



Construction of Education Pavilion, Tentsmuir Bay, Tayport, Fife Watching Brief Data Structure report






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1 Introduction

1.1 General

1.1.1 ARCHAS Cultural Heritage Ltd were commissioned by Kirsty Maguire Architects on behalf of Scottish Natural Heritage to undertake a watching brief during all ground breaking works associated with the proposed construction of an education pavilion at Tentsmuir Bay near Tayport, in the north east of Fife. The work is required in advance of construction work and is centred on NGR: NO 50065 26696. The development area is within the Tentsmuir Scheduled Monument (SM No: 9712) (area of development now de-scheduled).

1.1.2 Following submission of a planning application for the proposed development, the site was identified as archaeologically sensitive predominantly as it lies within a Scheduled Monument (SM) by Historic Environment Scotland (hereafter HES). The archaeological potential of the development area is primarily due to the development lying within the Scheduled Monument that comprises Scheduled Monument comprising Tentsmuir Coastal Defences (SM No 9712). This is the largest scheduled monument area in Scotland. The details of the scheduled monument are outlined in the scheduling document.

“The monument consists of a complex of linear defences, running from Leuchars Airfield in the south to Lundin Bridge in the north-east. It is made up of concrete anti-tank blocks, command posts, quadrant towers, pill boxes and what may have been a bombing decoy post to the north of the airfield.

There were also anti-glider posts on the foreshore, some of which are still visible under certain tidal conditions, and barbed wire entanglements. Set back behind the main line was a camp for those who built and later defended the line.

The defences were intended to protect a stretch of the coastline which was considered particularly vulnerable to attack by German forces in the Second World War. They were constructed in late 1940 by Polish troops.

Stretches of the line of anti-tank blocks have been lost through deliberate removal or through coastal erosion, or are now simply covered over by shifting sands, while at least one quadrant tower has collapsed. The camp for those who built and defended the line has now been reduced to the shells of two buildings and a water tank, though there are traces of other buildings in the surrounding woodland.”

1.1.3 This Data Structure Report has been prepared for Scottish Natural Heritage in support of the erection of an education pavilion at Tentsmuir Bay near Tayport, in the north east of Fife. The work is required in advance of construction work and is centred on NGR: NO 50065 26696.

1.1.4 The archaeological works were designed to mitigate the impact on any archaeological remains within the development area to the agreement of Historic Environment Scotland who are responsible for protecting Scheduled Monuments. ARCHAS Heritage Ltd (hereafter ARCHAS) were appointed by Scottish Natural Heritage to undertake the archaeological mitigation works.

1.1.5 A previously submitted and agreed (13/9/2018) Written Scheme of Investigation (hereafter WSI) outlined proposals from ARCHAS to undertake the programme of archaeological mitigation as required by HES. The WSI contained a small degree of research undertaken to put the site and the project in its historical context and established the methodology to be followed during the watching brief.

1.1.6 ARCHAS Cultural Heritage Ltd conforms to the standards of professional conduct outlined in the Chartered Institute for Archaeologists (hereafter CIfA) Code of conduct, and relevant Standards and Guidance documents produced by the CIfA.

¹HES email (R Heawood)-1.9.17

1.1.7 A record of the work has been deposited with the Online Access to the Index of Archaeological Investigations (OASIS) website hosted by the Archaeological Data Service (OASIS ID archascu1-395218)

