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**Building Recording at
Altcar Rifle Range,
Hightown,
Merseyside.
Final Report
Site Code 125**

Prepared for Sefton Coast Landscape Partnership

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Non-Technical Summary

This report is the final report on the results of a programme of building recording on a set of WWII bunkers and pill boxes at Altcar Rifle Range, Hightown, Merseyside.

The bunkers consist of a centrally placed command post and three smaller satellite pill-boxes. All are set partly below ground levels and are constructed in brick with reinforced concrete roofs. Initially identified as part of a Cold War experimental anti-aircraft radar code-named Newton Orange Yeoman, further investigation has shown that they are in fact part of a World War II anti-aircraft battery which pre-dated Orange Yeoman by about 10 years. The central bunker is a typical example of a 1940s Battery Command Post or BCP whilst the satellite bunkers are Type 23 pill-boxes. The latter are rare examples of construction in brick rather than concrete.

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Building Recording at Altcar Rifle Range, Hightown, Merseyside.

Final Report

Site Code 125

1. Introduction

This report describes a programme of building recording undertaken at Altcar Rifle Range, Hightown, Merseyside. The project was undertaken as part of the Sefton Coast Landscape Partnership Community Archaeology Project 'Soldiers, Sailors and Airmen' and was aimed at recording and interpreting a set of four semi-subterranean bunkers which had been recently uncovered at the camp. The bunkers were originally believed to be part of an experimental anti-aircraft radar code-named 'Newton Orange Yeoman'. However, an assessment of the structures and their layout shows that they are in fact part of a World War II anti-aircraft battery.

2. Site Location and Description

The site consists of four semi-subterranean bunkers set within the core of Altcar Training Camp at NGR SD 292 046 to either side of 'The Shanty' which forms part of the Camp road network (Figs 1 & 2).

The largest is a command bunker consisting of semi-subterranean offices and ancillary rooms with a tarmaced/paved area in a brick walled courtyard and storage bunkers at ground level. This now lies at the north-eastern corner of Anniversary Wood which was planted in 1982 (Fig. 2). There are also three satellite bunkers or pillboxes to c. 70 m north, c. 60 m south, and c. 60 m west of the command bunker. These are all constructed to the same pattern and are composed of two chambers, one roofed in concrete, the other open with a concrete post at the centre.

3. Archaeological and Historical Background

Until the late 18th century most of the area which is now Altcar Rifle Range lay within the River Mersey and the River Alt. Although there is evidence for Prehistoric settlement at Formby and Lunt to the north and east and Roman pottery and coins have been found at the mouth of the River Alt, the earliest known archaeological site within the camp is Alt Grange which lies c. 100 m to the north-east of the present site. In the 13th it century formed part of the holdings of Stanlawe (later Whalley) Abbey and was managed by the 'Granger of Alt' (Farrer & Brownbill 1907, 83, n 9), eventually passing to the Molyneux family after the Dissolution (Lewis 2002, 37). The attribution to Merivale Abbey on a sign attached to the barn is an error which first appears in Stoner (1957). The present building is largely 19th century with some 18th century elements, but may stand close to the site of the medieval grange. The barn contains cruck-framed timbers which are likely to be from the medieval farm.

Reclamation of land from the sea has been actively undertaken along the Sefton Coast since at least the late 18th century (Smith 1999, 59; Lewis pers. comm.) when gorse faggots were used to trap sand blows at Ballings Wharf at the mouth of the Alt. By 1855 the reclamation of Balling's Wharf was complete and the land rented out for grazing (Jones, Houston, and Bateman, 1993b, 18). Smith (1999, 59), gives further detail stating that '...by 1855, an area of 150 acres (61 ha) of reclaimed land could be rented out for rough grazing. However, the land proved unsuitable for agriculture and in 1860 became the Altcar Rifle Range estate'. Altcar Rifle Range was opened by

Lord Sefton on 28th July 1860 for the 5th Lancashire Rifle Volunteer Corps (Jones, Houston, and Bateman, 1993b, 18). Initially the site was leased from Lord Sefton, to provide a rifle range for Liverpool Volunteer Units. In 1885 Lord Sefton made an agreement with the Secretary of State for War for the use of the range by the Regular and Militia. The statement includes that its use is subject to accommodating the volunteers, it being for their "special use". The range remains in use to the present.

Smith (1999, 67) remarks that the Range 'rapidly developed into one of the premier facilities in the country and is unique in being the only major range owned by a Territorial Army Association'. Baines (1870, 406) also mentions the establishment of Altcar Rifle Range adding 'a battery of twelve guns has lately been erected on the shore to protect the mouth of the Mersey'.

The bunkers described in this report were exposed in 2012 by the Camp Commandant, Major Bill Hunter, who had them cleared of surface and internal debris and commissioned some limited repair works confined to rebuilding sections of collapsed brick wall and repointing. It was suggested that they related to a Post-War air defence system code named Newton Orange Yeoman (<http://www.subbrit.org.uk/rsg/sites/f/frodsham/index.html> and http://www.subbrit.org.uk/rsg/sites/n/newton_orange_yeoman/index.html). Most of the text below is derived from these web sites; the main published sources on Britain's World War II air defences (Dobinson 1996 & 2001) were out of print at the time of writing and unavailable at any local libraries.

