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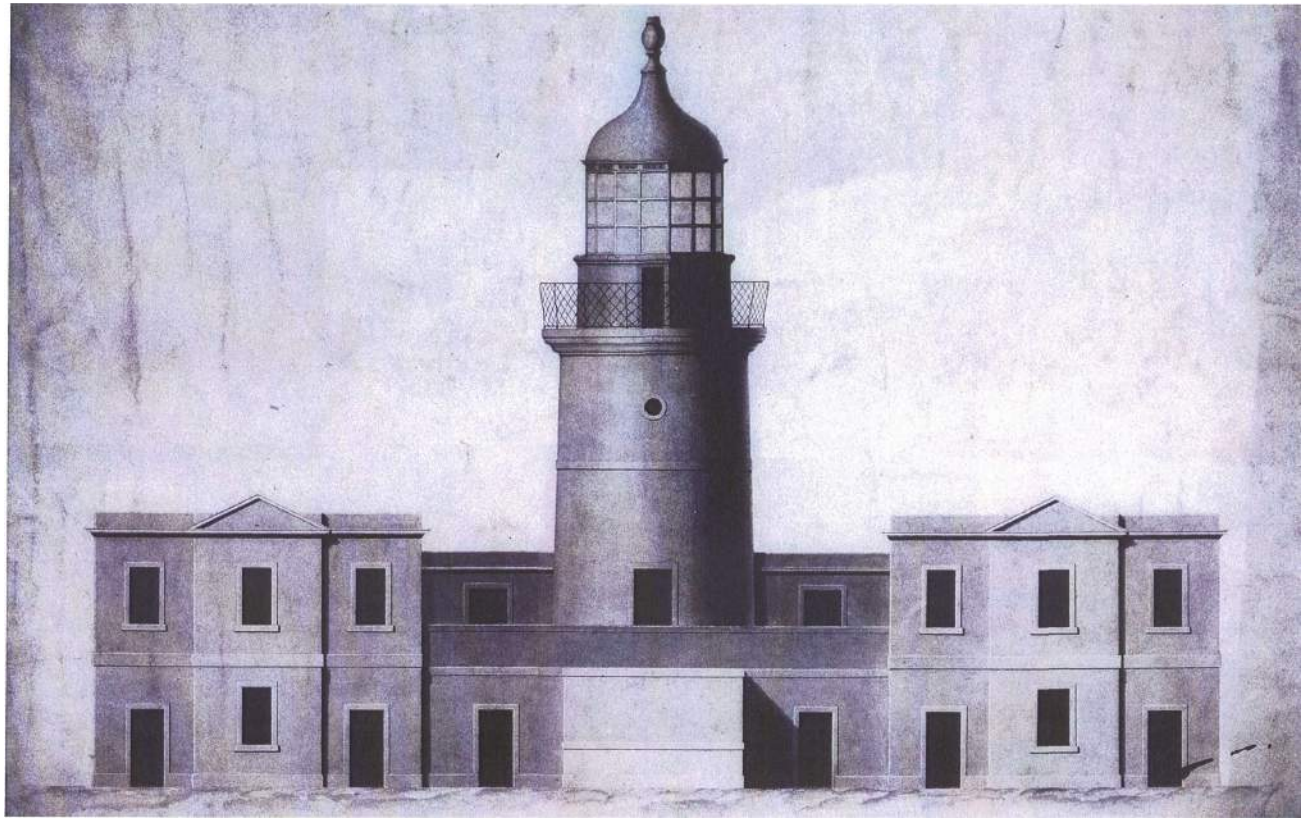

SUMBURGH HEAD LIGHTHOUSE RESTORATION AND DEVELOPMENT PROJECT
CONSERVATION MANAGEMENT PLAN

March 2009

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SUMBURGH HEAD LIGHTHOUSE

Conservation Management Plan

Executive Summary

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Appendices

1	*Condition survey*	
2	*Grading of significance*	
3	*Schedule of repairs*	
4	*Consultant report*	*Archaeology*
5	*Consultant report*	*Landscape*
6	*Consultant report*	*Geology*
7	*Consultant reports*	*Structural Engineering*
8	*Consultant reports*	*Ecology*
9	*Consultant report*	*Navigational significance*
10	*Consultant report*	*Wartime*
11	*Consultant report*	*Access*
12	*Consultant report*	*Maintenance Cost Model*
13	*Statutory designations*	*Ecology & Buildings*
14	*Historic Scotland Arch 1 report*	
15	*Heritage Impact Assessment*	
16	*Historic Drawings & Maps*	
17	*Consultant report*	*Lighthouse development*

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EXECUTIVE SUMMARY

Date of Adoption by Stakeholders

This Conservation Management Plan has been developed between September 2008 and March 2009 in accordance with the brief issued by SAT, and based on the guidelines set out by the Heritage Lottery Fund.

Statement of Significance

The research and survey work documented in this plan clearly demonstrates that the site at Sumburgh Head is of **outstanding cultural significance** because of:

- *Its exceptional historic value.*
- *Its exceptional architectural and aesthetic value.*
- *Its exceptional scientific and engineering value.*
- *The exceptional value of its setting and surrounding landscape.*
- *The exceptional value of the ecology of the site and its wider environs.*
- *Its exceptional geological value.*
- *Its social value to the local community and Shetlanders as a whole.*
- *Its considerable archaeological value.*

Statement of Policy

Future management of and works to Sumburgh Head must be concerned with conservation and repair of the lighthouse and other buildings on the site, its setting and the wider landscape within which it sits, with the possibility of adapting the existing buildings and identifying the potential for any new development on the site. The policies developed in order to support this aim are:

Conservation policies

1. *General - Conserve and manage the cultural significance of the site and in doing so enhance that significance*
2. *Setting and landscape - Conserve the setting and the landscape of the site*
3. *Ecology - Conserve the ecology of the site*
4. *Archaeology - Conserve the archaeology of the site*
5. *Architecture and buildings - Conserve the significant built fabric of the site*
6. *Moveable heritage - Conserve the moveable heritage of the site*

Management policies

7. *Use - Review the current and future use of all buildings on the site and identify sustainable and appropriate new uses for each*
8. *Property Management - Prepare and implement a system of property management consistent with 1 above.*
9. *Access - Optimise public access to the site consistent with 1 above.*
10. *Recreation, culture and tourism - Encourage tourism, cultural and recreational uses of the site consistent with 1 above.*

1 INTRODUCTION

1.1 Introduction

This Conservation Management Plan (CMP) has been commissioned by Shetland Amenity Trust (SAT) and is intended to provide a management framework for the conservation of Sumburgh Head lighthouse site in such a way that its significance is retained in any future development proposals.

1.2 Background

The lighthouse at Sumburgh became fully automated in 1991. The Northern Lighthouse Board retained ownership of the Lighthouse tower and a small building for operational/infrastructure purposes but sold the remaining redundant lighthouse outbuildings and Sumburgh Head to a private buyer. An RSPB Reserve was established by agreement at Sumburgh Head in 1994. This agreement currently runs until 2012. In addition the RSPB relocated its Shetland office to the site in 1996. In late 2002 Shetland Amenity Trust purchased Sumburgh Head and the redundant buildings. SAT currently also offer holiday accommodation in one of the former lighthouse keeper's cottages.

In December 2003, a design team led by conservation-accredited architects Groves-Raines Architects was commissioned by SAT to produce a document for the conservation and development of the Sumburgh Head Lighthouse. In March 2004 Historic Scotland's District Architect produced an Arch 1 report for Sumburgh Head Lighthouse (the tower and other structures are Category A Listed) and this was passed on to the Design Team to inform their work. An application for funding towards this project from Historic Scotland was successful, and on 1st September 2005 the Trust received written confirmation of their indicative offer of £392,663.

Following this, in March 2008 SAT secured a Stage One Pass and an award of development funding from the Heritage Lottery Fund (HLF) towards a project aimed at restoring and developing the Sumburgh Head site to provide a first class visitor attraction. A reorganised and expanded Design Team was commissioned to take the project forward. In order for the Stage Two Pass to proceed, the HLF listed a number of requirements that needed to be addressed, including preparation of a Conservation Management Plan.

Further more detailed information on the background to the Sumburgh Head project and what it involves is included in sections 1.4 and 1.5 below.

Fig. 1.1 View of Sumburgh Head Lighthouse from the access road looking west

1.3 Authorship and copyright

Groves-Raines Architects Ltd has prepared this CMP with input where appropriate from the following organisations or individuals:

Architects and Design Team Leaders:
Groves-Raines Architects Ltd

Quantity Surveyors & Cost Consultants:
Morham & Brotchie

Structural Engineers:
David Narro Associates
(Elliott & Co – authors of Feasibility Study report)

Building Services Engineers:
Irons Foulner Partnership

Landscape Consultants:
Robertson & McIntosh

Archaeologists:
CFA Archaeology

CDM Coordinators:
David Adamson & Partners

Ecological consultants:
Royal Society for the Protection of Birds (RSPB)(Scotland).

Other consultants:
Bob McIntosh, BSc. C Eng
Project Group-Team Leader, Northern Lighthouse Board; Chair of WG 2 on Heritage, Conservation and Civil Engineering of The Engineering, Environment and Preservation of Historic Lighthouses (EEP), Committee of the International Association of Marine Aids to Navigation and Lighthouse Authorities (IALA-AISM).

Professor John R Hume, OBE, BSc ARCST, Hon FRIAS, FSA Scot
Chairman of the Royal Commission on the ancient and Histroical Monuments of Scotland and Honorary Professor at the Universities of Glasgow and St. Andrews.

Invaluable assistance was also provided by staff from Shetland Amenity Trust, Shetland Museum & Archive and the Northern Lighthouse Board.

1.4 The site

Sumburgh Head is situated at the southern tip of Mainland Shetland, just 3km from Sumburgh airport. The lighthouse has an iconic status, and is the first building to be seen by visitors arriving in Shetland by air or sea.

Sumburgh Lighthouse is a Stevenson Lighthouse and is considered by Historic Scotland to represent one of Scotland's finest surviving pieces of early nineteenth century architecture. It was built by Robert Stevenson (grandfather of the famous author, Robert Louis) in 1819 and completed in 1821. A number of outbuildings and ancillary structures have been added subsequently, some of which are of considerable interest in their own right. For example, another of the Stevenson dynasty, David A Stevenson, built the foghorn in 1905. The buildings are Category A Listed and set amidst superb seascapes with a spectacular view south to Britain's most isolated inhabited island, Fair Isle.

A World War II Chain Home Low Radar station, one of the earliest such buildings in Britain, is situated in close proximity to the Lighthouse and indeed because of this proximity was in contravention of the Geneva Convention. Sumburgh Head was of strategic importance during the war and a great deal of wartime activity occurred in the Sumburgh area.

Sumburgh Head was notified as a Special Protection Area (SPA) under the European Union Birds Directive in 1995. It is also designated a Site of Special Scientific Interest (SSSI). An RSPB Reserve was established by agreement at Sumburgh in 1994. In addition the RSPB relocated its Shetland office to the site in 1996. Both the reserve and the offices are currently leased from SAT until 2012.

Fig. 1.2 Aerial view of Sumburgh Head

The SPA supports some 35,000 breeding seabirds including good numbers of Fulmar, Guillemot, Kittiwake, Puffin, Razorbill and Shag. It is one of the most accessible seabird colonies in the British Isles. A surfaced road runs close to the cliffs enabling the visitor easy access to large numbers and a good diversity of breeding seabirds. Puffins, much favoured by visitors, will even approach to within arms length.

Sumburgh is a key monitoring site under the Shetland Oil Terminal Environmental Advisory Group's (SOTEAG) Seabird Monitoring Programme. Consequently there is a superb run of data going back over 20 years relating to seabird population size and breeding success.

Since 1990 Sumburgh Head has become one of Shetland's premier sites for whale watching. Killer and Minke Whales are seen regularly during the summer months, along with dolphins and porpoises. During the mid 1990s Humpback Whales spent several weeks off Sumburgh over several successive summers. Despite regular sightings though, a slice of luck is still needed to encounter whales and dolphins. Grey Seals are, however, far more predictable and can be found regularly at the foot of the cliffs.

Sumburgh Head serves as an important landmark and landfall for migrating birds in spring and autumn. As such it is popular with birdwatchers and the buildings and surrounding bushes are checked several times a day during migration periods.

Fig.1.3 Puffins at Sumburgh

A small quarry in the cliffs below Sumburgh Head contains an exposed bed of impure limestone containing fossil Devonian fish. This particular bed is the earliest known fish-bed in the Devonian rocks of the Orcadian basin. The grasslands at Sumburgh support an array of salt-tolerant herbs, a diverse fungal flora and a suite of lichens and bryophytes including several nationally scarce and one near-threatened species.

Sumburgh Head is situated close to two of Shetland's key archaeological sites. Historic Scotland's famous 4,000 year old site at Jarlshof, and the exciting iron-age village at Old Scatness, owned by Shetland Amenity Trust. The close proximity of three of Shetland's most exciting and spectacular tourist attractions

has meant that they have become known locally as the 'Golden Triangle', providing the south end of Shetland with a huge opportunity to derive enhanced socio-economic benefits from tourism.

1.5 The current project

Please refer to 1.2, above, and SAT's Business Development Plan.

Following private purchase there was limited investment in the site and the buildings were not opened to the public. The East Pavilion was converted for use as RSPB offices and the former Principal Keeper's Cottage was converted into holiday accommodation. Without refurbishment many buildings started to deteriorate.

In 2000, Sumburgh Head was identified by the Community Council as a key site for development as a visitor attraction due to its unique mix of architectural and natural heritage. Immediately following this, SAT approached the owner about the possibility of purchase as it had become apparent that he was having difficulty in securing funding to maintain and develop the lighthouse buildings.

Following the purchase of the site by SAT in 2002, several pieces of external infrastructure needed securing or removal for safety reasons. During the winter of 2002/03 it was evident that the visitor accommodation was suffering considerable water ingress with damp patches were noted in most rooms. In response the Trust undertook significant repairs to the cottage in May 2003. It became obvious that some aspects of the buildings would present serious health and safety issues within the next ten years if further significant work were not undertaken.

The Trust's aspiration from the moment of purchase was to refurbish the Lighthouse buildings to a standard commensurate with their listed status and in so doing create a first-class visitor attraction at this spectacular location. In order to maintain a revenue stream to cover maintenance of the lighthouse buildings both prior to, and after, refurbishment, SAT also wished to retain both the RSPB office and visitor accommodation. Formal and informal dialogue with stakeholders was maintained since purchase of the site.

In January 2004 a cliff fall occurred at Sumburgh Head, removing some of the existing path and dyke. Emergency fencing was erected immediately by the Trust and employed specialist engineers, Ravey Consulting, to carry out a survey. The resulting report recommended that a section of the access road be rerouted further inland.

To date, SAT and the RSPB have together continued to manage and improve the external environment at Sumburgh Head. These works included improving access and building some viewing platforms. In addition the Trust has made access improvements to the wider Sumburgh area through its Ranger Service. SAT &

RSPB have continued to develop their vision for Sumburgh Head which has combined the respective strengths of the two organisations working in partnership to unlock the full potential of the site.

SAT recognise that they have a complex and unique site at Sumburgh Head, and they understand the need to therefore properly assess and protect its significance before undertaking any substantial works to provide a sustainable future for the buildings and landscape. In addition, SAT are aware that the preparation of a Conservation Management Plan is a requirement of many project funders. The recent history of the site, as outlined above, and the consequent need for considerable conservation and redevelopment work are the reason for the preparation for this Plan.

1.6 Scope and purpose of the CMP

Conservation management plans are increasingly recognised as being crucial to the beneficial use and custodianship of important historic structures and sites. They are designed to describe a site, define its significance and assess its vulnerabilities. Finally, they establish policies and set out a management plan to ensure the long-term protection of the site and the retention, or if possible enhancement, of its significance.

The objectives of this plan are therefore to:

1. Understand the site and its use by the owners and user groups, including the local community and members of the public; as set out in: the Business Plan, the Stage E Design Report and the Interpretation Plan.
2. Assess its significance, both generally and for its principal components or qualities, on a local, national and international level.
3. Define vulnerability, by identifying issues affecting the significance of the site and the buildings it contains, or which have the potential to affect them in the future.
4. Develop management policies to ensure that the significance of the site and buildings is retained in any future management, use or alterations. If possible, this significance should be enhanced through implementation of these policies.
5. Provide an action plan that sets out how these policies will be implemented in the future.

1.7 Methodology

This Plan has been prepared in accordance with the guidelines of the Heritage Lottery Fund[1] on preparation of conservation management plans. Other key references include:

- ICOMOS Australia (1999), The Burra Charter.
- Kerr, J S (2000) *The Conservation Plan* National Trust of Australia (NSW).
- Historic Scotland (2000) *The Stirling Charter.*
- Historic Scotland (2000) *Conservation Plans: A Guide to the Preparation of Conservation Plans.*

The terms used throughout this document are defined in the above publications.

1.8 Relationship to other plans

This document has been prepared as part of a submission to the Heritage Lottery Fund for financial support and should be considered alongside the associated: Business Plan, Stage E Design Report, Interpretation plan, Training plan, Audience development plan, Education plan, Risk plan and Access plan etc as appropriate.

[1] Heritage Lottery Fund (2008) *Conservation management planning : Intergrated plans for conservation, new work, physical access, management and maintenance at heritage sites.*

The content of this plan has been informed by the RSPB's *Sumburgh Head Reserve Management Plan 2006 – 2011*, which covers the wildlife and biodiversity aspects of the site and its wider environs; reference to this is made at various points throughout this plan. Other specialist reports or statements, including the archaeological report by CFA Archaeology, are included as appendices to this plan and are referred to as necessary.

1.9 Structure of the plan

This Plan is set out in five main sections, preceded by this *Introduction*. The sections are sequential and each builds upon the information and conclusions of those that precede it.

The *Understanding* section seeks to describe the site and summarise the various qualities it possesses, ranging from the complex of lighthouse buildings there through to the ecology of the site and its wider environs.

The *Significance* section builds upon the understanding and seeks to make judgements about the worth or significance of the site in various contexts. Further explanation of the process involved in this assessment is included in this section.

Following this, the *Issues* section highlights key issues and vulnerabilities affecting the site arising from the preceding sections.

The *Policies* section then sets out strategies for the future development and conservation of the site. These range from broad or general policies that are not time specific through to others that may stand only in the short- or remain in the long-term. It is important that these policies are reviewed on a regular basis.

The fifth and final main section summarises these policies into a long-term *Action Plan* covering the future management and maintenance of the site.

1.10 Publication date

The necessary work undertaken to prepare this CMP was carried out over a period of several months formally commencing in October 2008. Dating of consultants' reports is included within each relevant appendix.

The actual CMP was completed in March 2009 in its initial form and it will continue to be developed and modified in the future as necessary.

2 UNDERSTANDING

2.1 Introduction

The following section seeks to describe the site and summarise the various qualities it possesses. These descriptions include summaries from consultants' reports, each of which is included in full as appendices to the main body of this report. Further descriptive details on the individual buildings and other structures are to be found in the gazetteer to the report by CFA Archaeology forming appendix 4 to this plan.

2.2 Location and extent of the site

Sumburgh Head is a 100 metre high spur of rock at the southernmost point of mainland Shetland, situated only 3 kms from Sumburgh airport and some 40kms south of the islands' capital, Lerwick (see Fig. 2.1).

The complex of lighthouse buildings (map ref. HU409083), which comprise the lighthouse itself together with the former keepers' accommodation blocks, engine house and various ancillary buildings (see Fig. 2.2), sits atop a dramatic promontory site approached by a narrow corridor flanked by cliffs. To the immediate west of the lighthouse complex is an adjoining paddock previously used for rough grazing for the keepers' livestock. The site may be accessed only from its easternmost side, being surrounded by high cliffs and enclosed by stone rubble walling on all other sides.

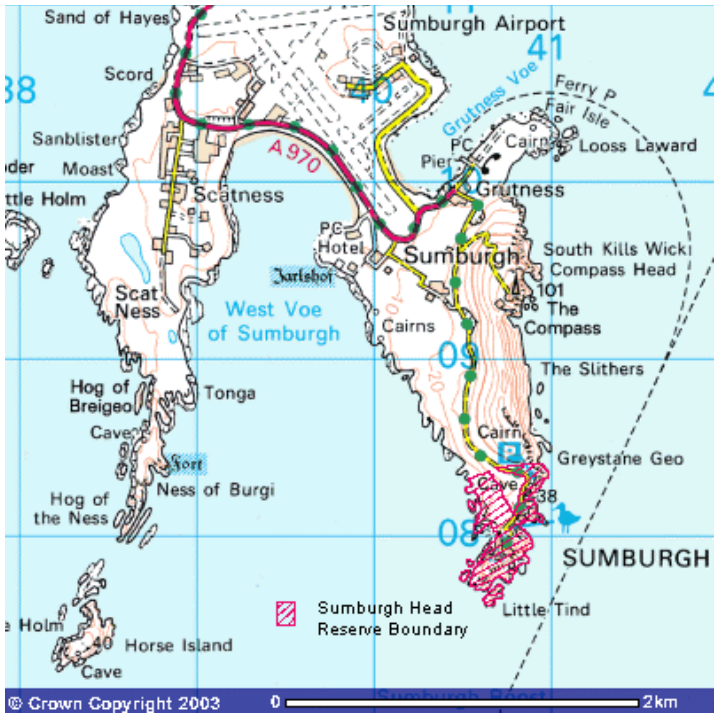

Fig. 2.1 Map of Sumburgh

The site under primary consideration includes the complex of lighthouse buildings and their immediate setting. Also considered are the adjoining areas of land to the immediate south-west and north-east of the lighthouse site, and the access roadway and car park to the north.

2.3 Current use and management

Current use and management arrangements are more fully described in the Trust's Business and Operational Plans but the most important of these are summarized below as follows.

In the late twentieth century all of Scotland's lighthouses were automated and the lighthouse at Sumburgh became fully automated in 1991. Shortly afterwards it was sold on the open market and purchased by a private buyer.

An RSPB Reserve was established by agreement at Sumburgh Head in 1994. This agreement currently runs until 2012. In addition the RSPB relocated its Shetland office to the site in 1996. Both leases are now held with the Trust and run concurrently until 2012.

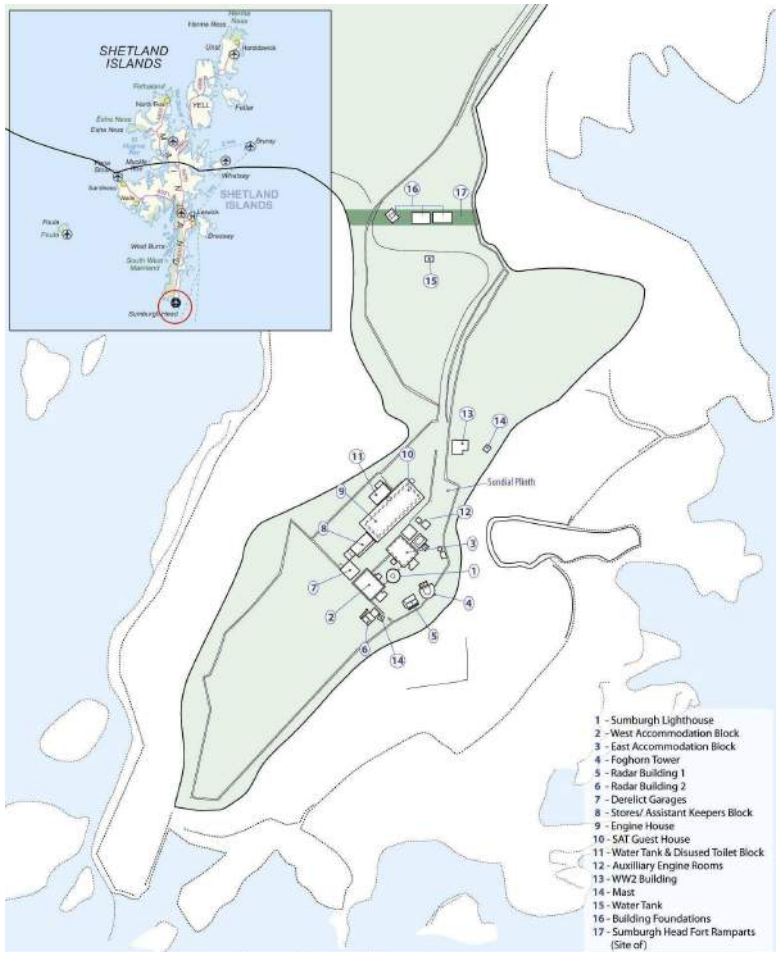

Fig. 2.2 Location Plan showing the Lighthouse and ancillary buildings

Following private purchase and a lack of investment the buildings quickly deteriorated and many were soon in a state of disrepair. There was no visitor access to the buildings and without refurbishment many were likely to have fallen into a state of decay. The community was quick to realise that the combination of such an important piece of architectural heritage and one of the most accessible seabird colonies in Britain presented a unique 'heritage' opportunity. When the Ness 2000 initiative was set up by the Dunrossness Community Council (with assistance from Shetland Enterprise and the SIC) the community identified Sumburgh Head as a key site for development as a visitor attraction.

With such strong community support the Trust first approached the owner about the possibility of purchase in 2000 when it became apparent that he was having difficulty securing funding to maintain the lighthouse buildings and to develop them further. In late 2002 Shetland Amenity Trust purchased Sumburgh Head and the buildings associated with the lighthouse. The Northern Lighthouse Board retained ownership of the Lighthouse tower itself, and a small building for operational/infrastructure purposes.

The Trust's aspiration from the moment of purchase was to refurbish the Lighthouse buildings to a standard commensurate with their listed status and in so doing create a first-class visitor attraction at this spectacular location.

During the period that the lighthouse complex was under private ownership there had been limited investment in the buildings although one building (the east house or east pavilion) was converted for use as RSPB offices and another (principal keepers cottage) converted for visitor accommodation. Both such uses continue.

In order to maintain a revenue stream to cover maintenance of the lighthouse buildings both prior to, and after refurbishment, SAT retain both the office and visitor accommodation.

Other buildings on the site, including the west house, the former smithy/occasional keepers' accommodation and the engine house, have been largely unused since the NLB moved out and have been maintained by the Trust.

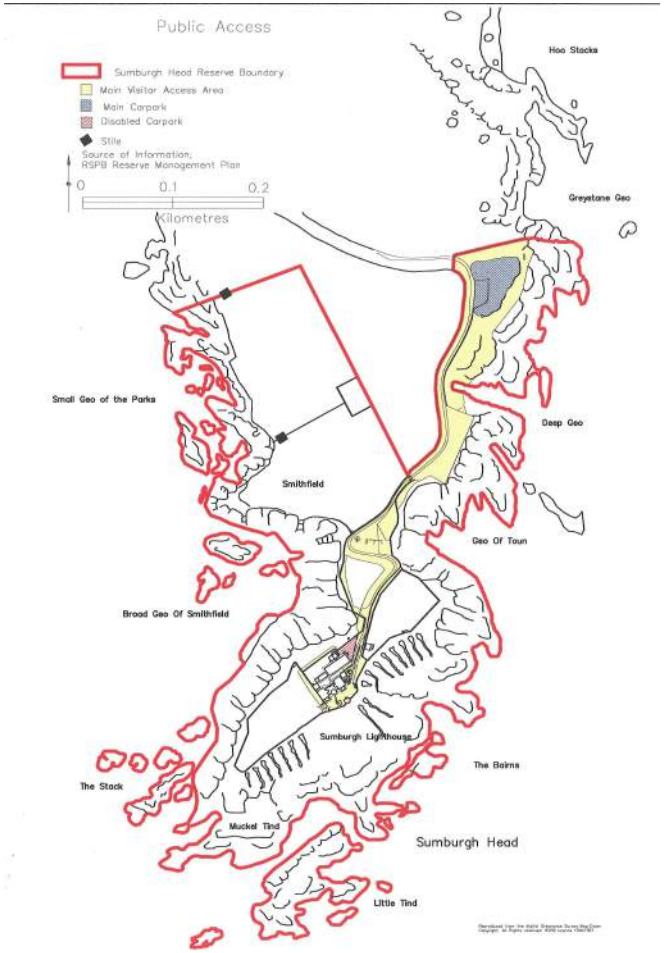

Fig. 2.3 Plan showing Public Access

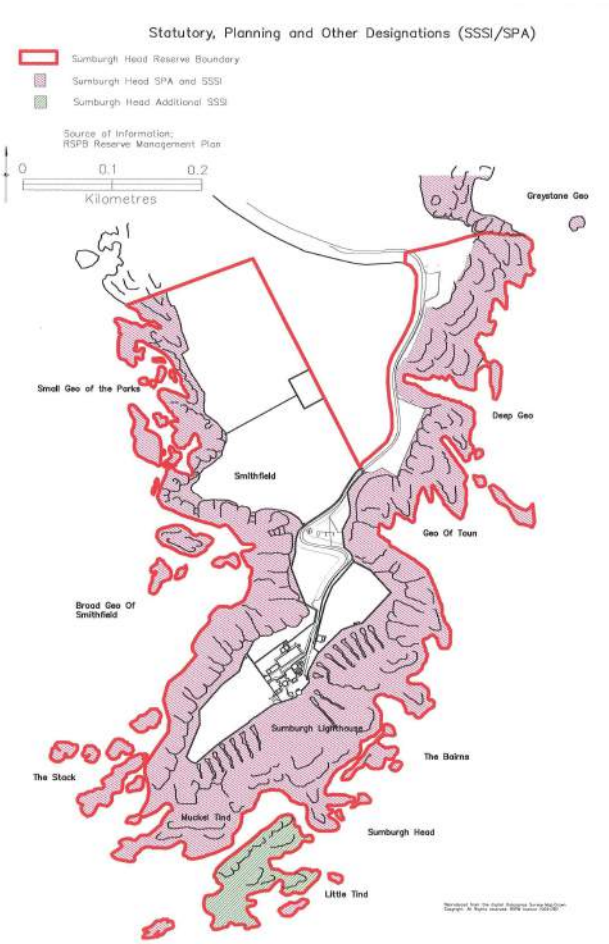

Fig. 2.4 Plan showing SSSI and SPA

heritage Shetland culture

2.4 Public access

Existing access, car parking and public rights of way are shown in Fig. 2.3. Access is via the A970. There is currently a car park for 16 cars at the north end of the reserve (HU409083) and limited car parking (for less mobile visitors) near the lighthouse buildings (HU408079).

A coastal trail with stiles has been established leading from the Sumburgh Hotel to the lighthouse site.

2.5 Statutory and other designations

The buildings and structures forming the lighthouse complex, including not only the lighthouse buildings but also the WW2 buildings, the boundary walls and gate piers, are listed as category A in the Historic Scotland statutory list of buildings of architectural or historic interest. This is the highest category of listing in Scotland and means that the buildings are considered to be of national or international importance.

The wider site is an RSPB nature reserve and is surrounded by a dramatic coastline of high cliffs, outlying stacks and a low lying headland (near Grutness). Sumburgh Head has been designated (since 1984) as a Site of Special Scientific Interest (SSSI) and also qualifies as a Special Protection Area (SPA) under the EU Birds Directive as it supports more than 20,000 breeding seabirds (see Fig. 2.4).

All of Shetland has been designated as an Environmentally Sensitive Area (ESA). The ESA Scheme was first introduced in Scotland in 1987 to help conserve specially designated areas of the countryside where the landscape, wildlife or historic interest is of particular importance and where these environmental features can be affected by farming operations.

2.6 History

Phase 1: Prehistory – 19th century

The place name *Sumburgh* is said to derive from the Norse *Sunnborg* (South Broch). The site is therefore likely to have played an important defensive roll during the Iron Age. The likely Iron Age structure at Sumburgh Head, first surveyed by Timothy Pont in 1592 and published in Johann Blaeu's Atlas Novus in 1654, appears to have been truncated during the construction of the lighthouse between 1818 and 1821. Blaeu first recorded the 'Ancient Fort of Swenburgh', a site that provoked comment from travelling antiquaries through the eighteenth and nineteenth centuries.

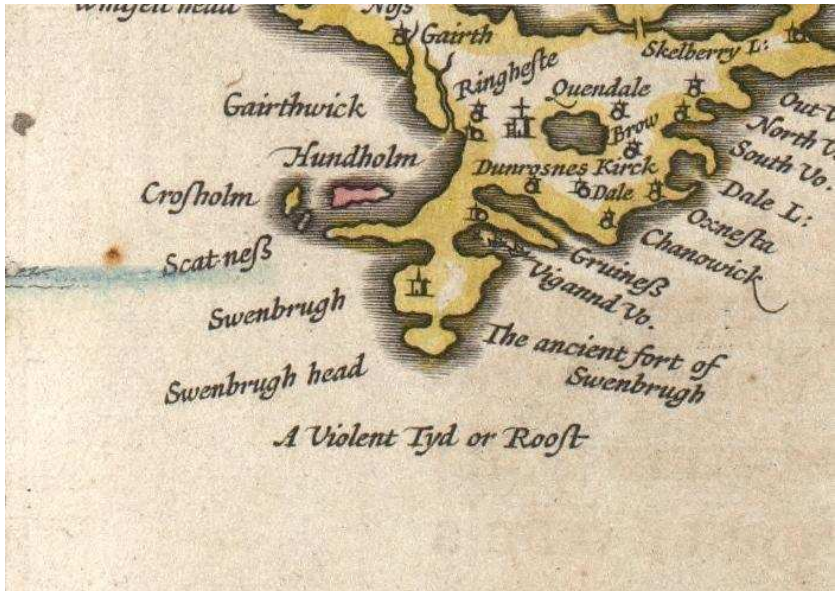

Fig. 2.5 Blaeu's map of Sumburgh from 1654

By 1968, the Ordnance Survey reported that *'traces of the defences are obliterated by the modern road to the lighthouse and no evidence was seen of a broch on the headland'* (the site at Sumburgh having been earlier referred to as a broch by H. Dryden in 1873). However, the combined cartographic and documentary accounts indicate that this was a significant group of structures, set within a dramatic steeply rising landscape, which may have represented the 'borg' or fort that inspired the name. The 'fort' at Sumburgh has made explicit use of the narrow neck of land between the cliffs and thus negating the need for elaborate earthwork or stone defences.

Excavation at the Ness of Burgi has led to the suggestion that some blockhouse forts were symbols of Iron Age status, quite apart from serving a shielding or aggressive role. The forts could also have comprised lookout posts or warnings to those at sea that ownership of the surrounding land was in no doubt. The ramparts of the prehistoric fort are situated on or near the site of Building 16 (see key plan overleaf). Excavations conducted by SAT have so far failed to locate the true extent of the ramparts. A recent landslip in which a c.10m length of c.19th century boundary wall and a large section of cliff fell into the sea has made any close inspection of the rampart site impossible for the time being. The construction of the WW2 Building 16 has had an impact on the upper rampart, which has led to the removal of the escarpments. The position of the vestigial rampart remains appear to be partially visible on the vertical aerial photograph taken by the RAF in 1967 although on the ground the ramparts have clearly been compromised by the construction of the WW2 building (Building 16).

Although the remains of the fort ramparts are fragmentary, the potential for the survival of other near-surface archaeological remains cannot be discounted (please refer to the report by CFA Archaeology forming appendix 4). There is

only anecdotal evidence for a broch on the headland and its likely position would have been the plateau area at the site of the lighthouse. If so, it is highly likely that its physical remains would have been known about before construction, based on the sheer volume of material used in broch construction. There is no reason to discount the presence of other more ephemeral features such as stone structures and associated prehistoric settlement remains. There can be little doubt that the headland was fortified and its internal remains might come to light in future groundbreaking works. Such verification may provide useful dating evidence that is currently lacking.

Phase 2: Development of the lighthouse station (1819-1823)

The Commissioners of Northern Lighthouses were established in 1786 by an Act of Parliament to build the first four lighthouses at Kinnaird Head, North Ronaldsay, Mull of Kintyre and Eilean Glas on Scalpay. A further Act of Parliament in 1814 gave the Commissioners the right to *'erect and maintain such additional lighthouses upon such other parts of coast and islands of Scotland as they shall deem necessary.'* This also included recommendations for Galloway, Skerryvore and Shetland such as Sumburgh Head.

Fig. 2.6 Early photograph of Sumburgh from c.1870 showing the first phase of development by Robert Stevenson

The light at Sumburgh Head was first lit in 1821 with Robert Stevenson as engineer; the first big light completed in Scotland for several years and the first in Shetland. Although Thomas Smith was the first engineer to the board, he quickly involved his son in law, Robert Stevenson, in assisting him with lights built from 1797 at Cloch Lighthouse for Clyde Harbour Trustees on to Inchkeith on the Forth and Start Point in Orkney and then probably Robert's most famous, the Bell Rock off Arbroath. By this time Robert was becoming the driving force of lighthouse engineering in Scotland and this was the beginning of the dynasty, the

Stevenson family of Engineers, which over a period of almost 140 years built most of the lighthouses which exist today around the coast of Scotland and the Isle of Man. Sumburgh Head lighthouse is therefore one of the 17 Lighthouses constructed under Robert Stevenson's stewardship between 1808 and 1833 and is a significant part of the early network of Scottish Lighthouses.

Robert Stevenson first visited Shetland in 1814 on the Northern Lighthouse board's vessel, the Pharos, to look at potential sites for the first lighthouse on the islands. Also on board were several of the Board's commissioners and his friend, Walter Scott, who wrote in his journal '*it is proposed to have a light on sumburgh-head, which is the first land made by vessels coming from the eastward; Fitful Head is higher, but it is to the west, from which quarter few vessels come*'.

Stevenson then reported to the Board that Sumburgh Head was *'an eligible situation for a lighthouse'* and he would *'survey the rock and report as to the proper site for a lighthouse.'* Following initial approval by the NLB, Stevenson compiled a detailed specification and schedule and sought tenders from three builders, including John Reid of Peterhead, who had undertaken repairs to Kinnaird Head lighthouse: over the winter of 1819-1820 preparatory work was to be done; building work was not to start before April and be complete by August and the lighthouse was to be functioning by the autumn of 1820. Preparatory work started as planned with John Reid as the appointed building contractor.

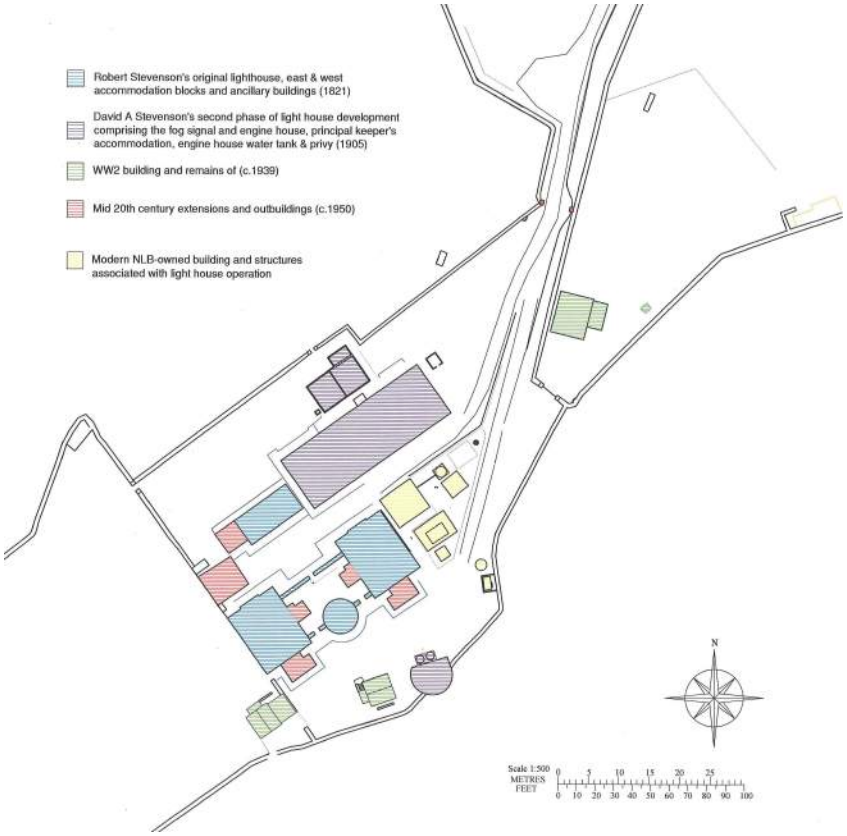

Fig. 2.7 Plan showing phases of work at Sumburgh

Not surprisingly, however, Reid was unable to meet this programme. He initially experienced problems in getting to Shetland but by December 1819 he had opened two quarries, built temporary barracks for the workmen, made about a mile and a half of road from the shore and started excavating the foundations. In June 1820 Stevenson wrote that he was happy with progress and hoped that the construction work would advance rapidly if the weather held out. But when Stevenson visited, the lighthouse was only about six feet from the ground and Reid had gone south for horses and stores. Stevenson instructed Reid to concentrate on the tower, and at his next visit in August it was at the full height of 35 feet, though there was little progress on the keepers' houses. Then in October disaster struck – the vessel *Freemason* foundered at nearby Grutness with loss of life and her cargo of glass and other materials, Reid's money, horses and business books.

