

Kenley Revival Community Archaeology Project 2017 Kenley Airfield London CR8

London Borough of Croydon

Archaeological Investigation Report

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Kenley Revival Community Archaeology Project 2017

Kenley Airfield London CR8

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Report on a community archaeological investigation

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Summary

This report presents the results of a community archaeological investigation with fieldwork supervised by MOLA at Kenley Airfield and forms part of the Heritage Lottery Funded Kenley Revival Project.

In accordance with the Written Scheme of Investigation (Bright 2017), six trenches were excavated on specific targets identified from aerial photographs. In addition to these trenches, a condition survey was undertaken on the area of a fighter pen (originally E-shaped). This work was to elucidate the form and function of the chosen targets as well as recording their condition and investigating any management or conservation issues.

The work was undertaken by twenty five, locally-recruited, volunteers and supervised by two MOLA professional archaeologists and three experienced and capable volunteers with knowledge of "conflict archaeology". It was supported by Corporation of London staff and Historic England staff, who helped with delivery. It was accompanied by open days, tours for the general public and stalls and information from local societies.

The investigations revealed the development of polygonal-tarmacked areas into triangularconcreted areas of hard-standing with anchor points to secure aeroplanes. A flight hut foundation was found to be broadly in good condition but bricks in the foundation have suffered some deterioration. There was no surviving evidence for a possible pillbox targeted in one of the trenches, suggesting it had been removed, as had the firing-mechanism electrical cables for the "Parachute and Cable" (PAC) anti-aircraft weapon.

New targets for investigation were also identified following a walk-over survey, metaldetecting and information received from an elderly neighbour. One of these new targets comprised a pair of upturned concrete sewer pipes; which may have been a deep-drop latrine, or possibly the remains of a light machine gun base. A survey of the fighter pen showed that the internal space within the courtyard and its framing walls was in fair condition, but the brick wall on the outside was found to be leaning out from vertical (pushed over by slumping of the earth wall it is meant to be retaining) and some of the bricks are beginning to weather badly.

The investigation, limited in time and resources, has allowed local volunteers to actively participate in the interpretation, presentation, and conservation of a small part of a large complex of monuments that are of national significance. It is hoped that further work on the finds recovered, and further opportunities for fieldwork, will ensue that the enthusiasm shown by volunteers on site will be carried forward in an ongoing programme of participation.

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1 Introduction

1.1 Site background

- 1.1.1 A community archaeological project with fieldwork supervision by MOLA, took place at Kenley Airfield and forms part of the HLF funded Kenley Revival Project by the City of London.
- 1.1.2 The airfield is located on Kenley Common which is a 56 hectare site of mainly chalk grassland, scrub and woodland lying within the London green belt. The Common lies just west of the A22 (Godstone Road) and opposite the Riddlesdown and Whyteleaf Recreation Ground. Within this larger area, the community archaeology project was confined to the area of the airfield outside of the taxiway on the north side, near Golf Rd, Kenley CR8 5ES and centred on National Grid reference *TQ* 3290 5835.



Fig 1 Site and archaeological project location

1.2 Scope of the investigations

- 1.2.1 Investigations comprised minor excavations to locate the Parachute and Cable system, investigation of the remains of surviving buildings and features identified on the ground and from historic aerial photography and building recording of the surviving fighter pen.
- 1.2.2 Trenches and features were to be excavated by hand under the direction and control of a MOLA Senior Archaeologist working on behalf of the City of London but involving volunteers from the wider community. Historic England are also involved in an advisory capacity.
- 1.2.3 This project was targeted to uncover archaeological evidence of the previously existing buildings and features of the airfield dating to the period of the Second World War (and potentially earlier) through a community project, and to engage the local community by involving members of the public as volunteers, and students as trainees. The resulting data and archive produced by the project will contribute to and inform wider site interpretation.
- 1.2.4 The site was located within the RAF Kenley Airfield, which contains fighter pens that are protected as Scheduled Monuments (30903 & 30904) under the Ancient Monuments and Archaeological Areas Act 1979, amended by the National Heritage Act 1983. As no intrusive works were proposed to the scheduled fighter pen (30904 01), Historic England deemed that there was no requirement for Scheduled Monument Consent (SMC) for these works.
- 1.2.5 Investigations were carried out in accordance with:
 - The Written Scheme of Investigation (Bright 2017). •
 - Standards for Archaeological Work (GLAAS, HE 2014). •
 - Chartered Institute for Archaeologists Codes, Standards and Guidelines Papers (ClfA, various dates).
 - MoRPHE (English Heritage, 2008).
 - Museum of London's A research framework for London Archaeology, 2002.
- Archaeological investigations were monitored by the Assistant Inspector of Ancient 1.2.6 Monuments, Iain Bright, and the Archaeological Advisor (GLAAS) for the London Borough of Croydon, Mark Stevenson.

2 Topographical and historical background

2.1 Introduction

This section is an edited precis of the background in the WSI (Bright 2017 Section 3) and follows that presented in Heritage Conservation Plan (Wessex Archaeology 2010) and the Conservation Management Plan (Stabler Heritage 2015). It also includes information which is the outcome of map regression exercises that formed part of the community archaeology programme.

