

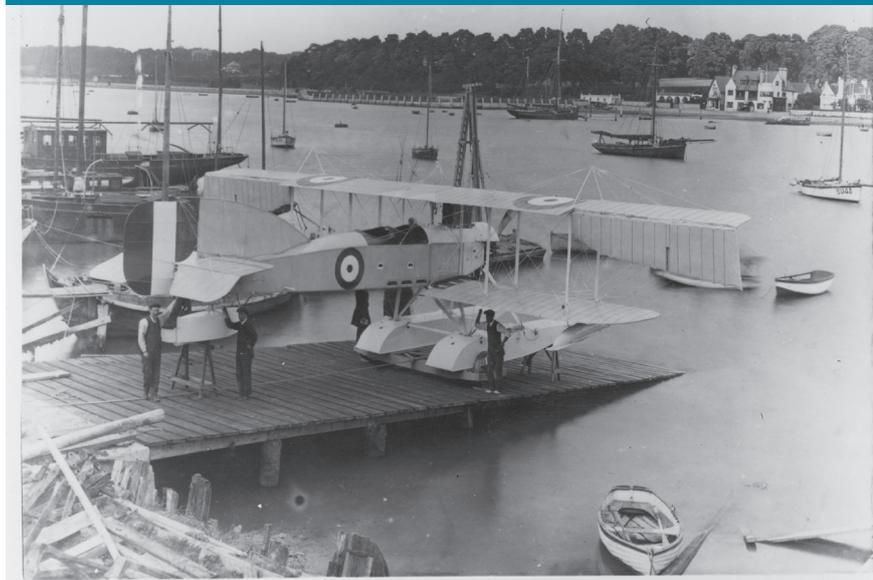
Forgotten Wrecks
of the
First World War

First World War Seaplane Stations of the South Coast of England



LED BY IWM

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FORGOTTEN WRECKS OF THE FIRST WORLD WAR

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Reporting writing by: Julie Satchell, Alastair Higton, Helen Wallbridge, Grant Bettinson and Amanda Bowens.

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1 Project Background

Forgotten Wrecks of the First World War is a Heritage Lottery Funded project dedicated to raising the profile of a currently under-represented aspect of the First World War. While attention is often focused on the Western Front and major naval battles like Jutland, historic remains from the war lie, largely forgotten, in and around our seas, rivers and estuaries.

With over 1,000 wartime wrecks and dozens of coastal sites along England's south coast alone, the conflict has left a rich heritage legacy and many associated stories of bravery and sacrifice. The underwater memorials represent the vestiges of a vital, yet little known, struggle that took place on a daily basis, just off our shores. The study and promotion of these archaeological sites presents a unique opportunity to better interpret them and improve physical and virtual access.

The project focuses on underwater and coastal sites from the Isle of Thanet in Kent, to beyond the Isles of Scilly, and over half way into the English Channel. The sites include merchant and naval ships, passenger, troop and hospital ships, U-boats, ports, wharfs, buildings and foreshore hulks. These sites, under water and on the foreshore, have been degrading and deteriorating due to natural and human processes for approximately 100 years and, as a result, are extremely fragile. In many cases, this project represents a final opportunity to record what remains on the seabed and foreshore before it is lost forever.

The project aims to characterise the nature and extent of the maritime First World War archaeological resource surviving on the south coast's seabed and around the coast. This will enable an understanding of the record of maritime activity created during the conflict and provide a window onto some of the surviving sites. While it will not be possible to visit and record every site dating to the First World War along the south coast of England, a representative sample of sites have been selected for more detailed study, analysis and interpretation.

With particular regard to coastal, rather than fully submerged archaeological remains, it has been noted in wider commentaries on England's coastal heritage (Murphy, 2014: 94) that there are relatively few surviving sites because of subsequent reuse and/or destruction during or following the Second World War. As a result, from the perspective of identifying coastal research priorities an emphasis has been placed (Murphy, 2014: 119) on the need to differentiate First World War sites from those of the Second World War. With all of this in mind, the following report addresses one of the types of coastal sites dating to the First World War – seaplane stations.

This report, created as part of the MAT's Heritage Lottery funded, Forgotten Wrecks of the First World War project, focuses on the historical background and fieldwork undertaken on a number of seaplane station sites. These sites, developed during the early 20th century, played a crucial role in the First World War (FWW).

A large quantity of data was collected and quantified, most notably by volunteer Alastair Higton who researched documents and publications in The National Archives, libraries and online. The work was used to assess each of the seaplane stations within the study area to establish their archaeological potential, and help direct site visits and fieldwork, this is summarised in Table 1.1- Summary table - Seaplane stations active & probability of archaeological remains .

Active fieldwork was carried out at four of the 12 seaplane stations which were selected to provide examples of sites in a range of preservation conditions. Eleven of the sites were part of the Royal Naval Air Service (RNAS), with Hamble Point being included as one of the early sites of seaplane development and testing. The geographical locations of the sites are shown in Figure 1: Location of all seaplane stations within Forgotten Wrecks of the First World War Study Area.

TABLE 1.1: SUMMARY TABLE – SOUTH COAST SEAPLANE STATIONS ACTIVE DURING THE FIRST WORLD WAR & PROBABILITY OF ARCHAEOLOGICAL REMAINS

Name	Established	Closure	Status of site
Bembridge	1915	1920 (disposal)	Largely cleared of military structures. Little new development. Bases of buildings may remain.
Calshot	29 th March 1913	1961	Three Listed hangars remain in use and parts of slipways survive. Associated buildings features also survive.
Cattewater	February 1917 (formal establishment as an RNAS station)	1992	Two Listed hangars remain in use. Other associated buildings and features may survive on site.
Dover (Marine Parade)	11 th November 1914	1920 (de-requisitioned)	Almost or entirely demolished and overgrown (2016), with some potential for associated buildings and features to survive.
Lee-on-Solent	30 th July 1917	1996	Five hangars and many assorted structures and buildings remain.
Newhaven	May 1917	1919	Hard / concrete standing of bases and remains of slipways survive. G-type hangar sold off and survives in Wimbledon.
Newlyn	Early 1917	1922 (earmarked for disposal)	Hard / concrete standing and some timber foundations remain, but are disarticulated.
Portland	28 th September 1916	Uncertain, probably 1919-1920 though site was retained for some time.	Possible remnants of the slipway, hangar area built over with light industrial buildings. Associated buildings used as part of the station survive.
Torquay	Early 1918	1919 (sold)	Pre-station piers remain, however, no structures appear to survive.
Tresco	Spring 1917	Uncertain. Probably 1919 or soon after	Site largely overbuilt. Slipway remains, and possibly some small structures and trackway, depending on extent of building.
Westgate	1 st August 1914	1920 (for disposal)	Mostly built over with residential homes, green / community space and car park. Possible that existing slipway is related to the seaplane station, other associated features may survive.
Hamble Point (construction)	1912 /1917 (very early uptake)	Complex production finishes 1958	Area used for range of marine related businesses, features related to slipways survive.

TABLE 1.2: SUMMARY OF SITES WHERE FIELD WORK WAS CONDUCTED

Site name	Location	Date conducted
Newhaven	Sussex	2017
Newlyn	Cornwall	2016
Calshot	Hampshire	2014, 2015 & 2017
Hamble Point	Hampshire	2014 & 2018



FIGURE 1: LOCATION OF ALL SEAPLANE STATIONS WITHIN FORGOTTEN WRECKS OF THE FIRST WORLD WAR STUDY AREA

2 First World War Seaplane Stations - Background and Project Approach

Seaplane stations played an important yet largely overlooked role in the English Channel during the First World War. Whilst the numbers of aircraft used were small and U-boat sinkings lacking, except in one *possible* instance, seaplanes were able to carry out anti-submarine, convoy defence and patrolling duties all along the south coast of England and disrupt the German's commerce war with very little challenge in return.

Their work supported the war effort in three ways, and for reasonably little outlay:

- Aircraft could spot a U-boat from further away than a ship could and approach with significantly greater speed. A single aircraft could therefore cover a much greater area and in the confines of the Channel the generally inferior performance of seaplanes mattered less (James 1991: 120);
- U-boats tended to travel on the surface as often as possible. The potential of an aircraft attack 'out of the blue' made this harder, disrupting their freedom of movement and ability to attack; and
- Royal Naval vessels could be freed up from convoy and patrol work for other purposes e.g. to maintain the distant blockade of Germany; and furthermore seaplane stations avoided the requirement to identify, prepare, purchase (or requisition) and maintain large, flat airfields.

New stations could be set up reasonably quickly as long as a suitable anchorage or foreshore could be found. Canvas 'Bessoneau' hangars could be erected swiftly and other buildings and accommodation would simply be requisitioned.

The use of airpower – whether from land or sea-based aircraft – could disrupt the enemy's strategy at sea whilst developing a new technology. It was an approach that could deliver naval supremacy through airpower and at a fraction of the cost of flotillas of fighting ships. Similarly, submarines were looked upon as having the same potential to challenge the power of the surface fleet.

On 5 June 1914 Admiral Sir Percy Scott wrote a letter to the Times encapsulating this new reality. Exuding modernity, he outlined the coming reality of naval warfare:

"Submarines and aeroplanes have entirely revolutionised naval warfare; no fleet can hide itself from the aeroplane eye, and the submarine can deliver a deadly attack even in broad daylight... As the motor vehicle had driven the horse from the road, so has the submarine driven the battleship from the seas".

Despite the outrage this letter caused amongst the navy-minded (and a good many Admirals) it did so mainly because Scott dared to impugn the supremacy of the battleship.

The Royal Navy understood the value of technology, most publicly demonstrated by the development of HMS *Dreadnought* in 1904, as well as the enthusiasm (and divisiveness) of Admiral Fisher's reforms (Marder 1966: 77-79). The war, once under way and in stalemate both at sea and on land, pushed each side to find a technological edge as an answer to their strategic problem. Seaplanes were one of many emerging approaches to keeping the country fed and the land war supplied. They were a key support to the war at sea, with stations spaced around the coast to provide strategic cover.

2.1 DEVELOPMENT OF THE SEAPLANE STATION

Seaplanes were helped along by the failure of an airship. The *Mayfly* was built after a sub-committee of the Committee for Imperial Defence recommended construction of an airship to explore the possibilities of using them for reconnaissance and “destructive purposes” (Marder, 1966: 336). Launched in September 1911 the *Mayfly* was an embarrassing failure, breaking its back on its debut owing to one or more possible reasons (Wragg 2009: 14). This halted rigid airship construction by the British until 1912.

This provided an opportunity for aircraft and for the Royal Navy’s seaplanes. On 1 January 1913 the Admiralty approved the establishment of a ‘regular chain of stations for naval aircraft along the coast of the United Kingdom within easy flight of each other’. That letter, to the Admiral Commanding Coastguard and Reserves, proposed 16 stations for seaplanes and three for airships (Fleet Air Arm, 2017).

The military value of seaplanes was further explained in Parliament by First Lord of the Admiralty Winston Churchill on 17 March 1914: they would scout, provide air defence of key installations and warn merchantmen of enemy commerce raiders. As early as in March 1913 Jacky Fisher predicted that ‘aviation will surely supplant cruisers’ (Marder 1966: 338).

Whilst policy and strategic discussions were taking place, the organisation of British air power went through some changes. In May 1912, the British naval and army aviation corps combined to become the Royal Flying Corps (RFC). The Naval Wing of the RFC lasted until July 1914 when the Royal Navy reformed its air branch, naming it the Royal Naval Air Service (RNAS).

In August 1914 the RNAS had 24 seaplanes but 1914/15 saw rapid growth so that by the summer of 1916 there were nearly 500 seaplanes (Abbatiello 2006: 87).

On 1 April 1918 the RFC and RNAS were merged to form the Royal Air Force, thereby removing all seaplane stations and their aircraft from Royal Navy control. The Navy’s Fleet Air Arm did not become operational until 1924 (Fleet Air Arm Archive, 2017).

2.2 SEAPLANES STATIONS ON THE SOUTH COAST DURING THE FIRST WORLD WAR

Seaplane stations were a reasonably new phenomenon and only two Navy stations – Calshot and Westgate - were operational on the south coast when the war began, with Hamble Point being active as a private aircraft development and testing site (Table 1.1: Summary table - Seaplane stations active & probability of archaeological remains).

Throughout the war, more stations were added to provide additional patrolling and anti-submarine capacity. On 15 December 1916 Rear Admiral A.L. Duff suggested to the new First Sea Lord Admiral Jellicoe that RNAS capabilities on the south coast be significantly increased and this led to the establishment of more stations (Abbatiello 2011: 88).

Despite the work undertaken by these stations whether any U-Boats were sunk by aircraft from any of these stations is debateable. UB-32 may have been sunk by a Calshot-based aircraft on 22 September 1917, however, it was operating out of Cherbourg at the time (Delve 2005:51). However, UC-66 is a strong candidate, believed to have been the U-boat bombed north of the Scillies by HM Seaplane No. 8656 on 27 May 1917 (McCartney 2015: 114 – 117). Other websites suggest additional sinkings but these have not been verified.

2.3 AIRCRAFT USED AS SEAPLANES AND HANGAR DESIGN

A range of planes were either designed for use as seaplanes or adapted from other planes. A list of the types of planes in use at Calshot during the war includes: Sopwith Bat Boats, Wright Seaplanes, Short 184 and 320, Curtiss H12/12B Large America, the Felixstowe F.2A (Figure 2), Fairey Campanias, Fairey IIIc and IIIe. An example of a Short 830 is shown in Figure 3.

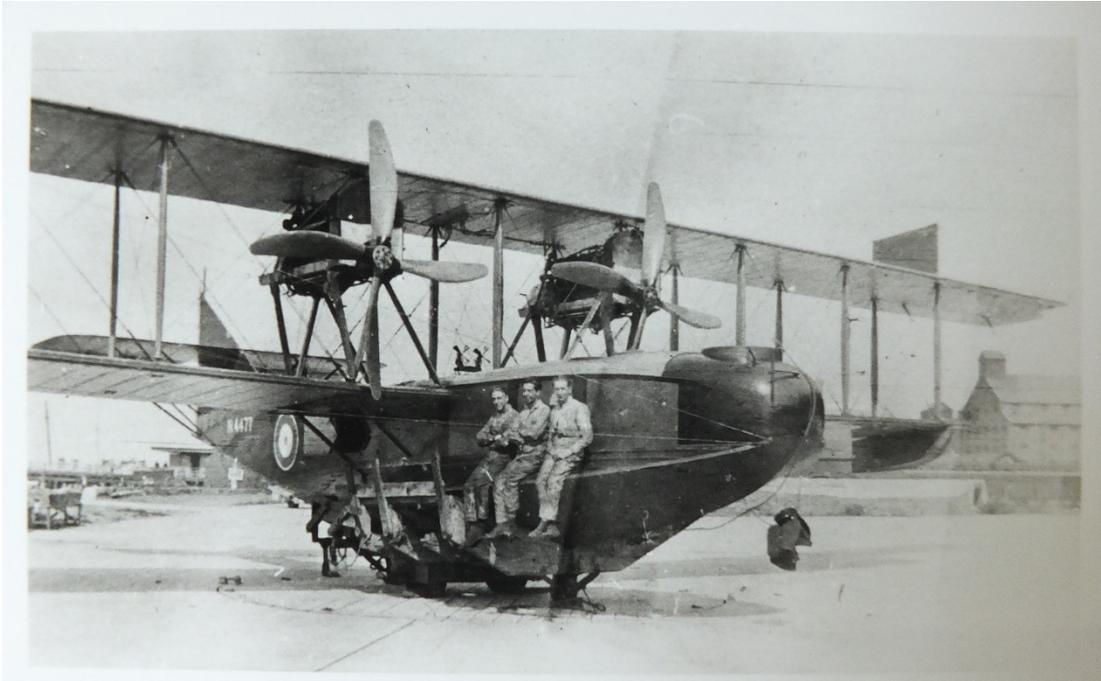


FIGURE 2: FLEXISTOW F2A AIRCRAFT (COURTESY OF THE NATIONAL MUSEUM OF THE ROYAL NAVY: CALSHOT, CHEESEMAN COLLECTION N.4477)



FIGURE 3: SHORT 830 AIRCRAFT ON THE SLIPWAY AT DOVER SEAPLANE STATION (COURTESY OF THE NATIONAL MUSEUM OF THE ROYAL NAVY: DOVER, CHEESEMAN COLLECTION)

With a range of sizes of aircraft and the need to have a base on the water's edge, the facilities designed and built for housing the aircraft differed according to the needs of the planes and the site. Details of the various hangar designs and their dimensions are held within the archives of the National Museum

of the Royal Navy. Hangar design types in use at seaplane stations included: type BB, type C, type F, type G, type H (Figure 4), and type J. Type BB was the largest at 200' x 100' (61m x 31.5m) with type J being the smallest at 60' x 48' (18.3m x 14.6m). All of the designs are relatively simple, being based on rectangular shaped buildings with large opening doors to allow the planes in and out, some types included annex areas, some had windows or 'glazing' areas. The construction materials varied with many constructed of metal frames and panels, while others were more temporary with frames covered with canvas.

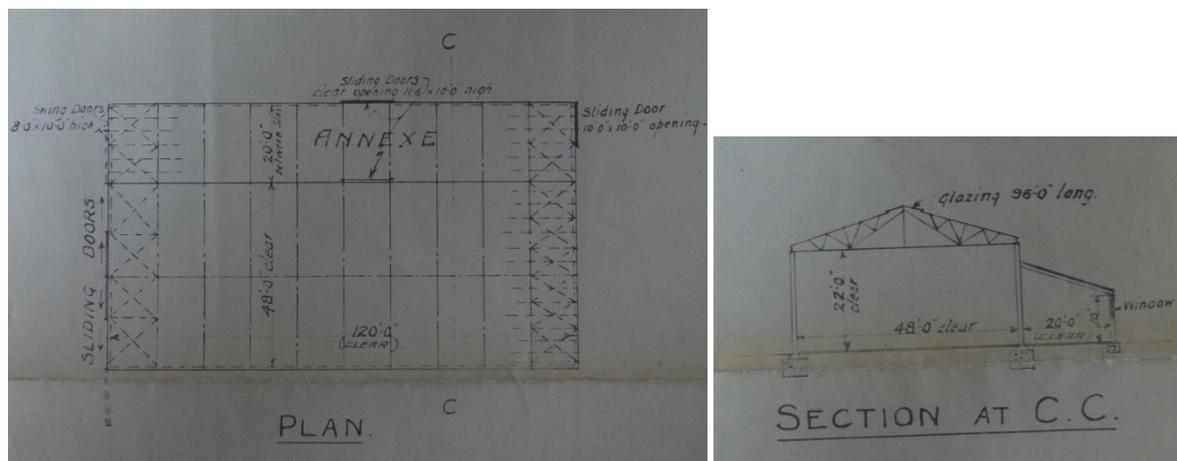


FIGURE 4: DESIGN PLANS OF THE TYPE H SEAPLANE HANGAR (COURTESY OF THE NATIONAL MUSEUM OF THE ROYAL NAVY)

2.4 POST WAR HISTORY

An armistice commenced on 11 November 1918, not a peace and the RAF did not immediately disband its squadrons until much nearer the signing of the Treaty of Versailles on 28 June 1919. Ten seaplane squadrons went in May 1919, the rest in June (James 1991: 78).

All but three of the stations – Calshot, Cattewater and Lee-on-Solent - were closed in the years immediately after the end of the war. There was no reason for the RAF to retain a large defensive force against an ally across the Channel and an exhausted and defeated enemy on the North Sea.

Despite a hundred years having passed, during which time some sites have largely disappeared under housing and others cleared of structures and left with nothing but hard standing, other sites have physical remains which have been recorded during this project.

In the case of Lee-on-Solent there are substantial standing remains and it is a stunning example of what a First World War seaplane station looked like (despite being a training establishment and having been through many changes) and there are powerful reminders at Calshot in Hampshire and Mount Batten (Cattewater) in Plymouth. There is even a seaplane hangar from Newhaven seaplane station in Wimbledon, having been sold and relocated there in the 1920s.

2.5 RESEARCH APPROACH AND SITES SUBJECT TO FIELDWORK

Seaplane stations have been the focus of numerous historical appraisals and books by a variety of historians giving an extensive background into the development, placement and function of the stations and the seaplanes during the First World War. The archaeology of these stations, however, has gone widely unassessed, leaving large gaps in our understanding of how they were decommissioned, disposed of and particularly the extent of what physically remains.

This situation has also been recognised by Historic England, Cant & Dunkley (2016) *The Naval War*, "It is clear that the surviving remains of former RNAS airfields, seaplane stations, airship stations and

balloon stations have not been comprehensively studied which has led to previous loss through neglect and development. Further investigation is therefore needed to identify, map and record the largely imperceptible remains to ensure that they are adequately sign-posted within historic environment records so as to assist with their future preservation”.

Taking this into account the sites of the seaplane stations were a priority site type within the MAT's Forgotten Wrecks of the First World War project. The following research questions were used to guide work on the seaplane stations, with some being subject to fieldwork. This report is the presentation of the research and the results of surveys taking place across the four years of the project.

- What do historical sources reveal about the seaplane stations?
- Can traces of seaplane stations be determined from aerial and satellite images?
- What can field recording reveal about remaining structures?

2.6 INVESTIGATION METHODS

Forgotten Wrecks project site visits and fieldwork aimed to:

- Provide opportunities for volunteers to access and take an active role in the recording and research of a range of different types of maritime First World War site.
- Record extant remains for heritage records.
- Record extant remains for public dissemination, enabling 'virtual' access for those not able to achieve physical access.

Intertidal/coastal fieldwork comprised a combination of the following (depending on the nature and extent of the site): initial site visit; characterisation of remains through detailed inspection, site sketch and photography; measured site survey, including photographic and video recording, employing a drone where appropriate and/or creation of a 3D digital model.

For the seaplane stations a desk based assessment of each site was conducted in order to understand the development of the sites as a whole and to identify the main areas of interest and those with potential for physical remains to be preserved. Fieldwork was then targeted at four different sites, with the most appropriate survey methods applied depending on the remains.

The fieldwork sites were Newhaven, Newlyn, Hamble and Calshot, little previous archaeological work had been conducted at the sites, with the exception of Calshot where the extant hangars are listed buildings. Fieldwork at Calshot instead focused on remains related to the movement of the planes to and from the water. The surveys were conducted at low tide, to ensure that the maximum archaeological remains where exposed could then be recorded.

The approach taken at each site is detailed in the individual sections below. Further general information related to project methods can be found in *Forgotten Wrecks of the First World War: Project Methodology Report*.

3 Results

The seaplane stations on the south coast are widely spread across the study area with at least one per southern county (see Figure 1). The stations needed direct access to the sea and were usually situated in areas within easy reach of supporting infrastructure.

The stations are of a semi-temporary nature, most consisting of flat-pack hangars and some canvas hangars such as those at Portland. They are obviously always adjacent to water with purpose built slipways for access. The access is designed to be used at both low and high tide as anything less would impact the defensive effectiveness of the station.

The stations are built with a concrete hard standing / foundations. The hangars are constructed of either metal or a light canvas structure. Research was undertaken to identify the number of buildings expected to be present at each site, with documents from The National Archives helping considerably with this task.

3.1 BEMBRIDGE

3.1.1 Site History

Bembridge Royal Naval Air Station was established in 1915 on the eastern coast of the Isle of Wight on a promontory extending into Bembridge harbour and the outflow of the River Yar (Figure 5). Created as a sub-unit of nearby Calshot, initially only the single slipway and some hard standing were provided. The original purpose of the station was anti-submarine warfare although later in the war more aircraft were added for general patrolling duties in the Isle of Wight area (Delve 2005: 250).



FIGURE 5: MAP SHOWING RAF BEMBRIDGE (DASHED OUTLINE), 31 OCTOBER 1918. (TNA).