Despite this, the reflecting apparatus arrived in Shetland in November and the light became operational on 15 January 1821. Much construction work however remained to be done and completion of the first phase of buildings was not achieved until June 1823.

Fig. 2.8 Store Building at Grutness

As may be seen from the phasing plan (see fig. 2.7), Robert Stevenson's first phase of building work at Sumburgh Head comprised the light tower (building 1) and two flanking pavilions (buildings 2 and 3), both of which provided accommodation for the lighthouse keepers and their families, and the building opposite, which formed the smithy and further accommodation for occasional keepers (building 8). In addition, it also included a stores building at Grutness (approx 2km from Sumburgh Head and under separate ownership) that is still extant and largely in its original form (see fig. 2.8).

In the years that followed the lighthouse would be adapted and modernised as changes in technology became available, starting with the use of Argand lamps in

conjunction with the parabolic reflectors developed by Thomas Smith. The fuel in the lamps changed depending on cost and availability, with the use of whale oil and colzoa oil (rape seed oil) before, in the 1850s, the discovery and production of a cheaper fuel, paraffin led to its almost universal use.

Around 1870 a new lantern and dome was installed. The original lantern had rectangular panes of glass made using flat glass. This was satisfactory when the lanterns initially had fixed lights installed but once the change to flashing lights reached Sumburgh Head this could create a problem of false flashes reflected back from the flat glass. In some countries they adopted curved glass to counteract this problem, e.g. Trinity House in England, but the Stevensons adopted triangular panes. This as well as approximating closer to curved glass also removed the problems of obscuration caused by the vertical astragals of a square paned lantern.

Phase 3: Development of the lighthouse station (1904-1907)

The second phase of building work at Sumburgh Head was undertaken by Robert Stevenson's grandson, David A Stevenson, and was concerned with construction of the fog-signal and the various buildings needed to support its operation. This comprised the engine house (building 9) and adjoining principal keeper's accommodation (building 10), associated water tank enclosures (building 11) and the fog-signal structure itself (building 4). These buildings are believed to have been completed around 1907.

Fig. 2.9 Sumburgh lighthouse and surrounding buildings in 1905

The fog signal was 1 blast every 90s from the horn which operated using compressed air from the three Kelvin engine compressors located in the engine house to vibrate the diaphragm. The installation of the foghorn required an increase in the number of lightkeepers from 2 to 3 and thus Sumburgh needed to have an additional dwelling house built along with the engine room to house the engine/compressor sets. This traditionally was combined in a single building block with the engine room at one end and the additional house at the other with

store buildings etc. included between the two, as exists at Sumburgh. This house, as the newer building, traditionally became the Principal Lightkeeper's (PLK) house. Adjacent to the engine room are large underground water tanks, which collect rainwater used as coolant for the engines.

Fig. 2.10 and 2.11 The Foghorn building and detail

The last Fog Signal in Scotland was switched off in October 2005 but the Fog Signal at Sumburgh Head was never automated which would suggest that it was discontinued prior to automation. Fog Signals became less and less useful as an Aid to Navigation with bigger and more modern ships and particularly once the fully enclosed bridges of modern vessels became the norm.

Phase 4: Shetland at war (WW1 and WW2)

The Shetland Islands, the most northerly islands of the British Isles, played an important part in the defence of Britain during both World Wars. With the Straits of Dover providing very vulnerable and dangerous passage, enemy shipping, warships and submarines leaving Germany and other occupied ports used the Denmark Straits as their passage to the Atlantic Ocean. The Shetland Islands were an important base for the Royal Navy and Royal Air Force who were patrolling these waters with warships and aircraft and for the radar stations scanning the skies and waters. The Army also played an important part, protecting the islands and their important installations and bases.

Due to the position of Sumburgh Head and the commanding views towards the North Sea and Atlantic Ocean, the lighthouse was used in WW1 as a lookout position to monitor the movement of enemy shipping.

At the commencement of WW2, Sumburgh Head was identified as one of the key sites in the British Isles for locating a radar station to monitor the movement of enemy craft. Construction of the station began in October 1939. This was one of the first Coast Defence U-boat (CDU) stations (i.e. Naval version of Chain Home Low) in the UK and was tasked with plotting U-boats attempting to escape from the North Sea into the North Atlantic. It was also capable of detecting aircraft.

The buildings comprise a transmitter hut, a receiver hut and an engine shed. The receiver hut (building 6) was placed just inside the southern wall of the inner enclosure of the lighthouse while the transmitter hut (building 5) was 20 metres from it, 7 metres from the foghorn tower and 10 metres from the lighthouse. What is thought to have been the engine shed (building 13) was around 50 metres away, outside the northern wall of the inner enclosure. Gantries that carried the aerial arrays straddled the transmitter and receiver huts. Inverted searchlight turntables were used for rotation, which was carried out by a bike chain that entered each hut through a hole in the roof to an up-turned bike with pedals replaced with wooden handles. The station at Sumburgh head was replaced by a CHL at Compass Head in March 1943.

Situated 6m downslope from Building 15 and built into the hillside are the remains of a rectangular building measuring 10m long and 4.5m wide (building 16). A single course of concrete measuring c. 0.15m high can be seen enclosing the hard standing of a floor. The 1942 and 1949 aerial photographs show a building at this location which was possibly associated with a barrack block for army sentries who where known to guard the headland during its use as part of the Chain Home Low radar station which as highly secret defensive installations demanded the tightest security.

Fig. 2.12 Radar Building 2 and the West Pavilion during wartime

Phase 5: Post-war developments

Following WW2, developments at Sumburgh Head were principally concerned with modernisation of or improvements to the lighthouse facility. Principal among these are brick-built extensions dating from the 1950s to the rear and courtyard sides of each pavilion, both of which were intended to improve the facilities provided within each dwelling.

A pair of derelict timber and concrete garages (building 7) occupies the ground between the west pavilion and the former smithy building. These too date from the 1950s.

This period also saw a number of unfortunate alterations to Robert Stevenson's original lighthouse buildings including, in addition to the extensions referred to above, removal of the pediments, octagonal chimney stacks and infilling of some window openings to the pavilions.

Other modern interventions include the building by the NLB of a single storey structure (building 12) housing an auxiliary generator and the addition of two aerial masts, all serving the lighthouse.

2.7 Buildings and structures

Each of the buildings referred to above are now described in the foregoing sections. The buildings are grouped under each of the phases used in section 2.6 and numbered according to those used in the archaeology report by CFA Archaeology (appendix 4).

Phase 1: Prehistory to 19th century

2.7.1 Sumburgh Head fort ramparts (feature 17)

The ramparts of the prehistoric fort are situated on or near the site of Building 16. Excavations conducted by SAT failed to locate the true extent of the ramparts. The positions of the vestigial rampart remains appear to be partially visible on the vertical aerial photograph taken by the RAF in 1967. A photograph taken from the north looking towards Sumburgh Head in 1970 (NMRS HU40NW 1) shows the possible remains of the ramparts, which are visible as a series of linear earthworks where the neck of land on the headland narrows.

A recent landslip, in which a c.10m length of c.19th-century boundary wall and a large section of cliff fell into the sea, has made any close inspection of the rampart site impossible for the time being. The construction of the WW2 Building 16 has had an impact on the upper rampart, which in turn has led to the removal of the escarpments.

Although the remains of the fort ramparts are fragmentary, the potential for the survival of other near-surface archaeological remains cannot be discounted. There can be little doubt that the headland was fortified and its internal remains might come to light in future groundbreaking works. Such verification may provide useful dating evidence that is currently lacking.

Phase 2: 1820-1823

This phase of development at the site, by the famous engineer Robert Stevenson, saw the first period of development of the lighthouse station and comprised the lighthouse itself together with the two accommodation blocks or pavilions that flank each side of the lighthouse, and the building opposite, which originally formed a smithy and storage accommodation.

2.7.2 The lighthouse (building 1)

The great height of the headland (at 91 metres above sea level) meant that the lighthouse required only a rather short tower, at 17 metres high, which rises from a single-storey podium flanked on each side by 2-storey, 3-bay pavilions (see 2.7.3 below). Taken together, they form a symmetrical, neo-classical composition similar to that seen at several other lighthouse sites by Robert Stevenson, most notably at the Rinns of Islay (1825), Mull of Galloway (1830) and Dunnet Head (1831).

The lighthouse tower has cavity walls finished externally with painted cement render. Record photographs indicate that the lighthouse, and indeed the other buildings constructed at the site during this period, originally had coursed granite rubble walls with sandstone dressings. The cement render to the walls was probably applied during construction of the engine house (see below) to give a more uniform appearance to the station and perhaps to improve their weatherproofing qualities. The original appearance of the external walls may also be seen at the former lighthouse storage building at Grutness.

Fig. 2.13 The Lighthouse tower at Sumburgh

The tower has a circular battered podium with the main doorway on the west side and circular (oculi) openings on its east and west sides at first floor level. Within the lighthouse interior there are 52 steps to the top of the tower. The optical apparatus is group flashing with Stevenson's equi-angular reflector showing flashes every 30 seconds, with a nominal range of 23 miles. The balcony has a cast-iron handrail that is corbelled out and rests on a moulded cornice. The lamp room is lined with varnished pine boards. The present dome is a late 19th-century replacement for the original one. The lighthouse has flanking walls that

have openings onto the terraced area on its west side. During the last 50 years a second gantry was added to the lighthouse dome. This feature is not shown on the c.1940s photograph of the lighthouse.

2.7.3 East and west pavilions/accommodation blocks (buildings 2 and 3)

The two accommodation blocks form neo-classical pavilions that flank each side of the lighthouse. The 2-storey, 3-bay pavilions are symmetrical in form and originally featured pediments over the middle bays to both the front and rear elevations. The pediments were removed during the late 1940s or 1950s during which time ad-hoc extensions to each building were constructed, chimneys taken down and removed and window openings infilled.

The walls are of cavity construction, the inner leaf being brickwork and the external leaf of granite masonry with sandstone dressings. Externally, the walls were given a later application of cement render and masonry paint similar to the lighthouse tower as noted above. Windows are generally the original 12-pane timber sash and case windows. The flat roofs are of timber construction covered originally with lead sheet subsequently replaced by modern synthetic sheeting. The lower level floors are partly of solid construction finished with granite setts and partly of suspended construction with sandstone flags supported on brickwork sleeper walls over a ventilated solum. The upper floors are of timber construction over brickwork vaulting.

Only the westmost pavilion was constructed with a staircase to connect the upper and lower floors. This stair is of stone construction and was later blocked at some point, and although generally intact the balustrading to the second flight was removed.

Both blocks are rectangular in plan and provide similar accommodation internally. Entrances at lower level are situated on the front (westmost) elevations providing access to brick-vaulted storage rooms. Entrances at upper floor level to each pavilion are provided from the inner (courtyard) facing elevations through porches added in the 1950s, leading to four main rooms. The layout of both pavilions is broadly as was originally constructed, although extensions to the rear, housing the kitchen, and the inner (courtyard) side, housing the entrance hallway and the bathroom, were added at some point during the 1950s. Many of the original internal features remain, including panelled doors, window shutters and architraves etc.

The east block is currently used as the RSPB headquarters of the Sumburgh Head RSPB reserve. The lower level rooms are used for storage while the upper level rooms have been converted to office accommodation.

The west block has been unoccupied for several years and although basically sound is in a neglected condition.

Externally, a screen wall links the upper levels of the accommodation blocks to the front of the lighthouse and contains a central doorway. A single flight stone staircase accessed via a centrally located door opening links the lower level with the upper level courtyard, which is again enclosed by a parapet wall between the pavilions.

Fig. 2.14 The West Pavilion.

Fig 2.15. The East Pavilion

2.7.4 Former smithy/occasional keepers' accommodation block (building 8)

This two-storey building is constructed of coursed granite rubble with a painted cement render finish. The roof is flat and is of timber construction covered originally with sheet lead that has since been replaced with a modern synthetic membrane. The ground floors are solid and partly retain the original granite setts while the upper floors are of timber boarded construction.

Fig. 2.16 and 2.17 The Smithy/Occasional Keeper's Block

The building measures 14m by 5m and has two rooms on each floor. The ground floor rooms have their own entrance doors on the front (east) elevation while the upper floor rooms are accessed via a single-flight timber staircase from an entrance door in the rear (west) elevation. According to historical photographs this building is contemporary with the construction of the lighthouse and accommodation blocks. The ground floor rooms include a smithy and byre. The smithy has a set of working bellows in the fireplace. The byre has retained its original cobble floor. On the upper floor there is accommodation for an assistant (or occasional) keeper and next to this there is a storeroom. A small annex building was added to the south elevation, probably in the 1950s, and this includes a fuel store and a toilet. The keepers' accommodation still contains a 'time-capsule' of fixtures and fittings including wooden bunk beds, carpeted floors, sink, and electric fire and cooker. The room is unchanged since it was no longer required by the NLB.

2.7.5 Gate piers (building 18)

A set of gate piers built of ashlar sandstone is situated at the entrance to the main lighthouse complex and form part of the group listing. The gate piers stand to a height of 1.8m and have hewn cope stones.

2.7.6 Sundial plinth (building 19)

A sundial plinth is situated to the south of Building 12, the auxiliary engine rooms. The plinth is made of cast-iron with fluted sides to a height of 1.2m. The sundial is missing. This style of plinth is a typical NLB feature and similar to those found at other comparable sites. The OS map of 1882 shows that the sundial was originally located in the field to the north east of the main site indicating that it was moved at some point after that year.

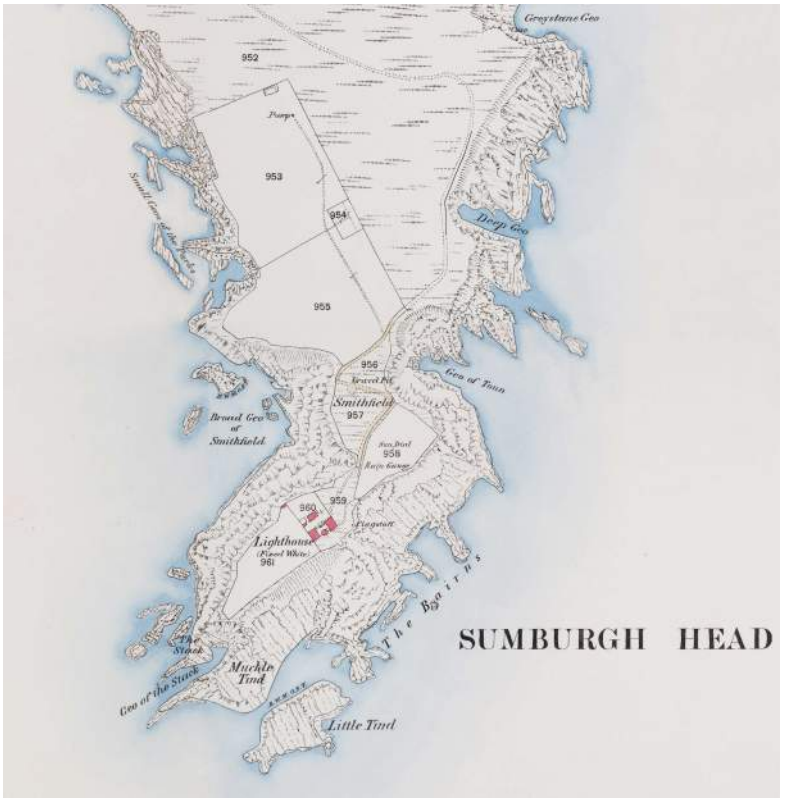

Fig. 2.18 OS Map of 1882 showing the original sundial location in the filed to the north east of the lighthouse

Phase 3: Development of the lighthouse station (1904-1907)

2.7.7 Engine house (buildings 9 and 10)

The engine house block was designed by Robert Stevenson's grandson, David A Stevenson (1855-1938). The block measures 27m by 9.55 and incorporates both the engine house (building 9) and the SAT holiday-let (building 10; see entry below). The block is brick built, covered with painted cement render, with sandstone dressings. The roof is flat surrounded by a parapet wall and is constructed of concrete supported of steel beams and covered originally with asphalt which has since been overlaid with a modern synthetic membrane. All the windows are eight-paned timber sash-and-case windows.

The engine block includes the engine room itself, a fuel store, a workshop and store/boiler room and an electrical switch-gear room. The walls internally are tiled with white glazed tiles to dado height with plastered walls above. The solid concrete floor incorporates encaustic floor tiles which are contemporary with the construction of the building.

The engine room was completed in 1907 to provide compressed air to the foghorn tower. The engine room interior includes three Kelvin marine diesel engines that supplied compressed air to three iron receiver tanks situated on the north wall. These tanks were manufactured in 1906 by James Dove & Co, Engineering Contractor, Edinburgh. The three engines are K2 Series engines linked to air compressors.

Fig. 2.19 The Engine Room interior

Fig. 2.20 The Engine Room exterior

The engines now have electric starter motors fitted requiring the use of paired 15 volt batteries. These were charged by battery chargers powered by direct mains current and also by a Lister diesel engine. The chargers are situated on the west wall of the engine room.

Adjoining the engine room and accessed by double-leafed doors is the oil fuel store. This room has as series of cylindrical fuel tanks supported on steel I-beams. The tanks would originally have held kerosene which was first used as lamp fuel. The tanks were later used to store fuel for the diesel engines. The fuel was fed to the engines via overhead fuel lines suspended from the ceiling. The

room is lit by a four-paned glass panelled door which was probably a safety feature in the event of a fire.

Two other rooms are accessed by another door from the engine room. The two rooms include a storeroom with smaller storeroom leading off and a larger room that contains electrical wall-mounted isolation switches. A fine Edwardian period wall-mounted cabinet is present on the east side of this room.

The SAT holiday-let, formerly the principal keeper's accommodation (building 10), has seven individual rooms and a hallway. It has been modernised to suit the needs of holiday accommodation but its main footprint is largely unaltered since it was last used by the NLB. It is of similar construction to the engine house, but has a suspended timber floor over a ventilated solum.

2.7.8 Concrete water tanks and toilet block (building 11)

A concrete part-subterranean water tank enclosure is situated to the west side of the SAT holiday-let/former principal keeper's accommodation. These water tanks were formerly used to collect and store rainwater used as coolant for the engines. The enclosure is brick built with a flat roof covered with mastic asphalt and measures c.8m by 4m. A set of steps descends on its northern end to a lower terrace level where two disused toilets exist. The toilets form a single building block measuring 3.5m by 1.5m. All internal sanitary goods have been removed.

Fig 2.21 and 2.22 The *Water Tanks and Toilet Block*

Phase 4: Shetland at war

As noted in section 2.6 above, this phase of development at the site saw construction of a number of basic buildings associated with its use during WW2 as a radar station. These comprise the receiver hut (building 5), the transmitter hut (building 6), the engine shed (building 13) and the remains of a further building located just outside the main site, thought to have been a barrack block for army sentries. Each of these buildings is briefly described as follows.

2.7.9 Radar building 1 (building 5)

Radar Building 1, thought to have been the transmitter hut, is situated c.4m from the base of the foghorn tower. The building is constructed of unreinforced

shuttered concrete, which was built around a wooden hut. The remains of the wooden hut and parts of its corrugated iron roof can still be seen within the interior of the building. The building measures 6m by 4m. The door to the building is situated on the west side close to its gable. On the east side there is a rectangular window. The window faces a concrete blast wall which was placed to offer protection to the occupants of the building.

2.7.10 Radar building 2 (building 6)

The Radar 2 receiver building is situated on the south side of a boundary wall and is again constructed of unreinforced shuttered concrete which was used to encase a timber-framed wooden hut. A blast wall protects the main entrance which is situated on the north-west side of the building. The building measures 6.2m long and 3.6m wide. The ridge of the roof stands 3.3m above the floor. The north wall of the building has been contrasts with the smooth face of the concrete. The wall carries concrete to a further height of c.1.5m. The east wall exhibits the impressions of the long decayed timber planks of the sheds cladding. At the south end of the wall there is an impression of a shuttered window measuring 1.1m by 1m; the south elevation has a window opening with the same dimensions. On the inside of the roof are the impressions of corrugated iron which was originally used to roof the timber hut.

built over the drystone boundary dyke and

Fig. 2.23 Radar Building 2

Fig 2.24 Radar Building 1

3)

This single storey building is situated within a walled enclosure and is constructed of shuttered concrete with a flat roof, and has a small annex on its east side. The concrete building dates to World War II and is associated with the Radar buildings. The exact function of the building is not known but may have been an engine shed. The building is not owned by the SAT and no interior access was available.

2.7.12 Water tank enclosure (building 15)

A brick built water-tank thought to be of WW2 date is situated alongside the main trackway to the lighthouse, immediately upslope of the Building 16. The tank measures c.3m by 2.5m and is c. 1.5m high. In all probability the tank was the main water supply for the nearby WW2 building (Building 16).

2.7.13 WW2 building foundations (building 16)

Situated 6m downslope from Building 15 and built into the hillside are the remains of a rectangular building measuring 10m long and 4.5m wide. A single course of concrete measuring c. 0.15m high can be seen enclosing the hard standing of a floor. Photographs taken in 1942 and 1948 are understood to show a building at this location which was possibly associated with a barrack block for army sentries who where known to guard the headland during its use as part of the Chain Home Low radar station which as highly secret defensive installations demanded the tightest security.

Fig. 2.25 and 2.26 Concrete Buildings at lower part of site

Phase 5: Post-war developments

As referred to above, developments at Sumburgh Head after 1945 were principally concerned with modernisation of or improvements to the lighthouse facility. These mainly comprised as follows.

2.7.14 Disused garages (building 7)

A pair of derelict concrete and timber garages occupies the ground between the west accommodation block and the former smithy/occasional keepers accommodation block. The garages have been built against the drystone boundary wall. The garages measure c. 8m by 4m and have their main entrances facing the main drive.

Fig 2.27 and 2.28 Disused Garages

2.7.15 NLB auxiliary generator building (buidling 12)

Owned by the NLB, this is a modern single-storey structure with barred doors and windows. The building houses an auxiliary engine to supply electricity to the lighthouse. The interior has two compartments, the largest housing the engine, the smaller being used for stores and maintenance equipment.

2.7.16 Aerial masts (building 14)

Two modern steel aerial masts carry an array of communication wires to the lighthouse. One mast is situated immediately adjacent to the Radar 2 building and the second is situated close to Building 13. The masts are approximately 20m high and painted white.

2.8 Science and engineering

Strong tides around the head have been recorded on early maps since at least the 17th century and a light has identified this headland since 1821, currently with the character of Fl(3)W 30s i.e. a white light flashing 3 times with a 2 second interval, every 30 seconds.

Early chroniclers described the seas around Sumburgh Head as "In the 'roost' off Sumburgh Head, tides and waves fight a battle whenever the winds rise high". More recently the Sailing Directions produced for small craft state that "the sea area between Fair Isle and Shetland is known as the hole. In bad weather very bad sea conditions have been reported. Off Sumburgh Head the tide runs very strongly in both directions with eddies inshore. South of the head a violent roost forms under conditions of wind against tide and/or swell. This can cover an area as great as three miles wide and extends up to 6 miles or more south. It is recommended to keep at least 2 miles to the east of Sumburgh Head or 2 miles west of Fitful head on the west side". Although this modern guidance is for small boats and may not be so relevant to large modern ships, those sailing around this area in the 19th century would no doubt have been greatly influenced and assisted by this type of information if it had been readily available then.

Until Muckle Flugga in the north and Out Skerries in the east were lit in 1854, Sumburgh Head was the only light erected and operated by the Commissioners of Northern Lighthouses (NLB) on Shetland.

Towards the end of the 19th century it became apparent that there was an increase in vessel traffic through the Fair Isle passage, called the north-about route, due to the number of Scottish, English, Baltic countries, Germany, Holland and other European countries vessels which were avoiding the congested English Channel where there were frequent collisions. This put pressure to increase the number of lights in this area such as on Fair Isle in 1892. This also indicates that the importance of Sumburgh Head would have been significantly increased in relation to the traffic using this route.

Grutness Voe is 1.5M north of Sumburgh Head on the east side of Shetland and is the first anchorage for small boats coming to Shetland and a possible point of shelter before tackling a trip south.

The oil industry use of Sullom Voe, further north in Shetland encouraged the provision of a large number of additional Aids to Navigation in the 1980's but also increased the importance of the existing lights.

On the 5th January 1993 MV Braer with 85,000 tonnes of crude oil on board ran aground after a loss of power on Garths Ness on the west side of the Bay of Quendale, just west of Sumburgh Head Lighthouse. There were immediate concerns with regard to the environmental impact, but attempts to deal with pollution from the grounded vessel were hampered by force 10 winds and eventually the stormy seas dispersed most of the oil and the widely predicted disaster failed to materialise. Following the Braer incident and the subsequent Donaldson inquiry, the UK government introduced a large number of new regulatory controls on tanker operators. These included a ban on the passage of oil tankers through the Minches channel and the provision of additional Aids to Navigation on the west side of the Outer Hebrides.

The International Maritime Organisation which regulates ship movements around the world and in which the UK Government participate fully produced the following regulations which are incorporated into navigation charts and sailing directions for the Shetland Isles:

"6.2.3 The following IMO adopted Areas to be Avoided (part):

In the region of the Fair Isle

In the region of the Shetland Islands

6.2.4 The following other IMO adopted Routing Measures (part):

Recommended routes in the Fair Isle Channel

(a) a single recommended route to the north of Fair Isle for use by west bound traffic; and

(b) separate recommended routes to the south-west of Fair Isle with eastbound traffic taking a route north-east of North Ronaldsay and westbound traffic taking a route to the south-west of Fair Isle"

A Differential (D) GPS system was established at Sumburgh Head in 1998 and after validation was given operational capability on 11 July 2002. It provides improvement in accuracy of down to 5m over the international GPS system as well as providing an integrity warning of GPS Service interruption or degradation. This ensures the continuing importance of Sumburgh Head in navigation around the coast of Scotland as the installation at the site is one of only four which cover the coastal areas of Scotland. There are however still significant concerns over the vulnerability of the GPS system due to accidental or malicious interference and therefore the existing traditional aids to navigation e.g. the light at Sumburgh Head, are also retained.

More recently an additional form of information transfer and Aid to Navigation has developed world wide and this led to the installation of an AIS (Automatic Identification System) base station at Sumburgh Head on 28 February 2003. This allows monitoring of information from ships sailing within 30 miles line of sight of the lighthouse. The base station controls and monitors the information transferred from the vessels and can repeat messages such as Search and Rescue (SAR) information.

Sumburgh Head, with its significant elevation is an ideal site for monitoring traffic in the southern channel and beyond Orkney to the Pentland Firth as well as vessel traffic heading north into Lerwick. As mentioned previously many vessels from the US to Europe use this route and can be logged by this system. This system is in addition to that controlled by the Marine Coastguard Agency (MCA) which covers the whole of the UK.

2.9 Setting and landscape

The landscape of Shetland is fundamentally important to the islands' natural and cultural heritage and contributes to the quality of life and economic development. The island location, the complex interplay of land and water, dramatic coastal scenery and expansive interior, the dramatic and constantly changing light and weather, and the long-standing human management of the more sheltered and fertile lowlands has created a very distinctive landscape. Whilst modern development and land management can sometimes threaten this landscape, it can also benefit from more sympathetic consideration.

The south mainland area, including Sumburgh Head, is characterized by lower-lying, undulating or gently sloping land related to open coastal waters dominated by pasture and rough grassland resulting from long established crofting, while the coastal edge comprises natural coastal features such as cliffs stacks, and rocky outcrops where natural forces dominate the perception, reinforced by the constant movement of the sea.

At the southernmost tip of the Shetland archipelago, the lighthouse is elevated on a dramatic promontory approached by a narrow corridor flanked by cliffs. The landform that leads up to the neck of the promontory is smooth in contour. Looking back from the lighthouse this broad gently sweeping grassland has a field pattern defined by stone walls. The land falls away fairly evenly with a pronounced angle of slope from south-east to north-west before gradually rising up to the hilltop ridge to the north with its counter incline.

Due to the broad regularity of these slopes and the simplicity of the land-cover the scale of the landscape appears quite vast in relation to the stone walls and other local features within it. By contrast this same landscape, when viewed as a whole, has a small scale in relation to the much vaster expanse of sea and sky all

around. These contrasts add to the drama of the scene, as do the distinctive sharp lines created where the grassland meets the edges of the surrounding cliffs.

The ridge to the north effectively closes down the visual connection to the topography beyond until a certain elevation is reached on the approach to the lighthouse. Although other more distant parts of the coastline can be seen from higher points around the lighthouse the effect of the rising ground to the north is to make the landscape of Sumburgh Head a self contained area of distinctive landscape character with a very strong sense of place.

Without the lighthouse this landscape would still be a special part of the scenery of Shetland not least because it is its southern–most point and the sense of a high rocky linear projection penetrating the ocean is very marked. The lighthouse has further characterised this strong sense of place and reinforced its identity. The very function of lighthouses is to mark the location of isolated coastal projections.

In viewing a landscape that contains a lighthouse, the eye is inevitably drawn to the lighthouse tower placed with such deliberate prominence and having an unmistakable character. The lighthouse at Sumburgh Head is a feature that defines and dominates the character of the landscape. From within its self-contained, simple, smooth grassland setting with its stone walls, Sumburgh Head could certainly be described as one kind of typical lighthouse landscape. From further down the coast to the north-west or from the sea itself, the high cliffs that form the promontory provide a different kind of view this time of the archetypal image of the lighthouse placed on a powerful rock formation. Both views offer classic perspectives of a very distinctive and familiar kind of coastal scenery. This quality is given a special significance due to the architectural interest and importance of the lighthouse buildings.

Fig. 2.29 Aerial view from south east.

Fig 2.30 Sumburgh Lighthouse, showing the access road leading to the site

The towering cliffs and the teeming birdlife that these cliffs support come into play the closer one approaches the narrow elevated neck of the promontory. This wildlife when it is present, transforms the character of the landscape adding the most significant dimension of all to the experience of the visitor.

Another vital feature that characterizes this landscape experience is not especially present within the landscape character area of the lighthouse. It is the archaeological character of the landscape that is passed though on the approach from the north. The landscape character area of Sumburgh Lighthouse is the final stage in a broader cultural landscape experience that includes these archaeological sites and the coastline of the National Scenic Area. The landscape of Sumburgh Head with its lighthouse and bird sanctuary is therefore one of several outstanding landscapes of distinctive character within this part of Shetland.

2.10 Ecology

The ecology of the site is fully described in the RSPB's Reserve Management Plan 2006-2011 which accompanies this plan.

The RSPB Reserve extends to approximately 16 ha and was established by agreement in 1994. This agreement currently runs until 2012. In addition the RSPB relocated its Shetland office to the site in 1996. Both leases are now held with the Trust and run concurrently until 2012.

From May to September, the sea-cliffs and offshore stacks support thousands of breeding seabirds, including large numbers of puffins, gulliemots, razorbills,

kittiwakes, shags and fulmars. The seabird colonies and the cliffs on which they nest are protected under the law.

Perimeter dry-stone dykes and fences make Sumburgh Head one of the safest and most accessible seabird colonies in Britain. A visitor trail with viewing platforms along the boundary edge, offer visitors exceptionally close views of puffins and impressive sights of the large seabird colonies on the rocky coast.

This commanding headland offers breathtaking sea-views of Shetland's dramatic coastline.

With it's excellent vantage point, there is good chance of spotting cetaceans at the site throughout the summer months. Minke whales, killer whales, porpoises and dolphins are recorded every year. Grey seals regularly haul out onto the rocks below the cliffs and can often be seen swimming amongst the submerged kelp.

Situated at the southernmost point of Shetland, Sumburgh Head also serves as an important landmark and landfall for migrating birds in spring and autumn. It is popular with birdwatchers for viewing migrating birds and the buildings and surrounding bushes are checked several times a day during migration periods. Its coastal grassland, sea-cliffs and dry-stone dykes are also home to breeding wheatears, twites, and the endemic Shetland wrens and starlings.

Wildlife recorded at the site in 2006 by the RSPB include:

Seabirds:	
Guillemots	17,455
Razorbills	636
Fulmars	2,706
Kittiwakes	894
Puffins	1,332
Shags	270

Wintering birds:	
Twites	53

Breeding Passerines:	
Wheatears	6
Twites	2
Wrens	5
Starlings	10

Other marine life:
Otters
Grey seals
Minke whales
Killer whales
dolphins
harbour porpoises

According to the RSPB plan, there are no known plants on the reserve that are of national or regional interest. The sea cliff grassland is dominated by *red fescue*, whilst *thrift* dominates parts of the cliffs. *Buck's-horn plantain*, *sea plantain* and *spring squill* are frequent in some areas. However, the grasslands of the wider headland at Sumburgh support an array of salt-tolerant herbs, a diverse fungal flora and a suite of lichens and bryophytes, including several nationally scarce and one near-threatened species.

2.11 Archaeology

The archaeology of the site is generally described in the report by CFA Archaeology and summarised in sections 2.6 and 2.7 above.

Below-ground archaeological remains at the site include the ramparts of a prehistoric fort (feature 17). Excavations by the Trust have so far failed to locate the true extent of the ramparts although the position of the vestigial remains appear partly visible on aerial photographs taken by the RAF in 1967. A photograph taken from the north looking towards Sumburgh Head in 1970 (NMRS HU40NW 1) shows the possible remains of the ramparts which are visible as a series of linear earthworks where the neck of land on the headland is at its narrowest.

The place name Sumburgh is said to derive from the Norse *Sunnborg* (South Broch). However, there is only anecdotal evidence for a broch.

2.12 Geology

Shetland's geology is central to its environment, being the foundation of its landscapes and a profound influence on the nature of its soils and freshwaters and on the plants and animals that they support. Shetland's geodiversity is increasingly recognised as a valuable resource for sustainable economic development.

Indeed, it is said that the geology of Shetland is more diverse than in any other region of the British Isles and it is certainly amongst the most complex. In recognition of these riches Shetland has applied for European Geopark status and a decision is awaited soon.

The steeply dipping Sumburgh Head 'Limestone' is exposed immediately south of Sumburgh Lighthouse, on high precipitous cliffs. It lies in a small quarried hollow at the bottom of the cliffs. The Old Red Sandstone clastic rocks at Sumburgh Head are grouped in the Brindister Flags. At this locality, 5 m of southeasterly dipping, fine-grained, thinly bedded and partly laminated calcareous siltstones with some thin bands of dark sandstones are exposed. The siltstones contain abundant plant fragments. In the basal few centimetres of some of the fine sandstone units are patches of coarse gritty sandstone with fish fragments.

Fig. 2.31 Cliffs below Sumburgh Lighthouse

Sumburgh Head has produced one of the youngest of the Middle Old Red Sandstone fish faunas of Shetland, and perhaps of the whole Orcadian Basin. This is the only site at which the distinctive placoderm *Asterolepis thule* (Watson, 1932) occurs.

The fossil fishes from Sumburgh Head are sparse, but they represent an instant in time, perhaps close to the Middle and Upper Devonian boundary, hence the site's conservation value. Two of the fishes are typical of earlier Middle Old Red Sandstone assemblages, but *Asterolepis thule* has more in common with Late Devonian fishes from elsewhere. The fish-bearing rocks at this site are well exposed, and more finds may be made. The fish bed is a Geological Conservation Review (GCR) Site. GCR sites form the basis of statutory geological and geomorphological site conservation in Britain.

3 SIGNIFICANCE

3.1 Introduction

The purpose of this section of the plan is to identify and assess the qualities possessed by Sumburgh Head that are of cultural significance or give value to us and our society. It is aimed at guiding policy decisions that will enable that signficance to be retained, revealed or enhanced and to establish a context within which decisions about conservation and repair work can be made with rigour and consistency. An assessment of the cultural significance of individual elements or components of the site is provided within Appendix 2 to this CMP.

It is important to note that if any particular aspect of the site has cultural significance, this does not automatically mean that it cannot be altered or changed. Understanding the nature and level of significance of the site and its component parts should not, therefore, only suggest constraints on future actions but also introduce flexibility by identifying those areas that can be adapted or developed with greater freedom.

The concept of cultural significance, defined in the internationally accepted Burra Charter 1999[1], refers to the qualities of a place or site that help us to understand the past, enrich our present lives and will be of value to future generations. It provides the following assessments of cultural significance:

Cultural significance means the aesthetic, historic, scientific or spiritual value for past, present or future generations. Cultural significance is embodied in the place itself, its fabric, setting, use, associations, meanings, records, related places and related objects.

The following assessment of the heritage value of Sumburgh Head is based upon an analysis and understanding of the various qualities possessed by the site as described in section 2 of this CMP.

Each element or component of the site, buildings, landscape and associated structures has been graded according to its importance as an individual element and within the overall site. The method for grading significance is included in Section 3.11 below, followed by an overall summary assessment of significance for the site as a whole.

The following definitions used for the assessment have been extracted and modified from the *Burra Charter Guideline – Cultural Significance* and other sources.

3.2 Existing assessments of significance

The buildings and structures forming the lighthouse complex, including not only the lighthouse buildings but also the WW2 buildings, the boundary walls and gate

[1] The Burra Charter (1999) The Australia ICOMOS Charter for the conservation of places of cultural significance

piers, are listed as category A in the Historic Scotland statutory list of buildings of architectural or historic interest. This is the highest category of listing in Scotland and means that the buildings are considered to be of national or international importance. Indeed the notes to Historic Scotland's listed buildings report states that the lighthouse at Sumburgh Head *"is one of Scotland's finest surviving pieces of early 19th century architecture"*. Listing imposes a number of duties or responsibilities upon owners or occupiers of such buildings, chief amongst which is that formal consent is required for any works that might affect its character as a building of special architectural or historic interest.

The wider site is an RSPB nature reserve and is surrounded by a dramatic coastline of high cliffs, outlying stacks and a low lying headland (near Grutness). Sumburgh Head has been designated (since 1984) as a Site of Special Scientific Interest (SSSI) and also classified as a Special Protection Area (SPA) under the EU Birds Directive as it supports more than 20,000 breeding seabirds (see Fig. 2.4). These designations require that owners and occupiers consult the appropriate conservation body, in this case Scottish Natural Heritage, if they want to carry out (or permit) activities on the land.

3.3 Historical significance

Historical significance encompasses the importance of the relationship of a site to the evolving pattern of our cultural or natural history, or has a strong or special association with the life or works of a person, group of persons or importance in our cultural or natural history.

An item may have historical value because it has influenced, or has been influenced by, an historical figure, event, phase or activity, or as the site of an important event. For any given place the significance will be greater where evidence of the association or event survives in situ, or where the settings are substantially intact, than where it has been changed or evidence does not survive. However, some events or associations may be so important that the place retains significance regardless of subsequent treatment.

Built by Robert Stevenson and dating from 1821, Sumburgh Head was the first large lighthouse completed in Scotland for several years and the first built in Shetland. By this time Robert Stevenson had already become the driving force of lighthouse engineering in Scotland and this was the beginning of the dynasty, the Stevenson family of Engineers, which over a period of almost 140 years built most of the lighthouses, which exist today around the coast of Scotland and the Isle of Man. Sumburgh Head lighthouse is therefore one of the 17 Lighthouses constructed under Robert Stevenson's stewardship between 1808 and 1833 and is a significant part of the early network of Scottish Lighthouses.

