

‘STARFISH BOMBING DECOY CONTROL SHELTER,
HIGH LANE, OSMOTHERLEY, NORTH YORKSHIRE

ARCHAEOLOGICAL SURVEY



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EXECUTIVE SUMMARY

In August 2019, Ed Dennison Archaeological Services (EDAS) Ltd were commissioned by Mr Nick Mason, Archaeology Officer for the North York Moors National Park Authority (NYMNP) to undertake an archaeological survey of a former Second World War 'Strategic SF Starfish' bombing decoy control shelter near Osmotherley, North Yorkshire (NGR SE 47375 97914 centred). The survey was required to help inform proposed remedial conservation works, and to provide a historic building record of the structure prior to these works being undertaken. The shelter is a Scheduled Monument (National Heritage List for England 1020041), and the survey work was funded as part of the NYMNP's 'Monuments for the Future' project.

The bombing decoy at Osmotherley forms an example of a permanent SF Starfish bombing decoy, one of a number of such sites set up to protect different types of enemy targets during 1941. The primary purpose of the Osmotherley decoy was to help divert enemy bombers from the important chemical and steel-making centre at Middlesbrough, some 23km (c.12 miles) to the north; it appears to have been one of the earlier examples of a 'Strategic' Starfish site. It was under the direct control of No. 80 Wing RAF at Radlett in Hertfordshire, with day-to-day operation provided by staff from RAF Thornaby, located some 16km to the north of the decoy.

The first known reference to the Osmotherley decoy occurs on 1st August 1941, and it operated in conjunction with other similar sites at Guisborough, Sneaton Moor, Middleton, Kirkleatham and Newton Bewley; the site at Osmotherley was designated SF10(c). It was manned by one RAF corporal and six other airmen including a driver and electrician who were all billeted at nearby Cote Ghyll farm. The last reference to the decoy occurs in April 1943, and it is believed to have closed in June 1943. It is reported that the decoy was never ignited.

The Osmotherley site differs from other permanent Starfish sites in that only basket fires were used, rather than in conjunction with other apparatus such as boiler fires, grid fires, coal fires and crib fires. Basket fires utilised small c.3 feet square crates, raised above ground level, lined with wire netting and filled with layers of highly flammable and inexpensive materials - flare cans filled with creosote were attached to the sides of some of the baskets for greater effect. The baskets were placed in clusters or rows of 8, 16 or 24 in individual fire groups which were defined by sub-circular fire breaks or bunds to prevent fire spreading further afield. Most of the baskets were fired by their own electronic igniters, activated by cabling from the control shelter, although the proximity of the baskets often meant that fire spread from one to another. Burning was limited to about an hour, meaning a sequence of firing episodes was usually needed to provide a sufficient decoy. A 1948 RAF aerial photograph shows some 13 fire groups at the site, placed c.525m to the north of the shelter. Little now remains at the decoy fire site.

The surviving control shelter conforms very closely to the 1941 design drawing (Air Ministry CT 557/41). It is brick built, with a reinforced concrete roof, and the entrance is protected by sloping side walls and a detached blast wall. The shelter would once have been surrounded by earth banks, now removed, and the external walls retain traces of paint perhaps related to wartime camouflage or bitumen damp proofing. The shelter contained the igniter switchgear and communications equipment - little evidence for any fixtures and fittings remains, although the former positions of the cast-iron climbing rungs used to access the roof hatch remain can be seen as well as some of the ventilation holes. There was a separate Nissen hut for the crew adjacent to the shelter, but this has also been demolished, leaving only the concrete base.

1 INTRODUCTION

Reasons and Circumstances of the Project

- 1.1 In August 2019, Ed Dennison Archaeological Services (EDAS) Ltd were commissioned by Mr Nick Mason, Archaeology Officer for the North York Moors National Park Authority (NYMNP) to undertake an archaeological survey of a former Second World War 'Strategic SF Starfish' bombing decoy control shelter near Osmotherley, North Yorkshire (NGR SE 47375 97914 centred). The survey was required to help inform proposed remedial conservation works, and to provide a historic building record of the structure prior to these works being undertaken.
- 1.2 The shelter is a Scheduled Monument (National Heritage List for England 1020041), first listed on 22nd June 2001, although the extent of the scheduling does not include the fire site further to the north. The extent and methodology of the pre-intervention survey work was defined by NYMNP project brief (see Appendix 2). The survey was funded as part of the NYMNP's 'Monuments for the Future' project, which was developed as a response to Historic England's Heritage at Risk surveys, and to address the Authority's Business Plan priority to reduce the risk status of Scheduled Monuments. The 'Monuments for the Future' project is a partnership using the joint financial resources of the NYMNP and Historic England (formerly English Heritage), which aims to improve the condition of vulnerable monuments as well as remove monuments from the Heritage at Risk Register.

Site Location

- 1.3 The bombing decoy control shelter is located within a series of walled enclosures set to the immediate south of Pamperdale Moor, some 1.80km to the north-east of the centre of Osmotherley in North Yorkshire (NGR SE 47375 97914 centred) (see figure 1). It lies on the east side of High Lane, a moorland access track which runs north from Solomon's Temple on an unclassified road running east out of Osmotherley. The shelter lies within an enclosed pasture field, at an elevation of c.272m AOD (see figure 2).
- 1.4 The control shelter is owned by the Thimbleby Estate and, at the time of the EDAS survey, it was being used by the Cleveland and Darlington Astronomy Society (CaDAS) to store equipment; its use is restricted to 29 days a year by the society (Pat Duggan, CaDAS, *pers. comm.*). Some 8m to the south-east of the shelter there is a concrete base, believed to have once supported a Nissen Hut used as a guardhouse. The fire site associated with the decoy lies some 400m to 600m north of the control shelter, mostly within enclosed land but with a small part on unenclosed moorland. The fire site was not included in the recording work.
- 1.5 It is not believed that the control shelter has been the subject of any previous detailed survey work, although it is included in a list of identified sites in this part of the Ryedale area (Harwood & McMillan 2014, 94-95), as well as more general works about Second World War bombing decoys in Britain (for example, see Dobinson 2000, 135 & 184). The complex is also included on Historic England's Research Record (1345542 shelter and 1532460 decoy), and the NYMNP Historic Environment Record (1364 shelter and 6647 decoy).

Survey Methodology

- 1.6 As noted above, the aims and objectives of the archaeological survey work were to provide a detailed pre-intervention record of the shelter, which could then be used to inform possible repair and conservation works.
- 1.7 The parameters for the archaeological survey work were defined by a NYMNPA project brief (see Appendix 2). This required a Level 2 descriptive record, comprising written, drawn and photographic elements, as set out by Historic England (2016, 26). Guidance produced by English Heritage (now Historic England) and other bodies was followed (e.g. RCHME 1999; ClfA 2019).
- 1.8 It was subsequently decided that various repair and conservation works would be undertaken to the shelter, and these were defined by a specification produced by the project architect (Pace 2019). There was no requirement for EDAS to monitor the works, nor to produce any 'as complete' records and photographs.

Collation of Documentary Material

- 1.9 Although not required by the brief, some limited documentary research was also carried out. This involved the collation of existing readily-available published and secondary material, to allow comparison with other bombing decoy control shelters, and to place the Osmotherly site within the general context of the development of bombing decoys in the Second World War, both nationally and locally.
- 1.10 Information relating to the site and the surrounding area was obtained from the NYMNPA HER and Historic England's Research Record. This information comprised records/reports of any previous historic research and archaeological activity, aerial photographs, past management and land ownership records, scheduled monument records, and historic maps and plans. A full list of primary and secondary sources consulted is given in the Bibliography below.

Historic Building Recording

- 1.11 The main phase of the historic building recording took place on the 25th September 2019, in fine conditions. A second visit was made on the 17th March 2021 to view the interior and roof of the shelter after modern fittings had been removed.
- 1.12 A ground floor plan of the control shelter and adjacent concrete surface was made at a scale of 1:50, together with a roof plan of the shelter at the same scale. In addition, a long section and cross-section were made through the shelter, again at a scale of 1:50. Finally, after the stripping out of modern materials, outline elevation drawings of all internal elevations were made at a scale of 1:50. The survey was undertaken using traditional hand-held methods. The resulting drawings were produced at a scale of 1:50 and are presented as interpretative hand-drawn wet ink drawings using conventions analogous to those used by Historic England.
- 1.13 Sufficient notes were taken in the field to provide a detailed written description of the shelter and its immediate environment. The written description and survey were supported by a small number of digital photographs, including general views and more detailed photographs of specific parts. The colour photographs were produced using an SLR digital camera with 12 megapixel resolution. Historic

England photographic guidelines were followed (Historic England 2015) and each photograph was normally provided with a scale. All photographs have been clearly numbered and labelled with the subject, orientation, date taken and photographer's name, and were cross-referenced to digital files etc (see Appendix 1).

Reporting and Archive

- 1.14 An EDAS archive survey report was produced, based on the results of the historic building recording. This assembles and summarises the available evidence for the site in an ordered form, synthesises the data, comments on the quality and reliability of the evidence, and how it might need to be supplemented by further field work or desk-based research. The report is illustrated by reduced versions of the survey and other drawings, and a selection of photographic plates. The survey report also contains various appendices, including a photographic catalogue.
- 1.15 The project archive was prepared according to national guidelines (e.g. ClfA 2020), and was deposited with the NYMNP at the end of the project (EDAS site code OSM 19).

2 ARCHAEOLOGICAL AND HISTORICAL BACKGROUND

Starfish Bombing Decoys

- 2.1 The Second World War saw the emergence of aerial bombardment as a decisive instrument of warfare, and to counter this threat, the United Kingdom maintained a flexible and diverse mechanism of air defence throughout the hostilities. This included the early warning of approaching aircraft, through radar, audible and visual detection, and the local defence of towns, cities and other vulnerable points using anti-aircraft batteries and balloon barrages. But less conspicuously, many potential targets were shadowed by decoys, involving the construction of dummy structures and producing lighting displays and fires, all designed to draw enemy bombs from the intended points of attack.
- 2.2 Britain's decoy programme began in January 1940 and it developed into a complex deception strategy, using four main methods: day and night dummy aerodromes ('K' and 'Q' sites using dummy aircraft and lights); diversionary fires ('QF' and 'Starfish' sites); simulated urban lighting ('QL' sites); and dummy factories, buildings and other structures. In all, some 839 decoys are recorded for England in the official records, built on 602 sites (some sites containing decoys of more than one type). These make up the greater proportion of the c.1000 decoys recorded for the United Kingdom (SM description). The decoy programme represented a significant investment of time and resources, and was initiated by Colonel Turner of the Royal Engineers and a technical department largely drawn from the film industry whose staff were familiar with the techniques of specialised lighting and visual effects. Apart from construction costs, several thousand men were also employed in operating the various types of decoys, the fortunes of which were closely tied to the wartime targets they served.
- 2.3 Decoys simulating fires in urban centres were known as 'SF (Special Fire) Starfish' sites, to distinguish them from the smaller 'QF' (quartz fire) installations. Each protected town was surrounded by a cluster of Starfish sites, the most technically sophisticated of all the decoy types, with each site replicating the various fire effects an enemy aircrew would expect to see when their target had been successfully set alight by incendiaries or bombs. These Starfish decoys employed

a combination of fire types, duration of burning and speed of ignition (see figure 3A).

- 2.4 In a permanent Starfish site, all fire types were used, set in discrete areas defined by firebreak trenches or bunds and controlled from a remote shelter (see below). 'Temporary' Starfish sites, built in 1942 to counter the threat from the so-called Baedeker raids against historic towns and cities, only utilised basket fires; one such site, adjacent to Fulford Golf Course near York has been discussed (Crawshaw 1992). In all, 228 decoys with a Starfish component are recorded in England, 37 of which were temporary with the rest being permanent. The permanent sites were located mostly in central England, close to the urban and industrial targets they were intended to protect, while temporary sites, like the Baedeker targets they were protecting, were largely confined to southern and eastern England (Dobinson 1996, 41-45). The 'QF' sites were first provided for the night protection of RAF airfields, but from August 1941 their role was extended to also protect urban centres. Although similar to Starfish sites, they differed in being considerably smaller and much less sophisticated, using a limited range of fire types and being sited for the local protection of specific vulnerable points rather than whole cities or conurbations.
- 2.5 These new QF sites of 1941-2 fell into four groups: for the protection of urban and industrial targets (the 'Civil or Civilian Series', located mostly in the west Midlands, the north-west and in the Middlesbrough area); Royal Navy sites (these were few in number and sited to protect coastal bases); Army sites, to protect ordnance factories or military installations which existed in a sparse belt running from central southern England into the west Midlands; and oil installations and tank farms (the 'Oil QF' sites). Nationally, by 23rd January 1941, the number of 'Civil' Starfish sites had risen to 43, covering 13 cities (including Middlesbrough), but this grew to 130 by the end of April of the same year, covering a total of 42 target towns (Dobinson 2000, 89).
- 2.6 In June 1941, a new type of 'Strategic' Starfish site was introduced with the aim of protecting general areas rather than specific cities, with overall control provided by No. 80 Wing RAF at Radlett in Hertfordshire, rather than a tier of local control (Dobinson 2000, 134-135); No. 80 Wing RAF co-ordinated the sophisticated communications network established to monitor the movements of enemy aircraft and alert the necessary personnel at a local level. These new Starfish sites were usually somewhat larger than the conventional type and were sited with an eye to covering larger areas which, in practice, meant serving a number of cities (SM description). Many of the Starfish sites were associated with nearby anti-aircraft or 'Z' rocket batteries.
- 2.7 The basic operation of a standard permanent SF Starfish site involved having various types of fire-producing equipment grouped together in different 'fire groups', ignited electronically through cabling from a control shelter, in order to replicate the effect of incendiaries dropped at the onset of a raid. An essential part of the design of the site was to isolate one fire group from another (and also from any nearby fuel reserves) by digging firebreak trenches or bunds around them, usually with a circular or sub-circular plan, to prevent grass fires spreading across the whole complex; there was also generally a looping access road for fuel deliveries, which was often camouflaged later in the war (Dobinson 2000, 104).
- 2.8 Four main types of fire group were used in combination at a typical site, to produce a variety of different fire and smoke effects - these were boiler or boiling oil fires, grid fires, basket fires and coal fires (see figure 3B). Boiling oil fires involved

feeding diesel or gas oil into metal troughs from a supply tank, which was initially heated and then fired electronically, with the addition of water resulting in a violent and explosive fire burst (see figure 4A) - each Starfish site typically had 12 to 14 boiling oil fires, and tank capacities of 480 gallons of oil and 200 gallons of water meant that a burn could be maintained for up to four hours. The grid fire system was similar, although it used paraffin to produce a bright yellow flame with less ferocity (see figure 4B). Basket fires utilised small c.3 feet square crates, raised above ground level on a stand, lined with wire netting and filled with layers of highly flammable and inexpensive materials; flare cans filled with creosote were attached to the sides for greater effect (see figures 5A-B and 6). This was the most common and numerous type of fire mechanism, with the baskets usually placed in clusters or rows of 8, 16 or 24. The majority were fired from their own electronic igniters, although the proximity of the baskets often meant that fire spread from one to another (see figure 4C). In this instance, burning was limited to about an hour, meaning a sequence of firing episodes was needed to maintain a four hour burn. The final method, using coal fires, consisted of a single or double brazier made from scaffolding supporting a metal tray beneath which were the igniters. It was very similar to the grid fire apparatus - coals were burnt in a one or more long thin braziers and a 36ft (c.11m) long feed pipe from a tank dripped diesel oil onto the coals to provide sudden violent explosions against the background burn (see figure 4D). A variant of the coal type was the crib fire, in which coal was held in a large above-ground wire-mesh container and ignited from flare cans beneath, which in turn were lit from donators linked to the control shelter (see figure 4E) (Dobinson 1996, 49-51; Dobinson 2000, 97-104).

- 2.9 Crucial to the operation of a Starfish site was the control shelter, which should more accurately be termed the night shelter as operation of the decoy was confined to night time. This was a much simpler structure than those present at other Q or QL decoy sites, and it functioned as a home for the igniter switchgear and communications equipment; a generator provided power to the electrical circuits and switches that activated the fire groups, either singly or in rotation. The shelters are almost all above-ground structures, as pre-1941 below-ground types were found to be susceptible to flooding. A design drawing for the shelter (Air Ministry CT 557/41) was produced sometime in 1941, and is believed to be the only type used on wartime Starfish sites (Dobinson 1996, 52-53; Dobinson 2000, 106) (see figure 5C). A tracing of the original design drawing, made in September 1942, survives in the National Archives (TNA AIR 40/1876) (see figure 7).
- 2.10 Essentially, the shelter consisted of a brick or concrete walled rectangle (10ft by 8ft internally, and 7ft high - 3.0m by 2.4m by 2.1m high) with a concrete roof, protected by earth banking for blast protection; the walls were to be constructed in 14 inch brickwork or 16 inch precast concrete hollow blocks filled with sand, and the roof was to have steel reinforced fabric. There was a single entrance accessed along a 3ft wide passage between two angled brick retaining walls, which was protected by an external brick blast wall measuring 7ft 6 inches high, 7ft long and 1ft 2 inches wide (2.28m high, 2.1m long and 0.35m wide). Internally, the shelter was a single space, with various air vents and an emergency exit through the roof which had a hinged opening and was accessed using step irons in the wall below placed 12 inches apart. There was a soakaway channel in the reinforced concrete floor for drainage, and the whole structure was painted with two coats of bitumen paint and surrounded by earth banking; the roof also had a 1ft thick cover of earth.
- 2.11 The basic principle of operation was to run cables from the fire groups to the shelter which housed the telephone (from which orders were issued to ignite), and the switchgear which activated the various fire groups in the decoy. The shelters

were placed at some distance from the fire groups, for obvious reasons, in some cases more than several hundred yards. The electrical engineering involved was complex, requiring constant maintenance from the two electricians who were included in a typical site's initial regular staff of 24 airmen; they would travel each day from a parent unit to man the site during the night, and the wiring grew in complexity as the sites built in 1941 expanded (Dobinson 2000, 106-7). In 1941-42, questions arose over manning levels, and numbers were reduced to 19 and then 17 by October 1941, and permanent accommodation was erected at a small number of sites (Dobinson 1996, 54).

