#### ARCHAEOLOGICAL EVALUATION REPORT

# WOODBRIDGE – SKANSKA SITE **SUT 199**

A REPORT ON THE ARCHAEOLOGICAL EVALUATION, 2004 (Planning app. no. C/03/2371)

Suffolk County Council

Archaeological Service

Rhodri Gardner and Mark Sommers Field Team Suffolk C.C. Archaeological Service

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Acknowledgements
This project was commissioned by Paloo Doshi of Skanska Integrated Projects on the 19<sup>th</sup> of April 2004 and was monitored by Robert Carr (Suffolk County Council Archaellari 100) April 2004 and was monitored by Robert Carr (Suffolk County Council Archaeological Service, Conservation Division).

The project was jointly directed by Rhodri Gardner and Mark Sommers, and managed by John Newman, who also provided advice during the production of the report. The excavation was carried out by Rhodri Gardner, Rob Brooks, James Rolfe and Jonathan van Jennians, all from the Suffolk County Council Archaeological Service Field Team.

Thanks are due to Tim Syer (Skanska Integrated Projects Safety Manager) for his assistance during site set-up and too Paloo Doshi for his help and co-operation throughout the project.

#### Summary

Sutton, RAF Woodbridge (TM 330 483; SUT 199). A programme of archaeological work including standing building recording, production of a brief airfield history and trial trench evaluation was carried out at RAF Woodbridge in advance of its redevelopment to house the 23 Engineers (Air Assault). A photographic record (monochrome prints and 3.2 megapixel digital backup was taken) of all the buildings within the Development Area was made. Two of the buildings were also subject to a measured survey. A total of thirteen evaluation trenches (totalling c. 750m<sup>2</sup>) were excavated and these revealed no significant archaeological features. Numerous modern services were found to have affected much of the site. A single area of protected heathland was not accessible at the time of the evaluation and further work (monitoring of the heathland relocation, followed by trial trenching) was recommended in order to assess the survival of archaeological deposits in the area during a later stage of the development.

(Rhodri Gardner/Mark Sommers, SCCAS, for the Skanska Integrated Projects, report no: 2004/82)

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#### **SMR** information

Planning application no. C/03/2371

 $27^{th} - 30^{th}$  April 2004 Date of fieldwork:

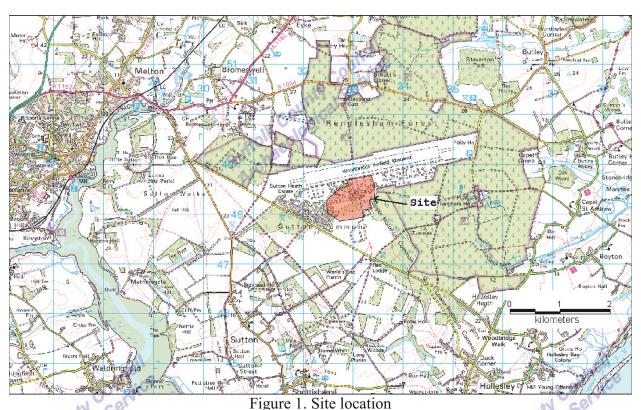
Grid Reference: TM 3300 4830

Funding body: Skanska Integrated Projects

#### 1 Introduction

Planning consent (C/03/2371) has been sought for the redevelopment of the existing site to form new barracks and associated services. Such consent was conditional upon an agreed programme of archaeological works being carried out. In this case an archaeological evaluation was recommended by Robert Carr of the SCCAS Conservation Team, to encompass recording of the standing buildings and other historic structures, the production of a concise history of the airfield's development and use, and field evaluation by trial trench. A Brief and Specification was produced for these works and a copy is included as Appendix 1. The SCCAS Field Team was subsequently commissioned by the client, Skanska Integrated Projects, to undertake the work.

The Development Area (DA) covers approximately 55ha and is centred on NGR TM 3300 4830 and lies almost entirely within the parish of Sutton, although in its north-eastern corner it falls partly within Hollesley, Capel St. Andrew and Eyke. The site lies at c. 26m AOD and is immediately surrounded by the extensive developments of the airbase. Beyond this RAF Woodbridge itself lies within an area almost entirely surrounded by Heathland with designated SSSI status in the Suffolk Coasts and Heaths Area of Oustanding Natural Beauty.



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As the DA lies within the ex-RAF Woodbridge airfield it has not been subject to any previous systematic archaeological survey work and it therefore contains no known sites in the County Sites and Monuments Record. Indeed, there are only two entries in the County SMR within a 1.5km radius of the centre of the DA. These are SUT 096 and SUT 097, which refer to a circular mound and a long mound respectively, both undated but found in close association on Sutton Common some 1.45km to the west of the centre of the DA. An account of the archaeological sites in the wider environs of the site has been given in an Archaeological and Cultural Heritage Appraisal previously commissioned by the client (MacQueen, 2003).

It was recognised by the SCCAS Conservation Team that large parts of the DA would have been heavily by airfield truncated developments and that other areas would not be affected by current development proposals. However, a number of areas remained where trial trench evaluation recommended. These are shown in Fig 2. They included areas thought to be original surviving Heathland with high potential for archaeological

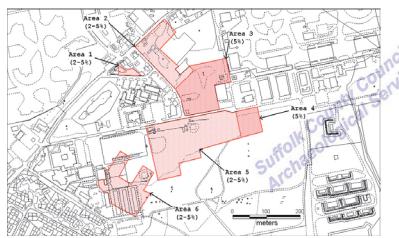


Figure 2. Areas identified for field evaluation (© Crown Copyright. All rights reserved. Suffolk County Council Licence No. 100023395 2004)

preservation (Area 4 and parts of Area 3). In addition areas occupied by early (pre 1950) buildings and sports pitches that would have seen relatively little landscaping were included. These were also thought to have the potential for the preservation of archaeological deposits (Areas 1, 2, 5 and parts of Area 6).

### 2 Methodology

#### 2.1 Building Recording

All buildings within the DA were photographically recorded using a 35mm SLR camera onto monochrome film. Colour photographs using a 3.2 megapixel digital camera were also taken as a backup. Generally, for each building a single photograph illustrating the main façade and one side was taken. For buildings considered to be of pre-1950s origin photographs recording all faces were taken. A small number of general views were also recorded. All the monochrome photographs have since been entered into the Suffolk County Council Archaeological Service Photograph Database and are held in the county archive under the reference codes FKH, FKI, FKJ and FKK.

For two of the buildings considered to be pre-1950s (huts 20 and 12) measured elevations of their main façade and a representative side were drawn at a scale of 1:50. Copies of these are reproduced in this report but at a reduced scale.

#### 2.2 Airfield History

All appropriate primary and secondary sources were consulted (see bibliography).

#### 2.3 Trial Trenching

The trial trenching was carried out between the  $27^{th}$  and the  $29^{th}$  of April 2004. A proposed trench plan was agreed in advance between the client, the SCCAS Conservation Team and the SCCAS Field Team incorporating c.  $1000\text{m}^2$  of trench. However, some slight variation to this was required after consultation with the client and examination of service drawings that were not available at the time the initial trench design was devised. The principal changes were the decision to abandon two trenches in the south west (Area 6) between Buildings 591/592 and 592/593 as the main drainage for these buildings followed the proposed alignment of the trenches. It was therefore considered that the survival of archaeological deposits in the narrow (c. 15m) corridor between the buildings would be compromised. The other alteration concerned the orientation of trenches in Area 5. These were moved from north to south to east to west to avoid one of the principal High Voltage power cables known to cross the centre of the area. The final trench locations are shown below in Figure 3.

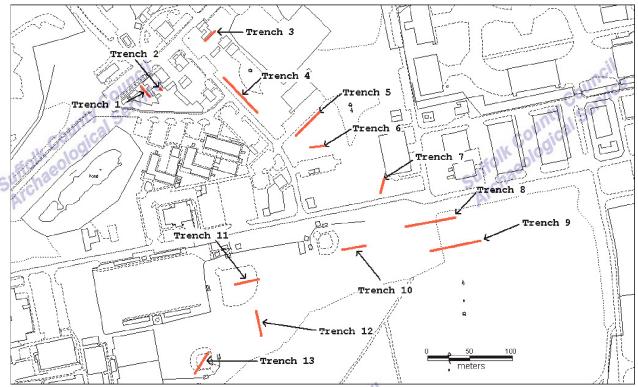


Figure 3. Trench locations

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All trial trenches were excavated using a 180° wheeled mechanical excavator (JCB) fitted with a 1.8m wide flat bladed ditching bucket. All mechanical excavation of topsoil and overburden was carried out under archaeological supervision until the top of the first appropriate archaeological horizon or undisturbed natural drift deposits were encountered. The surface of each trench and relevant upstanding sections were then cleaned by hand where necessary to further define any archaeological features. The trenches were located using a hand held GPS system (Garmin Etrex).