Fig. 3.1 Early (pre-1904) photograph of Sumburgh Head

The construction of the fog signal, associated engine house and additional keeper's accommodation by Robert Stevenson's grandson, David A Stevenson, in 1904, further underlines the position of Sumburgh Head in the body of work created by the Stevenson dynasty over their period of association with the Northern Lighthouse Board (NLB).

The Sumburgh Head lighthouse complex is a unique collection of historical buildings, which have survived more or less unaltered since they were first constructed. The neo-classical design of the two flanking accommodation blocks is, as referred to below, of great architectural interest and in keeping with Stevenson's quality of lighthouse engineering and design.

The WW2 radar building interiors are now severely dilapidated but their outer shell is well preserved. These two sites are unique survivors of the very first experimental CHL radar stations established in 1939. A year later they played a critical role in providing early warning of an aerial attack on the naval base moored at Scapa Flow and without doubt saved many lives.

Taking the above evidence into account, we believe that Sumburgh Head may therefore be considered to be of *outstanding historical significance (level A)*.

3.4 Architectural and aesthetic significance

The structure is important in terms of its contribution to an understanding of the architectural development of the site and in a broader architectural context locally, regionally or nationally. Aesthetic value includes aspects of sensory perception such as consideration of the form, scale, colour, texture and material of the fabric; the smells and sounds associated with the character of the place and its use.

As referred to in 3.2 above, Sumburgh Head is one of a suite of 17 lighthouses designed by the eminent Scottish engineer, Robert Stevenson, founder of an

international dynasty of lighthouse engineers, and the tower and flanking pavilions are particularly fine examples of his work.

According to Professor John Hume, Chairman of the Royal Commission on the Ancient & Historical Monuments of Scotland (RCAHMS) and a widely acknowledged expert on the field (see Appendix 17), Sumburgh Head marked a departure from previous lighthouse designs and set new aesthetic and functional standards for the NLB's lights. As such, its primary importance is as a pioneer of advanced lighthouse design in the years following the Napoleonic Wars.

A broadly neo-classical composition, with pedimented pavilions extending each side of the stubby raised tower, Robert Stevenson's design displays many characteristics typical of early 19th century eclecticism. The design adopts a symmetrical form and to this extent Robert Stevenson's original buildings are perhaps most similar in form to the lighthouses at the Rinns of Islay (1825).

Fig. 3.2 Lighthouse at Rinns of Islay

Apart from the lantern dome, which was replaced in 1870, and loss of the pediments and some of the chimneys and window openings in the late 1940s or 1950s, the original lighthouse buildings remain largely unaltered.

The lighthouse complex contains several high quality buildings and structures of architectural and technical excellence located in a dramatic cliff top setting. The complex of buildings, especially the tower and flanking pavilions, has great

aesthetic appeal as a powerful and evocative composition in a treeless landscape and contrast sharply with the dramatic natural features of the headland. The tightly arranged courtyard at the base of the tower between the two pavilions, the protective walls that connect them to the lighthouse and the detailing elsewhere on the site, clearly illustrate the intensely adverse environmental conditions under which the keepers lived and worked.

The significance of the landscape is set out more fully in 3.7 below, but the community, as well as users and visitors to the site, hold the landmark scenic or aesthetic qualities of Sumburgh Head and its lighthouse in high esteem. The lighthouse is a familiar and evocative landmark that contributes strongly to the sense of place for both residents and visitors to Shetland.

As referred to above, Sumburgh Head lighthouse is already category A-listed by Historic Scotland and described in its listed buildings report as being *"one of Scotland's finest surviving pieces of 19th century architecture"*.

Sumburgh Head lighthouse is of *outstanding architectural and aesthetic significance (level A)*.

3.5 Scientific and engineering significance

The scientific, engineering or related value of a place will depend upon the importance of the data involved, on its rarity, quality or representativeness, and on the degree to which the place may contribute further substantial information.

The location of and tidal conditions around Sumburgh Head mean that it has and continues to possess a high degree of navigational significance. With its significant elevation it is an ideal site for monitoring traffic in the southern channel and beyond Orkney to the Pentland Firth as well as vessel traffic heading north into Lerwick. Many vessels from the US to Europe use this route and can be logged by this system. This system is in addition to that controlled by the Marine Coastguard Agency (MCA), which covers the whole of the UK.

As described previously, the light at Sumburgh Head was first lit in 1821 with Robert Stevenson as engineer and was the first big light completed in Scotland for several years and the first lighthouse built in Shetland. It is one of 17 lighthouses constructed under Robert Stevenson's stewardship between 1808 and 1833 and is a highly significant part of the early network of Scottish Lighthouses.

Over the years the lighthouse has been adapted and modernised as changes in technology became available. Starting with the use of Argand lamps, in

conjunction with the parabolic reflectors developed by Thomas Smith, Sumburgh Head lighthouse would have been converted to run on electricity in the early 20th century. In 1912 conversion work was underway to install a new 1st order lens system designed by David A Stevenson, built by Chance Brothers & Co. of Birmingham, with the clockwork mechanism produced by James Dove & Co. of Edinburgh. This is one of only 8 remaining operational 1st order lenses in Scottish lighthouses and one of only 6, which use a mercury bath to act as the rotating bearing. This uses approximately 60 kg of mercury between the bath and the base of the lens as a thin, almost frictionless bearing supporting up to 5 tonnes of the lens.

Fig. 3.3
The newly built Foghorn in1905

The introduction of foghorns in Scotland started around 1874 with Sumburgh Head installed by Robert Stevenson's grandson, David A Stevenson, around 1904. The last fog signal in Scotland was switched off in 2005 but all the original buildings and equipment at Sumburgh Head associated with the foghorn remain extant and are understood to be in working order.

The ongoing process of automation of the lighthouse network in Scotland led to the lighthouse at Sumburgh Head becoming automatic in 1991. This process involved fitting electric motors to rotate the lens that replaced the clockwork mechanism, a standby generator installed to provide power if there was a mains failure and a monitor system was put in place to report by telephone link to headquarters in Edinburgh. Some conversion work was carried out during the automation process to provide for an automatic running standby generator building and to provide facilities for visiting personnel. Additional buildings and associated aerial masts were also provided for the DGPS installation when this was installed. This also allowed NLB to dispose of the remainder of the buildings considered redundant for Aids to Navigation purposes. At the time of automation the NLB was obliged to dispose of any redundant property on the open market if there were no other restrictions on their sale.

However, now that Shetland Amenity Trust have been able to obtain all the redundant property and to put forward this proposal for its future use, it would be expected that this should safeguard the future of this important site. There are only a few other sites in Scotland where such a complete site is under the control of one other organisation in addition to the NLB. Northern Lighthouse Board has stated its intention to co-operate with Shetland Amenity Trust in this project to ensure the future of the site as one entity and to protect this important site of historic engineering and navigational significance.

For the reasons stated above, Sumburgh Head lighthouse is of *outstanding scientific and engineering significance (level A)*.

3.6 Archaeological significance

Archaeological significance includes the potential for the site to yield information that will contribute to an understanding of our cultural and natural history. The archaeological research value of a site will depend on the importance of the data involved, on its rarity, quality or representative nature, and on the degree to which the site may contribute further substantial information.

Sumburgh Head has considerable archaeological potential. Some of the archaeological remains associated with the Sumburgh Head promontory fort are visible at the narrow neck of land to the north side of the lighthouse complex. Within the interior of the headland it is likely that substantial remains of the fort could survive. The field enclosures on the north and south sides of the lighthouse complex have never been cultivated in modern times and this will in all probability have led to the survival of near-surface archaeological remains (houses, middens, hearths and pits etc) containing organic material that will provide important radiocarbon dating and other evidence.

Documentary evidence indicates that there was a block-house fort on the site, most likely at the summit of the headland at the site of the lighthouse and in the park to the south of it. The construction of the lighthouse probably removed the near-surface archaeological remains from that area. Nonetheless, the potential exists for some physical evidence to be discovered.

Taking the above into account, we believe that the site has *considerable archaeological significance (level B)*.

3.7 Landscape significance

Landscape significance includes the landscape as a whole, including important views and the contribution of individual features within the landscape.

The landscape significance of Sumburgh Head must first be assessed against the backdrop of environmental designations which apply to Shetland and which reflect the special nature of these islands for wildlife, scenery and cultural heritage. Sumburgh Head is an SPA (Special Protection Area), there is a National

Scenic Area nearby and the Shetland Islands are designated as an Environmentally Sensitive Area.

The beauty, distinctiveness and special nature of the landscape at Sumburgh Head is the result of a number of contributory factors, all of which are fully described in section 2.9 above.

First of all Sumburgh Head is a dramatic promontory site visible for many miles from both land and sea. The contrast of scale between the landscape and the physical features on the site and its relationship with the sea and sky all around add to this drama. The headland is a self-contained landscape of distinctive character with a very strong sense of place, further reinforced and characterized by the deliberate prominence of the lighthouse. This quality is given a special significance due to the architectural interest and importance of the lighthouse buildings.

Fig. 3.4 View of Sumburgh Head from the air

play the closer one approaches the narrow elevated neck of the promontory. This wildlife, when present, transforms the character of the landscape adding the most significant dimension of all to the experience of the visitor.

Another vital feature that characterises this landscape experience is not especially present within the landscape character area of the lighthouse. It is the archaeological character of the landscape that is passed though on the approach from the north. The landscape character area of Sumburgh Lighthouse is the final stage in a broader cultural landscape experience that includes these archaeological sites and the coastline of the National Scenic Area. The landscape of Sumburgh Head with its lighthouse and bird sanctuary is therefore one of

several outstanding landscapes of distinctive character within this part of Shetland.

The landscape and setting of Sumburgh Head is therefore considered to be of *outstanding significance (level A)*.

3.8 Ecological significance

This encompasses the various aspects of ecological importance within the site, including rarity and any special features, representative value, diversity and pattern, integrity, size and viability of an ecosystem.

Sumburgh Head and its Stevenson Lighthouse is perhaps the most recognisable landmark in Shetland. It is Shetland's premier wildlife visitor attraction and the spectacular seabird colony is one of the most accessible in Britain. Designated an SPA and SSSI (see fig. 2.4), the headland is internationally important as it supports some 35,000 breeding seabirds, including a stunning puffin colony together with a good number of fulmars, guillemots, kittiwakes, razorbills and shags. The RSPB Sumburgh Head Reserve was established in 1994 and the Shetland Office is located in the lighthouse complex.

Since 1990 Sumburgh Head has become one of Shetland's premier sites for whale watching. With it's excellent vantage point, there is good chance of spotting cetaceans throughout the summer months. During the 1990s humpback whales spent several weeks off Sumburgh over several successive summers while minke whales, killer whales, porpoises and dolphins are recorded every year.

Grey seals regularly haul out onto the rocks below the cliffs and can often be seen swimming amongst the submerged kelp.

Situated at the southernmost point of Shetland, Sumburgh Head also serves as an important landmark and landfall for migrating birds in spring and autumn. It is popular with birdwatchers for viewing migrating birds and the buildings and surrounding bushes are checked several times a day during migration periods. Its coastal grassland, sea-cliffs and dry-stone dykes are also home to breeding wheatears, twites, and the endemic Shetland wrens and starlings.

The combination of dramatic setting, spectacular seabirds, magnificent sea mammals, celebrated lighthouse and vastly improved facilities, interpretation and access would, according to the RSPB's Reserve Management Plan, "be a brilliant visitor experience".

Sumburgh Head Reserve also provides a source for a world-class long-term research programme, carried out by Aberdeen University (SOTEAG). The monitoring programme shows a decline in productivity of Sumburgh Head's shags, kittiwakes, guillemots and fulmars. The RSPB intend to work in

partnership with the University, Scottish Natural Heritage and other stakeholders to influence fisheries management, principally the Shetland Sandeel Agreement, and contribute to research and debate on climate change.

Sumburgh Head may therefore be regarded as being of *outstanding ecological significance (level A)*.

3.9 Community and social significance

Social value represents the strong or special association of the site with a recognisable community or cultural group for social, spiritual or cultural reasons.

Sumburgh Head has been the guardian of the southern approaches to Shetland for millennia. It's unencumbered views of land and sea has made it an ideal point for both lookout and beacon.

For generations of Shetlanders returning home by air or sea, the distinctive and highly visible lighthouse buildings, contrasting starkly with the rugged coastline, have been a welcoming sight reminding them that they are nearly home.

The lighthouse also has social significance to Shetlander's, expressing the strong maritime nature of the islands and their culture. Occupied for well over 150 years it is associated with generations of lighthouse keepers and their families, many of whom still live in Shetland.

The site has long been a popular venue for both tourists and local visitors alike, who are drawn to Sumburgh for its lighthouse, to glimpse the stunning views and observe the garrulous seabird colonies at close quarters. No other site in Shetland offers visitors an opportunity to get so close to nesting seabirds.

In the year 2000, the NESS 2000 Conference took a critical look at what was needed to support the regeneration of the Dunrossness area of the south mainland of Shetland, of which Sumburgh Head forms the southernmost tip. In May 2000, a development strategy for the area was published which took on board all the work of the focus groups involved as well as the findings of the conference. A key strength identified for the area was the wealth of major visitor attractions concentrated in the south mainland; in particular, NESS 2000 endorsed the need to develop Sumburgh Head, already a highly popular visitor attraction, to improve the quality of visitor experience on site.

This is extremely important given that around 77% of all visitors to Shetland reportedly go there for reasons of Heritage and Culture. The development of Sumburgh Head as a major visitor attraction is, therefore, seen as a crucial element in the regeneration of the south mainland.

The site may therefore be considered to possess *local or moderate significance* in terms of its community or social value *(level C)*.

3.10 Geological significance

A small quarry to the northeast of the foghorn (HU408079) contains the youngest known fish bed of the Middle Devonian Orcadian Basin and is of national importance. It is also the only known location for the fossil fish *Asterolepis thule* in UK. The fish bed has been designated a Geological Conservation Review site of national importance and may therefore be regarded as being of *outstanding geological significance (level A)*.

3.11 Grading of significance

The values that contribute to the overall importance of the site have been graded in order to provide a relative assessment of its cultural significance when compared to other sites. For the purposes of this plan five levels of significance are considered sufficient to measure each aspect of cultural value and compare it to other sites consistently. These levels, their importance and their implications for conservation are as follows:

	Level of Significance	***Importance***	***Conservation Policy***
A	Exceptional/ Outstanding	International/ National	Reveal, maintain and enhance significance through meticulous preservation, conservation, restoration or reconstruction
B	Considerable	Regional	Reveal, maintain and enhance significance but some adaptation and supplementary construction may be considered to accommodate future compatible uses
C	Moderate	Local	Reveal, maintain and enhance significance but acceptable options may, subject to consensual agreement based on expert analysis, include alteration or removal in whole or in part
D	Little	Site	Interventions, alterations or demolition may be appropriate
E	Intrusive	Detrimental	Alter, remove or demolish

Given the size and complexity of issues affecting the sites, the assessment of significance is intended to deal only with those aspects sufficient to inform future conservation and development strategies. An assessment of the significance of individual elements is included in Appendix 2 to this Plan. As proposals develop for particular elements, detailed reviews of significance should take place to ensure that conservation policies remain relevant and appropriate.

3.12 Summary statement of cultural significance

The research and survey work documented in this plan clearly demonstrates that the site at Sumburgh Head is of **outstanding cultural significance** because of:

- Its exceptional historic value as the site of one of Robert Stevenson's first major lighthouses; its association with the Stevenson dynasty of lighthouse engineers; and its use during WW2 as an experimental radar station.
- Its exceptional architectural and aesthetic value through the quality and survival of the buildings and structures on the site and its role as an evocative landmark for both residents and visitors to Shetland.
- Its exceptional scientific and engineering value through its ongoing role as a vitally important navigational point; the survival and quality of its buildings and equipment; and its ability to demonstrate the evolution of lighthouse technology.
- The exceptional value of its setting and surrounding landscape through qualities of beauty, distinctiveness, wildlife and archaeological character.
- The exceptional value of the ecology of the site and its wider environs, gained primarily, though not exclusively, through its place as an internationally important seabird colony.
- Its exceptional geological value through the existence of a fossil fish bed and its status as a Geological Conservation Review site of national importance.
- Its social value to the local community and Shetlanders as a whole.
- The considerable value of its archaeology.

4 RISKS AND OPPORTUNITIES

4.1 Introduction

The importance and special nature of Sumburgh Head and the range and complexity of issues that affect it will undoubtedly combine on occasion to create situations where prospective uses, works or other interventions that need to be carefully considered to minimise any adverse impact on its cultural significance. The following issues have been identified as affecting the future conservation and management of the site. Policies relating to each of these issues are set out in chapter 5.

4.2 Statutory constraints

Sumburgh Head lighthouse, including the wider site in which it is located, has been awarded several statutory designations on account of its cultural and natural heritage value. These designations indicate that the site has particular significance that should be preserved and, in consequence, each places legal obligations upon owners and occupiers to manage and maintain it in certain ways.

Current statutory designations in place at Sumburgh Head include:

Planning (Listed Buildings and Conservation Areas)(Scotland) Act 1997

Sumburgh Head lighthouse, including all ancillary buildings, the engine house and foghorn, sundial, boundary walls, gates and gate piers, is afforded category A-listed status by Historic Scotland on account of its outstanding architectural and/or historic interest. This category of listing means that the site is officially recognised as being of national or international significance.

Listing covers not only the interior and exterior of each building, but also:

(a) any object or structure fixed to the building or buildings

(b) any object or structure within the curtilage of the building(s) which, though not fixed to building, forms part of the land and has done so since before 1st July 1948.

The fact that the complex of buildings at the site is listed as being of special architectural or historic interest does not mean that they must be preserved intact in all circumstances, but it does mean that demolition will not be allowed unless a very strong case for it is made and accepted. Alterations to the exterior or interior of any listed building should, as far as possible, preserve its character. Any such alterations are subject to 'listed building consent or control'.

This means that listed building consent must be applied for and obtained from the local planning authority for any proposals involving demolition, alteration or extension that might affect its character as a building of special architectural or historic interest. The procedure is similar to that for obtaining planning permission. If the proposed work was considered to have an adverse affect on the character of the building, the change would be very firmly discouraged and listed building consent likely to be refused by the planning authority.

It is a criminal offence to demolish, alter materially or extend a listed building without listed building consent: the penalty can be a fine of up to £20,000 or up to 2 years imprisonment, or both.

The local planning authority will consider applications for listed building consent with regard to advice provided by Historic Scotland in its Memorandum of Guidance as well as their own and other relevant policies. The authority may refer to Historic Scotland at any time during the consent process and must notify Historic Scotland of their intentions to grant consent for all category A and B listed buildings.

Council Directive 79 / 409 / EEC on the conservation of wild birds

Sumburgh Head is classified as a Special Protection Area (SPA) under the above directive on account of its breeding seabird population. The legal provision for an SPA in domestic legislation is the Wildlife and Countryside Act, 1981 (as amended). Most SPAs are underpinned by their designation as a Site of Special Scientific Interest (SSSI), see below.

The Nature Conservation (Scotland) Act 2004 and Wildlife & countryside Act (1984)(As amended)

Sumburgh Head has been a Site of Special Scientific Interest (SSSI) under the above and previous legislation since 27 June 1984 on account of its ecological and geological importance.

Local planning authorities are required to have policies in their development plans which protect SSSIs. They are then required to consult the appropriate conservation body, in this case Scottish Natural Heritage (SNH), over planning applications which might affect the interest of an SSSI (such a development might not be within or even close to the SSSI itself).

SNH has prepared a management statement for all SSSI sites in Scotland, and for Sumburgh Head this includes long-term objectives to:

(a) Maintain suitable conditions both on site and outwith the SSSI, for continued seabird breeding.

(b) Maintain the condition and accessibility of the fossil bearing rocks below the lighthouse.

Moreover, its status as an SSSI means that owners or occupiers of Sumburgh Head are required to consult with SNH, usually through the local planning authority, if they want to carry out (or permit) activities on the land. These activities are listed in the citation for each site and are deliberately wide-ranging; those listed for Sumburgh Head include:

- Dumping, spreading or discharge of any material
- Killing or removal of any wild animal
- Sea defense or coastal protection works, including cliff stabilization measures
- Extraction of rock
- Construction, removal or destruction of any road, track, wall or the laying or removal of any pipelines and cables, above or below ground
- Storage of materials
- Erection of any permanent or temporary structures or the undertaking of any engineering works, including drilling
- Modification of any natural or man-made feature

Where an owner or occupier is unwilling or unable to carry out management that meets the above requirements, SNH can ultimately require it to be done. Public bodies which own or occupy an SSSI have a duty to manage it properly.

4.3 Use

One of the main issues facing Sumburgh Head is that some of the buildings on the site have lain empty and unused since the lighthouse became fully automated in 1991. The Northern Lighthouse Board retained ownership of the Lighthouse tower and a small building for operational/infrastructure purposes but sold the remaining redundant lighthouse outbuildings and Sumburgh Head to a private buyer, following which there was limited investment in the site and the buildings were not open to the public.

After the purchase of the site by SAT in 2002, the East Pavilion continued to be used as offices for the RSPB and the former Principal Keeper's Cottage as holiday accommodation. All other buildings on the site have remained empty and unused since then and, while SAT has continued to provide basic custodianship, their condition has inevitably deteriorated over time. As referred to in more detail below, considerable capital expenditure is now required to fully conserve and repair all the buildings on the site and bring them to a condition capable of supporting beneficial new use.

In order to give the site a sustainable future it is essential that the use of all buildings was thoroughly reviewed and appropriate uses found for each. Such uses needed to be compatible with the conservation needs of the site and the statutory requirements imposed by its category A-listing.

The lighthouse still functions as an important navigational aid and remains the responsibility of the NLB. Any future development proposals at the site will need to take into account the operational requirements associated with this use and these should be established through early consultation with the NLB.

4.4 Future development

Sumburgh Head is a complex and sensitive site with many and varied conservation needs. Any proposals to develop the site must fully consider and take into account the conservation needs of the site and its environs. This applies to all aspects of both the built and natural heritage. Any development or new works must be carefully considered to ensure that they do not adversely impact upon their immediate surroundings or the wider area of the site.

4.5 Condition and repair

Perhaps the biggest issue facing the site is the deteriorating condition of its buildings and structures. Some are in a neglected state and a major programme of repair and improvement works is now required to bring them to an acceptable and appropriate condition. Most are of primary significance and together they make an essential contribution to overall significance of the site. They are by their nature and location highly visible to visitors. Given their significance it is unacceptable to let the buildings deteriorate further.

The conservation and repair works required for each building are listed in appendix 3 and at the date of writing this document costs are as stated in Morham & Brotchie's Cost Plan.

4.6 Access and circulation

A full access report on the site has been prepared by Jura Consultants and Adapt Access Services. This sets out the access-related issues that need to be addressed at the site and the measures required to improve accessibility. The issues identified in the access report include:

- Existing parking facilities have been shown to be inadequate with parking for approximately 16 cars in the main car park, and no dedicated coach parking, and limited parking at the lighthouse itself. This becomes particularly problematic during the summer season when cruise ships bring coach parties to Sumburgh Head.

- The site is easily accessible by foot, although the last 200m to the lighthouse is a steep slope making it inaccessible for wheelchair users. The reserve's cliffs are up to 80m high, however, they are fenced or walled off with hazard signs in place to warn of danger at each of the access points.
- Sumburgh Head is a significant visitor attraction and the seabird colony is one of the most accessible in Britain. During the breeding season, thousands of seabirds can be viewed safely and easily from the cliff top. Additionally, its high vantage point offers one of the best sites in Shetland to view cetaceans and other sea mammals from a number of viewing platforms. There is, however, a lack of seating for visitors.
- As the site is in an exposed location, extreme winter weather conditions can make the site inaccessible. At present, there are no public toilets at Sumburgh Head and no places for visitors to shelter.

Parking issues solicited the greatest concerns particularly amongst transport and tour operators. The lack of dedicated coach parking places and a turning circle have been highlighted as priority needs.

The limited space and topography of the lighthouse site itself constrains the number of parking spaces that may be provided or created there. In addition, turning space for delivery and emergency vehicles is inadequate and problematic.

In January 2004 a cliff fall occurred at Sumburgh Head, removing some of the existing path and dyke. Emergency fencing was erected immediately by the Trust and employed specialist engineers, Ravey Consulting, to carry out a survey. The resulting report recommended that a section of the access road be re-routed further inland.

The access report referred to above goes on to identify issues relating to the provision of physical access to the site for visitors with mobility problems, wheelchair users, older visitors and parents with young children who require the use of pushchairs. The report assesses the site with regard to physical and sensory access, noting problems and giving recommendations where necessary to improve physical access. The criteria used for assessment are:

- The need to maximise access to, and use of, the site and facilities for members of the public and staff.
- Provisions in the Scottish Building Standards and BS8300:2001.
- Guidance in the Disability Discrimination Acts 1995 / 2005
- The need to observe **reasonable** functional and financial practicalities.

These issues need to be considered in any future development proposals for the site and the full access report should be referred to in this regard. In summary, any proposals to carry out significant development of the site must involve

making it generally as physically accessible as is reasonable given its status as a protected natural and historic environment including:

- Where physical access to an area of the site is not possible for some disabled people, good quality interpretative material should be provided instead,
- Dedicated disabled parking spaces provided at the lighthouse complex rather than at the lower car park
- Staff should be available to assist visitors during the main summer season.
- The provision of disabled accessible toilets
- The provision of external wheelchair ramps where there is currently only stepped access to a building.

4.7 Visitor facilities and interpretation

There is currently no visitor centre nor any public toilets at the site. The RSPB Shetland Office is located in the east pavilion and visitors frequently call there for information or to use the staff toilet. As the site is in an exposed location, extreme winter weather conditions can make the site challenging , especially as there are no places for visitors to shelter.

Only limited interpretive facilities are provided at present. There are four interpretive panels on the site: one at the car park, one on the approach road, and two at the lighthouse site. Although reasonably well maintained, these panels are over ten years old and in need of refreshment. There is a lack of orientation material, which may lead to visitors missing seeing important seabirds as they are unaware of exactly where to look.

This obvious lack of visitor and interpretive facilities detracts substantially from the visitor 'experience'. A considerable degree of improvement is therefore necessary to interpret the site and provide adequate facilities for visitors.

A full interpretive plan for the site has been prepared by Bogacki Design. This addresses issues of intellectual accessibility to interpretation of the site, including measures to introduce innovative methods of communication for sensory impaired people.

4.8 Ownership and management

Issues relating to ownership and management of the site are included in SAT's Business and Operational Plans and should be referred to.

4.9 Risk management

The safety of users and visitors to the site is paramount. This applies in particular to any proposals to allow access to the lighthouse tower, the foghorn

and the engine room. Adequate risk assessment must be undertaken and appropriate measures put in place prior to allowing any such access.

A large cliff fall occurred at the site in January 2004 resulting in loss of an estimated 10,000 tonnes of material including some of the existing path and dyke. Emergency fencing was erected immediately by the Trust and specialist engineers, Ravey Consulting, were appointed to carry out a survey. The resulting report identified the potential for a further landslide and recommended that a section of the access road be re-routed further inland.

The cliffs around the site are up to 80m high and are fenced or walled off with hazard signs in place to warn of danger at each of the access points. All such signage and boundaries should be regularly inspected and maintained as necessary.

Fire is a threat to all buildings. The design and construction of Robert Stevenson's original buildings make them especially vulnerable to fire as they contain a considerable degree of timber and other combustible materials. The development proposals for the site will involve consultation with the local fire safety office and local authority building control department to determine the most appropriate fire safety management system

Although security has never been an issue at Sumburgh Head, this should nevertheless be reviewed commensurate with the level of risk associated with any new facilities proposed at the site.

4.10 Conservation and maintenance

The lighthouse at Sumburgh Head is Shetland's first and is recognised as one of Scotland's finest surviving pieces of early 19th century architecture.

The buildings have retained the majority of their internal and external integrity, while absorbing technological change and improvements associated with their use as a light station. The site itself has also changed relatively little over the years.

A considerable amount of original equipment, fittings and furnishings still exist at the site. These are important pieces of social history and provide the opportunity to show how the building was operated and occupied during its heyday as a manned lighthouse.

In addition, Sumburgh Head was of strategic importance during World War II. The two radar station buildings that exist at the lighthouse site were operated in direct contravention of the Geneva Convention and are valuable reminders of the importance of the site during this period.

For these reasons, Sumburgh Head has been assigned a category A-listing by Historic Scotland, meaning that it is officially recognised as being of national or international architectural and/or historical importance. It is therefore an essential conservation requirement that the existing historic character and integrity of the site and its buildings is protected and conserved.

While the buildings have, as referred to above, retained the majority of their internal and external integrity they have nonetheless suffered from a number of unfortunate alterations and additions carried out during the 1950s and 1960s. This includes the construction of poorly executed extensions to the rear and courtyard sides of both pavilions, removal of pediments to both the front and rear of the pavilions, removal of chimney stacks and infilling of window openings. A cement render coating was also applied to Robert Stevenson's original lighthouse buildings, probably around 1905 during construction by his grandson, David A Stevenson, of the engine house and principal keeper's accommodation block. Sufficient physical and documentary evidence exists to restore the buildings back to their original form and appearance.

The conservation and repair works required for each building are listed in appendices 3 and 7.

The very exposed location of the site also demands that all conservation works are carried out to a very exacting standard. In order to protect the long-term integrity of the site, a standard 'conservation' approach may not be suitable in all matters and the use of 'modern' materials and methods will therefore be given due consideration where appropriate. The practical experience of the NLB in maintaining buildings located in such exposed sites will be of considerable benefit and should be fully utilised. Weather conditions at the site underline the need to ensure that an effective programme of planned maintenance is implemented.

Weather conditions at Sumburgh Head often mean that the time available for outdoor construction activities is relatively limited when compared to the Scottish mainland. The timescale for undertaking re-roofing works and 'traditional' building techniques, such as working with lime, may be particularly affected. Careful pre-planning and should be employed to minimise these effects.

4.11 Ecology

Sumburgh Head is one of the most accessible internationally important seabird colonies in northern Europe. This demands, first of all, that the site is managed in such a way that minimises the effects of any construction or development activities on the seabird colonies, particularly during the breeding season. The RSPB has had a long-term presence at the site and understands the issues and vulnerabilities faced by both resident and visiting birds. These and other

ecological issues facing the site are fully set out and explored in the RSPB's Reserve Management Plan 2006-2011, a full copy which is appended to this plan and should be referred to.

4.12 Archaeology

A full report on the archaeology of the site has been commissioned by the Trust and forms appendix 4 to this plan. This sets out the archaeological issues facing the site which are now summarized as follows:

(a) The Sumburgh Head lighthouse complex is a unique collection of historical buildings which survive more or less unaltered since they were first constructed. The neo-classical design of the two flanking accommodation blocks is of great architectural interest and in keeping with Stevenson's quality of lighthouse engineering and design.

(b) The WW2 radar building interiors are now severely dilapidated but their outer shell is well preserved. These two sites are unique survivors of the very first experimental CHL radar stations established in 1939. A year later they played a critical role in providing early warning of an aerial attack on the naval base moored at Scapa Flow and without doubt saved lives.

(c) The archaeological remains associated with the Sumburgh Head promontory fort are visible at the narrow neck of land to the north side of the lighthouse complex. Here the two banks of the upper rampart are still visible running under a drystone boundary wall. A WW2 building has removed a large proportion of this rampart behind the boundary wall. Further downslope, a recent landslip has removed the lower ramparts terminus. Within the interior of the headland it is likely that substantial remains of the fort could survive. The field enclosures on the north and south sides of the lighthouse complex have never been cultivated in modern times and this will in all probability have led to the survival of near-surface archaeological remains (houses, middens, hearths pits) containing organic material that will provide important radiocarbon dating evidence.

(d) The desk-based assessment has brought together the readily available cartographic and documentary sources associated with the two WW2 radar structures and the lighthouse complex. It is clear that there is a great deal of further unseen information held within the NLB records deposited in the National Archive of Scotland. The NLB Secretary's Accounts dating from 1901 to 1936 have provided technical information on the early development of the lighthouse complex.

4.13 Setting and landscape

Specialist reports on the conservation and management of the landscape and setting of the site form appendices 5 (landscape) and 6 (geology) to this plan. This report sets out the issues and vulnerabilities facing the site which may be summarised as follows:

(a) Access is a major challenge to be addressed in the context of a very sensitive landscape. The realignment of the approach road was recommended in the specialist report commissioned after the landslip, and the car park is in need of expansion. The access for coach tours is also difficult. All of this gives rise to pressure on the sensitive landscape. This pressure can be accommodated but needs to be handled very carefully through an appropriate approach to landscape design.

(b) In such an exposed visually and ecologically sensitive location it is important that any building or engineering works are undertaken sensitively to minimise impact on the landscape heritage, and the character and setting of the listed buildings.

(c) The landscape is vulnerable to changes that conflict with existing character. At present there are some minor detractors such as overhead power lines, unsympathetic seating and a temporary cordon protecting the public from an area where there has been a recent rockfall along the edge of the cliff. In addition the external environs of the lighthouse complex are somewhat cluttered and neglected.

(d) In promoting conservation, consolidation and improvement of Sumburgh Head there is little need for significant landscape change. Any new building should be carefully integrated with the existing and should not be a prominent feature within the landscape. Factors which could potentially detract, albeit to a moderate extent, from existing landscape character include changes to the approach road, the car park, the pathways, the stone walls, the vegetation, the infrastructure and the buildings themselves. This is a situation where small inappropriate details within the landscape can detract from overall landscape quality in a cumulative way whereas the use of natural and traditional forms and characteristics adapted for a given purpose can enhance the landscape quality and experience.

The above report goes on to identify more specific issues that affect individual zones within the setting of the site and the surrounding landscape.

5 POLICIES

5.1 Introduction

This section of the plan sets out policy recommendations intended to resolve the issues and vulnerabilities facing the site identified in section 4 of this plan. These policies explain the principles to be followed to retain or reveal the various aspects of significance of the site. The aim is to show how the heritage significance of Sumburgh Head can be maintained and enhanced.

Published guidance on the preparation of conservation plans notes the theoretical distinction between *policies* and the *strategies for their implementation*. The conservation policy is largely dependent on the assessed level of significance which is unlikely to change drastically over time, whereas the strategy for implementation, which appears in the following section of this report (chapter 6), interprets this policy in the light of client requirements and funding, which are highly likely to change over time.

There are a number of reasons for the preservation of a building, its setting or the landscape around it on cultural grounds. One is historic or archaeological: for the information or evidence of the past embodied in it. In this case, the aim would be to conserve the site as found using the best conservation practice. Another reason is aesthetic: for its beauty, for its value as a work of architecture; where the original or secondary design is considered to be the part that gives the building or site its significance. A further reason is social: for the value embodied in both the tangible and intangible attributes of the site to the local and wider community.

Nearly all buildings are built with the intention that they should look well, in addition to being sound and useful. The beauty of a building, or a work of architecture or engineering, may depend on the intended or formal aesthetic qualities of its design. Unlike historical authenticity, which once lost can never be regained, the lost or buried beauty of a building can often be recovered, through a combination of conservative repair and restoration.

Future management of and works to Sumburgh Head must be concerned with conservation and repair of the lighthouse and other buildings on the site, its setting and the wider landscape within which it sits, with the possibility of adapting the existing buildings and identifying the potential for any new development on the site.

5.2 Definitions

The following definitions have been taken from British Standard BS 7913: 1998 *Guide to the principles of the Conservation of Historic Buildings:*

Alteration

Work to change or improve the function of a building or artefact, or to modify its appearance.

Conservation

Action to secure the survival or preservation of buildings, cultural artefacts, natural resources, energy or any other thing of acknowledged value for the future.

Design

An abstract concept of a building or artefact. It can exist in the mind or on paper and, if realised, can be represented in the building or artefact itself.

Fabric

Physical material of which a building or artefact is made.

Intervention

Any action which has a physical effect on the fabric of a building or artefact.

Maintenance

Routine work necessary to keep the fabric of a building, the moving parts of machinery, grounds, gardens, or any other artefact, in good order.

Preservation

State of survival of a building or artefact, whether by historical accident or through a combination of protection or active conservation.

Protection

Provision of legal restraints or controls on the destruction or damaging of buildings or artefacts, natural features, systems, sites, areas or other things of acknowledged value, with a view to their survival or preservation for the future.

Repair

Work beyond the scope of regular maintenance to remedy defects, significant decay or damage caused deliberately or by accident, neglect, normal weathering or wear and tear, the object of which is to return the building or artefact to good order, without alteration or restoration.

Restoration

Alteration of a building, part of a building or artefact which has decayed, been lost or damaged, or is thought to have been inappropriately repaired or altered in the past, the objective of which is to make it conform again to its design or appearance at a previous date.

5.3 Conservation policies

5.3.1 General

Policy 1:	***Conserve and manage the cultural significance of the site and in doing so enhance that significance***

Strategies

a) The buildings, their setting and the surrounding landscape should be conserved in accordance with the guidelines set out by Historic Scotland in the Stirling Charter (2000) and in the British Standard Guide to the Principles of the Conservation of Historic Buildings BS7913: 1998.

b) All conservation work should enhance Sumburgh Head as a site of historical, aesthetic, scientific and social significance.

c) Sumburgh Head lighthouse should be maintained in such a condition as to continue its status as a site of outstanding cultural significance.

d) Any new work to the buildings or the surrounding landscape should comply with the recommendations of this report and the guidelines referred to in a) above.

e) Any new work should comply with the recommendations of Shetland Island's Council Shetland Local Plan (June 2000) and other relevant planning instruments.

f) Any proposed works to the site, other than maintenance or like-for-like repairs, should be referred to the local planning authority and listed building consent applied for, as necessary, prior to undertaking any such works.

g) All persons undertaking repair, maintenance or new work at the site (including the landscape) should be made aware of its significance and the possible impact of their work. A copy of this Conservation Management Plan should be made available to all such persons.

h) Elements of *outstanding* significance, as defined in the chapter 3 and Appendix 2 to this Plan, should be revealed, maintained and enhanced through meticulous preservation, conservation, restoration or reconstruction.

i) Elements of *considerable* significance, as defined in the chapter 3 and Appendix 2 to this Plan, should generally be retained, maintained and enhanced but are capable of accepting some degree of change or adaptation to accommodate future compatible uses.

j) Elements of *moderate* significance, as defined in the chapter 3 and Appendix 2 to this Plan, should generally be retained, maintained and enhanced but acceptable options may, subject to consensual agreement and expert analysis, include alteration or removal in whole or part.

k) Elements of *little* or *neutral* significance, as defined in the chapter 3 and Appendix 2 to this Plan, do not adversely impact on the significance of the buildings or landscape. These elements may be removed or retained as required as part of any future use or development of the site.

l) *Intrusive* elements, as defined in the chapter 3 and Appendix 2 to this Plan, should be removed from the buildings or landscape as part of any future works and thereby restore original fabric or design, or to enhance elements of higher significance.

m) Any adaptation to the buildings or site, including new work should be undertaken by a conservation-accredited architect and should comply with the above requirements.

n) There will be a presumption against new buildings being commissioned on the lighthouse site where existing accommodation might be used instead.

o) A copy of this Plan of Management and Conservation Management Plan should be readily available to all persons and as a part of any new contract for the lease of the property.

p) A copy of this Conservation Management Plan should be held at the site and made available for viewing by interested parties. Copies should also be provided to all relevant stakeholders including:

- Shetland Amenity Trust
- RSPB
- NLB
- Shetland Islands Council
- Historic Scotland

q) Shetland Amenity Trust should undertake to implement this Conservation Management Plan.

r) The Conservation Management Plan should be reviewed and re-assessed every 5 years.

