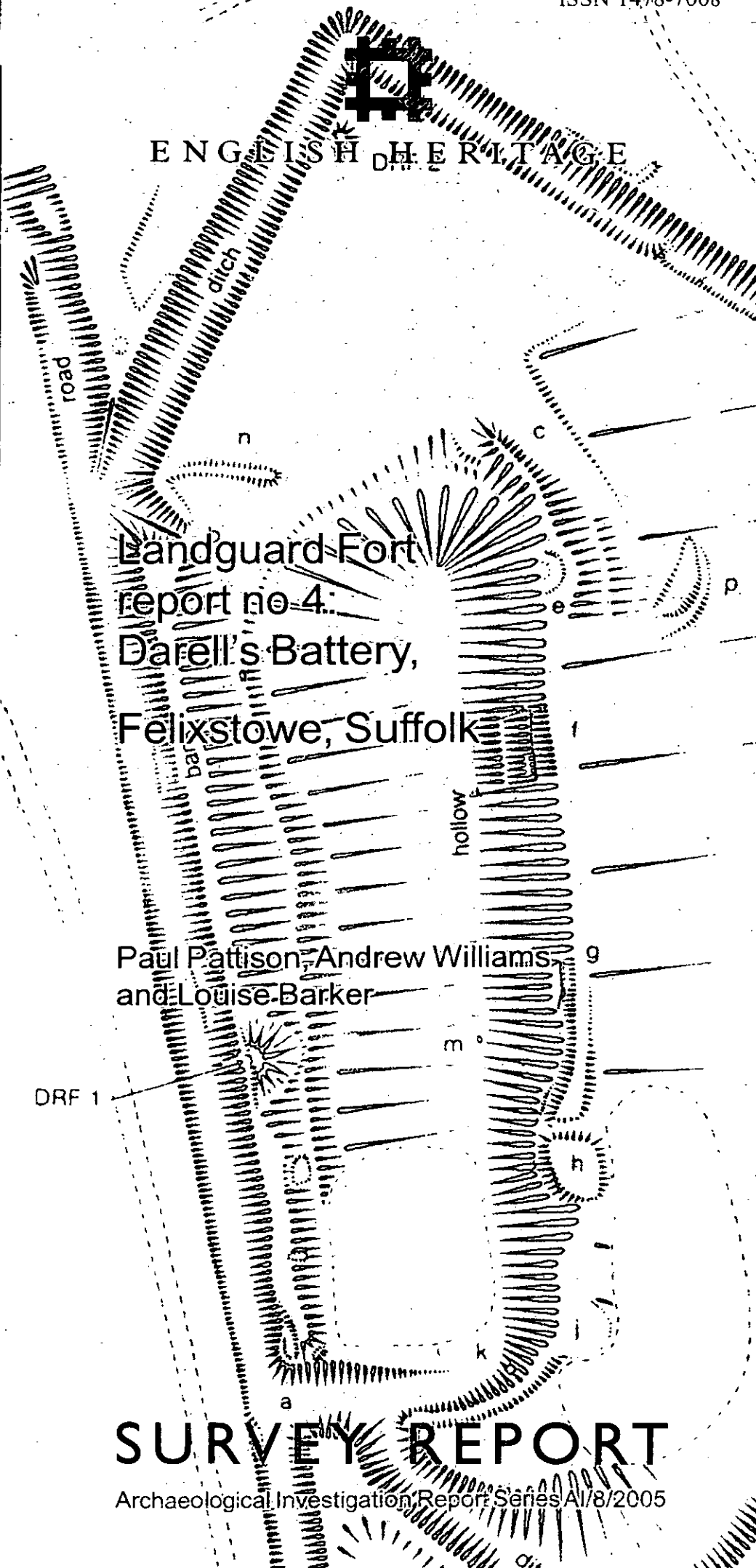




ENGLISH HERITAGE



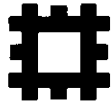
Landguard Fort  
report no 4:  
Darell's Battery,  
Felixstowe, Suffolk

Paul Pattison, Andrew Williams,  
and Louise Barker

DRF 1

SURVEY REPORT

Archaeological Investigation Report Series A1/8/2005



ENGLISH HERITAGE

**LANDGUARD FORT**  
**report no 4: DARELL'S BATTERY,**  
**FELIXSTOWE, SUFFOLK**

ISSN 1478-7008

Archaeological Investigation Report Series AI/8/2005

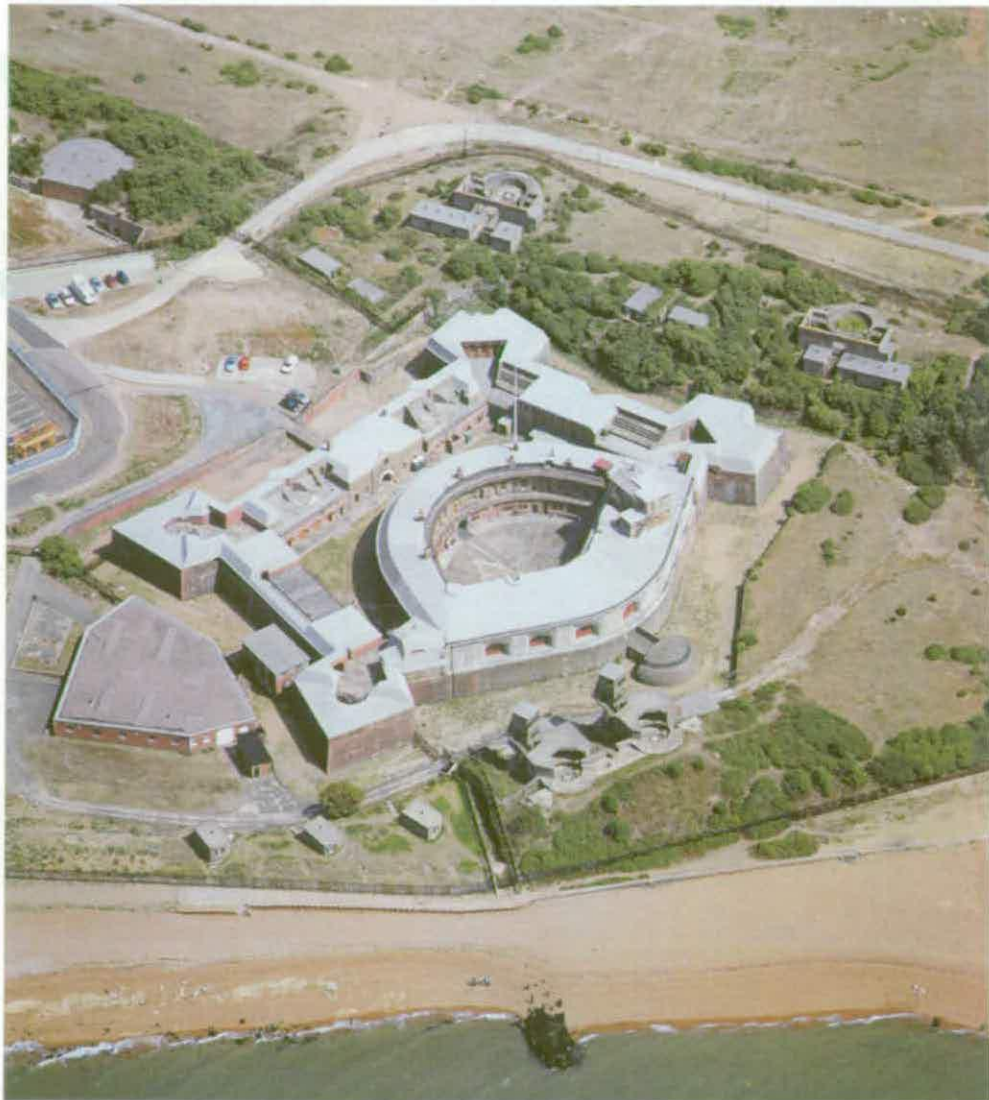
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**District:** Suffolk Coastal  
**Parish:** Felixstowe  
**NGR:** TM 282 319  
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**Surveyed by:** Louise Barker, Paul Pattison and Andrew Williams  
**Report author:** Paul Pattison and Andrew Williams  
**Illustrations by:** Louise Barker and Paul Pattison  
**Photography by:** Alun Bull and Paul Pattison

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*Landguard Fort and batteries, viewed from the air in July 2003. The twin towers, circular gun emplacements and three searchlight positions of Darell's Battery are visible in the lower centre of the photograph, just above the sandy beach (NMR: 23161-13, © copyright English Heritage)*

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## **ABBREVIATIONS USED IN THE TEXT**

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AA	Anti-aircraft
A/AMB	Anti-coastal motor boat
BCP	Battery command post
CASL	Coastal artillery searchlight
DEL	Defence electric light
DP	Director post
DRF	Depression range-finder
ELOP	Electric light observation post
QF	Quick-firing
PF	Position-finder
RA	Royal Artillery
RE	Royal Engineers
RSJ	Rolled steel joist
RML	Rifled muzzle-loader
SME	Submarine Mining Establishment
TA	Territorial Army



## GLOSSARY

---

### **Ammunition**

A general term applied to the shells and cartridges used in artillery

### **Apron**

A sloping concrete surface, forming the front face of a gun emplacement, designed to deflect in-coming shells over the top of the position

### **Autosights**

Optical sights attached to an artillery piece which allowed the gun crew to aim and fire at a target independently (without range and bearing information being transferred to them by position-finding or depression range-finding cells)

### **Barbette**

A protective breastwork or forward edge of an emplacement, over which the guns fire

### **Battery**

A work, either permanent or temporary, where artillery is mounted

### **Battery command post**

A position from which the area commanded by a battery is observed, and from which any action is co-ordinated

### **Caponier**

A protected position, running across or projecting into the ditch of a fortification, usually with embrasures and loopholes to provide flanking fire along the ditch

### **Cartridge**

An amount of gunpowder or other explosive made up into a measured charge, usually contained in a silk or serge bag, which was placed in a gun behind the shell. Firing the gun ignited the cartridge and thereby propelled the shell out of the gun towards its target

### **Casemate**

A bombproof vaulted chamber used for a variety of purposes, including artillery or small arms positions, storage of ammunition and to provide troop accommodation

### **Counterscarp**

The exterior slope or revetment of a ditch

### **Covered way**

A continuous walkway providing a safe route between parts of a fortification, protected from enemy fire by an earthwork parapet

### **Davit**

A simple crane, usually an iron post, curved at the top and fitted with a pulley, for hoisting heavy ammunition from one level to another

**Depression range-finder**

An optical instrument used to work out the position of a target by trigonometrical methods, obtaining both the bearing and the angle of depression between the instrument and target.

**Dials recess (containing range information dials)**

A small recess, usually built into the *barbette* or wing wall of a gun battery, containing dials on which a target's range and bearing information was displayed after being relayed electrically from position-finding and depression range-finding cells

**Embrasure**

An opening in a parapet or wall through which a gun - usually an artillery piece - could be fired. In searchlights, it applies to the aperture through which the electric light beam was projected

**Emplacement**

A prepared and protected position in a fortification or battery, in which an artillery piece was permanently or temporarily fixed

**Fixed ammunition**

An artillery projectile in which the shell and cartridge are combined into a single unit

**Glaçis**

The external slope of a rampart or battery, carefully and gradually extended in a long slope to ground level, and often massively reinforced with earth and other materials to absorb in-coming shell fire

**Gun house**

A form of casemate providing protection for an artillery piece, usually applied to concrete structures of the Second World War

**Gun store**

Usually applied to gun batteries of the Second World War: similar to an RA store, a subsidiary building for storing equipment and spares for the operation and maintenance of artillery pieces

**Holdfast**

A metal plate fixed to the floor of an emplacement to firmly anchor a gun in position

**Magazine**

A place for the safe storage of gunpowder, usually kept loose in barrels or cases. Also generally applied to any chamber for ammunition storage, whether for cartridge, shell or fixed ammunition

**Parapet**

A low wall or earthen breastwork protecting the front or forward edge of a defensive work

**Pivot**

The point about which an artillery piece is traversed

**Position-finder**

An optical instrument by which an artillery piece could be directed onto a target, even when moving (it took the speed of a target into consideration).

**Position-finding cell**

A room, usually a casemate on the flanks of a battery, for housing the position-finding equipment. Position-finding required at least two cells – one for transmitting and one for receiving – whose precise position in relation to each other was known. The receiving cell combined the observations of the two cells and hence essentially triangulated the position of the target

**Quick-firing (QF)**

A gun equipped with a quick-action breech mechanism, and using fixed ammunition, enabling a rapid rate of fire

**Ready-use recess**

A small alcove on or near the gun floor, for storing a few shells or cartridges as part of a rapid response in an emergency (the main supply was kept in the magazine)

**Rifled muzzle-loader**

A muzzle-loading gun is armed from the front of the barrel and in this case the barrel has grooves cut into the inside of the barrel which causes the shell to spin, thus ensuring greater speed and accuracy

**Royal Artillery store (or just artillery store)**

A subsidiary building in a fortification, storing equipment for the operation and maintenance of artillery pieces

**Saluting battery**

A small battery of artillery, usually old and obsolete pieces, fired during celebrations and ceremonies, often to greet important people or mark important events

**Shell**

A projectile fired from a gun, which explodes on impact or after a given period of time

**Shelter (or gun crew shelter or gun detachment shelter)**

A room in a fortification or battery where the gun crews were accommodated while on duty, where they could relax in safety but be ready for action (shelters were not intended as barracks)

**Talus**

The rear slope of a rampart

**Terreplein**

A level surface on a rampart or battery, behind the parapet or *barbette*, providing a platform for guns

**Territorial Army**

A national corps of volunteer soldiers, created as the Territorial Force in 1908, intended primarily for home defence. It was renamed the Territorial Army in 1922, merged with the Regular Army during the Second World War, and revived in 1947

## 1. INTRODUCTION

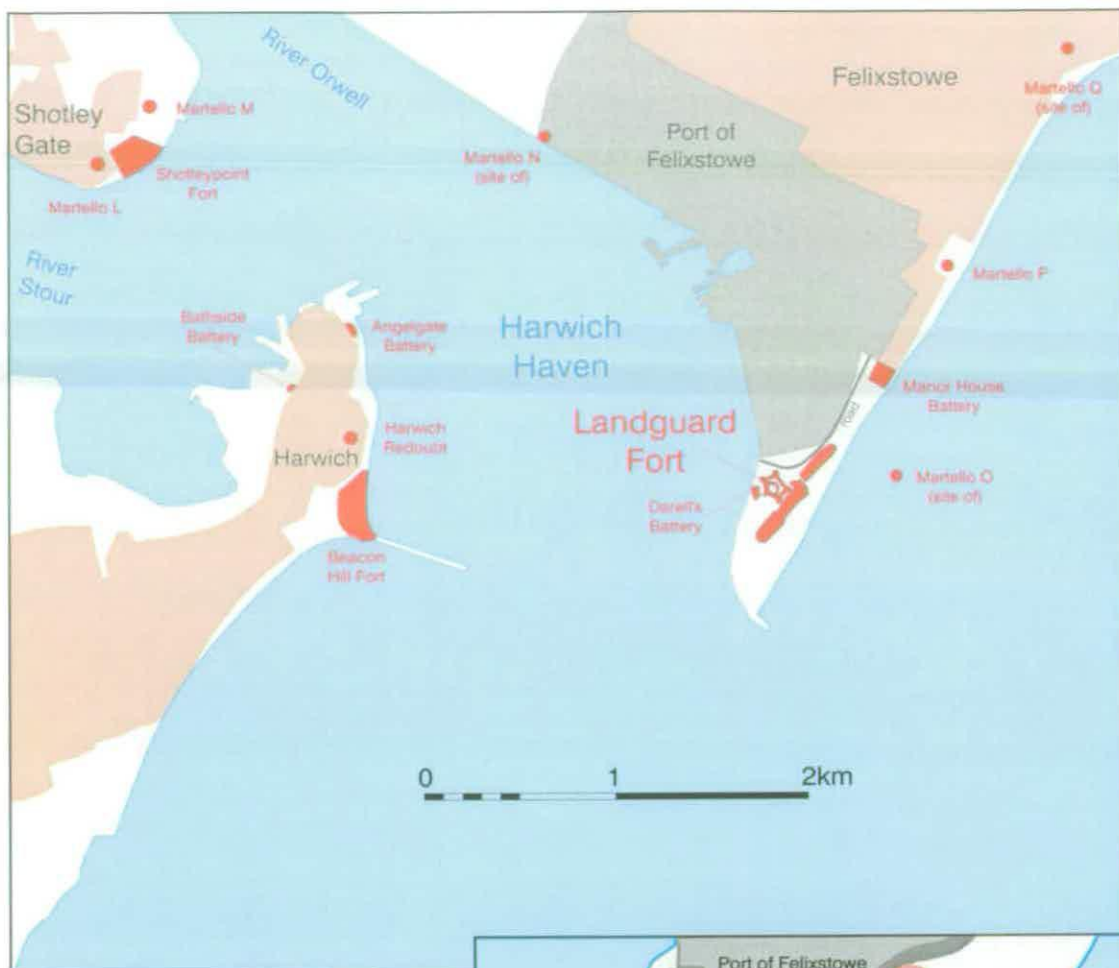
Between June and July 2003, staff from the Archaeological Investigation department of English Heritage (EH), based in Cambridge, carried out survey and analysis of the earthworks and buildings of Darell's Battery, a 20<sup>th</sup>-century coast artillery battery at Landguard Fort in Suffolk. The survey forms part of a wider study of the historic defences on the Landguard peninsula, carried out during an extensive conservation project on the fabric of the fort and its three associated coast artillery batteries (figs 1 and 2). The survey will also provide detailed information to assist in understanding the extent and significance of the archaeological resource of the peninsula, following an extension of the Scheduled Monument (No 21407) to include much of the surviving area of the sand and shingle spit extending from Manor House car park to Landguard Point. It is essential to its future conservation and management.

