

North Clyde Military Installations Project

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Abstract

As part of The North Clyde Military Installations Project by North Clyde Archaeological Society (NCAS) a survey was undertaken at Rosneath Home Farm and identified a series of four gun emplacements and ancillary buildings, which are known to date to the Cold War period of British Air Defences.

Introduction

The site is located at the South eastern tip of the Rosneath Peninsula (Figs 1&2), on a large flat plateau to the east of Rosneath Home Farm. Rosneath Peninsula is on the Western side of the Gareloch and lies only 1km to the SW of Helensburgh which itself is located on the north shore of the Firth of Clyde.

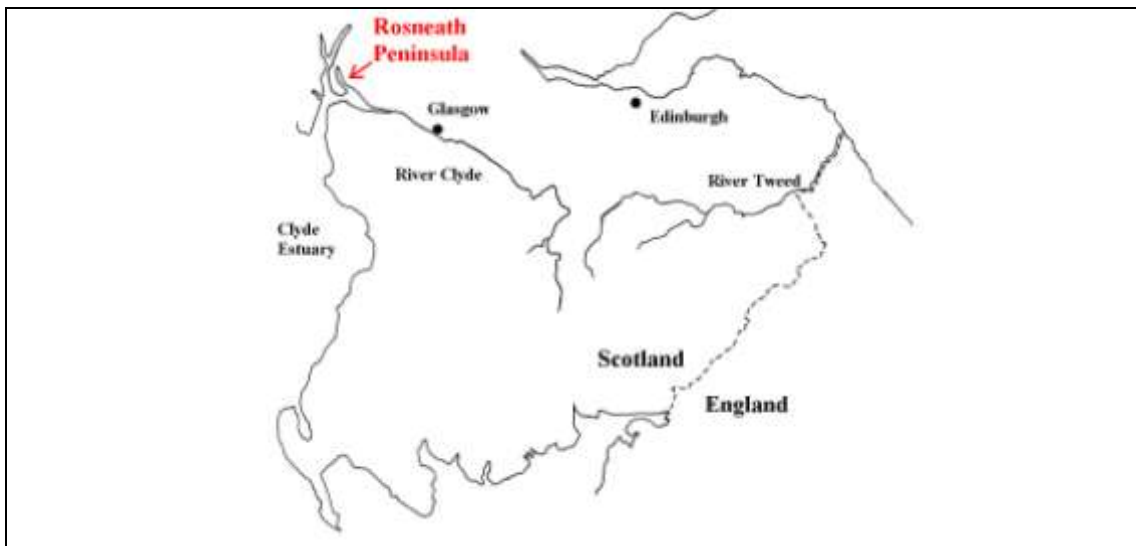


Fig 1



Fig 2

The site is located in an isolated wooded area centred at Grid reference NS 2700 8122 and given on OS Explorer Map No 347 Loch Lomond South.



Plate 1

This is one of a series of similar air defence sites in the vicinity of Glasgow (Ref <http://www.secretscotland.org.uk/index.php/Secrets/AABatteryRosneath>) and of particular note and in reference to Rosneath is the site at Barrhead which appears almost identical in layout and certainly in much of the detail of the buildings, for such details seen at the Barrhead site reference is made in this report in parenthesis [].

Rationale

North Clyde Archaeological Society are engaging in field project work covering all periods of time and within their area of interest which is on the North side of the Firth of Clyde extending from Erskine in the east to Arrochar in the north including Loch Lomond, Rosneath Peninsula and Helensburgh area. The project was conceived because of the number and variety of surviving military installations found along the Clyde coast due to its strategic importance during all periods of conflict but most especially throughout the 20th Century.

Methodology

Survey technique is recording by the tape off set method and measurement of up standing buildings. A full photographic record of digital stills is maintained to record sites and details. The work is conducted by members of the Society as part of training objectives. The site plan was surveyed at 1:200 scale, details were then recorded at 1:100 and 1:20. The overall details as given on the plans were gleaned from a composite of the four gun locations, since each site is different in visible appearance due to the fact that originally this gun complex was built as subterranean buildings and since their abandonment the entrances and gun pits were deliberately back filled for safety reasons. The locations of particular features as given in Fig 3 are given in parenthesis thus {}.

The Rosneath site is designated Site No 1 in the overall NCAS Military Installations Project survey.

Survey

The four gun positions (Fig 3) comprise of the identical elements of Gun Pit, Magazine and Engine House. All aspects of construction are in reinforced concrete. Numbers 1-3 lie in a straight line with slight variations in the orientation of their component parts, while Number 4 is off set from the line and considerably different in its orientation. The whole complex forms a slight curve which is represented by the current appearance of the woodland which now obscures it. The gun pits are located equidistantly at approximately 46 metre intervals while the building units swing in a westerly direction from No 1 to 4 covering 80⁰.

