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An Assessment of a Second World War Hangar Structure at Tollerton Airfield, Rushcliffe, Nottinghamshire

Paul Francis

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TOLLERTON AIRFIELD RUSHCLIFFE NOTTINGHAMSHIRE

AN ASSESSMENT OF A SECOND WORLD WAR HANGAR STRUCTURE AT TOLLERTON AIRFIELD, NOTTINGHAMSHIRE

Paul Francis

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SUMMARY

A Second World War Air-Raid Precautions (ARP) Fire Watcher's Shelter that has certain characteristics similar to a pillbox was listed in 2012 at Grade 2, because its relationship with 17 defence structures positioned around the airfield boundary. New research has proven that it, along with a few other structures (all non-designated heritage assets now demolished), were a part of mandatory ARP facilities provided by Tollerton Aircraft Services for the protection of the firm's workforce.

CONTRIBUTORS

Paul Francis researched and wrote the report.

ACKNOWLEDGEMENTS

The following people assisted in the preparation of this report; Barry Abraham (Airfield Research Group, ARG) (decd), Sam Foster, Chris Lowe (ARG), Wayne Cocroft (Historic England, HE), Albert Gunn, PDS Marwood, Ian Anderson (ARG), AH Hampshire, Denis Marshall, Richard Flagg (ARG), Steve Hurst (ARG), John Davis, J Kitchen, and Rex Morris.

ARCHIVE LOCATION

Some of the material used in this report is held by the Airfield Research Group.

DATE OF RESEARCH

01/12/2017

CONTACT DETAILS

Airfield Research Group

CONTENTS

PART 1: INTRODUCTION

1.1 Background

This report investigates the significance of a Listed Second World War structure (1402074) located on Tollerton Airfield at NGR: SK 61544 36017 which remains as part of a partly demolished hangar. The structure has previously been thought to have been associated with the inner defences of Tollerton airfield all of which were Listed on 30 January 2012 at Grade II, for the following reasons.

- Historic Interest: For the role it played in the strategic defence of Tollerton airfield during the Second World War.
- Group value: It has strong group value as one of 18 surviving pillboxes surrounding Tollerton Airfield.
- Rarity: It is part of an unusually large group of pillboxes which rarely survive in such numbers. It is also a particularly rare form of pillbox.

There is a current application for the demolition of the listed 'pillbox'.

1.2 Scope

This report is primarily about a structure now identified as a Fire Watcher's Shelter or Post inside a wartime civilian company hangar. The structure was not associated with airfield defence or the RAF, but was connected with the factory's Air-Raid Precautions (ARP). The report examines the civilian aspect of the site's history leading up to and including the Second World War. The report does not examine the military aspect of Tollerton airfield (though references are made where appropriate). The military history of Tollerton airfield is adequately covered in the CgMs *Statement of Significance Report* (HHR/JCH00086/01) of July 2017. Civilians and military personnel operated completely independently, the main hangar area had its own access routes off the public highway and was separated from the RAF site by fencing and lines of hedges (Figures 1, 2 & 3). Factory staff rarely mixed with RAF personnel; the only military interaction that they may have occurred was that some staff were members of the local Home Guard unit. Note that in terms of site classification with regards to ARP, the main hangar and its annexes are classified as a 'factory' and as such had to comply not only with pre-war factory acts, but also certain statutory wartime emergency acts and memoranda – these are examined in Part 3.

1.3 Site Visit

The site was visited on 5 December 2017, and the surviving fragment of the hangar and offices were photographed. Notes and took measurements (mostly by counting bricks) were taken. It was not possible to gain access to the structure, owing to its poor condition and difficult access. All other wartime and pre-war buildings apart from airfield defences had already been removed.

Figure 1: The main hangar (factory site) in 1947, there are two Stanton air raid shelters side-by-side in the bottom left corner, these belonged to the RAF and were outside the factory boundary fence and close to the RAF domestic site. [Aerofilms (Britain from Above) © Historic England EAW 009528]

Figure 2: Google Earth image of the site [© GoogleEarth]