This report is the fourth in a series of five as follows:

1. Landguard Peninsula report No 1: An outline history of the defences of Harwich Haven 1539-1956.
2. Landguard Peninsula report No 2: Landguard Left Battery; a late 19<sup>th</sup>-century coast artillery battery.
3. Landguard Peninsula report No 3: Landguard Right Battery; a 20<sup>th</sup>-century coast artillery battery.
4. Landguard Peninsula report No 4: Darell's Battery; a 20<sup>th</sup>-century coast artillery battery.
5. Landguard Peninsula report No 5: The military landscape.



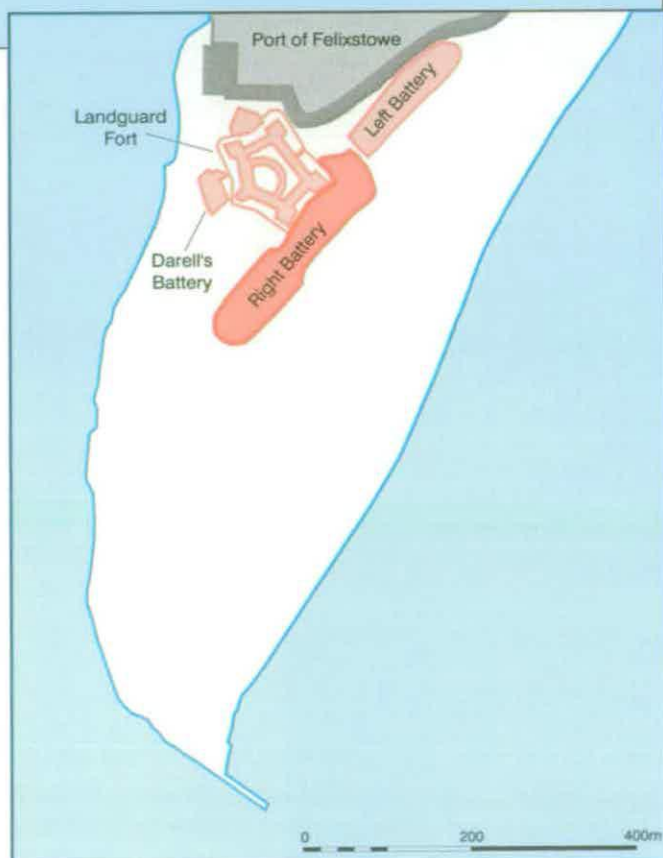
**Figure 1**  
Map showing  
the location of  
Landguard  
Fort at the  
entrance to  
Harwich  
Haven



**Figure 2**

The upper map shows the location of Darell's Battery in relation to the other main batteries and installations protecting Harwich Haven in the 19th and 20th centuries

The lower map is a detail of the Landguard peninsula, showing the surviving gun batteries in the immediate vicinity of Landguard Fort and also the searchlights (CASLs) that worked specifically with Darell's during the Second World War



## 2. HISTORICAL BACKGROUND

---

### 2.1 THE 4.7-INCH QF BATTERY 1900-1940

#### 2.1.1 The guns

Darell's Battery was built on the site of a redundant saluting battery (probably smooth-bore guns on truck carriages), on the western side of the *glacis* of Landguard Fort, close to the sea wall and facing across the mouth of Harwich Haven (fig 3). The construction of Darell's blocked the field of fire from part of the fort's Victorian casemated battery of rifled muzzle-loading guns (RMLs), though these were effectively obsolete at the time (PRO: WO 78/5146/7; WO 78/2735/2).

The new battery was built between May 1900 and April 1901 as *Minefield Battery* and formed part of a developing, co-ordinated system for the defence of Harwich Haven as a secondary naval base (PRO: WO 78/5139/2). It was equipped with two 4.7-inch mk IVb guns on quick-firing (QF) mk III mountings (fig 4), which were on site in 1902 but were not mounted until 1903; official record plans of the battery are dated September/October 1902 (PRO: CAB 18/19; WO 78/5139).

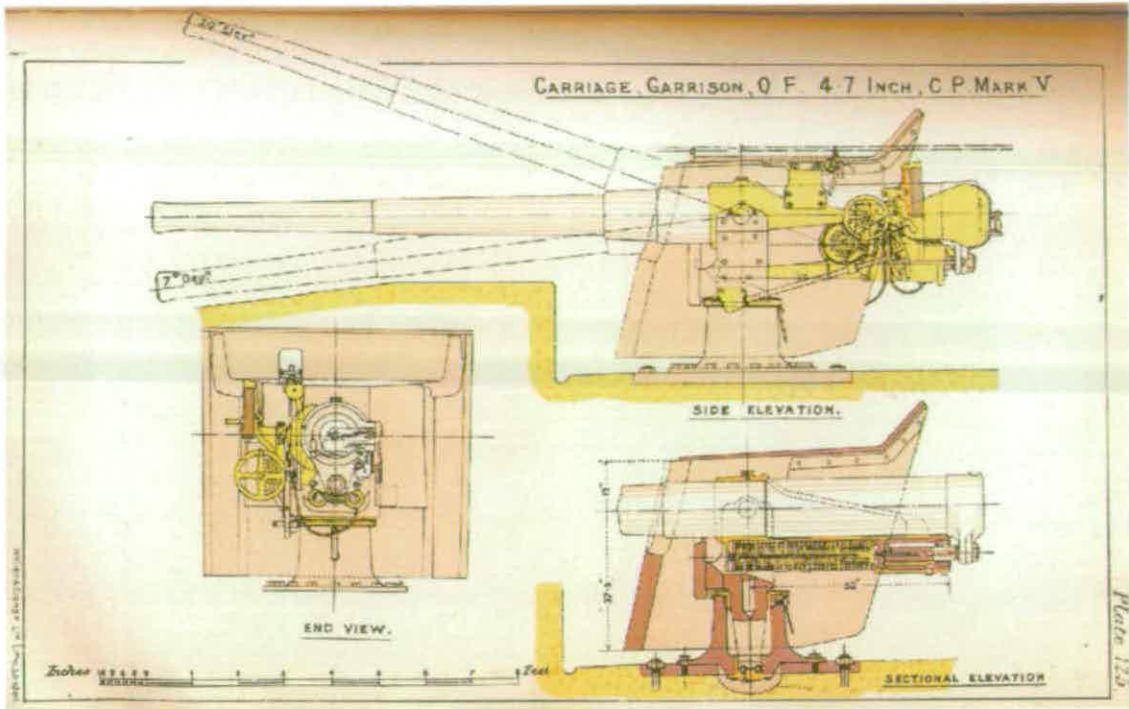
When first installed, the particular role of these 4.7-inch guns was to provide close defence at the haven entrance, principally against smaller vessels attempting to gain the anchorage by running through the submarine minefield or attempting to clear a path for larger vessels by countermining (hence the initial naming of the battery). Darell's Battery worked in conjunction with another, pre-existing battery of two 4.7-inch QF guns on the south side of the haven at Beacon Hill, and all four guns were co-ordinated by the Harwich Defences Fire Commander (Brown and Pattison 1997).

In the Defence Plan for Harwich of 1906, the personnel requirement for Darell's Battery is given as one officer and 30 other ranks. The officer commanded the battery under orders from the Fire Commander, although he could act independently



**Figure 3**

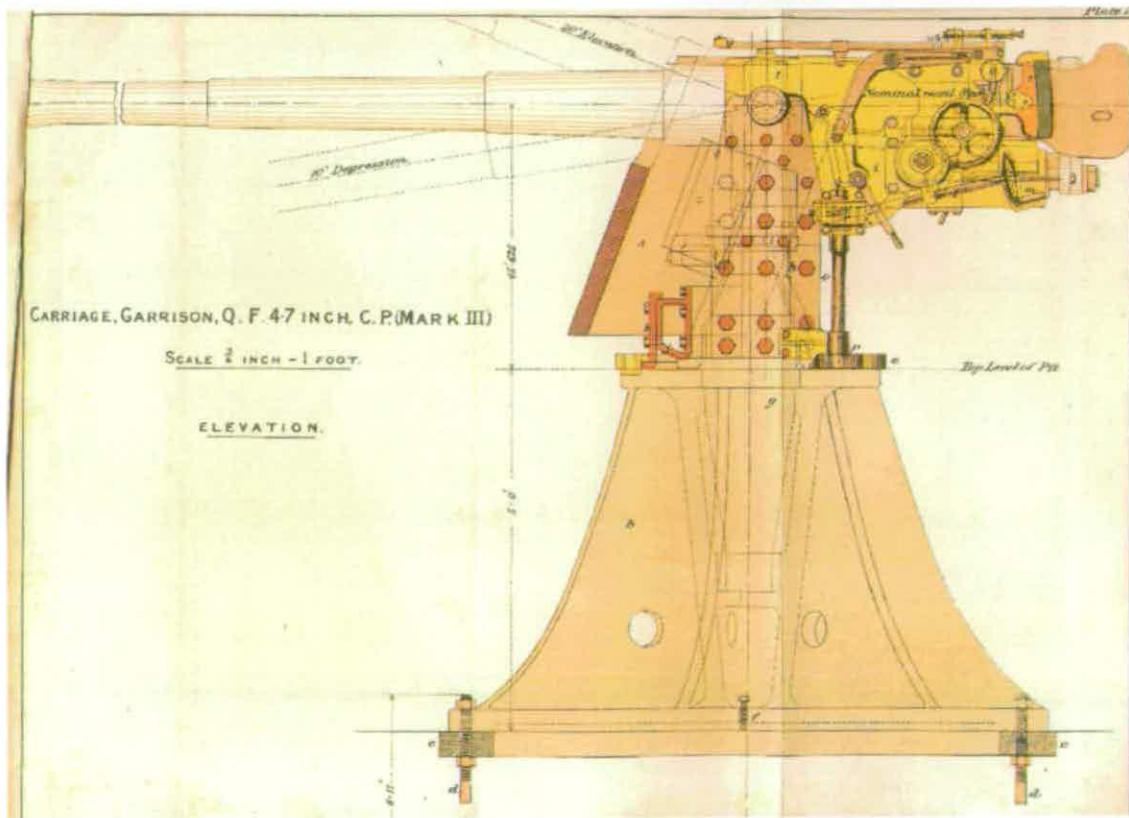
View of Darell's Battery from the south-west, marked by the two towers at left, to the right of which is the 1870s casemated battery of Landguard Fort (NMR: AA046895)



**Figure 4**

Two illustrations of 4.7-inch QF guns, from a War department manual of 1911.

The upper illustration is included to show the whole gun with its shield, though the mounting is different to those at Darell's. The lower illustration shows the correct mounting, a CP (central pivot) mk III.



at night if necessary. Eighteen men were needed for the guns; the rest were concerned with ammunition supply from the magazines, with telephone communications and with the operation of the position-finding (PF) and depression range-finding (DRF) instruments (PRO WO: 33/391A).

In 1904, Minefield Battery was re-named *Darell's Battery*, to commemorate the successful defence of Landguard Fort by Captain Nathaniel Darell against an assault by Dutch marines in 1667 (PRO: WO 78/5139/1). At the same time, a proposal for the installation of an additional battery at Landguard was approved and detailed plans were drawn up (PRO: CAB 18/19; WO 78/4049). This was to be built immediately south-west of Darell's and continuous with it, for two 12-pdr QF guns and a machine gun. This combination, the 12-pdr QFs quicker to load and fire than the 4.7-inch QFs and the machine gun an effective anti-personnel weapon, was by this date considered the most effective against fast torpedo boats. As it turned out, the proposed battery was not constructed because of the recommendations of the Committee on the Armaments of Home Ports (the Owen Committee), which reported in 1905 (PRO: CAB 16/1). This report sought to rationalize the nation's coast defences following a period of rapid expansion, recommending the definition of three classes of defended port, with appropriate guns allotted according to threat. Harwich had previously been designated as a secondary naval base and as such was well provided for, but its new grading - "C" - was the lowest because the perceived threat was from unarmoured vessels only, rather than a large armoured squadron.

Consequently, over the following two years, the Harwich coast defences were gradually reduced and the plans for a 12-pdr QF battery abandoned. According to the War Office armament returns, the 4.7-inch QF guns were withdrawn from Darell's by 1907 and from Beacon Hill after 1910; most importantly, the big 10-inch guns were removed from Beacon Hill, Landguard Left and Right batteries so that officially, the only guns left to defend the haven were those of 6-inch calibre at Landguard Right and Beacon Hill. Furthermore, the returns have no guns listed as mounted at Darell's Battery between 1907 and 1914 (PRO: CAB 18/19; WO 33/553; 599; 639; 683). However, there are two other official sources which suggest otherwise. Firstly, the Harwich Defence Scheme of 1911 lists the two 4.7-inch guns as "mounted but not approved" and this is confirmed by the second, an index plan of the Landguard defences, dated 1912 (PRO: WO 33/553 pt 1; WO 78 5137/4). It is clear that the guns remained in the battery after the Owen Committee in 1905, an unusual situation due to disagreement over the grading of Harwich. After protracted discussions, Harwich was eventually treated as a special case, being classed in April 1912 as a commercial port with special military and naval significance, and as such kept some of the armament that the Owen Committee had recommended be withdrawn (PRO: CAB 12/1; WO 32/9096). Clearly, this included the 4.7-inch QF guns at Darell's.

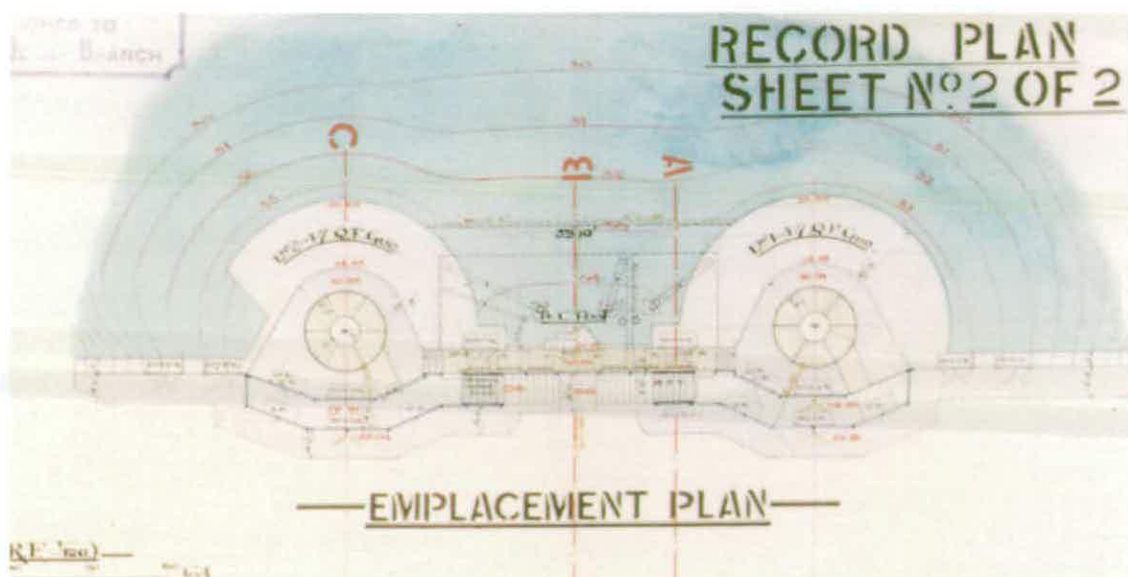
At the outbreak of the Great War, Harwich resumed its importance as a naval base for a Light Cruiser Squadron and the 4.7-inch QF guns are listed in the official return for 1915, when they were to have a night-fighting capability provided by searchlights described as "in progress" (PRO: WO 33/704). However, the mounting of the guns is listed as temporary in the return for the following year and by 1917, the guns were reserved for drill. They saw no action during the war and in 1919 were retained for drill only (PRO: CAB 18/19; SUPP 5/185; WO 33/942).

