving were also attached to the rear wall.
- 4.43 Room 2 is very small, and mostly occupied by the boiler (Plate 39). It butts on to the north-west facing elevation of the Avro Shed. The floor was not visible due to debris. The heating ducting seen in the north-west corner of Room 1 (paragraph 4.41 above) passes through into this room to the boiler. The boiler was visible with numerous switches and a pump.

5.0 CONCLUSIONS

- 5.1 The Avro Shed at Woodford Aerodrome was recorded in February 2014 to a Level 3 in line with an approved WSI, and in order to mitigate against its removal from the site ahead of development.
- 5.2 The Shed was a single storey aeroplane hangar at the southern end of the airstrip, and is believed to be one of the earliest buildings on site built in the years following the formation of Woodford Aerodrome in 1924. It appeared to be almost original in form.
- 5.3 The Shed was on a north-west to south-east axis and constructed of a steel frame clad in corrugated iron, with a laid concrete floor. It was two and a quarter bays wide, consisting of two barrel-vaulted roofs divided by a central ridged roof section. The roofing was a mixture of corrugated iron panels alternatively arranged on the barrel vaults and opaque fibre-glass panels on the ridged roof. It had a rear mono-pitched 'lean-to' extension to the rear, with a brick outshut housing the heating boiler.
- The Shed was painted green, except for the rear south-west facing elevation. The words 'A.V. Roe & Co. Ltd.' were painted across the principal north-east facing elevation in yellow paint. This was apparently applied during the 1980s but would appear to overlie earlier lettering that could not be deciphered.
- Internally the steel frame was entirely visible, with minimal features mainly associated with electrical fixtures, heating and brackets. The trusses supporting the barrel-vaulted roof spans were a hybrid of scissor- and bow-strung trusses. The ridged roof was supported by simple A-frame trusses with timber purlins.
- 5.6 The Shed is a relatively small hangar. It was not possible to determine the exact date of its original construction, which is thought to be either 1916 and moved from Avro's previous location on Alexandra Aerodrome, or c. 1930 and built specifically for Avro. Historic maps are only available to record its earliest presence at Woodford in 1938.
- 5.7 The earliest photographs and map of the Shed, dating to 1938 and 1939, show the north-west facing elevation to have been abutted by a six-span store. Evidence of this is seen as a scar and brackets, that presumably supported the

roof, on the north-west facing external elevation of the Shed. This was removed after 1972 but before 1992, according to mapping evidence, and was replaced by a military-style green store or workshop which was still extant.

The Avro Shed does not appear to conform to any apparent standard type of construction, and has neither a strictly bow-strung (see paragraph 4.38, above) or Belfast truss. No comparative sites of this design, the double-span bridged by a pitched roof, have been currently identified on British airfields or from historical sources, although there are similar, but much larger, sheds from First and Second World War airfields in the United States (Plates 40-43). Consequently, it is possible that the Shed was built specifically for Avro (possibly in 1927 [see paragraph 4.9]) and may have been based on a design similar to that also used for the examples known in the US.

SOURCES CONSULTED

1. **General**

Norman Redhead: County Archaeologist: Greater Manchester Archaeological Advisory

Service

Paul Hartley: Stockport Conservation Officer

Harry Holmes: Avro Heritage Group

2. **Bibliographic**

Clarke, B., 2000. The Archaeology of Airfields.

English Heritage, 2006. *Understanding Historic Buildings. A guide to good recording practice*.

Francis, P., 1996. British Military Airfield Architecture. From Airships to the Jet Age.

Freethy, R., 2007. Lancashire 1939-1945. Working for Victory.

Holmes, H., 1993. AVRO: The Story of Manchester's Aircraft Company.

Innes, G. B., 1995. British Airfield Buildings of the Second World War.

Innes, G. B., 2000. British Airfield Buildings. Volume 2: The Expansion and Inter-War Periods.

Jarvis et al., 1984. Soils and Their Use in Northern England. Soil Surveys of England and Wales, Bulletin No. 10.

Scholefield, R. A., 2004. Moving Manchester: Manchester's early airfields, an extensive chapter. *Lancashire and Cheshire Antiquarian Society*, pp210–229.

Smith, D. J., 1989. Britain's Military Airfields, 1939-45.

Smith, D. J., 1990. Action Stations, No. 3, Military Airfields of Wales and the North-West.

3. **Cartographic**

1938	Ordnance	Survey	Мар
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1954 Ordnance Survey Map

1972 Ordnance Survey Map

1992 Ordnance Survey Map

2014 Ordnance Survey Map

4. Website

AVRO - www.verdon-roe.co.uk

BAE Systems - www.futurewoodford.co.uk

Carlstrom Airfield - us.geoview.info

English Heritage: The National Heritage List for England - list.english-heritage.org.uk