Orange Yeoman originated in 1949 with a proposal to develop a tactical control radar to feed data to anti-aircraft gun sites. It was intended that the gun sites would be controlled remotely from the Anti-Aircraft Operations Room (AAOR) using radar data provided by two new radar sets, a fire control Radar No.3 Mk VII (Yellow River) and a surveillance Radar No.4 Mk VII which was known as Orange Yeoman, supplemented by a new No.11 Predictor. The specification for the Orange Yeoman radar stipulated a detection range of 91.43-km (100,000 yards) up to height of 18,287-m (60,000-ft) and the ability to supply radar information directly to sixteen remote gun sites, using an automatic data transmission system. Using data acquired by the radar, the predictor was able to calculate target trajectories and feed the information directly to the guns.

Orange Yeoman was eventually trialled at Frodsham AAOR in Cheshire; currently this is the only site where it is known to have been installed by the Army. When air defence was handed over to the RAF following the stand-down of Anti-aircraft Command, Orange Yeoman became the AMES Type-82 radar and was used as the Tactical Control Radar for the Stage-1 Bloodhound missile system with a prototype at North Coates in Lincolnshire.

The only Orange Yeoman trial site was at Newton, 1.5 miles from the AAOR at Frodsham and six gun sites were selected to take part in the trials they were Crank (MY10), Thurstaston (MY24), Norley (MY39), Flint (MY45), Altcar (MY66) and Penketh (MY76). Two pairs of lines were provided linking each gun site with the Orange Yeoman site at Newton. The Newton site consisted of the main data handling building (basic data room and tracking groups), five smaller buildings (staff accommodation etc.) and the remotely sited radar head which was approximately 100 m from the main site. The radar array consisted of a horizontal transmitter aerial with a receiver mounted above it.

Of these only Norley, Altcar and Penketh survive, the Norley site is a Scheduled Ancient Monument (No. 33888), Altcar and Penketh are not statutorily protected.

The Frodsham AAOR was in 4 Group, 79 Brigade serving the Mersey Gun Defended Area (GDA). It is of the standard design built in the early 1950's with both floors above ground. The main

entrance is into the lower floor while the second entrance is up an external flight of stairs at the rear of the building. The AAOR is located on 'The Beacons' (SJ 520766) a natural high point that has been artificially heightened. The building is set into a bank of this dumped material which surrounds it on two sides giving added blast protection.

The Altcar site described here appears to have been established as a Heavy Anti-Aircraft Artillery (HAA) Battery during World War II, presumably as part of the defences of the camp and Liverpool. The battery is present on the 1945 RAF aerial photograph of the site which shows a battery of four guns set within earthwork emplacements arranged in a west facing arc around a central Battery Command Post (BCP), probably the larger bunker recorded in this study.

The site is listed on Pastscape as Monument Number 1472975 described as follows:

'Remains of Second World War heavy anti-aircraft battery at Formby. It was armed with four 3.7-inch guns in 1942 when it was manned by the Home Guard. It was retained as an Off-Site Nucleus Force Battery in 1946. The four emplacements remain as structures, and have been converted to lighting towers.'

However, it is not listed on the CBA's Defence of Britain database and the emplacements do not survive; the lighting towers mentioned are newer, post-war, structures. The Operation Sandstone file for this section of the coast is undated but as probably produced c. 1950 (National Archives ADM 326/581). It does not mention the battery or any of the other camp defences.

4. Methodology

The survey was taken to English Heritage Level III (Menuge 2006) and the bunkers recorded using a mix of digital photographs, Black and White 35 mm still photographs, field notes and measured survey. The measured survey was undertaken with hand-held tapes and the locations of the structures tied in to an Ordnance Survey base map using a total station.

Fieldwork was undertaken by the author with the assistance of volunteers from the Sefton Coast Landscape Partnership. These were Bill Nixon, Ged Gallagher, Alison Burns, David Poole, Glennis Poole, Susan Munroe and John Settle.

5. Description of the Bunkers

5.1 Battery Command Post (Structure 1)

This is the largest of the four structures and consists of three open air courtyards at ground level and two sets of semi-subterranean rooms (Fig. 3). The walls are constructed in machine made brick laid in English Garden wall bond, possibly around a concrete core though this was not exposed, and the roofs are in reinforced concrete laid over fibreboard and timber shuttering (Plate 9). External walls are capped with a course of headers.

It was approached via a single entrance set in the eastern side of the courtyard (Plates 1 & 2), a c. 1m high brick wall set in front defined a baffle arrangement giving approaches to left and right (Fig. 3). The southern, western and northern sides were slightly embanked as a protection against blast. A brick path or area of paving had been partially uncovered at the southern side of the entrance and led to the east or south east (Plate 3).

At ground level the northern courtyard measured 4.14 x 4.24 m and was surfaced in coarse asphalt which showed evidence of buckling. Set slightly off-centre was an octagonal concrete plinth measuring 1.85 m across and set flush with the surrounding asphalt (Plate 4). Three mounting screws were set in its upper surface in a triangular pattern.

The central courtyard was irregular in plan, measuring broadly 4.05 x 7.6 m and was separated from those to north and south by low brick walls. It too was surfaced in asphalt and had two octagonal concrete plinths measuring 1.25 m across and set flush with the surface. Neither had any evidence of fixture points. To the north of these was a square low concrete plinth with a slightly off-centre reinforced concrete post, the top of this had been repaired but presumably was similar to that in Structure 2.

The southern courtyard was rectangular in plan and measured 3 x 3.1 m. A low, c. 1 m high, bunker or storage cupboard on its western side was roofed with a concrete slab and measured 1.45 x 3.1 m internally (Plate 5).

