A Report on Building 50
The RAF Feltwell Second World War
Lubricants and Inflammable Material Stores Facility

An Historical Report of Bldg 50
and Its Context With RAF Feltwell

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Introduction

This brief study was prepared to meet the requirements of Norfolk County’s Sites and Monuments Record and to provide background material for English Heritage’s growing database of Second World War historic buildings. It will also be used to augment the 48th Fighter Wing’s growing collection of information on RAF Lakenheath’s and Feltwell’s wartime infrastructure.

RAF Feltwell History

Background. Construction of airfields between 1935 and 1940 constitute a section of history for the Royal Air Force known as the “expansion period,” primarily because of Germany’s rearmament and overtones of militarism in the early 1930s. The RAF Expansion Period essentially began in 1935 following site recommendations and surveys conducted by the Air Ministry in 1934. Already a First World War aerodrome site, RAF Feltwell provided an ideal location for heavy bombers with the Air Ministry selecting the site in late 1935. Construction commenced in 1936 under the oversight of the Directorate General of Works, a technical branch of the Air Ministry which held a myriad of responsibilities to include aerodrome construction and facility maintenance.

The Royal Air Force’s “Expansion Period” Construction

The Committee of Imperial Defence, one of the government bodies responsible for reviewing Britain’s defense plans, recommended to abolish Britain’s 10-Year Rule in 1932. The 10-Year Rule, which originated with British Prime Minister Lloyd George’s War Cabinet, essentially recommended that Britain should frame its post-war air forces under the expectations that Britain would not be in a major conflict “for the next ten years.” That philosophy prevailed throughout 1929, 1930, and 1931. However, Japanese aggression in Manchuria prompted the Chiefs of Staff to recommend a revised strategy, chiefly to eliminate the 10-Year Rule and to increase Britain’s security through the means of additional flying squadrons and

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1 Designers for the RAF were very cognizant of the need to mitigate disruption to the countryside by constructing a large, modern aerodrome in the middle of a largely agrarian area. Equally important was the Air Ministry’s concerns that obtrusive military buildings would raise the concerns of politicians and the general public that England was on a path to rearmament.

2 During World War I the Royal Flying Corps operated from 300 operational and training aerodromes in England. By 1924, however, this figure had dwindled to a mere 24 operational stations. The development of a single-wing aircraft and the RAF’s focus on a bomber-oriented offensive against Germany prompted the British government to initiate expansion plans to beddown a number of bomber units. Under “Scheme C,” the RAF Expansion program sought to develop bomber bases in the eastern counties that would enable the bomber force to be able to reach Berlin in a latitudinally straight line. These would later be called the “Bomber Counties” during the Second World War.

aerodromes. Germany’s rearmament beginning in 1932, compounded by its
departure from the negotiation table during the disarmament Conference in October
1933 and from the League of Nations in 1933, prompted Britain to once again review
its defense strategy.4

To the British government, Germany’s rearmament and overt militarism
signaled one of two possible outcomes: strong rhetoric in the face of a world-wide
depression or the mobilization of German society for one purpose—expanding
Germany’s influences through open conflict. The latter was somewhat validated
when Hitler became chancellor of Germany in 1933 and began a plan to bolster
Germany’s air might. A number of government schemes were developed to bolster
the RAF’s strength between 1934 and 1939, each bearing a letter as proposed by the
Cabinet. Scheme A, which called for a front-line strength of 1,544 aircraft, also
included the construction of a number aerodromes in eastern England. The Cabinet
approved the scheme in July 1934 and planned to construct a number of air bases to
include four two-squadron heavy bomber stations located at Marham, Feltwell,
Stradishall, and Waddington.5

At the instruction of Prime Minister Ramsey McDonald, the Royal Fine Arts
Commission became heavily involved in airfield design. Three well-known
architects, Sir Edwin Lutyens, Sir Reginald Blomfield, and Giles Gilbert Scott, and
the planning authority Professor S D Adshead, began a process of consultation with
the Air Ministry. These and other members visited Upper Heyford and Abingdon in
1931 which would be the first of a series of site visits to proposed Expansion Period
sites. This new direction in airfield design also resulted in the selection of A. Bulloch
in 1934 as the first architectural advisor to the Director of Works and Buildings.
Bulloch presented his plans for Feltwell and Marham to the royal Fine Arts
Commission (RFAC) meeting on 28 November 1934 with the commissioners
expressing their concern over an absence of homogeneity between the two
aerodromes, notably their asymmetry.6 Nonetheless, the commissioners approved
many of the facility plans designed between 1934-1935 with Lutyens later handling
other matters including layout and liaison efforts.

