



ULSTER  
ARCHAEOLOGICAL  
SOCIETY

---

# Survey Report

---

---

Reference: **Survey Report No 70.**

Author: **C Stevenson**

---

---

In association with:



Location:

**Mount Stewart's Southern Quadrant Shelter  
Mount Stewart  
Co Down  
Northern Ireland**



© Ulster Archaeological Society 2018

Ulster Archaeological Society

c/o School of Natural and Built Environment

The Queen's University of Belfast

Belfast BT7 1NN

Cover illustration: Drone Image of Mount Stewart's Quadrant Shelter – Courtesy of David  
Craig/Irishsights.com

---

## CONTENTS

---

List of figures	4
1. Summary	5
2. Introduction	6
3. Survey	6
4. Discussion	15
5. Recommendations for further work	17
6. Bibliography	18
Appendix	
Photographic record	18

## LIST OF FIGURES

---

<b>Figures</b>	<b>Page</b>
1. View of Mount Stewart's Quadrant Shelter, with Survey Group.....	5
2. National Trust Archaeologist briefing UAS Survey.....	6
3. Diagrammatic layout of a typical RAF bombing range.....	7
4. Map of Mount Stewart's RAF Bombing Range.....	7
5. Ground floor plan of Mount Stewart's Quadrant Shelter.....	9
6. West-facing elevation of Mount Stewart's Quadrant Shelter.....	10
7. North-facing elevation of Mount Stewart's Quadrant Shelter.....	11
8. Plan of First Floor of Quadrant Shelter.....	12
9. View of shoreline from base of shelter.....	13
10. Interior of west wall.....	13
11. Part of lower north wall.....	14
12. External stairs embedded into supporting wall.....	14
13. Details of external staircase .....	15
14. Details of external staircase.....	15
15. Extract from List of RAF Bombing Ranges.....	16
16. Obvious signs of deterioration of shelter.....	17
17. Obvious signs of deterioration of shelter.....	17
18. Obvious signs of deterioration of shelter.....	17
19. Obvious signs of deterioration of shelter.....	17

## 1. Summary.

### 1.1 Location.

The Southern Quadrant Shelter of an RAF WWII bombing range is situated on the shoreline of Mount Stewart Estate, in County Down, Northern Ireland at GPS reference J 54786 69758. The area is recorded on OS and National Trust maps as the 'Sea Plantation'. The survey was one in a series of planned surveys in the area, undertaken by members of the Ulster Archaeological Society.



Figure 01: View of the Mount Stewart's Quadrant Shelter from west with members of the UAS Survey Group preparing to start. (Courtesy of David Craig/Irishsights.com)

### 1.2 Aims.

The survey was requested by the landowner (The National Trust) to record the site of a Quadrant Shelter used on the WWII bombing range at Mount Stewart. The shelter was still relatively intact but there were fears of it being destroyed by erosion, rising sea levels and further damaged by falling trees. This structure was one of two such shelters needed to accurately record where practice bombs landed. This is recorded in more detail in the Discussion section of this report. In order to enhance the archaeological record of this site, the aims of this survey were to produce accurate plan drawings of the structure and carry out a photographic survey. This information was compiled into a report and copies submitted to The National Trust and to the archives of the Ulster Archaeological Society.



Figure 02: Mr Malachy Conway (National Trust Regional Archaeologist) briefing members of the Survey Group, under the main shelter structure.

## **2. Introduction.**

### **2.1 Background.**

An initial site survey was undertaken on 24 March 2018, by the following members of the Ulster Archaeological Society Survey Group: Hilary Boyd, Colin Boyd, Randal Scott (Safety Officer) and Chris Stevenson (Site Director), ably assisted by David Craig (Irishsights.com) and Malachy Conway (National Trust Regional Archaeologist). A return visit was carried out on 30 March to clarify certain aspects of the survey. This area of the estate is known as the ‘Sea Plantation’ and this shelter is one of several unusual and interesting monuments in the area, including; an enigmatic stone building, said to have incorporated a lime kiln, two circular concrete platforms, a swimming pool complex and a memorial to a boating tragedy nearby in 1895. There are numerous other sites on the estate that have military connections and some of these were surveyed in 2016 under UAS Survey Report number 58: Preston 2017.

### **2.2 Previous Archaeological Surveys.**

As far as it is known, there has been no previous archaeological survey at this site