- 2.12 It is generally considered that the Starfish decoys in particular, compared to other types of decoys, were very successful in diverting enemy bombers away from their primary targets, and thus saving many lives. For example, on one night in April 1941 a Starfish site at Sinah Common drew 170 high explosive bombs and 26 parachute bombs away from Portsmouth, representing 95% of the total weight of explosive dropped during the whole attack (Dobinson 1996, 65). The sites protecting Portsmouth, Plymouth, Bristol, the Humber and Middlesbrough were considered the most effective (Dobinson 2000, 213). Overall, it has been estimated that over 2,500 civilian lives and countless buildings, equipment and facilities were saved by the decoy system (Floyd 2020).
- 2.13 As the war progressed, and Luftwaffe operations against Britain became less effective, a block closure programme of the Starfish sites took place, starting with those in peripheral positions, mostly serving northern targets. By early 1945 all of the various types of decoys were decommissioned. The instructions issued by the Air Ministry on 9th August 1944 noted that equipment that could be salvaged (e.g. metals and cables) should be removed and retained, while basket fires and non-oil fires should be fired *in situ*. Other obstructions should be cleared, but the shelters were not to be demolished due to the work involved - landowners were invited to purchase them as it was thought that they would serve a useful agricultural purpose, but many declined and so the shelters were simply left in their isolated locations (https://stmargarets.london/archives/2012/05/richmond_park_starfish_bombing_decoy_sf8a.html; Dobinson 2000, 205-207). As a result, many shelters survive but their associated decoy sites do not.
- 2.14 There has been a recent upsurge in interest in military sites associated with the Second World War, and this also extends to decoys in general and specific Starfish sites. Many are now described or detailed on the internet, with photographs, for example those in Arborfield in Berkshire, some in Lancashire, others in Richmond Park and those in the Cuckmere Valley in East Sussex (http://www.arborfieldhistory.org.uk/properties_starfish_sites.htm; <http://www.lancashireatwar.co.uk/decoy-sites/4575224154>; https://stmargarets.london/archives/2012/05/richmond_park_starfish_bombing_decoy_sf8a.html; https://stmargarets.london/archives/2012/05/richmond_park_starfish_decoy_sf8a_the_fires_burn_o.html). Two very well researched accounts detail one specific site at Wrington in Somerset built to protect Bristol, and another describes decoys in the Cuckmere Valley in East Sussex; both include much information on decoys in general (Floyd 2020; <https://www.blighty-at-war.net/decoy-qi-sites.html>). However, few archaeological surveys appear to have been carried out in England, although one 'Oil QF' site in Medway (Kent) has been recorded in detail (Small 2014), as well as parts of the extensive decoy complex on the north bank of the Humber east of Hull (Blood 1992). Some Starfish and QF sites in Calderdale and West Yorkshire have also been examined (Haigh 1993 & 2004). However, very few archaeological surveys have been undertaken of Starfish sites, either the fire groups complex or the shelters themselves.

The Osmotherley SF Starfish Bombing Decoy

- 2.15 The primary purpose of the Osmotherley decoy was to divert enemy bombers from the important chemical and steel-making centre at Middlesbrough, some 23km to the north. Nationally, by 23rd January 1941, the number of 'Civil' Starfish sites had risen to 43, covering 13 cities including Middlesbrough. The first three 'Strategic' Starfish to open nationally appear to have been those in the Middlesbrough system, located at Osmotherley, Guisborough (Kildale Moor) and Sneaton Moor, and others were later built to expand the system at Middleton (north-west of Stokesley), Kirkleatham and Newton Bewley; the Osmotherley site was designated SF10(c) and its position is highlighted on figure 3A (Dobinson 2000, 134-135). The first reference to most of these sites occurs on 1st August 1941, although those at Sneaton Moor and Newton Bewley are first noted on 1st March 1942 and 8th April 1943 respectively (Dobinson 1996, 149). The Sneaton Moor fire groups are still well preserved, although they have been disturbed by later tank movements during training for D-Day (see figure 4F); the shelter at this site does not survive. Harwood and McMillan also note the presence of another unofficial decoy on Hawnby Moor, where moorland was set alight by a random air raid but the fire was kept alight by the Home Guard for ten consecutive nights (Harwood & McMillan 2014, 89).
- 2.16 It was believed that German bombers approached Middlesbrough in a forked attack formation, one group heading northwards along the coast and then inland along the Tees Estuary, and the other flying north guided by the western scarp of the North York Moors above Osmotherley. Often, a breakaway flight path was used, flying first to Leeming or Goose Pastures, two important airfields, and then across the North York Moors. Local information notes that the Osmotherley area in general was also a target, because it hosted large numbers of billeted soldiers, defence equipment and army vehicles in open fields (Tom Rudd, *pers. comm.*). Starfish sites were generally positioned to the south and south-east of the centre which they were meant to protect, and within c.10 miles of the urban limit (Dobinson 1996, 44). The Osmotherley example corresponds with the southern positioning, but is actually set c.12 miles away from the approximate wartime urban limit of Middlesbrough.
- 2.17 As noted above, the first reference to the Osmotherley decoy appears on 1st August 1941. Day-to-day operation was provided by RAF Thornaby, located to the south of Stockton-on-Tees, some 16km to the north of the decoy, who provided the necessary staff to man the decoy. The main line of communication was via the telephone, and it is believed that the line of telegraph poles which now terminate some 235m to the south of the site once extended as far as the control shelter itself (Tom Rudd, *pers. comm.*). An RAF aerial photograph taken on 18th May 1948 (RAF 5036 540/37 F6//13750, held by the NYMNP HER) shows perhaps 12 fire groups in the decoy, all placed within enclosed land, with two other enclosures, perhaps not related to the decoy, slightly further afield on the open ground of Pamperdale Moor to the north-east. All are surrounded by circular or sub-circular fire breaks, and the former positions of individual fire baskets can be seen within some of the groups, as well as the access road which runs around the northern edge of the site (see figure 8).
- 2.18 The decoy was apparently only equipped with basket fires, and it is reported that they were never ignited, although bombs were dropped within two miles of the site (Harwood & McMillan 2014, 94; SM description). The shelter, which has a good view over all the surrounding land, lies some 550m to the south of the decoy, and this is described in detail in the following chapter. The site was manned by one

RAF corporal and six other airmen including a driver and electrician who were all billeted at Cote Ghyll, c.1 km to the west of the site, and who interchanged with men from the Middleton QF and QL decoys. This was fewer than the 17 men usually manning a Starfish site, in this case presumably because only basket fires were used. No arms were issued and, in addition to the shelter, there was a guard hut on the site (Harwood & McMillan 2014, 94; Roger Thomas, Conflict Archaeologist, *pers. comm.*). Local information suggests that the buildings were camouflaged (Tom Rudd, *pers. comm.*).

- 2.19 The assertion that only basket fires were present at Osmotherley appears to be supported by post-war aerial photographs (see below). However, if so, this would have been unusual, as Dobinson (1996, 46) states that the 1942 temporary Starfish were equipped only with basket fires, but that most other sites employed all four types of fire groups. Local information also notes that the site was also equipped with a fake landing strip, laid out to the east of the control shelter over the moorland (Tom Rudd, *pers. comm.*). Quite what purpose this served is unclear, and this might be a confusion with various tank tracks that run west from High Lane either side of the shelter (Harwood & McMillan 2014, 95). There were numerous searchlights in the general area, including one on Black Hambleton to the south and another at Ingelby to the south-west (Tom Rudd, *pers. comm.*), as well as anti-aircraft batteries to the south of Middleborough.
- 2.20 Dobinson (2000, 184) states that the Osmotherley decoy was closed in June 1943, whilst elsewhere it is reported that the last known reference to the site occurred on 8th April 1943 (Dobinson 1996, 149; SM description); all of the other Starfish sites associated with the Middlesbrough system are not referred to after this mid-1943 date either.
- 2.21 The command shelter and the concrete hut base to the south are clearly visible on an aerial photograph taken on 13th July 1972, but by this date the fire groups had faded somewhat (Meridian Airmaps Ltd 59/72, held by NYMNPA HER). An examination of the decoy site, as part of the current survey work, established that few earthworks remain apart from some vague banks and depressions, with no obvious patterning or layout evidence.
- 2.22 No previous archaeological survey work appears to have undertaken at the decoy site. Harwood and McMillan (2014, 94-95) published some 1997 and 2012 photographs of the shelter and adjacent hut base, and these allow an indication of the gradual deterioration of the structures to be measured; appropriate details are included in the descriptive text below. The shelter has been used by the Cleveland and Darlington Astronomy Society on an intermittent basis since 2006, who undertook repairs to the roof and placed the turf on the top, as well as other routine maintenance tasks to prevent water ingress (Pat Duggan, CaDAS, *pers. comm.*).

3 DESCRIPTION OF THE STRUCTURES

Introduction

- 3.1 The two surviving structures associated with the Osmotherley Starfish site (the control shelter and the hut base) are described below in a logical sequence, based on the information gathered in the field. The structures are aligned north-west/south-east or north-east/south-west, but for the purposes of the following description they are considered to be aligned either north-south or east-west. Reference should also be made to the survey plan (see figures 9 and 10) and plates, and the photographic catalogue which appears as Appendix 1; digital

photographs are referenced in the following text in square brackets, the numbers before the stroke representing the date on which the photograph was taken and the number after indicating the shot e.g. [1/32]. Finally, in the following text, 'modern' is taken to mean dating to after c.1945.

Location and Setting

- 3.2 As previously noted, the Starfish shelter is located to the immediate south of Pamperdale Moor, some 1.80km to the north-east of the centre of Osmotherley, and some 22km south of Middlesbrough, at an elevation of c.272m AOD (see figure 2). There are extensive views of the surrounding landscape from the shelter, although they are not panoramic. To the south-east, the ground surface gently rises, beyond which Black Hambleton, 6km away, can be seen. To the south-west and west, a gap in the hills allows a view right through to the northern part of the Vale of York [1/102-1/104].

The Control Shelter (see figures 9 and 10)

- 3.3 As has already been noted, a design drawing for the command shelter (Air Ministry CT 557/41) was produced sometime in 1941, and it is believed to be the only type used during the war on such sites (Dobinson 1996, 52-53; Dobinson 2000, 106) (see figure 7). The shelter at Osmotherley conforms to the 1941 design very closely.
- 3.4 The shelter is aligned east-west, with maximum external dimensions (including the entrance walls) of 6.50m east-west by 3.70m north-south; the actual internal space measures 2.40m east-west by 3.10m north-south, almost exactly the measurements given in the original design. The structure as a whole is placed on a reinforced concrete raft which projects slightly beyond the building itself [1/065-1/067] (see plate 1). The shelter is of a single storey with a roof formed by a single reinforced concrete slab, 0.20m thick; the edges of the roof are flush with the wall faces below, rather than projecting beyond or overhanging them to provide a drip sill. The roof is not quite flat (the original design noting that there should be a 1 inch fall), and there is a prominent raised strip running along the western side above the entrance doorway where it meets the entrance walls [1/081, 1/087] (see plate 2); this was presumably to stop water draining off the top into the interior through the doorway.
- 3.5 The shelter lies within a shallow depression, the sides of which are most prominent on the east and south sides - this is not thought to be an original feature, but probably results from the removal of the earth banking which would have originally surrounded the structure, as shown on the original 1941 design. It is reported that the banks were still partly present some years ago to the east and south sides of the structure, rising approximately half way up the external elevations (Pat Duggan, CaDAS, *pers. comm.*), but they have since been removed. It is not known when this was done, and Google Earth aerial imagery of July 2009 shows recently completed earthmoving around the shelter. However, no banking is shown on a 1997 photograph published by Harwood and McMillan (2014, 94), and so it was presumably some time before this. There is now a low linear mound of spoil to the west of the shelter and hut base. It has not been possible to find a photograph of the shelter with the earth banking intact.

External Elevations and Roof

- 3.6 The shelter is built of brownish-red machine-made bricks (average dimensions 225mm by 100mm by 70mm) set with a cement mortar and laid in English bond (alternating courses of headers and stretchers). The external walls have an average thickness of 0.30m. There are vestiges of black paint to all the external elevations, more prominent to the lower half, which gives the impression of different phases of build. The paint has been suggested to be a remnant of wartime camouflage, although why this would be necessary if there were earth banks around the shelter is unclear; it may be that the black paint is actually a bitumen coating to provide some damp proofing, as suggested on the original design drawing. The paint to the upper parts of the elevations is believed to have been added by the astronomy society when they took over the shelter (Pat Duggan, CaDAS, *pers. comm.*).
- 3.7 The south external elevation is largely blank. The entrance wall at the west end slopes downwards from east to west, and once had a concrete capping, although this has mostly been lost along with some of the underlying brickwork [1/074] (see plates 3 and 12); a comparison with a 1997 photograph published by Harwood and McMillan (2014, 94) shows the brickwork as then being intact. There are at least three thin vertical lines partly visible within the surviving paintwork on the elevation, a pair towards the centre and one at the eastern end, although their purpose and age is unclear [1/069-1/072]. The east external elevation is also largely blank [1/075] (see plate 4), although there is a small diameter lead pipe emerging from the southern end just above ground level, whilst to the northern end there is a larger diameter ceramic pipe in the same position. The smaller lead pipe would presumably have protected some of the electrical cabling leaving/entering the shelter, whilst the ceramic pipe is likely to have been a ventilation duct; the 1941 design shows it was an inlet vent running through the earth bank (Dobinson 1996, 53 & 55). Again, there is a single thin vertical line towards the north end of the elevation.
- 3.8 The east part of the north elevation also has a cast-iron down pipe emerging from the east end of the roof; the remainder of the pipe was lying on the ground at the time of survey [1/076-1/078] (see plate 5). Harwood and McMillan's 1997 photograph (2014, 94) shows the pipe as being intact. A 3 inch cast-iron pipe is also shown in this position on the 1941 design drawing, running down the wall inside the earth bank, and then continuing through the bank, sloping away from the shelter wall (see figure 7). The return at the west end of the north elevation has a ceramic pipe emerging from the base, to the north of centre, with a broken section of pipe adjacent [1/079] (see plate 6); again, this appears to have formed an inlet ventilation duct as shown on the 1941 design drawing, running through the earth bank. The 2.70m long sloping north entrance wall is better preserved than to the south entrance wall, and retains its concrete capping, although there is a crack below the capping which suggests that the upper courses of brickwork are in imminent danger of deterioration [1/080] (see plate 7).
- 3.9 The detached blast wall is placed 1.0m to the west of the entrance walls. It is 2.60m long, 0.30m wide and stands c.2.0m in height (24 courses), broadly conforming to the 1941 design; it now leans at a slight angle to the west, probably due to some sinking of the foundation [1/073, 1/084-1/086] (see plate 8). It is built of the same brickwork as the shelter, and is capped with a course of headers set on end [1/063, 1/064, 1/068]. It also sits on a concrete raft, set flush with the ground surface, which butts up to the concrete raft underlying the entrance passage. A modern covered shelf is hanging on the east face of the wall; this

houses a number of 'swallow cups' to provide nesting places for birds which had previously occupied the interior of the shelter before the door was put on (Pat Duggan, CaDAS, *pers. comm.*).

- 3.10 At the time of the initial survey visit, the roof was grassed. A modern square metal skylight centrally placed to the north side covers the position of the original concrete escape/roof access hatch [1/088]; this hatch measures 0.85m by 0.90m and extends 0.30m above the surface of the roof. The original 1941 design suggests that the top of the hatch would have sloped to the north, but this only became evident when the grass was removed. To the west of the skylight, a plastic bottle had been used to block a circular vent passing through the reinforced concrete roof.
- 3.11 The turf, which overlay a heavy plastic sheet (put in place by the astronomy society in 2009), was subsequently removed in March 2021, at which point a second survey visit was made. This revealed the full extent of the roof structure, including the 0.30m high raised strip to the west side over the entrance passage [2/410-2/413] (see plate 9). A shallow drainage channel was also seen to run along the eastern edge of the roof, leading to the downpipe positioned on the external north elevation [2/414, 2/415] (see plate 10). The removal of the turf revealed the remnants of a chimney blocked by the plastic bottle, presumably acting as a vent for the internal electrical equipment, or perhaps even a small stove, as well as some patch repairs to cracks in the roof. A number of general views of the shelter were also taken once the turf had been removed [2/420-2/423] (see plate 11).