1.2 Site Location and Setting

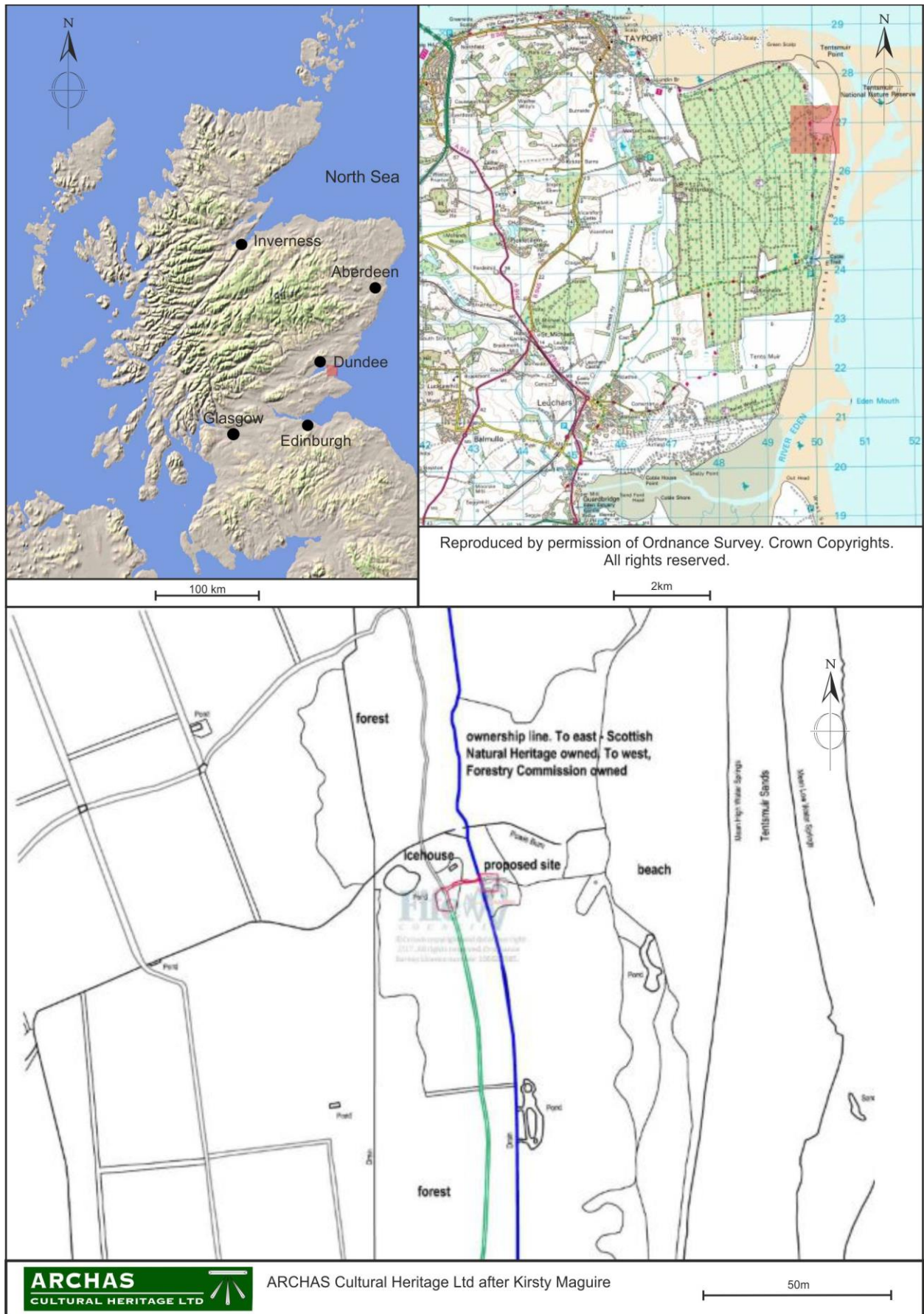


Figure 1: Site location showing

Proposed Development

- 1.2.1 The proposed development lies partially within the Scheduled Monument at Tentsmuir Sands (Figs 1 & 2) in North East Fife. The proposed development lies to the east of the track aligned north-south that connects the two car parks at Kinshaldy to the south and the one SE of the icehouse.
- 1.2.2 The proposed development was centred on NGR: NO 50065 2669 and comprises a single storey education pavilion building constructed on a concrete foundation on the boundary between the western edge of the managed dune systems and the general forestry plantations. The site lies to the south of an existing east-west aligned track leading to the dunes and immediately east of a deep drainage ditch. The site also lies 60m to the south east of the ice house a well known Tentsmuir structure and landmark south of the Powie Burn (Figure 1 & 2).
- 1.2.3 The proposed development area comprises to the west, an area of commercial forestry plantation managed by the Forestry Commission whilst on the east, the proposed development lies within an area of relict dune systems managed by Scottish Natural Heritage to avoid colonisation by vegetation on fixed vegetated dunes, inland of mobile dunes and surrounded by commercial forestry. This area measures up to 400m².