The SMR reference number SUT 199 was allocated to the site and all deposits were recorded stratigraphically and given unique context numbers within a continuous numbering system. Trial trenches and excavated features were recorded in a series of 1:50 scale plans and 1:20 scale sections where necessary.

#### 3 Results

#### 3.1 Standing Building Recording

A total of one hundred and eleven monochrome photographs were taken. These are catalogued in Appendix 2 with their individual photographic database reference number and the file name of any equivalent colour digital photographs. All buildings are identified by the individual numbers allocated during the military use of the site. A figure indicating the building numbers has also been included at the end of Appendix 2.

A small number of buildings thought to be pre-1950s in date were identified, namely buildings 10, 12, 13, 15, 16, 20, and 21 in an area adjacent to the Skanska site office, and buildings 500, 506 and 580 in the southwest corner of the DA. The elevations of two buildings of these buildings were recorded, buildings 12 and 20.

Building 12 (illustrated below) comprised two adjacent 'Nissen' type huts connected by a brick built flat roofed structure to form a single building. The end walls of each 'Nissen' hut portion is constructed of brick with a cement render on the outside. The long walls and roof comprises corrugated steel sheets approximately 3.5m in length and 1m wide. They are mounted vertically

onto an internal frame with three sheets forming a complete run, two side sheets and a third sheet laid over the roof and overlapping the two side sheets. This pattern is continued for the length of the building with all sheets overlapping its neighbour whilst the sheets at either end overlapped the brick walls. The brick walls are of single brick thickness and have buttresses on the outside face although these were not present on all the 'Nissen' type huts (see Fig. 4). The entrance doors of the majority of the 'Nissen' type huts are in the end walls although Building 10 had a side entrance but this is believed to be a later alteration. The corrugated steel sheet walls are double thickness with presumably a cavity between. The inner wall is again formed of corrugated steel sheets although they are mounted horizontally with the vertical joints between adjacent sheets being covered by thin metal strips which are riveted or bolted to the corrugated sheets. The floors appeared to be cement which was badly cracked suggesting a poor foundation.

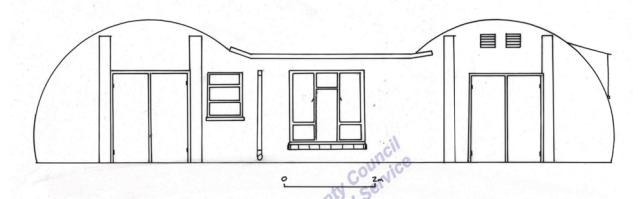


Figure 4. Building 12, front elevation

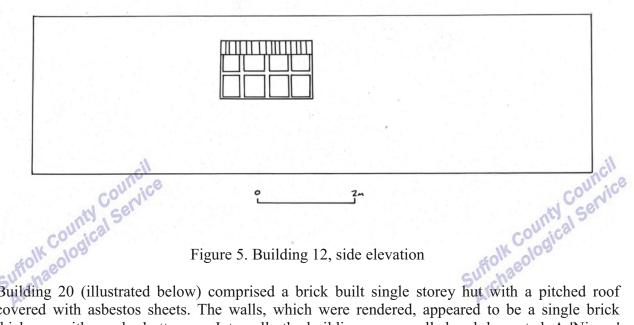


Figure 5. Building 12, side elevation

Building 20 (illustrated below) comprised a brick built single storey hut with a pitched roof covered with asbestos sheets. The walls, which were rendered, appeared to be a single brick thickness with regular buttresses. Internally the building was panelled and decorated. A 'Nissen' type hut was situated alongside and the two were connected by a brick built flat roofed passageway to form a single structure. The floors were linoleum covered.

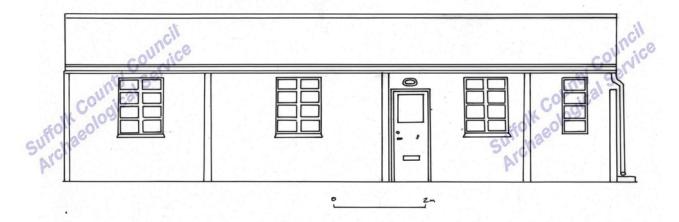


Figure 6. Building 20, side elevation

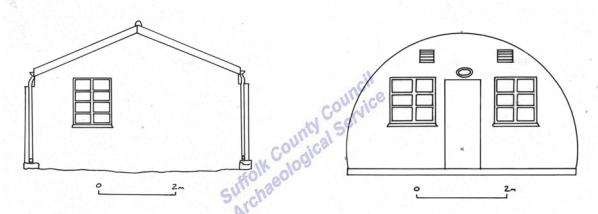


Figure 7. Building 20, end elevation

Figure 8. Building 10, elevation

#### 3.2 Airfield History

R.A.F. Woodbridge - A brief history By Roger Freeman

During the early years of RAF Bomber Command's offensive against Nazi Germany, it was found that when aircraft in distress crash-landed on airfields the wreck often temporarily hindered flying operations. As a measure to lessen such incidents and provide better facilities for bringing disabled aircraft down safely, the Air Ministry proposed the construction of a number of special landing grounds. By 1942 the standard bomber airfield, known as Class A standard, had a main hard surface runway of 2,000 yards and two intersecting runways of 1,400 yards, all 50 yards wide. For an emergency airfield only one large runway was deemed necessary, preferably on an east-west axis. To better the chances of damaged aircraft with poor control and lost braking ability to put down safely the length of the runway was to be 3,000 yards. Its width 250 yards, with a further cleared and levelled area of 75 yards either side. Additionally, a cleared 500 yards long by 400 yards wide overshoot was considered desirable at each end of the runway, making the whole area of the cleared strip 4,000 by 400 yards.

Three locations were selected to serve the Lincolnshire/Yorkshire area, East Anglia, and the southern counties. A site in the parishes of Sutton and Capel St. Andrew, 3 miles east of Woodbridge, Suffolk was taken for the East Anglia location and given the official name Woodbridge. It was common practice to use the name of a nearby town or village for a new

airfield, as if the name became known to the enemy it still did not provide the exact location. The site was only two and a half miles south of another where a Class A bomber airfield was to be built, although in the event work on this, Butley, was delayed.

Work began at Woodbridge in July 1942 with clearing an area some two hundred and fifty acres of vegetation, mostly young Forestry Commission conifer plantations in what was known as Rendlesham Forest. Several thousand trees had to be removed and disposed of, a task involving a great amount of hand labour and taking several months to complete. The area was formerly open heathland on sandy soil. As the demand of concrete products for use in the construction of Class A airfields in the district was already taxing supply sources, it was decided to employ what was termed a sand-mix process for the Woodbridge runway. This involved mixing the natural sand soil of the site with a small amount of hydrated lime, before mixing in bitumen with a special wetting agent. The paving so formed was 6 inches thick on the consolidated sand and gravel base.

Construction of the runway, access tracks, aircraft standings and buildings commenced in the autumn of 1942 and took some twelve months to complete with at times 600 men employed. The total paved area of the airfield amounted to approximately 871,600 square yards and cost some £900,000. Much to the displeasure of the contractors involved, there were delays caused by changes in the design, notably the provision and location of aircraft parkings. These eventually were confined to the south side of the runway and took the form of large U-shaped paved loops, eight in number and each able to hold 15 large aircraft. A control tower (type 43/343), Nissen type technical buildings and a steel frame and sheet B1 hangar were also located off the south side of the runway. Domestic accommodation for 585 officers and men was mainly Nissen huts, located in four separated clusters beside a former heath track that led to the north side of the public highway to Hollesley.

For operational purposes the runway was divided into three parallel strips and defined by borders of coloured lights. The southern most lane was the immediate emergency lane where any aircraft in distress could land without first contacting flying control by radio. This was identified by a string of red contact lights on the left side. Approach lighting, employing spaced lamps on poles were erected from the east end of the runway, eventually extending to within a mile of the North Sea coast.

Woodbridge was officially opened as an RAF station on 1 September 1943, although delays in runway lighting installation delayed the operational opening until 15 November that year. However, some aircraft in distress had already made use of the runway, the first recorded being a B-17 F Fortress in difficulties on 18 July. By the end of the year over a hundred 'lame ducks' had landed at Woodbridge, the numbers increasing dramatically during following months.

In January 1944 work commenced on the installation of FIDO (Fog Investigation and Dispersal Operation). This involved a double row of petrol burners stretching for a mile on a selected section of the runway and the necessary fuel supply and storage. When ignited the burners had the effect of clearing fog over that section of the runway, enabling aircraft to land safely in the most adverse conditions. As the system had a potential consumption of 250,000 gallons an hour it was necessary to build a special siding at Melton railway station where rail tankers could be unloaded into temporary holding tanks from which a four mile, 6 inch underground pipe line was laid to the airfield. Four large storage tanks of some 350,000-gallon capacity each were erected on the north side of the airfield near the runway head to hold this pumped fuel. The FIDO installation was completed in May 1944 and its first known operational use was shortly after D-Day; its last in March 1945.

