

**BEACON HILL FORT,
HARWICH, ESSEX**

Moraig Brown & Paul Pattison



Archaeological Field Survey Report

BEACON HILL FORT, ESSEX

by Moraig Brown and Paul Pattison



BEACON HILL FORT,
HARWICH,
ESSEX

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24 Brooklands Avenue,
CAMBRIDGE, CB2 2BU



Beacon Hill Fort, Harwich; photograph showing three of the main gun emplacements, demonstrating different phases in the Fort's history. Foreground: 1892 4.7-inch quick-firing gun emplacement. Middle: 1890 6-inch breech-loading gun emplacement, replaced around 1904 by a 6-inch Mark VII emplacement, with Second World War casemate over. Background: 1941 Cornwallis Battery for Twin 6-pounder guns (NMR: BB97/5431).

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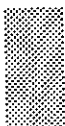
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1. INTRODUCTION

In February and March 1997 the Royal Commission on the Historical Monuments of England carried out an archaeological survey of Beacon Hill Fort, Harwich, Essex (NMR Number TM 23 SE 32; SAM Number Essex 182; Essex SMR Numbers 54-5). This survey was carried out at the request of Essex County Council, to assist with the future management of the site. The survey was funded in part by Essex County Council and Tendring District Council, and was the responsibility of staff of the Archaeological Field Office in Cambridge.

Further copies of this report are available from the National Monuments Record Centre, Kemble Drive, Swindon, Wiltshire SN2 2GZ.

Beacon Hill Fort (TM 262 317) is a coastal artillery fortification established towards the end of the 19th century, as part of an on-going consolidation of Britain's east coast defences. It is located in north-east Essex, on a promontory between Harwich and Dovercourt and commands the approaches to Harwich from Clacton-on-Sea to Felixstowe (Figure 1).

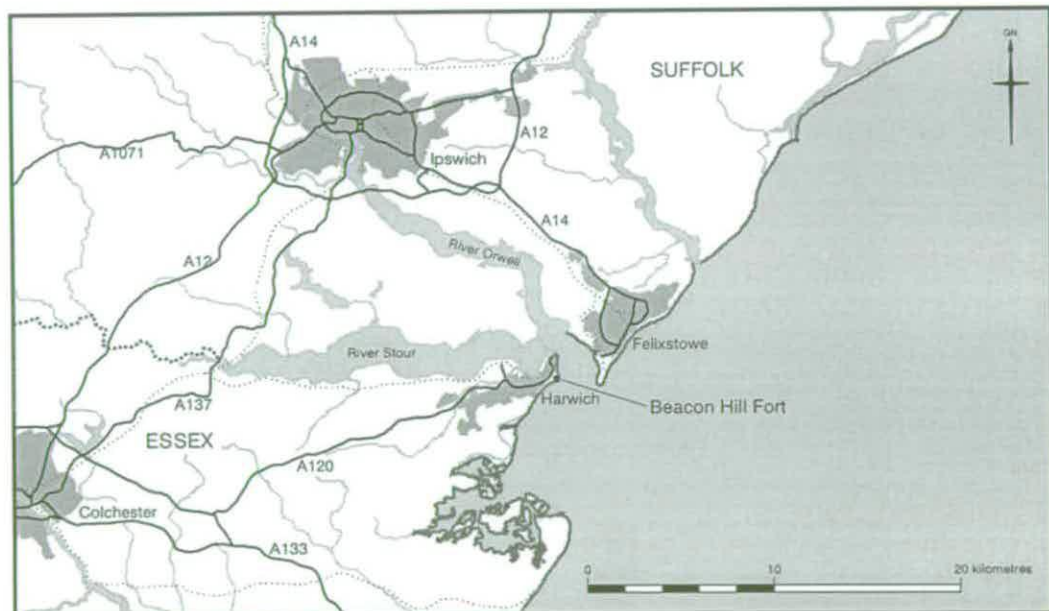


Figure 1
Location map

2. HISTORY OF THE DEFENCES OF HARWICH

This brief history of the defences of Harwich is based upon a chapter in *The Fortifications of East Anglia* by Peter Kent (Kent, 1988, 73-90) except where otherwise stated in the text.

Orwell Haven, the estuary on which Harwich is situated, is the only natural safe place for ships to put in on the east coast of Britain between the Thames and the Humber, a distance of some 200 miles (Trollope 1983, 5), and therefore Harwich has always played an important part in the defence of the Country.

Over the years there have been various attempts to fortify Harwich, though these have generally been sporadic and only partially effective, usually because of a lack of resources for this small, unprepossessing coastal town. In 1539 Henry VIII's commissioners visited Harwich, and the Earl of Oxford wrote that two trenches and two earthen batteries had already been constructed, and guns to arm them were sent from the Tower of London. Henry VIII selected Harwich as the site of a new naval base, and a small navy yard (later renamed Navyard) was established. The existing batteries were insufficient to protect the navy yard, and Richard Lee was commissioned to design two new artillery forts for Beacon Hill and Landguard Point; neither of these were built, and instead three small blockhouses were constructed along the eastern side of Harwich, manned by a small permanent garrison. The blockhouse at Beacon Hill (*'The Bulwark on the Hill'*) was later destroyed by coastal erosion.

By 1553, just ten years after the construction of the blockhouses, they had become too expensive and were abandoned and the guns returned to the Tower of London. Following the death of Henry VIII, Harwich declared for Mary Tudor and the guns from the blockhouse at Landguard Point were carried over the harbour and reinstalled at Harwich. The town walls were strengthened and around this time a triangular earthen ravelin was erected west of the town gate.

In 1561 Elizabeth I visited Harwich and upon leaving the town asked the townspeople what they required of her, to which they replied *'Nothing but to wish your Majesty a good journey'* (ERO a). Just four years later, however, the town was considered defenceless, though nothing was done at that time to rectify the situation. In 1576, following the Ridolfi Conspiracy and amid fears of troops landing from the Low Countries, the town successfully petitioned the Privy Council for artillery.

In 1584, Harwich was awarded only £20 out of a budget of £11,000 allotted to coastal defences; this was later adjusted due to the increased threat of war with Spain. This resulted in plans for a second blockhouse at Beacon Hill and a bulwark at the south-eastern corner of the town, but the following year the town was still considered to be poorly defended, and the Earl of Warwick estimated that £1,288 plus nineteen guns were required to bring it up to strength; £1,000 was allocated to build a palisade along the quays and a strong bulwark. Plans, dated 1588, to turn Harwich into a strong fortress were never realised, though various strengthening works were carried out, including the construction of a bank and ditch from the south-west corner of the town to Beacon Hill.

The works, such as they were, were allowed to decay, and by 1625, Harwich was once again considered to be defenceless. At some point during the first half of the 17th century fifty-eight Ipswich ships, fearing attacks from the Dunkirkers, crammed into Harwich harbour. News of a possible attack from the Continent prompted the Crown to send £300 for new defences which were begun in 1626 and consisted of a battery and a bulwark, both within the town. Once again, lack of continued finance ensured that these works were ruinous by 1634.

Harwich declared for Parliament during the Civil War, and in 1645 new works were ordered, though only twelve cannon were installed. In 1653 the governor of Landguard Fort was ordered to remove all guns and demolish two forts in Harwich, probably the Half Moon Battery and one of the Henrician blockhouses.

The next activity at Beacon Hill was in 1665, during the Second Dutch War, when a small battery was built on the headland. At the same time the town was surrounded by a ditch, one of the bastions and part of the town wall were remodelled, and a new wall was constructed facing the harbour; this work appears to have been in progress during a visit by Charles II the following year. By 1708 the new works were so neglected that not a single gun was mounted, and plans were drawn up for a two-bastioned rampart for the town and a small fort on Beacon Hill. The decline in the importance of the naval yard meant that these plans were never executed, and by 1713 the yard had been privately leased, though it continued to build warships.

Throughout the rest of the 18th century Landguard Fort was considered sufficient defence for the Haven, though minor attempts were made to consolidate this protection, including, in 1745, the mooring of HMS Winchester in the harbour to act as a floating battery. In the same year, a small stockaded battery of four 9-pounders was built on the site which would later be occupied by the Redoubt. Plans for a rampart with two redoubts at Dovercourt were scuttled by the advent of the American War, and in 1798 a masonry tower for Beacon Hill was proposed, but it was not built until six years later.

By the beginning of the 19th century it was clear that the Harwich defences were not sufficient, and various plans were considered for an installation which would complement Landguard Fort; the result of this was the construction of the Redoubt, finished in 1810 at a cost of around £60,000. The Redoubt was equipped with ten 24-pounder guns, and additional defence was provided by a small battery to the west of the town which contained three 24-pounders, and Angel Gate Battery overlooking the harbour which had five 24-pounders. In 1812, a small battery was also built on Beacon Hill; this was equipped with five 24-pounders.

These new defences were maintained after the Napoleonic War, but by 1822 Beacon Hill battery had been lost to coastal erosion, exacerbated by quarrying at the foot of the cliff. A replacement was planned in 1839 but was never realised.

In 1853 General Burgoyne, Inspector of Fortifications, said that the Redoubt was the only useful defence at Harwich, but that even this required some form of supplementary defence. He proposed building caponiers in the ditch and replacing the 24-pounders with heavier guns, as well as constructing a thirty- or forty-gun battery on a shoal in the middle of the harbour entrance, an idea he later abandoned in favour of rebuilding Landguard Fort. However, these proposals would have cost an estimated £150,000, money which was not forthcoming.

In 1860 a Royal Commission reported on Britain's coastal defences, managing to ignore Harwich completely, and this resulted in questions being asked in the House of Commons. As recompense, Harwich was awarded £15,000 to bring the defences up to date, and in 1862 work commenced, despite attempts by Parliament to stop it, on rearming the Redoubt with three 8-inch smooth-bore (SB) guns and seven 68-pounders and Angel Gate Battery with three 68-pounders. Eight years later a new report recommended replacing the SBs, which were obsolete as soon as they were installed, with heavy rifled muzzle-loaders (RMLs), and building caponiers in the ditch; the caponiers were never built but the guns were replaced with 12-ton 9-inch RMLs, guns intended to complement the artillery at Shotley Battery, on the north side of the River Orwell, and Landguard Fort in Felixstowe.

By the 1880s, the Harwich defences were once again obsolete: overtaken by developments in naval artillery, the town could have been bombarded from the sea by guns it could not reach. In 1889, following the results of a secret defence committee, work began on construction of Beacon Hill Fort, one of the first of a new generation of forts designed to mount the new breech-loading (BL) guns. The design of the Fort was innovative; almost invisible from the sea, the construction of a system of banks and ditches called a Twydall Profile at the rear of the Fort enabled infantry to defend the landward side. The initial armament of the battery consisted of one 10-inch BL gun on a disappearing carriage, one 6-inch BL gun on a similar carriage, and two 4.7-inch quick-firing (QF) guns. By 1892 the Fort was fully armed and complete with magazines, searchlights and position finders at a total cost of £25,000, some £13,000 of which was spent on armament and machinery (Figure 2).

During the 1890s the Fort was maintained at peak efficiency, and guns were added: two 3-pounders provided flanking fire for the larger guns and a practice battery of four 5-inch Vavasseur guns was also established west of the Fort. During this period, the Harwich garrison, which included troops at Felixstowe and Shotley, numbered 5000. At the end of the century, the increased threat from the German navy meant that the 6-inch gun was no longer capable of defending the harbour, and the Fort was extended northwards to accommodate a new emplacement for a 6-inch BL gun. The Owen report on the armament of military ports in 1904 suggested that all guns but the 6-inch BL and the 4.7-inch QF guns should be scrapped, resulting in the original 10-inch and 6-inch emplacements being remodelled to take 6-inch Mark VII guns on Mark II mountings.

During the First World War, Harwich was in the front line defences and the Fort was augmented with two 1-pounder automatics, the first anti-aircraft guns to be installed. The harbour was packed with destroyers, and the Royal Naval Air Station was established at Felixstowe. The town and surrounding area were designated a Class A fortress, and trenches and wired strongpoints were established across the Dovercourt peninsular. For the duration of the war, Harwich was ready and waiting, but the only German warships to enter the harbour were the surrendered U-boats which were brought there after the Armistice.

After the war the Redoubt and the surrounding area were sold to the Town Council, and the 4.7-inch guns removed from Beacon Hill Fort (Figure 3). During the 1930s, with the increased threat of war from the Continent, there were plans to install a twin 6-pounder gun and remount the 6-inch guns on long range carriages, but these were not initially carried out. By 1940, however, the need for greater fire-power was acknowledged, and work began on the Cornwallis Battery for a twin 6-pounder gun emplacement with a rangefinder and predictor tower to its rear.

During the Second World War (Figures 4 & 5) Harwich was once again ready and waiting, though the small size of the German Navy meant that attack by sea was unlikely; more dangerous by far was the threat from the air, and heavy and light anti-aircraft guns were situated around Harwich, which had been designated a gun-defended area, though the complement was reduced in 1940 to cover heavy Luftwaffe attacks elsewhere. The Luftwaffe did bomb the town, and an attack by the Italian Air Force has been described as striking "*blows of incomparable feebleness and incompetence*" (Kent 1988, 89).

As the threat of attack from the air increased, the two 6-inch Mark VII guns were provided with flat-roofed concrete casemates; that to the south was also armed with a Bofors anti-aircraft gun on the roof. A battery observation tower was constructed over the northern decommissioned 4.7-inch emplacement, and a brick tower was constructed north of the Fort for early developments in radar. The 6-inch Mark VII gun was moved from its original emplacement to the reconstructed 6-inch BL emplacement at the northern extent of the Fort, with an anti-strafting cover. There were plans to replace this with a 6-inch Mark XXIV or two 5.25-inch on dual purpose mountings, but neither scheme was adopted.

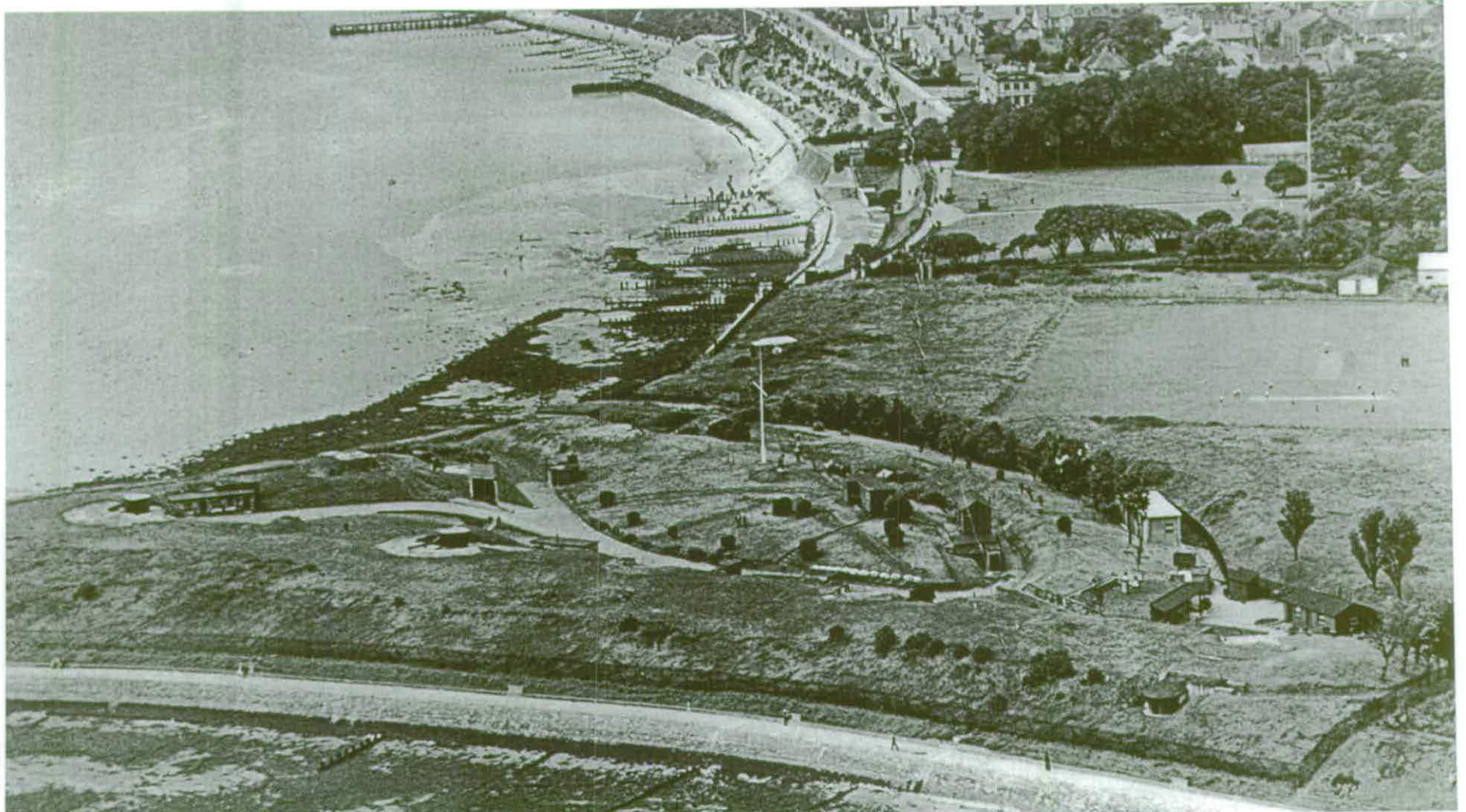


Figure 3 *Pre-Second World War aerial photograph of Beacon Hill Fort, showing the two 6-inch Mark VII guns in position (Harwich Society)*

Elsewhere in Harwich, Angel Gate Battery was rebuilt to contain two 12-pounders in brick gunhouses disguised as small cottages, and two searchlights and shelters, originally destined for Beacon Hill Fort,

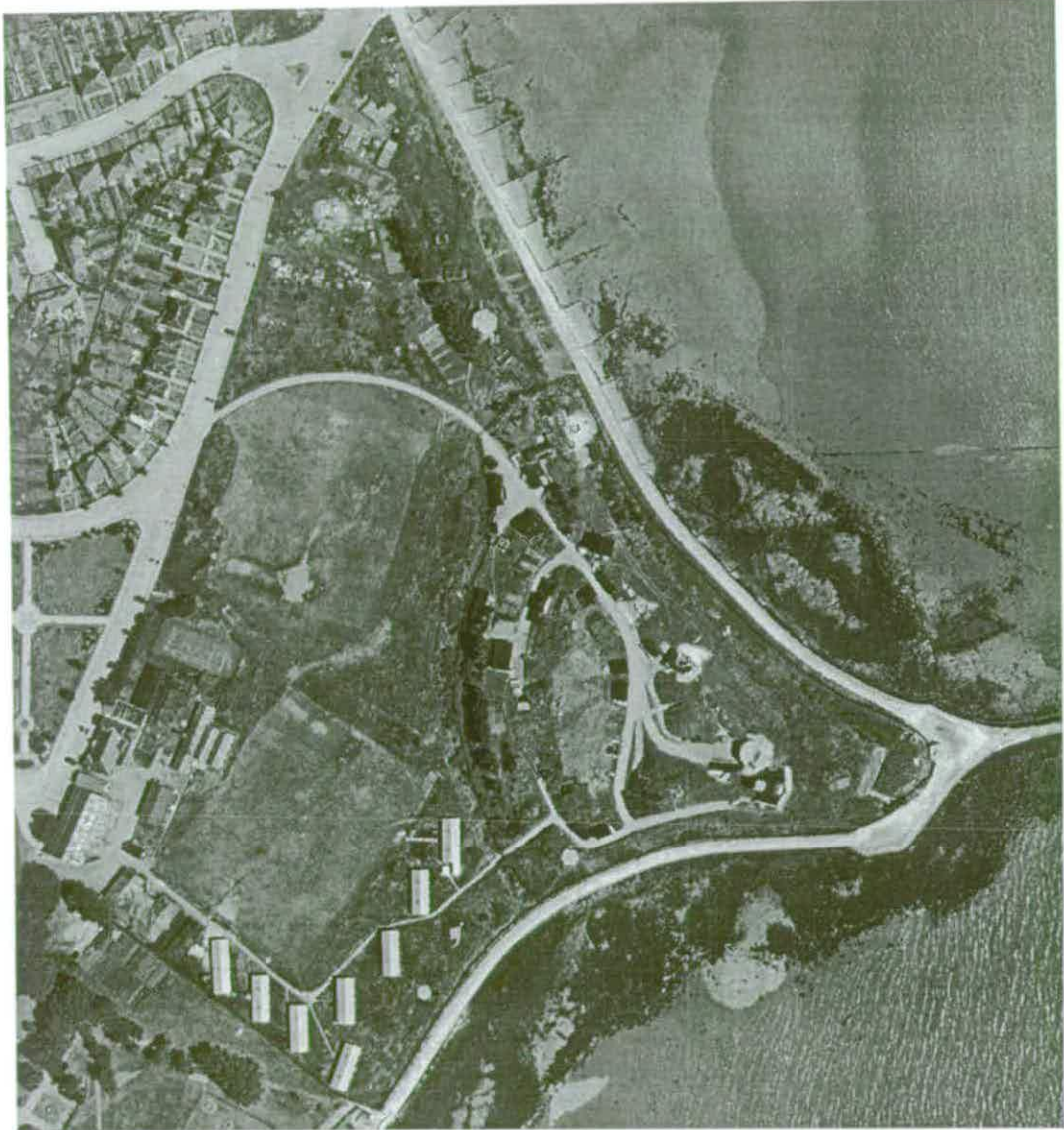


Figure 4
Aerial
photograph
dated 1948 of
Beacon Hill
Fort (NMR
AP:
58/85/Part
1/5044
(29-07-48))

were built nearby. There was also a temporary battery of 4-inch guns on Harwich Green. A line of pillboxes ran from south of Dovercourt to the River Stour near Parkeston Quay, armed with 25-pounders, 75mm guns and 6- and 2-pounder anti-tank guns. The Redoubt was reoccupied, but did not play a crucial defensive rôle, serving merely as a prison for unruly soldiers; their graffiti still survives in places.

In 1945 Angel Gate Battery was closed for the last time, and two years later the 6" gun at Beacon Hill Fort was removed, though the twin 6-pounder remained. A military presence was maintained at the

Fort until 1956 when it was decommissioned and all artillery removed, and by the late 1960s/early 1970s the military presence consisted of one soldier for 24 hours, one day per year. Unsurprisingly the site was soon stripped of its saleable material, scrap metal being carted off and sold on Bathside, and the site has been neglected ever since.

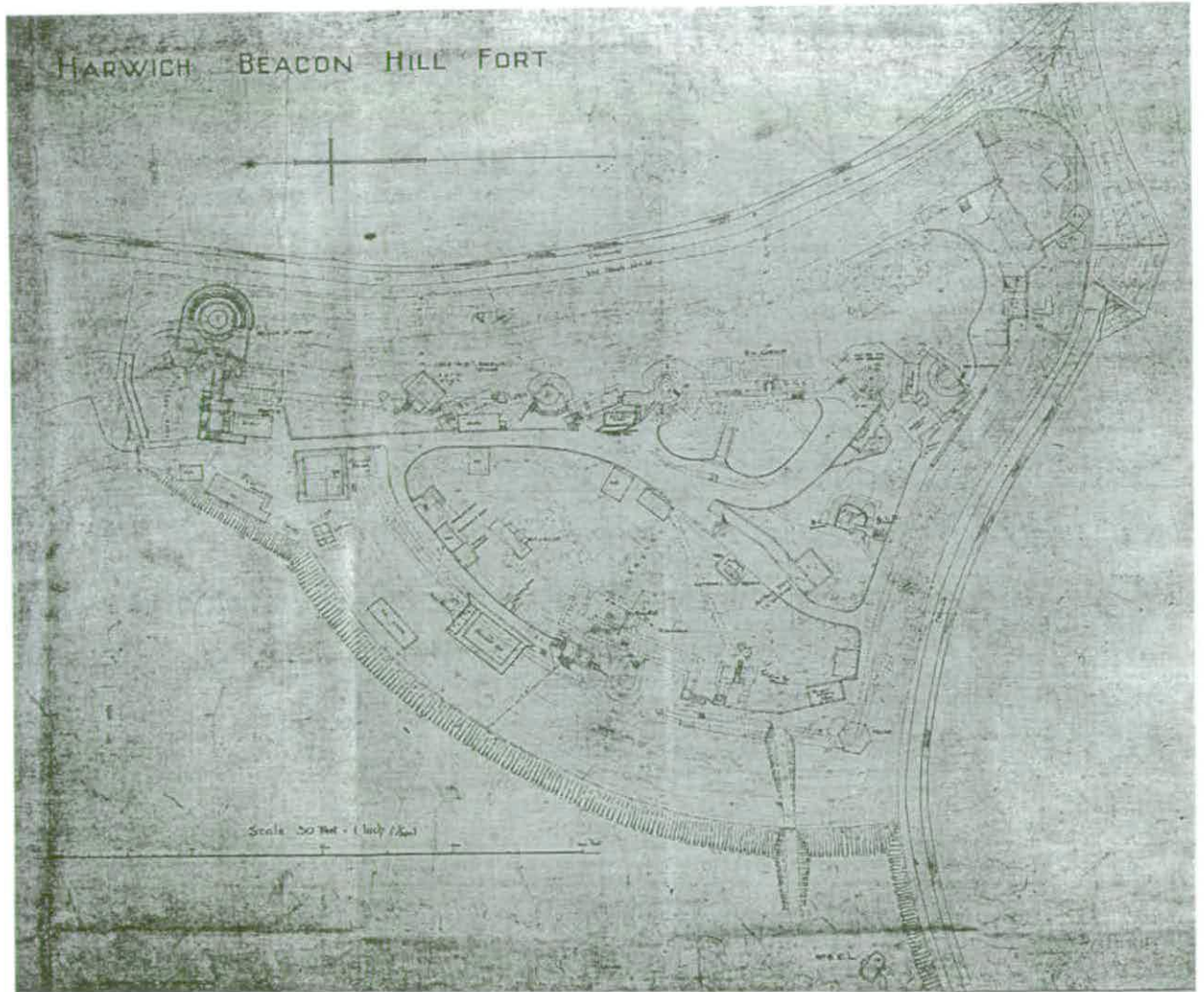


Figure 5 Plan dated 1945 of Beacon Hill Fort (PRO: WO 192/211)

3. **ARCHAEOLOGICAL HISTORY**

Until the recent survey by the Royal Commission on the Historical Monuments of England, Beacon Hill Fort had not been investigated in great detail. Two pieces of work concentrated on the defences of Harwich (Trollope 1983; Kent 1988), but these relied to a large extent upon material held by the Public Record Office, rather than on detailed survey. Conveniently, much of the site was surveyed at the time of construction, and these surveys survive in the Public Record Office at Kew. The site was not published on 1st and 2nd Edition Ordnance Survey maps, though the survey information existed, and the present work comprises the first detailed archaeological survey of the site.