Interior

- 3.12 The principal entrance to the interior of the shelter was through the doorway at the south end of the west wall, between the sloping entrance walls [1/060-1/062] (see plate 12). There was no door when the astronomy society took on the building in 2006, and so they added a solid WW2-looking steel-fronted door with appropriate handles salvaged from another site [2/426, 2/427] (Pat Duggan, CaDAS, *pers. comm.*). The door was subsequently removed prior to the proposed repairs, and a modern wooden door and frame was inserted [2/404]. There is a raised concrete sill at the base of the doorway, the floor level within the shelter being slightly lower than that between the sloping entrance walls [2/403] (see plate 15).
- 3.13 The interior of the shelter is floored with concrete, and contained no visible features of interest including scarring etc [2/405]. At the time of the initial survey visit, it was lined out with modern painted boarding erected by the astronomy society [1/082, 1/083] (see plate 14). This was subsequently removed, allowing the internal walls to be viewed. However, inspection and interpretation was hampered by the fact that the walls had been painted black and then polystyrene sheets glued to them beneath the board lining, so as to provide some insulation; this made any shadows or other markings that might have been left by removed fixtures and fittings very difficult to see [2/401] (see plate 16). Nevertheless, a few features could be recorded.
- 3.14 Towards the north end of the bottom of the west wall, a 0.25m square vent opening leading to the ceramic pipe visible externally was uncovered; this had once been fitted with a metal grille, although this had almost completely decayed away [2/395, 2/416] (see plate 13). A similar square vent, now blocked internally, was noted at the base of the north end of the east wall [2/417, 2/418] and above this, there were at least two 20mm diameter holes drilled into the brickwork, that appeared to pre-date the use by the astronomy society. At the south end of the east wall, two

strands of twisted (copper?) wire appeared to have once run up through the roof [2/419]. To the north wall, the position of five cast-iron square climbing rungs or step irons which were used to access the escape hatch, in a zig-zag alignment, were just visible [2/397]; again, some of these had been recovered previously as *ex situ* items [2/424, 2/425, 2/428] (see plate 17). The internal south wall was blank [2/402]. The ceiling over retained the marks left by the original wooden shuttering over which the reinforced concrete roof had been cast but otherwise contained no visible features [2/408].

The Hut Base (see figure 9)

- 3.15 The concrete base is set to the south of the shelter; the north end is now 5.70m south of the shelter's south wall, although there would once have been less space between the two structures due to the earth bank surrounding the shelter [1/094, 1/095, 1/101]; the correct relationship between the base and the shelter is shown on figure 9. The Scheduled Monument description interprets the base as the remains of a guard house "probably a Nissen hut, known from a contemporary document to have been part of the site", and this would appear to be the case. Nissen huts certainly were present at other Starfish sites close to the control shelter, such as at Stockwood, near Bristol (Dobinson 1996, 53). Harewood and McMillan (2014, 94) call it a 'rest hut' which is an apt description. As with the shelter, the base lies within a shallow earthwork depression, although this is not considered to be an original feature; there is a slight linear mound to the west of the hut base, probably the result of spreading the former banking which lay around the shelter.
- 3.16 The base has maximum dimensions of 8.25m north-south by 5.70m east-west [1/089, 1/090, 1/093], although the rectangular main body (which formed the internal floor) measures c.5.60m north-south by 4.75m east-west (18.3ft by 15.5ft) [1/092] (see plate 18). These measurements would accord with a typical small three bay Nissen hut which had a 16ft span, with each bay placed at 6ft centres, made of corrugated iron and steel sheets secured with T-ribs and straining wires, and with a semi-circular profile roof; the end walls would most likely have been of timber-framed sections rather than of half-brick (Francis 1996, 211).
- 3.17 At the very north end of the base, there is a small rectangular area of concrete, partly buried, with a low step on its south side, which has a shallow depression to the surface, running east- west. To the south of this, a larger rectangular area of concrete would once have supported a porch to the main body of the structure [1/091]. There is a narrow, shallow, rectangular slot in the surface of the main body's north end, in line with the porch - this slot has a short, threaded bolt with a hexagonal nut and washer at either end, which presumably represents the fixings for the timber-section wall [1/098] (see plate 19). The east and west sides of the main body once had a shallow 0.15m wide slot running along their full lengths, and there was once a similar feature placed along the south side. These slots retain short, threaded bolts with hexagonal nuts and washers in several places, together with small, square recesses within the bases of the slots themselves [1/097, 1/099] (see plate 20); they presumably represent fixings for the roof structure. There was originally a roughly cast concrete edge, 0.60m wide, running around all sides of the main body, although it is now largely covered by turf. This concrete edge contained the remnants of other slots, lined with an iron frame [1/096], which ran parallel to the slots to the main body but placed 0.70m away from them [1/100] (see plate 21); presumably this was to support the roof structure.

4 DISCUSSION AND CONCLUSIONS

- 4.1 The bombing decoy at Osmotherley forms an example of a permanent SF Starfish bombing decoy, one of a number of such sites set up to protect different types of enemy targets during 1941. The primary purpose of the Osmotherley decoy was to help divert enemy bombers from the important chemical and steel-making centre at Middlesbrough, some 23km (c.12 miles) to the north; it appears to have been one of the earlier examples of a 'Strategic' Starfish site. It was under the direct control of No. 80 Wing RAF at Radlett in Hertfordshire, with day-to-day operation provided by staff from RAF Thornaby, located some 16km to the north of the decoy.
- 4.2 The first known reference to the Osmotherley decoy occurs on 1st August 1941, and it operated in conjunction with other similar sites at Guisborough, Sneaton Moor, Middleton, Kirkleatham and Newton Bewley; the site at Osmotherley was designated SF10(c). It was manned by one RAF corporal and six airmen which included a driver and electrician who were all billeted at Cote Ghyll, a farm c.1 km to the west of the site. The last reference to it occurs in April 1943, and it is believed to have closed in June 1943.
- 4.3 The Osmotherley site differs from other permanent Starfish sites in that only basket fires were used, rather than the full range of apparatus which included boiler fires, grid fires, coal fires and crib fires. Basket fires utilised small c.3 feet square crates, raised above ground level, lined with wire netting and filled with layers of highly flammable and inexpensive materials - flare cans filled with creosote were attached to the sides of some of the baskets for greater effect. The baskets were placed in clusters or rows of 8, 16 or 24 in individual fire groups which were defined by sub-circular fire breaks or bunds to prevent fire spreading further afield. Most of the baskets were fired by their own electronic igniters, activated by cabling from the control shelter, although the proximity of the baskets often meant that fire spread from one to another. Burning was limited to about an hour, meaning a sequence of firing episodes was usually needed to provide the usual four hour firing period. A 1948 RAF aerial photograph shows a total of 13 fire groups at the site, placed c.525m to the north of the shelter. Little can now be seen at the decoy site.
- 4.4 The surviving control shelter conforms very closely to the 1941 design drawing (Air Ministry CT 557/41; TNA AIR 40/1876). It is brick built, with a reinforced concrete roof, and the entrance is protected by sloping side walls and a detached blast wall. The shelter would once have been surrounded by earth banks, now removed, and the external walls retain traces of paint perhaps related to wartime camouflage or bitumen damp proofing. The shelter contained the igniter switchgear and communications equipment. Little now survives for any internal fixtures and fittings, although the former positions of the cast-iron climbing rungs used to access the roof hatch remain visible as well as some of the ventilation holes. There was a separate Nissen hut for the crew adjacent to the shelter, but this has also been demolished, leaving only the concrete base.

5 BIBLIOGRAPHY

Primary Sources

- 1941 'Q' sites: instructional drawings and notes (The National Archives AIR 40/1876)
- 1948 RAF black and white vertical aerial photograph (5036 540/37 taken 18th May 1948 F6//13750)

- 1952 Ordnance Survey 6" to 1 mile map sheet 57NW (revised 1950)
- 1972 Meridian Airmaps Ltd 1:10,000 scale black and white vertical aerial photograph (taken 13th July 1992 59/72)

Secondary Sources

- Blood, K 1992 *Bombing Decoy at The Outstray, Humberside (TA 22 SW11): Archaeological Survey Report* (Royal Commission on Historical Monuments for England mss)
- ClfA (Chartered Institute for Archaeologists) 2020 *Standard and Guidance for the Creation, Compilation, Transfer and Deposition of Archaeological Archives*
- ClfA (Chartered Institute for Archaeologists) 2019 *Standard and Guidance for the Archaeological Investigation and Recording of Standing Buildings or Structures*
- Crawshaw, A 1992 'Aerial Archaeology in Yorkshire: a 'Starfish' Site. *Yorkshire Archaeological Journal* vol 64, 209-211
- Dobinson, C S 2000 *Fields of Deception: Britain's Bombing Decoys of World War II*
- Dobinson, C S 1996 *Bombing Decoys of WWII: England's Air Defence 1939-45* (Twentieth Century Fortifications in England vol 3, Council for British Archaeology)
- Floyd, R 2020 *The Wrington Warren Starfish* (available at <http://www.farvis.co.uk/wringtonstarfish/Wrington%20Warren%20Starfish.htm>)
- Francis, P 1996 *British Military Airfield Architecture*
- Haigh, D 2004 'Local History from World War II: Starfish Decoys and Targets in Calderdale and West Yorkshire'. *Transactions of the Halifax Antiquarian Society*, new series vol 12, 149-156
- Haigh, D 1993 'Local History from World War II: the 'Starfish' sites at Cragg Vale and Clifton'. *Transactions of the Halifax Antiquarian Society*, new series vol 1, 121-135
- Harwood, S M & McMillan, S 2014 *Defence of the UK: North Yorkshire and Cleveland: Ryedale vol 6 part 1* (North Yorkshire and Cleveland 20th Century Defence Study Group)
- Historic England 2016 *Understanding Historic Buildings: A Guide to Good Recording Practice*
- Historic England 2015 *Digital Image Capture and File Storage: Guidelines for Best Practice*
- Pace, P 2019 *WWII Bombing Decoy Control Shelter: part of the Star Burst Site CT 557/41 Scheduled Monument 1020041: Draft Condition Report and Specification for Repair*
- RCHME (Royal Commission on the Historical Monuments for England) 1999 *Recording Archaeological Field Monuments: A Descriptive Specification*
- Small, F 2014 *Second World War Oil QF Bombing Decoy, Allhallows, Medway, Kent* (English Heritage Research Report Series 8-2014)

Electronic Sources (accessed October 2021)

http://www.arborfieldhistory.org.uk/properties_starfish_sites.htm = Arborfield Local History Society: WWII 'Starfish Sites'

<http://www.lancashireatwar.co.uk/decoy-sites/4575224154> = Lancashire at War: Exploring the Hidden History of War Sites in Lancashire: Decoy Sites

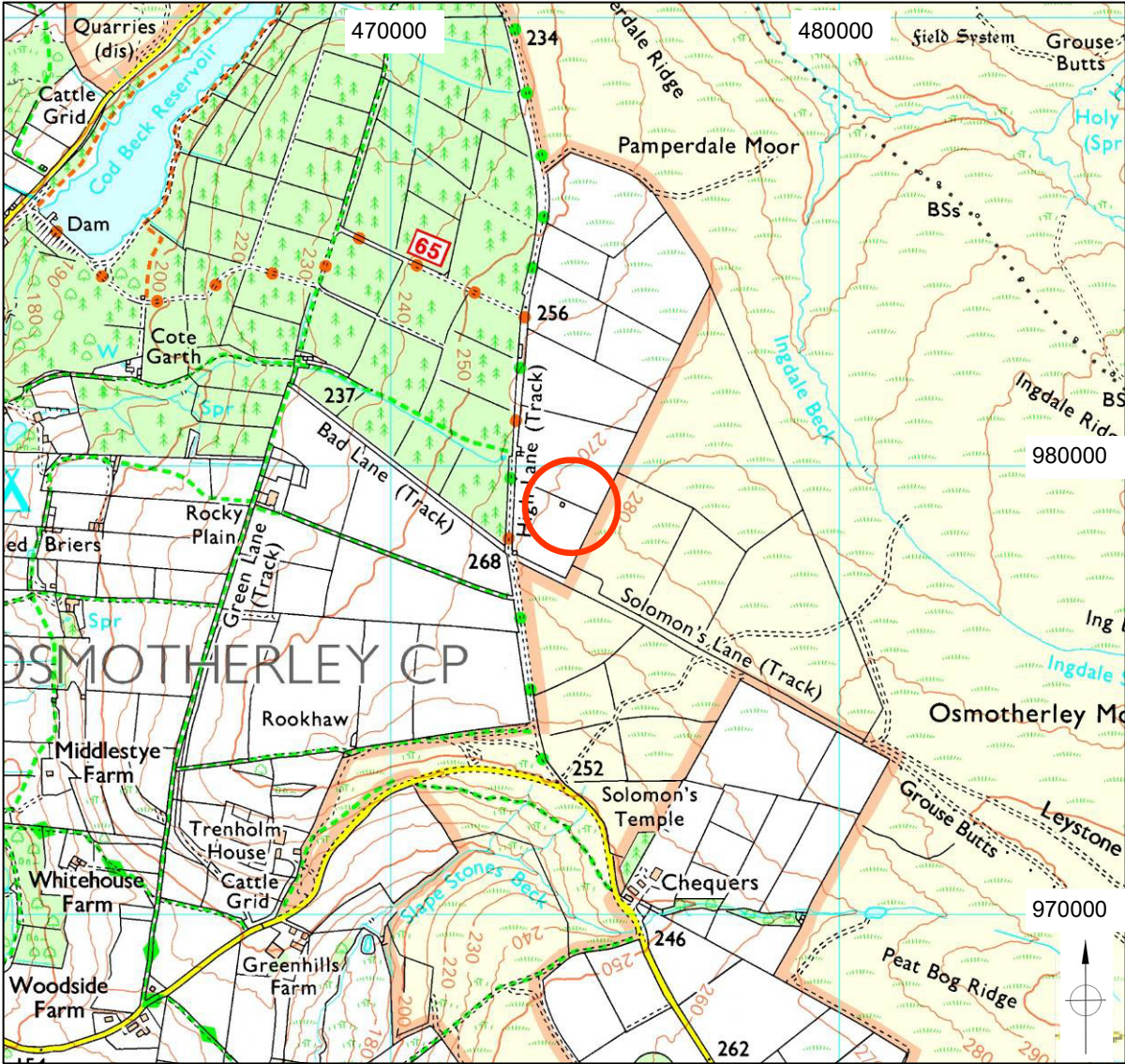
<https://www.blighty-at-war.net/decoy-ql-sites.html> = Blighty at War: The QL Decoy Sites: Cuckmere Valley, East Sussex

https://stmargarets.london/archives/2012/05/richmond_park_starfish_bombing_decoy_sf8a.html = Richmond Park: Starfish Bombing Decoy SF8A

https://stmargarets.london/archives/2012/05/richmond_park_starfish_decoy_sf8a_the_fires_burn_o.html = Richmond Park: Starfish Bombing Decoy SF8A: the Fires burn on!

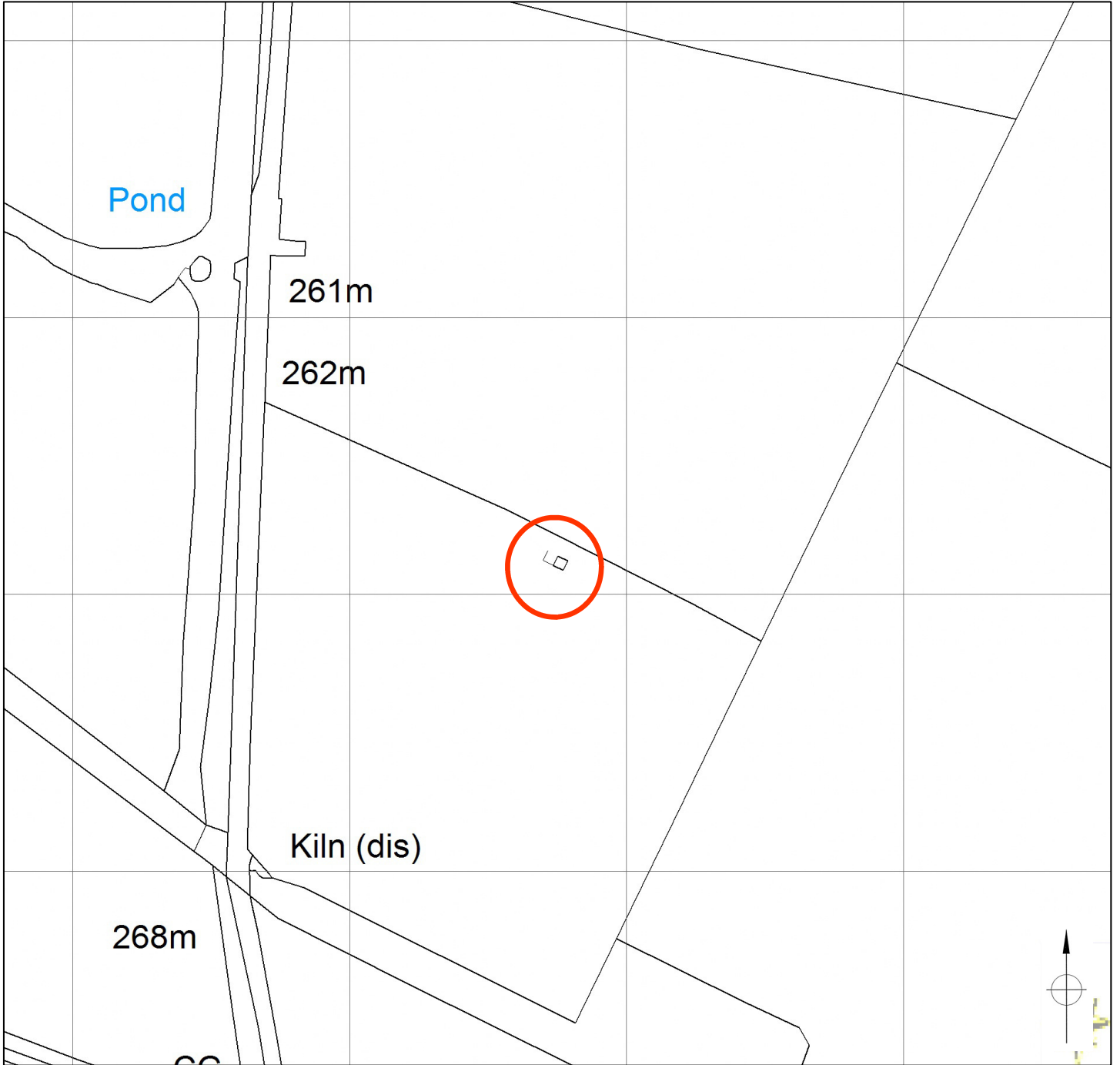
6 ACKNOWLEDGEMENTS

- 6.1 The pre-intervention archaeological survey of the Osmotherley Starfish control shelter was commissioned by Mr Nick Mason, Archaeology Officer for the North York Moors National Park Authority (NYMNP), with funds provided by the NYMNP's 'Monuments for the Future' project. Thanks are due to him for arranging the survey, and for providing local oral information and details from the NYMNP HER, to Andrew Shelley of the Thimbleby Estate for permission to survey, to Pat Duggan of the Cleveland and Darlington Astronomy Society for details regarding the site, and to Roger Thomas, Conflict Archaeologist, for information on Starfish decoy sites in general.
- 6.2 The archaeological recording was undertaken by Shaun Richardson and Richard Lamb, and the final report was produced by Ed Dennison, who retains responsibility for any errors or inconsistencies.



