Conservation Management

Land at Boughton Road, Rugby, Warwickshire

Phase 1 Building Assessment

Ref: 65700.02

Wessex Archaeology

June 2007

LAND AT BOUGHTON ROAD, RUGBY, WARWICKSHIRE

Phase 1 Building Assessment

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1.0 INTRODUCTION

1.1 Origins and scope of the report

1.1.1 Outline planning consent has been granted for the redevelopment of the former British Thomson-Houston (B.T.H.) Co. Ltd works in Rugby.

1.1.2 One of the conditions attached to the outline consent states that:

> *"No development shall take place until the applicant, or their agents or successors in title, has secured the implementation of a programme of archaeological work in accordance with a written scheme of investigation which has been submitted by the applicant and approved in writing by the Local Planning Authority."*

1.1.3 A Brief for the first phase of the archaeological work was prepared by the Planning Archaeologist at Warwickshire County Council. The scope of this first phase of work is a programme of Building Assessment of all of the buildings on the site to be altered or demolished, with an aim to identify those buildings and building components considered worthy of preservation 'by record'.

1.1.4 Wessex Archaeology were commissioned by St Modwen Properties PLC, through their agents, The Barton Willmore Planning Partnership-Midlands, to carry out the phase 1 Building Assessment. This has been carried out in accordance with a Written Scheme of Investigation approved by the Warwickshire CC Planning Archaeologist.

1.2 Site location and description

1.2.1 The site to which this assessment report relates - referred to as 'Land at Boughton Road, Rugby' – is situated to the north of Rugby town centre. The site is bounded to the south by the River Avon and to the north by the Oxford Canal (Fig. 1). To the west of the works the land has been redeveloped with a superstore. The main site access is from Boughton Road to the east.

1.3 Brief outline of development proposals

1.3.1 All existing buildings on site are to be demolished, and the entire site is to be redeveloped for residential use.

1.4 Scope and limitations of the documentary record

1.4.1 The holdings of the following archives were investigated during the research for this assessment:

Warwickshire SMR
Warwickshire Records Office
Rugby Local Studies Library
Rugby Museum

Modern Records Centre at the University of Warwick Library
ALSTOM company archive
National Monuments Record

1.4.2 The papers of Arthur Primrose Young, B.T.H. Works Manager from 1929-45, are held at the Modern Records Centre at the University of Warwick library. Research of the catalogue of these papers identify a number of items of potential relevance to the works buildings, but these are yet to be researched.

1.4.3 The B.T.H. works were not extended on to the Boughton Road site until 1941. The first OS edition on which they appear is therefore the 1959 edition. As this, and subsequent editions are not reproducible due to copyright restrictions, this results in it being impossible to present a map regression study for this site.

1.4.4 It is unfortunate that attempts to contact ALSTOM with regard to the continued existence of a company archive which might retain historical material relating to the site failed to elicit a response, and it remains unclear whether the company retains historical archive material at all.

1.4.5 It is understood that a former ALSTOM archivist works as a volunteer at the Rugby museum. It was unfortunately not possible to make contact with this individual during the course of the phase 1 assessment, but it is considered important that he is consulted as part of the phase 2 recording.

1.4.6 An English Heritage adviser who carried out research into one of the buildings on the site (Building BR3) in response to an application for it to be listed, managed to make contact with a former B.T.H. employee who had managed to salvage archive material from a skip when it was discarded some years ago. It is hoped that contact details for this individual will be forthcoming soon, and that any documentation that he retains might be made available for use in the phase 2 recording of the works.

1.5 Structure of the assessment report

1.5.1 The main body of the report provides an overview of the history of the B.T.H. Rugby works as derived from documentary sources, to provide a historical context within which the origins and development of individual buildings can be discussed.

1.5.2 The assessment of the individual buildings surviving on the site is provided primarily by means of individual Building Data Sheets which are included at Appendix One. These are derived from entries into an Access database, which is linked to files containing extracts from the site plan, showing the location of the individual building, and at least one photograph. Only a brief summary of the principal findings and conclusions of the assessment of the standing buildings is included in the body of the report, and photographs of individual buildings are not used to illustrate the report.

1.5.3 The assessment of the individual buildings, presented by means of the Building Data Sheets, includes a short section on the history of each building, its date of construction, a description of the building as surviving, an assessment of the significance of the building, and recommendations with regard to whether the building should be included in the phase 2 programme of archaeological recording, and if so, what level of detail of record is considered appropriate.

1.5.4 The levels of recording recommended are in accordance with the guidance provided by *Understanding Historic Buildings: A guide to good practice* (English Heritage, 2006). However, where that document provides a range of elements which might appropriately be included for each level of record, this assessment report has made recommendations with regard to the specific elements considered appropriate for the recording of individual buildings, or groups of buildings.

2.0 HISTORICAL BACKGROUND

2.1 The development of the British Thomson-Houston Company

2.1.1 The origins of British Thomson-Houston Company started in America, approximately 16 years before the company was formed in England. Elihu Thompson (1853 – 1937) and Edwin J Houston (1847 – 1914) formed the Thomson-Houston Electric Company in 1879. In 1892 this merged with the Edison General Electric Company to become the General Electric Company. In the UK, the company Laing, Wharton & Down was formed as a syndicate to sell to the UK market products manufactured the Thomson-Houston Electric Company. By 1894 a new company was formed, called British Thomson-Houston Limited which no longer acted as agent, as it had purchased the existing patents of the US company with the exclusive right to manufacture and sell machinery and apparatus in the UK and Ireland. By 1896 this had changed to "The British Thomson-Houston Co. Ltd", however, the company quickly became known as "the B.T.H." (Price-Hughes 1946, 9).

2.1.2 By 1899, the need for its own manufacturing facilities led the B.T.H. Company to look for suitable land on which to develop. The choice of Rugby for a manufacturing base centred around the town's location and communication network.

2.1.3 At the turn of the century, Rugby was a quiet market town, known for its public school, founded in 1567 and for being an important railway junction. The London and Birmingham Railway had been the first to open in 1838 and was soon followed by the Midland Counties line. Gradually more railways moved into the town necessitating a larger and more efficient station to be built in 1886 to cope with the growing traffic (Robinson 1993, 23).

2.1.4 The B.T.H. Company was not the first electrical engineering company to establish itself in Rugby. Willans and Robinsons (later English Electric) had been investigating the possibilities of building a factory at Rugby since 1894. Their works opened in 1896 and by 1898 almost 2,000 men had found employment with the company (ibid, 23). Other industry in Rugby by this point was limited to the Rugby Portland Cement Company, which began production in 1872, and the Rugby Corset Factory, which had opened in 1881. The majority of employment in the town at the turn of the century was provided by the railway companies where much of the workforce were employed as drivers, firemen, signalmen, porters and general station staff (ibid, 23).

2.2 British Thomson-Houston in Rugby

2.2.1 This section of the report provides a discussion of the development of the B.T.H Rugby works as a whole. The early development of the works relates only to the original site, the Leicester Road site, but provides a background to the expansion of the works onto the Boughton Road site. It also demonstrates the scale and rapid development both of the works complex, and the range of products manufactured by B.T.H, and, as such, demonstrates the significant role that this large engineering company played in the economy of the town.

2.2.2 The land around the railway station was available for purchase and development. The B.T.H. Company realised the potential of being so close to a number of railway networks and in addition felt that Rugby was also convenient due to its proximity to coal fields and the River Avon to provide water for cooling systems in the process of manufacture (ibid, 22).

2.2.3 Approximately 25 acres of land, known as Glebe Farm, and situated between the main railway station and the river, was purchased for £10,000 from Thos. Hunter & Co. (railway wagon builders) in January 1900, as a site for works. Levelling began on January 11th 1900, building operations commenced a few months later, and manufacturing commenced on March 14th 1902 (Price-Hughes 1946, 14).

2.2.4 The initial works were planned for approximately 800 operatives and consisted of 14 substantial steel and brick buildings with a total floor space of roughly 206,000 sq. ft. The principal buildings comprised:

Pattern Stores
Incandescent Lamp Factory
Iron and Brass Foundry
Main Machine Shop
Receiving Stores
Pattern Shop
Smithy
Meter Factory
Power House
Offices
Gate House
Foundry, Coke and Sand Stores
Despatch Stores

Early Developments at Rugby 1902 - 1914

2.2.5 At the end of 1902 an agreement was made between the B.T.H Company and Rugby Urban District Council for the supply of electric lighting and power in the town which commenced in October 1903 and continued until October 1923.

2.2.6 In 1902 B.T.H. acquired the 'Curtis' steam turbine rights and their first contract was in 1903 to the Cork Tramways. F. Samuelson was sent to America to study the General Electric 'Curtis' design turbine in 1903 and on his return to England the manufacture of these machines began at Rugby.

2.2.7 During the first decade of the 20th century the B.T.H. Company was involved in many pioneering projects in the design and manufacture of electrical and mechanical components for industry. Some firsts for the Company included the introduction of electric travelling cranes into engineering workshops and the electrification of shipyards, collieries, rolling mills and textile mills.