### **2.1.2 Battery command**

The 1902 record plan shows the Battery Command Post (BCP) as a small recess situated between the guns on the covered way (fig 5). It was large enough only for the battery commander and one other rank to observe and monitor an engagement. No position- or range-finding equipment is mentioned at this time, nor recorded in the



**Figure 5**  
 Extract of the  
 1902 record  
 plan, showing  
 the location of  
 the original  
 battery  
 command post  
 (labelled at  
 centre  
 "B.C.Post")  
 between the 4.7-  
 inch QF  
 emplacements  
 (PRO: WO 78/  
 5139/2;  
 reproduced with  
 the kind  
 permission of  
 the National  
 Archives)



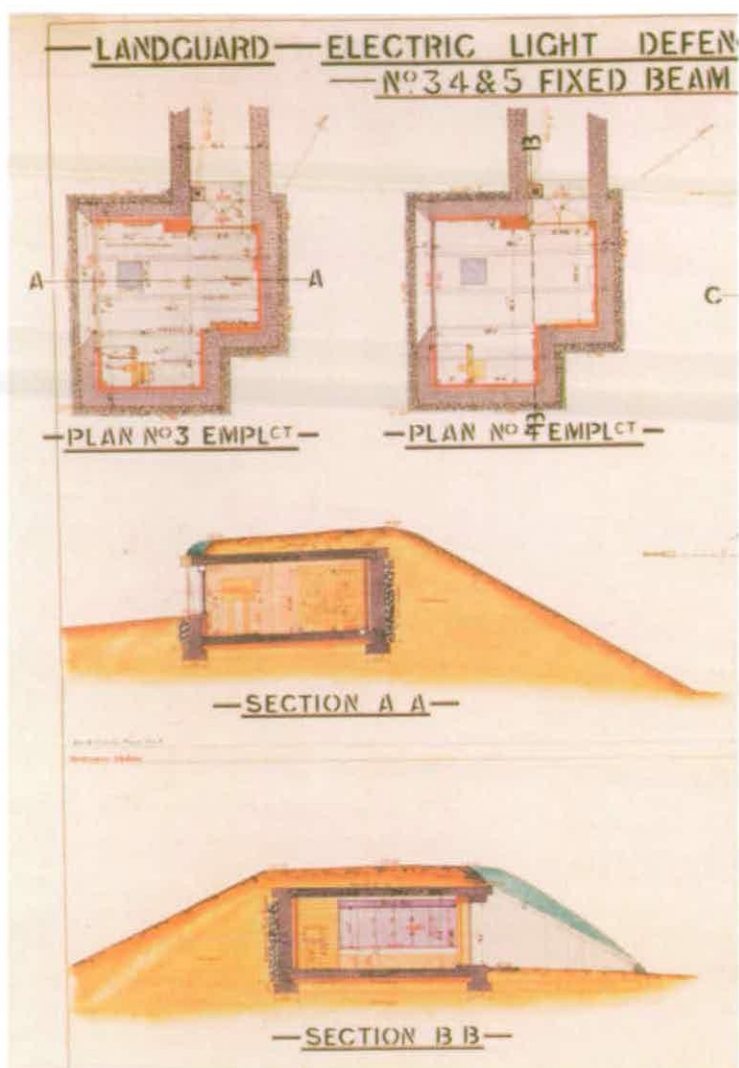
Eastern District Defence Scheme of 1904 (PRO: WO 78/5139/2; WO 33/329). This was remedied shortly afterwards, as a depression range-finding instrument (DRF), a position-finding (PF) instrument, a range information dial, autosights and relevant personnel are listed in the Harwich Defence Plan of 1906 (PRO: WO 33/391A). This makes it clear that the guns had a dual capability: for longer range work the operators of the DRF and PF instruments worked out the target location and transmitted it electrically to appear on dials in the gun emplacements; this was used by the crews to lay the guns onto their targets. However, the guns were also fitted with autosights operated by the gun crews for quick-response short-range action in the haven mouth and submarine minefield.

An emplacement for a position-finding instrument was adapted from an existing Observing Cell in the Submarine Mining compound just north of the battery; the alterations were complete by January 1902; the location of the second PF cell is unknown but was probably on the roof of Landguard Fort (PRO: WO 78/5143/3).

### 2.1.3 The defence electric lights (DELs)

The DELs that worked in conjunction with the original Darell's Battery are no longer extant but full details about their location and construction are contained in surviving historic plans. An electric light and an oil engine room to generate the necessary power were provided for the illumination of the submarine minefield by 1890. This light, situated 340m (370yds) to the north of the later site of Darell's Battery, enabled an observer to judge exactly when to remotely detonate mines, via an electrical contact, as a hostile vessel came close to it (PRO: WO 78/4089).

Revision of the minefield defences resulted in another two DELs and another engine room by June 1901, to work in conjunction with the 4.7-inch QF guns being installed in Minefield Battery (Darell's) at the same time. One of the new DELs was built immediately adjacent to the original, while the other, plus the new engine house, were placed in the Submarine Mining compound only 135m (148yds) north of Darell's. A record plan drawn in October 1903 shows the three lights as "Nos 3, 4 and 5 fixed beam emplacements" (they illuminated a pre-determined area rather than moving in the manner of a searchlight) and gives full details of their design (PRO: WO 78/5143; fig 6). They were small rectangular flat-roofed concrete casemates,



**Figure 6**  
Extract of a record plan, dated 1903, showing plans and sections of two DELs (PRO: WO 78/5143/1; reproduced with the kind permission of the National Archives)

with an internal brick skin and cavity, and a smaller rectangular annexe on one long wall, the latter intended as a crew shelter and telephone recess for communication with the Electric Light officer. A large embrasure occupied the front wall and was provided with shutters to expose the light and protect the crew and the light from the weather. Each emplacement was bomb-proofed by an earth covering that was blended into the fort *glacis*; crew access was via a concrete-revetted covered way.

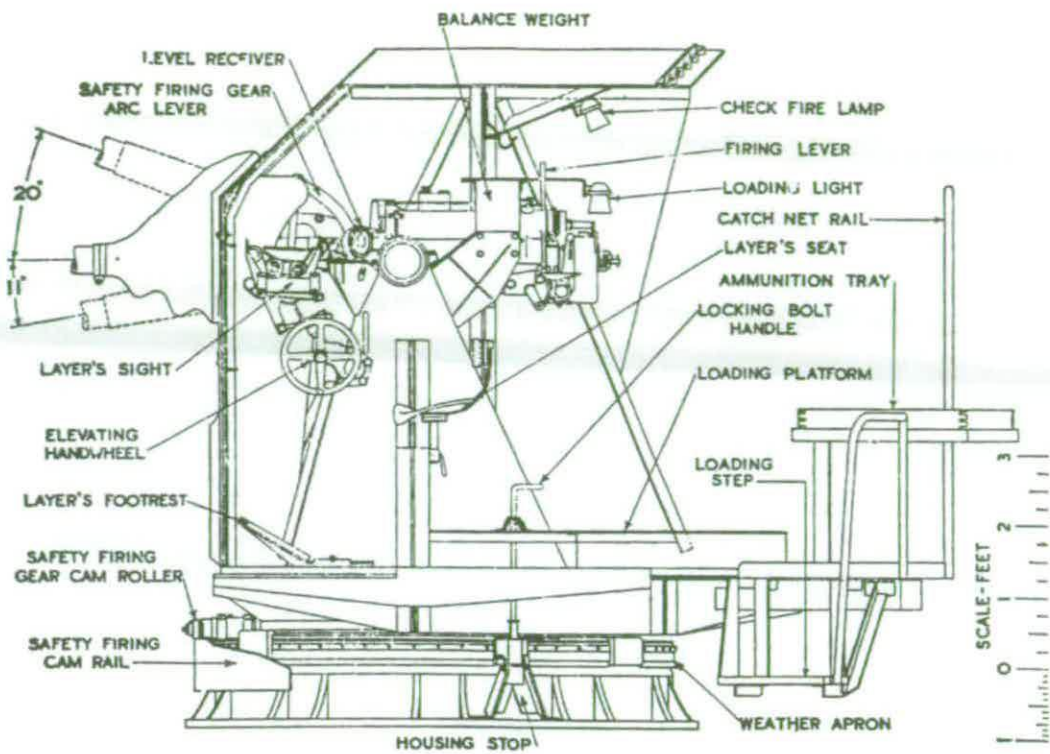
These DELs were short-lived, as the Owen Committee report recommended withdrawal of all but four of the DELs in the Harwich Defences; two were to remain at Beacon Hill and two at Landguard. Those retained at Landguard stood on the shingle spit south of Right

Battery and worked with its 6-inch guns. The old Nos 3, 4 and 5 were withdrawn (PRO: CAB 16/1) and do not appear in a later proposal - of 1910 - to have a total of six (PRO: WO 78/5143/2).

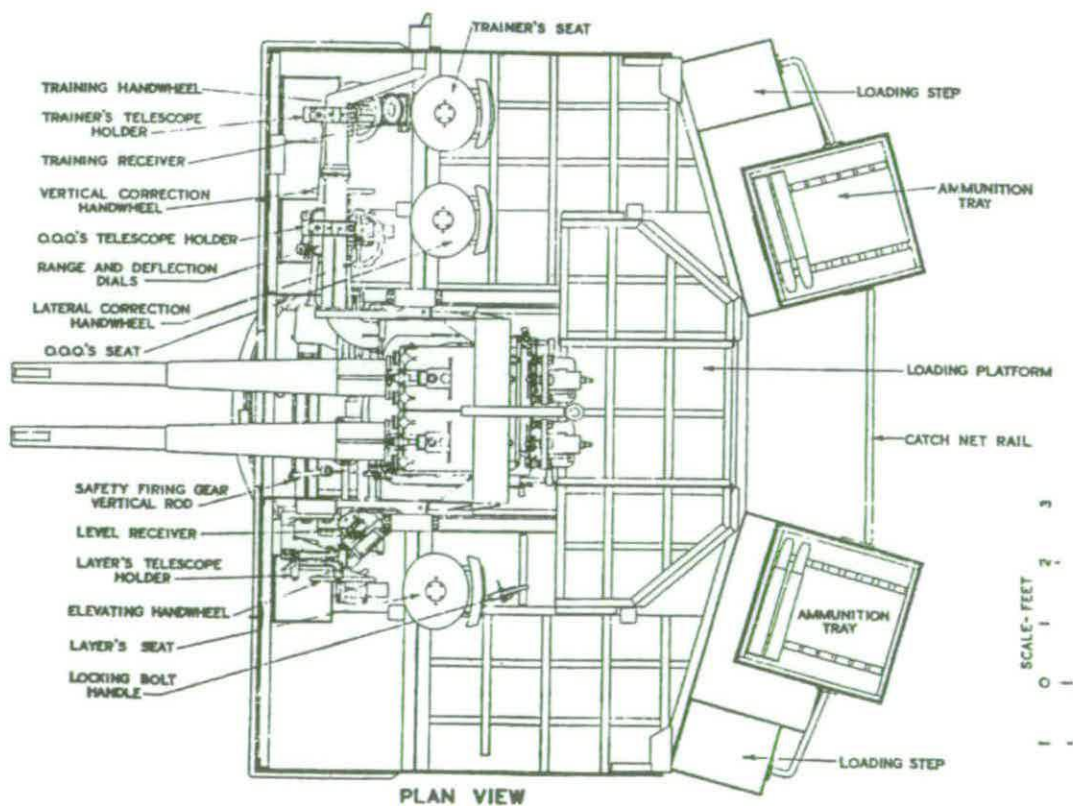
Further revision of DELs took place at the outbreak of the First World War and two new lights were provided to work with Darell's on the Harwich Conservancy jetty some 210m (230yds) south-west of the battery; these were dispersed beams that illuminated a fixed arc of 60° at the entrance to the haven (PRO: WO 78/5135/2; WO 78/5131/3).

#### 2.1.4 The inter-war years

The 4.7-inch QF guns remained in place at both Darell's and Beacon Hill in 1920 (PRO: WO 78/5131/1). However, only the guns at Darell's appear in the Harwich (Interim) Defence Scheme for 1933 (PRO: WO 33/1343). With war in Europe becoming more likely, some plans were made to improve the haven defences; an armament table dated 1936 lists two 6-pdr QF guns at Darell's and two more at Beacon Hill, probably mounted for the same reason as the intended 12-pdr QFs before the Great War - to achieve the rate of fire required to hit German torpedo



LEFT SIDE ELEVATION



PLAN VIEW

Figure 7  
Drawing in section (top) and plan (bottom) of a twin six-pdr QF gun. This one is on a naval mounting but the gun is the same as that mounted at Darell's Battery (Cooper 1976)

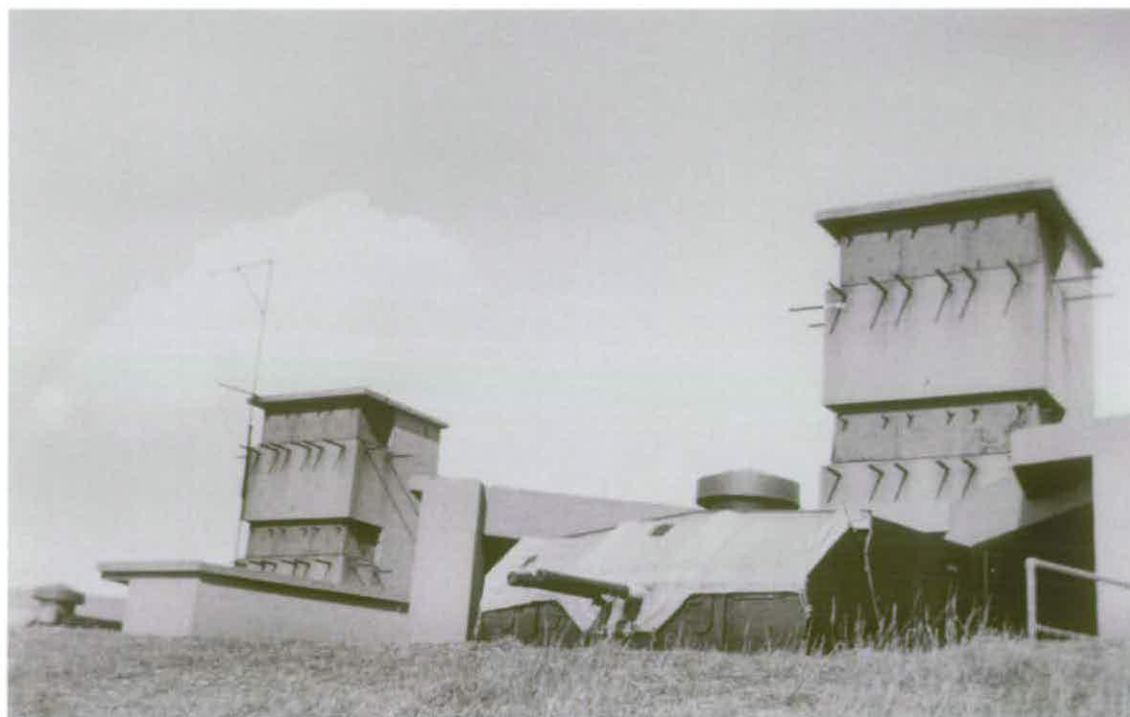
boats moving at up to 40 knots (they may also have helped to guard the floating naval defence boom which sealed the haven entrance). They are described as A/CMB (anti-coastal motor boat) and worked with a network of DELs that illuminated the entire haven mouth. Curiously, the 1936 table does not record the 4.7-inch QFs at Darell's, though it is possible that they had been withdrawn after 1933 and re-mounted after 1936, because they are recorded as being finally removed in 1940 (PRO: WO 78/5135/2; WO 192/213).

## 2.2 The twin 6-pdr battery 1940-56

In 1939 or 1940, it was decided to re-build Darell's Battery for new guns. As a temporary measure in January 1940, two 12-pdr QFs were mounted on the flanks (probably on the same mountings as the 6-pdrs), and the old 4.7-inch QFs were removed in April so that their emplacements could be remodeled for the new weapon.

This was the formidable twin 6-pdr which, at the time of its introduction in the late 1930s, was an integrated weapons system developed to destroy German high speed motor torpedo boats (figs 7 and 8). It combined two QF guns on the same mounting, each one of which had a very high rate of fire (60-120 rounds per minute), electrically powered traverse and elevation, and a vertical-sliding breech for quick loading. The twin 6-pdr proved a great success and was installed widely in coastal batteries in the UK and at British bases abroad. Its most notable engagement took place in July 1941 and resulted in the destruction of several Italian torpedo boats during a night attack on the Grand Harbour in Malta.

Progress was rapid and two twin 6-pdr QFs were installed at Darell's and calibrated in early July 1940; the 12-pdr QFs were withdrawn towards the end of June. The new battery was not at full fighting efficiency until the completion of new searchlights (CASLs), engine rooms for the electrical power supply, hoists etc in the winter of 1940/1 (PRO: WO 192/213).



**Figure 8**

Historic photo of the twin 6-pdr QF battery, from the south, taken c1950, showing no 2 gun. The small circular drum on top of the gun shield is part of a gunnery radar system (photo supplied by Roger Thomas)

A single twin 6-pdr QF gun was also built in a completely new emplacement at Beacon Hill, and named Cornwallis Battery, working in conjunction with Darell's to provide an effective crossfire at the haven mouth (Brown and Pattison 1997).

### **2.2.1 Post-war years 1945-56**

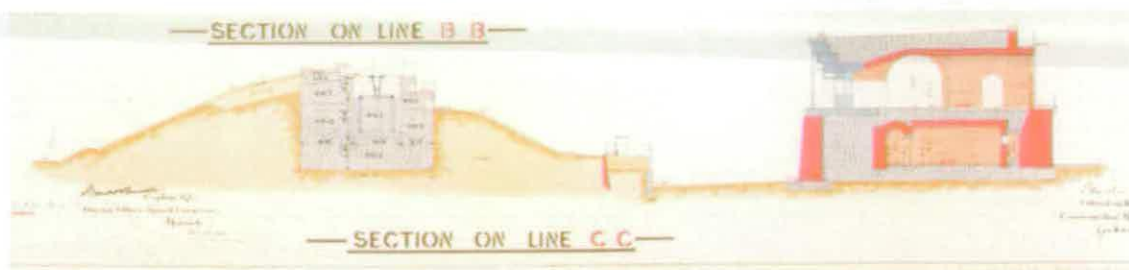
The twin 6-pdr battery remained fully operational until May 1945. After the war, it was manned by a Territorial Army (TA) unit and the guns were modified to enable both anti-aircraft use, by increasing the angle of elevation on the mounting, and for an increased arc of landward fire as far as Dovercourt Barracks on the Harwich side of the haven. These modifications were complete in June 1950 when further changes were made, perhaps to fit the Type 271 or 272 Blind Fire radar system shown on a surviving photograph (PRO: WO 192/209; fig 8). In 1956 the battery was stood down and disarmed in common with the rest of Britain's coast defence batteries.

