

# Second World War Defences, Fairbourne Seafront

## Archaeological Recording and Excavation



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Cover photograph: Pillbox PRN 34151 and anti-tank blocks

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# SECOND WORLD WAR DEFENCES, FAIRBOURNE SEAFRONT

## ARCHAEOLOGICAL RECORDING AND EXCAVATION (G2400)

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# SECOND WORLD WAR DEFENCES, FAIRBOURNE SEAFRONT

## ARCHAEOLOGICAL RECORDING AND EXCAVATION (G2400)

### SUMMARY

*Recording and conservation work was undertaken under an Ancient Monument Grant on the Fairbourne Second World War anti-invasion defences (SAM ME252), which stretch for c. 2.3km along the sea front at Fairbourne from c. SH6110 1203 to SH6107 1431. This defensive line is composed mainly of anti-tank blocks but there were five pillboxes spread along the length. Of these only one survives complete (PRN 34151). The aim was to clean and conserve this pillbox to aid its preservation and appreciation by the public. This involved cleaning the interior, fixing grills over the door and embrasures to prevent access and treatment of the exterior to prevent further deterioration of the bricks. An interpretation panel was created and fitted near the upstanding pillbox.*

*Before the conservation work was carried out a survey and photographic record was undertaken of the pillbox to document its condition. To inform the restoration of the upstanding example the base of another pillbox (PRN 34152) was exposed and recorded. The opportunity was also taken to record graffiti which dated from the construction of the blocks, and had been marked in the concrete prior to its setting.*

*The investigation of pillbox PRN 34151 showed that while there was photographic evidence for an external blast wall no traces of this now survive. There is also no evidence for an internal anti-ricochet wall although the neighbouring pillbox (PRN 34152) does seem to have had one as shown by the damage to the screed on the floor. A passage in PRN 34151 was a later addition but possibly added during wartime. PRN 34151 formerly had shelves fitted under the embrasures as shown by drill holes to fix them.*

*The exposure and recording of pillbox base PRN 34152 showed that it was similar to PRN 34151 but its western wall was only one brick thick, suggesting local alterations to the basic design.*

*Twenty three anti-tank blocks were recorded; twenty with graffiti, two with casts of iron posts in the top, and one with a hand print. Most of the graffiti were initials or names, presumably of the local people, but the radio show ITMA was also recorded in graffiti.*

*The initial cleaning and fitting of the grills as well as the recording work took place between 26<sup>th</sup> and 29<sup>th</sup> October 2015 and was monitored by Cadw. The final consolidation work took place on 3rd March 2016 and the interpretation panel was produced and installed by the end of March 2016.*

# 1 INTRODUCTION

An Ancient Monument Grant was applied for by Gwynedd Archaeological Trust (GAT) for undertaking a programme of recording and conservation on the Fairbourne Second World War anti-invasion defences (SAM ME252). This document reports on the results of the recording programme and also records the conservation works that were carried out. The anti-invasion defences stretch for c. 2.3km along the sea front at Fairbourne from c. SH6110 1203 to SH6107 1431 (figure 1). This defensive line is composed mainly of concrete anti-tank blocks but there were five pillboxes spread along the length. Of these only one survives complete (PRN 34151). The aim was to clean and conserve this pillbox to aid its preservation and appreciation by the public. This involved cleaning the interior, fixing grills over the door and embrasures to prevent access and treatment of the exterior to prevent further deterioration of the bricks. An interpretation panel was created and fitted near the upstanding pillbox to inform the public of the nature and importance of the monument.

Before the conservation work was carried out a survey and photographic record was undertaken of the pillbox to document its condition. To inform the restoration of the upstanding example the base of another pillbox (PRN 34152) was exposed and recorded. The opportunity was also taken to record graffiti which dated from the construction of the blocks, and had been marked in the concrete prior to its setting.

The initial cleaning and fitting of the grills as well as the recording work took place between 26<sup>th</sup> and 29<sup>th</sup> October 2015 and was monitored by Cadw. The final consolidation work took place on 3rd March 2016 and the interpretation panel was produced and installed by the end of March 2016.

The recording was carried out by GAT and followed the guidelines specified in *Standard and Guidance for the archaeological investigation and recording of standing buildings or structures* (Chartered Institute for Archaeologists, 2014). Gwynedd Archaeological Trust is a Chartered Institute for Archaeologists *Registered Archaeological Organisation*.

## 1.1 Copyright

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## 1.2 Acknowledgements

The project was managed by Andre Berry of AQB Historic Landscapes, professional cleaning was carried out by Powerchem Environmental Services, groundworks and the brick consolidation was undertaken by Stonewyracs and the steel grills were made and fitted by Poplars Forge. Matt Rimmer did research and provided advice. Thanks are due to Ian Halfpenney for advice. Thanks are due to the following people for sharing their knowledge and information on pillboxes: Roger J C Thomas

at English Heritage, Nina Steele at Gwynedd Archaeological Trust, Medwyn Parry at the RCAHMW, Tim Denton and Alasdair Ford of the Pillbox Study Group.

## **2 AIMS AND OBJECTIVES**

The defensive system stands on a dynamic coastline. Current projections indicate the likelihood of increased levels of stormy weather as a result of global warming (Met Office/Centre for Ecology and Hydrology 2014) as well as an overall increase in sea level rise. This represents an ongoing threat to the monument.

About 690 of the concrete anti-tank blocks survive; some of which have contemporary graffiti inscribed into the wet concrete on their upper surface. Several of the blocks have been lost due to sea erosion or have been removed in order to improve access onto the beach. The quality of the concrete is also variable and some have begun to disintegrate particularly along the lines of separate pours of concrete.

There were originally five standard FW3/24 pattern pillboxes set into the defences. One (PRN 34150) was destroyed in the storms of February 2014, three remain only as bases or scatters of bricks and concrete and one (PRN 34151) survives in good condition. It is known that the pillbox was used by the local yacht club for some time; there are signs of repair with concrete bricks and patches of rough render and the remains of door fittings.

The pillbox is however deteriorating at an increasing rate, as a result of the effects of storms, neglect and by deliberate vandalism. A photograph taken by Medwyn Parry in 1998 shows the pillbox with a somewhat eroded coating of white paint or whitewash. This has now largely been lost and many of the bricks are cracked and undergoing extensive surface failure and spallation, presumably as a result of absorbing water and subsequent frost damage. The interior and the entrance passageway have been sprayed with graffiti. The floor is covered with a layer beach cobbles mixed with the rubbish and detritus resulting from its use as an alternative to the nearby public toilets.

The pillbox required conservation to stabilise the external bricks and the provision of a grating to prevent access to the interior. The aim of the works was to consolidate and preserve the pillbox and also to present it to the public, who generally seemed to be unaware of the function of the structure and its importance. The detailed record of the structure made before the works ensured a record of its condition and a detailed measured survey in case of further loss by coastal erosion. Recording the pillbox base (PRN 34152) and the graffiti on the anti-tank blocks added to the understanding and interpretation of the whole defensive system.



## **3 METHODOLOGY**

### **3.1 Introduction**

The original specification for the conservation works is given in appendix II and the archaeological project design is included in appendix III. Changes were made to the original specification at the request of Cadw. The sections below record the work that was undertaken but more technical detail on the works carried out is given in the Completion Report, written by Andre Berry of AOB Historic Landscapes and included as appendix IV.

### **3.2 Detailed survey and recording of pillbox PRN 34151**

#### **3.2.1 Clearance**

The interior of the pillbox contained beach cobbles, rubbish and the remains of human excrement over the concrete floor. The stone and other debris was removed by hand by Powerchem Environmental Services under supervision of GAT. All the stone was cleaned in a detergent bath before being returned to the beach west of the pillbox. All litter and excrement was bagged and removed from site for appropriate disposal by Powerchem Environmental Services. The concrete floor was then cleaned with water and detergent. Removal of waste followed guidelines set out in *Managing offensive/ hygiene waste safely* ([hse.gov.uk/pubns/waste22](http://hse.gov.uk/pubns/waste22)).

#### **3.2.2 Recording**

The beach pebbles around the exterior of the pillbox were removed by mini-digger under constant archaeological supervision to expose the foundations of the pillbox and allow full recording of the exterior. The pebbles were replaced once the recording had been completed to prevent any risk of the pillbox being undermined.

A basic photographic survey was produced of all elevations of the interior and exterior of the pillbox. This used a levelled digital camera with the film plane parallel to the wall of the pillbox. Photographs were also taken of constructional details and of the building in the context of its surroundings.

In addition photographs were taken both externally and internally to produce a 3D model of the pillbox using Agisoft PhotoScan. Targets were included in the photographs and surveyed in using a Trimble R8 GNSS/R6/5800 GPS receiver. The Agisoft PhotoScan software performs photogrammetric processing of digital images and generates 3D spatial data. The accurately surveyed targets allow this data to be georeferenced and accurately scaled. The 3D model was used to produce orthographic projections of all elevations from which conventional scaled elevation drawings were produced.

#### **3.2.3 Investigation of external blast wall**

To determine whether remains of the external blast wall survived a mini-digger under constant archaeological supervision was used to gradually remove beach pebbles from between the pillbox and the sea wall. This was continued down below the level of the foundations at this side, until it was evident that no such traces remained. The area was recorded photographically and the pebbles were replaced.

### **3.3 Conservation and Reconstruction (PRN 34151)**

The detailed specification for the works is given in appendix II. The original plan was for the exterior of the pillbox to be protected by rendering over all outside surfaces. However after

consultation with Cadw this was altered to a treatment of the exterior with Kingfisher 'Stormseal' to prevent further deterioration of the bricks. It was also initially proposed to open two blocked rifle embrasures on the east elevation, but it was decided that these should be left blocked.

Access to the pillbox was restricted by closing the embrasures and doorway with custom made and fitted steel grills.

Graffiti was removed from the interior of the pillbox without damaging the underlying brickwork. No Second World War stencilling was evident.

As no remains of the external blast wall were found this was not reconstructed. Insufficient evidence was found for an internal anti-ricochet wall so this also was not reconstructed.

### **3.4 Interpretation panel (PRN 34151)**

A display panel was produced and installed near the pillbox (PRN 34151) to provide interpretation of the pillbox and the rest of the defences to the public. The panel was designed by Daydream Designs using text and illustrations provided by Andre Berry and Matt Rimmer. A lectern was custom-made by Poplars Forge in galvanised steel plate. This was installed on 14<sup>th</sup> March 2016 and the panel was then fitted before the end of March.

### **3.5 Assessment excavation of pillbox base (PRN 34152)**

There was some doubt about the former presence of a Y shaped blast/anti-ricochet wall in the interior of pillbox PRN 34151. To provide additional evidence on this the surviving base of the next pillbox to the north (PRN 34152) was uncovered. This was partly buried under a maximum of 0.2m of beach pebbles, much of which was consolidated with soil and turf. However there was no stratigraphy in this overburden so clearance involved removing the pebbles and turf by hand down to the concrete floor of the pillbox base. A large enough area was exposed to be certain that the outside face of the walls had been located, even where this had been damaged and was unclear.

The exposed base was photographed and notes were made on its character and construction. A detailed plan was produced by taking numerous overlapping photographs and processing these with Agisoft PhotoScan to produce a rectified vertical photograph of the base. Targets were included in the photographs and surveyed in using a Trimble R8 GNSS/R6/5800 GPS receiver, so that the rectified vertical photograph could be accurately georeferenced and scaled. This was used to draw a conventional scaled plan.

### **3.6 Survey of graffiti on the anti-tank blocks**

The entire length of the array of anti-tank blocks was walked so as to identify which blocks have contemporary graffiti on them. This was assisted by the blocks having been previously inspected by Matt Rimmer in different lighting and weather conditions and a temporary mark made on the sea wall to indicate those with graffiti. This reduced the risk of graffiti being missed.

Only those blocks with contemporary graffiti were recorded. These were recorded by surveying each exposed corner of each block with a Trimble R8 GNSS/R6/5800 GPS receiver (<10cm accuracy), and tied into the National Grid. Basic details of each block were noted on record sheets to record: condition, location (*in situ* or not), exposure/ amount buried and the details of the graffiti for each block. Each block recorded was allocated a Primary Record Number (PRN) for the Gwynedd Historic Environment Record (HER). A photographic record was produced of each block comprising at least two views, including a scale and a board with the relevant PRN.

### **3.7 Photographic standards used**

- A digital SLR set to highest resolution was used throughout.
- A tripod was used for slower exposure shots and for formal elevation shots
- Shots were taken in RAW format, except for those taken for the 3D model which were taken as in jpg format as lower resolution images are required for the modelling.
- Appropriate scales were used
- Remote flashes and additional lighting were used for interior views
- Adobe Photoshop CS4 was used for any post processing work required
- A complete table of metadata with details of each image, including descriptions and directions of each frame was produced for all shots, excepting those for the 3D model, which do not require separate archiving
- Images will be converted to TIFF format for long term archiving.

### **3.8 Dissemination and Archiving**

This report will be submitted to the regional Historic Environment Record on completion and a copy will also be sent to the National Monument Record (NMR). A note to be published in Archaeology in Wales will be produced.

A full archive, both physical and digital, including plans, photographs, written material and any other material resulting from the project has been prepared. This will be archived with the Royal Commission on Ancient and Historical Monuments of Wales.

## **4 BACKGROUND AND CONTEXT**

### **4.1 Topological and Geological Background**

The village of Fairbourne lies on the coast of Gwynedd just south of the mouth of the Mawddach Estuary, with Barmouth to the north on the other side of the estuary (figure 1). The village is largely built on a flood plain and salt marshes protected from the sea by a natural pebble ridge and sand bar. To the south the hills descend directly to the sea and landing from the sea would not be possible before Tywyn. To the north there are no gaps through the Rhinogydd Massif until the Dwyryd Valley. The Mawddach Valley forms a clear route through the mountains to Dolgellau and beyond and during the Second World War a railway ran through the valley as well as a road. The beach is wide and flat and gently sloping, ideal for an amphibious landing.

A large gravel and sand ridge extends along the landward side of the beach at Fairbourne and out across the Mawddach estuary (plate 1). Much of the ridge consists of beach pebbles, but the northern end, which projects as a spit into the estuary, is predominantly sand dunes. The main source of coarser sediment is probably the large gravel fans at Llwygwrl to the south (Pye *et al.* 2007, 69). This ridge provided the base for the anti-invasion defences and would have added to the difficulty of landing tanks on the beach (plates 2 and 3). However the long shore drift continues and the pebbles can be rapidly eroded from the ridge and moved further down the coast, leading to elements of the anti-invasion defences being undermined and in larger storms entirely destroyed by the force of the waves. At the northern end sand movement swamps and buries parts of the defences, protecting but also obscuring them.

The village of Fairbourne was established following the purchase of land by Arthur McDougall in 1895. McDougall hoped to tap in to the new demand for second homes on the Welsh coast, and was influenced by the success of Barmouth on the opposite shore, as well as by developments financed by Solomon Andrews east of Fairbourne. The presence of the Cambrian Railway was also a deciding factor. The village was laid out and built on the flat marshy lands behind the gravel ridge (colloquially known as Ro Wen or White Ridge) which protected the settlement from the sea. McDougall sold the estate in 1917, and the settlement subsequently developed in a haphazard fashion through the construction of bungalows and houses, the design of which contrasts with the earlier Victorian terraces belonging to the original settlement. A narrow gauge railway was originally built to transport building materials, but developed into a passenger line which connects to the Barmouth ferry to the north (Haslam *et al* 2009; Return to the Ferry website). The future of the village is threatened by rising sea levels.

## 4.2 Historical Context and Comparisons

Matt Rimmer

### 4.2.1 Pillbox design

By June 1940 the threat of invasion of Britain appeared very real and construction was started on a series of linear obstacles across England to slow down any invasion. This was known as the General Headquarters Line (GHQ Line). However Germany had already invaded neutral Norway and an invasion of Ireland was a real possibility. There is documentary evidence that Hitler did seriously consider the possibility. If Ireland was taken by the Germans then the west coast of Britain would be under direct threat of invasion (Parry 2006).

As Fairbourne beach was a suitable landing place and would have given direct access through the mountains if taken anti-invasion defences along this coast were a reasonable response to the potential threat. As well as the anti-tank blocks and pillboxes this defensive system would also have included barbed wire entanglements on the beach and trenches, mines and other obstacles, including a possible flame fougasse device (a crude flame thrower) next to the bridge under the railway (Dalton 2012, 18, 22).

During May 1940 the Directorate of Fortifications and Works (FW3) branch of the War Office was established, its purpose was to provide specific designs for pillboxes which were to be constructed throughout Britain at defensive locations.