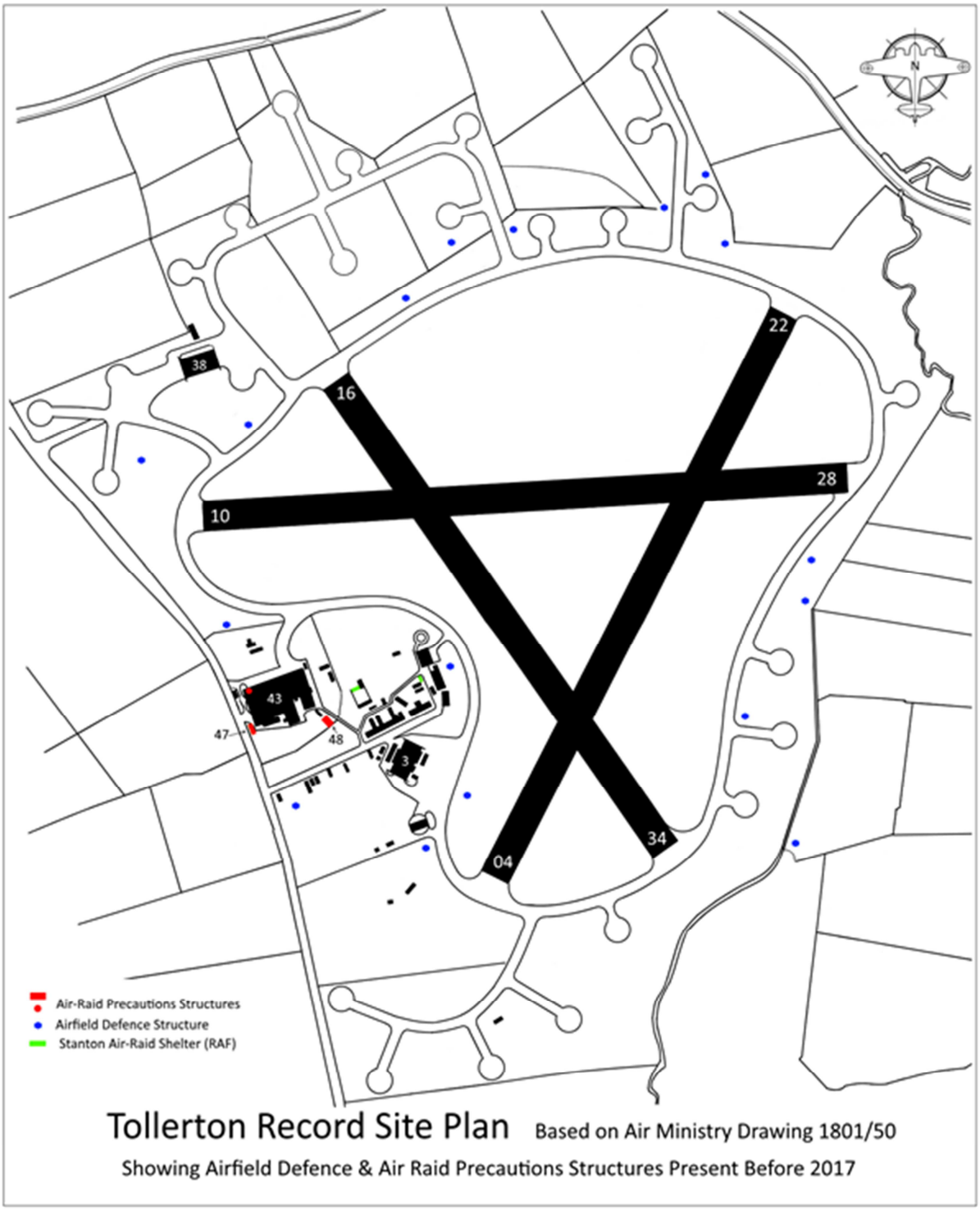


Figure 3: 1950 Site Plan – note that the inner airfield defence pillboxes are in groups of three forming defensive triangles, almost all outside of the taxi-track. This triangular arrangement is of a standard defensive pattern. There is one outside the airfield perimeter and this may form part of the outer defences, while another lone example is located in front of the clubhouse. [Drawing: Paul Francis]

PART 2: DESCRIPTION OF THE FIRE WATCHER'S SHELTER

2.1 Description

The shelter is positioned at the NW corner of the main hangar and rises to three-storey height; one storey above a two-storey suite of offices that are aligned on the west elevation of the hangar and the Gamston/Tollerton Road (Figures 4, 5 & 6). It occupies a position behind the main door stacking area wind-bracing and supporting side stanchions of part of the lattice girder that supported the roof trusses over the main doors.

Figure 4: Main hangar during demolition. [Milan Petrovic February 2017]

To the north is a typical defence location of three pillboxes arranged in a triangular pattern (the nearest is 300 feet away at NGR: SK 61529 36105) which faces away from the hangar.

The shelter is constructed with three walls of 13.5 inch brick and the fourth was formed by the Trafford tile cladding of the hangar. The asbestos cladding would offer insufficient protection to the fire watcher during an air-raid, so it is quite likely that this elevation apart from a roof access door, would be supplemented by a sand bagged wall. There are a limited number of metal brackets connecting the brick work and roof slab to the hangar wind bracing girders. These are light brackets, and may have helped with preventing slight movement.

Figure 5: To the left of the rainwater pipe a slightly raised portion of cladding indicates the position of the door that was used by the fire watchers to gain access to the roof. [Milan Petrovic 07-08-2009]

Figure 6: There are two ladders, one at either end of the roof truss, allowing access to the pair of roof gullies. [Milan Petrovic 07-08-2009]

2.2 The Hangar Offices and Fire Watcher's Shelter as seen 05 December 2015

Internally, the ground floor offices extended out by roughly 3 feet from the first-floor offices, the ceiling joists forming a walkway (with railings) at first floor level running full length along the rear elevation of the office accommodation (Figures 7-15). During the Second World War, the walkway could be accessed from the ground floor by a staircase at the main hangar door end, positioned against the supporting structure of the fire watcher's shelter – this was removed post-war when a new steel-framed and breeze block clad storage area was erected adjacent to it and against the door stacking area and first main door. There is a surviving portion of this walkway above the surviving portion of offices.

The roof joists of the first-floor offices have been extended in height to just below the concrete slab floor of the fire watcher's shelter. This may indicate that as originally built, the office roof was lower, and the fire watcher's shelter had yet to be built. This difference in construction, may reflect the publishing of Government's mandatory orders and acts of parliament concerning fire watchers and defence against fire on factory premises (see Part 3). The fire watcher's shelter survives in a precarious condition.

2.2A Ground Floor

The rear (east) wall of the ground floor offices is 4.5 inch brick (stretcher bond), this also forms the supporting structure for the first-floor walkway. There are a couple of cased steel stanchions present (within the wall) as well as a series of wooden windows and a doorway with staircase to the first floor.

2.2B First Floor

The brick supporting structure for the shelter at first floor level also has external walls of only 4.5 inch brick – further along are doorways to the front offices. The east elevation is fair-face brick apart from a window opening, while the south side elevation consists of two brick piers forming a doorway – these appear to be built above the walkway wooden floor. The roof over the first floor consists of a series of 8 by 2 inch joists.

2.2C Fire Watcher's Shelter (Second Floor)

The shelter is constructed of full-width 13.5 inch brick, on the north and east elevations only, these are laid in English bond (9 inch external face and 4.5 internal face – laid as English bond but with cut headers). The south elevation is 13.5 inch brick for half of the width, the remaining area is open and forms a doorway. There is an iron hand rail present, indicating that access was from an iron ladder. The west elevation (over the offices) is now completely open, the hangar cladding (Trafford tiles) having been removed exposing some steel framework for supporting the Trafford tile cladding.

There are three 'loop holes', one on the south-east corner and two along the front (east) elevation, the north elevation is 'blind'. These have partly been cast in concrete as part of the roof slab, the sides and lower portion of the loop hole is brick. These allow a view inside the hangar, with a focus on the roof structure. The shelter had limited headroom, the loop holes are positioned only 3 feet from the floor and rises 1 foot, this indicates that the watcher would have been sitting at his post, the low position of the loop hole enabling the floor space directly in front of his position to be easily seen, although the hangar floor space would have been cluttered with aircraft.

The structure appears to have all the hallmarks of being hurriedly built with little thought to fire safety, being reliant on standard off-the-shelf unprotected floor joists. If these had caught fire then it would have come crashing down, despite this, three walls were constructed heavy brick and included a roof that was proof against incendiary bombs and a concrete slab floor (this may be a screeded patent hollow fire-proof floor such as Smith's flooring).

The office roof is nominally flat, constructed of timber joists and felt-covered boarding. As far as can be seen, there was no way for the fire watcher to view the condition of the office roof, without leaving his post (this may have been a function of a colleague). The structure has been built slightly offset of the supporting brickwork which may also indicate that it was hurriedly built.

The hangar framework appears to have been supplied by the Appleby-Frodingham Steel Co and the internal brickwork are Flettons 'Phorpres' made by the London Brick Company near Peterborough.