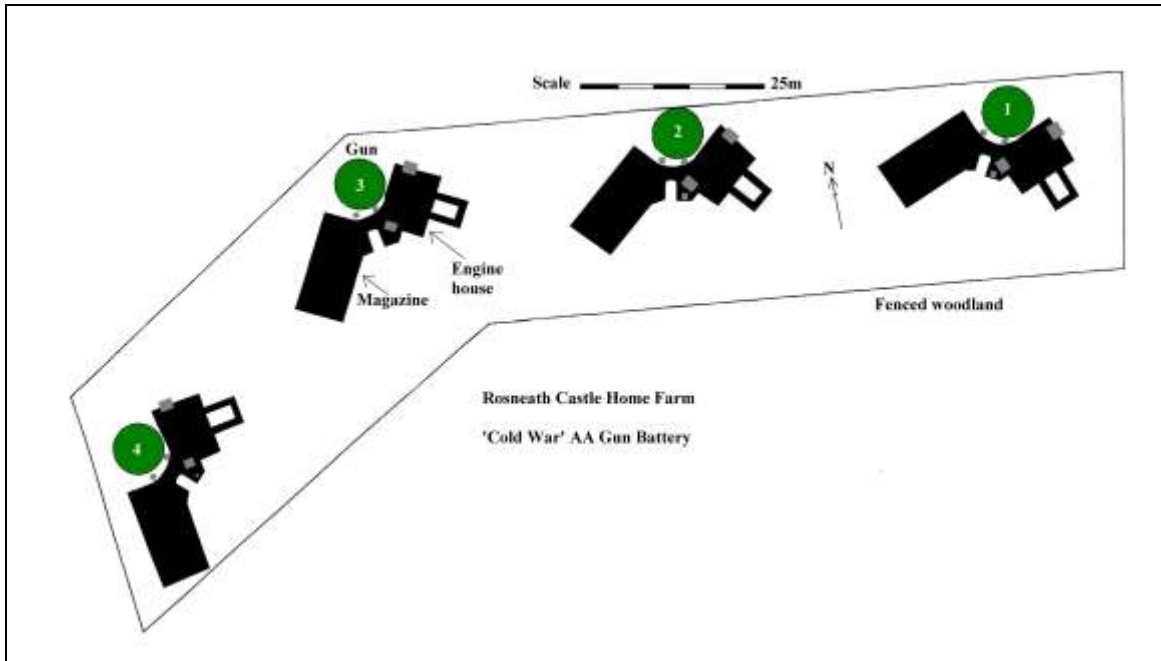


Fig 3

As stated above each gun position only revealed partial details because of being obscured by tree growth and partial infill all of which post-date the site.