5.3.2 Setting and landscape

Policy 2:	***Conserve the setting and the landscape of the site***

Strategies

a) All heritage features and their setting should be carefully protected and restoration promoted where necessary.

b) All proposals for development, improvement and other activities on the site should be carefully considered in respect of existing landscape character.

c) A statement of heritage impact should be prepared for any new work. New work should be undertaken or supervised by an appropriately qualified professional.

d) The scale, colour and choice of materials for new development or conversion of existing buildings should be carefully considered in order to assist with the integration with the landscape setting.

e) The visual qualities of the landscape should be considered from the surrounding land.

f) The visual qualities of the landscape should be considered from the sea.

g) The development of recreation and tourism facilities should not compromise the character of, or conflict with, the enjoyment of the landscape.

h) Adequate drainage should be provided along road sides and access roads to prevent erosion and verge treatment, suitably designed and implemented to ensure successful reinstatement of the surrounding natural vegetation.

i) Cuttings or embankments should be carefully formed to match natural landform gradients.

j) Proliferation of infrastructure should be avoided to safeguard landscape quality.

k) Paths and signs should use materials and colours that fit in with their surroundings.

l) Because the height of any vegetation will be limited, mitigation measures are generally confined to earth-modelling and surface re-vegetation.

m) It is extremely important to ensure that any proposed route to the site is selected with great care.

n) The stripping, storage and restoration of ground cover should be carried out sensitively to enable the appropriate restoration of roadside edges.

o) Avoid disturbance to the local drainage regime which can cause changes to ground cover and invasion by species inappropriate to the locality.

p) Boundary walls, fences, barriers, lighting and bus shelters etc should use materials, colours and designs that are appropriate to their surroundings.

q) Existing roads should be assessed to improve verge reinstatement of vegetation.

r) Undergrounding of low voltage transmission and telecommunication lines should be considered where sensitive habitats will not be disturbed.

s) Particular attention should be paid to the siting and screening of electricity substations and the siting of aero-generators with regard to visual and physical impact.

t) With regard to the recommended re-alignment of the access roadway due to the cliff fall, such realignment should be undertaken in a sensitive manner as close to the existing road as possible.

u) The removal of unnecessary outbuildings and infrastructure and the rationalisation of the surface materials around the lighthouse complex will increase the legibility of the historic structures by simplifying their setting.

5.3.3 Ecology

Policy 3: Conserve the ecology of the site

Strategies

a) Work with the RSPB to manage the site in accordance with the vision and management objectives set out in their *Sumburgh Head Reserve Management Plan 2006 – 2011* and all such subsequent plans.

b) A statement of heritage impact should be prepared for any proposed development or new work at the site.

5.3.4 Archaeology

Policy 4: Conserve the archaeology of the site

Strategies

a) The removal of internal and external wall linings within any of the lighthouse complex buildings should be subjected to more detailed fabric survey to record the position of any original architectural features currently masked or hidden

b) Plans to remove the two kitchen blocks on the rear (south) and inner courtyard (east) elevations of both accommodation blocks would provide the opportunity to examine the ground below. Plans to demolish the disused wooden garages (feature 7) would allow the opportunity to examine the ground at this site. The garage foundations are likely to be shallow and may not have impacted on any buried archaeological remains associated with the fort at this locality.

c) A programme of archaeological work should be undertaken on any areas to be subjected to ground-breaking work. This work could include:

- geophysical research to record the extent of any buried structural remains surviving from the promontory fort
- archaeological evaluation to assess the potential for the survival and quality of any buried archaeological remains
- archaeological recording of the eroding sections of the ramparts
- watching briefs to monitor ground-breaking works associated with the construction of new buildings, road realignment and car-park infrastructure works
- excavation to record any features brought to light during the evaluation and geophysical surveys
- post-excavation and publication to disseminate the results of the archaeological work.

5.3.5 Architecture and buildings

Policy 5:	***Conserve the significant built fabric of the site***

Strategies:

a) Prepare and implement a comprehensive programme of repair works to the buildings on the site as set out in the condition report forming Appendix 1 to this plan and in accordance with the Historic Scotland ARCH1 report dated 17 February 2004 reference HFL/B/Z/28.

b) Following a) above, the Maintenance Action Plan in chapter 6 should be implemented to ensure the continued maintenance of the buildings and structures on the site.

c) Conservation work to built fabric should be limited to repair, preservation or restoration, where interpretation of significance would be enhanced and sufficient evidence exists. Adaptive re-use of spaces is considered acceptable in compliance with those requirements stated in the general conservation policies set out in 5.3.1 above.

d) All repairs are to be undertaken to a conservation specification, utilizing like for like materials of construction unless a clear case to the contrary can be made. They shall be professionally designed, resourced and inspected by persons with appropriate building conservation experience and training and executed by contractors with appropriate conservation skills.

e) To preserve the lighthouse buildings from damage and deterioration, the highest standards of detailing against the weather should be adopted at the site.

f) All building services installation work shall be professionally and carefully designed, specified and inspected, and resourced so that

the conservation implications of the intervention, however small scaled, are fully taken into account. In particular, all service runs, drill holes and chases are to be agreed in advance. Inclusion of any new services should be restricted and concealed where possible. Replacement of original services should follow original details.

g) Fabric identified as being intrusive should be removed if practical. If this is unacceptable, sympathetic alternatives should be investigated as part of the management plan.

h) External paths and paved surfaces should be repaired with minimal disturbance to original fabric.

i) A suitable fire prevention system should be procured and installed at the site following consultation with the local fire prevention office and local authority building control department.

j) Specific recommendations for individual areas of fabric, where applicable, are set out in detail the condition report contained in Appendix 1 and the Maintenance Plan contained in chapter 6 of this Conservation Management Plan.

5.3.6 Moveable heritage

Policy 6:	***Conserve the moveable heritage of the site***

Strategies:

a) Items identified as movable heritage should be catalogued and adequately secured to prevent theft. Curatorial advice could be sought on the cataloguing and storage of such items or material.

b) Where possible relevant significant material should be retrieved from local museums and other places and conserved on site. This includes such items as the sundial. Such items should not be relocated until adequate security and conservation of material has been implemented.

c) Fittings and furniture should where possible be retained in original locations and conserved.

d) Paper and photographic material should be conserved and stored away from direct sunlight.

5.4 Management policies

5.4.1 Use

Policy 7:	***Review the current and future use of all buildings on the site and identify sustainable and appropriate new uses for each***

Strategies:

a) Any new uses should be compatible with their heritage value and should conform with the general conservation policies set out in 5.3.1 above.

b) The policy recommendations set out in this Plan should be applied irrespective of the use(s) to which the buildings are put.

c) Uses with complex servicing or other requirements that would have a strongly adverse effect on the character of the buildings should be avoided where possible.

d) No new development should be permitted on the site until the potential use(s) of all existing buildings has been thoroughly explored and considered.

e) The engine house should remain as it was originally intended, an engine house.

f) At least one of the exhibited engines will be kept in working order as far as is possible.

5.4.2 Property management

Policy 8:	***Prepare and implement a system of property management consistent with the general conservation policies set out above.***

Strategies:

a) Implement the policies set out in the accompanying Business Plan and Operational Plan for the site.

b) Work with the RSPB to manage the site in accordance with the vision and management objectives set out in the Operational Agreement annexed to the Business Plan.

c) Work with the NLB to manage the site in such way that their statutory and operational needs are met with regard to the ongoing use of the lighthouse as an important navigational aid.

d) Carry out maintenance of the site as per the Maintenance Plan included in chapter 6 of this document.

5.4.3 Access

Policy 9:	***Optimise public access to the site consistent with the general conservation policies set out above***

Strategies:

a) Implement the policies set out in the Access Plan prepared by Jura Consultants and Adapt Access Services dated February 2009 and all such subsequent plans. Specific management measures and adaptations should be made to maximise accessibility to as much of the site as possible for all persons, including those with physical disabilities, within the constraints imposed by the safety and security requirements of the lighthouse (including any operational requirements), and unavoidable physical limitations to parts of the station (eg steps in the light tower or foghorn).

b) Review the current parking arrangements at the site and seek to increase the number of spaces for cars and other vehicles at the lower car park, including provision for coaches.

c) Review the current vehicle management arrangements at the upper site with a view to formalising and improving the spaces available for staff, holiday-house users and disabled persons and turning space for delivery and emergency vehicles.

d) Implement the specialist report by Ravey Consulting in respect of the cliff fall that occurred in January 2004 and re-align the access road further inland as recommended.

5.4.4 Recreation, culture and tourism

Policy 10:	***Encourage tourism, cultural and recreational uses of the site consistent with the general conservation policies set out above***

Strategies:

a) Promote and encourage ongoing use of the site for cultural, recreational and tourist activities.

b) Encourage local schools to visit and study the site.

c) Implement the policies set out in the accompanying Business Plan in its totality, including its appendices such as the Training & Involvement Plan, Education Plan, Audience Development Plan and Risk Management Plan.

d) Implement the policies set out in the accompanying Interpretive Plan for the site.

6 IMPLEMENTATION & REVIEW

6.1 Introduction

A Conservation Management Plan should be a useful document that is constantly referred to and updated as appropriate. Therefore, this section details how the CMP will be put into action and kept up to date.

6.2 Adoption

Copies of the CMP are to be circulated both in paper and electronic form to the Heritage Lottery Fund and the SAT, prior to formal adoption by the SAT. Any conditions or reservations should be appended to the document. The date for adoption should set the dates for future reviews.

6.3 Distribution

It is recommended that the SAT should give consideration to forwarding copies of the adopted CMP to the following:

- Historic Scotland
- The National Monuments Record of Scotland
- Shetland Islands Council
- A local public library

A principal copy of the plan should be held by the SAT in a central location, and any new information should be lodged with the document so as to be ready in times of review. In addition, consideration should be given to disseminating information about the assets by way of public lectures to interested groups within the local community.

6.4 Use

Following adoption, SAT will own the plan and be responsible for putting it into practice. The plan is to be used to undertake further specialist assessments, develop full and detailed day to day management and maintenance strategies for the sites (see costs developed in Appendix 12), and to shape any future proposals, i.e. it will be used to select the most appropriate use or uses for the asset and to prepare heritage impact assessments for any work (see Appendix 15).

Any repairs, alterations or developments undertaken by SAT will be undertaken in accordance with the policies set out in this document (contractors are to be supplied with relevant policy extracts), and the research and recording work that accompanies any physical interventions will be used to update future versions of this document at times of review.

The CMP should also be used in other ways, such as to secure grant funding for future projects at Sumburgh Head, or to help shape the local planning authority's Local Plan for the area.

Actions required to fully implement the CMP are listed below:

Strategy	Action	By	Priority	Performance measure	Approx Cost
Policy 1: Conserve and manage the cultural significance of the site and in doing so enhance that significance					
Conserve the site in accordance with the guidelines set out by Historic Scotland in the Stirling Charter (2000) and in the British Standard Guide to the Principles of the Conservation of Historic Buildings BS7913: 1998.	Engage a Conservation Architect and proceed with the conservation work to enhance Sumburgh Head as a site of outstanding cultural significance as set out in the Stage E Design Report.	Project Team (PT)	H	Delivery of the Stage E design works.	£5.4m
Preserve the value and outstanding cultural significance of the site.	Maintain the site in accordance with the CMP.	Sumburgh Head Management Team (SHMT)	H	Adoption and implementation of site maintenance plan	See M&B Maintenance Cost Plan
Ensure that a copy of this Plan is held at the site and made available for viewing by relevant parties.	Copies of the CMP will be provided to all relevant parties.	SHMT	M	CMP copied to all stakeholders and Lessee's.	Negligible.
Carry out a review and assessment of this Plan every 5 years.	Engage a Conservation architect to review the CMP.	SHMT	M	CMP reviewed as appropriate.	£1k
Policy 2: Conserve the setting and landscape of the site					
All heritage features and their setting should be carefully protected and restoration promoted where necessary.	Implement the Sumburgh Head Conservation and Management Plan Landscape Character and Views.	SHMT	H	Adoption and implementation of the Sumburgh Head Conservation and Management Plan Landscape Character and Views.	See M&B Maintenance Cost Plan

Strategy	Action	By	Priority	Performance measure	Approx Cost
Policy 3: Conserve the ecology of the site					
Conserve the ecology of the site	Manage the site in accordance with regard to relevant legislation for SPA's / SSSI's and the RSPB's Sumburgh Head Management Plan.	SHMT	H	Adoption and Implementation of the Sumburgh Head Operational Agreements	See business plan.
Policy 4: Conserve the archaeology of the site					
Conserve the Archaeology of the site.	Undertake a programme of archaeological work on any areas to be subjected to ground-breaking work as set out in the report by CFA Archaeology Ltd. (see appendix 4).	PT	H	Implement the recommendations of the report by CFA Archaeology Ltd.	Cost will vary.
Policy 5: Conserve the significant built fabric of the site					
Preserve the value and outstanding cultural significance of the site.	Engage a Conservation architect to oversee the works to ensure the conservation of the built fabric.	PT	H	Implement a comprehensive programme of repair works to the buildings on the site as set out in the condition report forming Appendix 1 to this Plan and in accordance with the Historic Scotland ARCH1 report in Appendix 14.	Contained in policy 1 above.

Strategy	Action	By	Priority	Performance measure	Approx Cost
	Maintain the site in accordance with the CMP.	SHMT	H	Implement the maintenance plan costed in Appendix 12 to this Plan and in doing so ensure the continued maintenance of the buildings and structures on the site.	See M&B Maintenance Cost Plan
Policy 6: Conserve the moveable heritage of the site					
Conserve the moveable heritage of the site	Curatorial advice will be sought on the cataloguing and storage of such items or material.	SHMT	H	Items identified as movable heritage will be catalogued and adequately secured.	Contained in policy 1 above
Policy 7: Review the current and future use of all buildings on the site and identify sustainable and appropriate new uses for each					
Review the current and future use of all buildings on the site and identify sustainable and appropriate new uses for each	Ensure that any new uses of the buildings or structures on the site are compatible with their heritage value and conform to the general conservation policies set out in this Plan.	PT	H	Implement the Stage E design report.	Contained in policy 1 above
Policy 8: Prepare and implement a system of property management consistent with the general conservation policies set out in s 5.3 of this CMP					
Prepare and implement a system of property management consistent with the general conservation policies set out in s 5.3 of this CMP	Manage the site in accordance with the vision and management objectives set out in the Sumburgh Head Operational Agreements.	SHMT	H	Implement the policies set out in the accompanying Business Plan and Sumburgh Head Operational Agreements for the site and this CMP.	Contained in business plan

Strategy	Action	By	Priority	Performance measure	Approx Cost
Policy 9: Optimise public access to the site consistent with the general conservation policies set out in s5.3 of the CMP					
Optimise public access to the site consistent with the general conservation policies set out in s5.3 of the CMP	An access management plan has been prepared.	PT	H	Implement the policies set out in the Access Plan prepared by Jura Consultants and Adapt Access Services dated February 2009 and all such subsequent plans.	Contained in policy 1 above
Policy 10: Encourage tourism, cultural and recreational uses of the site having due regard to the conservation needs of the site					
Encourage tourism, cultural and recreational uses of the site having due regard to the conservation needs of the site	Encourage ongoing use of the site for cultural, educational, recreational and tourist activities.	SHMT	H	Implement the policies set out in the: Business Plan, Education Plan; Audience Development Plan; Interpretive Plan and the Training and Involvement Plan for the site.	Contained in business plan

6.5 Review

A Conservation Management Plan is a living document that must be updated to reflect any changes in the asset or its management. In order to keep the plan current and to check that it is being utilised effectively, i.e. that the agreed policies are being adhered to, it must be periodically re-evaluated at a maximum five-yearly interval. Therefore, the first review of this plan should be carried out in 2014 at the latest. Any new and relevant information that is found or recorded should be taken in account when conducting the reviews.

All changes to the report are to be recorded in a section at the beginning of the document, entitled 'Alterations'.

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See also consultant reports in appendices for further details of references.

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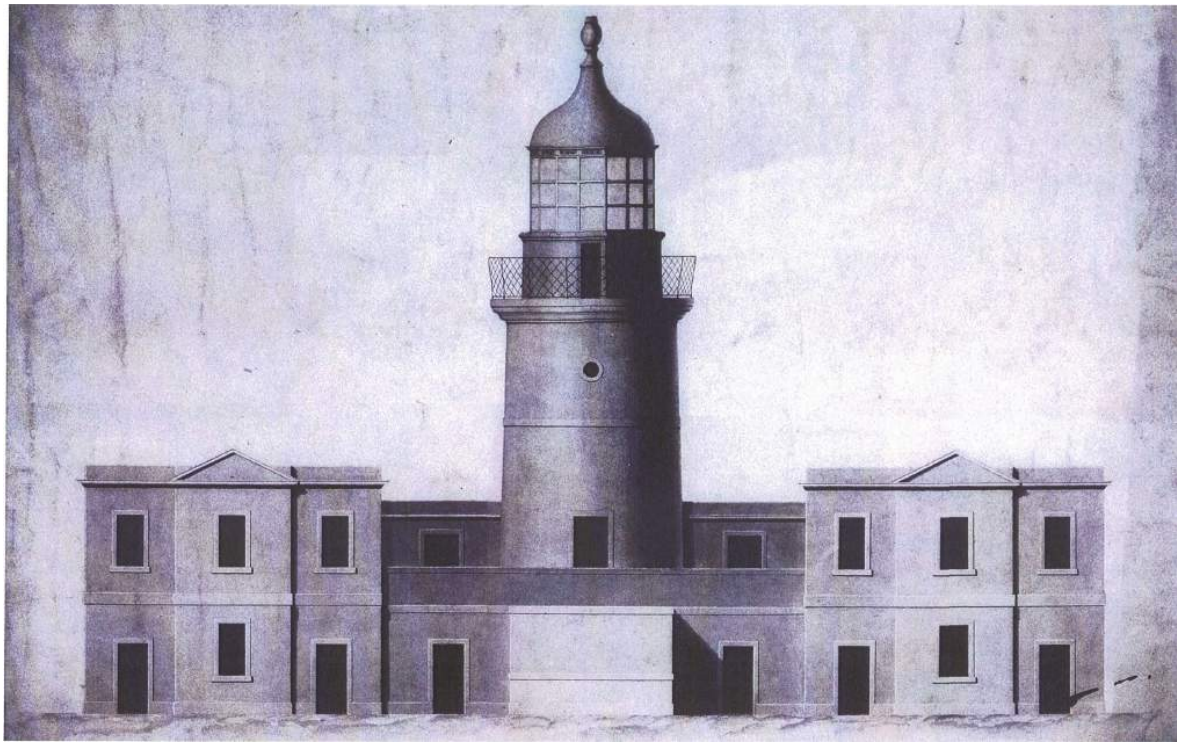

SUMBURGH HEAD LIGHTHOUSE RESTORATION AND DEVELOPMENT PROJECT
CONSERVATION MANAGEMENT PLAN APPENDICES

March 2009

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SUMBURGH HEAD LIGHTHOUSE

Conservation Management Plan

Appendices

1	*Condition survey*	
2	*Grading of significance*	
3	*Schedule of repairs*	
4	*Consultant report*	*Archaeology*
5	*Consultant report*	*Landscape*
6	*Consultant report*	*Geology*
7	*Consultant reports*	*Structural Engineering*
8	*Consultant reports*	*Ecology*
9	*Consultant report*	*Navigational significance*
10	*Consultant report*	*Wartime*
11	*Consultant report*	*Access*
12	*Consultant report*	*Maintenance Cost Model*
13	*Statutory designations*	*Ecology & Buildings*
14	*Historic Scotland Arch 1 report*	
15	*Heritage Impact Assessment*	
16	*Historic Drawings & Maps*	
17	*Consultant report*	*Lighthouse development*

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APPENDIX I
CONDITION SURVEY

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CONDITION SURVEY

Summary report on condition of the buildings owned by Shetland Amenity Trust

In general terms, the complex of buildings are in a stable condition, though this varies according to the nature and extent of use of each individual building and the degree of maintenance it has benefited from. Sumburgh Head is a very exposed site and as one would expect the building fabric has struggled to withstand the ferocity of the elements. Indeed, the fact that the buildings have survived so well owes much to the quality of and thought behind their construction. Nonetheless, dampness penetration through the roof and walls has clearly been a persistent and longstanding problem, and indeed continues to be so. Previous works to the buildings, such as the removal of pediments and other features, cement rendering of exposed masonry walls and their later overpainting with an impervious coating, have been undertaken in the belief that such measures would improve the performance of the buildings. These works have had a detrimental effect on the architectural quality of the buildings and some may have also contributed to their physical deterioration.

Photographic images showing the present condition of the site are included within the text of this report and in CFA's Archaeology report in Appendix 6. Proposals for the conservation and repair of the buildings are in Appendix 7, together with an earlier Feasibility Study report by Elliott & Co on the condition of the structures. In addition, the proposal drawings in the Stage E Design Report indicate the general extent of the repair and restoration considered necessary.

Taking each building or element of the site in turn, the main points concerning their condition and state of repair are set out below as follows:

1 The lighthouse pavilions

The pavilions comprise a mirrored pair of two-storey flat-roofed buildings arranged each side of the light tower. Historically, the upper levels of both pavilions were used as dwellings, but for some time the northmost has provided accommodation for the RSPB while the southmost has lain unused. The buildings are set into the fall of the ground, with the lower floors accessed from car-park level and the dwellings at upper level at a grade with ground to the east. The lower floors are typically vaulted stores in masonry. The upper floors are generally domestic in arrangement with timber floors and lined walls. The roof is flat and constructed in timber. An interesting feature is the brick cavity construction, representing an early example of this type of construction.

1.1 Roofs and rainwater goods

(a) Stevenson's original drawings indicate the timber roofs to these buildings to have originally been covered with traditional lead

sheeting. At some point in the past, however, these coverings have been removed and the roofs overlaid with modern timber sheet or other decking with a synthetic waterproof membrane such as 'Sarnafil' or similar single-ply elastomeric sheeting. Widespread ponding to these roofs suggests problems with the falls and discharge of rainwater. We also consider the present covering to be inappropriate to a building of this type and importance and would recommend that these roofs are stripped and taken back to their original decking, repaired as necessary and re-covered with lead sheeting. Given the degree of exposure of the site the advice of the Lead Sheet Association should be sought regarding recommended detailing and on the need for supplementary fixing methods. Stripping the roof would also provide the opportunity to improve rainwater discharge and upgrade its thermal performance through the fitting of insulation within the underlying fabric. Appropriate measures should be taken to ventilate the roof structure and minimise the risk of both interstitial condensation and underside lead corrosion.

(b) Roof leaks of varying magnitude currently exist within the buildings internally, these appearing most persistent and serious within the west dwelling and the former stores/assistants block. All such areas should be investigated further for possible timber rot and the necessary repairs undertaken following a policy of minimum intervention and minimal loss of original fabric. Allowance should be made for the replacement of a number of joist ends where built into the external walls.

(c) All flashings and weatherings require to be replaced in sheet lead of appropriate thickness. Water penetration and saturation of the stonework at parapet level (see image upper right) would also suggest that the installation of a lead tray or dpc beneath the copings should be considered.

(d) The cover flashing to the projecting cornice detail at parapet level has been painted over and the type of material used and its condition cannot be ascertained. However staining and saturation of the stonework below would suggest that this is failing and likely to require renewal. Sheet lead would be a suitable material although the exact nature of the original detail should be investigated further.

(e) The rainwater discharge system comprises a mixture of original cast-iron and more modern plastic replacements. This should be overhauled and refurbished as necessary, re-using all original cast-iron elements that are capable of still providing a serviceable life. All plastic components or defective sections should be replaced in cast-iron or aluminium to match the originals with thorough redecoration carried out upon completion.

(f) Rainwater discharge from each of the pavilion roofs is served by only one outlet. We would recommend that this be supplemented by adding a further outlet with a lead-lined chute, cast-iron hopperhead and downpipe to match the original detail.

(g) Previously removed features at roof level include the central pediments to the front and rear elevations of both pavilions and also the frontmost octagonal triple vent stone chimney stacks that existed to each. As may be seen from Stevenson's original drawings (Appendix 4), these made an important contribution, both collectively and individually, to the architectural quality of the most important buildings on the site and if possible they should be reinstated to their original form using matching traditional materials.

(h) The buildings currently sport a range of extraneous cables and ferramenta, which do not contribute to the historic or architectural quality of the building, have caused corrosion staining to the walls and may even accelerate deterioration. Such items should be removed wherever practicable.

1.2 External walls

(a) According to Historic Scotland's ARCH 1 report, the external walls of all the principal buildings on the site, including the pavilions, are constructed of granite ashlar with sandstone dressings. Regrettably, almost all external wall surfaces have been covered with a cementitious render along with several layers of masonry paint. This generally obscures the original stonework below. Archive images of the site suggest that the stone masonry to the light tower and flanking pavilions to have originally been left exposed. The small Stevenson building located next to the pier at Grutness (to the north east of the lighthouse site) would also appear to confirm this.

(b) Photographs from 1905 suggest the walls to the engine house/dwelling block have probably always been harled. It is perhaps likely that the earlier buildings were also harled at this time in an effort to improve their ability to withstand the elements. This harling generally appears to be based on a dense cementitious mortar mix rather than being lime based. Subsequent to this, as commented on above, the external walls have been repeatedly painted with masonry paint.

(c) It is now well-recognised that coatings applied to traditional masonry buildings should be 'breathable', i.e. water vapour permeable, so that moisture trapped within the walls can escape. The wall coatings described above are clearly not providing the degree of 'breathability' required and this is probably a factor that has contributed significantly to the levels of dampness now apparent within the buildings.

(d) Despite some minor cracking and local detachment, the harling generally appears to be securely bonded to the underlying stonework. While removal of this harling and its possible replacement with a more suitable lime-based alternative might remain as a longer-term objective, current conservation guidelines dictate that where such removal would cause damage to the underlying stonework then the later harling or render should remain in place, and that is the situation at Sumburgh.

(e) Our proposal is, therefore, to carefully assess the condition of each area of harling and to then carefully pick off and renew only those sections that are loose, cracked or detached from their substrate and where removal can be achieved without damage to the underlying stone. The mortar mix used for any such repairs will utilise laboratory analysis of the existing harling, take into account the texture and appearance of the original and also the need to ensure that 'breathability' of the wall is maximised. A hydraulic lime mortar is likely to be the most suitable mortar mix.

(f) Such repairs should be undertaken only after conclusion of external joinery repairs (see below) in order that the harling can be dressed up to the completed external joinery.

(g) All open or defective mortar joints in the masonry will also be repointed to match the original using an appropriate mortar mix as outlined above.

(h) Masonry paint presently covers the harled surfaces and all dressed stone surfaces. Test panels will be undertaken to assess the condition of these paint systems before any final decision is made. Repainting of harled surfaces only will then be carried out using a permeable and durable mineral paint system in an historically-appropriate NLB colour scheme.

(i) Levels of dampness within the buildings indicate that timber decay may be present in a number of the more vulnerable locations, particularly where built in or abutting the external walls. An appropriate allowance should be made in the budget costings pending further investigation of concealed areas.

(j) It was also noted that some of the original vent holes in the walls are blocked or obstructed and this may be another factor that is contributing to the dampness levels now evident internally. These will be cleared out and reinstated as necessary.

(k) We would also recommend that the cavity tray detail at first floor level of each building be inspected further. Dampness levels at these locations would suggest that a new lead cavity tray with drainage provided through weepholes in the masonry walls may be required.

(l) The circa 1950s extensions to the rear and inner sides of each pavilion at upper floor level are of secondary architectural merit and inferior constructional quality. Subject to being fully recorded,

we propose that these later accretions be removed to allow the elevations to be restored to their original design. A number of original 'window' openings in the flanking pavilions have also been infilled in the past. These were important elements in the architectural composition of this centrepiece building and we propose that they be reinstated to their original form and detail, complete with dressed sandstone bands.

(m) All chimney cans will be overhauled, re-haunched and fitted with suitable ventilated cowls as necessary.

1.3 External joinery

(a) External joinery items are generally consistent with the age and style of the original buildings and later additions. Most of the original twelve pane sash and case timber windows to the 1821 pavilions still remain, as do those to the other buildings, albeit a number have been taken out and replaced with more modern units. Most of the original vertical battened external doors also still remain.

(b) External joinery components are generally in reasonably good order overall, with only minor local areas of wet rot evident. Moving parts have often been overpainted and capillary grooves blocked.

(c) All external joinery items will be overhauled and carefully repaired using traditional methods and materials. This will be guided by a strict policy of maximising the retention of original fabric and glass.

(d) Reinstated openings to the external walls of the 1821 pavilion buildings will be fitted with new doors and windows that faithfully follow the style and pattern of the originals. Where appropriate, modern window units will be taken out and replaced to match the originals.

(e) Window openings on the Stevenson building to the northeast of the lighthouse site are fitted with vertical battened single-leaf shutters that match the external doors. Research will be undertaken to establish if there is any evidence that these existed to the lighthouse buildings proper, especially the 1821 pavilions, and consideration then given to their reinstatement if appropriate.

(f) The openings to the rear wall of the tower courtyard show clear evidence of having previously been fitted with timber doors. We propose that these be installed to the original detail elsewhere.

(g) Repointing around all door and window openings will be carefully carried out to match the original detail and provide a weathertight detail.

(h) Redecoration of external joinery components will be undertaken using a high specification paint system appropriate to the degree of

exposure of the site, using a colour scheme based on physical and documentary evidence.

1.4 Interiors

(a) The condition of the internal fabric to the buildings again varies according to the degree of usage and level of upkeep provided. Dampness penetration and its attendant problems are particularly apparent, especially in the westmost pavilion which has remained largely unused for a considerable period of time. This dampness has been caused through a combination of several factors, including defects and deficiencies in the roof coverings and parapets etc, penetration through movement and other cracking in the external walls and the inability of entrapped moisture to escape from the building fabric. Lack of heating and ventilation within unused spaces has further exacerbated these problems and also caused condensation to occur. Soil retaining sections of walling within the lower ground floor areas of the flanking pavilions do not appear to benefit from any damp proofing or tanking treatment and are affected in places by penetrating damp.

(b) Walls internally are lined mainly with hard plaster or lath and plaster on timber battens, although some sections of the walls within the flanking pavilions are lined with vertical timber boards. Traditional lime plaster appears to have been used throughout. In general terms, the wall linings appear to be in reasonably good order, although a number of areas require repair as a result of the dampness problems referred to above. All such damp affected areas will be checked further for possible rot defects within concealed areas and repaired as necessary. Repairs to original plaster, lath and plaster or timber linings will be carried out using matching methods and materials, although sawn lath may be used to repair damage to riven lath as this will self-document the areas of repair.

(c) Penetrating dampness affecting the soil-retaining sections of walling within the lower ground level of the pavilions is rather more serious and widespread, and tanking will be required to halt further moisture ingress and deterioration of the building fabric, as well as to provide satisfactory comfort levels for the occupants.

(d) Lower level floors to the pavilions are of stone flags or granite setts, and these are affected by varying degrees of dampness and unevenness. According to Stevenson's original drawings, the stone flag floors are laid on sleeper walls and we propose that the flags be lifted and laid aside, the underfloor space cleared out and a damp proof course fitted to the sleeper walls prior to the flags being relaid; cross ventilation to the sub-floor void will be introduced or supplemented as necessary. With regard to the granite setts, these are laid over a solid base, and we propose that these be uplifted and

relaid on a new lime concrete floor incorporating a suitable damp proof membrane and insulation; a floating timber floor will then be fitted over this.

(e) Floors to the upper levels are mostly of suspended timber construction, with those to the former kitchens and passageways being stone flags laid over the stone or brick vaults below. These are basically sound but should be further inspected for signs of timber rot at external walls, as previously outlined.

(f) At some point in the past the stone stair between the lower and upper floor levels of the southmost pavilion has been truncated and the floor infilled in timber construction to create a further room at this level. The infill floor requires removal to facilitate re-instatement of the stair. This will also require repair of the steps at lower level where corrosion of the iron balusters has caused cracking and detachment of the stone. The balusters also need to be overhauled, de-rusted and re-leaded into sockets in the treads as necessary, and the upper flight balustrading re-instated to match the original detail.

(g) Internal redecoration will be carried out based on available physical and documentary evidence. Any paint system used will also take into account the need to ensure breathability of the construction fabric.

1.5 Miscellaneous works

(a) As already commented on above, considerable levels of penetrating dampness within the soil-retaining sections of walling are evident to both the pavilions. In order to reduce this problem and alleviate the hydrostatic pressure on the retaining walls, we would recommend that a new french drain be formed around the perimeters of the pavilions at upper level, this being connected into the surface water drainage system.

2 Former engine room/dwelling block

Dating from 1904 and constructed some 83 years after the first lighthouse buildings on the site, the former engine house/dwelling block comprises a long single-storey range with rendered brick walls with sandstone dressings, these being generally covered with several layers of impervious masonry paint as previously described. The building has a flat roof formed in concrete over steel beams (spanning front to rear) and is surrounded by a parapet wall. According to the original drawings, the roof originally had an asphalt covering, but this has since been overlaid with what appears to be a modern single-ply elastomeric membrane. The roof drains to a cast-iron gutter set into the concrete along the rear edge. This gutter has leaked over a long period of time, causing the beam ends to corrode and 'oxide jacking' of the masonry to occur. The building is lacking adequate provision for ventilation and relatively high dampness and humidity levels are evident.

1.6 Roofs and rainwater goods

(a) Problems relating to inadequacies in the falls of the roof and disposal of rainwater clearly exist and the 'Sarnafil' roof covering is once again not considered technically suitable for a building of this type. We therefore propose that this roof be stripped back to the original decking and recovered with 20mm mastic asphalt with a solar reflective finish. As before, when the roof is stripped the opportunity should be taken to improve the falls and upgrade the thermal performance. Tapered natural cork insulation boarding may be the most appropriate material for this, but further investigation would be required to assess the range of alternatives available. All skirtings and upstands to this roof will also be renewed in mastic asphalt.

(b) The rear cast-iron gutter suffers from leakage and corrosion and is at the end of its useful life. We would recommend that this be removed and a new gutter formed in WBP plywood lined with mastic asphalt as before.

(c) The parapet wall along the rear elevation requires taking down and removal to beam support level. The steel beam ends will then be needle-gunned, wire-brushed and treated with high-build corrosion inhibiting paint with the ends encapsulated with fibreboard or similar and the ceiling linings repaired as necessary. The parapet wall along the rear elevation will then need to be rebuilt to match the original detail, incorporating a suitable overflow detail.

2.2 External walls and masonry

(a) The external walls and masonry are in a similar condition to that previously described for the pavilions, and treatment and repair to these elements should generally follow the recommendations set out in the relevant item numbers above.

(b) In addition, cracking to the south gable wall requires raking out and tying together with stainless steel ties at 225mm centres vertically, before being repointed and re-harled in lime mortar as previously described.

2.3 External joinery

(a) Generally as pavilions.

2.4 Interiors

(a) The interior of the engine room retains most of its original fittings and finishes, including encaustic floor tiles and glazed dado height brickwork. These finishes appear to have survived reasonably well and will be repaired and conserved in situ using traditional methods and materials.

(b) Internal redecoration will be carried out based on available physical and documentary evidence. Any paint system used will take into account the need to ensure breathability of the construction fabric.

3 Former stores/assistants block

This comprises a two-storey flat roofed building with a small toilet block abutting the southmost elevation. The walls are harled as before with sandstone dressings around door and window openings. The ground floor is of solid construction laid with uneven granite setts, while the upper floor is suspended timber. Access to the upper level is via a steep timber staircase from the rear elevation doorway.

The building appears to have been largely unused for a considerable period of time. Long-term water ingress is apparent, especially around the parapet wallheads and most particularly along the rear elevation. The lower cross walls appear to have been poorly founded and suffer from significant settlement, with disruption of the adjoining stair and floors above. The ground floors are damp and very uneven.

3.1 Roofs and rainwater goods

(a) No access was available to inspect the roof over the former stores/assistants block, but widespread and longstanding roof leakage was noted internally and complete uplift and renewal of the roof structure, deck and covering to this building should be budgeted for at present, all as previously outlined for the pavilions and including upgrading of the thermal performance as before.

(b) Archive material indicates construction of this building to at least pre-date circa 1870, which would suggest the original covering to have most likely been lead sheet and reinstatement of this material should be allowed for pending further investigation on site. This should include all flashings, gutter linings and the like to LSA standards as previously described for the pavilion roofs.

(c) Rainwater discharge from the roof is provided by only one outlet through the front (north) elevation wall. We consider this as inadequate and propose that the situation be improved by regrading the existing gutter profile and installing two new outlets at each end, complete with lead chutes and cast-iron hopperheads and downpipes to match the original detail elsewhere.

3.2 External walls and masonry

(a) The overall condition of the external walls and masonry of this building follows that described previously and their treatment and repair should generally follow the recommendations set out in the relevant item numbers above.

(b) The extent of dampness affecting the external walls is such that a significant allowance for taking out and replacement of inbuilt

timbers should be budgeted for, including first floor joist ends and wallplates, most especially those along the rear elevation. Replacement of upper level timber safe lintols in precast concrete should also be included.

3.3 External joinery

(a) Generally as pavilions and former engine room/dwelling block

3.4 Interiors

(a) One of the first floor bedrooms in this building (the northmost) is of particular interest, as it appears to have been left in more or less the same state that it was when the station was first automated and left unmanned. This will be carefully retained and restored.

(b) The two cross walls and the stair to first floor level have been adversely affected by structural movement and require replacement. A new timber stair will be fitted as shown.

(c) The cobbled ground floor in this building is extremely uneven in places. Where possible, the existing flooring is to be retained and conserved. However, a new reinforced concrete floor will be required in any areas of the building that will be inhabited to provide a satisfactory standard for new occupants. This should include a damp proof membrane and suitable thermal insulation.

(d) Internal plaster finishes have been affected by dampness ingress and several sections require repair. All surviving sections of plasterwork will be retained wherever possible and repaired using traditional methods and materials.

(e) Internal redecoration will be carried out based on available physical and documentary evidence. Any paint system used will take into account the need to ensure breathability of the construction fabric.

(f) If it is compatible with new uses, the small lean-to extension to the south of the building is to be repaired and adapted in a manner consistent with the works to the main buildings.

4 Water tank enclosure

This structure comprises a concrete tank enclosure half buried in the fall of the surrounding ground. It encloses two water tanks with a flat roof slab to the top surface supported on steel beams (not seen). Access is provided via 4 No manholes (two per section). The roof slab is covered with mastic asphalt with a small concrete upstand to the perimeter. Adjoining the seaward side downhill is a redundant external toilet with a slightly raised wall and slab.

Works required to this structure include:

(a) Allow for removal of existing coverings and form access into tank areas through roof slab to allow for inspection and repairs. Tanks to be drained down and existing linings to be stripped out.

(b) From back of existing store break through opening into east tank enclosure – allow for diamond coring and cutting of concrete.

(c) Allow for removal of paint and other coatings to external face of tanks walls to allow condition and extent of cracking to walls to be assessed.

(d) Allow for stripping of existing asphalt finishes to roof slab and for inspection of concrete.

(e) Allow for inspection of condition of existing steel beams to roof slab.

(f) Allow for cleaning back exposed bottom flange of existing steel beams (needle gun and wire-brushing) to remove all loose scale and rust. Exposed steel to be recoated with corrosion protection.

(g) Depending on condition of existing steel roof beams, allow for new steel beams spanning north south to re-support existing beams spanning east west. New steel to be fixed back at end to inside face of concrete side walls.

(h) Allow for concrete mortar and injected resin repairs to cracked concrete to external walls and roof slab of tank.

(i) Allow for stripping finishes to south wall and raking out crack, stitching and refacing with proprietory concrete repair system

(j) Allow for lining internal surface of tanks with 'Sika' type render. Also allow for repairs to water inlets as necessary.

(k) Plug drains and patch walls. Reline with cement render and finishes to match existing.

(l) Overhaul and repair rainwater goods to WC as necessary.

(m) Allow for stitching cracks in brickwork as necessary.

(n) Allow for inspection of condition of existing steel beams to roof slab.

5 Other buildings and structures

Works required to other buildings and structures on the site include the following:

5.1 Fog horn

(a) Existing ladder and guard to be removed and replaced. Care to be taken where breaking out fixings into existing concrete.

(b) Openings formed through into inner core. Allow for diamond cutting and coring of existing concrete.

(c) Existing rubble infill from inside concrete wall to be removed.

(d) Floor slab in housing at upper level to be broken out.

(e) Allow for concrete mortar repairs to areas of cracked or spalling concrete.

(f) Allow for possible removal and replacement of existing roof slab to Foghorn – condition of corroded plate to under side of existing slab

to be assessed. As minimum repair underside of plate to be cleaned back and repainted with corrosion protection.