2.2 Topography

- 2.2.1 The majority of Kenley Common, particularly the land surrounding the airfield, lies on a broadly flat plateau at c 170m OD. The land slopes gently towards the neighbouring valleys to the north and west of the airfield, whilst on the eastern edge is more steeply sloped. The location of the Common was instrumental in its use as an airfield, with the plateau easily enabling the construction of the RAF base, and the prominent eastern escarpment providing a natural defensive ridge.
- 2.2.2 The underlying solid geology of Kenley Common is (flint nodular-) Chalk, laid down as a sedimentary deposit during the Upper Cretaceous period. This is overlain by a deposit of Clay with Flints which dates to the Pleistocene (Stabler 2015).

2.3 Archaeology and History

- 2.3.1 No features or finds have been discovered on Kenley Common that date to the prehistoric period. However finds have been made in the surrounding area of material illustrative of human occupation dating back to the Mesolithic. Whilst steep valley slopes may have been difficult to cultivate, broad upland areas may have been more amenable to primitive agriculture.
- 2.3.2 This equally applies to the Roman and early-medieval periods. A single coin of Antoninus Pius (Roman Emperor AD 138 AD 161) was found during construction work for the airfield in the 1920s, but no structural remains from these periods have been recorded.
- 2.3.3 Kenley may be derived from Old English *Coena's Leah* ("*Kenele*" in 1255, Room 2003, 260). Nearby Waddington is recorded in in the late 9th century, in the will of Alfred the Ealdorman ("Elfred Dux", Maitland, 1921, 245) where a considerable area of land was willed to his son at *Hwætedune* (possibly, **wheat down* "the hill where wheat is grown"). Earthworks identified during an earlier survey are thought to represent the remains of a medieval field system.
- 2.3.4 Kenley House originated as a farm, and settlement is thought to have been on the same site for 800 years. A dry earthwork may be the remains of a former pond in the woods south of Kenley House.
- 2.3.5 The whole area is dotted with chalk pits and quarries. Some marked as such on maps, other disused or filled-in chalk pits may be identified from small circular fenced copses. A large quarry was recorded in the north-east corner of the common.
- 2.3.6 The 1837 Tithe Map indicates that at this time the whole of the hill top was open farmland. The boundary of the Common as shown in the 1837 Tithe Map can be largely traced in modern boundaries. The earliest record of the farm is the 1837 Tithe Map which shows the farm complex. The Common was purchased by the City

of London in the 1880s.

- 2.3.7 Kenley opened in 1917 as an aircraft acceptance park. The park prepared aircraft prior to their being sent to operational units. After the First World War the site was retained as a permanent RAF station. There was an extensive building program in the 1920s to convert the temporary air acceptance park into something more permanent.
- 2.3.8 In the 1930s, as concern about a possible war grew, Kenley was one of several airfields that were strengthened. New buildings were built to high design standards (nationally The Royal Fine Arts Commission advised on the design of many airfield buildings) and concrete runways built. Three Air Ministry boundary stones which survive on site probably mark this period of expansion and development.

2.4 World War 2

- 2.4.1 Because of ongoing construction work, Kenley was not an operational air field at the outbreak of war. The airfield became operational early in 1940. Around the edges of the airfield a series of defences had been constructed, these included anti-aircraft defences on the large terrace on the eastern edge, and the Parachute and Cable defence in the north. In 1941 a number of Blister hangars were erected around the airfield; a platform was noted during the survey on the site of one of these. A length of concrete road still leads to the site of the platform. In the woods on the western edge of the common the gun alignment range still survives.
- 2.4.2 Extensive remains of concrete footpaths and roads, relating to the airfield exist on site. Concrete blocks and areas of hard standing can also be observed.
- 2.4.3 Trenches have been identified in the woods both on the east and west sides of the airfield. The trench found to the west was a portion of a zigzag trench which is shown on aerial photographs as having once extended along much of this side of the airfield. Three features can be identified in the woods to the east, two of these were rectangular trenches measuring approximately 2m x 12m with large well preserved earthen banks to their east side. The third feature appeared to be the remains of a triangular machine-gun position, with a platform for the gun and a hollow for the crew surviving.
- 2.4.4 Within the woods to the west lie the remains of a small building and also the plinth for a fuel tank adjacent. The building appears to be a guardhouse or some similar structure as it was too small to perform a more technical role. It was directly adjacent to Hayes Lane which would again suggest a defensive role.
- 2.4.5 Towards the end of the Second World War Kenley was found to be too small to accommodate the new jet fighters that needed longer runways than could be constructed at his location. The late 1940s saw the airfield used to assess and test captured German and Japanese aircraft and equipment and also as the headquarters of a reserve training squadron. The airfield eventually began to be used as a glider training school and the barracks passed to the Army.

2.5 Post-war and undated

2.5.1 A mound, at the western edge of the Common is a modern construction as it is not shown in old aerial photographs, however its exact date of construction and purpose remain unclear. There exist six undated features within the site of the airfield, all of which comprise linear earthworks and earthen banks. They may relate to land management of the Common area prior to the airfield, although an exact date is unclear.



Historic Aerial photographs supplied by Historic England, not to be reproduced without permission Fig 2 The study area in relation to historic aerial photographs

3 Excavation methodology

3.1 Field methodology

3.1.1 The WSI specified a number of features for potential investigation as shown in Fig 3. They included (but were not limited to) the location of the parachute and cable launchers (1), the triangular aircraft holding areas (2 and 7), the footings of buildings (3), a concrete area (4), possible pillbox (5), former Flight Hut (6). Fuel store/switch house (8), footings on west side of "KC 29" (9) Blast Pen KC 29 (10), and areas of concrete paths (11).