4. DESCRIPTION OF FEATURES

Numbers in bold in brackets refer to features shown on the main site plans (Figures 6 & 7) and/or to the tabulated gazetteer.

Abbreviations used in the text:

AA	anti-aircraft
BC	battery command
BL	breech-loading
BOP	battery observation post
CASL	coastal artillery searchlight
DEL	defence electric light
DRF	depression range finder
ELD	electric light director
EXDO	extended defence officers post
HP	hydropneumatic
PF	position finder
QF	quick-firing
RDF	radio direction finding
RML	rifled muzzle loader
SB	smooth bore

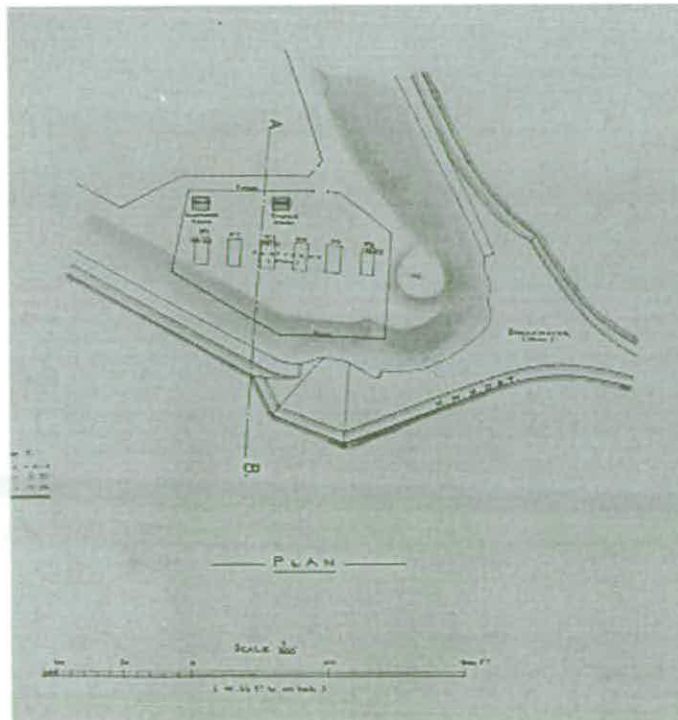


Figure 9
Plan of the
1871 practice
battery (PRO:
WO
78/4054/2)

PRE-FORT FEATURES

(1) Practice battery (Figure 9)

NGR: TM 262 316

This battery, dated 1871, is known only from a plan dated 1886 (PRO: WO 78/4054/2), though elements of it were still visible in 1945 (PRO: WO 192/211). The south-facing practice battery, constructed in 1871, consisted of six ground platforms for one 32-pounder smooth bore (SB) gun, three 8-inch SBs converted to 64-pounder rifled muzzle loaders (RMLs), and two 32-pounder SBs converted to 64-pounder RMLs. It was surrounded by a low fence, with an additional

fence and shallow ditch on the landward side, and there were wooden sheds for cartridges and tackle. No traces of this battery survive today, though some slight terraces in the area may be related.

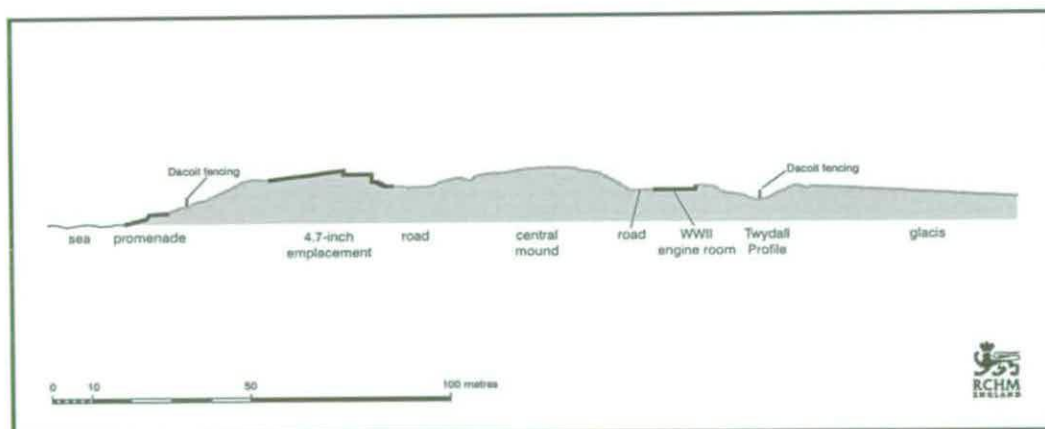
THE FORT

The earthworks

Beacon Hill Fort (or Battery, as it was originally known) is situated on a natural south-east facing promontory, with coastal views of Orwell Haven to the east and Dovercourt Bay to the south. In contrast to earlier coastal batteries, the Fort was designed to be invisible from the sea, and this necessitated the construction of banks on the seaward sides of the Fort to hide the emplacements, as well as a large central mound to hide the ancillary buildings. The natural scarps defining the coastal edges of the Fort were artificially steepened, and in places heightened, though it appears that little work was needed to achieve this effect (PRO: WO 78/5141/3). The entire Fort was surrounded by an unclimbable Dacoit fence, though much of this has been removed.

During the construction of the Fort, a huge amount of earth-moving took place, in order to build the huge central mound which protected the ancillary buildings, the sunken roads connecting them, and the Twydall Profile.

Figure 10
RCHME
profile across
the site,
illustrating the
Twydall
Profile and the
invisibility of
internal
structures
from the sea
(Vertical scale
same as
horizontal
scale)



(2) Twydall Profile (Figure 10)

NGR: TM 2610 3168 - TM 2617 3181

The Twydall Profile, completed in 1890, originally cut off the promontory, running from shore to shore, east of Barrack Field to a point south of Harwich. The ditch, with its unclimbable fence (Figure 11) at the bottom was not visible from outside the gently sloping glacis; the inner bank had an earthwork fighting platform, in parts strengthened by a concrete wall (3), for infantry who could pick off the enemy with 'grazing fire' over the glacis or as they struggled with the ditch and fence.

Most of the Profile has been altered at various points in its history, with buildings built into the ramparts, and the removal of the fence and almost total levelling of the earthworks south of the Second World War engine room. A breach in the Profile at the south-west corner of the Fort, known as the King's Gate, is contemporary with the construction outside the Fort of the practice battery for 5-inch Vavasseur guns in 1904 (PRO: WO 78/5141/3). During the Second World War mobile 75mm guns were located inside the King's Gate as well as at the main Fort entrance (Srnt. Baker, pers comm).

Figure 11
 Photograph
 showing a
 section of
 the Twydall
 Profile
 including
 the
 unclimbable
 fence
 (NMR:
 BB97/5440)



When a 6-inch breech-loading (BL) gun (25) was added at the turn of the century, the Fort had to be enlarged to include the new emplacement. The Twydall Profile was not extended, but a simple ditch was dug surrounding the new emplacement, and Dacoit fencing erected.

(3) Infantry wall (Figure 12)

A low wall for infantry defensive positions, dated 1890 (PRO: WO 78/5141/3). It is visible in four locations within the Fort.

NMR: TM 2619 3167 - TM 2622 3165

The wall section near the tip of the promontory is complete, and is essentially a revetment wall, 0.67m high, to an earthen bank which is now somewhat reduced. The wall was almost certainly originally higher, but alterations, such as the construction of the Cornwallis Battery (48) have had the effect of lowering it. Each end of the wall is angled in slightly. The wall contains ten arched recesses, 0.61m by 0.23m deep by 0.31m high, probably to hold ready ammunition for infantry manning the position.

NGRs: TM 2612 3172 & TM 2613 3173

Two other lengths of wall within the Fort are less complete and shorter, but identical in form. These sections of wall are located along the fighting platform in the bank of the Twydall Profile (2), and are visible on the original plan of the Fort (Figure 2).

NGR: TM 2621 3177 (between the 4.7-inch emplacements)

A concrete wall with angled wings, 3.70m long by 1.07m high, and three recesses. The northern one is a small arched recess similar to recesses in other sections of the infantry wall, the other two are larger and rectangular: the central one 0.62m wide by 0.24m deep by 0.76m high with an external



Figure 12
 Photograph showing a section of the infantry wall close to the Cornwallis Battery; view from the east (NMR: BB97/5386)

timber frame; the southern one similar but 0.76m wide by 0.31m deep and 0.40m high. Behind the wall is a level concrete platform which may be a later addition.

(4) 10-inch breech-loading (BL) emplacement converted to 6-inch Mark VII emplacement (Figures 13 & 14)

NGR: TM 2621 3168

An original concrete gun emplacement constructed in 1890, with several later phases, lasting until the construction of the Cornwallis Battery (48) in 1941.

Emplacement for a 10-inch BL gun on an Elswick hydropneumatic (HP) mounting

The only surviving elements of the original emplacement are part of the wall, apron and wing walls, plus openings for an ammunition lift and two adjacent recesses. One of these, 0.54m wide, 0.38m deep and 0.63m high, contained tubes, while the other, 0.99m wide, 0.94m deep and 1.15m high, contained cartridges; both have frames for doors and York stone lintels and sills. Electric lighting close to the lift opening is secondary. A small recess in the south wing wall, 0.49m wide, 0.44m deep and 0.55m high, appears to have been a dials box inserted in 1898 (PRO: WO 78/5141/4). The opening for the ammunition lift is situated to the north of the emplacement, and measures 1.38m by 0.82m. It has been altered and partly re-faced with brick and concrete. The original metal frame for outward-opening double doors has almost disappeared. A horizontal layer of asphalt 1.14m down the lift opening probably seals the roof of the main magazine.



Figure 13
Photograph
showing the
southern
6-inch Mark
VII gun
emplacement
with Second
World War
casemate over

Emplacement for a 6-inch Mark VII gun

A concrete emplacement comprising gun pit, with a semi-circular gun floor to the rear, and wall with a sloping apron to the front was inserted into the earlier emplacement. The circular gun pit is 3.78m in diameter and 1.37m deep, with a shallow shell recess around the front face and four irregularly-shaped ready-use ammunition lockers under the gun floor to the rear; the holdfast was anchored by two concentric rings of bolts, slightly offset from one another, on average 2.31m in diameter. Set into the rear of the gun floor are four ready-use ammunition lockers, on average 1.05m wide, 0.78m deep and 1.12m high; a fifth locker, 1.08m wide, 0.98m deep and 1.10m high is set into the wall on the southwest. The surface of the gun floor is scored with gun quadrant arcs; there are two sets, as if the arc of fire was altered at some point (Figure 15). Metal staples around the rear edge of the gun floor supported uprights for a metal railing. The apron rises 0.68m above the gun floor and contains remains of fittings for secondary electric lighting.

The back of the emplacement has a second platform made possible by the depth of the original 10-inch emplacement: set into it are four more lockers; three of them have evidence for double metal doors and were probably for shell storage (from the south they measure 0.85m wide, 0.98m deep and 0.93m high; 0.92m by 1.05m by 0.93m; 1.18m by 1.10m by 0.93m), while the fourth, 0.90m square by 0.92m high, was considerably altered during construction of the overlying casemate. A fifth locker, 1.15m wide, 1.02m deep by 0.91m high, in the north wing wall also had doors.

Second World War casemate

A flat-roofed reinforced concrete casemate was added to the 6-inch Mark VII emplacement probably in 1940, before the emplacement became disused following construction of Cornwallis Battery in the ensuing year. The side walls are corrugated, probably to prevent ricocheting bullets, and externally buttressed. The front is rendered and the whole structure was probably originally camouflaged. The roof once extended over the emplacement but is now broken.



Figure 15
Photograph
showing
detail of the
gun quadrant
arcs for the
southern
6-inch Mark
VII gun
(NMR:
BB97/5388)

The casemate is approached up a flight of steps from the rear through a doorway, 0.84m wide by 1.96m high. However, further north a flight of steps leads up to another doorway in the casemate, 1.10m wide by 1.98m high, which is blocked; perhaps this is the pre-casemate entrance which was initially retained. The interior was lit partially by natural light through small windows high up in the curved rear wall: these are 0.30m square and splay internally. The glazing is now broken but comprised small screw-in glass panels, roughly 0.10m in diameter. There is a 0.40m square opening in the rear wall, with a wooden surround, possibly an extractor fan and a small concrete shelf, 0.38m by 0.27m above head height. A 1.00m wide by 0.96m high opening in the north wall has a metal frame for outward-opening heavy metal doors, and, unusually, gives directly onto the apron.

The roof of the casemate supported a Bofors anti-aircraft (AA) gun, still visible in an aerial photograph dated 1944 (NMR APs: 106G/LA/17/4102-3). Access was provided by metal stairs, of which only the stubs survive. Holdfast bolts which secured the gun survive, as do remains of a metal railing across the front of the casemate.

(5)6-inch BL emplacement converted to 6-inch Mark VII emplacement (Figure 14)

NGR: TM 2621 3173

An original concrete gun emplacement constructed in 1890, with several later phases, lasting until the end of the Second World War.

Emplacement for a 6-inch BL gun on an Elswick HP mounting

The southern part of the wall and sloping apron survives, as does part of the south-west wall of the gun pit with two shallow recesses, 0.35m wide, 0.10m deep by 0.29m high, containing heavy metal

rings of 0.23m diameter. These were used for the installation or withdrawal of the gun by means of block and tackle and timber skidding. The south wing wall is also original and, outside the later casemate, the first recess (1.05m wide by 1.00m deep by 0.89m high) carried cartridges for the early gun but was later adapted for shells (PRO: WO 78/5141/3-4). A fragment of the north wing wall, containing a battery recess (0.67m wide by 0.40m deep by 0.56m high), is also preserved under the later steps to the Mark VII gun. Other than this, the original emplacement has been destroyed or concealed by the later conversion.

Emplacement for a 6-inch Mark VII gun

A concrete emplacement comprising gun pit with a semi-circular gun floor to the rear with a sloping apron to the front. It partially re-uses the wall and south-western part of the pit of the earlier 6-inch BL gun.

The circular gun pit is 3.78m in diameter and 1.40m deep, with a shallow shell recess around the front face and three irregularly-shaped ready-use ammunition lockers under the gun floor to the rear; the holdfast was anchored by two concentric rings of bolts, slightly offset from one another, on average 2.31m in diameter. Set into the rear of the gun floor are three ready-use ammunition lockers, the southern two formerly with outward-opening double doors and measuring 1.08m, 0.88m deep and 0.87m high. The remaining recess appears to have been altered considerably, at one point extended through into the gun pit, though it is now blocked by a brick wall.

The surface of the gun floor is scored with gun quadrant arcs: there are two sets, as if the arc of fire was altered at some point. Also, at the southern end are two openings for ammunition lifts from the main magazine below (6): one in the gun floor for an inclined band lift for shells, the other in the side of the emplacement, for a vertical lift for cartridges; the single outward-opening metal door survives. Metal staples around the rear edge of the gun floor supported uprights for a metal railing.

The apron rises 0.65m above the gun floor and contains remains of fittings for secondary electric lighting.

The rear wall of the emplacement, overlain by the casemate (see below), is the wall of the gun pit for the earlier 6-inch BL gun. It contains two ready-use ammunition lockers for the later gun, each 1.08m wide, 1.05m deep and 0.90m high, with frames for double doors; the eastern one has a small opening in its rear wall through which can be seen the blocked steps which provided direct access from the main magazine to the earlier gun pit. The northern locker was adapted from an original one.

The steps into the emplacement are obstructed by the later casemate but there is a blocked door in the latter, indicating that the steps remained in use for a while after the casemate's construction.

Second World War casemate

This is virtually identical to its southern neighbour excepting the following. The doorway in the rear wall is 1.45m wide and 2.80m high and the steps up to it are sheltered by a porch supported on concrete pillars. The roof, which is more severely damaged, did not support a Bofors gun.

(6) Main magazine

NGR: TM 2621 3171

An original subterranean magazine serving the 10-inch (4) and 6-inch (5) gun emplacements, and dated 1890 (PRO: WO 78/5141/3) (Figure 16).

The structure is constructed mainly in concrete, with brick cavity-wall lining in the cartridge stores, and all the corners are neatly chamfered and stopped. It is whitewashed throughout, though there is

evidence for other layers of paint beneath. Originally lit by lamps in recesses, the magazine retains evidence for secondary electric lighting.

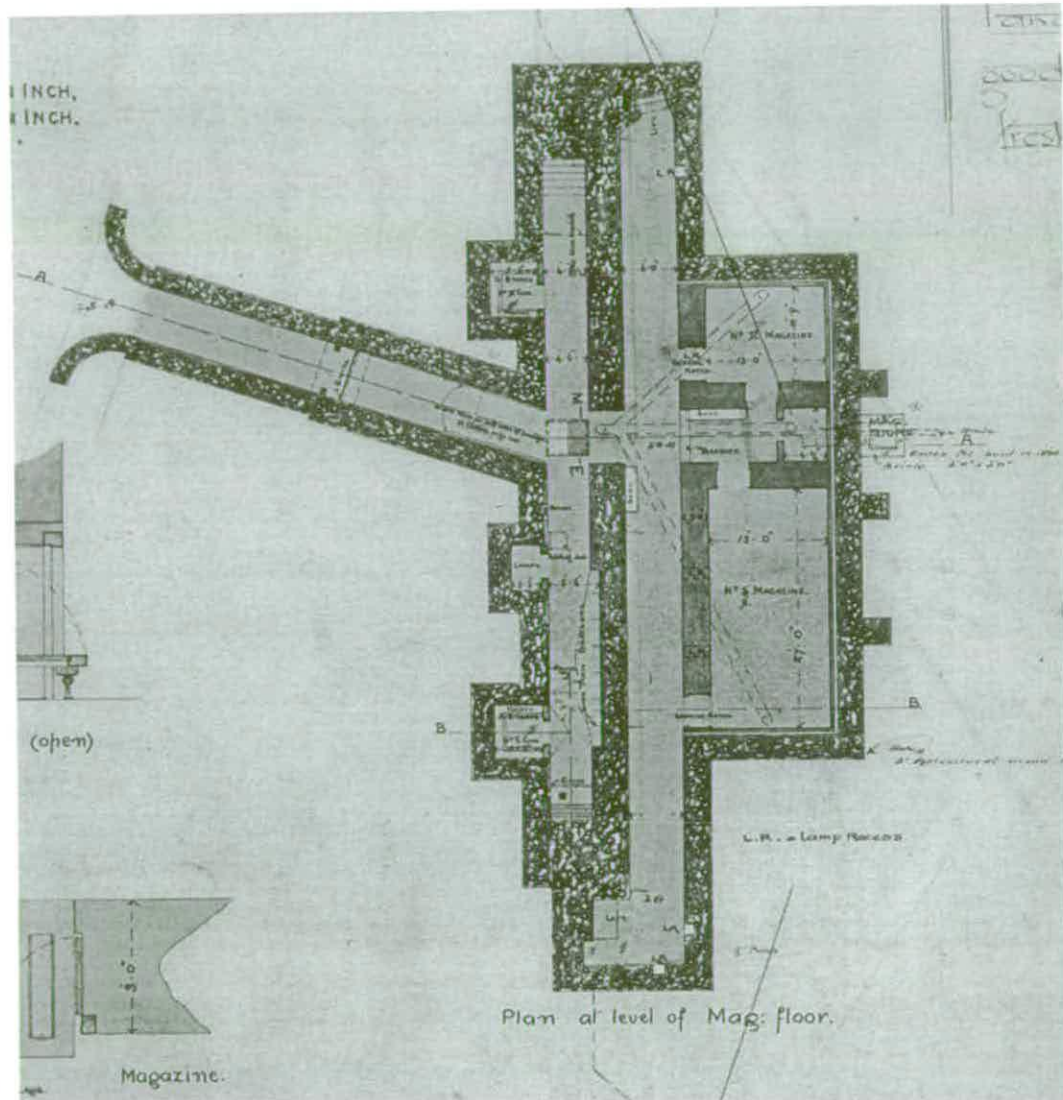


Figure 16
Plan dated
1890 of the
main
magazine
(PRO: WO
78/5141/4)

In plan (Figure 14) there is a central magazine corridor, aligned north-south, flanked on the west by a parallel passage and on the east by two cartridge magazines. The principal entrance from the Fort is down an inclined ramp from the north-west, carried initially in a concrete-lined cutting up to strong outward-opening double metal gates. Beyond them the approach is in a subterranean vaulted tunnel, changing angle at the base of the ramp to cross the passage and central corridor to form a small lobby between the two magazines.

The passage is 1.4m wide and 2.40m high to the apex of the barrel vault. Its southern arm is guarded by strong outward-opening double metal gates at the base of the steps ascending to the 10-inch gun emplacement. The northern arm of the passage is shorter but likewise has a flight of steps ascending to the 6-inch gun emplacement; the access has, however, been sealed by a complete blocking. There are no traces of gates, presumably because the steps led directly into the gun pit.

Along the western side of the passage are three rooms with simple lamp recesses in the walls beside them: the latter are 0.38m wide, 0.44m deep and 0.52m high. The rooms, starting from the south, measure 1.78m by 1.97m, 1.55m by 1.00m and 1.80m by 1.58m respectively and are all entered through doorways 0.82m wide by 1.97m high, formerly with single inward-opening doors. Each room is barrel-vaulted and contain remains of timber shelving along their western walls. The smaller central room was originally for lamp storage whereas the other two contained stores for the 10-inch and 6-inch guns. A long shallow recess along the eastern wall of the southern arm held brackets for side arms; further brackets were located along the northern arm, though these were not recessed (PRO WO 78/5141/4). At the junction of the passage with the base of the ramped entrance, a rectangular pit measuring 0.88m by 1.38m is the sump for drainage of the whole magazine: several drains can be seen leading into it.

The magazine corridor is 1.85m wide and 2.39m high to the apex of the barrel vault. Access to it from the main entrance was guarded by double outward-opening doors with metal spikes and a grille above (PRO: WO 78/5141/5), though only traces of the frame survive in disturbed brickwork. To the south the corridor is 15.05m long before opening out into a rectilinear area, 2.25m by 3.05m, which contains the remains of an ammunition lift: one of the metal trays (which carried a single 10-inch shell to ground level outside the emplacement) survives *in situ*, as does the winch mechanism (labelled 'No M941'). A shallow recess, inserted in the south wall, accommodated a soldier operating the winch. Two lamp recesses in the south and east walls, of the same dimensions to those in the passage, have York stone sills and lintels, and ventilation bricks are located above and to the side; a slight rebate allows for glazing. Two more lamp recesses in the east wall are shared with the southern cartridge magazine (see below). Substantial concrete supports for a later 0.99m high shelf are situated against the west wall.

To the north, the corridor is 9.90m long before a slight angle change in the end wall which has been considerably altered. The original ammunition lift was situated near the end of the corridor (PRO: WO 78/5141/4), now marked only by a rectangular hole in the ceiling. Another rectangular aperture, in the ceiling at the present end of the corridor, is associated with a slight recess in the west wall which allowed for turning of a winch handle: this is a second phase ammunition lift. A second lift, for shells, survives *in situ*, an inclined band lift, the base of which is supported by a wooden table on a concrete pillar. The chain, loading mechanism and lift winder are still in place and in the wall adjacent a simple lamp recess has been blocked and replaced with another, angled to throw light onto the base of the lift; it has no sill or lintel but has rudimentary ventilation bricks.