Heritage Gateway - www.heritagegateway.org.uk

MAGIC - www.magic.gov.uk

WWI Hangars - www.airfields-freeman.com

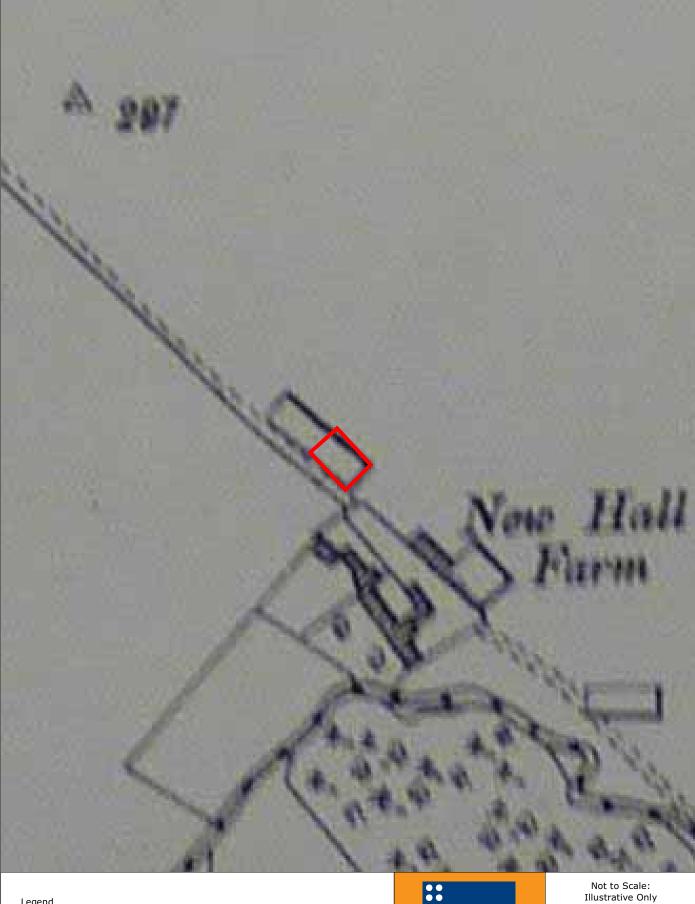


Not to Scale: Illustrative Only