(g) Scope of repairs to existing foghorn equipment / mechanism to be agreed. Assume minimum removal of existing paint and wire brushing to remove scale and rust, then repainting with suitable corrosion protection (epoxy paint system).

(h) Concrete repairs to faces of concrete cut where opening formed.

(i) Steel angles resin bolted to concrete to form new lintels at openings

5.2 West radar enclosure (WW2 building 2)

(a) Allow for removal of remains of timber shed and corrugated sheeting, retaining existing fabric where possible, and clear all debris within building

(b) Allow for possible dismantling of rubble stone wall to east end to facilitate rebuilding – temporary support required to roof slab over.

(c) Allow for erection of internal structural framing within building fixed and supported off existing concrete ground slab. Framing to fixed to inside face of existing concrete wall and roof slab at regular interval using drill resin anchor fixings.

(d) Allow for concrete mortar repairs to areas of badly cracked or spalling concrete.

(e) Allow for additional stainless steel stitching ties and cramps across cracked sections of concrete wall and roof slabs.

(f) Allow for other works as per SE's recommendations.

5.3 East radar enclosure (WW2 building 1)

(a) Allow for removal of remains of timber shed and corrugated sheeting, retaining existing fabric where possible, and clear all debris within building

(b) Take down block infill wall to west end.

(c) Allow for erection of internal structural framing within building fixed and supported off existing concrete ground slab. Framing to fixed to inside face of existing concrete wall and roof slab at regular interval using drill resin anchor fixings.

(d) Allow for concrete mortar repairs to areas of badly cracked or spalling concrete.

(e) Allow for additional stainless steel stitching ties and cramps across cracked sections of concrete wall and roof slabs.

(f) Allow for construction of timber framed and boarded construction within build – to match former shed.

(g) Install louvered infill panel to outer opening.

(h) Allow for repairing concrete floor.

(i) Replace door to west doorway. Allow for forming concrete ramp to doorway as necessary.

(j) Remove remains of east window and replace with louvered panel.

(k) Consider applying waterproof covering to exposed concrete pitched roof slopes.

6 External works

6.1 Concrete hardstandings

This comprises areas of concrete around the former Engine Building / Keeper's House, the former Smithy, the Lighthouse Tower and the two Pavillions. The necessary repairs include:

(a) General repairs and replacement in concrete of badly cracked or subsided sections.
(b) Repairs to cracked sections (cutting and out and concrete repair along cracks).
(c) Reinstatement of areas disturbed or broken out for new drainage and below ground services.
(d) Repair and reinstatement of lengths of cracked and subsiding edge drainage channel.
(e) Form areas of new concrete hard standing where any existing modern structures are removed.

6.2 Access road up to headland and lighthouse complex

(a) Scalp off top surfacing and apply new top dressing / asphalt wearing course or Fibredec type dressing.
(b) Patch repairs to pot holes, previously damaged areas and areas disturbed or broken out for new drainage and below ground services.
(c) Extend existing surfacing where any existing modern structures removed and repair areas disturbed by excavations and building works. Works to include compacted type 1 sub-base, and asphalt base and wearing courses.

6.3 Dry bound macadam and areas without asphalt surfacing

*This i*ncludes track up ramp to east side of site providing access to upper part of site.

(a) Allow for regarding of surface, filling of potholes and ruts. Lay additional layer of graded granular material and compact. Dress surface either with fine material vibrated/brushed into surface or with fibredec type surfacing.
(b) Extend top area of rough surfacing to form turning area and car parking spaces.
(c) Allow for reducing of levels and possible rock cut to form turning area.
(d) Batter back ground to side and as required form dry stone retaining wall around turning area.
(e) New dry bound surfacing comprising a layer of compacted graded granular material dressed either with fine material vibrated/brushed into surface or with fibredec or similar type surfacing.

6.4 Existing concrete steps

(a) Repair and rebuild existing concrete steps as necessary.

6.5 *Areas of stone flags*

Includes areas between two Pavilions and to north of former Smithy.

(a) Allow for taking up and rebedding existing flags as necessary.

(b) Allow for replacement of badly cracked or damaged flagstones to match existing as necessary.

6.6 Boundary walls

(a) Allow for all necessary repairs to dry stone dykes around compound including replacement of missing pinnings, loose stones and replacement of capping stones.

(b) Take down and repair cracked or damaged of boundary walling to south side of site along cliff edge

(c) Consider heightening walls in places for public safety.

(d) Carry out general repairs to retaining wall to ramp on east side of site, including resetting coping, repairing / replacing low iron railings along wall head and repainting railings on completion.

6.7 Drainage

The existing drainage on site appears all to date from the later periods of development of the site from the early 20th Century with subsequent alterations and repairs. A separate report by David Narro Associates dated January 2009 has recently been prepared for submission with a planning application for proposed development of the lighthouse site. The report describes the existing drainage arrangements on site. The capacity of the existing drainage system is assessed. The scope of the proposed drainage is described and the likely discharge compared with the capacity of the existing system. Recommendations for the repair and renewal of the drainage are included.

The summary conclusions and recommendations of this drainage report are:

Foul Drainage

- Based on a check of the capacity of the existing septic tanks on the site, these tanks appear to undersized for the existing levels of discharge on the basis of current standards.
- The discharge into the foul system is likely increase with any significant development of the site.
- Given the age and general condition of the foul drainage and the changes required to suit the new development, renewal of the foul drainage network is proposed.

- One or more new septic tank or package treatment plant will be needed.
- Two options have been explored for the layout of the new drainage. The layout of pipework around the buildings is broadly the same in both cases.

Surface Water Drainage

- The general aim will be to keep the surface water drainage separate from the foul drainage.
- Where possible the existing surface water drainage will be retained and repaired.
- Where practical redundant foul water drains will be reused for surface water.
- As necessary new surface water drains will be added to complete the renewal of the network.

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APPENDIX 2
GRADING OF SIGNIFICANCE

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GRADING OF SIGNIFICANCE

The various elements of the site have been assessed and graded to assist with decisions concerning the future conservation and management of the site and its environs.

Grading of individual elements of the site is based on the contribution they are considered to make to each component of significance (historical, archaeological, architectural and aesthetic, landscape, social and ecological) whether it be at a local, regional, national or international level.

The elements of the buildings and their setting are graded according to the following criteria:

1 Elements of outstanding significance

A building or element of national or greater importance or a fine, intact or little altered example of a particular period, style or type that embodies the importance of the building or site overall.

2 Elements of considerable significance

A building or element of regional (more than local) importance, or a good example of a particular period, style or type with a high degree of intact original fabric that contributes substantially to the importance of the building or site overall, that may have been altered.

3 Elements of moderate significance

A building or element of local (within south mainland Shetland) or an element that contributes but is not key to the importance of the building or site overall, that may have been altered.

4 Neutral elements

An element that neither contributes nor detracts from the overall significance of the site.

5 Intrusive elements

A building or element that detracts from the overall significance of the site.

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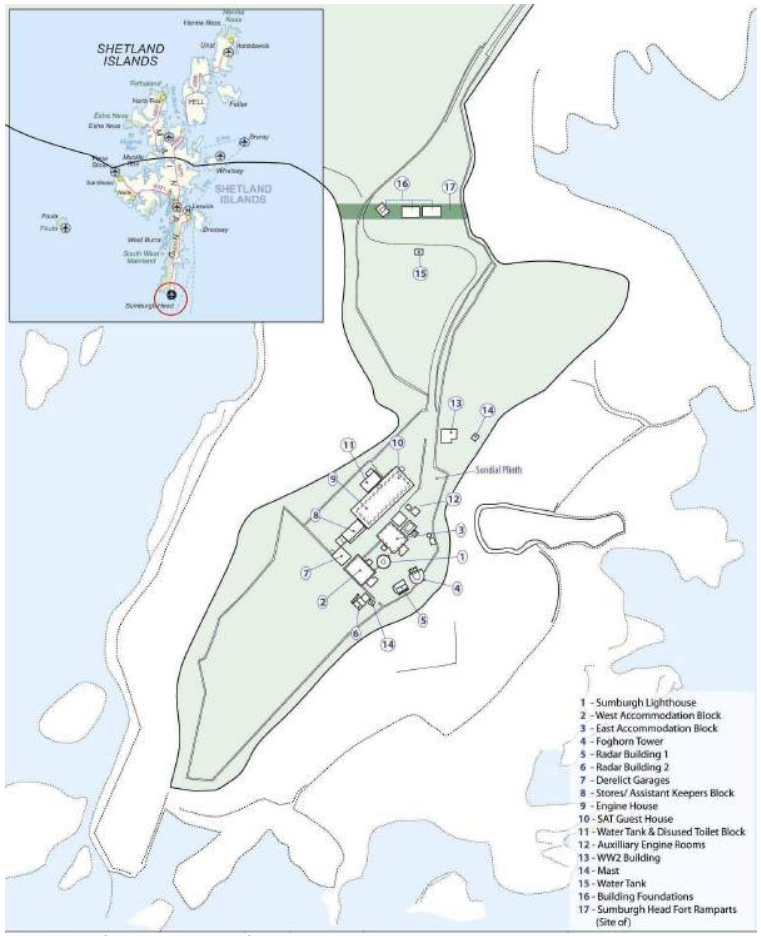

Key Plan for building reference numbers
(from archaeology report by CFA Archaeology included as Appendix 4)

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Building or element:	*Building ref no:*	*Level of significance:*	*Notes:*
The lighthouse tower	1	*Outstanding*	Still owned by the NLB and in ongoing use as an important navigational aid. Despite some internal improvements and modifications the tower remains largely as originally designed.
East and west pavilions /accommodation blocks	2 & 3	*Outstanding*	Alterations and extensions carried out to both pavilions during the 1950s may be considered as *intrusive*.
Foghorn tower	4	*Outstanding*	Retains most of its original fittings and equipment.
Radar building 1	5	*Considerable*	Internal structure, windows and fittings have been lost.
Radar building 2	6	*Considerable*	Internal structure, windows and fittings have been lost.
Disused garages	7	*Intrusive*	In poor condition and of no historic interest. May be removed subject to adequate recording.

Building or element:	*Building ref no:*	*Level of significance:*	*Notes:*
Former smithy/occasional keepers' accommodation block	8	*Outstanding*	The rooms are much as they were left when the NLB vacated them and contain many fittings, furnishings and items of historic interest.
Engine house and former principal keeper's accommodation block	9 & 10	*Outstanding*	The engine house is largely unaltered and retains the original engines, compressor tanks and fuel tanks as well as its original encaustic floor tiles and other finishes. The former principal keeper's accommodation has been modernised to suit the needs of a holiday cottage but it too is largely unaltered.
Concrete water tanks and toilet block	11	*Moderate*	In poor condition and all sanitary goods have been removed.
NLB auxiliary generator building	12	*Neutral*	Owned and required for operational purposes by the NLB.
WW2 building	13	*Moderate*	Under private ownership and no interior access available.

Building or element:	*Building ref no:*	*Level of significance:*	*Notes:*
Aerial masts	14	*Neutral*	Owned and required for operational purposes by the NLB.
Water tank enclosure	15	*Intrusive*	In poor condition and of no historic interest. May be removed subject to adequate recording.
WW2 building foundations	16	*Neutral*	Construction of this building probably damaged the vestigial fort rampart remains.
Sumburgh Head fort ramparts (site of)	17	*Considerable*	Extent of remains is unclear. A recent landslip has made close inspection impossible for the time being. On the ground the ramparts have been compromised by the construction of WW2 building 16.
Gate piers	18	*Moderate*	The gates are missing, except for some pedestrian gates to the South of the site, and only the gate piers remain.
Sundial plinth	19	*Moderate*	The sundial plinth has been relocated from its original location in the field to the east of the main lighthouse site. The gnomen, or sundial face, may be missing.

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APPENDIX 3
SCHEDULE OF REPAIRS

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SCHEDULE OF REPAIRS

Prioritised schedule of conservation and repair works

The following recommendations are divided based on the condition report into 'urgent', 'necessary' and 'desirable' sections:

- 'Urgent' (U) works are items that are causing actual harm to the building fabric which require attention as soon as possible to prevent further damage. Work in this category should be put in hand within one year of the date of this report.

- 'Necessary' (N) works while not causing actual damage may become urgent within five years. Work in this category should be put in hand within one 2 and 4 years of the date of this report.

- 'Desirable' (D) are works that may become urgent within ten years. This category also includes works of repair of a long-term nature and works concerned with the restoration of the original appearance of the building. Work in this category should be put in hand within one 5 and 10 years of the date of this report

Efficient organisation of repair works is likely to have a bearing on the phasing of individual items, which may not necessarily therefore conform precisely to the degrees of urgency. The urgent, necessary and desirable items within the part of the report for each part of the building are not written in order of priority.

Element/Location	Description	Condition	Recommendations	Priority
East and west pavilions/ accommodation blocks	Flat roofs	Inappropriate coverings of limited lifespan.	Strip existing coverings and replace with new sheet lead to LSA standards.	N
	Flashings and weatherings	Fair/poor	Remove and replace in new sheet lead to LSA standards	N
	Octagonal stone chimneys	Fair	Overhaul and repair as necessary	N
		Front most stack was taken down and removed in the 1950s.	Restore/reinstate to original detail	D
	Timber roof structure	Moisture penetration from roof leaks evident	Check for rot defects and repair as necessary.	N
	Rainwater pipework	Fair/poor	Replace in cast-iron or aluminium to match original. Improve rainwater discharge from roofs as necessary.	N
	External walls	Cement render sound overall with some cracked and defective sections evident.	Overhaul and patch repair as necessary using hydraulic lime-based render to improve breathability of the external walls.	N
		Mortar pointing to stonework missing or decayed in places.	Rake out and repoint using approved lime-based mortar.	N
		Masonry paint finish to external walls deteriorating and largely impermeable.	Undertake test panels to ascertain condition of existing paint.	N
			If required following testing, remove existing paint coating from wall surfaces and repaint all rendered sections of walling with breathable mineral-based masonry paint.	N
		Ventilation grilles and cavity drains in external walls blocked or obstructed.	Clear out and reinstate to match original.	N
		Damp at lower level in places	Form new French drain connected to surface water drainage system.	D
	Floors	Fair. Some concrete added to lower floors.	Clear our debris in underfloor voids. Lay DPM on ground floor where feasible. Inspect timber beam ends for decay.	N

Element/Location	Description	Condition	Recommendations	Priority
	Interiors	Fair with modern decoration.	Repair and redecorate based upon physical and documentary evidence, bearing breathability in mind.	D
	Intrusive elements	Extensions to rear (south) and inner (courtyard) facing elevations to both pavilions of secondary architectural merit and low constructional quality.	Carefully take down and remove.	D
	Missing features	The central pediments to the front and rear elevations, and chimneys at the front, were taken down and removed during the 1950s	Reinstate to match original detail.	D
Former engine room/dwelling block	Flat roofs	Inappropriate coverings of limited lifespan, with inadequate falls.	Strip back roof to the original decking and recover with 20mm mastic asphalt with a solar reflective finish. The opportunity should be taken to improve the falls and upgrade the thermal performance. Tapered natural cork insulation boarding may be the most appropriate material for this, but further investigation would be required to assess the range of alternatives available.	N
	Flashings and weatherings	Poor	Renew in mastic asphalt all skirtings and upstands.	N
	Chimneys	Fair	Overhaul and repair as necessary.	N
	Roof structure		Take down the parapet wall along the rear elevation to beam support level. Needle-gun, wire-brush, treat and encapsulate the steel beam ends. Repair linings as necessary. Rebuild the parapet wall along the rear elevation to match the original detail, incorporating a suitable overflow detail.	N

Element/Location	Description	Condition	Recommendations	Priority
	Rainwater pipework	Poor. The rear cast-iron gutter suffers from leakage and corrosion and is at the end of its useful life.	Remove existing gutter and form a new gutter in WBP plywood lined with mastic asphalt as before.	N
	External walls	Generally as pavilions.	Generally as pavilions.	N
		In addition, the south gable wall is cracked.	Rake out and tie the crack to the south gable wall using stainless steel ties at 225mm centres vertically. Repoint and re-harl in lime mortar as previously described.	N
	Interiors	Decoration fair	Repair and redecorate based upon physical and documentary evidence, bearing breathability in mind.	D
	Missing features	One chimney to accommodation was removed in the 1950's.	Reinstate to match original detail.	D
Former stores/assistants block (aka the smithy)	Flat roofs	Very poor. Long term water ingress to interior. Inappropriate coverings of limited lifespan, with inadequate falls.	Remove and replace existing roof covering using lead to LSA recommendations.	U
	Flashings and weatherings	As above	As above	U
	Chimneys	Fair	Overhaul and repair as necessary.	N
	Roof structure	Poor	Remove and replace in built joists where decayed.	U
	Rainwater pipework	Inadequate – one outlet only.	Regrade the gutter profile and install two new outlets at each end, complete with lead chutes and cast-iron hopperheads and downpipes to match the original detail elsewhere.	U
	External walls	Generally as pavilions.	Generally as pavilions.	N
	Floors	Upper floor structure in poor condition due to movement and water ingress.	Remove and replace in built joists where decayed.	U
		Lower floor damp and very uneven.	Where possible, retain and conserve existing floor. Elsewhere install new ground floor slab on DPM.	D
	Interiors	Internal walls and stair poorly founded and have settled unevenly.	Replace stair and internal walls on suitable foundations.	U

Element/Location	Description	Condition	Recommendations	Priority
		Decoration poor	Repair and redecorate based upon physical and documentary evidence, bearing breathability in mind.	D
	Intrusive elements	External 1950's lean-to is not part of original symmetrical design.	Retain and repair if compatible to new uses. Otherwise, remove.	D
		Some windows have been replaced and do not match original. Poor condition.	Reinstate original window pattern.	D
	Missing features	Some chimney pots etc.	Reinstate to match existing.	N
Water tank enclosure	Flat roofs	Fair. Asphalt covering requires renewal.	Strip and replace to match existing.	N
	Flashings and weatherings	Concrete upstands fair.	Repair as above.	N
	Roof structure	Steel beams to be inspected further.	Strip asphalt to roof slab and inspect concrete and roof beams. Clean back exposed bottom flange of existing steel beams. Recoat exposed steel against corrosion. Add new steel beams to re-support existing beams if required. Allow for concrete mortar and injected resin repairs to cracked concrete to roof slab of tank.	N
	Rainwater pipework	To be inspected.	Overhaul and repair as required.	N
	External walls	To be inspected.	Remove paint and other coatings to allow condition and extent of cracking to walls to be assessed. Allow for concrete mortar and injected resin repairs to cracked concrete. Allow for stripping finishes to south wall and raking out crack, stitching and refacing with proprietory concrete repair system. Allow for stitching cracks in brickwork as necessary. Repair render and finishes to match existing.	N
	Floors	To be inspected.	Allow for repairs.	N
	Interiors	To be inspected.	Strip linings. Allow for lining internal surface of tanks with 'Sika' type render.	N

Element/Location	Description	Condition	Recommendations	Priority
Fog horn	Access	Ladder and supports heavily corroded.	Remove existing ladder and guard and replace with new ladder/stair.	N
	Roof structure	Fair	Removal and replacement of existing roof slab, condition of corroded plate to underside of existing slab to be assessed. As minimum, repair underside of plate, clean back and repaint with suitable corrosion protection.	N
	External walls	Fair	Form openings through into inner core. Repair faces of concrete where cut to form openings. Resin bolt steel angles to concrete to form new lintels at openings.	D
			Mortar repairs to areas of cracked or spalling concrete.	N
	Exteriors metalwork	Fair	Removal of existing paint and wire brushing to remove scale and rust, then repaint with suitable corrosion protection (epoxy paint system).	N
	Floors	Fair	Brake out floor slab in housing at upper level.	D
	Interiors	Fair	Remove existing rubble infill from inside concrete wall.	D
			Redecorate to match existing.	D
West radar enclosure (WW2 building 2)	Concrete roof structure & external walls		Repair concrete mortar to areas of concrete badly cracked or spalling.	N
			Add stainless steel stitching ties and cramps across cracked sections of concrete wall and roof slabs.	N
	External stone walls		Possibly dismantle rubble wall to east end to facilitate rebuilding, temporary support required to roof slab over.	N
	Floors		Reinstate missing floor structure with DPM to east end.	D

Element/Location	Description	Condition	Recommendations	Priority
	Interiors		Clear all debris within building. Retain remains of timber shed and corrugated sheeting where possible.	D
			Erect new internal framing within building, fixed and supported off existing concrete ground slab. Fix framing to inside face of existing concrete wall and roof slab at regular interval using drill resin anchor fixings.	N
East radar enclosure (WW2 building 1)	Roof covering	None	Consider applying waterproof covering to exposed concrete pitched roof slopes.	D
	Concrete roof structure & external walls		Repair concrete and add ties and cramps as with West radar enclosure.	N
	External block walls		Take down block infill wall to west end.	D
	Floors		Repair concrete floor.	N
	Interiors		Clear all debris within building. Retain remains of timber shed and corrugated sheeting where possible.	D
			Construct timber framed and boarded construction within building to match former shed.	D
	Windows & doors		Install louvered infill panel to outer opening.	D
			Remove remains of east window and replace with louvered panel.	D
			Replace door to west doorway. Form concrete ramp to door as necessary.	D
Concrete hard standings	Generally	Fair with some cracking	Repair generally and replace concrete sections where badly cracked or subsided.	N
			Repair cracked sections (cut out and repair along cracks).	D
			Reinstate areas disturbed or broken out for new drainage and below ground services.	N

Element/Location	Description	Condition	Recommendations	Priority
			Repair and reinstate lengths of cracked and subsiding edge drainage channel.	N
			Form areas of new concrete hard standing where the rear outshots and porch extensions to the two Pavilions are taken down and where the existing garages and toilet block are removed.	D
Access road up to headland and lighthouse complex	Generally	Fair with potholes and wearing surface requiring replacement	Scalp off top surfacing and apply new top dressing/asphalt wearing course or Fibredec type dressing.	N
			Patch repair to potholes, previously damaged areas and areas disturbed or broken out for new drainage and below ground services.	N
			Extend existing surfacing where garages are to be removed outside new education building and repair areas disturbed by excavation and building works. Works to include compacted type 1 sub-base and asphalt base and wearing courses.	D
Dry bound macadam and areas without asphalt surfacing	Generally	Fair with potholes and wearing surface requiring replacement	Regrade surface, fill potholes and ruts. Lay additional layer of graded granular material and compact. Dress surface with either fine material vibrated/brushed into surface or with Fibredec type surfacing.	N
			Extend top area of rough surfacing to form turning area and car parking spaces.	D
			Reduce levels and possibly cut rock to form turning area.	D
			Batter back ground to side and as required form dry stone retaining wall around turning area.	D

Element/Location	Description	Condition	Recommendations	Priority
			New dry bound surfacing comprising a layer of compacted graded granular material dressed either with fine material vibrated/brushed into surface or with Fibredec or similar type surfacing.	N
Existing concrete steps	Generally	Fair with some cracking and movement.	Repair and rebuild as necessary.	N
Areas of stone flags (includes areas between two Pavilions and to north of former Smithy)	Generally	Fair with some cracked slabs	Take up and rebed existing flags as necessary.	D
			Replace badly cracked or damaged flagstones to match existing as necessary.	N
Boundary walls	Generally	Fair. Some wallheads require repair and some sections are very low.	Allow for all necessary repairs to dry stone dykes around site including replacement of missing pinnings, loose stones and replacement of cope stones. Take down and repair cracked or damaged of boundary walling to south side of site along cliff edge Consider heightening walls in places for public safety. Carry out general repairs to retaining wall to ramp on east side of site, including resetting coping, repairing / replacing low iron railings along wall head and repainting railings on completion.	N
	Missing areas	Land slip has removed some sections by the access road	Replace to match existing within safe area.	N

Element/Location	Description	Condition	Recommendations	Priority
Foul drainage	Generally	Septic tanks appear to be undersized for the existing levels of discharge on the basis of current standards, and discharge into the foul system is likely to increase with any significant with any significant development of the site.	Install one or more new septic tanks or package treatment plants.	N
		System generally is old and requiring repair/renewal.	Renew the foul drainage network. There are two options for new drainage layout that need to be confirmed.	N
Surface water drainage	Generally	System generally is old and requiring some repair/renewal.	Retain and repair existing surface water drainage where possible.	N
			Reuse redundant foul water drains for surface water where practical.	D
			Add new surface water drains to complete the renewal of the network where necessary.	N

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APPENDIX 4
CONSULTANT REPORT – ARCHAEOLOGY

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CFA ARCHAEOLOGY LTD

November 2008

Commissioned by Groves Raines Architects on behalf of the Shetland Amenity Trust

This document has been prepared in accordance with CFA standard operating procedures.	
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Sumburgh Head Lighthouse

Desk-based assessment and Level 1 Standing Building Survey

Report No. 1574

CONTENTS

Tables

Technical Appendices

Figures (bound at rear)

Plates (bound at rear)

0. Executive Summary

0.1 This report presents the results of a desk-based assessment and Level 1 standing building survey carried out by CFA Archaeology Ltd in October 2008 at Sumburgh Head Lighthouse, Shetland. The work was commissioned by Nicholas Groves Raines Architects on behalf of the Shetland Amenity Trust (SAT). SAT is developing a Conservation Management Plan (CMP) for the lighthouse to inform a future Heritage Lottery Fund bid for the renovation, conservation and redevelopment of the lighthouse complex into holiday accommodation, a new RSPB education centre and offices. The lighthouse is owned by the Northern Lighthouse Board and is not part of the development proposal; it does however form a focal point within the complex as a whole.

0.2 The results obtained from the archaeological survey include a photographic record of each building within the lighthouse complex. Both interior and exterior elevations of the main building groups have been examined. A desk-based assessment has also been undertaken to complement the photographic record.

0.3 The results show that Sumburgh Head Lighthouse and its associated buildings comprise a unique collection of buildings that have undergone only minor alteration since they were first constructed during the early 19th and early 20th centuries.

0.4 The potential for the survival of important architectural information uncovered during future building refurbishment works is very high and a series of fabric surveys are recommended to record any new features brought to light.

0.5 The potential for the survival of buried archaeological remains associated with the prehistoric fort of Sumburgh Head is very high. Suitable mitigation is recommended to deal with the impact of all ground-breaking work associated with the construction of new buildings, road realignment and car park infrastructure works.

1. INTRODUCTION

1.1 Scope of the study

1.1.1 Sumburgh Head Lighthouse is located at the southernmost tip of the Shetland Islands Mainland (NGR 4072 0787 Fig 1).

1.1.2 The study area includes the lighthouse itself (Fig 1, No. 1), associated structures (Fig 1, Nos 2-3, 8 and 10), buildings added to the complex in the early 20th-century and during the Second World War (Fig 1, Nos 4-7, 9, 11-16), and the prehistoric fort ramparts (Fig 1, No. 17).

1.2 Background

1.2.1 This document is designed to be included within the Conservation Management Plan (CMP) for Sumburgh Head Lighthouse. It was commissioned by Nicholas Groves Raines Architects on behalf of the Scottish Amenity Trust and prepared by CFA Archaeology Ltd. A desk-based assessment and on-site Level 1 standing building survey has been prepared in accordance with the brief issued by Shetland Amenity Trust (SAT), and following Heritage Lottery Fund (HLF) guidelines.

1.2.2 SAT seeks to address key remedial issues associated the conversion of several buildings within the lighthouse complex. These include the east and west lighthouse keepers' accommodation blocks, the so-called stores/assistant keeper's accommodation block and an engine house and SAT guesthouse. Also included are the remains of two World War II radar huts. Other features recorded within the Statutory List were also included within the survey and include gate piers and a sundial plinth.

1.2.3 The commissioning of the CMP reflects the desire of Shetland Amenity Trust and its partners to implement a sustainable and positive future for Sumburgh Head Lighthouse and this reflects the status of the complex as a unique historical heritage site. The site is of immense local and regional importance with a rich history tied to Shetland's maritime past during the 18th to 20th centuries. Its present status as a major visitor attraction for marine birdlife and sea mammals underpins its importance and the requirement to sustain the site for the future.

1.2.4 Sumburgh Head Lighthouse is relatively unaltered from its early 19th-century plan. The lighthouse and its accommodation blocks have a unique architectural character that combine aesthetically to provide a living and working complex within a dramatic seascape setting. There is a strong sense of history present at the site, which is evident in the design of the lighthouse by Robert Stevenson in 1819. Various later additions (1906) include the engine house, which contains a varied collection of mechanical apparatus.

1.3 Statement on the significance of Listed Buildings and setting (from Scottish Planning Policy 23: Planning and the Historic Environment).

1.3.1 Listed buildings are buildings of special architectural or historic interest and are listed by Historic Scotland on behalf of Scottish Ministers. The term building includes structures such as walls and bridges. Listing covers the whole of a building including its interior and any ancillary structures within its curtilage provided these were constructed before 1 July 1948. Change should be managed to protect a building's special interest while enabling it to remain in active use. Planning authorities are responsible for handling applications for listed building consent and for assessing the impact of development proposals on listed buildings and their settings. The Listing and Listed Building Consent processes are described in the current SHEP.

1.3.2 We can see the historic environment in our landscape, the layout of fields and roads, and the remains of a wide range of past human activities. The historic environment includes ancient monuments, archaeological sites and landscapes, historic buildings, townscapes, parks, gardens and designed landscapes and other features. It comprises both statutory and non-statutory designations.

1.3.3 The location of historic features in the landscape and the patterns of past use and activity are part of the historic environment. Setting is more than the immediate surroundings of a site or building and, for example, may be related to the function or use of a place, or how it was intended to fit into the landscape or townscape, the view from it or how it is seen from around, or areas that are important to the protection of the place, site or building.

Legislation

1.3.4 The historic environment is covered by the following legislation:

* Planning (Listed Buildings and Conservation Areas) (Scotland) Act 1997
* Ancient Monuments and Archaeological Areas Act 1979
* Town and Country Planning (Scotland) Act 1997
* Planning etc (Scotland) Act 2006
* Protection of Wrecks Act 1973
* Protection of Military Remains Act 1986

2. KEY OBJECTIVES

2.1 The key objectives towards the archaeological study of the site are as follows:

- to carry out a desk-based assessment to place the lighthouse in its historical context;
- to carry out a standing building appraisal to define the level of survey required within the building complex;
- to produce a standing building appraisal report, suitable for inclusion within the CMP, with recommendations as appropriate.

2.2 This report is intended to fulfil these objectives.

3. METHOD STATEMENT

3.1 General

3.1.1 An effective standard for this type of project has been established by previous research conducted by CFA. Recording of all elements followed established CFA methodologies and included standard architectural building recording supported by photography and base-line measurements and note-taking on architectural record sheets.

3.1.2 CFA follows Institute of Field Archaeologists Code of Conduct, Standards and Guidelines for Historic Building Survey as appropriate.

3.2 Desk-based assessment

3.2.1 CFA conducted a desk-based assessment prior to fieldwork, the results of which are presented in Section 4. Sources consulted include:

3.2.2 *Historic Scotland Statutory List.* The Statutory List was examined to determine the elements held within the group listing. The list provides a summary of significant architectural details on the lighthouse buildings and enclosing boundary walls.

3.2.3 *National Monuments Record of Scotland*. All relevant records relating to the site and its immediate vicinity were checked and bibliographic sources followed up.

3.2.4 *Sites and Monuments Record (SMR)*. The SMR records held by the Shetland Amenity Trust was made available to CFA and included bibliographic and historical photographic information.

3.2.5 *National Map Library and National Archive of Scotland - early map coverage of Sumburgh Head*. An examination of all the Ordnance Survey map editions was made, together with any other readily available cartographic information on pre-recent land use within the project area.

3.2.6 *Aerial photographic coverage*. Available vertical aerial photographs were examined for the distribution of World War II structures associated with the two radar station buildings and geomorphologic details associated with the earthwork ramparts of the prehistoric promontory fort.

3.2.7 *Historical documentary search*. Readily available documentary sources for the area were checked for relevant information. Documents of the Northern Lighthouse Board (NLB) held within the National Archive of Scotland (Appendix 3), including Secretary's Department, Correspondence and Reports have been examined (Appendix 4). Extracts from the NLB Archive have been examined, including first-hand accounts written by the Officer in Charge of the Royal Navy Radar Station between 1939 and 1941. Historical photographs, including contemporary photographs of the radar buildings and the lighthouse, have also been examined.

3.2.8 *Secondary sources.* Technical and non-technical sources have been examined in relation to three Kelvin diesel engines within the engine house.

3.3 Historic building appraisal

3.3.1 The historic building appraisal was undertaken at Sumburgh Head in October 2008 (Fig 1). Examination of all building interiors and exteriors was carried out, and individual rooms were allocated their own unique room number. Descriptive notes were taken on the building interiors including internal fixtures. A sites and monuments gazetteer (Appendix 1) provides a descriptive summary of the buildings shown in Fig 1.

3.4 Photographic survey

3.4.1 A comprehensive photographic survey was carried out (Appendix 2). The survey was conducted on a room by room basis and where possible each internal elevation was photographed. General characterisation shots were taken including any significant architectural details, fixtures and fittings and scars showing where features had been removed. Particular attention was given to areas currently damaged or under threat in order to assist in future management proposals for areas currently affected by natural decay. The photographic survey also took in other features mentioned within the Statutory List including boundary walls, gate piers and a sundial plinth.

3.5 Walk-over survey

3.5.1 A walk-over survey was carried out within the complex boundary and over the area in which the fort ramparts lie. Any features of archaeological interest were noted and photographs taken.

4. DESK-BASED SURVEY RESULTS

4.1 Statutory List

4.1.1 Within the Statutory List, Sumburgh Head Lighthouse is afforded Category A status (HB Number 5442) and is part of a larger group category that includes ancillary buildings, fog horn house, sundial, boundary walls and gates and gate piers. The site was listed on 18 October 1977.

4.2 National Monuments Record of Scotland and Sites and Monuments Record

National Monuments Record of Scotland (NMRS)

4.2.1 The NMRS holds a generic record for Sumburgh Head Lighthouse (HU40NW 3.00) and five other records for the following:

HU40NW 3.01	West Keeper's House
HU40NW 3.02	East Keeper's House
HU40NW 3.03	Engine House
HU40NW 3.04	Foghorn
HU40NW 4	Sumburgh Radar Station

4.2.2 The NMRS mentions that the lighthouse was completed in c.1830 by engineer Robert Stevenson. The lighthouse is described as a short circular-section tower with blocks of two-storey keepers' houses. The record also includes copies of original drawings by Robert Stevenson that include plans, elevations and cross-sections of the lighthouse and flanking keepers' accommodation blocks (Appendix 3).

4.2.3 NMRS Record HU40NW 4 provided details and references to the Chain Home Low Radar Station situated within the boundary of the lighthouse buildings. The record mentions that the transmitter building (Tx) and receiver (Rx) blocks along with the engine room and tower bases are extant. The record explains that this is one of the early types of Chain Home Low radar stations, begun as separate transmitting and receiver aerials which were later combined into one. Due to interference from the lighthouse buildings, the radar station was moved to nearby Compass Head (NMRS HU40NW 5) in 1943. The buildings are described as constructed of shuttered concrete and both have blast walls present to protect the entrance and windows.

4.2.4 NMRS Record HU40NW 1 provides details on Sumburgh Head Fort and cites an observation made by G Low (Low 1879):

Mull of Sumburgh or the extreme point of the headland is fortified in the same manner as the Mull of Uist. Here the neck of land is cut by a ditch and strong wall, which must in old times have formed a considerable fortification. It encloses a plain and hill (the head); at the entrance, still observable, the foundation of a large house, which probably served as a guardroom; along the wall at some distance the marks of numerous small buildings.

4.2.5 The same record quotes Dryden (1873) who mentioned that a broch stood at the site of the present lighthouse. Dryden cites no evidence for the broch and may have been relying on placename evidence, which is certainly significant. The record also mentions that at NGR: HU 4077 0803, where the neck of land joining the mainland to Sumburgh Head narrows to about 50m, there are traces of what may two stony ramparts with possible external ditches. The ramparts are reduced to scarps 0.8m and 0.5m high respectively and the ditches to mere terraces. Of significance is the mention of a stretch of walling that was visible in the innermost rampart at its west end before traces of these defences were obliterated by the modern road to the lighthouse. No evidence was found relating to the remains of the broch when the Ordnance Survey visited the site in May 1968.

Sites and Monuments Record (SMR)

4.2.6 The SAT Sites and Monuments Record provided the same information as that recorded in the NMRS and the Statutory List. The SMR does provide a summary of the results of archaeological evaluation in the Sumburgh Head Fort ramparts (SMR No. 551 - MSN551) and notes the remains of three, possibly four ramparts (although one of these could be the result of the creation of the road). Concrete foundations – possibly war-related – have been sunk into the top of the third (inner) rampart. The inner and middle ramparts may actually be one. They are very disturbed, with a lot of small stones protruding where they are cut by the road. They stand c.3m high in total. Below this there is a terrace c.6m wide. The lowest rampart stands c.1m high and is very disturbed, possibly having been quarried for stone. On the west side of the road are traces of a possible bank which goes into the sea. Immediately outside the ramparts (which are across the neck of the promontory) the hill has three gentle terraces, which could be natural (Turner et al 1995).

4.2.7 SMR entry No. 5056 (MSN5055) refers specifically to the radar stations situated within the lighthouse complex and notes that these were one of the first Coastal Defence U-boat stations, i.e. the Naval version of Chain Home Low (CHL), capable of detecting U-boats and aircraft. The concrete receiver hut was just outside the south wall of the inner enclosure of the lighthouse. The concrete engine shed was 50yds away, outside the north wall of the enclosure. The stations were built in 1939 and replaced by a CHL at Compass Head in March 1943.

4.2.8 The SMR records a total of sixteen radar stations and the majority of these appear to relate to World War II, although the sites at Twarri Field and Ward of Scousburgh functioned during the Cold War (Table 1).

SMR No.	Location	Admin Area	Grid Ref
1686	Ward Hill	Fair Isle	HZ 2108 7326
4004	Virdag	Walls and Sandness	HU 1837 5106
4455	Clett	Whalsay	HU 549 614
4456	Noss Hill	Dunrossnes	HU 3620 1881
4457	Ward of Scousburgh	Dunrossness	HU 372 1881
4460	Saxa Vord	Unst	HP 6320 1670
4462	Mid Geo	Fair Isle	HZ 2000 6980
4463	Ward Hill	Fair Isle	HZ 2220 7400
4464	Kirn of Scroo	Fair Isle	HZ 2220 7400
4504	Sumburgh	Dunrossness	HU 4074 0942
5056	Sumburgh Head	Dunrossnes	HU 4070 0785
5542	Inner Skaw	Unst	HP 6600 1550
6086	Noss Hill	Dunrossness	HU3650 1555
6089	The Hulse	Dunrossness	HU3692 1533
7726	Bluejibs, Skaw	Unst	HP 6640 1670
7763	Twarri Field	Dunrossness	HU 396 198

Table 1 Names and location of coastal defence radar stations within the SMR

4.3 Cartographic Sources

4.3.1 The early map editions are of interest but are naturally schematic and include Blaeu's Atlas (1649-55) that depicts the 'ancient fort of Swenbrugh' on Sumburgh Head, and the words 'A Violent Tyd or Roost' to the south of 'Swenbrugh head' (Fig 2a). Herman Moll's map of 1732 (Fig 2b) mentions 'The Tydes are Violent here', whilst Preston's (1743-44) depicts the name Sumburgh Head for the first time with 'vulgo Swenbrugh or Simbrough' placename derivations observed on the earlier maps.

4.3.2 The most useful maps in terms of detail are those published by the Ordnance Survey. The 1877 First Edition Ordnance Survey (Fig 2c) map depicts two buildings but no Lighthouse. Both maps depict a field enclosure on the north side of the lighthouse. A track leading north to south is also depicted. The 1895 Second Edition map (Fig 2d) depicts a symbol of a lighthouse and a single building. The 1910 Third Edition map shows the same detail as the Second Edition.

4.3.3 Chris Dyer of the Shetland Amenity Trust has carried out a detailed regressive analysis on the available cartographic sources and this is included as Appendix 5.