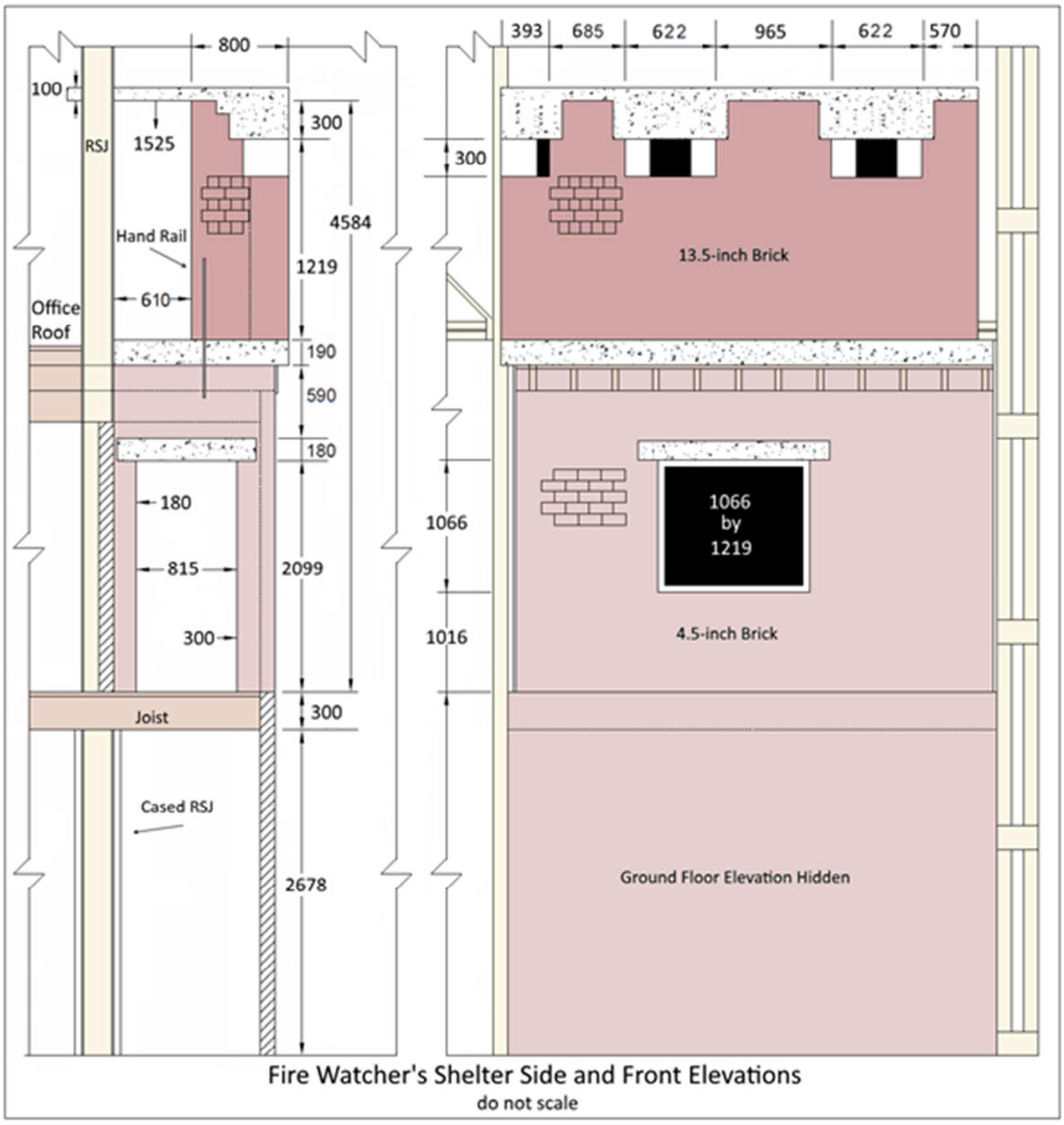


Figure 7: Firewatcher's Post. [Drawing by Paul Francis]

Figure 8: The ground floor and first floor offices and their relationship with the fire watcher's post. [Paul Francis 05-12-2017]

Figure 8: Exterior view looking south showing blind end of the fire watcher's post and door wind bracing. [Paul Francis 05-12-2017]

Figure 9: Exterior view looking east, it is partially hidden by the parapet wall of the flat roof. [Paul Francis 05-12-2017]

Figure 10: View from the hangar's interior showing the front (east) elevation. Note the row of joists below the floor slab. [Paul Francis 05-12-2017]

Figure 11: View from the hangar's interior showing entrance side (south) elevation. [Paul Francis 05-12-2017]

Figure 12: View from the hangar's interior of the fire watcher's shelter. [Paul Francis 5 December 2017]

Figure 13: View from the hangar's interior of the fire watcher's shelter. [Paul Francis 5 December 2017]

Figure 14: Views showing the metal brackets from the hangar wind girder framework preventing movement of the brick work and roof slab. [Milan Petrovic 15-03-2017]

Figure 15: Views showing the metal brackets from the hangar wind girder framework preventing movement of the brick work and roof slab. [Milan Petrovic 15-03-2017]

2.3 Conclusion

The structure has certain characteristics (such as the presence of loopholes), that are similar to a pillbox erected for defence against attacking forces, but on further investigation it appears that this is not the case. Beyond all reasonable doubt, it has been identified as an Air Raid Precautions fire watcher's post, the reasons for this are as follows:

- The hangar was operated by civilians as an aircraft repair facility, it was never occupied by military forces.
- The rear wall which faces the airfield is not constructed of brick and instead relies on the asbestos cement cladding of the hangar for protection. A few hundred yards away there is a military defence locality, making the rear of the shelter vulnerable to stray bullets during an attack on this position.
- There is evidence of a doorway at the rear of the structure to the office roof where there are two ladders for access to the hangar roof – for fire-fighting purposes.
- The ceiling height is inside the structure is too low for a person to stand up, suggesting that the occupier would have been sitting rather than standing.
- There were Government statutory regulations in place for the protection of factory workers in time of war, which firms had to comply with.
- There were other factory type ARP structures close by such as an air-raid shelter and a decontamination / first-aid post.
- Examples of fire watcher's posts survive or have been recorded elsewhere that are similar to the Tollerton structure.

PART 3: FACTORY AIR-RAID PRECAUTIONS (ARP)

3.1 Background

The Government's policy for protection of the civil population against the hazards of aerial bombardment was laid down in many official publications and Acts of Parliament. There were statuary obligations imposed upon local authorities, landowners and employers to provide certain standards of protection. The relevant acts were:

- Air Raid Precautions Act of 1937
- Fire Brigades Act of 1938
- Civil Defence Act of 1939.

Detailed information regarding the organisation of an air-raid precautions scheme for an industrial establishment was contained in *Air Raid Precautions for Government Contractors*, issued by the Air Ministry (amongst other Government departments). Briefly, the general considerations were that personnel and plant in factories should be protected against the effects of air-raids to give security and confidence to the workers.

Certain duties, such as first-aid, fire-fighting, defence against gas, decontamination, rescue and salvage work could only be performed with training.