## 2.3 Cartographic Evidence.

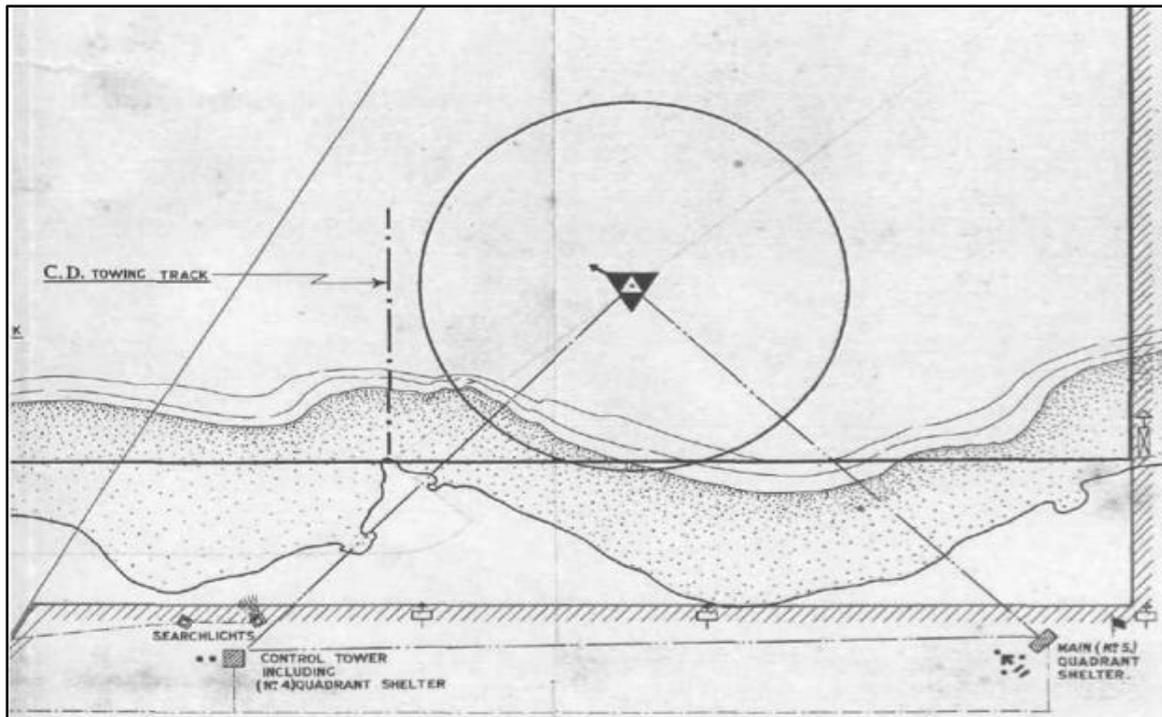


Figure 03: Typical diagrammatic layout for Combined Air Firing and Bombing Ranges – Courtesy of Airfield Research Group.

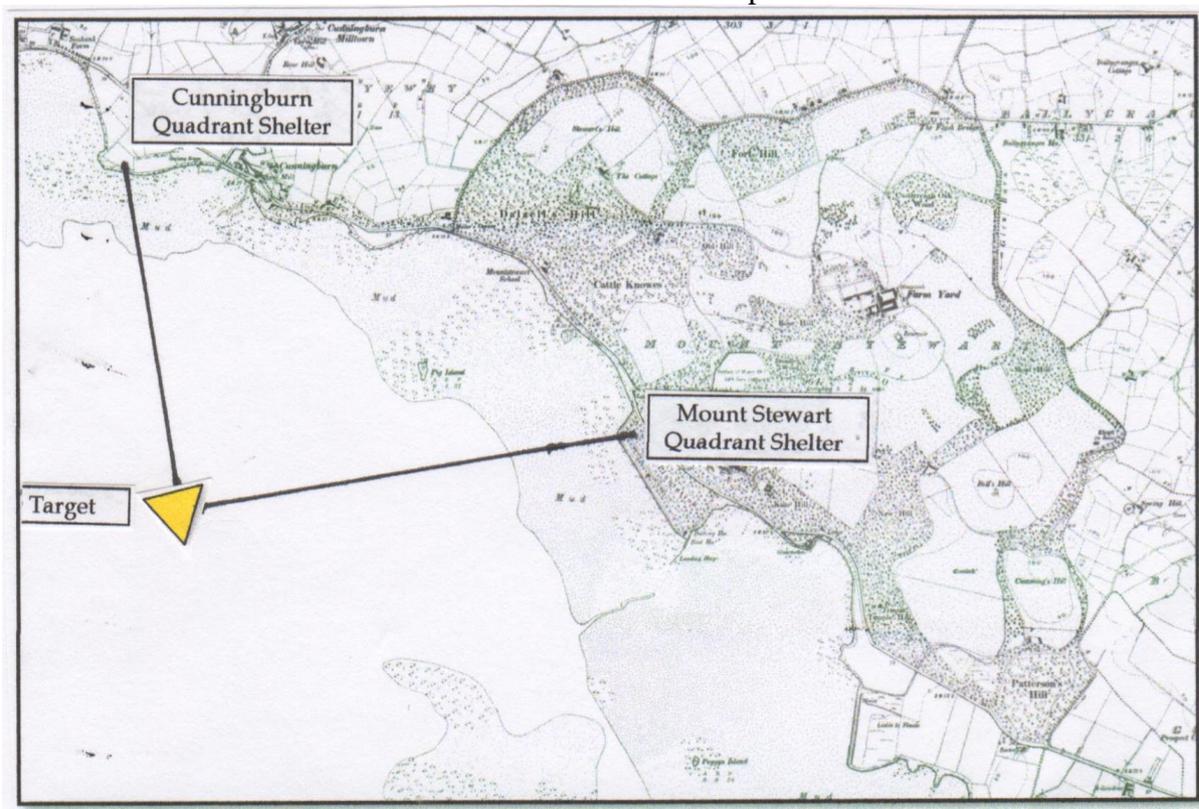


Figure 04: Map of Mount Stewart Bombing Range - Ordnance Survey, County Series, Fourth Edition, Down Sheet 11, part of, 1933.