Room 1 was set on the north-eastern corner of the bunker and was approached from ground level via a set of concrete steps leading from the south from the northern edge of the baffle entrance (Plate 1). Internally the room measured 4.45 x 1.78 m. The only features were a pair of brick piers above which was a circular hole in the concrete roof and a shallow sump at the southern end of the room which presumably related to drainage (Plate 6). The brick piers were presumably a support for a stove because the hole in the roof was positioned above. There were no windows and no traces of fixings for a door.

The western suite of rooms was accessed by an identical set of steps at the base of which was another sump (Plate 7). Presumably the sump was covered by a grille when the bunkers were in use. A sliding wooden door gave access to Room 2 which measured 2.5 x 2.6 m with a small outshut to the east measuring 0.92 x 1.3 m, a window in the southern wall gave a view of the stairs. Traces of a bracket above a low concrete plinth survived on the western wall and was set below a vent similar to that in Room 1. Light was provided by a square window placed on the eastern wall (Plate 8).

Room 3 lay to the south of Room 2, the sliding door to the main entrance ran across the doorway to this room which therefore can never have had its own door (Plate 10). Little survived within this room apart from traces of brackets, probably for a shelf, in the south-eastern corner. However, the walls were peppered with pegs for screw mounted wall fixtures. The walls had been coated in a white paint which survived in small patches and carried a small section of graffiti (Plate 11). The concrete floor had buckled upwards by c. 50mm in the centre.

Room 4 lay to the north of Room 2. The architrave for the door frame survived and was painted the same drab green colour as the main door (Plate 12). No internal fixtures survived in this room though it too was peppered with pegs for screw mounted wall fixtures

5.2 Pillboxes (Structures 2, 3 and 4)

Three pillboxes measuring 5.5 x 3.6 m were sited around the BCP to its north, south-east and south-west (Fig. 2). All were constructed to the same plan with a few minor variations, only Structure 2 is described in detail.

Structure 2 was situated 65 m to the north of the BCP and 20 m to the east of the access road. It was rectangular in plan, aligned north-south parallel with the access road and composed of two compartments. Its overall dimensions were 5.60 x 3.25 m (Fig. 4, Plate 13). The southern

compartment was unroofed and is now entered via a 0.4 m wide gap in the southern wall created during recent repair works. Structure 4 has no such gap at this point and it is likely that this was the original form of all three bunkers. The original access was probably via ladders set into the walls, though no trace of fixings was present in any of the bunkers so these may have been removable. Internally the southern compartment measured 2.3 x 1.8 m and was 1.5 m deep. Set at its centre was a reinforced concrete post measuring 0.15 x 0.15 m at its base and tapering gradually to c. 0.13 x 0.13 m at the top and 1.1 m tall. It was set slightly off-centre and had a socket in its upper surface.

The walls were 0.46 m thick and in the southern compartment were constructed entirely in brick. The northern compartment appeared to be similarly constructed, though the possibility of concrete core could not be ruled out.

The northern compartment had a reinforced concrete roof c. 0.3 m thick and was approached from the open compartment via a doorway measuring 0.45 x 1.3 m and a set of steps leading downwards to the north. There were no traces of fixtures for a door. Internally it measured 2.3 x 2.54 m and was sub-divided by a north-south aligned stub wall or baffle. The embrasures or gunslits were cast in reinforced concrete and set slightly off-centre in each wall. The roof was in concrete which had been cast onto galvanised corrugated iron sheets.

Structure 3 was similar in most respects to Structure 2 though the concrete post in the open section did not survive. The break in the wall to the open section was on the eastern wall.

Structure 4 was aligned with the roofed section to the east and did not have the break in the wall to the open section.

6. Conclusions

The structures described in this report are typical examples of a WWII Battery Command Post (BCP) and Type 23 Pillboxes for an anti-aircraft battery. These were produced to designs by the Directorate of Fortifications and Works (FW3) which was set up in May 1940 at the War Office under the direction of Major-General G. B. O. Taylor. Its purpose was to provide a number of basic pillbox designs which could be constructed by soldiers and local labour at appropriate defensive locations. In the following June and July FW3 issued 6 basic designs for rifle and light machine gun, designated Type 22 to Type 27. The pillboxes must therefore have been constructed after mid-1940.

The BCP and Structure 2 are clearly visible on the 1945 RAF aerial photograph of Altcar and Structure 4 also appears to be present. Structure 3 is less clear but this may be a result of camouflage or its having blended in with an area of ground disturbance.

All of these structures were laid out in a regular pattern around what appears to be a standard WWII HAA battery with four pre-1943 design 3.7" emplacements (DFW 55414?) arranged around the usual BCP of that era (DFW 55402?). The concrete posts were used as mountings for Bren guns used as a defence against low flying aircraft. This was presumably Battery I/H1 Formby of the Mersey Gun Defended Area (GDA). (pers. comm. P. Bellamy, Airfield Information Exchange) and is possibly the battery listed on the Merseyside HER as being located at Formby Point for which there is no other record or physical evidence (Adams & Harthen 2007, Johnson 2009, 113).