Of particular interest to engineers and designers was the permanent nature of
these newer aerodromes, an idea also under consideration by engineers within the

5 The Cabinet also approved, in rapid succession, Schemes C, F, L, and M, which called for 1,500
aircraft in two years, 2,500 first-line airframes by march 1939, 23 squadrons, respectively for C and F
while scheme M replaced scheme L which called for a re-vamped 2,250 first-line aircraft force by
March 1942.
6 Paul Francis, *RAF Scampton: An Operational History and Gazetteer of Surviving Structures*, English
Heritage ARP Report No.26, June 2004. Paul Francis’ report of RAF Scampton provides detailed
background information on the Expansion Period aerodromes as well as the architecture and building
styles of these unique airfields, including designs similar to RAF Feltwell. Paul notes that compared to
RAF Waddington, which contained symmetric lines, Marham and Feltwell contained two roads that
formed a “V”-shaped arrangement that ran perpendicular to the access roads. The ends of the “V”
met the curve of hangars with technical buildings placed inside the “V” shape. In turn, spaces inside the
“V” were dissected into triangles with roads connecting to the arms of the main roads.
U.S. Army Air Forces who were designing modern airfields using architectural styles compatible with a particular region. The Works Directorate began designing a simple yet elegant architectural style that could easily be replicated between aerodromes to include a number of permanent-type specialist facilities that would support multi-squadron units. The architectural style chosen was essentially Georgian, with subtle variations being adapted to the local environs. In Feltwell’s case, the country Georgian style was adopted but with Art Deco overtones, notably walls, windows, and roofs with distinct vertical and horizontal thrusts. Finishes on the facilities consisted of hand-finished brickwork while roof tiles were selected to blend with the older stately homes of Norfolk and Suffolk.

Once completed, facility designs were reviewed by the Royal Fine Arts Commission while the Society for the Preservation of Rural England reviewed compatibility of the countryside and the placement of structures. As a result, “the first generation of bases constructed after 1934, was a curious blend of Garden City planning and architecture for married quarters, neo-Georgian propriety for the barracks and other domestic buildings, and a watered-down “Moderne” style for the technical buildings.”

However, unlike Ebenezer Howard’s Garden City design which incorporated a single road to separate domestic from work areas, the expansion era airfields were somewhat simple. Four distinct groups of buildings dominated the aerodrome to include technical, communal, housing, and bomb stores, with the latter located at the opposite end of the aerodrome to avoid blast damage and injuries to the living and operational areas.

Engineers completed RAF Feltwell during the spring of 1937 with the Royal Air Force taking possession of the airfield that same month. The aerodrome, constructed by various government contractors, was completed with three grass runways and 29 pan-shape hardstands (including one square-shaped hardstand) by 1941. The hardstands were laid in clusters with hardened access strips to facilitate movement to and from the runways. These were located near Grange Farm and Field Farm on the south side and east side of the aerodrome, respectively. A T2 hangar was later erected near Field Farm and another to service the dispersal cluster on the

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7 Randolph Field, Texas and Hickam Field, Hawaii, were examples of American aerodrome development during the mid-1930s, a period also referred to as the expansion era for the U.S. Army Air Corps. As part of the design team at Randolph, Maj Howard Nurse designed Hickam Field (now Hickam AFB) using ideas based on Ebenezer Howard’s Garden City hub and poke community motif, a movement popular in England between 1880-1940. This design incorporated function with comfort, essentially providing a work center with a feel of community in which families would feel comfortable without the feeling of living in an industrial environment.


eastern side of the aerodrome. The RAF constructed additional domestic accommodations in 1941 which would facilitate a total population of 1,719 male and 515 female personnel. Finally, the RAF assigned Feltwell the Pundit Code “FL” and concrete lettering laid to the south of southwesterly hangar for aircrews to identify the station during flight.\textsuperscript{11}