Along the western wall of the corridor are a series of concrete pillars, the supports for a heavy continuous timber shelf, 1.00m high and around 0.80m wide, for the storage of shells. A sign at the southern end of the northern arm of the corridor identifies it as 'SHELL STORE 2'.

Access to the two cartridge magazines was restricted by a waist-high barrier between the corridor and the lobby dividing them: a disturbed area of brickwork marks its position and the wall-corners are chamfered only above the barrier. In the lobby, there are scars of coathooks along the south wall, and a seat existed along the north wall (PRO: WO 78/5141/4). At the very eastern end the lobby was a subdivided to create a tiny room, the magazine store (PRO: WO 78/5141/4) but all signs of this have disappeared, possibly during the insertion of a new door to the southern cartridge magazine (see below).

The southern cartridge magazine is of cavity-walled construction, a rectangular room 8.28m long by 4.0m wide. The shallow brick vault, 2.40m high, has a central circular ceramic ventilator. There is one entrance, 1.08m wide and 1.90m high, formerly with outward-opening double wooden doors. Two serving hatches, with York stone lintels, pierce the west wall; the northern one 0.78m wide,

0.90m deep by 0.91m high, with chamfered edges and the remains of a wooden sliding door. The southern hatch, 0.99m wide, 0.90m deep by 1.07m high, is the original of the two: it had double doors which opened into the hatch, with flap-down doors supported on short gun metal legs forming a serving table across which cartridges were passed on their way to the lift (PRO: WO 78/5141/4). Three lamp recesses, each 0.38m wide, 0.90m deep by 0.53m high, lit both magazine and corridor (one is situated immediately above the northern serving hatch).

An original plan shows a doorway into the southern cartridge magazine further west (PRO: WO 78/5141/4). Given that there are no obvious signs that the present doorway is not original, it is possible that the actual construction differed from the design represented by the plan. Alternatively the door may have been moved to enable insertion of the second serving hatch, probably when the adjacent corridor was converted to a shell store at an unknown date.

The northern cartridge magazine is similar to its partner, but much smaller at 3.35m by 4.0m, and entered through an identical doorway. There is a circular ceramic ventilator in the vault close to the north wall. A single serving hatch, 1.08m wide, 0.90m deep by 1.04m high, has a simple wooden frame for outward-opening double wooden doors, with a lamp recess (as described above) immediately above it. Four concrete pillars (and the scars of three more) formerly supported a shelf along the north, east and west walls; evidence, as in the magazine corridor, of its undated conversion into a shell store.

(7) Electric light engine house and bombproof shelter

NGR: TM 2614 3173

Built in 1890 to provide power for searchlights, the engine house was almost certainly used latterly for general lighting and Fort power (PRO: WO 78/5141/3) (Figure 17).

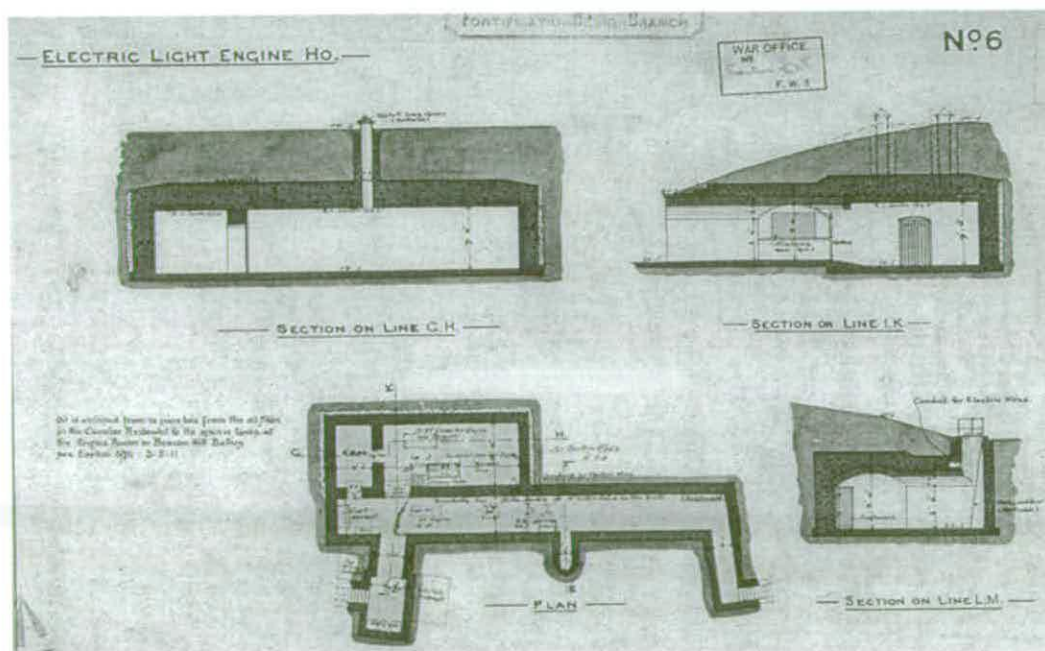


Figure 17
Plan dated
1890 of the
electric light
engine house
and
bombproof
shelter (PRO:
WO
78/5141/7)

A subterranean structure mainly of concrete with some brick in the vaulting (Figure 18). It comprises a long corridor with two entrances at the north and south ends, and two rooms off its north-east side.

It is well built, the wall corners neatly chamfered and stopped, with the exception of those in the larger of the two rooms, and the interior is whitewashed throughout.

There is a small forecourt outside the north entrance, reached from ground level to the north down a flight of steps. At the western end of the forecourt there were originally three circular cooling tanks. At ground level overlooking the forecourt, on each side, are original metal tanks, that to the north for oil storage and to the south for water (PRO WO 78/5141/7).

The forecourt leads to the north entrance, a 2.42m-high brick arch guarded by an inward-opening double metal gate. Beyond it, a short passage leads to the main corridor, a vaulted tunnel 33.3m long and 3.05m wide and aligned roughly north-east to south-west, with three large ceramic ventilators in the vault.

The northern end of the corridor is blind but the southern end turns directly into a 1.48m wide passage, leading to the southern entrance. This is arched and also guarded by inward-opening double metal gates, 2.20m high. Outside, the passage turns south onto a flight of ascending steps.

The corridor is an unusual feature. Towards the centre of the north-west wall, a short passage 3.45m long and 0.95m wide leads to a circular vertical shaft of 0.95m diameter, which originally had a moveable ladder (PRO: WO 78/5141/7) giving access to a level platform on the surface, depicted on the Fort plan of 1892 (PRO: WO 78/5141/3). This position commanded a complete view of the Twydall Profile and the ground beyond and it seems likely that the shaft was designed for ascent to a command and control position for infantry manning the landward defence. The corridor itself, therefore, is the '*Bomb-proof shelter*' described but not located on the 1892 plan. Certainly there were brackets for side arms along the south-east wall, and their positions remain visible (PRO: WO 78/5141/7).

All other features in the corridor are secondary but many were in place by 1903: a partition dividing the corridor in two, beds for an oil engine and dynamo (PRO WO 78/5141/7) are no longer apparent, the principal remains being a complex of channels in the floor, rebated for metal covers. These can be traced from the south entrance and along the north-west wall with branches into the engine room (see below) and short passage with shaft. They link with vertical iron pipes at the south entrance and in the shaft and are concerned with the supply of fuel, water and power to and from the engines. The significance of a double row of sheared bolts along the southern half of the corridor is unknown.

At the northern end of the corridor is a secondary window, 1.25m wide by 0.78m high, with an external metal frame. The window is situated within a wider (1.55m) recess which may be an earlier feature. A scar on the wall under the recess is from a shelf which supported a cistern (PRO: WO 78/5141/7).

Located off the corridor and reached from the north entrance are two rectangular rooms forming the Electric Light Engine facility. Both have flat ceilings reinforced with cross-axial metal girders on York stone pads. The small room, 5.89m by 3.08m, has a doorway 1.25m wide by 2.17m with provision for inward-opening double doors. A ramp leads down into the room which was originally the coal store for the steam engine in the adjacent room: it became obsolete when an oil engine was installed in 1903-4 (PRO: WO 78 5141/3). In the south-west wall a doorway to the adjacent room, 1.18m wide by 2.23m high, is blocked.

The larger room, 11.58m by 5.89m, contained the engines and is approached directly along the passage from the north entrance through a doorway 2.08m wide. There is a ramp down into the room which has a secondary doorway, 0.80m wide by 1.96m high, leading up two steps back into the main corridor from the south-west corner: this one has a wooden frame for an inward-opening door and was inserted by 1903 (PRO: WO 78/5141/7).

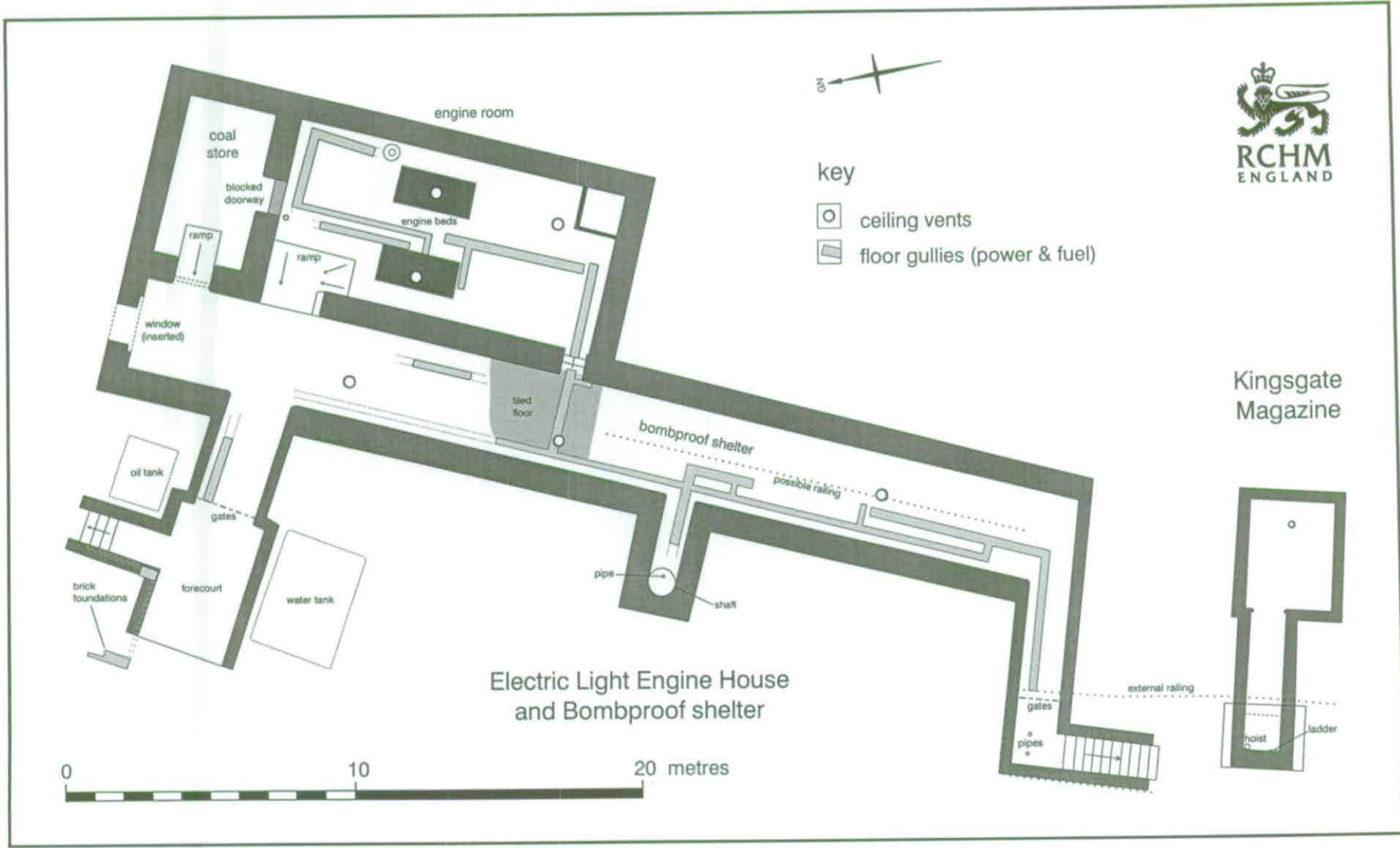


Figure 18 RCHME plan of the electric light engine house and bombproof shelter, and Kingsgate magazine

A complex arrangement of channels in the floor, like those in the corridor, connect two raised concrete engine beds, each 2.70m by 1.25m and 0.15m high. Debris obscures the route of some channels, but they are continuous with those in the corridor. Heat and exhaust from the engines escaped through large circular ceiling vents located directly above the beds, and another vent is situated close to a kerb, defining an unknown structure, in the south-east corner. Along the walls are various metal brackets and attachments.

The original engine appears to have been a 30HP Crossley Engine with dynamo sited a little to the north of the surviving eastern bed. The present western bed supported an oil engine installed 1903-4 (PRO: WO 78/5141/3) and in use until the completion of the Second World War engine room in 1943 (Srnt. Baker, pers comm).

Wartime aerial photography shows a structure, possibly with a tin roof, immediately west of the northern entrance to the engine house (NMR APs: 106G/LA/17/4102-3); the remains of this brick structure were identified in the field.

(8) Guard house (Figure 19)

NGR: TM 2619 3181

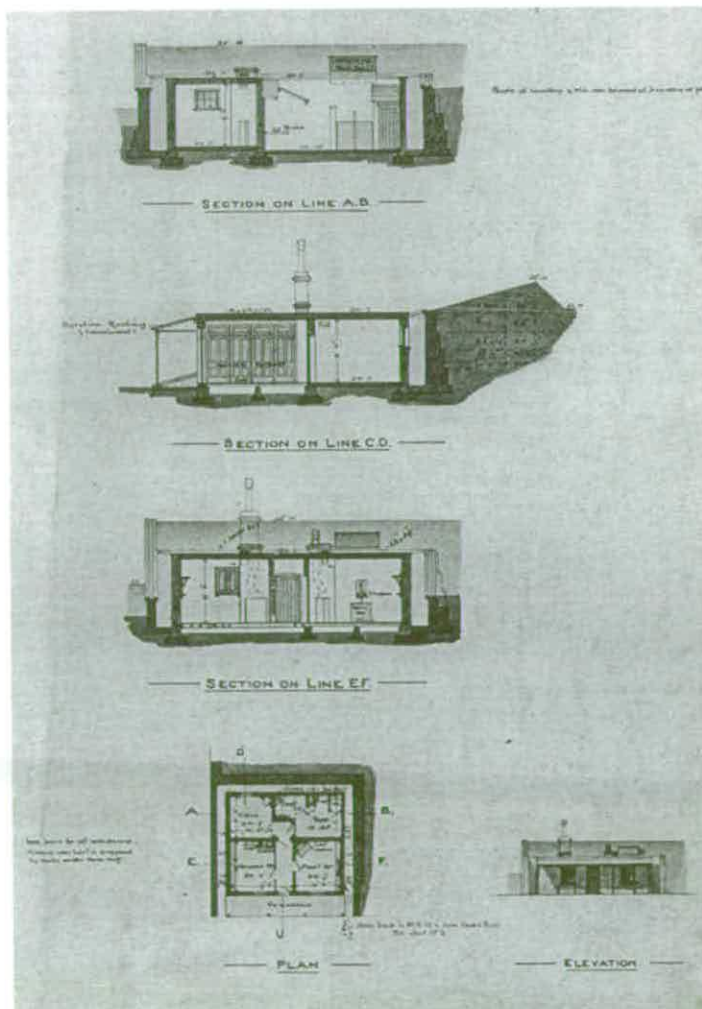


Figure 19
Plan dated
1890 of the
guard house
(PRO: WO
78/5141/7)

The guard house, built in 1890 (PRO: WO 78/5141/3), later served as the Master Gunner's house and an officer's mess.

This building is situated in a concrete-lined cutting in the bank of the Twydall Profile, and is predominantly of brick with a flat concrete roof coated with a thick layer of asphalt. It faces north and originally had a verandah (with translucent Duraline Roofing) across this elevation (PRO: WO 78/5141/7). Brackets on the external east wall were almost certainly for fire buckets. Externally the building measures 9.8m by 8.6m and in plan it has three rooms and a yard. The main entrance, 0.94m wide by 2.42m high, has a York stone sill and a half-light above the door. It is located centrally and originally led into a short corridor, 1.5m wide, between the front two rooms and on to

the rear room and yard (PRO: WO 78/5141/7). Today, the partition wall defining the east side of the corridor has gone. Electric fittings are apparent in all three rooms.

The north-eastern room, 3.7m by 4.3m, was the guardroom and the north-western room, 3.8m by 4.3m, was the prisoners' room: both had wooden floors (removed), fireplaces and north-facing windows, 1.23m wide and 1.68m high, with York stone sills and lintels. The guardroom was decorated and several layers of paint are visible. The west wall of the prisoners' room has a scar indicating a shelf and it formerly contained a telephone (PRO: WO 78/5141/7).

The south-eastern room, 3.4m by 3.5m, served as a cell (PRO: WO 78/5141/7). It also contains a fireplace, and two small, high windows which provide scant light given that they are overshadowed by the concrete wall of the cutting; the floor is of concrete and there are two ventilator grilles high in the walls.

The yard, in the south-western corner of the cutting, contained WC's and washing facilities (PRO: WO 78/5141/7): a small structure with a lean-to roof survives against the south wall and there are two galvanised water tanks. Remains and scars of corrugated iron roofing suggest that most of the yard was covered.

Between the wars the guard house served as the Master Gunner's house, and during the Second World War it was the officer's mess for the standby shift; a nearby building served as the guard house (Srnt. Baker, pers comm).

(9) Artillery store (Figure 20)

NGR: TM 2617 3169

Built in 1889-90 (PRO: WO 78/5141/3); continued into the Second World War (PRO WO 192/211).

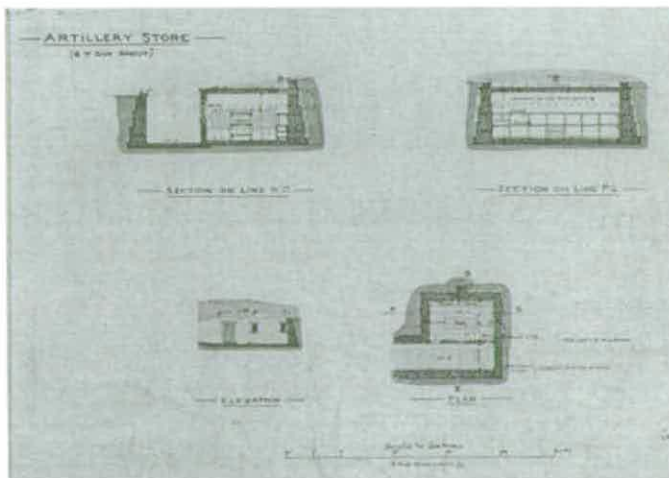


Figure 20
Plan dated
1890 of the
artillery store
(PRO: WO
78/5141/7)

A rectangular store building in a concrete-lined cutting, approached down a long ramp. Metal hinges for a pair of gates survive towards the base of the ramp. A brick wall built across the base of the cutting forms the front, or north-west elevation of the store. The building measures 7.3m by 4.6m internally, and has a concrete floor and a flat concrete roof reinforced with cross-axial metal girders on York stone pads, and covered with a thick layer of asphalt. The only doorway, 1.20m wide by 2.13m

high, is situated towards the northern end of the front elevation; its wooden frame supported double doors, opening internally. The detail in both the door and in two adjacent windows, each 0.76m wide by 0.94m high, is of good quality: York stone is used for the sills and chamfered lintels and the interior edges are finished in moulded brick. The windows opened externally and have vertical iron security bars.

The interior is whitewashed and painted and there is a solitary ceiling ventilator. Scars on all walls are from shelving. Brackets on the north-east wall were later re-used for fire buckets and there was a secondary pot-bellied stove between the windows.

As originally fitted, there was a bench and shelf along the south-east wall, with brackets for side arms and tackle above, a bench with vice in the western corner, and a rack in the centre of the room (PRO: WO 78/5141/7).

Joist slots in the cutting wall opposite the main elevation once supported a secondary corrugated iron roof spanning the gap between cutting and store, visible on an aerial photograph dated 1936 (Harwich Society).

4.7-inch quick-firing (QF) gun emplacements and magazines

Emplacements and magazines for two 4.7-inch QF guns, built in 1892 (PRO: WO 78/5141/3). The northern emplacement later served as the foundation for the battery observation post (BOP) built in 1941 (Figure 21).

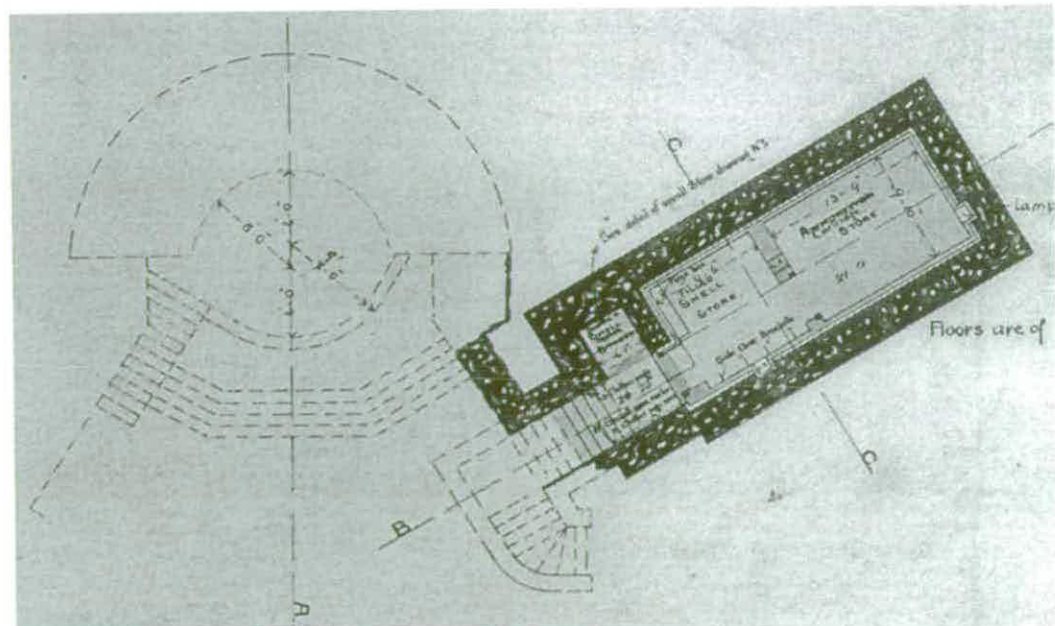


Figure 21
Plan dated
1892 of a
4.7-inch
QF gun
emplacement
and magazine
(PRO: WO
78/5141/6)

(10) Southern emplacement

NGR: TM 2621 3175

This emplacement, in concrete throughout, comprises a gun floor, a semi-circular wall and sloping apron at the front and wing walls on the flanks. The gun floor, 1.34m high, is reached by a flight of steps protected by the north wing wall. The fourteen securing bolts for the holdfast form a circle 1.24m in diameter. Staples for the uprights of a railing survive around the rear of the gun floor. Three ready-use ammunition lockers are set into the back of the gun floor; a larger central one, 0.91m wide, 1.10m deep by 0.99m high with a wooden frame for outward-opening double doors; and small outer ones, 0.95m wide, 0.65m deep by 0.99m high and 0.62m wide, 0.55m deep by 0.66m high respectively; these appear to have been open lockers. All are approached by a separate flight of steps which spans the width of the emplacement.