The pillboxes were possibly intended as part of the camp's core defences but the use of Type 23 Pillboxes with mountings for Light Anti-Aircraft guns suggests that their primary function was to

defend the larger guns against low flying aircraft. At first glance the siting of Structures 2 and 3 appears poor, the eastern gun slits now point into the levee of the River Alt and would appear to perform little or no defensive function. However, the extent to which the levee has been modified since WWII has not been determined and it is possible that it has been raised since the 1950s

The site was modified after WWII when the present battery, the post-WWII MY66 Altcar battery, with four late-1940s design Nucleus/Igloo scheme octagonal 3.7" emplacements with attached engine rooms, a rectangular concrete surface BCP and a smaller square generator building was constructed. (pers. comm, P. Bellamy, Airfield Information Exchange). These new structures were slightly to the north-east of the WWII site and the earlier gun emplacements appear to have been destroyed when they were constructed.

In terms of their overall design Structures 2, 3 and 4 are typical examples of the Type 23 Pillbox, the embrasures in the roofed section are suitable for rifles or light machine guns, the open section was for a light anti-aircraft defence and a Bren or Lewis gun would have been mounted on the reinforced concrete post. Usually, there is no ground level entrance; access was by climbing over the wall into the open section. The embrasures were available precast and factory produced to standard designs, and those at Altcar appear to be of this type but as these were in short supply some embrasures were improvised from brick or concrete paving. Internally, pillboxes are generally cramped and Spartan and it is unlikely that those at Altcar have been altered since first construction. Sometimes internal concrete shelves and tables were provided to support weapons and some were whitewashed inside though there was no evidence for this at Altcar.

However, the Altcar pillboxes are slightly larger than usual at 5.60 x 3.25 m with walls at 0.5 m thick, typically Type 23 pillboxes measured 4.9 m x 2.4 m with walls built to a bulletproof standard of 12 inches (30 cm) thick. The slightly larger size of the Altcar examples may be partly a result of their construction in brick as opposed to the more common method of casting in concrete. Although the internal space in these pillboxes is not significantly different to other examples of the type, the use of brick probably necessitated a greater wall thickness and hence greater overall dimensions in order to reach the bulletproof standard. The reason for the use of brick instead of concrete is not obvious but it is probably a consequence of the local availability of materials. Two Type 23 Pillboxes at Gorse Lane, Great Crosby are in concrete and the Altcar examples appear to be rare examples of the use of brick construction.

Nationally the Type 23 is uncommon, 156 are recorded as being extant, three are listed in Sefton in the CBA's Defence of Britain archives (Sites S0011769, S00117700 and S0013276) and the examples described here therefore significantly increase the number of known examples.

The design of the BCP appears to have been subject to more local variation than the pill-boxes, though the example described here fits the general pattern of extant examples from the 1940s. Room 3 was almost certainly used as the Plotting Room which was usually the largest in the post. The others will have housed the heightfinder, predictor, telephones and offices. The function of the hexagonal mounts has not been determined but it is likely that these were settings for items such as range finders which were common features of these structures. The concrete post is likely to have been a mounting for a light machine gun similar to those in the pill boxes.

In general all four structures are in a good to fair condition, though there is some evidence of spalling of reinforced concrete sections caused by corrosion and expansion of the iron bars.

The brick path leading from the southern entrance to the BCP is probably that visible on the 1945 RAF Aerial photograph. This does not lead to Structure 3 but to a bridge across the River Alt which is no longer present.

The closest comparable sites are the batteries at Penketh and Norley which also later formed part of the Newton Orange gunnery system. The Penketh site is was also a reused WWII 3.7" site. Four new 3.7" emplacements were provided laid out in an arc and some of the earlier emplacements were modified and reused. The post war emplacements are eight sided in plan with two of the sides open for access (http://www.subbrit.org.uk/rsg/sites/p/penketh_haa/index.html). The two WW2 magazines and generator house were reused but the original command post in the centre of the original four emplacements was replaced by a new building capable of accommodating the new No. 11 predictor. This consisted of a long rectangular reinforced concrete building located some distance to the rear of the arc of four new emplacements. Two hard standings were also provided for the gun-laying radar. The original BCP at Penketh may have been abandoned but remains standing, so perhaps was reused.

At Altcar it is possible that the two rectangular structures at the southern end of the fenced off gun compound north of Structure1 are in fact the generator building and command post for MY66 and that the WWII BCP was re-used for Newton Orange Yeoman. However, these are now in use as ammunition stores and were not inspected internally.

Despite there being little evidence for the BCP and pillboxes being directly associated with Newton Orange Yeoman they are of some local significance being a rare survival of Merseyside's WWII air defences, the only other example is at Speke Airport and is in much poorer condition (and possibly demolished) . The pillboxes are also well preserved examples of a type which is rare nationally and in addition are constructed partly in brick rather than the more common concrete.

7. Recommendations for Further Work

No further work is required.

8. Bibliography

Adams, M.H. & Harthen, D. 2007 An Archaeological Assessment of the Sefton Coast. Unpublished NMLFAU Report for Sefton Council.

Dobinson, C. 1996 *Anti-aircraft artillery: England's air defence gunsites 1914-46. Twentieth Century Fortifications in England series. Vol. 1.1 & 1.3*, Council for British Archaeology

Dobinson, C. 2001 *AA Command: Britain's anti-aircraft defences of the Second World War*. English Heritage/Methuen

Johnson B. 2009 *North West Rapid Coastal Zone Assessment (NWRCA) ARS Ltd Report 2009/53* for English Heritage, Archaeological Research Services Ltd

Jones, C. A., Houston, J. A., and Bateman, D. 1993a 'A History of Human Influence on the Coastal Landscape', in Atkinson D. and Houston J. (eds) *The Sand Dunes of the Sefton Coast*, National Museums and Galleries on Merseyside in association with Sefton Metropolitan Borough Council, 3-17.