## **2.4 Archiving.**

Copies of this report have been deposited with the National Trust and the Ulster Archaeological Society. All site records have been archived by the National Trust at Rowallane, Saintfield, County Down.

## **2.5 Credits and Acknowledgements.**

The Ulster Archaeological Society is particularly grateful to Malachy Conway, Regional Archaeologist of the National Trust, who worked closely with the survey team in choosing the site and facilitating access. It is also appropriate to acknowledge the assistance given by David Craig (Irishsights.com) for carrying out the drone survey, Peter Kirk (airfieldresearchgroup.org) and Roger Thomas co-ordinator for the Pillbox Study Group, who both gave exceptionally valuable background information on the construction and use of RAF bombing ranges during WWII.

## **3. UAS Survey**

**3.1 Methodology.** After walking the site, it was decided that the survey would take the form of the production of plan drawings and elevations, accompanied by a photographic survey. This report was compiled using the information obtained from these sources, in addition to background documentary material.

### **3.3 Production of plan and elevation drawings.**

Plan and elevations drawings were completed, using data obtained from the field survey. The society's *Leica Sprinter 100* electronic measuring device was not used on this occasion, due to the restricted nature of the site. Rough sketches were completed on site and these measurements were recorded in UAS Site Notebook 'A'. DavidCraig/Irishsights.com provided drone images to enhance the team's understanding of where and how the shelter fitted into the overall landscape. All this data was later transferred to a computer-based format for printing. As the shelter had originally been designed and constructed using imperial measurements, all drawings were recorded using feet and inches.