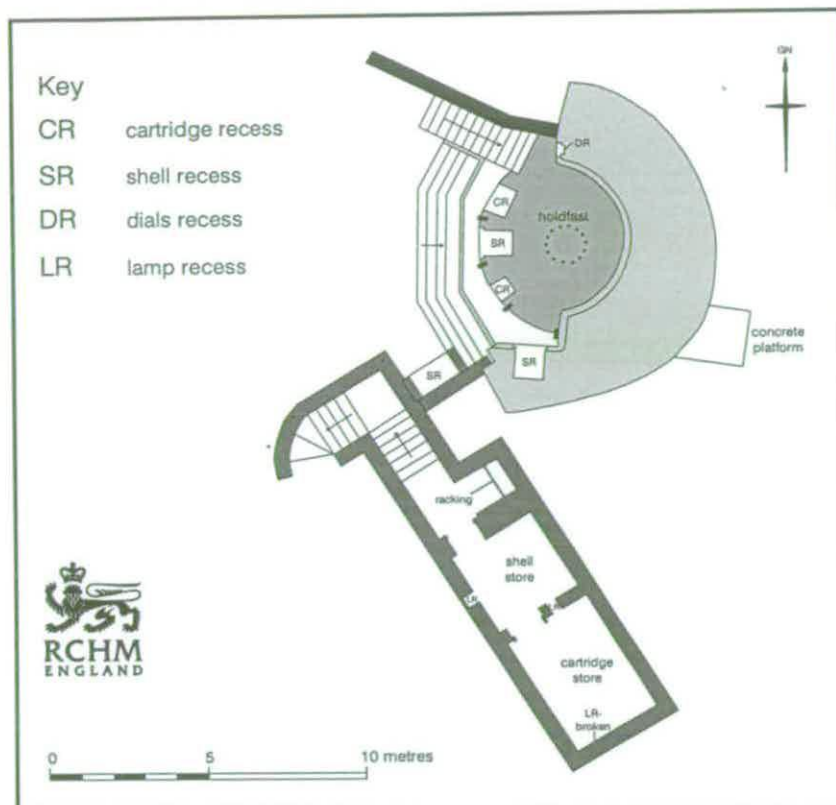


Figure 22
RCHME plan
of the southern
4.7-inch QF
emplacement
and magazine

The walls of the emplacement rise 0.68m above the gun floor; to the north is a dial recess, 0.32m wide, 0.18m deep and 0.20m high, which is rebated for a timber surround. Its southern side contains a fourth ready-use ammunition locker, 0.95m wide, 1.1m deep by 1.02m high, also with a wooden frame for outward-opening double doors.

Another recess, formed of concrete slabs, is 0.92m wide, 0.80m deep by 0.78m high and built against the southern wing wall: it is a secondary feature.

A concrete platform, 1.65m by 1.95m, attached to the south-eastern side of the apron has no obvious function.

The dial recess, the southern recess in the gun floor and that abutting the south wing wall are all later additions (PRO: WO 78/5141/6). There are remains of secondary electric lighting in the emplacement.

(11) Southern magazine

NGR: TM 2620 3174

Built in 1892 and comprising a small store room, shell store and ammunition store (PRO WO 78/5141/3); the last two were altered by 1903 to a filled shell store and cartridge store, both with side arm brackets fitted (PRO WO 78/5141/6). The magazine may have been re-used when 4.7-inch guns were removed after the First World War.

Situated underground immediately south-west of the emplacement, the magazine is of concrete construction with a brick cavity-wall lining and single shallow brick barrel vault. The three rooms are arranged in series from the entrance. It is whitewashed throughout and has secondary electric power fittings.

A curving flight of steps leads down to an arched entrance, where a sign reads 'B1 (?) MAGAZINE'; there is no trace of a gate or door. Just inside is a small lobby, formerly with coathooks and side-arm racks, north-east of which is a tiny room accessed through a doorway 1.20m wide by 2.00m high, originally with inward-opening double doors with a metal grille above. Only 1.30m by 1.55m, the room contains well-preserved wooden racking and drawers, 0.69m deep, the original fittings for small stores (PRO WO 78/5141/6).

From the lobby, a 0.98m wide by 2.00m high opening for inward-opening double doors, leads into the shell store, a larger room measuring 3.00m by 2.85m. The remains of racking survive along the northeast wall, for shells, and south-west wall, for side arms, and there was a single coathook beside the door. There are two lamp recesses, both formerly ventilated and glazed; one in the south-west wall, 0.38m wide by 0.40m deep and 0.45m high; a second is in the party wall with the ammunition store.

The door to the ammunition store is identical to that in the shell store except that it opened outwards to accommodate a waist-high wooden barrier. Inside the room, which measures 4.22m by 2.85m, there is a double coathook beside the door and a solitary ceramic ventilator in the vault at the far end of the room. The end wall has been vandalised by the removal of a section of brick cavity walling around the site of a lamp recess.

(12) Northern emplacement

NGR: TM 2621 3178

Most of this emplacement is obscured by the building of a BOP (51) over it. However, it is almost identical to its southern counterpart except for a secondary added recess, of concrete slab construction against the northern wing wall: it is 0.92m wide, 0.80m deep by 0.78m high, with evidence for a light frame around it.

(13) Northern magazine

NGR: TM 2620 3177

The magazine is identical to its southern counterpart and is in a similar state of preservation.

(14) Practice battery for 64-pounder RMLs (Figure 23)

NGR: TM 2625 3165

Emplacement for three guns on traversing carriages, probably 64-pounder converted RMLs from the earlier practice battery (see above), built c1894 (PRO: WO 78/5141/3).

A level concrete gun emplacement, 22.1m by 5.8m, protected on three sides by a concrete wall 0.75m high. In the south-eastern wall are three open embrasures, each 2.42m across the back, 1.85m at the front, and 0.47m deep. Two embrasures still retain the large metal pivots which supported the guns but the south-western embrasure was broken to enable construction of the coastal artillery searchlights (CASLs); its gun pivot lies at the base of the steps to the CASLs. On the floor of the emplacement behind each embrasure are four concentric semi-circular iron racers which enabled the guns to traverse on their carriages:

1. The innermost racer consists of a 0.17m wide flat metal strip which carried the racer wheels on the gun carriage;
2. The second racer, a toothed metal runner 0.08m wide, meshed with the traversing mechanism on the gun carriage;
3. The third racer, a flat metal strip 0.17m wide, also supported racer wheels;

4. The outermost racer, now only a rebate 0.08m wide, formerly contained a copper graduated arc marked with bearings.



Figure 23
 Photograph of
 the 1894
 practice
 battery
 showing racers
 and gun pivots
 (NMR:
 BB97/5406)

In the wall next to each embrasure is a small recess, 0.28m by 0.21m deep by 0.30m high, which held fuzes or tubes. In the south-western wall another recess, 0.46m by 0.14m deep by 0.23m high, rebated for wooden frame, may have held a telephone. At the north-western end of the north-east wall, a shallow flight of steps is now blocked by rubble and vegetation, but probably led down to a ready-use ammunition locker. On the emplacement floor opposite each fuze or tube recess is a small hole, 0.25m square by 0.16m deep, probably for drainage. Other drains run along the front wall and along the rear of the emplacement.

During the Second World War the practice battery was covered over with earth (Srnt. Baker, pers comm).

(15) South magazine

NGR: TM 2617 3168

Built in 1894, this was originally the ammunition store for the practice battery (14) (PRO: WO 78/5141/3) (Figure 24).

A subterranean magazine (Figure 25) in cavity-walled construction, comprising a concrete shell with brick lining and subdivisions. It is reached by a flight of concrete steps, now partly blocked, which descend 2.56m below ground level. There is no evidence for a gate at the bottom of the steps. The

magazine comprises a passage, 2.51m high, aligned roughly north-south, and two rooms to the east separated by a brick party wall: all have shallow barrel vaults and concrete floors. It was originally lit by lamps in recesses but has evidence of secondary electric lighting.

The shell store is closest to the steps and is entered through a doorway, 1.03m wide by 2.00m high, originally with double outward-opening wooden doors. The vault is 2.47m high, the walls whitewashed.

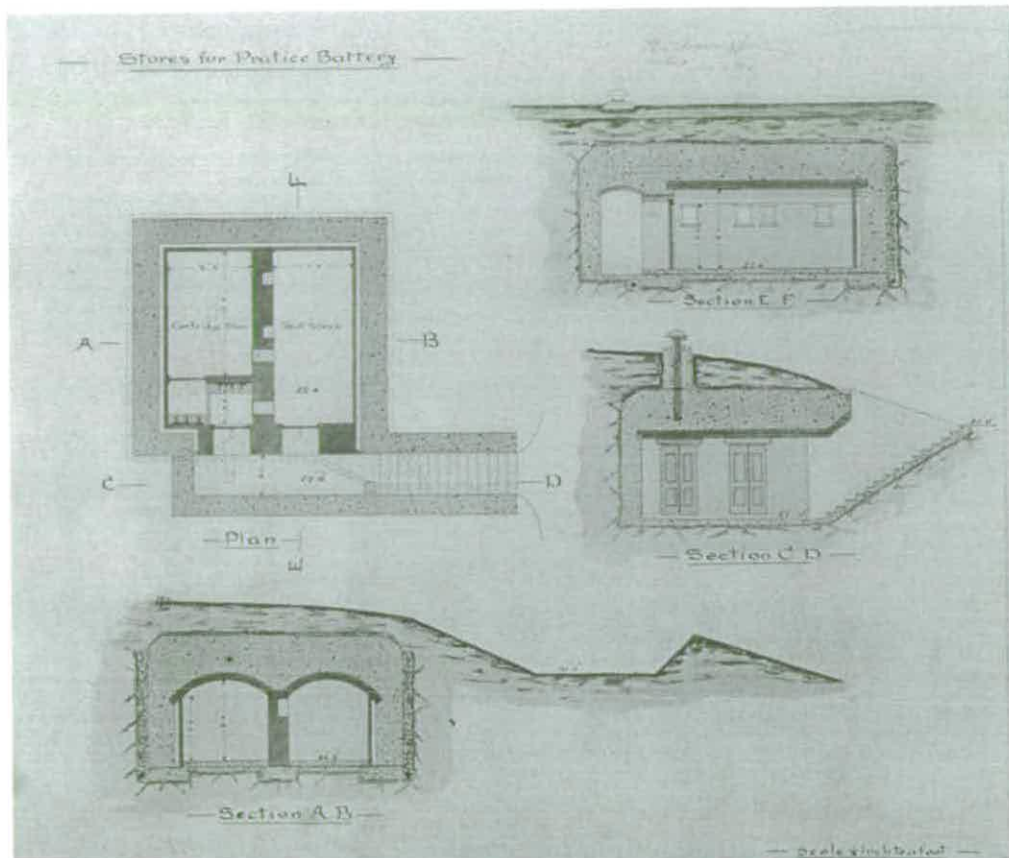


Figure 24
Plan dated
1894 of the
ammunition
stores for the
practice battery
(South
magazine)
(PRO: WO
78/4054/3)

The other vaulted room is subdivided into a small shifting lobby and a cartridge store. Access to the volatile cartridges was strictly controlled in the shifting lobby which had doors at each end and was subdivided by a waist-high barrier: on the outer side outdoor clothing was removed and on the inner side special magazine clothing was put on. The door frames and timber stops of the barrier survive.

The cartridge store is entered through a doorway identical with that to the shell store. The vault is 2.41m high and has a circular ceramic ceiling ventilator located at its apex. Additional ventilation is provided in the party wall by a rectangular opening, 0.38m wide, 0.63m deep and 0.38m high, originally with a single row of glazed ventilation bricks at either end. Also in the party wall are three lamp recesses which provided a common light source for the lobby and both stores; each recess is 0.38m wide, 0.63m deep and 0.54m high, with York stone sills and lintels. At the base of the walls, the floor is painted with a continuous white strip, 0.15m wide.

The

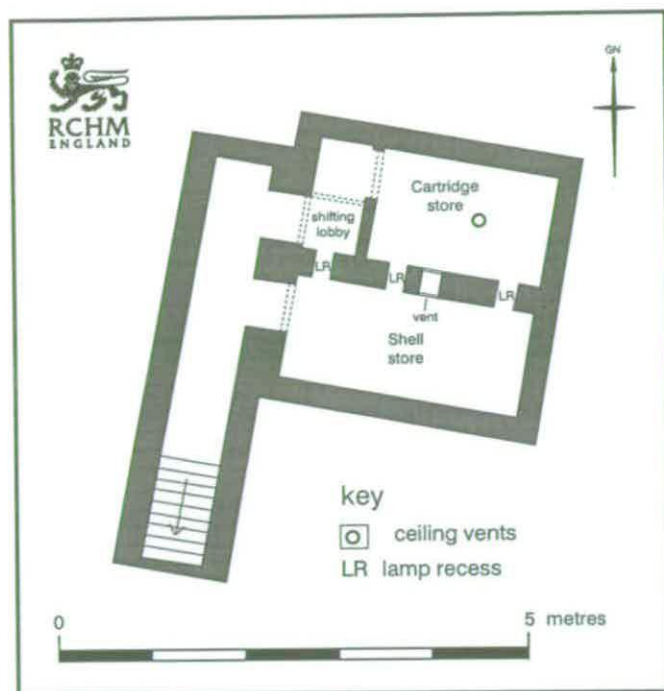


Figure 25
RCHME plan
of South
magazine

There is minor variation in contemporary plans over the four recesses in the party wall. Today, three are common to both stores, the fourth to the shell store and shifting lobby. A plan, apparently dated 1894, shows the two northern recesses as common but the southern ones only on the shell store side (PRO: WO 87/4054/3); a second plan, dated 1892, shows the three northern as common, with the southern recess only on the shell store side (PRO: WO 78/5141/8). Evidently such details could be altered during or shortly after construction.

3-pounder QF gun emplacements (Figures 26 & 14)

Emplacements for 3-pounder QF guns providing flanking fire for the 10-inch and 6-inch BL guns. Built in 1898 (PRO: WO 78/5141/3) and not used after 1910 (PRO: WO 78/5141/8).

(16) Northern emplacement

NGR: TM 2621 3173

A concrete gun floor reached by steps rising 0.82m from the west, with a 0.22m high wall on its eastern side. Although the securing bolts have been removed, the position of the gun holdfast is visible as a circular mark in the concrete platform, 1.22m (4ft) in diameter. Metal staples along the back of the gun floor are for the uprights of later metal railings (PRO WO 78/5141/8). There were two ready-use ammunition lockers: one survives in the rear wall of the gun floor, 0.90m wide, 0.69m deep by 0.64m high, with traces of a wooden frame for double doors; the second, situated in the northern end of the wall, is now obscured (PRO: WO 78/5141/8).

(17) Southern emplacement

NGR: TM 2620 3168

A concrete gun floor reached by steps rising 1.18m from the south-western corner, with a 0.77m high wall forming the south-eastern face. The wall contains a single recess, 0.30m wide, 0.24m deep by 0.30m high, possibly for a telephone. Six metal bolts form a circle of 0.97m (3ft 2inches) diameter, marking the location of the gun holdfast, and staples across the back of the gun floor indicate the uprights of a later railing. There are two lockers for ammunition let into the rear of the gun floor, the first 0.93m wide, 0.61m deep by 0.62m high, with no evidence for doors; the second is similar, but is cut through by the shelter for crews of the 6-inch Mark VII guns (36). Construction of the shelter also destroyed a second flight of steps to the gun floor (PRO: WO 78/5141/8).

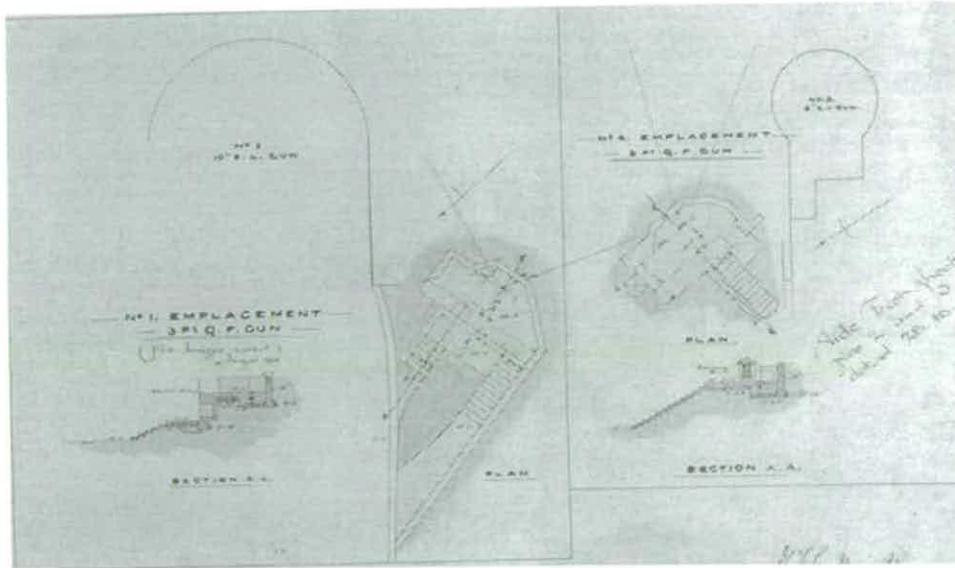


Figure 26
Plan dated
1898 of the
two 3-pounder
gun
emplacements
(PRO: WO
78/5141/8)

(18) Kingsgate magazine

NGR: TM 2614 3172

Ammunition store for 3-pounder QF guns, built 1895 (PRO WO 78/5141/3) (Figure 27).

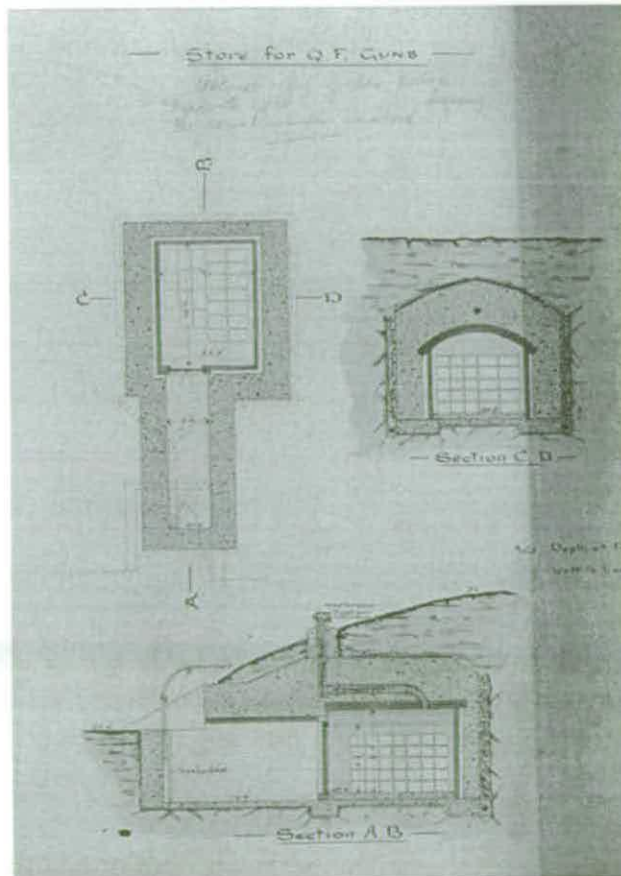


Figure 27
Plan dated
1895 of the
ammunition
store for the
3-pounder QF
guns (Kingsgate
magazine)
(PRO: WO
78/4054/3)

A subterranean magazine (Figure 18) in cavity-walled construction, comprising a concrete shell with brick lining. It is reached by a fixed ladder which descends 2.55m below ground level, next to a davit for a crane hoist. There is slight evidence for a gate at the entrance to the magazine. The magazine comprises a passage, 2.30m high, aligned roughly east-west, and a single room at the eastern end; both have shallow barrel vaults and concrete floors. There is evidence of secondary electric lighting, and the magazine is whitewashed throughout.

The store is entered through a doorway, 1.60m wide by 2.11m high, originally with double outward-opening wooden doors. Ventilation is provided by a single circular ceramic ceiling ventilator at the apex of the vault and a low-level rectangular ventilator with glazed ceramic bricks. There is no evidence for shelving in the store.

Gun sheds and artillery store for 3-pounder QF guns and Ordnance Artificers workshop
(Figure 28)

NGR: TM 2617 3178

Gun sheds and artillery store built in 1894-5 but guns not used after 1910 (PRO: WO 78/5141/8). North shed used as a Moveable Armaments shed in 1936 (PRO 78/5135/3); south shed used as a Fire Engine shed in 1936 (PRO 78/5135/3) and during the Second World War (PRO WO 192/211). Artillery store used as such into the Second World War (PRO WO 192/211). Artificers workshop built in 1898 (PRO WO 78/5141/3) and remained in use into the Second World War (PRO WO 192/211).

Sheds, workshop and store are conjoined structures forming a long range of four rooms facing north-west, built into the lower slope of the central mound. The rear wall, floors and flat roof are of concrete construction, the remaining walls are brick. The roof is coated with a thick asphalt layer.

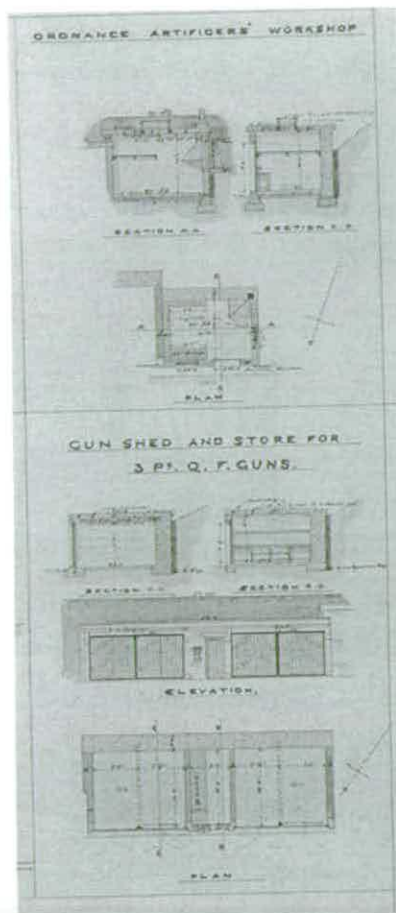


Figure 28
Plans dated
1898 of the
3-pounder gun
sheds and
artillery store
and the
artificers'
workshop
(PRO: WO
78/5141/8)

(19) Gun sheds

There are two identical gun sheds for the 3-pounder guns, each measuring 4.45m by 3.95m, with a small artillery store between. The roof is reinforced with axial iron girders on York stone pads. Now apparently open-fronted, each shed originally had two pairs of outward-opening full-height wooden doors: the vertical iron columns between each pair survive, as do some of the large metal door hinges. Iron girders run at roof level from the columns to the rear wall, possibly to anchor lifting gear. The floor is slightly higher inside. The interiors are whitewashed and there are brackets for shelves on the north-east wall of the south shed. The north shed differs only from the southern in that the north-west side has been bricked in, and a doorway, 0.91m wide by 1.92m high, inserted in the north-east wall and approached through a brick lobby of unknown date. Two windows in the lobby, both 0.92m wide by 1.18m high, have concrete sills and lintels.

(20) Artillery store

The artillery store lies between the gun sheds and is a small room, 2.00m by 3.75m, entered through a doorway 0.89m wide by 2.05m high, with a concrete sill and a York stone lintel. A tiny window adjacent, 0.32m wide by 0.59m high, uses York stone in both sill and lintel and there are York stone pads in the north-west wall which support the door hinges of the gun sheds. The interior is whitewashed and scars along

the north-east wall are from an original bench. Electricity was provided. A secondary baffle wall protects the entrance.

(21) Ordnance Artificers' workshop

The Ordnance Artificers' workshop is a small rectangular room, 4.30m by 3.03m, with a single doorway in the north-west wall, 1.20m wide by 2.44m high, with a concrete sill and a chamfered

stone lintel. The double doors opened inwards. A sign above the doorway reads 'FITTERS' above part of an earlier sign which probably says 'ARTIFICERS'. The adjacent window, 0.96m wide by 1.30m high has a concrete sill and a chamfered stone lintel, while another of similar size in the south-west wall has concrete lintel and sill and vertical metal security bars. The roof is reinforced with cross axial iron girders. The interior is whitewashed and in the southern corner, the original hearth and scar from a forge canopy survive, though all metalwork has been removed. Ventilation was provided by high level metal grilles in the south-west wall and by a small skylight which was blocked with concrete by 1903 (PRO WO 5141/8). Scars along the north-east and north-west walls are from shelves, on the south-east wall from a bench.

Along the southern end of the artificers' workshop, a secondary flight of steps leads up to the roof, where a concrete sill measuring 6.80m by 3.05m is the base of a building visible on aerial photographs taken before and during the Second World War (Harwich Society 1936; NMR AP: 58/85/Part 1/5043-5) and described as a 'hut' on a Second World War plan (PRO: WO 192/211).

A yard on the north-east of the whole range contains a concrete ledge with several pipes in the recess below.

(22) Depression Range Finding (DRF) post

NGR: TM 2617 3176

A 1.80m-square concrete plinth with two steps ascending to the south-east is probably the site of a DRF post for the guns in the first decade of the 20th century (PRO WO 78/5141/3).

(23) Depression Range Finding post

NGR: TM 2615 3171

Little remains of this DRF post, other than its concrete base and an upright pillar, 0.42m square and 1.26m high, for the depression range finding equipment. The pillar has the usual side niche for a telephone and power cables. It is probably contemporary with the telephone room (24) built in 1898. The post was used during the Second World War until the construction of the BOP (51).