Lowry, B. 2004. *British Home Defences 1940-45*. Osprey Publishing. ISBN 1-84176-767-0.

Smith, P. H. 1999 *The Sands of Time: An Introduction To The Sand Dunes of the Sefton Coast*, NMGM and Sefton Metropolitan Borough Council.

Altcar Rifle Range Building Recording

Stoner R.J. 1957 *Liverpool's Hidden Story*. Birchley Hall Press, Billinge, Lancashire

9. Figures



Fig. 1. Site location. Contains Ordnance Survey data © Crown copyright and database right 2015.

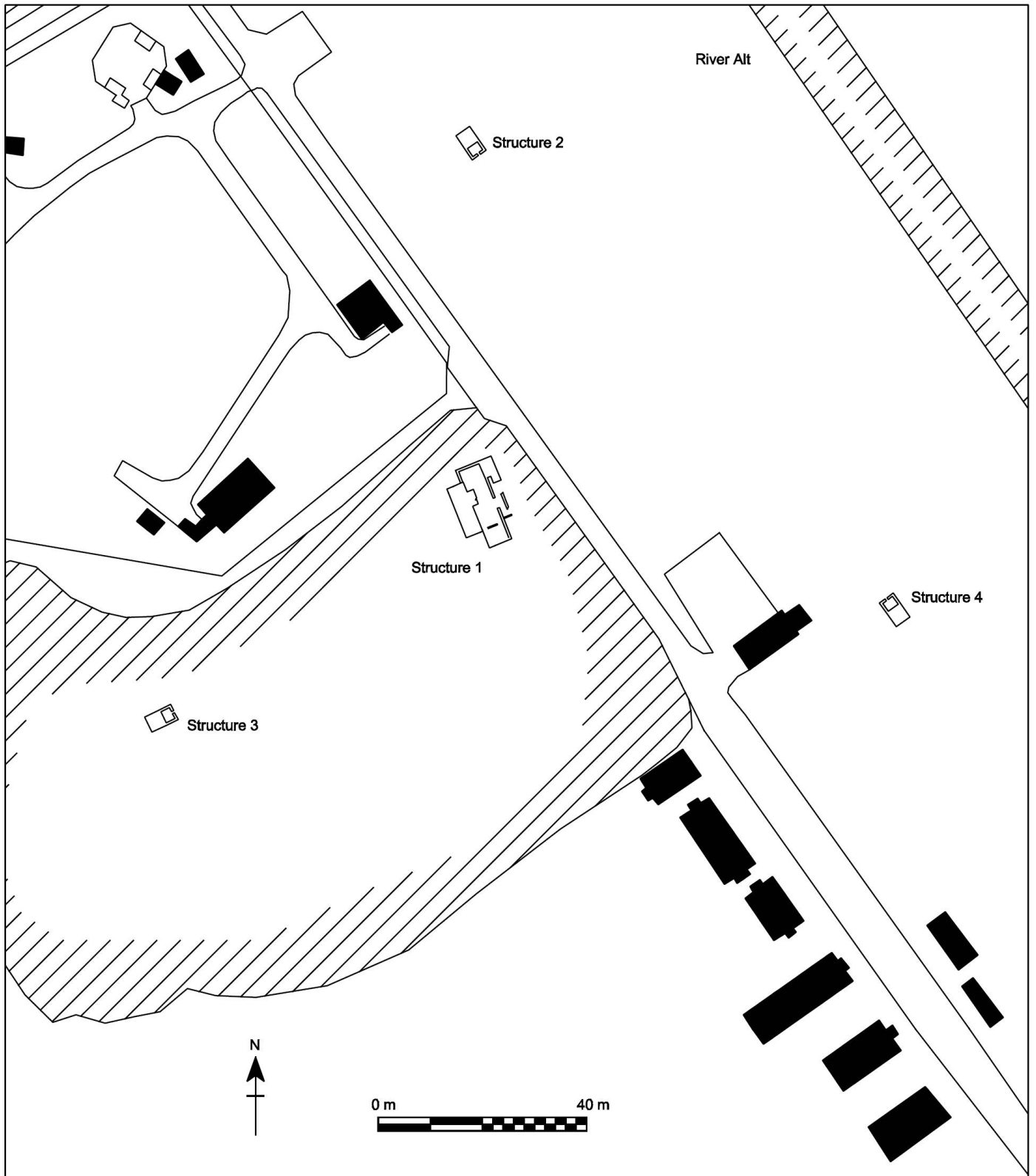


Fig. 2. Location of structures discussed in the text.