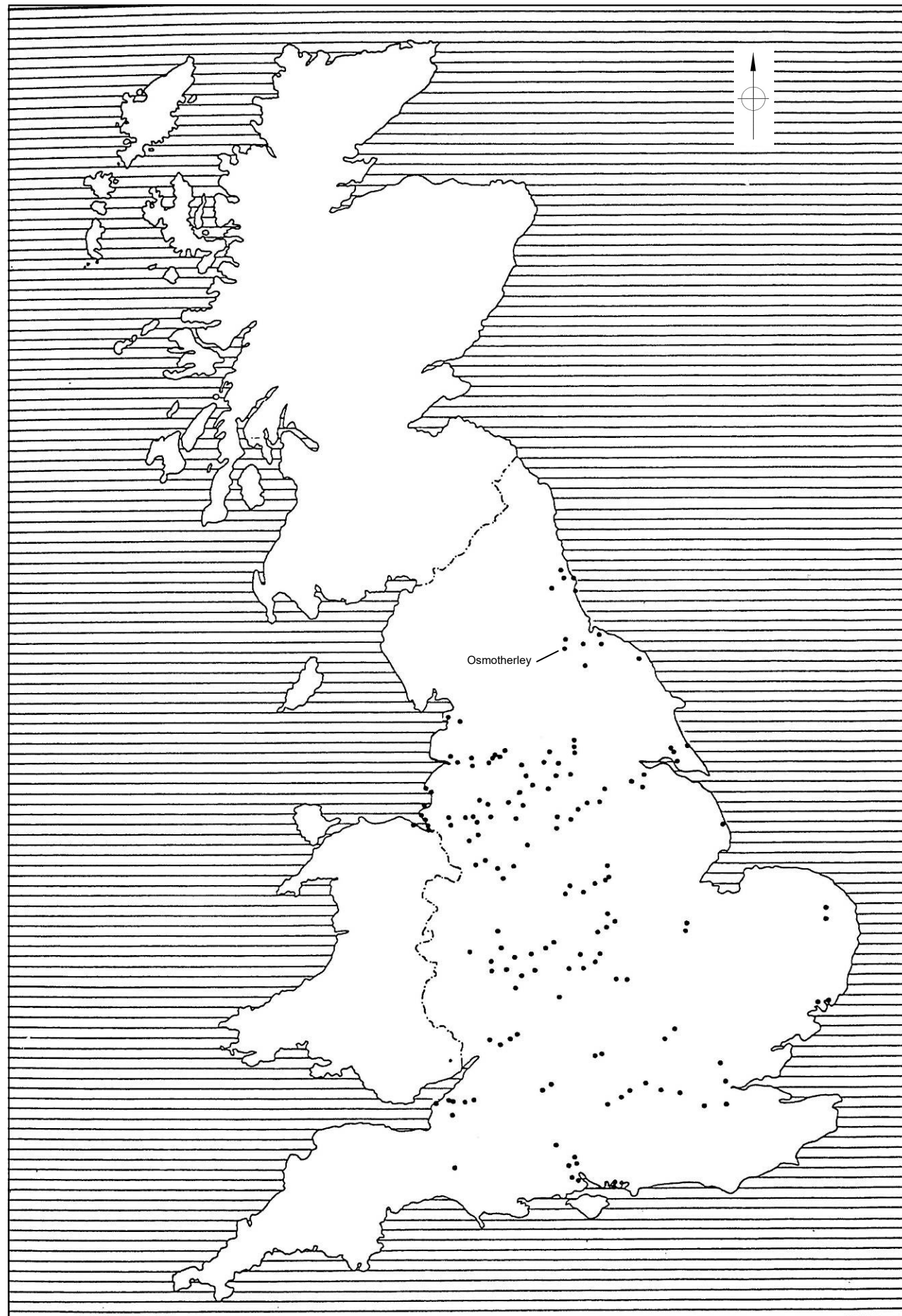
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PROJECT OSMOTHERLEY STARFISH SHELTER	
TITLE GENERAL LOCATION	
SCALE AS SHOWN	DATE DEC 2021
EDAS	FIGURE 1

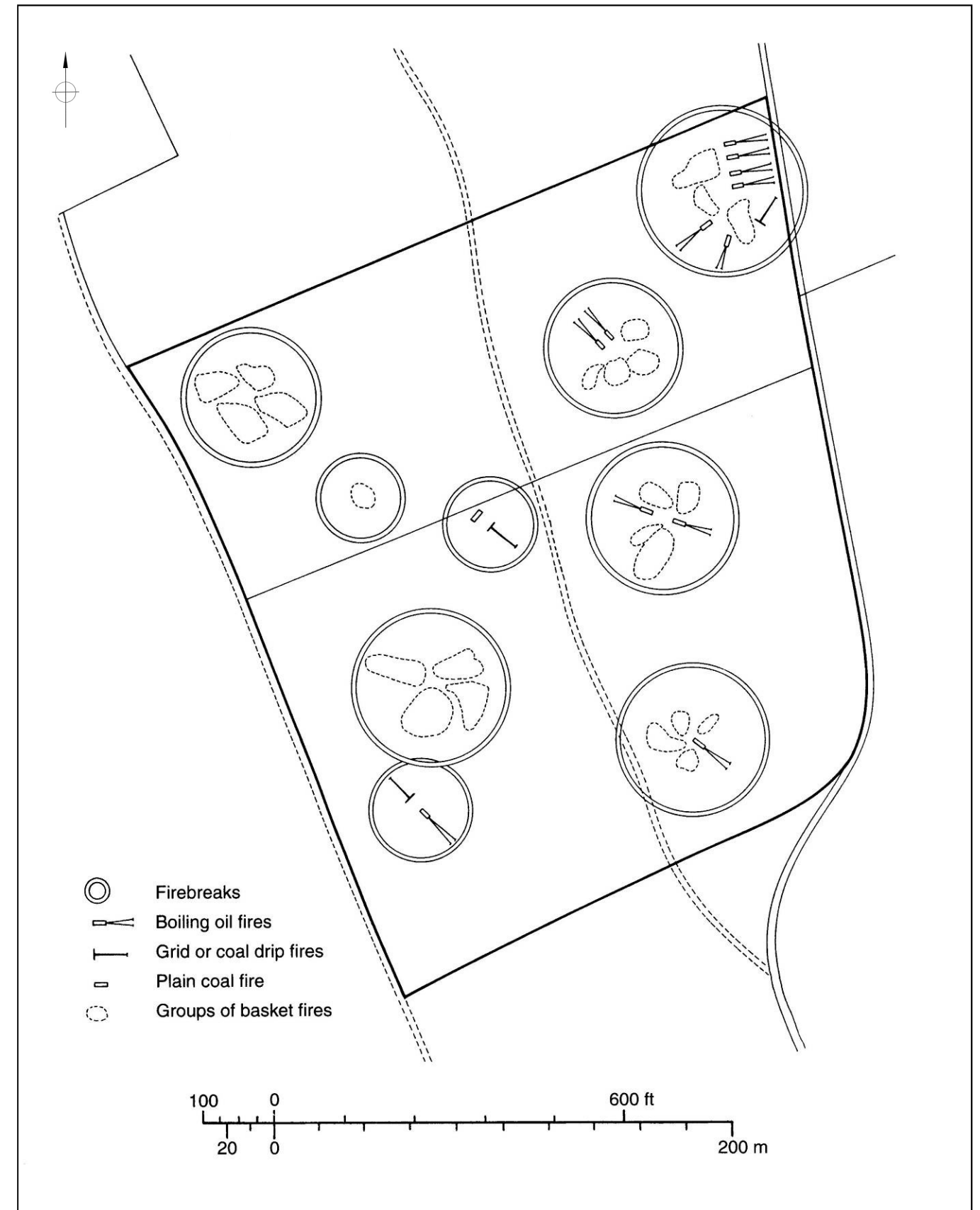


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PROJECT OSMOTHERLEY STARFISH SHELTER	
TITLE DETAILED LOCATION	
SCALE AS SHOWN	DATE DEC 2021
EDAS	FIGURE 2

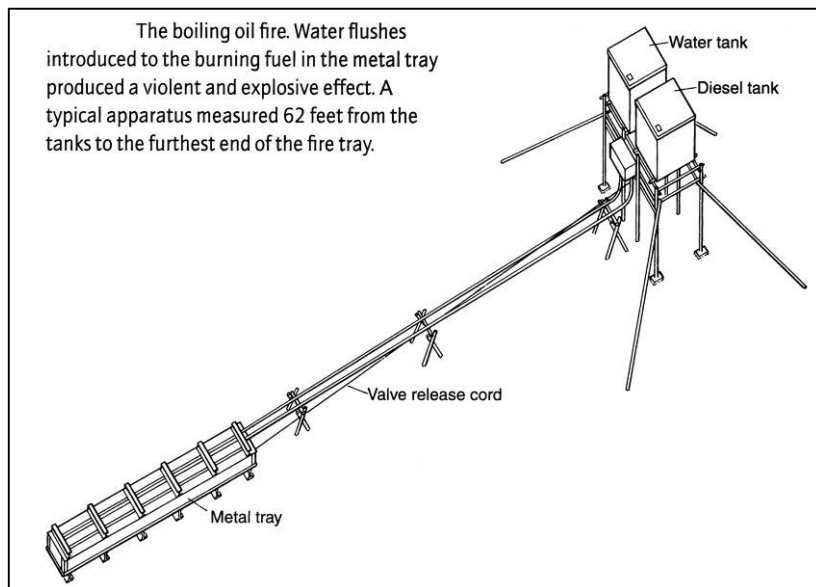


A: Distribution of permanent Starfish sites in England (source: Dobinson 1996, p.43). There is a cluster of sites around Middlesbrough, the Osmotherley site being highlighted.

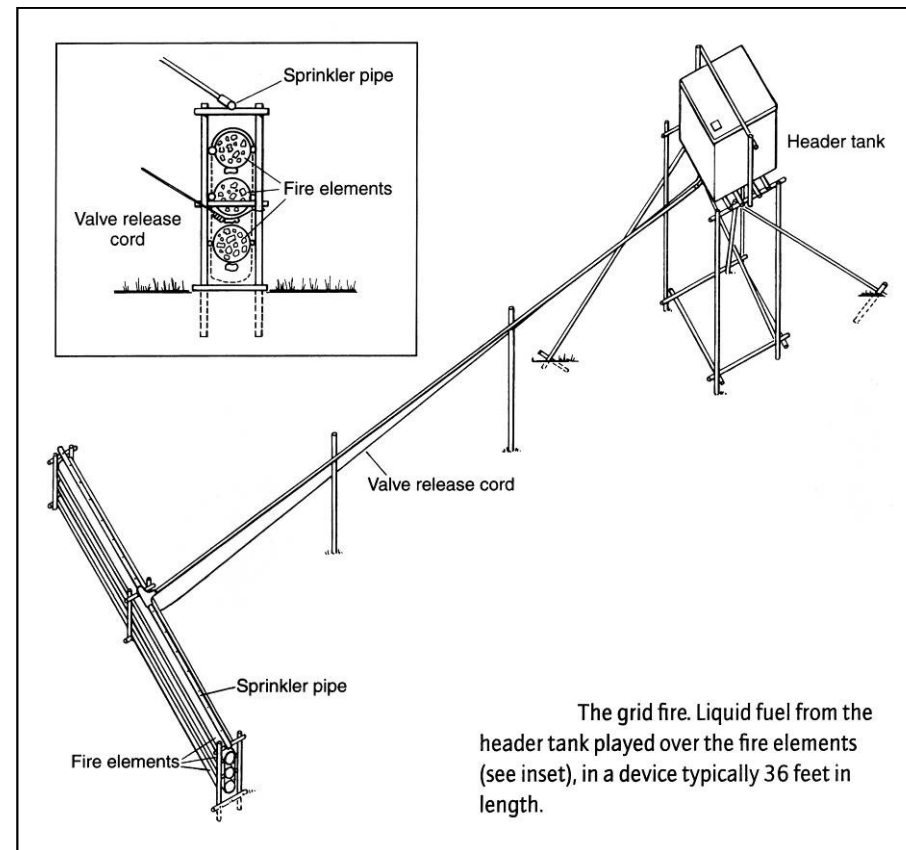


B: Schematic layout of a typical Starfish site, showing the arrangement of fire groups and the fire types within them (source: Dobinson 2000, p.105).

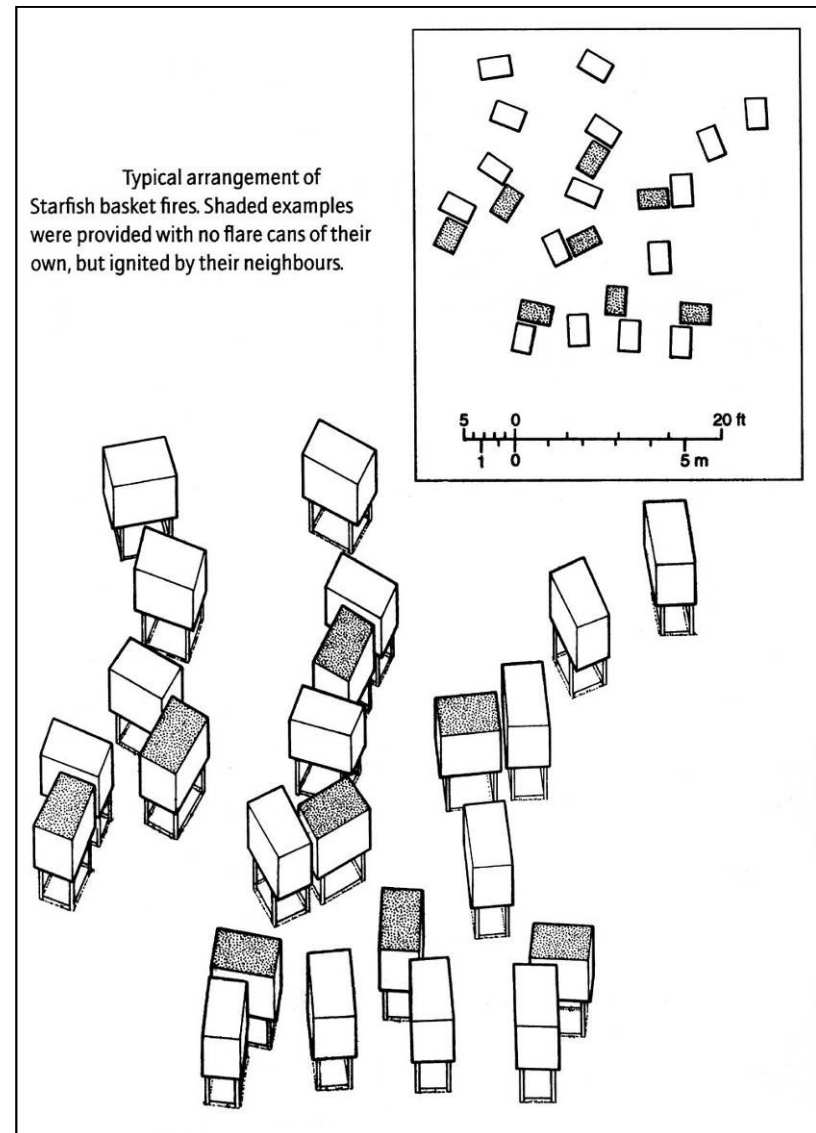
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OSMOTHERLEY STARFISH SHELTER	
TITLE	
DISTRIBUTION AND LAYOUT	
SCALE	DATE
AS SHOWN	DEC 2021
EDAS	FIGURE
	3



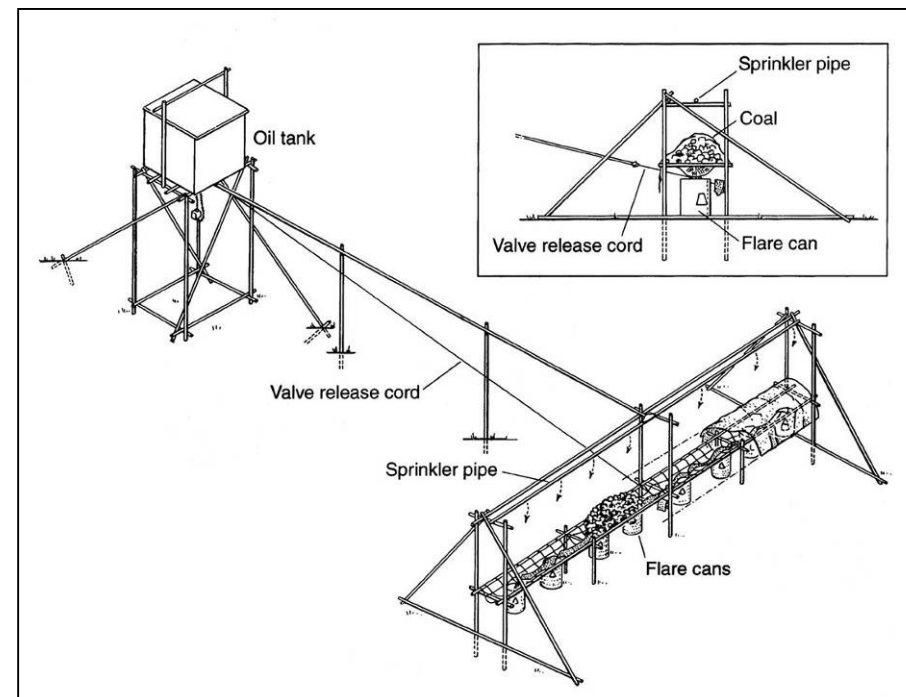
A: Boiling oil fire apparatus (source: Dobinson 2000, p.102).