(24) Telephone room for DRF post (Figure 29)

NGR: TM 2614 3170

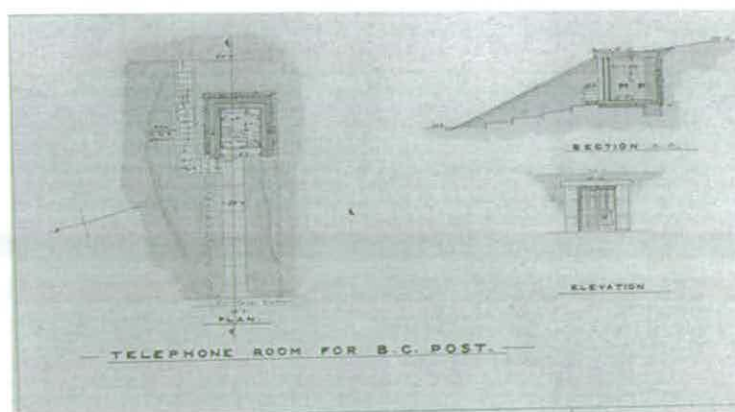


Figure 29
Plan dated
1898 of the
telephone
room for one
of the DRF
posts (PRO:
WO
78/5141/8)

Built in 1898 (PRO: WO 78/5141/8).

A three-sided brick structure, 2.43m by 2.15m by 1.92m high, of cavity-wall construction with a flat concrete roof, now partly destroyed. It is built into an artificial cutting. A wooden partition across the fourth side had a doorway and a

window but no longer survives. Inside were telephones and tables (PRO: WO 78/5141/8). Steps immediately outside the north wall lead up to the DRF post (23).

6-inch BL gun emplacement, magazine and shelter (Figure 30)

NGR: TM 2621 3183

An emplacement for a 6-inch BL gun was built in 1901 with a magazine and shelter. A Defence Electric Light (DEL) was situated in front of the emplacement by 1916 (PRO: WO 78/1886/2), but was destroyed by the construction of a 6-inch Mark VII emplacement (47) in 1941.

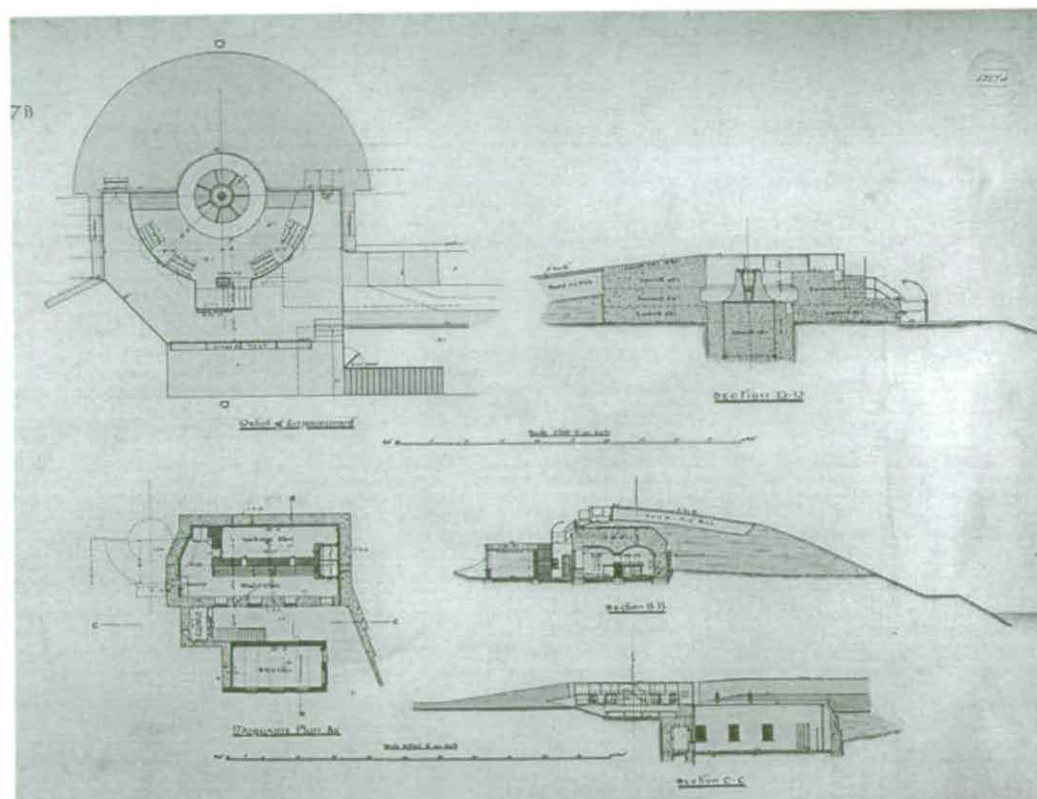


Figure 30
Plan dated
1901 of the
new 6-inch
BL gun
emplacement
with magazine
and shelter
(PRO: WO
78/4054/4)

(25) Emplacement for 6-inch BL gun on converted QF mounting

Very little remains of this concrete emplacement, destroyed or buried beneath structures associated with the 6-inch Mark VII emplacement and ammunition tunnel. Parts of the gun floor, 1.18m high, north wall, 0.77m high, and south flanking wall survive as does a cartridge lift. The lift opening, 0.57m wide, 0.82m deep by 0.51m high is in the right side of the emplacement, closed by a single outward-opening heavy metal door: much of the lift mechanism is *in situ*. There is an open recess, always without doors (PRO: WO 78/4054/4) in the south flanking wall and nearby, a short length of original concrete ramp leads up out of the emplacement but is now obscured by earth.

(26) Magazine

The subterranean magazine for the 6-inch guns is of concrete construction with brick cavity wall lining on all but the entrance front, and twin brick barrel vaults along its axis. It has a single entrance for outward-opening double doors, 1.84m wide and 2.16m high, with a chamfered and stopped concrete

lintel and a plain sill; a sign above the doorway reads 'A2 MAGAZINE'. One side of the doorway is occupied by a concrete block, 0.49m wide, 0.73m deep and 0.82m high, which helped to support a later shelf running east-west along the shifting lobby (see below). The building is rectangular in plan but with a slightly irregular north wall; it is sub-divided into shifting lobby, shell store and cartridge store. The entire structure is whitewashed, with the exception of the area around the cartridge lift in the north-west corner, which is painted black.

The shell store is encountered immediately inside the entrance and occupies a rectangular space along the west side of the building, 8.55m long by 2.75m wide. A central circular ventilator pierces the vault. There are two original windows in the west wall, 0.94m wide by 1.60m high, each with its own vault skillfully let into the main vault; they have chamfered and stopped concrete lintels and plain concrete sills. A doorway, 2.05m wide by 2.03m high, has been inserted into an original third window, giving onto a small room measuring 3.15m by 2.60m. This room replaces a smaller lamp room, originally entered from the courtyard in front of the magazine (PRO: WO 78/4054/4), and contains the shaft for the cartridge lift associated with the 1941 6-inch Mark VII gun (47).

Metal brackets along the east wall of the shell store supported shelving at a height of 1.00m, on which the shells were placed. An angled lamp recess in the south wall provided light for the shell store and the shifting lobby.

The north end of the shell store is continuous with a space which spans the north end of the magazine: this is an original arrangement which contained the ammunition lifts. One of these survives in the east wall; a recess, 0.93m by 1.21m, containing the metal and timber mechanism of a band lift, for cartridges, with the winding handle still present. The other original lift, a ladder lift, occupied the north-western corner of the magazine, but it has been removed. Light for the lifts was provided by lamp recesses above the issue hatch of the cartridge store and in the northern end of the shell store's west wall.

The shifting lobby lay directly in front of the entrance; it had doors at each end, a central waist-high wooden barrier, and a seat and coathooks along the north wall (PRO: WO 78/4054/4). All this was at some time removed to accommodate extra shell storage; the concrete supports for a shelf survive along the south wall.

The cartridge store, reached through the shifting lobby, is a rectangular room, 7.93m long and 2.75m wide, with a single ceramic ventilator in the vault. Originally, two simple lamp recesses in the party wall provided light for both the cartridge and shell stores. They have York stone sills and lintels and are ventilated into the wall cavity; metal frames for glazing occur on the shell store side. An issue hatch in the north wall has an internal sliding wooden door (similar to that inserted into the southern cartridge magazine in the main magazine (6)), and another lamp recess above, providing light on either side of the wall. An original second lamp recess next to this one is apparent in the brickwork but all traces of it have been hidden below the whitewash.

A courtyard in front of the magazine originally had a flight of steps leading up to the north, providing direct access to the original 6-inch gun emplacement. No sign of them survives.

(27) Shelter

A shelter built in 1901 for detachments for the 6-inch QF gun.

A rectangular brick building, measuring 7.62m by 3.65m internally, with a concrete floor and a flat concrete roof coated with a thin layer of asphalt. A simple blast wall outside the western elevation survives to a height of 1.37m. A doorway, 0.95m wide by 2.18m high, in the south wall has an internal wooden frame for outward-opening double doors. Next to this is a window measuring 0.93m wide by 1.54m high externally (internally the opening is 0.22m wider and 0.17m taller); two windows in the

west wall are identical. The door and windows have plain concrete sills and chamfered concrete lintels. A doorway, 0.93m wide by 2.02m high with an internal frame for an inward-opening door, has been inserted into an earlier window opening (PRO: WO 78/4054/4) at the northern end of the west wall. The north wall, which is of cavity construction, is almost totally destroyed, though the glazed ventilation bricks survive in the west wall. Ventilation is provided by a single steel-lined circular ventilator in the south-west corner of the ceiling. On the walls are the remains of several layers of paint including a black band at dado level with green below. There is a possible scar for a bench or table along the east wall, and heavy metal hooks, anchored through the walls, along the east and west walls.

Outside the inserted doorway is a protected porch leading to steps up to the 1941 6-inch Mark VII gun emplacement (47).

Attached to the eastern side of the shelter is a small room measuring 2.82m north-south by 1.55m transversely. Of brick construction, it has a concrete floor and a flat concrete roof, slightly lower than the roof of the shelter. The single doorway in the south wall measures 0.77m wide by 2.00m high and had a wooden frame for an inward-opening door. A single window in the east wall measures 0.49m wide by 1.00m high externally (internally the opening is 0.17m wider and 0.07m taller). The doorway and window have plain concrete sills and chamfered concrete lintels. Internally, the room appears to have been painted yellow, and the remains of wooden shelving survive along the east, north and west walls.

(28) Artillery store

NGR: TM 2617 3182

Artillery store built 1901 and rebuilt 1903 (PRO: WO 78/5141/3).

No signs of this store survive, but its location is occupied by a timber and corrugated iron shed.

(29) Shelter (Figure 31)

NGR: TM 2620 3177

Constructed as a shelter, presumably for detachments of the 4.7-inch guns, in 1903 (PRO: WO 78/4054/1), this building has undergone several alterations through its history, probably at some stage serving as a store.

A rectangular building, partly subterranean, measuring 9.5m by 4.0m externally (7.9m by 2.8m internally). The east wall, and the eastern parts of the north and south walls, are of concrete with brick cavity wall lining (including some glazed ventilation bricks); the west wall is entirely of brick. The floor and roof are of concrete and the latter, which slopes slightly towards the west, is reinforced on cross-axial iron beams and coated with a thick layer of asphalt. The end walls contain exceptionally large doorways, 1.07m wide by 2.65m high, with wooden jambs for outward-opening doors. The south door is a secondary insertion (PRO: WO 78/4054/1). In the west wall, two high-level windows, 1.06m wide by 0.47m high, were hinged at the top and have brick arches and stone sills. These windows were inserted into original larger openings and a third window has been totally blocked (PRO: WO 78/4054/1). Ventilation is provided by two round ceiling vents located centrally, opposite the

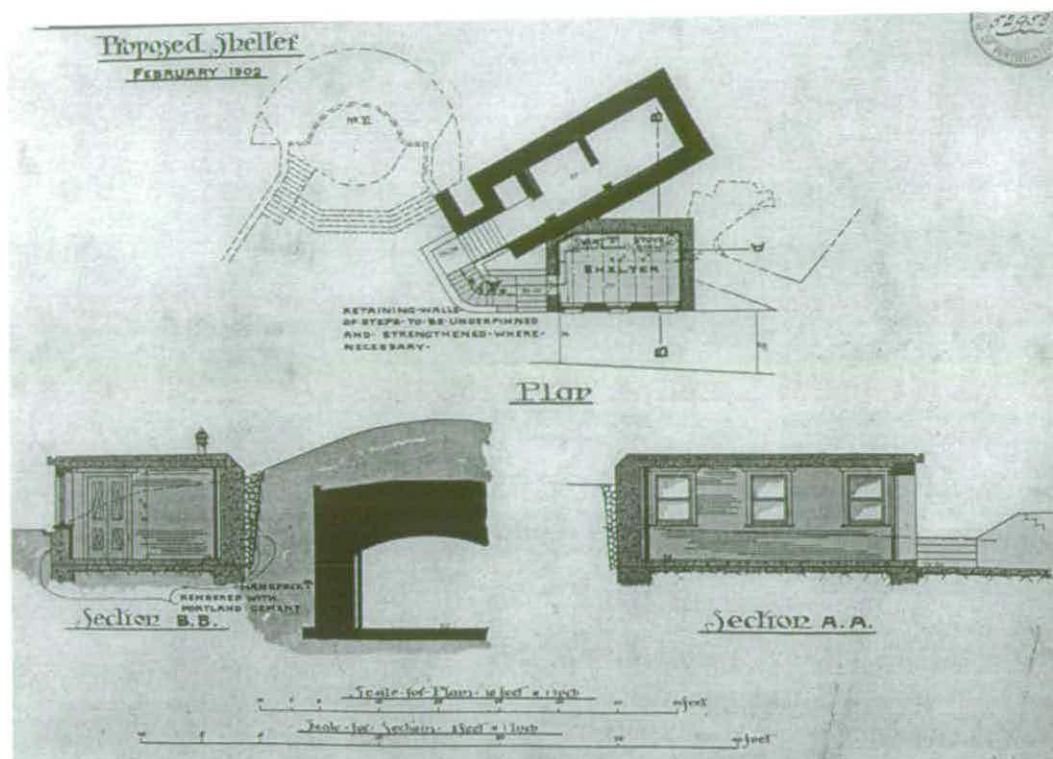


Figure 31
Plan dated
1903 of a
shelter,
probably for
detachments
manning the
4.7-inch QF
guns (PRO:
WO
78/4054/1)

windows; two smaller ceiling vents close to the west wall, one of them blocked, look secondary. There is no evidence of internal decoration but there are fittings for secondary electric power.

(30) Latrines

NGR: TM 2617 3181

Built in 1903 (PRO WO 78/5141/3).

In a cutting in the Twydall Profile, a roughly square brick building, whitewashed internally, measuring 4.75m by 3.75m externally. It has a concrete floor and the remains of a gently-sloping concrete roof with a thin asphalt coating. The building is divided into two by a brick wall: the west section comprises a single room with the remains of urinals; the east section is sub-divided into four small cubicles. Most of the structure was unroofed (NMR APs: 58/85/Part 1/5043-5).

(31) Flagstaff

NGR: TM 2615 3173

A flagstaff was erected in 1904, moved from its original location immediately south of the 10-inch BL gun emplacement (4).

The flagstaff has gone, but its location is marked by a concrete base and surrounding metal stays.

(32) Royal Garrison Artillery (RGA) Store

NGR: TM 2613 3169

Originally an oil and paint store, completed in February 1905 (PRO WO 78/5141/3), by 1916 it was an Artillery store (PRO WO 78/1866/1). Possibly also used as a shelter in the Second World War.

A rectangular structure, measuring 8.1m by 4.4m externally, in brick with a concrete floor and a flat concrete roof, reinforced by cross-axial metal girders on York stone pads, and coated with a thin layer of asphalt. Ventilation is provided by high level rectangular metal grilles in the west wall and a single circular ceiling vent, central to the room. The south wall has been rendered externally. The door and two windows in the west elevation have York stone sills and rubbed brick arches. The doorway, 1.22m wide by 2.00m high, is situated at the northern end of the west wall and has a sign above it: '(R)GA STORE'. The adjacent windows are 0.94m wide by 1.34m high and contain the remains of neatly chamfered wooden frames and internal vertical metal bars. A third window, in the south wall, is c 0.9m wide by 1.34m high but is badly damaged; it has a York stone sill and has been reinforced above with a metal girder. The damage to the window was almost certainly caused by the insertion of a pot-bellied stove in the building, with a circular vent in the wall above the window, possibly indicating use as a shelter by troops in the Second World War manning the nearby pillbox (45) and Blacker Bombard position (56). The internal walls are whitewashed and scars along the north wall indicate shelving.

A cutting in the bank immediately east of the RGA store marks the position of a hut, probably of Second World War date, when it was used as a gun store (Srnt. Baker, pers comm). The only surviving remains of this structure is the concrete hearth for a pot-bellied stove.

(33) Combined Battery Command (BC) and Electric Light Director (ELD) Post (Figure 32)

NGR: TM 2618 3169

Built in 1909-10, altered in 1913 (WO 78/1886/1), this structure was possibly still extant in 1936 (PRO WO 78/5135/3), though disused on an AP of 1936 (Harwich Society).

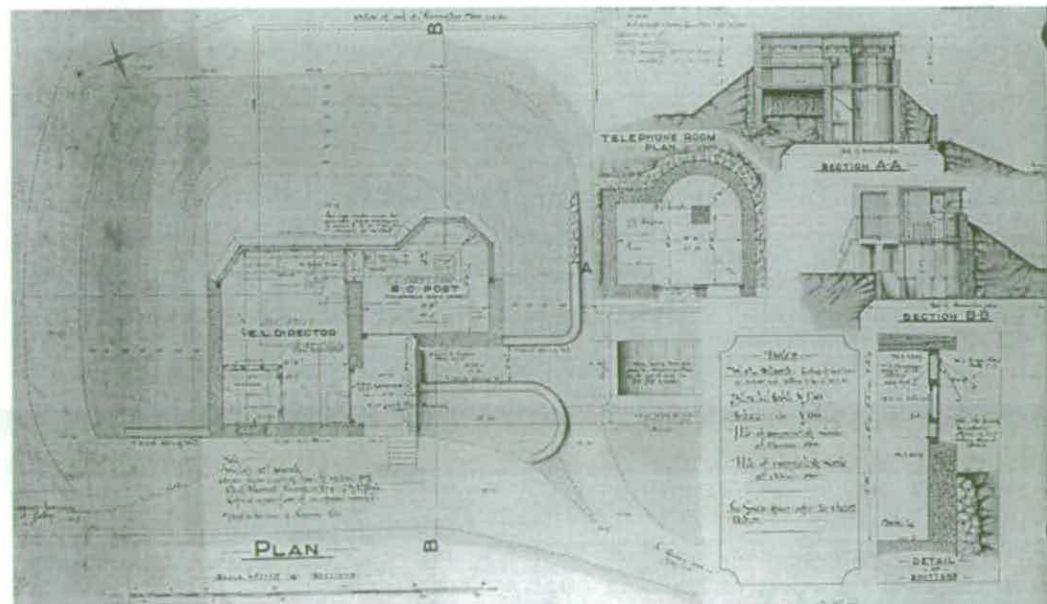


Figure 32
Plan dated
1911 of the
combined BC
and ELD post
(PRO: WO
78/1886/1)

This structure is situated on top of a large earthen mound, measuring 16.2m by 10.7m by 1.2m high, to gain the height required for its roles in battery command and searchlight direction.

The remains, now a crumbling concrete shell, represent the ground floor level: the first floor is destroyed. The surviving part consists of two rooms with flat roofs of reinforced concrete. The southern room was originally the telephone room of the post (PRO WO 78/1886/1): it is rectangular with an east-facing apse and is entered through a doorway in the west wall, 0.69m wide by 1.88m high, approached along a slightly sunken path, 0.77m wide, with revetment wall 0.83m high. A window next to the door, 0.75m wide by 1.30m high, opened outwards. Inside, just behind the apse, a concrete column 0.42m square rises to the ceiling and originally continued into the first floor room where it supported the depression range finding instrument. Two small floor level openings in the north wall, each 0.32m wide by 0.28m high, may be battery recesses (PRO WO 78/1886/1). Electric power fittings are apparent.

The northern room was always a void underneath the ELD post on the floor above: its roof overhangs that of the southern room because it formed a landing for the ELD post above, reached by external metal steps from the west (PRO: WO 78/1886/1). The room is rectangular, measuring 2.72m by 4.43m, but with a chamfered north-eastern corner; the east and west walls are smashed out. No floor is apparent and the interior is partly filled with earth and rubble.

In 1913, the ELD and BC rooms were switched over (PRO: WO 78/1886/1).

During the Second World War a Lewis gun was emplaced on top of the demolished structure (Srrt. Baker, pers comm).

(34) Petrol store

NGR: TM 2612 3175

Built before 1916 (PRO: WO 78/1886/2).

A small structure, 1.6m square, of concrete throughout with a sloping reinforced roof. It is divided into two compartments and has a central doorway, 0.57m wide by 1.65m high. Ventilation is provided by high level vents in the west wall.

Shelters for 6-inch gun detachments (Figure 14)

Two shelters of similar design for detachments manning the 6-inch Mark VII guns, built after 1916 (PRO: WO 78/1886/2).

(35) Northern shelter

NGR: TM 2620 3174

A rectangular concrete building, measuring 7.5m by 2.8m externally (6.9m by 2.2m internally), with a concrete floor and a flat concrete roof coated with a thin layer of asphalt. Timber plugs in the external wall may mark the positions of brackets for fire buckets and a brick blast wall outside the western elevation survives to a height of 1.3m. There are openings for two sliding metal doors, 0.92m wide by 1.83m high, one at either end of the west wall flanking two central windows, each 0.92m wide by 1.20m high, with metal surrounds. The doors and windows have concrete sills but no lintels. Inside are remains of a wooden floor with cross-axial joists and axial floorboards. On the walls are the flaking remains of several layers of paint including a creamy colour with a painted frieze at dado level, superseded by orange with a horizontal red stripe. There are scars of two shelves along the north and

east walls and coat hooks along the south and east walls. A pot-bellied stove fitted into an angled recess in the east wall, with a circular hole for the chimney pipe in the roof above; the hearth is defined by a low concrete sill. Ventilation was provided by rectangular metal grilles high up in the walls.

(36) Southern shelter

NGR: TM 2620 3168

A rectangular building of concrete throughout, 9.52m long by 2.21m internally (10.05m by 5.0m externally), with a flat roof coated with a thin layer of asphalt. It was ventilated by rectangular metal grilles high up in the walls. A simple blast wall, 0.60m wide at the base, 0.22m wide at the top and surviving up to 1.61m high, runs along the north-western or entrance front. Here are openings for two sliding metal doors, 0.92m wide by 1.83m high, with two windows between them, 0.92m wide by 1.20m high; a third window lies beyond the easternmost door. The windows have metal surrounds and, like the doors, concrete sills but no lintels. Inside are signs of some basic comforts: the remains of a wooden floor with cross-axial joists and axial floorboards and a pot-bellied stove fitted into an angled recess in the south-west wall, with a circular hole for the chimney pipe in the roof; the hearth is defined by a low concrete sill. There are several layers of paint flaking from the walls, including traces of a painted frieze like that in the other shelter. Marks in the paint indicate shelving and coathooks along the north-west wall.

(38) Oil store (Figure 33)

NGR: TM 2615 3179

Datable to before 1936 (Harwich Society).



Figure 33
Photograph of
the oil store;
interior
showing
supports for the
oil tanks
(NMR:
BB97/5462)

A brick structure of temporary construction, one course thick, with brick buttresses at regular intervals, measuring 13.5m by 3.5m. It has a concrete floor and a flat concrete roof coated with a thin layer of asphalt and supported on cross-axial metal beams. The walls are pebble-dashed externally and contain high level metal grilles for ventilation. A doorway located centrally in the north-west wall, 2.7m wide by 2.8m high, has metal sliding double doors, one of which is displaced; they are signed

'OIL STORE'. The interior is whitewashed and on the floor is a line of nine concrete blocks which formerly supported oil tanks; those at the ends measure 1.08m by 0.30m by 0.50m high, while the other seven are 1.08m by 0.55m by 0.50m high. A pipe issues from the floor at the southern end of the building. The end walls have been almost totally destroyed, possibly during the removal of the oil tanks.

(39) Latrines

NGR: TM 2616 3171

Post dates 1916 (PRO WO 78/1886/2); present on an AP of 1936 (Harwich Society) and on a Second World War plan in Fort Book PRO WO 192/211.

A roughly square brick building, whitewashed internally, measuring 4.0m by 3.75m externally, with a baffle wall protecting the north-east entrance. The south-east side is badly damaged. It has a concrete floor and a gently-sloping concrete roof with a thin asphalt coating. It is divided into two by a brick wall; the larger north section contains two cubicles and the remains of three urinals; the smaller south section contains one cubicle and probably had a single urinal on the south-east wall, though this no longer survives. The division is between soldiers (north) and officers (south) (PRO: WO 192/211). Ventilation was provided by simple rectangular grilles high on the north-west wall. The urinals area was unroofed (NMR APs: 58/85/Part 1/5043-5).

(40)? Control post

NGR: TM 2621 3176

Undated but visible on a 1936 aerial photograph (Harwich Society). This structure, which had huge amounts of wiring associated with it, may have been the control post for moveable CASLs (41-43) along the crest of the east-facing slope during the Second World War (Srnt. Baker, pers comm).

A semi-subterranean brick structure with a concrete floor and a flat reinforced concrete roof. Internally it is 2.60m by 1.47m and 1.86m high, reached by two steps down from the Infantry Wall (3). This room was provided with a massive amount of electric wiring.