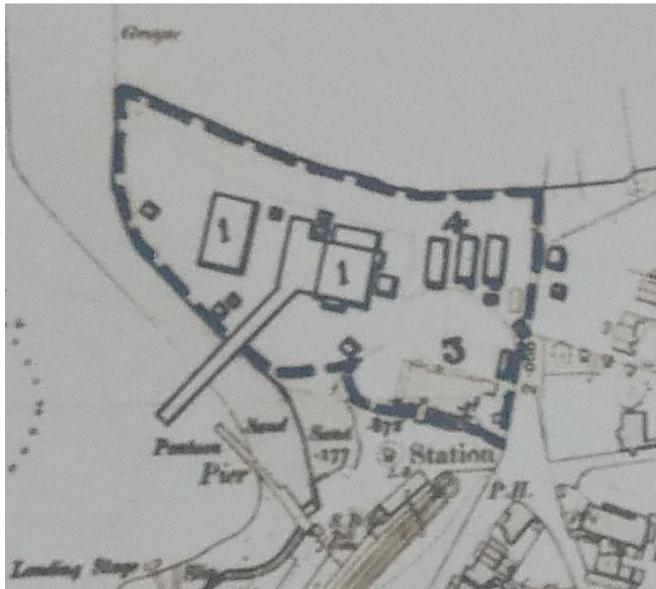


FIGURE 6: RAF BEMBRIDGE (IN DETAIL) (TNA)

TABLE 3.1: REFERENCE TABLE TO NUMBERED STRUCTURES IN FIGURES 5 AND 6

Key to numbered structures in Figures 5 and 6	Map reference
2 x Seaplane Sheds 1 x 71'x71' 1 x 96'x60'	1 1
Spithead Hotel Officers' Mess Officers' Quarters Officers' Latrines Accommodation for other ranks	3 3 3 3
3 x Men's Huts (used for Regimental Institute)	4



FIGURE 7: BEMBRIDGE SEAPLANE STATION TAKEN 24 OCTOBER 1917 (COURTESY OF THE NATIONAL MUSEUM OF THE ROYAL NAVY: A.STN406)

Some sources indicate that by November 1916 more facilities had been added including two seaplane sheds (Figure 8, below) (Island Eye 2017) and several huts to service the flight of four Short 184s detached there from Calshot (Delve 2005:250). However, an aerial photograph indicated as being taken in October 1917 (Figure 7), shows that the second hangar building has not yet been built. Accommodation was provided off site: the Spithead Hotel for officers, the coastguard station for ratings (Delve 2005:250). Seaplanes could moor in the harbour, however, the profusion of boats and moorings there meant that aircraft were required to taxi into open water North West of St Helen's Fort to take off (TNA Air1/ 452/15/ 312/26 vol V) .



FIGURE 8: HANGARS AT BEMBRIDGE, - DATE UNKNOWN (ISLAND EYE 2018)

U-boat patrols by seaplanes were usually uneventful despite their value in thwarting U-boats from attacking shipping or running on the surface. Nevertheless there was one occasion when a Bembridge aircraft had the opportunity to carry out an attack, on 18 October 1917 when Flt. Cmdr. McLaurin and his observer attacked a U-boat. The kill remains unconfirmed (Philpot 2013: 242).

After the creation of the Royal Air Force on the 1 of April 1918, 412 (Float Seaplane) Flight was

formed in May becoming part of 253 Squadron in August and joined by 413 Flight in September. The squadron was part of 10 Group and both Flights operated Short 184s although Fairey Campanias and Hamble Babys were also used (Delve 2005: 250). By the end of the war 12 machines operated out of Bembridge (TNA Air1/ 452/15/ 312/26 vol V).

3.1.2 Summary of Structures

The RAF's Quarterly Airfield Survey of Autumn 1918 states that 191 personnel and 12 aircraft were based at the five acre site. A variety of technical and regimental buildings were either complete at this time or expected to be so by the end of November 1918; technical buildings were reported as 75% complete, and lighting 90% complete.

TABLE 3.2: BEMBRIDGE SUMMARY TABLE - BUILDINGS AND STRUCTURES, OCTOBER 1918

Technical buildings	Regimental buildings
2x Seaplane Sheds <ul style="list-style-type: none"> • 1x 71'x71' (22m x 22m) • 1x 96'x60' (29m x 18m) 	In the Spithead Hotel <ul style="list-style-type: none"> • Officers' Mess • Officers' Quarters • Officers' Latrines • Accommodation for other ranks • Sick Bay
1x Slipway	Sergeants' Mess
Workshop (annex to shed)	Sergeants' Latrines
Technical Stores (annexes to shed)	Regimental Store
Oil Store	3x Men's Huts (used for Regimental Institute)
2x Petrol Stores	Men's Baths
Winch House	Men's Latrines and Ablution
Wireless Telegraphy Hut	Women's Hostel (in adapted Coastguard Station)

Offices	
Power House	
Latrines	
Guard House	
Armoury	
Ammunition Store	
Detonator Store	
Pigeon Loft	

3.1.3 Decommissioning

253 Squadron was disbanded in May 1919 and the station disposed of in 1920 (Philpott 2013: 242). Figure 9 is a modern aerial photograph and appears to show the site clear of all upstanding military structures including the slipway. There is some potential for concrete bases of structures to be present on site, with a strip of ground free from vegetation being located in the area of the form buildings. The larger hangar from the station was sold and rebuilt for use as a theatre in Shanklin on the South East of the island and is now part of the Summerland Amusement Arcade (Hampshire Airfields 2017). The Spithead Hotel was demolished in 1989 and the site is now redeveloped (Bacon 2017). Part of the site appears to be currently in use for mineral extraction, possibly sand, and some homes have been built on the eastern edge of the site.

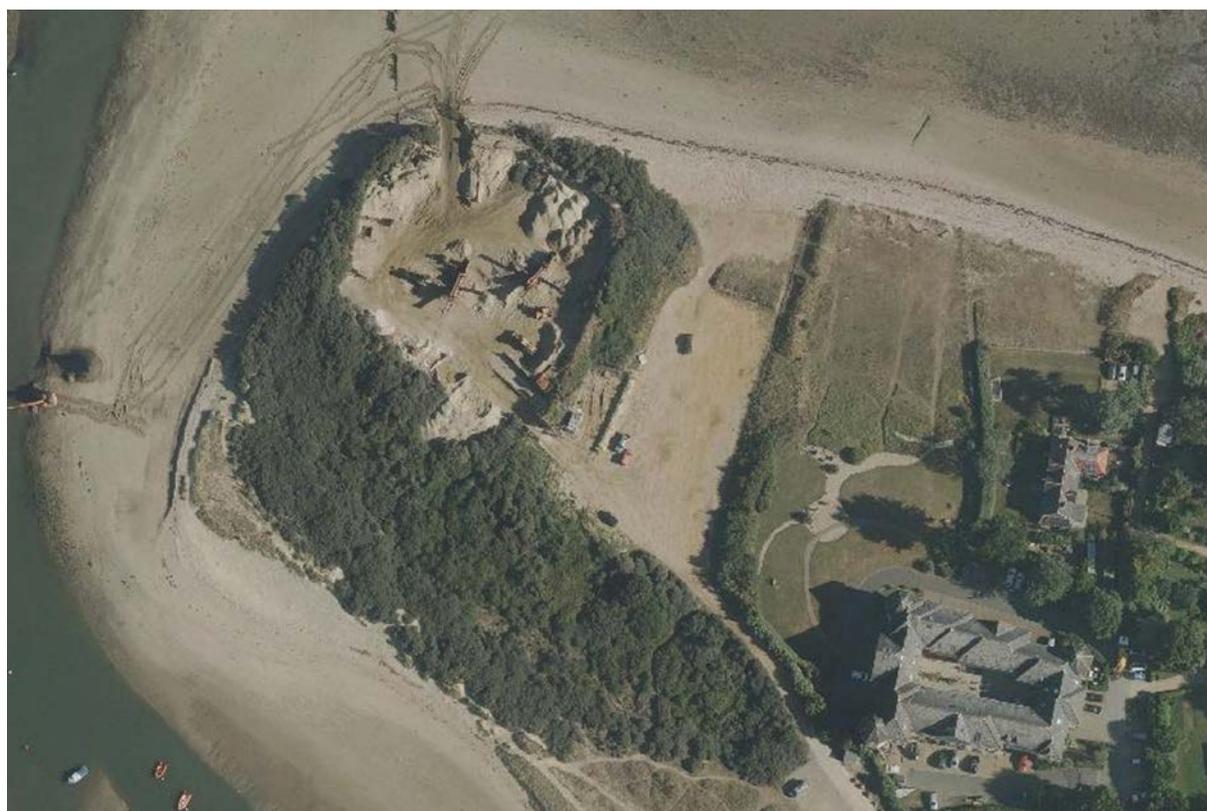


FIGURE 9: AERIAL PHOTOGRAPH FROM 2016 OF THE AREA OF BEMBRIDGE SEAPLANE STATION (CCO)

3.1.4 Discussion and Future Work

Although few physical remains are extant at the Bembridge Station site, there is further potential for examination on site to determine whether the concrete bases of buildings are still extant. Further work should include the recording the relocated seaplane hangar which is situated at Shanklin. This would help determine which type of hangar it represents and whether there are any other surviving examples of this type.

3.2 CALSHOT

3.2.1 Site History

Positioned at the end of Calshot Spit in Southampton Water, Calshot Naval Air Station opened on 29 March 1913 as a flying boat station for testing seaplanes. It was one of the first naval air stations in the country. Three of its hangars remain in use today (The Transport Trust 2017). The First Lord of the Admiralty, Winston Churchill took his first seaplane flight from Calshot in August 1913.

Calshot undertook the usual war service of anti-submarine warfare, coastal defence and convoy protection duties but was principally an experimental (aircraft and armaments) and training unit. In this role the first air-dropping of a torpedo was carried out at Calshot by Squadron Commander A.M. Longmore just before the war broke out (Delve 2005: 51).

During the war Calshot continued in its role as a site for training new pilots, but also began to support experimental techniques to spot U-boats, drop bombs, fire guns and take aerial photographs. In 1915, active patrols for the year totalled 3,400 flying hours. From the end of 1916, with the increase in German submarine activity, regular anti-submarine patrols were flown out of Calshot. By 1918, 42 U-Boats had been spotted by the Calshot Patrols and they claimed to have sunk three (source: Information panels at Calshot). On 22 September 1917, a Seaplane, built by J Samuel White on the Isle of Wight, attacked and may have sunk a submarine when Sub-Lieutenant Mossop bombed the German U-boat UB-32; an action for which he was awarded the Distinguished Service Cross.

Three hangars were erected in the pre-war period and could house 12 aircraft (Delve 2005: 51). Of those only one, the Grade II* listed Sopwith Hangar still exists. Positioned approximately 250 metres west of Calshot Castle it is a timber framed structure of 720 square metres with corrugated iron cladding, built in 1913 or possibly earlier and is the earliest known – and only remaining – example of a Belfast truss Canoe Hangar, and has an 80ft span rather than later 100ft span (Historic England 2017a). It was probably constructed for use by Sopwith Bat Boats which were stationed at Calshot from 1913 (Historic England 2017b). Accommodation was originally made available in Coastguard cottages on the Spit and across the estuary in Warsash (Moore 1988: 94). Figure 10 is of unknown date, but shows the hangars at the station along with the tracks and slips for the planes. Calshot Pier and a close up of the seaplane slip rails are shown in Figure 11 which dates from 1918.

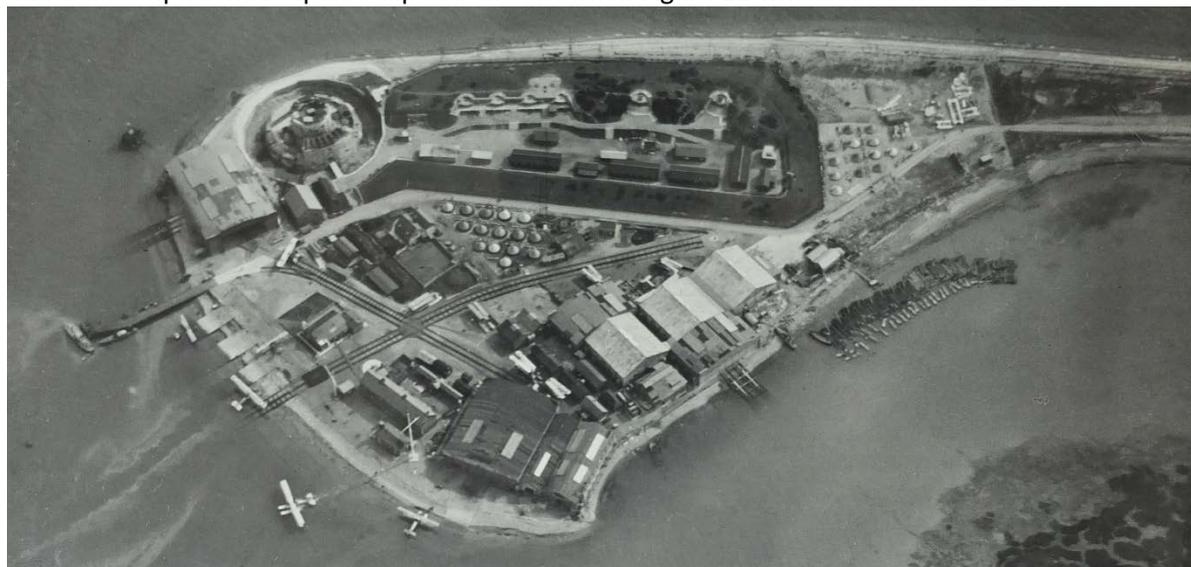


FIGURE 10: AERIAL VIEW OF CALSHOT SPIT DURING THE FIRST WORLD WAR (COURTESY OF THE NATIONAL MUSEUM OF THE ROYAL NAVY: A/STN 979).



FIGURE 11: CALSHOT PIER IN 1918, WITH SEAPLANE SLIP RAILS IN THE FOREGROUND (COURTESY OF THE NATIONAL MUSEUM OF THE ROYAL NAVY)

A major expansion at Calshot took place in 1917 when new buildings, offices and workshops were constructed by the Henry Boot Company (The Transport Trust).

Most notable from that expansion include two aircraft hangars still in existence:

- The construction of a large (5,704 square metres) steel-framed flying boat hangar immediately south of Calshot Castle. Completed in 1918 and still in use today it comprises three F-type hangars and is the largest hangar built for fixed wing aircraft in Britain during the First World War. Now known as the Sunderland Hangar it is a Grade II* listed building (Historic England 2017c).
- Completed in 1917 a K+ type steel-framed flying boat hangar, now known the Schneider Hangar. Approximately 130 metres south-west of Calshot Castle it is also a Grade II* listed building (Historic England 2017).

There were also new slipways for the aircraft installed.

As part of this expansion new accommodation blocks were built on the mainland south west of the station and known as Eaglehurst Camp (The Real New Forest Guide 2017). There is some confusion in the records and sources over a railway/tramway connecting Eaglehurst Camp with the hangars and technical buildings on Calshot Spit: Heritage England records that a narrow-gauge railway was run to aid expansion and movement of personnel for 1917 (Historic England Listing 2017), however the October 1918 RAF Quarterly Airfield Survey stated that the tramway ran only from the railway station to the regimental buildings despite the accompanying plans showing an apparently well-developed line running from Eaglehurst Camp to the Spit, and no railway line running out from any part of the seaplane station (TNA Air1/ 452/15/ 312/26 vol V). The full line was not operational until 1919 (Mitchell et al 2004).



FIGURE 12:- CALSHOT SPIT FROM THE AIR, SUNDERLAND HANGAR UNDER CONSTRUCTION 1917 (SOURCE: IMPERIAL WAR MUSEUM: [HTTPS://WWW.IWM.ORG.UK/COLLECTIONS/ITEM/OBJECT/205358555](https://www.iwm.org.uk/collections/item/object/205358555)).



FIGURE 13 : EAGLEHURST CAMP, 1917. TOP RIGHT ARE THE SERGEANTS' MESS AND AIRMENS' MESS UNDER CONSTRUCTION (SOURCE: IMPERIAL WAR MUSEUM: [HTTPS://WWW.IWM.ORG.UK/COLLECTIONS/ITEM/OBJECT/205358561](https://www.iwm.org.uk/collections/item/object/205358561)).

Calshot was a busy station and a centre of command for seaplane defence. Sub-stations for Calshot at Bembridge and Portland were established becoming "Portsmouth Group" on 1 January 1917 with Cherbourg, Newhaven and Polegate (an airship station) joining the group in the early summer (Delve 2005: 51-52).

After creation of the RAF, Portsmouth Group became part of 10 Group and Calshot's aircraft were reorganised into two flying boat flights – 345 and 346 - and one seaplane flight - 410. In 1918 Calshot became the School for Naval Co-Operation and Aerial Navigation, training in sea rescue and recovery, and the headquarters of 74th Wing (Delve 2005: 51-52).

A variety of aircraft types operated out of Calshot throughout the war: Sopwith Bat Boats, Wright Seaplanes, Short 184 and 320, Curtiss H12/12B Large America, the Felixstowe F.2a, Fairey Campanias and Fairey III d & III f (Delve 2005: 53).

3.2.2 Summary of Structures

The RAF's Quarterly Airfield Survey of Autumn 1918 (TNA Air1/ 452/15/ 312/26 vol V) states that by this time the site had grown to 80 acres with an establishment of 246 personnel supporting 12 float seaplanes and six Felixtowe F2a flying boats. The estimated date for completion of the whole Station was given as 31 March 1919.



FIGURE 14: AERIAL VIEW FROM THE NORTHWEST SHOWING ALL FOUR AIRCRAFT HANGARS AND OTHER ORIGINAL STRUCTURES. DATE UNCERTAIN THOUGH DURING 1930s. (SOURCE HAMPSHIRE AIR FIELDS 2017).

TABLE 3.3: REFERENCE TABLE TO NUMBERED STRUCTURES IN FIGURE 15, AND SUMMARY OF THE BUILDINGS AND STRUCTURES PRESENT AT THE SITE

Key to numbered structures in Figure 15 - Map showing RAF Calshot (dashed outline), 31 October 1918.	Map reference
5x seaplane sheds	1
Officers' Mess	3
Regimental Institute	4
Women's Hostel	6
Technical buildings	Regimental buildings
5x Seaplane Sheds <ul style="list-style-type: none"> • 1x 104'x90' • 1x 140'x91' • 1x 160'x95' • 1x 180'x60' • 1x 600'x100' 	Commanding Officer's House
6 Slipways	Officers' Mess
2x Motor Transport Sheds	13x Officers' Quarters
Turntable and Compass Base	Officers' Baths and Latrines
Workshops <ul style="list-style-type: none"> • 2x Engineers', 70'x66' & 90'x50' • 2x Carpenters', 70'x66' & 90'x50' • 1x Dope, 70'x60' • 2x Smiths', 40'x12' 	Sergeants' Mess
Technical Stores	Officer's Servants' Mess

General Store	Regimental Institute
Propellor Store	Recreation Room
2x Oil Stores	Regimental Store
3x Petrol Stores	28x Men's Huts
General Lecture Hut	Men's Baths
Photographic Dark Room at Calshot Castle	Men's Latrines and Ablution
Offices	Sick Bay
2x Power Houses	Drying Room
Latrines	Coal Yard
Guard House	Drill Shed
Machine Gun Range	Women's Hostel
Magazine	Women's Rest Room
Detonator Store	Church
Meteorological Hut	YMCA Hut
Pigeon Loft	Lecture Room
Pump House	Post Office
Septic Tank	Tramway Store
Winch Houses	
Wireless mast and Wireless Telegraphy Hut	



FIGURE 15: MAP SHOWING RAF CALSHOT (DASHED OUTLINE), 31 OCTOBER 1918

3.2.3 Decommissioning

The Calshot Station remained operational until 1 April 1961 in a variety of training, maintenance and modification roles (Delve 2005: 52). Calshot was also the venue for the 1929 and 1931 Schneider Trophy races (Historic England 2017a), a race for seaplanes and flying boats that took place at various international locations between 1913 and 1931.

As already discussed, three of the First World War aircraft hangars survive:

- Sopwith Hangar (Belfast truss Canoe design);
- Schneider Hangar (K+ design); and
- Sunderland Hangar (F-type design).

All three hangars are listed and described as the most outstanding group of early aircraft structures of this type in the British Isles, demonstrating the great advances made in aircraft technology during 1914 – 18 (Historic England 2017a). They are currently part of an indoor and outdoor activities centre run by Hampshire County Council (Hantsweb 2017). Parts of the slipways remain, however, the pre-1917 development on the western side of the Spit appears lost.

The Old Coastguard Tower built in 1973 immediately north of the Castle exists on the site of an original hangar. Western parts of Eaglehurst Camp are now the site of the village of Calshot, however, parts of the Eaglehurst site appear undeveloped, though permission for a cemetery on the site was granted in December 2017 (<http://www.newforest.gov.uk/calshot>). The Warsash Maritime Academy and some residential homes now occupy part of the site where the station accommodation at Warsash once was.



FIGURE 16: AERIAL VIEW OF CALSHOT SPIT, INCLUDING THE AREA WHERE EAGLEHURST CAMP WAS SITUATED (PHOTOGRAPH CHANNEL COASTAL OBSERVATORY).

3.2.4 Fieldwork Results

The aim of the fieldwork at Calshot was to record surviving First World War features noting their extent and current state of preservation. Fieldwork was undertaken during October 2014 and January 2017. Details of the listed hangar structures are already available from written sources, so these were visited to gather basic details of their construction through photography to aid research and interpretation of other seaplane stations. Recording work at the site then focused on smaller features

including traces of jetties and slipways and a walkover survey of the route of the light railway along the spit. Features were photographed and a position obtained via GPS. Figure 17 shows the location of features identified and recorded during the 2014 survey and includes the route of the light railway shown in yellow. The 2017 survey, assisted by local historian Colin Van Geffen recorded further First World War features.



FIGURE 17: FIRST WORLD WAR SITES AND FEATURES ON CALSHOT SPIT (PHOTOGRAPH CHANNEL COASTAL OBSERVATORY)

3.2.4.1 *Sunderland Hangar*

Sunderland Hangar is the largest of the three surviving seaplane hangars and was built in 1918 as an 'F' type hangar (Figures 18 and 19). The hangar covers an area of approximately 5,704 square metres and is made from a steel frame with corrugated metal cladding, much of the external elements have been replaced over the years but the steel lattice girders on the inside are thought to be original, along with some of the lights. Sunderland Hangar is the largest hangar built in Britain during the First World War for fixed-wing aircraft. During the survey several original features were noted, these include the interior steel work, lights, and door sliding mechanism (Pastscape, 2013, ref 1328249).



FIGURE 18: SUNDERLAND HANGAR IS NOW USED AS THE CALSHOT ACTIVITIES CENTRE. RIGHT: PLAQUES ON THE OUTSIDE ARE A REMINDER OF THE BUILDINGS ORIGINS.



FIGURE 19: INTERNAL FEATURES OF THE SUNDERLAND HANGAR. TOP LEFT: LIGHTS. TOP RIGHT: SLIDING DOOR MECHANISM. BOTTOM: STEEL CEILING.

3.2.4.2 Schneider Hangar

The Schneider Hangar was built in 1917 and is a 'G' type hangar covering an area of approximately 972 square metres (Figures 20 and 21). This hangar has a steel frame with metal cladding and a gabled roof. The sliding doors are still used today (Pastscape, 2013, ref 1328497).



FIGURE 20: THE SCHNEIDER HANGAR AND A PLAQUE LOCATED ON THE OUTSIDE OF THE BUILDING.



FIGURE 21: INSIDE THE SCHNEIDER HANGAR. RIGHT: THE SLIDING DOORS USED TO ALLOW ACCESS TO THE FIXED-WING AIRCRAFT.

3.2.4.3 Sopwith Hangar

Sopwith Hangar is the oldest of the three surviving flying boat hangars at Calshot (Figure 22). Built in 1913 this hangar is timber-framed with metal cladding and a pitched roof. It is the smallest of the three hangars at approximately 720 square metres. Original elements which survive include the timber framing, sliding doors (although not still functioning), unique wooden 'roll-up' slat doors, the wooden floor and wooden lattice braced roof trusses. It is a unique hangar and is the earliest known example of its type. It was thought to have been built to house the Sopwith Bat Boat used from 1913 in Calshot (Pastscape, 2013, ref 1328240).

At the time of the survey much of the inside contained scaffolding due to work to replace the roof windows after damage, possibly from the winter storms.