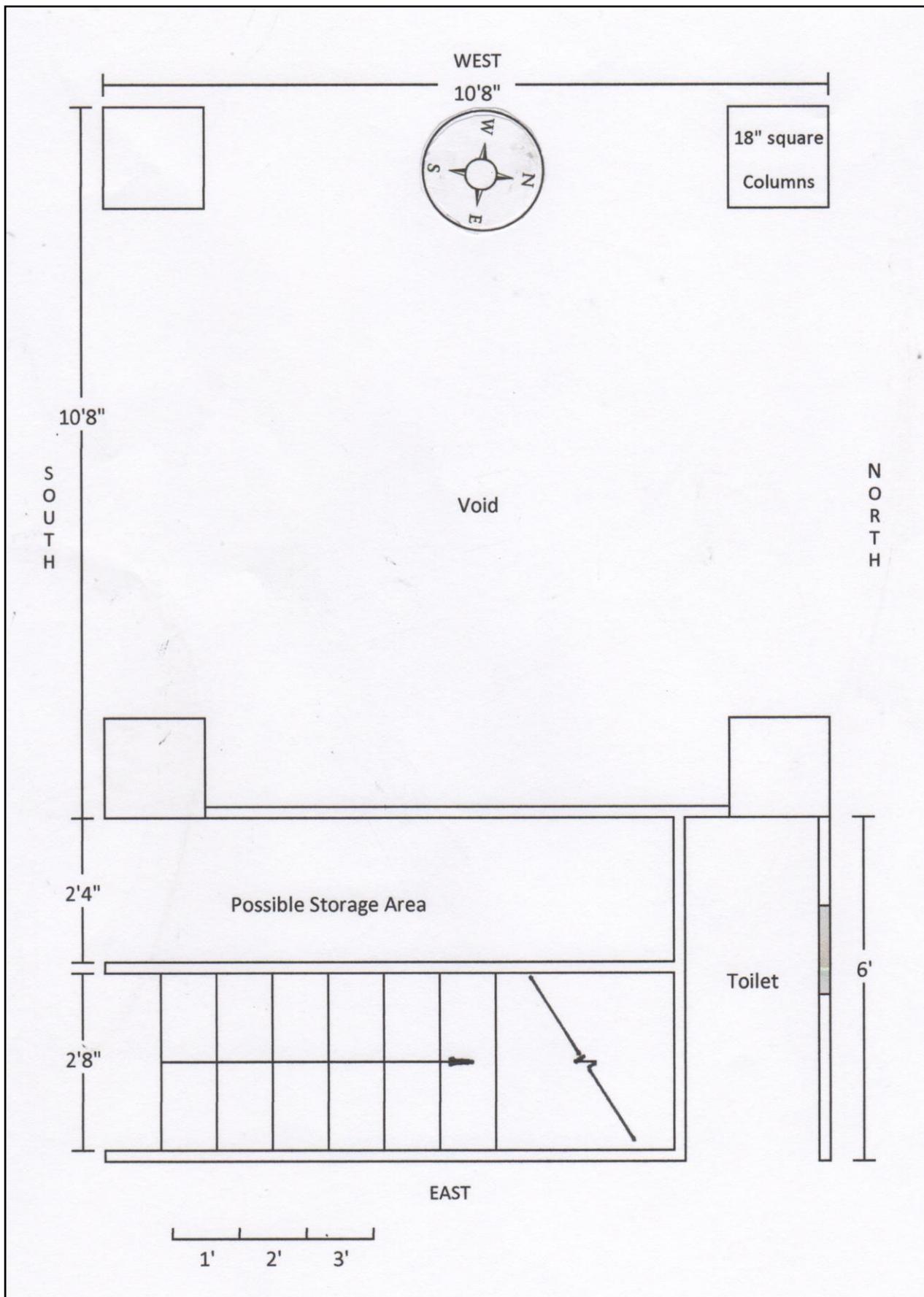


Figure 05: Ground floor plan of Mount Stewart's Quadrant Shelter

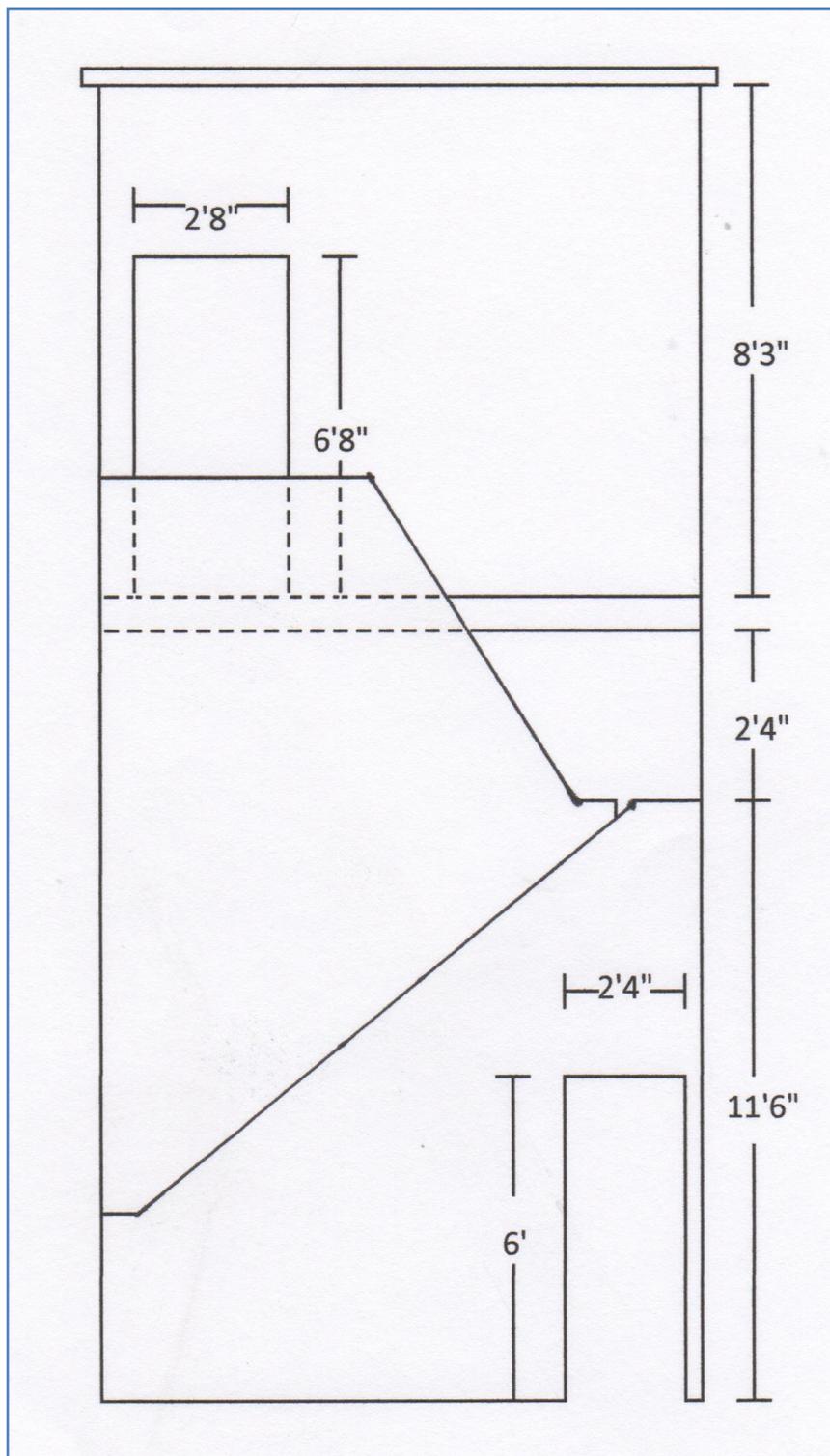


Figure 06: West-facing Elevation of Mount Stewart's Quadrant Shelter - Not to Scale