{View from the magazine entrance of Gun 1 through to the engine house of Gun 1}

Plate 2

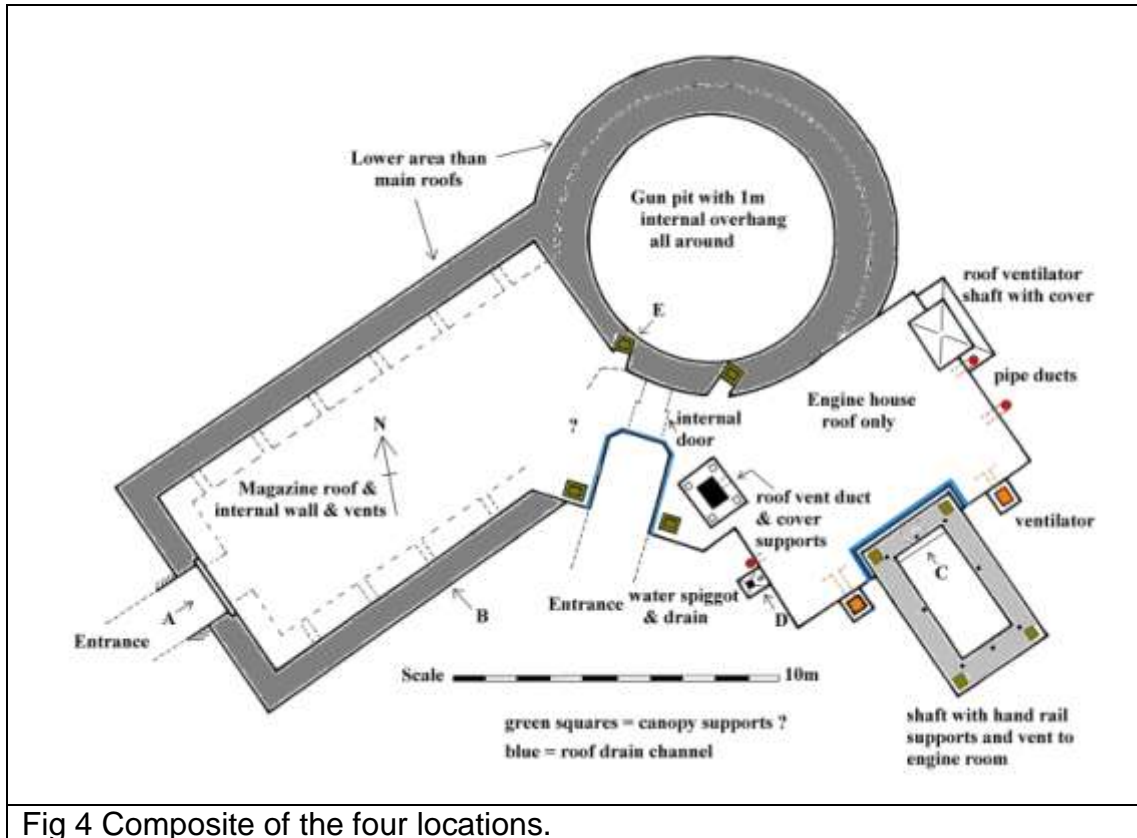


Fig 4 Composite of the four locations.

Gun Pit

The Gun No 1 Pit as seen comprises of an internal ring formed by a steel channel 50mm deep by 75mm wide, the channel is embedded in the concrete of the structure, the roof of which is 100mm above the base of the channel and the ceiling of the overhang to the gun pit is 70mm below the base of the channel (Fig 5), the channel forms a complete circle 7.3 metres in diameter.



{Gun 1 The top roof structure with heavy bitumen covering with the detail of drainage channels and square pads are clearly seen as was the water pipe and drain and covers on engine room roof vents. The diameter and channel around the top part of the gun pit was also identified.}

Plate 3

The depth of the pit is unknown. The thickness of the surrounding wall is 0.9m, within which there is an overhang of 1.0m wide which supports the steel channel, thus a 1.9m wide and level top surrounds 50% of the gun pit on the “open side”, the rest of the overhang adjacent to the magazine and engine house reduce to 1.0m in width. The level of all this is 0.4m below the magazine and engine house roof surface.

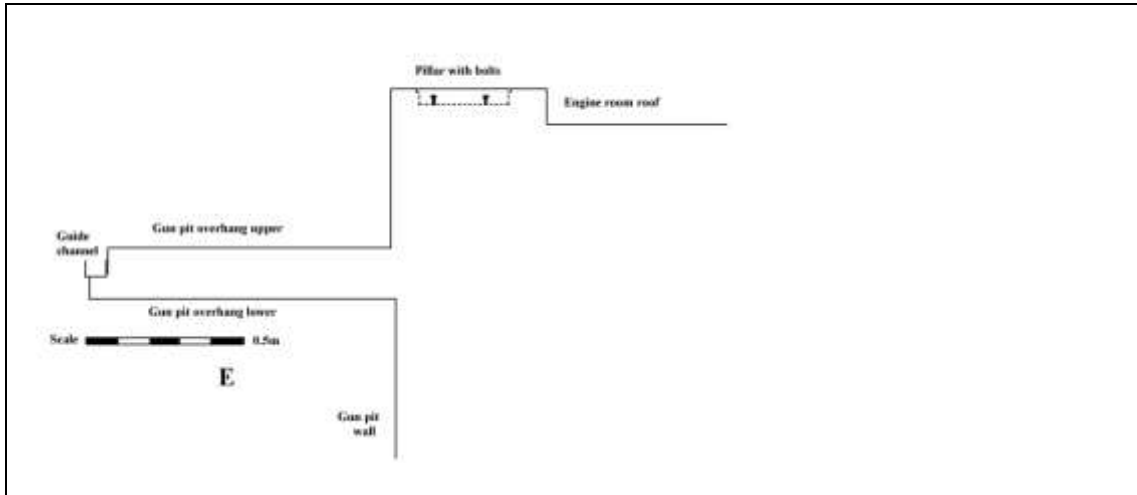
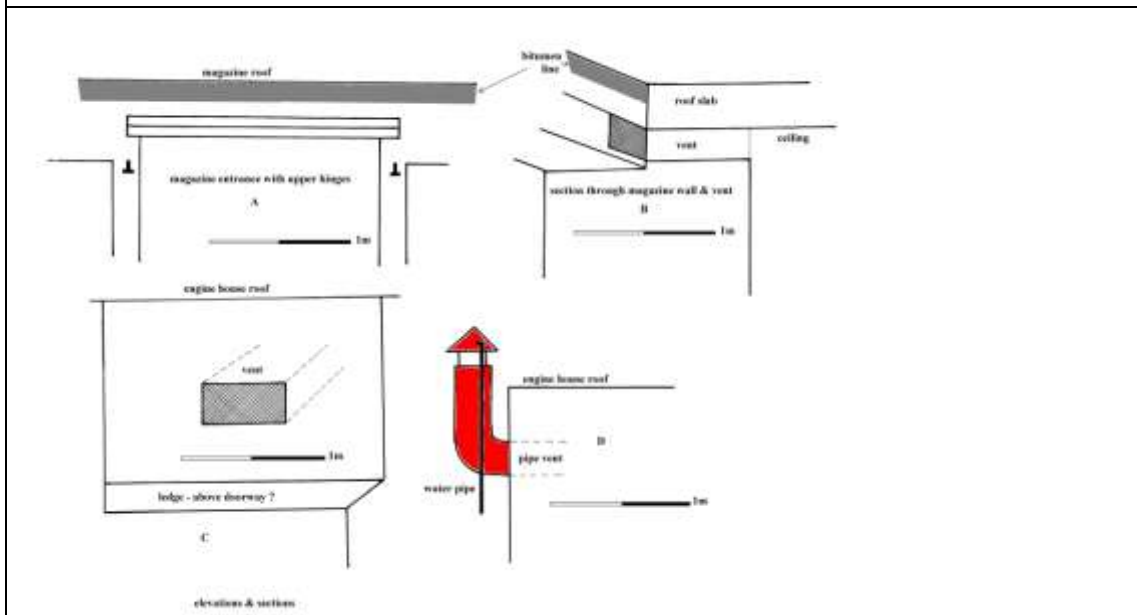