During 1944 more than 2,600 aircraft made emergency landings at Woodbridge. By the end of the war the overall total since Woodbridge came into use was some 4,000. Of these 770 were due to battle damage, 880 to fuel shortage, 1,090 to technical problems and 1,170 because of bad weather. Between 550 and 600 landings are know to have been aided by the FIDO installation.

One of the most dramatic incidents that occurred at Woodbridge was the capture intact of a Luftwaffe night-fighter. Due to a compass failure the crew believed they were landing somewhere near Berlin. The aircraft had the latest night-fighting radar and its capture greatly aided RAF Bomber Command countermeasures.

Before the end of hostilities Woodbridge had also been occasionally used for special operations, mostly small scale. However, in mid-March 1945 sixty sorties were launched when RAF Halifax tugs with Horsa and Hamilcar assault gliders used the airfield as a forward base for *Varsity*, the Allied Rhine crossing operation. Two small RAF trials units were formed at Woodbridge. The first, in May 1944, was the Bomb Ballistics Unit, which worked with the experimental station at Orfordness and remained in residence for two years. The Blind Landing Experimental Unit, formed in October 1945 also moved out in the summer of 1946. Among other post-war uses of the long runway was the first flight of the DeHavilland Swallow "flying wing" jet.

Woodbridge was officially closed as an RAF station on 15 March 1948 having had no more than a holding party present for some months. It was apparently used for limited war surplus storage by the Ministry of Supply for the next four years. However, with the coming of what came to be known as the Cold War and the build-up of NATO forces, Woodbridge was reclaimed by the RAF. Although there were a large number of redundant airfields to choose from, many with much better camp facilities than Woodbridge, ideally jet-powered warplanes required longer runways than the 2,000 yards main on wartime Class A sites. Additionally, wind direction was no longer considered such a critical factor with the heavier jet-powered aircraft.

Although officially remaining an RAF station with token personnel, Woodbridge became a USAF base in June 1952. During that month the 25 F-84G Thunderjets of the 79<sup>th</sup> Fighter-Bomber Squadron moved in, initially with support teams totalling some 400 personnel. This was the third squadron of the 20<sup>th</sup> Fighter Bomber Wing which moved into Wethersfield, Essex at the same time. Development of facilities at Woodbridge were soon commenced and would continue off and on for the next forty years.

An additional hangar and operations building were priorities. A base housing project was commenced in 1954, the initially 80 dwellings concluded in 1957 to be followed by further expansion of family units, all situated between the technical site at the south side of the runway and the Hollesley road. A school, dispensary, and recreational facilities were also provided. A modern disposal system was installed at the wartime sewage works south of the Hollesley road. A further domestic building programme was carried out in later years, and in 1973 a purposebuilt American High School was brought into use. Only 2,600 yards of the centre section of the runway was normally used for flying during the first years of USAF residence. Runway resurfacing was carried out in 1958 and aircraft standings extended.

The 79<sup>th</sup> Fighter Bomber Squadron, later Tactical Fighter Squadron, converted to the swept-wing F-84F Thunderstreak in 1955, and to the larger F-100D Super Sabre in 1957. In a rationalisation of its UK bases, in 1958 the USAF planned to move a second squadron in to Woodbridge, this taking place in December when the 78<sup>th</sup> Tactical Fighter Squadron moved from Shepherd's Grove to convert to the F-101 Voodoo in following months. The 78<sup>th</sup>'s parent unit, the 81<sup>st</sup> Tactical Fighter Wing, was the resident at nearby Bentwaters (originally named Butley) and had taken administrative control of Woodbridge in advance of this movement. Two different types of

aircraft, both with a fighter-bomber mission and able to deliver tactical nuclear warloads, were then based at Woodbridge although major servicing was carried out at the squadrons' parent stations. The 78th TFS converted to the F-4C Phantom in the spring of 1966, and in April 1970 the 79th TFS moved to join the 20th TFW's other squadrons to Upper Heyford and covert to the F-111. However, in a further consolidation the USAF moved the 67th Aerospace Rescue & Recovery Squadron with HC-130 Hercules and HH-3 helicopters up from Spain to take over the vacant facilities at Woodbridge. While this small unit's mission was primarily rescue of downed aircrew, it also had a clandestine roll, finally acknowledged in June 1988 when to all intents and purposes it was redesignated as the 67th Special Operations Group and was soon moved out to Alconbury.

In 1977 the 81st TFW began to give up its Phantoms, receiving instead the A-10A Thunderbolt II which was more commonly known as the "Warthog" because of its ungainly appearance. Its mission was ground forces support, primarily against armoured vehicles. The 81st TFW was expanded with an additional squadron and the following year its 91st TFS was moved the three miles to Woodbridge to join the 78th and prevent congestion at Bentwaters. For the following 14 years the two squadrons and some 50 A-10s continued to operate from Woodbridge. During this period hardened shelters were erected at the eastern end of the site to provide aircraft with protection if the airfield came under attack. The ordnance stores at the western end were also given hardened shelter protection.

With the end of the Cold War and the closing of most USAF bases in the UK, the 78th TFS was inactivated at Woodbridge in May 1992 and the 91st TFS the following August, the American presence soon to be a memory. Rumours circulated that the station was to be sold, but the Army Air Corps at Wattisham took an interest and increasingly, during the last decade of the century, used the runway area for helicopter training exercises. Being short of accommodation at Wattisham, Army personnel were billeted in the housing at Woodbridge airfield and retained the school. In 2002 it was announced that Woodbridge would become a permanent Army base for two forces totalling some 700 personnel. Some one hundred million would be spent on adaptation of the site for Army purposes and it would probably be re-named Hawker Barracks.

#### 3.3 Trial Trenching

Basic details of each trench are given below in Table 1. Narrative accounts of the findings of each trench are then presented on a trench by trench basis. Plans and sections that merit illustration (including those with notable modern services) are shown in Fig. 9.

Two types of topsoil/overburden deposits could be differentiated throughout the site:

- The first, 0002, was encountered wherever 20<sup>th</sup> century disturbance or development had taken place (broadly Areas 1, 2 and 6 as shown in Fig 2). It comprised a soft dark brownish grey silty sandy loam with common brick/tile fragments, moderate root disturbance and rare fragments of other modern refuse (glass, plastic etc.).
- The second, 0003, was encountered in the areas of less disturbed heathland (broadly Areas 3, 4 and 5). This was a soft dark mottled grey silty sand with rare brick/tile fragments and occasional small sub-angular to sub-rounded flint pebbles. A notable darker band could be seen at the base of this deposit at its contact with the underlying sands and gravels. It was unclear whether this could have been due to some form of managed clearance by burning or, more likely, as a natural consequence of leaching and podzolization.

Trench	Dimensions	Area	<b>Archaeological Features</b>	Depth (and type) of Overburden
1	16.5m	$29.7m^2$	None	0.85m (see below)
2	4m	$7.2m^2$	None	0.8m (see below)
3	17m cil	30.6m <sup>2</sup>	None	0.55m (0002)
4	57m	102.6m <sup>2</sup>	None	0.7m (0002)
5	39.5m	71.1m <sup>2</sup>	None	0.7m (0003)
6 QUITE	18.5m	33.3m <sup>2</sup>	None	0.7m (0003)
117 000	18m	$32.4m^2$	None	0.7m (0002) 0.7m (0003) 0.7m (0003) 0.6m (0003)
8	60m	$108m^2$	None	0.7 - 1.1m (0003)
c19	60m	$108m^2$	None	0.5m (0003)
10	28.5m	51.3m <sup>2</sup>	None	0.6m (0003)
11	30m	$54m^2$	0004	0.6m (0003 and see below)
12	31m	$55.8m^2$	None	0.5m (0003)
13	30m	54m <sup>2</sup>	None	0.6m (0003 and see below)

Table 1. Evaluation trench summary

#### Trench 1

Situated in an area of hardstanding/yard amongst some of the earlier buildings in the north-western part of the site between Building 10 to the west and Buildings 11 and 12 to the east this trench revealed some 0.85m of heavily disturbed overburden along its entire length. This directly overlay natural sands. Much modern truncation was recorded, including an earlier concrete path running between buildings 10 and 12 as well as a concrete-capped service trench encountered some 9m from its north-western end. Several patches of hydrocarbon contamination were encountered throughout the trench, presumably from fuel and oil spillages/leakages during the occupation of the base. No archaeological features were encountered.

#### Trench 2

This was also in the far north-western part of the site, between Buildings 14 and 11. Some 0.8m of disturbed modern overburden was again recorded overlying natural sands. Excavation was ceased after only 4m when a concentration of modern services (notably power lines) were encountered just beneath the surface. Further excavation was not considered necessary as the highly disturbed nature of the north-western part of the site was confirmed. No archaeological features were encountered.

#### Trench 3

Situated immediately south-west of Building 20 this revealed a uniform 0.55m of topsoil (0002) overlying the natural sands and gravels. Two services were encountered at its north-eastern end (a fuel oil pipe and recent power cable). No archaeological features were observed.