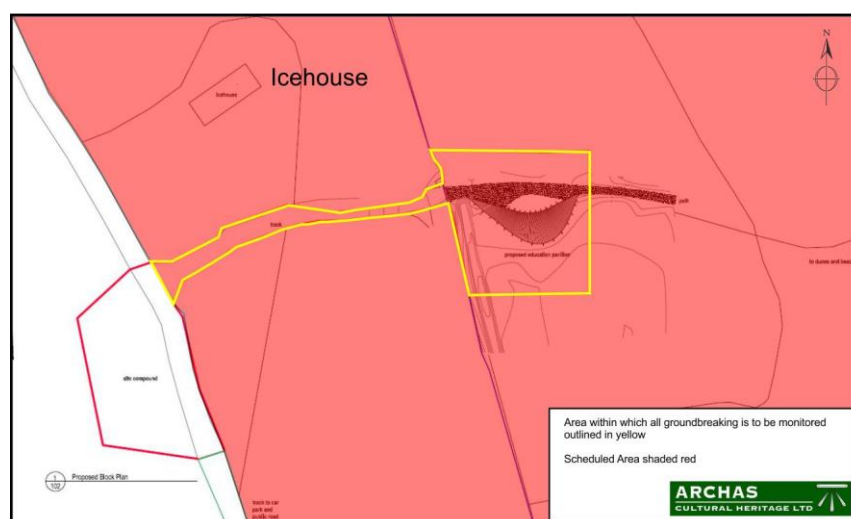


Figure 2: Plan of area showing area in which excavations are to be monitored outlined in yellow with Scheduled Area shaded red. ARCHAS after Kirsty Maguire Architect

Geology

- 1.2.4 The superficial geology is predominantly blown sand and gravel. Superficial deposits formed up to 3 million years ago in the Quaternary Period. Local environment previously dominated by wind-blown deposits. These deposits were formed from wind eroding, transporting and depositing sand and silt-sized material.
- 1.2.5 The bedrock geology of the proposed development is Arbuthnott-Garvock Group - Sandstone with subordinate conglomerate, siltstone and mudstone. Sedimentary bedrock formed approximately 407 to 416 million years ago in the Devonian Period. Local environment previously dominated by rivers and alluvial fans.

2 Background

2.1 General

The Construction

- 2.1.1 The proposed development comprises a single storey education pavilion building constructed on a concrete foundation.

Scope

- 2.1.2 Prior to completing the archaeological watching brief it is necessary to briefly assess the history and recorded archaeology of the proposed development area and the surrounding landscape in order to provide context for the site and an understanding of the likelihood of archaeological deposits surviving.
- 2.1.3 In completing the background archaeological assessment, ARCHAS access a number of available sources, including:
- *National Monuments Record of Scotland (NMRS);*
 - *Fife Council Archaeology Service Sites and Monuments Record (SMR);*
 - *Early editions of Ordnance Survey and earlier mapping held by the Map Library of the National Library of Scotland (NLS);*
 - *Historic and current aerial imagery as held by the National collection of Aerial Photography (NCAP) and displayed on readily available online platforms;*
 - *Published and unpublished archaeological reports, articles, journals and books.*
- 2.1.4 Where sites are discussed in the text, the numbers that follow are the CANMORE IDs from the NMRS and the SMR number from the WoSAS SMR.

2.2 Historic Background

- 2.2.1 There is only one known site within the immediate Study Area.
- 2.2.2 The reference provided for each site is the CANMORE ID assigned by the NMRS.
- 2.2.3 The development lies within the Largest Scheduled Monument in Scotland, the Tentsmuir Coastal defences comprising an area within which numerous coastal defences are sited. The entry states:

“The monument consists of a complex of linear defences, running from Leuchars Airfield in the south to Lundin Bridge in the north-east. It is made up of concrete anti-tank blocks, command posts, quadrant towers, pill boxes and what may have been a bombing decoy post to the north of the airfield.

There were also anti-glider posts on the foreshore, some of which are still visible under certain tidal conditions, and barbed wire entanglements. Set back behind the main line was a camp for those who built and later defended the line.

The defences were intended to protect a stretch of the coastline which was considered particularly vulnerable to attack by German forces in the Second World War. They were constructed in late 1940 by Polish troops.

Stretches of the line of anti-tank blocks have been lost through deliberate removal or through coastal erosion, or are now simply covered over by shifting sands, while at least one quadrant tower has collapsed. The camp for those who built and defended the line has now been reduced to the shells of two buildings and a water tank, though there are traces of other buildings in the surrounding woodland.

The main area to be scheduled is an irregular L-shaped configuration running 6,600 metres from north to south, and 4,000 metres from east to west, as indicated in red on the accompanying map extract. For much of its length the inner boundary of the area is defined by the lines of existing trackways. Excluded from this area is an enclosure around the quadrant tower at NO500248, which is in residential occupation.