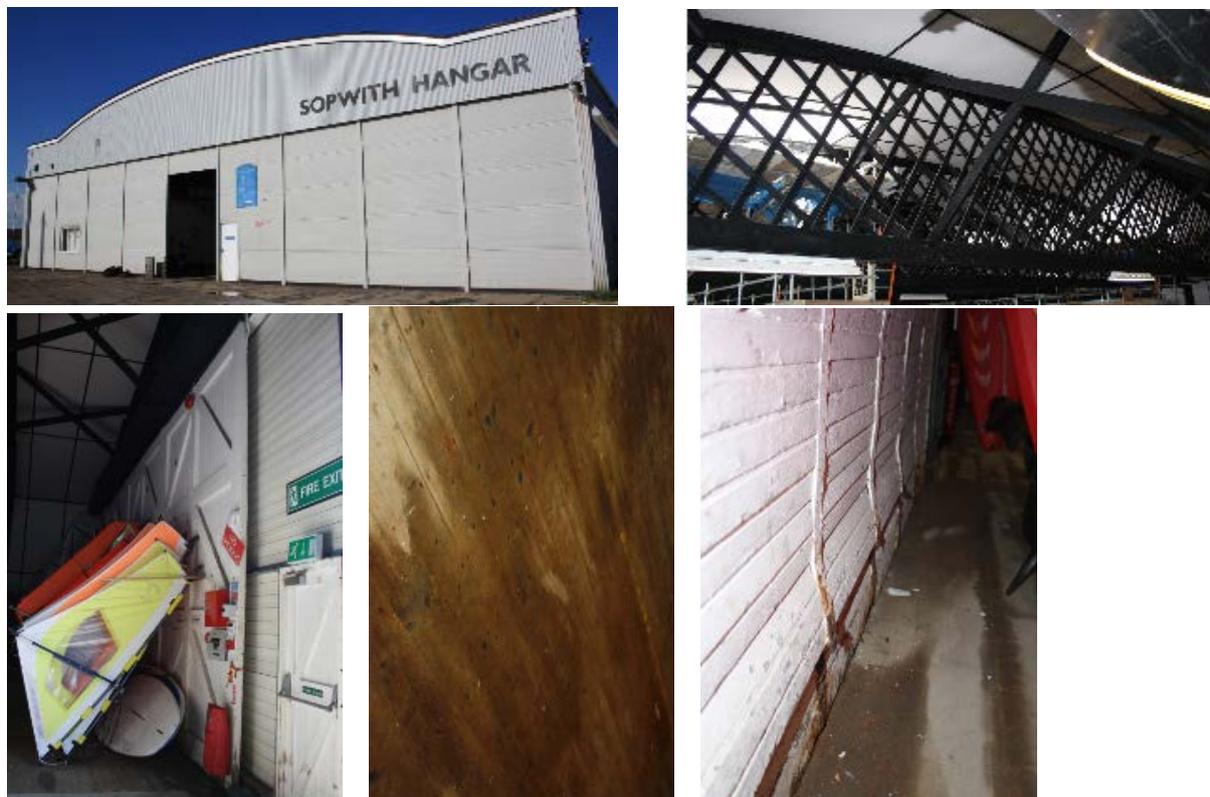


FIGURE 22: TOP LEFT: SOPWITH HANGAR. TOP RIGHT: SURVIVING TIMBER ELEMENTS. BOTTOM LEFT: SLIDING DOORS. CENTRE: WOODEN FLOOR. BOTTOM RIGHT: WOODEN SLAT DOORS.

3.2.4.4 Slipways and Seaplane Rails

As Calshot grew in importance several buildings and workshops were constructed including the hangars described above, slipways were also built for the seaplanes, and although heavily modified they still remain in use today (Figure 23). Remains of seaplane rails are also present (Figures 24 and 25), these can be seen on the aerial photographs taken during the war on the Northern edge of the spit.



FIGURE 23: THE SLIPWAY ON THE NORTHERN EDGE OF CALSHOT SPIT.



FIGURE 24: THE REMAINS OF SEAPLANE RAILS



FIGURE 25: REMAINS OF SEAPLANE RAILS AT THE WATERS EDGE



FIGURE 26: SEAPLANE TETHERING HOOKS ARE VISIBLE AROUND THE END OF THE SPIT

3.2.4.5 *Stainforth Cottage*

This grade II listed building on Calshot Spit was built as a Coastguard building but was converted to military use after 1913 – serving as a first aid building amongst other functions (Figure 27).



FIGURE 27: STAINFORTH COTTAGE, CALSHOT SPIT

3.2.4.6 *Marconi Wireless Hut*

Marconi lived at Eaglehurst House between 1911 and 1916 and used the top of the tower for his transmissions. A small brick building on the beach behind the Sopwith Hangar is also said to have been used by Marconi during his testing of early wireless telegraphs. It's location here no doubt led Marconi to develop wireless telegraphy to aircraft.



FIGURE 28: THE MARCONI HUT (PHOTO: CHANNEL COASTAL OBSERVATORY, OPEN GOVERNMENT LICENCE V2)

3.2.4.7 Degaussing Station

Along the spit, this fenced off area was the site of the degaussing station where planes would come in and make contact to de-magnetise them to protect them from magnetic mines (Figure 29).



FIGURE 29: SEAPLANE DEGAUSSING STATION

3.2.4.8 Light Railway

Eaglehurst Camp was constructed to accommodate personnel from Calshot Spit during the First World War. In order to transport food and later personnel a narrow gauge railway, known as “The Calshot Express” was constructed in 1919 and remained in use until 1945 (Figure 30). The modern road was built over the length of the railway. A walkover survey along the old route of the railway aimed to record any potential surviving features. With many modifications after the First World War it is not possible at this stage to determine whether these features are related. Feature locations were recorded with the handheld GPS (Figure 31 includes examples of features).



FIGURE 30: (LEFT) THE CALSHOT EXPRESS MARTIN FULLER [HTTP://WWW.HAMPSHIREAIRFIELDS.CO.UK/AIRFIELDS/CAL.HTML#](http://www.hampshireairfields.co.uk/airfields/cal.html#); RIGHT THE SAME ENGINE – NO 6 DOUGLAS IN RAF LIVERY FOR ITS 100TH BIRTHDAY IN FEBRUARY 2018 - IN PRESERVATION AT TALLYLYN BARBARA FULLER



FIGURE 31: FEATURES NOTED ALONG THE COURSE OF THE OLD RAILWAY INCLUDE CONCRETE BLOCK AND POTENTIAL BUILDING OUTLINES.

One section of railway track does remain however, opposite the Sunderland Hangar (Figure 32).



FIGURE 32: SECTION OF THE LIGHT RAILWAY TRACK STILL IN-SITU OPPOSITE THE SUNDERLAND HANGAR

3.2.4.9 NAAFI Hut

Situated along the route of the light railway are a series of beach huts. Hut number 16 (Figure 33) is reputed to have been the NAAFI hut, a place where airmen could stop en-route between the camp and the airbase and buy cigarettes and refreshments. Although it has undergone a lot of renovation over the years, it remains perpendicular to the other huts and retains a serving hatch opening at the rear.



FIGURE 33: HUT NUMBER 16, REPUTED TO HAVE BEEN THE NAAFI HUT

3.2.4.10 Pilot Lodgings

A house called Pilots which stands on Jack Maynard Road leading out of Calshot was one of the places where pilots lodged (Figure 34).



FIGURE 34: 'PILOTS' ONE OF THE HOUSES ON JACK MAYNARD ROAD WHERE PILOTS LODGED.

3.2.4.11 *St George's Chapel*

St Georges Chapel in Tristan Close claims to be the oldest RAF church, having held its first service in June 1919. The building was part of the First World War military base and remains in use as a community centre. The cemetery which was recently granted approval on this site will retain the chapel.



FIGURE 35: ST GEORGE'S CHAPEL, TRISTAN CLOSE – PART OF THE MILITARY CAMP.

3.2.5 Discussion and Future Work

Calshot was clearly an important site during the First World War, it was located in a strategically important area at the entrance to Southampton Water and played a crucial role in defending the coast, training pilots and facilitating the experimentation of new techniques to spot U-Boats.

The importance of the site during the First World War is reflected by the numerous buildings that were constructed during this period, those that survive today have been listed and are being used by the activity centre.

There is further potential survey work to be done at Calshot which could include:

- Recording the First World War gun which was installed on the roof of Calshot Castle;
- Recording elements of Eaglehurst Camp that may survive; and
- Further review of historic photograph collections to identify those showing the station during the First World War.

3.3 CATTEWATER

3.3.1 Site History

Although a basic flying boat station was established in 1913 for seaplane and flying boat trials it was not until February 1917 that the Cattewater site came under Royal Navy ownership and a naval air station was formally established (Delve 2006: 170/174). Sited on a peninsular projecting into Plymouth Harbour (Figure 36), mooring facilities were good and well protected by the existing breakwater (TNA Air1/ 452/15/ 312/26 vol V).

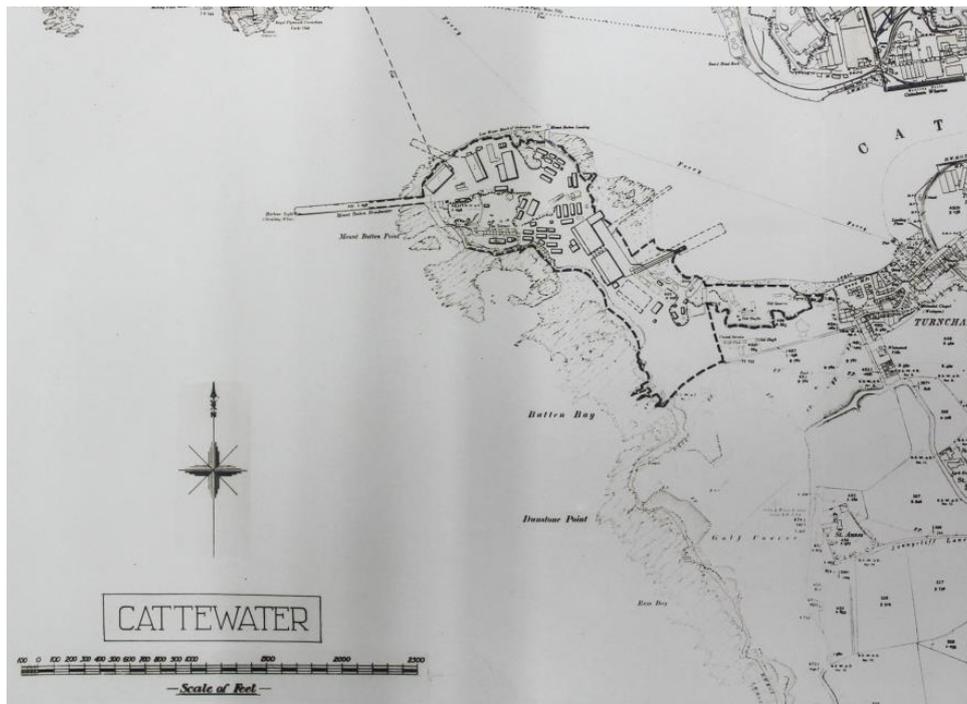


FIGURE 36: MAP SHOWING RAF CATTEWATER (DASHED OUTLINE), 31 OCTOBER 1918 (PHOTOGRAPH OF TNA DOCUMENT).

Four seaplane hangars were erected (Figure 37) as well as the usual workshops and slipways. Accommodation for officers was provided in coastguard cottages and huts on the station site were constructed for the men (Van Der Kiste 2014: 34-35). 14 Short 184s were based at Cattewater in 1917, along with nine Sopwith Hamble Babys and two Curtis Large America flying boats (Delve 2006: 170/174). Felixstowe F5s were also used (Lewis 1968: 83). As well as the slipways that were built, the breakwater was also used as a pier: a steam crane on a rail track was used to hoist aircraft into and out of the water (Figure 38).

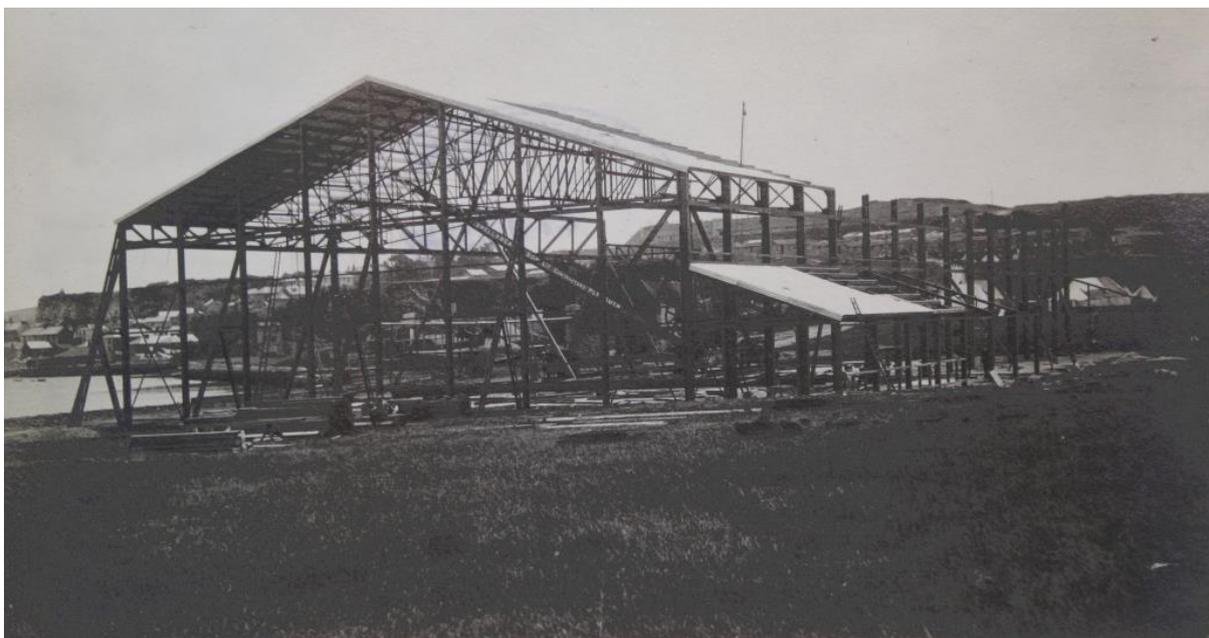


FIGURE 37: THE LARGE F-TYPE HANGARS UNDER CONSTRUCTION, 1917 (THE NATIONAL ARCHIVES: AIR 58/9, ADMIRALTY DIRECTOR OF WORKS 41).

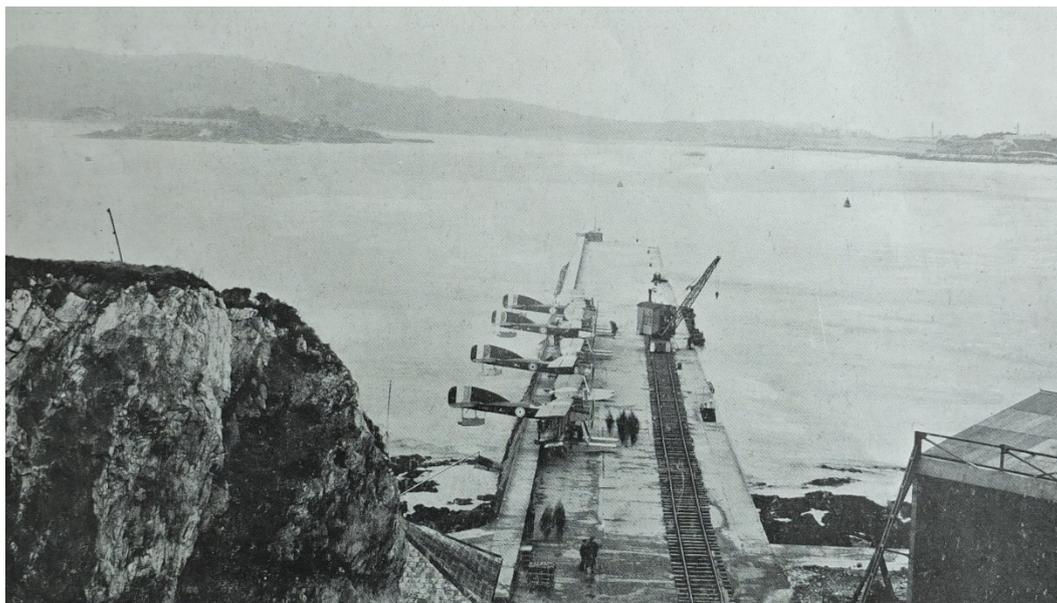


FIGURE 38: SHORT SEAPLANES READY FOR PATROL ON MOUNT BATTEN BREAKWATER (COURTESY OF THE NATIONAL MUSEUM OF THE ROYAL NAVY)

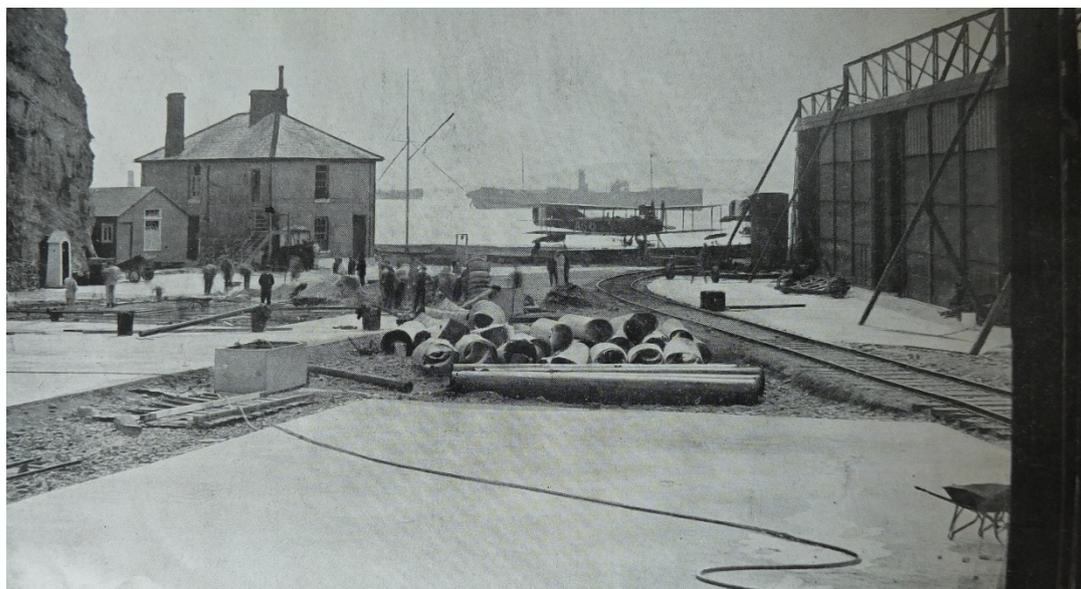


FIGURE 39: VIEW ACROSS THE PARADE GROUND WITH HANGAR (RIGHT) AND SEAPLANE (COURTESY OF THE NATIONAL MUSEUM OF THE ROYAL NAVY)

Upon the formation of the RAF in April 1918 development work was undertaken across the site. Consideration also appears to have been given to building an additional F-type hangar (TNA, AIR1/453/15/312/ 26 Volume 5 Quarterly Survey of RAF Stations, Autumn 1918). The RAF created several seaplane and floatplane formations: 347 and 348 (Flying Boat) Flights were created as part of 238 Squadron in June and July respectively and 349 (Flying Boat) Flight formed as part of 237 Squadron in October (Delve 2006: 174).

3.3.1.1 Summary of Structures

The RAF's Quarterly Airfield Survey of Autumn 1918 states that 583 personnel and 33 aircraft were based at the 30 acre site. Similar to other seaplane stations, it was not fully completed - as of 1 September 1918 the station was not complete, though all works were expected to be completed by 30th November.

TABLE 5: BUILDINGS AND STRUCTURES AT CATTEWATER, OCTOBER 1918 (TNA AIR1/452/15/312/26 VOL V)

Technical buildings	Regimental buildings
4x Seaplane Sheds <ul style="list-style-type: none"> • 2x 200'x100' • 2x 180'x60' 	Officers' Mess
3 Slipways	5x Officers' Quarters
2x Motor Transport Sheds	Officers' Baths
Workshops <ul style="list-style-type: none"> • Engineers', 123'x20' (in annex) • Carpenters, 80'x33' • Dope, 40'x20' (in annex) • Smiths' Shop 	Officers' Latrines
4x General Stores	Sergeants' Mess (used as Women's Quarters)
3x Oil Stores	Sergeants' Latrines
Petrol Store	Sergeants' Baths
Propellor Store	Regimental Institute
Canvas Store	Regimental Store
Engine Store	6x Men's Huts
Rope Store	Men's Baths
Photographic Hut	Men's Latrines and Ablution
Wireless Station	Sick Bay
Offices	Drying Room
Sick Bay Office	Coal Yard
Telephone Exchange Hut	Meat Store
Power House	
Latrines	<i>Other ranks are also accommodated in 9 cottages at Cattewater and 12 huts and Batten Camp adjoining the station.</i>
Guard House	
Armoury	
Bomb Store	
Detonator Store	
Pigeon Loft	
Pier (with Launching Crane)	

3.3.1.2 Decommissioning

237 Squadron was disbanded on 15th May 1919 and 238 Squadron on 20 March 1922 (Delve 2006: 174). The station was placed in reserve in April 1922 but became operational again on 1 October 1928 as RAF Mount Batten. The site was finally closed on 5 July 1992 (Forces War Records 2017) and transferred to the Plymouth Development Corporation in 1993 to be regenerated (Hansard 25 March 1993).

The continuous use of the site between 1928 and 1992, especially during the Second World War when it was bombed, means that the site will have changed significantly over time. However, several First World War structures remain: built in 1917 two F-type hangars with adjoining workshops, offices, lean-tos and a winch house were listed in 2003 and represent "an important survival of early aviation structures" (Historic England 2017d). The northernmost of those hangars was seriously damaged by a German air raid on 27 November 1940 but has since been repaired (Delve 2006: 172). The breakwater also remains, as do parts of slipways.

Mount Batten is now home to a mixture of tourist and leisure businesses including an activities and watersports centre. The two F-type hangars are now used for boat building and other maritime uses.



FIGURE 40: THOSE HANGERS TODAY, SHOWING SINGLE-STOREY OFFICES TO THE REAR. RICHARD DREW, 20TH NOVEMBER 2014 (ATLANTIKWALL 2017)

3.3.2 Discussion and Future Work

There is potential for further archaeological recording of the site which would benefit from a visual survey aided by the historic photographs and site plans to locate features. The breakwater and slipways would benefit from survey, particularly to identify any extant features specifically related to the operation of the seaplanes.

3.4 DOVER (MARINE PARADE)

3.4.1 Site History

Marine Parade was selected as a seaplane station during 1913, but it wasn't fully established until after a U-boat sank the gunboat *Niger* off Deal Pier on the 11 November 1914 (Philpott 2013: 245). On the 18 November 1914 two Wright navy floatplanes were dispatched to Dover for U-boat patrols and the ice-skating rink on Marine Parade was requisitioned as an aircraft shed. A slipway was constructed to allow the floatplanes to be moved from the sea to the road and vice versa (Philpott 2013: 254).



FIGURE 41 - MAP SHOWING RAF DOVER MARINE PARADE (DASHED OUTLINE) 1918



FIGURE 42: THE SKATING RINK C.1900 BEFORE ITS REQUISITION FOR THE SEAPLANE STATION.

The seaplane station was nestled below Dover Castle between the cliffs and the sea, with a road in between. Whilst accessible it was a cramped set up. Aircraft were able to take off and land in the shelter of Dover Harbour but did have to be manhandled across the road between hangars and shore (TNA Air1/ 452/15/ 312/26 vol V). Despite the addition of Short 184s to its strength in May 1915, in August operational work was transferred to Dunkirk and Dover Marine Parade became a training station and repair depot. Two new seaplane sheds and another slipway were built for this purpose (Philpott 2013: 245).

After the RAF take-over in April 1918 Dover Marine Parade became an operational station once more. As well as U-boat patrols its seaplanes also took part in the 22 – 23 April 1918 Zeebrugge raid by creating a diversion to cover the approach of the attacking naval force (Philpott 2013: 245).

The Short 184s based at Dover became part of 5 Group in April and 407 Flight in May (Delve 2005: 254). It was not until September that 407 Flight joined 233 Squadron (Philpott 2013: 245 & Delve 2005: 254). The station operated as part of the Dover Patrol (TNA Air1/ 452/15/ 312/26 vol V).