#### Trench 4

This was adjacent to the north-west to south-east aligned access road running through the centre of the site in order to evaluate the deposits in an area that had been partly occupied by scrub prior to the evaluation. A uniform 0.7m of heavily disturbed topsoil (0002) was recorded throughout the trench, directly overlying natural sands and gravels. Two modern rubbish pits were encountered at 8m and 35m from the north-western end of the trench. Some 9m from the south-eastern end of the trench two service runs were recorded crossing the trench from east to west (one carried a data cable, the other was not investigated). No archaeological features were encountered.

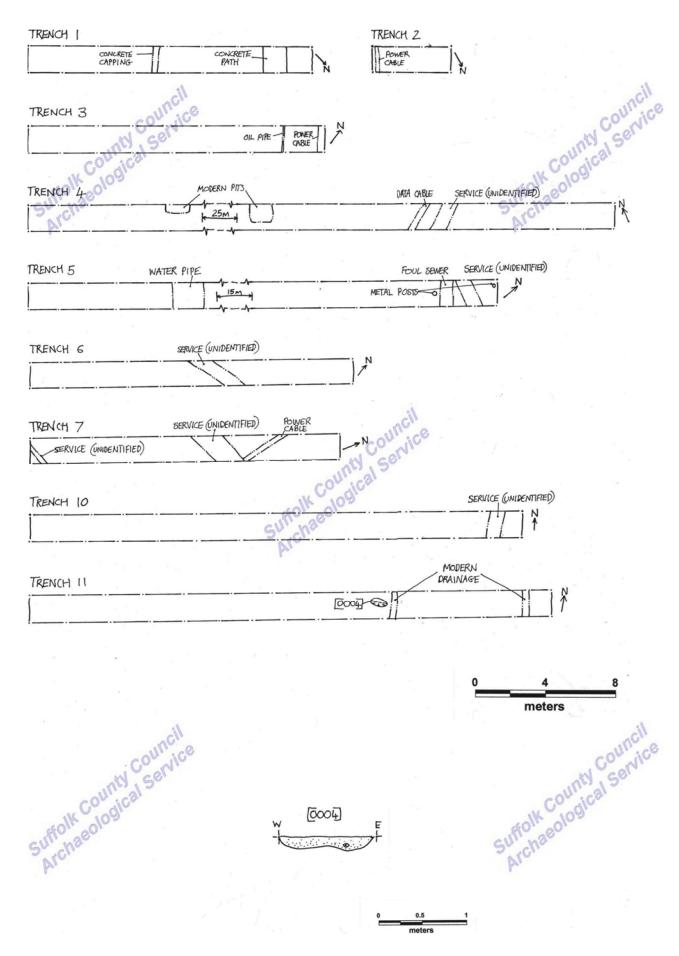


Figure 9. Trench plans and sections

#### Trench 5

This was situated at the north-western edge of Area 3 (Fig. 2) on surviving heathland. A uniform layer of heathland topsoil (0003) 0.7m thick was recorded overlying natural drift deposits. Disturbance by service runs was again evident. Some 8m from the south-western end of the trench a large (1.5m wide and in excess of 1.5m deep) mains water service trench was encountered crossing the trench. At the north-eastern end of the trench another two services (one a concrete-capped foul sewer) were recorded along with two vertical metal posts cut off at ground level. No archaeological features were recorded.

#### Trench 6

Also situated in Area 3 this revealed a uniform 0.7m of topsoil 0003. A single 0.75m wide northwest to south-east orientated service trench was recorded crossing the centre of the trench. No archaeological features were recorded.

#### Trench 7

At the time of the evaluation no disturbance of the heathland that made up the southern part of Area 3 was permitted. Consequently, Trench 7 had to be relocated to the very edge of the area. Some 0.6m of topsoil (0003) was recorded overlying natural drift deposits. Again modern disruption was recorded, this time two separate service trenches on broadly east to west and north-north-west to south-south-east alignments. Neither was investigated further and clearly extended into the area of protected heathland to the north and west of the trench. No archaeological features were encountered.

#### Trench 8

The western half of this trench revealed 0.7m of topsoil (0003) over natural drift. The eastern end of the trench was situated in an area that had only recently been cleared of substantial tree cover. This end of the trench had some 1.1m of overburden, the lowest 0.6m of which was recognisable as topsoil 0003. The uppermost 0.5m comprised a very mixed dump deposit containing frequent brick/tile and other modern rubbish material. The ground level in this part of Area 4 adjacent to the main east to west road did appear slightly raised, presumably as a result of some dumping during base developments but prior to the tree planting that occupied much of Area 4. Visibility was good, despite the disruption caused by a number of substantial tree stumps and no archaeological features were observed.

#### Trench 9

This revealed 0.5m of topsoil (0003) overlying natural sands and gravels. No services were recorded and there was no sign of the dumping observed in Trench 8. Tree disturbance was common and no archaeological features were recorded.

#### Trench 10

This was situated in the centre of Area 5 which had formerly been occupied by sports pitches and despite the uppermost 0.2m of topsoil and turf line being slightly different a uniform layer of topsoil (0003) some 0.6m thick was recorded overlying natural drift deposits. A single modern 0.8m wide service trench running broadly north to south was recorded 1m from the eastern end of the trench. No archaeological features were observed.

#### Trench 11

The majority of this trench was sited on a baseball diamond, in order to test the nature of the deposits used for its construction and their potential for truncation of any archaeological deposits beneath. The following stratigraphy was recorded within the prepared area of the diamond:

# Depth (bgl)Description0 - 0.1mRed "fibrous" sandy clay with small sub-rounded to sub-angular gravel.0.1 - 0.15mLayer of stiff yellow clay with occasional chalk flecks.0.15 - 0.25mCrushed gravel and cinder base layer.0.25 - 0.6mTopsoil (0003)

At the eastern of the trench two equal sized (0.4m wide) parallel drainage trenches were recorded 7m apart. Constructed in a similar fashion to agricultural field drains these clearly served to aid the drainage of the baseball diamond and their alignment suggests that they would have continued for its whole circumference.

Some 10m from the eastern end of the trench a single feature, 0004, was recorded. This was 1.1m long (east to west) and 0.6m wide (north to south) by 0.16m deep with gently sloping irregular sides and an uneven rounded base. It was filled with soft dark greyish brown sand (0005) with frequent gravel inclusions, root disturbance and a single fragment of burnt flint. No dateable finds were recovered but burnt flint is most usually associated with late prehistoric period. Given its irregular profile this has been interpreted as a natural feature such as a tree hollow.

#### Trench 12

A uniform 0.5m thick layer of topsoil (0003) overlay natural drift deposits. No archaeological features were recorded and no modern services could be seen.

#### Trench 13

This was the only trench excavated within Area 6 in the south-western part of the site, as two further trenches in the area had been abandoned (see *Methodology* above). It was situated in the area of another baseball/softball diamond and a similar stratigraphy to that observed in Trench 11 was recorded. No archaeological features or modern services were encountered.

#### 4 Discussion and Conclusions

#### 4.1 Building Recording

Not applicable. See Section 3.1.

#### **4.2 Airfield History**

Not applicable. See Section 3.2.

#### 4.3 Trial Trenching

Given the size of the DA it is thought more appropriate to consider each of the original Evaluation Areas (see Figure 2) separately.

#### Area 1

This was characterised by heavy disturbance caused by the high density of 20<sup>th</sup> century services that criss-cross the yards between the early buildings. All the overburden observed also appeared to be of modern origin. It seems unlikely that the surface of the natural sands and gravels in Trenches 1 and 2 represents a former occupation level. The nature of the deposits in this area suggests that truncation in this part of the site during the construction of the airfield in 1942/43 was severe. It is likely that any archaeological features were destroyed prior to the levelling of the ground on which the Area 1 buildings now stand or during the extensive disturbance that took place during their occupation and use.

#### Area 2

This was less heavily disturbed as Area 1 but still contained numerous service runs between the buildings in the northern part of the area. The southern part of the area was similarly affected by  $20^{th}$  century services, as seen in Trench 4. No buildings were currently standing in this part of the site. However, examination of 1943 aerial photographs (not reproduced here) suggests that the area was occupied by structures at that time, particularly along the edge of the north-west to south-east access road, subsequently demolished during later development of the base. It did not seem as though widespread truncation of the natural sands and gravels had occurred and that archaeological features could have been preserved.

#### Area 3

The northern half of Area 3 was not under protected heathland and was accessible for trenching. The two trenches (5 and 6) revealed numerous modern services but the topsoil deposits were otherwise largely undisturbed, suggesting that should the area have contained archaeological features they would have been clearly visible.

The southern half of Area 3 lay under protected heathland and could not be subjected to trial trenching at the time of the evaluation. Consequently the nature of the deposits remains largely unknown in this part of the site. The single short trench excavated on the very edge of the area (Trench 7) showed that 20<sup>th</sup> century services continued into the area of the protected heathland.