Fig 5




Sections A,B,C and D supporting Fig 4 above

Fig 6

Projecting from the two roofs and above the overhang there are two rectangular columns of concrete, these extend 100mm above the roofs. Each has a central pit measuring 50 mm deep and has two bolts with nuts surviving; these are identical in upper form to the two on either side of the entrance (below). For some reason the pedestal on the engine room side is askew to the other three. On each of these square structures, and indeed the four

similar mounts seen on the engine room shaft, there is indicated in the cement that metal plates had been installed over them all.

	<p>{This is the detail as observed at Gun No 1}</p>
<p>Plate 4</p>	

The finish of the internal wall faces in the gun pit and ceilings is of a high quality; this is also noted in the magazine chamber.

The entrance to the gun pit is a passage between the magazine and engine room but it only connects to the gun pit. It has been covered for a distance of 2.4m its roof being level with the other main roofs.

	<p>{Gun pit entrance doorway at Gun No 1}</p>
<p>Plate 5</p>	



Centrally located within the passage which is 1.0m wide at the gun pit side and 1.2m on the external side is a steel framed doorway with pintle hinges on each side, indicating a double door, which opened outwards. The passage extends outwards for a further 2.5m and is 2.0m wide and the corners where the covered and uncovered parts meet are chamfered. The walls of the

uncovered passage at roof level are slightly higher than the roof preventing ingress of water from the roof.

Magazine

The magazine and engine house lie at right angles to each other with the gun pit at the outside junction of these two buildings. Internally the magazine measures a maximum of 13.5m long by 4.75m wide. Details of the internal walls adjacent to the gun pit entrance are not available.

It would appear that the total thickness of the magazine walls are 1.75m however the upper wall thickness to the internal ceiling reduces to 0.75m thick, this thinner upper part is only 0.3m high, really part of the roof and being above what appears as a high level plinth around the magazine walls.

	<p>{Detail of magazine vent from Gun No 1. The magazine vents were visible as was the large concrete plinth around the lower part of the magazine wall.}</p>
<p>Plate 6</p>	
	<p>{Magazine door and hinge detail visible at Gun No 1}</p>
<p>Plate 7</p>	

On the upper wall beside the gun pit entrance there are four vents, these measure 0.3m by 0.15m and are covered in mesh. The upper side of the vent

ingoing is the ceiling of the magazine indicating the roof thickness of 0.3m. On the other long wall there are six similar vents equidistantly spaced, four of which are directly opposite those on the other wall.

The entrance to the magazine is 1.9m on the internal side with an external uncovered passage of 1.75m wide. Two metal doors have been hung on pintle hinges and opened outwards into a corridor of indeterminate length and detail, above the hinged doors was a drip stone integrated into the structure.

The roof of the magazine, engine house and gun pit overhang are all covered in a thick layer of bitumen as a waterproofing agent, on the flat roofs this is extended down the wall for 150mm, it is absent only on the 'extended wall thickness' of the magazine and the upper surfaces of the engine room shaft. The magazine opens for its entire width into the gun pit apparently with no doors having been installed.



[The Barrhead Gun site magazine building showing doors and vents all above ground]

Plate 8

Engine House

No details of the internal layout of the engine houses are available at Rosneath, however the roof measures 8.5m by 6.25m. Two covered roof vent shafts lie at the gun pit end of the room. The vent shaft through the roof measures 1.0m by 0.5m, surrounding it is a raised plinth measuring 1.75m x 1.4m and 0.1m high, upon it are four pedestals supporting a cover slab the same dimension as the plinth but up to 75mm in thickness, there is a subtle run off gradient from the centre of the cover which is also covered in bitumen. Each roof vent is incorporated into an extension of the room length one being at the gun pit entrance and the other extending 1.0m out from the roof line of the engine house, this extension having a chamfered top on which there is no bitumen.