It was the duty of occupiers of factory premises to report the provision of air-raid shelters for persons working in the factory to the district factory inspector. Accommodation required for the protection and operation of ARP services consisted of:

- ARP control post
- First-aid post with trained staff and cleansing facilities
- Fire-fighting squads and fire watchers
- Rescue and salvage squads
- Decontamination squads and gas searcher personnel
- Key men who must remain tendering their plant (such as furnace operators).

All of the above was to be provided with splinter-proof and incendiary bomb-proof accommodation and these had to be positioned close to the scene of activity.

3.2 First-Aid Post and Cleansing Centre - NGR: SK 61667 35970 (demolished)

First-aid posts and the ARP posts had also to be gas-proofed, generally to the standard laid down in ARP booklet No.6, and Home Office pamphlet *First-Aid Posts*, dated April 1938. The cleansing centre (Figures 16 & 17) should adjoin the first-aid post so that slightly wounded, contaminated personnel could be cleansed first before receiving treatment for conventional wounds.

The criteria for a surface first-aid post and cleansing centre was as follows:

- Gasproof entrances and exit points, with air-locks, all entrances and doorways should be accessible by the passage of stretchers
- Gas filtration was not necessary, but ventilation should be provided when the building not in use.
- Separate access points for wounded and fit and able.
- Dirty clothing area or weatherproof shed where contaminated personnel should take off and leave behind their clothing.

Figure 16: Cleansing (decontamination) and first-aid post (Bldg.48), view looking SE, now demolished. [Paul Francis 07-08-2009]

Figure 17: Cleansing (decontamination) and first-aid post (Bldg.48) – a view looking NW, now demolished. [Richard Flagg 07-08-2009]

3.3 Fire Watchers Wartime Regulations

After the outbreak of war, fire watching became compulsory so that occupiers of business premises had by law to make arrangements for fire watching. Compulsory fire watching was provided for under Regulations 26A, 27A & B and 38 of the Defence (General) Regulations, 1939. These were:

- The Fire Watchers Order No.1677 (19 September 1940)
- General Regulations Order No.68 (15 January 1941) – mainly applied to housing rather than industry.
- Fire Prevention (Business Premises) Order No.69 (18 January 1941.
- Civil Defence Duties (Compulsory Enrolment) Order No.70 (18 January 1941).
- There were also Government (HMSO) issued handbooks available:

    ARP Handbook No.6: *ARP in Factories and Business Premises*, 1938

    ARP Handbook No.9: *Incendiary Bombs*, 1938

    ARP Handbook, No.14: *The Fire Guard's Handbook*, 1942 (mainly written for the organised local authority Fire Guard Service who might be volunteers or compulsory enrolled. Published in 1942, it gave important changes in procedure, based on over two years of war).

3.4 Fire Watchers in Business Premises

Occupiers of businesses were required to make proper and adequate arrangements to ensure that fires occurring at their premises because of a hostile attack would be quickly detected and dealt with. The following requirements applied:

- An adequate number of persons for discharging fire prevention duties were always present at the premises and that they were aware of their duties
- That adequate fire prevention equipment was always available on the premises
- The fire watcher had to be always present during the duty period.
- During a period in which a hostile attack was in progress either in the vicinity, or when an air-raid warning was in operation, the watcher would be in readiness to detect outbreaks of fire and to summon assistance as well as being available to use fire-fighting appliances. An air-raid warning was assumed to last from the sound of the warning signal to the sounding of the raiders past signal.

A typical fire squad consisted of six people, under the command of a leader and a squad was always on duty during day and night. All personnel were trained in the use of fire-fighting appliances. Two were always on patrol and the remainder were ready for instant action. Should an incendiary device land on the roof, one of the

patrol would immediately tackle it, while the others offered assistance, having called for help.

Incendiaries were classified as the following types:

- Medium case intensive type designed to penetrate and set fire to buildings and bring the incendiary agent into direct contact with the material to be damaged.
- Medium case scatter type containing groups of smaller incendiary agents scattered by the explosion of the bomb to set fire to readily combustible materials, such as hutments and grain fields, etc.
- Heavy case intensive type for attack on solidly constructed targets such as buildings roofed in concrete.

3.5 Types of Fire Watchers Posts

Shelters for fire watchers and look-out posts were constructed in a variety of ways, from fixed local designs in brick or a combination of brick and or concrete and sandbags, to commercially available portable steel shelters (see Appendix 'A'). They might be at ground-level, or high-level but almost always sited in the corner of buildings.

Fire equipment was provided for dealing with fires and incendiary bombs in buildings. Firefighting equipment (fire engines and pumps) were stored in splinter-proof and incendiary bomb-proof shelters.

3.6 Air-Raid Shelter (Bldg.47) – NGR: SK 61544 35958 (demolished)

Factory shelter accommodation was covered by the Civil Defence Act, 1939, Part III Sections 12 to 23. Basically, this meant that factories had to provide adequate air-raid shelters for their staff, and these had to be constructed to an approved standard. Once built, they had to be inspected by the local factory inspector and there were hefty fines to be paid for any factory not complying with the order.

The building illustrated below was an air-raid shelter that post-war was converted into a metal store and was identified on the 1950 site plan as a 'store' (Figures 18 & 19) As originally built it would have had two shelter rooms (with separate entrances) separated by a shared central emergency exit. The evidence in support of this being an air-raid shelter is as follows:

- Its construction was similar to others as seen at the aircraft works at Filton.
- It had vented 13.5 inch brick walls laid in English bond (a very strong wall) which supported a 4 inch concrete slab roof (proof against most incendiary devices).
- The floor slab was raised (in case of flooding).
- The large doors were not original, but the central door opening had been bricked up.