(41-43)? Coastal Artillery Searchlight positions

NGRs: TM 2622 3175, TM 2623 3172, TM 2624 3168

Three amorphous depressions, on average 6.2m by 4.2m, are located along the eastern side of the Fort, overlooking the Haven. Each is situated close to one of the original gun emplacements and may be the sites of artillery searchlights, which are known to have been located along the east-facing cliff during the Second World War (Srnt. Baker, pers comm).

(44) Observation post

NGR: TM 2621 3171

On the site of an 1892 infantry position (PRO: WO 5141/3). The structure is visible on a 1936 aerial photograph (Harwich Society), and is possibly a site marked GGC on a 1945 plan (PRO: WO 192/211).

A three-sided concrete structure with no roof or floor. Facing east over the haven, it measures 1.40m by 1.25m and 1.10m high. The front wall is substantially thicker than the sides, 0.64m compared to

0.16m, and slopes down into the structure; three narrow grooves on top of this wall may have supported a timber superstructure. In the back of the east wall a recess, 0.80m wide, 0.40m deep and 0.93m high, has a timber frame for a door. A similar recess in the south wall, a 0.30m cube, has no timber frame. A concrete platform behind the structure has a railing across the back and the start of metal steps leading down the slope behind.

Pillboxes

Second World War, probably dating to mid-1940 (Roger Thomas, pers comm). These pillboxes are similar to Type 27 style, but hexagonal rather than octagonal (Lowry 1995, 83). It is possible that the pillboxes were designed to take Bren light machine guns, both inside and in the central AA pit (Roger Thomas, pers comm; Wills 1985, 34-5).

(45) Southern pillbox

NGR: TM 2612 3168

A hexagonal concrete pillbox with sides of 3.7m externally, at the south-western corner of the Fort, entered through a low passage, 0.69m wide by 1.77m long by 1.15m high, with an anti-ricochet rear wall. The interior is a hexagonal passage, whitewashed throughout, with embrasures in each side, all of which are of Bren-gun type: they are splayed internally and stepped externally, with rectangular boxes below for ammunition; some of the bolts for the gun mounting survive. A central hexagonal pillar is in fact hollow and originally contained a small door into an AA gun pit but the door is blocked, the pit infilled and the bolts of a holdfast for a secondary light AA weapon are evident on top of the pillbox.

(46) Northern pillbox

NGR: TM 2622 3184

This example is identical except that the central AA gun pit survives: the circular pillar, 0.58m in diameter, with metal pivot for a Bren machine gun or similar weapon *in situ* and the pit retains traces of camouflage paint. The doorway from it to the pillbox, 0.44m wide by 1.05m high, is also extant. This pillbox could only have operated to landward following construction of the casemate for the 6-inch Mark VII gun emplacement (47).

(47) 6-inch Mark VII gun emplacement (Figure 34)

NGR: TM 2623 3184

A casemated gun emplacement (Figure 35) constructed in 1941 using reinforced concrete and iron throughout, with an anti-strafting protective cover. It replaced and almost totally removed the 1901 6-inch BL gun emplacement (25), while re-using its magazine (26) and shelter (27); it partially superseded a pillbox (46).

Casemate

The casemate is a rectangular wall 2.95m high extending around part of the sides and the rear of the gun emplacement, and entered through a simple opening in the west, or rear wall. Against the northern side it includes a small rectangular room, measuring 2.45m by 1.22m, reached through a doorway 0.92m wide by 1.82m high. The door opened outward. The room probably received and directed electric and hydraulic power to the gun and emplacement: a continuous channel in the floor leads around the room and out into the gun pit. Scars on the walls are probably from shelving, power boxes and coathooks.



Figure 34
Photograph of
the 6-inch
Mark VII
emplacement
which
replaced the
1901 6-inch
BL
emplacement;
view from
south showing
the terraced
concrete
buttressing



The casemate roof is an anti-strafting cover, comprising a framework of iron girders supporting a roof of 3ft-square (0.96m), 3in thick (7.5cm) concrete-asphalt tiles. The upright girders holding the roof are carried on small concrete pads.

Along the back wall of the casemate are five recessed ready-use ammunition lockers, two of which about the sides of the pillbox. Measuring on average 1.00m wide, 0.95m deep and 0.95m high, the recesses have metal frames for outward-opening double doors; one is labelled 'CARTRIDGE'.

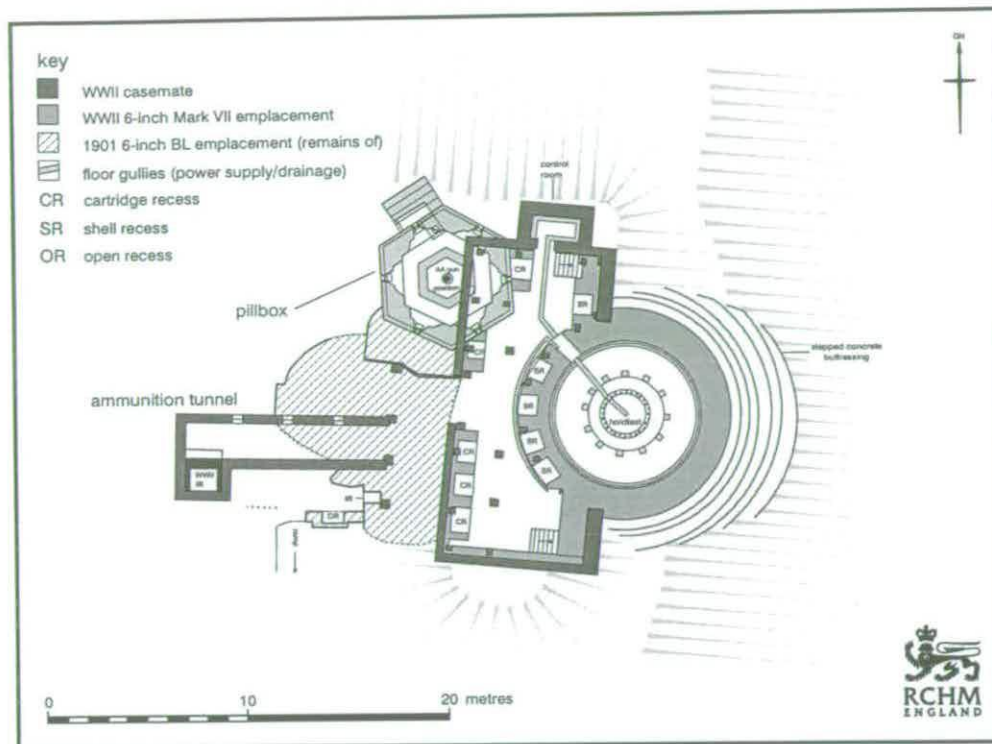
Emplacement

The gun emplacement itself is reached by two upward flights of steps at the northern and southern ends of the casemate. The rear of the emplacement contains five recessed lockers for ready-use ammunition, measuring on average 1.00m wide, 0.95m deep by 0.90m high. Several have heavy-duty metal frames for outward-opening double metal doors, and at least one is labelled 'SHELL'. A drainage gully runs around the outside of the emplacement.

The emplacement defines a circular gun pit 7.5m in diameter and 1.62m deep, partly covered by a platform supported on concrete pillars leaving a central circular aperture, 4.0m wide, for the mounting of the 6-inch Mark VII gun. The heavy holdfast bolts in the base of the gun pit are offset in two concentric circles of 2.23m and 2.25m diameter. The channel bringing power to the gun, rebated for metal covers, runs into the gun pit through a gap in the emplacement, 0.75m wide, in the north-western corner.

This gun was sited on the edge of the promontory overlooking the Haven. Such was the potential instability of the site that the emplacement has been strengthened with six tiers of roughly concentric concrete buttressing, such that it resembles a 'wedding cake' when viewed from a distance. The buttressing, which is visible in aerial photographs dated 1944 (NMR APs: 106G/LA/17/4102-3), has not prevented the appearance of large cracks in the structure.

Figure 35
RCHME plan
of the 6-inch
Mark VII
emplacement
with
underlying
pillbox,
showing the
position of the
1901 6-inch
BL gun
emplacement



Ammunition tunnel

Behind the casemate to the west, but offset southward from its entrance, is a covered corridor, 10.1m long and 1.85m wide internally. It is lit partly by natural light at high level in the north wall by three six-light windows, each 0.53m wide by 0.36m high. At the far end the south wall is carried around the shaft of an ammunition lift from the magazine below, accessed through an opening in the wall, 1.80m by 1.66m deep, with a shelf 0.49m wide projecting into the corridor at waist level. An electric light bracket survives above the lift. Brickwork in the lift opening is a late feature. Ammunition would have been unloaded and taken along the corridor on wheeled trolleys to the ready-use ammunition lockers in the casemate. An external sign on the northern wall denotes the most recent military designation of the gun: 'A3 EMP(LACEMENT)'.

(48) Cornwallis Battery: Twin 6-pounder emplacement (Figure 36)

NMR: TM 2621 3166

A self-contained battery (Figure 37) constructed in 1941. Mainly of reinforced concrete construction, it comprises a casemated gun emplacement, a BOP tower over, a sunken war shelter for the detachment and a subterranean magazine. The guns, which had a range of 7 miles, and which once sunk a torpedo boat during target practice, were never fired in anger (Srn. Baker, pers comm).

Figure 36
 Photograph of
 the Cornwallis
 Battery
 showing the
 emplacement
 and its BOP to
 the rear; view
 from the
 south-east
 (NMR:
 BB97/5383)



Emplacement for Twin 6-pounder gun

The gun emplacement is protected by a casemate which has a flat roof with a thick asphalt covering. On the two external sides to seaward, the casemate has the added reinforcement of a thick battered shell, and retains traces of camouflage paint. The interior was lit partially by natural light from high level in the rear walls by a row of small square, inward-splayed openings which were originally glazed. Access to the casemate is on the south-west through a doorway, 0.91m wide by 2.05m high, reached by four steps from outside, and protected by an L-shaped covered lobby.

Just inside the entrance, the opening for the vertical ammunition lift from the magazine has been blocked in concrete but the recess in the rear wall of the casemate is extant, measuring 1.85m wide by 1.35m deep by 1.70m high. The remains of metal stanchions on the wall and floor in front of the lift recess may be part of a table or shelf onto which the shells were placed before being taken to the ready-use ammunition lockers nearby (see below).

The gun pit, circular at the rear and angled at the front, is 0.95m deep, with a deep spent cartridge recess along its rear face: marks from ejected cartridges can be seen. A metal fighting platform, 0.82m high, is set into a trough, 0.41m deep, around the rear of the pit. There are steps onto this platform at its north-eastern end. The central gun mounting comprises a circle of 1.99m diameter, and the securing bolts for the holdfast survive.

Behind the gun pit is a semi-circular gun floor, 1.82m high, supporting two concentric metal rails on which ammunition trolleys were wheeled to the breech of the guns. Steps lead up to the gun floor from the north-east, protected by the casemate. Set into the rear of the platform are five ammunition lockers (1.38m wide by 0.92m deep by 1.00m high), with metal frames for outward-opening double doors; remains of electric lights survive between each recess.

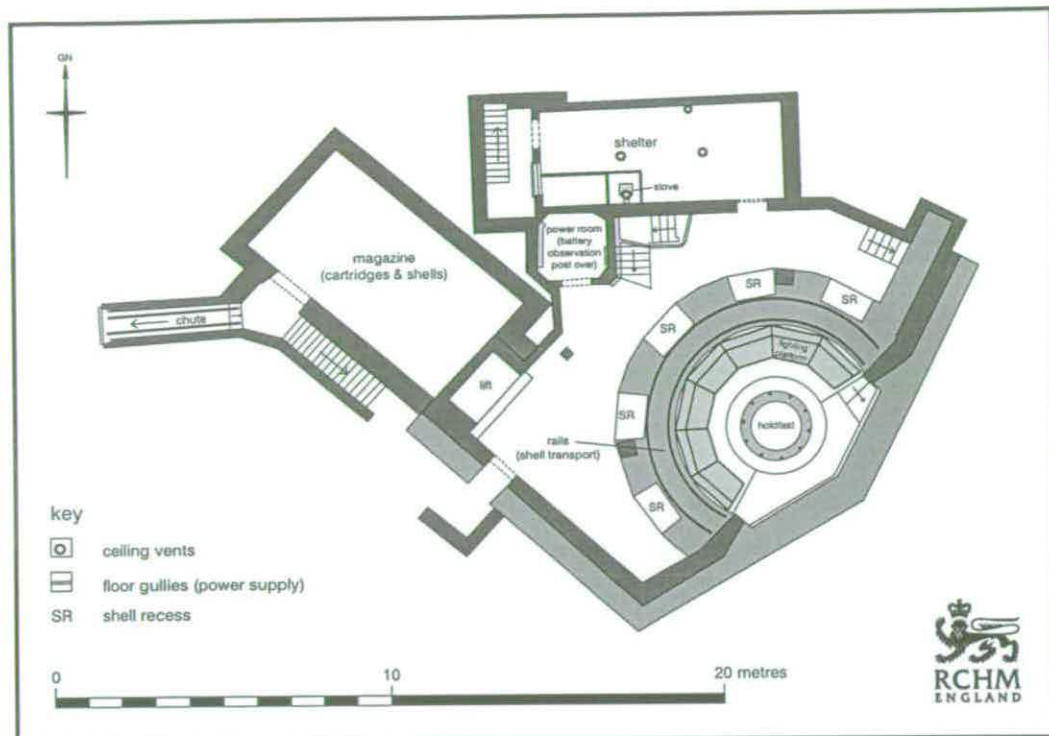


Figure 37
RCHME plan
of the
Cornwallis
Battery,
including
magazine and
shelter

Shelter

The war shelter is a sunken rectangular room of brick construction, measuring 7.31 m by 3.06 m, against the northern side of the casemate. It is reached from the casemate through a single doorway, 0.77 m wide by 1.94 m high, with the remains of a wooden frame for an inward-opening door. Another doorway, 0.92 m wide and 1.96 m high, in the west wall gives onto a roofless lobby with steps up to ground level. This wall also has a window onto the lobby, 0.94 m wide and 0.86 m high, with a metal frame for outward-opening double lights, and a concrete lintel and sill. The interior was lit electrically and has several layers of paint, cream the most recent, and coathooks were ranged along the north and east walls, with scars from a shelf above them on the north wall and gun racking below on the east wall. A concrete surround for a stove and water tank survive on the floor in the south-west corner, with a circular hole for the stove pipe in the ceiling above. The shelter is ventilated by two circular ceiling vents placed centrally to the axis of the shelter, and by a third smaller one, perhaps inserted, close to the north wall.

Battery observation post

The BOP was contained in a four-storey concrete tower served by external steps, which may have been protected by metal shuttering, rising from inside the casemate; a painted sign '6 PDR BOP' survives on the wall at the foot of the steps. Each floor is a single room: the lower two are 2.1 m square with angled corners, while the upper two are rotated through 45°, and are 2.43 m square. The rooms have metal frames for heavy outward-opening metal doors. A narrow slit in each floor presumably allowed access for power cables and metal water pipes provided heating from the stove and boiler in the war shelter.

The ground floor room is reached by a doorway in the south wall, 0.90 m wide by 1.98 m high. It has no windows. Small recesses in the floor and scars on the walls are probably connected with distribution of electric power throughout the battery.

The first floor room, entered through a doorway in the south wall, 0.75m wide and 1.82m high, has no internal features, but was probably the telephone exchange for the battery (Smt. Baker, pers comm).

The second floor room, with a doorway in the south-west wall, 0.90m wide and 1.89m high, has an observation embrasure, 0.60m high, extending the full length of the south-east wall and 0.89m along the adjoining walls. The remains of vertically-sliding internal galvanised shutters survive, though all glazing has gone. External metal shutters along the south-east and north-east walls open downwards onto metal strut supports; others to the south-west open upwards to prevent blocking of the steps there. Inside, the scars of coathooks are situated beside the door. This room functioned as the searchlight direction station, and possibly also for the commanding officer (Smt Baker, pers comm).

The third floor room, reached through a doorway 0.93m wide and 2.01m high in the south-east wall, originally had a wooden floor; the concrete base is 0.63m lower. An observation embrasure is identical to that in the room below, except that all external shutters open downwards. A central concrete pillar, 0.54m square and originally 1.19m high, supported a Coast Director 13 instrument for gun control (Anon 1981, 6), with telephone niche below, 0.22m wide, 0.34m deep and 0.62m high. Scars from coathooks and shelves occur on the south-west wall. The scar of a box on the wall may relate to power supply or telephone communications.

Magazine

The Twin 6-pounder magazine comprises a subterranean rectangular chamber reached by a flight of steps and an inclined chute, both of which descend 2.67m to a small lobby outside the main room. The steps are now partly blocked. The magazine is 7.28m long (8.78 to the back of the lift) and 3.98m wide, and has a single entrance, 1.3m wide and 1.97m high, closed by twin outward-opening metal doors. The roof is flat, the walls painted cream below, and white above, a shoulder-high black line; ventilation is provided by high level rectangular metal grilles in the north and south walls. In the ceiling at the eastern end is a blocked rectangular opening for the ammunition lift and a corresponding pit in the floor below; the mechanism has been removed but it was probably electrically powered (Roger Thomas, pers comm).

Ammunition was deposited in the magazine down an inclined chute, 0.68m wide, on timber rails with metal runners on their external faces; the chute levels off as it enters the lobby. At the top of the chute are twin, outward-opening metal doors, now secured by metal bars.

(49 & 50) Coastal Artillery Searchlights (Figure 38)

NGRs: TM 2624 3163 & TM 2625 3163

Fighting lights built in 1941 to serve the Cornwallis Battery.

Located at the foot of the Fort's southern rampart and approached by a flight of steps descending from the promontory, are two identical concrete CASL cells, rectangular in plan with apsidal south-eastern walls. Both measure 3.67m by 2.89m internally and 4.50m by 3.75m externally. Each CASL has a single entrance, 1.55m by 1.99m high, with a metal frame supporting metal outward-opening double doors. The interiors are painted cream, though there is evidence of other colours beneath, and ventilation is provided by high level rectangular grilles in the side walls and a central square vent directly above the search light position. The apsidal walls are pierced by two

outwardly-splayed vertical slit embrasures, 0.10m wide by 1.03m high, with the remains of metal glazing bars and internal sliding shutters. Above these embrasures are stencilled bearings for the lights:

In the eastern CASL: NOB 125_, AOB 95_

In the western CASL: NOB 15_, AOB 1_5_ (some parts obscured)

(NOB: Normal open bearing; AOB: alternative open bearing)



Figure 38
Photograph of
two CASLs,
built for the
Cornwallis
Battery; view
from the
promenade

The flooring is of concrete with a bitumen-type coating. A cross-axial channel in the floor formerly contained a power supply for the lights, and a cross-axial girder in the ceiling above may have supported them. The positions of the lights are marked on the floor by a circular groove, 0.17m in diameter, surrounded by a painted circle of 0.36m diameter; the eastern CASL has two overlapping grooves, suggesting that the light was re-positioned.

(51) Battery Observation Post (Figure 39)

NGR: TM 2621 3178

A three-storied rectangular concrete tower built over a 4.7-inch QF gun emplacement (12); constructed in 1941 (Smt. Baker, pers comm).

The BOP is rendered and painted with camouflage: the south-east wall is painted with a door and windows to look like a house; there are even painted curtains.

Each floor, reached by an external stair on the north-eastern wall, comprises a single room measuring 6.38m by 4.56m. Just below ground floor level, a doorway under the stairs opened onto part of the 4.7-inch gun emplacement.

The ground floor room is entered through a doorway in the north-west wall, 0.91m wide by 1.96m high, with a metal frame and an inward-opening metal door. In the north-east and south-west walls, high level horizontal-slit windows splay to the interior; they have two-light metal frames which open



inwards and downwards, and there are remains of internal wooden shutters. There was formerly a boiler against the north-east wall which supplied hot water to heat the BOP: several pipes remain and pass from floor to floor through narrow slits. Similar slits in the floors on the south-west side allowed passage of electric cables. This room housed the telephones.

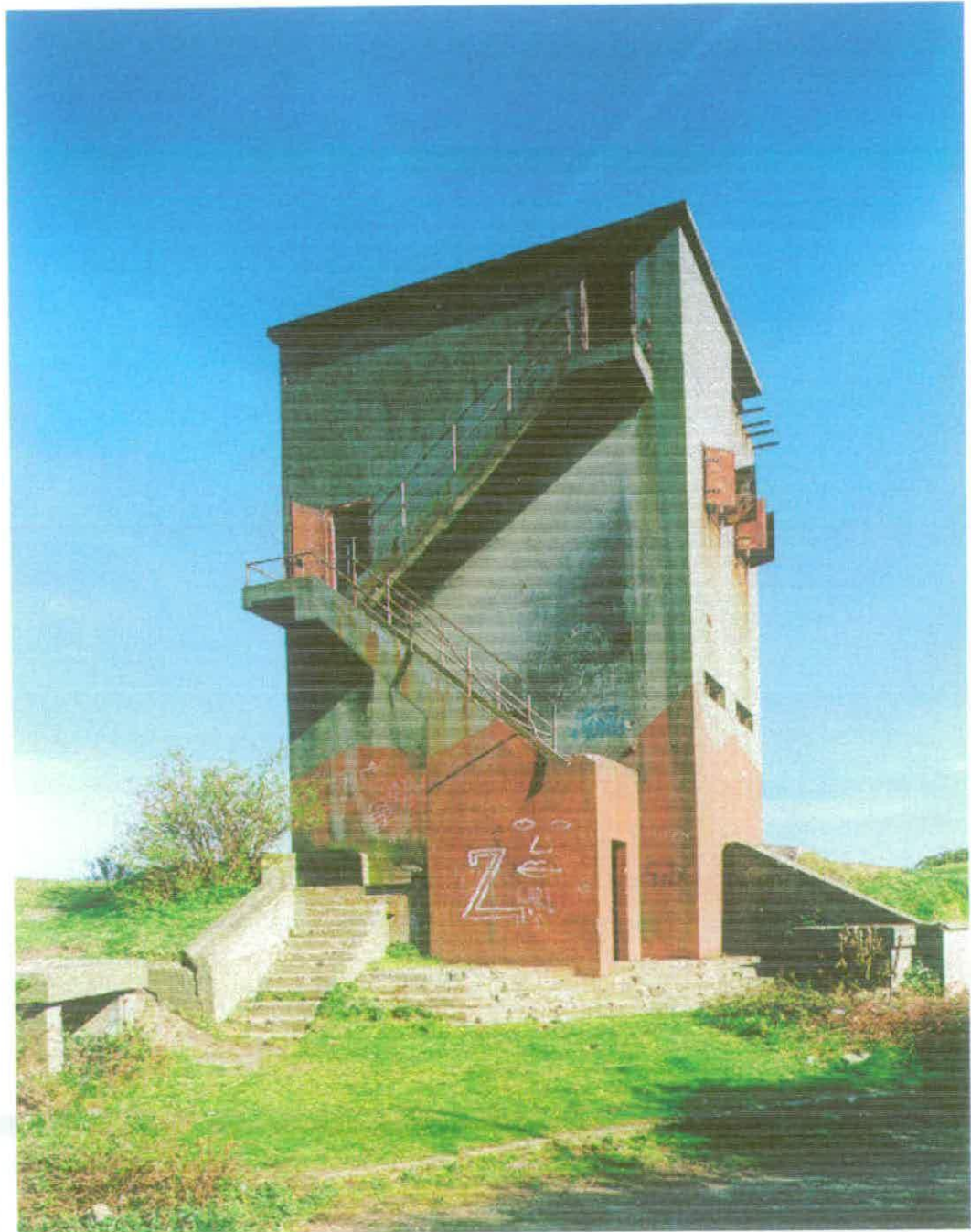


Figure 39
Photograph of
the BOP built
in 1941,
showing the
remains of the
northern
4.7-inch QF
emplacement;
view from the
west (NMR:
BB97/5425)

The first floor room is reached through a doorway in the north-western wall, 0.77m wide by 2.00m high, with a metal frame and an outward-opening metal door. The interior is painted orange with

cream above head height and there are windows in the north-east and south-west walls, each 1.07m wide by 0.92m high, with metal frames for a vertical row of three lights, opening downwards, next to a single larger light, opening sideways. All windows have external metal shutters. Heating pipes and power fittings survive. This room was for the officer in charge of the BOP.

The second floor room, with a door identical to that below, is unpainted. An observation embrasure, 0.62m high, runs the length of the south-east wall and for 1.47m along the north-east and south-west walls. The embrasure contains the remains of metal glazing bars and, below it, vertically-sliding galvanised iron shutters. External metal shutters opened downwards to rest on metal struts projecting from the walls. A central iron girder runs axially along the centre of the room and is embossed by the makers, Dorman Long of Middlesbrough. Towards the eastern corner, a pillar 0.41m square and 1.22m high supported a depression range finding instrument, and there is a small niche in the side for a telephone. Behind the pillar are bolts on the floor which anchored a plotting table. Heating pipes and power fittings survive.