A second area to be scheduled is a rectangle centred on NO239480, extending to 590 metres on its north-south axis and 190 metres on its east west axis, as indicated in red on the accompanying map extract.

- 2.2.4 Within the Scheduled area lies one known site, a 19th-century icehouse (Canmore ID: **139908**, NGR: NO 49996 26732) The ice house, near the proposed development at Tentsmuir Forest is recorded as a substantial rectangular, roofed, mortared stone building dug into a sand dune with a track approaching from the south, its former use being an ice house for the local Salmon Fishery. The icehouse was used by fishermen working stake nets fixed in the Abertay sands (Plate 1).



Plate 1: Icehouse

- 2.2.5 The proposed development site lies approx. 50m south-east of the icehouse.

2.3 Tentsmuir

General

- 2.3.1 Tentsmuir is the name given to an extensive area of windblown sand that has accumulated between the estuaries of the Rivers Tay and Eden in North -East Fife. The sand that forms Tentsmuir is of recent origin and has accumulated progressively since the Mid-Holocene sea level maximum at c.5500 BC and currently extends to over 25km² (Ballantyne and Dawson 1997; Armstrong et al 1985).

Archaeology

- 2.3.2 Due to the slow accumulation of sand creating land from deposited sand, there are unlikely to be archaeological remains within the study area. With the exception of a small collection of flint and coarse pottery from south of Kinshaldy, no Prehistoric finds have come from the sand in the eastern part of Tentsmuir. This area has yielded medieval artefacts so there does seem to be a genuine absence of Prehistoric Material (Carter, S. 1997).

World War I

- 2.3.3 Military activity on Tentsmuir begins with the establishment of the RAF Leuchars airbase after WWI and continued until recently where the Army has now been stationed at the Leuchars base. The military significance of Tentsmuir was two fold. Firstly, it was classified as a coast at high risk from sea-borne attack and secondly there was a major airbase in this exposed coastal location. In the early stages of the war (1940-42), when the possibility of a German sea-borne invasion seemed very real there was heavy investment in coastal defence. Tentsmuir was part of the coastal sector from Angus to East Lothian controlled by the Polish Army. Defensive units were manned by Units of the Polish 1st rifle brigade, primarily by the 2nd Battalion in 1941 and 1942. The men were accommodated within a camp within the Tentsmuir forest.
- 2.3.4 The majority of defences were set up to protect Leuchars airfield and the Craigie landing ground. There was clear concentration of structures directly on the coast including a continuous line of ant tank blocks. Most gun emplacements were located towards the southern end where there is deep water close inshore, most suitable sea-borne attack, and adjacent to Leuchars airfield. The open ground on Earls Hall Muir was covered by additional gun emplacements and small minefields were created to block open lines of advance in from the coast between the tree plantations. A widely spaced line of gun emplacements was also constructed on the west side of the Tentsmuir plantations to protect the camp from the west and to guard against an air-borne attack on the Craigie landing ground. Craigie landing ground functioned as an alternative landing site for planes returning to Leuchars if they were unable to use the airfield.

2.4 Map Regression

General

- 2.4.1 All relevant available maps as held by NLS were consulted in order to identify the recorded development of the site as well as any additional features that may previously have gone unrecorded within the limits of the proposed development. A summary of consulted maps is listed in the Bibliography.

Pre-Ordnance Survey maps

- 2.4.2 A number of early maps which cover the area of Tentsmuir Forest were consulted for any indication of historical occupation within the proposed development area. Due to the generally imprecise accuracy of these early maps and relatively small area covered by the proposed development, early maps are of limited use in showing any occupation of the Study Area.
- 2.4.3 William Roy's Military Survey of Scotland was conducted from 1747-52 and is the first map of the area which can be considered to have any real degree of accuracy. The scale of the map is also such that it allows the Study Area to be pinpointed. Roy's map clearly shows the study area was close to the high water line almost within the intertidal zone, although the level of accuracy is unclear.