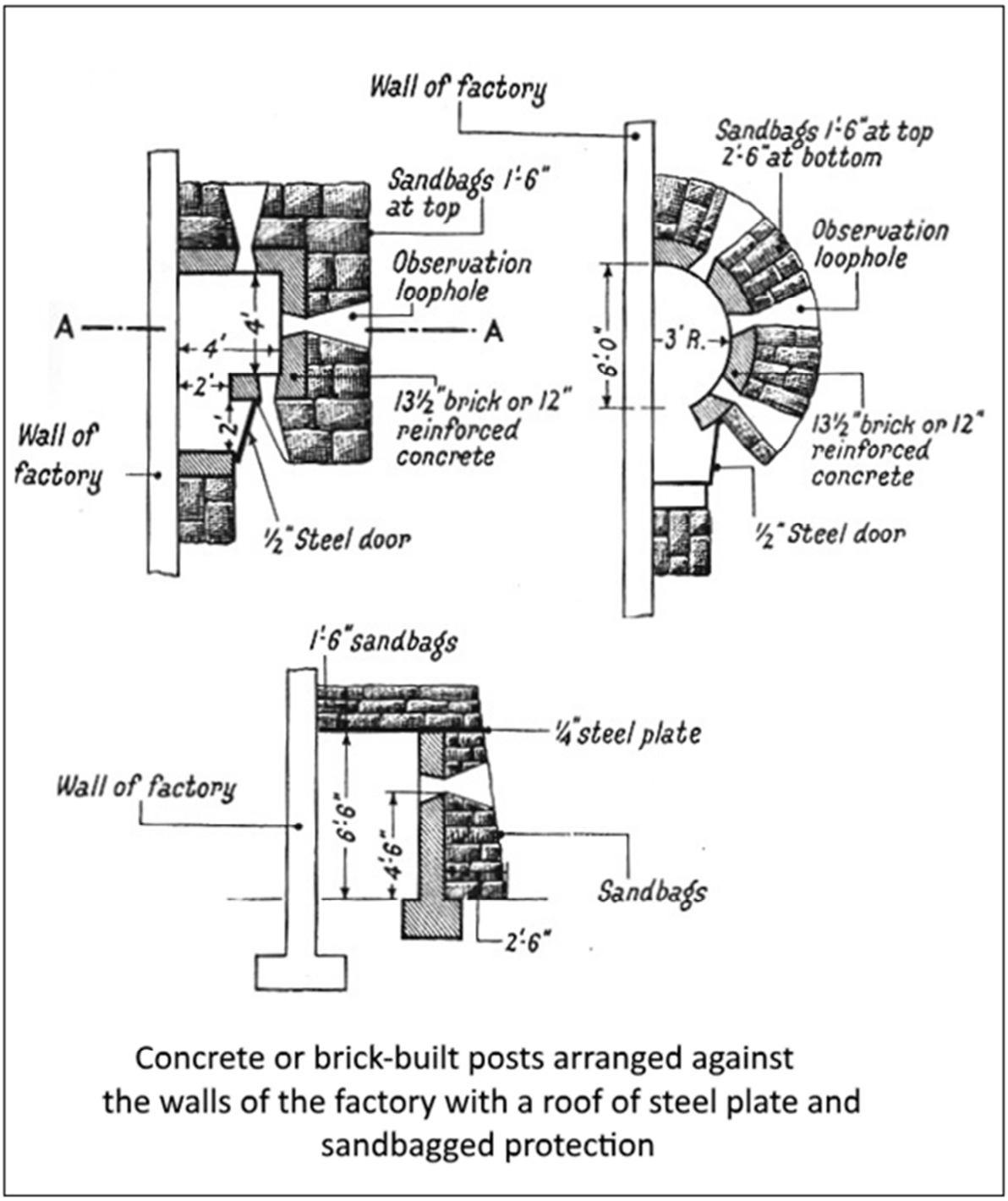
- It was positioned close to the public road for easy access by emergency services.

It had two emergency escape apertures with 4.5 inch brick panels at the rear, for kicking out in an emergency (see Figure 19). In contrast, the aerodrome had many locally made Stanton arched precast concrete shelters, at least two were extant in 2009 at NGR: SK 61790 36007 and SK 61747 36006.

Figure 18: Air-raid shelter front (modified) elevation (Bldg.47). [Richard Flagg 07-08-2009]

Figure 19: Air-raid shelter (Bldg.47) rear elevation showing two emergency escape apertures. [Milan Petrovic February 2017]

APPENDIX 'A' FIRE WATCHER POSTS DESIGN EXAMPLES



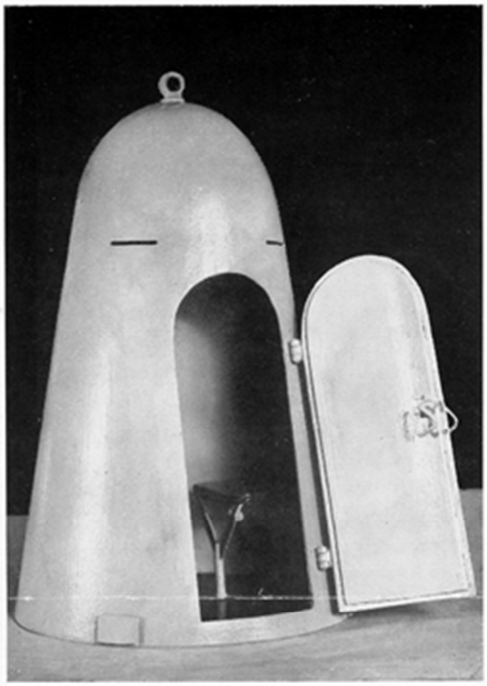
Concrete or brick-built posts arranged against the walls of the factory with a roof of steel plate and sandbagged protection

Figure 20: Internal fire watcher's shelter designs (Glover 1941, Civil Defence). Note that these are built against an existing factory wall.

Figure 21: Fire watcher's shelter inside a north-light hangar – NGR: SJ 81013 84727 (hangar) at Ringway (Manchester Airport). [Ian Anderson]

Figure 22: Built above the toilet annexe is this external example - NGR: SP 33466 61235, at Bishop's Tachbrook - a Stirling aircraft repair factory. The extra height enabled good views over two Bellman hangars. [Paul Francis 1993]

CONSTRUCTORS—SOLENT



PATENT APPLIED FOR

"CONSOL"

PORTABLE SHELTERS PROVIDE SECURITY

for KEY PERSONNEL

MANUFACTURED FROM HEAVY BULLET-PROOF STEEL PLATE

Key personnel unable to leave their posts during air raids must be assured protection. The "Consol" Shelter is designed for this purpose; manufactured from bullet-proof steel plate, it **provides protection against splinters, shrapnel, falling masonry, glass, etc.**

The "Consol" Shelter is readily portable and may therefore be stored until an emergency arises. A strong eye at the apex facilitates transport and removal to the "action station."

Holes in the base are provided for anchoring to the ground or floor.

The "Consol" Shelter is supplied in three sizes for one, two or four men.

Finish Battleship Grey.

Type No.	Accommodation	Height	Diameter	Approx. Weight
MK. I	One man	5ft.	3ft.	9 cwt.
MK. II	Two men	6ft. 6in.	4ft.	10 cwt.
MK. IV	Four men	7ft.	4ft. 9in.	14 cwt.

Figure 23: Portable Consol Shelter advert

Figure 24: Concrete fire watcher's shelter at the Bristol Aeroplane factory – NGR: ST 59969 79218, Filton (one of many built there). [Paul Francis 22-06-2005]

Figure 25: Brick fire watcher's post Royal Ordnance Factory Bishopston – NGR: unknown. [Paul Francis October 2009]

APPENDIX 'B' AIRCRAFT MAINTENANCE & REPAIR

B1 Background to Wartime Aircraft Repair Organisation at Tollerton

Aircraft repair before 1938 presented few problems; military aircraft requiring repairs were dealt with by RAF Maintenance Command, others demanding further resources were sent back to the manufacturer. It was only in 1938 when the repair of aircraft in quantity during an emergency that Air Ministry policy, came under review. From this came the plan to build six large depots to undertake all repair of aircraft (except engines which would be returned to the manufactures). It was then realised that this would lead to heavy demands on RAF personnel. In March 1939 it was agreed that civilian labour would be employed at three of these depots (Burtonwood, Stoke and Abbotsinch). It was also recognised that the building of the depots would take some time and it was therefore, decided in the spring of 1939 that five 'fringe' firms should be employed for the repair of airframes.