During June and July 1940 the FW3 branch issued seven basic pillbox designs, however once in the field those carrying out the construction often modified these under the direction of the area commands, and on occasion a “one-off” type was designed to the War Office standard by the local Command and Corps chief engineer.

The design concept was to provide a simple “fieldwork standard” which could be constructed very quickly. Most designs consisted of or incorporated some of the following elements.

- Minimum of bullet/splinter proof protection, though some were enhanced to shell proof standard.
- Simple blast walls to protect open entrances.
- External flat side walls with rectangular or polygonal shape.

The Type 24 was one of the most numerous of the standard designs (figure 2) and this is reflected by the comparatively large number which still exist; The Defence of Britain Project (DOBP) noted that more than 1700 Type 24's existed in the UK at the time the DOBP database was compiled.

The remaining FW3 Type 24 pillbox at Fairbourne is overall typical of its type and generally conforms to the design issued by the War Office in 1940. It exhibits some characteristics consistent with its early construction date, such as large splayed embrasures without stepping, and possibly a degree of local interpretation of the design drawings.

The walls of the pillbox are of brick construction, with a cement and local stone core. They measure 18” thick overall, slightly more than the minimum of 15” specified in the War Office drawings. Based on examination of two of the now demolished pillboxes at Fairbourne, the wall infill appears to be a combination of cement and locally sourced beach stones, rather than solid concrete (plate 4).

#### **4.2.2 Camouflage, Concealment and Disguise**

Various methods were employed to conceal or camouflage the position of pillboxes and other defensive positions, some schemes being more elaborate than others, though all fall into two broad categories; merging with the background and terrain through the use of camouflage, or disguising the position to look like an innocuous structure or object.

In 1940 the Camouflage Development and Training Centre (CDTC) was established at Farnham Castle, Surrey with the purpose of developing and teaching military camouflage techniques. The CDTC recruited artists, stage set designers and at least one stage illusionist to work on schemes for camouflage and disguise. A noted member of the CDTC was Roland Penrose, a Quaker pacifist who wrote the “Home Guard Manual of Camouflage” and later became Senior Lecturer at the Eastern Command camouflage school at Norwich.

Camouflage could take many forms, including the use of netting, foliage (both real and fake), paint, cladding with local stone, render or other materials to help the structure blend into its surroundings. Some surviving pillboxes have steel rods or hooks set into the structure to which camouflage netting could be attached.

Examples of render being used as a basis for camouflage on brick structures have been noted on surviving coastal and airfield defence sites on Anglesey, where a pattern has been applied to the render in an effort to give the appearance of a rough stone structure (Dalton 2012, 51, 159, 163).

Camouflage could also include attempts to transform the appearance of a pillbox into that of another structure or object. Noted examples from England include the construction of a false roof, chimney and garden to create the appearance of a rural cottage, disguise as a railway track-side hut, barn, haystack, a petrol station, gypsy caravan, boat house, chicken shed, and in at least one case, the addition of the cab and forward chassis of a redundant lorry was mated to a pillbox, which was then painted to resemble a delivery van body.

Disguised pillboxes are those which were constructed to resemble another building, structure or object and in some cases were constructed within an existing building; locally the pillbox at Egryn, near Llanaber, north of Barmouth is of such a design, with a false chimney and gables which would originally have supported a false ridge roof over the flat reinforced concrete roof (plate 5).

Another local example of effective concealment is the pillbox at Aberamffra, near Barmouth. This is again of a unique design, being constructed of local stone combined with concrete reinforcement, and built into the rocky hillside (plate 6).

With regard to the pillbox at Fairbourne, no contemporary records, images or oral accounts have yet been found which could assist in establishing exactly how this particular pillbox was camouflaged; however given its prominent location it seems reasonable to suggest it would likely have received some form of camouflage or disguise. Examination of the structure has not revealed any obvious traces of hooks or other fittings to support netting. The vertical external surfaces

exhibit traces of at least two layers of paint, and at least one application of render, all of which seem to post-date the use of the pillbox in the war.

Of the traces of paint the most obvious is white, with an earlier black layer beneath. Based on recent examination of the external surfaces and photographs taken during the early 1990's, the white paint at least appears to have been applied after the majority of the render had come off the brickwork.

Examination in May 2013 of the damaged pillbox at the southern end of Fairbourne beach indicated that it had also received a thin layer of render at some point (plate 7), although it is again not easy to establish when this might have been applied; the fact the render appeared to cover the bricks which had been used to block the original entrance and embrasures would seem to suggest it was applied post war. This pillbox was significantly damaged by the storm of January 2014, and its remains were subsequently moved during sea defence works.

In conclusion, while there are examples elsewhere in the UK of pillboxes having been rendered as part of a camouflage or disguise scheme, no definitive evidence has been located to date which would suggest the Fairbourne pillboxes were rendered during wartime. Further research and specialist examination of the remaining render may help to determine when this finish was applied.

#### **4.2.3 Embrasures**

The cast concrete embrasures of the Fairbourne pillbox are fairly typical of both early war construction and other surviving examples found in Wales, however they are nationally (in a UK sense) quite unusual, having rather large openings, with five of the seven embrasures having external openings which measure 34" wide by 24 ½" high and which lack the stepping commonly seen on pillboxes constructed later, or retro modified to incorporate stepping in the embrasures. The two rifle embrasures in the rear wall, one each side of the entrance, are smaller than the other five embrasures, which were designed for use with both rifles and light machine guns, this is consistent with the War Office drawing for the Type 24. Both of these rear embrasures have been blocked with cement bricks which have also been rendered over on the external wall. It would appear this was probably done post war, possibly during the period when the pillbox was used for storage by the Barmouth Yacht Club. It was in use at least until 1996 (Dutton and Gwyn, 1996, 79). Both rear embrasures also have a cement step on the lower sill which does not appear to be made from the same cement bricks used to block the openings.

It was discovered that however well-concealed or camouflaged a position was, the outline of the embrasure openings were a give-away to the pillboxes position, so measures were taken to counter this. Embrasure covers could take the form of lightweight removable mesh screens, hinged flaps made from wood, asbestos, steel, or cast concrete plugs, which fitted into the embrasure opening from within and could be removed as required. Despite careful examination no physical evidence has been noted to suggest the pillbox at Fairbourne was fitted with hinged screens, though as the lower sills of most of the embrasures have suffered some degree of damage, the possibility that screens were fitted cannot be ruled out. Perhaps the most likely form of embrasure cover which may have been used at Fairbourne are the concrete plugs, as these have been noted in other pillboxes in North Wales, including examples at Egryn near Barmouth (plates 8 and 9), Dinas Dinlle near Llandwrog and in the pillbox which overlooks Llyn Ogwen in Snowdonia (Dalton 2012, 29). The plugs in the Egryn pillbox differ from those at Dinas Dinlle and Llyn Ogwen in that they feature two steel handles and a securing latch which drops into a hole in the lower sill of the embrasure. The plugs at both Dinas Dinlle and Llyn Ogwen have only a single steel handle and no latch.

Although it is perhaps unlikely that any trace of cast embrasure plugs now remain at Fairbourne, if indeed they were fitted at all, there is a possibility partial remains of plugs could exist, either in the vicinity of the locations of the five pillboxes which originally stood along the defence line, or within the beach stone and debris which now cover the floor of the remaining pillbox.

#### **4.2.4 Internal Anti-Ricochet Wall**

The War Office design for the Type 24 pillbox called for the construction of an internal anti-ricochet wall. This was to be of a Y-shape, with the top of the Y toward the pillbox entrance (figure 2). The wall was generally constructed from the same materials as the pillbox and usually extended to roof level, though reference has been made to partial height walls, and examples have been noted elsewhere of Type 24's do not appear to have ever had the anti-ricochet wall constructed.

The Fairbourne pillbox does not have an anti-ricochet wall and it is not clear if it was built without one or whether it was removed post war to make the pillbox more suitable for civilian usage. Parry (2007) notes in relation to the southernmost (and now destroyed) pillbox (PRN 34150) "There is now no trace of the internal anti-ricochet wall, except for the faint marks on the floor and ceiling".

The pillbox exhibits an interesting feature which is not included in the War Office drawing for the type, nor was it evident in the southernmost example when it was examined in May 2013; an internal wall has been constructed on either side of the pillbox entrance, of the same bricks used in the rest of the pillbox. Clearly constructed after the pillbox was built, their position would have made entry extremely difficult, if not impossible with an internal Y-shaped anti-ricochet wall present. These walls could have been added post-war, though the purpose for doing so is unclear.

#### **4.2.5 External Blast Wall**

The entrance to most pillboxes would originally have been protected by either an external anti-blast wall (plate 10), or in some cases a steel door. Visual examination of the Type 24 at Fairbourne has failed to reveal any clear indication of either, though it is possible if external blast walls had been built at Fairbourne, they may have been removed when the pillbox was used for civilian purposes post-war, or when the later sea defences were constructed.

A postcard image obtained by the author via the online auction site eBay of the sea front and defences at Fairbourne in the years following the war clearly shows an external blast wall present at the now destroyed southernmost pillbox (PRN 34150), and appears to show a similar wall in place at the pillbox which is the focus of this report (PRN 34151) (plates 11 and 12). The postcard is postmarked 1960, though the image is probably slightly earlier.

#### **4.2.6 Internal Fittings**

Generally pillboxes were rather spartan internally, with the only fixed equipment often consisting of folding wooden shelves beneath some embrasures (plates 13 to 15), and occasionally a basic set of coat hooks would be fitted.

The walls beneath the five larger embrasures of the Fairbourne pillbox all exhibit holes where battens for the folding shelf were fixed to the wall. From the pattern and spacing of these holes it has been possible to establish the shelves fitted were of the type with hinged wooden supports, rather than the type which utilised a folding steel support. The two rifle embrasures in the rear wall exhibit no trace of having folding shelves fitted; this is consistent with the War Office drawings.

#### **4.2.7 Internal Paintwork, Markings and Graffiti**

The internal walls of pillboxes were sometimes whitewashed, probably in an attempt to improve visibility internally. The interior of the Fairbourne pillbox has at some time been partially painted white, however this was likely done post-war by its civilian users, rather than during wartime, as indicated by the fact the white paint covers the areas where the battens to affix the folding shelves would have been located and the paint is within the mounting holes in the brickwork.

Markings contemporary to the pillboxes wartime use could include an individual number identifying the pillbox within the defence line, and range data to assist the defenders in sighting upon an enemy. Contemporary graffiti has also been observed within pillboxes in the UK, ranging from doodles and writing in pencil, to more elaborate designs.

In recent years the Fairbourne pillbox has become the target for modern graffiti, and this now covers the majority of the internal walls and part of the ceiling. While no evidence of original wartime markings or contemporary graffiti has been observed, there is a possibility it could exist beneath later paint, and care should be taken when planning removal of these later layers to avoid the loss of earlier markings or graffiti.

## 5 RESULTS

### 5.1 Detailed survey and recording of pillbox PRN 34151

The pillbox is located at SH 61140 12536 next to a carparking area (figure 3). It is within the line of anti-tank blocks (plate 16). It should be noted that the polygon defining the scheduled monument area as provided to Gwynedd HER by Cadw does not precisely fit over the actual features on the ground (see figure 3). This applies for the whole length of the monument.

For internal and external plan of the pillbox see figure 4. External elevations are shown in plates 17 and 18 and figure 5, and internal elevations are shown on plate 19 and figure 6.

The pillbox is an irregular hexagon in plan with an entrance on the eastern, landward side. The eastern wall is 4.0m long externally and aligned almost exactly north-south. The north-west and south-east walls are 2.4m and the other walls are 1.1m long. The eastern elevation is 2.4m high externally but the western elevation is 3.1m high as it has been extended into the beach pebbles to provide support on the seaward side and prevent the pillbox being undermined by the sea.

The walls are built from a double skin of brick with a roughly concreted rubble core and are all 440mm thick. The bricks measure 230 by 110 by 80mm and are laid in stretcher bond with occasional headers in the middle of the walls to ensure the correct length of the wall. Externally the bricks are generally quite badly cracked and eroded. The mortar used is hard and grey and made with beach sand. Some concrete bricks have been used in the northern side, but these may have been repairs.

The roof is concrete 0.24m thick and laid in three layers as can be seen in places outside (plate 20). It was clearly laid *in situ* once the walls were built. The walls of the pillbox must have been surrounded by shuttering to cast the roof and the underside of the roof was cast onto boards some of which were covered by a material, possibly tar paper, the wrinkles of which can be seen cast in the concrete (plate 21). The casts of the planks, including the grain of the wood (plate 22), can also be seen in the roof.

The pillbox has large rectangular firing loops or embrasures cast from concrete. There are embrasures in all the walls with one embrasure at each side of the door in the eastern wall. The embrasures measure about 320 by 380mm externally and 740 by 380mm internally, splaying out inside, with no stepping (plate 23). There is some slight variation in size between individual embrasures, mainly related to erosion of the sill and sides. The rear embrasures have been blocked with concrete bricks and have a cement step behind the blocking but this seems to be earlier than the blocking itself (plate 24).

A thin deposit of concrete projects from under the base of the brick walls (plate 25) and it appears that trenches were dug in the pebbles and concrete placed as a foundation. Some bricks were used in the foundations on the south-east side. The walls were built on these foundations and then the concrete for the floor was laid within the walls. The floor is covered in screed which is only



slightly worn. There is no trace of an internal blast wall in the screed. The concrete used for the roof, embrasures and the foundations all has a high proportion of beach pebbles.

The outside of the pillbox has been rendered. This render covers the blocking of the rear embrasures so it post-dates the abandonment of the pillbox. Elsewhere the remains of the render mainly consists of a thin skim obscuring the bricks in patches but more substantial areas survive on the north-western elevation (plate 26). This render seems to have been painted black at some stage as some traces of black bitumous paint survive. The render has been modelled into a protecting hood over the north-eastern embrasure (plate 27) and odd traces hint at something similar over some of the other embrasures. When much of the render had fallen off the whole outside of the pillbox had been painted white. The render was probably applied when the pillbox was converted for use by the Barmouth Yacht Club and the white external paint must belong to a later phase of this use. There is no evidence that the pillbox was painted white during use in the war.

The entrance is 0.68m wide and 2m high, the full internal height of the pillbox. Two brick walls extend into the pillbox for 0.72m on either side of the entrance, creating a passageway. These are a brick length wide, i.e. 230mm. The bricks used are the same as for the main walls and occasional bricks project from these walls to partially bond them into the main walls (plate 28). However the passage walls are built on top of the screed on the floor that is laid up against the main walls, so the passage walls must be a later addition. Although added after the initial completion of the pillbox this does not exclude them from being built during the war, possibly as an alternative to an anti-ricochet wall. Certainly there would not have been room for both the passage walls and an anti-ricochet wall, and if the latter did exist it must have been removed before the former were built. There is however no evidence for the removal for an anti-ricochet wall as the screed floor is undamaged. Use by the Yacht Club is certainly represented by hinges for a door that are screwed into the northern passage wall. There are also two screws in the upper north side of the northern passage wall.

Most of the interior walls of the pillbox have been painted white and this paint extends onto the south face of the southern projecting wall. The painting is rather rough and seems to have started on the north-western wall and continued round to the southern projecting wall by which time the paint is running out and the paint is thinly applied. The paint seems to have run out before the whole interior could be completed.

Under all the embrasures except on the eastern wall are drill holes where the fixtures for shelves under the embrasures were screwed into the wall (plate 29). The white paint extends into these holes and covers any filling material in the holes, showing that the painting was done after the shelves had been removed.

The small excavation between the pillbox and the sea wall revealed no trace of an external blast wall. There were no remains of a foundation for this or of any concrete or brick remains that might be fragments of it, although the beach pebbles were in a dirty sandy matrix that suggested disturbance. It is assumed that when the sea wall was built all traces of the blast wall were removed.

## **5.2 Assessment excavation of pillbox base (PRN 34152)**

The pillbox stood on the shingle ridge just west of the junction between Beach Road and Penrhyn Road South at SH 61100 13083 (plate 30). This was also set within the line of anti-tank blocks. There was a gap in the line about 5.5m south of the pillbox where a block has presumably been removed, although there is no ramp or other modern structure that would explain this removal (figure 7). All the upstanding remains have been removed but the base of the pillbox survived largely buried under beach pebbles and soil.

The removal of beach pebbles and soil revealed the base of the pillbox which survives in quite a complete condition and provides a section through the walls of a pillbox as the foundations of the walls survive while the superstructure has been removed (plate 31). The plan of the pillbox is an irregular hexagon with the entrance on the eastern, landward side (figure 8). The damaged state of the remains makes measurement of the walls less precise than for PRN 34151 but the eastern side measures about 3.83m externally, the north-eastern side 2.20m, the north-western side 1.76m, the western side 2.75m, the south-western side 1.84m and the south-eastern side 2.30m.