The accommodations were designed in a circular arrangement, a design distinctly different from the wartime airfields in which many of the buildings were dispersed. Engineers located the technical buildings behind or adjacent to the hangars since bomber units required larger hangars and considerable more space for materiel including spare parts, lubricants, and other necessities. Airmen’s quarters were also located near the technical buildings to accommodate an easy walk to and from the workcenters, a concept not too dissimilar to the Garden City concept. With the commencement of hostilities between Germany and the allies in 1939 the RAF began camouflaging buildings with paint, netting, or other materials to blend with the countryside. Members of the Royal Air Force stationed at Feltwell painted a number of buildings, much of which is still extant in 2009, mainly on the larger facilities to include hangars, messes, and barracks buildings. Some of the smaller stores facilities also received camouflage on both the sides and the roof, some of which may be seen on building 50.\textsuperscript{12}

\begin{center}
\includegraphics[width=\textwidth]{map.png}
\end{center}

This illustration depicts Building 50 (in the red circle) in context with the three of the five wartime hangars (in green circles). Similar to other expansion era airfields, building 50 and other technical buildings were built in proximity to the squadron areas to facilitate quick and easy access to stores and materiel.

\textsuperscript{11} Ibid.
In terms of wartime operational history, RAF Feltwell has hosted a number of operational, training, and support units. The airfield was also of interest to Germany’s Luftwaffe, the first recorded attack coming on October 27, 1940 when a hangar was hit. There were five more attacks during the first half of 1941 and another hangar was set on fire during a night raid in May. In all probability these raids resulted from enemy intelligence establishing that Feltwell was one of the key Bomber Command stations in East Anglia utilizing Wellentons to attack Reich targets.

Table One illustrates RAF Feltwell’s operational chronology and major units associated with the station.
Table 1

RAF Feltwell Unit History

<table>
<thead>
<tr>
<th>Unit</th>
<th>Aircraft</th>
<th>Operational Dates</th>
</tr>
</thead>
<tbody>
<tr>
<td>37 Squadron, (3 Gp)</td>
<td>Harrow, Wellington I</td>
<td>26 Apr 1937 - 13 Nov 1940</td>
</tr>
<tr>
<td>75 Squadron (NZ), (3 Gp)</td>
<td>Wellington I, II</td>
<td>8 Apr 1940 – 15 Aug 1942</td>
</tr>
<tr>
<td>57 Squadron, (3 Gp)</td>
<td>Wellington I, II, III</td>
<td>18 Nov 1940 – 4 Sep 1942</td>
</tr>
<tr>
<td>1519 BAT</td>
<td>Oxfords, Horsa Gliders, Wellington X, Halifaxes, Ansons</td>
<td>Nov 1941 – 26 Jun 1945</td>
</tr>
<tr>
<td>487 Squadron (2 Gp)</td>
<td>Ventura II</td>
<td>15 Aug 1942 – 3 Apr 1943</td>
</tr>
<tr>
<td>192 Squadron (3 Gp)</td>
<td>Mosquito IV, Wellington X</td>
<td>5 Apr – 25 Nov 1943</td>
</tr>
<tr>
<td>Bombing Development Unit</td>
<td></td>
<td>4 Nov 1943 – 1 Jun 1945</td>
</tr>
<tr>
<td>320 Squadron (2 Gp)</td>
<td>Mitchell II</td>
<td>Apr-May 1943</td>
</tr>
<tr>
<td>1473 RCM Flt (3 Gp)</td>
<td>Tiger Moth; Wellington; Anson; Whitley</td>
<td>Sep – Nov 1943</td>
</tr>
<tr>
<td>3 LFS (3 Gp)</td>
<td>Lancaster I, III</td>
<td>Nov 1943 – Jan 1945</td>
</tr>
<tr>
<td>1903 AOP Flight</td>
<td>Auster AO6P</td>
<td>1956 - 1957</td>
</tr>
<tr>
<td>No 3 Flying Training School</td>
<td>Tiger Moths, Harvards, Prentices, Provosts</td>
<td>9 Apr 1947 – 30 Apr 1958</td>
</tr>
<tr>
<td>No 77 Squadron</td>
<td>Thor IRBM</td>
<td>1 Sep 1958 – 1 Jul 1963</td>
</tr>
</tbody>
</table>

AOP-Air Observation Post; BAT-Beam Approach Training; Gp-Group; IRBM-Intermediate Range Ballistic Missile; LFS-Lancaster Finishing School; NZ-New Zealand