These companies were at the time engaged in modification work on aircraft. In the summer of 1939 Lord Nuffield was offered and accepted the task of running the first nearly completed civilian repair depot at Burtonwood. In October 1939, an arrangement was made with Morris Motors Ltd, this came to be known as the Civilian Repair Organisation (CRO) under which idle capacity of many fringe firms was mobilised for the repair of airframes.

The first three fringe firms utilized in this way were companies that had occupied airfield premises so that they could carry out flight testing. These were Rollason Aircraft Services at Tollerton (Tollerton Aircraft Services), Airwork General Trading Co Ltd at Heston and Brooklands Aviation at Sywell. The Air Ministry provided extra accommodation for two of the three firms (a date of contract of 6 May 1939 has been suggested for the main hangar at Tollerton) and three other fringe firms, Marshalls Flying School, Taylorcraft and Martin Hearn were introduced to repair work. By the end of October 1939 there were 12 firms engaged in airframe repair work, all with premises on airfields.

B1A Repair of Hampden Aircraft

The Brush Electrical Company of Loughborough and the London Midland and Scottish Railway Company (LMS) at Derby provided capacity for repair of Hampdens, the railway company being employed as sub-contractors to a couple of fringe firms. An agreement was made in September 1940 for the LMS to undertake the repair of Hampden components in their carriage and wagon works at Derby as sub-contractors to Tollerton Aircraft Services Ltd. By April 1941, the relationship between the two was altered whereby Tollerton Aircraft Services, the LMS and Brush Coachworks Ltd were re-organised as a group for Hampden repairs under the control of LMS. The function of the latter was to repair fuselage centre sections, main planes and undercarriages which were subsequently sent to Tollerton for final assembly and flight testing.

B1B Repair of Lancaster Aircraft

In August 1942 arrangements were made to deliver selected major components direct to LMS at Derby, some new hangars were erected for this purpose in conjunction with the carriage and wagon works, and the locomotive works were to be used for the repair of Lancaster components to be delivered to the AV Roe repair depot at Langar for assembly and flight test. In November similar arrangements were made to use the premises of Tollerton Aircraft Services Ltd on the repair of Lancaster components as well as flight testing.

B2 Staff at Tollerton

During the Second World War, staff worked at between 50 and 70-hour weeks day or night-shift with around 70% female, and boy apprentices plus adult males, who were mostly inspectors, chargehands, foreman or skilled fitters, some of whom had been local garage mechanics before the war. These trades were covered by the Schedule of Reserved Occupations (Cmd.6015 of 1939). The inspector had his stamp which was used to stamp an aircraft part and paperwork to indicate that it had be checked and conformed to the drawing. Each one had a unique number representing the inspector who owned it, with No.1 being held by the chief inspector. They also had the letters 'RTN' which stood for 'Rollason Tollerton Nottingham'. Fitters were also occasionally called out to damaged aircraft, if possible to make a repair on site, if not to dismantle and transport it back to Tollerton by RAF Queen Mary trailer, or contracted out to one of the local haulage firms. Captain Walter Rogers was the sole test pilot, employed by the parent company Rollason Aircraft Services and from 1941, Field Consolidated Aircraft Services (after a name change) at Croydon. In addition to testing aircraft at Tollerton, he flew others from Croydon, Hanworth and Luton.

Known Test Flights of Aircraft Repaired at Tollerton

Aircraft Type	From	To	Tests
Harrow	17-04-1940	03-09-1941	6
Harrow	11-03-1942	14-05-1943	16
Hereford/Hampden	19-04-1940	09-03-1942	274
Hampden	11-03-1942	14-05-1943	281
Halifax	14-09-1942	14-05-1943	9
Boston	29-01-1943	13-12-1943	21
Lancaster	15-05-1943	04-01-1946	76

B3 Main Aircraft Hangar with Annexes (Bldg.43)

The main hangar (SK 61589 36010) (Figures 26 & 27) functioned as the repair and maintenance section. Aircraft repaired included Harrows, the conversion of Herefords into Hampdens and Hampdens to torpedo-carrying aircraft. The task was made easier with aircraft such as the Hampden (and all subsequent wartime-built aircraft) as it was designed around split-assembly whereby the aircraft was divided into sub-assemblies with a one-piece centre-section for attachment of the front fuselage and cockpit, rear fuselage, tailplane, wing sections and engines. Engines were removed outside the main hangar using a large gantry, runway and lifting tackle (removed in the early 1990s).

The main hangar could hold 23 Lancaster fuselages (minus wings). Once the main wheels and wings had been fitted and with all fuselage sections in place, a repaired Lancaster was towed over to the Bridge hangar for final assembly.

Figure 26: Main hangar, airfield elevation (Bldg.43). Note the roof access ladder positioned close to the fire watcher's shelter (which is hidden behind the wall cladding). [Paul Francis 07-08- 2009]

Figure 27: Main hangar (Bldg.43) with engine gantry. [Paul Francis 1987]

B4 Bellman Hangar (Bldg.3) (demolished)

A Bellman hangar (SK 61788 35890) (a pre-war Air Ministry design hangar erected mostly at sites in the early part of the Second World War), was probably initially erected for use by No. 27 Elementary & Reserve Flying Training School – as it was erected adjacent to the school site), until the school closed. It may have been used by the Polish elementary flying training school, until requisitioned by Tollerton Aircraft Services, and then used for spray painting and repair to aircraft skins. It is the only hangar listed in the 1942 edition of Secret Document (SD) 310.

B5 Type 'R' Hangar with Brick Annexes (Bridge Hangar) (Bldg.36) (demolished)

Around 1942, the type 'R' hangar (SK 6147 365522) (a Ministry of Aircraft Production hangar design) was erected (locally called the Bridge Hangar – one source has indicated that it was named after a humped-back bridge over the Grantham Canal, a small distance away from the hangar), this for a short while was used for Hampden repair, then (possibly around November 1942) it began to be used for Lancaster assembly (Figure 28). The Hampdens apparently were pushed outside the Bridge Hangar to make room for the Lancaster, the main-plane bolts being removed, the wings allowed to fall onto the ground and the aircraft then dismantled for scrap. Three Lancaster aircraft would be completed at a time, in through one set of doors for final assembly and out the other ready for refuelling and test flying.

The hangar was believed to be removed around 1958 after the airfield was de-requisitioned, the site is now Tollerton Park Caravan Park.