{Gun No 2 the engine room roof vent cover had been toppled. The shaft was full of water but a duct (PI 10) could be seen leading to the engine room.}

Plate 9



Plate 10



{Gun No 3 metal hook on the roof square are visible at this position.}

Plate 11



[At the Barrhead site the inside of the engine room could be viewed, showing signs of cable trays just below the ceiling, and support brackets on the wall. Two pipe exit into the gun pit along with two square service ducts which were also visible. The bottom of the ventilation shaft could also be seen with a square opening at the bottom and duct towards the top]

Plate 12

Projecting from the engine house is a pit described here as a 'shaft'. Its uniform wall thicknesses is 0.7m, the wall heads being absent of bitumen. Spaced at regular intervals there are eight handrail mounting plates and also four square sunken mounts?

{Engine house shaft vent, see Plate 14 below}



Plate 13

With two bolts as described above. The only other details on the Rosneath site is a wall vent 0.6m wide by 0.3m high and also covered in mesh, placed centrally and 0.6m below the roof level, and which connects to the engine house indicating a wall thickness of 0.75m. 0.4m below the vent is a projecting drip stone of 0.3m wide this covers the entrance from the shaft to the engine room (however this entrance is not visible at Rosneath).



[Barrhead gun site engine room shaft showing entrance to engine room]

Plate 14


Surrounding the interface between the shaft and the engine house roof is a gully for drainage. At each side of the shaft are ventilator ducts or sumps set into the ground, these have had a metal cover plate fitted, leading from the pits is a 0.2m diameter pipe through the engine house wall. On each end of the engine house there are 0.25m diameter galvanised pipes coming through the wall and rising to above roof level where they terminated in a conical cowl.

On the gun pit entrance side there is a single pipe while the other side of the room has two; these pipes are not regularly spaced over the four gun sites and in some cases rise through the plinth of the roof shaft vent. Adjacent to the single vent pipe is a galvanised water pipe, presumably for a tap since it rises above a concrete drain



{Engine room twin side wall vents showing cowl detail only identifiable at Gun 4. As seen this gun position is almost completely buried.}

Plate 15

	<p>{The engine house side wall vent with water pipe and drain identified from Gun No 1}</p>
<p>Plate 16</p>	

In general only some of the upper surfaces of these buildings are visible because they have clearly been constructed as a subterranean site, however in various places visible access was available allowing limited views below. It is known from local knowledge that the site was backfilled at some point and a plantation of mixed trees was created within the confines of the four gun positions and indeed on top of some of them. Domestic rubbish dating to circa post 1960s also covers the area. Massive chunks of concrete including structural remains is also littered along the Southern side of the gun emplacements, however the age and source of this material is unknown. Furthermore stumps of mature trees have been dumped among the rubble.

Ancillary Buildings

At the field boundary to the south of the gun positions are two surviving buildings which demonstrate the identical constructional features as may be seen on the gun buildings, indicating they are of the same period. Given on OS maps the two buildings are at NS 270814 (B1) and NS 271814 (B2). The westerly structure is designated Building No 1 in this report.

Building No 1

It is a simple rectangular single storey building of shuttered reinforced concrete external walls measuring 0.25m thick with subsidiary internal walls of single brick thickness (Fig 7). The building measures 12.5m by 6.75m overall, the long axis lies E/W, it has a small projecting extension at the south western corner which comprises of two compartments, one with a concrete plinth and four bolts indicating the position of a motor or pump. A surviving square section steel duct leads from the plinth chamber into the main room and this may indicate a ventilation system being installed in the plinth room.