3.4.1.1 Summary of Structures

The RAF's Quarterly Airfield Survey of October 1918 states that the two acre site had an establishment of 62 personnel and six seaplanes and that all buildings were completed (Table 3.5). A detailed plan of the Station was drawn up to show planned modifications (Figure 43).

TABLE 3.4: BUILDINGS AND STRUCTURES AT DOVER MARINE PARADE, OCTOBER 1918 ((TNA AIR1/452/15/312/26 VOL V).

Technical buildings	Regimental buildings
3x Seaplane Sheds <ul style="list-style-type: none"> • 2x100'x90' • 1x146'x74' 	Regimental Accommodation is in hired buildings however there is also: Officers' Latrines, Regimental Store, Men's Mess Room, Men's Latrines, Sick Bay, Coal Yard and Water Tank.
2 Slipways	
Motor Transport Shed	
Turntable and Compass Base	
Workshops <ul style="list-style-type: none"> • Engineers', 50'x30' • Carpenters', 50'x30' • Fabric Shop, 50'x25' • Smiths' Shop 	
4x Technical Stores	
Carpenters' Float Store	
Timber Store	
Electric Stores	
Oil Store	
Petrol Store	
3x Heating Chambers	
Wireless Telegraphy Hut	
Offices	
Winch House	
Latrines	
Guard House	
Armoury	
Machine Gun Range	
Ammunition Store	

3.4.1.2 Decommissioning

As with many other seaplane formations 233 Squadron was disbanded on 15 May 1919 (Lewis 1968: 82). The site was de-requisitioned in 1920 (Philpott 2013: 245), however, Dover Harbour remained on the RAF's list of "alighting areas" into the 1930s (Delve 2005: 254).

There appear to be few remains of the seaplane station at Dover. Hangars have been demolished and the dual-carriageway A20 runs through the site of the skating rink. The sites of the other two hangars appear largely undeveloped.

Tantalisingly, Figure 44, below shows several red brick buildings behind the main road, on the line inland from the stone beach defences. They may be part of the station quarters and an office. Caves in the cliffs behind the Station were also used and may still be accessible.

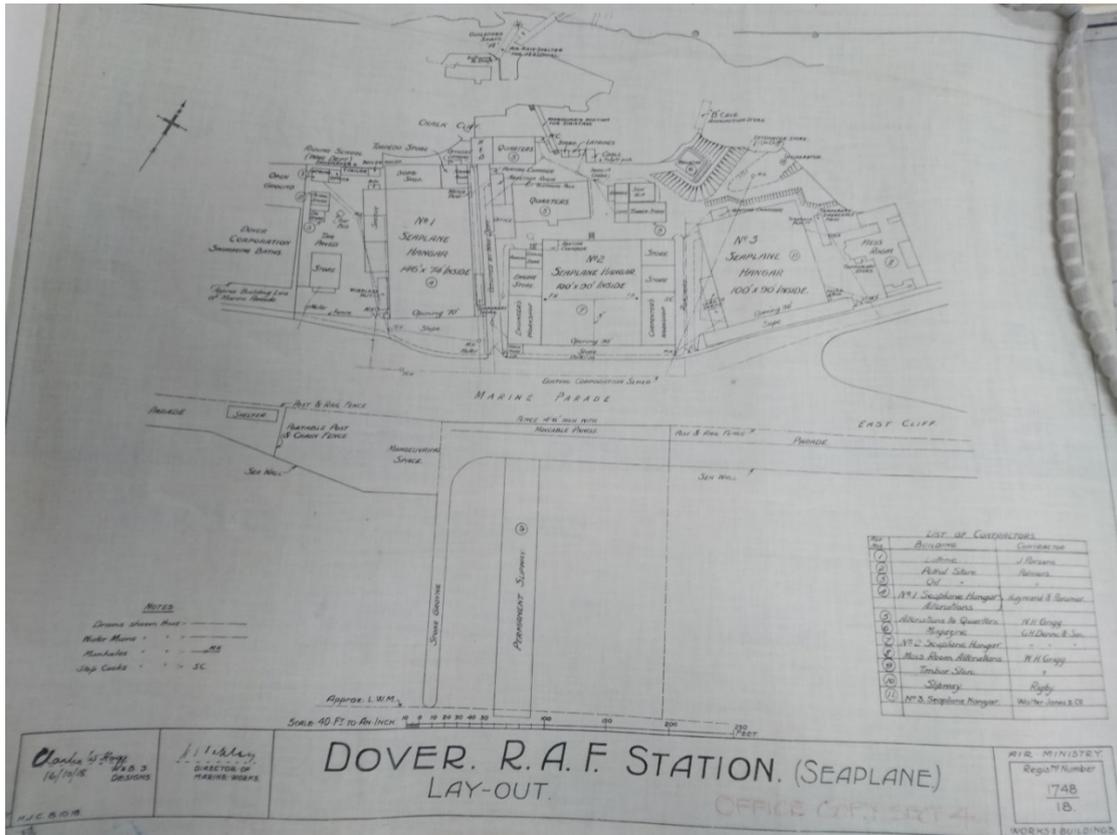


FIGURE 43: DOVER (MARINE PARADE) RAF STATION LAY-OUT SHOWING ADDITIONAL DETAIL, 16TH OCTOBER 1918 (TNA).



FIGURE 44:- THE SITE OF THE DOVER MARINE PARADE SEAPLANE STATION – BEARINGS CAN BE FOUND FROM THE SEMI-CIRCULAR STRUCTURE IN THE UPPER LEFT OF THE IMAGE, ALSO PRESENT IN THE RAF 1918 SURVEY PLAN. YELLOW CIRCLE SHOWS POSSIBLE STATION BUILDING REMAINS (CHANNEL COASTAL OBSERVATORY).

3.4.2 Discussion and Future Work

There is further investigation required to determine whether the red brick buildings visible in photographs (Figure 44) were part of the Station. There is also potential to visit the sites where the hangars were once situated to survey whether any archaeological traces of them survive.

3.5 HAMBLE

Although not formally a Royal Navy site, Hamble Point has been included within this study as it was used extensively for the development and testing of seaplane designs. The Admiralty did construct a depot at the site, but it was not completed before the end of the war and was then demolished.

3.5.1 Site History

Prior to its use as a base for seaplane building and testing Hamble Point had been used for a range of activities which included salt production with associated saltern structures, 19th century lobster fishing trade which included the construction of a pond (clearly visible on Ordnance Survey maps of 1897 onwards, and in the 1880s for Shipbuilding by Luke and Co (Underdown 2009). There was also a sailing club situated on the Point from 1889 until the start of the First World War (Underdown, 2009) (the boathouse is visible in Figure 47 – the 1909 OS map).

Luke and Co. briefly tried their hand at seaplane construction (Murphy, 2009, 70) in 1912 (www.hampshireairfields.co.uk, n.d.), but the venture saw little success and they quickly gave way to other aviation companies at Hamble Point, which made much more of an impact through infrastructure construction.

The two slipways that were surveyed are likely to be those constructed by the Daily Mail in 1912, just prior to the First World War. These were accompanied by a flying shed (all of which are visible on the 1932 OS map; Figure 47) and were used during the round-Britain tour by a Farman plane that the newspaper sponsored (Murphy, 2009, 70).

After this, Hamble Point was turned over to the Avro and Fairey aviation companies that established bases here during the First World War (Underdown, 2009). Fairey were the more active of the two during the war, and from 1915 the newly founded company (Poulsen, 1941, 152) were using the site to test and construct their planes (Murphy, 2009, 70). In 1916, their workshops were mostly tasked with manufacturing the wings and floats and for experimental work (Poulsen, 1941, 153).

Also in 1916, the company was commissioned by the Admiralty to build a seaplane larger than their Hamble Baby plane, so they designed and tested the Campania; many of these planes were built and used during the First World War (Poulsen, 1941, 154).

The second aviation company, Avro, appeared in 1916, when they bought land to build the Hamble (south) airfield, and a factory from where they developed aircraft over the next 15 years (www.hampshireairfields.co.uk, n.d.).

In 1917, the Admiralty, wanting to expand their seaplane operations, built the No. 1 (southern) Marine Acceptance Depot on the Point, but the war finished before the facility was used, so it was demolished in 1919 (www.hampshireairfields.co.uk, n.d.).

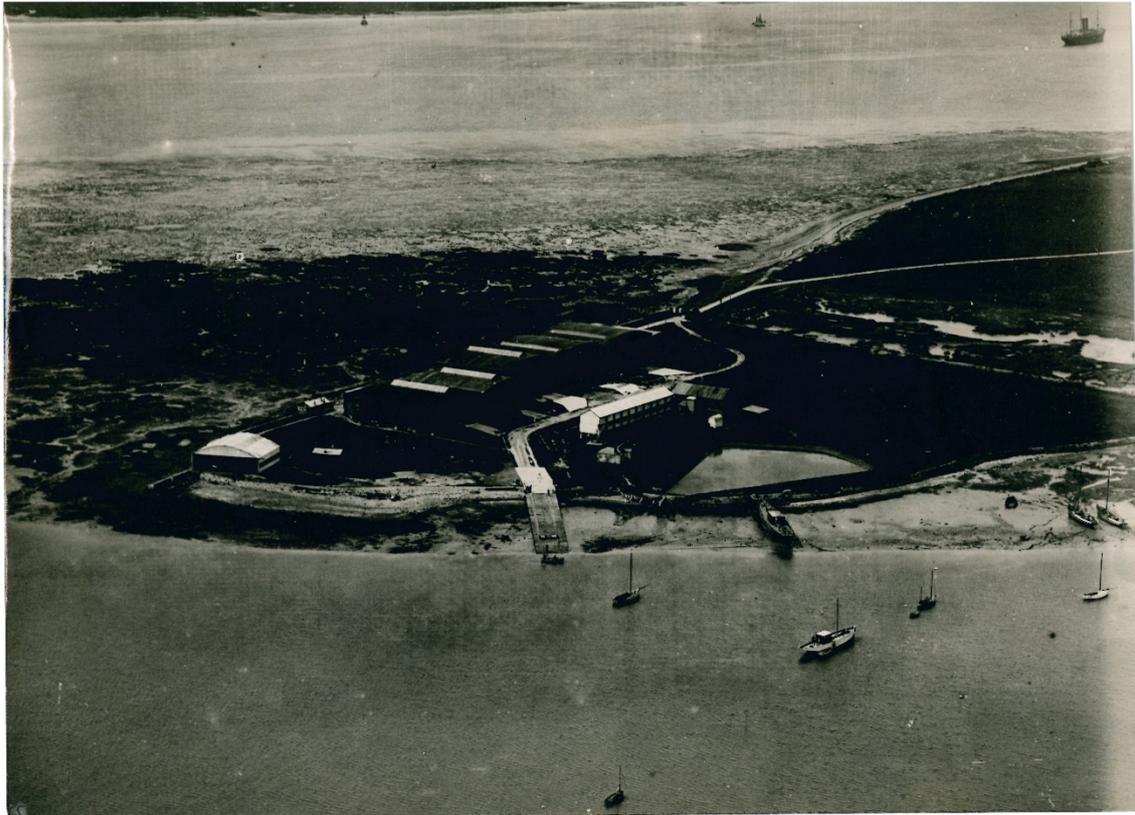


FIGURE 45: AERIAL PHOTOGRAPH FROM 1920 SHOWING HAMBLE POINT AND LOOKING AT THE SEAPLANE MAIN SLIPWAY (CENTRE) AND SLIPWAYS WITH RAILS (LEFT IN FRONT OF HANGAR), (COURTESY OF THE NATIONAL MUSEUM OF THE ROYAL NAVY: YEORN 2015_163_67)

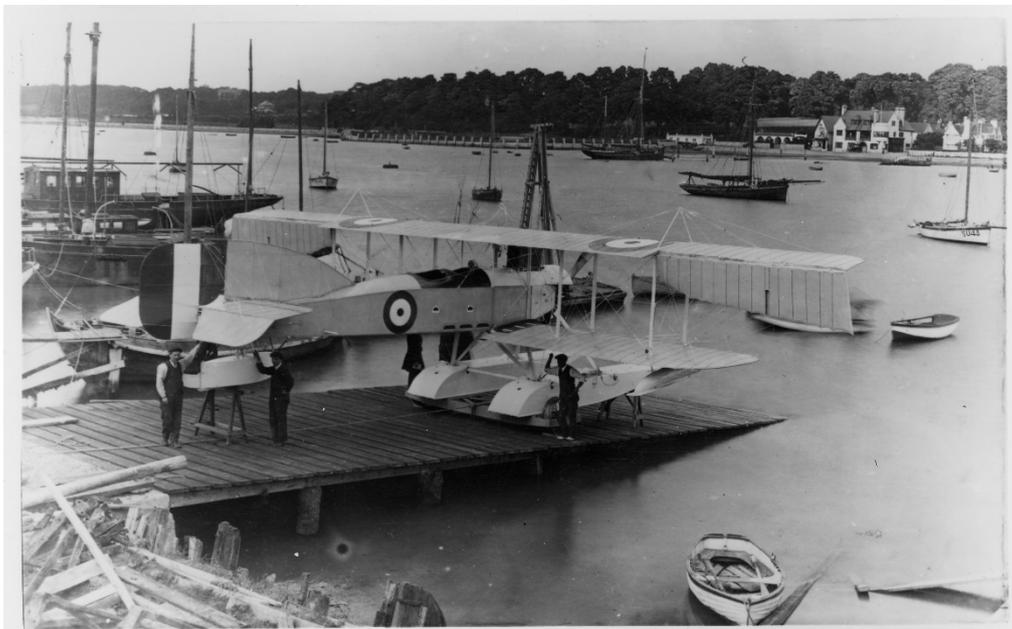


FIGURE 46: SEAPLANE ON THE MAIN SLIP AT HAMBLE POINT (COURTESY OF THE NATIONAL MUSEUM OF THE ROYAL NAVY: YEORN 2003_100_123)

After the war, Avro continued to have an active interest in seaplane construction at the Point. In 1929, Avro sold the company to Armstrong Whitworth Aircraft, leaving the Point to the British Marine Aircraft company and the Air Service Training pilots college to head up the aviation on the Hamble

(www.hampshireairfields.co.uk, n.d.). However, seaplane construction gives way to boat manufacture after the Second World War (Murphy, 2009. 70).

Review of historic mapping in relation to modern aerial photography has enabled development of a map regression of the site, charting the development of the features outlined above (See Figure 47 and 48). As can be seen from the map dating to 1932 there were three main slipway features shown, a main slipway to the south of the lobster pond and towards the Point, two features marked 'slips'.

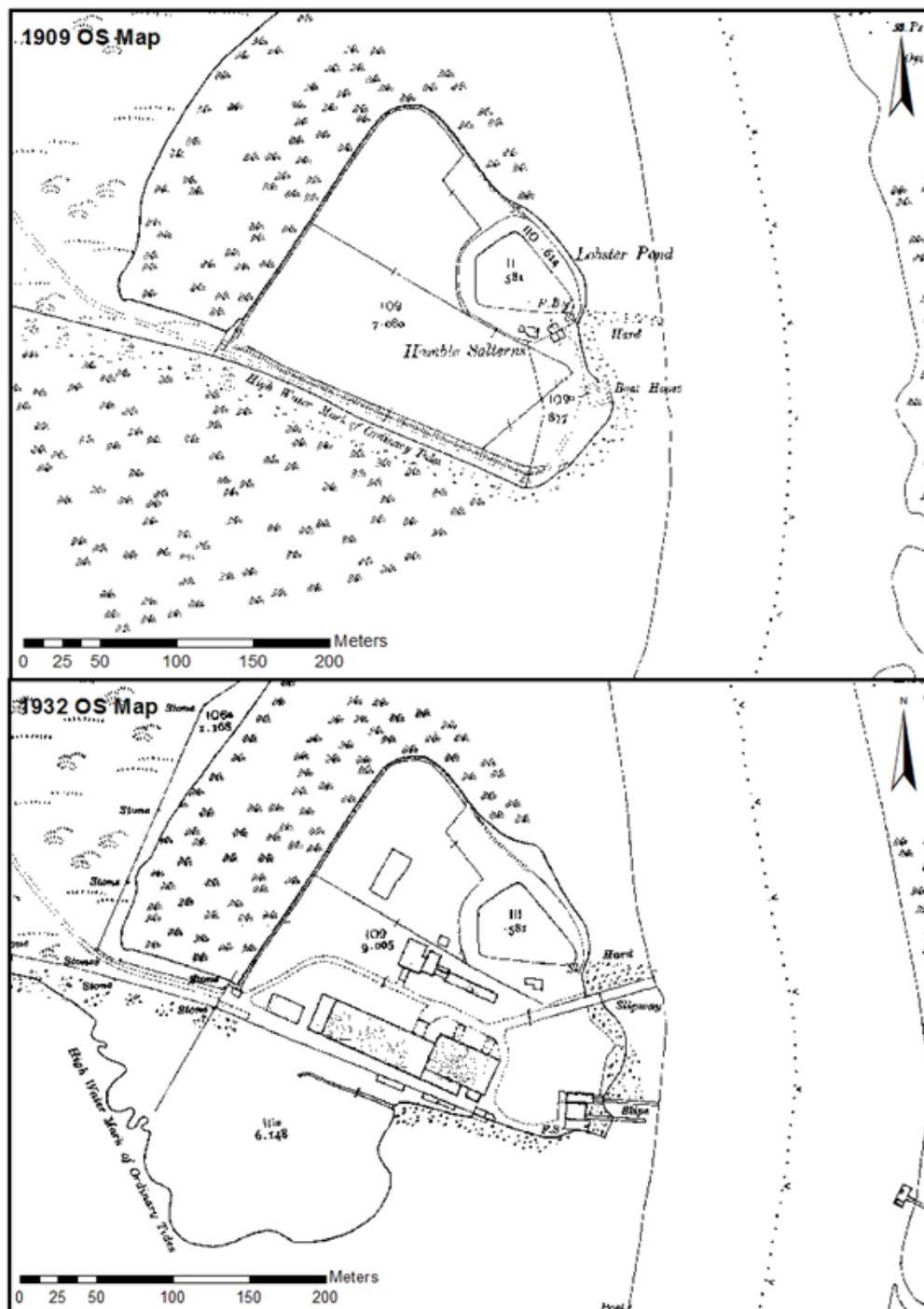


FIGURE 47: ORDNANCE SURVEY MAPS FROM 1909 AND 1932 SHOWING DEVELOPMENT ON HAMBLE POINT

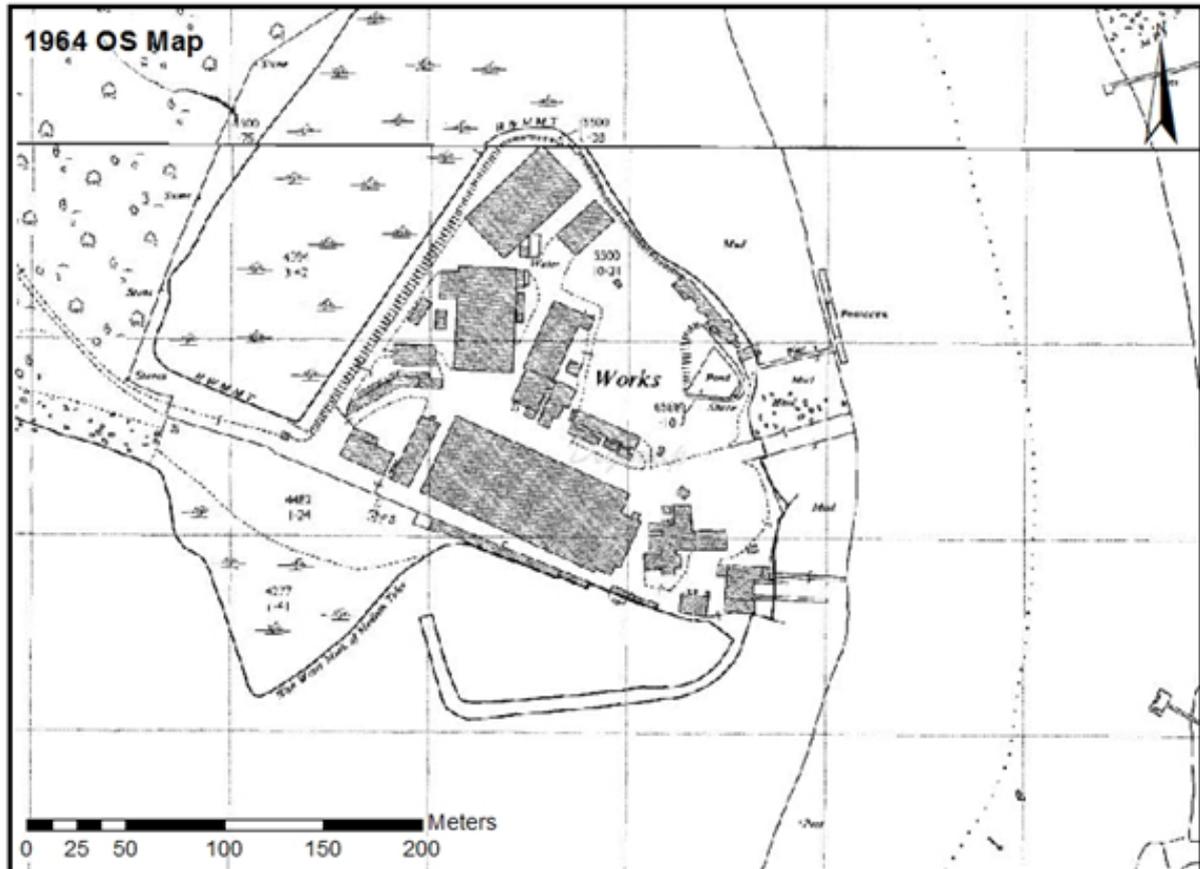


FIGURE 48: ORDNANCE SURVEY MAP OF 1964 SHOWING THE DEVELOPMENT OF THE HAMBLE POINT SITE

3.5.2 Fieldwork Results

Desk based research identified a number of features of interest at Hamble Point, these included the main slipway and to the south close to the point two slipways with rails and a possible jetty feature. These were all potentially related to the manufacture of seaplanes and were operating during the First World War. Fieldwork recorded these features; survey techniques employed at the site included GPS survey, photography and scale drawing.