4.4 Aerial photographic survey

4.4.1 Vertical aerial photographs dating to 1942 and 1946 were examined to identify the position of military structures in relation to the earthworks associated with the ramparts of the prehistoric promontory fort. The 1942 photograph shows the position of what appears to be a Nissan hut at the site of Building 16. This is consistent with the position of the concrete wall footings that survive on the ground today. A narrow linear feature leading from the hairpin bend in the road leading to the hut is probably a path. The 1946 aerial photograph shows the same detail. Both photographs show the position of the brick-built water tank that is situated approximately 10m to the south-west of Building

16. The RAF 1967 vertical aerial survey of Sumburgh Head shows the alignment of the possible earthwork ramparts where the cliffs form a narrow neck of land. The Luftwaffe photographs of Sumburgh RAF airfield do not include Sumburgh Head.

4.5 Documentary sources

4.5.1 John Guy's survey of 20th-century defences of the Shetland Islands includes the Radar 1 and 2 buildings (Guy 1995). Guy mentions that the radar establishment at Sumburgh Head is one of the earliest Chain Home Low Radar stations built, and was very much an experimental station.

4.5.2 In a newspaper article published in *The Orcadian* newspaper on 10th August 1995, entitled '*The Pearl Harbour that might have been*', Richard W Feachem recounts the impact that the early warning system had on protecting Scapa Flow, which was for much of the war occupied by the Royal Navy's Home Fleet. In April 1940 a large Luftwaffe aerial armada heading for Scapa was thwarted by the newly established coastal defences established at high points within Shetland. The 'Scapa group' of radio stations were known as Admiralty Experimental Stations (AES) and were established in Shetland, Fair Isle and Orkney and on the nearby mainland. AES1, on Sumburgh Head, became operational on Boxing Day 1939. AES2, stationed on Fair Isle, was a vital link in the chain of coastal defence. Both AES1 and AES2 found the aerial armada half an hour before it arrived, informed RAF Lyness on Orkney and necessary evasive action was taken.

4.5.3 In a letter from Richard Feachem (2001) to the warden of the RSPB reserve at Sumburgh Head, Feachem recalls the thwarted raid on Scapa and the routine air raids in 1940 and 1941. It was during the close of 1941 when the north lighthouse on Fair Isle was bombed, with no loss of life. Fair Isle South Light and Sumburgh Head Lighthouse were shot at but not bombed. A radar station on Ward Hill, Unst was bombed but the bombs sank deep into the peat and exploded harmlessly. Accompanying the letter was a collection of photographs of the Sumburgh Lighthouse and various family members of the principal and assistant keepers. Most significant are the two photographs taken of the radar buildings which show the two metal aerials that were supported on wooden stanchions. These photographs are reproduced as Plates 1 and 2.

4.5.4 Plate 1 was taken from the drifter Good Shepherd in January 1940. The wooden-framed aerials on Radars 1 and 2 can be seen. Plate 2 is a later photograph taken on the south-west side of the Western accommodation block and by the time this photograph was taken, in mid 1940, the Radar 1 aerial had been removed. It had been made redundant by the invention of coaxial cable, which enabled the Radar 2 metal-framed aerial to revolve continuously instead of through three-quarters of the circle and back again as was necessary with pre-coaxial twin wires, thus the single metal-framed aerial shown on top of Radar 2 was now able to send and receive radar transmissions.

Original design drawings by the Stevensons (Figs 3-5)

4.5.5 A large collection of original design drawings (Appendix 3) are housed within the NMRS. Some of these have been annotated at a later stage. A block layout plan of the accommodation blocks dating to 1819 has been heavily annotated during the early 20th century with various measurements and comments added as part of proposed renovations.

4.5.6 The 1904 design drawings for the engine room (competed 1906) include elevation drawings and a roof plan. A ground plan and longitudinal section drawing of the same date was also produced. This collection also included technical drawings of the foghorn house and the configuration of three compressed air receiver tanks. The dispositions of the tanks and the air lines from the engine room are also depicted, alongside profiles of the ground in relation to the proposed buildings.

Northern Lighthouse Board documents

4.5.7 Secretary's Department Reports dating from 1901 to 1930 provide a snapshot on the quality of this data. The accounts include dates of completion for major building works and information on who was commissioned to construct various features such as the fog signal machinery. Tender quotes and acceptance letters are also included. The 1912-1915 manuscripts record a tender for a new floor in the lighthouse '*which should be strong enough to carry the weight of the new machinery, the revolving carriage, mercury float, also the lantern is old at this station, and no safety rail, a new rail and path (is required) for cleaning the lantern panes*'.

4.5.8 On 13th June 1918 under the heading 'Naval Lookout at Sumburgh Head, a request was made to acquire a telephone for the lookout station. A telephone was present in the keeper's house but a new phone was requested along with a request to move a small look-out hut to a position close to the lighthouse. The motion was passed in subsequent letters. This is the fist account of World War I activity at Sumburgh Head. Later accounts relate to work on roof repairs in 1921.

5. SURVEY RESULTS

5.1 General

5.1.1 This section provides an assessment of the archaeological results obtained during the Level 1 standing building survey. The discussion is accompanied by a gazetteer (Appendix 1) that provides additional technical details where appropriate. Table 2 lists the features considered to be of archaeological interest within the lighthouse complex and these are shown on Fig 1. The lighthouse has been described in relation to grid north. The accommodation blocks retain the names 'east and west blocks' as they were named by the NLB, and the same names are used for the purpose of this survey. The existing elevations and building plans by Groves Raines Architects (2004) have been used during the survey and annotated as appropriate (Figs 6-10).

Feature No.	Building description
1	Sumburgh Head Lighthouse
2	West Accommodation block
3	East Accommodation block
4	Foghorn tower
5	Radar building 1
6	Radar building 2
7	Disused garages
8	Stores/ local assistant's block
9	Engine room and fuel store
10	SAT Guest House (former principal keepers dwelling)
11	Concrete water tank and toilet block
12	NLB Auxiliary engine and switch-gear room
13	WW2 building remains
14	Aerial masts
15	Brick-built water tank
16	Building foundation
17	Sumburgh Head Fort Ramparts (Site off)
18	Gate-piers
19	Sundial plinth

Table 2 List of features shown on Fig 1

5.2 Feature 1: Sumburgh Head Lighthouse (Fig 8-9, Plates 3-8)

5.2.1 The lighthouse was designed by the engineer Robert Stevenson. The building work started in January 1819 under Mr John Reid building contractors of Peterhead. The tower sits on the 91m contour and is 17m high, with cavity walls and harled and whitewashed exterior walls. The tower has a circular battered podium with main doorway on its west side with circular (oculi) openings on its east and west side at first floor level. Within the lighthouse interior there are 52 steps to the top of the tower. The optical apparatus is group flashing with Stevenson's equiangular reflector showing flashes every 30 seconds, with a nominal range of 23 miles. The balcony has a cast-iron handrail which is corbelled out. The balcony rests on a moulded cornice. The lamp room is lined with varnished pine boards. The present dome is a late 19th-century replacement for an earlier one. The lighthouse has flanking walls which have openings onto the terraced area on its west side.

5.2.2 Early photographs (Groves Raines Architects 2004, Section 2.3) indicate that the lighthouse and flanking pavilion buildings originally had plain rubble walls but these were weatherproofed with harling at an unknown date.

5.3 Features 2-3: West and East Accommodation Blocks (Figs 6-10, Plates 9-18)

5.3.1 The east block is a mirror image, in terms of size and layout, of the West Accommodation Block, so only the west block is described in detail below. Original drawings by Stevenson (Figs 3-5) of the lighthouse and its accommodation blocks show the disposition of the two flanking pavilions with pediments on the advanced middle bays.

5.3.2 The West Accomodation Block is one of two pavilion buildings that flank the lighthouse. It occupies a rectangular plan and measures 11.3m by 9m. The west elevation has three bays with an advanced middle bay. Early photographs show that the middle bay had a pediment but this has subsequently been removed. The main entrances are situated on either side of the west-facing elevation of the building. The windows are all twelve-paned sash-and-case with sandstone raised margins. The building is two-storey with eleven individual rooms. It is set into a slope so that the rear elevation appears to be single-storey.

5.3.3 The basement rooms, of which there are four, are accessed from the ground floor and comprise three barrel-vaulted storage rooms (Plates 13-14). Room 1 is accessed for the northern door on the west elevation. A partition wall separates it from Room 2 at the rear, and from this an internal door leads to Room 3. Within Room 3, a staircase (Plate 15) led up to the first floor. Access was later blocked, and although the first flight is still intact, the second now has its balustrade removed. Room 4 has a separate entrance, the southern doorway on the west elevation.

5.3.4 The second floor contains seven rooms and a hallway (Rooms 26-32). The hall allows access to bedrooms and the main living room. The kitchen (29) is a later addition, along with the bathroom (26). The largest room is the living room (28). All the rooms have been refurbished at some point, probably during the 1970s. All the doors have been boarded and hide original four-panelled pine doors. The interior of building is in a poor state if repair and it has not been occupied for some time.

5.3.5 The east block building is currently used as the RSPB headquarters of the Sumburgh Head RSPB reserve. The basement rooms are currently used for equipment storage whilst the first floor rooms have been converted into offices. The bathroom and kitchen have the same fixtures and fittings as seen in the west block.

5.3.6 A curtain wall links the upper levels of the accommodation blocks to the front of the lighthouse, and contains a central doorway (Plate 16).

5.4 Feature 4: Foghorn House (Plate 19)

5.4.1 Situated on the eastern boundary with commanding views of the cliffs, the foghorn house comprises a concrete two-tier tower occupying a battered semi-circular plan. A cast-iron ladder leads up to a platform in which there is a small rectangular building. The tower parapet wall incorporates a cogged track which supports the rotating foghorn. At ground level on the west side of the tower there are two large riveted iron tanks which supplied compressed air to the horn. A square building at the top of the tower was not accessible but it is presumed that it held the building valve equipment associated with the foghorn. The foghorn blast is recorded as lasting for 30 seconds.

5.5 Feature 5: Radar Building 1 (Plates 20-28)

5.5.1 Radar Building 1 is situated c.4m from the base of the Foghorn House. The concrete building is one of two radar buildings on the site. The building is constructed of shuttered concrete which was built around a wooden hut. The remains of the wooden hut and parts of its corrugated iron roof can still be seen within the interior of the building. The building measures 6m by 4m. The door to the building is situated on the west side close to its gable. On the east side there is a rectangular window. The window faces a concrete blast wall which was placed to offer protection to the occupants of the building.

5.6 Feature 6: Radar Building 2 (Plates 29-35)

5.6.1 The Radar 2 receiver building is situated on the south side of a boundary wall and constructed of shuttered concrete that was used to encase a timber-framed wooden hut. A blast wall protects the main entrance which is situated on the north-west side of the building. The building measures 6.2m long and 3.6m wide. The ridge of the roof stands 3.3m above the floor. The north wall of the building has been built over the drystone boundary dyke and contrasts with the smooth face of the concrete. The wall carries concrete to a further height of c.1.5m. The east wall exhibits the impressions of the long decayed timber planks of the sheds cladding. At the south end of the wall there is an impression of a shuttered window measuring 1.1m by 1m; the south elevation has a window opening with the same dimensions. On the inside of the roof are the impressions of corrugated iron which was originally used to roof the timber hut.

5.7 Feature 7: disused garages (Thumbnail 445, Folder 4)

5.7.1 A pair of derelict plank-built garages occupy the ground between the West Accommodation Block and the Occasional Keeper's Block. The garages have been built against the drystone boundary wall. They measure c.8m by 4m in plan and have their main entrances facing the main drive. The garages are 20th-century in date (1950s) and are of no historical interest.

5.8 Feature 8: stores/assistant keepers' block (Plates 36-41)

5.8.1 This is a two-storey building that is constructed of coursed rubble with a wet-dash cement render. The building measures 14m by 5m and has four compartments on the ground floor (Fig 6, Nos 9-12) and two compartments on the first floor that are accessed by a wooden staircase on the west elevation. According to historical photographs this building is contemporary with the construction of the lighthouse and accommodation blocks. The ground floor rooms include a smithy and byre. The smithy has a set of working bellows in the fireplace. The byre has retained its original cobble floor. On the upper floor there is accommodation for an assistant keeper and next to this there is a storeroom. A small annex building was added to the south elevation and this includes a fuel store and a toilet. The keepers' accommodation still contains a 'time-capsule' of fixtures and fittings including wooden bunk beds, carpeted floors, sink and electric fire and cooker. The room is unchanged since it was no longer required by the NLB.

5.9 Feature 9: engine house and fuel store (Plates 42-55)

5.9.1 The engine room block measures 27m by 9.55 and incorporates the SAT Guest House (see entry below). The block is stone-built, covered with painted wet-dash render, and its window dressings are long-and-short and painted to contrast with the main walls. The engine block includes Rooms 13 (the engine room), 14 (a fuel store), 15-16 (a workshop with store/boiler room) and 17 (an electrical switch-gear room). The internal walls of the engine room are tiled with white fire-clay tiles to dado height with blue painted walls above. The floor incorporates ornate floor tiles which are contemporary with the construction of the building.

5.9.2 The engine room was completed in 1907 (NLC/1/35) to provide compressed air to the foghorn tower. The engine room interior includes three Kelvin marine diesel engines that supplied compressed air to three iron receiver tanks situated on the north wall. These tanks were manufactured the previous year by James Dove & Co, Engineering Contractor, Edinburgh. The three engines are K2 Series engines linked to air compressors. The engines now have electric starter motors fitted requiring the use of paired 15 volt batteries. These were charged by battery chargers powered by direct mains current and also by a Lister diesel engine. The chargers are situated on the west wall of the engine room.

5.9.3 Adjoining the engine room and accessed by double-leafed doors is the oil fuel store (Plates 50-53). This room has as series of cylindrical fuel tanks supported on iron I-beams. The tanks would originally have held kerosene which was first used as lamp fuel. The tanks were later used to store fuel for the diesel engines. The fuel was fed to the engines via overhead fuel lines suspended from the ceiling. The room is lit by a four-paned glass panelled door which is probably a safety feature in the event of a fire.

5.9.4 Two other rooms are accessed by another door from the engine room. The two rooms include a storeroom with smaller storeroom leading off and a larger room that contains

electrical wall-mounted isolation switches (Plate 54). A fine Edwardian period wall-mounted cabinet is present on the east side of this room (Plate 55).

5.10 Feature 10: SAT Guest House (Thumbnails 30-35, Folder 1 and 387-405, Folder 2)

5.10.1 The SAT Guest House (former keeper's accommodation) has seven individual rooms and a hallway. It has been modernised to suit the needs of holiday accommodation but its main footprint is largely unaltered since it was last used by the NLB. All the windows are eight-paned sash-and-case windows in keeping with the East and West Accommodation Blocks.

5.11 Feature 11: Concrete water tank and toilet block (Thumbnails 399-344, Folder 2)

5.11.1 A concrete part-subterranean water tank is situated on the west side of the SAT Guest House. The tank has a flat roof and measures c.8m by 4m. A set of steps descends on its northern end to a lower terrace level where a pair of disused toilets are present. The toilets form a single building block measuring 3.5m by 1.5m. All internal sanitary goods have been removed.

5.12 Feature 12: NLB Auxiliary engine and switch-gear room (Thumbnail 25, Folder 1)

5.12.1 Owned by the NLB, this is a modern single-storey structure with barred doors and windows. The building houses an auxiliary engine to supply electricity to the lighthouse. The interior has two compartments, the largest housing the engine, the smaller is used for stores and maintenance equipment.

5.13 Feature 13: WW2 building (Thumbnail 362, Folder 2)

5.13.1 This single storey building is situated within a walled enclosure and is constructed of shuttered concrete with a flat roof, and has a small annex on its east side. The concrete building dates to World War II and is associated with the Radar buildings. The exact function of the building is not known. The building is not owned by the SAT and no interior access was available.

5.14 Feature 14: Aerial masts (not illustrated)

3.14.1 Two modern steel aerial masts carry an array of wires to the lighthouse. One mast is situated immediately adjacent to the Radar 2 building and the second is situated close to Building 13. The masts are approximately 20m high and painted white.

5.15 Feature 15: Brick-built water tank (Thumbnails 423-425, Folder 3)

5.15.1 A brick built water-tank of probable Second World War date is situated alongside the main trackway to the lighthouse, immediately upslope of Building 16. The tank measures c.3m by 2.5m and is c.1.5m high. In all probability the tank was the main water supply for the nearby Building 16.

5.16 Feature 16: WW2 building foundations (Plates 56-57)

5.16.1 Situated 6m downslope from Building 15 and built into the hillside is the remains of a rectangular building measuring 10m long and 4.5m wide. A single course of concrete measuring c.0.15m high can be seen enclosing the hard standing of a floor. The 1942 and 1949 aerial photographs show a building at this location which was possibly associated with a barrack block for army sentries who where known to guard the headland during its use as part of the Chain Home Low radar station which, as top secret defensive installations, demanded the tightest security.

5.17 Feature 17: Sumburgh Head fort ramparts (Plate 58-59)

5.17.1 The ramparts of the prehistoric fort are situated on or near the site of Building 16. Excavations conducted by SAT failed to locate the true extent of the ramparts. A recent landslip, in which a c.10m length of c.19th-century boundary wall and a large section of cliff fell into the sea, has made any close inspection of the rampart site impossible for the time being. The construction of the WW2 Building 16 has had an impact on the upper rampart which has led to the removal of the escarpments. The positions of the vestigial rampart remains appear to be partially visible on the vertical aerial photograph taken by the RAF in 1967. A photograph taken from the north looking towards Sumburgh Head in 1970 (NMRS HU40NW 1) shows the possible remains of the ramparts which are visible as a series of linear earthworks where the neck of land on the headland narrows.

5.17.2 The placename Sumburgh is said to derive from the Norse *Sunnborg* (South Broch). The site is therefore likely to have played an important defensive role during the Iron Age. The likely Iron Age structure at Sumburgh Head was first surveyed by Timothy Pont in 1592 and published in Johann Blaeu's *Atlas Novus* in 1654. There is only anecdotal evidence for a broch, whose likely position would have been the summit of the headland at the site of the lighthouse, the construction of which must have removed any near-surface archaeological remains.

5.17.3 The types of archaeological deposits typical of later prehistoric sites found within other promontory sites within Shetland strongly points to the potential survival of pits. Middens, fire-shattered stones and large assemblages of pottery would not be uncommon within this type of site. Blockhouses which are stone-built structures often associated with gateways to larger settlement remains are widely recorded in the south of Shetland (Carter et al 1995).

5.18 Gate piers and sundial plinth (Plates 60-61)

5.18.1 A set of gate piers built of ashlar sandstone are situated at the entrance to the main lighthouse complex and form part of the group listing. The gate piers stand to a height of 1.8m and have hewn coping stones. A sundial plinth is situated to the south of Building 12, the auxiliary engine rooms. The plinth is made of cast-iron with fluted sides to a height of 1.2m. The sundial is missing.

6. DISCUSSION

6.1 Shetland at war

6.1.1 The Shetland Islands, the most northerly islands of the British Isles, played an important part in the defence of Britain during both World Wars. With the Straits of Dover providing very vulnerable and dangerous passage, enemy shipping, warships and submarines leaving Germany and other occupied ports used the Denmark Straits as their passage to the Atlantic Ocean (Guy 1995). The Shetland Islands were an important base for the Royal Navy and Royal Air Force who were patrolling these waters with warships and aircraft and for the radar stations scanning the skies and waters. The Army also played an important part, protecting the islands and their important installations and bases.

6.1.2 Guy (1995) mentions that, due to the general remoteness of the islands and the extreme remoteness of the installations, many have survived to this day. Most of the few WW1 and WW2 batteries in the whole of the British Isles to survive with their original armament still in place are located in the Shetland Islands.

6.1.3 RAF Sumburgh (NGR: HU 395105) emerged out of a small commercial airfield in 1936 to become strategically important to the air defence of Shetland and the Wick Sector. In 1940 a wartime pilot described the criss-cross of runways as '*a sea circled loneliness with the great lion of Sumburgh Head snoozing in the circuit*' (Smith 1983).

6.1.4 Due to the position of Sumburgh Head and the commanding views towards the North Sea and Atlantic Ocean, the lighthouse was used in WW1 as a lookout position to monitor the movement of enemy shipping (NCL/1/85).

6.1.5 Radar Buildings 1 and 2 at Sumburgh Head are unique survivors of a larger chain of radar installations that were placed on hill and cliff tops as part of the Chain Home Low (CHL) radar system. The radar establishment at Sumburgh Head was one of the earliest CHL radar stations built, and was very much an experimental station. The locations of other CHL stations on Shetland are known and probably do not survive as well as the buildings at Sumburgh Head. Although the buildings are in a derelict state of repair with the original wooden huts having largely decayed, the concrete outer casing is in a good condition and the thickness of the walls has contributed to their survival.

6.1.6 The significance and their role in thwarting enemy attacks on Scapa Flow in 1940 and probably several others on the Shetland mainland cannot be understated. Without the early experimental radar installations in 1939 and the subsequent research and development using radar countless lives would have been lost. The home front owed a great debt to these isolated stations that provided early warning of enemy attack from both by air and sea.

6.2 The lighthouse complex

6.2.1 As Grade A listed structures the Sumburgh Head Lighthouse and associated accommodation blocks are of National Importance. The two neo-classical accommodation blocks that flank the lighthouse are unique reminders of the quality of workmanship and the 'over-engineered' design quality typical of the Stevenson family of engineers and the NLB. The facades of the accommodation blocks are missing their pediments that were taken down sometime after 1940. The symmetrical arrangement of each block is shown in the identical room dimensions and interior layout. The West Accommodation Block is in a state of dereliction and is suffering from damp due to the lack of heating. The east block has fared better owing to its current use as RSPB offices.

6.2.2 The engine room and its ancillary fuel store is unique in that everything is still in place from when it was last used to supply compressed air to the foghorn tower. The Edwardian period engine room floor and the tiled ceramic walls reinforce the importance of the building. The three later K2 Series Kelvin diesel engines display the technical quality and underlying importance of maintaining such important equipment. The engines themselves are of great interest in that they are all complete and appear close to working order.

6.2.3 The stores/assistant keepers' block is also in a state of disrepair but it still has much internal character. The ground floor rooms include the smithy and byre. The upstairs storeroom is suffering from the ingress of damp. The assistant keepers' bothy contains a 'time capsule' of fixtures and fittings from the 1970s and is a reminder of the social needs of the NLB workers of that era.

6.2.4 The SAT holiday accommodation block, formerly keeper's accommodation, has changed little in terms of its general layout. This part of the building is in good condition having been well maintained and is currently used throughout the year. Examination of the visitors' book confirms that the local seascapes and profusion of wildlife and archaeological sites are the main attraction to the holidaymakers and it would seem that few rarely leave disappointed.

6.3 The Sumburgh Head Fort and environs

6.3.1 Although the remains of the fort ramparts are fragmentary, the potential for the survival of other near-surface archaeological remains cannot be discounted (17 in Appendix 1). There is only anecdotal evidence for a broch on the headland and its likely position would have been the plateau area at the site of the lighthouse. If so, it is highly likely that its physical remains would have been known about before construction, based on the sheer volume of material used in broch construction. There is no reason to discount the presence of other more ephemeral features such as stone structures and associated prehistoric settlement remains. There can be little doubt that the headland was fortified and its internal remains might come to light in future ground-breaking works. Such evidence may provide useful dating evidence which is currently lacking.

6.3.2 To the west of Sumburgh Head, the Scatness peninsula has been used intensively through modern times, for both agricultural and military purposes. In spite of this, the southern end of the peninsula contains two Iron Age blockhouses (Ness of Burgi and Scatness North), both of which have been excavated (Carter et al 1995). In addition, there are traces of prehistoric walling and a possible figure-of-eight-shaped house. It may be that the possible structure of antiquity recorded at Sumburgh Head was concurrent in usage with the two forts on the western peninsula, thereby augmenting our knowledge pertaining to the density of occupation and giving tantalising hints as to the political and social situation within the Old Scatness/Jarlshof environs during the Iron Age.

7. CONCLUSION

7.1 The Sumburgh Head lighthouse complex is a unique collection of historical buildings which survive more or less unaltered since they were first constructed. The neo-classical design of the two flanking accommodation blocks is of great architectural interest and in keeping with Stevenson's quality of lighthouse engineering and design.

7.2 The WW2 radar building interiors are now severely dilapidated but their outer shell is well preserved. These two sites are unique survivors of the very first experimental CHL radar stations established in 1939. A year later they played a critical role in providing early warning of an aerial attack on the naval base moored at Scapa Flow and without doubt saved lives.

7.3 The archaeological remains associated with the Sumburgh Head promontory fort are visible at the narrow neck of land to the north side of the lighthouse complex. Here the two banks of the upper rampart are still visible running under a drystone boundary wall (shown on Plate 57). A WW2 building has removed a large proportion of this rampart behind the boundary wall. Further downslope, a recent landslip has removed the lower ramparts terminus. Within the interior of the headland it is likely that substantial remains of the fort could survive. The field enclosures on the north and south sides of the lighthouse complex have never been cultivated in modern times and this will in all probability have led to the survival of near-surface archaeological remains (houses, middens, hearths pits) containing organic material that will provide important radiocarbon dating evidence.

7.4 The desk-based assessment has brought together the readily available cartographic and documentary sources associated with the two WW2 radar structures and the lighthouse complex. It is clear that there is a great deal of further unseen information held within the NLB records deposited in the National Archive of Scotland. The NLB Secretary's Accounts dating from 1901 to 1936 have provided technical information on the early development of the lighthouse complex.

8. RECOMMENDATIONS

Historical research

8.1 Further research (both of archives and oral history) will be of use in placing the lighthouse and the WW2 remains into a wider historical context and, conversely, within a more intimate social historical context. The Engineers Accounts will contain important information on the maintenance of the machinery still present at the complex that would be useful for future interpretation of the existing plant and machinery at the site. The range of plans held in the NMRS hold much detail and it is clear from those that have been examined there is a wealth of further information that could be gleaned from them.

Building recording

8.2 The removal of internal and external wall linings within any of the lighthouse complex buildings should be subjected to more detailed fabric survey to record the position of any original architectural features currently masked or hidden.

Archaeological investigation

8.3 Plans to remove the two kitchen blocks on the east-facing elevations of both accommodation blocks would provide the opportunity to examine the ground below. Plans to demolish the disused wooden garages (Site 7) would allow the opportunity to examine the ground at this site. The garage foundations are likely to be shallow and may not have impacted on any buried archaeological remains associated with the fort at this locality.

8.5 A programme of archaeological work should be undertaken on any areas to be subjected to ground-breaking work. This work could include:

- geophysical research to record the extent of any buried structural remains surviving from the promontory fort
- archaeological evaluation to assess the potential for the survival and quality of any buried archaeological remains
- archaeological recording of the eroding sections of the ramparts
- watching briefs to monitor ground-breaking works associated with the construction of new buildings, track realignment and car-park infrastructure works
- excavation to record any features brought to light during the evaluation and geophysical surveys
- post-excavation and publication to disseminate the results of the archaeological work.

8.6 Any future works would be presented in formal WSI's to be drawn up in consultation with and approved by SAT and NGR.

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NLC3/1/4 1 Apr 1902-31 Mar 1903
NLC3/1/8 1 Apr 1903-31 Mar 1906
NLC3/1/22 1 Apr 1906-31 Mar 1909
NLC3/1/35 1 Apr 1909-31 Mar 1912
NLC3/1/51 1 Apr 1912-31 Mar 1915
NLC3/1/66 1 Apr 1912-31 Mar 1915
NLC3/1/85 1 Apr 1915-31 Mar 1918
NLC3/1/105 1 Apr 1921-31 Mar 1924
NLC3/1/118 1 Apr 1924-31 Mar 1927
NLC3/1/129 1 Apr 1927-31 Mar 1930
NLC3/1/142 1 Apr 1930-31 Mar 1933

Aerial Photographs in the NMRS

Sortie	**Plates**	**Date**
WL/10	2111-2112	4:7:42
106G/Scot/UK97	4025-4026	1946
RAF S86	67 152	6:6:1967

APPENDIX 1: SITES AND MONUMENTS GAZETTEER

ID No on Fig 1	Building Name and/or Room No	Summary description
1	Sumburgh Head Lighthouse	The lighthouse was designed by the engineer Robert Stevenson. The building work started in January 1819 under Mr John Reid building contractors of Peterhead. The tower sits on the 91m contour and is 17m high and built with cavity walls with harled and whitewashed exterior walls. The tower has a circular battered podium with main doorway and window with raised margin on its east side. On its third tier there are four circular openings (oculi) openings to light the first floor level. Within the lighthouse interior there are 52 steps from the base to the top of the tower. The optical apparatus is group flashing with Stevenson's equiangular refractor showing flashes every 30 seconds and has a nominal range of 23 miles. The contractors were Chance Brothers & Co Ltd of Birmingham and James Dove & Co Greenside Edinburgh. The balcony has a cast-iron handrail which is corbelled out balcony resting on a moulded cornice. The lamp room is lined with varnished pine boards. The lighthouse has flanking walls which have openings onto the terraced area on its west side. During the last 50 years a second gantry was added to the lighthouse dome. This feature is not shown on the c. 1940s photograph of the lighthouse.
2	West Accommodation Block Rooms 1-4, 26-32	The West Accommodation Block is one of two pavilion buildings that flank the lighthouse and occupies a rectangular plan and measures 11.3m by 9m. The west elevation has three bays with an advanced middle bay. Early photographs show that the middle bay had a pediment but this has subsequently been removed. The windows are all 12-paned sash and case with sandstone raised margins. The building is two storey with 11 individual rooms. The basement rooms, of which there are four are accessed from the ground floor and comprise two barrel vaulted storage rooms. The main entrances are situated on the west side of the building and are flanked by 12-paned sash and case windows. Rooms 1, 2 and 4 have barrel-vaulted ceilings. Within Room 3, a staircase led up from the rear room (Room 3) up to the first floor. Access was later blocked although the first flight is still intact, the second has its balustrade removed. The second floor contains seven rooms and a hallway. The hall allows access to bedrooms and the main living room. The kitchen (29) is also an addition along with the bathroom (26). The largest room is the living room. All the rooms have been refurbished sometime probably during the 1970s. All the doors have been boarded and hide original 4-pannelled pine doors. The interior of building is in a poor state if repair and has not been ivied in for some time. Original drawings by Stevenson of the lighthouse and its accommodation blocks show the disposition of the two flanking pavilions with pediments on the advanced middle bays. All the openings have raised margins although it was much later that the buildings were harled. The pediments depicted in the original Stevenson drawings were taken down sometime after the Second World War.
3	East Accommodation Block	The east block is a mirror image in terms of size and layout as the West Accommodation Block. The dimensions of the room are the same throughout. The building is currently used as the RSPB headquarters of the Sumburgh Head RSPB reserve. The basement rooms are currently used for equipment storage whilst the first floor rooms have been converted into offices. The bathroom and kitchen has the same fixtures and fittings as seen in the West accommodation block. The exterior is harled and painted. The windows have raised margins. The basement rooms are currently used by the RSPB as stores. The first floor rooms with the exception of the bathroom and kitchen have all been fitted out in recent times and used as offices.
4	Foghorn House	Situated on the eastern boundary with commanding views of the cliffs, the

		foghorn house comprises a concrete two-tier tower occupying a battered semi-circular plan. A cast-iron ladder leads up to a platform in which there is a small rectangular building. The tower parapet wall incorporates a cogged track which supports the rotating foghorn. At ground level on the west side of the tower there are two large riveted iron tanks which supplied compressed air to the horn.
5	Radar building 1	Radar Building 1 is situated c. 4m from the base of the foghorn House. The concrete building is one of two radar buildings on the site. The building is constructed of shuttered concrete which was built around a wooden hut. The hut was a prefabricated structure bolted together on its main frame. The remains of the wooden hut and parts of its corrugated iron roof can still be seen within the interior of the building today. The building measures by 6 m by 4m. The four-panelled door is situated on the west side close to its gable. On the east side there is a rectangular window. The window faces a concrete blast wall which was placed to offer protection to the occupants of the building. A large wooden beam (0.4m) long protrudes down from the roof. This has a large iron bolt fixed to it. Its function is not known. Designated Admiralty Experimental Station (AES) No 1, construction of the station began in October 1939 and the station started permanent watch on 27/12/39. This was one of the first Coast Defence U-boat (CDU) stations (i.e. Naval version of Chain Home Low) in the UK and was tasked with plotting U-boats attempting to escape from the North Sea into the North Atlantic. It was also capable of detecting aircraft. The Receiver Hut was placed just inside the southern wall of the inner enclosure of the lighthouse; the Transmitter Hut was 20 yards from it, 7 yards from the foghorn tower and 10 yards from the lighthouse. The engine shed was 50 yards away, outside the northern wall of the inner enclosure. The huts were straddled by gantries which carried the aerial arrays. Inverted searchlight turntables were used for rotation, which was carried out by a bike chain which entered each hut through a hole in the roof to an up-turned bike with pedals replaced with wooden handles. The station at Sumburgh head was replaced by a CHL at Compass Head in March 1943. **Sumburgh Head CDU (SMR 5056) – Source Ian Brown. Historic Radar Archive. 7.4.03.** Designated Admiralty Experimental Station (AES) No. 1, construction of the station began at the end of October 1939 and the station started permanent watch on 27 December 1939. This was a Coast Defence U-boat (CDU) station, tasked with plotting U-boats attempting to escape from the North Sea into the North Atlantic, but also capable of detecting aircraft as well. Apart from an earlier station of the same type erected at Anstruther, on the east coast of Fife, Sumburgh Head was the first CDU (i.e. Naval version of Chain Home Low) station in the UK. These stations represented a great improvement over the existing Chain Home long-range early warming radar. CDU or CHL consisted of a rotating aerial array typical of modern radars, but different to the fixed, floodlight arrangement of Chain Home Radar (CH). It would also eventually use a Plan Position Indicator (PPI) radar screen which showed the blips in the form of a map-like display, again common now, but very new then. A more detailed account of the basic operating principal of CH is described very graphically by Neale (2008). The Receiver Hut was placed just inside the southern wall of the inner enclosure of the lighthouse. The Transmitter Hut was 20 yards from it, 7 yards from the foghorn tower and 10 yards from the lighthouse. The Engine Shed was 50 yards away, outside the northern wall of the inner enclosure. The information to hand, as supplied by Ian Brown of Historic Radar Archive, suggests that all three huts were made of wood and had been prefabricated. No reference has been identified by the Historic Radar Archive indicating when the wooden huts were

		replaced by concrete ones, but this must have taken place at some time between 1939 and 1944. Richard Feachem (2001) mentioned that the lighthouse and huts were straffed by the Lufftwaffe and this led to the huts being encased in concrete to protect the radar personnel. The huts were straddled by timber stanchions which carried the aerial arrays (one transmitting, the other receiving). Inverted searchlight turntables were used for rotation, which was carried out by a bike chain which entered each hut through a hole in the roof to an up-turned bike with pedals replaced with wooden handles. Due to interference from the lighthouse buildings, the station at Sumburgh Head was replaced by a CHL at Compass Head in March 1943, where radar was housed in a single building using a single array to both transmit and receive. From then, the original site was used as a standby for periods of maintenance and breakdowns until it closed completely in April 1944. The building at Compass Head is still in use by the civil aviation authority to this day. Sumburgh Head played a crucial role in plotting German aircraft heading towards Scapa Flow in the Spring of 1940, the warning being sufficient to put the defences on alert and result in several aircraft being shot down. Thus a potential 'Pearl Harbour' style disaster to the British Home Fleet had been prevented. This was due in no small measure to the success of Sumburgh Head CDU. The placing of radar installations contravened the Geneva Convention where military installations were not to be placed within civilian sites. As a result of this made lighthouses a legitimate target by the Luftwaffe. The Sumburgh Head radar installations and lighthouse was straffed by enemy fire with no loss of life. This act led to the encasement of the huts in concrete and the erection of blast wall. The northern light on Fair Isle was not so lucky. According to records of the NLB, on 28 March 1941 the dwelling houses were machine gunned by an enemy plane. Two bombs were also dropped but landed 60 yards south east of the tower and damage was confined to broken glass. The second main attack happened on 18 April 1941 when a single enemy plane machine gunned the buildings and dropped two HE bombs one of which registered a direct hit on the buildings situated 30 feet from the back wall of the dwelling houses. The outhouses, comprising store houses and closets were completely demolished and all contents destroyed, plus 24 feet of boundary wall which was also demolished.
6	Radar building 2	The Radar 2 receiver building is constructed of shuttered concrete that was used to encase a timber-framed wooden hut. A blast wall protects the main entrance which is situated on the north-west side of the building. The building measures 6.2m long and 3.6m wide. The ridge of the roof measures 3.3m above the floor. The north wall of the building has been built over the drystone boundary dyke and contrasts with the smooth face of the concrete. The wall carries concrete to a further height of c. 1.5m. The east wall exhibits the impressions of the long decayed timber planks of the sheds cladding. At the south end of the wall there is an impression of a shuttered window measuring 1.1m by 1m. The south elevation has a window opening with the same dimensions as above. On the inside of the roof are the impressions of corrugated iron which was originally used to roof the timber hut. At the centre of the roof ridge there are two holes. One is likely to have been for the rotating shaft of the radar aerial and the other may have been for a stove pipe. The concrete floor has two levels, with the northern portion being 0.20m lower than the southern end. On line with the holes in the roof, there is a rectangular wooden-framed concrete dais which stands to a height of 0.10m. It is suggested that this was either part of a mounting for the radar equipment or more likely a stove base. The blast wall protecting the main entrance is 0.30m thick. There is an absence of fitting scars associated with the radar equipment and as the planks of the shed have almost now rotted away it is impossible to glean any further information other than that that has been recorded.