Woodford Aerodrome Avro Shed Figure 1: Site Location

Legend

Site Location



Legend

Site Boundary

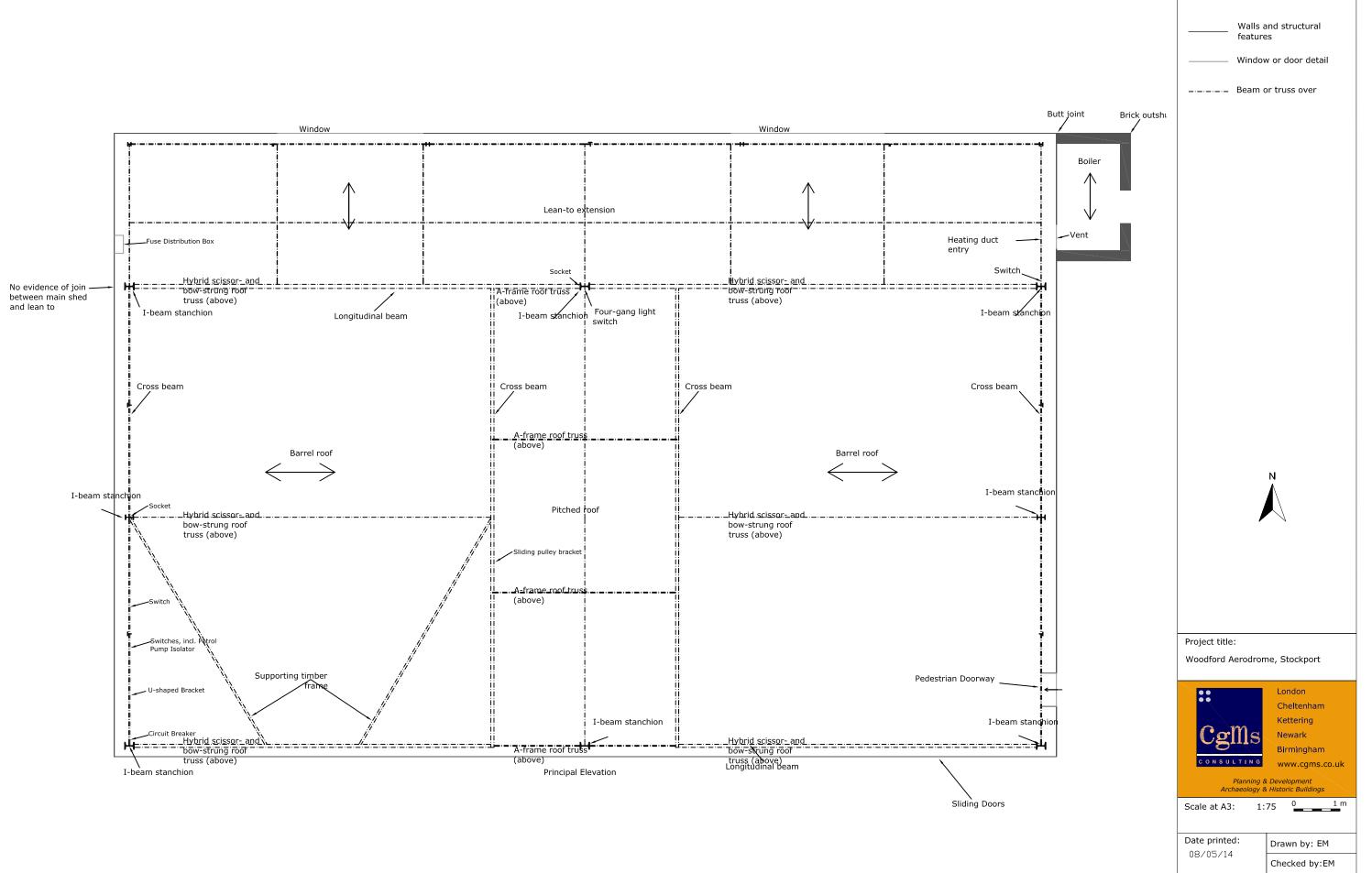




Woodford Aerodrome Avro Shed Figure 2: 1938 Ordnance Survey Мар