#### Area 4

Despite the recent presence of substantial trees it was clear from the evidence seen in Trench 8 that the northern part of Area 4 had seen dumping activity at some time during the base's development. The presence of the tree cover does not necessarily mean long abandonment as the species concerned, Scots Pine, is capable or rapid growth; certainly rapid enough to have become well established since the earliest developments on the base in the 1940s.

There was no sign of extensive truncation affecting the natural drift deposits in either of the trenches excavated in Area 4 and the preservation of archaeological features would therefore be possible. However, the tree root disturbance seen in much of Trenches 8 and 9 suggests that the quality of any archaeological preservation would be compromised.

#### Area 5

Trenches 10, 11, 12 and the western end of Trench 8 all showed quite thick and largely undisturbed topsoil deposits overlying the natural drift. Services were noticeably fewer than in the northern part of the site and the make up of the baseball diamond seen in Trench 11 was not substantial enough to affect the underlying natural deposits. Conditions for archaeological preservation in Area 5 were therefore favourable, but only a single feature was identified.

This feature, interpreted as a tree hollow, was recorded in Trench 11 and contained a single fragment of burnt flint. This evidence is insufficient to suggest actual occupation but does indicate an ephemeral presence across the site, most likely of late prehistoric date.

#### Area 6

The single trench (13) excavated in this area suggests that conditions for archaeological preservation are favourable in the undeveloped parts of the area. However, more than half of the area has been affected by substantial modern development (barrack blocks and services as well as hard surfaced tennis courts) which would preclude the survival of archaeological deposits.

#### **Recommendations for Further Work**

No further work is recommended for either the Building Recording or Airfield History sections of the evaluation.

Similarly further fieldwork is not recommended in Areas 1, 2, 4, 5 or 6, as these could be adequately assessed by trial trenching which showed that they all had very low archaeological potential.

However, the southern part of Area 3 was not accessible at the time of the evaluation due to the presence of protected heathland. single trench (7) located at its margins was insufficient to characterise the nature of the deposits. It is therefore recommended that programme of monitoring is required when development next affects the area outlined in Fig 10. In this case it is understood that relocation of this patch of

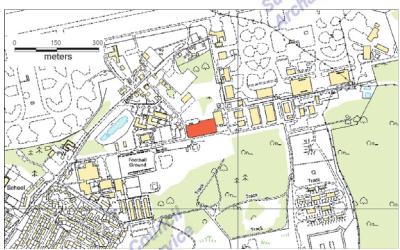


Figure 10. Area requiring archaeological monitoring (© Crown Copyright. All rights reserved. Suffolk County Council Licence No. 100023395 2004)

heathland is to be carried out. The presence of an archaeologist throughout during this relocation is recommended followed by trial trenching of 5% of the area as originally specified.

#### **Bibliography**

MacQueen, J., 2003, Redevelopment of Part of Woodbridge Airfield Archaeology and Cultural Heritage Appraisal, Scott Wilson

#### **Sources used for Airfield History (Section 3.2)**

RAF Woodbridge Operation Records Book, AIR 28/954, National Archives, Kew.

RAF Museum, Hendon, collection re-Woodbridge airfield.

Airfield Research Group journals.

Action Stations 1, by M.J.F.Bowyer.

Flying Through Fire, by Geoffrey Williams.

Report No. 2004/34

Rhodri Gardner, for SCCAS, March 2004.

#### Disclaimer

Any opinions expressed in this report about the need for further archaeological work are those of the Field Projects Division alone. The need for further work will be determined by the Local Planning Authority and its archaeological advisors when a planning application is registered. Suffolk County Council's archaeological contracting service cannot accept responsibility for inconvenience caused to clients should the Planning Authority take a different view to that expressed in the report.

#### **APPENDIX 1**

# SUFFOLK COUNTY COUNCIL ARCHAEOLOGICAL SERVICE - CONSERVATION TEAM

Brief and Specification for an Archaeological Evaluation

#### RAF WOODBRIDGE - SKANSKA SITE

#### 1. Background

- 1.1 An application [C/03/2371] has been made for redevelopment to form new barracks and services. Within this area a development boundary has been defined by Skanska, this brief covers only the development area on their Master Plan.
- 1.2 The Planning Authority has been advised that any consent should be conditional upon an agreed programme of work taking place before development begins (PPG 16, paragraph 30 condition). An archaeological evaluation of the application area will be required as the first part of such a programme of archaeological work; decisions on the need for, and scope of, any further work will be based upon the evaluation.
- 1.3 The development areas lie within the envelope of the ex RAF Woodbridge airfield. The area has never been the subject of archaeological field survey and there are no known archaeological sites recorded in the County Sites and Monuments Record.
- 1.4 The development has been the subject of a 'desk-top' appraisal of 'Archaeological and Cultural Heritage' (Scott Wilson, December 2003) which formed part of the planning application. The document adequately covers the known archaeology around the airfield and indicates the potential for archaeology to exist within the area.
- 1.5 A site walk-over on Wednesday, 17 March, 2004, demonstrated to my satisfaction that there are no earthwork features (e.g. tumuli, bank/ditch systems or early agricultural boundaries) of archaeological significance surviving at the locations for new development. The woodland areas not liable to change were not comprehensively investigated, however, it should be noted that indications of undated earthworks were seen. I conclude that within the area for development there are no surviving above ground archaeological monuments or buildings which are of national importance and worthy of preservation *in situ*; however, there is a need for mitigation by record where standing buildings and any archaeological deposit which may survive below ground are to be disturbed.
- It is the developer's responsibility to identify to the Archaeological Conservation Team all areas where ground disturbance will occur; this brief is based upon an understanding of proposed ground disturbance originating from the 'Proposed Site Master Plan' drawing A107 revision 03 and discussion during a site meeting on 17 March 2004. The site includes areas of heathland which do not show signs of being re-profiled, these areas have high potential for archaeological deposits to survive. There are other areas (e.g. the sports pitches and areas adjacent to pre 1950 buildings) which may have had only slight re-profiling and have moderate potential for survival. Airfield operational areas and recent barracks were identified where it seems likely that ground disturbance has been significant and that any archaeological deposit is likely to have been destroyed. The evaluation outline specification recognises these distinctions. The intention of the

- brief is to evaluate those areas with high to moderate potential for survival which will be disturbed by development
- 1.7 The circular feature referred to at item E7 in the executive summary of the appraisal (site '18' on table 1, page 5), is clearly a modern feature which was part of the sports facilities, it has no archaeological significance.
- 1.8 All arrangements for the field evaluation of the site, the timing of the work, access to the site, the definition of the precise area of landholding and area for proposed development are to be defined and negotiated with the commissioning body.
- 1.9 Detailed standards, information and advice to supplement this brief are to be found in "Standards for Field Archaeology in the East of England" Occasional Papers 14, East Anglian Archaeology, 2003.
- 1.10 In accordance with the standards and guidance produced by the Institute of Field Archaeologists this brief should not be considered sufficient to enable the total execution of the project. A Project Design or Written Scheme of Investigation (PD/WSI) based upon this brief and the accompanying outline specification of minimum requirements, is an essential requirement. This must be submitted by the developers, or their agent, to the Conservation Team of the Archaeological Service of Suffolk County Council (Shire Hall, Bury St Edmunds IP33 2AR; telephone/fax: 01284 352443) for approval. The work must not commence until this office has approved both the archaeological contractor as suitable to undertake the work, and the PD/WSI as satisfactory. The PD/WSI will *provide the basis for measurable standards* and will be used to establish whether the requirements of the planning condition will be adequately met

#### 2. Brief for the Archaeological Evaluation

- 2.1 Identify the date, approximate form and purpose of any archaeological deposit or possible historic structure (e.g. WW2 buildings, unusual Cold War structures) within the defined development area, together with its likely extent, localised depth and quality of preservation.
- 2.2 Evaluate the likely impact of past land uses, with particular regard to the potential for damage by works associated with the construction and use of the airfield, i.e. landscaping; site preparation; sports pitch preparation; building works.
- 2.3 Provide sufficient information to construct an archaeological conservation strategy, dealing with preservation, the recording of archaeological deposits, working practices, timetables and orders of cost.
- 2.4 This project will be carried through in a manner broadly consistent with English Heritage's *Management of Archaeological Projects*, 1991 (*MAP2*), all stages will follow a process of assessment and justification before proceeding to the next phase of the project. Field evaluation is to be followed by the preparation of a full archive, and an assessment of potential. Any further excavation required as mitigation is to be followed by the preparation of a full archive, and an assessment of potential, analysis and final report preparation may follow. Each stage will be the subject of a further brief and updated project design, this document covers only the evaluation stage.
- 2.5 The developer or his archaeologist will give the Conservation Team of the Archaeological Service of Suffolk County Council (address as above) five working days

- notice of the commencement of ground works on the site, in order that the work of the archaeological contractor may be monitored.
- If the approved evaluation design is not carried through in its entirety (particularly in the 2.6 instance of trenching being incomplete) the evaluation report may be rejected. Alternatively the presence of an archaeological deposit may be presumed, and untested areas included on this basis when defining the final mitigation strategy.
- An outline specification, which defines certain minimum criteria, is set out below.