2.2.8 Electric traction was very much to the fore at this period and some of the earliest attempts at developing petrol-electric road vehicles were made by the B.T.H. Company in 1904. The B.T.H. petrol-electric system, however, was handicapped by high initial cost and extra weight over its gear driven competitor, and further development was abandoned in 1909 (ibid, 23). Other early projects carried out at Rugby included the equipping of more than 50 tramway systems throughout the country as well as equipment for the tube in London.

2.2.9 During this time the growth in turbine production also started to increase as did the size of the castings with equipment weighing 30 to 40 tons soon becoming commonplace (ibid, 24). This catalyst led to some early development of the site. The main machine shop at Rugby (Building 4) was lengthened by 154 feet in 1904 to provide space for the new turbine manufacturing activity (ibid, 21).

2.2.10 In 1911 the company acquired the trade name of “Mazda” (borrowed from the Persian mythology, where it signified the god or principle of light). This coincided with developments in the production of more robust lamps (light bulbs). Previously, lamps were very fragile and transit caused an excessive amount of breakages. With the development of a system of drawn fire tungsten filaments this allowed for much more robust lamps (bulbs) and a dramatic change to the economics of electric lighting. With the increase in production in lamps this led to production of meters and Tirrill regulators being transferred to a new premises which was established at Coventry, 11 miles away (ibid, 31).

2.2.11 In the years leading up to the First World War, the B.T.H. Company supplied Auxiliary machinery for naval ships having entered the marine turbine field in 1905. Turbines were supplied to battleships such as the “Ajax” and the “Agincourt” as well as battle cruisers, destroyers and depot ships (ibid, 33).

The First Wold War 1914 – 1918

2.2.12 Owing to the huge demand for electrical apparatus of all kinds during the war, a very large percentage of the total output from the factories, though for war purposes, was of normal B.T.H. products.

2.2.13 The British government soon found itself in desperate need for magnetos, as the previous source of supply was Germany. This led to the B.T.H. to concentrate the resources of the Coventry factory on the manufacture of magnetos for aircraft. This was to the detriment of the B.T.H. business in meters which ceased production. The pioneering design work with magnetos was achieved by A. P. Young.

2.2.14 In addition to the normal electrical products manufactured by the Rugby works, a vast quantity of war material was manufactured by the B.T.H. Company. This included shells of all sizes, parts for guns, tanks, submarines, warships, depth charges and mines as well as turbines for many naval vessels (ibid, 35).

2.2.15 1,795 B.T.H employees decided to join the armed services during the course of the war and 243 of them were killed. A memorial to those who died was designed by Sir Edwin Lutyens, R. A. and erected at the Mill Road entrance to the Rugby works.

2.2.16 In the run up to war, the manufacturing load was increasing with larger machines being designed and manufactured. This led to some large scale building operations and development of the factory complex further. The first of these projects was authorised in 1912 when it was decided to erect a large reinforced concrete building known as “Building 29” to house the manufacture of large generators and rotary converters. This building, when completed, had a floor area of approximately 60,000 sq. ft. However, the large influx of post-war orders soon necessitated further extension and another 60,000 sq. ft. was added. In the Turbine factory about 20,000 sq. ft. of additional floor space was added between 1913 and 1918, followed soon afterwards by an additional 60,000 sq. ft.

2.2.17 Among other buildings erected during this period was one devoted to traction plant, controllers and tinsmiths work, and later changed to the Control Gear factory. In 1918 a building near the L.N.W.R. Station at Rugby was purchased and fitted out for the purpose of manufacturing projectors, reflectors and other lighting equipment of special B.T.H design (ibid, 37).

2.2.18 During this period the B.T.H. Company was involved with experiments with plastics in 1916, including developing high-frequency, high-speed motors for spinning artificial silk, as well as further turbine development for naval vessels in 1918 - 1919.

Post WWI developments

2.2.19 With the establishment of the BBC in 1922 the B.T.H. Company was interested in the development of radio and the manufacture of wireless apparatus. Thanks to some of the developments made during the war, most of the moulded plastic parts of the sets, head-phones, and insulation were manufactured by the B.T.H Company. The manufacture of these parts was transferred from Rugby to the Coventry works in 1924. Other developments included the production of the RK Loudspeaker, the electrical gramophone as well as the continued development and manufacture of larger turbines and turbo-alternators for ships and heavy switchgear to be supplied to power stations.

2.2.20 In 1928, the rationalisation of a number of British electrical industries was considered to be desirable as a good way of pooling resources, and consequently Associated Electrical Industries Ltd (AEI) was formed as a holding company in 1928. The new organization bought B.T.H. along with other companies including Metropolitan-Vickers Electrical Co. Ltd. and The Edison Swan Electric Co. Ltd.

2.2.21 During the 1930s the B.T.H. Company was involved in the development of the sodium and mercury discharge lamps which were used in street lighting. The increased production of lamps led to the construction of an additional Lamp Factory on the west side of the works in 1935. This was a single storey building covering 100,000 sq. ft. and was completed for lamp manufacture by Easter 1936. Between 1940 and 1946 the building was extended to the north by 30,000 sq. ft. for additional space for lamp manufacture.

2.2.22 Other expansion of the site during this period occurred in April 1937 when work was commenced on a new office block at Rugby. The building had an imposing frontage to the east and containing a total floor area of 74,600 sq. ft. It was designed to house the engineering and commercial offices, and was constructed in reinforced concrete with a brick facing. This new building enabled 27,000 sq. ft. elsewhere in the Works to be released for manufacturing functions. The new office building was completed in 1938 (ibid, 83).

The Second World War

2.2.23 As in the First World War, the outbreak of war in September 1939 necessitated changing the course of normal production at Rugby. Many of the B.T.H's peacetime products were indirectly required for the war effort, however, the B.T.H. Company was involved with the research, design and manufacture of widely differing mechanisms and devices for war purposes.

2.2.24 Major changes at Rugby included the expansion of the research laboratory by three times it's pre-war size, refrigerator and switchgear shops were dismantled and turned over to shell lines, the control gear shops were used for making Radar equipment, and the lamp assembly areas were converted into manufacturing areas for special valves and large mines.

2.2.25 In addition to work on jet propulsion engines, the B.T.H Company made an important contribution to the war effort in devising apparatus for the detection of clouds, aircraft and ships, as well as in the manufacture of parts for guns, aircraft, ships and submarines, complex machinery for the remote control of searchlights and gun turrets, radio valves and transmitters, anti-aircraft shells and electric torpedoes. The B.T.H research laboratory personnel also took part in the development of the atomic bomb (ibid, 91) and radar equipment developed by the B.T.H. was responsible for the sinking of the German battleships "Scharnhorst" and "Bismarck".

2.2.26 At Rugby the capacity was increased by the introduction of a large night shift which, for the first time, involved women. The inauguration of rest-rooms for female workers, music-while-you-work, and midnight concerts during meal breaks, proved so attractive that night-shift working even became popular (ibid, 92).

2.2.27 In 1936, the B.T.H. Company was approached by Frank Whittle with regard to the development of his jet propulsion engine for aircraft. A new company was formed, known as Power Jets Ltd., to exploit the Whittle invention for which the B.T.H. Company was a shareholder. In 1937 the first jet engine was constructed at Rugby under the supervision of Frank Whittle which eventually led to the design and construction of the first aircraft made by the Gloster Aircraft Company in May 1941 (ibid, 100).

2.2.28 However, although B.T.H had a major role in developing the jet engine, the directors seemed skeptical about the design, and in 1940, having transferred development to

their Lutterworth works, they withdrew from the manufacture of jet engines, which was transferred to Rover.

2.2.29 The expansion of the Rugby works onto the Boughton Road site, which lay to the north of the River Avon which formed the north boundary of the main Leicester Road works, took place during the Second World War (see below).

2.2.30 Documentary sources note that B.T.H. Company was the first British company to develop electrically propelled torpedoes after some were captured from the Germans in 1941, and that this led to the erection of a new torpedo building specially designed and equipped for the purpose.

2.2.31 A new factory, known as the Small Gear Assembly Factory, was built at Rugby specifically for the production of predictors (Building 92). These were fitted to guns so that they would be able to predict how a shell could reach a swiftly moving aircraft at a given time and position. The manufacture of the predictors ceased in 1943 when they were superseded.

Later developments

2.2.32 Following the Second World War, AEI began a massive expansion, but this appears to have led to rivalries between the various formerly autonomous companies of which it comprised. In order to reduce this friction, AEI stopped using the name BTH in 1960, but the whole AEI empire continued to slide into financial trouble. Despite this, a large research laboratory was constructed on the Boughton Road site in 1957(situated to the west of the current Boughton Road development site).

2.2.33 The size and production at B.T.H.'s Rugby works had peaked in the 1960's, and from the 1980s began to decline. Buildings were demolished, and areas of land sold off for developments such as the superstore to the west of the Leicester Road development site.