Avro Shed Figure 6: 2014 Ordnance Survey Мар



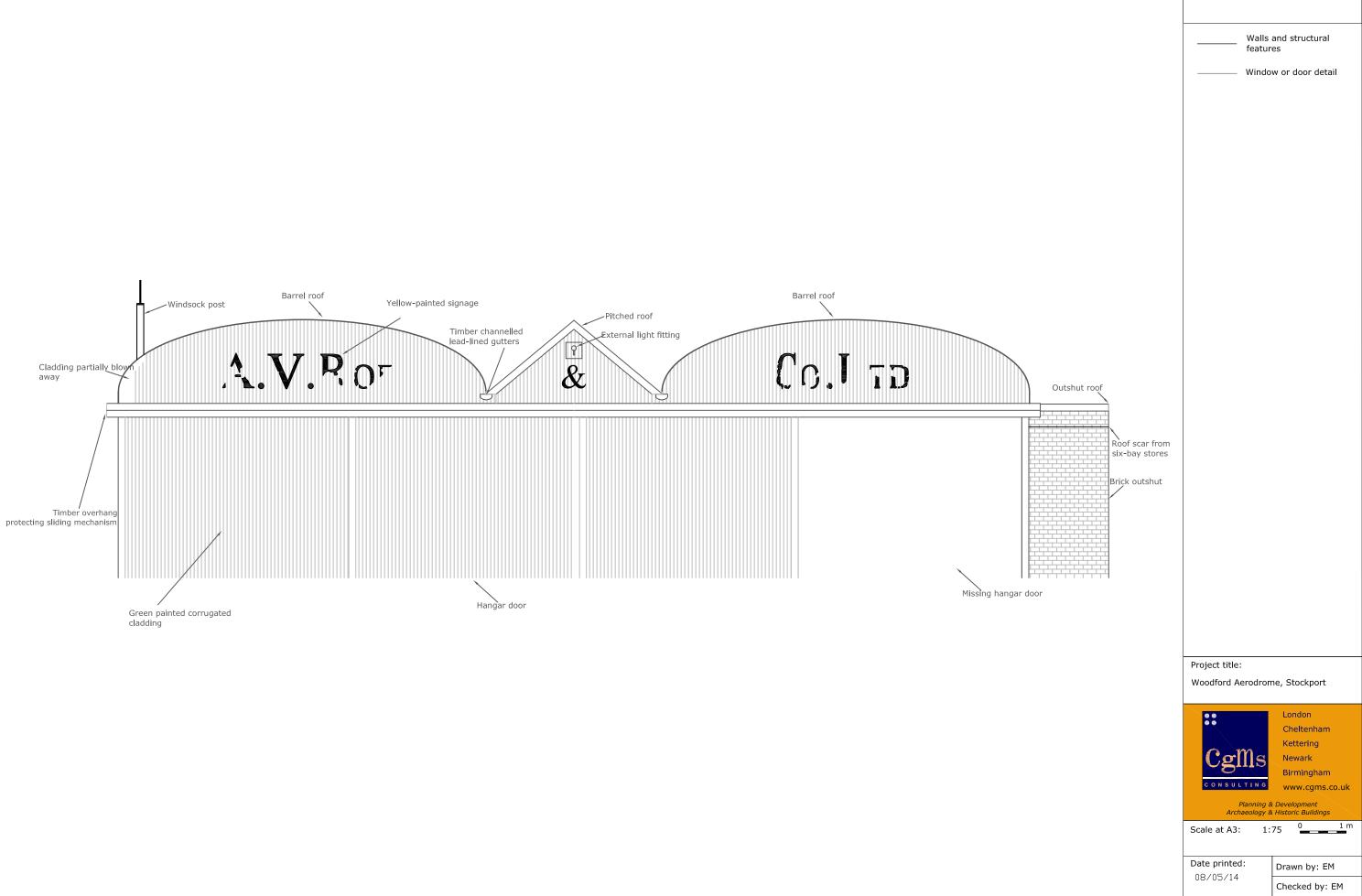
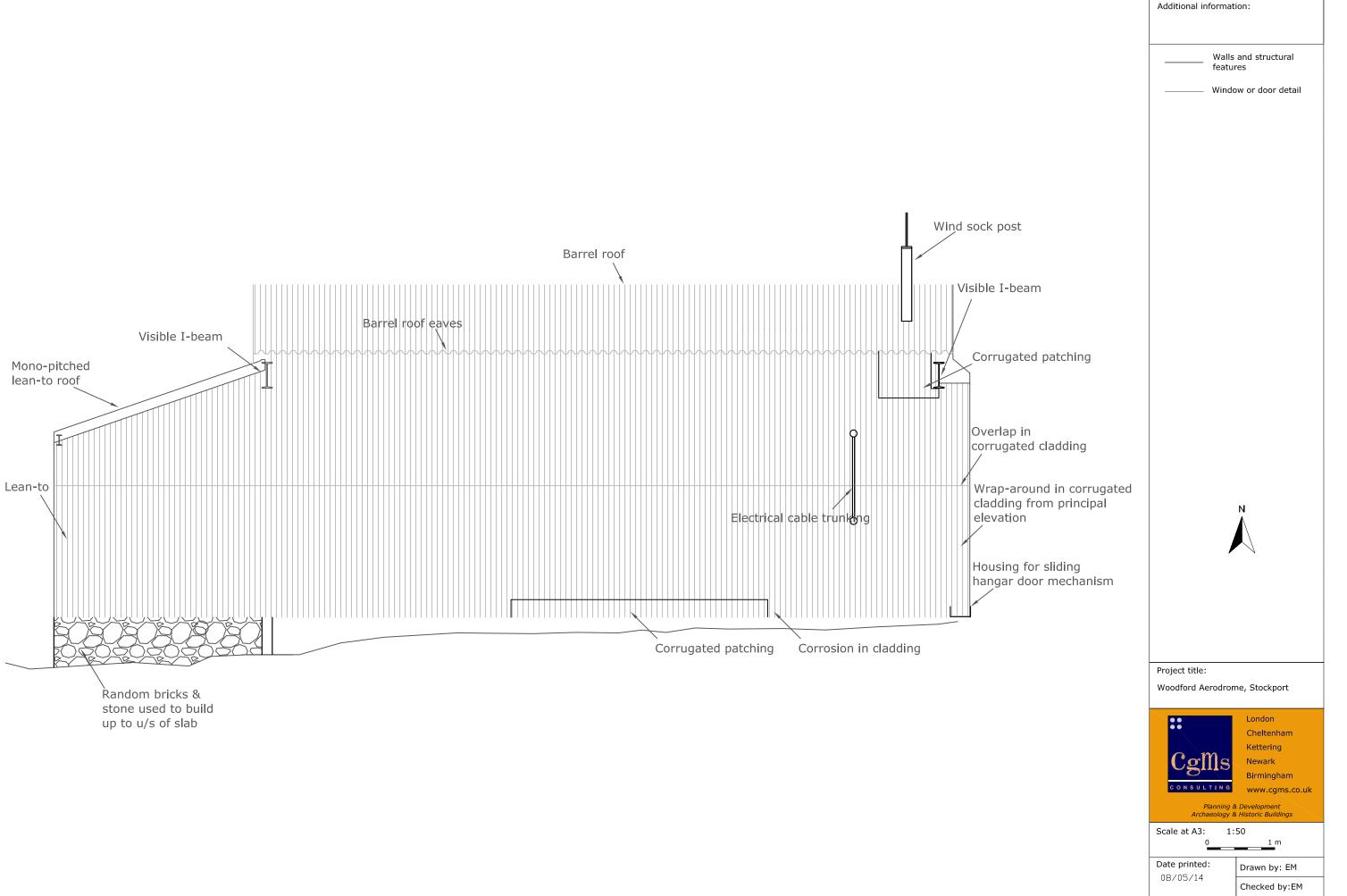
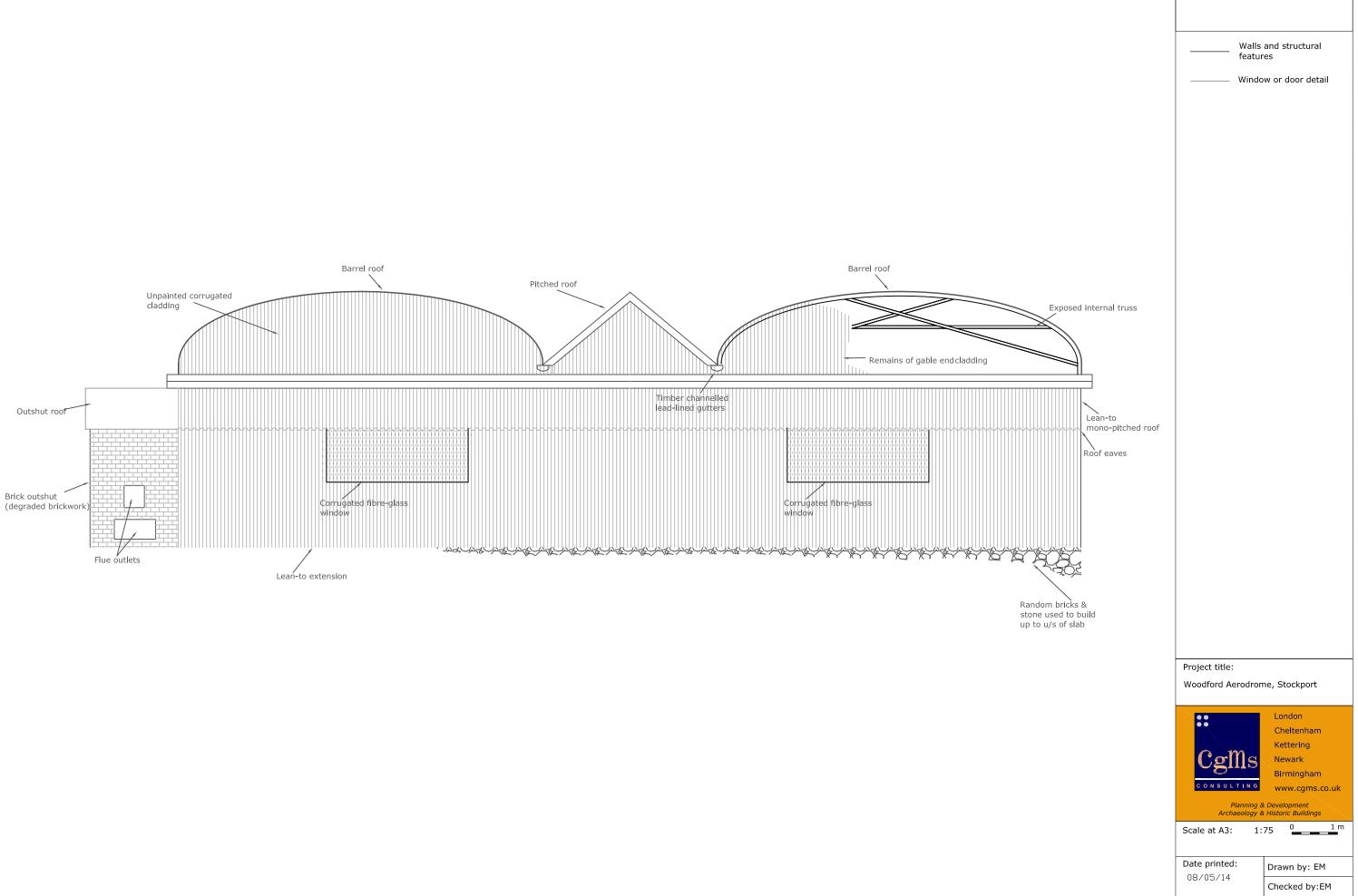