Historic Aerial photographs supplied by Historic England, not to be reproduced without permission *Fig 3 Potential Areas of Investigation*

- 3.1.2 These areas were located on the OS National Grid projection using rectified versions of supplied aerial photographs (above). They were then marked on the ground by MOLA geomaticians using setting-out procedures and standard GPS survey equipment. At the same time, a series of baselines were set out on known OS co-ordinates to form a control network from which future planning was to be undertaken. A number of Temporary Benchmarks were also established to provide elevation control for levels. All locations were scanned with a cable-location tool ("CatScan") to ensure there were no unrecorded services in the areas of proposed excavation.
- 3.1.3 The City of London mobilised local volunteers, provided site inductions and an ordnance professional. All volunteers were taught the safe use of excavation tools before digging.
- 3.1.4 Trenches were hand excavated down to the first significant archaeological deposit or structure. In the case of structural remains a small sondage was excavated down the side of the structure to determine the depth and condition below ground. All works were supervised by the MOLA professional team of Senior Archaeologists, , with able assistance form a group of three experienced volunteers, supporting teams of local volunteers (up to 15 per day). Groups of volunteers were rotated through various tasks on site, including planning, recording and levelling as well as excavation. Training was also given on photography for a "condition survey" record.
- 3.1.5 One target location (trench 4) exposed a piece of cement-bonded asbestos sheet so that trench was abandoned.
- 3.1.6 Deeper excavations were edge protected with road pins and barrier fencing.
- 3.1.7 All exposed archaeological remains were investigated and recorded. There were no remains that required novel or different approaches. No "natural" deposits were exposed. Opportunity was provided for Historic England to assess the condition of the remains. None required conservation work or immediate reburial. All archaeological exposures were metal detected.
- 3.1.8 All trenches with significant archaeological remains were planned at appropriate scales, relative to the established baselines. Two trenches with negative results were recorded as dimensioned sketches on Trench Record Sheets. Both plans and record sheets were then digitised onto an archaeological base drawing, on Ordnance Survey National Grid co-ordinates. Photographs of remains were taken throughout and incorporated into the training exercise. No sections were recorded
- 3.1.9 Building recoding was carried out on various aspects of the fighter pen, agreed on site with the archaeological supervisor and Historic England. This was a basic level survey on a measured sketch plan, together with a photographic "condition" survey. It is intended as a lasting record prior to conservation works. Care was taken not to damage any historic fabric whilst undertaking this work.
- 3.1.10 All works were undertaken in accordance with the Written Scheme of Investigation and relevant Historic England/GLAAS Guidance Papers and this report forms the assessment of the data arising from the project.

3.2 Site archive

Number of trench record sheets	6
Number of overall location plans	1 digital
Number of Context (SU) sheets	4
Number of photographs	66
Number of Plan sheets	8 including measured sketches and level location
Number of Sections	0

4 Results of the evaluation



Fig 4 Location of investigations

4.1 Trench 1 Triangle

- 4.1.1 Trench 1 was located south of the Fighter Pen, north of the other investigations; this trench was intended to investigate a triangular feature that appears on aerial photographs.
- 4.1.2 The concrete triangle [101] was located immediately below a covering of turf. It was an equilateral triangle of 12.9m long sides and was 0.13m thick, made with grey white cement-bonded (predominantly flint) aggregate. It was somewhat domed up to the centre at 166.46m 166.66m OD. Two iron "anchor points", formed of an iron bar curved into a loop 200mm across and cast into concrete blocks 450mm, and 500mm square were set laterally along the centre line of the triangle (from east to west).



Fig 5 Trench 1 concrete triangle. Looking west along line of "tie downs"

- 4.1.3 Investigating the side and depth of this feature exposed an earlier "version" which comprised of a polygonal shape, similar to others around the perimeter taxiway. This was made of a 100mm thick layer of hardcore and re-used building rubble [103] topped with 130mm 140mm of tarmac to 166.59m OD. It had been set in a prepared trench [104] dug into brown subsoil [105].
- 4.1.4 A series of three more anchor points, made of curved iron bars set into concrete blocks roughly 0.5m diameter, were set around this tarmac hard standing.
- 4.1.5 Since both polygons of a similar size and shape (on their own) and concrete triangles are present on aerial photographs, it would appear likely that the triangle was a development of, or renewal of, the same structure.



Fig 6 Tarmac on rubble base with "tie down" fixing point



Fig 7 Edge of earlier hard standing with concrete triangle behind, looking north



Fig 8 Trench 1 with aerial photograph rectified to concrete triangle

4.2 Trench 2 Possible Flight Hut

4.2.1 Trench 2 targeted the foundations south of Trench 1. The remains were cleared of vegetation. They consisted of an east-west aligned rectangular concrete floor 11.09m x 4.79m, at 167.19m OD. There was a 15mm fine concrete screed [201] laid on a rougher concrete base [202], between 90mm and 130mm thick. This had been cast on brick footings [203] which stepped out 100mm, with one course visible at the south side.