#### **Specification A: Standing Buildings**

- 3.1 All buildings of pre 1950 origin (e.g. the 'Nissen' huts, and a brick built pitched roof hut) and unusual Cold War structures (check for below ground structures) are to be identified, plotted on an OS base map and recorded photographically both externally and internally.
- 3.2 The least 'improved' example of each building type identified above is to be the subject of a measured survey of plan and elevation, and brief description.
- 3.3 All buildings of whatever date within the development area (whether to be demolished, continue in use or abandoned) are to be the subject of a simple photographic record adequately illustrating the building form (e.g. a minimum of front & side views) linked to a location plan.
- Evaluation trenching (see 5.2) is to include areas adjacent to the WW2 structures to 3.4 locate associated hard surfaces and provide information on building footing design.
- Photographs are to be on conventional black & white film stock which is suitable for long 3.5 term archive unless uncompressed images from three-megapixel or better camera are provided, coupled with adequate provision for digital archiving with a recognised archive facility.

#### 4 **Specification B: Airfield History**

- 4.1 Provide a simple history of the airfield development and use (c. 2000 words) plus summary table of significant dates/events to put the building record in context. Include a bibliography of sources.
- 4.2 To inform Section 3 above, use documentary sources to attempt to identify the type and ar activ location of buildings associated with World War II and immediate post-war activity which may survive.

#### 5. **Specification C: Field Evaluation**

- Areas which will not be affected by the proposed building, landscaping or creation of sports pitches are excluded from this evaluation. Areas which have been significantly compromised by airfield development are excluded from this evaluation. These areas are mapped at Figure 1.
- 5.2 In areas where damage to any archaeology may have occurred during earlier site preparation for the airfield or its facilities, evaluation trenching is to be designed and initiated on the basis of 2% by area. However, if, following a site inspection by the Conservation Team archaeologist, disturbance is shown to have been unlikely to cause

- significant damage, or where archaeological levels are shown to exist, the sample is to be increased to 5%. This area is mapped on Figure 1.
- 5.3 In other defined areas, where the site may not significantly re-profiled and certainly where heathland surfaces are apparent (or where trees have been felled), trial trenches are to be excavated to cover a minimum 5% by area and shall be positioned to sample all parts of the defined area. Linear trenches are thought to be the most appropriate sampling method. Trenches are to be a minimum of 1.8m wide unless special circumstances can be demonstrated. If excavation is mechanised a toothless 'ditching bucket' at least 1.2m wide must be used. The trench design must be approved by the Conservation Team of the Archaeological Service before field work begins. (These standards will also apply to trenching under paragraph 5.2).
- 5.4 The topsoil may be mechanically removed using an appropriate machine fitted with toothless bucket and other equipment. All machine excavation is to be under the direct control and supervision of an archaeologist. The topsoil should be examined for archaeological material.
- 5.5 The top of the first archaeological deposit may be cleared by machine, but must then be cleaned off by hand. There is a presumption that excavation of all archaeological deposits will be done by hand unless it can be shown there will not be a loss of evidence by using a machine. The decision as to the proper method of further excavation will be made by the senior project archaeologist with regard to the nature of the deposit.
- In all evaluation excavation there is a presumption of the need to cause the minimum disturbance to the site consistent with adequate evaluation; that significant archaeological features, e.g. solid or bonded structural remains, building slots or postholes, should be preserved intact even if fills are sampled.
- 5.7 There must be sufficient excavation to give clear evidence for the period, depth and nature of any archaeological deposit. The depth and nature of colluvial or other masking deposits must be established across the site.
- 5.8 The contractor shall provide details of the sampling strategies for retrieving artefacts, biological remains (for palaeoenvironmental and palaeoeconomic investigations), and samples of sediments and/or soils (for micromorphological and other pedological/sedimentological analyses. Advice on the appropriateness of the proposed strategies will be sought from P Murphy, English Heritage Regional Adviser for Archaeological Science (East of England). A guide to sampling archaeological deposits (Murphy and Wiltshire 1994) is available.
- 5.9 Any natural subsoil surface revealed should be hand cleaned and examined for archaeological deposits and artefacts. Sample excavation of any archaeological features revealed may be necessary in order to gauge their date and character.
- 5.10 Metal detector searches must take place at all stages of the excavation by an experienced metal detector.
- 5.11 All finds will be collected and processed (unless variations in this principle are agreed with the Conservation Team of SCC Archaeological Service during the course of the evaluation).

- 5.12 Human remains must be left *in situ* except in those cases where damage or desecration are to be expected, or in the event that analysis of the remains is shown to be a requirement of satisfactory evaluation of the site. However, the excavator should be aware of, and comply with, the provisions of Section 25 of the Burial Act 1857.
- 5.13 Plans of any archaeological features on the site are to be drawn at 1:20 or 1:50, depending on the complexity of the data to be recorded. Sections should be drawn at 1:10 or 1:20 again depending on the complexity to be recorded. Any variations from this must be agreed with the Conservation Team.
- 5.14 A photographic record of the work is to be made, consisting of both monochrome photographs and colour transparencies.
- 5.15 Topsoil, subsoil and archaeological deposit to be kept separate during excavation to allow sequential backfilling of excavations.

#### 6. **General Management**

- 6.1 A timetable for all stages of the project must be agreed before the first stage of work commences, including monitoring by the Conservation Team of SCC Archaeological Service.
- 6.2 The composition of the project staff must be detailed and agreed (this is to include any subcontractors).
- 6.3 A general Health and Safety Policy must be provided, with detailed risk assessment and management strategy for this particular site.
- 6.4 No initial survey to detect public utility or other services has taken place. The responsibility for this rests with the archaeological contractor.
- 6.5 The Institute of Field Archaeologists' *Standard and Guidance for Archaeological Desk-based Assessments* and for *Field Evaluations* should be used for additional guidance in the execution of the project and in drawing up the report.

#### 7. **Report Requirements**

- 7.1 An archive of all records and finds must be prepared consistent with the principles of English Heritage's *Management of Archaeological Projects*, 1991 (particularly Appendix 3.1 and Appendix 4.1).
- 7.2 The data recording methods and conventions used must be consistent with, and approved by, the County Sites and Monuments Record.
- 7.3 The objective account of the archaeological evidence must be clearly distinguished from its archaeological interpretation.
- 6.4 An opinion as to the necessity for further evaluation and its scope may be given. No further site work should be embarked upon until the primary fieldwork results are assessed and the need for further work is established

- 7.5 Reports on specific areas of specialist study must include sufficient detail to permit assessment of potential for analysis, including tabulation of data by context, and must include non-technical summaries.
- 7.6 The Report must include a discussion and an assessment of the archaeological evidence. Its conclusions must include a clear statement of the archaeological potential of the site, and the significance of that potential in the context of the Regional Research Framework (*East Anglian Archaeology*, Occasional Papers 3 & 8, 1997 and 2000).
- 7.7 Finds must be appropriately conserved and stored in accordance with *UK Institute of Conservators Guidelines*. The finds, as an indissoluble part of the site archive, should be deposited with the County SMR if the landowner can be persuaded to agree to this. If this is not possible for all or any part of the finds archive, then provision must be made for additional recording (e.g. photography, illustration, analysis) as appropriate.
- 7.8 The site archive is to be deposited with the County SMR within three months of the completion of fieldwork. It will then become publicly accessible.
- 7.9 Where positive conclusions are drawn from a project (whether it be evaluation or excavation) a summary report, in the established format, suitable for inclusion in the annual 'Archaeology in Suffolk' section of the *Proceedings of the Suffolk Institute for Archaeology*, must be prepared. It should be included in the project report, or submitted to the Conservation Team, by the end of the calendar year in which the evaluation work takes place, whichever is the sooner.
- 7.10 County SMR sheets must be completed, as per the county SMR manual, for all sites where archaeological finds and/or features are located.

Specification by: R D Carr

Suffolk County Council Archaeological Service Conservation Team Environment and Transport Department Shire Hall Bury St Edmunds Suffolk IP33 2AR

Date: 24 March 2004 Reference: /RAFWoodbridge-Skansk03

Tel: 01284 352441

This brief and specification remains valid for 12 months from the above date. If work is not carried out in full within that time this document will lapse; the authority should

be notified and a revised brief and specification may be issued.

If the work defined by this brief forms a part of a programme of archaeological work required by a Planning Condition, the results must be considered by the Conservation Team of the Archaeological Service of Suffolk County Council, who have the responsibility for advising the appropriate Planning Authority.