(52) Engine Room

NGR: TM 2615 3175

Engine room for oil-powered engines providing power for the Fort. Built 1942-3 (Smt. Baker, pers comm) to replace the electric light engine house (7).

A high rectangular structure, measuring 11.4m by 7.0m, of concrete throughout, with a flat roof supported on cross-axial metal girders; it is built into a concrete-lined recess in the back of the Twydall Profile. Ventilation is provided by high level rectangular grilles in all walls.

Internally there is a single room accessed by a wide entrance, 1.86m by 2.12m high, at the southern end of the south-east wall, for double outward-opening metal doors. Decoration consists of camouflage externally, and multiple paint layers internally. Four large windows with four-light metal frames, 1.05m wide by 1.87m high, are situated in the south-east and north-west walls. Two large extractor vents, 1.07m wide by 1.22m high, in the north-east wall have the remains of metal hoods surviving on the external wall.

Four iron girders supported on concrete corbels project internally from high up on the south-east and north-west walls. Their ends are square, indicating that they have not merely been broken when the building was decommissioned. Four more girders project from a similar height in the north-east and south-west walls but these *may have* been broken. It seems likely that they formed a framework for moving heavy machinery. Two more girders issue from a lower level on the south-east and north-west walls, above the floor level engine beds (see below), presumably to support machinery situated there.

The floor contains a series of concrete beds and channels. Two raised beds are located close to the western corner at right-angles to one another. One measures 2.31m by 0.89m by 0.14m high and has six metal securing bolts on its surface; a small extractor, 0.53m wide by 0.69m high, is situated immediately behind it in the north-west wall. The second bed measures 2.30m by 0.79m by 0.34m high, and has twelve metal securing bolts. Two floor level engine beds are situated parallel to one another in front of the main extractor vents in the north-east wall, each measuring 1.09m by 3.75m, with twelve metal securing bolts.

Recessed channels of varying dimensions connect the engine beds and presumably held fuel pipes and power cables. Those from the raised beds lead to a large floor recess which may have housed the main power distribution equipment. On the south-west wall there are a series of holes for cabling and

brackets, possibly for a site power chart. The channels continue outside the south-west wall, presumably taking power to all locations within the Fort.

(53) Gun store (Figure 40)

NGR: TM 2618 3172

A Second World War structure (PRO: WO 192/211).

A rectangular brick building measuring 8.25m by 4.0m externally with a concrete floor and flat concrete roof with a thin asphalt coating. The doors and windows have concrete lintels. The building has two rooms divided by a solid wall, each room a mirror image of the other and measuring 3.66m by 3.06m. Both have large metal stable-type doors in the south-east elevation, 1.10m wide by 2.24m high, and a gap along the base of each door may have once been gridded for ventilation. Each room also has a window, 1.10m wide by 0.90m high, in the same wall. The interior is painted creamy-orange and marks along the north-west wall are from tables or shelves. The broken ends of electric cables are also present and there were pot-bellied stoves, apparently secondary insertions, against the end walls. A small single ceiling ventilator survives in the centre of each room.



Figure 40
 Photograph of
 the Second
 World War
 gun store;
 view from the
 north-east
 (NMR:
 BB97/5436)

A cutting in the bank immediately north of the gun store was for a single storey hut visible on aerial photographs (NMR APs: 58/85/Part I/5043-5) and detailed in the Fort Book Plan of 1945 (PRO: WO 192/211). A large pile of material behind this hut is visible on the aerial photographs, but is of unknown significance.

(54-57)Blacker Bombard emplacements (29mm Spigot mortars) (Figure 41)
 NGRs: TM 2622 3194, TM 2623 3197, TM 2612 3170, TM 2610 3174
 Second World War.

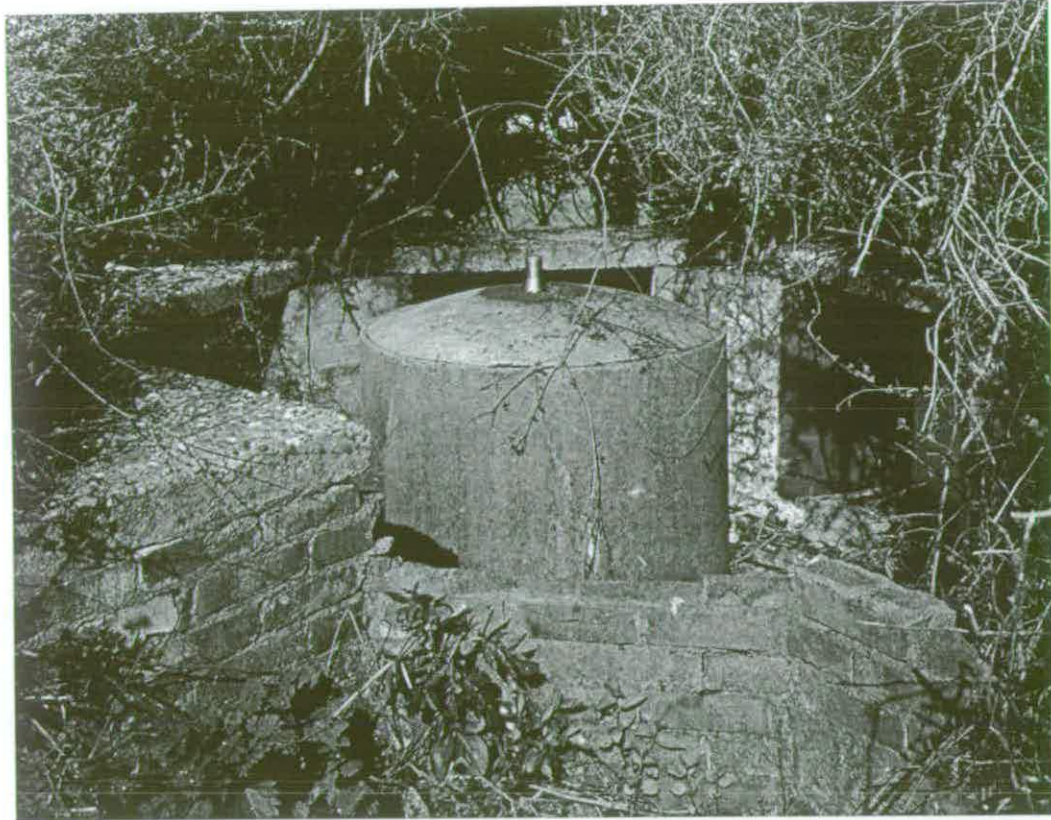


Figure 41
 Photograph of a
 Second World
 War Blacker
 Bombard
 position,
 showing the
 ammunition
 lockers and the
 central gun
 pivot (NMR:
 BB97/5447)

There are four spigot mortar positions, one in the south-west corner of the Fort, one close to the Engine room and two outside the Fort along the northern extension; a fifth, west of the radio direction finding (RDF) tower, is no longer visible (NMR APs: 58/85/Part 1/5043-5). All are of standard pattern with a gun pit containing the central circular concrete pedestal (thimble), 1.0m in diameter, with a stainless steel gun pivot on top, surrounded by four rectangular ready-use ammunition lockers, each 1.00m wide by 0.60m deep. The pit was reached by a narrow passage or flight of steps between lockers, depending on the position.

(58)Small unidentified structure

NGR: TM 2617 3176

This crude structure is on the site of a Combined BC and ELD Post, proposed on plans of July 1916 (PRO: WO 78/1886/2-3) and visible on an aerial photograph dated 1936 (Harwich Society) (37). The structure existed by 1944 (NMR APs: 106G/LA/17/4102-3), but it is not related to the BC and ELD Post.

It is a simple rectangular structure of concrete slabs with corrugated surface, supporting a flat, reinforced concrete roof. The structure, 3.5m by 1.25m externally (3.25 by 1.0m by 1.9m high

internally), has two small slit embrasures high in the east wall, which splay slightly to the exterior. An entrance in the north end is rebated for a door frame. Cabling indicates provision of electricity.

(59)Hut

NGR: TM 2619 3177

A Second World War 'hut' (PRO WO 192/211), function unknown.

Three sides of a simple brick structure, which survives to a maximum height of 1.3m and measures 3.6m by a minimum of 3.8m externally. The concrete floor slopes towards the adjacent path, and there are no indications of paint or whitewash.

Other features

Several buildings are shown in rough outline on a plan dated 1945 (PRO: WO 192/211) (Figure 5).

(60)NGR: TM 2615 3176

A single storey building of unknown function was situated between the oil store and the Second World War engine room (NMR APs: 106G/LA/17/4102-3). No traces of the building survive on the ground, but a shallow terrace measuring 5.5m by 3.0m probably marks its location.

(61)NGR: TM 2618 3183

The foundations of a brick building measuring 13.4m by 4.7m. This single storey building (NMR APs: 58/85/Part I/5043-5) had a concrete floor and brick baffle walls, which survive, around the entrance in the south-east corner. This may have been the guardroom during the Second World War (Smt Baker, pers comm).

Another building immediately north of this is visible on aerial photographs, but the area was not penetrable during the course of the survey.

(62)Slit trenches

Numerous slit trenches survive around the site. These generally consist of simple hollows in the ground with six, eight or ten metal posts sticking out of them in pairs, defining the edges of the trench. They date from the Second World War.

(63)?Service trenches

Along the top of the east-facing bank, a series of narrow trenches (0.2m wide by 0.1m deep) may mark the position of buried communications and/or power wires.

(64)Barrage balloons

Barrage balloons are visible on wartime aerial photographs over Dovercourt, Harwich Green and Beacon Hill Fort (NMR APs: 106G/LA/17/4102-3).

(65)Allotments

During the Second World War various areas were given over to allotments, both within and close by the Fort. These are visible on aerial photographs (NMR APs: 58/85/Part I/5043-5).

PROMONTORY: under Naval control

An area at the tip of the promontory and partly within the Dacoit fencing contains several structures for which there are no War Office plans. During the Second World War it was under Naval control (Srn. Baker, pers comm) and may also have been so earlier in the century. The following descriptions are based solely upon the surviving field evidence, except where otherwise stated.

(66) Extended Defence Officers Post (EXDO) over pillbox (Figure 42)

NGR: TM 2628 3164

Second World War.

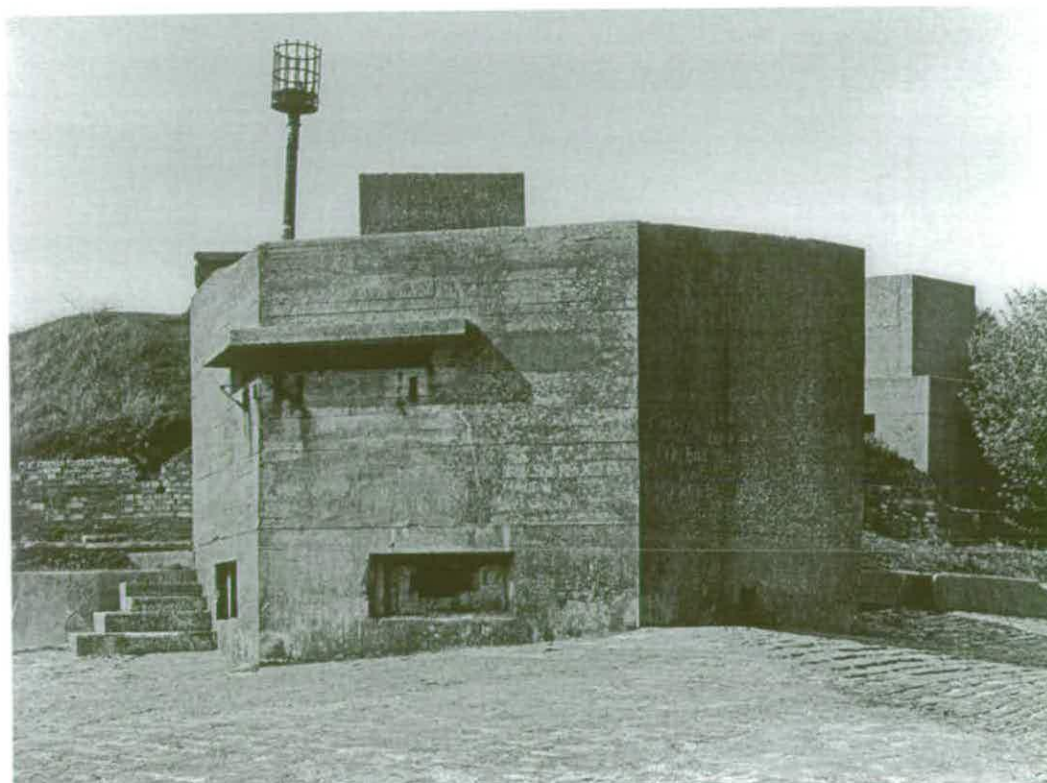


Figure 42
 Photograph of
 the EXDO
 with pillbox
 below; the
 main
 observation
 slit is evident,
 and the turret
 is just visible
 above (NMR:
 BB97/5410)

In some cases, EXDO posts have built-in defences designed from the outset (for example, Coalhouse Fort, Tilbury), though in this case the complicated entrance arrangements for the pillbox and the fact that it has a blocked embrasure, makes this unlikely. Additionally, the EXDO blocks the arc of fire of the early Second World War Type 22 pillbox (67).

The EXDO post is therefore probably built precisely over an earlier pillbox, probably of early Second World War date. In plan it is an irregular pentagon with sides of 5.88m, 4.86m, 3.35m, 3.91m and 4.25m. Concrete is used throughout and there are patches of external rendering. The structure was possibly originally camouflaged.

The pillbox was designed to be reached from ground level, but is now accessed by a narrow passage at the rear of the EXDO from which a ladder descends 1.77m to the original pillbox entrance passage. Internally, the walls are painted black over an earlier layer of whitewash. They measure 3.98m, 2.10m,

2.18m, 2.75m and 2.75m, with an embrasure in each. Those to the north and north-east are of Bren-type, those to the south-east and south are smaller, with inward splays on either side and scars from shelves below, perhaps for ammunition. In the west wall a small blocked embrasure protected the original pillbox entrance; this was splayed internally to the top and sides. Coathooks and the remains of metal structures survive beside the door and in the south-western corner, possibly for ammunition racks or a telephone.

The EXDO post has a main room (communications/chart room) with a smaller room (crew duty room) off the north-eastern side. The former is irregular with sides of 5.59m, 2.30m, 2.67m, 3.24m and 3.12m internally. A prominent observation embrasure, 0.60m high, was shortened for operational reasons, extending for 0.84m along the south wall (originally 1.22m) and 1.22m along the south-east wall (originally 1.98m). It has an external overhanging canopy and internal metal brackets for top-hinged shutters. The remains of painted calibration markers survive on the lower surface of the embrasure. Projecting from the ceiling on the north-west side is a small turret, 0.91m square internally, with its own observation embrasure. Scars and timber fittings on the wall below are from a structure which allowed access to the turret. Coathooks remain beside the doorway, and various scars on the whitewashed walls indicate the presence of shelves or racking.

The crew duty room has sides of 2.13m, 1.59m, 2.42m and 1.53m. It is whitewashed and has fittings for coathooks and shelving. Two large holes low down in the north-west wall were for power cables.

(67) Type 22 Pillbox (Figure 43)

NGR: TM 2627 3165

A Second World War concrete hexagonal pillbox with an AA gun pit (probably for a Lewis gun) built over. This was the commonest type of Second World War pillbox (Wills 1985, 15), though the addition of the AA gun pit is less common. This type of pillbox generally dates to 1940.

The pillbox sides are 1.77m internally and 2.23m externally. The interior is reached along a short passage, 1.37m by 0.72m by 1.54m high, with anti-ricochet walls. There are four gun embrasures, the one in the west wall now blocked by made-up ground. All are simple square openings splaying to the interior, each with a metal shield on the outer side which could be opened to different widths. Below each embrasure are wooden supports for shelves, presumably for ammunition. In the centre of the pillbox is a T-shaped concrete pillar providing anti-ricochet defence.

The AA gun position is a hexagonal concrete gun pit, 1.60m deep, and open-topped, the sides measuring 1.21m internally and 1.56m externally. A central circular concrete pillar, 0.76m in diameter and 1.43m high, is topped with a metal pivot, 0.26m high, which formerly supported the gun. The interior may have been painted black.

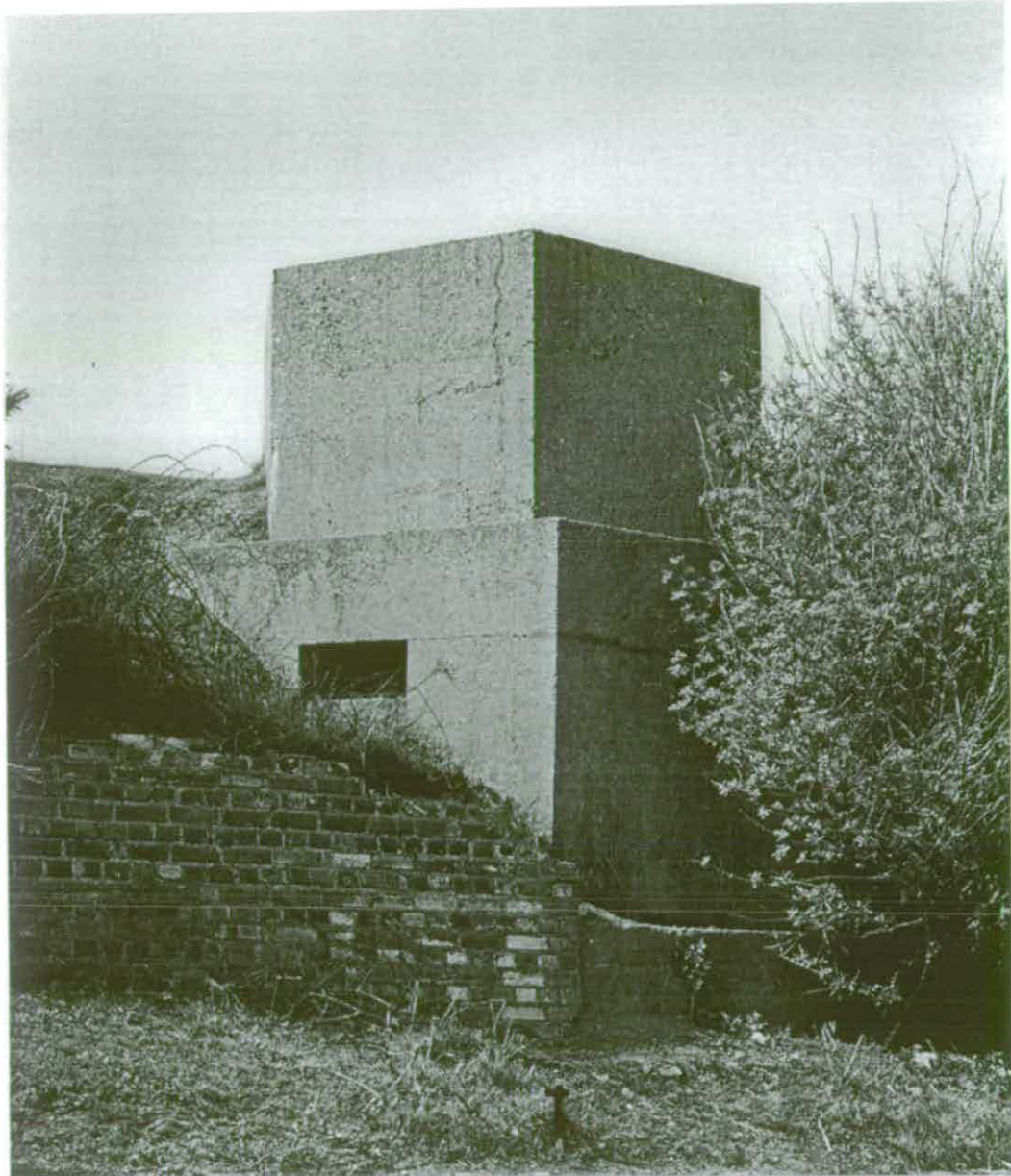


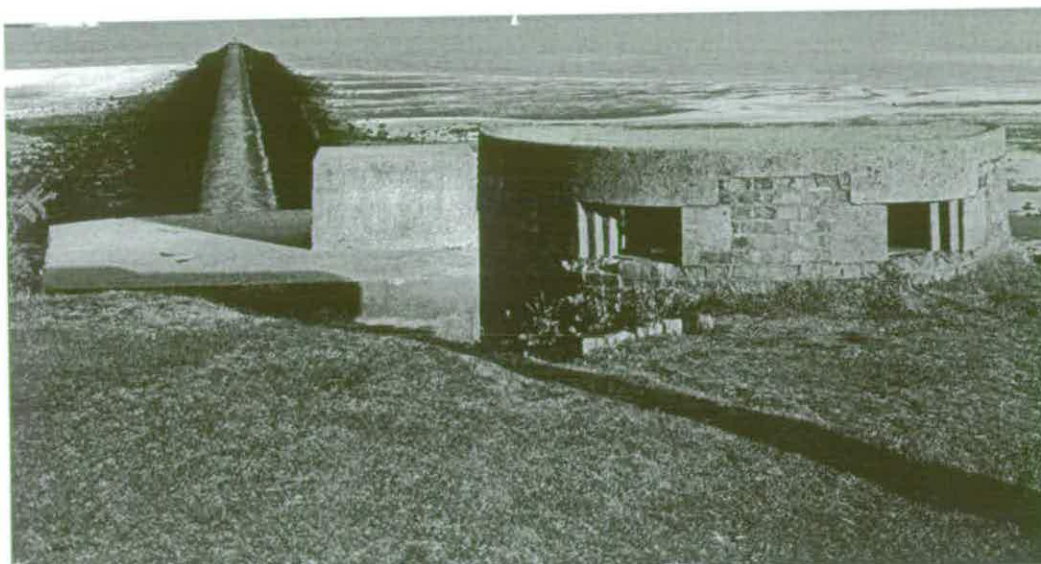
Figure 43
*Photograph of
a Type 22
pillbox, with a
hexagonal
emplacement
for an AA gun
above (NMR:
BB97/5412)*

(68) Pillbox (Figure 44)

NGR: TM 2627 3164

Built in 1943 (Smt Baker, pers comm). This pillbox faces inland towards the rest of the Fort, and may have operated in part as a sentry post for the area under Naval command; it almost certainly also defended the EXDO (66).

Figure 44
 Photograph of
 the Second
 World War
 semi-circular
 pillbox with
 the
 breakwater
 visible behind
 it; view from
 the west
 (NMR:
 BB97/5407)



A semi-circular structure of light construction, with a concrete floor and a flat roof, measuring a maximum of 3.36m by 2.00m. There is an entrance, 0.62m by 1.86m high, in the north-eastern side. Within are two north-west facing simple concrete-lined embrasures, with external ricochet walls. Modern steps leading up to the doorway probably replace earlier ones.

(69) Boom

NGR: TM 267 316 - TM 282 319

During the Second World War a floating boom stretched between Beacon Hill Fort and Landguard Fort. It comprised two sections, one between the far end of the breakwater and a boat in the Haven, the second between the boat and Landguard Fort.

Two large concrete attachments are visible at the far end of the breakwater, and close to Landguard Fort.

NORTHERN EXTENSION OF FORT

A strip of land running north from the Fort along the shoreline has an earthen bank, shown in 1898 on the confidential version of the Ordnance Survey 25" Second Edition map (PRO: WO 78/5135/3), together with a variety of structures of unknown date. This area is not included on any of the War Office plans in the Public Record Office, despite it clearly having been an operational part of the Fort. As a result, the current knowledge of all structures rests solely upon their interpretation in the field, except where otherwise stated.

The bank is 117.0m long by a maximum of 20.0m wide, and rises to a maximum height of 2.8m close to the northernmost Position Finding (PF) cell (70). It is stepped on the seaward side, the uppermost 'steps' partially concealing the PF cells. The bank certainly existed by the end of the 19th century, and may represent the remains of a much earlier defence along the eastern side of Orwell Haven; unfortunately the main site plan of Beacon Hill Fort (Figure 2) does not show this area, and its association with the Fort remains slightly unclear.

Position Finding cells (Figure 45)

NGRs: TM 2622 3193, TM 2621 3191, TM 2621 3190, TM 2621 3188

Marked as 'Position Finding Cells (Station No. 6)' on the confidential Ordnance Survey map of 1898 (PRO:WO 78/5135/3), these are probably the original PF structures associated with the Fort; triangulation was achieved in conjunction with two more in Dovercourt (Roger Thomas, pers comm).



Figure 45
 Photograph of
 a PF cell; view
 from the west
 showing the
 rear of the cell
 and the slit
 embrasure to
 the front
 (NMR:
 BB97/5465)

Four similar brick structures built into the north-south bank overlooking the Haven, with cavity-wall construction, concrete floors, wide strongly-built embrasures and concrete, asphalted roofs reinforced with metal girders. They were originally rendered and painted internally. These structures have been altered considerably and added to such that their changing functions are difficult to determine. The massively built embrasures with large stone dressings and reinforced roofs are crudely built and appear to represent a final but uniform phase of use, probably partial reconstruction of the earlier positions. The cells were, allegedly, Bren-gun positions during the Second World War (Foyne 1994, 64).