### 3. DESCRIPTION AND INTERPRETATION OF THE 4.7-INCH QF BATTERY

#### 3.1 Summary (fig 11)

A detailed record plan of Darell's Battery, made in 1902, shows that the design is a standard one in all aspects except ammunition supply. The magazine was established in a detached location, in several adapted casemates inside Landguard Fort, an awkward arrangement which required that a larger than usual number of ready-use ammunition recesses be incorporated into the emplacements (fig 9; PRO: WO 78/5139/2).

Figure 9  
Extract of the  
1902 record  
plan, showing in  
section the  
relationship of  
the 4.7-inch QF  
gun  
emplacements  
to Landguard  
Fort (PRO: WO  
78/5139/2;  
reproduced with  
the kind  
permission of  
the National  
Archives)

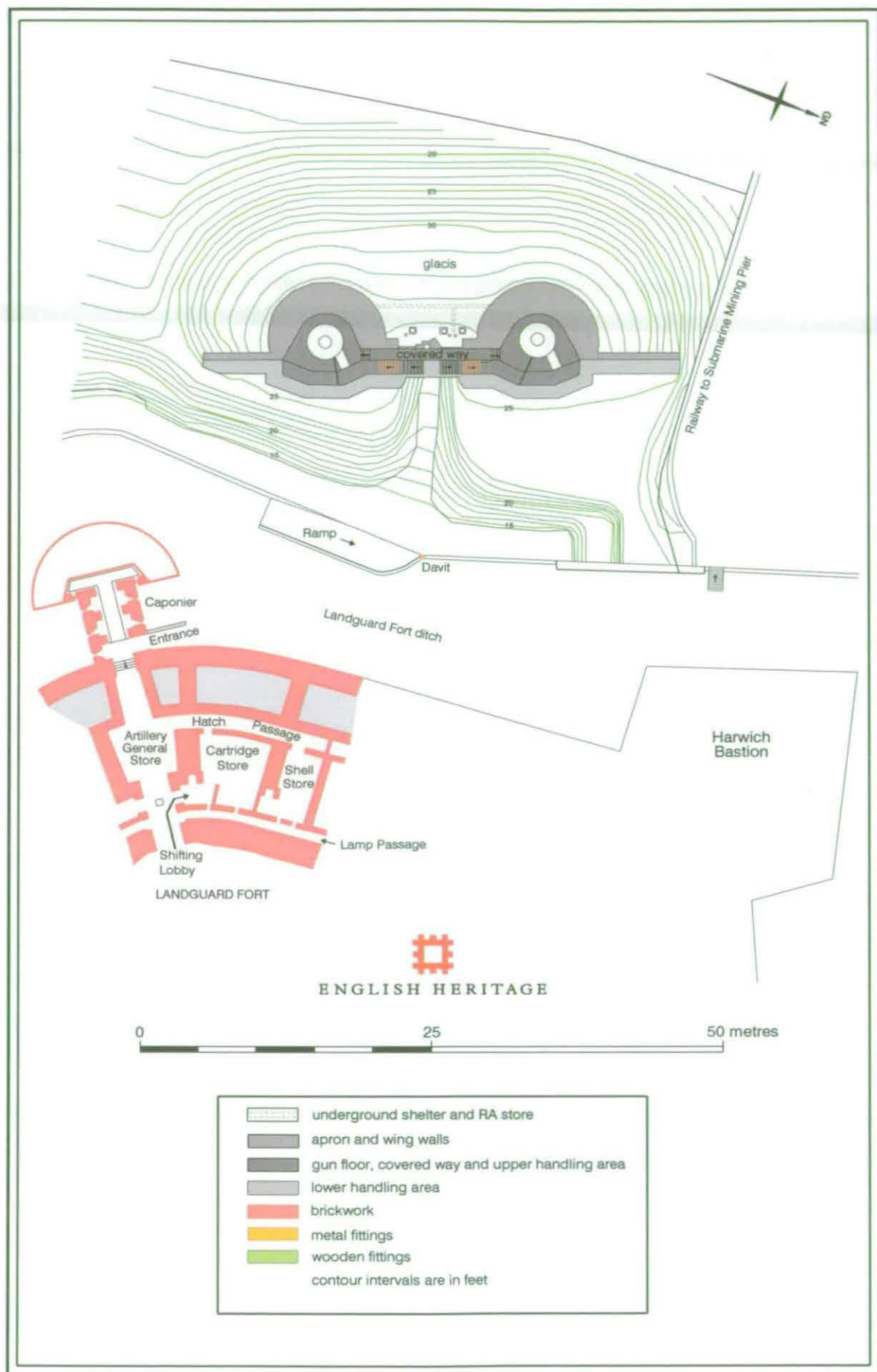


The battery is built mainly of mass concrete, with a finer grain concrete screed on the exposed surfaces, the structure protected on the front and flanks by a large sand-capped shingle mound carefully profiled to form a *glacis* that would absorb the impact of in-coming shells. The emplacements, now mostly obscured by later work, were mirror images, with the guns set in circular pits surrounded by the gun floors. The seaward face of each gun floor was carried up into a low *barbette* over which the gun fired and beyond which a concrete apron sloped outward to a shallow profile onto the *glacis*, so that only the barrel and the top of the gun shield was visible from without. The rear of the gun floors were protected by removable steel handrails set in cast stanchions, which continued along the back of a covered way that ran between the two gun floors. The covered way was protected by a parapet that was continuous with the *barbettes* and into which was incorporated centrally a Battery Command Post (BCP) with a ready-use ammunition recess on each flank.

Behind and below the gun floors were ammunition-handling areas, also backed by removable handrails, where ammunition was relayed to the guns from ready-use recesses under the gun floors (fig 10). Behind and below these were additional handling floors with access to more ready-use recesses under the upper handling areas and in the wing walls that revetted the mound on the flanks of the battery. In all there were 8 ready-use recesses per gun.

Figure 10  
Extract of the  
1902 record  
plan, showing  
the rear  
elevation of the  
4.7-inch QF gun  
battery (PRO:  
WO 78/5139/2;  
reproduced with  
the kind  
permission of  
the National  
Archives)





**Figure 11**  
 Darell's Battery: the original configuration of the 4.7-inch guns and magazine (after PRO: WO 78-5139-2)

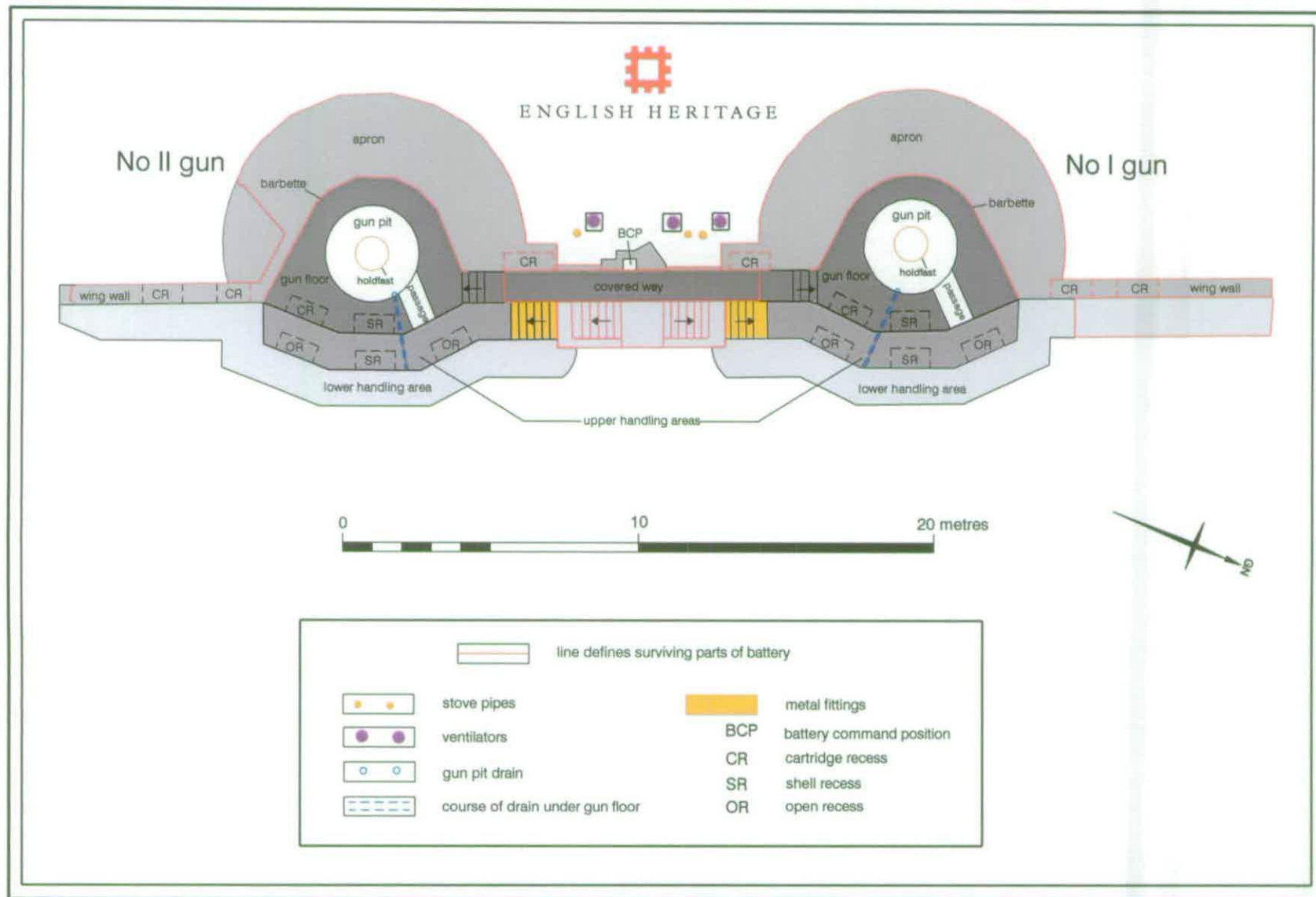


Figure 12: Detailed plan of the 4.7-inch battery at gun floor level (after PRO: WO 78-1392-2)



From the upper handling floors, flights of steel open-tread steps led down to half-landings, from which concrete steps descended and converged on a central point in the rear of the battery. At this point is the entrance to the gun crew shelter and adjacent Royal Artillery (RA) store, which survives entirely, located in a protected position in the body of the mound under the covered way and the BCP (fig 10).

A concrete pathway recessed into the mound at the rear of the battery, descends from the gun crew shelter to the fort ditch. A concrete ramp leads down into the ditch, from which the magazine was formerly accessible via a doorway (now blocked) cut into the old *caponier*.

### 3.2 The 4.7-inch QF gun emplacements (fig 12)

Most of the original structure has been modified or destroyed by later work but parts of the aprons, *barbettes*, gun pits, covered way and wing walls remain, together with



**Figure 13**

Photo looking south-east across the emplacement for 4.7-inch QF gun no 1, showing the cut-down barbette and scarred apron (the gun holdfast is from the twin six-pdr of 1940)(NMR: AA046718)

the shelter and RA Store. The aprons are quite complete but were cut down to accommodate the twin 6-pdrs in 1940; this work also lowered the *barbettes* and totally destroyed or obscured details of the 4.7-inch QF gun pits (fig 13). There is no trace of a dials recess, nor of any provision for electric lights to assist the crew during night fighting (neither of which are shown on the 1902 record plan), although in gun no 1 there is a small steel bracket for an oil lamp at the junction between *barbette* and covered way parapet. The covered way is substantially complete, though much of the parapet and BCP have been altered. Though partially obscured, the original wing walls on the flanks of the battery are intact.

The distance from the magazine to the guns made the supply of ammunition a little more complicated than would have been the case in a battery of standard design. The slightly earlier 4.7-inch QF battery at Beacon Hill in Harwich (1892) and the slightly later Dummy Battery on the Isle of Grain (1904-5) have more conventional arrangements. At Beacon Hill, each gun has its own dedicated magazine behind and underneath the guns in a slightly offset position, while at Grain the magazine occupies exactly the same position as the gun crew shelter at Darell's - this is the *ideal* magazine location (Brown and Pattison 1997; 1998). At Darell's, ammunition from the magazines was taken along a passage to the *caponier*, through a new doorway cut in its southern wall, along the fort ditch to a new ramp built against the ditch counterscarp. It may have been taken up the ramp or lifted using a small steel davit, which survives, fixed against the counterscarp (Fig 14). From there it was taken up the slope towards the shelter and finally up the steps to the ready-use recesses or the guns.



**Figure 14**

Photo looking south from the access road into the ditch of Landguard Fort, showing the davit, ramp and blocked doorway to the magazine through the old caponier (NMR: AA046762)

Such a convoluted supply route was probably the product of military pragmatism ie the relative proximity of safe storage in the fort but it might have compromised the efficiency of the guns during a sustained action. At this date however, the proximity of the crews became steadily more important (and similarly, a shelter was provided close to the 4.7-inch QF guns at Beacon Hill in 1903 (Brown and Pattison 1997, 26-7), especially for QF guns which had to counter the threat of torpedo boats, against which the crews had to react and fire rapidly at their fast moving targets. To compensate, twice the normal number of ready-use ammunition recesses was built into the emplacements.

Each emplacement had eight ready-use ammunition recesses, four each for shell and cartridge. These were located as follows: one shell and one cartridge recess under the gun floor; a cartridge recess under the parapet of the covered way; two open recesses and a shell recess under the upper handling floor and two cartridge recesses in the wing wall (fig 15). Those which survived the rebuilding of the battery in 1940, ie those on the parapet and the right wing wall, were all for cartridge.

The parapet cartridge recesses are 1.37m (4ft 6in) wide by 0.6m (2ft) high and 0.58m deep (1ft 11in), set 0.05m (2in) above the current floor level. They have rendered interiors and steel frames with twin steel doors hung on hasp hinges and secured by internal bolts and pivoting locking bars and padlocks, all recently repainted dark green. The southern of the two is painted black inside, while there is evidence for signs above both, consisting of a white background with black writing that is no longer legible. There are also scars from galvanized rain hoods.

The two cartridge recesses in the right flank wing wall are of a larger size, 1.37m (4ft



**Figure 15**  
*Photo of  
cartridge  
recesses in the  
right wing wall of  
the 4.7-inch QF  
battery (Paul  
Pattison)*

6in) wide, 1.14m (3ft 9in) high and 0.55m (1ft 10in) set 0.1 (4in) above the current floor level. All other details are as described for the covered way recesses, save that the interiors are lime-washed.

The shell recesses had twin wooden doors while the open recesses had none.

### 3.3 The battery command post (BCP) (fig 12)

The 1902 record plan shows only a small recess for the BCP, situated centrally in the parapet of the covered way between the guns (fig 5). The location of the DRF could originally have been on the fort roof but it may have been quickly moved onto the battery itself. This is suggested by a modification that enlarged the recess to its present apsidal plan, almost certainly to house a DRF instrument and, if so, possibly accomplished by 1906 when a DRF is specifically mentioned (fig 16; PRO: WO 33/391A). It incorporates a small recess at floor level on its left flank, 0.82m (2ft 8in) wide, 0.52m (1ft 8½in) high and 0.22m (8½in) deep, flush with the floor, rendered inside and painted black over red and green. The recess had a wooden frame and door, both of which are missing.