Figure 8: North East Elevation



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Figure 9: South East Elevation



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Figure 10: South West (Rear) Elevation

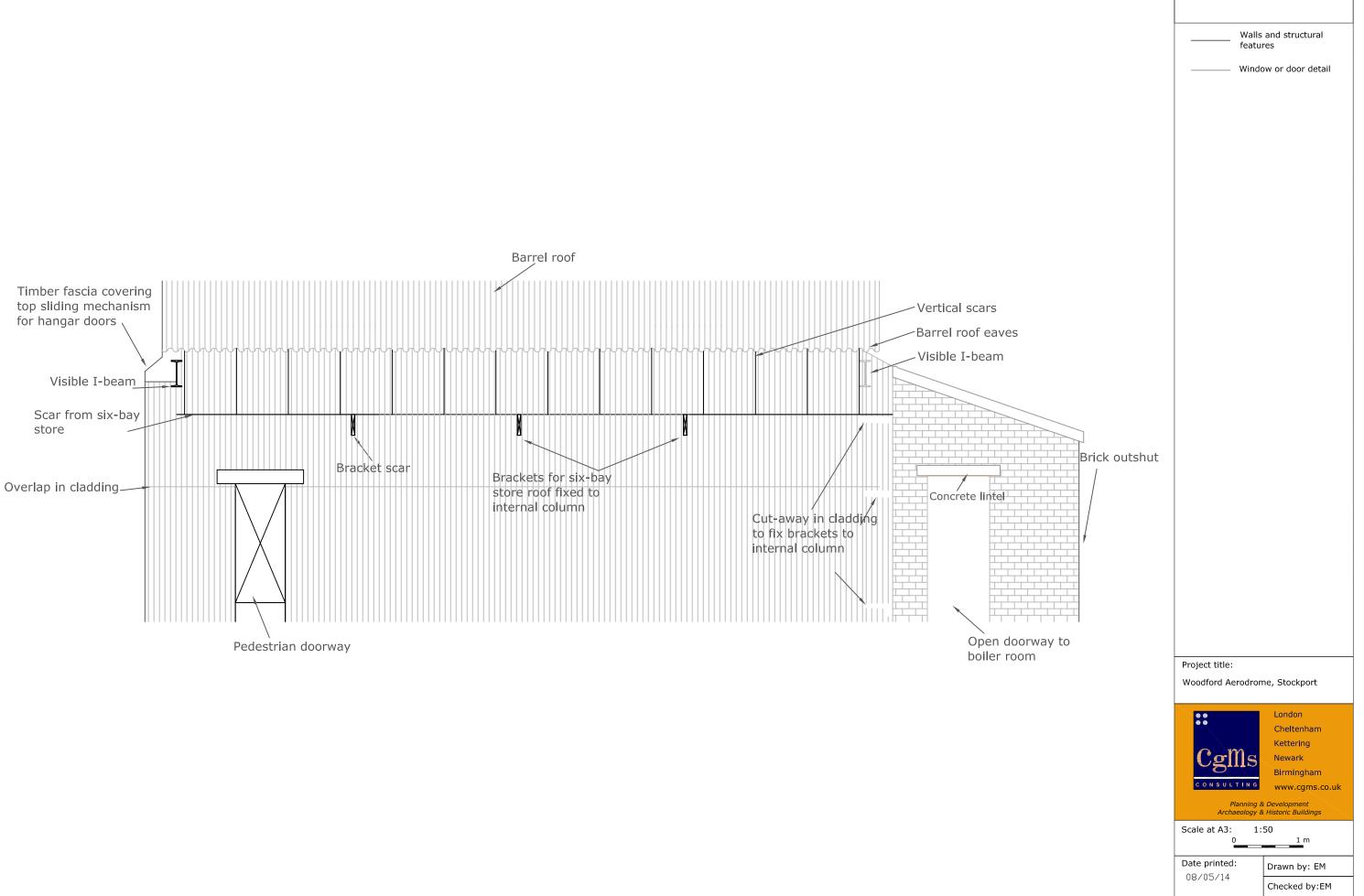


Figure 11: North West Elevation

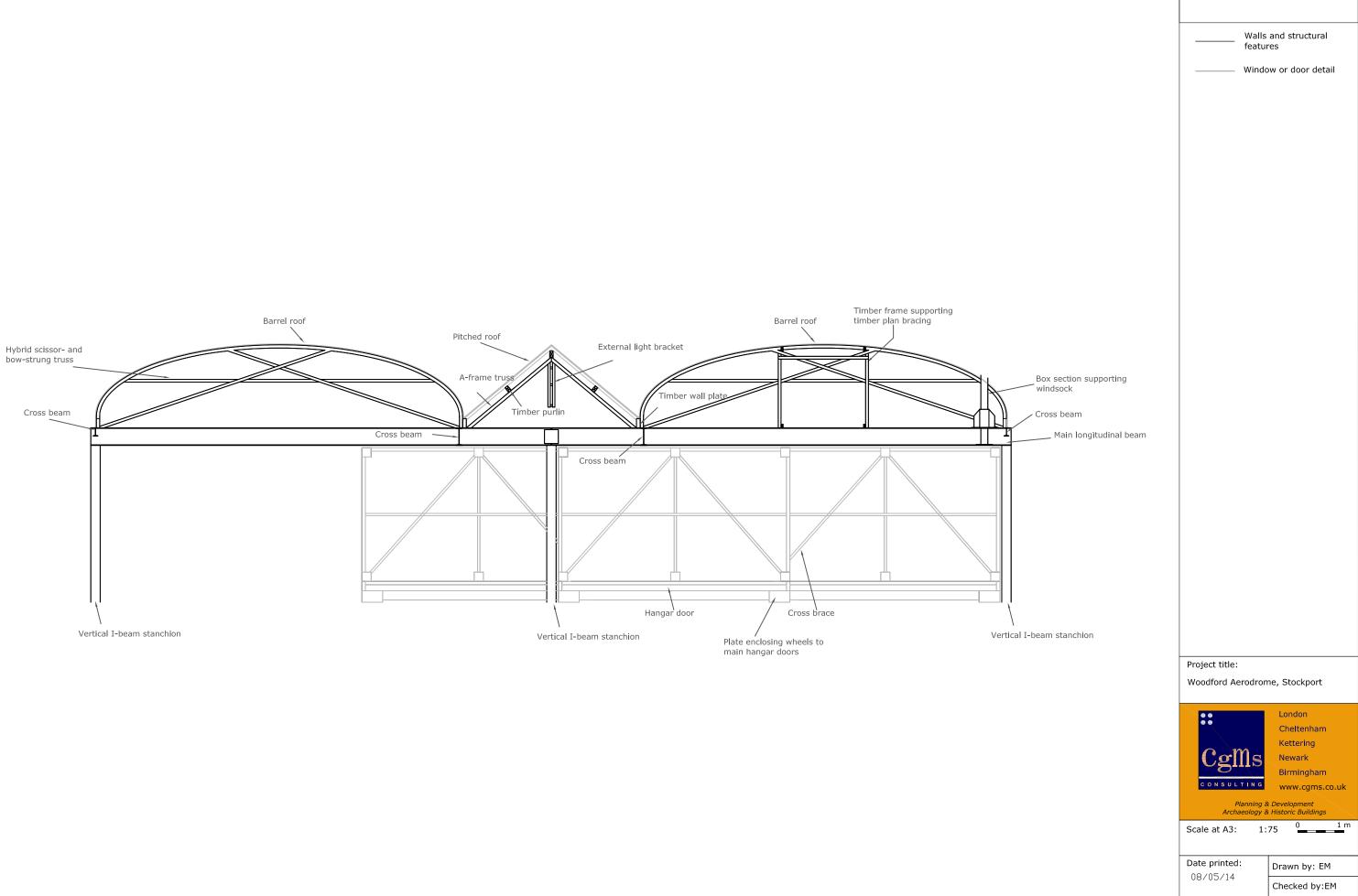


Figure 12: South West Facing Composite Cross-section



Plate 1: View north-east from the Avro Shed and workshop looking across the airfield



Plate 2: The Aerodrome perimeter fencing behind the Avro Shed





Plate 3: Green workshop north-west of the Avro Shed



Plate 4: View of the flood light located to the south of the Avro Shed and the wind sock pole fixed to the south-east corner of the Shed



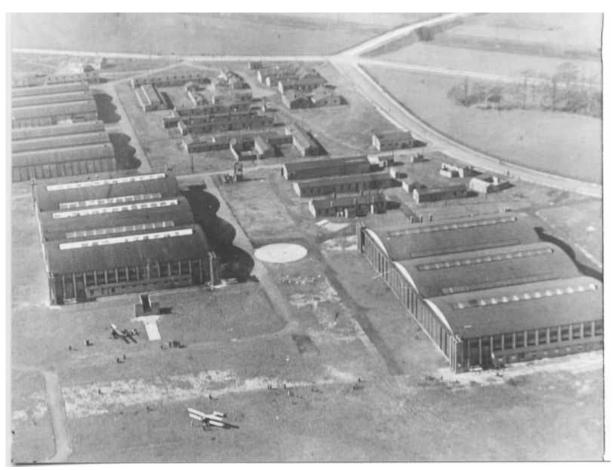


Plate 5: North-west view of Alexandra Park Aerodrome, 1923 (no evidence of Avro Shed