As depicted by Table 1, post-war use of Feltwell remained largely training for RAF aircrews until 1958 when the RAF decided to use the installation as a missile base. The RAF and USAF co-operated the newly arrived Thor Intermediate Range Ballistic Missile (IRBM) with the RAF maintaining the installation. Construction of Thor infrastructure commenced in June 1958, chiefly on the south side of the installation near the old First World War aerodrome dispersal area. The RAF activated Number 77 (Strategic Missile) Squadron on 1 September 1958 to receive the first missiles which began arriving in November. The Thor weapon system, however, would only remain at Feltwell for a short period since the missile’s vulnerability to ground and air attack prompted the RAF to remove the missiles in 1963. Many of the missiles removed from Feltwell would be used to support the U.S. space program, notably the Gemini and satellite projects. It bears mention that the
USAF maintained a cadre of personnel at the base supported by an air base wing at nearby RAF Mildenhall. At that time, Air Force personnel occupied portions of the military housing while dependent children attended either local British or Department of Defense schools at Mildenhall or Lakenheath.13

The United States Air Force took possession of RAF Feltwell on 8 July 1968 when it became a satellite installation of RAF Mildenhall.14 At that time, Americans began occupying the 190 military family housing units built for the RAF during WW II. It was during this time that both the Army Air Forces Exchange Service (AAFES) and Department of Defense Dependent Schools began utilizing former RAF facilities for retail and educational activities, respectively. The RAF Feltwell Family Housing Annex (later redesignated the RAF Feltwell Storage Annex and RAF Feltwell Storage Site) once again changed hands when the 48th Tactical Fighter Wing assumed administrative control of the installation on 30 November 1974. Between 1974 and 2009 various support units have been present at Feltwell including a DODDS middle school, Precision Measurement Equipment Laboratory (PMEL), and Airmen Leadership School.15

Building 50 Utilization

Very little history has been written about the various stores buildings that were built on the Expansion Period airfields. Building 50, with several counterparts at other Expansion Period aerodromes, was a standard three-squadron stores facility for the RAF. Upwood and Feltwell maps depict four C-Type hangars in a curve with the fifth hangar behind either the hangar to the left or right. A small rectangular building is located behind the second hangar and has been identified as the stores for inflammables, carbide, kerosene, and lubricants. The small stores building sat adjacent to the main stores building which would have been the main facility for receiving and storing aviation and personnel supplies.

Building 50 is a typical storage facility with Art Deco “moderne” features, with two lower side rooms bisected by the main structure. Each of the side rooms are accessed by doors from the sides of the buildings while the four main rooms in the center of the structure are accessed by either single- or double-doors configurations. All of the doors and locks appear to be original, with the locks of a standard skeleton key configuration. The door handles are substantial as the doors are made of iron and somewhat heavy.

The doors on the front of the building bear raised lettering under layers of brown paint (standard USAF paint scheme beginning in the 1990s) while the two side

14 Headquarters USAFE activated the Feltwell Family Housing Annex on 8 July 1968 and assigned it to RAF Mildenhall.
doors contain no markings of any type. The left double doors contain the word “INFLAMMABLES,” suggesting that non-flammable materials such as cleaning fluids were stored in this area. A concrete curb approximately six inches in height lines the doorway, a measure added to perhaps contain spills. Similarly, the two smaller, middle doors bear the letters “CARBIDE,” which presumably would have secured various carbide supplies for the aircraft and flightline functions. The lettering on the far right double door bears the letters “KEROSINE.” Each of the other doorways likewise contain a six-inch curb in the entrance way.

A concrete pintel sits atop each of the doors and wooden louvered windows located above each pintel which would have served as ventilation to the building. Four windows with substantial, half-inch steel frames are connected to the window frames with one-inch bars serving to prevent inadvertent access to the facility. The barred windows appear to be original and perhaps served to secure the valuable wartime materiel inside during a period of rationing, notably kerosene which was heavily rationed throughout the war. The interior floors are all concrete with all walls constructed of single-layer, nine-inch brick. The building is predominantly red brick with darker grey or red brick randomly interspersed for artistic effect. The walls appear to have once been painted a lighter shade of color to perhaps blend with the surrounding environment. Light shades of camouflage paint also appear to have been added to the building to soften the building’s lineaments. It bears mention that the iron fixtures for securing camouflage netting so prevalent on smaller buildings are absent from Building 50, hence the faded camouflage paint. The rear of the building contains eight windows of equal spacing, each of which contains bars on the windows’ exteriors to prevent outside access. One of the small rooms on the right side of the building also contains a barred window.