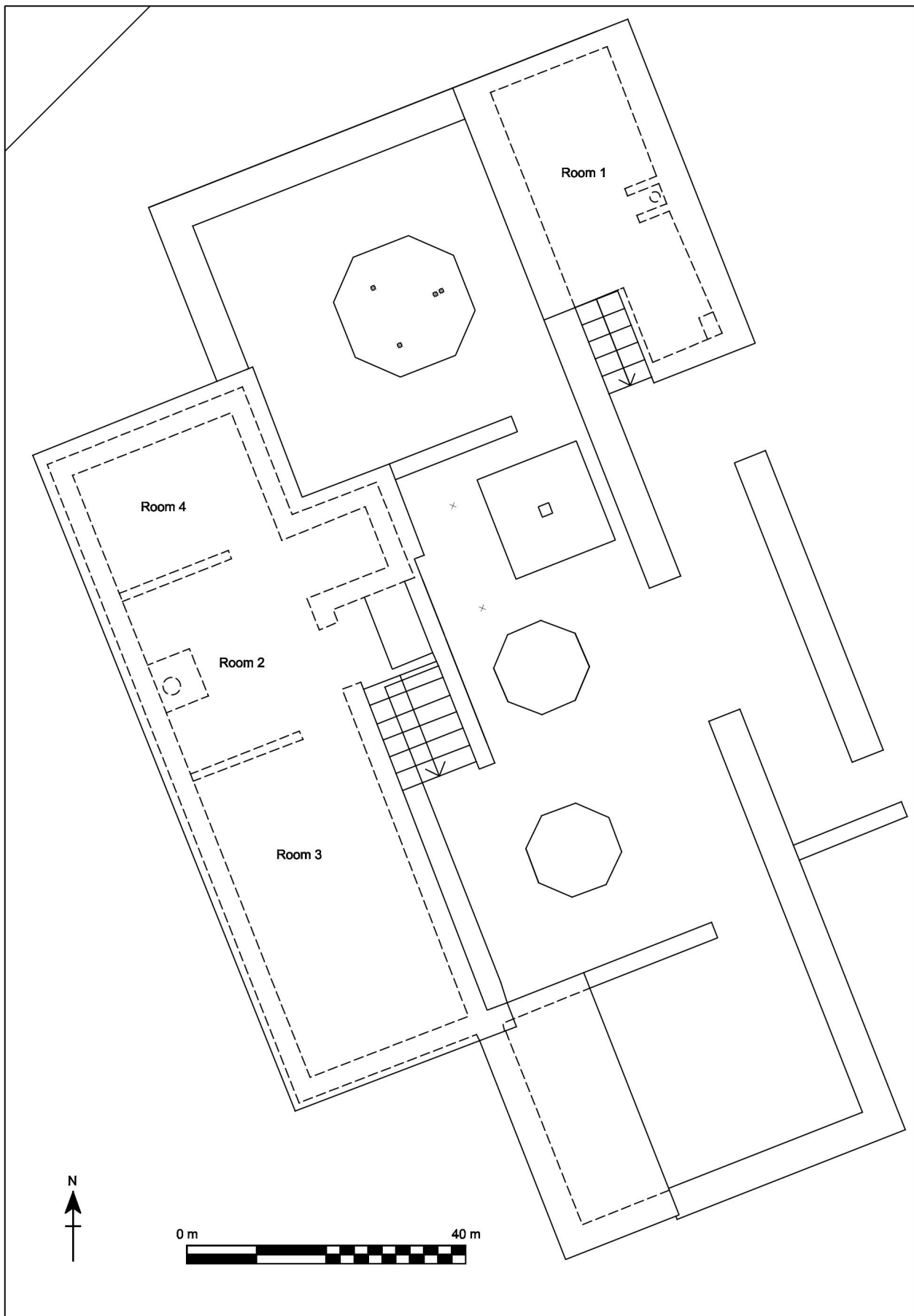


Fig. 3. Plan of Structure 1. Dashed lines represent buried or obscured elements.