Fig 9 Flight hut foundations, looking North West (lower concrete visible in west sondage)

- 4.2.2 A sondage (limited area) excavated on the west side of the concrete floor exposed a second offset of poured-concrete at 166.98m OD, dug into subsoil at (roughly) 166.9m OD. Another on the north side showed two courses of brick laid directly onto earth. The bricks used were soft yellow "Phorpres" frogged bricks of standard sizes, set in brittle cement-based mortar. From mortar applied to the top of them, it would appear that they supported the hut superstructure directly.
- 4.2.3 An irregular area of concrete, less than 100mm thick, lay on the east side of the trench. It was 3.6m east–west and 3.1m north–south and is thought to have provided hard standing for access to the hut's doors (facing onto the concrete access to the fighter pen to the north).



Fig 10 Flight hut foundations on north side



Fig 11 Trench 2 with hard standing (for entrance) in front, looking west



Fig 12 Trench 2 recorded features with aerial photograph (background)

4.3 Trench 3 Parachute and Cable

4.3.1 Trench 3 was located between two of the triangular concrete areas adjacent to the perimeter taxiway. It targeted the possible route of the cable firing mechanism of the "Parachute and Cable launchers" which was controlled by an electrical circuit.



Fig 13 Trench 3 location (red) with angle-iron and possible route of PAC dotted line (left) , looking south (right)

4.3.2 The trench was 11.1m long, 0.4m wide and 0.3m deep. It exposed only mixed soil, building rubble and slate. No evidence of the firing mechanism was found and it was not thought to have been deeply buried (if it was buried at all, it may have lain on the surface). Some angle-iron lay obliquely across the north end of the trench (solid line in Fig 13). It is assumed to have been dumped in post-WW2 clearance.

4.4 Trench 4 Possible pillbox

- 4.4.1 Trench 4 lay towards the south of the project area, 15m north of the perimeter taxiway. It targeted a feature identifiable on aerial photographs as projecting above the ground (it had a shadow).
- 4.4.2 A trench measuring 4.74m long (north–south), 0.5m wide and 0.36m deep, with a 0.6m long extension, 0.4m wide and 0.2m deep, from 1.7m north of the southern end. The extension lay over the baseline established by MOLA geomaticians and the west end of it was at 3.2m from the west end of the baseline.
- 4.4.3 The ground level sloped from 167.79m OD to 167.65m OD south to north.



Fig 14 Trench 4, looking south (left) and plan superimposed on aerial photograph (right)

4.4.4 Below modern turf mixed soil and redeposited clay with flints was exposed, as was a piece of cement-bonded asbestos board. No structures were observed and the asbestos was reburied where it lay.

4.5 Trench 5 "Concrete area"?

4.5.1 Trench 5 was located at the junction of the perimeter taxiway and the concrete approach to the (scheduled) Fighter Pen. It was identified as a possible concrete area, forming an irregular hexagon. Of the shape identified from aerial photographs, only half was excavated. The exposed area measured 14m north–south x 8.6m east–west and was only 0.2m deep, except for a small 0.5m wide sondage at the north edge which was 0.5m deep.



Fig 15 Trench 5 looking north (left) and tie-down survey team with visitors' tour behind (right)

4.5.2 On removal of the turf, it became apparent that this was an "earlier" hardstanding area for aircraft. It was made in a similar way to the polygonal area in Trench 1 with a rubble base covered with tarmac (300mm thick), dug into the local subsoil. Three concreted in anchor points, or "tie-downs", were recorded, all of a similar construction to those reported above



Fig 16 Trench 5 plan over aerial photograph

4.6 Trench 6 Concrete rings

4.6.1 During the excavation of the trenches described above, it became apparent that there were two other areas within the vicinity of the study area that were worthy of further investigation, partly as a result of interest from visitors to the site. One area was a concrete-lined trench that the team were informed was part of a rifle range, and the other was an area of concrete rings. It was decided to investigate two concrete rings because of their proximity to the Flight Hut, and possible significance in its interpretation and use, and also because of the added group value of remains.



Fig 17 Trench 6 in relation with former Flight Hut

- 4.6.2 The rings were two former concrete sewer-pipe segments 1.5m external diameter (100mm-thick pipe walls), set vertically into the ground with the tops of the sewer pipes at or near ground level.
- 4.6.3 They were filled with a mixture of coal ash (with some clinker) and redeposited soil, which was excavated 200mm-deep in one concrete ring only.



Fig 18 Trench 6 (foreground, with 300mm scale) looking east to flight hut

4.7 Fighter pen condition survey

- 4.7.1 The fighter pen (Scheduled Monument 30904) centred at TQ 32918 58429, is the subject of proposed conservation works. A limited condition survey conforming to Level 1 of Historic England's Guide to Good Recording Practice (HE2016, 25). This comprised a measured sketch plan, a targeted levels survey, and a photographic record, showing some main features of the pens, as well as some conservation issues. The following description is derived from those records.
- 4.7.2 The pen was formed of an inverted U-shape in plan (north to "top") revetted earth wall. It was 65m wide (externally) with a single doorway on the outside (north) centred on 25.7m from the west edge and 0.9m wide. The width may be compared to that of the digitised aerial photographs (67.3m) which might reflect operational constraints, or the "corners" may have eroded. The doorway gave access to a tunnel that ran laterally along the rear earth wall. The arms were 25.8m long externally, and the west arm 9.2m wide (east arm was too vegetated to measure). Between the arms was a yard 51.8m wide. Two doorways gave access to the tunnel referred to earlier, both centred 20.3m from the internal sides of the "U". Neither doorway aligned with the doorway on the outside, and it is thought that they gave access to pens separated by a central earth bank, that was subsequently removed.
- 4.7.3 Around the internal edge of the pen was a gully, formed of a 600mm-wide concrete berm sloping away from the bank, down to a 240mm-wide linear depression and a 490mm-wide concreted area to the large slabs of concrete that had been cast to form the floor of the pen. At either end of the gully was a manhole (to a rainwater trap?) 700mm square on the east side and 500mm x 600mm on the west.