2.2.34 In 1967 GEC bought AEI outright to become the UK's largest electrical group. In 1989 GEC in Rugby split into GEC Alstom and Cegelec Projects, but the two firms were re-united again in 1998. They continue to operate within certain of the buildings at the north end of the Leicester Road site.

2.3 The chronological development of the Boughton Road site

2.3.1 Development of the Boughton Road site did not take place until the Second World War, when additional capacity was required by the company to manufacture products specifically for the war effort. The documentary record notes that this expansion of into a new area of the works was for the production of magnetos for aircraft engines and other war products. Magnetos were used in the Merlin engines of Hurricane fighters during the Battle of Britain, and in the later Spitfire fighter along with Wellington, Halifax and Lancaster bombers.

2.3.2 Cartographic evidence indicates that a high proportion of the buildings on the site were built during a single phase of construction between 1940 and 1945 (and this is borne out by building analysis, see 3.0 below).

2.3.3 The Boughton Road Works site, lay to the north of the River Avon which formed the north boundary of the main Leicester Road works. Expansion onto this site took place during the Second World War, and although the new works are referred to as having been for the manufacture of magnetos for aircraft engines, and other products related specifically to the war, the single large manufacturing building on this site (BR2) is referred to as 'the torpedo factory'.

2.3.4 Documentary sources note that B.T.H Company was the first British company to develop electrically propelled torpedoes after some were captured from the Germans in 1941, and that this led to the erection of a new torpedo building specially designed and equipped for the purpose. It is therefore unclear whether Building BR2 was originally built for the manufacture of torpedoes, or whether it was built for the production of magnetos, and only later transferred to torpedo production.

2.3.5 The initial programme of development included buildings whose uses are now catalogued as:

BR1 Offices
BR2 Machine shop
BR3 Jet engine test house
BR6 Toilets
BR7 Power converter station and offices
BR8 Canteen
BR12&13 Associated machine or test sheds
BR15 Light machine shops
BR16 Radar test house

These buildings are identified by these reference numbers on Figure 2.

2.3.6 Despite the very different scales and uses of the buildings constructed as this initial phase of development of the site, their materials, and many of the details of their construction are consistent throughout the group.

2.3.7 In addition to the main manufacturing, administration and staff welfare buildings, the site was also provided with a large number of air raid shelters, of which at least twelve survive. These are grouped largely at the south-east corner of the site, to the north and west of Buildings 15 & 16, though with individual survivals elsewhere on the site.

2.3.8 Only the brick structure of BR3 is thought to have been constructed within the first phase of development of the site, with the steel-framed structure abutting it to its north having been constructed during the 1950s. It has also been suggested that this element of Building BR3 originally extended north from its surviving footprint, and that the test beds for the jet engine development were situated to the north of the surviving building, though this has not been substantiated by conclusive documentary evidence, nor is there any evidence in the structure of the building to suggest that it has been reduced in size.

2.3.9 It would appear that further expansion to the Boughton Road works took place during the 1950s. The radar test house (BR16) was constructed in 1950, and the similarity in both form and function between the north end of BR3, and the nearby sheds BR12 & 13, suggests that they comprise a single phase of construction. The English Heritage adviser's report notes that the northern structure of BR3 was a test house for testing gas turbines, and it is likely that this was the function of all three buildings.

2.3.10 Other surviving buildings constructed during the 1950s include the light machine shops BR15, 15a-c, in the south-east corner of the site. A large Drawing Office (BR56) was constructed towards the south-west corner of the site, probably towards the end of the decade. Although its footprint is shown on the 1959 OS edition, it is not rendered as all the other buildings. However, it is shown to pre-date the construction of the AEI laboratory (see 2.4.13 below), and it is therefore possible that it was under construction at the time of the OS survey for the 1959 edition.

2.3.11 The expansion also included six long rectangular parallel ranges to the east of Building BR2L (Fig. 2). It is assumed that these were single storey, pre-fabricated buildings, and are understood to have accommodated administrative functions of the works.

2.3.12 Small buildings set on concrete slabs (which still survive) were situated on the high ground at the north end of the site, and were set within attractive landscaped grounds which were used by the staff during lunch breaks.

2.3.13 In 1960, AEI built a large research laboratory on a site to the east of the existing Boughton Road works (outside the present development site), and it is likely that the addition of one and a half units to the east of the six parallel ranges of prefabricated offices took place at much the same time. (see 2.4.11 above). Two terrapin units have been added to the north-west corner of Building BR56 since 1975.

2.3.14 Following the demise of GEC in the 1980s, their manufacturing function withdrew from the Boughton Road site, and the buildings there became occupied by a number of small firms, some of which continued in operation at the time of survey.

3.0 STANDING BUILDING ASSESSMENT

3.1 Individual Building Assessment

3.1.1 The assessment of individual buildings is contained within the Access database for the Building Assessment.

3.1.2 The database entry for each building is structured to provide information within the following fields:

- Unique building ID
- Building name/ref.
- Date of construction
- National Grid Reference
- History and significance
- Description
- Recommended archaeological recording strategy

3.1.3 The database entry for each building will also be linked to a folder containing an extract from the site plan highlighting the building, and another folder containing at least one photograph of the building.

3.1.4 The Access database has been designed to allow the printing of a report for each individual building, complete with plan extract and photos of the building. These are included in this report at Appendix One.

3.2 Summary of site assessment

3.2.1 The Boughton Road Works were not developed until some 40 years after B.T.H. first established their engineering works in Rugby. However, their association with one of the largest manufacturing companies in the town, and one of the top engineering companies in the country, gives the works a level of significance by association.

3.2.2 The development of the works is testament to the expansion of the B.T.H. company, and the diversification of their manufacturing base in response to the military requirements for the war effort.

3.2.3 While the majority of industrial buildings constructed during the war are extremely basic in terms of materials and architectural detailing, the buildings belonging to the initial phase of construction of the site, although of no architectural interest, are generally well-built and have elements of detailing which lift them above the purely functional.

3.2.4 The significance of the buildings, particularly of those belonging to the initial phase, lies primarily in their group value, as their survival is good, including the full range of functions on the site, from the fundamental engineering manufacture and testing, through administrative functions and staff welfare facilities.

3.2.5 Two buildings are considered to be of particular interest on the site. The first is the former Jet engine test house, which forms the southern element of Building BR3. An application was made to the Department of Culture, Media and Sport (DCMS), for this building to be added to the *List of Buildings of special architectural or historic interest*. This application had been made on the basis that this test house had been the location of the pioneering testing and development of the jet engine, carried out by Frank Whittle during the 1930s. However, research by the English Heritage adviser charged with advising DCMS on this case discovered that this was not, in fact, the building used by Frank Whittle, and that it had, in fact, been constructed after Whittle's activities had been transferred from the Rugby works to those in Lutterworth.

3.2.6 The building does, however, retain much evidence of its original form and function, and is a generally good survival of a building purpose-built for a very specific function, and therefore has technological significance.

3.2.7 Another individual building on the site considered to be of elevated significance is the Radar testing house, known as the Elephant Building, BR16. The form and structure of this building relates directly to its original and interesting function, and it appears to retain a number of notable features from its original use.

3.2.8 Of a lesser degree of significance, but of some interest due to their survival as a group, and their perceived original function, is the small group of buildings constructed at some time during the 1950s, and situated towards the north-west corner of the site. Including the northern extension of the test house BR3, and three others – BR12, 13 & 17 – this group of buildings appear to have been used for the testing of turbines, possibly exclusively gas turbines. Although of very utilitarian materials and construction, they appear to retain features specific to their early function, which elevates their overall interest and significance.

3.2.9 Those buildings constructed on the site in the later 1950s, which are not discussed above, are deemed to be of little interest.

4.0 RECOMMENDATIONS

4.1 Levels of Archaeological Recording

4.1.1 The recommendations for an appropriate level of archaeological building recording for each of the buildings on the Boughton Road site, will be made with reference to the guidance provided by *Understanding Historic Buildings: A guide to good recording practice* (English Heritage 2006).

4.1.2 The guidance identifies four potential levels of archaeological record appropriate to the recording of buildings, from the least detailed – Level 1, a basis visual record – to the most detailed – Level 4, a comprehensive analytical record.

4.1.3 The guidance also provides an outline specification for the level of detail required within each level of record for each of:

- Survey and drawings
- Photography
- Written Account

4.1.3 The specifications considered appropriate for each level of archaeological recording, as provided by the English Heritage document, are presented in Appendix Two of this report.

4.2 Recommendations for Phase 2 Archaeological Recording

4.2.1 None of the buildings on the Boughton Road Works site could be considered to be of architectural interest, and few are of historical or technological interest. However, it is considered appropriate that a limited programme of archaeological recording is carried out on the buildings, in mitigation of the development proposals which will involve their comprehensive demolition.

4.2.2 The individual building assessment identified that, with the exception of the original element of BR3 and BR16, the significance of the buildings belonging to the initial phase of construction on the site relates almost exclusively to their good survival as a group, including manufacturing, testing, service and staff welfare buildings.