### **APPENDIX 2**

# RAF WOODBRIDGE, SUFFOLK List of Monochrome and Digital Photographs

Convice			Cochio
DESCRIPTION OF PHOTOGRAPH	DATE		D <i>Digital Eq</i> .
general view featuring buildings 111 and 99.	2004/04/29	FKK 30	adica
general view featuring buildings 115 and 113.	2004/04/29	FKK 31	09
general view featuring buildings 201 and 200.	2004/04/29	FKK 33	
general view featuring buildings 203 and 201. View facing SE	2004/04/27	FKI 15	P4270045.JPG
general view featuring buildings 203 and 201. View facing SE	2004/04/27	FKI 16	P4270045.JPG
general view featuring buildings 203 and 201. View facing SE	2004/04/27	FKI 17	P4270045.JPG
general view featuring buildings 203 and 201. View facing SE	2004/04/27	FKI 18	P4270045.JPG
general view featuring buildings 299, 298 and 202.	2004/04/29	FKK 32	
general view featuring buildings 209, 208, 214 an 213. View facing NW	2004/04/26	FKH 21	P4260006.JPG
general view featuring buildings 299 and 298.	2004/04/29	FKK 34	
Sporting feature 595. View facing SE	2004/04/29	FKK 36	
Building 3. View facing NW	2004/04/27	FKI 24	P4270055.JPG
Building 3. View facing SE	2004/04/29	FKK 29	
Building 6. View facing S	2004/04/27	FKI 25	P4270056.JPG
Building 8. View facing S	2004/04/28	FKK 22	P4280050.JPG
Building 8. View facing E	2004/04/28	FKK 23	P4280051.JPG
Building 9. View facing S	2004/04/28	FKK 26	P4280062.JPG
Building 10. View facing NW	2004/04/28	FKK 13	P4280039.JPG
Building 3. View facing SE  Building 6. View facing S  Building 8. View facing S  Building 8. View facing E  Building 9. View facing S  Building 10. View facing NW  Building 10. View facing NW  Building 10. View facing NE	2004/04/28	FKK 12	P4280038.JPG
Building 10. View facing NE	2004/04/28	FKK 11	P4280036.JPG
Buildings 10 and 'f'. View facing NW	2004/04/28	FKK 19	P4280047.JPG
Buildings 'f' and 10. View facing SW	2004/04/28	FKK 15	P4280043.JPG
Building 11. View facing NW	2004/04/28	FKK 10	P4280033.JPG
Building 11. View facing SW	2004/04/28	FKK 9	P4280029.JPG
Building 12. View facing E	2004/04/28	FKK 16	P4280044.JPG
Building 12. View facing NW	2004/04/28	FKK 7	P4280027.JPG
Building 12. View facing N	2004/04/28	FKK 17	P4280045.JPG
Building 12. View facing NW	2004/04/28	FKK 6	P4280026.JPG
Building 12. View facing NE	2004/04/28	FKK 18	P4280046.JPG
Building 13. View facing SE	2004/04/28	FKK 5	P4280021.JPG
Building 13. View facing NW	2004/04/28	FKK 4	P4280019.JPG
Building 13. View facing S	2004/04/28	FKK 3	P4280016.JPG
Building 14. View facing NE	2004/04/28	FKK 20	P4280048.JPG
Building 14. View facing SW	2004/04/28	FKK 21	P4280049.JPG
Building 15. View facing NE	2004/04/28	FKK 24	P4280054.JPG
Building 15. View facing NW	2004/04/28	FKK 25	P4280056.JPG
Building 15. View facing NW	2004/04/28	FKK 1	
Building 16. View facing E	2004/04/28	FKK 2	P4280015.JPG
Building 16. View facing SW	2004/04/28	FKJ 34	P4280014.JPG
Building 20. View facing SE	2004/04/28	FKJ 33	P4280013.JPG
Building 20. View facing SW	2004/04/28	FKJ 32	P4280012.JPG

Building 20. View facing NW	2004/04/28	FKJ 31	P4280011.JPG
Building 20. View facing NE	2004/04/28	FKJ 30	P4280010.JPG
Building 20. Interior view, facing SW	2004/04/28	FKJ 29	P4280009.JPG
Building 21. View facing NW	2004/04/28	FKJ 28	P4280008.JPG
Building 21. View facing SW	2004/04/28	FKJ 27	P4280007.JPG
Building 21. View facing NE	2004/04/28	FKJ 25	P4280005.JPG
Building 21. View facing SE	2004/04/28	FKJ 26	P4280006.JPG
Building 28(?). View facing NE	2004/04/28	FKJ 21	P4280001.JPG
Buildings 29 and 30. View facing NE	2004/04/28	FKJ 24	P4280004.JPG
Buildings 30 and 29. View facing SW	2004/04/28	FKJ 22	P4280002.JPG
Building 99. View facing S	2004/04/27	FKI 8	P4270038.JPG
Building 99. View facing S	2004/04/27	FKI 7	P4270038.JPG
Building 99. View facing N	2004/04/27	FKI 11	P4270041.JPG
Building 99. View facing NW	2004/04/27	FKI 10	P4270040.JPG
Building 111. View facing SE	2004/04/27	FKI 12	P4270042.JPG
Buildings 112, 118 and 113. View facing SE	2004/04/27	FKI 13	P4270043.JPG
Buildings 113 and 115. View facing SW	2004/04/27	FKI 14	P4270044.JPG
Building 114. View facing E	2004/04/26	FKI 6	P4260037.JPG
Building 200. View facing SE	2004/04/26	FKI 5	P4260034.JPG
Building 201. View facing E	2004/04/26	FKH 33	P4260030.JPG
Building 202. View facing E	2004/04/26	FKH 30	P4260027.JPG
Building 203. View facing NE	2004/04/26	FKI 1	P4260031.JPG
Building 203. View facing NE	2004/04/26 2004/04/26 2004/04/26 2004/04/26 2004/04/26 2004/04/26 2004/04/26 2004/04/26	FKI 2	P4260031.JPG
Building 205. View facing NW	2004/04/26	FKH 23	P4260008.JPG
Building 206. View facing NW	2004/04/26	FKH 29	P4260026.JPG
Building 207. View facing N	2004/04/26	FKH 31	P4260028.JPG
Building 208. View facing NW	2004/04/26	FKH 27	P4260012.JPG
Building 209. View facing NW	2004/04/26	FKH 22	P4260007.JPG
Building 210. View facing N	2004/04/26	FKH 26	P4260011.JPG
Building 211. View facing NW	2004/04/27	FKI 22	P4270053.JPG
Buildings 223 and 212. View facing NW	2004/04/27	FKI 20	P4270051.JPG
Buildings 224 and 213. View facing NW	2004/04/27	FKI 19	P4270050.JPG
Building 214. View facing NW	2004/04/26	FKH 28	P4260013.JPG
Buildings 218 and 215. View facing NW	2004/04/27	FKI 21	P4270052.JPG
Building 219. View facing NW	2004/04/26	FKH 19	P4260001.JPG
Building 220. View facing NW	2004/04/27	FKI 23	P4270054.JPG
Building 234. View facing NE	2004/04/26	FKH 24	P4260009.JPG
Building 241. View facing NE	2004/04/26	FKI 3	P4260032.JPG
Building 245. View facing NE	2004/04/26	FKI 4	P4260033.JPG
Building 247. View facing W	2004/04/26	FKH 20	P4260005.JPG
Building 500. View facing E	2004/04/27	FKJ 10	P4270069.JPG
Building 506. View facing N	2004/04/27	FKJ 12	P4270071.JPG
Building 506. View facing S	2004/04/27	FKJ 11	P4270070.JPG
Building 521. View facing SW	2004/04/27	FKJ 13	P4270072.JPG
Building 566. View facing SW	2004/04/27	FKJ 20	P4270079.JPG
Building 575. View facing E	2004/04/27	FKJ 6	P4270063.JPG
Building 576. View facing NW	2004/04/27	FKJ 5	P4270062.JPG

	Building 579/580. View facing E	2004/04/27	FKJ 19	P4270078.JPG
	Building 580. View facing N	2004/04/27	FKJ 9	P4270068.JPG
	Building 581. View facing NW	2004/04/27	FKJ 7	P4270066.JPG
	Building 582. View facing NE	2004/04/27	FKJ 18	P4270077.JPG
	Building 583. View facing NE	2004/04/27	FKJ 17	P4270076.JPG
	Building 585. View facing NE	2004/04/27	FKJ 2	P4270059.JPG
	Building 590. View facing NE	2004/04/27	FKJ 16	P4270075.JPG
	Buildings 593, 592, 591 and 590. View facing SW	2004/04/29	FKK 35	09.
C	Building 591. View facing NE	2004/04/27	FKJ 14	P4270073.JPG
2	Building 591, 592 and 593. View facing NE	2004/04/27	FKJ 15	P4270074.JPG
	Building 594. View facing SE	2004/04/27	FKI 26	P4270057.JPG
	Building 596. View facing NE	2004/04/27	FKJ 3	P4270060.JPG
	Building 597. View facing NW	2004/04/27	FKJ 4	P4270061.JPG
	Buildings 599 and 598. View facing SW	2004/04/28	FKK 27	
	Buildings 598, 599 and 600. View facing NW	2004/04/27	FKJ 1	P4270058.JPG
	Buildings 599 and 600. View facing SE	2004/04/28	FKK 28	
	Building 600. View facing SW	2004/04/28	FKJ 23	P4280003.JPG
	Building 'a'. View facing W	2004/04/26	FKH 25	P4260010.JPG
	Building 'b'. View facing SW	2004/04/26	FKH 32	P4260029.JPG
	Building 'c'. View facing SE	2004/04/27	FKI 9	P4270039.JPG
	Building 'd'. View facing NE	2004/04/27	FKJ 8	P4270067.JPG
	Building 'e'. View facing SW	2004/04/28	FKK 8	P4280028.JPG
	Building 'f'. View facing NW	2004/04/28	FKK 14	P4280040.JPG
		Holkeolos		
	51	Chae		
		2004/04/26 2004/04/26 2004/04/27 2004/04/27 2004/04/28 2004/04/28		