Fig 19 West of two internal doorways (earth bank rises to cover the tunnel to the right)

- 4.7.4 The centre of the fighter pen concrete standing, was at 166.08m OD, the top of the manhole cover on the east side was 166.01m OD and the base of the gully channel in the north-east corner 165.96m OD. The door of the eastern doorway was at 166.06m OD, and the berm adjacent to it rose from 166.04m to 166.24m OD. That had been cast against a short revetment concrete wall to 166.46m OD. And the top of the doorway was at 168.16m OD.
- 4.7.5 The top of the earth wall was at 168.67m OD, where it covered the tunnel between doorways, but fell to 167.93 west of the tunnel. The outer door floor fell from 166.0m OD at the threshold to 165.3m OD externally. The floor of the doorway was made of concrete grooved diagonally so that water wouldn't collect in the grooves, but drain down to the side and away. An external revetment wall of Phorpres bricks, built somewhat erratically with some bricks laid on edge, was at 166.23m OD at the top (0.93m high from ground level). Some bricks were in a fragile condition and the whole wall slopes outwards as a result of pressure from the (slumping) earth bank.



Fig 20 Recording the fighter pen, rear (north) revetment wall



Fig 21 Sloping back (north) wall of fighter pen

4.8 The finds

4.8.1 Finds were of metalwork collected according to their location. They include some (safe) .303 rifle rounds and metalwork thought to be discarded aircraft parts. At present, they have been retained at the West Wickham & Coulsdon Commons, Merlewood Estate Office, Ninehams Road, Caterham, Surrey CR3 5LN, with the intention that Guy Taylor lead volunteers cataloguing and researching them.

4.9 The site as a whole

4.9.1 This community archaeology investigation has provided a unique insight into the operation of a small corner of a very large site of national importance. Although concentrating on one study area, as many of the types of structures excavated are reproduced across the airfield, it helps interpret the airfield as a whole. One example of this may be areas of hard standing with ground anchor "tie-downs". Some aerial photographs show fighter planes parked ignoring these places. However, the tie-downs may have been principally used to run aero engines on the ground, as part of maintenance, or when high winds were anticipated from weather forecasts. This is also (sometimes) called "picketing action" (see, for example, USA, DoT FAA 1974). Tie down points are recorded on other airfields, such as Perranporth, where they form part of the scheduled monument description for standings adjoining the perimeter taxiway and offset "frying-"pan dispersals (https://historicengland.org.uk/listing/the-list/list-entry/1020556 accessed 14.08.2017). Similar "polygonal" hard standing areas were inside the perimeter

14.08.2017). Similar "polygonal" hard standing areas were inside the perimeter taxiway at RAF Hunsdon (Herts) built 1941 (http://merlinsroared.tripod.com/raf-hunsdon.html accessed 14.08.2017)



Fig 22 RAF Hunsdon

4.9.2 Survival varies from the Parachute and Cable system, unique but of which nothing could be found (there may be buildings yet to be identified, that were associated with it), to substantial concrete remains. A rapid walk-over assessment of the site indicated that it appears representative of the airfield as a whole. It may be that some structures have been removed postwar (a possible pillbox?) but it is known that other unique defence structures survive remarkably intact (Pickett Hamilton

Fort). Survival is sufficient that interpretation and presentation of the site as a whole is possible.

- 4.9.3 Given the limitations of area, and duration of the investigation, it has thrown into relief aspects of interpretation, to the extent that structures served the core functions of the airfield, to what extent they were ancillary, and to what extent they were defensive structures for the airfield.
- 4.9.4 One such structure was the two concrete rings. It is possible that they were set in the ground to form simple long-drop (or "pit-") latrines, serving the "flight hut". As people had to be present in the flight hut from before dawn (e.g. Gordon Batt's testimony in Reeve 2015). They may have been pits to provide some protection for light machine guns (e.g. Lewis guns). Two similar sewer pipe sections, with wooden posts fixed to the inside, one with a concreted base and a metal mount (for a machine gun?) fixed to the centre, were found on top of the north-east face of a fighter pen at RAF King's Cliffe (Defence of Britain database: S0005868). Two sections of pipe on the King's Cliffe airfield perimeter, also one with a mount concreted at the base, stand side by side half-buried (DoB database: S0005865). The Kings Cliffe concrete sewer pipe section would barely come up to waist height of a standing person (c.f. Lowry 2014, 39) and less than 2 feet (0.6m) between central mount and sewer pipe wall would allow nothing but an erect stance). Such a position would be highly exposed and may well have been embanked with sand bags, higher and wider.
- 4.9.5 Alternatively, the possibility that may be a very rare example of the early design of a "Tett Turret" cannot be eliminated. The turret was named after its inventor H.L. Tett and manufactured by Burbridge Builders Ltd of Surrey. It had a revolving concrete turret mounted on a ball race, set above a pit. In early designs, the pit was formed by a standard section of concrete pipe 4 feet (1.22m) in diameter (Wills 1985, 21– 22), which would agree with the diameter pipes at Kenley. They were used in airfield defences, e.g. Westhampnett, (where a sunken sewer pipe lies next to a brick bunker with an intact turret, a response to the perceived limitations of a confined sewer pipe?) . Original manufacturer's specifications were that they may be set in combinations with intersecting tunnels.