**Figure 16**  
Photo looking down on the covered way and modified Battery Command Post of the 4.7-inch QF battery (NMR: AA046770)

### 3.4 The gun crew shelter and Royal Artillery store (fig 17)

This two-room rectangular building is securely built into the massive aggregate and cement base of the emplacements, to provide protection against incoming shells (fig 18). The ceiling is of reinforced concrete poured between steel 'I'-section joists positioned across the axis of the building. The entrance originally had a pair of

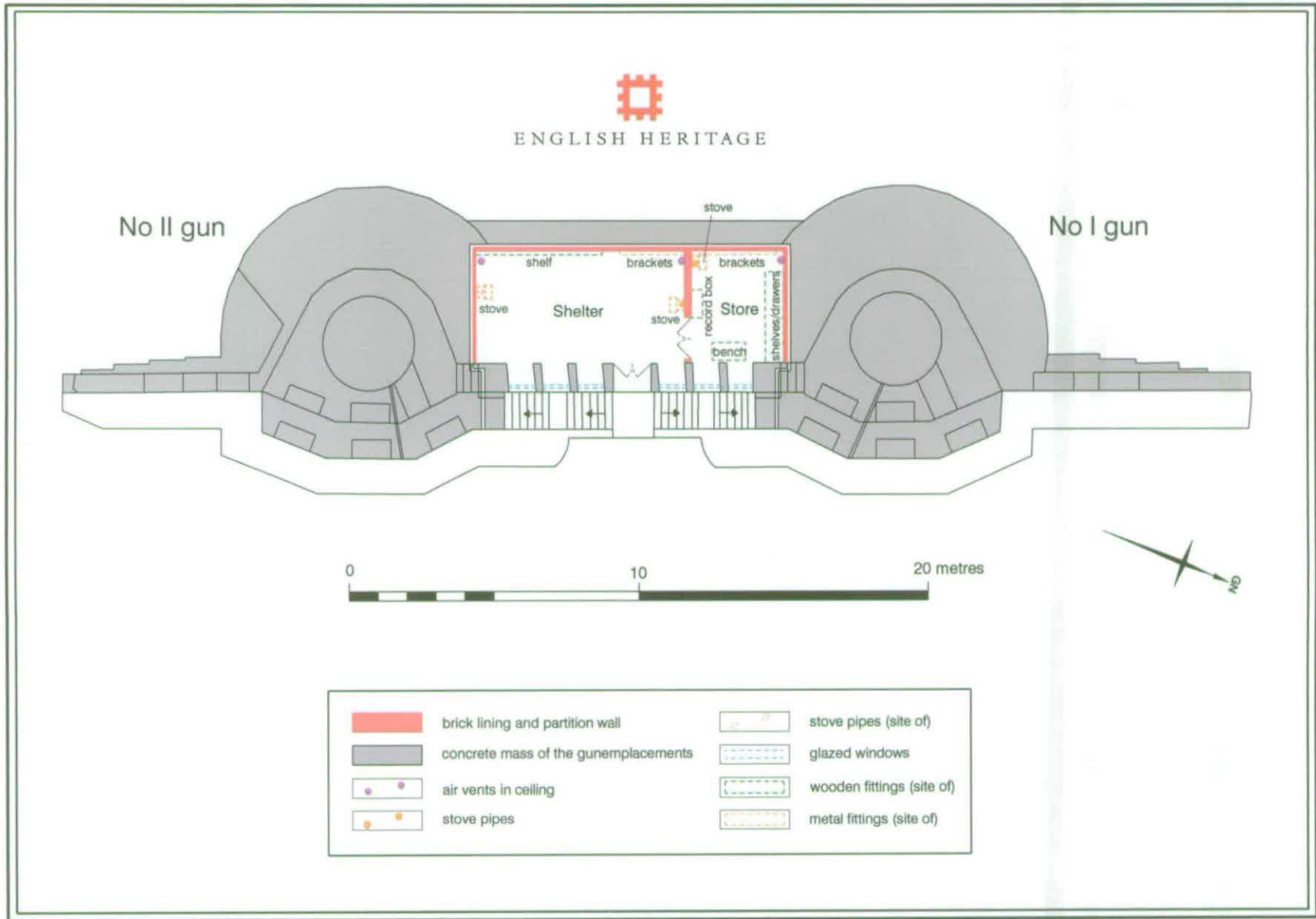


Figure 17: Detailed plan of the crew shelter and Royal Artillery store associated with the 4.7-inch QF gun emplacements. 'Site of' detail has been taken from PRO: WO78/1392.

wooden doors that opened outwards into a shallow porch formed in the thickness of the wall, but they have been joined together to run as an internal sliding door (the rail has been renewed recently). A steel lintel over the door appears to be a piece of rail re-used from the SME tramway nearby. Marks on the porch wall indicate the position of tiebacks to hold the original doors open, both for ventilation and to improve access during a stand-to. To each side of the door are three windows with inward-opening casement frames; the outer pairs are smaller, respecting the flights of steps that rise against the wall to the gun emplacements.

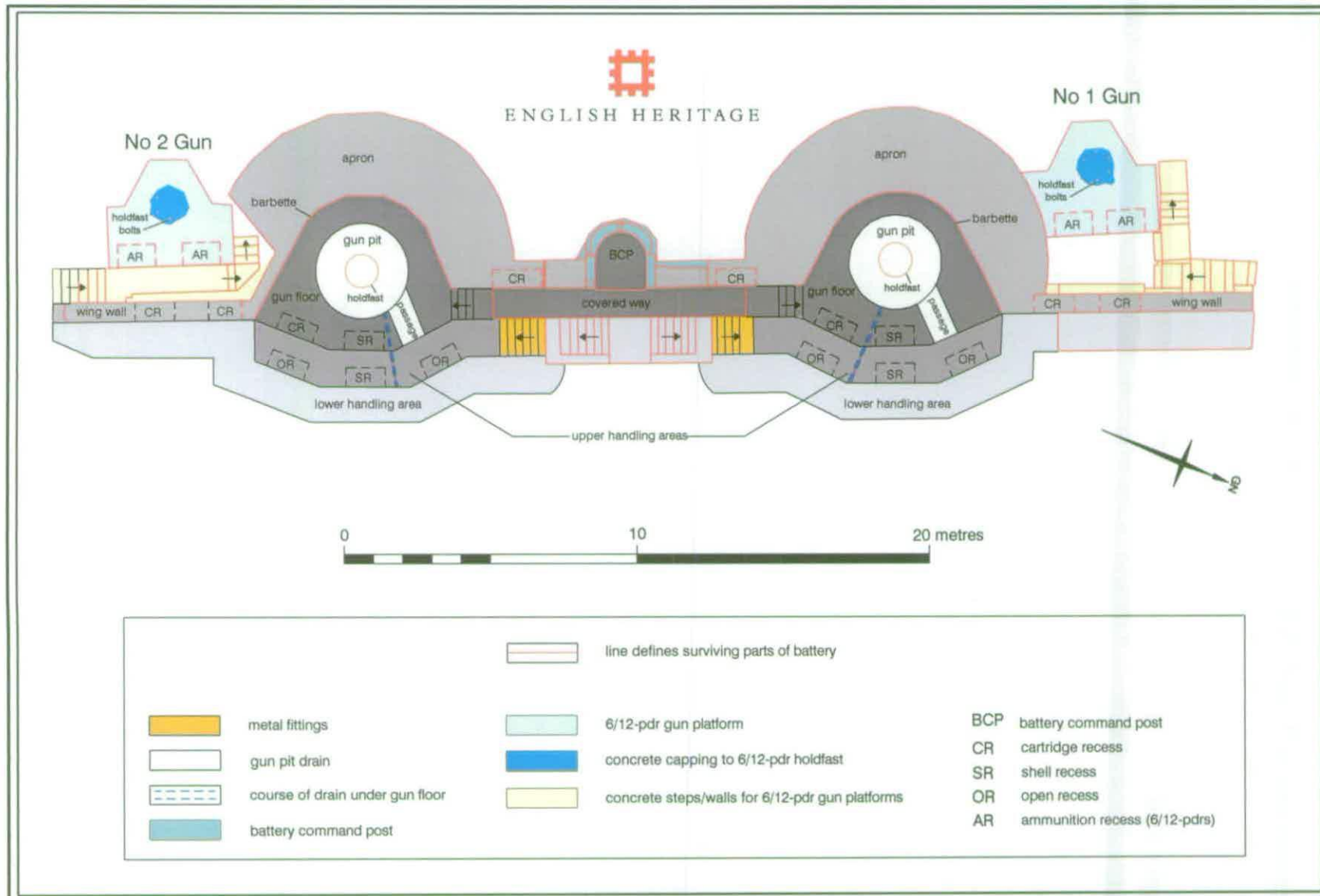
The interior has a floor of concrete slabs with caulked joints. The concrete walls are lined in brick, laid in English bond, to form a cavity on all but the entrance elevation. This originally vented through columns of airbricks in the entrance elevation, but is now blocked by the construction work of 1940. Three earthenware pipes piercing the concrete roof were originally capped by Howarth rotating vents to provide further ventilation.

A partition wall is positioned one window bay to the north of the entrance and is of single-thickness brick, 0.1m (4in) wide. It divides the interior into rooms of unequal size: in the original configuration the larger southern room was the gun crew shelter. It was heated by stoves against the north and south walls, though the hearth slab and concrete round-sectioned kerb visible today against the south wall is from a later example. In fact, no original fittings and joinery have survived: timber plugs in the north wall suggest the location of equipment racks or shelves from a secondary use, as the 1902 record plan shows a shelf there but secured in a different position (PRO: WO 78/5139/2).



**Figure 18**  
Photo of the  
entrance  
elevation to the  
shelter/Royal  
Artillery store of  
the 4.7-inch QF  
battery (NMR:  
AA046766)

The RA store was secured by strong double doors in the partition walls. These opened outward (only the frame survives) under a segmental arched head. Shutters for the two windows were another security measure. In the ceiling a blocked flue in the south-west corner shows the location of another stove, while a work bench was originally positioned under the windows, and drawers and shelves placed against the north wall (PRO: WO 78/5139/2). Nothing of these survive but various timber plugs in the walls and the remains of two rifle racks on the partition wall and the east wall, are later additions which show that the room was adapted as a shelter. This occurred following the conversion of the battery for twin six-pdr guns in 1940, when new stores, called gun stores, were provided for the same function.



**Figure 19:** Detailed plan of the 6/12-pdr gun platforms added on the flanks of the 4.7-inch emplacements. This plan also shows the modified BCP, which was probably built only shortly after completion of the original 4.7-inch battery (after PRO: WO 78-1392-2)



#### 4. DESCRIPTION AND INTERPRETATION OF THE 6/12-PDR QF EMPLACEMENTS

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Open emplacements for two QF guns were built on the north and south flanks of the battery, butted against or let into the outer face of the aprons for the 4.7-inch QF guns (Fig 19). These may have supported the two 6-pdr QFs listed in 1936 and certainly mounted the 12-pdr QFs early in 1940 (PRO: WO 78/5135/2; WO 192/213). Both emplacements are identical and comprise a block of cast concrete resting on the shingle and sand of the *glacis*. Access is via flights of concrete steps from the ends of the wing walls of the original battery. In the southern emplacement, the apron of the 4.7-inch position was cut back to accommodate concrete steps rising to the apron and *glacis*.

Each emplacement is an open platform, with a canted front and rectangular rear section protected by a steel handrail (fig 20). The holdfast plates have been removed but the four securing bolts remain *in situ*, although capped with concrete, suggesting a radius of 0.48m (1ft 7in), a size and pattern of holdfast that was common to 3-pdr, 6-pdr and 12-pdr QF guns. There are two ready-use open ammunition recesses built under each emplacement.



Figure 20  
Photo of the  
open gun  
platform of no 2  
6/12-pdr QF  
emplacement;  
Landguard Fort  
is in the  
background  
(Paul Pattison)

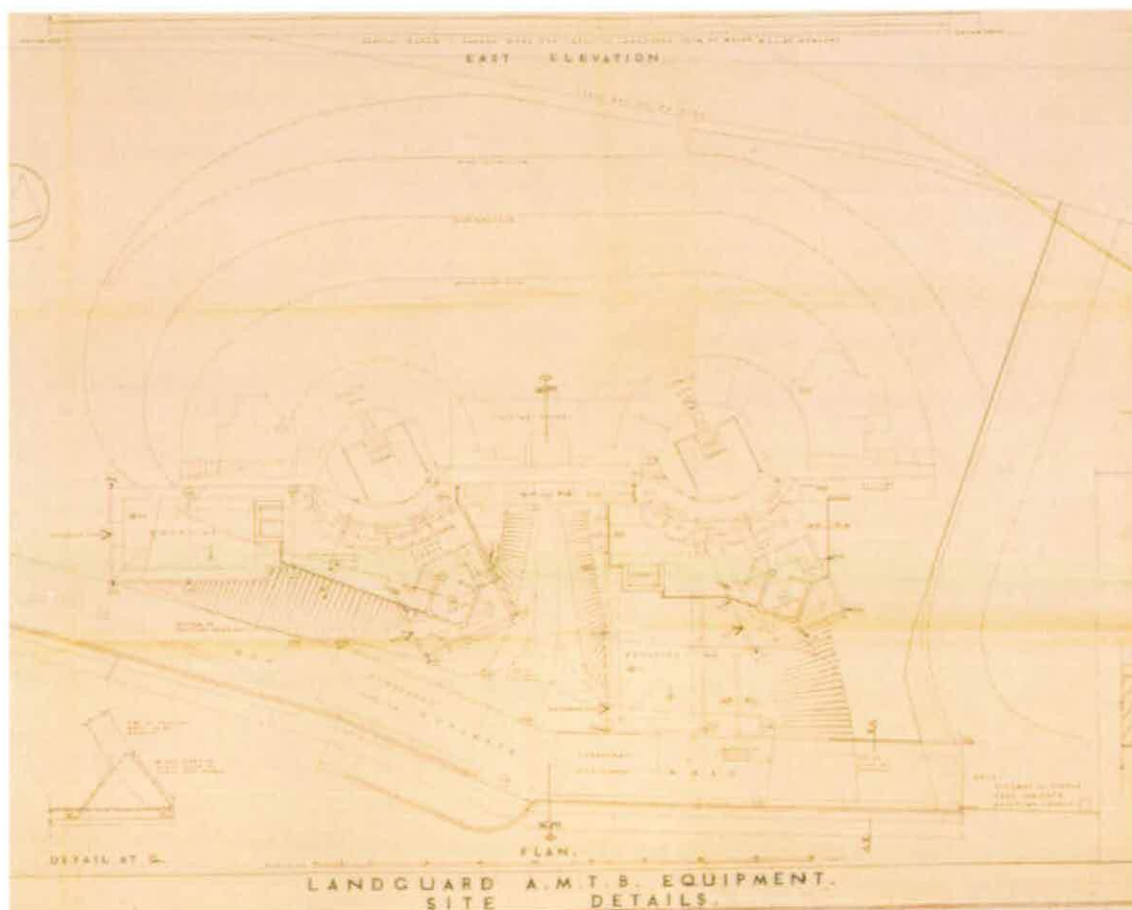
## 5. DESCRIPTION AND INTERPRETATION OF THE TWIN 6-PDR QF BATTERY, 1940-56

### 5.1 Summary

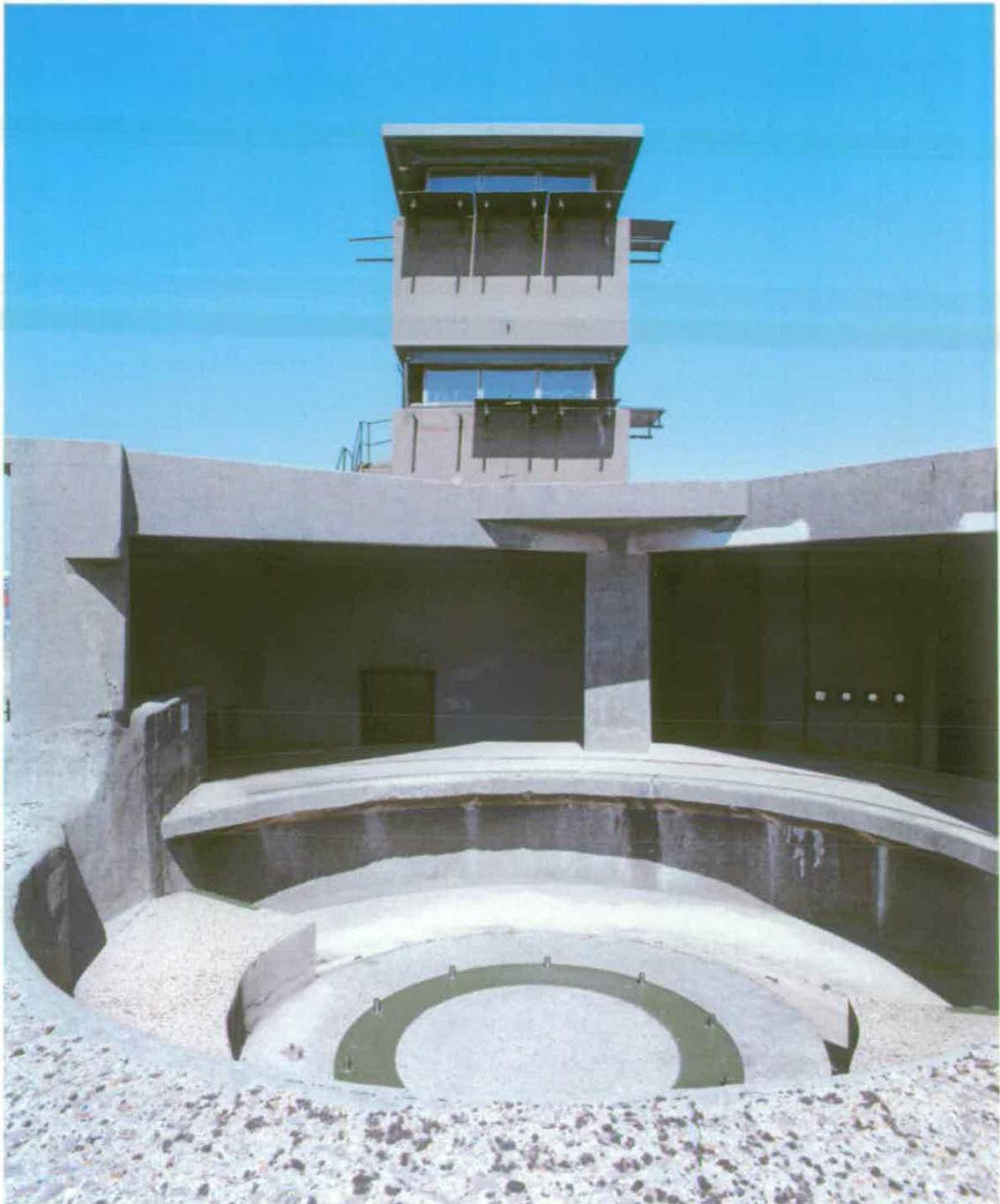
The proposed twin 6-pdr QF battery is clearly shown on a series of twelve constructional drawings prepared by the Royal Engineers at Colchester in March 1940, although the work actually carried out shows some slight variations (PRO: WO 192/209; EH 1012/1-12; fig 21). The twin 6-pdrs were housed in emplacements partially covered by gun houses, built onto and re-using the old 4.7 inch positions; other parts of the old battery were demolished.