Plate 17

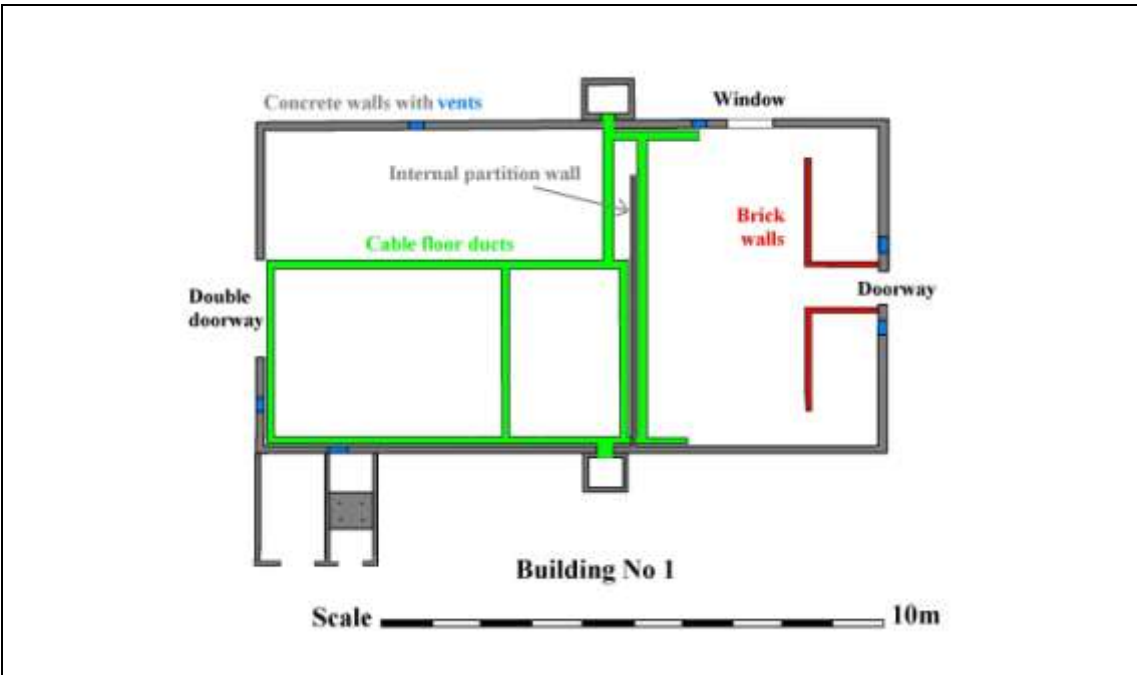


Fig 7

Internally the main building is split by a dividing wall of only 100mm thick, it has been made by building timber vertical studding and infilling with shuttered concrete, and leaving a doorway at its northern end, the larger of the two rooms thus created measures 7.25m by 6.4m, it has three high level ventilators, one on each external wall. This chamber was entered at the end wall via a double metal doorway, the doors being hung on three pintle hinges identical to those seen on the gun site, drip stones, also the same as the gun site are seen on all doors of the two buildings under discussion.

The smaller room measures 3.4m by 6.4m and it is sub divided by two chambers built as brick walls and with individual internal doorways, both measuring 2.5m by 1.4m, each has a ventilator at high level on the exterior wall. The small rooms form a passage leading to the external door of identical steel framed structure as the opposite main entrance, but in this case it is a single door. The main room has a single high level ventilator and a metal

framed window of six panes with opening sashes; the windows have been screened or protected on the outside by double shutters.

On the floor of both chambers is a layout of cable duct formed as part of the concrete floors, the duct is 300mm wide by 150mm deep and has been covered by a probable grill 32mm thick. It is evident that panels have been installed over parts of the duct running along the centre of the room. It is likely that panels or desks lay over the parts of the ducts against both internal and external walls. Ducts lead outside to opposing manholes on the north and south sides of the building, and three armoured cable stumps are projecting from pipes at the base of the duct in the SW corner of the room where there may have been a switchboard.

The roof of the entire building is made from single span concrete 'bison slabs' which have been layered above in concrete and then covered in thick bitumen, the latter is covering the top 150mm of wall head exactly the same as the gun buildings.

Internally the walls and ceilings have been strapped with wood and panel lined, it is evident that the electrical system was wired in conduits as various lines of pipe fixing saddles are seen, although all pipes and any other internal fittings have been removed. A water pipe for a spigot is located outside the western wall of the building.

Building No 2

This building is formed by two single compartments built on a long axis E/W and measures overall 20.25m by 8m at the wider east end and 4.4m wide at the long room on the west. Despite the fact that two doorways; one a double door, exist on the long north wall of the room, there is no indication within that it was ever internally sub-divided. Also on the same wall are three identical windows, exactly the same as the single example on Building No 1, however these windows have wooden external shutters in situ, although badly decayed they are mounted on stout hinges the same as all door fittings.