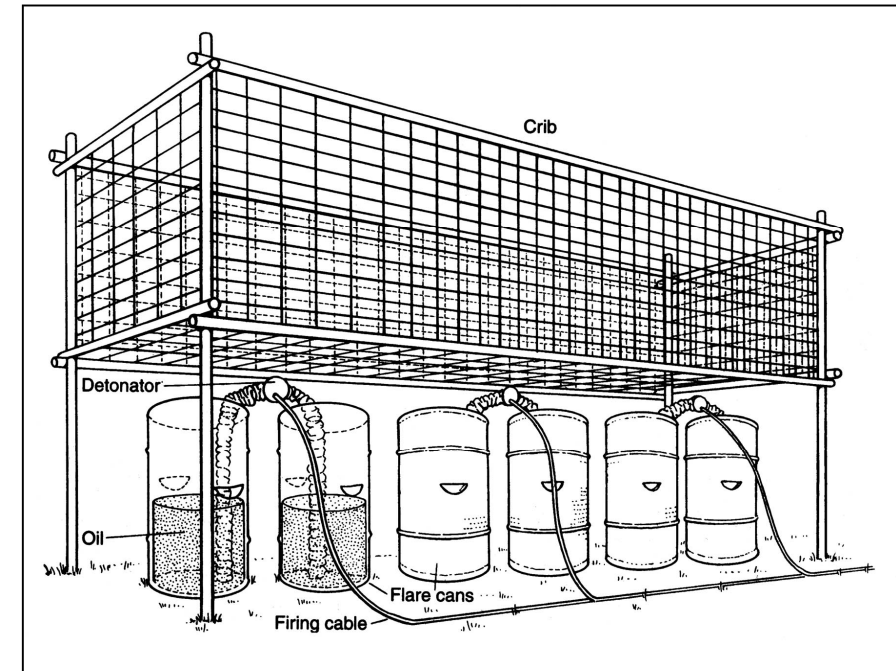
B: Grid fire apparatus (source: Dobinson 2000, p.103).



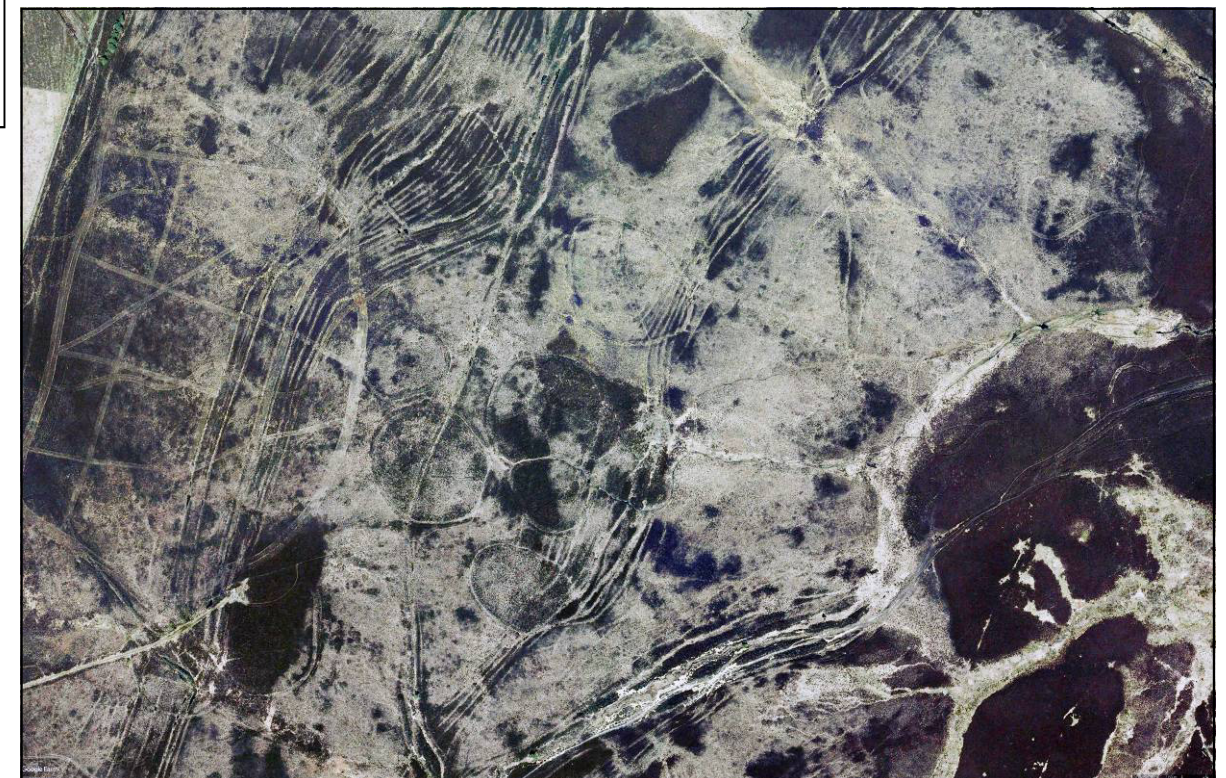
C: Typical arrangement of basket fires; shaded examples had no flare cans but were ignited by their neighbours (source: Dobinson 2000, p.98).



D: Coal drip fire apparatus (source: Dobinson 2000, p.73).

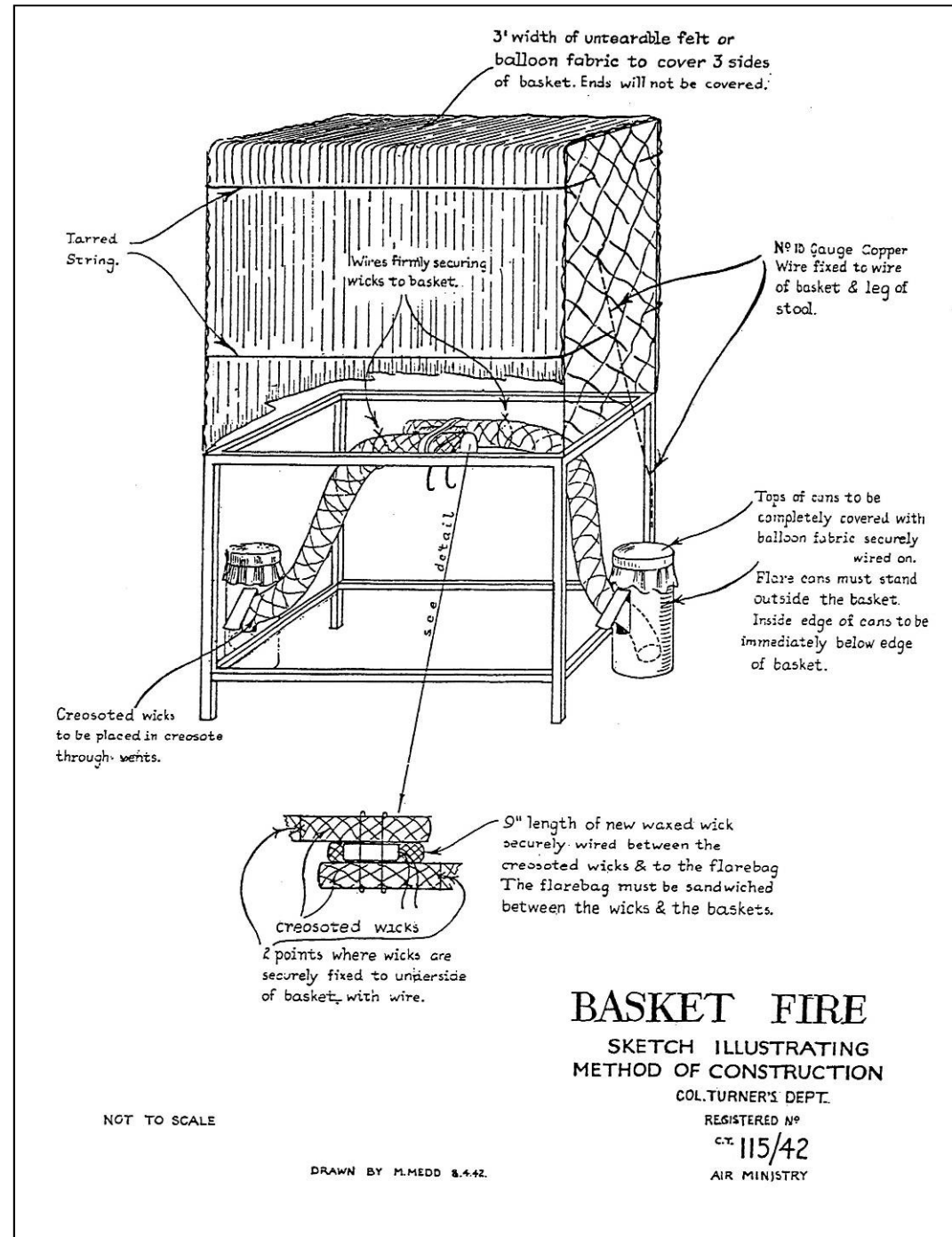


E: Crib fire apparatus (source: Dobinson 2000, p.99).

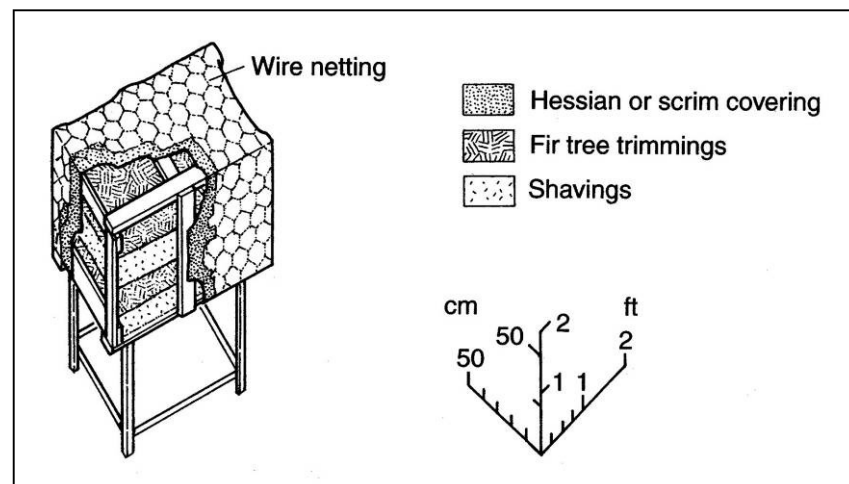


F: Aerial view of fire group of the Sneaton Moor Starfish site, near Scarborough, North Yorkshire, one of the Middlesbrough decoys, showing the circular and sub-circular fire groups (source: Google Earth 2009 photography).

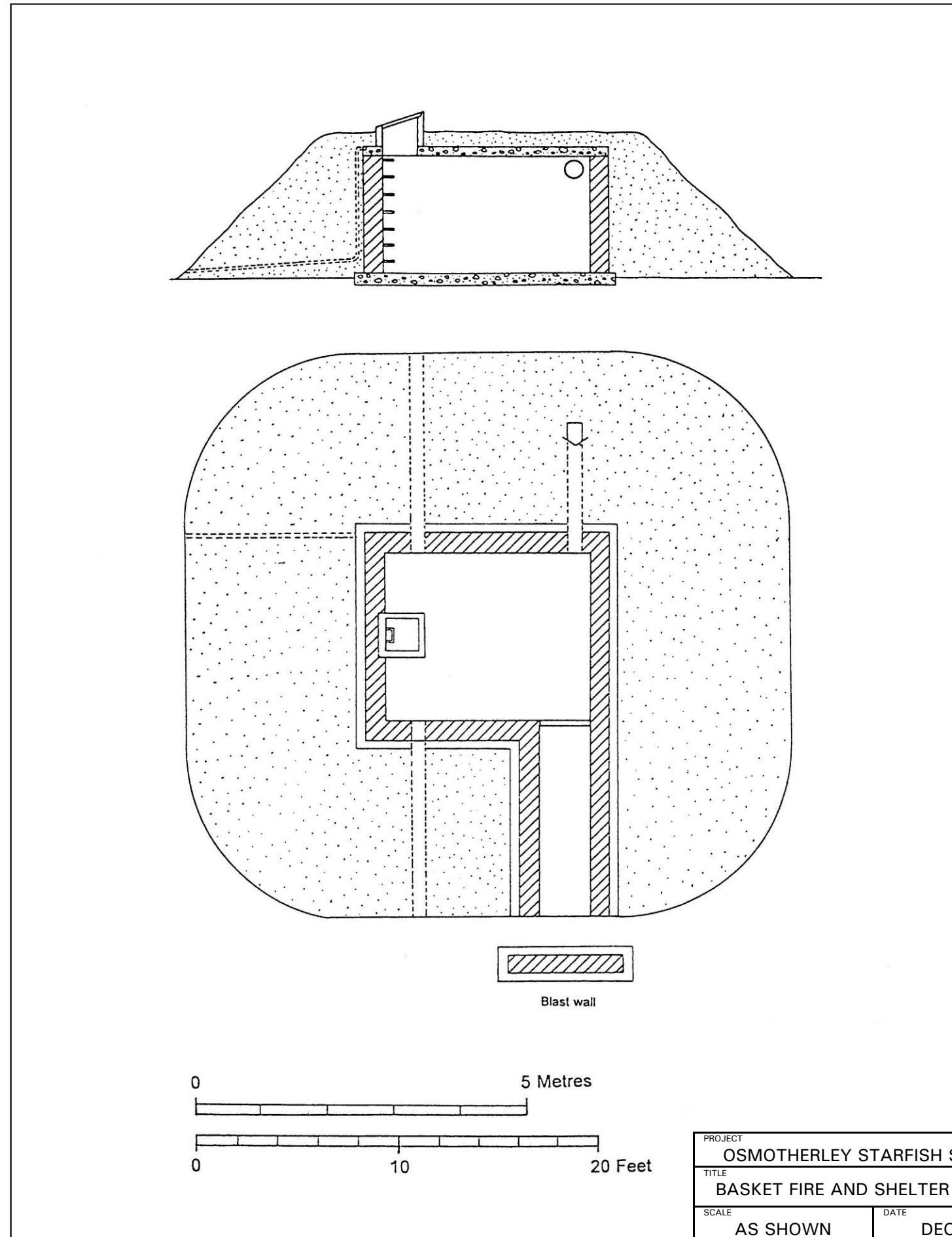
PROJECT	
OSMOTHERLEY STARFISH SHELTER	
TITLE	
FIRE APPARATUS	
SCALE	DATE
AS SHOWN/NTS	DEC 2021
EDAS	FIGURE
	4



A: Design for Starfish basket fire, 1942 (Air Ministry CT 115/42) (source: Dobinson 1996, p.50).



B: Typical Starfish basket fire (source: Dobinson 2000, p.97).



C: Design for Starfish shelter, 1941 (Air Ministry CT 577/41) (source: Dobinson 1996, p.55).

PROJECT	
OSMOTHERLEY STARFISH SHELTER	
TITLE	
BASKET FIRE AND SHELTER DESIGNS	
SCALE	DATE
AS SHOWN	DEC 2021
EDAS	FIGURE
	5



General view of basket fires and boiling fire apparatus at an unidentified Starfish site
 (source: Dobinson 2000, p.104).