Figure 28: Hampden aircraft and fitters at Tollerton. [AH Hampshire 1945]

B6 Requisitioned Factory - NGR: unknown (demolished)

In 1940, Tollerton Aircraft Services requisitioned a factory used by Charles Butler Ltd, manufacturer of quality dresses and suits located on Daleside Road, Nottingham, about half a mile from the city centre.

In 1944, the Charles Butler factory specialised in the repair of Lancaster components (as did the Willowbrook Coachworks Ltd in Derby Road, Loughborough who had also previously repaired Hampden parts). At Nottingham, the factory was sub-divided into sections that included Merlin engines (serviced by RR Derby staff), outboard and inboard main-planes, flaps and petrol tanks (amongst other parts), staff were mostly women (between 200 and 300 staff). These along with the Loughborough components were shipped to Tollerton for final assembly and test flight.

B7 Secret Document SD 310 (RAF Airfields in the UK)

The February 1942 edition of Secret Document SD 310 records that there was a tarmac perimeter track of 11,108 yards with 24 hardstandings. Runways were grass with the following dimensions (width was 50 yards):

- N-S: 1,100 yards

- NE-SW: 1,033 yards
- E-W: 1,146 yards
- SE-NW: 1,118 yards

This puts the construction of the runways later than what has been published elsewhere. It is known that half of the hardstandings were used by the RAF and the other half by Tollerton Aircraft Services.

APPENDIX 'C': TIMELINE 1928 – 1941

Extracts about aerodrome companies and buildings only – the following is a summary of entries in either the journal 'Flight' or local newspapers (sources are as shown).

07-03-1929: Nottingham Aero Club, the tenancy of Hucknall aerodrome expired on 31 December 1928, temporary accommodation was sought at Ruddington, but this came to nothing, so permission was granted to continue flying at Hucknall from 1 March until the Tollerton scheme had been finalised. *Flight*.

01-08-1929: Lord Mayor of Nottingham (Alderman AR Atkey) received the license (27-07-1929) for the new Nottingham Corporation Aerodrome (Tollerton) from Mr. F Montague, Under Secretary of State for Air, at Stag Lane with Sir Sefton Brancker observing. He immediately flew (in the Nottingham club's DH Moth) back to perform the opening ceremony (sic) at which Sir Alan Cobham was present. *Flight*.

21-11-1929: Clubhouse and hangars to cost £5,000 Rapid development in aerial passenger transport on a commercial basis in prospect for Nottingham. This is conveyed in the announcement that NFS have leased Tollerton aerodrome from Nottingham Corporation, they have practically completed preparations for the construction of the aerodrome, the erection of hangars and a clubhouse. The 'Post' understands that NFS have taken the aerodrome on a 25-year lease. *Nottingham Evening Post*.

28-03-1930: Tollerton Hangar Nearing Completion – the progress that has been made in the erection of the hangar at the City of Nottingham municipal aerodrome at Tollerton, is now that the builders will probably hand over to National Flying Services (NFS) within the next week or ten days. The whole structure is in the final stages of completion, a concrete taxi-way is being laid to the landing ground. The hangar will house eight planes or 16 with wings folded. The clubhouse is also in the course of erection, the foundations have been laid and the walls are now taking shape. The landing ground is at present has a very uneven surface and it badly needs levelling. *Nottingham Journal*.

15-08-1930: The Nottingham Flying Club Ltd – Capital £100 in £1 shares. Under an agreement, the Nottingham Aero Club Ltd (CR Sands and NI Smith), a copy of which is scheduled as an agreement, dated 23 May 1930. Made between National Flying Services Ltd , of the first part, the Nottingham Aero Club of the second part, and CH Sands and HA Hallam of the third part, to establish and maintain an aeroplane club with the City of Nottingham; and to acquire the Tollerton Aerodrome near Nottingham. *Flight*.

27-06-1930: Nottingham's Municipal Airport at Tollerton was opened by Sir Sefton Brancker, Director of Civil Aviation, the occasion being marked by a successful Air Pageant organised by NFS and the Nottingham Flying Club, which is affiliated to the former. Tollerton is the official home of NFC and the ceremony included the standard NFS clubhouse and hangar. *Flight*.

21-12-1932: Nottingham Corporation General Purposes Committee decided at a meeting held yesterday to improve the surface at Tollerton aerodrome. The work will be commenced next week under the direction of Mr Wallis Gordon, the City Engineer and the work will be carried out by men from Stoke Farm. *Nottingham Journal*.

07-12-1933: Nottingham's fully-licensed aerodrome at Tollerton is operated by NSF Ltd on behalf of Nottingham Corporation. The landing ground measures 675 yards from north to south, 900 yards from NE to SW, 800 yards from east to west and 650 yards SE to NW. The surface is good, and level and grass covered. It is well drained and slopes slightly towards the east. There are three ponds and a shed in the west portion of the aerodrome, but both of these and the NE corner are divided from the landing area by hedges. The name 'Nottingham' and a landing circle surrounding the 'NFS' initials are all marked in white concrete near the centre of the landing area. Hangar accommodation has a door width of 60 foet. The club house of Nottingham Flying club has a restaurant. Minor repairs can be carried out in the workshops. *Flight*.

02-04-1934: Big Changes Ahead at Tollerton – New Company to Take Over Control. Flying at Tollerton is to come under control by a new company. Unfortunately, NFS is now in liquidation and this has led to a new company – now in course of formation, to be formed. The directors are JJ Hall, Captain LW Hall and TW Shipside. *Nottingham Journal*.

13-09-1934: Tollerton Aero Club Ltd, The Aerodrome, Tollerton. Capital £1,000 in £1 shares. Objects: to carry on the business of carriers of persons for pleasure flights, and carriers of passengers, goods and mail in aeroplanes and aircraft of every description. *Flight*.

31-01-1935: From the Clubs – Since the change of management in March 1934, the Nottingham Flying Club has made great strides. The total membership is now 280, of which flying members number 88; this is an increase of 360% since the change-over. A total of 850 hours were flown in the last nine months of 1934 – again showing an increase of 66% over the corresponding period of 1933. The club house is being extended by adding a further three bedrooms and by enlarging the lounge and bar. *Flight*.

29-03-1935: Bigger Flying Club HQ Lord Mayor (Mr RE Ashworth), who was accompanied by the Lady Mayoress, officially opened the clubhouse extensions. *Nottingham Journal*.

14-03-1935: Rollason Aircraft Services Ltd, Airport of London, Croydon, Surrey. Capital £10,000 in 8,000 shares of £1 and 10,000 of 1/- each. Object: to acquire the business of Captain William A Rollason and Fredrick A Kent at Croydon, as Rollason Aircraft Services and to carry on the business of dealers in aircraft and other vehicles, engines, accessories and spare parts etc. *Flight*.