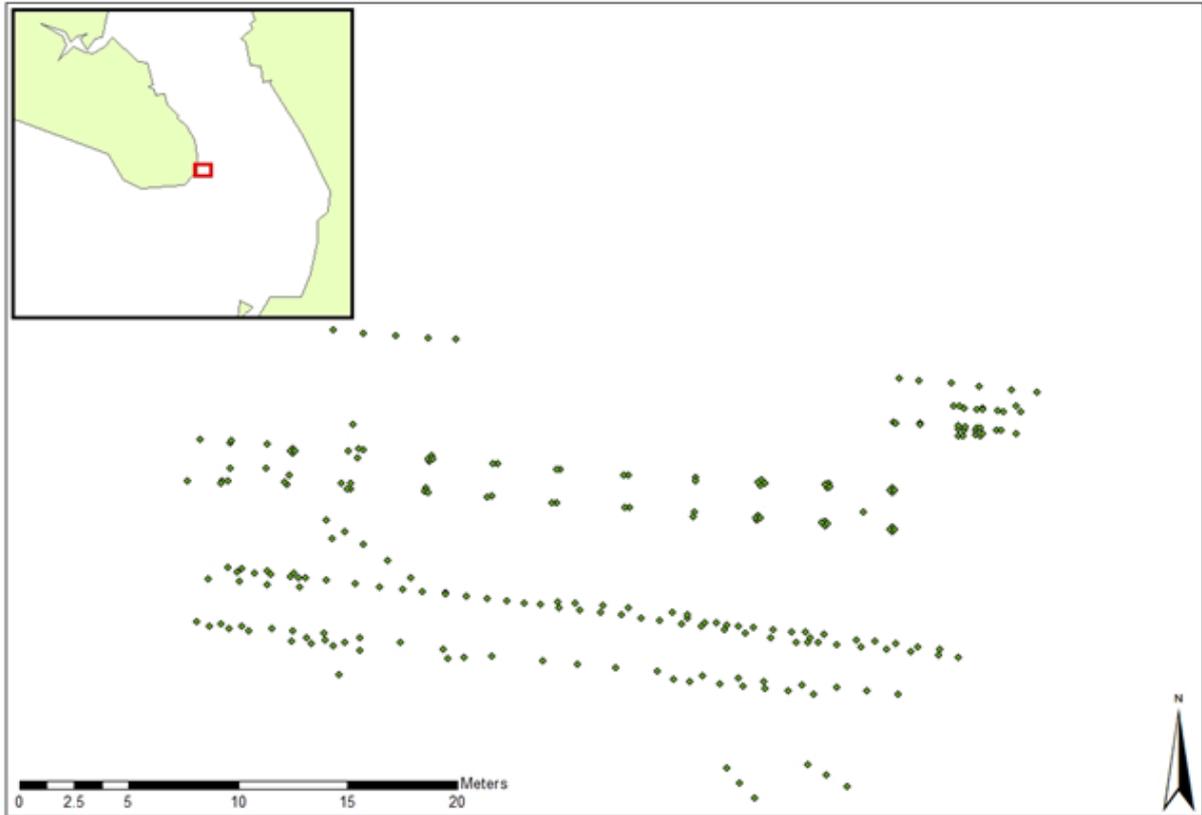


FIGURE 49: PLOT OF SURVEY POINTS ON THE SLIPWAYS WITH RAILS AND POSSIBLE JETTY FEATURE

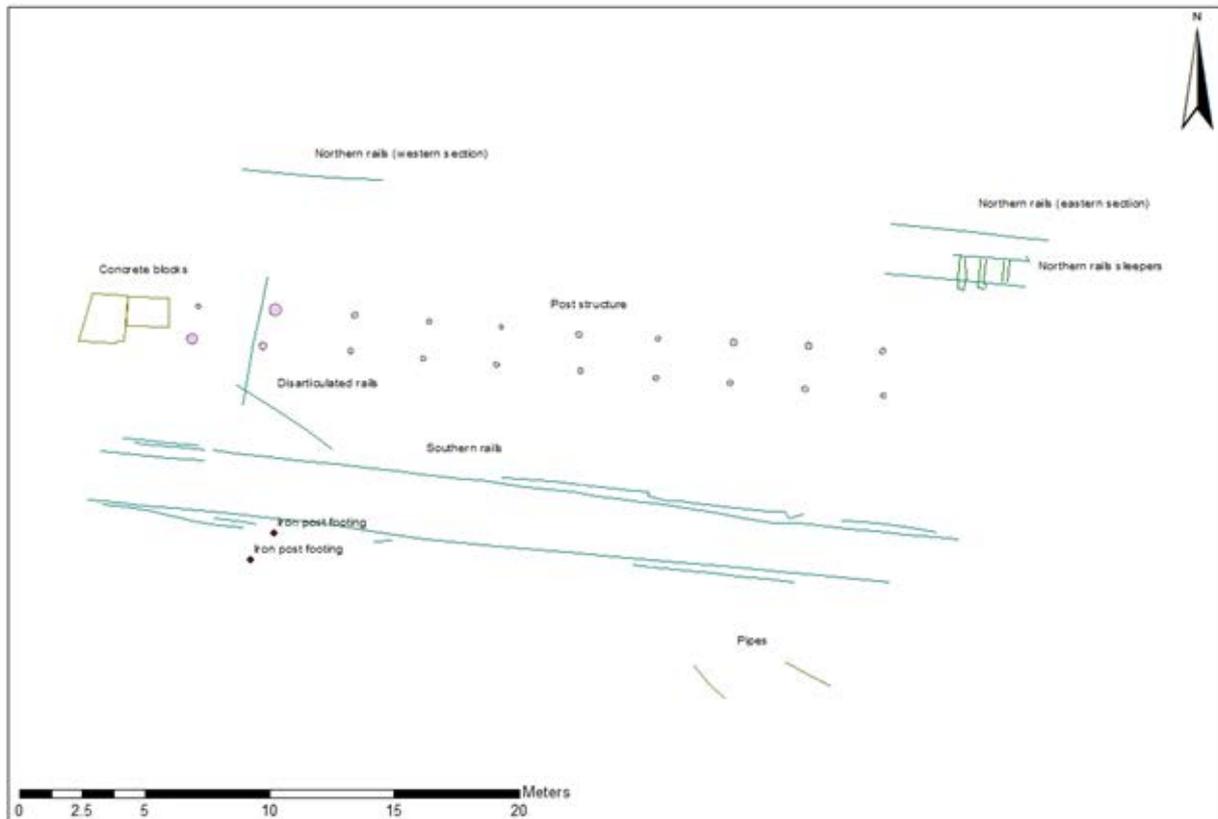


FIGURE 50: PLAN SHOWING THE SLIPWAYS WITH RAILS AND POSSIBLE JETTY FEATURE AND THEIR RELATIONSHIP TO EACH OTHER.

3.5.2.1 Main Slipway

The main slipway at the Hamble Point site was formed of a wide concrete approach, which joined to a wooden ramp, the ramp can be clearly seen in Figure 45. There is a slipway in the same position today, with a concrete approach, however, the wooden ramp has been replaced by more concrete with continues into the intertidal zone (Figures 51 and 52). This is a wide slipway that was originally required to be this large to facilitate the movement of seaplanes at the site.



FIGURE 51: MAIN SLIPWAY AT HAMBLE POINT MARINA LOOKING TOWARDS THE WATER



FIGURE 52: MAIN SLIPWAY AT HAMBLE POINT LOOKING FROM THE WATER'S EDGE BACK TOWARDS THE FORMER SEAPLANE SITE

3.5.2.2 Northern Slipway and Rails

The northern set of rails is a linear feature made up of rails that sit on top of sleepers that lie perpendicular to the rails (Figure 54 and Figure 55), although most of the sleepers are buried and it is not known if there are any more foundation elements beneath them that would be comparable to the concrete elements present with the southern rails. It survives in two separate sections, one close to the Mean High Water Mark (MHW), and one that is close to the Mean Low Water Mark (MLWM). The MHW section of the rails was measured as 60mm (A), 60mm (B), 115mm (C), 20mm (D), 65mm (E), 35mm (F), and 20mm (G) for the dimensions of the rail as shown in Figure 53. The MLWM sections of rails was partially buried when measured. The dimensions that that it was possible to measure were as follows; 60mm (B), 30mm (F), and 20mm (G). It was not clear during the survey why the middle section of this feature was not present, although it could be that the rails had come detached from their foundations, and may be represented by the disarticulated rails that could be seen nearby.

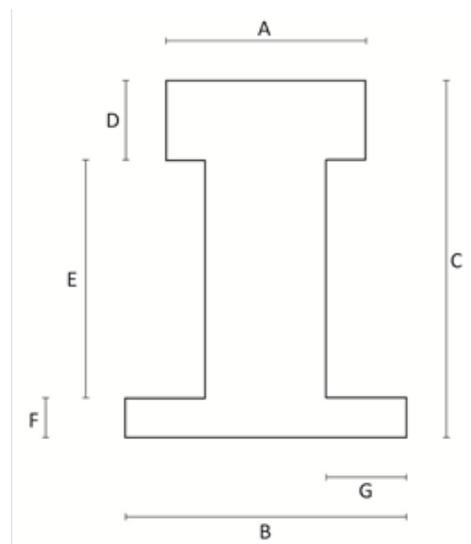


FIGURE 53: DIAGRAM SHOWING THE CROSS-SECTION SHAPE OF THE RAILS, LETTERS RELATE TO MEASUREMENTS WITHIN TEXT



FIGURE 54: THE NORTHERN SLIPWAY RAILS CLOSE TO THE MEAN LOW WATER MARK



FIGURE 55: ONE OF THE SLEEPERS WHICH PROVIDE THE FOUNDATIONS FOR THE RAILS OF THE NORTHERN SLIPWAY

3.5.2.3 Southern Slipway and Rails

The southern set of rails is superficially of similar appearance to the northernmost section; however, its foundations are markedly different. It is composed of a set of rails that sit on top of a concrete and a parallel wooden foundation structure, which appears to be much more substantial than that of the northern rails (Figures 56 and 57). The rails were measured as; 65mm (A), 100-110mm (B)135mm (C), and 25mm (E) (Figure 53). This feature runs from the MHW to the MLWM continuously, unlike the northern rails which appears to be discontinuous and partially buried, therefore, more of the feature can be examined without excavation.



FIGURE 56: VIEW OF THE RAILS OF THE SOUTHERN SLIPWAY



FIGURE 57: THE CONCRETE AND WOODEN FOUNDATIONS OF THE SOUTHERN SLIPWAY RAILS

3.5.2.4 Post Structure - Possible Jetty

The post structure is linear in nature, again running from the MHW to the MLWM, and is composed of two parallel lines of posts (Figure 58). Most of the posts that are visible are heavily degraded and only survive to a maximum of approximately 10cm above the surface. However, there are several posts nearer to the MHW that survive to a greater extent, several of which are at least 1m high, and one (Figure 60) which has a surviving cross brace. One of these better preserved posts had a diameter of approximately 200mm. Its proximity and alignment suggest that the two concrete blocks may be associated with this structure. One of the concrete blocks has two wooden posts and an iron ring embedded into its structure (Figure 59 and Figure 61). This block measured approximately 2m across and 1.4m wide. It is believed that they are associated with the post structure.



FIGURE 58: POSTS RELATED TO A POSSIBLE JETTY STRUCTURE



FIGURE 59: CONCRETE BLOCK THAT ARE LIKELY TO BE THE FOUNDATION FOR THE POSSIBLE JETTY STRUCTURE

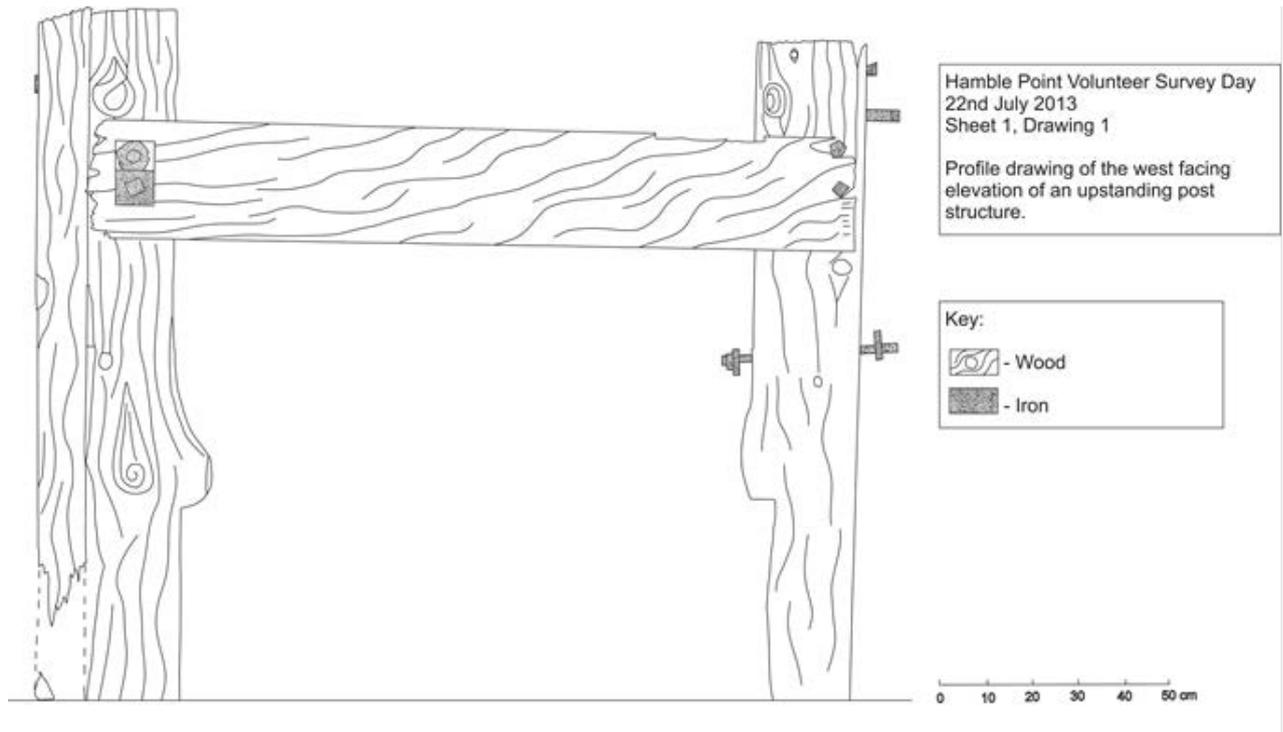


FIGURE 60: PROFILE OF THE WEST FACING ELEVATION OF UPSTANDING POST STRUCTURE

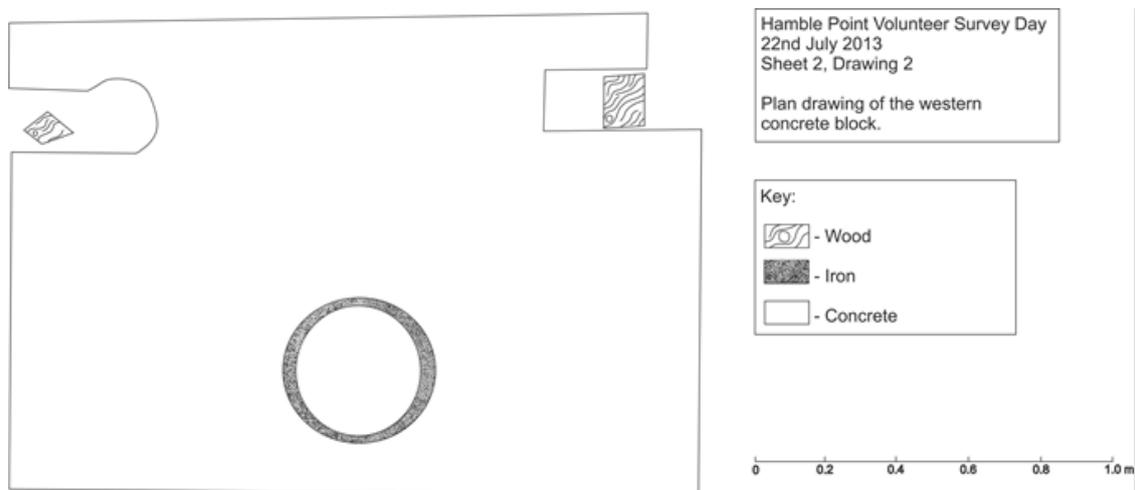


FIGURE 61: PLAN DRAWING OF THE WESTERN CONCRETE BLOCK

3.5.3 Discussion and Future Work

It is clear that the northern and southern slipways correspond to the features depicted on the 1932 Ordnance Survey map (see Figure 62 - below). These features do not appear on the 1909 map, indicating they were constructed after this date. The slipways may be the ones installed by the Daily Mail for their round-Britain flight that took place in 1912. Alternatively, they could represent a slipway associated with the Fairey Aviation company and the construction of sea planes during the First World War. Figure 45, a historic photograph from 1910, shows a slipway in this position in front of a hangar.

It is unclear whether the possible jetty feature, consisting of posts in the intertidal zone and associated concrete blocks are related to activity during the First World War. During survey a local resident spoke to the team and recalled the jetty when it was intact, which may indicate it is of a later date than the slipways.

Further work at the site could examine the slipways in more detail to gather more precise information on their construction. This may help relate them more directly to the various phases of use and development of the Point and their relationship with seaplane activity.



FIGURE 62: 1932 ORDNANCE SURVEY MAP WITH THE SLIPWAY REMAINS SURVEYED OVERLAID.

3.6 LEE-ON-SOLENT

3.6.1 Site History

Lee-on-Solent is the most complete surviving example of a seaplane station in Britain (Historic England 2017e). Located 11 miles south east of Southampton the site was probably being used unofficially from 1915 (Gosport Borough Council 2017). Despite this small and inauspicious beginning Lee-on-Solent went on to become one of the largest, and certainly the best preserved, seaplane stations in Britain.

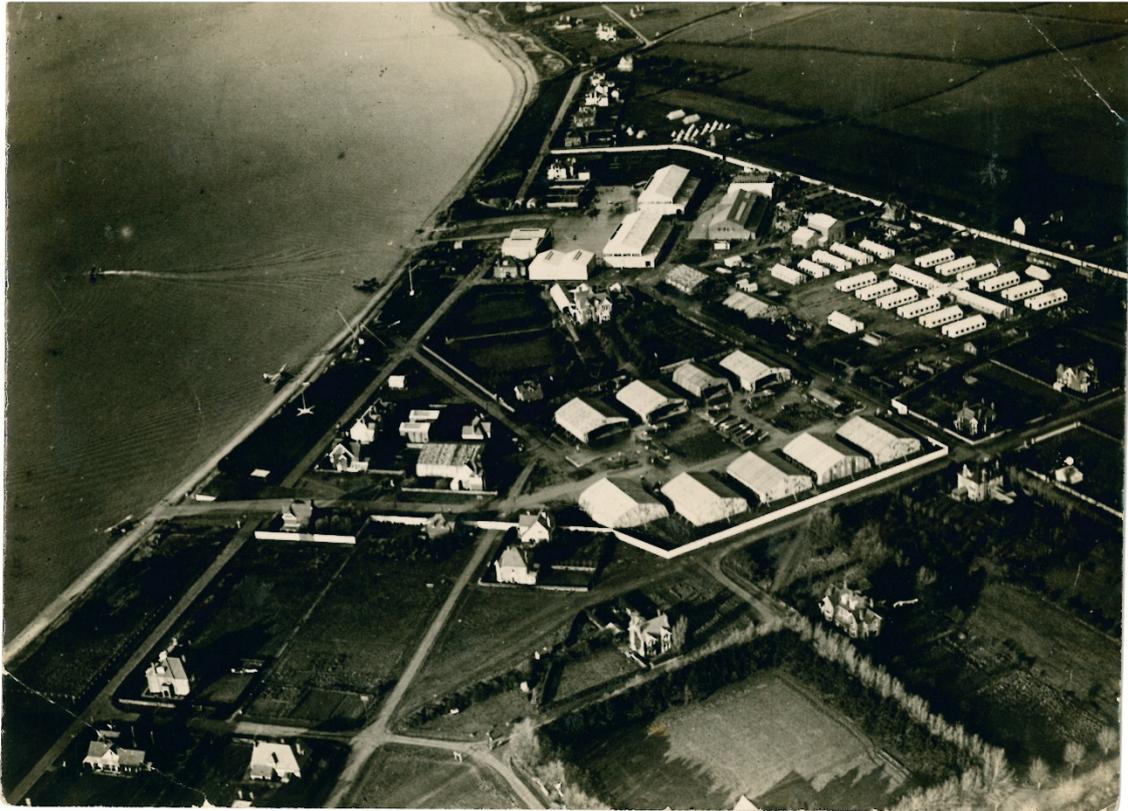


FIGURE 63: LEE-ON-SOLENT SEAPLANE TRAINING SCHOOL IN 1918 (COURTESY OF THE NATIONAL MUSEUM OF THE ROYAL NAVY: YEORN NEG AIRSTN 1551)

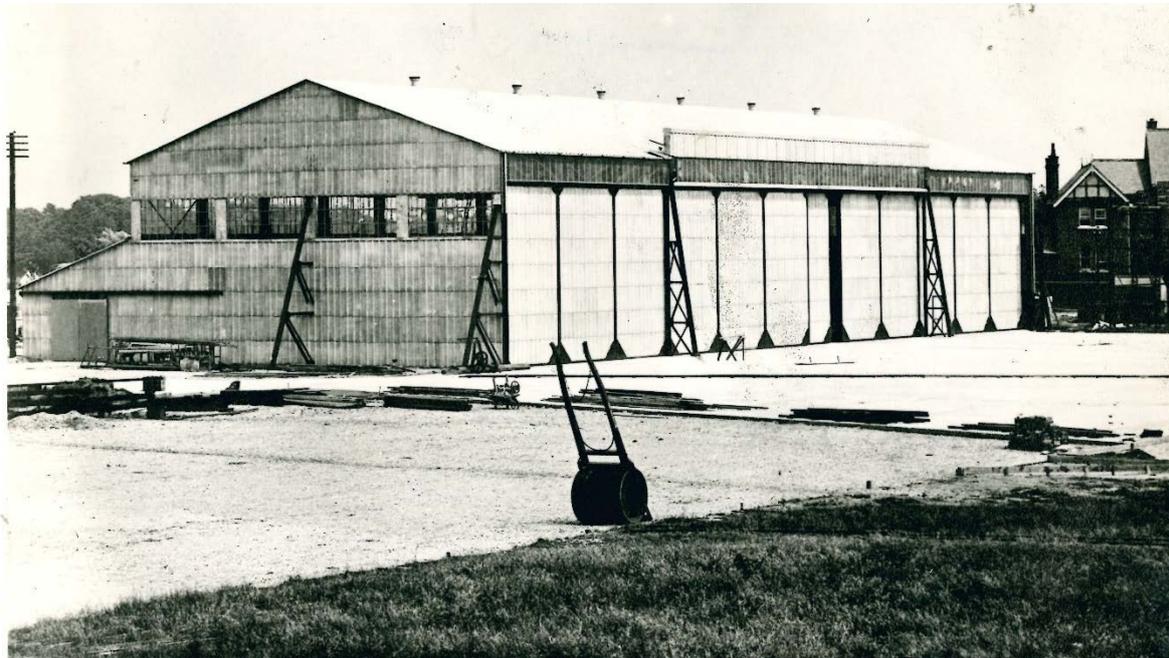


FIGURE 64: HANGAR AT LEE-ON-SOLENT SEAPLANE STATION (COURTESY OF THE NATIONAL MUSEUM OF THE ROYAL NAVY: CRTY_2018_112_4)

Increased losses of shipping during Spring 1917 increased the pressure on training establishments to produce more aircrew (Philpott 2013: 249). Lee-on-Solent was chosen for expansion by the commanding officer of Calshot who had been requested to increase output of trained aircrew. The Naval Seaplane Training School opened on 30th July 1917 using Bessoneau hangars, tents for personnel and a variety of huts. Training began that August using Short 827 floatplanes. Lee-on-Solent was a

training station rather than an operational base for anti-submarine warfare and patrols (Delve 2005: 159).

Originally the school was a temporary measure but in November 1917 the decision was taken to make it a “long term” training station (Gosport Borough Council 2007) after plans to locate a training establishment at Holy Island in Northumberland were halted (Delve 2005: 159). Following this decision expansion at Lee began with new slipways and permanent aircraft sheds (Types G and J) (Gosport Borough Council 2007) to replace the earlier canvas Bessoneau hangars (Delve 2005: 159).

The sheltered state of the Solent made waters generally smooth for take-off and landing in all but the most challenging wind conditions (TNA Air1/ 452/15/ 312/26 vol V): ideal for pilots in training and ideal for the Admiralty and RAF who needed new aircrew without delay. After creation of the RAF in April 1918 training continued at Lee which became 209 Training Depot Station, part of 10 Group.

3.6.1.1 Summary of Structures

When Lee-on-Solent was catalogued for the RAFs Quarterly Survey of Airfields in August 1918, 485 personnel and 72 seaplanes and floatplanes were recorded on its establishment at the 30 acres acquired in 1913. By 1918 there were a large array of buildings many of which survive.

As of 1 August 1918 the station was not complete. The completion dates for the entire station are given as 29 February 1919.

TABLE 3.5: BUILDINGS AND STRUCTURES AT LEE-ON-SOLENT, AUGUST 1918

Technical buildings	Regimental buildings
8 x Seaplane Sheds <ul style="list-style-type: none"> • 2 x 180' x 60' • 6 x 60' x 48' 	Officers' Mess
8 x Canvas Hangars	3 x Officers' Quarters
4 x Slipways	Servants' Mess
2 x Winch Houses	Women Officers' Quarters
Workshops <ul style="list-style-type: none"> • General Shop, 180' x 60' • Engineers', 80' x 48' • Dope Shop, 48' x 35' • Test House • Stripping Shed • Smiths' Shed 	Sergeants' Mess
2 x Engine Stores	Sergeants' Latrines
Oil Store	Sergeants' Baths
2 x Petrol Houses	Men's Mess
General Lecture Hut	Regimental Institute
2 x Offices	Regimental Store
Latrines	15 x Men's Huts
Guard House	Men's Baths
Machine Gun Range	Men's Latrines
	Sick Bay
	Coal Yard

3.6.1.2 Decommissioning

The squadron was disbanded on 15 May 1919 (Delve 2005: 162), however, the station was not disposed of, becoming the RAF School of Naval cooperation and headquarters of 10 Group in 1921. The foundation of the Fleet Air Arm in 1924 led to additional investment and development including

an airfield. Lee on Solent became Coastal Command Headquarters in 1936 and in 1939 was renamed HMS Daedalus when the Admiralty gained control of the Fleet Air Arm (Gosport Borough Council 2007).