Fig 23 Tett Turret (image, https://www.airfieldresearchgroup.org.uk/community/50612=2457-The%20Tett%20Turret.jpg)

- 4.9.6 Only 31 turrets were actually sold (Pollard & Oliver 2003, p. 295), so if it was one, it would be a very rare example. It may be compared to the Pickett-Hamilton forts, of which 335 were installed (http://www.pillbox-study-group.org.uk/advanced-pillbox-designs/part-2-o-z/pickett-hamilton-fort accessed 11.08.2017). The slightly more practical Allan Williams enclosed steel turret had a wider, 6-foot diameter (1.83m), (http://www.iwm.org.uk/collections/item/object/30028163, accessed 11.08.2017).
- 4.9.7 The potential for the concrete rings to be a simple long-drop latrine depends upon the identification of the hut base as a "Flight Hut". However, a series of drawings have been examined and doubt has been thrown on this interpretation. Research by Guy Taylor on the Kenley Record Site Plan (AM Drwg 2430/46), shows a rather illegible key number that could either be 102, Small-Arms Ammunition store, a Nissen Hut, or 103, Flight Office, a Timber Hut. To try and resolve it, aerial photographs were examined. There were definitely some aerial photographs where building resembled others identified as Nissen Huts. However, there was one Aerial Photograph (dated March 1944), where it appeared quite different. It does not appear in the aerial photographs taken in 1941.
- 4.9.8 A small Nissen hut is 16-feet wide, internally. The dimensions of the foundation in trench 2 at Kenley measured 4.34m across, or 14ft 3inches. This would appear too large a gap to be explained by external wall foundations for a flimsy structure. The length is 11.06m, or 36ft 31/2inches. This may equate to 6 lengths (a very common length of Nissen hut, although you could make any length you liked). So, the dimensions of the hut are not thought to conclusively indicate whether it was a Small-Arms Ammunition Store or a Flight Office.

5 Archaeological potential

5.1 Answering original research aims

- 5.1.1 Original Research Aims and Objectives . (*Bright 2016, 10*) were answered as follows:
- 5.1.2 To actively encourage the involvement of the local community in investigating, interpreting and managing their historic environment. The Kenley Revival Project team actively recruited 25 volunteers who supported the archaeological project throughout its duration (1 week). For the recruitment process They used social media (Twitter and Facebook), Eventbrite, e-newsletters, posters on site and the website (kenleyrevival.org). There were no reserved places for stakeholders, everybody had the same chance to participate.
- 5.1.3 To educate and promote a greater understanding within the local communities of their local heritage and in particular that of Kenley Airfield. Potential exists for specialist training in military and conflict archaeology. Volunteers investigated 6 different features and the scheduled fighter (blast) pen. They also took part in map regression exercises and had many informal opportunities to compare and pass on information. That was also true of the Weekend of free guided tours and with society stalls to visit, 150 people attended, 120 went on tours (some in pouring rain!).
- 5.1.4 To offer opportunities for volunteers of all levels to gain practical experience of archaeological field work, including building recording and all manner of field techniques .

Volunteers took part in various levels of excavation and recording. All were trained in physical aspects of excavation and everyone had archaeological stratigraphy, and stratigraphical recording, demonstrated to them. One volunteer went on to record individual context sheets. All volunteers took part in surveying and levelling and approximately half the volunteers took part in "standing building" recording.

- 5.1.5 To highlight the importance of the heritage to local communities and lay the foundations for the beneficial utilisation of their heritage resource for the future. Most of the volunteers were local, all report a better understanding of the airfield (quantified feedback C Corazon Pers. Comm.). Seven reported that they appreciated the opportunity to meet likeminded people, and they may form the nucleus of an active group for further events. The attendance at the weekend, despite heavy rain, was very encouraging. There is undoubtedly potential for a regular "diary" of events which use the heritage as a resource for fun and education.
- 5.1.6 To establish the nature, date, purpose and state of preservation of the buried features, interpreted from historical research, cartographic evidence and other visual observations.

The exact dates of many of the features remain a mystery, however relative, stratigraphical dating has shown that polygonal areas of hard standing were superseded, in selected areas, with triangular concrete areas. *Loop, Spectacle, Eyeglass, Frying Pan, Saucepan, Pancake, Banjo, Circular, Apron, Chevron Oval, Square, and Spurs* are all descriptions used for aircraft dispersal hardstanding areas, many of which were used for bombers and heavy aircraft. It would appear the Tarmac polygonal areas and later concrete triangles were for fighter aircraft. The metal land-anchor "tie-downs" would appear to be diagnostic. Such areas were used for running engines, or if there were extreme weather events, or perhaps to cover aircraft with camouflage netting. The condition of bricks, concrete and tarmac has been exposed, as was the inclination of the rear wall of the fighter pen.

5.1.7 To undertake an assessment of the archaeological potential of the site, the condition of any surviving archaeology and the establish impacts from past and future land-use.