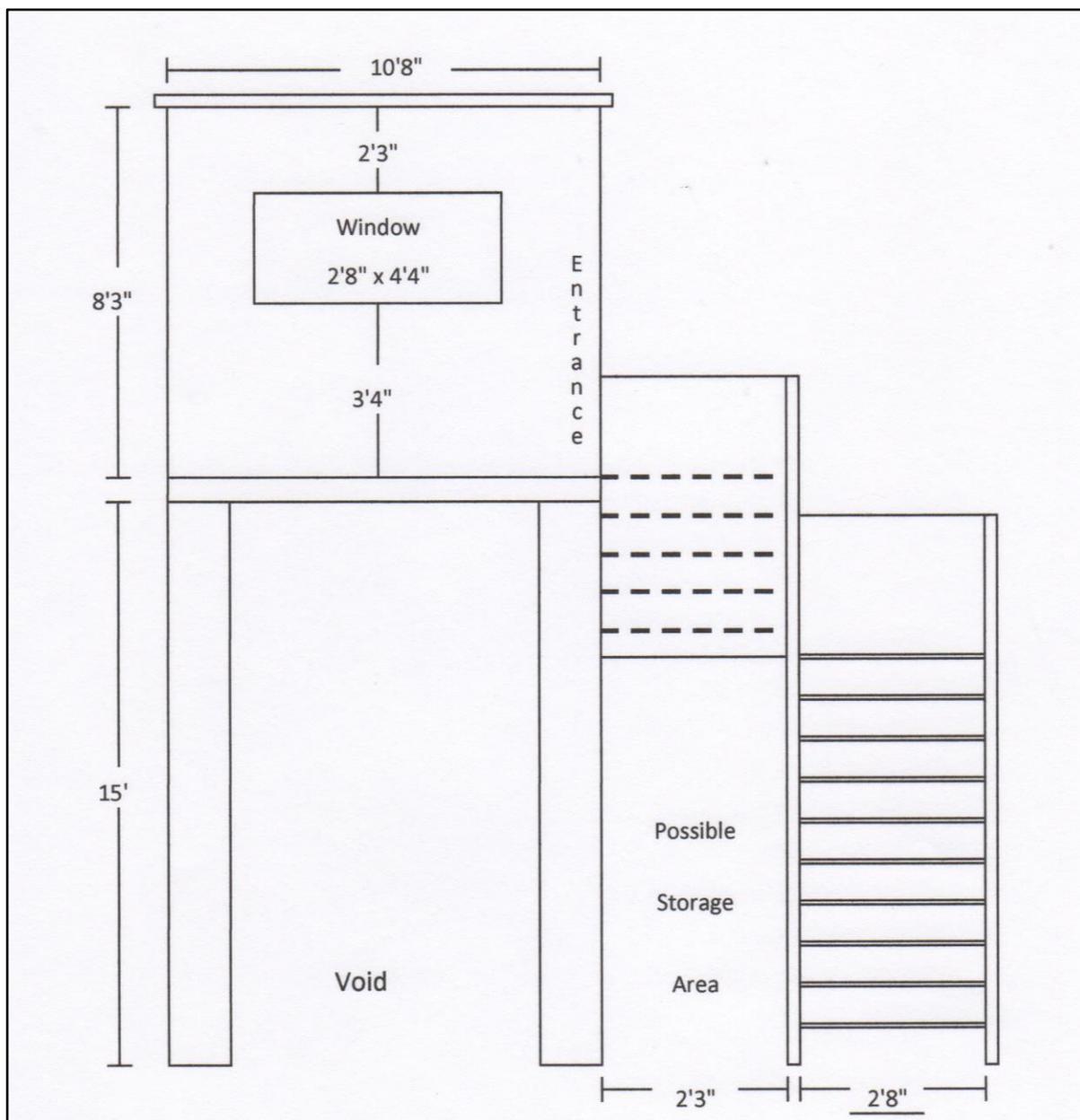


Figure 07: North-facing Elevation of Mount Stewart's Quadrant Shelter – Not to Scale