The facility is accessed by a small driveway that connects with the main access road. This small driveway would have facilitated delivery and pick-up of supplies since the building sits near the main stores building. Typical of the Expansion Period aerodrome technical facilities, Building 50 sits adjacent to Hangars 4 and 5 which would have provided ready access to the stores for cleaning aircraft components or for providing kerosene or carbide to the general flightline area.

The few wartime and immediate post-war records that do exist do not mention Building 50. However, since the aerodrome maintained an aircraft training function through 1958 it may be assumed that the building was utilized for its original purpose until that time. Similarly, the Thor period does not mention Building 50 or its use during the brief period the IRBM was operational at Feltwell. However, RAF members present at Feltwell during the early 1960s vaguely remember the building being used to store supplies, notably kerosene for use in fueling portable heaters.

When the U.S. Air Force’s occupation of the aerodrome commenced in 1968 no mention of the building is made until 1973 when the Boy Scouts and Girl Scouts

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16 Carbide would have been used to clean aircraft parts and for lighting. Carbide, when combined with water, produces a flammable gas which was used to power lights for industrial use.
used its interior to hold supplies. In 1979 the Department of Defense Dependent Schools assumed responsibility for a number of the smaller technical facilities and began storing laboratory supplies for the nearby Lakenheath Middle School. Documents posted on the walls dating back to 1982 and sundry boxes containing disused Bunsen burners, test tubes, and other items with contemporary markings lined shelves throughout the middle two rooms. Similarly, older locker cabinets containing school ephemera littered many of the rooms as did discarded Girl and Boy Scout supplies and bulletin boards. At least four layers of paint are discernable on damaged or gouged corners or walls, suggesting that the facility was continuously painted for extensive use. The facility apparently once again fell into disuse in the late 1990s as DODDS began utilizing other facilities for storage.
Plan and Photograph Contextual Overlays

A westerly view of the building illustrating the original driveway.
For orientation purposes, the doors face south while the back of the building faces north.
The rear of the building illustrating the Art Deco influences including the horizontal thrust of the windows and roof in contrast to the vertical thrusts accentuated by the smaller side rooms.
An easterly view of the facility. This photo depicts the camouflage applied to the exterior, still visible after 70 years.
A photo of the left storage room containing storage shelves built by Department of Defense Dependent Schools (DODDS) personnel in the early 1980s.
This photograph illustrates the concrete ceiling which still bears the elongated imprints of the wooden planks used to form the frame for holding the concrete.
The double doors leading to the left set of storage rooms. This set of doors bore the word “INFLAMMABLES” stenciled beneath layers of brown paint, and was probably used to store hydraulic fluid and other non-combustive materials.
The entrance to the lubricants room and the curb at the base of the doorway. This curb was installed perhaps to contain spills and serve as a door jam.
The interior of the lubricants room illustrating the wall and entrance to the second room. Also pictured are the supply cabinets and leftover materials when DODDS personnel used the room as storage for their science labs. Boxes on the shelves were filled with old test tubes, petrie dishes, bunson burners, and other equipment. The bulletin board and side of the archway contained letters to DODDS personnel dated 1982, subjects of which related to the proper use of lab chemicals and disposal procedures.
Pictured is the interior of the left side of the lubricants storage room. Visible are the original metal window frames and wooden louvers for ventilation. Also visible is the original light fixture, curiously the only light fixture in the entire building.
The original electrical junction box on the south wall of the lubricants room.
One of the storerooms containing modern storage shelves and supplies for the DODDS middle school.
DODDS memorandums dated 1982 and 1983 relating to chemical safety for students and faculty.
One of the original doors and locks. Note the substantial construction of the door and industrial style lock for securing the stores contained in the building. Each of the rooms contained these doors and locks.
The kerosene room with the original tank to the right and disused DODDS filing cabinets.
The original kerosene tank and supports. The turn handle and spigot would have provided access for ground crews transporting containers of kerosene to the hangars or flightline.
A westward view of the building’s eastern side. Note the lighter camouflage paint scheme to tone down the red brick.
A ground level view of the bars on the original steel-framed windows.
Conclusion. Building 50 is a period technical building that was constructed between 1936-1937. As such it is a snapshot in time of the mental template of architects attempting to blend regional design with functionality. It is one of several buildings of its type, a number of which still remain throughout RAF aerodromes in East Anglia. Because of its disuse and absence of non-restorative activity it is slowly becoming derelict and poses a safety risk for military members, their families, and students at the nearby DODDS middle school.
SOURCES

Books


Reports