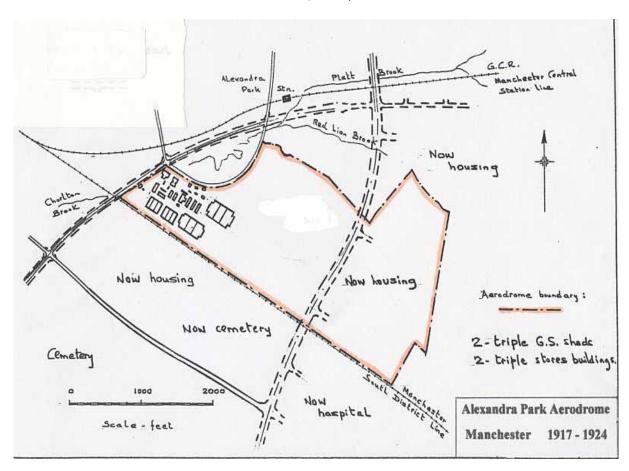


Plate 6: Sketch map of Alexandra Park Aerodrome, 1917-24



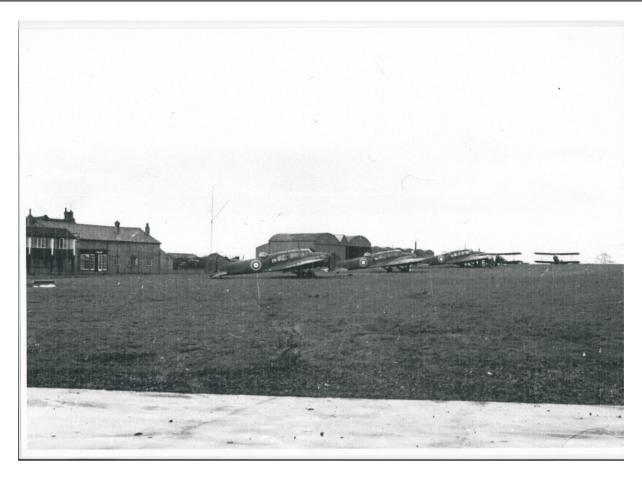


Plate 7: West-facing view showing the Avro Shed and stores



Plate 8: North-east facing view showing the Avro Shed and stores





Plate 9: Principal north-east facing elevation of the Avro Shed



Plate 10: Rear south-west facing elevation of the Avro Shed, showing the full width lean-to





Plate 11: Additional access on the north-west facing elevation



Plate 12: View through the building, facing south-west showing the internal structural frame





Plate 13: View facing north-east, towards the rear of the principal elevation, showing the roof trusses



Plate 14: Sliding door mechanism, showing the roller in place on the rail



Plate 15: View of the roller on the bottom of the fallen sliding door, and the inset rail



Plate 16: View of the north-east corner of the Shed





Plate 17: The pitched roof gable on the principal elevation showing the timber-channelled lead-lined gutters and angle-poised electric light



Plate 18: View of south-east facing elevation, showing the base of the flood light to the rear of the Shed



Plate 19: South-east facing elevation showing extension to the rear



Plate 20: View of the south-east facing elevation of the rear extension, showing the made up ground level bricks





Plate 21: South-east corner of the Shed



Plate 22: Rear, south-west facing, elevation



Plate 23: Apertures in south-west facing elevation of brick outshut



Plate 24: North-west facing elevation of the Shed



Plate 25: Doorway inserted in north-west facing elevation



Plate 26: View of the brackets fixed to the north-west facing elevation





Plate 27: North-west facing elevation of the brick outshut



Plate 28: North-west facing view of Room 1, the main Shed





Plate 29: View south along the extension of the Shed, Room ${\bf 1}$



Plate 30: Internal view of north-west facing elevation



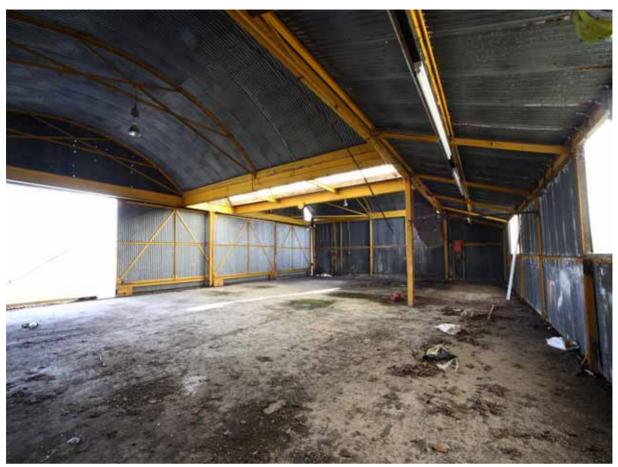


Plate 31: View south-east of the main Shed, Room 1



Plate 32: West view of trusses in north barrel vaulted roof



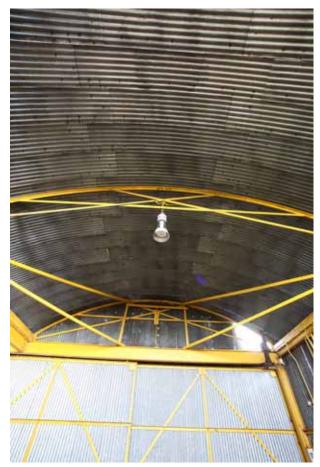


Plate 33: View of timber bracing to the truss of the southern barrel vaulted roof



Plate 34: Electrical switches and trunking visible on south elevation, Room 1





Plate 35: Fuse distribution box attached to south elevation, Room 1



Plate 36: Heating ducting in the north-west corner of Room 1 that passes into the brick outshut



Plate 37: Bracket fitted internally for the wind sock



Plate 38: Sliding pulley bracket





Plate 39: Boiler and heating duct visible within the brick outshut



Plate 40: Hicks Airfield/Camp, Texas, US (1940s)



Plate 41: Bainbridge-Decatur County Airfield (Taliaferro Field No. 1), South Georgina, US (1940s)



Plate 42: Carlstrom Airfield, Florida, US (1942)



Plate 43: Dorr Field, Florida, US (1940s)



Plate 40: Hicks Airfield/Camp, Texas, US (1940s)



Plate 41: Bainbridge-Decatur County Airfield (Taliaferro Field No. 1), South Georgina, US (1940s)



Plate 42: Carlstrom Airfield, Florida, US (1942)



Plate 43: Dorr Field, Florida, US (1940s)

APPENDIX 1: Written Scheme of Investigation



WRITTEN SCHEME OF INVESTIGATION FOR HISTORIC BUILDING RECORDING

AVRO SHED WOODFORD AERODROME CHESTER ROAD STOCKPORT

Planning Authority: Stockport Metropolitan Borough Council

Site centred at: SJ 8954 8144

Author: Emily Mercer BA (Hons) MSc MIfA

Approved by:
Dr Robert Smith CEnv CGeog CSci
C.WEM FRGS MCIWEM MIFA

Report Status: Final

Issue Date: February 2014

CgMs Ref: RS/EM/13781

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- 1.0 Introduction
- 2.0 Aim and Objectives
- 3.0 Methodology
- 4.0 Timetable and Personnel
- 5.0 Monitoring
- 6.0 Insurance
- 7.0 Health and Safety