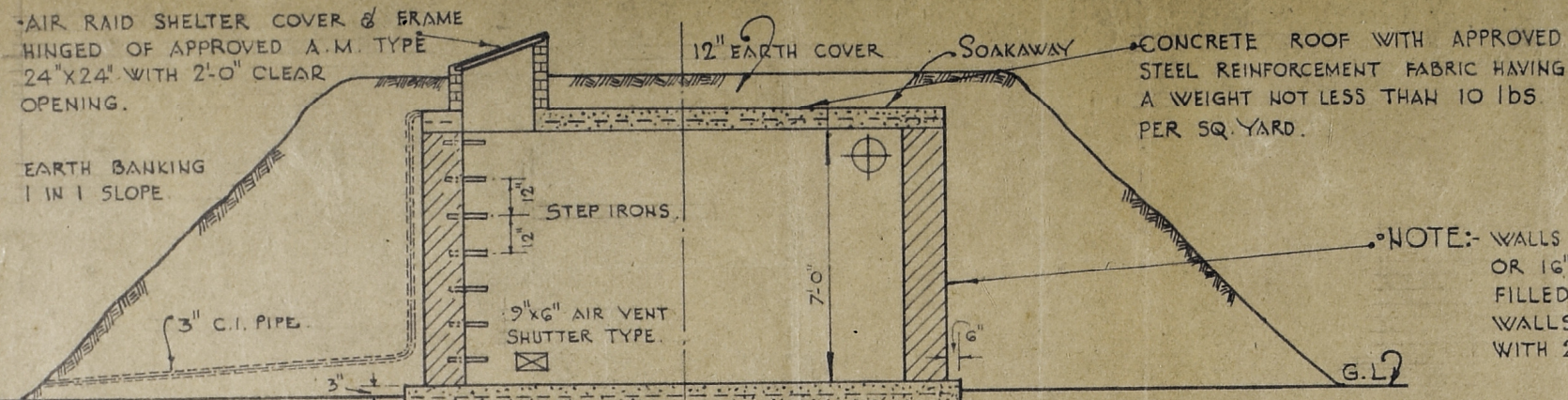
Starfish basket fires in operation
 (source: Dobinson 2000, p.101).

PROJECT		OSMOTHERLEY STARFISH SHELTER	
TITLE		STARFISH BASKET FIRES	
SCALE	NTS	DATE	DEC 2021
EDAS		FIGURE	6

SECRET

AIR RAID SHELTER COVER & FRAME
HINGED OF APPROVED A.M. TYPE
24" X 24" WITH 2'-0" CLEAR
OPENING.

EARTH BANKING
1 IN 1 SLOPE.

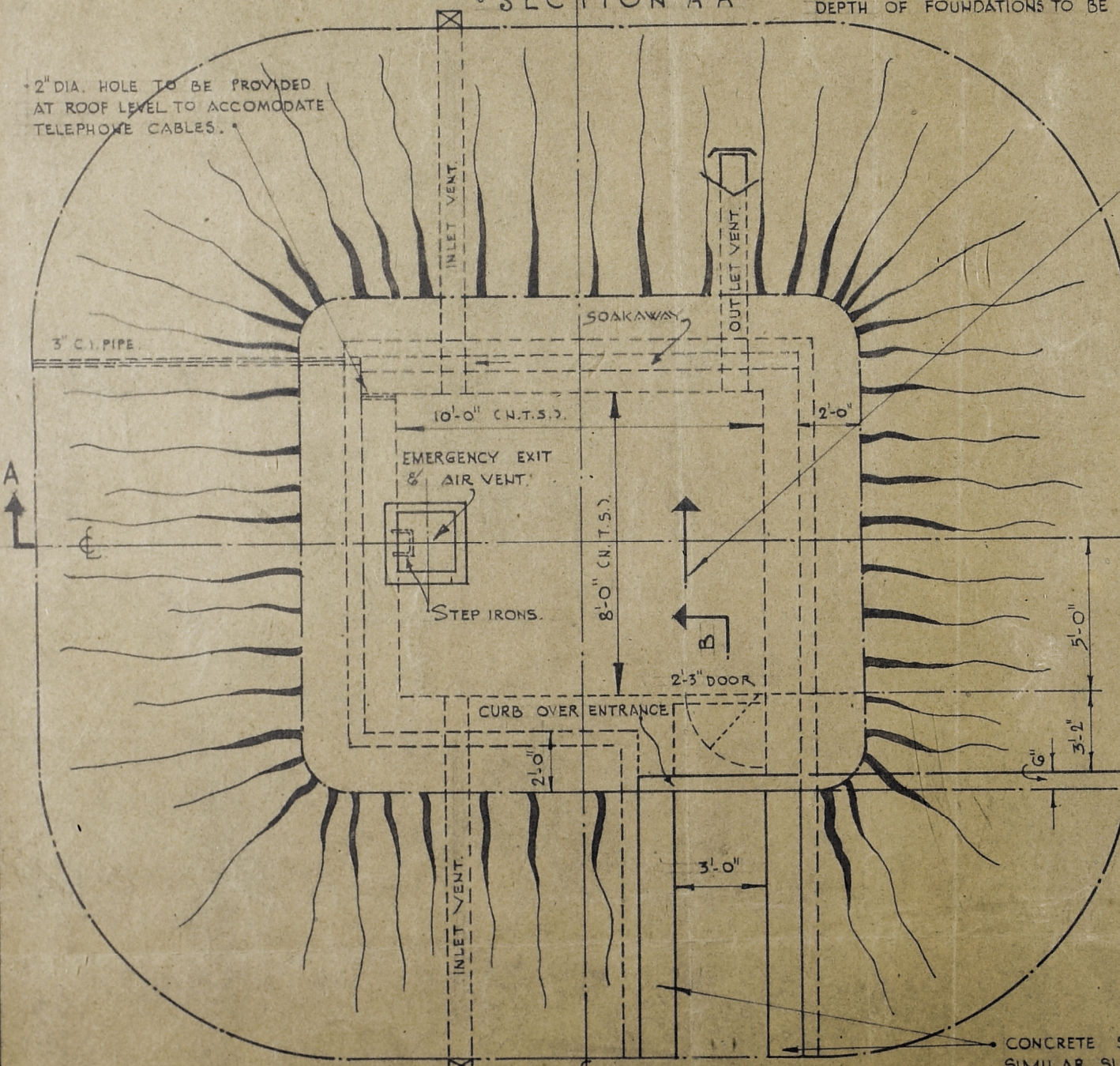


NOTE:- WALLS 14" BRICKWORK IN CEMENT MORTAR
OR 16" PRECAST CONCRETE HOLLOW BLOCKS
FILLED WITH SAND AS WORK PROCEEDS.
WALLS & ROOF TO BE TREATED EXTERNALLY
WITH 2 COATS OF BITUMINOUS PAINT.

SECTION A-A

9" CONCRETE WITH SIMILAR REINFORCEMENT AS ROOF
DEPTH OF FOUNDATIONS TO BE GOVERNED BY LOCAL CONDITIONS.

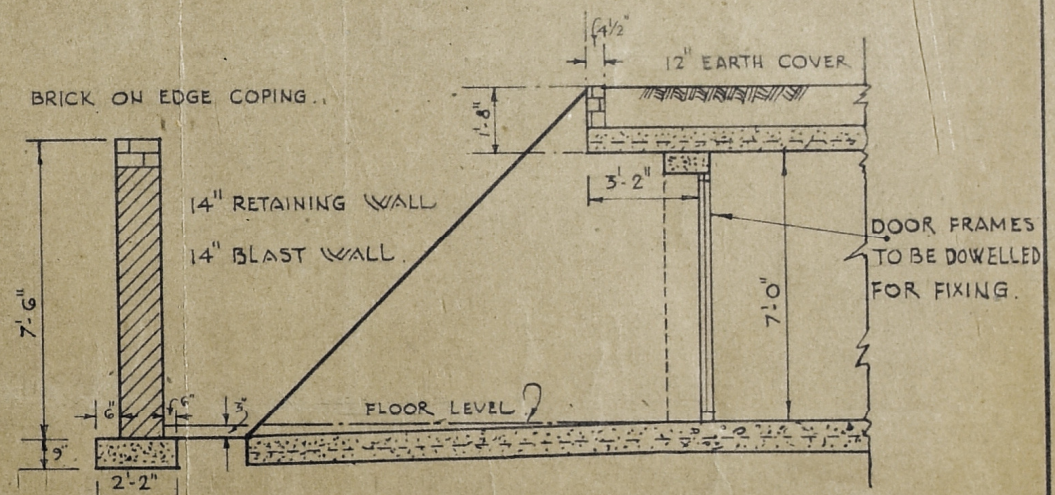
2" DIA. HOLE TO BE PROVIDED
AT ROOF LEVEL TO ACCOMMODATE
TELEPHONE CABLES.



ROOF 1" THICK WITH 1" FALL
IN DIRECTION OF ARROW.

CONCRETE SIDE RETAINING WALLS TO HAVE
SIMILAR SLOPE AS EARTH BANKING.

PLAN

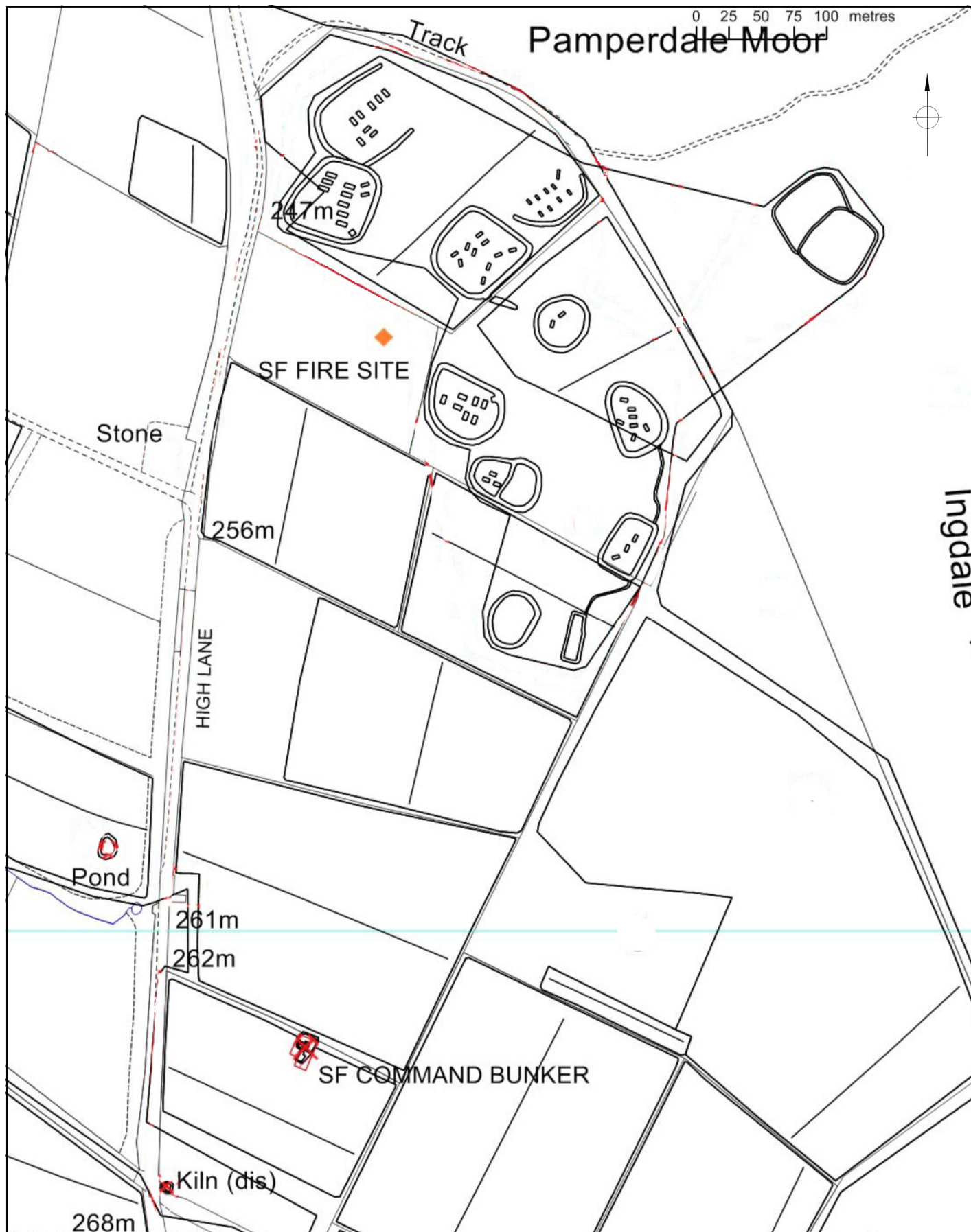


SECTION B-B

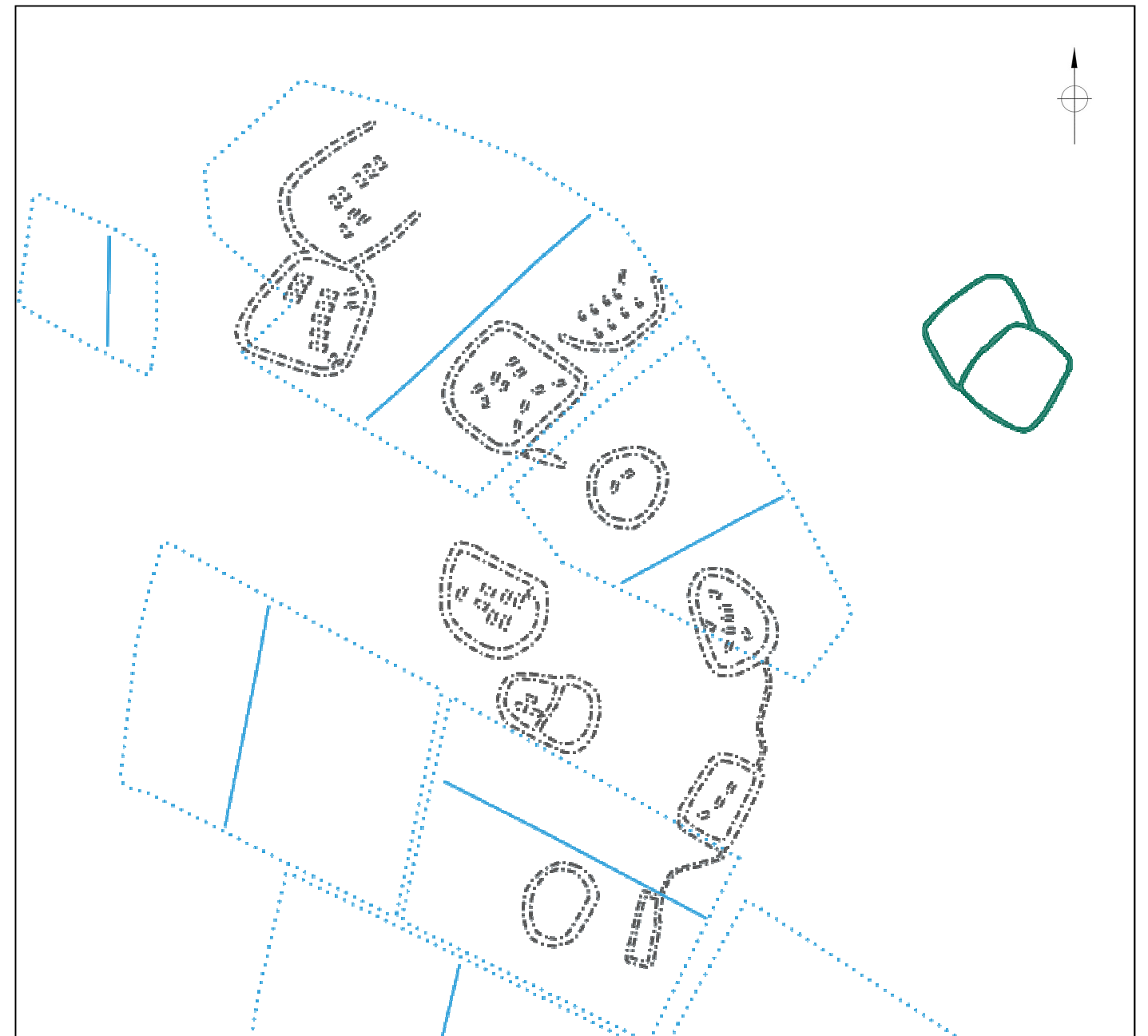
PROJECT		OSMOTHERLEY STARFISH SHELTER	
TITLE		ORIGINAL 1941 SHELTER DESIGN	
SCALE	NTS	DATE	DEC 2021
EDAS		FIGURE	7

Source: TNA AIR 40/1876.