The airfield has considerable potential of the engagement of the public in archaeological research with aural history and reminiscence, to answer questions as to the use and chronology of structures on site (e.g. what was the function of the concrete rings set into the ground, latrines? Or defence?). Structures vary from having been removed, to being in good condition, but there are specific areas of concern (e.g. leaning retaining wall to rear of the fighter pen).

- 5.1.8 To record and preserve the archaeology before it suffers any further damage and highlight the importance of the heritage to local communities. Local volunteers undertook recording exercises on individual structures and were involved in consideration of their interpretation, and were tasked with considering the wider historic significance of the airfield on a landscape and regional scale, through map discussions.
- 5.1.9 To accumulate sufficient data to produce an informed report of the archaeology of the site, including recommendations for further works and inform on future conservation and management of the site. Sufficient information was retrieved to inform aspects of the archaeology of Kenley airfield. Even within the study area, it provoked discussions and community involvement that raised more questions about structures that weren't on the original list of possible targets for investigation. In many ways, it barely scratched the surface of the potential archaeological queries and locations. It highlighted a particular conservation issue, the rear fighter pen retaining wall. It uncovered the surface of one structure (concrete rings) which might repay full excavation in the future, it helped refine the understanding of a category of structure, areas of hard standing, some of which may be exposed as examples for future visitors. It added to the stock of knowledge about the site, but asked far more questions than it answered. Within the limited boundaries of the investigation, there were still

individual items of interest that remain uninvestigated (e.g. paths) and new structures identified, to investigate, interpret, and conserve. There are also choice to be made, of what can be displayed and how (avoiding the creation of unnecessary hazards for visitors to the airfield).

5.2 General discussion of potential

- 5.2.1 The archaeological investigations have demonstrated the potential for buried remains to be exposed, investigated, better understood within the wider development of the airfield, and displayed.
- 5.2.2 The ease of access to the site with options for able-bodied and for disabled, for all members of the local community, whatever their educational or cultural background or age, indicates the site has potential for wider community engagement (although elderly, parents with young children and disabled will need transport up the hill).
- 5.2.3 There are numerous structures of interest across the site, some of which attract attention by visitors from curious locals to enthusiasts from wider areas.
- 5.2.4 Arguably, the greatest potential is in marrying informal reminiscence with oral history approaches and historical research, alongside archaeological investigations and a landscape-scale interpretation of the site.

5.3 Significance

5.3.1 The archaeological remains of the airfield are of national significance, playing the role it did in historical events pivotal to the course of World War 2.

5.4 New research aims

5.4.1 Specific research aims arising directly from this community investigation include:a) to determine the function and purpose of the vertically set concrete pipes in trench 6,

b) to discover where polygonal and triangular hard stands built in other airfields and if they correlate to individual aircraft, and

c) to relate the various defensive structures and features of the airfield to each other, to determine the changing strategies and priories and, as far as practical which units manned them.

5.5 Assessment of the investigation

- 5.5.1 The primary significance to the data is in stimulation of enquiry and the use of Kenley Airfield as a monument for and by the local community.
- 5.5.2 The Heritage 2020, National Heritage Framework has Public Engagement as a theme, and includes: *The historic environment sector in England has a good track record in public engagement.....we need to find new ways to enthuse a wider range of individuals, groups and communities to participate in the historic environment and, increasingly to take a lead in its management. We need to encourage more dialogue and shared understanding between the varied interest groups in our communities and encourage people to take more direct action in caring for their historic environment. We must inspire teachers and community leaders to see the potential of the historic environment on their doorsteps for learning, skills development, and improved wellbeing. (Historic Environment Forum 2015, 5.5, 11-12). The 2017 archaeological investigations at Kenley have laid a solid foundation to engage a core group of individuals from the local community in active participation in the management and care of historic structures on Kenley airfield*
- 5.5.3 The 2015 Greater London Historic Environment Research Strategy set out research priorities, including, *Post-medieval defensive sites and structures: A survey to create an inventory of post-medieval defences, organised by date, type and function, could provide a basis for future thematic study and amplify developer-funded work. The survey should extend up to and include structures associated with World War II and the Cold War, and is particularly suitable for community and local society involvement..* (Museum of London 2015 **RP15**, 38) On the face of it, the archaeological aspects of the Kenley Revival Project precisely address this research priority.
- 5.5.4 The 2002 "Research Framework for London Archaeology" poses the following objective *Establishing how well the various defence systems around London from the 16th century to the beginning of the 20th century survive, and considering their influence and effect on Londoners both practically, and psychologically as reflections of power and political security (Museum of London 2002*, **L5**, 71). You can hardly have a more significant moment in the history of Londoners, nor a more acute psychological or physical effect on the capital, than that of the Battle of Britain and the Blitz, and Kenley played a pivotal role in them. Given the physical and psychological trauma of the Blitz on the civilian population, the subsequent history of the airfield was of profound importance to the feeling and the reality of security of Londoners. A state that would only be challenged by the emergence of rocket-engined terror weapons towards the end of the war.
- 5.5.5 Whilst a small community investigation, of short duration can, only aspire to add details to the fringes of this framework objective, nonetheless, its contribution

should not be underestimated in a field of study that has been noteworthy for its fragmentary and partial nature (c.f. the successful exception of Aggregates levy-funded RAF Hornchurch Project, http://www.rafhornchurch.thehumanjourney.net)