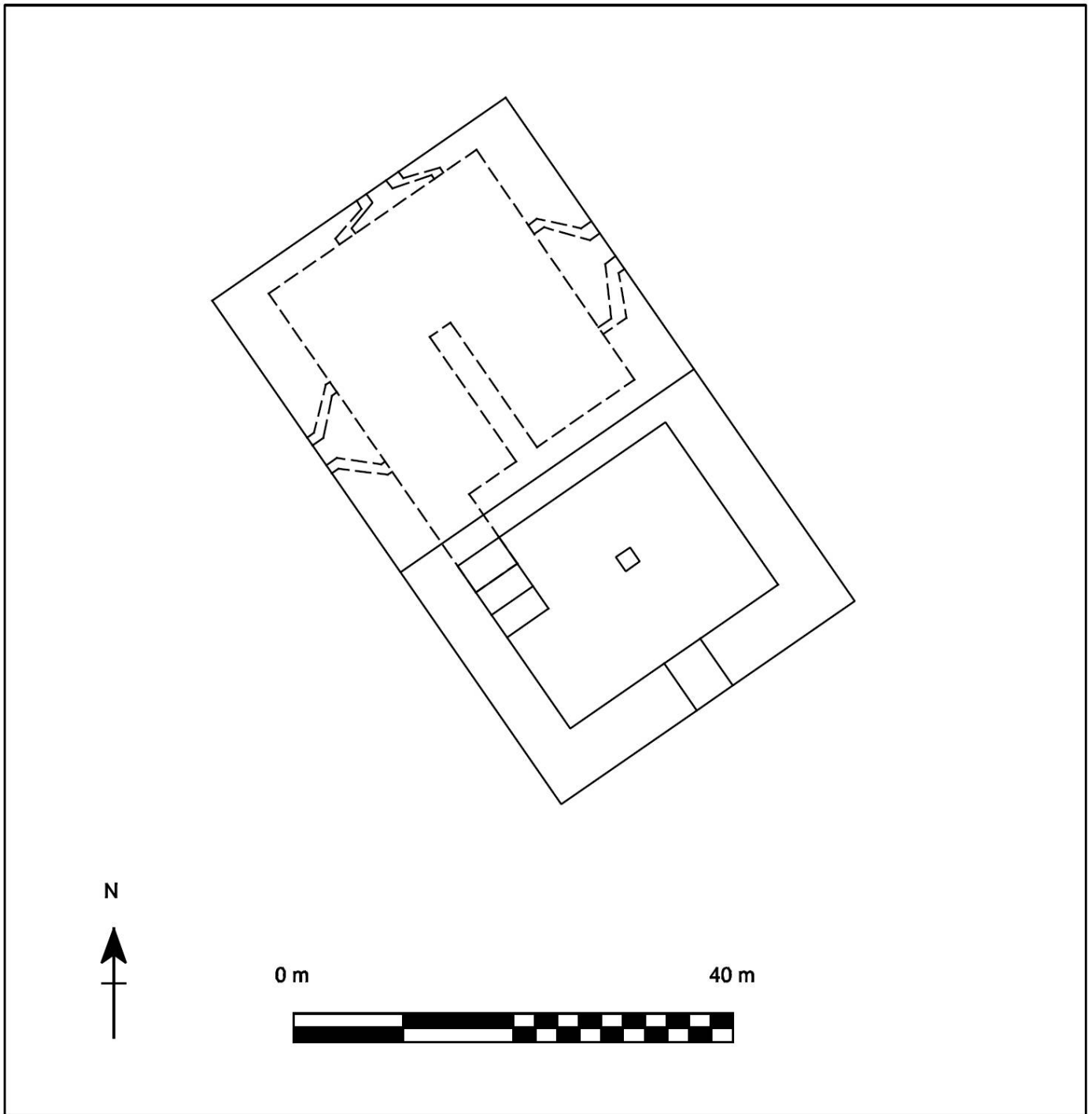


Fig. 4. Plan of Structure 2. Dashed lines represent buried or obscured elements.



Fig. 5. 1945 RAF aerial photograph. The four gun emplacements have been circled in yellow. The BCP is visible to their south-east.

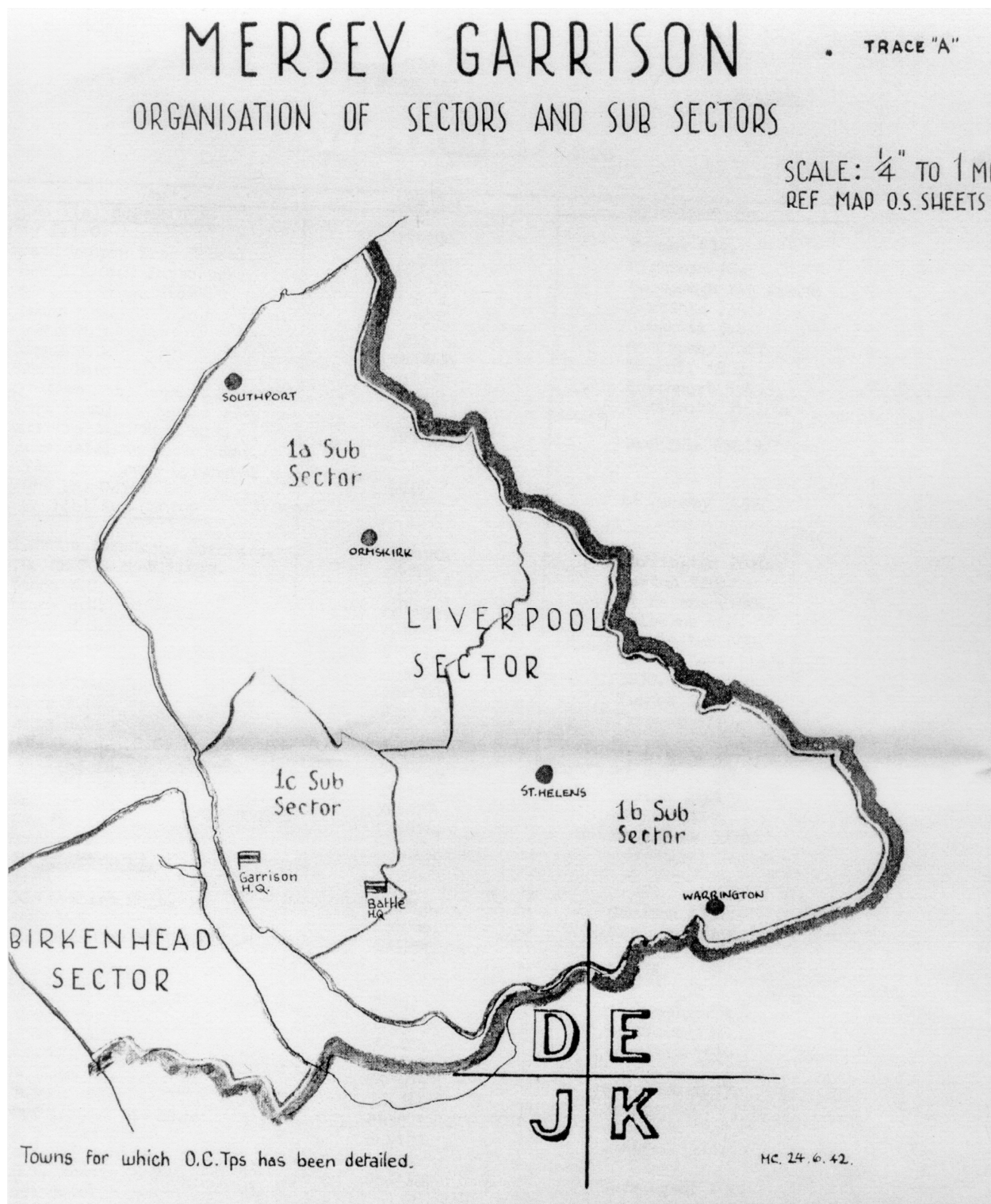


Fig. 6. Map showing the Sectors and Sub-Sectors of the Mersey Garrison in World War II.