After the war HMS Daedalus reverted to its training role and as a shore base for ship-borne squadrons. Helicopter trials and training for their crew followed, however, it was never quite as busy as during its 1939-45 heyday. Hovercraft trials also took place there from 1962 followed later by military hovercraft training.

The military left Lee-on-Solent in 1996 (Delve 2005: 162). The hangar and apron areas of the seaplane station are now a hovercraft museum, the airfield remains in use as Solent Airport and large parts of the site are part of the Solent Enterprise Zone.

Despite the longevity of Lee-on-Solent as an operational base and the many changes it underwent – including two bombing raids during the Second World War - a large number of First World War structures remain (Gosport Borough Council 2007). As such, Lee-on-Solent is an exceptional record of the 1914-18 seaplane war.

The seaplane station site is now within a Conservation Area. A Conservation Area Appraisal by Gosport Borough Council identified a large and varied collection of buildings of First World War (or earlier) vintage (Gosport Borough Council, March 2007).

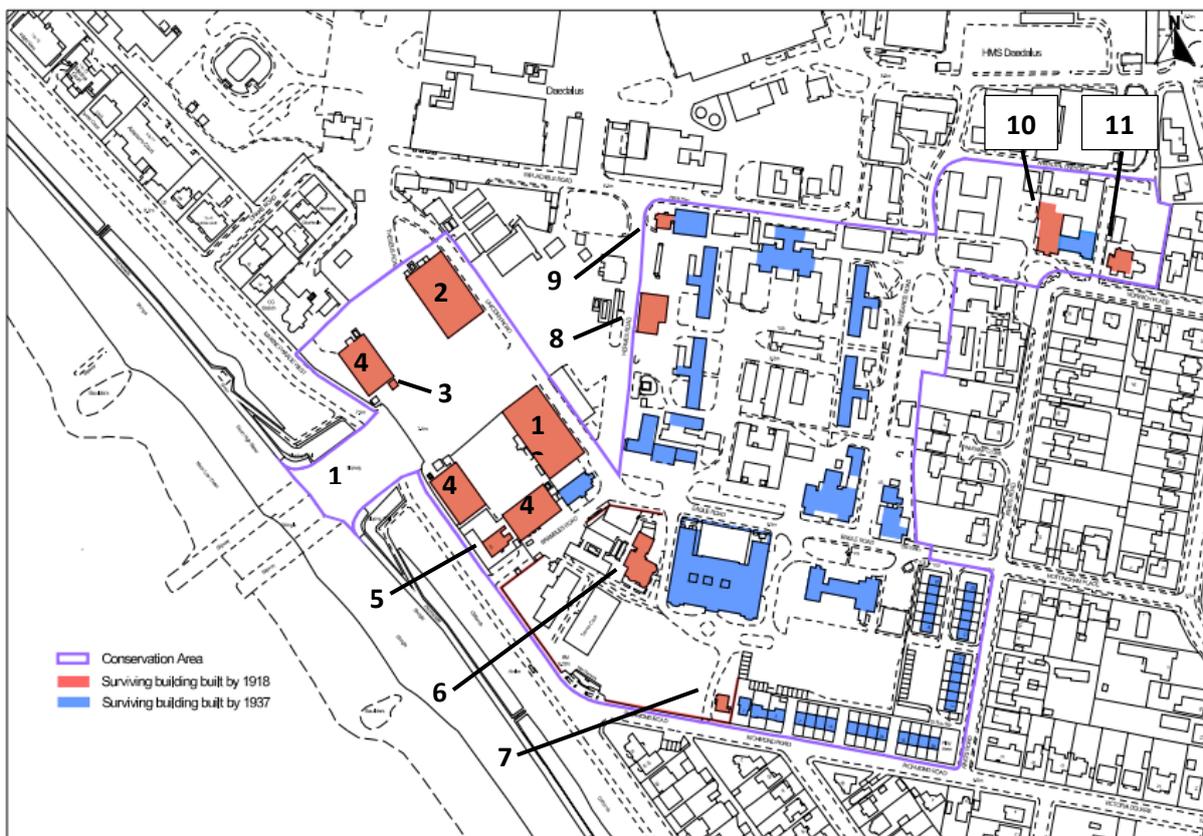


FIGURE 65: GOSPORT BOROUGH COUNCIL CONSERVATION AREA APPRAISAL: SURVIVING HISTORIC BUILDINGS BY TWO KEY DEVELOPMENT PHASES (AUTHOR'S NUMBERING) 2007

TABLE 3.6 - REFERENCE TABLE FOR NUMBERS INDICATED IN FIGURE 65

1	Slipway	The concrete slipways remains in place and was built in 1918. The Winch House (see below "3") would move aircraft to and from it using a cable (Gosport Borough Council 2007). Parts of the trackway from the slipway into the sea also remain.
2	Type J Seaplane Hangars x 3	Built circa 1917-18 – precise date is uncertain - and Grade II listed, these three paired seaplane hangars are believed to be the only surviving examples in the UK. Despite some renovation and modification their original frames remain intact. They were some of the earliest structures on the site and connected to concrete slipways (Historic England 2017f).
3	Winch House	The connected Winch House moved seaplanes from the shoreline to the concrete apron and vice versa (Gosport Borough Council 2007). It is also listed at Grade II (Historic England 2017f).
4	Type G Seaplane Hangars x 2	Constructed in 1917-18 only three other Type G hangars exist, at Calshot. Some bays have been removed (Historic England 2017f). They are not currently listed.
5	The Brambles	This Edwardian house was requisitioned in 1917 for use as Quarters for the Commanding Officer (Gosport Borough Council 2007).
6	Westcliffe House	This large villa from 1904, Grade II listed along with its attached terrace walls (Historic England 2017e), was originally used as pupils' quarters, mess and classrooms later becoming the Officers' Mess and WRNS Officer's accommodation. Requisitioned in 1917 its inclusion in the seaplane station is characteristic example of how early seaplane stations requisitioned properties (Historic England 2017f).
7	Lodge to Westcliffe House	To be found in what were once the grounds of Westcliffe House it is of a similar design (Gosport Borough Council 2007).
8	Power House	This purpose-built engine room also had adjacent rooms for a battery charging room, a workshop, offices and stores (Gosport Borough Council 2007).
9	Norbury House	Requisitioned in 1918 as a Quartermasters Store it later became Married Quarters and then the Station Armoury after modification and extension Gosport Borough Council 2007: Daedalus 10).
10	Wykeham Hall (part)	This house dating from 1895 was, like many others at Lee, requisitioned by the Admiralty in 1917. In 1931 a large wing was added to the rear (Gosport Borough Council 2007: Daedalus 11).
11	Keith Cottages (part)	Two late Victorian Houses also requisitioned around 1917, becoming Married Quarters (Gosport Borough Council 2007: Daedalus 11).

3.6.2 Discussion and Future Work

The exceptional levels of preservation of First World War elements of the seaplane station at Lee-on-Solent mean it provides a vital comparative resource for the study of other stations where physical remains no longer survive to such an extent. Using the examples of the hangars, tracks and slipways at Lee can assist when analysing other sites.

Much of the physical remains at Lee-on-Solent are afforded some degree of protection either through being listed buildings or lying within a Conservation Area. However, it has not been possible to ascertain whether full archaeological surveys have been undertaken of the buildings or the slipway and track from the slipway to the sea.

3.7 NEWHAVEN

3.7.1 Site History

Newhaven was one of the primary ports for shipping supplies from Britain to the Western Front, responsible principally for moving stores. This importance, combined with the resumption by Germany of unrestricted warfare in February 1917, led the Admiralty to respond to the increased threat and the need to protect its cross-channel supply lines from U-boat attack.

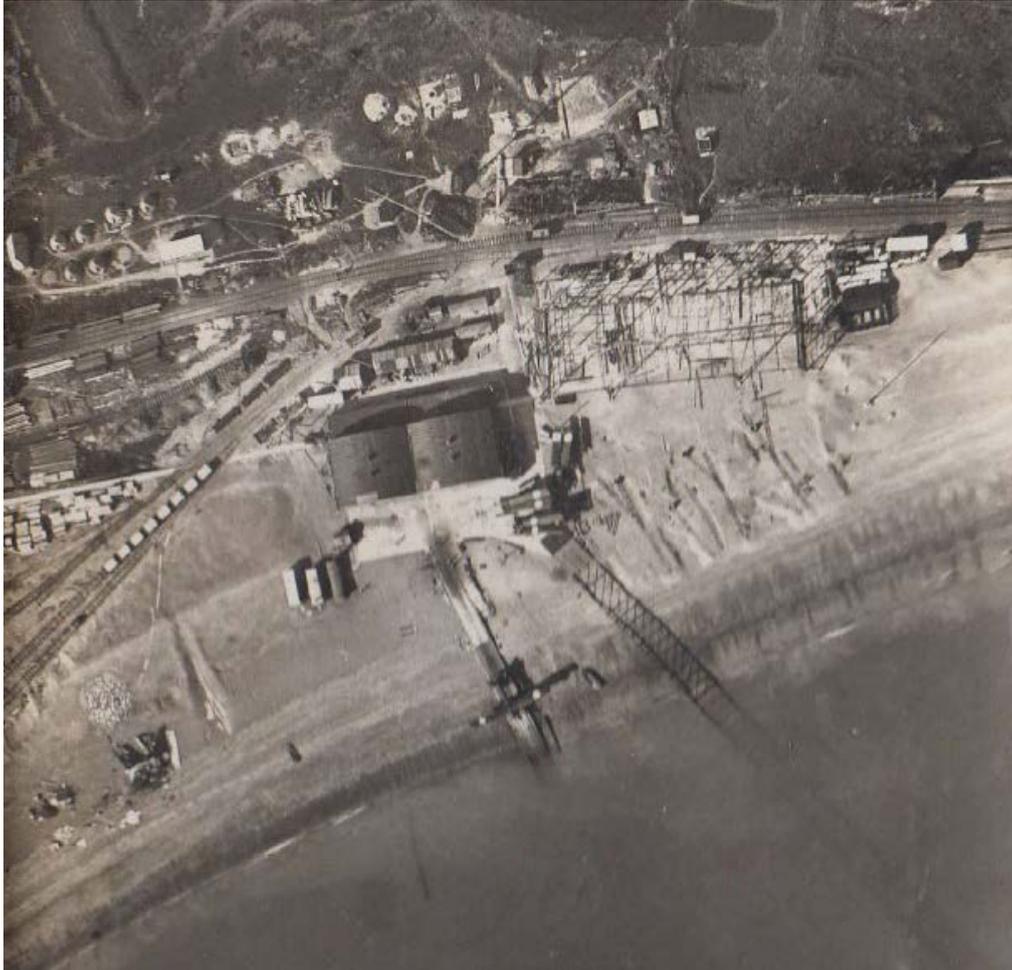


FIGURE 66: AERIAL SHOT OF NEWHAVEN DURING CONSTRUCTION OF THE SECOND HANGAR. H.R. ALDERSON, 1918.

In May 1917 Newhaven Naval Air Station was opened to provide additional protection to shipping (Delve 2005: 261). The station was built 300 yards east of Newhaven harbour on the shingle foreshore. A 120' x 50' seaplane shed was built opening onto a wooden slipway, with a second larger hangar built in 1918 (Flood 2017). Offices and rooms for aircrew were provided by three old train carriages. The breakwater provided adequate space so taking off was possible in any wind except a south-easterly (TNA Air1/ 452/15/ 312/26 vol V).

Men lived at the seaplane station in wooden huts; accommodation for officers was provided at Tide Mills, and billeting at Bishopstone (Flood 2017).

Originally allocated four Short 184s this was later increased to six (TNA: AIR 1/645/17/122/308). Fairey Campanias and IIIbs also joined the station (Flood 2017).

When the RAF took control in April 1918 plans to expand the station were considered but not acted upon. They did however reorganise the aircraft at Newhaven into 408 and 409 Flights, becoming 242 Squadron in August 1918 (Delve 2005: 261).

3.7.1.1 Summary of Structures

The RAF's Quarterly Airfield Survey of Autumn 1918 states that RAF Newhaven covered approximately 12 acres: five occupied by the seaplane station, six by the Drill Quarters to the north east, and ½ an acre for the Officers' quarters (Figure 67). Establishment was 194 personnel and 12 float seaplanes. There was extensive development of the station in 1918. The estimated date for completion of the whole Station was given as 31 December 1918.

Some officers were accommodated in hired buildings and some of the other ranks were billeted.



FIGURE 67: A PLAN OF NEWHAVEN STATION FROM 1918 (TNA)

TABLE 3.7: BUILDINGS AND STRUCTURES AT NEWHAVEN, OCTOBER 1918

Technical buildings	Regimental buildings
2 x Seaplane Sheds <ul style="list-style-type: none"> • 1 x 180' x 60' • 1 x 120' x 50' 	Officers' Quarters
2 x Slipways	Sergeants' Mess
Motor Transport Shed	Regimental Institute
Workshop, 40' x 20' in annex next to Shed	Regimental Store
Technical Store	2x Men's Dormitories
Petrol Store	Men's Baths
Wireless Telegraphy Hut	Men's Latrines and Ablution
Offices	Women's Rest Room
Winch House	First Aid Room
Latrines	Drying Room
Guard House	
Bomb Store	
Ammunition Store	
Pigeon Loft	

3.7.1.2 Decommissioning

242 squadron was disbanded in May 1919 (Lewis 1968: 84). The seaplane station closed later that year (Delve 2005: 261). The buildings were auctioned off in the 1920s (Flood 2017). The larger of the hangars is still in existence. The 180' x 60' Type G hangar was auctioned off around 1921, dismantled, and acquired by London & South Western Railway. This shed, along with its annexe, were re-erected at Wimbledon Depot in the early 1920s for use as a civil engineering and signal telegraph store. It is now owned by Network Rail and is one of only four surviving Type G sheds of this date, the others being at Calshot and Lee-on-Solent. It was Grade II listed on 23 July 2012 (Historic England 2017g).

Hard standing / concrete bases remain at the seaplane station but there are no complete structures (Flood 2017). Bishopstone (where men from the station were billeted) is now farmland within the South Downs National Park and the site of officer's accommodation at Tide Mills appears to have no standing structures. The site has been subject to survey by Sussex Archaeology Society with Peter Fellows having undertaken extensive research (Fellows, Undated).

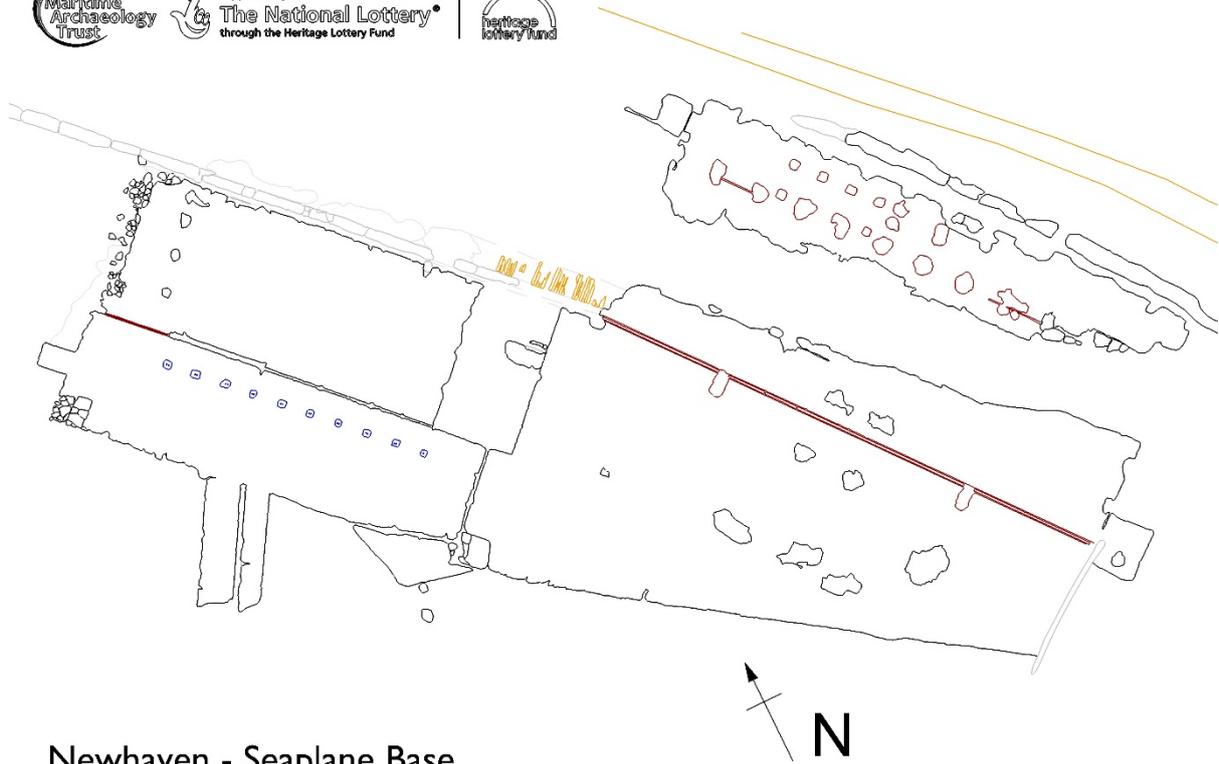
3.7.2 Fieldwork Results

The survey of the Newhaven seaplane station took place in two phases, following an initial site visit on behalf of the Trust by CITiZAN (a UK wide Community archaeology project) a decision was made to return to the site in 2017 to carry out a full survey of the station. The aim of the 2017 survey was to confirm the extent of the archaeological remains, create an accurate mapped record of the remains and examine a series of posts on the beach that are likely to be the remains of the wooden slipway seen in the historic image (Figure 66 above).

The site, unlike many contemporary comparative sites, provides a perfect ground plan of all the elements relating to a seaplane station. Using an RPAS (drone) a series of aerial photographs were obtained which were processed through photogrammetric software to produce a scaled orthographic image of the site (Figure 68). An offset survey collected detailed measurements of the ground plan which enabled scaling of the images to create an accurate site plan (Figure 69).

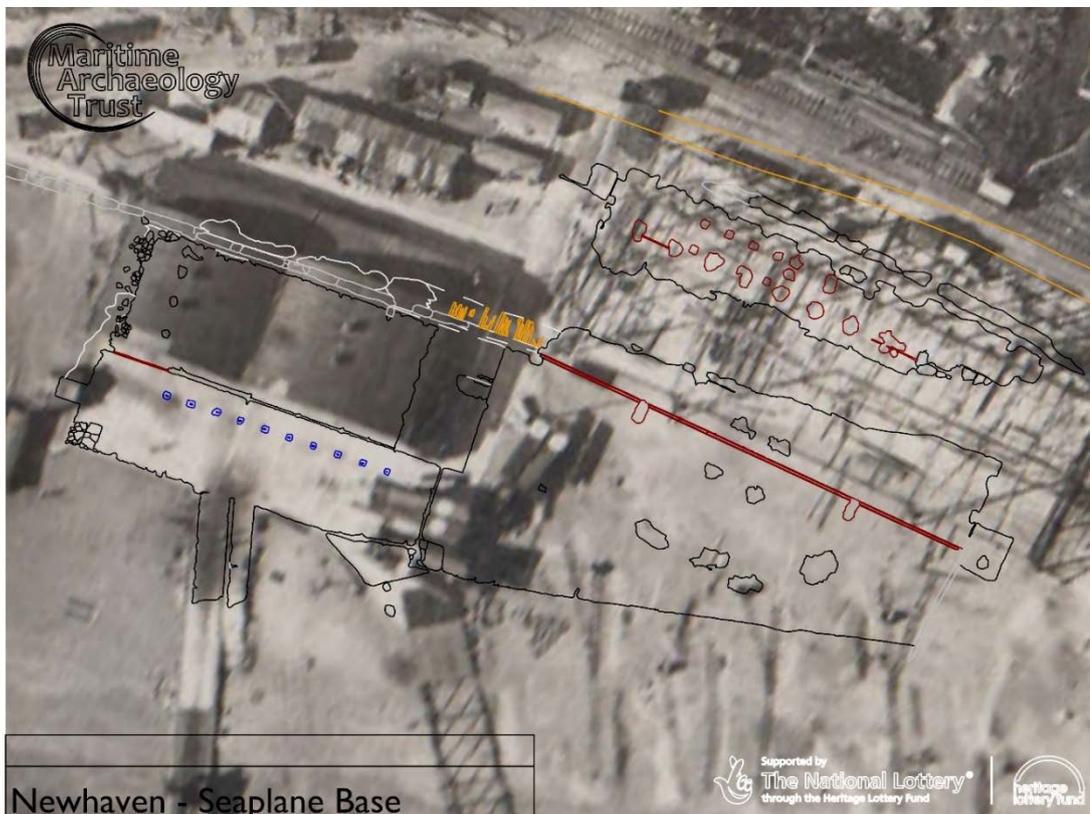


FIGURE 68: ORTHOGRAPHIC IMAGE OF THE SITE GENERATED THROUGH PHOTOGRAMMETRIC SOFTWARE



Newhaven - Seaplane Base

FIGURE 69: PLAN OF EXTANT ARCHAEOLOGICAL REMAINS AT NEWHAVEN SEAPLANE STATION



Newhaven - Seaplane Base

FIGURE 70: PLAN OF ARCHAEOLOGICAL REMAINS OVERLAIN OVER AN HISTORIC PHOTOGRAPH OF NEWHAVEN SEAPLANE STATION

The concrete slabs which can be clearly seen in Figure 68, are the bases of the two seaplane hangars and the apron running between and in front of them. The site is disrupted by an earthwork bank which post-dates the use of the station and runs east to west across the site behind the area of the westerly (left in Figures 68 - 70) hangar, dissecting it from the former workshop area of the station, and through the middle of the easterly (right in Figures 68 -70) hangar.

The iron runners for the sliding doors of the hangars are still in-situ (Figure 71). Additional features, include iron fittings within the concrete that are the bases for the struts that supported the hangars, and the footings for a tank at the eastern end of the concrete apron.

Closely laid sleepers form a surface along the northern edge of the westerly hangar, this extends across the site to the east and continues for around 30 metres. These may be related to the seaplane base or may be later features (Figure 73).

At the eastern end of the concrete slabs there is a concrete pillar lying in a north to south orientation (Figure 74). This is stamped with the date 16.9.20, and is related to the use of the base after the First World War as a manufacturing site for concrete pillars.

The remains of two slipways can also be seen, one being a wide concrete slipway (Figure 75) and the other being formed of wooden posts (Figure 76) which were once part of a more substantive structure which can be seen in the historic aerial photograph Figure 66.



FIGURE 71: IRON RUNNERS FOR THE SLIDING DOORS OF THE HANGARS



FIGURE 72: LOOKING EAST ACROSS THE WESTERN HANGAR WITH THE CONCRETE SLIP ON THE RIGHT LEADING ACROSS THE SHORE



FIGURE 73: (LEFT) AREA OF SLEEPERS RUNNING EAST TO WEST ACROSS THE SITE



FIGURE 74: (RIGHT) CONCRETE PILLAR LYING AT THE EASTERN EDGE OF THE SITE



FIGURE 75: CONCRETE SLIPWAY LOOKING NORTH FROM THE SHORE TOWARDS THE WESTERN HANGAR



FIGURE 76: SELECTION OF PHOTOGRAPHS SHOWING WOODEN POST REMAINS FROM THE FORMER SLIPWAY PRESENT ON THE FORESHORE

3.7.3 Discussion and Future Work

The almost complete preservation of the floor plan of the Newhaven seaplane station makes it archaeologically significant. Like Lee-on-Solent (see Section 3.6.2) the extant remains at Newhaven could provide valuable information to aid identification and interpretation of other First World War seaplane station sites.