The old *barbettes* and aprons were cut down, leaving tool marks which remain visible today, to accommodate the lower height of the twin 6-pdr QFs (figs 13 and 22). The gun pits were partially infilled with concrete to support new holdfasts, some 0.6m (1ft 6in) above the old ones, behind which loading platforms were formed in steel chequerplate supported on stanchions anchored into the concrete. Behind them, the old gun floors and the handling areas were largely demolished, though the wing walls were left. New gun floors were built behind the loading platforms, forming the rear of the new gun pits and supporting tracks for trolley trays that carried ammunition in an arc behind the guns.

Further alterations included removing the earth scarping from the front of the covered way and the top of the shelter, the roof of which was covered with asphalt and the



**Figure 21**  
Plan, dated  
February 1940,  
showing the  
proposed twin 6-  
pdr QF battery  
(extract of PRO:  
WO 192/209,  
reproduced with  
the kind  
permission of  
the National  
Archives)



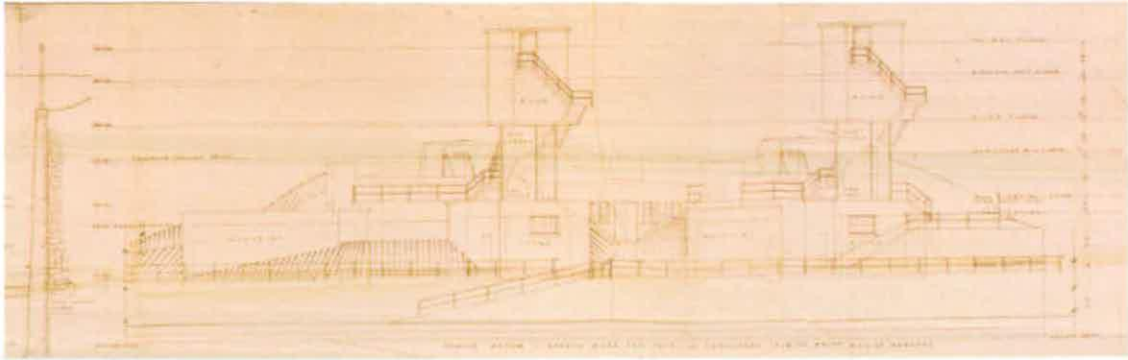
**Figure 22**  
*Photo of no 1  
 twin 6-pdr  
 QF  
 emplacement,  
 showing the  
 gun pit and  
 its gun  
 holdfast  
 plate, the  
 ammunition  
 trolley rails,  
 the gun  
 house and  
 the director  
 sight tower  
 (NMR:  
 AA046717)*

seaward face of the parapet roughly reinforced with low grade sea-shingle concrete. The redundant BCP was used possibly as a local defence position; a small recess in the apsidal end may have been a pintle mount for a light AA gun (PRO: WP 192/209 records two light machine guns allocated to the battery for this purpose)

At the rear of the battery, all of the earthwork scarping was removed to produce a level area for the construction of new magazines, stores and director sight towers (figs 23 and 24). This also created space for a new road alongside the fort ditch, linked to around the north side of the fort to the main military road, and continuing south to Right Battery. Its construction road involved removing a temporary crew shelter and gun store, which may have been provided for the old 6-pdr or 12-pdr QF

**Figure 23**

*Proposed rear elevation of the twin 6-pdr QF battery, dated February 1940 (extract of PRO: WO 192/209, reproduced with the kind permission of the National Archives)*



guns (1012/1; plan enclosed with PRO: WO192/209). The old shelter and RA store were re-used as a larger shelter for the gun crews.

Each gun had a dedicated magazine, set below the level of the gun floor. Ammunition was stored on specially designed pallets and brought up to the handling floor inside the gun house by an electric hoist. The pallets were lifted manually to the gun floor onto two trolley trays (each held 36 rounds), which ran on steel tracks in an arc behind the gun. From here the ammunition could be lifted and loaded by separate teams into the breech of each barrel. The whole gun was protected at the front and sides by an armoured steel shield and by the roof and walls of the gun house.

Each gun was traversed, elevated and directed remotely from a multi-storey concrete tower, the director sight tower, set immediately behind the gun house. As the intended target was most likely to operate at night and at high speed, the battery was provided with coast artillery searchlights (CASLs) to illuminate specific target areas. These lights were monitored from the director sight tower but commanded by an

**Figure 24**

*Photo from the south-east showing the rear elevation of the twin 6-pdr QF battery. The gun houses are surmounted by the director sight towers; the magazines are at a lower level (extreme left and right); the small building at centre is no 2 store/power room (NMR: AA046747)*



officer in the Fire Command Post on the roof of Landguard Fort.

The battery is constructed of reinforced concrete poured into shuttered moulds. Walls are on average 0.75m (2ft 6in) thick to give protection against bomb blast and small arms fire. A coloured render was applied over the concrete surface to give a camouflage effect with a wavy line between the two colours; structures visible and invisible from the sea are grey-green and red-brown respectively (fig 25). The roofs, except in the gun houses, are formed of reinforced concrete slabs weather-proofed with a covering of asphalt. All roofs have a small overhang. The doors are of the blast-proof type hung on hasp hinges and made from steel plate with angle-iron rails, stiles and jambs. Compared to many other concrete structures of this date, the standard of construction is very high, with the edges to roof slabs and window openings sharply defined.

The rear of the battery was arranged for easy access for both the gun crews and for vehicles carrying ammunition and other supplies. The entrance to the shelter was not changed and it was still connected to the gun floors by flights of steel steps leading to entrances in the gun house walls. Each entrance has a blast-proof door and several new steel steps, while short landings were added to each flight (fig 26).

All of the doorways to the power/store rooms and magazines face onto and are at the same level as the new access road. The buildings are arranged in echelon so that vehicles could halt in the relatively protected area between Right and Darell's Batteries and then reverse back to the relevant store or magazine.



**Figure 25**

*Photo from the south-east showing the coloured camouflage render (on the rear elevation of no 2 twin 6-pdr QF gun house, magazine and store)(NMR: AA046774)*



**Figure 26**

Photo showing the steel steps and door at the entrance to the gun house of no 1 twin six-pdr QF (NMR: AA046767)

The following description addresses all of the structures of No 2 gun, the southern of the two. Provision for No 1 gun is virtually identical, apart from the position and orientation of its magazine and hoist, which are turned 90° to avoid the fort ditch. Only significant variations relevant to No 1 gun are detailed in the text.

### **5.2 No 2 power/store room (fig 27)**

This simple rectangular room, south of the gun house and on a lower level, also provides structural support for the director sight tower directly above it (fig 24). It also served as a distribution point for the power and phone lines of the battery and as a location for the central heating boiler that warmed the director tower. Power cables and phone lines came via underground conduits from the fort and emerged into the store via eleven earthenware pipes set at the base of the east wall, then fed into distribution and switch boards mounted above (of which only scars, holes and wooden plugs survive). Most of the cables leaving these switchboards entered the director sight tower via a conduit through a slot in the ceiling, though a few went to the magazine and probably the shelter via a single earthenware conduit in the base of the south wall. One of the RE drawings shows the central heating boiler located against the north-west wall, where its concrete and brick base and raised kerb remains (EH 1012/4). This drawing suggests that the water supply pipes were conducted across the ceiling to the same conduit as the phone and power lines. A steel-framed Crittal window, described as a "warehouse window" with "¼-inch wired roughcast glass", is set high in the north-east wall and helped to illuminate and ventilate the room (EH 1012/9). The remaining three-quarters of the interior was utilised for storage of miscellaneous supplies and spares. No 2 store has been

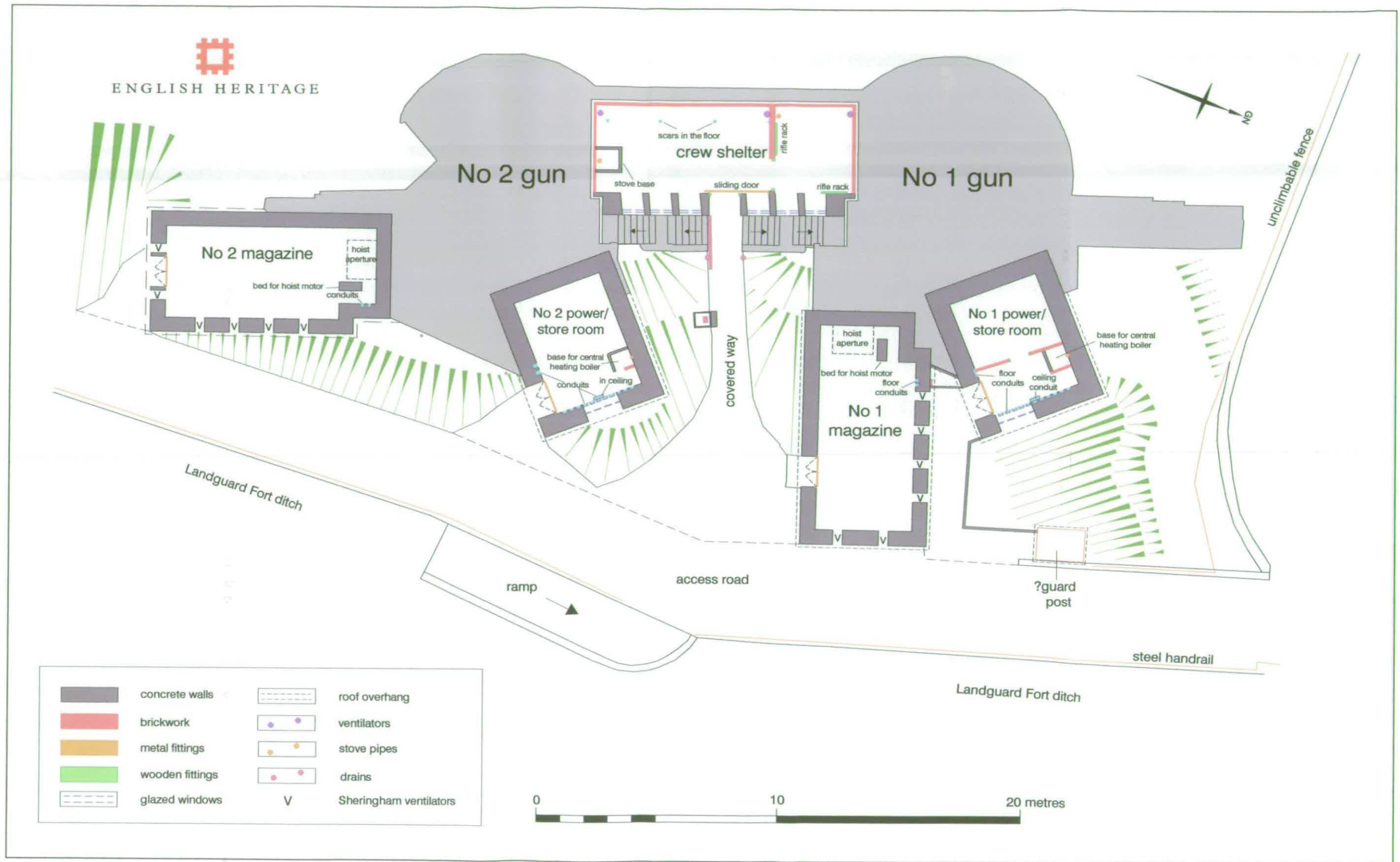


Figure 27: Darell's Battery twin 6-pdr equipment; detailed plan at magazine level showing the magazines, store/power rooms and the crew shelter



**Figure 28**  
 Photo, from the south-east, showing the whole twin 6-pdr QF battery; the nearest building is no 2 magazine (NMR: AA046746)

further adapted for storage by a partition wall, 0.1m (4-inch) thick, in Fletton brick. This separates the larger storage area in the western part of the room from the smaller power room in the eastern, with access through a central timber door. Borrowed lights at the top of the partition illuminated the store.

### 5.3 No 2 magazine (fig 27)

This is a large rectangular room with a reinforced roof formed of concrete poured over ribbed steel troughing, providing safe storage for ammunition (fig 28). It also provided structural support for the gun house. Like all magazines, it is well ventilated, in this case with six Sheringham type flap ventilators set at the top of the north-east and south-east walls. Most of the interior was left open for the stacking of ammunition pallets, in three rows each of 2ft 3in (0.69m) width separated by 3ft 1½in (0.95m) wide gangways (EH 1012/11). At the north-western end of the room an electric hoist, running inside a concrete shaft (or "well"), delivered the pallets to the handling floor at the rear of the emplacement above. The hoist motor and machinery was located inside the magazine and the small holdfast for the motor remains *in situ*. The opening at the top of the hoist is closed by steel plate in which is a self-closing steel door, ensuring that any explosion at the gun would not reach the ammunition in the hoist or magazine (fig 30).

### 5.4 No 2 gun house (fig 29)

This structure, which has an irregular polygonal plan, protected the rear third of the gun pit, the ammunition hoist and handling area behind it, and access to the shelter and director sight tower (fig 22). Its cantilevered roof is supported on upright posts and the soffits are lined with fibre tiles, perhaps partly as a sound absorption measure, but also to prevent flying chips of concrete dislodged by aerial attack. The tiles



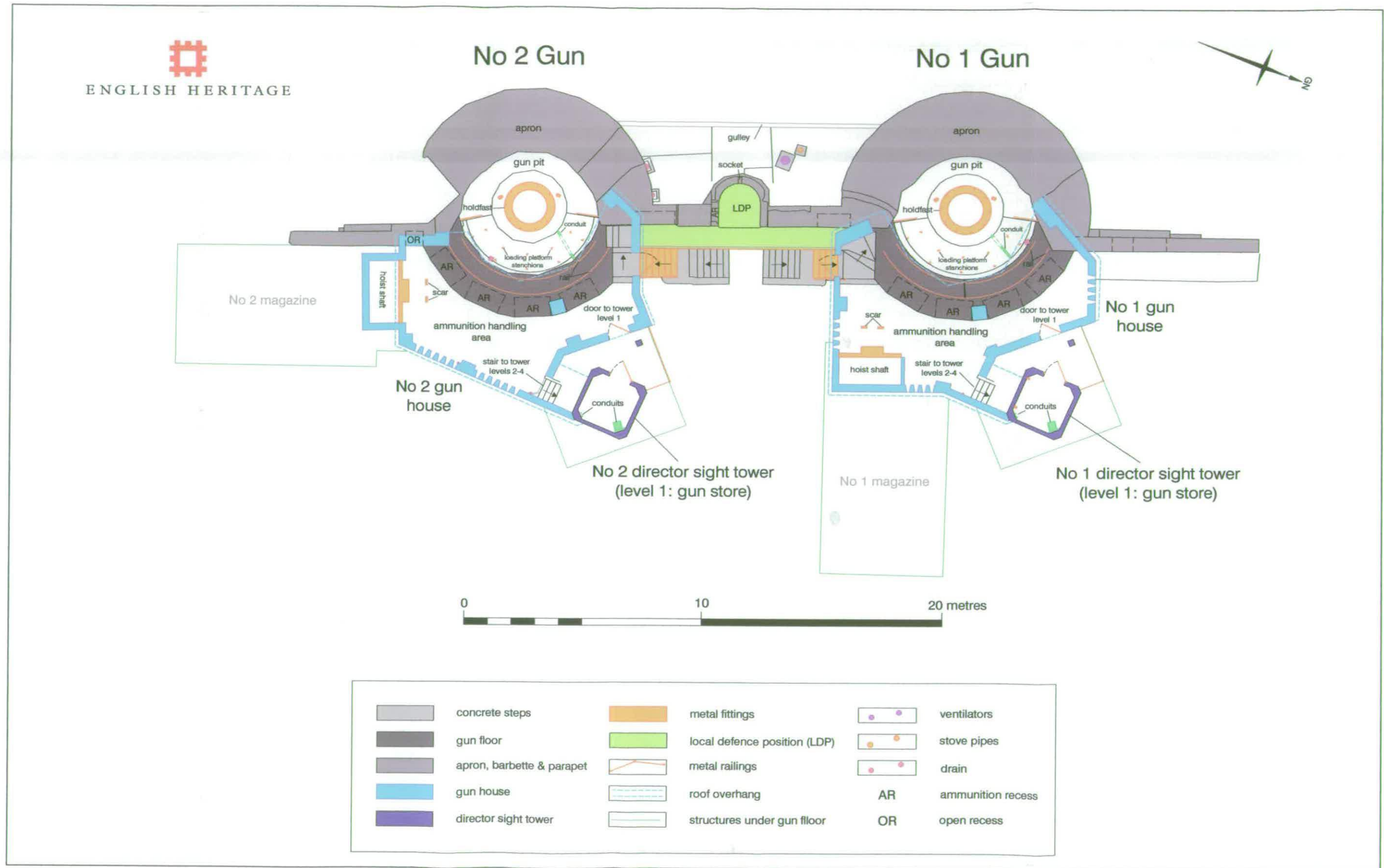


Figure 29: Darell's Battery twin 6-pdr equipment; detailed plan at gun floor level showing the emplacements, gun houses and director sight towers

are attached to battens set below the surface of the concrete. Small square glass blocks set in the rear walls of the gun houses aided illumination of the handling area, augmented by electric lighting in bulkhead fittings which no longer survive.