With the exception of the western wall the walls are double skinned, 440mm wide, with brick facing and a concrete core. The red bricks measure 230 by 110 by 80mm. The concrete for both the walls and the floor is made with local beach pebbles. Some of the bricks are perpendicular to the wall face and project into the core to ensure the length of the wall is correct (plate 32).

The western, front wall, facing the direction of potential attack, had only a single skin of bricks with no concrete core. A small amount of additional excavation was carried out to confirm that this was an outer face and it clearly proved to be (plate 33). This face was also bonded into the other walls of the structure. This would have made the pillbox weak on the most vulnerable side but would have saved time and bricks and would not have been obvious once the structure was completed, apart from the embrasure, which could only have been a window in this thin wall. To get the correct length of the wall the bricks could not be turned 90 degrees as in the other walls so some were broken to be only 180mm long.

The entrance is 0.68m wide, but was partially blocked by a continuation of the outer brick wall face with some concrete behind it (plate 32). The bricks used for blocking were the same as those used for the main construction.

The floor of the pillbox was made of concrete covered with a layer of screed. In the centre of the floor a roughly Y-shaped area of screed has eroded away (plate 34). It is probable that this indicates where the internal blast wall was located and the removal of that wall has damaged the screed in this area. There are also impressions in the screed. One is a groove 30mm wide and extending perpendicularly from the rear wall for 320mm before being lost in the screed damage (plate 32). This groove is 5mm deep and the eastern end is rounded. There are also impressions of battens along the floor inside the south-eastern and south-western walls, which may be related to a lining or some furniture. Other slight grooves are difficult to explain but must have been made when the screed was wet and are related to the construction of the pillbox (plate 35).

Between the pillbox and the sea wall is a section of intact wall that has been laid flat (plate 32). Presumably this had fallen outwards and had been cut by the sea wall when that was built.

### **5.3 Survey of graffiti on the anti-tank blocks**

All the anti-tank blocks were originally the same size and are square in plan with a trapezoidal section. Their square tops all measure 930mm by 930mm and their bases are c. 1.53m square. They are constructed of concrete containing pebbles up to 150mm long laid in layers. The imprint of timbers shows how they were shuttered during the casting of the concrete. They were c. 170mm tall but only those fully exposed at the southern end of the beach show their full height (plate 36). Some of that height must always have been intended to be buried under beach pebbles to keep them stable and protected from sea erosion. Many others are almost buried (plate 37), or at the northern end where sand has built up, some are entirely buried. The blocks at the southern end of the line have been most severely hit by sea erosion and some have been entirely tipped over and moved down towards the sea (plate 38), while others have been moved to form part of the coastal defences (plate 39).

Twenty three anti-tank blocks were recorded; twenty with graffiti, two with casts of iron posts in the top, and one with a hand print. These are located on figure 9 identified by the PRN allocated to each recorded block. All the anti-tank blocks recorded were in good condition, but erosion hits the top of the blocks most severely so those that were in a poor condition would have lost any graffiti (plate 40) and so would not be included in the survey. Although some of the surveyed blocks had slumped and were leaning to one side, generally to towards the south-west, they were all approximately *in situ*. The degree to which the blocks were exposed or buried varied greatly with those towards the southern end of the line generally more exposed and those to the northern end in some cases almost entirely buried. Obviously no completely buried examples were included in the survey as no graffiti would be visible on these.

Most of the graffiti consists of names, either fully spelt out such as "THOMAS ROBERTS" on PRN 60988 (plate 41) and "L WILLIAMS" on PRN 61002 (plate 42), or as initials. There is a very clear "ER" on PRN 60992 (plate 43), and "MM" (or possibly "WW") on PRN 60993 (plate 44). "JRO" on PRN 60995 (plate 45) and "CWT" on PRN 60997 (plate 46). The initials "DW" appear on two blocks (PRN 61000, and 61003) (plates 47 and 48). PRN 60989 may also have been marked by DW as there is a "D" associated with other illegible letters but also with the letters "FLR". On PRN 61000 was written "DW 1940 FL[?]" (probably FLR, and presumably DW's girlfriend's initials). The "LW" on PRN 61004 may be the same person as "L Williams" mentioned above. The letters "AR" are visible on PRN 61006 but this block is almost buried and they could be the start of a name or word the rest of which is buried in the sand.

It may be speculated that these names and initials refer to the men that constructed the blocks but it is not impossible that wet concrete left overnight attracted the graffiti of the general population. Not all the names are necessarily male. "PAT" on PRN 60997 and "PATTY" on PRN 60996 (plate 49) may refer to the same person, probably a woman. Possibly this represents a woman writing her own name but more likely it is the name of a girlfriend.

Four blocks have dates with the initials; "JG L-W 18 8 1940" on PRN 60998 (plate 50), "DW 1940 FL[?]" on PRN 61000 (plate 47), "LW 11 40" on 61004 (plate 51), and "JJ 40" on PRN 61008, where the "40" is almost certainly is part of a date.

Some graffiti is quite hard to decipher, such as "9[?] PANT" on PRN 60999 (plate 52). The "9" is rather elongated and may not be a number but if it is this might possibly be an address (there is a road called Pant Einion in Friog). One piece of graffiti that can be easily deciphered is "ITMA" written on PRN 60996 (plate 53). This refers to the BBC radio comedy programme "It's That Man Again", which ran from 1939 to 1949 and starred comedian Tommy Handley.

Some graffiti is poorly defined. The letters "FLR" with possibly other letters just above them beginning with "D", can be read on PRN 60989, but other possible letters are illegible. PRN 60990 has a possible "D" and may be a "p" or "d" but other marks cannot be read and may not be graffiti. In some cases marks on the surface of the blocks seem to be the result of vegetable matter being stuck to the wet concrete and in some cases it appears that the concrete was covered with some material, possibly tar paper, to keep rain from the wet concrete. This has left wrinkles cast into the concrete surface in some cases and it is likely that some marks that resemble letters may also be the result of these wrinkle casts.

Not all the marks are graffiti. Near the western corner of the top of PRN 61007 is a hand print (plate 54). This measures 190mm x 150mm and the index finger is c.100mm long. The palm is only lightly impressed and the other fingers are not as deeply impressed as the index finger. It is a right hand and is fairly large for a woman, so it is probably a male hand.

Two blocks (PRN 60986 and 60987) each have two rectangular holes, cast into the concrete in the top of the blocks, near the north-east corner in both cases. Each hole measures c. 35mm x 30mm and they are over 60mm deep (plate 55). It appears that these were for iron posts supporting a sign

but this must have been contemporary with the blocks as the holes are cast in wet concrete not drilled afterwards. Presumably this sign warned the public not to try and access the beach.

During the survey a few other features were recorded. These include a wooden structure between anti-tank blocks and two wooden posts on the beach which probably held barbed wire. Two substantial squared timbers forming part of a structure (PRN 61011) between two largely buried anti-tank blocks (plate 56). The structure is largely covered by sand so its form is difficult to see and its function is unclear. It is not known if this is an original feature of the anti-tank defences or something that has been added later.

There are two wooden posts on the beach towards the northern end (PRN 61009 and 61010). The posts are c.0.1m in diameter and survive up to a maximum height of 0.5m above the present sand level (plate 57). They are made of roundwood with branch bases or knot holes projecting and are quite firm and well-preserved. They probably supported the barbed wire entanglement constructed on the beach as part of the coastal defences. Dalton (2012, 63) presents a 1945 aerial photograph of Red Wharf Bay on Anglesey showing such an entanglement defence. Local residents report that at Fairbourne there were many more of these posts surviving on the beach until recent years and that they were all wooden and not iron, as was often used elsewhere.

## 6 CONCLUSIONS

Inspection of pillbox PRN 34151 showed that while there was photographic evidence for an external blast wall associated with this pillbox no traces of this now survive as all must have been removed when the sea wall was built in 1981. There is also no evidence for an internal anti-ricochet wall visible on either the floor or the ceiling, but it is possible that one did exist. The neighbouring pillbox (PRN 34152) does seem to have had one as shown by the damage to the screed on the floor, but no similar damage is present in PRN 34151. If there was an anti-ricochet wall in PRN 34151 it must have been removed when the internal passage walls were built.

However pillbox PRN 34152 also provides a warning against assuming that neighbouring pillboxes were identical. The seaward wall of PRN 34152 is only one brick thick, while that of PRN 34151 is the same as the other walls of the pillbox. The details therefore do not have to be exactly the same even between pillboxes that are part of the same defensive system and were probably built at the same time and by the same people.

The two passage walls in PRN 34151 were built later than the external walls. While this means that they could be much later the way that they have been carefully bonded into the outer walls rather than just abutting them does perhaps suggest that they were designed with a blast wall function in mind and that they were built instead of a Y-shaped anti-ricochet wall inside the pillbox towards the end of its construction.

PRN 34151 clearly had shelves fitted under the embrasures as shown by drill holes to fix them. The external rendering seems not to be related to the wartime use of the pillbox and the painting of both exterior and interior is also not original. No evidence for original paint or other means of camouflaging the pill box was identified.

The graffiti on the anti-tank blocks has been recorded and provides a record of the names and interests of local people during the Second World War. However it is a priority to survey in all the anti-tank blocks to provide a detailed plan for future management. If the current position and condition of all blocks were recorded it would be easier to track damage by sea and weather erosion and tell which blocks had been lost to the sea or buried in sand.

## 7 SOURCES CONSULTED

Chartered Institute for Archaeologists, 2014. *Standard and Guidance for the archaeological investigation and recording of standing buildings or structures*

Dalton, M., 2012. *Defending Anglesey*, Folly Books Ltd

Gwyn, D. Rh. And Dutton, L. A., 1996. Coastal Erosion Survey Aberdaron to Aberdyfi, unpublished GAT report 198

Haslam, R., Orback, J., Voelcker, A., 2009 *The Buildings of Wales: Gwynedd*, London.

Met Office/Centre for Ecology and Hydrology 2014, *The Recent Storms and Floods in the UK* ([http://www.metoffice.gov.uk/media/pdf/n/i/Recent\\_Storms\\_Briefing\\_Final\\_07023.pdf](http://www.metoffice.gov.uk/media/pdf/n/i/Recent_Storms_Briefing_Final_07023.pdf), consulted October 2015)

Osborne, M., 2007. *Pillboxes of Britain and Ireland*, The History Press Ltd

Parry, M., 2006, *WWII Defences on the Shores of the Mawddach Estuary*, unpublished report RCAHMW

Pillbox Study Group Website <http://www.pillbox-study-group.org.uk/>

Pye, K., Saye, S. and Blott, S., 2007. *Sand Dune Processes and Management for Flood and Coastal Defence Part 3: The Geomorphological and Management Status of Coastal Dunes in England and Wales*. Environment Agency/DEFRA Technical Report FD1302/TR

Redfern, N., 1998. *Twentieth Century Fortifications in the United Kingdom, Vol. II, Site Gazetteers: Wales*, CBA

Return to the Ferry Website: <http://www.return2ferry.co.uk/fairbourne.html>, accessed 26/2/2016

Ruddy, A.J., 2003. *British Anti-Invasion Defences 1940-1945*, Historic Military Press

Wills, H., 1985. *Pillboxes, A Study of UK Defences 1940*, Leo Cooper

Additional information has been provided via email and conversation with several specialists, including Roger J C Thomas at English Heritage, Nina Steele at Gwynedd Archaeological Trust, Medwyn Parry at the RCAHMW, Tim Denton and Alasdair Ford of the Pillbox Study Group.

## 8 APPENDIX I: GAZETTEER OF SITES

PRN	Site Name	NGR	Notes
7275	Tank Defences, Fairbourne	SH6106713400	<p>An excellent example of a second world war coastal defence, consisting of a concrete sea-wall surmounted by cube tank defences, on a shingle bank. (Dutton &amp; Gwyn, 1996)</p> <p>A long line of large, square concrete blocks line the seaward side of the sea-wall at Fairbourne. They are well preserved and now quite a rare example of such defences. They must have been made in situ. Efforts to remove them, as an eyesore to the tourist trade after the end of the war had to be abandoned because of their size and weight. However, by the existing sewage outfall one or two are missing or subsided into the beach, possibly as a result of relaying the outfall. (Smith, 2002)</p> <p>The monument consists of anti-invasion defences, dating to the early period of WWII (AD 1940-41), that formed part of Western Command's coastal crust defences. The defences are aligned N-S to defend a flat area of salt marsh and the gently shelving beach. They are located on the top of Fairbourne beach immediately in front of the sea wall. The monument consists of at least 650 concrete anti-tank blocks arranged in a single and almost unbroken line c.2.3km in length, punctuated at regular intervals by at least four Type 24 pillboxes. &lt;3&gt;</p> <p>The cubes are nearly all situated in their original positions, and form an almost continuous single line extending 2.4km. When constructed the line comprised 691 anti-tank cubes. Eight of the cubes at the extreme south of the line have been moved off the original line, turned on their sides, and used to reinforce the sea wall. The next six in line have fallen on their sides, possibly due to the shifting of the shingle beach. There were five standard FW3/24 pattern pillboxes set into the defensive line (PRNs 34150 - 34154). It was standard military practice to have the pillboxes set a short distance behind the line, but at Fairbourne they were set into the linear defence itself. (Parry, 2006)</p> <p>Recent high tides and bad weather have badly damaged the anti-tank cubes between Beach Road and Ffriog. Many of them are in a dangerous state and need to be consolidated. (Burman, 2014).</p> <p>The concrete sea wall, which was built in 1981, is not part of the defences, which would have been built directly on the unaltered shingle ridge.</p> <p>Coflein has a fine collection of aerial photographs of the anti-tank blocks taken on 02/06/2009.</p>
34150	Pillbox, Fairbourne	SH6110012037	<p>A standard hexagonal type FW3/24, brick built, double skin with a concrete and rubble infill. The walls are 430mm thick, with internal headroom of 2.12m, and a roof thickness of 0.22m. The entrance is set into the rear wall (3.97m long) with a small loophole each side of the doorway. Two of the front walls of the pillbox have been removed, and the remaining firing loop and entrance have been blocked off. The concrete roof and foundation both remain intact. Forms part of a defensive line with the anti-Tank Cubes (PRN 7275) and another five pillboxes (PRNs 34150 -</p>

PRN	Site Name	NGR	Notes
			<p>34154). (Parry 2006).</p> <p>Pillbox almost completely destroyed by high tides and bad weather. Some brick and concrete debris scattered on the beach are all that remains of this pillbox. (Burman, 2014).</p> <p>Almost nothing can now be seen. Just occasional bricks amongst the pebbles.</p> <p>The NMR record for this site is incorrectly located.</p> <p>A photograph taken by RCAHMW on 02/06/2009 shows this pillbox still largely intact (see NPRN 270353).</p>
34151	Pillbox, Fairbourne	SH6114012536	<p>A type FW3/24 brick built pillbox in excellent condition. Forms part of a defensive line with the anti-tank cubes (PRN 7275) and another five pillboxes (PRNs 34150 - 34154). (Parry, 2006).</p> <p>Concrete rectangular structure, now painted white and used by Barmouth Yacht Club as a store. (Dutton &amp; Gwyn, 1996)</p> <p>Coflein has an aerial photograph of this pillbox and adjacent anti-tank blocks taken on 02/06/2009.</p>
34152	Pillbox, Remains of, Fairbourne	SH6110013083	<p>Directly in line with (and defending) the access road to the village. Only the concrete foundation of the structure survives, but its unmistakable Type FW3/24 plan on the ground is very clear. Forms part of a defensive line with the anti-tank cubes (PRN 7275) and another five pillboxes (PRNs 34150 - 34154). &lt;1&gt;</p>
34153	Pillbox, Remains of, Fairbourne	SH6104313603	<p>Faint remains of a type FW3/24 pillbox. Almost all trace of the pillbox has gone. A part of the foundation is still visible, with a few fragments of red brick and concrete in the vicinity. Forms part of a defensive line with the anti-tank cubes (PRN 7275) and another five pillboxes (PRNs 34150 - 34154). (Parry 2006)</p> <p>It is likely the remains are still there but when inspected the area was buried under pebbles.</p>
34154	Pillbox, Former Site of, Fairbourne	SH6102014129	<p>An aerial photograph taken in 1950 shows a pillbox here leaning over at a shallow angle, probably due to coastal erosion. Now completely demolished, but large fragments of the pillbox can be seen in the immediate area. Formed part of a defensive line with the anti-tank cubes (PRN 7275) and another five pillboxes (PRNs 34150 - 34154). (Parry 2006)</p> <p>Some chunks of brick and concrete can be seen partially buried by pebbles in this location.</p>
60986	Anti-tank block, Fairbourne	SH6113712623	<p>Anti-tank block in good condition and in situ, but half buried by pebbles (c.1m exposed). In the top of the block, near the NE corner, are 2 rectangular holes, cast into the concrete. These measure c. 35mm x 30mm and are over 60mm deep. The adjacent block (PRN 60987) has matching holes and it is likely that the supports for a sign were fixed in these holes.</p>
60987	Anti-tank block, Fairbourne	SH6113712627	<p>Anti-tank block in good condition and in situ, but half buried by pebbles (c.0.85m exposed). In the top of the block, near the NE corner, are 2 rectangular holes, cast into the concrete. These measure c. 35mm x 30mm and are over 60mm deep. The adjacent block (PRN 60986) has matching holes and it is likely that the supports for a sign were</p>