Plate 18

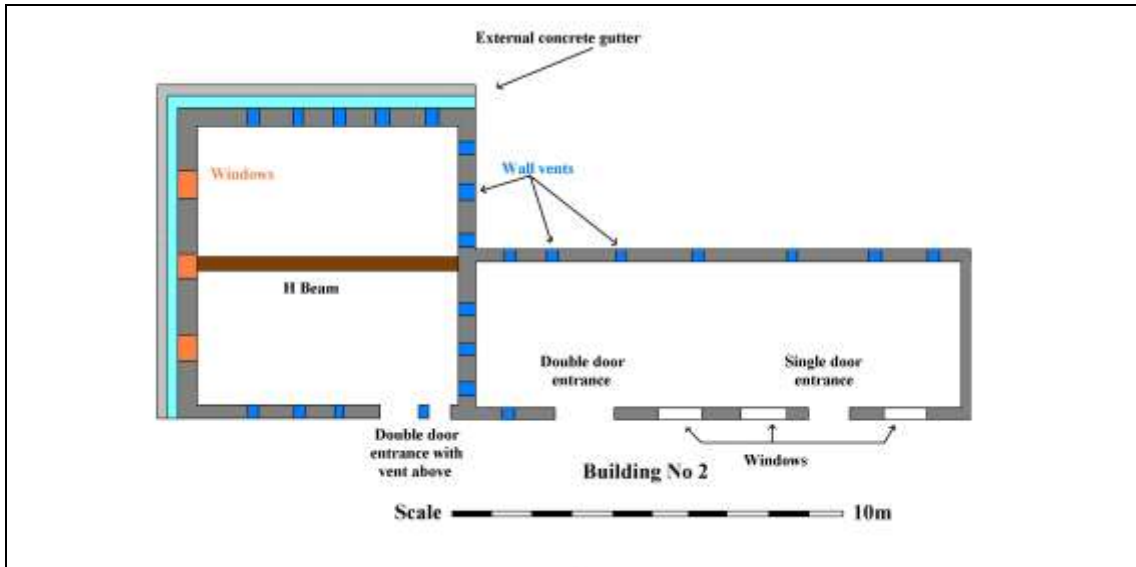


Fig 8

[Barrhead gun site ancillary buildings]



Plate 19



Plate 20

The room has a series of eight high level wall vents, the upper side of which are level with the bare concrete ceiling, which is 2.7m above a concrete floor. Three further vents connect to the chamber on the east end, the vents on the entire building measure a standard 0.3m square. No details of the floor were available due to flooding with manure effluent but no other details of the room were visible as far as could be seen.

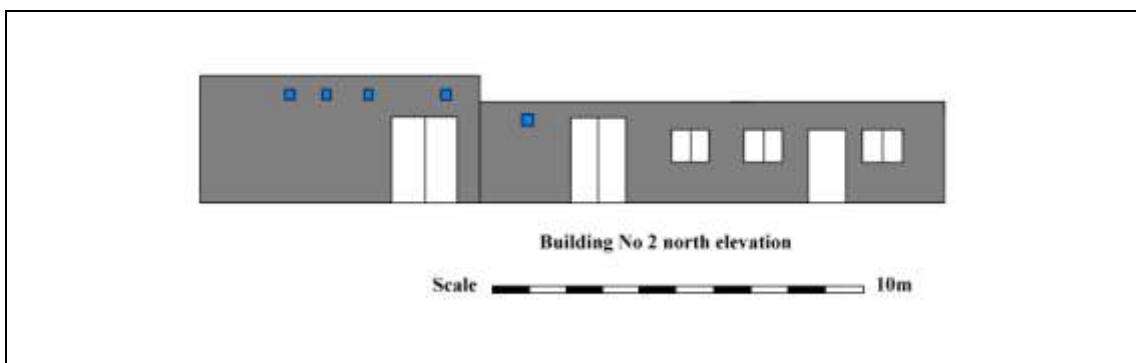


Fig 9

The chamber on the east end is also a single room; measuring internally 6.5m by 7m it is also higher than the other room at 3.4m. A steel 12" (300mm) H beam runs along the ceiling, indicating this room was probably a workshop. A

total of twelve high level wall vents are on the external walls with the three already alluded to and which connect with other chamber. Three windows are located 1m above the floor and on the gable end, they measure 1m by 0.9m, these appear only to have external shutters and may have been primarily for ventilation. The double steel doors survive here and all the doorways on the building have identical drip stones to those on Building No 1 and the gun buildings.

Like Building No 1 the roofs were formed by 'bison slabs' and similarly water proofed with bitumen. No original features remain within and the concrete floor is entire and visible. Running along the ground on the external south and east sides of the higher chamber is a concrete gutter; it is only visible at those locations.

Discussion

Initial surveying and site clearance was conducted of the site which was originally thought to date from the World War II period when the whole of the Rosneath Peninsula was known to have been designated a US Navy Base.

Further research identified this site to be of 'cold war' heritage. The Royal Commission on the Ancient and Historical Monuments of Scotland (RCHAMS), Canmore (ID106348) identifies Rosneath, Anti-Aircraft Battery.

Secret Scotland website <http://www.secretscotland.org.uk> allowed for further research on Scotland's cold war constructions which identified similar sites at Stockiemuir Canmore (ID105315), Pattiston Canmore (ID106350), Limekiln Viewfield Canmore (ID106351) Millthird and Wemyss Plantation.

These sites form a system of Heavy Anti-Aircraft (HAA) gun defensive ring around Glasgow and the Clyde anchorage area. There were also two associated Anti-Aircraft Operational Rooms (AAOR) at Inverkip and Torrance House. These facilities can be tied to improvements in British post war air defences under work programs operation ROTOR and IGLOO.