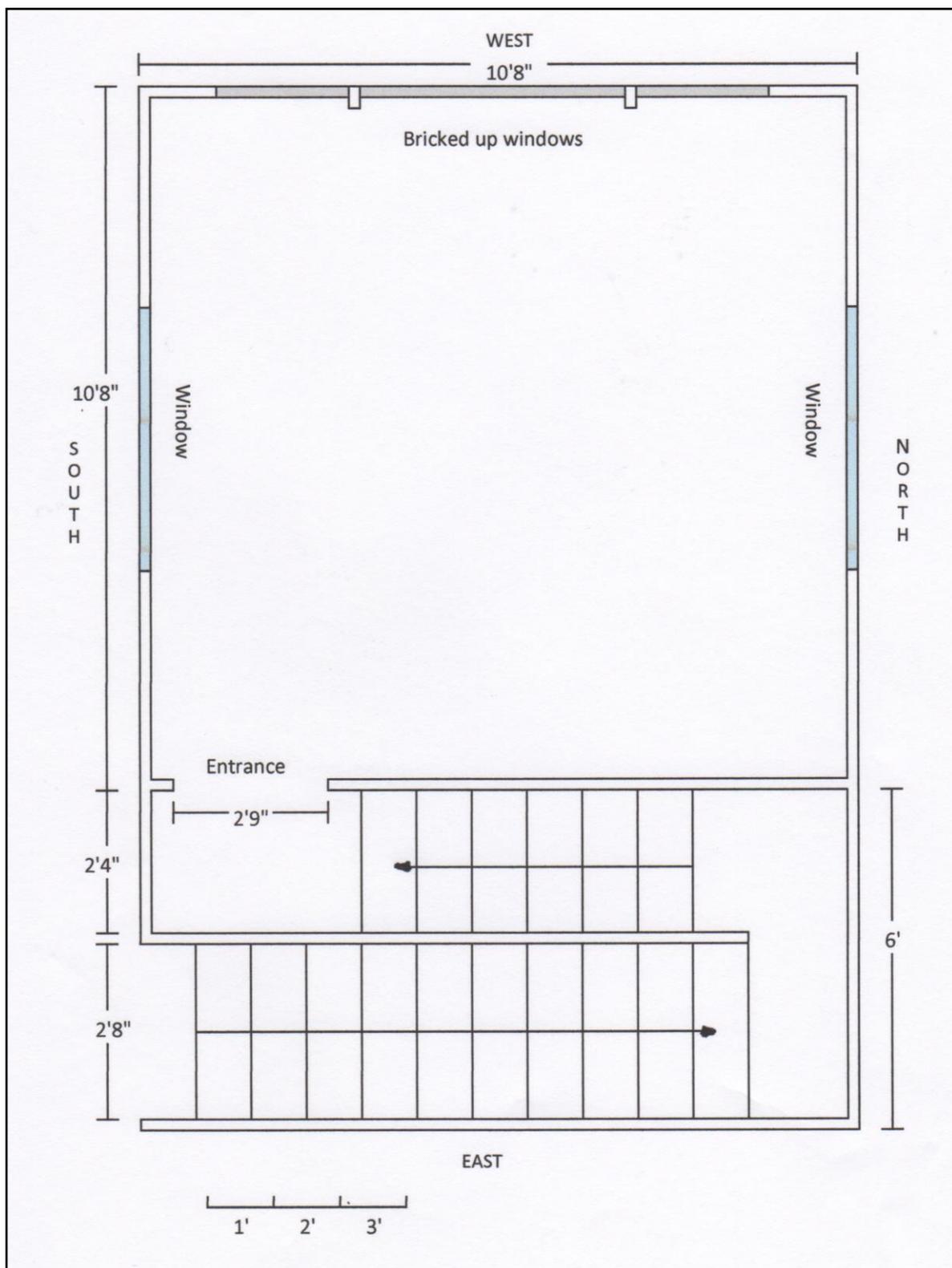


Figure 08: First Floor Plan of Quadrant Shelter.

### 3.3 Photographic archive.

A photographic record of the site was taken by using an Olympus SZ-31MR, 16 megapixel digital camera and images obtained from a drone, piloted by Irishsights.com. A photographic record sheet was

employed, corresponding to photographs taken during the site survey on 24 March 2018 and on a follow-up visit on 30 March. The archive has been compiled in jpeg format and saved to compact disc.



Figure 09: View of the shoreline from the base of the shelter. The wooden posts may be the remains of signage associated with the shelter.



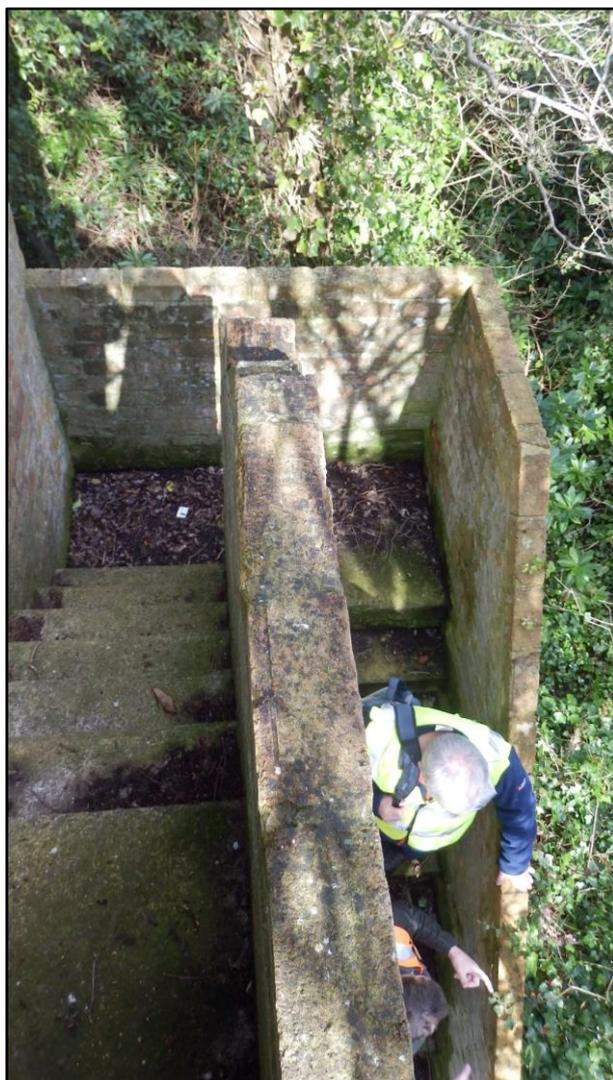
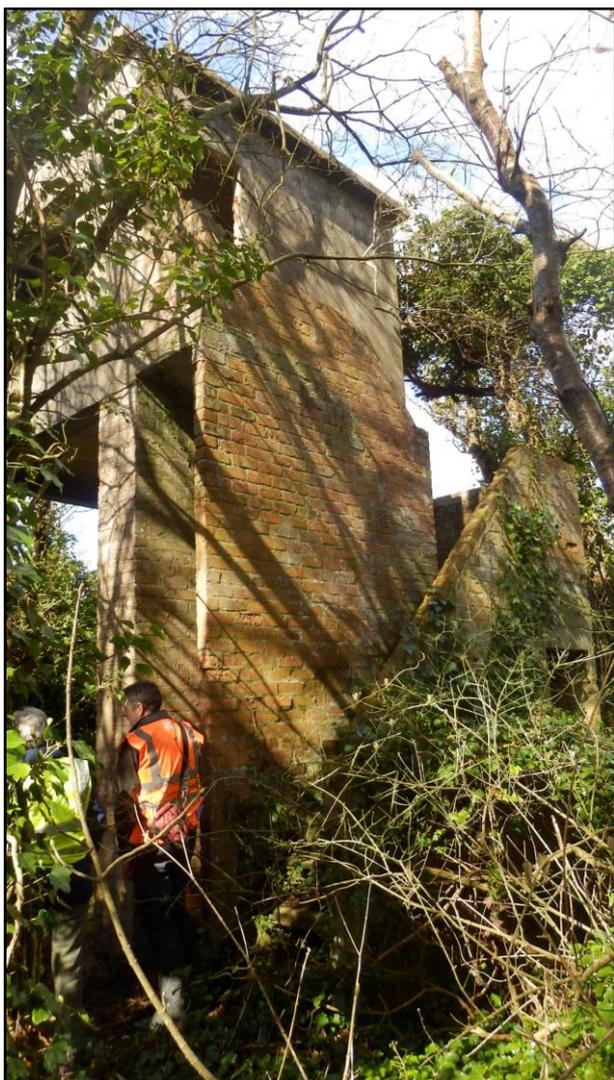
Figure 10: Interior of west wall showing bricked-up main observation windows.