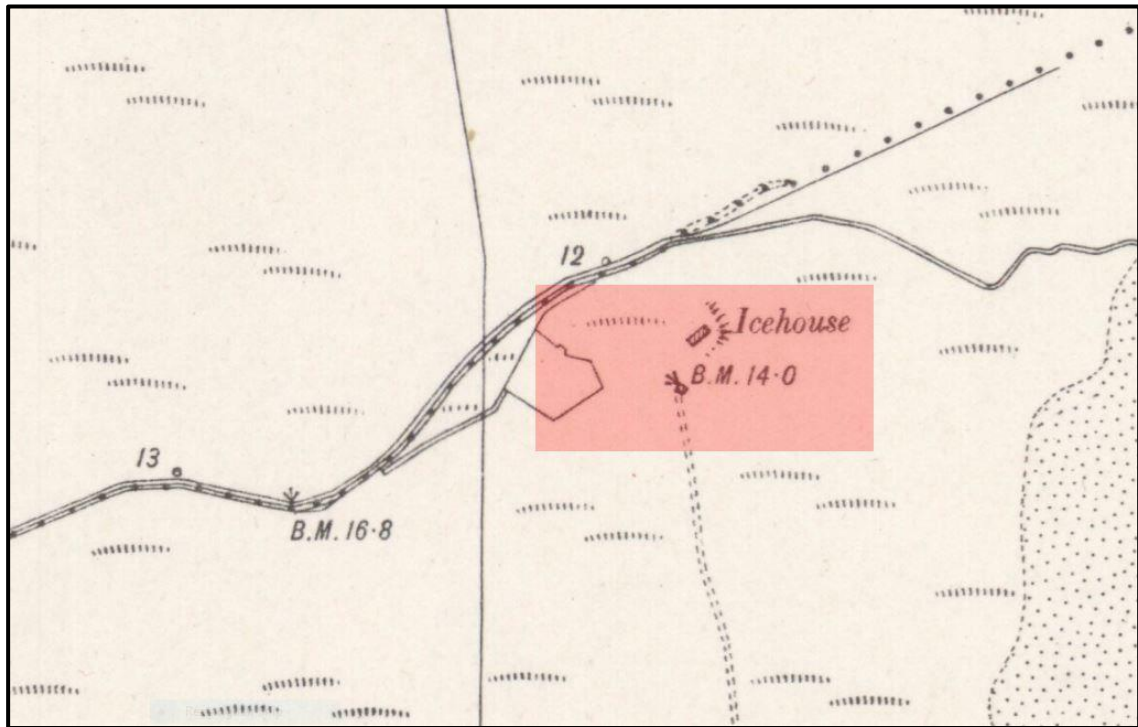


Figure 3: Extract from OS six-inch to the mile map of 1892 showing the general location of the Study Area (marked red).

Ordnance Survey maps

- 2.4.4 The Ordnance Survey began their survey of the area in 1843, publishing the map in 1855.
- 2.4.5 The 6 inch to 1 mile Fife, Sheet 3 (includes: Ferry Port On Craig; Leuchars) shows the study area in detail, with the icehouse shown and a small roofed structure 40m south.
- 2.4.6 The 6 inch to 1 mile Fife and Kinross Sheet V.NW (includes: Ferry Port On Craig; Leuchars) shows further detail, with the Powie Burn being canalised and a small “lade” branching off to feed the pond which survives today which may have been used to harvest ice.
- 2.4.7 The 25 inch to 1 mile Fife 005.01 (includes: Ferry Port on Craig; Leuchars) shows the canal, icehouse and smaller structure as well as a sluice marked alongside the canal as it branches into a pond.

2.5 Aerial Imagery

- 2.5.1 Aerial images of the proposed development area were consulted in order to assess the potential for previously unrecorded archaeological features to survive within the boundaries of the site.
- 2.5.2 Current and historical aerial images held by the National Collection of Aerial Photography (NCAP) were viewed in addition to those available from online platforms. Details of those images consulted can be viewed in the Bibliography.
- 2.5.3 The aerial images failed to reveal any new sites or features of note within the limits of the proposed development or close to it. In fact, little activity was noted. However the small structure with the Bench mark indicated was not visible.

2.6 Walkover Survey

- 2.6.1 A walkover survey was undertaken on Thursday the 17th August 2017 during fine sunny dry weather by Alastair Rees. The area proposed for construction comprises an area formerly forested with recent tree felling visible with gently undulating vegetated windblown sand deposits (Plate 2 below).
- 2.6.2 No previously unrecorded sites were located during the walkover. A specific search was made of the general location where the small roofed structure noted on the early OS mapping to the west of the proposed development but this appeared to be located where the present large trackway is and it has presumably been demolished.