4.2.3 As such, they survive as a relatively good example of an engineering works established during the Second World War for the manufacture of state-of-the-art products and components specifically for the war effort. It is therefore considered appropriate that a low level **(Level 2)** record is made of all members of this building group. This group of buildings comprises: **BR1, BR2, BR6b, BR7a, BR7f, BR8, BR10,** and a single, well-preserved air raid shelter.

4.2.4 The EH guidance sets out a number of elective elements that might be included in a level 2 record, in addition to a number of mandatory ones. For clarity, it is recommended that the level 2 record for this group of buildings include:

Drawings:	7-9
Photography:	1-8
Written:	1-4, 11 & 12

4.2.5 A second group of buildings assumed to be of contemporary construction, which includes **BR3** (north end), **BR12, BR13** and **BR17**, are also considered to derive significance from their group survival. A low level **(Level 2)** record of these is also recommended, with an emphasis on recording those surviving features which relate specifically to the testing of turbines. It is recommended that a photographic record is made of each of the buildings, but that a drawn record is made only of the most complete and representative example of the group.

The level 2 record for this group of buildings should therefore include:

Drawings of all:	7-9
(of one example only):	2, 4, 12
Photography:	1-8
Written:	1-4, 11 & 12

4.2.6 Although not considered to satisfy the criteria for listing, due to the lack of direct association with the development of the jet engine by Frank Whittle, the jet engine test house, **BR3** (south end), is considered to be of technological interest. This is due to the relatively good survival of its plan form and structure, and also of a number of elements of its original fitting out, which are clearly indicative of its original function. It is therefore considered appropriate that a more detailed **(Level 3)** record is made of the original brick-built element of this building (the later northern extension being recorded to level 2 within the group described in 4.2.5 above).

4.2.7 This will provide an analytical record of the building in mitigation of its proposed demolition. However, within the range provided by the outline specification for a level 3 record presented in the EH guidance document *Understanding Historic Buildings: a guide to good recording practice,* it is considered that this building merits a record towards the upper end of this level (see Appendix Two). It is considered that the following elements should be included in the record:

Drawings:	2, 4, 8, 12
Photography:	1-8
Written:	1-3, 6-9, 11-13, 20-22

4.2.8 It is also considered appropriate that an analytical **(level 3)** record be made of the 'Elephant building' **BR16**. The scale and form of the building are directly related to its original function for testing radar, and elements such as the huge roller shutter are of interest, and it is recommended that it should be subject to *preservation by record*. It is recommended that the following elements are included in the record of this building:

Drawings:	2, 4, 8
Photography:	1-8
Written:	1-3, 6-9, 11-12, 20-22

4.2.9 Other buildings on the site, constructed during the later 1950s are deemed to be of little interest, and no archaeological recording is considered necessary to mitigate against the impact of their demolition.

4.2.10 Those buildings recommended for archaeological recording, and the level of recording deemed appropriate, are identified on Figure 3.

Bibliography

Price-Hughes, H. A. (1946) *B.T.H Reminiscences Sixty Years of Progress*

Robinson, E. (1993) *A Rugby Company & Their Female Workers: The British Thomson-Houston Company Ltd, 1930 – 1955* (Dissertation)

Date:	7/04/07	Revision Number:	0
Scale:	1:50000	Originator:	SEJ
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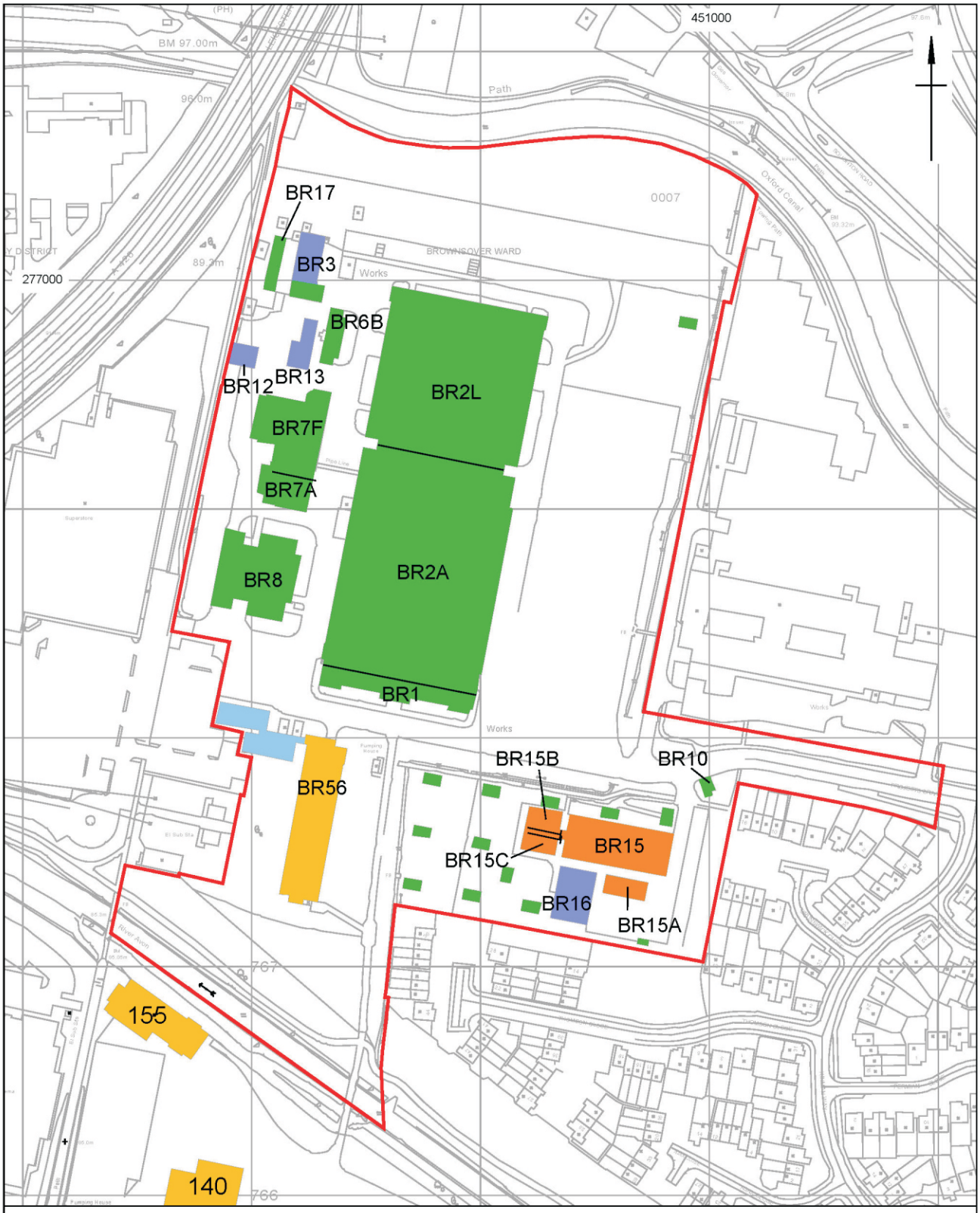
WA Heritage

Site location map

Figure 1



Conservation Management
Wessex Archaeology

Date:	7/05/07	Revision Number:	0
Scale:	1:2500	Illustrator:	MJR/SEJ
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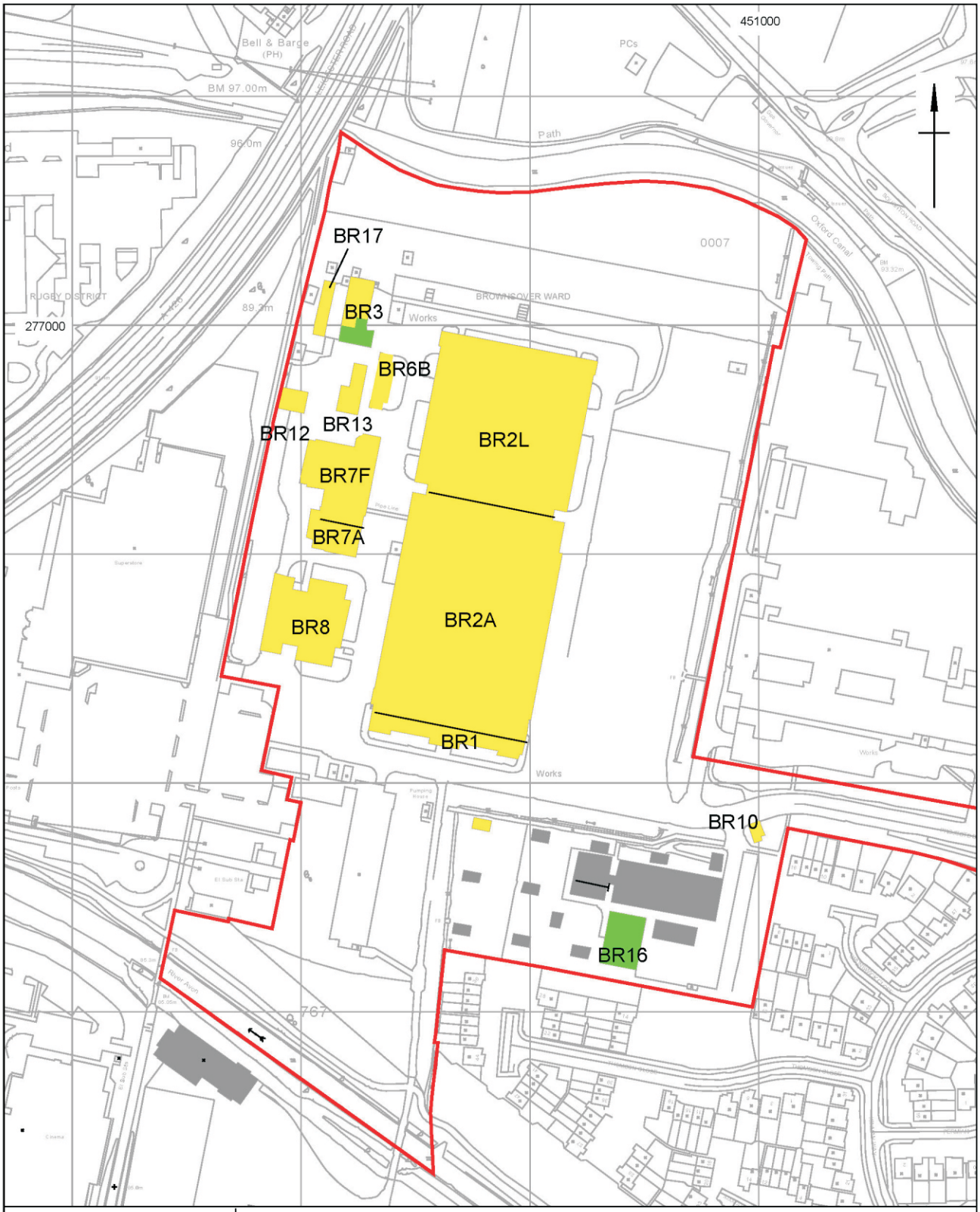
Phased block plan showing individual building numbers