Figure 11: Part of lower north wall with widow bricked in, but a 'letterbox' aperture constructed and meshed over.



Figure 12: Showing external stairs embedded into supporting wall.



Figures 13 and 14: Detailing the external staircase.

#### 4. Discussion

The Quadrant Shelter was one of a pair of shelters used on the Mount Stewart bombing range by the Royal Air Force during WWII to plot bearings and distances of bombs dropped at targets moored just off the coast in Strangford Lough. The target would have been a yellow triangular raft, the size of which depended on the bombing height. For low level bombing practice its sides could be as small as 16 feet, but 32 feet and 64 feet were more common from 1941. Flying orders dictated that no aircraft would fly below 200 feet. The observers in the shelters would turn the desk-mounted sights to bear on the smoke or flash and read off the bearing. The resulting bearings and distances from both shelters would be collated and reported back, by telephone, to the home airfields of the pilots who dropped the bombs. Normally anything outside 300 yards from the target was recorded as a miss. In the case of Mount Stewart, only practice bombs of 8.5 or 12 lbs emitting smoke or a flash would have been used. By 1945 the controlling authority for the range was Flying Training Command, but it is possible that Coastal Command had overall authority during the war years. Quadrant shelters would ideally be sighted so that the line of sight from each shelter to the target intersected at  $90^\circ$ , but this didn't often happen in practice. However it was rare to be more than  $\pm 10^\circ$  out.

- - 4 - -

Name	Function	1" Map	Grid Reference	Controlling Authority
Millom CUMBERLAND	P.B. & A.to G	18.19.24	550095) 594015) 648858)	F.T.C.
Morte Bay DEVON	P.B.R.	118	880640	C.C.
Mochrum	P.B.R.	Scot 91	828735	F.T.C.
Misson NATTS	P.B.R.	38	180170	B.C.
Mowsley LEICESTER	P.B.R.	73	098068	B.C.
Mercham BERKS	P.B.R.	105	882150	B.C.
Maddington Down WANTS	P.B.R.	122	475640	<del>F.T.C.</del>
Milton Ness	G to A	51	279058	R.A.F. Reg.
Masham Moor YORKSHIRE	A to G	21	614003	A.D.C.B.
Mareross	A to G	109	366895	A.D.C.B.
Margam Sands GLAM	P.B. & A.to G	109	218030) 225996) 195060) 203070)	F.T.C.
Morpeth	Parrot	<del>7</del>	793060	F.T.C.
Margate	A.to G.	<del>117</del>	<del>768893</del>	U.S.S.T.A.F.
Misson <i>pl. with</i>	<del>P.B.R.</del>	<del>38</del>	<del>195066</del>	<del>B.C.</del>
X Mersea ESSEX	P.B.R.	97	454330	U.S.S.T.A.F.
Mersea Flats ESSEX	P.B.R.	97	515305	U.S.S.T.A.F.
Mulltown	A.to G.R.	Iro.327	382212	U.S.S.T.A.F.
Mount Stewart <i>North Ireland</i>	P.B.R.	314	534693	F.T.C.
Mill Bay	A.to S.R.	Iro.321	637495	U.S.S.T.A.F.

Figure 15: Extract from Air Ministry Record of bombing sites.

The shelter surveyed formed the southern end of the observation area, with its pair being situated north, along the shoreline, towards Newtonards, just north of the junction of Cunningburn Road and the A20 road to Portaferry. An initial search of the site thought most likely to have been used to build the Cunningburn shelter indicated that nothing remained of the original structure and the area was densely overgrown with gorse and brambles. Enquiries in the local area yielded no further useful information.