		Historical photographs taken in c.1940 confirm that this building combined both a send and receive aerial mounted on top of the roof. This was supported by wooden stanchions that were supported on concrete plinths. The stanchion posts were pitched and were contemporary with the wooden huts. Later encased in concrete, the visible traces of the stanchions can still be seen within the concrete walls and roof of the present building. A concrete plinth survives to a height of 0.90m and is situated on the south-west side of the building. Both radar buildings are visible on the RAF vertical aerial photographs.
7	Disused garages (interior not seen)	A pair of derelict plank-built garages occupy the ground between the West Accommodation Block and the Occasional Keepers Block. The garages have been built against the drystone boundary wall. The garages measure c. 8m by 4m and have their main entrances facing the main drive. The garages are 20th century in date (1950s) and are of no historical interest.
8	Stores/ Local assistants block	This building is a two-storey building that is constructed of coursed rubble with a wet-dash cement render. The building measures 14m by 5m and has four compartments on the ground floor (9-12) and two compartments on the first floor that are accessed by a wooden staircase on the west elevation.
	Rooms 9-12 GF	Room 9 is a later annex that has been added to the main building block and was used as fuel store. Room 10 is a toilet that is accessed on the west side of the building. The toilet is lit by a small window on the east-facing elevation. Room 11 was a small byre with a single central plank-built door. The walls are plain rubble and the floor is constructed of granite setts. A small drain measuring 0.20m wide runs north to south. The north wall is red-brick and possibly a later partition. The rest of the walls are rubble that has been whitewashed. There is room for two small animal stalls. The width of the door suggests that the byre was either used for housing pigs or small Shetland ponies. The adjoining Room 12 was at one time used as a smithy. On the north wall there is a central stone fireplace (1.48 by 1.30m) which has been painted light grey. The chimney breast has been modified to accommodate a set of bellows and hearth that rests in a steel-built frame. The east wall has a centrally placed plank-built door and on the opposite wall there is a centrally placed 4-paned sash-and-case window. On the south wall there is a cupboard behind a plank-built door. A red brick-built partition wall is visible at the rear of the cupboard. The floor is original sandstone setts.
	Rooms 39-40 FF	A double-leafed plank-built door allows access to a wooden staircase on the west-elevation. The stairs was at one time lit by a 12-paned sash-and-case window but this is now blind. There are two rooms (39-40) of the main landing. Room 37 is at the north end of the building and comprises the assistant's keepers bothy. On the west wall there are two box bunk-beds with cupboards underneath for bedding. An external ladder at the end of the bunks allows access to the top. On the north wall there is a central stone-painted fireplace with wooden mantelpiece flanked on the left by a cupboard containing crockery and pots. To the right of the fireplace there is an electric cooker. The east wall has a 12-paned sash-and-case window with a Belfast sink below. The south wall is plain. Here a small red Formica-topped table and two chairs are present. The wooden floor is covered with linoleum and covered with rugs. This room is very much as it was left when the NLB transferred ownership to the SAT and has not been altered since. It provides a snap-shot of the conditions in which the assistant keeper or visiting contractors would have lived. The character of the fixtures and fittings date to the 1960s or later. Room 38 is entered from the right of the stairs landing. A softwood 4-pannelled door is situated on the north wall. The east wall is lit by a 12-paned sash and case window. The south and west walls are featureless with only

		exposed coursed rubble which has at one time been whitewashed. This is now green stained due to the ingress of rainwater. Two hatches are present on the red-painted floor. These appear to have been chutes, possibly for ashes or other waste. The function of the room appears to have been a storeroom given the unplastered walls.
9	Engine room (Room 13)	The engine room measures 8.2m by 8.2m and is lit on the east, south and west sides by two large sash-and-case windows. The walls are tiled from the floor to dado height with white fireclay sanitary tiles. The walls are plastered and painted blue. The floor is a mosaic brown and cream patterned tiles. Three Kelvin diesel engines (Nos 1-3) are situated 2m apart from each other and rest on concrete foundations with holding down bolts at each corner. The plinths are aligned north-south. Each engine is replicated with the same fixtures and fittings. The company making Kelvin engines was founded in 1904 by Walter Bergius as the "Bergius Car & Engine Company". Bergius rented a premises in Finnieston Street, Glasgow, and set about developing his first car which he named the "Kelvin". The car was not a commercial success, however its engine proved to be an excellent marine engine following trials in a rowing gig in 1906. Car manufacture was abandoned, and the company began to specialize in marine engines. In 1907 the company installed one of its engines in a fishing boat, and in 1908 produced its first purpose designed marine engine. The name of the company was changed to the "Bergius Launch and Engine Company" In 1921 Walter Bergius (d.1949) designed his sleeve valve range of engines, though the engines performed well and were very quiet, a feature of sleeve valve engines due to the lack of noisy valves and tappets, the engines were prone to excessive wear. The last sleeve-valve Kelvin engine was made in 1946. The company's first diesel engine was introduced in 1931, a 2 cylinder engine which formed the basis of the model "K" range of engines, with 1, 2, 3, 4, and 6 cylinder versions. Later in 1933 a smaller diesel engine called the model "J" was launched, with 2, 3, and 4 cylinder variants. The "K" range remained in production until 1974, and the "J" range continued until 1970. Each engines exhaust pipes vertical and then at right angles out through the rear wall of the engine room. A direct-feed fuel line suspended from the ceiling runs down to each engine. The fuel supply was housed in tanks in the fuel store (Room 14). Exiting from each compressor on the north side of the engine blocks is a green-painted compressed air pipe each with a shut-off valve. The pipes rise upwards and traverse the engine room and converge at one of three large cream compressed air storage tanks situated against the north wall. Here a master shut-off wheel is present. The tanks were installed in 1906 and the middle tank has a manufacturers nameplate James Dove & Co, Engineering Contractor, Edinburgh and predate the engines by roughly 35-40 years. The importance of keeping a ready supply of charged starter batteries is attested by the presence of a Siemens wall-mounted battery-charger which converted the mains 250volt supply down to 30v and 15v. This charger was supported by a Lister marine diesel engine which was fuelled by direct line from the fuel store. The Siemens charger is fixed to the west wall and the Lister diesel engine is situated in the south-west corner of the room. Here an electric cable connects to an array of batteries stored in a wooden cabinet on the south wall. It is presumed that the Lister engine provided the necessary back-up in the event of loss of mains supply electricity. Likewise by having three Kelvin engines on station to supply compressed air to the foghorn, when one engine was serviced or undergoing repairs the other two engines could supply the requisite amount of air to internal and external receiver tanks.
	Fuel Oil Store, Room 14	The fuel oil store is accessed by double-leafed brown-painted plank-built doors. The room measures 4.7m by 4.2m with cream-painted walls. A pair of I-beams

		suspended off the floor at a height of 0.30m run round the room. These hold four large grey-panted steel or copper fuel storage tanks. Another large rectangular tank is suspended on a steel-framed tower on the corner of the room. The room is lit by glazed panels in the wooden door that exits into the yard area in front of the building.
	Workshop, Room 15	Room 15 is a workshop accessed by a door on the north wall of the engine room. The workshop measures 2.7m by 2.3m and has a door leading to Room 16, a small storeroom and Room 17 an electrical switch gear room. On the east wall of the workshop there is a work-bench with shelving and storage bins above. The shelves and bins still contain equipment used for the
	Stores Room 16	A small storeroom measuring 2.6m by 1.9m currently houses the boiler for the SAT Guest House. The room was lit by a window on the west wall, the window but it is now boarded up. On the south wall there is an array of storage bins containing pipe fitting and valve apparatus.
	Switch-gear room, Room 17	This room measures 4m by 2m and is lit by a 6-pane sash-and-case window on the west wall. The north wall houses an array of silver-painted electrical isolation boxes each labelled according to the various buildings within the lighthouse complex. On the east wall there is a pair of pine cabinets built into the wall. The top cupboards are locked. The lower cupboards have lids and contain cotton wadding for cleaning apparatus.
10	SAT Guest House (former principal keepers dwelling)	The SAT Guest House has seven rooms and a hallway. It has been modernised to suit the needs of holiday accommodation and has largely been unaltered since it was last used by the NLB. However some of the rooms earlier function is recorded on one of the historical plans of the building housed in the collection of NLB drawings. All the windows are 8-paned sash-and-case windows in keeping with the East and West Accommodation blocks.
	Room 18, bedroom	Room 18 is a small bedroom measuring 3.3m by 2.7 and was converted to a bedroom from a coal store.
	Room 19, kitchen	Room 19 is a kitchen measuring 4.9m by 2.7 and has been enlarged by the removal of central partition wall.
	Room 20, bedroom	Room 20 is a bedroom measuring 3.9m by 3.7m. A c.1960s style tiled fireplace occupies the south wall. This room was once probably a living room.
	Room 21, living room	Room 21 is the living room measuring 4m by 3.4m and has a moulded cornice and boxed-in panel door.
	Room 22, bedroom	Room 22 is a bedroom measuring 3.9m by 3.2m.
	Room 23, bedroom	Room 23 is a bedroom measuring 4m by 3m
	Room 24, hallway	The hallway measures 4.3m by 3.3m and is accessed by double-leafed doors on the main entry. Doors lead off to three bedrooms, the living room and the bathroom.
	Room 25, bathroom	The bathroom measures 2.9m by 1.5m and the fixtures and fittings are the same as those seen in the East and West Accommodation Blocks.
11	Concrete water tank and toilet block	A concrete part-subterranean water tank is situated on the west side of the SAT Guest House. The tank has a flat roof and measures c. 8m by 4m. A set of steps descends on its northern end to a lower terrace level where a pair of disused toilets are present. The toilets form a single building block measuring 3.5m by

		1.5m. All internal sanitary goods have been removed.
12	NLB Auxiliary engine and switch-gear room	Owned by the NLB, this is a modern single-storey structure with barred doors and windows. The building houses an auxiliary engine to supply electricity to the lighthouse. The interior has two compartments, the largest housing the engine, the smaller is used for stores and maintenance equipment.
13	WW2 building	This single storey building is situated within a walled enclosure and is constructed of shuttered concrete with a flat roof. The building has a small annex on its east side. The concrete building dates to WW2 and is associated with the Radar buildings. The exact function of the building is not known. The building is not owned by the SAT and no interior access was available.
14	Two aerial masts	Two modern steel aerial masts carry and array of wires to the lighthouse. One mast is situated immediately adjacent to the Radar 2 building and the second is situated close to Building 13. The mast are approximately 20m high and painted white.
15	Brick-built water tank	A brick built water-tank of probable WW2 date is situated alongside the main trackway to the lighthouse, immediately upslope of the Building 16. The tank measures c.3m by 2.5m and is c. 1.5m high. In all probability the tank was the main water supply for the nearby WW2 building (Building 16).
16	WW2 Building foundations	Situated 6m downslope from Building 15 and built into the hillside is the remains of a rectangular building measuring 10m long and 4.5m wide. A single course of concrete measuring c. 0.15m high can be seen enclosing the hard standing of a floor. The 1942 and 1949 aerial photographs show a building at this location which was possibly associated with a barrack block for army sentries who where known to guard the headland during its use as part of the Chain Home Low radar station which as highly secret defensive installations demanded the tightest security.
17	Sumburgh Head Fort Ramparts (site of)	The placename *Sumburgh* is said to derive from the Norse *Sunnborg* (South Broch).The site therefore likely to have played an important defensive roll during the Iron Age. The likely Iron Age structure at Sum burgh Head, first surveyed by Timothy Pont in 1592 and published in Johann Blaeu's Atlas Novus in 1654, appears to have been truncated during the construction of Shetland's first lighthouse between 1818 and 1821. Blaeu first recorded the 'Ancient Fort of Swenburgh', a site which provoked comment from travelling antiquaries through the eighteenth and nineteenth centuries. By 1968, the Ordnance Survey reported that 'traces of the defences are obliterated by the modern road to the lighthouse and no evidence was seen of a broch on the headland' (the site at Sum burgh having been earlier referred to as a broch by H. Dryden in 1873). However, the combined cartographic and documentary accounts indicate that this was a significant group of structures, set within a dramatic steeply rising landscape which may have represented the 'borg' or fort that inspired the name. The 'fort' at Sunburgh has made explicit use of the narrow neck of land between the cliffs and thus negating the need for elaborate earthwork or stone defences. Excavation at the Ness of Burgi has led to the suggestion that some blockhouse forts were symbols of Iron Age status, quite apart from serving a shielding or aggressive role. The forts could also have comprised lookout posts or warnings to those at sea that ownership of the surrounding land was in no doubt. Chris Dyer of SAT (Appendix 5) states there is an important overlap between forts and brochs and this may explain the contrasting interpretations from Low (1774) and Dryden (1873) of the structures at Sumburgh Head. A significant proportion of Shetland's broch sites are contained by walls, ramparts or ditches. Many of these could feasibly be classified as forts if they did not have broch structures within them. The earthen ramparts of the broch sites at Underhoull in Unst and Dalsetter in Dunrossness are more impressive than the ruinous brochs they contain whilst the earthworks surrounding the brochs at Burraland in Cunningsburgh and Burland in Quarff could function as promontory fort

		landscapes. Therefore, we must be open in our interpretation for Sum burgh Head inasmuch as whilst the notion of a fort appears likely, broch sites in Shetland may have been protected by or preceded by forts whilst fort sites may have been replaced by brochs. The ramparts of the prehistoric fort are situated on or near the site of Building 16. Excavations conducted by SAT failed to locate the true extent of the ramparts. A recent landslip in which a c.10m length of c.19th century boundary wall and a large section of cliff fell into the sea has made any close inspection of the rampart site impossible for the time being. The construction of the WW2 Building 16 has had an impact on the upper rampart which has led to the removal of the escarpments. The position of the vestigial rampart remains appear to be partially visible on the vertical aerial photograph taken by the RAF in 1967 although on the ground the ramparts have clearly been compromised by the construction of the WW2 building (Building 16).
18	Gate-piers	The Statutory List includes a set of stone-built gate piers. The gate-piers are built of ashlar sandstone are situated at the entrance to the main lighthouse complex and form part of the group listing. They stand to a height of 1.8m and have hewn coping stones.
19	Sundial plinth	A sundial plinth is situated to the south of Building 12, the auxiliary engine rooms. The plinth is made of cast-iron with fluted sides to a height of 1.2m. The sundial is missing. This style of plinth is a typical NLB feature and a similar one is recorded on the Isle of May.

APPENDIX 2: PHOTOGRAPHIC REGISTER

CONTENTS OF FOLDER 1

Shot	Description	From	Conditions
1	West block, east-facing elevation	E	Dull
2	West block, curtain wall and lighthouse base	E	Dull
3-5	Lighthouse, east-facing elevation	E	Dull
6-7	East Block, and curtain wall, east-facing elevation	E	Dull
8	East Block, east-facing elevation	E	Dull
9	East Block, north-facing elevation (gable)	N	Dull
10	Terrace on west side of the lighthouse and steps railing	S	Dull
11	Looking down the steps from the terrace to ground level	N	Dull
12-14	West block, south-facing elevation, (gable)	S	Dull
15-17	South boundary wall and gable of the old garages	S	Dull
18	Radar 2, west-facing elevation blast wall	W	Dull
19	Radar 2, south-facing elevation, window opening	S	Dull
20	Radar 2, south-facing elevation and plinth for radar tower	S	Dull
21-22	Radar 2, west-facing elevation and steel mast	W	Fair
23-24	Radar 2, north-facing elevation and boundary wall	N	Fair
25	NLB auxiliary engine and electrical switch-gear room	W	Fair
26	East block, west-facing elevation, general shot	W	Fair
27	Occasional keepers house, east-facing elevation	E	Fair
28-29	Engine house, east-facing elevation	E	Fair
30-31	Guest house, east-facing elevation, window details	E	Fair
32	Guest house, north gable	N	Fair
33	Guest house, west-facing elevation	NW	Fair
34	Guest house, west-facing elevation, oblique view	NW	Fair
35	Guest house, west-facing elevation, window details	W	Fair
36	Engine house south and west-facing elevations, oblique	SW	Fair
37	Occasional keeper's house, west-facing elevation	W	Fair
38	Occasional keepers house, south-facing elevation toilet block	S	Fair
39	Fuel tanks and south boundary wall	N	Fair
40	South boundary wall, general detail	N	Fair
41-42	Radar 2, south-facing internal wall, rubble built boundary wall and concrete gable	S	N/a
43	Radar 2, south-facing gable, internal east and west walls and roof	S	N/a
44-47	Radar 2, internal west-facing elevation, impression of boarded window in the shuttered concrete	E	N/a
48	Radar 2, internal east-facing elevation, with alcove and wood remains adhering to the shuttered concrete	E	N/a
49	Radar 2, blast wall with recess showing the position of aerial tower timbers at an oblique angle	E	Fair
50	Radar 2, east-facing elevation of the blast wall	N	Fair
51	Radar 2, ghost position of timber aerial post above main door	W	Fair
52-53	Radar 2, dais and wooden surround, possible stove plinth?	E	N/a
54	Radar 2, roofing felt (remains of) adhering to the shuttered concrete roof	S	N/a
55	Radar 2, main entrance and flanking walls	E	N/a
56-57	Radar 2, west-facing elevation, blast wall	W	Fair
58	Radar 2, west-facing elevation of the blast wall crossing an aerial tower plinth	W	Fair
59	Radar 2, looking between the blast wall and doorway	N	Fair
60	One of two iron air receiver tank on the west side of the foghorn tower	S	Fair
61-62	A pair of iron air receiver tanks on the west side of the foghorn tower	S	Fair
63-65	Foghorn tower, south elevation, general shots	N	Fair
66-67	Lighthouse, east-facing elevation	NE	Fair

Shot	Description	From	Conditions
68	Radar 1, interior shot of the south, west and east walls	S	N/a
69	Radar 1, interior east-facing elevation, window and concrete wall	E	N/a
70	Radar 1, interior shot of the walls and roof details	S	N/a
71	Radar 1, interior shot of the north-facing gable, door and east window	N	N/a
72	Radar 1, interior shot if the north-facing gable and east-facing window	NE	N/a
73	Radar 1, corrugated iron of the hut roof and central wooden post	SE	N/a
74	Radar 1, corrugated iron of the hut roof and central wooden post	W	N/a
75	Radar 1, alcove at the side of the door, and plank-built hut wall	N	N/a
76-77	Radar 1, general shot of the plank-built hut door	W	N/a
78	Radar 1, general shot of the doorway and plank-built door	N	N/a
79	West block, Room 1, vaulted cellar, east-facing elevation	E	Flash
80	West block, Room 2, west-facing elevation and vaulted ceiling	W	Flash
81	West block, Room 2, door leading to Room 3	N	Flash
82	West block, Room 2, doorway leading to Room 1	E	Flash
83	West block, Room 3, stairway and banister	N	Flash
84	West block, Room 3, looking up the staircase	W	Flash
85	West block, Room 3, door leading to Room 2	S	Flash
86	West block, Room 3, cupboard at the west end of the room	E	Flash
87	West block, Room 4, vaulted cellar, boiler room	W	Flash
88	Occasional keepers block, Room 12, smithy, internal east-facing elevation	E	Flash
89	Occasional keepers block, Room 12, smithy, internal north-facing elevation, cupboard under the staircase	N	Flash
90	Occasional keepers block, Room 12, smithy, internal west-facing elevation, doorway	W	Flash
91	Local assistant keepers block, Room 11, byre, internal east-facing elevation	E	Flash
92	Local assistant keepers block, Room 11, byre floor setts	E	Flash
93	East block, Room 8, RSPB stores, west-facing internal partition wall and door to Room 6	E	Flash
94	East block, Room 8, RSPB stores, south-facing elevation	S	Flash
95	East block, Room 8, RSPB stores, east-facing internal wall and door yard areas	E	Flash
96	East block, Room 8, RSPB stores, chute feature in the vaulted ceiling	S	Flash
97	East block, Room 7, RSPB stores, west-facing wall and clutter	W	Flash
98	Local assistant keepers block, staircase leading to Rooms 37-38	W	Flash
99	Local assistant keepers block, blocked window above stair	E	Flash
100	Local assistant keepers block, Room 40 bothy, fireplace on south-facing elevation	S	Flash
101	Local assistant keepers block, Room 40, electric cooker on south-facing wall	S	Flash
102	Local assistant keepers block, Room 40, main entrance and formica table	N	Flash
103	Local assistant keepers block, Room 40, north-facing wall with formica table and two chairs	N	Flash
104	Local assistant keepers block, Room 40, ladder at the end of the bunk beds	E	Flash
105	Local assistant keepers block, Room 39, cracks in the south-facing wall	S	Flash
106	Local assistant keepers block, Room 39, west-facing window	W	Flash
107	Local assistant keepers block, Room 39, decay on north-facing wall	NE	Flash
108	Local assistant keepers block, Room 39, decay on the east-facing wall	E	Flash
109	Local assistant keepers block, Room 39, west-facing window, distance shot	W	Flash
110	Local assistant keepers block, Room 39, rectangular chute in the floor- leads to room 11 below	N/a	Flash
111	Local assistant keepers block, Room 40, general shot of the bunks and fireplace	SE	Flash
112	Local assistant keepers block, Room 10, toilet interior	W	Flash
113	Local assistant keepers block, Room 10, toilet interior, north wall	W	Flash

Shot	Description	From	Conditions
114	Local assistant keepers block, Room 10, toilet interior	W	Flash
115-116	Engine room, Room 13, compressed air receiver tanks on the south-facing interior wall.	S	Flash
117	Engine room, Room 13, compressed air receiver tank and main shut-off valve	E	Flash
118	Engine room, Room 13, compressed air receiver tank and main entrance and flanking sash-and-case window	W	Flash
119	Engine room, Room 13, interior detail of the south-east corner of the room	W	Flash
120	Engine room, Room 13, Kelvin diesel engine No.1, east side	E	Flash
121	Engine room, Room 13, compressor on the north side of Kelvin diesel No 1	N	Flash
122	Engine room, Room 13, brass engine plate on engine No 1	W	Flash
123	Engine room, Room 13,Kelvin engines Nos. 1-3, south end	S	Flash
124	Engine room, Room 13, starter motor batteries on the west side of engine No 2.	NW	Flash
125	Engine room, Room 13, flywheel on engine No 2	W	Flash
126	Engine room, Room 13, Siemens battery charger, mounted on east-facing wall	E	Flash
127	Engine room, Room 13,looking south on engines Nos. 1-3	N	Flash
128	Engine room, Room 13, ornate ceramic tiles	N	Flash
129	Engine room, Room 13, diesel powered Lister battery charger in the south-west corner of the room	NE	Flash
130	Engine room, Room 13, battery storage cupboard on the south wall	N	Flash
131-132	Engine room, Room 13, exhaust silencer and suspended outlet pipe from engine No 2	N	Flash
133	Engine room, Room 13, green-painted compressed air line	N	Flash
134	Engine room, Room 13, compressed air main shut-off valve	E	Flash
135-136	Oil store, Room 14, fuel storage tanks	S	Flash
137	Oil store, Room 14, fuel storage tank on stanchion	W	Flash
138-139	Oil store, Room 14, fuel storage tanks, general shot	E	Flash
140	Oil store, Room 14, fuel storage tank on west-facing wall	W	Flash
141	Engine Room stores, Room 15, door to room 17	S	Flash
142	Engine Room stores, Room 15, storage shelves on the west-facing wall	W	Flash
143	Engine Room stores, Room 16, storage and shelving above main door	N	Flash
144-146	Engine Room stores, Room 16, blocked window on the east-facing wall	E	Flash
147	Engine Room switch gear room, pine cupboard and storage bins	W	Flash
148	Engine Room switch gear room, pine cupboard and storage bin interiors	W	Flash
149	West block, Room 27 bedroom, East facing wall	E	Flash
150	West block, Room 28 living room, west facing wall and kitchen entrance	W	Flash
151	West block, Room 29 kitchen, west facing wall, work-tops	W	Flash
152-153	West block, Room 30 box bedroom, west facing window	W	Flash
154	West block, Room 27 bedroom, east facing wall and door	E	Flash
155	West block, Room 30 small cupboard at the south end of the hall	N	Flash
156	West block, Room 32 bedroom, south-facing wall	S	Flash
157	West block, Room 32 bedroom, west facing wall and door	W	Flash
158	West block, Room 32 bedroom, east-facing wall	E	Flash
159	West block, hallway looking south	N	Flash
160	West block, Room 27 bedroom, south- facing wall	S	Flash
161	West block, exterior east facing elevation, general shot	E	Sunny
162	West block and curtain wall, east-facing elevation	E	Sunny
163	Lighthouse, east-facing elevation	E	Sunny
164	East block, east-facing elevation, general shot of kitchen	E	Sunny
165-166	East block, south-facing external wall	E	Sunny
167-168	East-facing terrace wall and railings	E	Sunny
169-171	Stairs leading from the terrace to ground floor level	N	Sunny
172	West block, external south-facing wall	S	Sunny

Shot	Description	From	Conditions
173	South boundary wall, garage gable and OS trig-point	S	Sunny
174	Radar 2, west-facing elevation and blast wall	W	Sunny
175	Radar 2, south-facing wall and window opening	S	Sunny
176-177	Radar 2, east facing wall, gable	E	Sunny
178	South boundary wall, east end and gate	NE	Sunny
179	NLB auxiliary engine house	W	Sunny
180	East block, west-facing elevation	W	Sunny
181-182	Curtain wall between East and West Blocks	W	Sunny
183-184	Local assistant keepers fuel store entrance, Room 9	E	Sunny
185	East block, west-facing elevation, general shot	W	Sunny
186	NLB auxiliary engine house	W	Dull
187-188	Engine room fuel store entrance	E	Sunny
189	Guest house and gable wall	NE	Sunny
190-192	Guest house block at rear, west-facing elevation	W	Sunny
193	Engine room, west-facing elevation, window detail	W	Sunny
194	Engine room, south gable and passage	SW	Sunny
195-197	Local assistants accommodation block, west-facing elevation	W	Sunny
198	Local assistants accommodation block, south elevation fuel store annex	S	Dull
199-200	Garage walls, west-facing elevation and fuel storage tanks	W	Dull
201	Southern enclosure boundary wall, distance shot	N	Sunny
202	Radar 2, west-facing interior elevation, window impression	W	Flash
203-204	Radar 2, east-facing interior elevation, timber gladded walls	E	Flash
205	Radar 2, west-facing elevation and drystone boundary wall junction showing differences in fabric	S	Flash
206	Radar 2, looking upwards on the roof interior, showing roofing felt (remains of)	N/a	Flash
207	Radar 2, west-facing exterior blast wall running over a concrete timber stanchion plinth	W	Bright
208	Radar 2, looking between the blast wall and main entrance	N	Bright
209-210	Radar 1, south-facing elevation showing blocked opening	S	Bright
211	Radar 1, south side of building showing concrete stanchion plinth	S	Bright
212-213	Radar 1, west-facing elevation, general shot	W	Bright
214-215	Radar 1, north-facing elevation, (in shadow)	N	Sunny
216	Radar 1, east-facing elevation, blast wall	NE	Sunny
217-218	Radar 1, south-east corner of the gable and blast wall	SE	Sunny
219-220	Foghorn tower, general shots	S	Sunny
221	Foghorn tower and compressed air holding tank	S	Sunny
222-223	Radar 1, interior shot of the south-facing elevation	S	Flash
224	Radar 1, interior shot of the west-facing elevation	SW	Flash
225	Radar 1, interior shot of the north-facing elevation	S	Flash
226	Radar 1, corrugated iron roof remains	N/a	Flash
227	Radar 1, timber shed remains, interior north-facing elevation	N	Flash
228	Radar 1, east-facing elevation, plank-built door detail	NE	Flash
229-230	West block, Room 1, West facing interior wall and vaulted ceiling	W	Flash
231	West block, Room 1, south-facing wall	S	Flash
232	West block, Room 1, north-facing interior wall	N	Flash
233-234	West block, Room 1, east-facing interior wall, door and window	E	Flash
235-236	West block, Room 2 south-facing interior wall showing fallen plaster	S	Flash
237	West block, Room 2, partition wall between Room 2 and 1	E	Flash
238	West block, Room 3 stair well and blind window	N	Flash
239-240	West block, staircase below Room 30	W	Flash
241	West block, Room 4, derelict boiler room	W	Flash
242	West block, Room 4, derelict boiler room	NE	Flash

Shot	Description	From	Conditions
243	West block, Room 4, derelict boiler room, entrance	E	Flash
244	Local assistant keepers block, Room 12, hearth and bellows	S	Flash
245	Local assistant keepers block, Room 12, west-facing elevation, plank-built door	W	Flash
246	Local assistant keepers block, Room 12, north-facing elevation and door below stairs	N	Flash
247	Local assistant keepers block, Room 12, east-facing elevation, window detail	E	Flash
248	Local assistant keepers block, cupboard below staircase	N	Flash
249	Local assistant keepers block, Room 12, door frame, entrance to cupboard below the staircase	N	Flash
250	Local assistant keepers block, Room 11, south-facing elevation	S	Flash
251	Local assistant keepers block, Room 11, north-facing elevation	N	Flash
252	Local assistant keepers block, Room 11, byre floor, setts	E	Flash
253	East Block, Room 8, east-facing elevation, door and window	E	Flash
254	East Block, Room 5, boiler room, wall detail	W	Flash
255	East Block, Room 5, boiler room, boiler on south-facing elevation	S	Flash
256-257	Local assistant keepers block, stairs to Rooms 37 and 38	E	Flash
258	Local assistant keepers block, Room 40, bunk beds	E	Flash
259	Local assistant keepers block, Room 40, bunks and fireplace	SE	Flash
260	Local assistant keepers block, Room 40, fireplace	S	Flash
261	Local assistant keepers block, Room 40, west-facing elevation window and sink detail	W	Flash
262	Local assistant keepers block, Room 40, bunk beds	E	Flash
263	Local assistant keepers block, Room 40, door to landing	N	Flash
264-265	Local assistant keepers block, Room 40, north-facing elevation and wardrobe	N	Flash
266	Local assistant keepers block, Room 40, north-east corner and door to landing	SW	Flash
267	Local assistant keepers block, Room 40, bunk beds	NE	Flash
268	Local assistant keepers block, Room 40, window and door to landing	NW	Flash
269-270	Engine House, cream-painted iron tanks for holding compressed air	SE	Flash
271	Engine House, makers-plate on compressed-air tanks *James Dove, Contracting Engineers, Edinburgh 1906*	S	Flash
272	Engine Room, compressed air tank for No 3 engine	SW	Flash
273	Engine Room, west-facing elevation, general shot	W	Flash
274	Engine Room, one of three Kelvin diesel engine	W	Flash
275	Engine Room, shut of valve on the diesel compressor	N	Flash
276	Engine Room, Kelvin diesel No 1, general shot	W	Flash
277	Engine Room, Kelvin diesel No 1, general shot	SW	Flash
278	Engine Room, Kelvin diesel No 2, flywheel detail	W	Flash
279	Engine Room, Kelvin diesel No 2, compressor detail	W	Flash
280	Engine Room, east-facing elevation, wall tiles to dado height	E	Flash
281	Engine Room, general interior view	N	Flash
282	Engine Room, ornate floor tiles, general view	W	Flash
283	Engine Room, main shut-off valve to air tanks	E	Flash
284	Engine Room, aerial air pipes above diesel engines	NW	Flash
285	Engine Room, aerial air pipes above diesel engines	NW	Flash
286	Oil Store, main double-leafed doorway to Engine Room	N	Flash
287	Oil Store, fuel tank on iron stanchion	W	Flash
288	Oil Store, double-leafed doorway to Engine Room	N	Flash
289	Engine Room, workshop, Room 15, workbench on the west-facing elevation	W	Flash
290	Engine Room, workshop, Room 16 stores doorway	E	Flash
291	Engine Room, workshop, Room 16 storage bins on north-facing elevation	N	Flash
292	Engine Room, workshop, Room 16 window frame detail	N	Flash
293	Engine Room, workshop, Room 16 stores boiler on south-facing elevation	S	Flash

Shot	Description	From	Conditions
294	Engine Room, Room 17, electrical switch gear on south-facing elevation	S	Flash
295	Engine Room, Room 17 doorway and gasket board	N	Flash
296	Engine Room, Room 17, window and small table below	E	Flash
297	Engine Room, Room 17, electrical switch gear on south-facing elevation, detailed shot	S	Flash
298	West block, Room 26, bathroom, general shot	SW	Flash
299	West block, Room 26, bathroom, toilet and wash-hand basin	W	Flash
300	West block, Room 26, bathroom window	W	Flash
301	West block, Room 26, bathroom door	NE	Flash
302	West block, Room 28, living room fireplace	N	Flash
303	West block, Room 28, living room cupboard and door to hall	E	Flash
304	West block, Room 29, kitchen and pantry	E	Flash
305	West block, Room 29, kitchen window (dark failed shot)	W	Flash
306	West block, Room 29, kitchen worktops	N	Flash
307	West block, Room 29, kitchen, door to living room	E	Flash
308	West block, Room 30, box-room	NE	Flash
309-310	West block, Room 31, cupboard door	N	Flash
311	West block, Room 32, bedroom, window on north-facing elevation	N	Flash
312	West block, general shot down the hall	N	Flash
313	West block, Room 27, bedroom, south-facing wall	S	Flash
314	West block Room 27, west facing elevation and door detail	W	Flash
315	West block Room 27, north-facing elevation	N	Flash

CONTENTS OF FOLDER 2

Shot	Description	From	Conditions
316	West block Room 27, west-facing elevation	W	Flash
317	East block, RSPB office bathroom	W	Flash
318	East block, RSPB office bathroom, window and w.h.basin	W	Flash
319	East block, RSPB office bathroom toilet and wall	SW	Flash
320	East block, RSPB office bathroom door	E	Flash
321-322	East block, RSPB office hallway	S	Flash
323	East block, RSPB office hallway cupboard	S	Flash
234	East block, RSPB Room 37	W	Flash
235	East block, RSPB Room 37 interior walls and cornice	W	Flash
236	East block, RSPB Room 37 interior walls and doorway	E	Flash
237-238	East block, RSPB Room 37 interior, cornice detail	N	Flash
329	East block, RSPB Room 35 interior detail	W	Flash
330	East block, RSPB Room 35 south-facing elevation, general shot	S	Flash
331	East block, RSPB Room 35 north-facing elevation, general shot of window and walls	NE	Flash
332-334	East block, RSPB Room 36 kitchen window on west-facing elevation	W	Dull
335	East block, RSPB Room 36 north-facing elevation, cupboard	N	Dull
336	East block, RSPB Room 36 south-facing elevation, kitchen worktops	S	Dull
337	East block, RSPB Room 36, door to Room 35	E	Dull
338	East block, RSPB Room 36 small cupboard, former pantry	N	Dull
339-340	Underground water tank, toilet block entrance	W	Dull
341	Underground water tank, toilet block entrance	W	Dull
342-343	Underground water tank, toilet block, distance shot	W	Dull
344	Underground water tank, toilet block distance shot	S	Dull
345	Seascape with cliffs, looking west from toilet block	E	Dull
346	Compass Hill looking from toilet block to the north	S	Dull
347	Concrete building with later addition on east side	S	Fair
348	Concrete building with later addition on east side	SE	Fair

Shot	Description	From	Conditions
349	Concrete building with later addition on east side	N	Fair
350	Compass Hill taken from concrete building, looking north	S	Sunny
351-352	Compass Hill taken from the field to the north of the complex	S	Sunny
353	Seascape with cliffs, to the west of Compass Hill	S	Sunny
354-355	Lighthouse complex looking southwards	N	Sunny
356	Sum burgh Head Hillfort ramparts seen below the drystone boundary wall.	E	Sunny
357	Seascape to west of Compass Hill taken from northern boundary wall	SE	Sunny
358-359	Lighthouse seen from the northern boundary	N	Sunny
360	Interior of a ruined building at the north end of the site	W	Sunny
361	Distance shot of ruined building at the north end of the site	N	Sunny
362	WW2 concrete building and modern annex, general shot	SE	Sunny
363	Lighthouse interior, looking up the stair	N/a	Flash
364	Lighthouse interior, staircase balustrade and hand rail	N/a	Flash
365	Lighthouse interior, staircase to lamp room	N/a	Flash
366	Lighthouse interior, ocular window on main wall	N/a	Flash
367	Lighthouse interior, drive motor for lamp reflectors	N/a	Flash
368-369	Lighthouse interior, brass plate on motor casing	N/a	Flash
370	Lighthouse interior, gimbol at the base of the reflector	N/a	Flash
371	Lighthouse interior, gambol and lamp reflectors	N/a	Flash
372	Lighthouse interior, lamp reflectors, close up	N/a	Flash
373-374	Lighthouse interior, lamp reflector and 250w bulb	N/a	Flash
375	Lighthouse interior, glass and steel dome	N/a	Flash
376-378	Lighthouse interior, reflector, assorted angles	N/a	Flash
379	Lighthouse interior, wood paneling on lamp room walls	N/a	Flash
380-382	Lighthouse interior, balustrades on stairs	N/a	Flash
383-384	Lighthouse interior, spiral staircase from ground floor	N/a	Flash
385-386	Auxiliary engine room interior of NLB	W	Flash
387-388	Guest house, Room 22, bedroom, general shot	SW	Flash
389	Guest house, Room 22, bedroom door	E	Flash
390	Guest house, Room 24 hallway, general shot	E	Flash
391	Guest house, Room 25, bathroom looking down the hall	W	Flash
392	Guest house, Room 20, bedroom	W	Flash
393	Guest house, Room 20, bedroom	N	Flash
394	Guest house, Room 20, bedroom	S	Flash
395	Guest house, Room 18, boxroom	E	Flash

CONTENTS OF FOLDER 3

Shot	Description	From	Conditions
396	Guest house, Room 18, boxroom	W	Flash
397	Guest house, Room 18, boxroom	W	Flash
398	Guest house, Room 21, living room	W	Flash
399-400	Guest house, Room 21, living room	SW	Flash
401	Guest house, Room 19, kitchen	W	Flash
402-403	Guest house, Room 19, kitchen	E	Flash
404	Guest house, back porch off the kitchen	E	Flash
405	Guest House, front porch floor tiles (same as Engine Room)	E	Flash
406-407	Radar 1 looking down from the foghorn tower	N	Dull
408	Lighthouse looking down from foghorn tower	N	Dull
409	Lighthouse looking down from foghorn tower	NE	Dull
410	East block looking down from foghorn tower	E	Dull
411	East block looking down from foghorn tower, detail	E	Dull
412	Cliffs looking south from foghorn tower	N	Dull
413	Radar 1, looking south from foghorn tower	N	Dull

Shot	Description	From	Conditions
414	Looking northwards from the foghorn tower	S	Dull
415-417	General shot of Compass Hill	S	Dull
418-419	Rampart area and fenced-off area	W	Dull
420	Looking upslope from rampart area towards the lighthouse	N	Dull
421-422	WW2 concrete footings in rampart area	E	Dull
423	WW2 brick-built water-tank by roadside leading to lighthouse	N	Dull
424	WW2 brick-built water-tank by roadside leading to lighthouse (blurred shot)	N	Dull
424-425	WW2 brick-built water-tank by roadside leading to lighthouse	N	Dull
426	Looking north-east over rampart area	SW	Dull
427-428	Looking north-east along the boundary wall that crosses the rampart	SW	Dull
429-430	Stone gate piers at the entrance to the complex	S	Dull
431-433	Sundial plinth, general shots	E	Dull
434	Looking up towards foghorn tower from trackway	NW	Dull
435	Guest house, west-facing elevation, long and short dressings	NW	Dull
436-440	Distance shots looking southwards on the lighthouse, from track leasing to the site	N	Dull

CONTENTS OF FOLDER 4

Shot	Description	From	Conditions
441	East block, Room 5, boiler room	W	Flash
442	East block, Room 5 north interior wall (part of)	NW	Flash
443	East block, Room 5, plank-built door	E	Flash
444	East block Room 8, RSPB stores	W	Flash
445	Disused garages, north-facing elevation	N	Flash
446-447	Local assistant keepers block, Room 9, fuel store wall	N	Flash
448	Local assistant keepers block, Room 9, east-facing wall	E	Flash
449-450	Local assistant keepers block, Room 40, bunk beds	E	Flash
451	Local assistant keepers block, Room 40, pot cupboard	SE	Flash
452-453	Local assistant keepers block, Room 40, fireplace	S	Flash
454-455	Local assistant keepers block, Room 40, close up on pots	SE	Flash
456-457	Local assistant keepers block, Room 40, fireplace	S	Flash
458	Local assistant keepers block, Room 40, window on east wall	W	Flash
459	Local assistant keepers block, Room 40, mat in front of sink	W	Flash
460	Local assistant keepers block, Room 40, door to landing	N	Flash
461	Local assistant keepers block, Room 40, formica table	N	Flash
462	Local assistant keepers block, Room 40, lamp shade and bedding	E	Flash
463	Engine Room, Kelvin diesel engine name plate	W	Flash
464	Engine Room, Air compressor name plate '*Alley & Maclellan Compressor*'	W	Flash
465-467	Engine room, name plate on wall mounted battery charger	N	Flash
468-469	Engine Room, patent badge on wall mounted battery charger	N	Flash
470	Engine Room, makers badge on Lister battery charger	N	Flash
471-472	Engine Room, Room 17, east-facing sash-and-case window	E	Flash
473	Engine Room, Room 17, electrical switch gear on south-facing elevation	S	Flash
474-475	Engine Room, Room 17, pine cupboard and storage bins	W	Flash
475	Engine Room, Room 13, Kelvin diesel engines Nos. 1-3	E	Flash
476	Engine Room, Room 13, middle engine, No.2	E	Flash
478	Engine Room, Room 13, middle engine compressed air tank	S	Flash
479	Engine Room, Room 13, middle engine compressed air tank, makers name-plate	S	Flash
480	Engine Room, Room 13, No 3 engine compressed air tank with shut-off valve	SE	Flash
481-482	Engine Room, Room 13, Engines Nos. 1-3	N	Flash
483-484	Engine Room, Room 13, ornate floor tiles	W	Flash
485	Engine Room, Room 13, compressor detail	N	Flash

Shot	Description	From	Conditions
486	Engine Room, Room 13, wall mounted battery charger on west wall.	E	Flash
487	Engine Room, Room 13, charger and RSPB server	N	Flash
488-489	Engine Room, Room 13, engine details and compressor	NE	Flash

35mm SLIDE FILM

Shot	Description	From	Conditions
1-2	Looking south on Radar Buildings 1 and 2	N	Fair
3	West accommodation block, east-facing elevation	W	Fair
4	Lighthouse, east-facing elevation, general shot	E	Fair
5	East accommodation block, east-facing elevation	E	Fair
6	Radar building 1, north-facing gable	N	Fair
7	Radar building 1, west-facing elevation	W	Fair
8	Radar 1 building, south-facing elevation	S	Fair
9	Radar building1, blast wall	S	Fair
10	West accommodation block, west-facing elevation	W	Fair
11-12	Stores and assistants block, east-facing elevation	E	Fair
13-14	East accommodation block, west-facing elevation	W	Fair
15-16	Engine room, north-facing gable	N	Fair
17-18	Engine room, oblique view	SE	Fair
19-20	West accommodation block, oblique view	NW	Fair
21-22	SAT Guest accommodation and engine room, oblique	SE	Fair
23-24	SAT Guest accommodation and engine room, oblique	NE	Fair
25-26	Stores and accommodation block, oblique	NW	Fair
27-28	Stores and accommodation block, general shot	W	Fair
29-30	Radar building 2, south-facing gable	S	Fair
31-32	Radar 2 building, east-facing elevation, oblique	NE	Fair
33	Lighthouse, general character shot	SE	Fair

APPENDIX 3: TABLE OF NORTHERN LIGHTHOUSE BOARD PLANS AND DRAWINGS HOUSED IN THE NMRS, EDINBURGH

NMRS Archive Number	Caption	Date of Original
DC 9135	Plan showing lighthouse site.	1876
DC 9136	Sections showing lighthouse position	1819
DC 9137	Plan	1876
DC 9138	Roof Plan.	1876
DC 9139	Section through cliffs ad lighthouse	1819
DC 9140	Drawing of offices	1876
DC 9141	Drawing of store house.	1876
DC 9142	Elevation of lighthouse.	1819
DC 9143	Section of lighthouse.	1819
DC 9144	Elevation of lighthouse.	1819
DC 9145	Detail of first class lantern.	1876
DC 9146	Plan of parapet and elevation of lantern.	1876
DC 9147	Detail of dome and lantern.	1876
DC 9148	Plan of engine room.	1904
DC 9149	Plan of fog signal.	1904
DC 9150	Elevation of roof plan of engine room.	1904
DC 9151	Detail of water tank and horn house.	1904
DC 9152	Plan and section of lighthouse table.	1869

APPENDIX 4: NLB SECRETARY'S DEPARTMENT, CORRESPONDENCE AND REPORTS 1901-1930 NLS

Manuscript ID (NAS number)	Manuscript Name	Date	Date of event	Event	Description
NLC/1/1	CNL Records*	1901 - 1902			No mention
NLC/1/8	CNL Records	1903-1906	1903	Letter	Permission granted to the lighthouse families to attend church - 12 trips per year
			1904	Inspection	Recommendation for the lighthouse to be whitewashed
			1904	letter	Secretary for Lighthouse (C Dick Peddie) agreed lighthouse should be whitewashed – "it might be left till the fog signal works now about to begin are completed"
			14th Dec 1904	letter to building contractors for Sum burgh Head Fog Signal Builders	Invitation for tenders for the erection of a dwelling house, engine room etc (etc in letter - not CJ abbreviation). Copies of the specifications and measurements may be obtained from Mr D A Stevenson, Engineer to the Commissioners
			17th Jan 1905	letter/notice on acceptance of tenders. By Peddie.	Mr Munroe of Wick tender accepted cost of £2,801 15 8.
			26th Jan 1905	letter accepting tender	
			2nd Mar19 05		Munroe wants to start work immediately. A Mr Macbeth to inspect the works.
			31/05/1905	report on tenders for fog signal machinery	Mr J Dove and Coy of Edinburgh gave lowest tender.
			09/06/1905	letter from lighthouse board	Acceptance of Dove tender
			15/11/1905	report on tenders for oil cisterns	Oil tanks - Mr George Callam and Coy provide the lowest bid
			11/11/1905	report on tenders for electric bells	W Brydon and Son tender accepted. Noted that price increase due to new method of making them.