PRN	Site Name	NGR	Notes
			fixed in these holes.
60988	Anti-tank block with graffiti, Fairbourne	SH6112912742	Anti-tank block in good condition and in situ, but largely buried by pebbles (c.0.5m exposed). On the top of the block, in a fairly central position, is the graffiti "THOMAS ROBERTS".
60989	Anti-tank block with graffiti, Fairbourne	SH6112412819	Anti-tank block in good condition and in situ, but largely buried by pebbles (c.0.6m exposed). On the top of the block, in the NW corner, is some possible graffiti. The letters "FLR" can be seen with possibly other letters just above them beginning with "D", but the others are illegible.
60990	Anti-tank block with graffiti, Fairbourne	SH6108613222	Anti-tank block in good condition and in situ, but partially buried by pebbles (c.1.25m exposed). On the top of the block are marks resembling letters (perhaps "Pit") in the W corner, with 3 parallel lines to the NE of this, and a possible "D" against the E side. There may be a "p" or "d" in the N corner. Not all these marks are certainly graffiti.
60991	Anti-tank block with graffiti, Fairbourne	SH6108013280	Anti-tank block in good condition and in situ, but partially buried by pebbles (c.1.3m exposed). On the top of the block, close to the NE side, are marks resembling letters. These are mainly 2 sets of parallel, or near parallel, lines. One mark has a cross bar on top and resembles a "T". Also larger letters along NE side reading JAH with other possible letters following.
60992	Anti-tank block with graffiti, Fairbourne	SH6107813296	Anti-tank block in good condition and in situ, but half buried by pebbles (c.1m exposed). On the top of the block, in the W corner, is the graffiti "ER". There are also some slight marks below this and a possible "F" near the NE side.
60993	Anti-tank block with graffiti, Fairbourne	SH6107813300	Anti-tank block in good condition and in situ, but half buried by pebbles (c.1m exposed). On the top of the block, in the S corner, is the graffiti "MM" (or possibly "WW").
60994	Anti-tank block with graffiti, Fairbourne	SH6107113367	Anti-tank block in good condition and in situ, but half buried by pebbles (c.0.7m exposed). On the top of the block, in the W corner, is a sub-circular groove with a faint line running across it and a "V" to one side. This appears to be a deliberately inscribed symbol.
60995	Anti-tank block with graffiti, Fairbourne	SH6105613502	Anti-tank block in good condition and generally in situ, but tipped towards the W. It is half buried by pebbles (up to c.1m exposed). On the top of the block, in the W corner, is the graffiti "JRO".
60996	Anti-tank block with graffiti, Fairbourne	SH6105513515	Anti-tank block in good condition and in situ, but half buried by pebbles (c.1.2m exposed). On the top of the block, in the E corner, is the graffiti "ITMA", and along the SE side is "PATTY", which is rather faint. ITMA refers to the BBC radio comedy programme "It's That Man Again", which ran from 1939 to 1949 and starred comedian Tommy Handley.
60997	Anti-tank block with graffiti, Fairbourne	SH6105413519	Anti-tank block in good condition and in situ, but half buried by pebbles (c.1.2m exposed). On the top of the block is the graffiti "CWT" with other possible graffiti. The latter seems to be three lines of writing all underlined. The top line reads "PAT" but the others are not legible.



PRN	Site Name	NGR	Notes
60998	Anti-tank block with graffiti, Fairbourne	SH6105213539	Anti-tank block in good condition and generally in situ, but tipped towards the W. It is half buried by pebbles (up to c.0.85m exposed). On the top of the block, near the E side, is the graffiti "JG L-W 18 8 1940".
60999	Anti-tank block with graffiti, Fairbourne	SH6105113549	Anti-tank block in good condition and generally in situ, but tipped towards the W. It is half buried by pebbles (up to c.0.9m exposed). On the top of the block, near the E corner, is the graffiti "9[?] PANT". The "9" is rather elongated and may not be a number but if it is this might possibly be an address (there is a road called Pant Einion in Friog).
61000	Anti-tank block with graffiti, Fairbourne	SH6104913562	Anti-tank block in good condition and generally in situ, but tipped towards the W. It is largely buried by pebbles (up to c.0.6m exposed). On the top of the block, near the E corner, is the graffiti "DW 1940 FL[?]".
61001	Anti-tank block with graffiti, Fairbourne	SH6104713583	Anti-tank block in good condition and generally in situ, but tipped towards the W. It is largely buried by pebbles (up to c.0.7m exposed). On the top of the block are marks resembling letters. Marks that could be "T", "L" and "E" can be seen but they make little sense.
61002	Anti-tank block with graffiti, Fairbourne	SH6104413622	Anti-tank block in good condition and generally in situ, but tipped towards the W. It is largely buried by pebbles (up to c.1m exposed). On the top of the block, in the E corner, is the graffiti "L WILLIAMS". There is also a possible "B" or "13".
61003	Anti-tank block with graffiti, Fairbourne	SH6104313629	Anti-tank block in good condition and generally in situ, but tipped towards the W. It is largely buried by pebbles (up to c.0.8m exposed). On the top of the block, near the E corner, is the graffiti "DW".
61004	Anti-tank block with graffiti, Fairbourne	SH6104213677	Anti-tank block in fairly good condition and in situ, but largely buried by pebbles (c.0.5m exposed). On the top of the block, near the S corner, is the graffiti "D[?]W [?] 11 40".
61005	Anti-tank block with graffiti, Fairbourne	SH6102514015	Anti-tank block in good condition and in situ, but largely buried by pebbles (c.0.6m exposed). On the top of the block are two broad, slightly curving grooves coming together at the NE end. These seem to have been deliberately created rather than being chance impressions but it is not clear that these are definitely graffiti.
61006	Anti-tank block with graffiti, Fairbourne	SH6102014103	Anti-tank block in good condition and generally in situ, but tipped to the W. It is almost entirely buried and partly over grown with marram grass. On the top of the block, in the N corner, is the graffiti "AR". This may continue under the pebbles covering the lower part of the top of the block.
61007	Anti-tank block with hand print, Fairbourne	SH6102114089	Anti-tank block in good condition and generally in situ, but tipped towards the W. It is almost entirely buried by pebbles (up to c.0.35m exposed). On the top of the block, near the W corner, is a hand print. This measures 190mm x 150mm and the index finger is c.100mm long. The palm is only lightly impressed and the other fingers are not as deeply impressed as the index finger. It is a right hand and is fairly large for a woman, so it is probably a fairly small male hand.

PRN	Site Name	NGR	Notes
61008	Anti-tank block with graffiti, Fairbourne	SH6104213673	Anti-tank block in good condition and generally in situ, but slightly tipped towards the W. It is largely buried by pebbles (c.0.5m exposed). On the top of the block, in the N corner, is the graffiti "JJ 40". The "40" almost certainly is part of a date, the rest of which may have been eroded away.
61009	Wooden post, Fairbourne	SH6099314194	Wooden post c.0.1m diameter and surviving to c.0.35m high on Fairbourne beach. It is made of roundwood with branch bases or knot holes projecting from it. It is quite firm and well preserved. This and the other nearby post (PRN 61010) probably supported the barbed wire entanglement constructed on the beach as part of the coastal defences during the Second World War. Local residents report that there were many more of these posts surviving on the beach until recent years and that they were all wooden and not iron.
61010	Wooden post, Fairbourne	SH6097214206	Wooden post c.0.1m diameter and surviving to c.0.5m high on Fairbourne beach. It is made of roundwood and is quite firm and well preserved, although covered in silt and green weed. This and the other nearby post (PRN 61009) probably supported the barbed wire entanglement constructed on the beach as part of the coastal defences during the Second World War. Local residents report that there were many more of these posts surviving on the beach until recent years and that they were all wooden and not iron.
61011	Timber structure, Fairbourne	SH6103314214	Two substantial squared timbers forming part of a structure between two largely buried anti-tank blocks. The structure is largely covered by sand so its form is difficult to see and its function is unclear. It is not known if this is an original feature of the anti-tank defences or something that has been added later.

## **9 APPENDIX II: SPECIFICATION FOR WORKS**

### **9.1 Site Preparation**

#### **9.1.1 Site Safety**

During working, Stonewyracs Cyf shall establish an appropriate 'exclusion zone' around the pillbox, using temporary barrier fencing or similar, so as to exclude members of the public from the working area.

At the end of each working day, the immediate area around the pillbox shall be secured using Heras-type fencing of at least 1800 mm in height, installed fully in accordance with the manufacturer's instructions. The fencing shall carry appropriate signage about the dangers of unauthorised access to construction sites fully in accordance with current guidelines; and, shall carry laminated 'Conservation in Action' and Cadw/Welsh Government funding acknowledgement signage (to be provided by the appointed project manager).

#### **9.1.2 Area of Former External Blast Wall**

Beach pebbles and other debris overlying the location of the former external blast wall, lying between the east elevation of the pillbox and the concrete margin of the sea wall/path, and extending the full width of the east elevation of the pillbox shall be removed by hand by Gwynedd Archaeological Trust.

All stone arising shall be returned to the beach area to the west of the pillbox by Stonewyracs Cyf. Any litter arising shall be bagged and removed from site for appropriate disposal.

Gwynedd Archaeological Trust shall clean back the extent of the area described above and produce a measured photographic record of the location- and any evidence of- the former external blast wall. Its position and dimensions, if determined, shall then be clearly marked out to enable the reconstruction, by Stonewyracs Cyf, of a partial, replica blast wall, to the specification described below.

#### **9.1.3 Other External Areas**

Beach pebbles and other debris lying against all other elevations of the pillbox shall be removed using a two-tonne, 360°, skid-steer mini excavator, fitted with a narrow (i.e. 300 mm width or less) toothless ditching bucket.

The excavator shall not remove rubble from within 200 mm of the elevations of the pillbox. Beach pebbles and other debris within this zone shall be cleaned back from the face of the pillbox elevations by hand. This material may be cleared out by hand into a zone beyond 200 mm from the elevations where it can be removed by the excavator.

All beach pebbles and other debris shall be cleaned back in such a manner as to reveal the full and complete face of all elevations down to the concrete base. The cleaned back area shall fully grade out to the 'natural' level of the surrounding shingle, so as not to leave a lip or step. And, this work shall be undertaken so as not to undermine either the pillbox or any adjoining concrete block defences.

All stone arising shall be returned to the beach area to the west of the pillbox by Stonewyracs Cyf. Any litter arising shall be bagged and removed from site for appropriate disposal.

#### **9.1.4 The Interior**

All stone and other debris shall be removed by hand from the extent of the floor of the interior of the pillbox by Powerchem Environmental Services under archaeological supervision by Gwynedd Archaeological Trust.

All stone arising shall be cleaned in a detergent bath by Powerchem Environmental Services before being returned to the beach area to the west of the pillbox by Stonewyracs Cyf.

Any litter, human or other waste arising shall be bagged and removed from site for appropriate disposal.

Gwynedd Archaeological Trust shall produce a measured photographic record of all internal elevations and the floor and ceiling, including the location- and any evidence of - the former internal anti-ricochet wall. Its position and dimensions, if determined, shall then be clearly marked out to enable the reconstruction, by Stonewyracs Cyf, of a partial, replica anti-ricochet wall, to the specification described below.

## **9.2 Conservation Works**

### **9.2.1 The Exterior**

The two, closed rifle embrasures on the east elevation, either side of the entrance way shall be carefully re-opened by Stonewyracs Cyf so as to preserve the concrete/mortar form of the former embrasures and sills, removing only the infill brickwork.

All external elevations, including the external faces of all embrasures; the vertical face of the concrete roof capping; and, the original brickwork 'returns' of the entrance way (back only to the line of the tied-in, 'butt-jointed', later side walls of the entrance way) shall be rendered by Stonewyracs Cyf.

Render shall be a three-coat Sika system render, comprising a first layer Sika spritz and bonding coat mortar; a second layer of Sika render mortar; and, a third layer of Sika finishing mortar.

These mortars shall be mixed with Sika 1 liquid waterproofing admixture, diluted and mixed fully in accordance with the manufacturer's instructions.

The colour of the finishing mortar shall be a grey colour to match that of existing render remnants and adjoining concrete blocks, an appropriate additive dye being used to achieve this, as necessary.

The three coats of mortar shall be applied so as to encapsulate and tie-in surviving render remnants and parts of former 'hood' mouldings above embrasures. This shall be done in a manner so as to avoid creating a lip or edge that may form a line of weakness that may enable subsequent water ingress. All hood mouldings shall be appropriately recorded by Gwynedd Archaeological Trust prior to this work being undertaken.

The three coats of mortar shall be taken into the embrasures, so as to re-create missing embrasure or sill material and re-form the embrasure openings. The three coats of mortar shall finish level with surviving embrasure or sill material.

At top of roof level, the three coats of render shall be 'feathered' back to the lip of the roof on all elevations. It is recognised that this will create an inherent line of weakness that may result in subsequent water ingress and delamination of the render. PVA shall be used to enhance the bond of the mortar to the concrete roof edge so as to minimise this inherent line of weakness.

At all times during rendering, the ground area around the exterior of the pillbox shall be covered by plywood boards, Visqueen sheeting or similar, so as to catch- and enable the full removal of- all dropped render material. Particular care shall be taken to ensure that the area of the former external blast wall is fully protected in this manner at all times during working.

Once the applied render is fully dry, its full extent shall be treated with two coats of Graffiti Magic External Anti-Graffiti Coating fully in accordance with the manufacturer's instructions

<http://graffitimagic.com/products/graffiti-magic>).

### **9.2.2 The Interior**

Graffiti shall be removed (insofar as possible) from the underside of the roof of the pillbox by Stonewyracs Cyf using Graffiti Magic Bare Surface Graffiti Remover fully in accordance with the manufacturer's instructions ([http://graffitimagic.com/bare-surface-graffiti-remover/?doing\\_wp\\_cron=1435681790.4980490207672119140625](http://graffitimagic.com/bare-surface-graffiti-remover/?doing_wp_cron=1435681790.4980490207672119140625)).

All graffiti on interior elevations shall be left untreated.

The full extent of all interior elevations, including those faces of embrasures flush with the wall facing, shall be treated with two coats of smooth, brilliant white, microporous, water-based Dulux Weathershield masonry paint by Stonewyracs Cyf.

At all times during graffiti removal/painting, the floor area of the interior of the pillbox shall be covered by Visqueen sheeting or similar, so as to catch- and enable the full removal of- all dropped graffiti removal gel and paint.

All fixing holes for folding shelves below embrasures shall be retained and maintained visible.

## **9.3 Reconstructions**

### **9.3.1 Exterior Blast Wall**

Stonewyracs Cyf shall reconstruct a replica exterior blast wall to the dimensions determined by Gwynedd Archaeological Trust and informed by advice from Matt Rimmer.

The reconstructed wall shall reflect the original design and appearance, that is, comprise an external facing of reclaimed bricks, chosen by Stonewyracs Cyf so as to closely match the original brickwork of the pillbox, with a core comprising beach pebbles mixed with a standard, cement-based mortar.

The wall shall stand approximately 1000 mm in finished height, the core closed off with a course of bricks.

A standard cement-based mortar suitable for a maritime environment shall be used for all pointing.

### **9.3.2 Interior Anti-ricochet Wall**

Stonewyracs Cyf shall reconstruct a replica interior anti-ricochet wall to the dimensions determined by Gwynedd Archaeological Trust and informed by advice from Matt Rimmer.

The reconstructed wall shall reflect the original design and appearance, that is, comprise an external facing of reclaimed bricks, chosen by Stonewyracs Cyf so as to closely match the original brickwork of the pillbox, with a core comprising beach pebbles mixed with a standard, cement-based mortar.

The wall shall stand a minimum of three brick courses in height, with the core left exposed to view. A standard cement-based mortar suitable for a maritime environment shall be used for all pointing.