FIGURES

Figure 1 Site Location

1.0 INTRODUCTION

Background and Scope of Document

- 1.1 This Archaeological Written Scheme of Investigation (WSI) has been researched and prepared by Emily Mercer (Senior Archaeological Consultant, CgMs Consulting) on behalf of Harrow Estates.
- A planning application has been submitted for the development of land at Woodford Aerodrome, Stockport. Following consultation with Norman Redhead of Greater Manchester Archaeological Advisory Service (GMAAS), a programme of archaeological investigation and building recording will be re uired as mitigation. As part of this investigation, an English Heritage (EH) Level 3 recording of an aircraft hangar, known as the AVRO Shed, is necessary so that it can then be subse uently dismantled for storage before being rebuilt elsewhere. To this end, WSI is re uired to be submitted to the Local Planning Authority for approval prior to recording taking place. This document therefore presents the written scheme.
- 1.3 The AVRO shed is located in the south-western corner of Woodford Aerodrome, Stockport. It is centred at National Grid Reference SJ 8954 8144.

Site Description

- 1.4 The AVRO Shed (Greater Manchester Historic Environment Record [HER] Number: 16029.1.0) dates from the 1930s and represents one of the first structures to be built as part of the Aerodrome. It is painted green with the words 'A V Roe & Co Ltd' in gold lettering over the hangar doors linked by shallow arched roofing.
- 1.5 An initial inspection carried out in February 2012 (CgMs Consulting 2012) reported that the Shed appeared to retain the majority of its original construction features. However, it was noted to be in poor condition.

Significance of the AVRO Shed

- 1.6 The AVRO Shed is considered to be of regional importance as it provides a valuable record of aviation manufacture within the site which reflects wider national trends, and the history it embodies tells an interesting narrative of phased development and adaption of functional buildings to new purposes through time.
- 1.7 The Shed does not individually ualify for listed building status under the criteria of representing the historical development and character of aviation in its broad context, nor is it remarkable for its intrinsic architectural and/or historic merits of rarity and importance in a national context this is reflected in the cultural values assigned to it.
- 1.8 Nevertheless, the Shed is of interest as it appears to have survived with relatively little alteration since its construction in 1931.

Planning Background

1.9 GMAAS has advised Stockport Metropolitan Borough Council (SMBC) that an EH Level 3 recording of the AVRO Shed will be re uired as part of a wider archaeological mitigation strategy which will aim to fulfil the following condition:

No demolition or development ground works shall take place until the applicant or their agents or their successors in title has secured the implementation of a programme of archaeological works in accordance with a Written Scheme of Investigation (WSI) which has been submitted to and approved in writing by the local planning authority. The WSI shall cover the following:

- 1. A phased programme and methodology to include:
- an agreed scope of mitigation for each historic building and archaeological site affected by the scheme, including as appropriate the following elements
- archaeological evaluation
- where the above identifies significant remains, targeted archaeological excavation
- watching brief
- palaeo-environmental sampling and analysis
- historic building survey EH Levels 1 to 3
- 2. A programme for post investigation assessment to include:
- analysis of the site investigation records and finds
- production of a final report on the significance of the heritage interest represented.
- 3. Provision for archive deposition of the report, finds and records of the site investigation.
- 4. Dissemination of the results through a popular publication in the Greater Manchester Past Revealed series and through other media.
- 5. Nomination of a competent person or persons/organisation to undertake the works set out within the approved WSI.

Reason: In accordance with NPPF policy 12, paragraph 141, "to record and advance the understanding of the significance of any heritage assets to be lost (wholly or in part) and to make this evidence (and any archive generated) publicly accessible".

1.10 This document therefore forms the WSI which is re uired to fulfil part of condition 1 of the planning permission.

2.0 AIMS AND OBJECTIVES

- 2.1 The principal aims of the historic building recording will be to undertake:
 - An EH Level 3 recording of the AVRO Shed
- 2.2 In order to address the main aim, the general objectives are to:
 - Provide a drawn and contextual record of the Shed and
 - · Report production.
- 2.3 This specification conforms to the re uirements of current national and local planning policy (including the *National Planning Policy Framework (NPPF)* [2012]). It has been designed in accordance with current best archaeological practice, and the appropriate national and local standards and guidelines, including:
 - Understanding Historic Buildings (English Heritage 2006)
 - Management of Recording Projects in the Historic Environment: MORPHE (English Heritage 2006)
 - Code of Conduct (Institute of Field Archaeologists [revised edition] 2013) and
 - The Archaeology of North West England An Archaeological Research Framework for the North West (Brennand 2006).

3.0 METHODOLOGY

Historic Building Recording

- 3.1 As highlighted above, the historic building recording will comprise the following:
 - An EH Level 3 of the AVRO Shed
 - · Report production.

Building Recording

3.2 As indicated above, the historic building recording of the Shed will be undertaken to Level 3 (in line with English Heritage's guidance document *Understanding Historic Buildings* [2006]). As a minimum, the following points from the guidance notes would be addressed:

Survey and Drawings

- Measured plans (to scale or fully dimensioned) as existing. Plans should show the form and location of any structural features of historic significance, such as blocked openings, masonry joints, ceiling beams and other changes in floor and ceiling levels, and any evidence for fixtures of significance, including former machinery.
- 2) Measured drawings recording the form or location of other significant structural detail, such as timber or metal framing.
- 3) Measured cross-sections, long-sections or elevational sections illustrating the vertical relationships within a building (floor and ceiling heights or the form of roof trusses, for example).
- 4) Measured drawings showing the form of any architectural decoration or small-scale functional detail not more readily captured by photography. A measured detail drawing is particularly valuable when the feature in uestion is an aid to dating.

The survey drawings will be produced by the enhancement of existing architect's drawings, and the accuracy will be checked prior to any recording work being undertaken. Any such survey inaccuracies will be noted but will not be corrected.

The drawings will be used to illustrate the phasing and development of the Shed and will incorporate detail such as window and door openings, a change of ground and roof level, and changes to building material.

Site Photography

- 1) A general view or views of the building (in its wider setting or landscape, if the views noted in 2 below are also adopted).
- 2) The building's external appearance. Typically a series of obli ue views will show all external elevations of the building, and give an overall impression of its si e and shape. Where an individual elevation embodies complex historical information, views at right angles to the plane of the elevation may also be appropriate.
- 3) The overall appearance of the principal rooms and circulation areas. The approach will be similar to that outlined in 2 above.
- 4) Scaled detail, internal and external, structural or architectural, relevant to the design, development and use of the building, not ade uately seen on general photographs.
- 5) Scaled detailed views of any internal features of notable architectural interest, ephemera, fixtures and fittings, or fabric detail relevant to phasing of the building not seen ade uately on general photographs.