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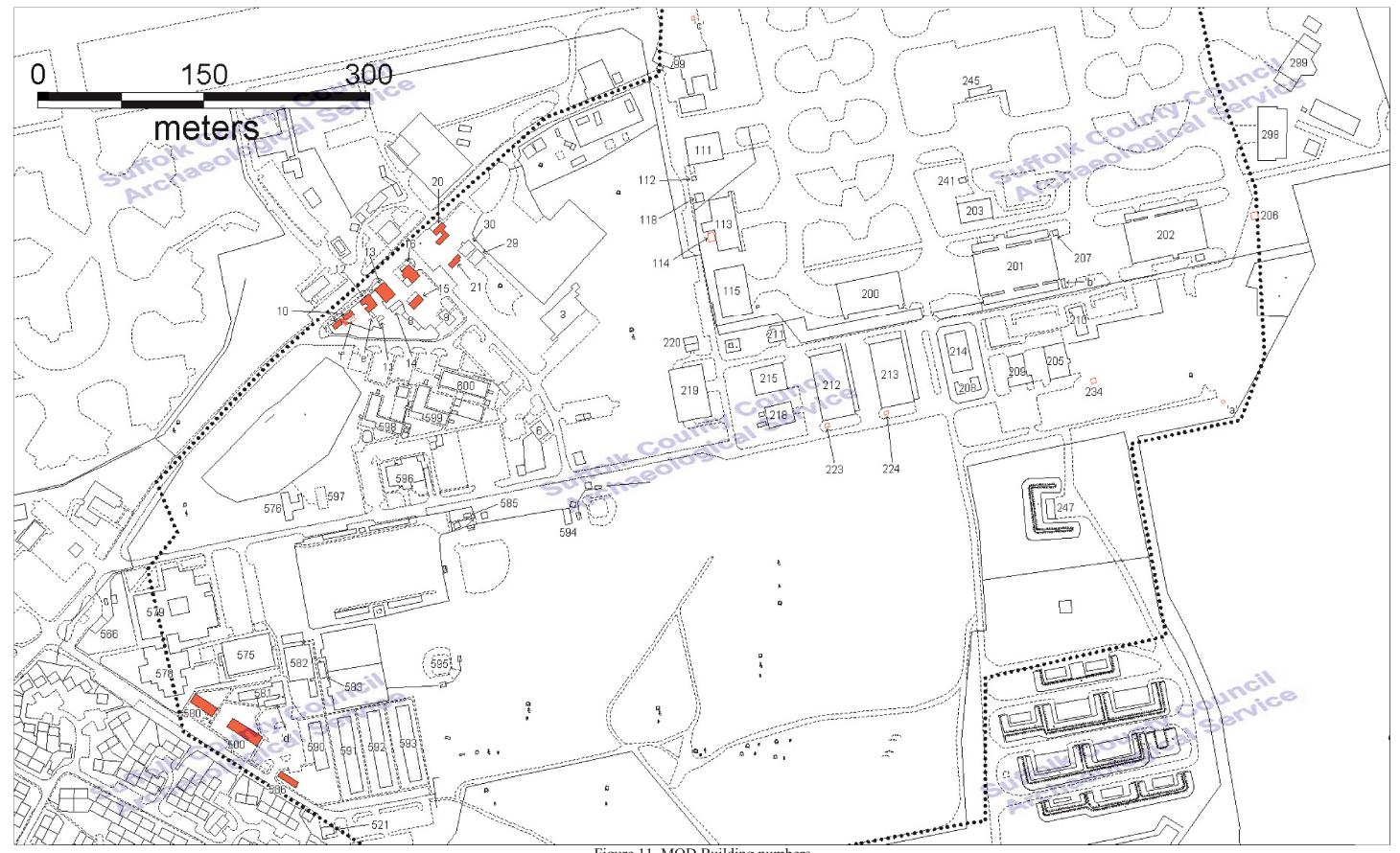


Figure 11. MOD Building numbers
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Building 3. View facing NW (P4270055)



Building 9. View facing S (P4280062)



Building 6. View facing S (P4270056)



Building 10. View facing NW (P4280039)



Building 8. View facing S (P4280050)



Building 10. View facing NW (P4280038)



Building 8. View facing S (P4280051)



Building 10. View facing NE (P4280036)



Buildings 10 and 'f'. View facing NW (P4280047)



Building 12. View facing E (P4280044)



Buildings 'f' and 10. View facing SW (P4280043)



Building 12. View facing NW (P4270027)



Building 11. View facing NW (P4280033)



Building 12. View facing N (P4280045)



Building 11. View facing SW (P4280029)



Building 12. View facing NW (P4280026)



Building 12. View facing NE (P4280046)



Building 13. View facing SE (P4280021)



Building 13. View facing NW (P4280019)



Building 13. View facing S (P4280016)



Building 14. View facing NE (P4280048)



Building 14. View facing SW (P4280049)



Building 15. View facing NE (P4280054)



Building 15. View facing NW (P4280056)



Building 16. View facing E (P4280015)



Building 20. View facing NW (P4280011)



Building 16. View facing SW (P4280014)



Building 20. View facing NE (P4280010)



Building 20. View facing SE (P4280013)



Building 20. Interior view, facing SW (P4280009)



Building 20. View facing SW (P4280012)



Building 21. View facing NW (P4280008)



Building 21. View facing SW (P4280007)



Buildings 29 and 30. View facing NE (P4280004)



Building 21. View facing NE (P4280005)



Buildings 30 and 29. View facing SW (P4280002)



Building 21. View facing SE (P4280006)





Building 28 (?). View facing NE (P4280001)



Building 99. View facing N (P4270041)



Building 99. View facing NW (P4270040)





Building 111. View facing SE (P4270042)



Building 200. View facing SE (P4260034)



Bldgs 112, 118 & 113. View facing SE (P4270043)



Building 201. View facing E (P4260030)



Buildings 113 and 115. View facing SW (P4270044)



Building 202. View facing E (P4260027)



Building 203. View facing NE (P4260031)





Building 205. View facing NW (P4260008)



Building 209. View facing NW (P4260007)



Building 206. View facing NW (P4260026)



Building 210. View facing N (P4260011)



Building 207. View facing N (P4260028)



Building 211. View facing NW (P4270053)



Buildings 223 and 212. View facing NW (P4270051)



Building 219. View facing NW (P4260001)



Buildings 224 and 213. View facing NW (P4270050)



Building 220. View facing NW (P4270054)



Building 214. View facing NW (P4260013)



Building 234. View facing NE (P4260009)



Buildings 218 and 215. View facing NW (P4270052)



Building 241. View facing NE (P4260032)



Building 245. View facing NE (P4260033)





Building 247. View facing W (P4260005)



Building 521. View facing SW (P4270072)



Building 500. View facing E (P4270069)



Building 566. View facing SW (P4270079)



Building 506. View facing N (P4270071)



Building 575. View facing E (P4270063)



Building 576. View facing NW (P4270062)



Building 579/580. View facing E (P4270078)



Building 580. View facing N (P4270068)



Building 581. View facing NW (P4270066)



Building 582. View facing NE (P4270077)



Building 583. View facing NE (P4270076)





Building 590. View facing NE (P4270075)



Building 591. View facing NE (P4270073)



Building 597. View facing NW (P4270061)



Bldgs 591, 592 and 593. View facing NE (P4270074)



Bdgs 598, 599 and 600. View facing NW (P4270058)



Building 594. View facing SE (P4270057)



Building 600. View facing SW (P4280003)



Building 596. View facing NE P4270060)



Building 'a'. View facing W (P4260010)



Building 'b'. View facing SW (P4260029)





Building 'c'. View facing SE (P4270039)



General view bldgs 203 and 201. View facing SE (P42700745)



Building 'd'. View facing NE (P4270067)



General view bldgs 209, 208, 214 and 213 (P4260006)



Building 'e'. View facing SW (P4280028)