### **9.3.3 Interior embrasure shelf**

The embrasure shelf shall be constructed and installed by Matt Rimmer.

A single interior embrasure shelf shall be reconstructed to original design, for installation in its original position below the embrasure on the interior west elevation.

The shelf shall be made of Baltic pine, or similar, and be treated with an appropriate, clear wood preservative.

Butt hinges and fixings shall be of stainless-, galvanised- or zinc-plated- steel (suitable for a maritime environment) and shall closely match the type and style of the original.

## **9.4 Steelwork**

All steelwork shall be fabricated, finished and installed by Poplars Forge Ltd.

### **9.4.1 Embrasure grilles**

All embrasures to be closed with steel grilles, constructed of 40 mm x 12 mm flat bar with 20 mm diameter round bar inserts, bars to be spaced at 120 mm centres to comply with current regulations. The embrasure grilles shall stand 100 mm off from the interior elevations, with returns on all four sides to the interior elevations where fixing points shall be mounted to each side only, top and bottom so as to align with mortar coursing in the brickwork.

All steelwork will be affixed to the pillbox using resin-set stainless steel, threaded anchor pins into existing mortar joints of brickwork surrounding the concrete embrasures only. These threaded pins shall be fitted with standard hexagonal stainless steel nuts.

### **9.4.2 Entrance way door grille**

The entrance way shall be closed with a steel grille door, constructed of 40 mm x 12 mm flat bar with 20 mm diameter round bar inserts, bars to be spaced at 120 mm centres to comply with current regulations.

The door shall be designed to open outwards and shall lie more-or-less flat with the wall when fully opened.

The door shall be positioned at least two brick's width forward of the rear (interior) edge of the side return walls and be hung on two 'pin' hinges resin-set into the mortar joints of the brickwork wall. These hinge 'pins' shall be capped so as to prevent removal of the door by lifting, as required.

The door shall lock into a plate that has fixings resin-set into the mortar joints of the brickwork wall.

The door shall be secured using a bullet lock.

Four keys shall be required (two for Cadw, one for Gwynedd Council, one for local community TBC).

### **9.4.3 Finish**

All steelwork to be unquenched zinc galvanised, neutralised by 'T'-washing to create a mottled dull grey/blackened finish and then painted with a clear vinyl lacquer.

This treatment will present a modern finish, but of design and robustness in keeping with the character of the pillbox.

The treatment is expected to have a Service Life in this marine environment in excess of 50 years ('Service Life' being defined as the time to 5% rusting of steel surface).

## **9.5 Interpretation**

A bilingual, glass reinforced or similar, interpretative panel, bearing Cadw and Gwynedd Council logos, shall be produced and mounted, lectern-style on the east face of the partially reconstructed exterior blast wall.

The contents of the panel shall be determined under guidance from Matt Rimmer and shall describe the features of the pillbox, the purpose of the defences and the role of the local community in their construction and use.

Design style and contents shall be approved by Cadw and Gwynedd Council prior to production. Gwynedd Council shall assist with Welsh language translation.

## **10 APPENDIX III: ARCHAEOLOGICAL PROJECT DESIGN**

### **WWII DEFENCES FAIRBOURNE SEAFRONT**

#### **PROJECT DESIGN FOR ARCHAEOLOGICAL RECORDING AND EXCAVATION**

**Prepared for Cadw, September 2015**

### **10.1 Introduction**

Gwynedd Archaeological Trust (GAT) has been asked by Cadw to provide a project design for undertaking archaeological recording of the WWII coastal defence system at Fairbourne (NGR SH61411253C) along with the excavation and recording of one extant pillbox and one pillbox base. The entire coastal defensive system is a scheduled ancient monument (ME252).

The proposed works include:

- A basic survey of all the anti-tank cubes with graffiti.
- Clearance of the interior of the surviving pillbox and a full measured written and photographic survey of both the interior and exterior of the structure.
- Excavation of the concrete base of the raft of pillbox no3

A detailed description of the coastal defence system was produced by Medwyn Parry of RCAHMW in *WWII Defences on the Shores of the Mawddach Estuary* (undated c. 2007). Further documentary research is being carried out by Matt Rimmer in preparation for the present project.

Several elements of the defences were damaged or lost in the storms of February 2014. Most of the damage was at the south end of the defences where one pillbox and several anti-tank cubes were undermined. The pillbox was largely destroyed and the remains were subsequently broken up by the local Council.

Reference will be made to the guidelines specified in the Chartered Institute for Archaeologists (CIfA) *Standard and Guidance for the archaeological investigation and recording of standing buildings or structures* (CIfA 2014) and *Understanding Historic Buildings: A Guide to Good Recording Practice* (English Heritage, 2006).

### **10.2 Aims and Objectives**

The defensive system stands on a dynamic coastline. Current projections indicate his likelihood of increased levels of stormy weather as a result of global warming (Met Office/Centre for Ecology and Hydrology 2014, *The Recent Storms and Floods in the UK*) as well as an overall increase in sea level. This represents an ongoing threat to the monument. It would therefore be desirable to produce a detailed georeferenced record of the entire defensive system in advance of any major storm events. The anti-tank blocks, are square in plan with a trapezoidal section and are made from cast shuttered concrete, presumably poured in-situ, and incorporate stone and probably sand from the beach. Some have graffiti cut into the wet concrete on their upper surface. About 690 survive; some have however been undermined by the sea or moved in order to create access points. The quality of the concrete is also variable and some have begun to disintegrate particularly along the lines of separate pours of concrete.

There were originally five standard FW3/24 pattern pillboxes set into the defences. One was destroyed in the storms of Feb 2014, three remain only as bases or scatters of bricks and concrete



and one survives in good condition. The remaining pillbox is built from a double skin of brick with a roughly concreted rubble infill. It has large rectangular firing loops cast from concrete. The entrance is in the eastern wall and the passage is extended into the pillbox by two brick walls. The two firing loops in the eastern walls have been blocked with concrete bricks. A central Y-shaped blast or anti-ricochet wall is a common feature of this type of pillbox. Medwyn Parry records that it has been removed (c.2007, 10) there is currently no visible evidence of this. It is known that the pillbox was used by the local sailing club for some time; there are signs of repair with concrete bricks and patches of rough render and the remains of door fittings. The status of the inner entrance passage is unknown, if original there would not have been room for a Y shaped internal wall. The style of the original finish is unknown; there are remains of black bitumous paint and concrete render but it is no known if these were part of the original or a feature of later repairs. A coat of white paint almost certainly dates from the use by the Sailing Club.

The pillbox is however deteriorating at an increasing rate, as a result of the effects of storms, neglect and by deliberate vandalism. A photograph taken by Medwyn Parry in 1998 shows the pillbox with a somewhat eroded coating of white paint or whitewash. This has now largely been lost and many of the bricks are cracked and undergoing extensive surface failure and spallation, presumably as a result of absorbing water and subsequent frost damage. The interior and the entrance passageway have been sprayed with graffiti. The floor is covered with a layer beach cobbles mixed with the rubbish and detritus resulting from its use as an alternative to the nearby public toilets.

It has been decided that the pillbox requires conservation. Initial measures have been suggested comprising stabilisation of the external bricks and the provision of a grating to prevent access to the interior. A detailed record of the structure will be required before any works are carried out.

## **10.3 Methodology**

### **10.3.1 Basic survey – the anti-tank blocks**

The entire length of the array of anti-tank blocks will be walked so as to identify which blocks have contemporary graffiti on them. Only those with contemporary graffiti will be recorded as follows:

A simple four point record marking a square based on the exposed corners of each block will be taken with a Trimble R8 GNSS/R6/5800 GPS receiver (<10cm accuracy), and tied into the National Grid. This will be supplemented with the recording of basic details of each block on a simple database with checkbox fields that can be entered into a tablet device in the field. This will record condition, location (*in situ* or not), exposure/ amount buried and the details of the graffiti for each block. Each block will be allocated a sequential identifying number. A photographic record will be produced of each block comprising two views. Each will include a scale and a number identifying the block.

### **10.3.2 Detailed survey and recording – the pillbox**

#### **Clearance**

The interior contains beach cobbles, rubbish and the remains of human excrement in one area. This is on a concrete floor so removal should be straightforward and there will be no archaeological stratigraphy. The cobbles can be returned to the beach; rubbish can be bagged up and disposed of. All other waste should be assessed and removed following guidelines set out in *Managing offensive/ hygiene waste safely* (hse.gov.uk/pubns/waste22). This is not classed as hazardous waste but robust health and safety measures will need to be in place including measures for the removal and disposal of needles.

## **Recording**

A basic photographic survey will be produced of all elevations of the interior and exterior of the pillbox. This will use a levelled digital camera with the film plane parallel to the wall of the pillbox. The interior will be more problematic due to limited viewing angles and to lighting problems. The most accurate record would be produced by producing a 3D model using Agisoft PhotoScan. The software performs photogrammetric processing of digital images and generates 3D spatial data designed to be used in GIS applications, cultural heritage documentation, and visual effects production as well as for indirect measurements of objects of various scales. This can produce orthographic projections of all elevations which can be used to produce drawings prior to adding details or marking up in the field. In effect it can join and rectify a series of overlapping photographs to produce a 3D model and output orthographic elevations. This can be useful where there is no usable line of sight for straight-on photographic recording of elevations. Collection of photographs is swift, a series of overlapping hand held views from different angles and with similar lighting are taken. These are processed by the software to produce a 3D model. The images are used to produce the surfaces of the 3D objects thus producing a photorealistic model that can be used to produce orthogonal elevations (i.e. without parallax error). This is increasingly being used to produce full 3D records of excavations and structures in archaeology.

A standard photographic record will also be produced of constructional details a general record of the building in the context of its surroundings.

Details of photographic standards to be used:

- A digital SLR set to highest resolution will be used throughout.
- A tripod will be used for slower exposure shots
- Shots will be taken in RAW format
- Appropriate scales will be used where possible
- Remote flashes and additional lighting will be used for interior views
- Adobe Photoshop CS5 will be used for any post processing work required
- A complete table of metadata with details of each image, including descriptions and directions of each frame will be produced using Microsoft Access
- Images will be converted to TIFF and JPEG format for archiving.

### **10.3.3 Assessment excavation**

There is some doubt about the former presence of a Y shaped blast/anti-ricochet wall in the interior. If no evidence emerges after clearance of the interior it is suggested that the base of the next pillbox to the north should be uncovered in order to produce comparative evidence. This is currently partly buried under a thin deposit of beach cobbles. There appears to be no stratigraphy here so simple clearance, basic recording and reinstatement should be sufficient. It is also suggested that a simple sondage should be excavated through the beach deposits between the current footpath and the entrance to the pillbox in order to test for the presence of an external blast-wall.

### **10.3.4 Data processing and report compilation**

Following completion of the stages outlined above, a report will be produced incorporating the following:

1. Non-technical summary
2. Introduction
3. Aims and purpose
4. Specification
5. Methods and techniques, including details and location of project archive

6. Archaeological Background (possibly incorporating research results from Matt Rimmer)
7. Overall plan of the defences
8. Description and elevations of the pillbox
9. Summary and conclusions
10. List of sources consulted.

The report will include annotated photographs and/or detailed drawings (whatever is applicable) including important architectural details and any evidence of repairs and additions to the pillbox.

## **10.4 Dissemination and Archiving**

A full archive including plans, photographs, written material and any other material resulting from the project will be prepared. All plans, photographs and descriptions will be labelled and cross-referenced, and lodged in an appropriate place (to be decided in consultation with the client and the regional Historic Environment Record) within an agreed submission period.

### **10.4.1 Historic Environment Record**

In line with the regional Historic Environment Record (HER) requirements, the HER must be contacted at the onset of the project to ensure that any data arising is formatted in a manner suitable for accession to the HER. At the onset, the HER Enquiry Form provided by the HER, will be completed and submitted.

## **10.5 Personnel**

The work will be managed and undertaken by David Hopewell, Senior Archaeologist GAT Contracts Section along with one other member of staff with experience in survey and 3D modelling.

## **10.6 Health and Safety**

The Trust subscribes to the SCAUM (Standing Conference of Archaeological Unit Managers) Health and Safety Policy as defined in **Health and Safety in Field Archaeology** (2006). Risks will be assessed prior to and during the work.

On site GAT will abide by the requirements of the Principal Contractor and will submit a risk assessment and method statement (RAMS) to the Principal Contractor prior to attending site.

## **10.7 Insurance**

### **Public Liability**

Limit of Indemnity- £5,000,000 any one event in respect of Public Liability

INSURER Aviva Insurance Limited

POLICY TYPE Public Liability

POLICY NUMBER 24765101CHC/000405

EXPIRY DATE 22/06/2016

**Employers Liability**

Limit of Indemnity- £10,000,000 any one occurrence.

The cover has been issued on the insurers standard policy form and is subject to their usual terms and conditions. A copy of the policy wording is available on request.

INSURER Aviva Insurance Limited

POLICY TYPE Employers Liability

POLICY NUMBER 24765101CHC/000405

EXPIRY DATE 22/06/2016

**Professional Indemnity**

Limit of Indemnity- £5,000,000 in respect of each and every claim

INSURER Hiscox Insurance Company Limited

POLICY TYPE Professional Indemnity

POLICY NUMBER

HU PI 9129989/1208

EXPIRY DATE 23/07/2016

## 11 APPENDIX IV: COMPLETION REPORT ON CONSERVATION WORKS

### WWII Defences Fairbourne Seafront Scheduled Ancient Monument ME252 Works to Type 24 Bulletproof Pillbox: Completion Report

By Andre Berry, AQB Historic Landscapes



*IMG\_8272, 26.10.2015*

## **11.1 Context**

This Completion Report describes scaled-back works to the surviving Type 24 bulletproof pillbox at Fairbourne undertaken on Monday 26 October 2015, Tuesday 27 October 2015 and Thursday 3 March 2016.

Cadw requested a scaling-back of works originally proposed, because of significant beach erosion seaward of the pillbox. This erosion was caused by the unusual sequence of storms between mid-November 2015 and 31 January 2016.

The cost of works was met by Cadw and the project was managed on their behalf by Gwynedd Archaeological Trust.

The repair works described were undertaken by Stonewycs Cyf., Poplars Forge Fabrications and Powerchem Environmental Services.

## **11.2 Site Preparation**

### **11.2.1 Cleaning Back**

Beach pebbles and other debris lying against all external elevations of the pillbox was removed using a Neuson 1503, two-tonne, 360°, skid-steer mini excavator, fitted with a toothless bucket.

The excavator cleaned back beach pebbles and underlying material to a distance of *c.*200 mm from the elevations. Beach pebbles and other debris within this zone was cleaned back from the face of the elevations by hand.

All beach pebbles and other debris was cleaned back so as to reveal the full face of elevations down to the concrete base. The cleaned back area was graded out to the 'natural' level of the surrounding shingle. This work was undertaken so as not to undermine either the pillbox or any adjoining concrete block defences.

### **11.2.2 Replacing Beach Pebbles**

Following conservation works to the exterior of the pillbox, beach pebbles were reprofiled against the elevations of the pillbox using the mini excavator.

Reprofiling was undertaken so as to restore the level of beach pebbles to that existing prior to cleaning back.

In addition, some work was undertaken to restore beach pebbles to the seaward side of the pillbox, to partially address the significant erosion of the beach during the winter storms.



*Neuson 1503 mini-excavator cleaning back beach pebbles to reveal lower brickwork courses, IMG\_9773, 03.03.2016*



*Removing beach pebbles from lower brickwork faces by hand, IMG\_9776, 03.03.2016*



*Fully revealed footings and lower brickwork courses, IMG\_8296, 26.10.2015*



*Re-profiling shingle following completion of exterior works, IMG\_9824, 03.03.2016*





*Shingle beach seaward of pillbox, before erosion during Storm Imogen, IMG\_8272, 26.10.2015*



*Shingle beach seaward of pillbox after erosion during Storm Imogen, IMG\_9764, 03.03.2016*



*Shingle beach seaward of pillbox, following small-scale re-profiling, IMG\_9827, 03.03.2016*

## **11.3 The Works**

### **11.3.1 The Interior**

The interior of the pillbox was filled with a shallow, c.200mm deep layer of debris and beach pebbles prior to works commencing. It had also been used as a toilet on a number of occasions. On Monday 26 October 2015, all beach pebbles and other debris was removed by hand from the interior floor of the pillbox by Powerchem Environmental Services under archaeological supervision by Gwynedd Archaeological Trust.

Beach pebbles were cleaned in a detergent bath before being returned to the beach area seaward of the pillbox.