14-04-1935: Nottingham Airport Ltd Nominal capital, £3,000 in £1 shares. To carry out the business of carriers of persons for pleasure flights and carriers of passengers, goods and mail in aeroplanes, airships, seaplanes, flying machines and aircraft. Flight, 28-06-1934. Later the share capital was increased to £5,000. *Flight*.

22-10-1936: Nottingham City Council approved a report by their General Purposes Committee for the purchase of Tollerton Aerodrome. They also took steps to ensure that, when the occasion arises, the city shall have a commercial airport equal to any in the country. *Flight*.

18-02-1937: Questions Asked in Commons. In Parliament yesterday, the Under-Secretary for Air was asked by Mr WT Kelly whether as proposed by Nottingham Corporation, a compulsory purchase order for the acquisition of 166 acres of land at Tollerton for an aerodrome had been made. The land belonged to Earl Manvers, what price had the owner was asking or what had been agreed? *Nottingham Journal*.

1938: In September, Hunting and Son Ltd take a minority shareholding of Rollason Aircraft Services and increased its stake to a majority in 1939.

18-02-1938: Negotiations between Nottingham Airport Ltd and the Air Ministry for the establishment of a reserve training centre at Tollerton aerodrome have been completed. The erection of the necessary buildings is to be proceeded with immediately – the contract has to be completed by 1 June next. *Nottingham Journal*.

16-05-1938: Flying School at Tollerton – Opportunities in New Reserve Arm. No 27 Elementary and Reserve Flying Training School (operated by Nottingham Airport Ltd) will open at the Nottingham Airport, Tollerton on 24 June. The airfield has been enlarged by 40 acres to 150 acres and the new buildings required to house the school are rapidly taking shape. The main buildings comprise, a lounge, pupils' canteen, instructors' mess, a kitchen and clothing, armament and parachute stores. The new flying school will start as an 'A' centre limited to 50 pupils, but it is expected that it will become a 'B' centre (limited to 100 pupils) in a short time. *Nottingham Journal*.

26-05-1938: Arrangements have been made for the entry of personnel for training as pilots at three new RARVR centres, at Grimsby, Nottingham and Oxford. This brings the total of such centres to 25. *Flight*.

23-07-1938: The Air Minister, Sir Kingsley Wood announced the details of the new national organisation which is being set up to provide a cheap flying tuition. The organisation will be known as the Civil Air Guard (CAG) and will be civil in character, operating through the light aeroplane clubs. The CAG will be open to any person between the ages of 18 and 50, regardless of sex. Reserve or regular forces personnel are exempt. *Flight*.

04-08-1938: Nottingham Flying Club is listed as one of the 75 participating flying clubs that had signed up to the CAG scheme. *Flight*.

14-10-1938: From the Clubs and Schools – Applications for CAG enrolment now number nearly 500 at Tollerton and 23 members are in training. *Flight*.
1939: Rollason Aircraft Services commenced aircraft maintenance operations at Tollerton and forms a subsidiary company, Tollerton Aircraft Services Ltd.

15-09-1941: Hunting and Son Ltd take complete control of Rollason Aircraft Services and changes its name to Field Consolidated Aircraft Services (FCAS). Tollerton Aircraft Services becomes a subsidiary of FCAS.

APPENDIX 'D' SOURCES

D1 The National Archives and Royal Air Force Museum

TNA AVIA 46/316: Factories for Repair of Aircraft

Site Plan IWA/265/49 (1801/50)

D2 Books / Journals

Glover, C W, 1941 *Civil Defence* 3rd edition – Chapman & Hall Ltd

Air-Raid Precautions Handbook No.9 (First edition) *Air Raid Precautions in Factories and Business Premises*, HMSO 1938

Air-Raid Precautions Handbook No.14 (First Edition) *The Fire Guard's Handbook*, HMSO 1942

Lilley, Suzanne: British Archaeology Casefiles No.35 Hangar Pillbox, Tollerton Airport

CgMs Heritage 2017 *Statement of Significance: Two Storey Pillbox inside Hangar at SK 615 360 Tollerton Airfield, Nottinghamshire*.

D3 Correspondence

The entries below are in the Airfield Research Group Archive and are a small part of a large collection of similar items about many other Second World War CRO firms as well as the main airframe companies. The Tollerton collection is the result of an appeal for information in the Nottingham Evening Post made by the late ARG Chairman Barry Abraham and the following:

Joan E Beckett writing about her late father Herbert Hampshire employed as an electrical mechanical engineer. He was in charge of a six-man team working for Tollerton Aircraft Services repairing aero-engines out in the field. He was also a member of the local Home Guard unit who met Oakdale Road, near the Rio Cinema in Nottingham. Undated letter but presumably dated March 1996.

John Davis (father was a haulage contractor recovering crashed aircraft). Letter dated 24-02-1996.

Sam Foster worked at Daleside Road Lancaster components, flaps and petrol tanks. Letter dated 19-02-1996.

Albert Gunn (engine fitter) worked on converting Harrows to Sparows in April 1942, he remembers Hampdens being scrapped. Two letters dated 19-02-1996 and 05-03-1996.

AH Hampshire (father worked on Hampdens). Letter dated 12-03-1996.

J Kitchen worked post-war at Tollerton, remembers management staff names worked a 48-hour week for 2s 3d per hour in 1947. Letter dated 19-02-1996

Denis Marshall (age 70) ex-Nottingham Forest footballer apprentice, enrolled as an apprentice metal aircraft fitter working on Hampden and Wellingtons popping rivets. Letter dated 17-02-1996.

PDS Marwood (age 69) electrical apprentice at Tollerton. Letter dated 15-03-1996.

Rex Morris (former inspector). Two letters dated 18-02-1996 and 28-02-1996.

Jack Palmer (age 82) worked at Tollerton beginning to end of WWII letter includes details of working parties. Letter dated 21-02-1996.

Handley D Rogers (father was Captain Walter Rogers test pilot), a comprehensive set of letters and notes, includes a complete list of aircraft serial numbers test flown at Tollerton. Seven letters dated 17-03-1996, 07-05-1997, 24-05-1996, 28-05-1996, 12-06-1996, 03-10-1996 and 14-12-1996.

Dick Shepherd supplied a Tollerton village newsletter extract on the airfield. Undated letter

Betty J Simpson worked at Daleside Road repairing flaps, airframes and electrical looms. Worked between 72 and 84 hours per week. Undated letter.

Jean Watts (nee Tyrell) worked at Charles Butler Ltd. Letter dated 19-02-1996.

D4 Web Sites

https://www.britishnewspaperarchive.co.uk/ accessed 5 February 2018

https://www.flightglobal.com/pdfarchive/search.aspx accessed 5 February 2018

https://www.airfieldresearchgroup.org.uk/forum accessed 5 February 2018

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