Plate 1: View of area proposed for construction

- 2.6.3 No physical evidence of construction of defence related structures or remains associated with the Scheduled Monument was noted during the visit

2.7 Conclusions

- 2.7.1 The previous DBA and walkover survey (Rees, A. 2017) identified only one known site lying within the Scheduled Monument and close to the development area, the icehouse with no other previously unidentified sites or remains noted close to or within the boundaries or general area of the proposed construction.
- 2.7.2 The best source of evidence for the presence or absence of WWII structures, remains or activity within or close to the proposed development site which may comprise elements of the scheduled Monument were the vertical aerial photographs taken immediately following the end of WWII.
- 2.7.3 Although the proposed development is bounded on the north by a slightly raised track which may well have been used by the Polish troops tasked with construction and maintaining the Tentsmuir defences, it appears unlikely that the development will physically impact upon any remains which may be part of the Scheduled Monument/area.

- 2.7.4 However, there remains the possibility that due to the presence of the raised trackway and the general location close to the icehouse and track, that artefacts associated with the defence works may survive buried within the sand.

3 Methodology and Monitoring Results

3.1 Watching Brief

- 3.1.1 The watching brief as required following consultation with HES and the submission of SMC, involved the monitoring of all ground breaking works associated with the proposed development within the Scheduled Area (Figure 2). This will involve the excavation of foundations for the proposed structure, landscaping and associated groundworks.
- 3.1.2 All ground-breaking works will be undertaken by the contractor using a mechanical excavator fitted, where possible, *with a toothless ditching bucket*.
- 3.1.3 This mechanical excavation work was monitored at all times by a qualified ARCHAS archaeologist under watching brief conditions until:
- any archaeological horizons are noted;
 - undisturbed natural subsoil is apparent; or
 - the depth of the development impact is reached.

3.2 Results

- 3.2.1 Excavation began on the 12th December 2018 and the felled tree roots and turf were removed by machine excavator first (**Plate 3**). The tree roots were found to be fairly shallow and after a second cleaning of the surface, no buried structures or features were identified. Following the removal of the turf and tree roots, the sand subsoil was cleaned by machine bucket once more and then rolled.



Plate 3: Area under excavation (12/12/2018)

- 3.2.2 Following clearing of the footprint of the structure, hardcore (Type 3) was laid on the surface. Following this, actual foundation trenches were to be excavated a further 0.30m into the sand subsoil. ARCHAS were subsequently recalled to the site on the 11th and 14th January 2019 to monitor this work (Plate 4).



Plate 4: Excavation of foundation trenches

- 3.2.3 The foundation trenches were 0.50m wide and excavated to a depth of 0.60m into the sand subsoil. Again, no structures or features were identified and the sand as found to be clear of any artefacts and probably represents windblown dune sand rather than beach deposits as no beach material like shells were identified. This does suggest that there remains the possible presence of earlier structures or features being located deeper within this material.

4 Discussion

- 4.1 No structures or deposits were located or identified during the monitoring exercise. The sand subsoil that was excavated appears to comprise windblown sand as there were no artefacts recovered from within this material. This suggests that there remains the possibility that structures or deposits may lie within this material at a greater depth.
- 4.2 ARCHAS Ltd recommend no further work is required in connection with this development.

Bibliography

Aerial Images

Image reference	Date	Source
Frame 3027 Sortie: CPE/SCOT/UK/0215	22/6/1947	NCAP
Frame 3072 Sortie: 106G/UK/0033	25/04/1946	NCAP
Frame 60024 Sortie: 106G/DY/0009	10/9/1944	NCAP

Bibliographic References

Rees, A. 2017. Construction of Education Pavilion Desk Based Assessment and walkover survey ARCHAS Ltd Unpublished report

Ballantyne, C K & Dawson, A G 1997 Geomorphology and Landscape Change in KJ Edwards and IBM Ralston (eds) *Scotland: Environment and Archaeology, 8000 BC – AD 1000*, Chichester: John Wiley

Carter, S. 1997. The Archaeology of Tentsmuir. A synthesis and interpretation of existing records: Headland Archaeology

Websites

www.nls.uk
pastmap.co.uk

Cartographic References

Maps consulted during the cartographic regression include:

Pre-Ordnance Survey

Date	Cartographer	Map
c. 1843	OS	Fife, Sheet 3 (includes: Ferry Port On Craig; Leuchars)
c. 1895	OS	Fife and Kinross Sheet V.NW
c. 1747	Roy Highlands	Roy Highlands 1747 - 1752