DETAILS OF CONTROL SHELTER FOR S.F. SITES	
TRACED FROM AIR MINISTRY DRAWING NO. CT.557/41	
DATE: 18-9-42	DRAWN: G.S. BRANCH (S.D.10)
TRACED: P.A.D.	G.H.Q. (INDIA)
CKD: M.M.A.	REF: NO. I.C. 215
SCALE: 1/4" = 1'	

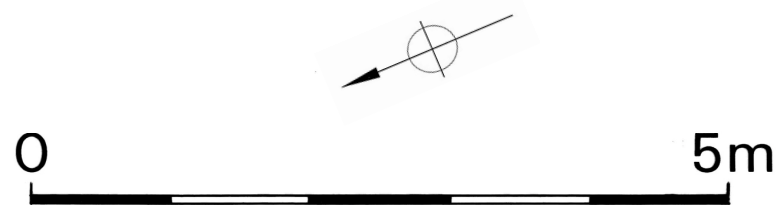
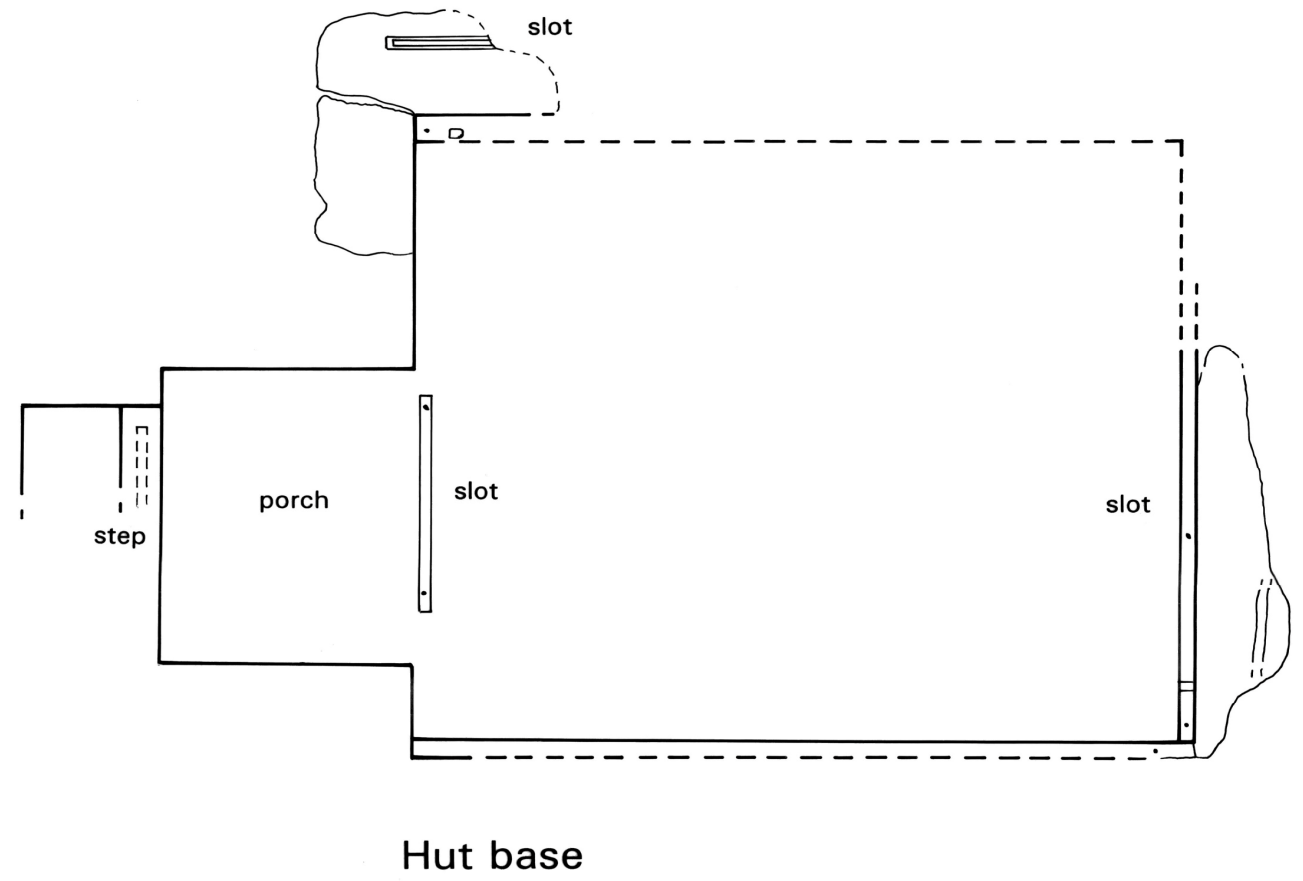
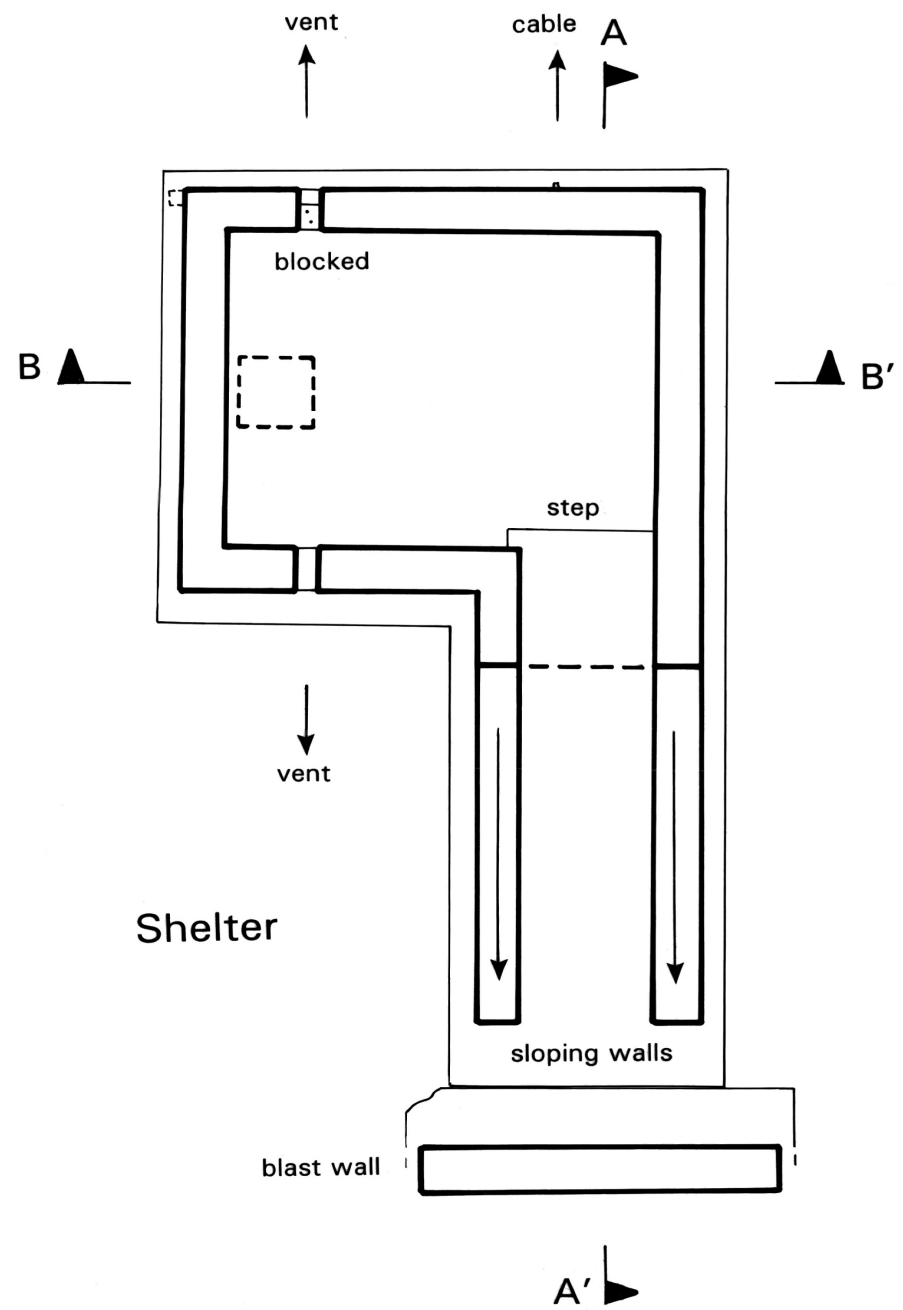


A: Osmotherley Starfish complex, showing relationship between the control shelter and the fire breaks, as mapped by NYMNPA HER (reproduced with permission).

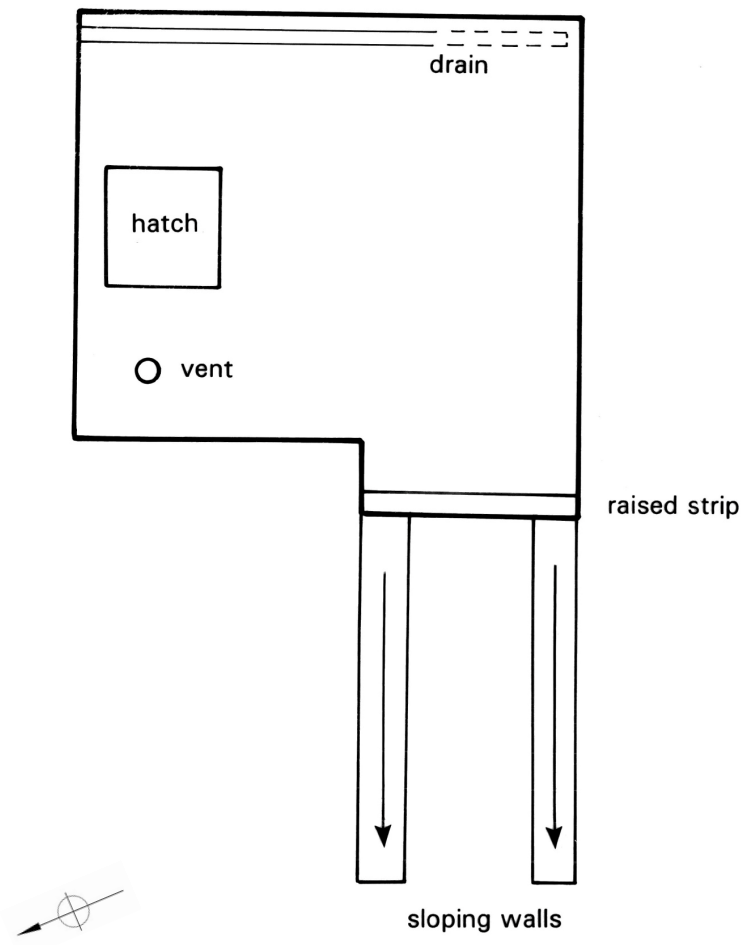


B: Aerial photographic mapping of Osmotherley Starfish fire groups (source: Historic England Aerial Archaeology Mapping Explorer).

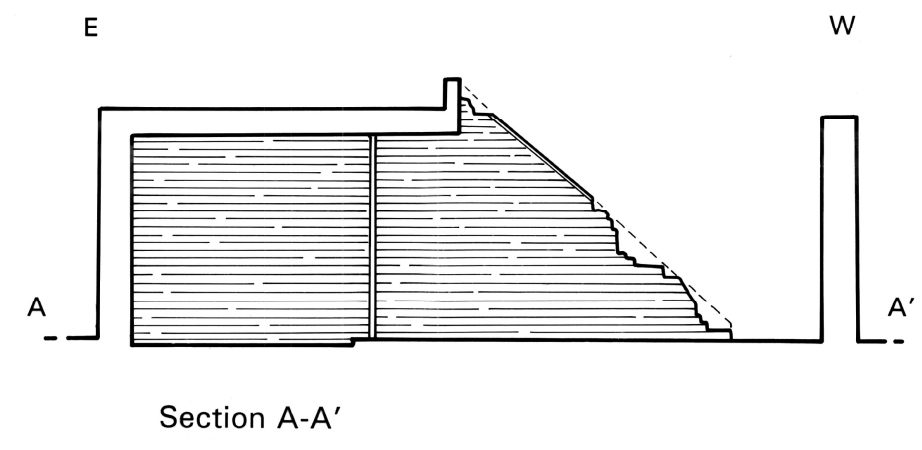
PROJECT		OSMOTHERLEY STARFISH SHELTER	
TITLE		OVERALL SITE COMPLEX	
SCALE	DATE		
AS SHOWN/NTS	DEC 2021		
EDAS		FIGURE	8



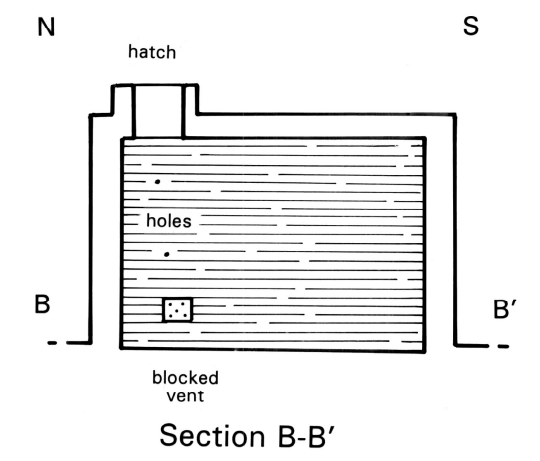
PROJECT		OSMOTHERLEY STARFISH SHELTER	
TITLE		GROUND PLAN	
SCALE	AS SHOWN	DATE	DEC 2021
	EDAS	FIGURE	9



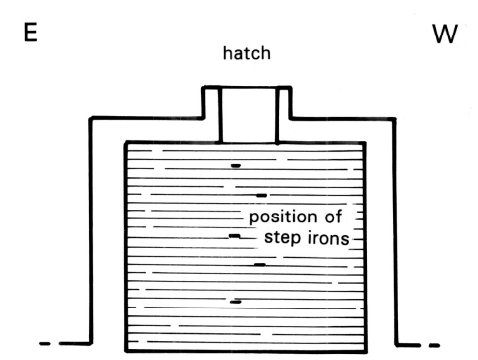
Roof plan



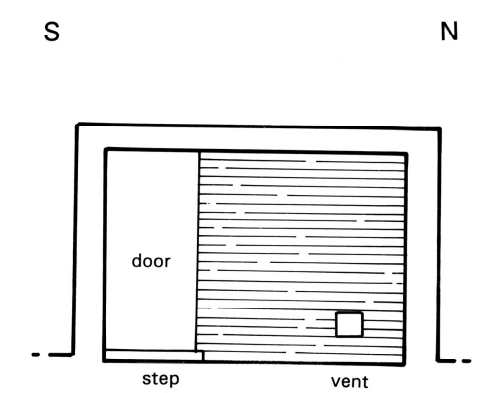
Section A-A'



Section B-B'



North internal elevation



West internal elevation



PROJECT		OSMOTHERLEY STARFISH SHELTER	
TITLE		ROOF PLAN AND INTERNAL ELEVATIONS	
SCALE	AS SHOWN	DATE	DEC 2021
	EDAS	FIGURE	10



Plate 1: Shelter and blast wall, looking S (photo 1/067).



Plate 2: Shelter, detail of raised lip to roof over entrance, looking S (photo 1/081).



Plate 3: Shelter, south external elevation, looking NE (photo 1/069).



Plate 4: Shelter, east external elevation, looking NW (photo 1/075).



Plate 5: Shelter, north external elevation, looking SW (photo 1/076).



Plate 6: Shelter, return to north external elevation, looking SE (photo 1/079).



Plate 7: Shelter, north external elevation, sloping wall to entrance, looking SW (photo 1/080).



Plate 8: Shelter, west elevation of blast wall, looking SE (photo 1/068).



Plate 9: Shelter, roof after removal of turf, showing earlier repairs, drain, hatch and chimney to vent, looking NE (photo 2/413).



Plate 10: Shelter, roof after removal of turf showing drain to the east side, looking E (photo 2/414).



Plate 11: General view of shelter after removal of turf to roof, looking N (photo 2/420).



Plate 12: Shelter, entrance walls and passage, looking SE (photo 1/061).

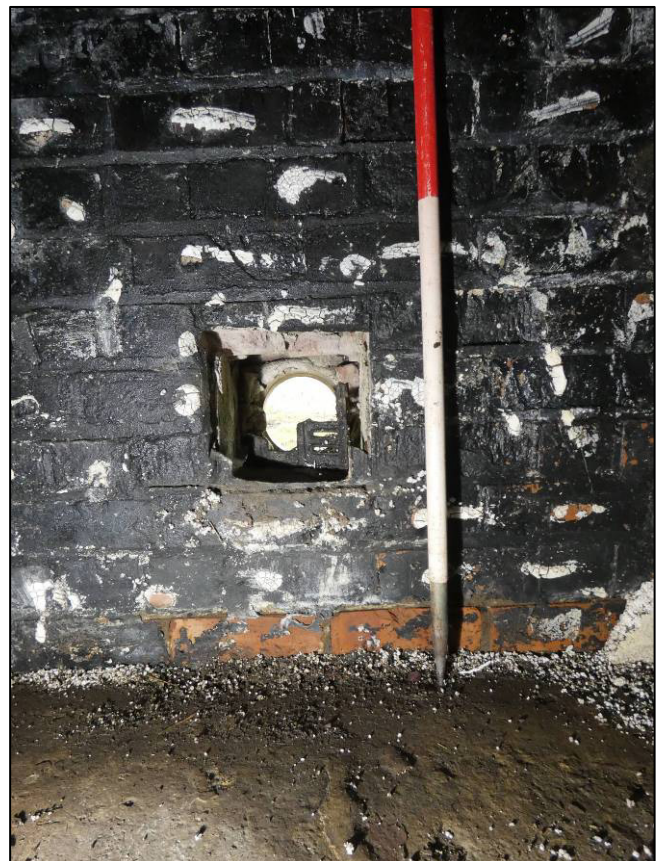


Plate 13: Shelter, west internal wall after stripping out showing vent, looking NW (photo 2/416).