There is further potential for buried remains at the site as shingle and vegetation is clearly creeping across the site from the edges, particularly in the area of the eastern hangar. Behind the eastern hangar there are further remains related to workshops that could be more fully investigated.

3.8 NEWLYN

3.8.1 Site History

Newlyn, along with Tresco extended anti-submarine air power further westward (TNA Air1/ 452/15/ 312/26 vol V). Opened in early 1917 to carry out anti-submarine and convoy patrols, RNAS Newlyn was equipped with six Short 184s operating out of a station consisting of three canvas Bessoneau hangars and several other small buildings (Delve 2006: 317). A slipway was also constructed and officers billeted at nearby York House (TNA *ibid*). Historic documents and photographs provide evidence that a large seaplane hangar was constructed on the site at some time after July 1917, accommodating the new hangar required one of the three canvas hangars to be moved into a new position.

After the RAF took over Newlyn two Special Duties Flights were created from the Shorts 184 aircraft taken over from the navy, 424 and 425 Flight (235 Squadron) joined in August 1918 (Delve 2006: 317).

Between 14 and 16 September 1918 a conference took place to discuss the possibility of basing large flying boats at Newlyn, however, the area was considered too small and creation of a new breakwater to create a sheltered area was thought too big a task during wartime. Furthermore, there would be no further expansion because of its “temporary station” status, although the already approved slipway and concrete areas would be completed. The conference did confirm that groins were being constructed to protect the foreshore from erosion (TNA *ibid*).

3.8.1.1 Summary of Structures

The RAF’s quarterly airfield survey of Autumn 1918 states that 189 personnel and 12 floatplanes were based at the five acre site, one acre of which was taken up by the wireless telegraphy station. There is no record of any buildings being incomplete at this time, the table below outlines the buildings present on site.

TABLE 3.8: BUILDINGS AND STRUCTURES AT NEWLYN, OCTOBER 1918

Technical buildings	Regimental buildings
1 x Seaplane Shed, 180' x 60'	Officers are in a hired building, "York House." Other ranks are in 2 hired houses.
3 x Canvas Bessoneau Hangars, 66' x 66'	
Slipway	
Motor Transport Shed	
Workshops <ul style="list-style-type: none"> • Engineers', 60'x20' • Carpenters', 40'x20' • Dope Shop 	
Technical Stores	
Oil Store	
Petrols Store	
Wireless Store	
Chart Room Hut	
Photographic Hut	
Offices	
Winch House	
Latrines	
Guard House	
Armoury	
Ammunition Store	
Detonator Store	
Wireless Telegraphy Installation	
Pigeon Loft	
First Aid Hut	

Research in the Newlyn Town Archive revealed an original letter dated to 12 January 1917 (Archive: 5166), from Marechael and Hervieu of 166 Picadilly London to Mr Curnow at the Seaplane Station, Newlyn. The letter stated

"Dear Sir, We confirm herewith the telegraph we sent you this afternoon as under: "We agree to you erecting second shed. Letter following". As the shed is not of our make, do not take any responsibility if there is anything wrong with the construction, or for what may happen during the erection. We are advising the Commanding Officer that we have received authorisation from the Admiralty for you to erect this shed."

Also, within the Newlyn archive was a photograph of a seaplane shed frame (Figure 77), it is not known if this frame is completed or if it was fully installed at the Newlyn site. The dimensions of the shed do not appear to match those of the hangars pictured on the site in 1917 (Figure 78), or in what are believed to be a later photographs possibly from 1918 (Figures 80 and 81). Figures 80 and 81 are indicated as possibly circa 1917, but the presence of a large seaplane hangar on the site, as opposed to the canvas covered hangars on previous aerial photographs (Figure 71), would suggest they are of a later date. The large hangar, listed as present in the 1918 survey, must have been installed after July 1917, Figure 79 appears to show the site during early construction of the larger hangar.

The photographs also show what appears to have been a large area of concrete having been installed after July 1917, presumably in conjunction with the construction of the large hangar. The area of

foreshore used by the station seems to have been consolidated behind a small barrier. This was a considerable area to have concreted over and demonstrates further investment in the site.



FIGURE 77: POSSIBLE FRAME OF NEWLYN SEAPLANE SHED (NEWLYN ARCHIVE)



FIGURE 78: NEWLYN SEAPLANE STATION, 14 JULY 1917 (COURTESY OF THE NATIONAL MUSEUM OF THE ROYAL NAVY)



FIGURE 79: NEWLYN SEAPLANE BASE LARGE HANGAR APPEARS TO BE UNDER CONSTRUCTION (SOURCE UNKNOWN)

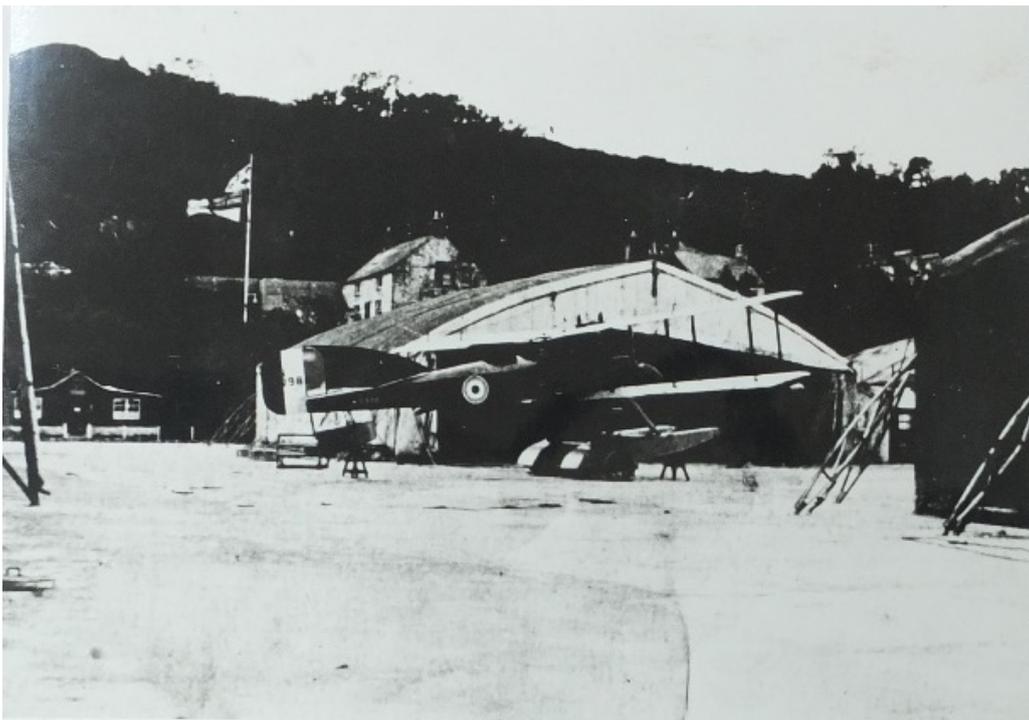


FIGURE 80: NEWLYN SEAPLANE STATION (COURTESY OF THE NATIONAL MUSEUM OF THE ROYAL NAVY (FAAM NEG NO A/STN 67))

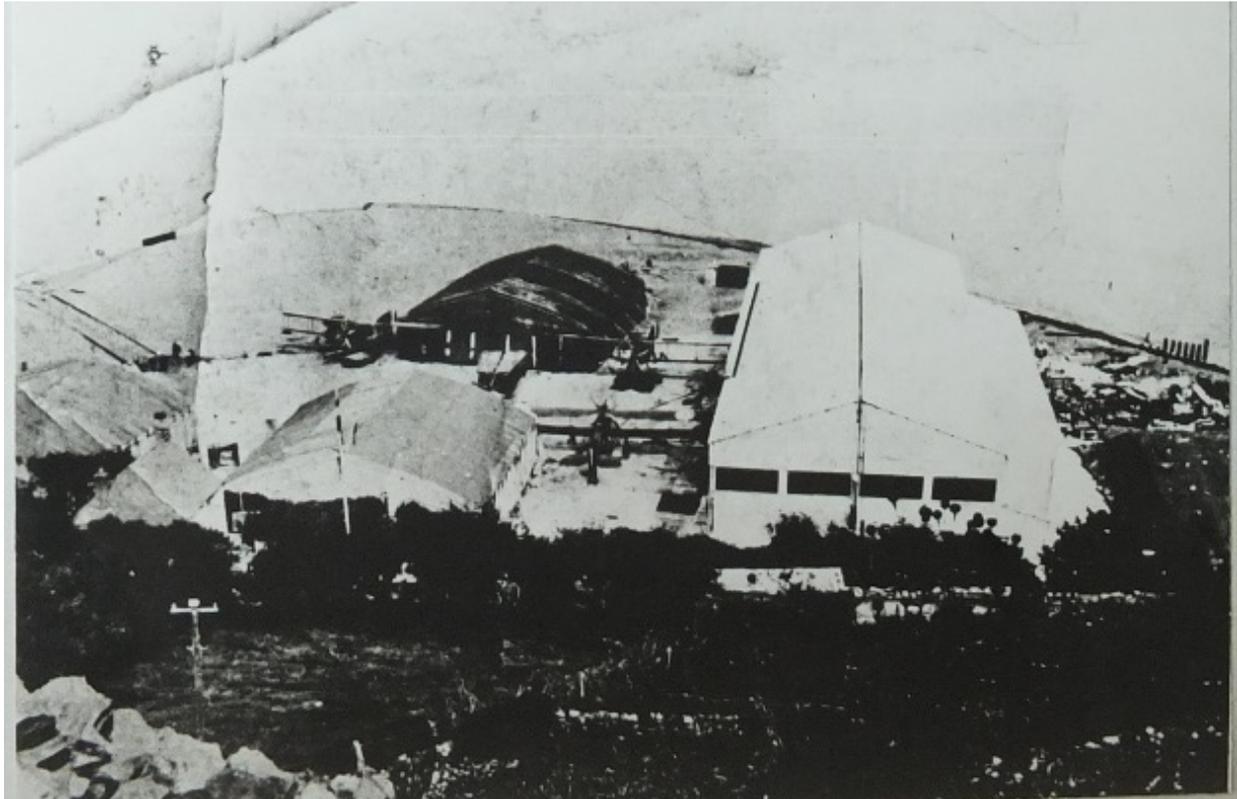


FIGURE 81: NEWLYN SEAPLANE STATION (COURTESY OF THE NATIONAL MUSEUM OF THE ROYAL NAVY: FAAM NEG NO A/STN 68)

3.8.1.2 Decommissioning

424 and 425 Flights were disbanded on 22 February 1919 (Lewis 1968: 82). The station was not immediately closed and was retained until August 1922 when it was earmarked for disposal on grounds of unsuitability (Delve 2006: 317). Heritage records indicate that very little appears to remain of the seaplane station other than timber foundations (Heritage Gateway 2017) and some concrete standing (Historic Cornwall 2017).

3.8.2 Fieldwork Results

The survey at Newlyn took place in the summer of 2016. The station was heavily demolished after the war and is now a large debris scatter abutting the coastal path. The scale and disbursed nature of the site lead to the rapid survey of concrete and metal elements using georeferenced photographs and drone survey. The site plan produced (Figure 82) demonstrates the scatter of concrete elements across the foreshore. Figure 83 overlays part of the site plan on aerial photographs demonstrating how the concrete remains are situated within and across the shore deposits and rocks.

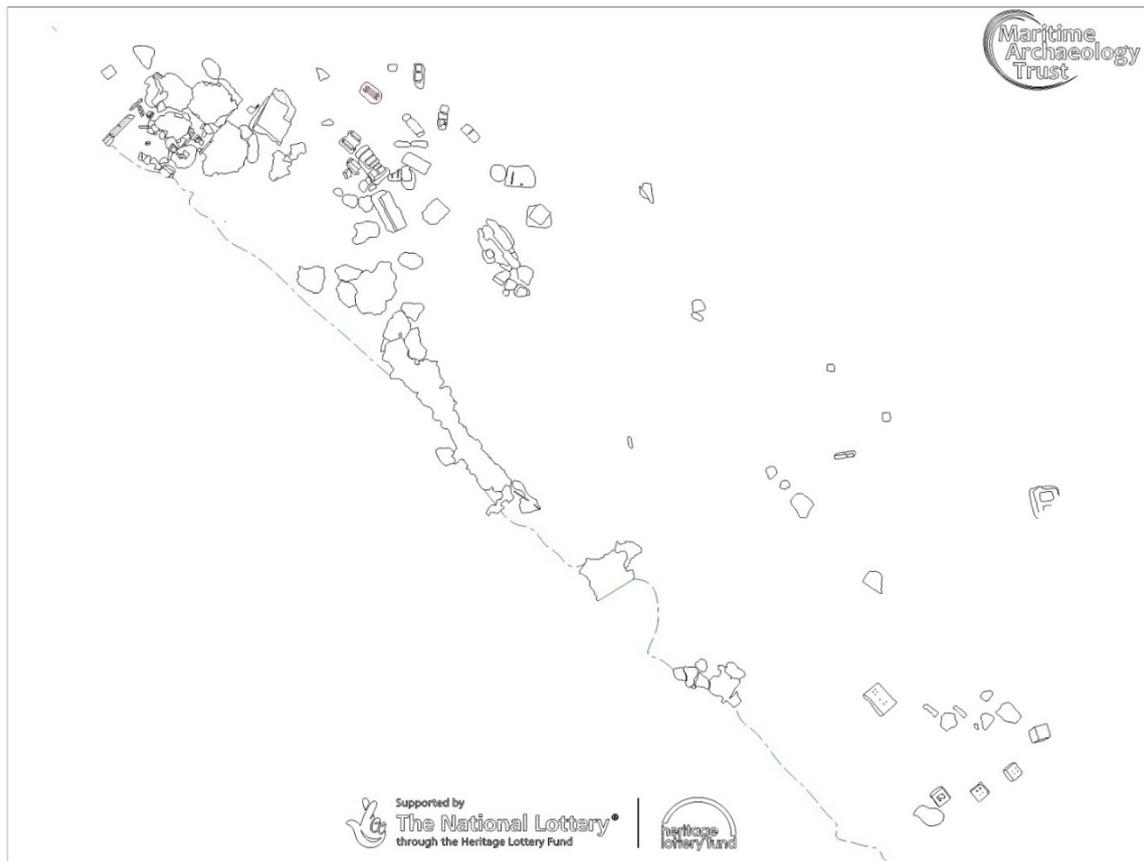


FIGURE 82: SITE PLAN OF NEWLYN SEAPLANE STATION REMAINS

The disarticulated pieces of concrete which are scattered across the foreshore are a wide range of shapes and sizes. The concrete used appears to be relatively uniform made up of dark coloured gravel inclusions within a paler concrete matrix (Figures 84 - 87). It appears that the foundations for the station have been broken up in a fairly unsystematic way as there are no pieces of concrete of a uniform size. It is difficult to positively identify specific features within the concrete, however, there are a number of pieces with sets of four iron pins/ bolts protruding from them which could have been the fixings for the bases of the stations of the large seaplane hangar (Figure 85). Other pieces have iron features, either within or fixed to them. Figure 86 shows what could be related to winching gear for the seaplanes. Several pieces of concrete have what appear to be sections of an iron track running across them (Figure 87) which could have been the runner for the sliding hangar doors, a very similar feature is present at the Newhaven site, still in situ within its hangar base.



FIGURE 83: PART OF SITE PLAN OVERLAIN ON AERIAL PHOTOGRAPHS



FIGURE 84: DISARTICULATED CONCRETE REMAINS OF NEWLYN SEAPLANE STATION



FIGURE 85: CONCRETE SECTION WITH IRON FASTENINGS WHICH COULD HAVE FIXED A HANGAR STANTION



FIGURE 86: CONCRETE PIECE WITH IRON FEATURE EMBEDDED WITHIN



FIGURE 87: CONCRETE PIECE WITH POSSIBLE TRACES OF HANGAR DOOR RUNNER

3.8.3 Discussion and Future Work

Fieldwork at the site confirmed that there is little of the original seaplane station remaining in-situ, with much of the concrete having been broken up into large chunks which are now scattered across the foreshore. There are some complete areas of concrete closer to the shore, which may relate to the station and further survey of this in comparison with historical photographs and aerial photographs may help identify what might be original.

It is not known when the concrete base was broken up, but it is likely that discussion with local residents would reveal more about this. Further review of aerial photographs may provide evidence of the concrete bases of the station prior to them being broken up.

3.9 PORTLAND

3.9.1 Site History

Although some seaplanes did use Portland earlier, on 25 September 1916 the Commander-in-Chief Portsmouth Sir Stanley Colville informed the Admiralty of the “*urgent necessity for establishing a sub-air station of 4 machines at Portland*” (TNA AIR 1/645/17/122/308). His reasoning was that a seaplane from Calshot had nearly managed – but failed – to destroy a U-boat attacking a steamer. Whilst the steamer was saved the Admiral expressed the view that aircraft from Calshot, being training aircraft, were not suitable for active service and that properly operational war machines “are a necessity.” (TNA *ibid*).

Only four days later on the 29 September the Head of Military Branch and Director of Air Service agreed to Colville’s request: a sub-station to Calshot would be established at Portland and four seaplanes were being sent to Calshot either to work from there or Portland ((TNA): AIR 1/645/17/122/308) . Portland’s status as a sub-station was for convenience of upkeep and repairs (TNA *ibid*).

Portland seaplane station became operational on 28 September 1916 as HMS Sarepta (The Encyclopedia of Portland History 2017). Its principal role was protection of shipping from the U-boat threat (Delve 2006: 202). The seaplane station was not set up on the site of the later HMS Osprey, instead being constructed at Castletown, further east between the Target and Camber jetties.

Using an existing slipway (see Figure 88) a canvass hangar was erected to house aircraft. It is not clear when the permanent hangar was built. The RAF's November 1918 Survey of Airfields confirms a canvas hangar and a seaplane shed, yet there does not appear room for both and the plan accompanying the entry does not clarify the situation.



FIGURE 88: SHORTS 184 ON THE SLIPWAY, IN FRONT OF A CANVAS HANGAR. PORTLAND PICTURE ARCHIVE, DATE UNKNOWN (PORTLAND PICTURE ARCHIVE 2017).

The RAF took over operations in April 1918 and in August No. 241 Squadron was formed from 416, 417 and 513 Flights based at Portland and nearby Chickerell (Royal Air Force 241 Squadron 2017). Aircraft flown included Short 184s, Fairey Campanias as well as a few Wright Seaplanes (The Encyclopaedia of Portland History 2017).

3.9.1.1 Summary of Structures

The RAF's quarterly airfield survey of Autumn 1918 numbers 190 personnel and 12 floatplanes on establishment. The site covered only $\frac{1}{2}$ an acre. All buildings were recorded as complete except the meteorological hut which was due to begin construction on 1 November 1918. A map discovered within the Fleet Air Arm Archive folder for Portland seaplane stations (Figure 89) indicates that a seaplane shed extension was under construction, it also shows the position of a range of the bases supporting buildings and facilities. The larger hangar was clearly in place by November 1917 as Figure 90 shows it in use with seaplanes outside.

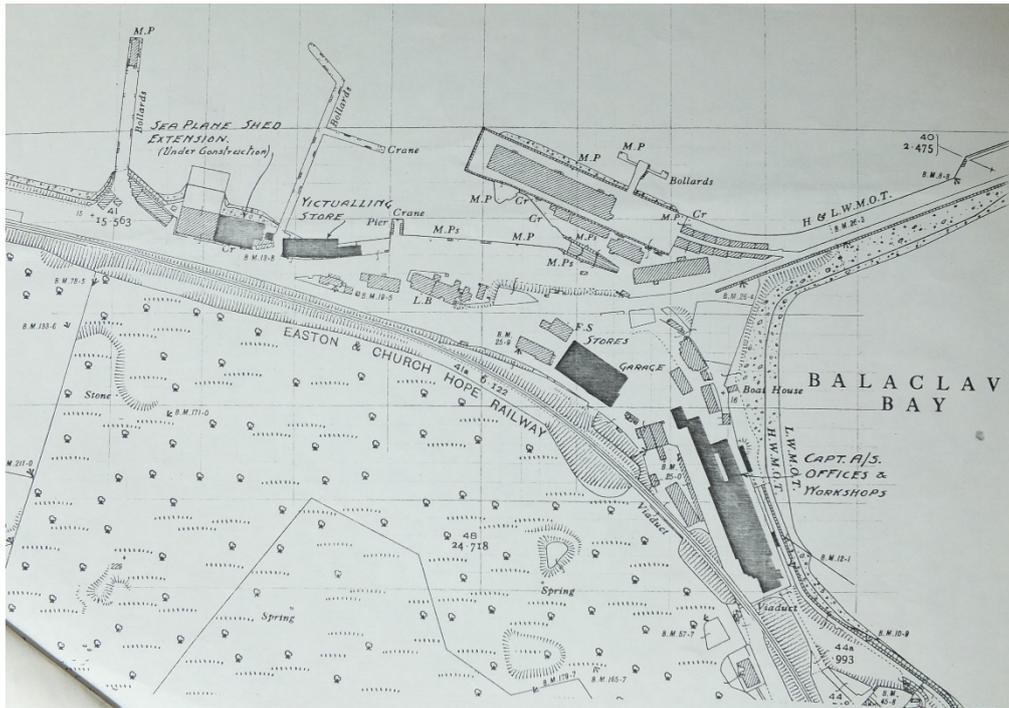


FIGURE 89: MAP OF PORTLAND SEAPLANE STATION BUILDINGS AND FACILITIES

TABLE 3.9: BUILDINGS AND STRUCTURES AT PORTLAND, OCTOBER

Technical buildings	Regimental buildings
Seaplane shed, 90'x60'	Portland Castle and the Castle Inn are occupied by personnel. There is also a: <ul style="list-style-type: none"> • Mess Hut • Regimental Store • Coal Yard • Swimming Baths
Canvas Hangar	
Slipway	
Motor Transport Shed	
Workshops <ul style="list-style-type: none"> • Carpenters', 40'x25' • Fitters', 20'x23' 	
Motor Generator House	
Accumulator and Engine Boiler House	
2x Technical Stores	
Oil Store	
Petrol Store	
Engine Store	
Offices	
Latrines	
Bomb Store	
Ammunition Store	
Pigeon Loft	
Wireless Telegraphy Station	
Meteorological Hut (at Portland Bill)	



FIGURE 90: PORTLAND SEAPLANE STATION WITH HANGAR, NOVEMBER 1917 (COURTESY OF THE NATIONAL MUSEUM OF THE ROYAL NAVY (NEG NO A/STN 348))

3.9.1.2 Decommissioning

The squadron was disbanded on 18 June 1919 (Royal Air Force 241 Squadron; 2017). The station was retained throughout the interwar period experiencing very little activity until just before the Second World War (Delve 2006: 202).

The more recent and commonly known RNAS Portland / HMS Osprey is not on the site of the seaplane station HMS Sarepta, which now appears to have no remaining First World War structures, although remnants of the slipway can be seen in the harbour. Prior to the hangar being dismantled the Fleet Air Arm Museum undertook extensive survey and photography, retaining part of the structure within their collection at Yeovilton. Today, a large warehouse dominates the site and the entire area is now part of Portland Port.

3.9.2 Discussion and Future Work

Further work to photograph the remains of the slipway that can be seen in the harbour may be possible to ensure there is a record of these remains, there is also potential for buildings used as part of the station to survive at the Port which could be subject to survey. Examination of the archive of photographs of the hangar prior to dismantling that are held at the Fleet Air Arm Archive would provide more evidence of the detail of this type of hangar and would be useful for comparison with other known examples.

3.10 TORQUAY

3.10.1 Site History

The history of this station is relatively short. Situated between two piers, the foreshore and the road behind, RNAS Torquay was a cramped site. Opened in early 1918 six Short 184s were established at the station (Delve 2006: 319).

In June 1918 the RAF reorganised the aircraft into 418 (Special Duties) Flight of 239 Squadron carrying out coastal patrols and anti-submarine work (Delve *ibid*; Royal Air Force 239 Squadron, 2017). By late 1918 the number of aircraft had increased to 12 as well as some balloons operating there as a sub-station of Merifield Balloon station near Plymouth (Delve *ibid*; (TNA Air1/ 452/15/ 312/26 vol V).