Figure 2



KEY

- Level 2 Recording
- Level 3 Recording
- Development boundary

Conservation Management

Wessex Archaeology

Date:	7/05/07	Revision Number:	0
Scale:	1:2500	Illustrator:	MJR/SEJ
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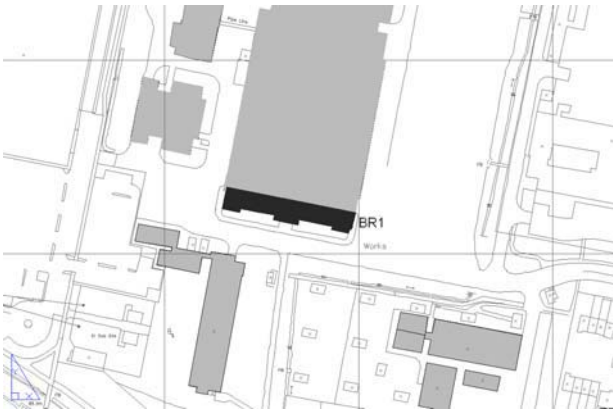
Recommendations for Phase 2 Archaeological Recording

Figure 3

Appendix One:

Individual Building Data Sheets

BUILDING		BR1



Building Name	Office block	*Built*	C.1941

H I S T O R Y

This building was constructed during the original phase of construction on the Boughton Road site, which took place from 1941 onwards. It first appears in the cartographic record on the 1959 OS edition.

It is unclear whether this office building dealt with administrative matters relating only to the manufacturing activities on the Boughton Road site, or whether expansion into the new site from the Leicester Road works was used as an opportunity to provide additional office accommodation for the BTH Rugby works in general.

D E S C R I P T I O N

Aligned roughly east-west, this two-storey building abuts the southern end of the large machine shop (BR2). Constructed of the same orange-brown textured Fletton brick, laid in English bond, as the contemporary group, it has a flat concrete slab roof. In plan, the building is long and shallow, with projecting bays at either end. With windows only on the south and end elevations, it is assumed that all rooms are set to the south (front) with a corridor behind, and staircases in the bays at either end. The entrance is positioned centrally along its southern elevation, and is detailed in a restrained 30's-40's style with constrasting yellow brick in vertical panels, rendered piers and an extending flat concrete canopy over. A central recessed bay at first floor level provides an external balcony over the entrance. Along the main length of the elevation, the windows at both ground and first floor form continuous bands, with glazing and panels separated by brick piers.

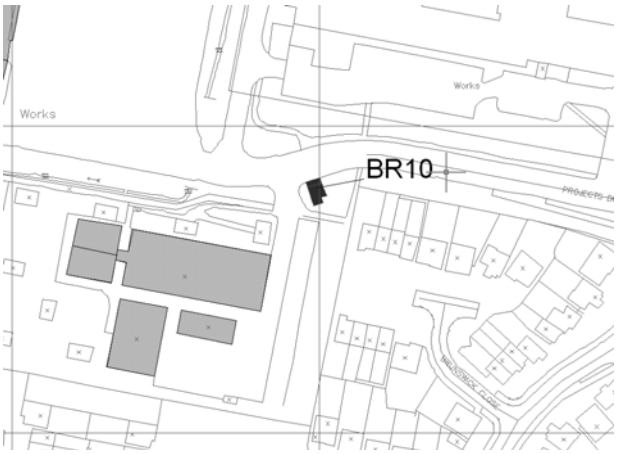
A S S E S S M E N T

The building is of little individual architectural or historic interest, but contributes to the group value of the contemporary works complex.

Recommendations for Archaeological Recording	Level 2 Recording

047

BUILDING		BR10



Building Name	Security kiosk	*Built*	c.1941

HISTORY

This building is one of the group associated with the initial development of the Boughton Road works. It formed the security hut at the entrance to the site, as it still does today.

DESCRIPTION

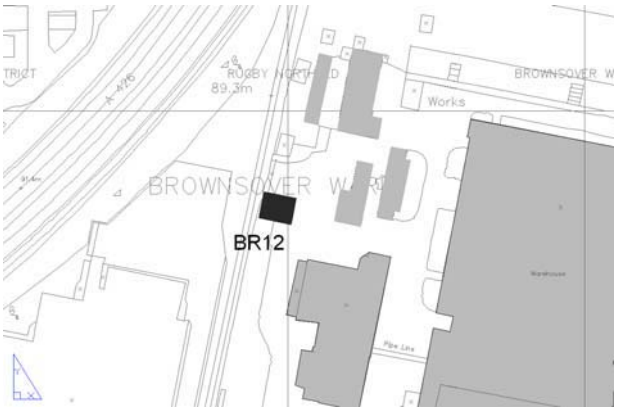
A small, square single storey brick building with deeply projecting concrete slab roof providing shelter on two sides. The textured brickwork laid in English bond is identical to that of the contemporary group, though it has had modern upvc windows and panels installed in the large bi-directional corner windows.

ASSESSMENT

This building, though of no individual architectural or historic interest, contributes to the comprehensive group survival of the intitial development of the Boughton Road works.

Recommendations for Archaeological Recording	Level 2 Recording

BUILDING		BR12



Building Name		*Built* 1950's

HISTORY

This building first appears within the cartographic record on the 1959 edition of the OS. While the brickwork of its lower walls is the same as that employed in the original brick buildings of the Boughton Road works development, dating to c.1941, it is not possible to determine whether this building was constructed in the initial phase of development, or slightly later. Its internal form and structure is similar to the shed abutting the north end of test house BR3, which is thought to date to the 1950's, and it is possible that they are contemporary (together with BR13, and possibly also BR17).

DESCRIPTION

A tall shed providing a single tall interior volume. The lower walls are of pink-orange textured brick, which extends to window sill level. Steelwork set on these walls carry the roof trusses and the corrugated metal cladding. Lattice steel stanchions built into the brickwork at the corners and along the long sides of the building carry the rails for a travelling crane/hoist. Natural light is provided by large metal framed roof lights and small-pane steel-framed windows in the long walls. Original timber double doors in the end elevation survive, but their function appear to have been superseded by rolling corrugated metal doors suspended on tracks mounted across the windows in the north elevation. A circular steel lined opening in the east end elevation is of similar form to that in the test house BR3, and it is assumed that these were exhaust manifolds, and that this building similarly functioned as a gas turbine test facility.

ASSESSMENT

This building is a very basic industrial shed, though appears to retain some fixtures relating to its original function. It is of similar construction to the northern element of BR3, and to BR13, and it is likely that they functioned as a group of gas turbine test houses at this north-western corner of the site. It therefore contributes to the group value of this functionally specific group.

Recommendations for Archaeological Recording Level 2 Recording

North-west corner of interior

BUILDING		BR13

Building Name		*Built* 1950's

HISTORY

This building first appears within the cartographic record on the 1959 OS edition. It is considered likely that it is contemporary with the similar structure comprising the northern element of BR3, dated to the 1950's, and similar building BR12 to its west.