From the north they are:

(70) Cell 1

This structure is reached up a narrow flight of steps. It was originally 3.06m by 2.60m internally, with a lightly constructed timber rear wall, now gone, probably with door and window.

At some point the cell was enlarged north-westward to 4.50m by 2.60m, the division marked by ventilation bricks for the cavity-walling and the steps made steeper. At the same time, the sloping concrete roof was added, perhaps replacing an earlier one, the brickwork roughly broken to insert the York stone pads upon which the iron girders supporting the roof rest. An inserted embrasure also breaks the brickwork and extends the length of the south-east wall, 1.46m along the north-east and 0.85m along the south-west walls: the sill is of York stone and retains evidence of metal glazing bars; there is no evidence for shutters. The later additions are not rendered.

The position finders were normally anchored on three concrete pillars, or on two at the rear and set into the wall at the front (Roger Thomas, pers comm). The remains of these structures are not clear, though a 0.30m square scar on the floor may be related.

(71) Cell 2

As cell 1, except for the following: the steps are full width and the positions of two pillars are evident, as well as scars behind the PF pillars for a wooden rail upon which the observers sat (Roger Thomas, pers comm).

It also has an extension to the north-west at the back of which are the remains of a wooden frame, 2.53m by 2.00m high, which probably held outward-opening double doors; a sign above it reads 'OLD M(B?) GUNNERS (OFFICE?)'. The interior is whitewashed and had cross-axial joists for a wooden floor which appears to have been replaced by an asphalt one.

Against the north-east wall of the extension is another brick-built room, of good workmanship and possibly the 'office' referred to. It is a rectangle of 3.60m by 1.22m at the south-east end and 1.45m at the north-west (the internal wall is thicker at its south-eastern end), entered through a door in the south-west wall, 0.85m wide by 2.15m high, at the foot of the steps to the original PF cell. A window in the centre of the north-west wall, 0.91m wide by 1.41m high, has a wooden frame for outward-opening double lights, and a York stone sill. Three rectangular apertures in the south-west wall, each 0.18m wide by 0.23m high, also have York stone lintels and wooden frames, and were perhaps glazed. Ventilation is provided by a rectangular metal grille high in the north-east wall. Scars on the walls are from shelving and coat hooks and a stove may have stood against the north-east wall, with a vent above it.

(72) Cell 3

As cell 1, with the following exceptions: there are fewer steps since the rampart is lower here, and there are scars for three pillars for the PF equipment arranged in a triangle with its apex the embrasure.

(73) Cell 4

As cell 1, with the following exceptions: there are no steps, since the rampart is lower here, and no obvious PF position due to disturbance to the floor.

(74) Defence Electric Light

NGR: TM 2623 3200

A defence electric light emplacement of around 1900 (Roger Thomas, pers comm), re-used by the Royal Engineers as a workshop during the Second World War (Srnt. Baker, pers comm). The structure is not shown on the 1936 plan (PRO: WO 78/5135/3), though this may be an oversight.

A rectilinear concrete structure, originally with brick cavity-wall lining but now mostly removed, with a flat roof reinforced with cross-axial metal girders and coated with a thick layer of asphalt. A curving blast wall protects the entrance, a doorway 1.90m wide by 1.97m high with a timber frame for outward-opening double doors. A painted sign above the door reads 'R(OYAL) E(NGINEERS) WORKSHOP' testifying to its use in the Second World War. Inside is a single room, 4.75m by 4.9m, with an aperture in the east wall for the light beam, 1.20m wide and 1.16m tall to the bottom of its curved base; there are remains of external double metal shutters. Cracks to the fabric above the aperture, which has no sill or lintel, might indicate that it has been modified. Behind the aperture, a scar on the floor probably marks the position of the electric light. A small round hole broken through the west wall contained a small glazed panel to admit light. Ventilation is provided by circular ceiling vents close to the doorway and above the aperture.

It is not clear whether this was a fixed or a fighting light, though the opening suggests the latter. The walls of the building, especially on the east, are partly buried by dumped earth and rubbish.

(75) Moveable Defence Electric Light

NGR: TM 2624 3201

A concentrated moveable DEL shown on a map of 1936 (PRO: WO 78/5135/3), probably for a fighting light (Roger Thomas, pers comm).

A small rectangular brick building, 3.12m by 2.29m externally (internal access was not possible) with a slightly sloping concrete roof which has been heightened at some time. There is a single wooden door in the west wall, 0.87m by 1.64m high, but no windows. Two small breaches low in the east wall contain ceramic pipes, perhaps for cabling. On the roof are three identical settings comprising a central hollow asbestos pipe surrounded by four metal pipes; the pipes may have contained cabling. Two settings are located together near the south-west corner, while the third is in the north-east corner. These are presumably the anchoring and power points for the moveable DEL.

(76) Building

NGR: TM 2621 3187

The foundations of a rectangular building measuring 6.1m by 3.8m externally are represented by a brick sill and some reinforced concrete beams (the latter not *in situ*). It is visible as a roofless building, open to the east, on aerial photographs dated 1944 (NMR APs: 106G/LA/17/4102-3). Although of a similar size, there is no evidence to suggest that this structure was a fifth PF cell.

(77) Type 287 Radio Direction Finding tower (Figure 46)

NGR: TM 2622 3189

Built 1940-1 (Srnt. Baker, pers comm), this tower was involved with early developments into the practicalities and uses of radio direction finding technology, developed from the earlier Type 284. It was one of the first to provide gunners with a bearing of the target *and* a report of the fall of the shot, and it was used in conjunction with the 6-inch guns in the Fort (Harwich Society 1993, 1).

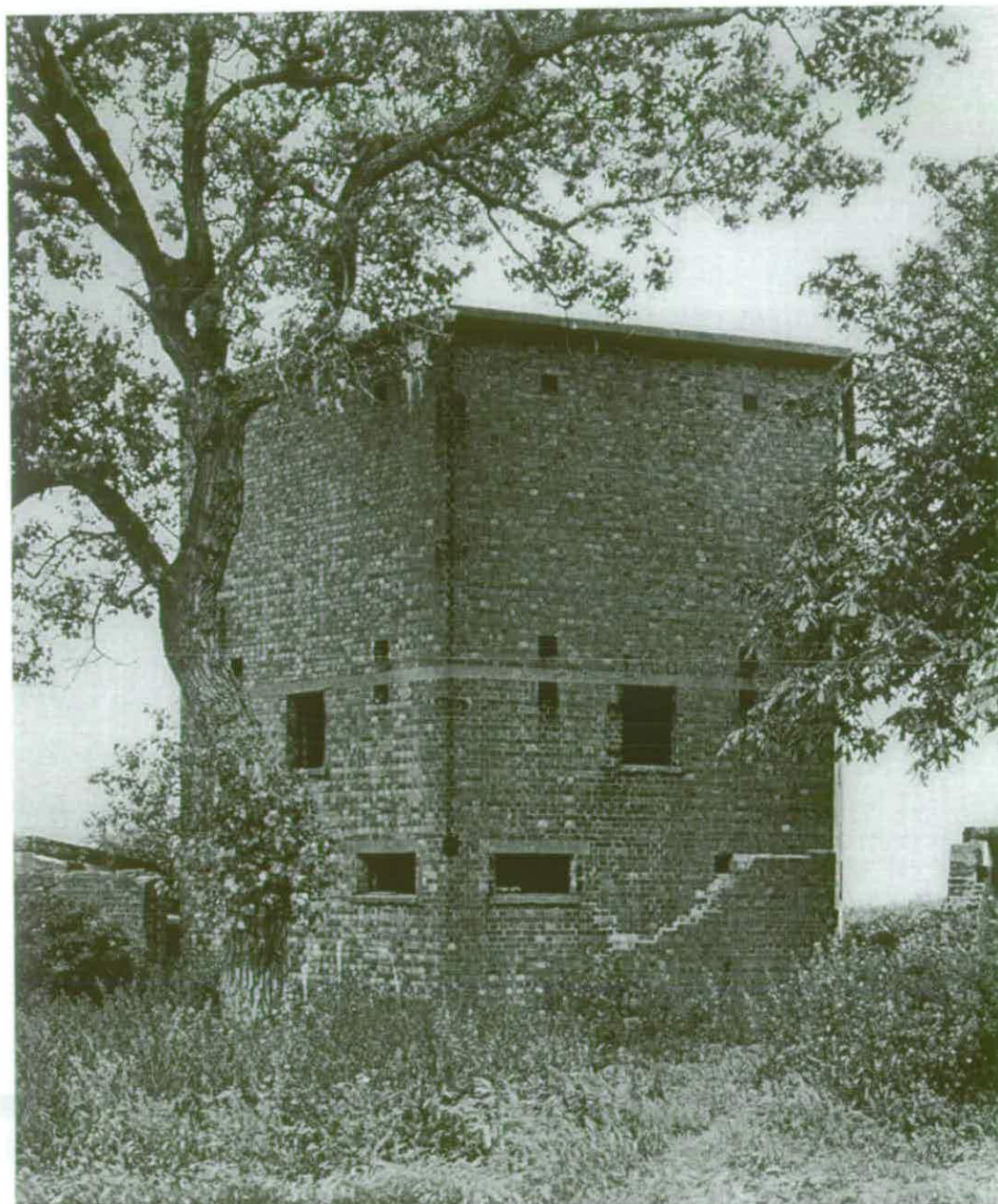


Figure 46
*Photograph of
 the Second
 World War
 RDF tower;
 view from the
 west (NMR:
 BB97/5464)*

A three storey hexagonal cavity-walled brick building with sides measuring 4.3m internally (4.8m externally) and a baffle wall to the north-west. There are doorways with concrete lintels in the north

and south walls, the former blocked; originally 1.24m by 1.93m high, the raised floor inside the tower has shortened them by 0.39m. There are large horizontal metal shuttered windows on the ground floor, large vertical central metal shuttered windows on the first floor, while the second floor has no glazing; all windows have concrete lintels and sills. Ventilation was provided by square grilles in the walls: on the ground floor at ceiling height (north-west and south-west walls only); on the first floor at ceiling height; and on the second floor at floor and ceiling height. The tower was constructed in the back of the rampart, and there is no evidence that it was ever externally rendered or camouflaged.

Internally, the ground floor is divided into four rooms, though some of the internal detail may be later. Some of the RDF array is *in situ* on upper floors, but these were not investigated during the RCHME survey.

(78) Royal Engineers Depot

On wartime and later aerial photographs (NMR APs: 106G/LA/17/4102-3; 58/85/Part I/5043-5), numerous buildings and other structures are visible at the northern extent of the site. Little remains other than the foundations and terraces upon which the buildings were situated, and analysis of the area was hampered by thick vegetation and rubble. These structures appear to be the remains of a Royal Engineers Depot, an interpretation supported by the nearby DEL which was converted to a Royal Engineers workshop (74).

Building terraces, platforms and building foundations

NGR: TM 2619 3197

Two terraced platforms, their slopes 0.8m and 1.1m high, are the bases for structures now dismantled. The terraces are at least 22m long and 5m wide.

NGR: TM 2622 3197

A concrete platform at least 6.8m long and 3.4m wide with a narrow ramp leading up to what was presumably the doorway, though all traces of this have disappeared.

NGR: TM 2623 3197

Beneath heavy vegetation, and therefore not investigated in detail, were the remains of what appear to be wall footings.

(79) Anti-tank defences

NGR: TM 2622 3193

Second World War.

A single concrete anti-tank block currently obstructs the narrow path at the foot of the main north-south rampart (see above). It is not *in situ*, and may originally have formed part of a more extensive defensive scheme.



BARRACK FIELD

Field to the west of Beacon Hill Fort.

(80)Vavasseur battery (Figure 47)

NGR: TM 2603 3165

This practice battery of four 5-inch Vavasseur guns was probably built in 1904, when the King's Gate was cut through the rampart of the Twydall Profile (PRO: WO 78/5141/3).



Figure 47
Photograph of
a holdfast for a
5-inch
Vavasseur
gun; view out
to sea, with the
Cornwallis
Battery visible
in the top left
hand corner
(NMR:
BB97/5470)

Remains of three of the gun holdfasts survive; the fourth is buried. Each holdfast has a central metal bolt on a hexagonal screw, with two concentric plate metal arcs behind it; the inner one is plain, while the outer one has bolts at regular intervals.

A nearby level concrete circle (4.3m in diameter) may be associated.

(81) Defence Electric Light

NGR: TM 2659 3169

An electric light emplacement was situated close to the southwest corner of Barrack Field by 1916 (PRO: WO 78/1886/2), but was obsolete by 1936 (PRO: WO 78/5135/3). The building was still standing in 1948 (NMR APs: 58/85/Part I/5043-5), but no traces of it were identified during the survey, though the area was not rigorously examined.

A concrete structure (NGR: TM 2595 3175) just outside the western corner of Barrack Field was an electric light sub station (Ordnance Survey 1956), presumably for this DEL emplacement; this structure survives.

(82) Air raid shelter

NGR: TM 2620 3175

Second World War.

A subterranean concrete shelter outside the Fort in Barrack Field. The shelter, covered by an earthen blast mound measuring 14.5m by 6.7m by 1.0m high, is a simple passage, 7.33m by 1.46m and 1.96m high, with small square lavatory cubicles, 0.95m by 0.90m, at either end, in front of which steps rise to ground level at right angles to the shelter. The cubicles had narrow doors, and there were doors at either end of the passage; there is also slight evidence for a wooden barrier at the bottom of the steps. There are two ventilators in the ceiling and electric light fittings are evident.

(83) Barracks

In addition to the structures detailed above, Barrack Field was also host to a number of barrack blocks and associated buildings. Most of these have disappeared (NMR APs: 58/85/Part I/5043-5), though some, in the western corner, survive, clustered around the headquarters building for the Essex and Suffolk Royal Garrison Artillery. These structures would merit investigation but were outside the scope of the present survey.

5. SUMMARY

Following the failure of the 1860 Royal Commission to mention Harwich in its report on Britain's coastal defences, work began on re-arming the Redoubt and Angel Gate Battery. A few years later, in 1871, a practice battery was built on Beacon Hill, consisting of six guns on ground platforms, within a perimeter fence. The guns, mostly 32-pounder and 8-inch smooth bores (SBs) were later converted to 64-pounder rifled muzzle loaders (RMLs), in keeping with a general trend in armament development.

Towards the end of the 19th century, a new type of fortification was being developed, demonstrating a move away from the earlier generation of strong but highly visible casemated forts; this was made possible by the development of disappearing gun carriages. New coastal fortifications were to be invisible from the sea, which, combined with the fact that the guns could hardly be seen as they fired, made it difficult for the enemy to select a target. (In practice this was less effective than anticipated, since the gunpowder charge left a plume of smoke, advertising the gun's presence (Hogg 1974, 85).) In England a number of these new type of batteries were constructed, including that at East Tilbury, Essex, which, in 1892, was equipped with two 10-inch, four 6-inch and one 3-pounder gun, enclosed within an unclimbable fence with a Twydall Profile to the rear (Smith 1985, 34-5).

In 1889, work began on the construction of Beacon Hill Fort, one of the first of these new generation coastal batteries. A Twydall Profile was built to defend the landward side of the Fort; an earthen fighting platform along its length, with short stretches of wall, which would enable infantry to fire at the enemy as they came over the gentle glacis and struggled with the ditch and unclimbable fence. The coastal cliffs were slightly raised and probably steepened, and the unclimbable Dacoit fence continued around the whole Fort. In the centre of the Fort, ancillary buildings were constructed and then covered over with a huge earthen mound which served two main functions: it protected the buildings and the access roads within the Fort, and it provided a view from the sea of what would appear to be a natural hillock, complementing the 'invisibility' of the other works.

By 1890 the two main guns had been installed: 10-inch and 6-inch breech-loading (BL) guns on Elswick hydropneumatic (HP) disappearing carriages. Between the guns, and serving both, was an underground magazine with separate storage areas for shells and cartridges. In 1904 the emplacements were converted for use by 6-inch quick-firing (QF) Mark VII guns on Mark II mountings, and alterations in the magazine were also required, including the replacement of the original ammunition lift for the 6-inch BL gun by two ammunition lifts for the 6-inch QF gun, and the blocking of the steps to the 6-inch QF gun.

During the first phase of construction at the Fort, an electric light engine house with bombproof shelter was built beneath the large central mound, as well as a guard house at the entrance and an underground artillery store. The bombproof shelter, which was equipped with side arms, provided direct infantry access to the earthen fighting platform and infantry wall on the Twydall Profile. It is a rare, if not unique, structure.

By 1892, the BL guns had been augmented with two 4.7-inch QF guns on barbette mountings, each with its own underground magazine with separate shell and cartridge storage. By around 1894 the earlier practice battery had been replaced by a new emplacement for three traversing carriages, probably the converted 64-pounder RMLs, and a magazine was built for it.

In the remaining years of the 19th century, two 3-pounder QF guns providing flanking fire for the BL guns were installed, along with a magazine, gun sheds and artillery store. An Ordnance Artificers'

workshop, one of the only buildings to have continued in its original use throughout the Fort's history, was soon added to the gun sheds.

The situation as regards position finding for gun control is far from clear, since many of the early plans do not show, or at least do not detail, this element of Fort activity. North of the main fortification is a linear earthwork bank which existed by 1898 (PRO: WO 5131/3). Set into this are four Position Finding (PF) cells which are thought to have existed by 1895 (Harwich Society 1993, 1); these almost certainly comprise the original PF complement for the Fort, but it is interesting that they are not detailed on the 1890 plan of the site (PRO: WO 78/5141/3). Towards the end of the 19th century two depression range finding (DRF) posts were installed on top of the central mound in the Fort; one is undated, but the other is almost certainly contemporary with a telephone room built in 1898.

At the turn of the century, the Fort was extended northwards to accommodate a new gun. Work on the emplacement for the new 6-inch QF gun commenced, along with construction of its magazine and shelter, and probably a Defence Electric Light (DEL) in front of it. A second DEL, thought to date from around 1900 (Roger Thomas, pers comm), was situated at the northern end of the Fort extension, and a third one, apparently of similar design, though only seen on contemporary plans (PRO: WO 192/211) and aerial photographs (Harwich Society) was in the north-east corner of Barrack Field.

By 1903 a shelter, probably for detachments manning the 4.7-inch QF guns, and latrines had been built, and in the next two years the flagpole was moved to a new site above the electric light engine house and an oil and paint store was built at the south-western corner of the Fort. A water supply from Harwich was laid down, and the steam engine in the electric light engine house was replaced by an oil-fired one. In 1904 a cutting, known as the King's Gate, enabled access to a new practice battery for four Vavasseur 5-inch QF guns in Barrack Field.

By 1911 a Combined Battery Command (BC) and Electric Light Director (ELD) post had replaced the earlier DRF posts, and this was altered in 1913. In 1916 this was replaced by a BC & ELD post at the northern tip of the central mound, on the site of one of the earlier DRF posts (PRO Refs: WO 78/1886/1-4). By the same date shelters for the now converted 6-inch Mark VII guns were built.

The picture of Beacon Hill Fort between the wars is far from clear, but it was maintained as a military installation, manned by volunteers (Srnt Baker, pers comm). By 1936 the 4.7-inch and the 6-inch QF emplacements were obsolete, and an aerial photograph (Harwich Society) shows only the two 6-inch Mark VII guns in position. A moveable DEL was located at the extreme northern end of the Fort extension.

On the eve of the Second World War, Beacon Hill Fort boasted only two 6-inch Mark VII guns, and measures were quickly taken to remedy the situation. A new self-contained battery for Twin 6-pounder guns, the Cornwallis Battery, was installed in place of the southern 6-inch Mark VII emplacement, whose gun was moved to a new emplacement built over the now-redundant 6-inch QF emplacement. All of the active emplacements were provided with concrete casemates or anti-strafting coverings. The armament now consisted of two 6-inch Mark VII guns and a Twin 6-pounder, supplemented by anti-aircraft (AA) guns (Bren, Lewis and Bofors) in the Fort and in Harwich. Ground defence consisted of slit trenches, pillboxes and Blacker Bombard (Spigot mortar) emplacements, as well as probably limited anti-tank defences. Battery control was achieved by two Battery Observation Post (BOP) towers, and Coastal Artillery Searchlights (CASLs) for the Cornwallis Battery were installed on the shore to the south; more CASLs were located along the cliff to the east (Srnt Baker, pers comm), their locations possibly today marked by earthworks, and all of the earlier DELs, with the exception of that destroyed by the new 6-inch Mark VII emplacement, were probably also in use.

Second World War aerial photographs (NMRAPs: 106G/LA/17/4102-3) show barrage balloons above Dovercourt, between Beacon Hill Fort and the Redoubt and over Harwich Green. Barrack Field was covered in barrack blocks, and what appears to have been a Royal Engineers Depot was based at the extreme northern end of the Fort extension. In 1941 a tower which saw some of the earliest developments in radio direction finding (RDF) technology was constructed (Harwich Society 1993, 1). During the Second World War, and perhaps earlier, the tip of the promontory was under Naval command, and included an Extended Defence Officer (EXDO) post, for marine minefield control, and three pillboxes.

Few of the structures at Beacon Hill Fort have not undergone some alteration during their lifetime: emplacements were modified, altered and replaced; magazines were adapted for new forms of ammunition, some of them later perhaps having different uses altogether; and stores changed use, some becoming personnel shelters. Contemporary plans have proved vital in the identification of original structures, and the dating of various alterations, but many changes, especially after the turn of the century, were not documented, and ground survey has helped to reveal a more complete picture.

6. SURVEY AND RESEARCH METHODS

The archaeological survey was carried out during February and March 1997 by Moraig Brown, Paul Pattison and Trevor Pearson. Hard detail and some features were surveyed using a Wild TC1610 Electronic Theodolite with integral EDM, using Trimap surveying software. Data was captured on a Wild GRM 10 Rec Module and plotted via computer on a Designjet 750C Plus plotter. Further details of the plan were supplied at 1:500 and 1:100 scale using conventional graphical methods. Profiles were taken across the site and of selected structures.

Site photography was carried out by Patricia Payne and Alun Bull.

The report was researched and written by Moraig Brown and Paul Pattison with assistance from Roger Thomas. Illustrations and the assembling of the final report was carried out by Moraig Brown with assistance from Trevor Pearson, Anwen Cooper and Paul Pattison using AutoCad and Corel software.

The site archive has been deposited in the National Monuments Record Centre, Kemble Drive, Swindon SN2 2GZ (NMR Number TM 23 SE 32).

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WO 78/1886 Plans and elevations of proposed Combined Battery Command (BC) and Electric Light Director (ELD) Posts

- /1 Plans and elevations of Combined BC and ELD Post (dated June 1911; alterations 28-10-1913)
- /2 Site plan of proposed structure and alternative location (dated 10-07-1916)
- /3 Proposed BC and ELD (pencil) (dated 10-07-1916)
- /4 Alternative BC and ELD (pencil) (dated 10-07-1916)

WO 78/4054 Plans and elevations in colour

- /1 Proposed shelter (dated Feb 1902)
- /2 1871 practice battery and stores, detailing guns (dated 15-03-1886)
- /3 Ammunition stores (South and Kingsgate magazine) for practice battery and 3-pounder guns (dated 29-06-1894)
- /4 6-inch BL gun converted to QF mounting, and magazine (dated 26-02-1900; alterations 21-01-1903)

WO 78/5135 Annotated 1898 Ordnance Survey maps (annotated 25-08-1936)

- /3 Beacon Hill Fort
- /4 Landguard Fort

WO 78/5141 Plans and elevations in colour

- /3 Plan of Beacon Hill Fort, showing all structures and arcs of fire (dated May 1892; various alterations, probably all pre-1908)
- /4 10-inch and 6-inch gun emplacements and main magazine (dated June 1892; alterations 08-07-1903)
- /5 Details of gun emplacements and magazines (dated June 1892; alterations 08-07-1903)
- /6 4.7-inch gun emplacement with magazine (dated July 1892; alterations 08-07-1903)
- /7 Guard house, Electric Light Engine House, Artillery store (dated 30-09-1892; alterations 08-07-1903)

/8 Ammunition stores (South and Kingsgate magazines), gun shed, two 3-pounder emplacements, Artificers workshop, telephone room (dated 17-10-1898; alterations 08-07-1903)

WO 192/211 Fort Book with 1:360 scale plan of site showing all detail (dated ?; alterations 02-07-1945)

Essex Record Office, Chelmsford and Colchester

EROa *A Plott and survey by Roger Drayton Gent of his coppie and frehould lands; lying in and houlding of Sr George Whitmors Mannor of Dovercourt; in the County of Essex* (Undated but thought to be 1603; copy made 1855)

The Harwich Society

Aerial photograph dated 1936

National Monuments Record: Air Photographs

106G/LA/17/4102-3 (28-May-1944)

58/85/Part I/5043-5 (29-July-1948)