There was no slipway at the station (TNA *ibid*). The derrick on Haldon Pier appears to have been used to move aircraft into and out of the water (see Figure 91). South Pier is also shown as within the confines of the station so may also have been used.

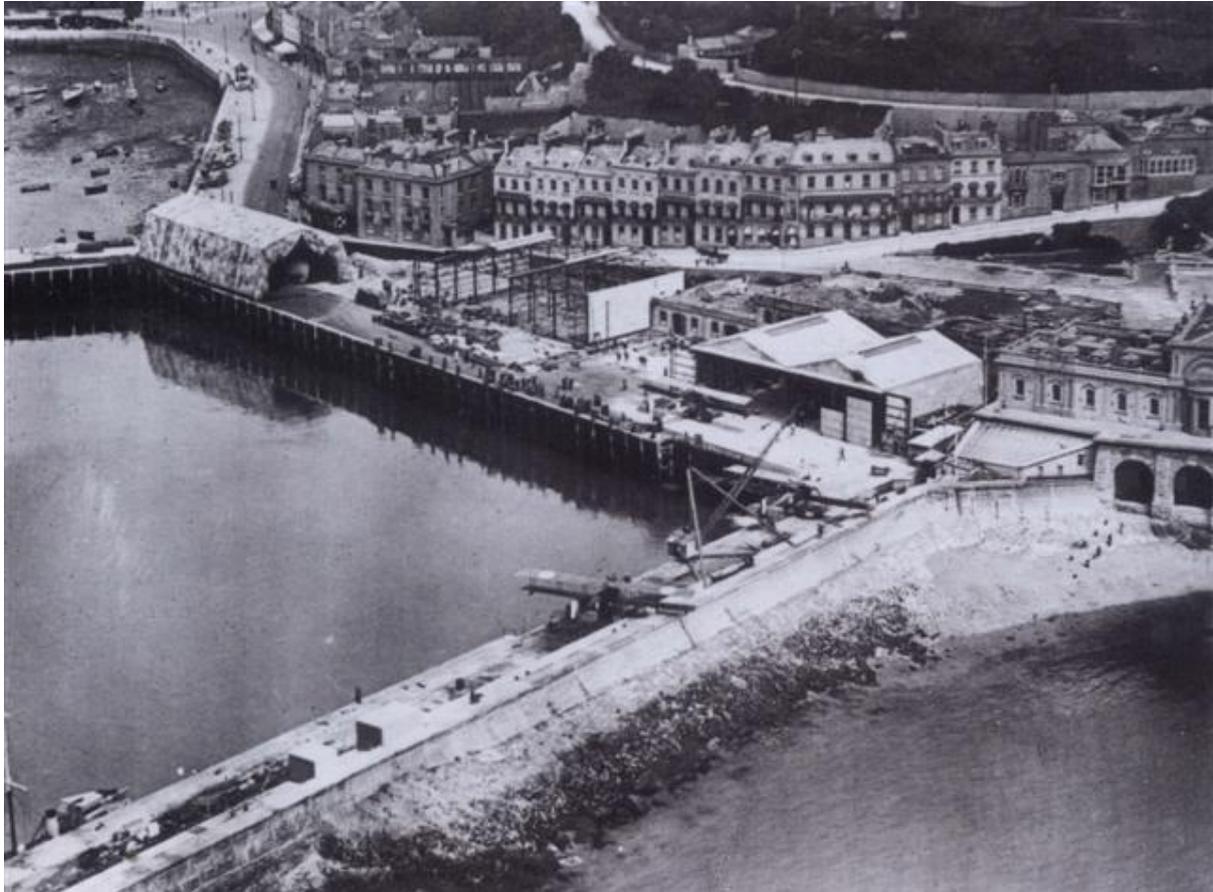


FIGURE 91: TORQUAY SEAPLANE STATION. AERIAL VIEW FROM THE SOUTH WEST. NOTE THE UNFINISHED SEAPLANE SHED, AND DERRICK ON THE NEAREST (HALDON) PIER. 1918 (DEVON AIRFIELDS 2017)

3.10.1.1 Summary of Structures

The RAF's Quarterly Airfield Survey of Autumn 1918 states 190 personnel and 12 floatplanes on establishment, and included four small balloons (Delve 2006: 315). The site covered only four acres on the waterfront at Beacon Quay between South Pier and Haldon Pier. Waters were smooth with "fair mooring facilities." (TNA Air1/ 452/15/ 312/26 vol V).

As of 26 October 1918 the station was not complete but was expected to be so only five days later on the 31st. Progress was recorded for the buildings and works with percentage complete as sheds (75%), technical buildings (80%) and lighting (5%).

TABLE 3.10: BUILDINGS AND STRUCTURES AT TORQUAY, OCTOBER

Technical buildings	Regimental buildings
4 x Seaplane Sheds, 60' x 48'	Personnel are billeted and the Sea Lawn Hotel was taken over. There is a "Day Quarters" Room for Officers on the Station. No.11 Beacon Terrace is adapted as a Women's Hostel, and the Coastguards' Boat House for the Women's Mess Room.
1 x Balloon Shed, 105' x 60'	
3x Canvass Hangars, 66'x66'	
Workshops <ul style="list-style-type: none"> • Engineers', 55'x30' • Carpenters', 60'x30' • Dope Shop, 40'x20' • Blacksmiths' Shop 	
Oil Store	
Petrol Store	
General Store	
Offices and Guard Room	
Armoury	
Detonator Store	
Ammunition Store	
Derrick (on Haldon Pier)	
Pigeon Loft	

3.10.1.2 Decommissioning

239 Squadron was disbanded in May 1919 (Royal Air Force 239 Squadron, 2017). The site was then sold (Delve: 2006: 315). None of the structures built for the station appear to survive, although the Haldon Pier is still in use. Now a busy marina, shops and restaurants sit on the site and the foreshore is now largely obscured by imposing concrete slipways built for embarking soldiers and materials for the D-Day landings (Airfield Research Group, 2017).

3.10.2 Discussion and Future Work

A site visit was not undertaken as part of the project, so it is not known whether any traces of features related to the seaplane base survive on site. There are substantial changes to the area, as mentioned above, however, there is still potential for surviving features.

3.11 TRESKO

3.11.1 Site History

The general lack of threat of a German invasion on the south coast – especially in the far south west – meant that little serious investment was made on coastal defence in Cornwall and the Isles of Scilly during the First World War (Historic Cornwall 2017). However, the U-boat threat was very real and the Western Approaches were a key battle ground. In concert with Newlyn, Tresco would extend anti-submarine air power further westward (TNA Air1/ 452/15/ 312/26 vol V).

It nevertheless took several attempts to establish a seaplane station on the Isles of Scilly. In 1916 a detachment of Short 184s was making use of temporary moorings at St Marys' Harbour. This was not a successful arrangement so in January 1917 a station was established at Port Mellon. By February 1917 Curtis H12 Large America flying boats were using moorings there. However the station was

relocated to New Grimsby Harbour on Tresco before it became operational: a survey of the island had suggested the move and in Spring 1917 a seaplane station opened on the foreshore there (Delve 2006: 320).

A substantial seaplane station was constructed, including two large hangars, a single slipway and a large number of support and personnel buildings, presumably to ensure the viability of the station given it was some distance from the mainland and sources of supply (Figures 92 and 93).

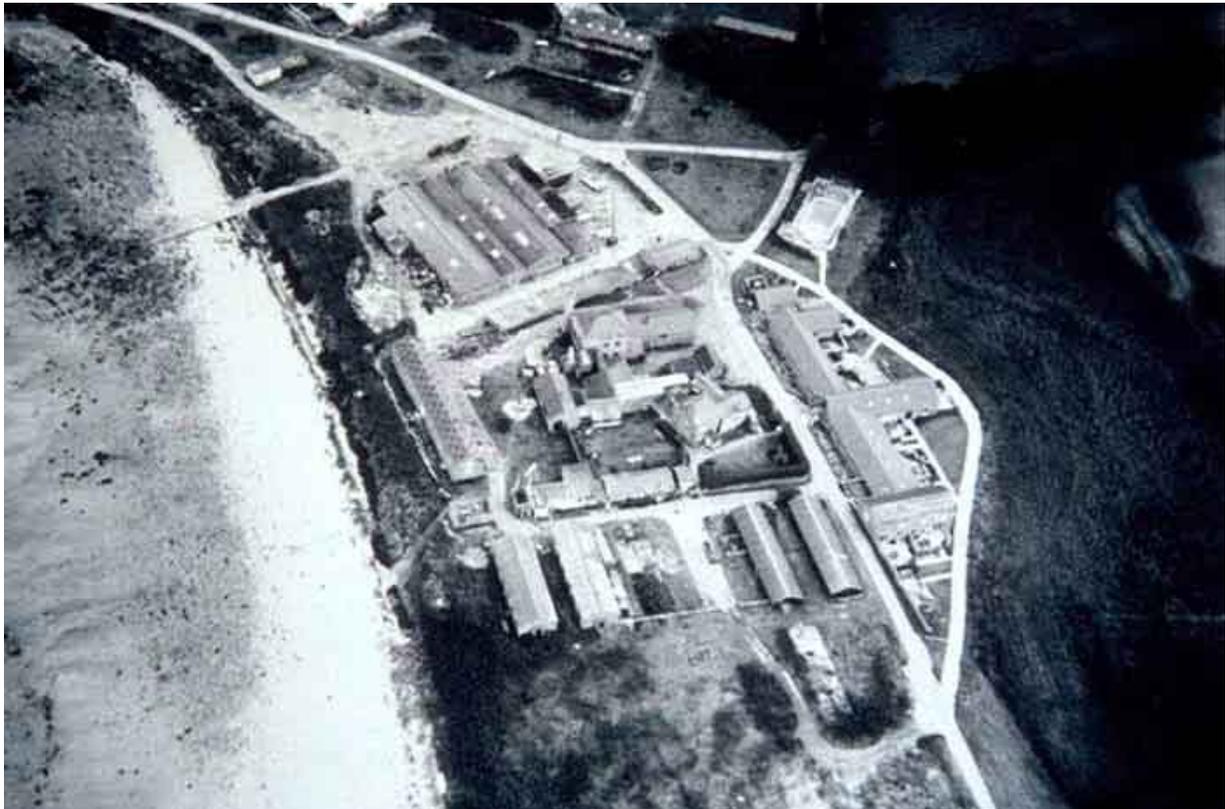


FIGURE 92: THE SEAPLANE STATION AT NEW GRIMSBY, TRESKO (FROM THE SOUTH WEST). THE RAMP TOWARDS THE TOP LEFT OF THE PHOTO WAS FOR TAKING THE PLANES DOWN TO THE WATER. HISTORIC CORNWALL, DATE UNKNOWN.

The first operational patrol took place on 28 February 1917 and by the end of the war there had been 13 U-Boat sightings, nine attacks and one suspected yet unlikely kill (Tresco Estate 2017). By the end of the war four Flights (350-353) of seaplanes operating various types were established at Tresco as part of 352 Squadron (Delve 2006: 320).

3.11.1.1 Summary of Structures

The RAF's Quarterly Airfield Survey of Autumn 1918 shows 348 personnel and 12 Felixtowe F3 Flying Boats on establishment, using a 20 acre main site and another ten acre in six small plots in the nearby area. Excellent mooring facilities for six flying boats and usually smooth water – despite strong tides – are recorded.

TABLE 3.11: BUILDINGS AND STRUCTURES AT TRESKO, OCTOBER 1918.

Technical buildings	Regimental buildings
2x Seaplane Sheds <ul style="list-style-type: none"> • 1x 200'x100' • 1x 105'x45' 	Officers' Mess
Slipway	Officers' Quarters
Workshops <ul style="list-style-type: none"> • Engine Repair Shop, 20'x10' • Fitting Shop • Dope Shop 	Officers' Baths
Technical Stores	Officers' Latrines
Oil Store	Sergeants' Mess
Petrol Store	Sergeants' Latrines
Offices	Regimental Store
Power House	Dining Room (Men's)
Latrines	Recreation Room
Guard House	E.I. School
2x Bomb Stores	12x Men's Huts
Water Tower	Men's Baths
Camp Store	Men's Latrines and Ablution
Materials Store	Drying Room
Store Shed (Cement)	Coal Yard
Pigeon Loft	Baggage Store
Wireless Telegraphy Station	Meat Store
Lookout Tower	Sewage Tank
	Women's Hostel
	Cold Storage Building

Although when surveyed on 1 September 1918 the station was not completed it was estimated that it would be by 31 October (TNA *ibid*). The state of completion of works and buildings was provided as a percentage: shed (90%), technical buildings (80%), regimental buildings (75%), women's hostel (10%) and water supply (45%).

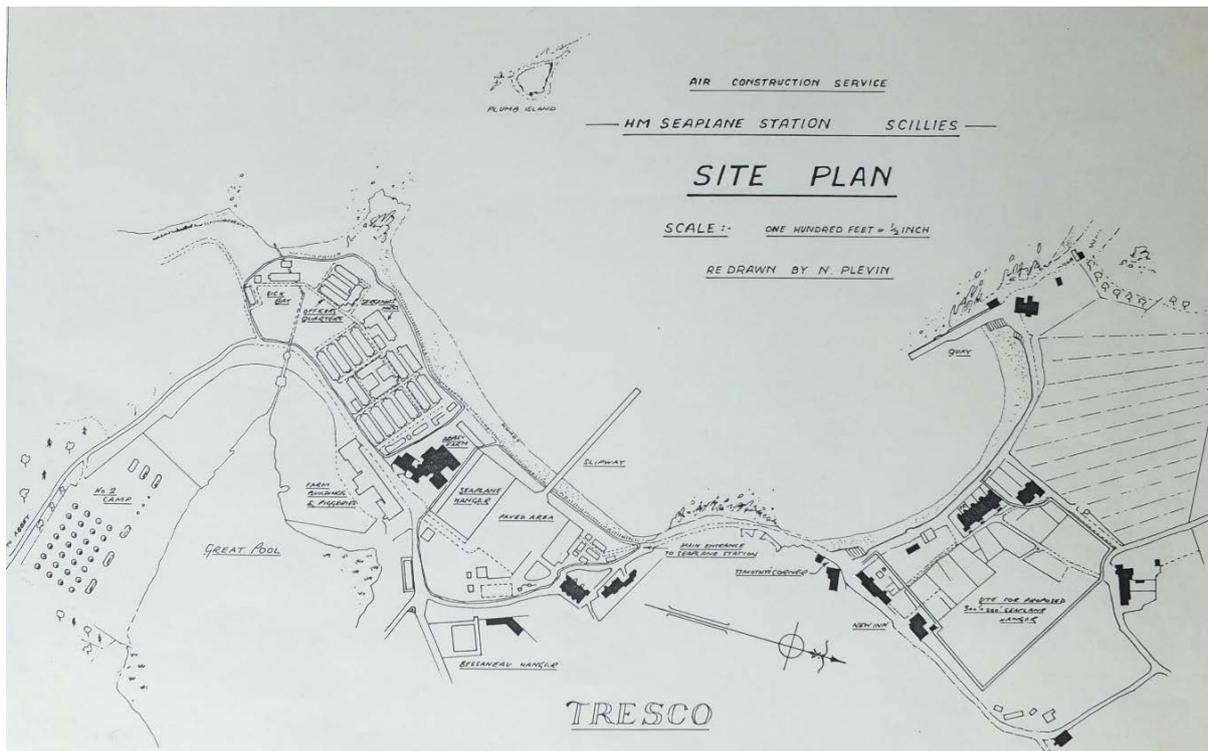


FIGURE 93: PLAN OF TRESCO SEAPLANE STATION (COURTESY OF THE NATIONAL MUSEUM OF THE ROYAL NAVY)



FIGURE 94: THE SEAPLANE STATION AT TRESCO LOOKING FROM THE SHORE TOWARDS THE HANGARS (COURTESY OF THE NATIONAL MUSEUM OF THE ROYAL NAVY)

3.11.1.2 Decommissioning

The squadron was disbanded in May 1919 (Delve 2006: 320).

Little of the station survives and it is largely overbuilt with modern houses and other buildings. It is reported that a former potato store used for bomb storage and known as The Bothy does remain, despite being damaged in an explosion, and an agricultural building converted into a power house also survives (Tresco Estate 2017). Concrete standing is still visible as well as the slipway (Historic Cornwall 2017) and iron rails on the slipway show where flying boats and seaplanes were launched and recovered on trolleys (Tresco Estate 2017). However, this information may have been overtaken by development of the site.

3.11.2 Discussion and Future Work

A site visit was not undertaken as part of the project, so it is not known whether any traces of features related to the seaplane base survive on site. There is considerable scope for more research and survey of this site.

3.12 WESTGATE

3.12.1 Site History

This station at St. Mildred's Bay on the Isle of Thanet coast near Margate was opened on 1 August 1914. To begin with aircraft would be dragged along the gentle slope of the beach to and from the sea, though by the late summer slipways, a hangar and other buildings were constructed. Once again buildings were requisitioned, including St. Mildred's Hotel being pressed into service for accommodation.

By the end of the year two seaplanes had been permanently posted to the station. As well as reconnaissance and anti-submarine work (TNA Air1/ 452/15/ 312/26 vol V) they also had a responsibility not generally shared by the seaplane stations on the Channel Coast: interception of Zeppelins (Delve 2006: 266).

An airfield was constructed on top of the cliffs to the east. Before long, however, it became clear that it was not suitable: there were several accidents. The airfield based aircraft were moved to Manston in July 1916 (Delve 2005: 266).

Upon the creation of the RAF, the aircraft were reorganised becoming 406 (Seaplane) Flight in July 1918, joining 219 Squadron in August (Delve 2005: 266), and 442 Flight joining 230 Squadron (date unknown) (TNA *ibid*). A variety of types were flown: Short 184s, the Fairey IIIb, Curtis H12 Large Americas, Sopwith Babys and Avro 504s (Lewis 1968: 78). 219 Squadron had a land-based element and it is not clear whether the Avros were the seaplane or landbased version.

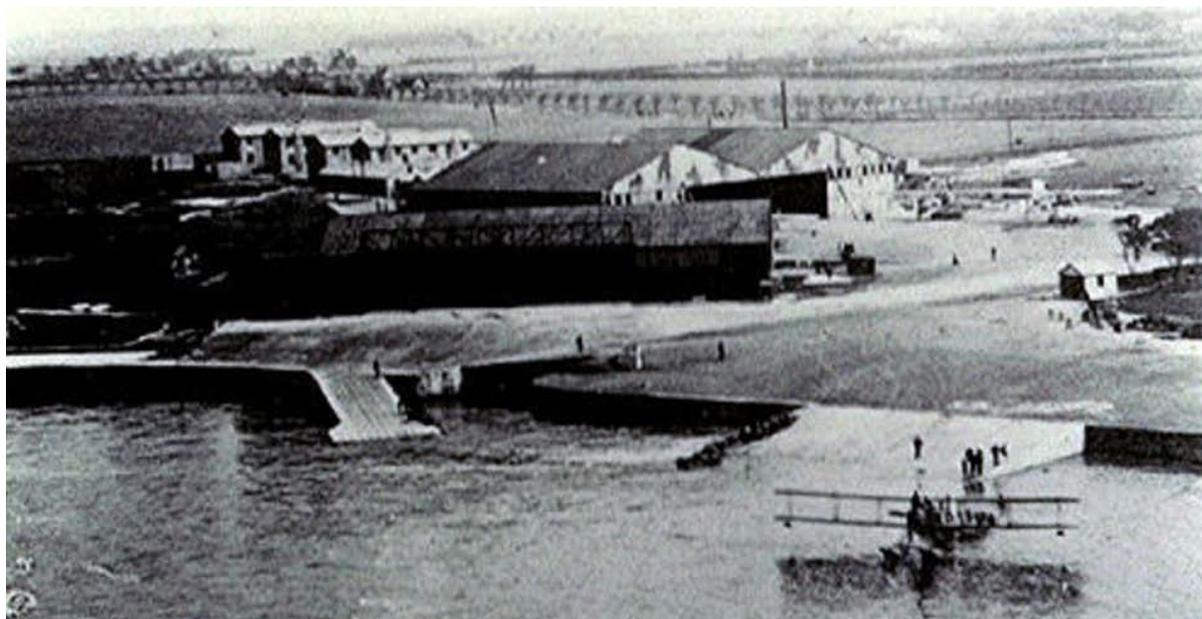


FIGURE 95: WESTGATE TAKEN FROM THE NORTH, A SHORT 184 IN THE WATER. MAX MONTAGUT, FLICKR. DATE UNCERTAIN – GIVEN AS 1914.

3.12.1.1 Summary of Structures

Occupying 23 acres fronting a firm sandy beach but rocky waters the RAF's Quarterly Survey of Airfields in autumn 1918 stated that 134 personnel were on establishment alongside a dozen float seaplanes. The station was considered to be complete when surveyed.

TABLE 3.12 - BUILDINGS AND STRUCTURES AT WESTGATE, AUTUMN 1918.

Technical buildings	Regimental buildings
2x Seaplane Sheds <ul style="list-style-type: none"> • 1x 180'x60' • 1x 200'x100' 	Sergeants' Mess
2x Slipways	Sergeants' Latrines
Motor Transport Shed	Regimental Institute
Workshops <ul style="list-style-type: none"> • Welders, 30'x20' • Dope, 45'x25' 	Regimental Store
Technical Store	4x Men's Huts
Oil Store	Men's Baths
Petrol Store	Men's Latrines and Ablution
Wireless Station	Drying Room
Offices	Women's Hostel
Power House	
Latrines	
Guard House	
Machine Gun Range	
Armoury	
Ammunition Store	
Detonator Store	
Pigeon Loft	

3.12.1.2 Deccomisioning

219 Squadron was disbanded on 7 February 1920 (Lewis 1968: 78). It is not known if the seaplane Flight survived up to this point. The seaplane station closed on the same date and was immediately put up for sale (Delve *ibid*).

The site is now occupied by a mixture of residential homes, grassed areas, a promenade and car parking. No seaplane station structures appear to remain and the Westbrook Promenade occupies what once was the station's frontage however there is a slipway that may be part of the original.

3.12.2 Discussion and Future Work

A site visit was not undertaken as part of the project, so it is not known whether any traces of features related to the seaplane base survive on site. There is considerable scope for more research and survey of this site.

4 Discussion & Conclusions

The work undertaken as part of the Forgotten Wrecks of the First World War project has developed understanding of the locations and history of the south coasts seaplane stations. While it has not been possible to undertake sites visits and/or field survey on all of the sites, where work has been undertaken it demonstrates the potential for the survival of archaeological remains of the stations.

The available historical archive, which includes plans and a range of historic photographs has been vital for understanding the physical form of the stations, hangars and associated facilities. Photographs have often been the key source for revealing when more temporary canvass covered hangars were replaced with more permanent structures.

Review of modern aerial photograph resources enabled initial assessment of whether there were likely to be physical remains of the various stations, particularly identifying sites where there had been little modern development. This information helped target sites for field investigation and survey. However, for stations where there has been more recent development the aerial photograph resources did not enable a confident assessment of whether physical remains may still survive.

Archaeological survey of stations where substantial remains of the floor plan survives (such as Newhaven) demonstrated the potential detail that can be gathered to help understand the 'as built' sites. Features such as the fixings for hangar stations, runners for hangar doors and bases for site facilities enabled direct comparison of the physical remains with the available historical plans, such as those for the design of different hangar types.

There are a large number of potential research avenues that could be followed up to further understanding of the archaeological potential and heritage significance of the remains, they include:

- Undertaking site visits to each of the stations to confirm whether any physical remains survive
- Undertake site survey to enable comparison of the 'as built' stations with planned layouts from historical documents
- More detailed comparison of the site plans of the stations to review whether there are similarities with layouts beyond the positioning of hangars in relation to slipways
- Positively identifying the specific hangar types represented at each site
- Use detailed archaeological survey of sites with extant hangar and hangar bases to compare the 'as built' remains to the plans
- Survey and comparison of the physical remains of the slips for the seaplanes to access the water to determine how they were influenced by local foreshore conditions

While the project has enabled a significant step forward in the understanding of the physical archaeological remains of the south coasts seaplane stations, there is further work to expand this knowledge base.

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