DESCRIPTION

Similar to BR12, this building has lower walls of brick. The structural steelwork is also identical to that of BR12, but this has been recently clad with profiled metal sheet, with clear sheet panels in the roof slopes to provide natural light. The building no longer has windows, though the original timber doors survive in the south elevation. The building has a small, single storey brick extension at its northern end.

ASSESSMENT

A basic industrial shed with no architectural merit or technological significance this building does, however, contribute to the group value of the small group of buildings of similar structure and function at the north-west corner of the works.

Recommendations for Archaeological Recording Level 2 Recording

BUILDING		BR15

Building Name		*Built* 1950's

HISTORY

This group of buildings, identified separately as buildings 15, 15a, 15b & 15c on the site plan, based on the site owners building identification, are a contemporary group of light machine shops which first appear in the cartographic record on the 1959 OS plan. They do not appear to belong to the initial phase of construction of the Boughton Road works, and it is therefore likely that they represent an expansion of the works on this site during the 1950's. Their generic nature, not specific to any particular function, has led to their having performed a number of different functions throughout their period of use, including, recently, a micro-brewery.

DESCRIPTION

This group of single-storey light machine shops are all rectangular in plan, building 15 comprising conjoined parallel ranges. Their structure comprises panels of Fletton brickwork set within sectional concrete framing, with original 12-pane windows occupying the full upper half of the panels. The brickwork of these buildings is dissimilar to the distinctive textured brick used throughout the initial phase of works buildings on this site. As a group they have undergone considerable repair and alteration, the eastern end of building 15 having been comprehensively rebuilt following a fire. While building 15a retains its corrugated asbestos sheet roof, the two ranges of building 15 have been re-covered with modern profiled metal sheet, with integral translucent panels providing light.

ASSESSMENT

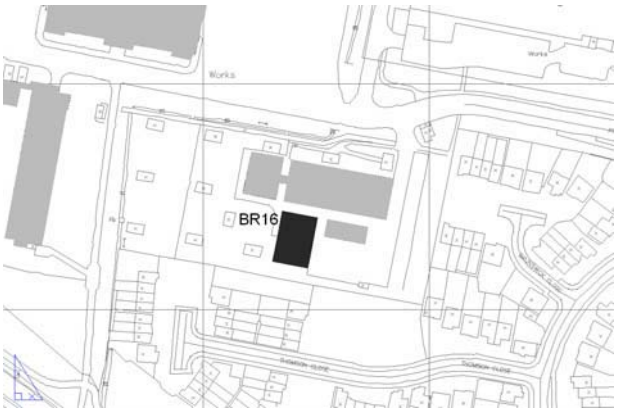
These buildings are of little intrinsic architectural or historic interest.

Recommendations for Archaeological Recording NONE

BR15A

BR15B

BUILDING		BR16



Building Name	'Elephant Building'	*Built*	1950

HISTORY

This building, still known on site as the 'Elephant Building' was constructed for the testing of radar tubes. The brickwork and detail of this building indicates that it does not belong to the initial phase of construction of works buildings on the Boughton Road site. It appears to have been built in 1950, and its travelling crane is dated 1951. At the time of its construction, the building's roller shutter is reputed to have been the largest in Europe. It is understood that the height of the building, and the size of the original shuttered opening was determined by the length of the tubes being tested in the building.

DESCRIPTION

This tall rectangular building is constructed of smooth Fletton brickwork, with shallow external brick piers extending to the level of the window heads, and dividing the wall planes into two bays. Tall panels of window are set within each bay, except that in the east elevation which contains the former large opening which, at the time of its installation, contained the largest roller shutter in Europe. This roller shutter still survives, though its function has been replaced with a smaller shutter. Lattice steel columns support a travelling crane, dated 1951, and steel girders at the top of the building held the radar dish which swivelled when planes flew over. The roof is hidden behind a brick parapet, capped with a concrete coping. A small, single storey sub-station is situated at the northern side of the building.

ASSESSMENT

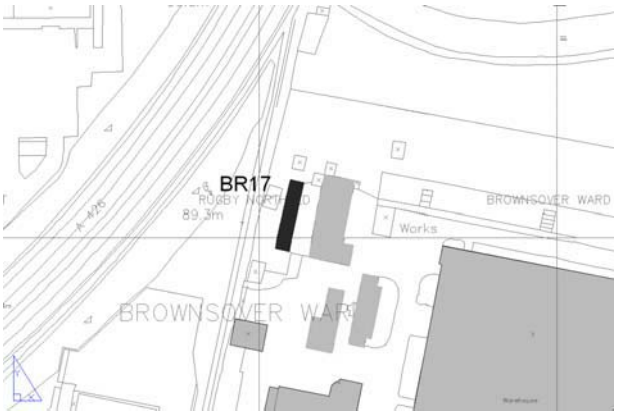
Although of slightly later date than the initial phase of works buildings on the Boughton Road site, this building performed a specialist and interesting function, and appears to contain a number of fixtures and structural components which directly relate to that function. It is therefore of some historical and technological interest.

Recommendations for Archaeological Recording Level 3 Recording


Interior of roller shutter


Travelling crane

BUILDING		BR17



Building Name | *Built* 1950's

H I S T O R Y

Building BR17 appears to be of similar construction to the northern element of building BR3, and to buildings BR12 & BR13, and its construction is therefore likely to similarly date to the 1950's. It appears for the first time in 1959 (OS mapping). It is assumed to have performed a similar function to the other buildings noted above, that is as a turbine test house.

D E S C R I P T I O N

No access was possible to this building. However, a cursory visual assessment indicates that it is of similar construction to buildings BR12 & 13, that is, with brick lower walls, and corrugated sheet on a steel frame above. Tall windows set on the brick walls in the bays along the east side are probably replicated on the west. The building has a large central roof ventilator identical to that on BR12.

A S S E S S M E N T

The building is of little architectural or technological interest, though its significance is raised by it being one of a stylistically and functionally similar group.

Recommendations for Archaeological Recording Level 2 Recording

BUILDING		BR2

Building Name	'Torpedo factory'	*Built*	C.1941

H I S T O R Y

Constructed in the original phase of building on the Boughton Road site c.1940, documentary records suggest that this building was purpose-built for the manufacture of magnetoes, which were used in the Merlin engines of Hurricane fighters during the Battle of Britain. Other planes using BTH magnetos included the later Spitfire fighter along with Wellington, Halifax and Lancaster bombers.
The building is widely known, however, as the 'Torpedo factory'. Documentary sources indicate that BTH developed the electrically-propelled torpedo, after some were captured from the Germans in 1941, and that this led to the erection of a new torpedo building specially designed and equipped for the purpose.
It therefore remains unclear whether this might have been the building specially erected in 1941 for torpedo production, as the current name suggests, or it was used for the manufacture of magnetoes as the documentary record suggests.

D E S C R I P T I O N

An extensive manufacturing shed with brick external walls, an internal steel frame, and a north-light roof. The building is in the order of 30 bays long from north to south. It was originally a single open volume internally, with a central cross-spine housing the heating equipment blowing warm air into the two halves of the building. Since its vacation by BTH, the building has been sub-divided into two main spaces, separated by a partition wall. Smaller spaces run down the west side of the building, providing ancillary spaces and offices to the main manufacturing volume, though these are within the external wall and roof line. Blocked windowsvisible within the internal face of the former east wall are testament to the fact that the lean-to range along the east side of the building is of a later phase of construction. The majority of openings once connecting the main volume with the ancillary rooms along its flanks, or to the exterior have now been blocked. The original brickwork, where exposed, is of identical brick type and bond to the contemporary group. The internal steel structure comprises I-columns and composite small-section steel roof trusses.

The southern half of the building has undergone more significant alteration than the northern, with vertical metal cladding masking the saw-tooth of the north-light roof, and new brick cladding to the single-storey lean-to ranges along the sides.

A S S E S S M E N T

This large manufacturing shed appears to be of standard construction for an industrial building of its date. Fixtures and fittings specific to its former function are virtually non-existent, and it has undergone a considerable degree of alteration. However, it was the location of the principal manufacturing acitivity on the Boughton Road site, and as such, formed the focus of the site, around which the majority of the other buildings provided merely a service function. It therefore contributes to the group value of the Boughton Road works as a whole.

Recommendations for Archaeological Recording Level 2 Recording

BUILDING		BR2

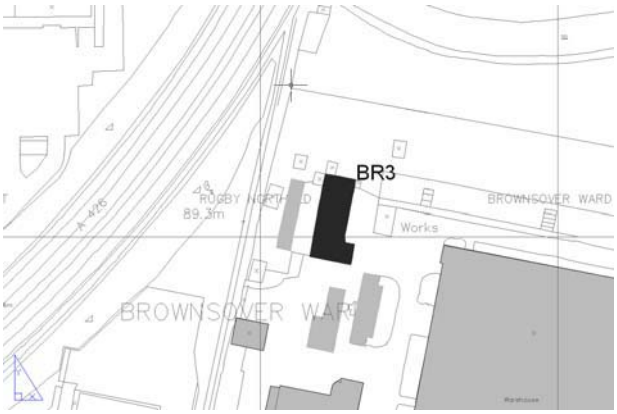
Blocked openings on east wall

Interior of BR2 looking north

Later lean-to units on east side

Original lean-to spaces on west side

BUILDING		BR3



Building Name	Jet engine test house	*Built*	1941& 1950's

HISTORY

Although the first test run of a jet engine by aviation pioneer Frank Whittle, took place on the BTH site in Rugby in April 1937, it was not in this test house. It actually took place in an older converted building, which was adapted by removing a pane of glass from a window, and pointing the jet pipe outside. In 1938, the tests were transferred to another BTH factory at Lutterworth in Leicestershire.
In view of the time and knowledge that BTH had invested into the developments by Whittle, they decided to build their own test facility in Rugby, and in 1941 Building BR3 was constructed, with the first test carried out in August of that year.
The large shed attached to the north end of the brick building was constructed at some time during the 1950's, apparently for the testing of gas turbines.