All litter, human and other waste was bagged and removed from site for appropriate disposal. Once the interior had been cleaned, Graffiti Magic Bare Surface Graffiti Remover was trialled on the underside of the concrete roof; and, on one northern interior elevation.

### **11.3.2 Graffiti**

Following trials on Monday 26 October 2015, graffiti was removed from the entirety of the interior of the pillbox on Thursday 3 March 2016 using Graffiti Magic Bare Surface Graffiti Remover. Applied fully in accordance with the manufacturer's instructions, the Graffiti Remover and graffiti was washed from treated surface using a petrol-powered pressure washer.

### **11.3.3 Securing Steelwork**

On Tuesday 27 October 2015, steel grilles were fitted internally to all embrasures; and, a door grille to the entrance, to secure the pillbox. All steelwork was fabricated, finished and installed by Poplars Forge Fabrications.

#### 11.3.4 Finish

All steelwork is unquenched, zinc galvanised, neutralised by 'T'-washing to create a mottled dull grey/blackened finish and then painted with a clear vinyl lacquer.

This treatment presents a modern finish, but of design and robustness in keeping with the character of the pillbox.

The treatment is expected to have a Service Life in this marine environment in excess of 50 years ('Service Life' being defined as the time to 5% rusting of steel surface).

#### 11.3.5 Embrasure Grilles

All embrasures were closed with steel grilles, constructed of 40 mm x 12 mm flat bar with 20 mm diameter round bar inserts. Bars are spaced at 120 mm centres to comply with current regulations. The embrasure grilles stand 100 mm off from the face of the interior elevations, with returns on each side to the elevations where fixing points are mounted. Fixing points are positioned top and bottom to align with mortar coursing in the brickwork.

All grilles are fixed using stainless steel, threaded anchor pins, set using Fischer FIS VT 380 C vinyl ester solid injection mortar. Standard, stainless steel hexagonal fixing nuts are capped with A2 stainless steel armour rings to obstruct easy removal.



*Drilling mortar joints for fixing points for the embrasure grilles, IMG\_8320, 27.10.2015*



*Securing stainless steel anchor pins using Fischer FIS VT 380 C vinyl ester solid injection mortar, IMG\_8339, 27.10.2015*



*Steelwork fixings, before (left) and after (right) installation of A2 stainless steel armour rings, IMG\_9805 and IMG\_9806, 03.03.2016*

### 11.3.6 Entrance way grille

The entrance way is closed with a steel grille door, constructed of 40 mm x 12 mm flat bar with 20 mm diameter round bar inserts. Bars are, again, spaced at 120 mm centres to comply with current regulations.

The door grille is designed to open outwards and lies more-or-less flat with the wall when fully opened. The door grille is positioned at least two brick's width forward of the rear (interior) edge of the side return walls and is hung on two 'pin' hinges. Due to the perceived weakness of the side return walls, hinge and lock fixing points are mounted on 40 mm x 12 mm flat bar, bolted through the thickness of the walls. The door grille is secured using two, keyed-alike bullet locks, top and bottom.



*Entrance way grille, IMG\_9769,  
03.03.2016*

### 11.3.7 The Exterior

As described above, beach pebbles and other debris was cleaned back to expose the full extent of exterior elevations.

Following this, all exterior elevations and the roof of the pillbox were spray-treated with two coats, wet-on-wet, of Kingfisher Storm Seal. Storm Seal is a silane/siloxane, water-based, water repellent, and susceptible to hydrolysis, for the sealing and priming of porous surfaces. It is microporous and breathable; and, has an effective life of 3 to 5 years.

The intention of the treatment is to inhibit saltwater penetration into the brickwork and mortar joints, thereby slowing the rate of deterioration through spalling.

Following treatment, beach pebbles were re-profiled around the pillbox, as described above.



*Applying Kingfisher Storm Seal, IMG\_9800, 03.03.2016*

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- Plate 51. "LW 11 40" inscribed on anti-tank block PRN 61004 (28/10/2015)
- Plate 52. "9 PANT" inscribed on anti-tank block PRN 60999 (28/10/2015)
- Plate 53. "ITMA" inscribed on anti-tank block PRN 60996 (28/10/2015)
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- Plate 57. Wooden post PRN 61010 (28/10/2015)



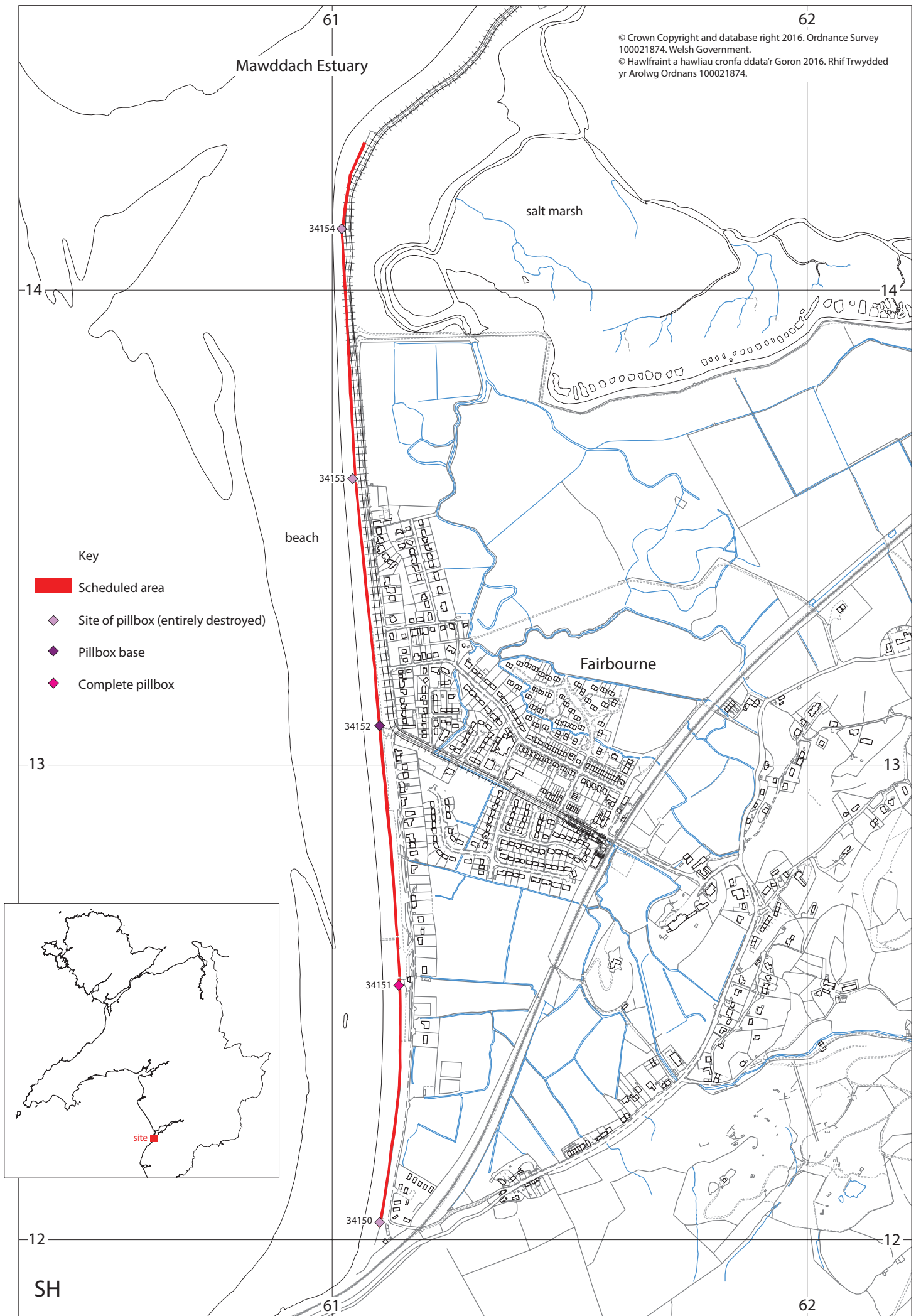


Figure 1. Location of anti-invasion defences at Fairbourne, showing position of pillboxes

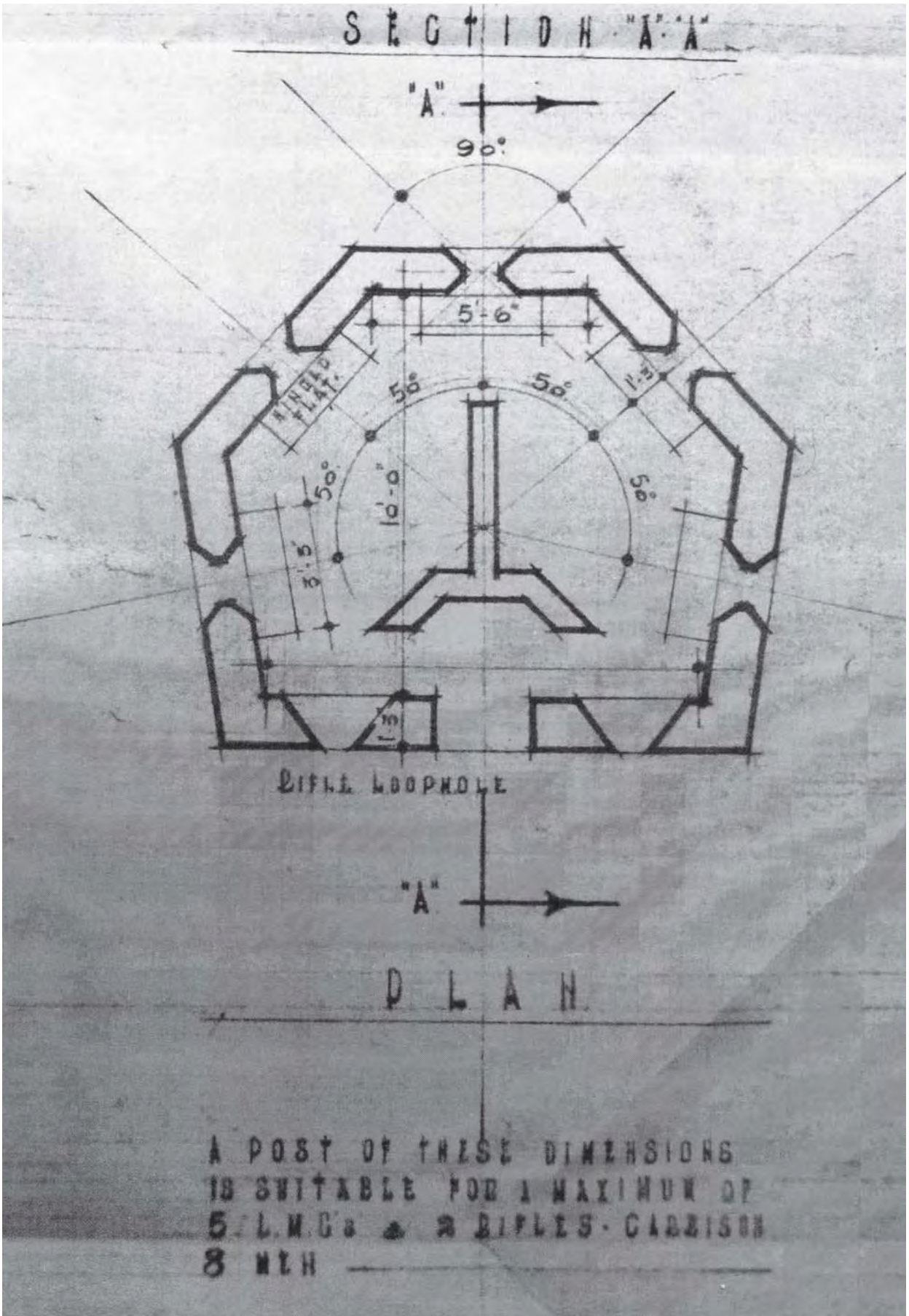


Figure 2. Directorate of Fortifications and Works plan of Type 24 pill box



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- Key
- Scheduled area as shown on digital polygon
  - Anti-invasion defences
  - Sea wall and modern ramps and steps

Figure 3. Detailed location of pillbox PRN 34151 and adjacent anti-tank blocks as surveyed for this project

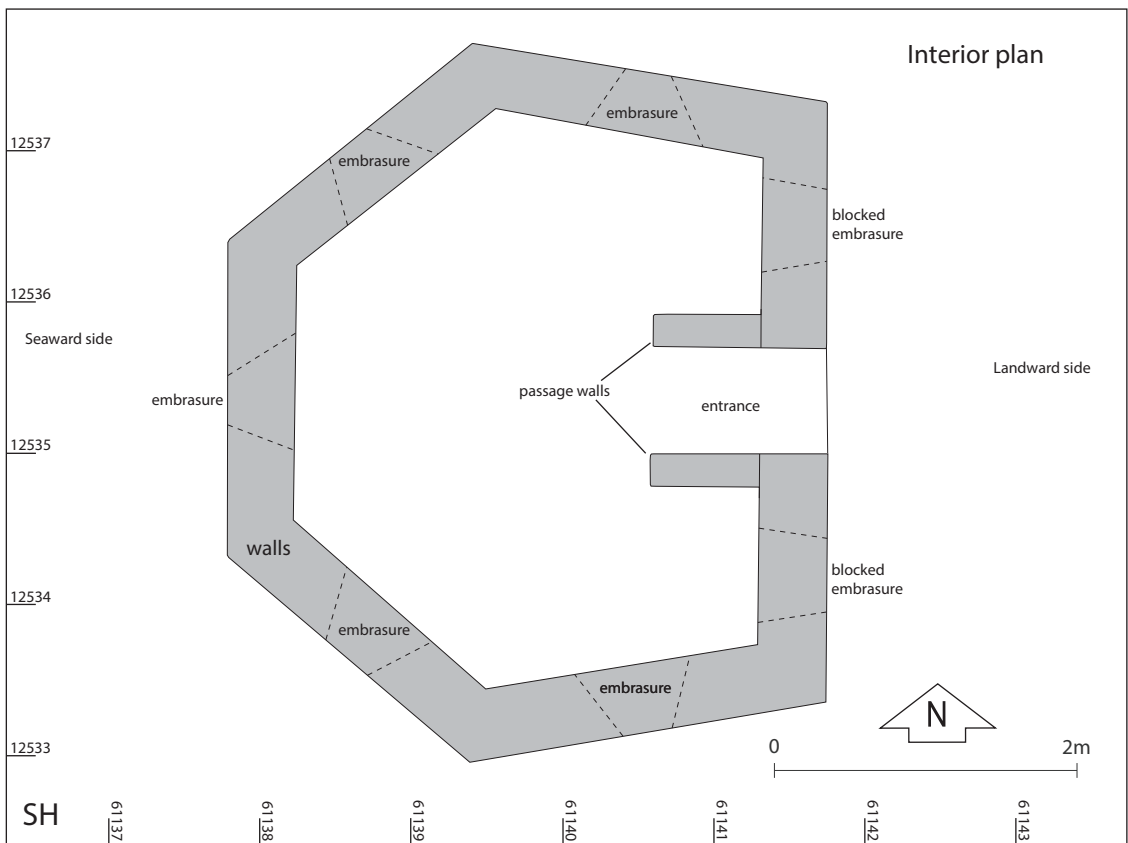
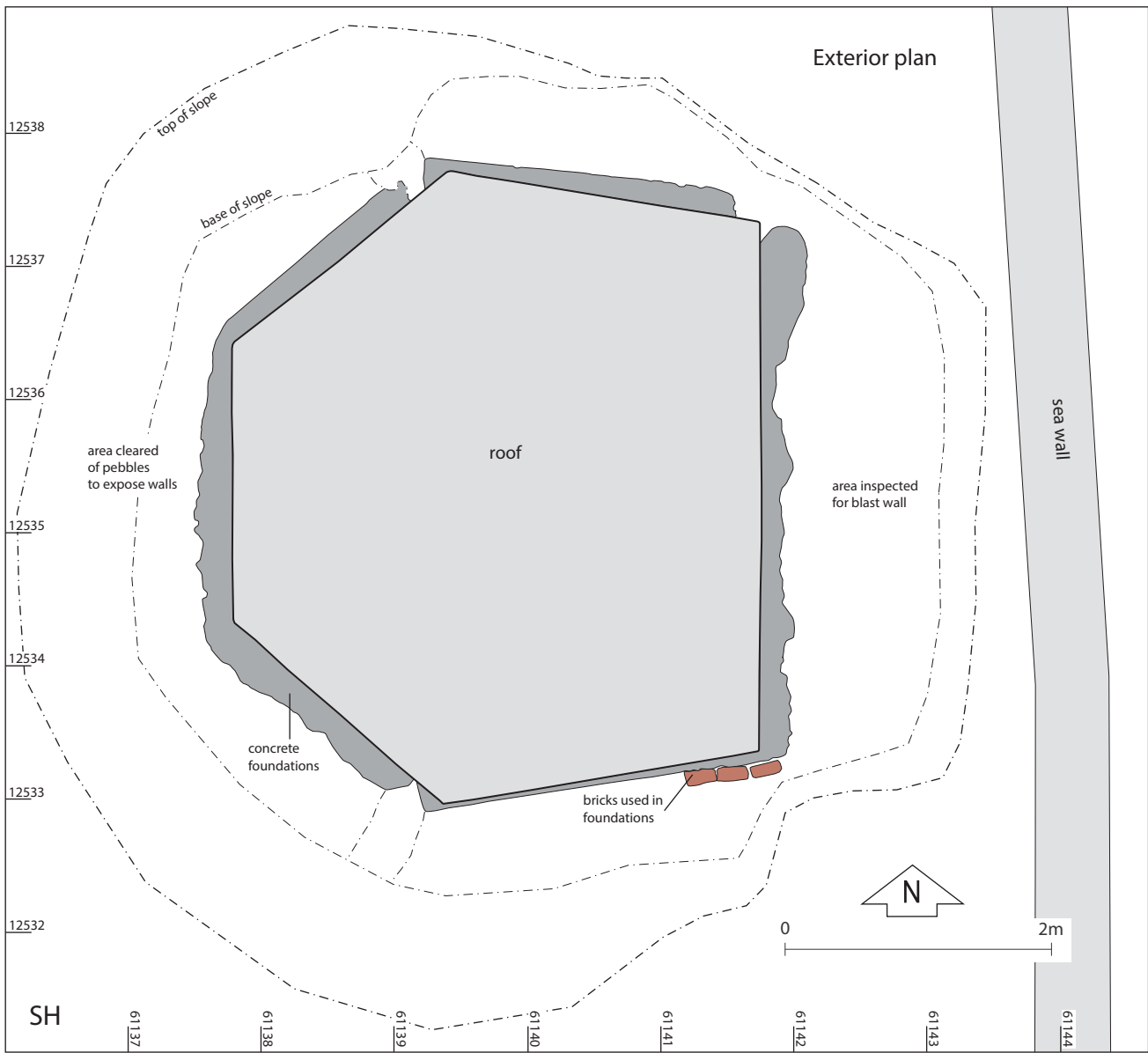