- 5.5.6 Nationally, airfield defence evolved as a response to the perceived threat, from the "expansion period" pre-WW2 through the experience of Blitzkrieg tactics on continental Europe through to the newly-formed RAF Regiment taking over ground defence from 1942 (Oliver 2002). Ground defence of airfields may be divided between May–June 1940, when simple weapon pit and gun emplacements were brought in. June–September, saw the creation of pillboxes, in consort with wider national defences. September 1940– saw defences against the perceived threat of parachute troops (a threat realised in the invasion of Crete in 1941). From Autumn 1941, static defences were abandoned, in favour battle headquarters, spigot mortars, barbed-wire and mobile forces, a trend that was consolidated from 1942, when the RAF Regiment took over (Dobinson 2000, 47–61). The defences at Kenley may be "broadly" aligned with this time frame but further research on an airfield-wide basis, including two Pickett-Hamilton Forts, is required to set out its defence on a landscape scale.
- 5.5.7 Similarly, parallels, or partial parallels to hard stands and tie-downs may be found on other airfields. Those investigated at Kenley have yet to be fitted into their requisite chronology and related to the operation of aircraft types (for instance). This fieldwork provides the starting point for research rather than the endpoint. The same comments may be made about the E-shaped fighter pens, the uses of which may be related to those of hard-stands.

6 Conclusions

- 6.1.1 The archaeological investigations at Kenley Airfield 2017 were enabled by the participation of local volunteers, and skilled archaeologist volunteers from further afield in London and well as professional archaeologists, curators and City of London staff with overall responsibility for the management of the site. The co-operation of such a diverse group directly responds to a major theme of Heritage 2020, National Heritage Framework, the strategy document *that sets out the shared strategic priorities for organisations working together to maximise the public benefit of the historic environment in England* (Historic Environment Forum 2015, **1.5**, 2), which defines five themes through which collaborative action can bring the fullest range of resources to bear on the tasks that have been identified as of greatest urgency to sustain and promote the historic environment of England, encourage access and broaden knowledge for a variety of audiences (ibid, **1.7**).
- 6.1.2 The activities undertaken have investigated the form and function, as well as the physical condition and some of the conservation and management requirements of a series of structures on the airfield. It has answered real academic inquiries on the nature of preserved remains and their historical functions, and it has raised new lines of inquiry for the futures.
- 6.1.3 The contributors to the archaeological inquiry left with a determination to pursue further work. It is to be hoped that this can be integrated into the other activities of the Kenley Revival Project as a seamless strand on a project with multiple aspects to enable *people to connect with, and take ownership of, a vital part of British history* so that *Kenley will also become a nationally significant heritage resource* (Kenley Revival website http://www.kenleyrevival.org/).
- 6.1.4 The project archive will be made available via the Museum of London Archaeological Archive, and digital copies of records and drawings will be stored with the Kenley Revival Archive. A summary of the results will be stored in the national "OASIS Report Form" (below) and summaries sent to London Archaeologist and Post-Medieval Archaeology. The resources generated, including this report, may be used to inform "blog posts", websites and leaflets about the site by the Kenley Revival Project, and, in the longer term, information signs around the site.

7 Acknowledgements

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9 OASIS archaeological report form

OASIS ID: molas1-296236

Project details	
Project name	RAF KENLEY - COMMUNITY ARCHAEOLOGY PROJECT
Short description of the project	Supervised volunteer project aimed at a series of
Project dates	Start: 17-07-2017 End: 22-07-2017
Previous/future work	No / Not known
Any associated project reference codes	KRP17 - Sitecode
Type of project	Research project
Site status	Scheduled Monument (SM)
Current Land use	Other 15 - Other
Monument type	AIR DEFENCE SITE Modern
Monument type	FIGHTER PEN Modern
Monument type	ROYAL AIR FORCE BASE Modern
Monument type	AIRFIELD BUILDING Modern
Investigation type	"Aerial Photography - interpretation","Part Excavation","Part Survey","Test-Pit Survey"
Prompt	Conservation/ restoration
Project location	
Country	England
Site location	GREATER LONDON CROYDON COULSDON RAF KENLEY – COMMUNITY ARCHAEOLOGY PROJECT
Postcode	CR8
Study area	49285 Square metres
Site coordinates	TQ 32918 58429 51.308913008025 -0.092809547075 51 18 32 N 000 05 34 W Point
Project creators	
Name of Organisation	MOLA
Project brief originator	Historic England
Project design originator	Historic England
Project director/manager	David Divers
Project supervisor	David Sankey
Type of sponsor/funding body	Heritage Lottery Funding
Name of sponsor/funding body	Kenley Revival Project

OASIS ID: molas1-296236 cont'd

Project archives	
Physical Archive recipient	Museum of London Archaeological Archive
Physical Contents	"Metal"
Digital Archive recipient	Museum of London Archaeological Archive
Digital Media available	"GIS","Images raster / digital photography","Survey","Text"
Paper Archive recipient	Museum of London Archaeological Archive
Paper Media available	"Context sheet","Drawing","Notebook - Excavation',' Research',' General Notes","Plan","Unpublished Text"
Project bibliography 1	
Publication type	Grey literature (unpublished document/manuscript)
Title	RAF KENLEY - COMMUNITY ARCHAEOLOGY PROJECT, Assessment Report
Author(s)/Editor(s)	D Sankey
Date	2017
Issuer or publisher	MOLA
Place of issue or publication	London
Description	A4 report
Entered by	david sankey (DSankey@mola.org.uk)
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