Manuscript ID (NAS number)	Manuscript Name	Date	Date of event	Event	Description
			22/11/1905	letter from lighthouse board	Both tenders accepted
NLC/1/35	CNL Records	1909 - 1912	30/06/1909	report by committee on delay of completing building contract	Building (Engine Room) should have been built by April 1906. buildings were not completed until 30th September 1907
			30/06/1909	statement of accounts for building work	Building works entailed the building of the fog signal and the general overhaul of station
					Much correspondence on extra cost of the renovations - who is to blame etc. Mr Monroe states that the inspector prolonged work - another letter noted that it was in the inspector's interest to prolong work as they are on a fixed term contract.
			15/12/1911	letter	Request from county of Zetland to fix the light from a fixed to a flashing one, as mariners take it to be the light of a vessel.
xx	xx		28th March 1912	letter from Stevenson	Letter states that Sumburgh Head is an important lighthouse and the light should become a flashing one
NLC/1/22	CNL Records	1906 - 1909	12-Feb-07	notice of fog signal	Fog signal siren will start on 8th April 1907
xx	xx	xx	20th March 1907		request for funding for third keeper and one principal and assistant keepers
xx	xx	xx	May-1907	Record	John Howden and Co Ltd Ironmongers, 4 North Saint Andrew Street, Edinburgh. Sent up gun metal cocks (for pipes?). Other mention of iron mongering also.
NLC/1/66	CNL Records	1915 - 1918	11-Nov-1916	xx	Engineers report about the state to the engines - time of reaction etc. No specific type of engine is mentioned.
xx	xx	xx	no date	from lighthouse keeper	Telegram saying urgent need for circulating water pump
NLC/1/51	CNL Records	1912-1915	15/10/1913	TENDER	Tender for new floor in the lighthouse, "which should be strong enough to carry the weight of the new machinery" Revolving Carriage, Mercury float. Also lantern is old one at the station, and no safety rail. New rail and path for cleaning the lantern panes
xx	xx	xx	6th September 1913	acceptance of tender	Mr Dove (same as above) accepted for works (1) Lightroom machines, revolving carriage, Mercury Float, New floor. (2) Cleaning path and rail

Manuscript ID (NAS number)	Manuscript Name	Date	Date of event	Event	Description
xx	xx	xx	11-Mar 1913		order for triple flashing light similar to Maughold Head but with 3 mirror prisms less and 2 additional reflector prisms in centre face.
xx	xx	xx	31st March 1914	tender accepted	From Messrs Chance Brothers Limited for supply of the optical apparatus in connection with the improvement of the light
xx	xx	xx	30-Mar-1914	notice	Over the course of the summer the light will be altered from a fixed light to a flashing one
xx	xx	xx	Xx	xx	Light in tower changed by September
xx	xx	xx	6th April 1914	letter	tTnder accepted for Messrs Chance brothers to supply two incandescent burners
NLC/1/85	CNL Records	1918-1921	13th June 1918	Letter	Naval lookout at Sumburgh Head. Request to get a telephone for the naval lookout. Telephone in keeper's house but request for a separate one. Also request to move a small look-out hut to a position close to the light house keepers. Motion passed in subsequent letters.
xx	xx	xx	8th Feb 1919		Look out hut now removed, telephone replaced into lighthouse.
xx	xx	xx	Xx	letter	Dwelling houses roofs repaired on 1921 (Feb) and other repairs.
NLC/1/118	CNL Records	xx	Xx		No detail
NLC/1/105	CNL Records	22 April 121-24	11-May 1921	Minutes	Mr P Milne appointed inspector of works at Sumburgh Head
xx	xx	xx	13-Jul 1921	xx	Work completed on the roofs at Sumburgh Head
NLC/1/ 142	xx	1930 - 33		xx	No detail
NLC/1/ 129	xx	1927 - 1930		xx	No detail

* CNL Records = Records of the Commissioners of Northern Lighthouses

APPENDIX 5: HISTORIC MAP REGRESSION ANALYSIS

Chris Dyer, Shetland Amenity Trust

Timothy Pont, Henry Hondius and Johann Blaeu (1592-1654)

The 'Ancient Fort of Swenbrugh', on Sumburgh Head, at the southernmost tip of mainland Shetland, was first published by Johann Blaeu in the fifth volume of his *Atlas Novus*, in Amsterdam in 1654. The fort is implied to be located on an oval promontory area, linked to the mainland by a narrow causeway. The place names of 'Swenburgh Head' and 'Swenburgh' are illustrated independently whilst the phrase 'A violent Tyd or Roost' indicates the area to the south of Sumburgh Head, marked on the contemporary Ordnance Survey as Sumburgh Roost.

An interesting differentiation is made in the text annotation between the ancient 'fort' of Sumburgh and the ancient 'brugh' of Mousa, illustrated a short distance to the north. The Sumburgh Head feature has largely consistently been interpreted as a fort site, perhaps similar to the severely eroded site on the Scatness peninsula and the Ness of Burgi. Nevertheless, Henry Dryden's late nineteenth century reference to a broch on the site of the present lighthouse may be used as the site that inspired 'Sumburgh'. However, a fort may equally have influenced the place name, derived from the Norse word 'borg', meaning 'strong place' or 'fortification'.

Blaeu's *Atlas Novus* represented the first comprehensive atlas of Scotland and comprised 49 engraved maps together with 154 pages of regional descriptions written in Latin. Its publication was the culmination of over 70 years of cartographic and editorial activity by a dispersed network of individuals in Scotland and the Low Countries.

Blaeu's atlas contains eight descriptions of Orkney and Shetland in Latin. Six of these texts, largely translated in the seventeenth century, have been identified to include many historical inaccuracies. Contrasting this the 'New Chorographic Description of the Orkneys' and the 'New Description of Schetland' are of a much superior quality and were translated by Ian Cunningham in 2004 to mark the 350th anniversary of Blaeu's publication.

When Blaeu published his *Atlas Novus* in 1654, he did not attribute authors or dates to his map of Orkney and Shetland or to the accompanying Latin descriptions. It was not until 1967 that Moir and Skelton established that the map was attributable to the famous cartographer Timothy Pont and probably dated from 1592. Despite the obvious distortions of Pont's map, it represented a hallmark in local cartography. With over 400 place names in Orkney and over 300 in Shetland, it remains unequalled in this respect until the first Ordnance Survey maps were published nearly thee centuries later.

In June 1592, as the local deputy to the '*master of visiting the mineralles of his hienes Realme*', Pont was authorised to '*visit the mynes and Mineralles or appearing of finding out of Mineralles within the bounds of the Countries of Orkney and Shetland*'. He probably conducted his visit several months later when there is a presumption that he accompanied his father, Robert Pont, a leading reformation cleric who was Minister of St. Cuthbert's in Edinburgh from 1574 to 1602. During his visit, Timothy Pont, by implication, gathered material for his maps of Orkney and Shetland. Certainly Robert Gordon of Straloch (1580-1661), in notes written some years later, 'attributed the printed map of the Orkneys and Shetlands without hesitation to Mr. Timothie'.

Due to problems with publishers, it was not until 1611 or 1612 that Pont managed to get the first of his 70 or more maps of Scotland published, but within two years both Pont and his engraver had died. Due to subsequent difficulties in obtaining maps of some of the other regions of Scotland and delays caused by wars and copyright problems, it was in 1654 that Johann Blaeu was at last able to publish his volume containing the first Atlas of Scotland and containing the reference to the 'Ancient Fort of Swenbrugh'.

However, 18 years earlier in 1636, Henry Hondius had published a map of Orkney and Shetland which likewise contained cartographic reference to the 'Ancient Fort of Swenbrugh'. The similarities between the publications of Hondius and Blaeu are significant, and indeed their respective Amsterdam publishing houses were rivals. There are many small differences between the maps although the distinctive distortions of the coastal outlines and nearly all of the place names are close to identical. Despite the difference in published date, it is interpreted that Hondius engraved his map from a rare earlier, unpublished copy of Blaeu's engraving.

The ‘Ancient Fort of Swenbrugh’ does not feature in the Latin translation of the ‘New Description of Schetland’ that accompanies Blaeu’s Atlas Novus. This was compiled in around 1646 by Walter Stewart, the Commissioner for the Presbytery of Orkney and Minister of South Ronaldsay. The 1750 words describe the activities and character of Shetlanders in considerable detail, including insights into pets, dress, trades, customs, manners and health. The reader is reminded that ‘Scallowaybanks’ was the largest settlement, as opposed the Lerwick. The leading families of the day are listed, as well as their faiths.

George Low – 1774 (published 1879)

In the late eighteenth century, George Low conducted and wrote of his ‘*Tour through the Islands of Orkney and Schetland*’, noting the fortified headland at Sumburgh that Blaeu had illustrated and Pont had surveyed over a century before. Low was born in 1747 in Edzell, Forfarshire and attended Marischal College, Aberdeen, an later the College of St. Salvator in St. Andrews where he was a student of philosophy and divinity. Like many clergymen and tutors of his time, Low had scientific interests reaching far beyond his studies of philosophy and divinity.

It is likely that the idea of a ‘grand tour’ originated through Low’s correspondence with Thomas Pennant, the author of ‘A tour of Scotland’ in 1769. It is implied that there was a suggestion that Low should undertake a tour of the Shetland Islands in particular which had not been visited by Pennant. Indeed, Pennant appears to have part-sponsored Low’s passage.

Low accepted the offer and left Stomness on the 4th May 1774. After visiting many of the Orkney Islands he left Kirkwall and sailed for Lerwick, where he arrived on 19th June. From there, he commenced his ‘Grand Tour of Schetland’, listing day by day his passage through the islands, excluding Fair Isle due to weather conditions. After two and a half months in Shetland, Low arrived back in Orkney in early September 1774.

Low was interested in all aspects of daily life and reported on a wide variety of subjects; the health status of the population of various islands and villages, the professions on which they made their living, their clothing standards and their skills as craftsmen. He expressed keen naturalist and geological interest, studying birds and reporting on bats, as well as conducting mineralogical studies and drawings. As an antiquarian, he observed the ancient monuments and buildings, such as churches, of architectural merit.

Low’s illness in subsequent years delayed immediate publication of his tour. Meanwhile, his former sponsors quoted a lot of his observations when publishing works on the geography of the British Isles and Scotland specifically. It took more than 100 years before Low’s full account was finally published in 1879, entitled ‘A *Tour through the Islands of Orkney and Schetland – Containing hints relative to their ancient, modern and natural history, collected in 1774*’.

During Low’s passage in Dunrossness, he journeyed to Sumburgh Head and stated that the site had formerly been fortified. ‘Here the neck of land is cut off by a ditch and strong wall, which must in old times have formed a considerable fortification. It encloses a plain and hill (the Head); at the entrance, still observable the foundation of a large house, which probably served as a guardroom, along the wall, and at a distance, the marks of numerous small buildings, exactly like those described in Unst’. By the buildings in Unst, Low alludes to a set of oblong foundations on the high headland of Blue Mull, a site which falls into the pattern of early monastic settlements typified by sites such as Birrier of West Sandwick in Yell and Kame of Isbister in Northmavine. It has therefore been interpreted that at Sumburgh Head, Low saw something which represented a promontory-fort occupation.

The oblong buildings are interpreted to have likely been situated on the site of the lighthouse and its associated buildings, although some defences are recorded as having survived on the approach to the headland until 1968, when a new road was made. Shortly before this, they were described by the Ordnance Survey as ‘traces of two stony ramparts, with external ditches, on the narrowest part of the neck’.

Sir Henry Dryden (1873)

In May 1872, Sir Henry Dryden compiled for publication his ‘Notice of the Brochs or “Pictish Towers” of Mousa, Clickemin, &c., in Shetland, illustrative of part of the series of Plans and Sections deposited in the Library of the Society’. The document was published in the *Archaeology Scotland* journal in 1873.

Sir Henry Dryden of Canons Ashby, Northamptonshire was an archaeologist, antiquary and draughtsman. His collection, presently held in Northampton Central Library, includes thousands of Dryden's drawings, plans and notes that were presented to the town of Northampton after his death in 1899 by his only daughter, Alice Dryden. Dryden's work includes studies of buildings and historic sites and monuments throughout Britain and Europe, occasionally providing the only record of structures that have not survived.

With regard to Sumburgh Head, Dryden comments that 'a broch stood where the present lighthouse is'. It is a short reference, set at the end of his paper in which he comments that he visited, made plans and views of a number of brochs throughout the Shetland mainland and North Isles. The greater part of the article focuses on the brochs of *Clickemin* (Dryden's spelling) and Mousa.

Dryden cites no evidence for the broch he records once stood at Sumburgh Head before the lighthouse was erected in 1820. Nonetheless, his observation regarding their locations within the Shetland landscape was accurate. He comments that 'most of them are within a few yards of the shore, often on little promontories, but some are on little holms in the sea, or in lakes near the shore'. The promontory-like nature of Sumburgh Head certainly lends itself to this description of where brochs have elsewhere been recorded.

It is perhaps most likely, given the date of Dryden's account several decades after the construction of the Sumburgh Head lighthouse, that the author was basing an assumption on local oral history and place name evidence. As discussed above, the latter is certainly of significance. A variation of the place name is recorded by the Royal Commission on the Ancient and Historic Monuments of Scotland in 1946. Here, the oldest extant spelling is noted as 'Soundburche' and during the early twentieth century when the Commission was carrying out its survey work, fishermen referred to the stretch of sea between Fitful and Sumburgh Heads as 'the Soond'.

Royal Commission on the Ancient and Historic Monuments of Scotland (1946)

The Royal Commission on the Ancient and Historic Monuments of Scotland (RCAHMS) was established by Royal Warrant in 1908 to make a list or inventory of the surviving heritage from the earliest times up to the year 1707. They were created at a time when there was widespread concern at the destruction of historical monuments through quarrying and construction. There was also a growing appreciation of the need to assess surviving sites and structures, as the means to decide which should be preserved.

RCAHMS published its first report as an Inventory for Berwickshire in 1909. The twelfth report in 1946 contained the Inventory of the Ancient Monuments of Orkney and Shetland, Volume I, Report and Introduction, Volume II, Inventory of Orkney, Volume III, Inventory of Shetland (HMSO, 1946). The Commissioners had largely reported for this report during the mid to late 1930s although the Second World War delayed final publication.

RCAHMS records a broch at Sumburgh Head within the Dunrossness chapter of Volume III (Monument Number. 1189, Page 45). The site had been visited on 3rd September 1930. Sir Henry Dryden's reporting of a broch site within his article of 1873 are noted first (see above). The RCAHMS reference also goes on to include a reference pertaining to Sumburgh Head made within Edward Mills Nelson's 1909 publication entitled 'The Cult of the Circle Builders'. Nelson identifies that the stones of the fort or broch structure were used to 'make the dykes around the lighthouse buildings, but its site is indicated by a grass mound, a few yards north-east of the lighthouse tower'.

It is difficult to believe Nelson's statement regarding the dykes without reservation, for the stones of which they are composed have all the appearance of having been quarried. However, RCAHMS does state that between 80 and 90 yards within the gate which gives access to the lighthouse grounds, there is 'something which might be called a mound, and on the face of this there are what my possibly be traces of artificial construction. The RCAHMS reference concludes by briefly noting the appearance of 'The Ancient Fort of Swenbrugh' at Sumburgh Head on Blaeu's atlas of 1654.

Undated post-Second World War Ordnance Survey Map (c. 1950)

Appendix 1 of the Nicolas Groves Raines Architects 'Proposals for the conservation and adaptive re-use of Sumburgh Head lighthouse, Shetland' (November 2004 Report for Shetland Amenity Trust) features a copy of an

undated post-Second World War Ordnance Survey map of the lighthouse environs. Two horizontal, east-west dashed lines are visible either side of the 'Z bends', immediately north of the lighthouse.

These are taken to represent the truncated lines of the earthwork ramparts mentioned in the 1968 Ordnance Survey reference. This alludes to 'two stony ramparts are noted with possible external ditches', recorded where the 'neck of land joining the mainland to Sumburgh Head narrows to approximately 50m'. The ramparts are still visible today although have been truncated through the hut bases for the two rectangular side-by-side wartime buildings, the foundations of which remain visible.

A matter of concern was formerly the proposed car park design options A-C (NGR As Proposed Drawings – Appendix 7 – November 2004 Report) which proposed terracing and groundworks immediately adjacent to the recorded position of the ramparts. This would have required predetermination archaeological excavation and likely preservation by record given the impracticalities of preservation *in situ*. However, subsequently, these car parking plans have been superseded with the desire to extend the existing car park to the north. A degree of road realignment/widening may be required but this is not interpreted to be as archaeologically detrimental as the original proposals.

J. Stewart (1956)

The publication entitled Discovery and Excavation in Scotland is published by the former Council for Scottish Archaeology – now Archaeology Scotland. It is an established journal which records all archaeological fieldwork undertaken and discoveries made in Scotland during the preceding year. It is a critical resource for archaeological research and is unique in Europe. In the mid-twentieth century, the journal was published by the Scottish Regional Group within the Council for British Archaeology.

The 1956 publication of Discovery and Excavation – Scotland incorporated a reference from John Stewart pertaining to the fort structures at Sumburgh Head. Stewart was born at Brough in Whalsay in 1903 and spent most of his adult life in Aberdeen where he was a teacher and deputy headmaster at Skene Square school. A self-taught enthusiast for archaeology, he produced An Outline of Shetland Archaeology in 1956. Stewart excavated several Neolithic sites in his native island, notably at Pettigarth's Field in 1938 and the Benie Hoose before the later fieldwork of Charles Calder in 1954-5.

Stewarts's reference to the Sumburgh Head structures alludes largely to George Low's 1774 '*Tour through the Islands of Orkney and Schetland*', published in 1879 (see above). Stewart therefore notes the fortified headland which encloses a plain and hill. The foundations of a large house, reported by Low as probably serving as the guardroom, is recorded as well as the marks of numerous small buildings.

Ordnance Survey (1968)

A reference to the fort at Sumburgh Head is made during a visit by the Ordnance Survey on 20th May 1968. The new Ordnance Survey house style of that year used the now famous OS logo for the first time. Each sheet had a one-colour cover and the cover image map was surrounded by a white border. In 1968, Ordnance Survey produced an A5 booklet, *Place names on maps of Scotland and Wales*. The publication underwent several reprints, with the final version printed in 1995.

The 1968 Ordnance Survey quotation alludes to Grid Reference: HU 4077 0803, where the neck of land joining the mainland to Sumburgh Head narrows to approximately 50m. Here, two stony ramparts are noted with possible external ditches. The ramparts are reduced to earthworks 0.8m and 0.5m high respectively and the ditches to mere terraces. A short stretch of walling is recorded as visible in the inner rampart. Significantly, no evidence was recorded of a broch on the headland. It has been interpreted that some of the defences originally recorded by Low survived on the approach to the headland until 1968, when a new road was made. The implication is therefore that the buildings of antiquity, first published in the Blaeu Atlas in 1654, were situated on the site of the present lighthouse and its associated buildings.

R. G. Lamb (1973)

In 1973, Raymond Lamb, formerly the Orkney Archaeologist, published an article in Scottish Archaeological Forum Volume 5 entitled 'Coastal settlements of the north'. Within this article, he briefly alludes to the fort at Sumburgh Head by referencing George Low. During his tour of 1774, Low had described a high cliff-headland at Blue Mull, in Unst, with seven oblong buildings side-to-side in a row. Lamb comments that if 'we are to believe Low's account – he is a very reliable witness –buildings exactly like those on Blue Mull existed on Sumburgh Head, the bold cliff-promontory which forms the southern extremity of Shetland'.

R. G. Lamb (1980)

Lamb further referred to the fort at Sumburgh Head within the British Archaeological Reports (British Series) 79, published in 1980. A landmark work, this book was entitled 'Iron Age Promontory Forts in the Northern Isles'. The study looked at brochs and cliff castles, Shetland blockhouses and their relations, multivallate forts and the western seaways and the meaning of forts and brochs.

Lamb's study was based on field surveys made between 1970 and 1973 for his PhD thesis at Birmingham University. His reference to Sumburgh Head may be seen in the close geographical context of more detailed descriptions of the Ness of Burgi and the North Fort, Scatness, both situated on the peninsula immediately to the west of Sumburgh Head across West Voe of Sumburgh. These two sites feature within the chapter on 'Shetland blockhouses and their relations', whilst the annotated Sumburgh Head reference comes in the gazetteer. Lamb draw's on George Low's observations during his 1774 tour as well as the 1968 Ordnance Survey description of 'traces of two stony ramparts, with external ditches, on the narrowest part of the neck'.

E.W. MacKie (2002)

The most recent reference to the features at Sumburgh Head features in Euan W. MacKie's British Archaeological Reports – British Series – 342, published in 2002, entitled '*The Roundhouses, Brochs and Wheelhouses of Atlantic Scotland c. 700 BC – AD 500*'. This volume addresses architecture and material culture within Orkney and Shetland.

Dr. Euan MacKie is an Honorary Research Fellow at the University of Glasgow – Hunterian Museum and Art Gallery. A former curator of Prehistoric Archaeology and Anthropology, his research interests have focused upon the prehistory of northern Britain, specifically the stone circles and standing stones of the later Neolithic period and the Iron Age brochs of Atlantic Scotland.

MacKie's '*The Roundhouses, Brochs and Wheelhouses of Atlantic Scotland c. 700 BC – AD 500*' addresses a history of research into brochs with chapters on the brochs of Shetland and Orkney and specific essays on Jarlshof, Mousa and Clickhimin. The reference to Sumburgh Head is contained within the social background of the brochs of Shetland. MacKie records 'a possible broch in Dunrossness, on the site of the present lighthouse, claimed as an antiquity by Dryden on unknown evidence, perhaps the name of the headland'. The 1968 Ordnance Survey reference to ramparts crossing the neck of the headland is also reported.

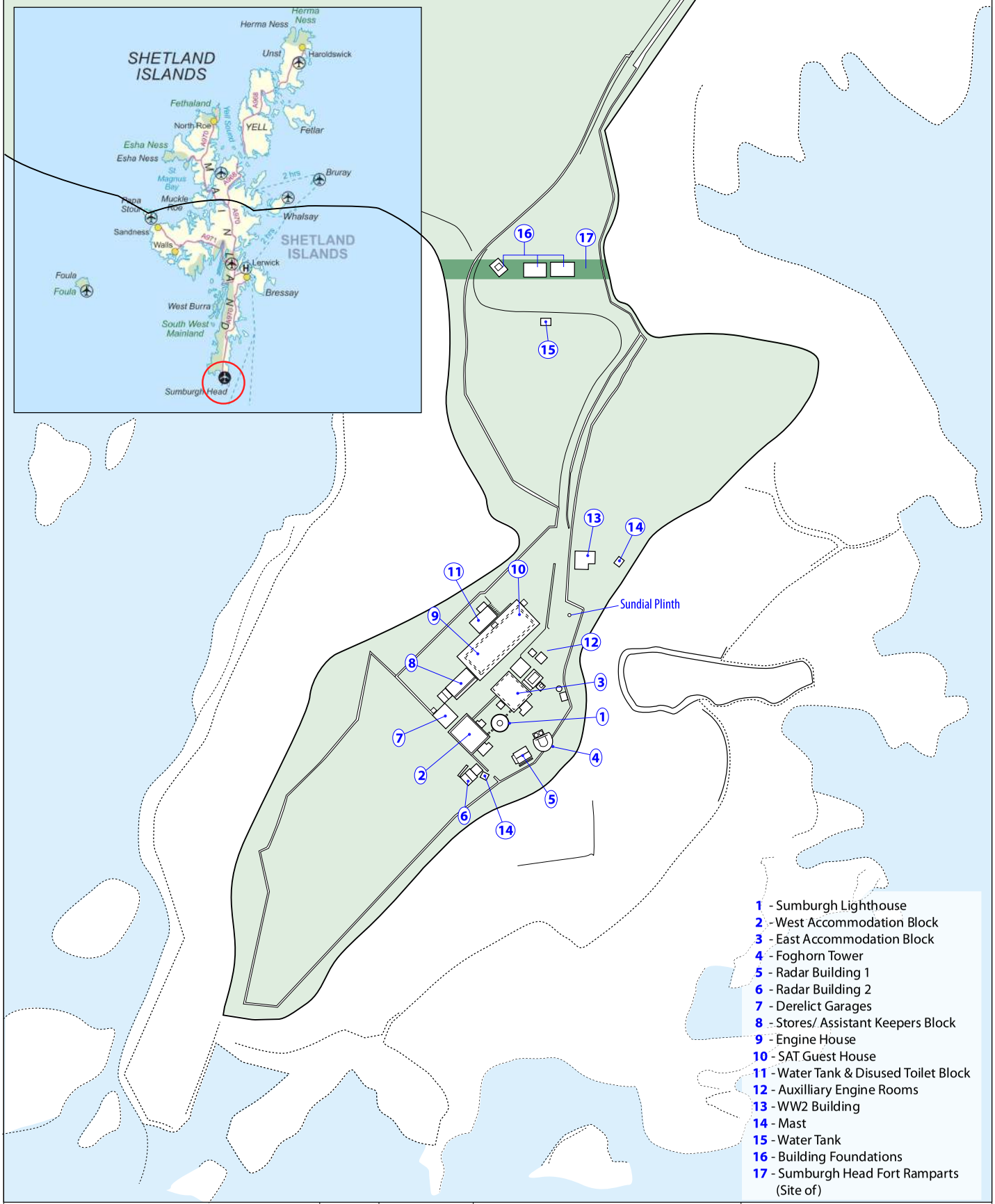

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Fig. No: 1 | Revision: A | Client: Groves Raines Architects on behalf of the Shetland Amenity Trust

Title: Location Map

Project: Sumburgh Head Lighthouse, Desk-based assessment and Level 1 Standing Building Survey

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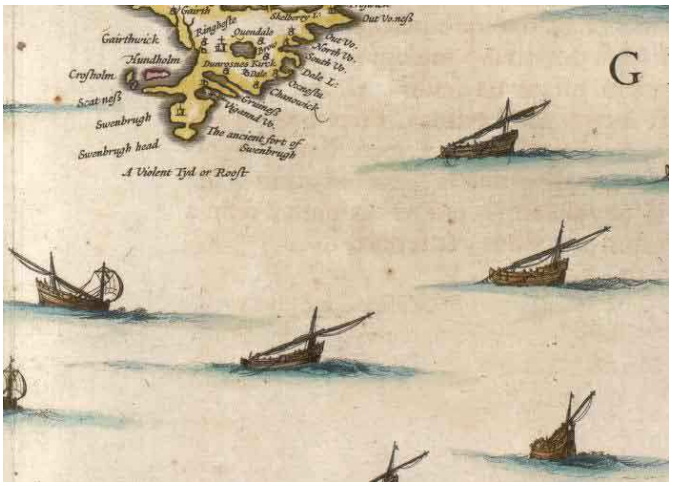

Fig 2a - Blau's 1654 Map

Fig 2b - Moll's 1732 Map

Fig 2c - Ordnance Survey 1st Edition 1877

Fig 2d - Ordnance Survey 2nd Edition 1895

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Scale: 0 200 m

Fig. No: 2 | Revision: A | Client: Groves Raines Architects on behalf of the Shetland Amenity Trust

Title: Historical Map Regression

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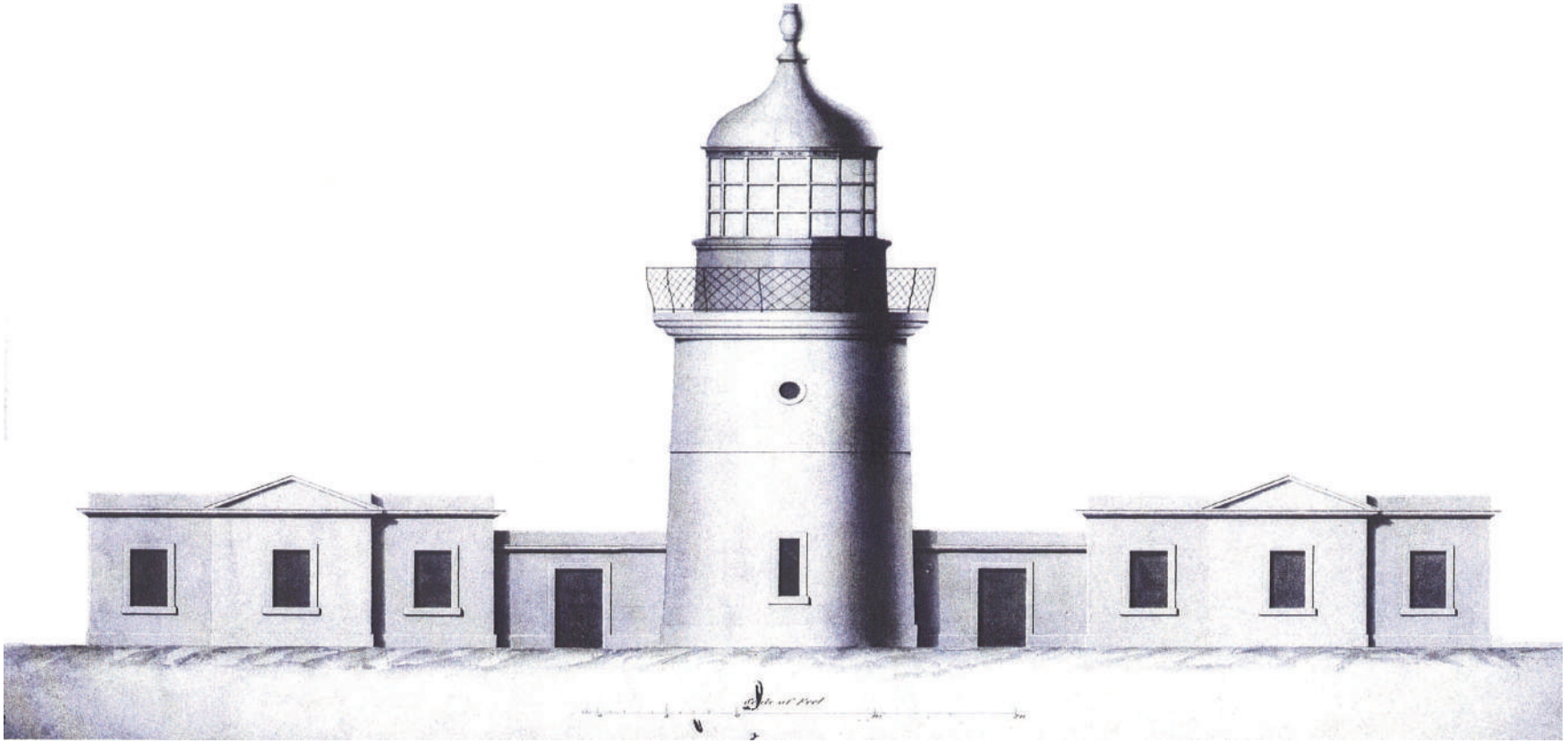

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Fig. No: 3

Revision: A

Title: South Elevation, Dwelling Block, Stevenson 1819

Project: Sumburgh Head Lighthouse, Desk-based assessment and Level 1 Standing Building Survey

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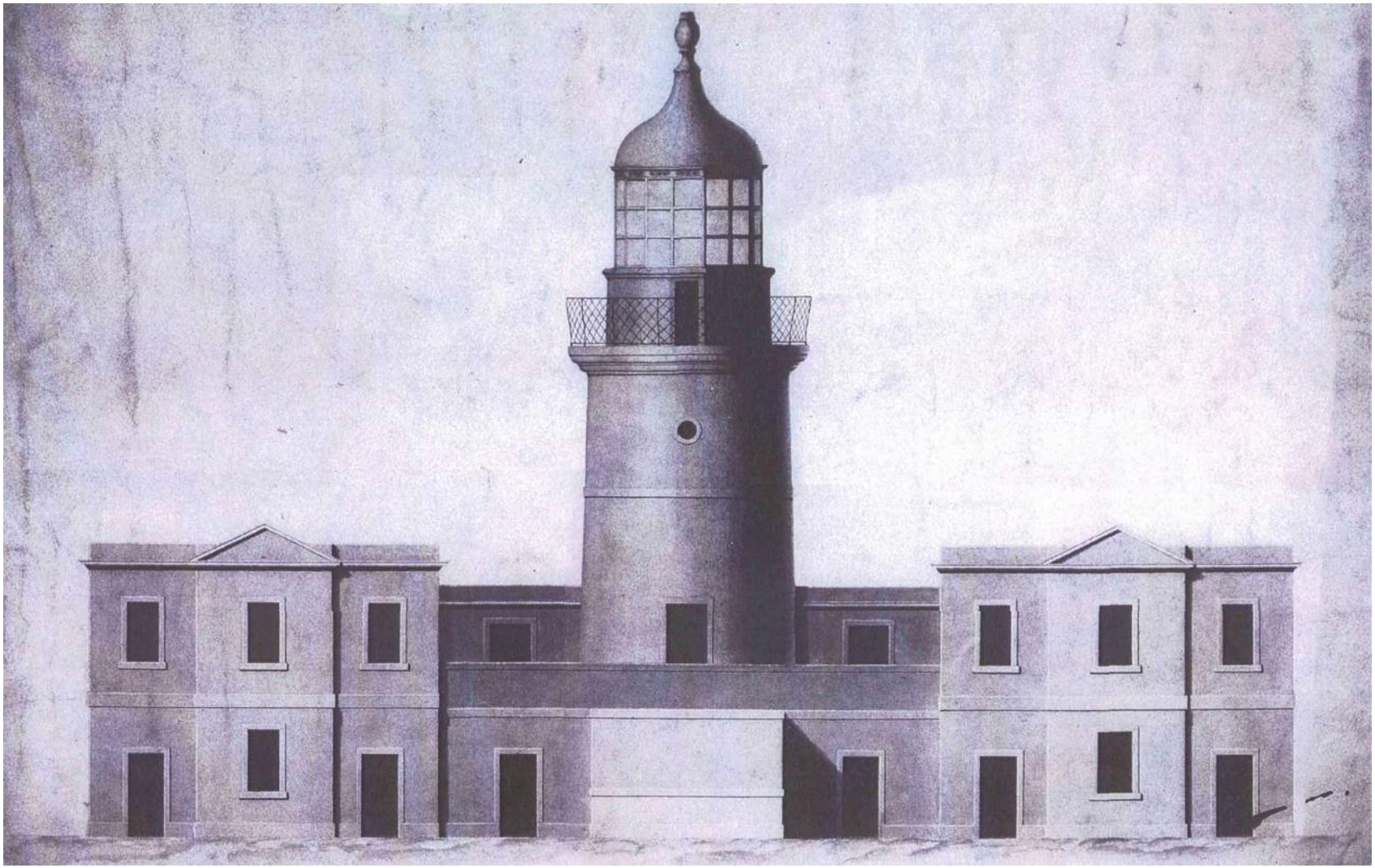

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Fig. No: 4

Revision: A

Title: North Elevation, Dwelling Block, Stevenson 1819

Project: Sumburgh Head Lighthouse, Desk-based assessment and Level 1 Standing Building Survey

Scale:

Client: Groves Raines Architects on behalf of the Shetland Amenity Trust

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Fig 5a - Section through Lighthouse, Stevenson 1819

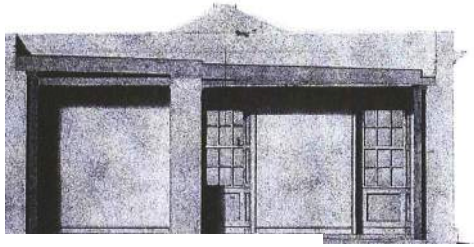

Fig 5b - Section through Dwelling Block, Stevenson 1819

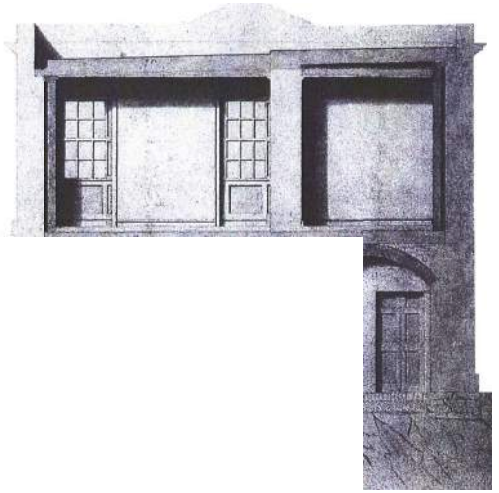

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Fig. No: 5a,b

Revision: A

Title:

Project: Sumburgh Head Lighthouse, Desk-based assessment and Level 1 Standing Building Survey

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