Figure 4. Plans of pillbox PRN 34151 at 1:50



- Key
- Concrete
  - Brick
  - Render
  - Beach pebbles
  - Opening into interior

Figure 5. External elevations of pillbox PRN 34151 at 1:50



Internal elevation of north-east wall



Internal elevation of rear, east wall



Internal elevation of south-east wall



Internal elevation of south-west wall

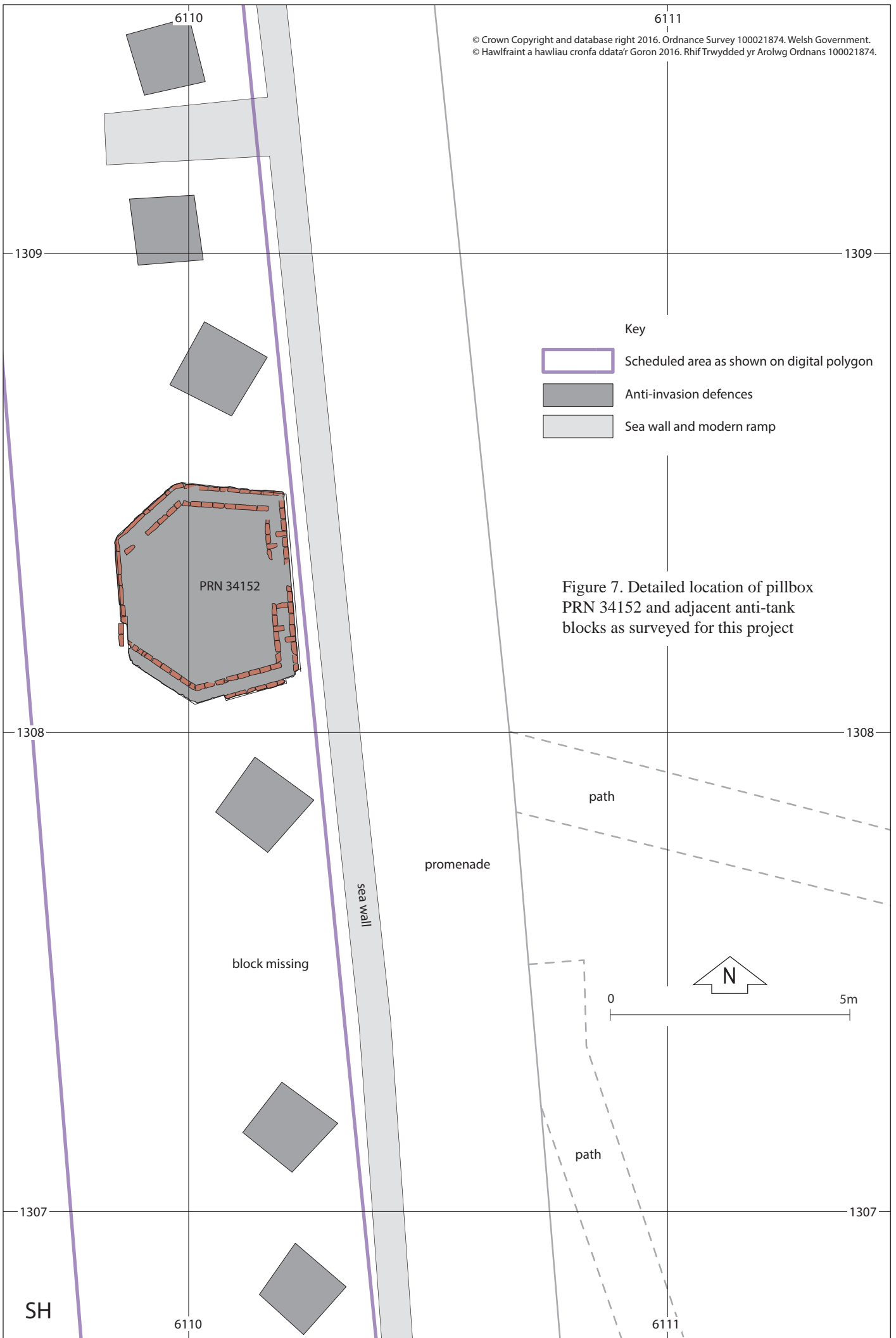


Internal elevation of front, west wall



Internal elevation of north-west wall

Figure 6. Internal elevations of pillbox PRN 34151, produced from 3D model and reproduced at 1:20



Key




-  Scheduled area as shown on digital polygon
-  Anti-invasion defences
-  Sea wall and modern ramp

Figure 7. Detailed location of pillbox PRN 34152 and adjacent anti-tank blocks as surveyed for this project

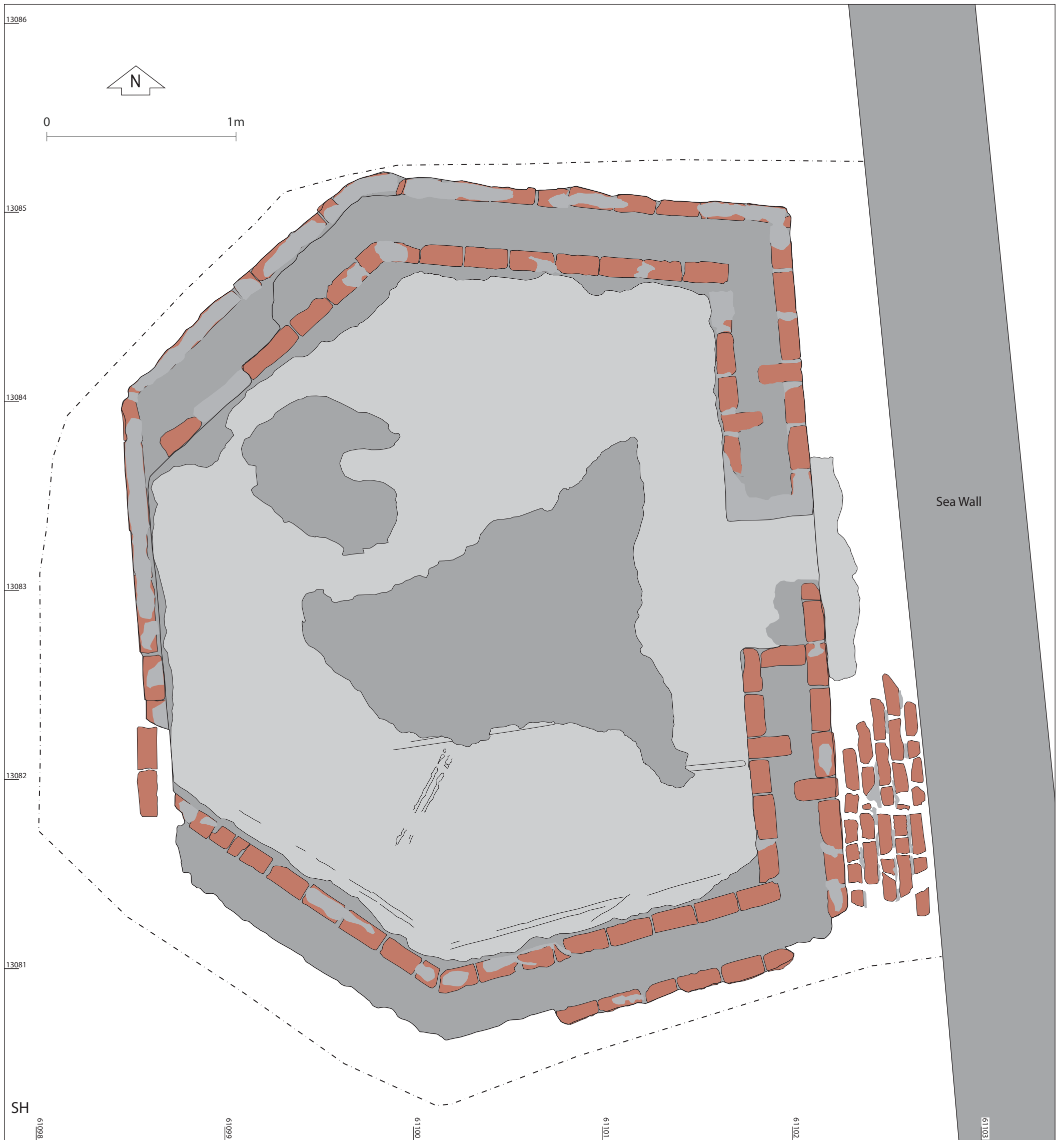


Figure 8. Plan of pill box base PRN 34152 at 1:20

- Key
- Concrete
  - Brick
  - Screed
  - Mortar
  - Limit of excavation
  - Impressions in floor





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- Key
- ◆ Recorded anti-tank blocks
  - ◆ Pillboxes
  - ◆ Other features

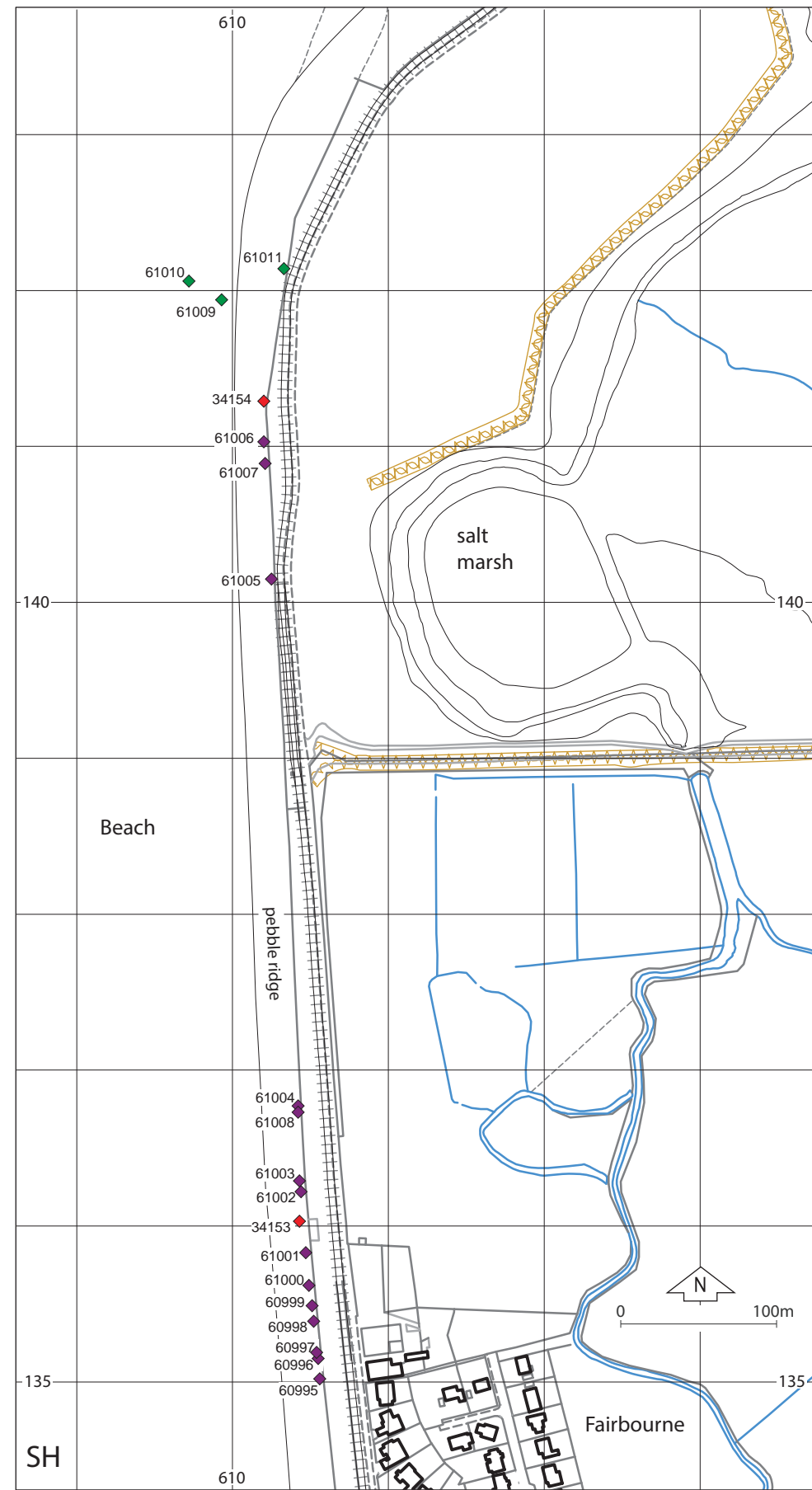


Figure 9. Location of recorded anti-tank blocks, with pillboxes also shown



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Plate 2. Pebble ridge with pillbox and anti-tank blocks on top, looking south (28/10/2015)

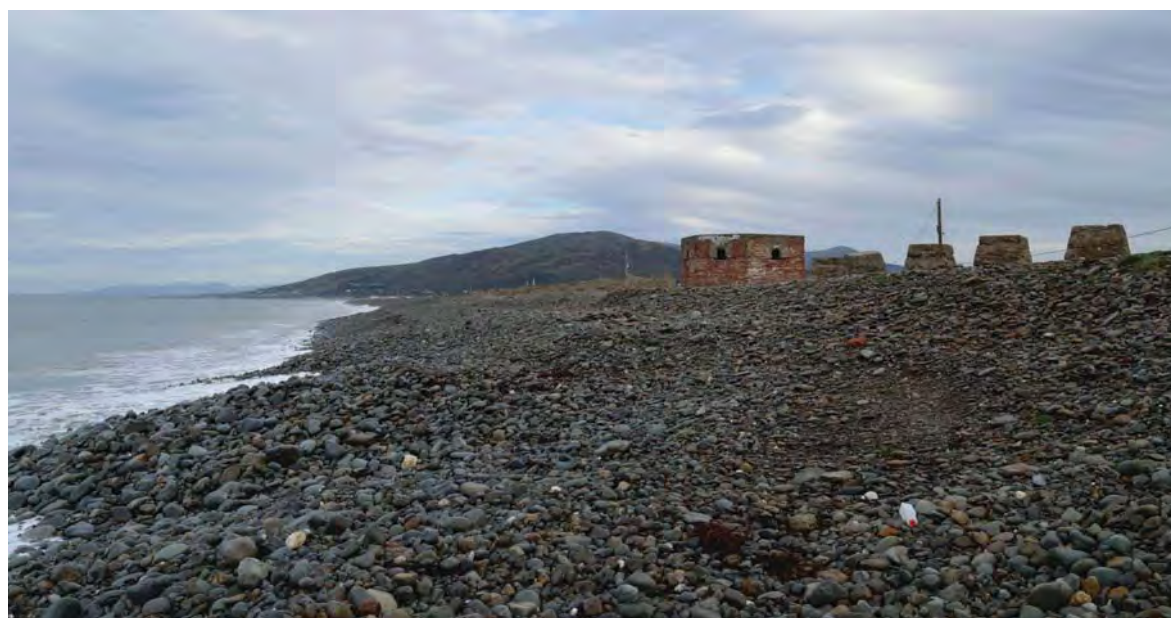


Plate 3. Pebble ridge with pillbox and anti-tank blocks on top, looking north (28/10/2015)