The top of the ammunition hoist from the magazine is located at the southern end of the handling floor (or delivery area as it is termed on EH 1012/2); the shaft is sealed by steel plate containing a top-hinged self-closing steel door (fig 30). This area was an unobstructed space that enabled the crew to work in safety, manhandling pallets from the hoist to the trolley trays on the rear of the gun floor. There are four ready-use recesses in the rear wall of the gun floor, each with a steel sill. The steel doors, held on hasp hinges, have been removed but the sill and its rubber weather seal remains. These recesses were provided for immediate use and as a back-up in case the supply from the magazine was interrupted, each one holding 480 rounds (EH 1012/2). Each recess sits 0.07m (2¾in) above the ground level and measures 1.52m (5ft) wide by 1.05m (3ft 6in) high by 0.78m (2ft 7in) deep. The recesses were closed by double outward-opening steel doors, though only one survives, secured by bolts and pivoting locking bars. Gun no II also has an open recess at floor level in a part of the wing wall of the former 4.7-inch battery. This was originally a cartridge locker but may have been re-used; it lacks its original doors and has been reduced in size (0.76m (2ft 6in) wide by 0.55m (1ft 9¾in) high and is 0.63m (2ft 1in) deep).

The gun house has three entrances, one in the north-west wall and two in the north-east wall, two of which were provided with blast-proof steel doors secured by strong catches and bolts at top and bottom. The north-west entrance opens onto a steel stair leading down to the shelter and formed the main route for the crew to reach the gun. Of those in the north-east wall, one leads onto the roof of the store and from



**Figure 30**  
*Photo of the self-closing door at the top of the ammunition hoist for no 2 twin 6-pdr QF gun. The ammunition handling area is in the foreground, the gun floor loading platform to the right (Paul Pattison)*

there to a gun store in the basal level of the director sight tower; the other (the one not provided with a steel door) leads onto another stair going up to the other three levels of the tower.

### 5.5 No 2 director sight tower (figs 32-34)

This is a tall rectangular tower with four levels, each of which is a simple rectangular room (1 is at the base, 4 the top level). Level 1 is reached independently while the others are approached via an external concrete stair, which is cantilevered out from and doglegs around the external surface of the tower. A small landing is provided outside the doorway to each level (fig 31).

Gun stores (fulfilling the same function as the old RA store) occupied levels 1 and 2, with independent entrances, their low ceiling height and lack of windows made them suitable only for storage (EH 1012/4). Their internal wall faces contain a large number of timber plugs for equipment racks and, in common with all the rooms in the tower, the ceilings have a slot to allow passage of the central heating pipes, power and phone cables.



**Figure 31**  
Photo from the west showing levels 3 and 4 of no 2 director sight tower, with its external staircase, observation windows and shutters (NMR: AA046786)

Levels 3 and 4 are reached by the external stair, which is guarded from level 2 up by malleable iron pipe handrails (fig 31)

Level 3 housed the Electric Light Observation Post (ELOP) and level 4 the director post (DP). Both are entered through blast-proof steel doors opening outward onto the landings. The principle feature of both rooms is an observation slot, 0.69m (2.3ft) high in the ELOP and 0.84m (2ft 9in) in the DP, between the wall and the ceiling, extending across the entire west wall and about a quarter of the north and south walls, giving a view through 180°. The slit contains armoured glass windows in steel frames, which run in guide rails

stretching from floor to ceiling. In good weather the windows could be slid down into steel panelled recesses below the observation slits, and could be hoisted back into position using chains running around pulleys attached to the rails. Once the windows were in the down position, access was gained to external bottom-hinged steel shutters, which were lowered by chains welded to their inside faces, and supported in the down position by projecting horizontal steel stanchions anchored into the concrete below the sill of the observation slit.

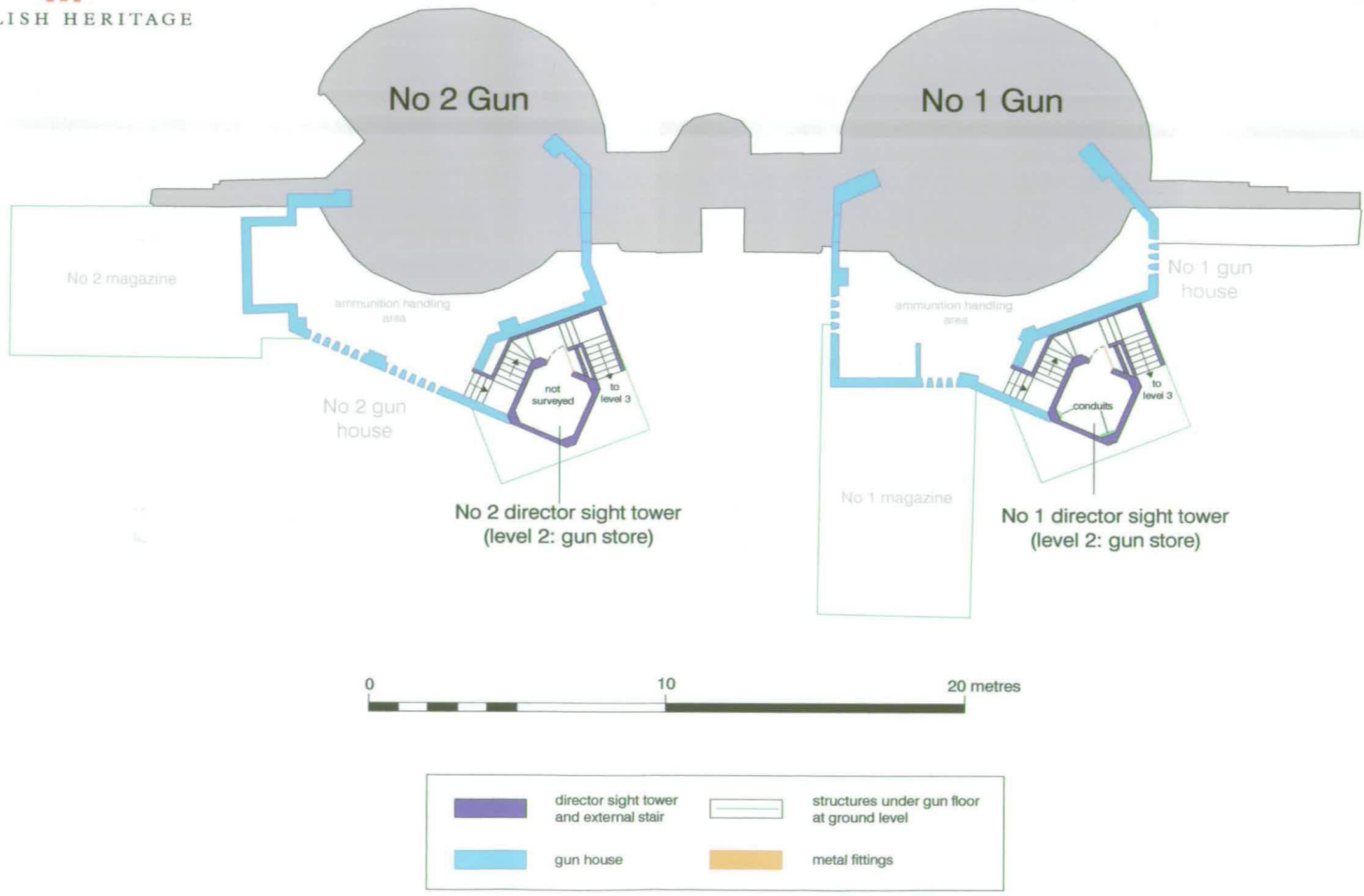


Figure 32: Darell's Battery twin 6-pdr equipment; detailed plan showing level 2 of the director sight towers

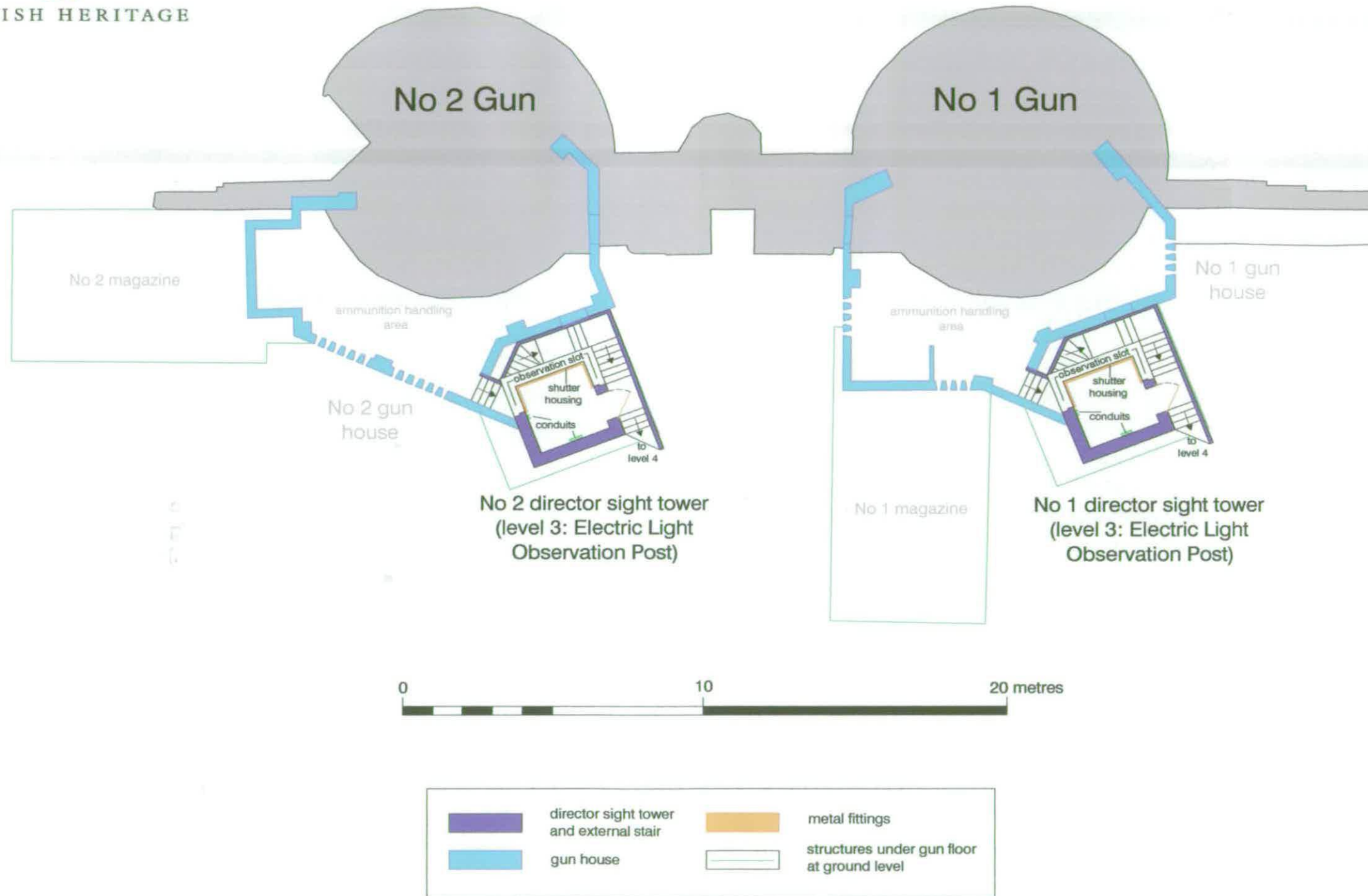


Figure 33: Darell's Battery twin 6-pdr equipment; detailed plan showing level 3 of the director sight towers

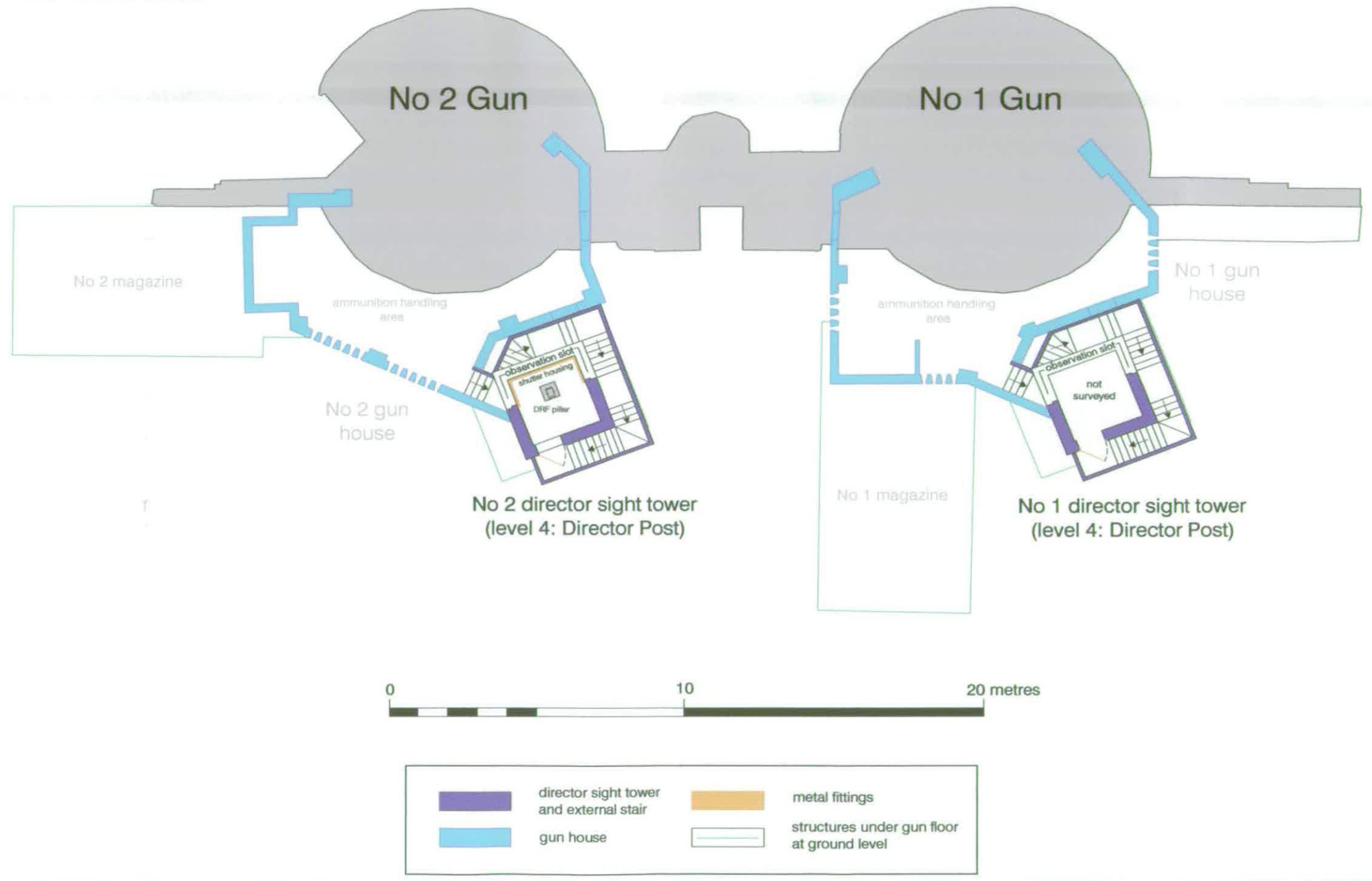


Figure 34: Darell's Battery twin 6-pdr equipment; detailed plan showing level 4 of the director sight towers

Both the ELOP and DP were provided with radiators whose position can be detected from marks on the walls and by reference to the RE design plans (EH 1012/4). The ELOP had a single large radiator beneath the main observation slit; the DP had one in the same position, two smaller versions against the north and south walls and the expansion tank high in the south corner. The difference may be explained by the manning of the DP for long periods while the ELOP was only occupied at night. Other marks and plugs on the walls of both rooms show the former locations of switch panels, coat hooks and equipment racks. The DP retains a concrete pillar for a Mark 13 DRF instrument. The cables for transmission from the DRF, power supply and the telephone headsets ran beneath a suspended timber floor (now removed) with the pillar rising in the centre. On the ceiling is a rail for a blackout curtain, which closed behind the range-finder to avoid obscuring its view. A similar rail remains in the ELOP.

### **5.6 Modifications**

Evidence for the post war modifications, principally the increase in elevation for anti-aircraft work, wider traverse to seaward and the installation of fire control radar, is difficult to detect. The removal of some concrete from the north side of the no 1 gun house, leaving chamfered edges to the walls and one of the supporting piers, may have been required to accommodate the wider traverse. Increased elevation was probably achieved by the modifications to the gun mounting, while the radar units were fitted to the top of the gun shields. A photograph dating to around 1950s show some aerials attached to no 2 director tower.