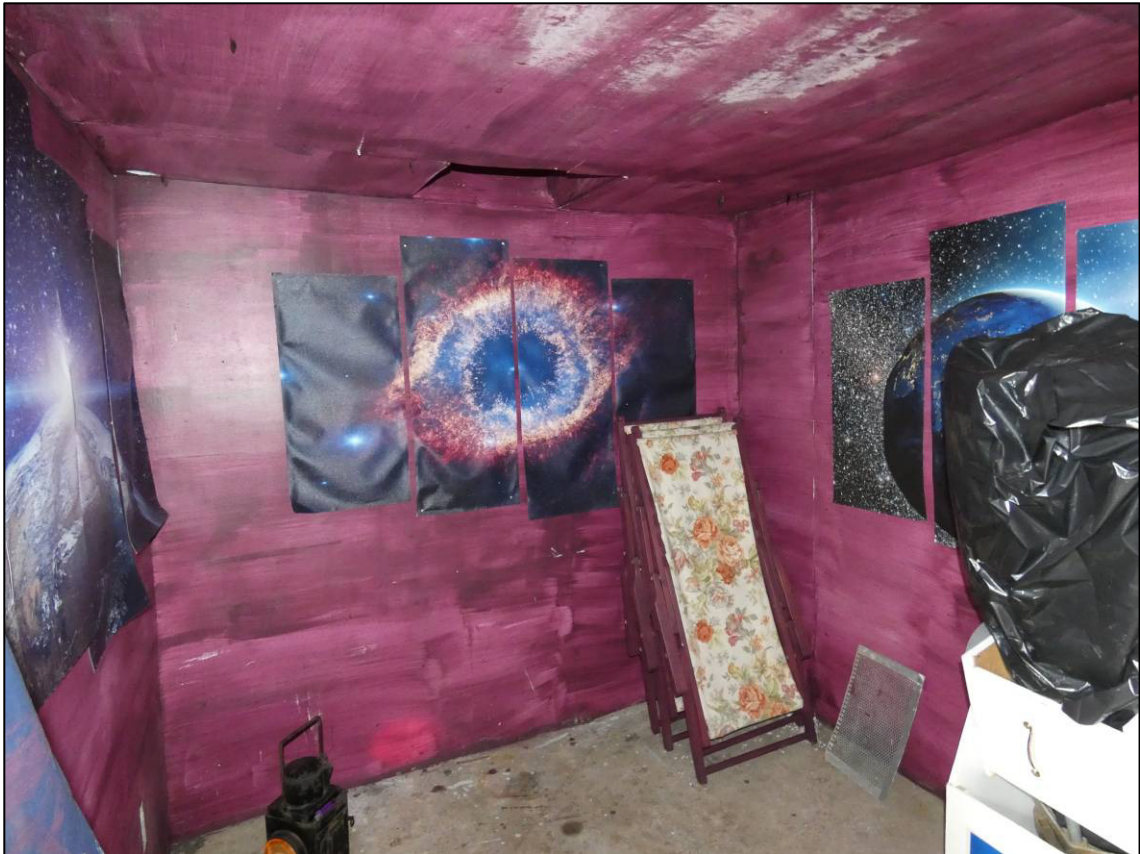


Plate 14: Shelter, interior prior to stripping out, looking NE (photo 1/082).

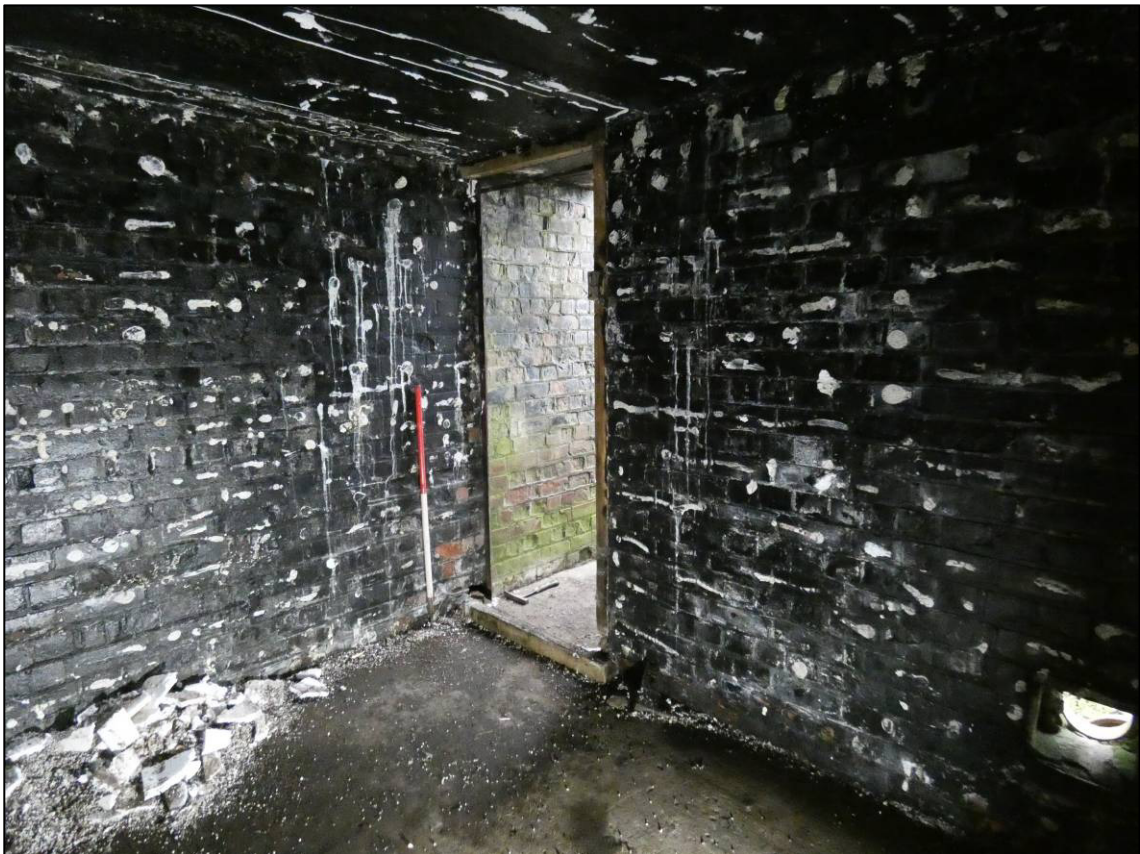


Plate 15: Shelter, interior after stripping out, showing entrance step, looking W (photo 2/403).



Plate 16: Shelter, east internal wall after stripping out, looking E (photo 2/401).



Plate 17: Ex situ climbing rung or step iron (photo 2/428).



Plate 18: Hut base, looking SW (photo 1/089).



Plate 19: Hut base, showing slot to porch, looking SE (photo 1/098).



Plate 20: Hut base, slot to porch showing detail of fixings, looking SE (photo 1/099).



Plate 21: Hut base, inner and outer slots to south end, looking S (photo 1/100).

APPENDIX 1
EDAS PHOTOGRAPHIC CATALOGUE

OSMOTHERLY STARFISH SHELTER - PHOTOGRAPHIC CATALOGUE

Film 1: Colour digital photographs taken 25th September 2019

Film 2: Colour digital photographs taken 17th March 2021

* = not printed

<i>Film</i>	<i>Frame</i>	<i>Subject</i>	<i>Scale</i>
1	060	Shelter, entrance walls and passage, looking S	1m
1	061	Shelter, entrance walls and passage, looking SE	1m
1	062	Shelter, N entrance wall, looking E	1m
1	063	Shelter, blast wall, E elevation, looking SW	1m
1	064	Shelter, blast wall, N elevation, showing slight lean to top, looking SW	1m
1	065*	Shelter and blast wall, looking S	1m
1	066	Shelter and blast wall, looking SE	2 x 1m
1	067*	Shelter and blast wall, looking S	2 x 1m
1	068	Shelter, W elevation of blast wall, looking SE	1m
1	069	Shelter, S external elevation, looking NE	2 x 1m
1	070	Shelter, S external elevation, looking N	2 x 1m
1	071	Shelter, E end of S external elevation, looking NE	1m
1	072	Shelter, W end of S external elevation, looking NE	2 x 1m
1	073	Shelter, W end of S external elevation and blast wall, looking NE	1m
1	074	Shelter, W end of S external elevation, looking NE	1m
1	075	Shelter, E external elevation, looking NW	2 x 1m
1	076	Shelter, N external elevation, looking SW	2 x 1m
1	077	Shelter, N external elevation, looking W	2 x 1m
1	078	Shelter, N external elevation and blast wall, looking W	2 x 1m
1	079	Shelter, return to N external elevation, looking SE	1m
1	080	Shelter, N external elevation, N sloping wall to entrance, looking SW	1m
1	081	Shelter, detail of raised lip to roof over entrance, looking S	-
1	082	Shelter, interior prior to stripping out, looking NE	-
1	083	Shelter, interior prior to stripping out, looking W	-
1	084	Shelter, blast wall, E elevation, looking NW	1m
1	085*	Shelter, blast wall and entrance, looking NW	1m
1	086	Shelter, blast wall and entrance, looking NW	1m
1	087	Shelter, roof, detail of raised lip, looking NW	2 x 1m
1	088	Shelter, roof, detail of skylight, looking NE	1m
1	089	Hut base, looking SW	2 x 1m
1	090	Hut base, looking SW	2 x 1m
1	091	Hut base, porch to N end, looking SW	1m
1	092	Hut base, main body, looking SW	1m
1	093	Hut base, looking SW	2 x 1m
1	094	General view of hut base, looking SW	2 x 1m
1	095	General view of hut base, looking S	2 x 1m
1	096	Hut base, outer slot to E side, looking SE	0.3m
1	097	Hut base, inner slot to E side, looking SE	0.3m
1	098	Hut base, showing slot to porch, looking SE	0.3m
1	099	Hut base, slot to porch showing detail of fixings, looking SE	0.3m
1	100	Hut base, inner and outer slots to S end, looking S	0.3m
1	101	Hut base and shelter, looking NE	-
1	102	General view of shelter, looking N	-
1	103	General view of shelter, looking W	-
1	104	General view of shelter, looking SW	
2	395	Shelter, W internal wall and entrance after stripping out, looking NW	2 x 1m
2	397	Shelter, N internal wall after stripping out, looking NE	2 x 1m
2	401	Shelter, E internal wall after stripping out, looking E	2 x 1m
2	402	Shelter, S internal wall after stripping out, looking SW	2 x 1m
2	403	Shelter, interior after stripping out, showing entrance step, looking W	1m
2	404	Shelter, replacement door frame after stripping out, looking W	1m
2	405	Shelter, concrete floor after stripping out, looking NE	1m
2	408	Shelter, shuttering marks to roof, looking NE	-
2	410	Shelter, roof and hatch after removal of turf, looking E	2 x 1m

2	411	Shelter, roof and hatch after removal of turf, looking NE	2 x 1m
2	412	Shelter, roof after removal of turf, looking SW	2 x 1m
2	413	Shelter, roof after removal of turf, showing repairs, hatch and chimney to vent, looking NE	2 x 1m
2	414	Shelter, roof after removal of turf showing drain to E side, looking E	1m
2	415	Shelter, roof after removal of turf showing drain to E side, looking E	1m
2	416	Shelter, W internal wall after stripping out, showing vent, looking NW	1m
2	417	Shelter, E internal wall after stripping out, showing blocked vent detail, looking SE	1m
2	418	Shelter, E internal wall after stripping out, showing blocked vent detail, looking SE	1m
2	419	Shelter, E internal wall after stripping out, old wiring?, looking S	-
2	420	General view of shelter after removal of turf to roof, looking N	2 x 1m
2	421	Shelter, S external elevation after removal of turf to roof, looking NE	2 x 1m
2	422	Shelter, E external elevation after removal of turf to roof, looking SW	1m
2	423	Shelter, N external elevation after removal of turf to roof, looking SE	1m
2	424	Ex situ climbing rungs or step irons	0.3m
2	425	Ex situ climbing rung or step iron	0.3m
2	426	Ex situ door knob	0.3m
2	427	Ex situ door knob	0.3m
2	428	Ex situ climbing rung or step iron	0.3m

APPENDIX 2
NYMNP SURVEY BRIEF

Brief for archaeological recording of a Scheduled WW2 bombing decoy control shelter near Osmotherly, North York Moors National Park

NHLE: 1020041

NGR: SE 47375 97906

1. Introduction

Bombing decoys were an important means of distracting enemy air crews away from urban centres, to deliver their payloads harmlessly in open areas, during the Second World War. 839 such sites are recorded across England, of which 228 were designated 'SF' or 'Starfish' sites, which lit controlled fires to simulate burning buildings. The site near Osmotherly, and approximately 20km south of Middlesbrough, is one of few with any surviving remains. Although the fire areas are now reduced earthworks and not part of the Scheduling, the command shelter still stands. The brick and concrete shelter was once protected by an earth bank, and without it, it is deteriorating and leaking. This brief is for a non-intrusive archaeological survey, in order to help inform remedial works, and to record the building prior to these works. The work is being carried out under the North York Moors National Park Authority's Monuments for the Future project.

2. Background

2.1 *Monuments for the Future*

Monuments for the Future is the latest phase of the Authority's Monument Management Scheme, which was developed as a response to Historic England's Heritage at Risk surveys, and to address the Authority's Business Plan priority to reduce the risk status of Scheduled Monuments. It is a partnership project using the joint financial resources of the NPA and Historic England (HE – formerly English Heritage), with NPA staff, volunteers and accredited contractors. The current scheme aims to improve the condition of Vulnerable monuments as well as remove monuments from the Heritage at Risk Register.

2.2 *Previous work and Scheduling*

No known archaeological work or recording has been done on the site. NPA staff have periodically visited the site, most recently in November 2018. Discussions have been going on since 2000 about potential remedial works, but none have yet been carried out. The site was made a Scheduled Monument in 2001 in recognition of the building's scarcity and what it represents.

2.3 *Current condition and assessment of risk*

The site is currently leased by the Thimbleby Estate to the Cleveland and Darlington Astronomy Society, who use the shelter as a store room for astronomy equipment. The adjacent concrete platform remains of a guardhouse provide stable ground for telescopes etc. The society has made various alterations over the years including a new door after the last was destroyed by vandalism, and an internal wooden frame for insulation. Possible former internal fittings have been seen in and around the shelter, and may be suitable for reinstatement.

The external blast wall is beginning to lean towards the entranceway and may become dangerous. A steel roof hatch was also damaged by vandals, and may require replacement. Brick, concrete and mortar is spalling and breaking, and water is leaking through to the interior. Although not listed on HE's Heritage at Risk Register, the planned record should inform works aimed at keeping it off the Register.

3. Project aim and scope

The aim of the project is to record all original features of the Scheduled Monument to a high standard. This will stand as a record of the decoy control shelter and adjacent building platform into the future, after remedial works have been carried out. A separate condition survey will be carried out to directly inform these works, but the archaeological record may also influence the form of repairs. The scope of recording includes all features within the Scheduled area, interior and exterior, including associated fixtures and fittings which may be found around the control shelter. Low earthworks surrounding the structures should be included as they may represent the remains of the original protective earth banking.

4. Archaeological work required

4.1 Survey

- A measured survey of the whole Scheduled area is required to make a record of the monument before restorative works.
- This should include the standing building and its blast wall, the concrete building platform to the south, and any surrounding earthworks.
- The survey should include appropriately scaled plans, drawings and photographs of the above features, equivalent to Level 2 of Historic England's *Understanding Historic Buildings: A Guide to Good Recording Practice*. This is both a full visual and descriptive record.
- A condition survey will also be carried out by Peter Pace Chartered Architects, and the archaeological contractor may wish to liaise with them on dates etc for ease of access.

4.2 Reporting

- A brief report of the survey should be produced, including:
 - a title page giving project name and name of organisation carrying out the work;
 - a map showing the monument location and NGR;
 - background information on the project;
 - a description of the survey methodology employed;
 - a plan and profiles of the monument features;
 - a catalogue of photographs, indicating the direction from which each was taken;
 - recommendations for further actions, if appropriate.
- A digital copy of the survey report and photographs should be submitted to the North York Moors National Park Authority as a PDF for addition to the HER.
- Please note that by depositing this report, the contractor gives permission for the material presented in the document to be used by the NPA, in perpetuity, although the contractor retains the right to be identified as the author of all project documentation and reports as specified in the Copyright, Designs and Patents Act 1988 (chapter IV, section 79). The permission will allow the NPA to reproduce material, including for non-commercial use by third parties, with the copyright owner suitably acknowledged.

5. Health and Safety and Insurance

5.1 Contractors are expected to abide by the 1974 Health and Safety at Work Act and its subsequent amendments. Appropriate provision of first aid, telephone and PPE as described

in the SCAUM manual Health & Safety in Field Archaeology 2002 should be made. A risk assessment must be undertaken prior to any site work.

5.2 It is the contractor's responsibility to ensure that they have adequate public and professional insurance cover (see also attached Terms and Conditions).

6. Access and Constraints

6.1 The monument lies in a field owned and managed by the Thimbleby Estate, at SE 4737 9790. It is accessed by a gate in the eastern corner which leads to the field to the north, which in turn is accessed by a gate from High Lane, Osmotherly, SE 4728 9803. Vehicle access with a 4-wheel drive may be possible, but agreement with the Estate will need to be agreed in advance. Otherwise it is approximately a 300m walk from the road.

6.2 All dates for access will need to be agreed in advance with the Thimbleby Estate (contact below), and the Cleveland and Darlington Astronomical Society. Both are agreeable to the survey, but will require notice to prepare the site. The NYMNPA can assist and liaise with this.

Andrew Shelley
Thimbleby Estate Office
Thimbleby
Northallerton
North Yorkshire
DL6 3PY
01609 883205

6.3 This project is being carried out with the permission of Historic England through the North York Moors Monuments for the Future. No variation to the work will be permitted unless it has been agreed by the Head of Historic Environment, Mags Waughman.

7. Timetable

7.1 The survey of the Osmotherly Starfish site should be carried out at the earliest date possible so that preparations can be made for subsequent remedial work. Liaison with Peter Pace Chartered Architects may be beneficial to align surveys.

7.2 The report should be finalised and submitted within one month of the survey being carried out.

Nick Mason
August 2019