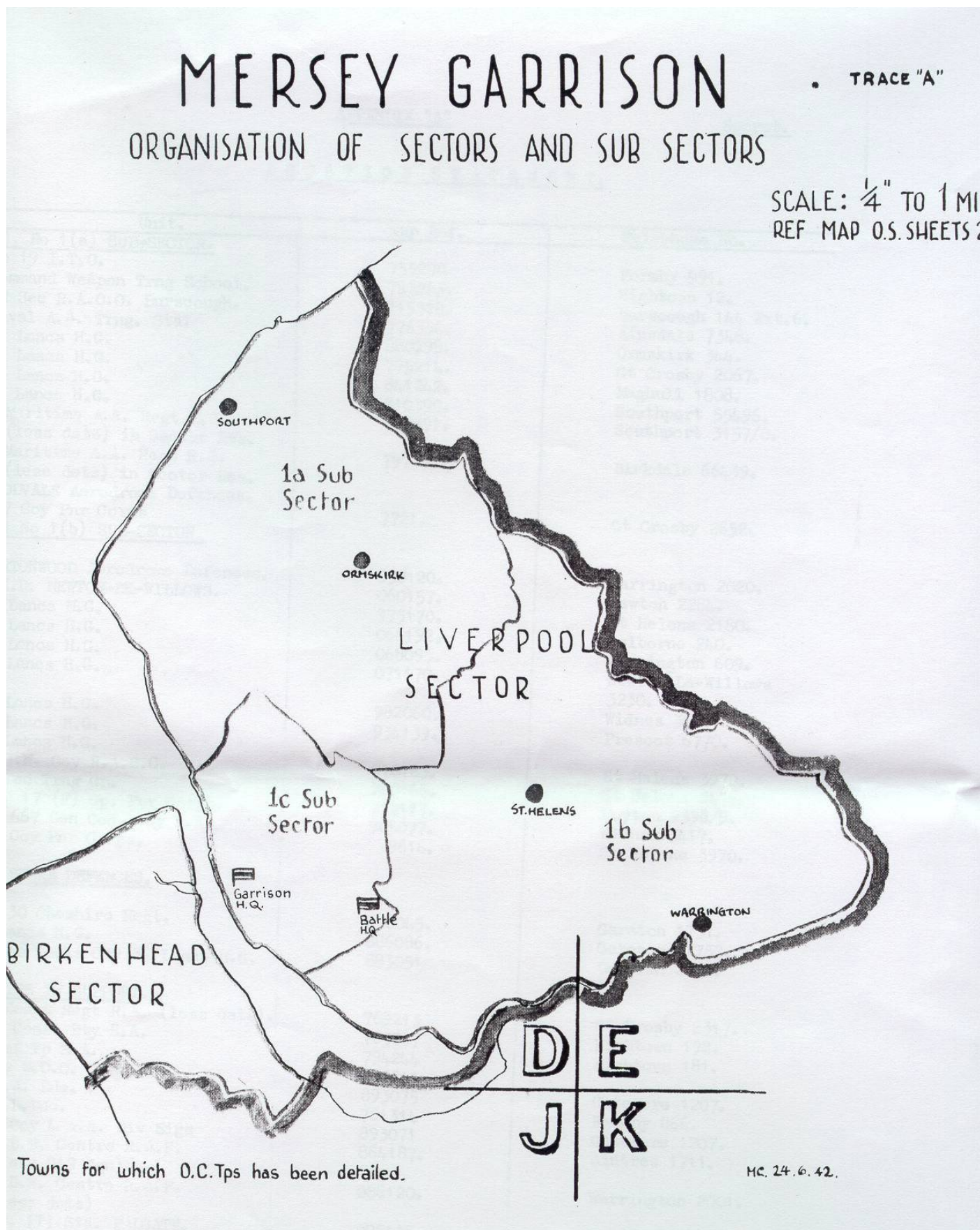


Fig. 7. Map showing the Sectors and Sub-Sectors of the Mersey Garrison.

10. Plates



Plate 1. Structure 1, central courtyard, baffle entrance and entrance to Room 1 from the south.



Plate 2. Structure 1, central courtyard, baffle entrance and entrance to Rooms 2-4 from the south.



Plate 3. Structure 1, path leading from eastern entrance.



Plate 4. Structure 1, northern courtyard view from the north.



Plate 5. Structure 1, southern courtyard, storage bunker from the east.



Plate 6. Structure 1, Room 1, view looking south.



Plate 7. Structure 1, steps leading to Rooms 2-4.



Plate 8. Structure 1, Room 2, window giving view of stairs (right).



Plate 9. Structure 1, Room 4, view looking south.



Plate 9. Structure 1, Room 4, view looking north to sliding door.



Plate 11. Structure 1, Room 3, detail of graffiti on wall.



Plate 12. Structure 1, Room 4 view to door to Room 2.



Plate 13. Structure 2, view looking south-west. Note how the eastern gun slot points into the slope of the bank to the River Alt.



Plate 14. Structure 2. View looking north-west into the entrance.



Plate 15. Structure 4, internal view of eastern gun slit.



Plate 16. Structure 3, view looking south-east.



Plate 17. Structure 4, view looking east.