### **5.7 Coast artillery searchlight emplacements (CASLs)**

The twin 6-pdr QFs operated with five CASLs - designated nos 5 to 9 - four of which were built in 1940-1 and the fifth added in 1944 (PRO: WO 192/213). Three lie to the north of the battery and two to the south, all carefully sited to project light along fixed bearings to illuminate a defined area of the sea.

Those to the north (nos 5-7) form a group in echelon on top of an earthwork bank created by the construction of the access road (fig 35). The other two are situated singly further to the south-east; no 8 near the Harwich Conservancy jetty and no 9 against the inside face of the sea wall further along the shingle spit.

All are of similar construction in fine-grained reinforced concrete, with asphalt-covered overhanging roofs that slope very slightly towards the front. In plan, each building is essentially rectangular, with an apsidal front in which are embrasures for the searchlight beams. In most cases, the beams could be switched between bearings, each of which has its own narrow rectangular slot-like embrasure cast to pre-determined angles. The number of embrasures varies in each CASL, ranging between one and four. 'Sheringham' hopper ventilators with metal grilles, like those used in the battery magazines, are set just below the eaves.

#### **5.7.1 CASL nos 5-7**

These three are approached up flights of concrete steps from the access road. Each is entered through a pair of outward-opening blast-proof steel doors similar to those in the battery, hung to allow a maximum entrance width so that the searchlight could be removed easily. Internally, the roof is supported by two cross-axial RSJs



**Figure 35**  
*Photo looking north from Darell's Battery showing CASL nos 5, 6 and 7 (NMR: AA046727)*

and is pierced by an earthenware pipe surmounted externally by a Howarth rotating ventilator. The position for the searchlight is immediately below the vent, shown by circular pad marks on the concrete slab floor. All three have remains of a curved steel shutter that moved in steel tracks at top and bottom, enabling the opening or closure of each embrasure.



**Figure 36**  
*Photo of the south side of CASL no 8, adjacent to the Harwich Conservancy Jetty (NMR: AA053416)*



The power supply for the lights came from an Engine Room built in 1941, located a short distance away in the fort ditch between Harwich and Chapel Bastions (PRO: WO 192/213). The electricity cables ran along the ditch and up the counterscarp in concrete conduits, under the access road to emerge at a switchboard in the rear wall of each CASL. From there, cables were fed through conduits in the floor slab, emerging in a large transverse conduit below the searchlight.

### 5.7.2 CASL no 8

This structure presents an unusual sight, apparently held up precariously on nine tall concrete pillars above the water level (fig 36). However, the original building was raised only 0.4m above ground level and it is tidal erosion that has exposed the pillars which were firmly anchored in the shingle. This is apparent from the rough-cast circular section for most of their height; the tops were always above ground and are rectangular in section, with the same standard of finish as the CASL itself, clasping the underside of the structure and buttressing its walls.

The entrance in the rear wall is sealed by concrete blocks but its original steel frame, for double doors, is *in situ*. The front face contains two searchlight apertures.

### 5.7.3 CASL no 9

This CASL (fig 37), built later than the others in 1944, is very slightly different in having a canted front wall formed from three straight faces (rather than an apsidal one with only one straight face for the embrasures). It is supported on short concrete piers, leaving a gap underneath of

some 0.7m (2ft 4in) to the ground level. In the rear wall, the entrance is approached up a short flight of steps to a small landing. The doorway, 1.54m (5ft 1in) wide x 2.02m (6ft 6in) high, is sealed with concrete blocks but originally had the familiar double steel doors. These doors seem to have re-



Figure 37  
photo of CASL  
no 9, from the  
south (NMR:  
AA031383)

placed a smaller one, of which only a scar in the wall remains. Another scar around the doorway is probably a previous attempt at preventing entry to the derelict building. The red painted "No 10" by the side of the door is not of military origin.

The front face has a single aperture for the searchlight, some 1.06m (3ft 6in) high by 0.64m (2ft 1in) wide, now blocked with concrete blocks from inside. A scar on the wall around the aperture probably relates to an earlier, external, blocking.

## 6. CONCLUSIONS

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Darell's Battery is a very fine example of a coast artillery battery that was built and modified wholly in the twentieth century, primarily for the close defence of Harwich. The Second World War structures are particularly well-preserved and constitute one of the most complete and best surviving of only a few examples nationwide. This significance is enhanced by the equally good survival of its sister battery, Cornwallis Battery, on the opposite side the haven at Beacon Hill in Harwich.

When considered alongside the other surviving historic defences of Harwich, two further important observations can be made:

- 1) It forms part of a remarkable relict military landscape with buildings, structures, earthworks and buried archaeological remains spanning over 400 years of coast defence of Harwich Haven. In many respects, it forms a microcosm for the whole history of coastal defence in England.
- 2) In particular, it is part of a surviving and recognisable integrated defensive system centred on Landguard Fort, which emerged in the last twenty years of the 19<sup>th</sup> century and which evolved until redundancy in 1956.

## **7. SURVEY AND RESEARCH METHODS**

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The archaeological survey was carried out during June and July 2003 by Paul Pattison, Louise Barker and Andrew Williams. Most of the survey data were collected in the field using a Trimble 5600 series (DR 200+) theodolite with integral electromagnetic distance measurement (EDM). Fine details were supplied using conventional graphical methods. Working scale was 1:100.

All photography was undertaken by Alun Bull.

The report was researched and written by Paul Pattison and Andrew Williams, while Louise Barker and Paul Pattison prepared the illustrations using Trimble Geomatics, AutoCAD, Adobe Photoshop and Adobe Illustrator software. The final report was assembled using Adobe Pagemaker software.

The site archive has been deposited in the National Monuments Record Centre, Great West Village, Kemble Drive, Swindon SN2 2GZ (NMR reference \*\*\*).

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## **8. ACKNOWLEDGEMENTS**

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Thanks are due to the following people who assisted with various elements of the survey:

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Richard Linzey, formerly a senior architect with English Heritage

The Landguard Fort Trust, particularly David Tolliday and David Moore

The Landguard Bird Observatory, particularly Steve Petrowski

The National Archives (formerly the Public Record Office)

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*Proposed battery for 2 x 12pdr QF guns adjoining Minefield Battery, dated April 1904*

**WO 78/4089/1**

*Harwich Defences: Electric Light Emplacement, Landguard, dated 21<sup>st</sup> July 1893*

**WO 78/4089/2**

*Harwich Defences: Electric Light Engine House, Landguard, dated 13th July 1893*

**WO 78 5131/1**

*Harwich N Sheerness Defences: Admiralty chart of North Foreland to Orford Ness, coloured and annotated to show arcs of fire of the Harwich and Sheerness coast defence guns, plus an armament table, dated 23<sup>rd</sup> June 1920*

**WO 78 5131/3**

*Admiralty chart of Harwich Harbour, coloured and annotated to show arcs of fire of the Harwich coast defence guns, arcs of the defence electric lights, plus an armament table, dated February 1916*

**WO 78/5135/2**

*Admiralty chart of the Harwich Approaches, coloured and annotated to show arcs of fire of the Harwich coast defence guns, plus an armament table, dated 25<sup>th</sup> May 1936*

**WO 5137/4**

*Harwich Defences Index Plan, dated March 1912*

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*Landguard: Minefield Battery; Harwich Division ED; record plan sheet no 1 of 2, dated September 1902 (general plan and location)*

**WO 78/5139/2**

*Landguard: Minefield Battery; Harwich Division ED; record plan sheet no 2 of 2, dated October 1902 (block plan, emplacement, shelter and magazine plans and sections)*

**WO 78/5143/1**

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**WO 78/5143/2**

*Eastern Coast Defences; Harwich: Defence Electric Lights, dated 15<sup>th</sup> July 1910*

**WO 78/5143/3**

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Historic Plans Collection

**1012/2**

*Landguard AMTB Equipment: details of emplacements for twin 6 pounder guns, dated 4<sup>th</sup> March 1940*

**1012/4**

*Landguard AMTB Equipment: director sight tower, dated 4<sup>th</sup> March 1940*

**1012/9**

*Landguard AMTB Equipment: details of store under director sight tower, dated 4<sup>th</sup> March 1940*

**1012/10**

*Landguard AMTB Equipment: Half-inch scale & eighth full size details of tower stairs Magazine, dated February 1940*

**1012/11**

*Landguard AMTB Equipment: Magazine, dated 4<sup>th</sup> March 1940*

## **10. PHOTOGRAPHS TAKEN DURING THE SURVEY**

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All photographs are in colour

**AA031486**

Coast Artillery searchlights, view from south

**AA031487**

Coast Artillery searchlight interior

**AA031488**

Coast Artillery searchlight, floor showing settings where searchlight was positioned

**AA031489**

12-pdr QF emplacement from the north-west

**AA031490**

Right flank barbette to 4.7-inch QF emplacement, showing ready-use ammunition lockers

**AA031491**

Gun crew shelter, south room interior

**AA031492**

Gun crew shelter, south room interior

**AA031493**

Interior of store/generator room, no 2 gun (twin 6-pdr)

**AA031494**

Twin 6-pdr magazine interior

**AA031495**

View up lift shaft in magazine of twin 6-pdr gun

**AA046713**

No 1 gun; director tower of twin 6-pdr of 1940 from the north

**AA046714**

No 1 gun; director tower of 1940 from the north-west

**AA046715**

Twin 6-pdr of 1940; director tower of no 1 gun from the south

**AA046716**

Twin 6-pdr of 1940; detail of director tower to no 1 gun, searchlight position, from the north-west

**AA046717**

Twin 6-pdr of 1940; no 1 emplacement, holdfast and director tower, from the west

**AA046718**

Twin 6-pdr of 1940; no 1 gun holdfast from the north

**AA046719**

No 1 gun; holdfast for twin 6-pdr of 1940, from the south-east

**AA046720**

No 1 gun; gunpit and holdfast of twin 6-pdr of 1940, from the north

**AA046721**

No 1 gun; detail of holdfast and apron for twin 6-pdr from the north-east

**AA046722**

No 1 gun; detail of twin 6-pdr emplacement gun house, from the north

**AA046723**

No 1 gun; detail of twin 6-pdr emplacement gun house of 1940, from the south

**AA046724**

No 1 gun; twin 6-pdr emplacement gun house of 1940, from the south

**AA046725**

No 1 gun; ammunition hoist from the north

**AA046726**

Coast Artillery Search Lights of 1940-41, from the south

**AA046727**

Coast Artillery Search Light of 1940-41, from the south

**AA046728**

Coast Artillery Search Lights of 1940-41, general view from the south

**AA046729**

No 1 gun; twin 6-pdr emplacement and director tower of 1940, from the south

**AA046730**

No 1 gun; twin 6-pdr emplacement and director tower of 1940, from the south

**AA046731**

No 1 gun; twin 6-pdr magazine, emplacement gun house and director tower of 1940, from the south-east

**AA046732**

No 1 gun; twin 6-pdr of 1940, magazine, emplacement and director tower, from the south-east

**AA046733**

No 1 gun; magazine, emplacement and director tower of twin 6-pdr of 1940, from the south-east



**AA046734**

Twin 6-pdr of 1940; magazine, emplacement and director tower of no 1 gun, from the south-east

**AA046735**

No 1 gun, store and director tower of twin 6-pdr of 1940, from the east

**AA046736**

Twin 6-pdr of 1940; detail of magazine, emplacement and director tower of no 1 gun, from the south-east

**AA046737**

Twin 6-pdr of 1940; emplacement, store and director tower of no 1 gun, from the south-east

**AA046738**

Twin 6-pdr of 1940; no 1 gun magazine, emplacement and director tower from the south-east

**AA046739**

Paul Pattison and Louise Barker of EH during survey of Darrell's Battery (background) in August 2002

**AA046740**

Louise Barker engaged in survey of no 2 gunpit; twin 6-pdr of 1940

**AA046741**

Left: Darell's Battery; right: granite casemates of the 1870s, from the south-east

**AA046742**

General view of twin 6-pdr battery of 1940, with *caponier* of 1870's fort at right, from the south-east

**AA046743**

General view of twin 6-pdr battery of 1940, with *caponier* of 1870's fort at right, from the south-east

**AA046744**

General view of twin 6-pdr battery of 1940, with *caponier* of 1870's fort at right, from the south-east

**AA046745**

General view of twin 6-pdr battery of 1940 from the south-east

**AA046746**

General view of twin 6-pdr battery of 1940 from the south-east

**AA046747**

General view of twin 6-pdr battery of 1940 from the south-east

**AA046748**

General view of twin 6-pdr battery of 1940 from the south-east

**AA046749**

General view of twin 6-pdr battery of 1940 from the south-east

**AA046750**

General view of twin 6-pdr battery of 1940 from the south-east

**AA046751**

Twin 6-pdr emplacements, magazines and director towers of 1940 from the south-east

**AA046752**

Twin 6-pdr emplacements, magazines and director towers of 1940 from the south-east

**AA046753**

Twin 6-pdr director towers of 1940 from the south-east

**AA046754**

Twin 6-pdr director towers of 1940 from the south-east

**AA046755**

Twin 6-pdr director towers of 1940 from the south-east

**AA046756**

Twin 6-pdr director towers of 1940 from the south-east

**AA046757**

Twin 6-pdr director towers of 1940 from the south-east

**AA046758**

Twin 6-pdr director towers of 1940 from the south-east

**AA046759**

Twin 6-pdr director towers of 1940 from the south-east

**AA046760**

Twin 6-pdr of 1940; store, magazine and director towers from the south-east

**AA046761**

Twin 6-pdr of 1940; director towers from the south-east

**AA046762**

Detail of ammunition davit for Darell's Battery 4.7" guns, dated 1900-1; granite casemates and *caponier* of 1870s behind

**AA046763**

Darell's Battery of 1900-01; ammunition davit for 4.7" guns, from the north-west

**AA046764**

Darell's Battery of 1900-01; detail of ammunition davit for 4.7" guns from the north-east

**AA046765**

Darell's Battery of 1900-01; detail of ammunition davit for 4.7" guns

**AA046766**

4.7" Battery of 1900-01; crew shelter with battery observation post over, from the east

**AA046767**

Detail of crew shelter with door to no 1 gun at right, from the south-east

**AA046768**

4.7" Battery command post (foreground) of 1900-01, with gun no 2 (twin 6-pdr) of 1940 beyond; from the south

**AA046769**

4.7" Battery command post (lower right) of 1900-01, with gun house of gun no 2 (twin 6-pdr) of 1940 beyond; from the north

**AA046770**

Battery Command Post, with crew shelter under, from 4.7" battery of 1900-01; from the east

**AA046771**

No 1 gun; flank of 4.7" battery of 1900-01, with ready-use cartridge lockers

**AA046772**

Twin 6-pdr of 1940; general view of gun no 2 from south-east

**AA046773**

Twin 6-pdr of 1940; general view of gun no 2 from south-east

**AA046774**

Twin 6-pdr of 1940; gun no 2 emplacement and director towers from the SE

**AA046775**

Twin 6-pdr of 1940; gun no 2 emplacement and director towers from the south

**AA046776**

Twin 6-pdr of 1940; magazine, emplacement and director tower of gun no 2 from the south

**AA046777**

No. 2 gun of 1940; rear of emplacement and director tower, from the east

**AA046778**

Darell's Battery of 1940: no 2 gun; rear of emplacement and director tower, showing camouflage render, from the east

**AA046779**

Store and director tower of twin 6-pdr gun no 2 (left), with crew shelter of battery of 1900-01 (right), from the east

**AA046780**

Twin 6-pdr of 1940; director tower of gun no 2, from the north

**AA046781**

Darell's Battery: gun no 2; emplacement, gun house and director tower of 1940 from the north

**AA046782**

Twin 6-pdr of 1940 gun no 2; general view from the north.

**AA046783**

Gun no 2 of 1940; director tower, with *caponier* and granite casemates of 1870s fort (at left), from the north

**AA046784**

Gun no 2; director tower of twin 6-pdr of 1940 from the north

**AA046785**

No 2 gun; twin 6-pdr gun house and director tower of 1940, from the west

**AA046786**

No 2 gun; director tower of twin 6-pdr 1940, from north-west

**AA046787**

No 2 gun; detail of twin 6-pdr director tower of 1940 showing electric light (lower) and director (upper) positions, from the west

**AA046788**

Twin 6-pdr of 1940, no 2 gun; emplacement with holdfast, gun house and director tower from the west

**AA046789**

No 2 gun; twin 6-pdr emplacement and director tower of 1940 from the south

**AA046790**

No 2 gun; gun pit and holdfast of twin 6-pdr of 1940, from the south

**AA046791**

No 2 gun detail of hatch to ammunition hoist, at gun floor level, from the north

**AA046792**

No 2 gun; interior of cover to twin 6-pdr emplacement of 1940, from the south-east

**AA046793**

No 2 gun; interior of cover to twin 6-pdr emplacement of 1940, from the south-east

**AA046794**

No 2 gun; interior of director position of 1940, showing pillar for direction range-finder, from the north-east

**AA046795**

No 2 gun; interior of director position of 1940, showing pillar for direction range-finder, from the south-east

**AA046796**

No 2 gun; interior of director position of 1940, showing pillar for direction range-finder, from the east

**AA046797**

No 2 gun; director tower of twin 6-pdr of 1940, from the north



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