DESCRIPTION

The brick building which comprises the southern element of Building BR3 is of orange-brown brick laid in English bond, with concrete dressings and flat roofs. It is connected to a later corrugated iron clad shed to its north, which was used for testing turbine engines, and to the north of this, there is a large sunken fuel tank half buried beneath a grass-covered mound.
The brick building is of three distinct elements; the tall side bays each with a test house at ground level and air-louvre above, with the lower volume of the control room between. Test house 1 is to the east, Test house 2 to the west. The test houses each had tall double doors, though those in test house 2 have now been blocked. The side walls of each test house hav a door and small window, all openings being surmounted by concrete lintels.
The ground floor plan of the test house has four chambers - a central control room flanked by test house 1 and 2, and an office/stores at the north-east corner. Above each test house is an attic cotaining a large air-louvre and tanks for furle and oil, and beneath the test houses are two large fuel tanks, each with a 3,000 gallon capacity. A detailed description of the test installation, produced by BTH notes that the control room contained two sets of instruments - one for each cell - measuring speed, thrust, pressures and temperatures. No 2 test house (east) had more sophisticated testing machinery than No.1. The central control room had a double-glazed window through to each test house, and access between the two was through double doors. The control room is lined with perforated board for sound-insulation, attached to the walls with timber battens. Test house 1 survives in more authentic condition than TH2, which has been converted for office use.
The tall shed to the north of the brick building has a steel frame comprising composite lattice stanchions connected by cross bracing at upper level, and composite steel roof trusses. The walls and roof are clad with corrugated metal sheet, with tall windows set in each bay. It has been suggested that the building has been raised in height since its construction, but there is no evidence in the fabric for this. There is evidence of a number of machine or test pits beneath the general floor level, and other fixtures survive relating to the former use of the building as a test house.

ASSESSMENT

An application was made to DCMS for the listing of this building, on the grounds that it was thought to have been associated with the pioneering early testing and development of the jet engine by Frank Whittle. However, further research has indicated that there is no direct connection with those events, and this considerably reduces the potential significance of the test houses. However, both elements of the building retain much evidence of their original functions, and as such, are of some historical and technological interest. The original brick building, like the other buildings of the contemporary group, is well-built, considering their date, though they are of fundamentally functional design, with little in the way of architectural treatment.
Within the comtemporary group on the Boughton Road site, this is the most interesting and significant building for two reasons. Firstly, it was constructed for an industrial/ manufacturing function rather than service or administrative function, and secondly, that it retains singnificant evidence of that original function.

Recommendations for Archaeological Recording	Level 3 Recording

BUILDING		BR3

Exhaust opening

Interior of control room

Interior of later structure looking south

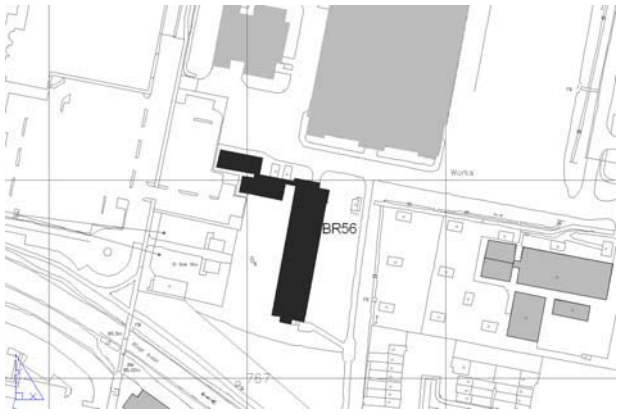
Later gas turbine Test house

Test house 2

Travelling crane

Water cooling valve

BUILDING		BR56



Building Name		*Built* late 1950's

H I S T O R Y

The cartographic record indicates that this building pre-dates the laboratory building (outside the current development area) which was constructed in 1960, as one epoch of mapping shows this building, but not the laboratory. The 1959 Os edition is somewhat ambiguous, in that the outline of the building is shown, but it is not shown rendered as existing buildings are. It is assumed that it dates to the late 1950's. It was constructed as a drawing office building.

D E S C R I P T I O N

The structure of this long rectangular, two-storey building comprises a concrete frame with panel infill largely of steel framed windows set above shallow panels of smooth Fletton brick. The building has a flat concrete slab roof, and is entirely utilitarian in design. Two terrapin huts have been connected to the north end of the building.

A S S E S S M E N T

This utilitarian building has no intrinsic architectural of historic interest.

Recommendations for Archaeological Recording NONE

BUILDING		BR6b

Building Name		*Built* c.1941

HISTORY

One of the contemporary group of buildings constructed in a single phase during the early part of the Second World war. This building houses w.c.s.

DESCRIPTION

The building is a single storey block with flat concrete slab roof with deep overhang. Of the same construction as the rest of the original contemporary group of buildings on the Boughton Road site. Mixed pinky-orange to re-brown textured brick, bull-nosed at door openings, which have concrete lintels. Bottom two courses of brick rendered externally.

ASSESSMENT

Although contributing to the group value of the contemporary collection of buildings on the Boughton Road site, the low status of the function of the building reduces its relative significance. It is considered appropriate to include a brief record of this building within the overall site record.

Recommendations for Archaeological Recording Level 2 Recording

BUILDING		BR7A

Building Name		*Built* c.1941

HISTORY

One of the original group of contemporary buildings constructed early in the Second World War, first evidenced in the cartographic record on the 1959 OS edition. Originally part of the 'power house', or power converter station (BR7f), where power was brought in from main power house on Leicester Road site, and converted for use on the Boughton Road site. The use to which the newly created offices were put is unknown, but the large proportion of fenestration suggests that they may have been drawing offices before the construction of Building BR56.

DESCRIPTION

Of same basic materials and construction as contemporary group. Mixed pinky-orange textured brick laid in English bond. Bull-nosed brick at ground floor openings, squared reveals at first floor. Thin concrete cills and lintels, painted white. Steel-framed windows with security grilles to interior. Appears to have originally been predominantly tall single storey with lower single storey range across south end. Second floor added across majority of southern half using matching materials, therefore likely to have been soon after original construction. Flat roofs behind brick parapetsfinished with soldier course. Later single storey additions along west side and at south-west corner.

ASSESSMENT

Of little individual functional or architectural interest, but contributes to group value of original site complex. Alterations survive as document to changing requirements of the buildings as the function of the industrial site changed over time.

Recommendations for Archaeological Recording	Level 2 Recording

BR7A from the south-east

BR7A from the south-west

BUILDING		BR7F

Building Name	Power converter station	*Built*	c.1941

H I S T O R Y

Constructed as part of the original development of the Boughton Road site. Originally the power convertor station, a mini power house providing power to the buildings on this site. Power lines carried between this building and principal manufacturing shed, Building BR2, by means of high level gantry. Converted in recent times to a garage.

D E S C R I P T I O N

Tall single storey building in same palette of materials and detailing as rest of contemporary group. Darkish red-brown textured brick, flat roofs behind brick parapet topped with soldier course. Large openings have bull-nosed brick reveals and concrete lintels. Single storey extension at north-east corner has chimney base engaged. Power lines carried between this building and principal manufacturing shed, Building BR2, by means of high level gantry. West side of building is top lit by windows in upstand above general roof level. This major lantern spanned by deep concrete beams.

A S S E S S M E N T

With the exception of the chimney base at the north-east corner of the building, the building bears little evidence of its original function. Of no architectural or technological interest, the building does, however, contribute to the group value of the comprehensive survival of the industrial group.

Recommendations for Archaeological Recording Level 2 Recording


Chimney base at the north-east corner


Interior of western side of building

Appendix Two:

Extracts from English Heritage 2006 *Understanding Historic Buildings: A guide to good recording practice*

LEVELS OF RECORD

Level 1

Level 1 is essentially a basic visual record, supplemented by the minimum of information needed to identify the building's location, age and type. This is the simplest record, not normally an end in itself but contributing to a wider aim. Typically it will be undertaken when the objective is to gather basic information about a large number of buildings – for statistical sampling, for area assessments or historic landscape characterisation, for a pilot project, to identify buildings for planning purposes, or whatever resources are limited and much ground has to be covered in a short time. It may also serve to identify buildings requiring more detailed attention at a later date.