Plate 4. Pebble and concrete core to pillbox wall, as seen in southernmost pillbox (PRN 34150) before its destruction. (Photo taken by Matt Rimmer 2013)

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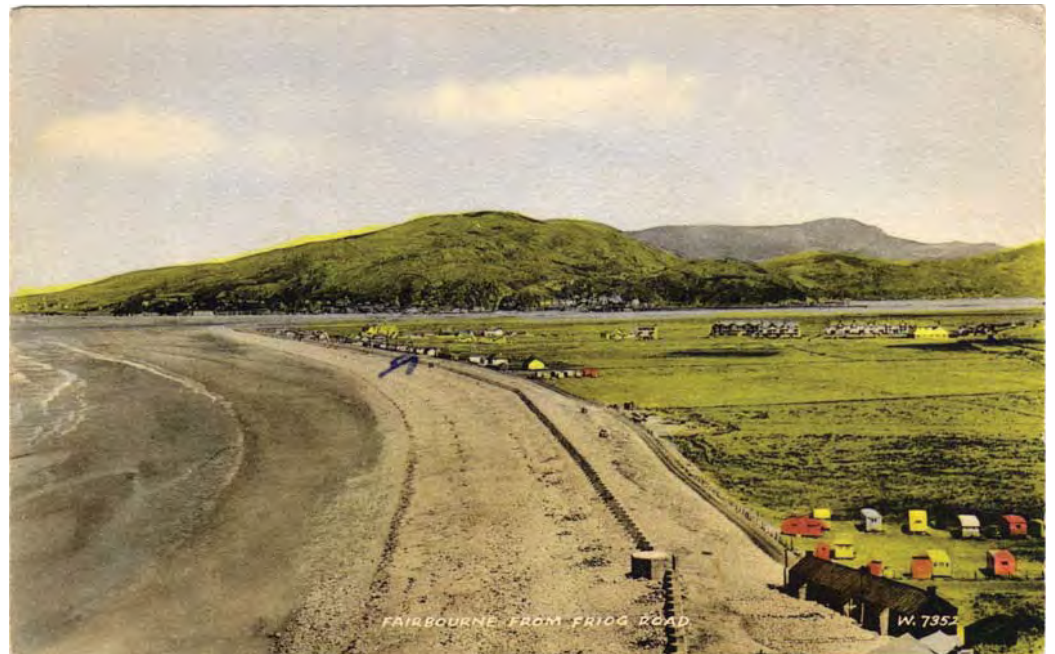


Plate 12. Enlargement from the above image, showing the external blast wall to the rear of the pillbox PRN 34150

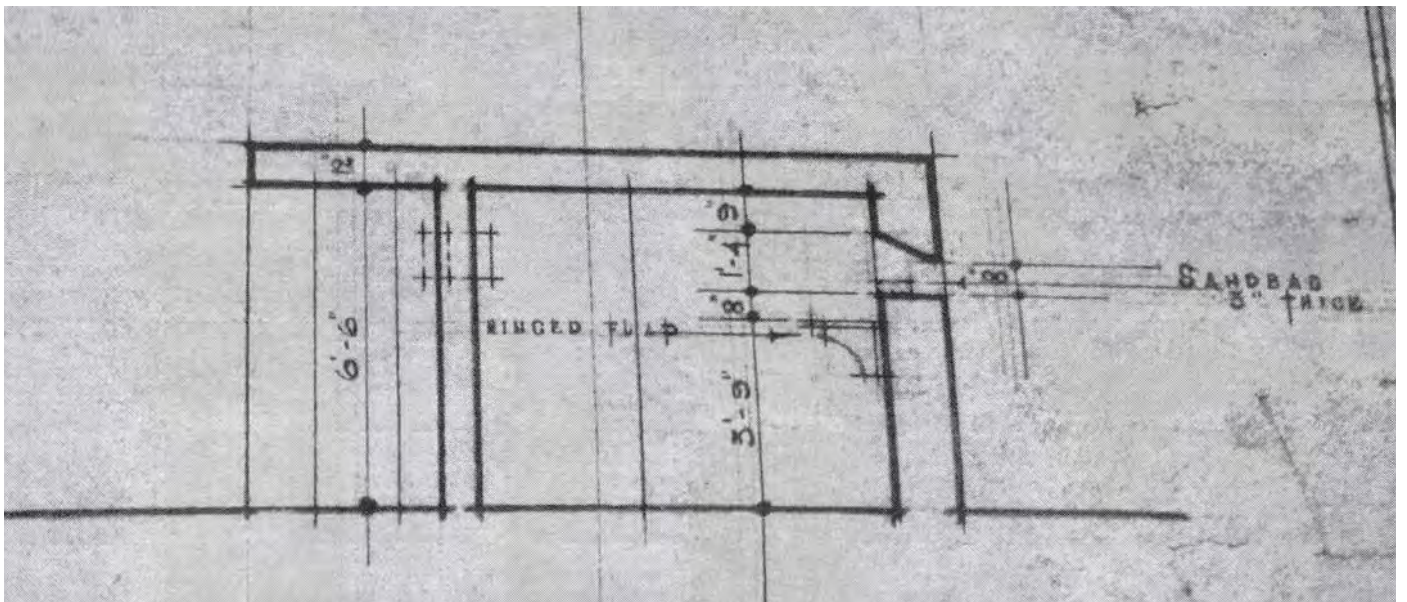


Plate 13. War Office drawing showing the folding shelf, or “hinged flap” beneath the embrasure

Plate 14. Surviving example of a folding shelf within a pillbox in England; Image courtesy of Tim Denton of the Pillbox Study Group



Plate 15. Another design of folding shelf found in some pillboxes; Image courtesy of Tim Denton of the Pillbox Study Group



Plate 16. Pillbox PRN 34151 and anti-tank blocks from south-east (28/10/2015)



Plate 17. Pillbox PRN 34151 east elevation (27/10/2015)



South-east elevation



South-west elevation



West elevation



North-west elevation



North-east elevation

Plate 18. External elevations of pillbox PRN 34151  
(26/10/2015)





Interior of east wall south of door



Interior of south-east wall



Interior of south-west wall



Interior of west wall



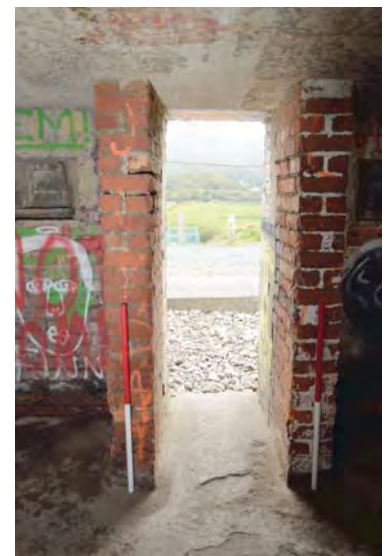
Interior of north-west wall



Interior of north-east wall



Interior of east wall north of door



Interior of entranceway



Plate 20. Edge of the roof on the south-east side showing it built up in three layers (29/10/2015)



Plate 21. Cast of planks with wood grain in ceiling of pillbox PRN 34151 (27/10/2015)



Plate 22. Cast of tar paper with over planks in ceiling of pillbox PRN 34151 (27/10/2015)



Plate 23. Interior of embrasure in south-west wall (27/10/2015)



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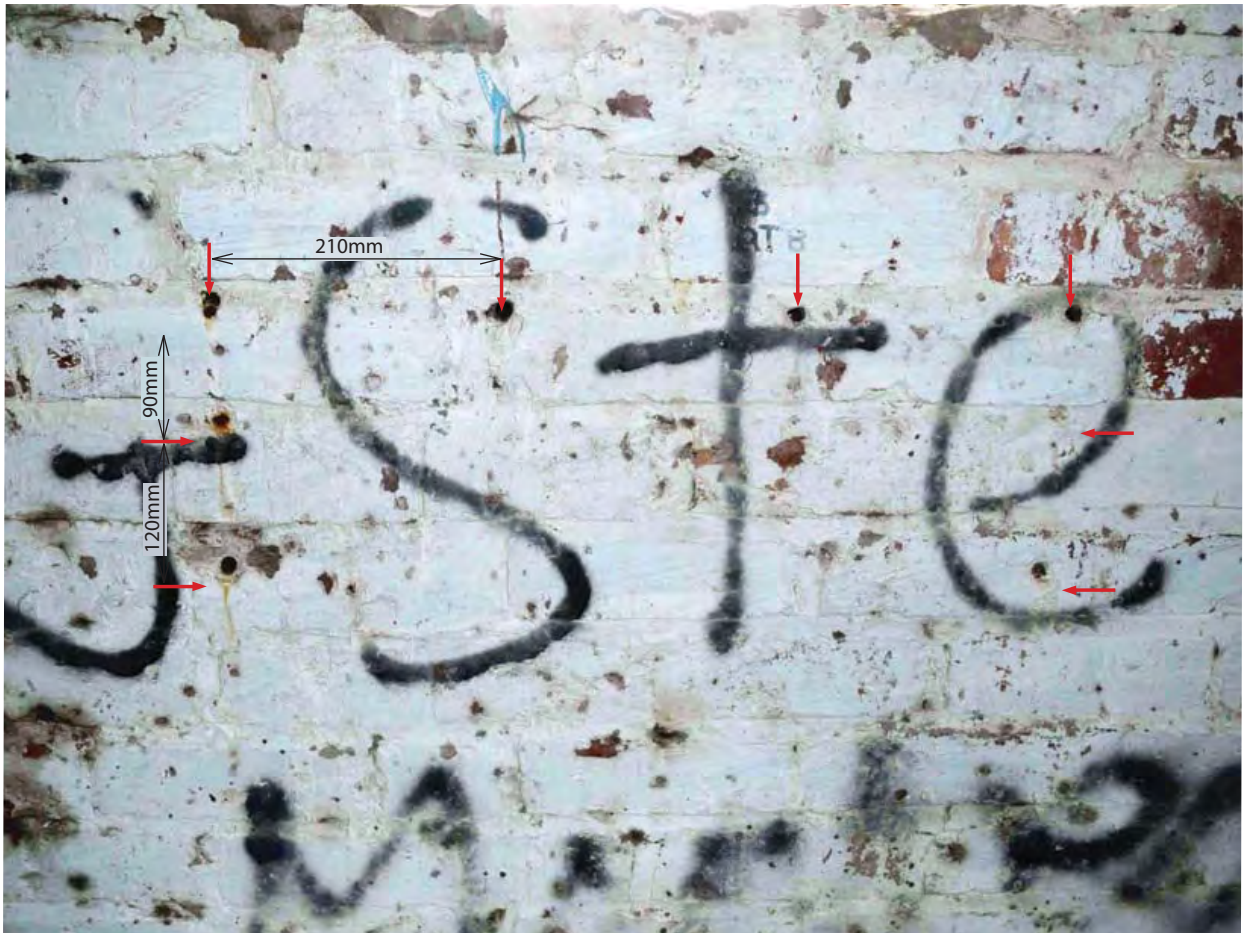


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Plate 38. Anti-tank blocks at the southern end of the line toppled and moved. These show their construction using beach pebbles and bricks (29/10/2015)

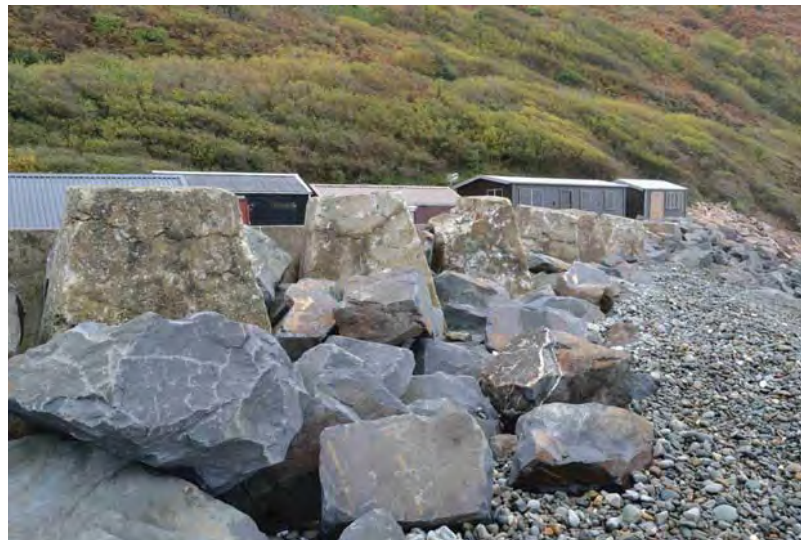


Plate 39. Anti-tank blocks at the southern end of the line that have been moved and used in the coastal defences (29/10/2015)



Plate 40. Eroding anti-tank blocks south of pillbox PRN 34151. The construction in layers with beach pebbles can also be seen picked out by the erosion (29/10/2015)



Plate 41. "THOMAS ROBERTS" inscribed on anti-tank block PRN 60988 (10/10/2015)



Plate 42. "L WILLIAMS" inscribed on anti-tank block PRN 61002 (28/10/2015)





Plate 43. "ER" inscribed on anti-tank block PRN 60992 (28/10/2015)



Plate 44. "MM" inscribed on anti-tank block PRN 60993 (28/10/2015)



Plate 45. "JRO" inscribed on anti-tank block PRN 60995 (28/10/2015)

Plate 46. "CW" and "PAT" with other letters inscribed on anti-tank block PRN 60997 (28/10/2015)





Plate 47. "DW 1940 FL[?]" inscribed on anti-tank block PRN 61000 (28/10/2015)



Plate 48. "DW" inscribed on anti-tank block PRN 61003 (28/10/2015)

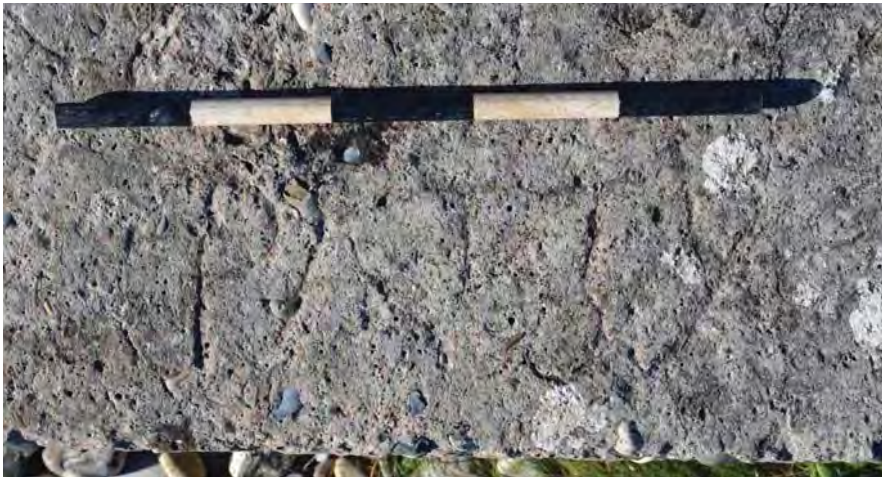


Plate 49. "PATTY" inscribed on anti-tank block PRN 60996 (28/10/2015)



Plate 50. "JG L-W 18 8 1940" inscribed on anti-tank block PRN 60998 (28/10/2015)



Plate 51. "LW 11 40" inscribed on anti-tank block PRN 61004 (28/10/2015)



Plate 52. "9 PANT" inscribed on anti-tank block PRN 60999 (28/10/2015)



Plate 53. "ITMA" inscribed on anti-tank block PRN 60996 (28/10/2015)



Plate 54. Hand print on anti-tank block PRN 61007 (28/10/2015)



Plate 55. Holes cast in the top of anti-tank block PRN 60987 (28/10/2015)



Plate 56. Wooden structure PRN 61011 between anti-tank blocks (28/10/2015)



Plate 57. Wooden post PRN 61010 (28/10/2015)



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