**4.1 The Site.** The quadrant shelter is basically a brick cube with a floor area of 10 feet by 10 feet and an internal height of 8 feet 3 inches. It was raised approximately 17 feet off the ground on four 18-inch square columns, with an external staircase leading up to the first floor. The shelter is positioned 10<sup>0</sup> off north, on the shores of Strangford Lough, on the Sea Plantation area of Mount Stewart estate. Originally the shelter had three windows on the west wall looking into the Lough; two were 3 feet high by 1 foot 8 inches wide and the other was 3 feet by 4 feet 4 inches (but these were later bricked up and the outside wall rendered). The south wall still has a gap for a window 2 feet 10 inches high by 4 feet 4 inches wide. The north wall has a similar sized window to the south wall. Entrance to the shelter was via a doorway at the top of the stairs on the east side. The door and frame are missing, but the gap is 6 feet 8 inches high by 2 feet 9 inches wide. On the ground floor there is an empty 10 square feet space under the shelter, with two small rooms under the stairs. The room on the north side was a toilet and probably fitted with an 'Elsan' chemical toilet. The toilet originally had a window 2 feet 2 inches high by 1 foot 8 inches wide, but this is mainly bricked in, however there is a curious letterbox shaped area 4 inches by 11 inches that had been left un-bricked, with a wooden frame and covered by zinc mesh. The whole construction is of single brick and mortar, with the outside of the cube rendered at some stage. The main viewing window would have been glazed with optical quality glass, as apposed to wartime austerity glass. The roof and treads on the staircase were made of reinforced concrete.

**4.2 State of Preservation.** It is apparent that the shelter is slowly succumbing to the ravages of time, tide and storm. Reinforcing rods in the ceiling are exposed and pieces of concrete are flaking off. The

brickwork forming the stair rail has started to crumble away and there is evidence of loose bricks lying around the site. Daylight can be seen through a crack in the masonry on the west wall. All but fragments of wood have rotted away and all windows, frames and doors have perished or been removed. The four brick pillars appear to be sound with little or no subsidence noted. Four scrub trees are growing perilously close to the shelter and are leaning towards the building and constitute a threat to the integrity of the structure.



Figures 16/17/18/19: Views showing obvious signs of deterioration in the structure.

## 5. Conclusions and Recommendations for further work.

It is concluded that the shelter is in remarkably good state of repair, considering that it was built in a time of austerity with only a single thickness of brickwork and the fact that it has stood neglected for over seventy years on a very exposed and windswept site.

Although the National Trust has a policy of minimum intervention on sites effected by tidal erosion, it is believed that the identification and removal of at least four scrub trees would remove one hazard at minimum expense and would not spoil the wind breaking effect of the surrounding trees that are necessary to preserve the specimen trees growing on the estate.

Any visitors to the shelter should be aware that the footpath to the site is narrow, uneven and slippery; the structure is situated at the bottom of a steep, muddy bank and that some form of assistance may be required to egress and exit the ditch; inside the observation room there is a rough piece of rusting metal

protruding 10 mm from the floor (near where the west window was originally situated) and constitutes a trip hazard.

## Bibliography

- Air 10/1698 – Armament Training Manual: ‘Ranges and Armament Buildings’, dated 1939 & 1942, Public Records Office (Kew).
- MAF 140/21 – Air Ministry: ‘Release of Practice Bombing Ranges’, dated 1945-1958, Public Records Office (Kew).
- BT 249/88 – Navigational Hazards: ‘Issue of Instructions, Memoranda and Maps’, dated 1945-1950, Public Records Office (Kew).
- Ordnance Survey Map, County Series, Fourth Edition, Down Sheet 11, part of, 1933.
- Preston, R. 2017. ‘Military Base at Mount Stewart, Co Down’. Survey Report No 58. Belfast: Ulster Archaeological Society.

## PHOTOGRAPHIC RECORD FORM

Site: Mount Stewart WWII Bombing Range Quadrant Shelter

Date: 24 & 30 March 2018.

Make and model of camera: Olympus SZ-31MR

Camera	Page Number	Viewed From	Details
Irishsights	Cover	W	View of Mount Stewart’s Quadrant Shelter from drone.
Irishsights	5	W	View of Mount Stewart’s Quadrant Shelter from drone.
Olympus SZ-31MR	6	S	NT Archaeologist briefing UAS survey group.
Olympus SZ-31MR	13	E	View of shoreline from base of shelter.
Olympus SZ-31MR	13	W	Interior of supporting wall.
Olympus SZ-31MR	14	N	Part of lower north wall.
Olympus SZ-31MR	14	W	External stairs embedded in supporting wall.
Olympus SZ-31MR	15	S	Detail of exterior staircase.
Olympus SZ-31MR	15	S	Detail of exterior staircase.
Olympus SZ-31MR	17	S	Obvious signs of deterioration.
Olympus SZ-31MR	17	W	Obvious signs of deterioration.
Olympus SZ-31MR	17	W	Obvious signs of deterioration.
Olympus SZ-31MR	17	N	Obvious signs of deterioration.