Level 1 surveys will generally be of exteriors only, although they may include superficial interior inspection for significant features. Only if circumstances and objectives allow will any drawings be produced, and these are likely to take the form of sketches.

A Level 1 record will typically consist of:

drawings	sometimes 1
photography	1, sometimes 2
written account	1-4

Level 2

This is a descriptive record, made in circumstances similar to those of level 1 but when more information is needed. It may be made of a building which is judged not to require any fuller record, or it may serve to gather data for wider project. Both the exterior and the interior will be viewed, described and photographed. The record will present conclusions regarding the building's development and use, but will not discuss in detail the evidence on which these conclusions are based. A plan and sometimes other drawings may be made but he drawn record will normally not be comprehensive and may be tailored to the scope of a wider project.

A Level 2 record will typically consist of:

drawings	sometimes 1, Sometimes one or more of 2-7
photography	1, 2, 4
written record	1-3, 6

Level 3

Level 3 is an analytical record, and will comprise an introductory description followed by a systematic account of the building's origins, development and use. The record will include an account of the evidence on which the analysis has been based, allowing the validity of the record to be re-examined in detail. It will also include all drawn and photographic records that may be required to illustrate the building's appearance and structure and to support an historical analysis.

The information contained in the record will for the most part have been obtained through an examination of the building itself. If documentary sources are used they are likely to be those which are most readily accessible, such as historic Ordnance Survey maps, trade directories and other published sources. The record will not normally discuss the building's broader stylistic or historical context and importance at any length. It may, however, form part of a wider survey – thematic or regional, for example – of a group of buildings, in which additional synthesis. A Level 3 record may also be appropriate when the fabric of a building is under threat but time or resources are insufficient for detailed documentary research, or where the scope for such research is limited.

A level 3 record will typically consist of:

drawings	normally 2; sometimes one or more of 3-12
photography	1-9
written account	1-3, 6-9, 11-13, 22; sometimes 5, 14-16, 18-20, 23

Level 4

Level 4 provides a comprehensive analytical record and is appropriate for buildings of special importance. Whereas Level 3 analysis and interpretation will clarify the building's history in so far as it may be deduced from the structure itself, the record at Level 4 will draw on the full range of available resources and discuss the building's significance in terms of architectural, social, regional or economic history. The range of drawings may also be greater than at other levels.

A level 4 record will typically consist of:

Drawings	2; sometimes one or More of 3-12
photography	1-9
written account	1-3, 5-8, 10-22; Sometimes 23

Drawings

1. Sketched plan, section, elevation or detail drawings (if a more thorough drawn record is not made). Sketches may be roughly dimensioned.
2. Measured plans (to scale or fully dimensioned) as existing. These may extend to all floors, or may be limited to one or a few. The latter option may be appropriate, for example, in a town centre building where upper floors have been little altered but modern retail use has obscured evidence of an earlier form of the ground floor. Buildings with a repetitive structure (such as some industrial buildings) may also be planned on one floor only, but a note or sketch plan should indicate the arrangement of other floors. Plans should show the form and location of any structural features of historic significance, such as blocked doors, windows and fireplaces, masonry joints, ceiling beams and other changes in floor and ceiling levels, and any evidence for fixtures of significance, including former machinery.
3. Measured drawings recording the form or location of other significant structural detail, such as timber or metal framing.
4. Measured cross-sections, long-sections or elevation sections illustrating the vertical relationship within a building (floor and ceiling heights or the form of any architectural decoration (the moulding profiles of door surrounds, beams, mullions and cornices, for example)
5. Measured drawings showing the form of any architectural decoration (the moulding profiles of door surrounds, beams, mullions and cornices, for example) or small-scale functional detail not more readily captured by photography. A measured detail drawing is particularly valuable when the feature in question is an aid to dating.
6. Measured elevations, where these are necessary to an understanding of the building's design, development or function and not more readily obtained by photography.
7. A site plan, typically at 1:500 or 1:1250, relating the building to other structures and to related topographical and landscape features.
8. A plan or plans identifying the location and direction of accompanying photographs.
9. Copies of earlier drawings throwing light on the building's history.
10. Three-dimensional projections when these are of value in understating the building. If these are to be considered as components of the record they must always be supported by measured plans, sections and elevational details.
11. Reconstruction drawings and phased drawings, when these are of value. Since these are by their nature interpretive, the evidence on which any reconstruction or phasing is based must always be given. Successive phases of a building's development may be shown by graded tone (dark to light, with darker being the earlier), by colour, by sequential diagrams or by annotation. Whenever phased drawings are included in a record, they must be accompanied by the unmarked drawings on which they are based.
12. Diagrams interpreting the movement of materials (process flow) or people (circulation), or the segregation of people or activities (eg permeability diagrams), where these are warranted by the complexity of the subject. As with items 10 and 11, the evidence supporting the interpretations must be provided.

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 oblique views will show all external elevations of the building, and give an overall impression of its size 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. Further views may be desirable to indicate the original design intentions of the builder or architect, where these are known from documentary sources or can be inferred from the building or its setting. In the case of building elevations which have been conceived as formal compositions, views at right angles to the plane of the elevation may again be appropriate.
4. The overall appearance of the principle rooms and circulation areas. The approach will be similar to that outlined in 2 above.
5. Any external or internal detail, structural or decorative, which is relevant to the building's design, development or use and which does not show adequately on general photographs. When photographing details it can be helpful to include a clearly marked and suitably sized scale next to the subject and parallel to one edge of the photograph.
6. Any machinery or other plant, or evidence for its former existence.
7. Any dates or other inscriptions, any signage, makers' plates or graffiti which contribute to an understanding of the building or its fixtures or machinery, if not adequately captured by transcription. A contemporaneous transcription should be made wherever characters are difficult to interpret.
8. Any building contents or ephemera which have a significant bearing on the building's history (for example, a cheese press or a malt shovel), where not sufficiently treated in general photographs.
9. Copies of maps, drawings, views and photographs, present in the building and illustrating its development or that of its site. The owner's consent may be required.

The written account

1. The building's precise location. As a National Grid reference and in address form.
2. A note of any statutory designation (listing, scheduling or conservation area). Non-statutory designations (historical 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. A summary (if not further details are called for) of the building's type or purpose, historically and at present, its materials and possible date(s), in so far as these are apparent from a superficial inspection.
5. A table of contents and a list of illustrations or figures.
6. An expansion of 4, if appropriate, summarising the building's form, function, date and sequence 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 findings.
7. An introduction, setting out the circumstances in which the record was made, its objectives, methods, scope and limitations, and any constraints which limited the achievement of the objectives. Where appropriate the brief for the work or the project design should be stated or appended.
8. Acknowledgements to all those who made significant contributions – practical, intellectual or financial – to the record or its analysis, or who gave permissions for copyright items to be reproduced.
9. A discussion of published sources relating to the building and its setting, an account of its history as given in published sources, an analysis of historic map evidence (map regression) and a critical evaluation of previous records of the building, where they exist.
10. An expansion of 9, if appropriate, drawing additionally on primary documentary sources.

11. An account of the building's overall form (structure, materials, layout) and its successive phases of development, together with the evidence supporting the analysis.
12. An account of the past and present uses of the building and its parts, with the evidence for these interpretations. An analysis of any circulation pattern or decorative, iconographic or liturgical scheme. An account of any fixtures, fittings, plant or machinery associated with the buildings, and their purposes. For an industrial building. A sequential account of the ways in which materials or processes were handled.
13. Any evidence for the former existence of demolished structures or removed plant associated with the building.
14. A summary of the findings of any specialist reports (dendrochronology or paint analysis, for example).
15. A discussion of the building's past and present relationship to its setting: for example its relationship to local settlement patterns, to a field system, to a park, garden, moat, graveyard or other artificial landscape; its part in any larger architectural or functional group of buildings; its visual importance as a landmark.
16. An assessment of the potential for further investigative or documentary work, and of the potential survival of below-ground evidence for the history of the building and its site.
17. A discussion of the architectural or historical context or significance of the building locally, regionally or nationally, in terms of its origin, purpose, form, construction, design, materials, status or historical associations.
18. Copies of historic maps, drawings, views or photographs illustrating the development of the building or its site (the permission of the owners or copyright holders may be required).
19. Copies of other records of the building, including specialist reports (again with any necessary permissions), or a note of their existence and location.
20. Any further information form documentary sources, published or unpublished, bearing on the circumstances of its building, designer, craftsmen, ownership, use and occupancy, with a note on the sources of the information.
21. Relevant information from owners, builders, architects or others who may be acquainted with the building, including oral history. The sources of the information must be given and it is important that the particular strengths and weaknesses of oral information are weighed.
22. Full bibliographic and other references, or a list of the sources consulted (in long reports it is preferable to include both). Websites which may prove to be ephemeral should be avoided as references wherever possible; where their use is unavoidable the date on which the site was consulted should be noted.
23. A glossary of architectural or other terms likely to be unfamiliar to readers. If few in number, terms may be explained more economically within the text or in foot or endnotes.

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