The photographic archive will be produced using a digital SLR with a selection of lenses to produce digital images in TIFF, RAW and JPEG formats. A full photographic index will be produced.

The Written Account

A report will be prepared within a period of 2 months of the completion of the fieldwork, describing the methods employed and outlining the results. It will include a

systematic account of the origin, development and use of the buildings as well as the evidence on which this is based. This will include:

- 1) The building's precise location, as a National Grid reference and in address form.
- A note of any statutory designation (listing, scheduling or conservation area).
 Non-statutory designations (historic parks and gardens registers, local lists etc.)
 may be added.
- 3) The date of the record, the name(s) of the recorder(s) and, if an archive has been created, its location.
- 4) An analysis of the building's plan, form, function, date and se uence of development. The names of architects, builders, patrons and owners should be given if known. The purpose of such an expansion is to describe the building when no fuller record is necessary, to serve as an introduction to the more detailed body of the record that may follow, and to satisfy those users who may need no more than a summary of the report's finding.
- 5) An account of the past and present us of the building.
- 6) An account of the fixtures and fittings and their purpose.
- 7) Identification of key architectural features (including fixtures and fittings).
- 8) Discussion of the relative significance of rooms.
- 9) Description of the historic context of the building, including its relationship with nearby buildings in architectural and functional terms.

Copies of the report will be submitted to GMAAS and the SMBC Conservation Officer in order to demonstrate compliance with the re uirements of part of the historic building condition of planning permission. One bound and one digital copy of the report will also be provided to the Greater Manchester Historic Environment Record. Copies will also be uploaded as part of the ADS OASIS database record.

Site Archive

The site archive is to be prepared in accordance with guidance issued by the IfA (Standard and guidance for the creation, compilation, transfer and deposition of archaeological archives [2009]) and the Archaeological Archives Forum (AAF) (Archaeological Archives: A guide to best practice in creation, compilation, transfer and curation [Brown 2011]).

4.0 TIMETABLE AND PERSONNEL

- 4.1 Following approval of this WSI, it is anticipated that the historic building recording will take place at the end of February 2014.
- 4.2 It is proposed that the work will be undertaken by Emily Mercer (Senior Archaeological Consultant, CgMs Consulting), under the supervision of Dr Robert Smith (Director, CgMs Consulting). CgMs Consulting is an Institute for Archaeologists (IfA) Registered Organisation (RO) and the above named individuals are IfA members.
- 4.3 Curriculum Vitaes of key personnel can be provided to Norman Redhead in advance of works commencing.

5.0 MONITORING

- 5.1 The aim of monitoring is to ensure that the programme of historic building recording is undertaken within the limits set out in this WSI, and to the satisfaction of the Local Planning Authority and Norman Redhead.
- 5.2 Norman Redhead of GMAAS and Paul Hartley, the SMBC Conservation Officer, will be free to visit the site by prior arrangement in order to monitor the implementation of the building recording on behalf of SMBC and assess the work being undertaken on site against the methodology detailed in this specification.
- 5.3 Norman Redhead and Paul Hartley will also be responsible for considering any changes to the specification of the building recording. Any such alterations should be agreed in writing with the relevant parties prior to commencement of the recording, or at the earliest available opportunity thereafter.

6.0 **INSURANCE**

6.1 CgMs can produce evidence of Public Liability, Professional Indemnity Insurance and/or general all risk insurance, each to the minimum value of 5 m.

7.0 HEALTH AND SAFETY

- 7.1 All works will be in compliance with the *Health and Safety at Work Act* (1974), applicable regulations and codes of practice, and the *Construction Design Management Regulations* (2007).
- 7.2 Emily Mercer will undertake the work in accordance with safe working practices.
- 7.3 A site-specific Risk Assessment can be undertaken and recorded prior to the commencement of work on site.
- 7.4 A continuous process of dynamic risk assessment will be undertaken, and if significant ha ards are identified, a specific risk assessment will be carried out and recorded. Control measures will be implemented as re uired in response to specific ha ards.

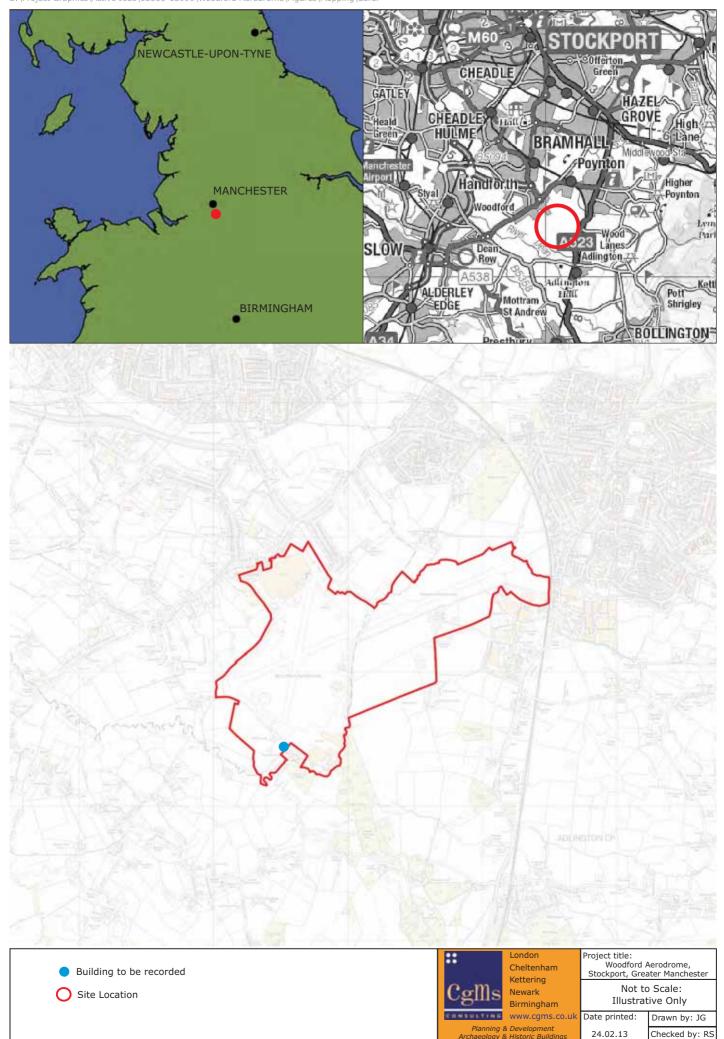


Figure 1: Site Location