Operation ROTOR was a programme to drive improvements in radar detection systems supporting command and control of gun batteries and intercept aircraft.

Operation IGLOO was a series of air defence sites partly renovating old World War 2 sites and building new ones. These would be controlled by the AAOR with information provided by the ROTOR sites.


The Sector Operations Centre (SOC) Caledonian Sector at Barton Quarry Edinburgh was tasked with correlating information from ROTOR radar stations throughout Scotland. During this period there was also a move from a star shape group of guns of WW2 designed for defending against attack by many aircraft to a line of guns providing a line of fire with a view of defending against a lone aircraft.

The references suggest the sites consisted of radar controlled 5.25 inch calibre guns similar to those from built between 1950 and 1951. There is no evidence available currently to show that the Rosneath site was ever completed in fact the lack of the boundary fence would suggest it was still under construction when abandoned, however it is recorded that the guns were sold to a Coatbridge scrap merchant.

The site at Pattiston in Barrhead now the Heather Park Bank Retirement site was visited and appears identical to the Rosneath installation with one significant difference. The Barrhead site is built on top of a hill and stands proud on the surface, where as the site at Rosneath appears to be constructed almost entirely buried on a low lying plateau with roof tops just above the surrounding general ground level.

Aerial photographs of these sites show similar layout to the site at Rosneath. A site visit to Barrhead assisted in understanding the Rosneath site and comparison of features. The Stockiemuir Canmore ID 105315 site images

also show some similarity to the site at Rosneath. Stockiemuir being partially sunken image DP 095216.
Concrete fence posts of the site boundary are visible at Barrhead and Stockiemuir from the roadway.

	<p>[Barrhead gun site with the remains of the fence line enclosing the site]</p>
<p>Plate 21</p>	

This differs from Rosneath where there is no visible evidence of the fence line. Photographic images of the Stockiemuir site on Canmore image DP095242 show similar gun pit, engine house and magazine construction. There is a visible davit arrangement on the wall of the engine room shaft image DP095205. The gun pit has not been filled in and details can be observed of the connection between the gun pit and the engine room image DP 095222 and magazine image DP095207. A wall arrangement can also be seen with concrete steps leading down to the magazine entrance image DP095235.

The gun sites in Scotland would have been operated by the 3 AA Group and the 69th Heavy Anti-Aircraft Regiment (Royal Artillery). The command headquarters was in Edinburgh and they were responsible for the Clyde and Forth areas.

In 1953 the Minister of Defence of the time Harold Macmillan in a Statement on Defence CAB/129/73/29 [www.national archives.gov.uk](http://www.national.archives.gov.uk) briefed the cabinet on the futility of attempting to protect large urban and industrial areas from air attack specifically in light of recent Soviet Hydrogen bomb testing and the developments in high altitude, supersonic aircraft which now out-perform radar controlled air defence guns. There was a need for a different approach to defence. This signalled the end of the gun defended areas in the UK. Protection would now only be provided to air stations and the deterrent by surface to air missiles and on the 1st Dec 1954 it was announced that the AA command would be disbanded effective March 1955 at which time it is believed that work on these sites was abandoned.

Information provided by the Muckleburgh Military Collection suggests the gun base was connected to a generator. The engine room may have contained a 5 cylinder meadows diesel electric generator and associated switch gear. The chamber also contained a diesel fuel tank. Air was drawn in through one vent and exhaust gas emitted through another.

The square plinths were solid footings for the erection of metal gantries for lowering the diesel engine and other equipment into the engine room and the gun into the gun pit. When the equipment was installed the gantry was removed but could be re-erected at a later time in order to conduct maintenance or repair.

A 5.25 inch gun with engine house can be seen at the Princess Anne Battery on Gibraltar. This differs from the ones identified around Glasgow not having an attached magazine building but ready use ammunition stores around the gun pit. Guard rails and davit are also visible. The addition of a Magazine building could suggest the Glasgow guns were being designed as fully automatic loading.

Conclusion

The gun installations at Rosneath, Stockiemuir and Barrhead appear to have almost exactly the same layout of gun pit, magazine and engine house supported by two buildings assumed to be control rooms/workshops and of which direct comparison may be made between the sites. The main difference is that Rosneath (only) appears to have been built as a subterranean gun complex, the reason for that is unclear. Research will continue until a final report is prepared.

A full photographic record of the sites was taken and these with survey plans and the report will be submitted to the National Monuments Records for Scotland.

Acknowledgements

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Muckleburgh Military Collection

National Archives

Secret Scotland

Royal Commission on the Ancient and Historical Monuments of Scotland

The Project Leader was Tam Ward and the survey team was: Carole Biggam, Anne Evans, Alasdair Jamieson, Sandra Kelly, Nick Maidment and Helen Rodgers.