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## Summary

This report contains an assessment of the likely impacts of the proposed Tetney to Saltfleet flood defence improvements upon the known cultural-heritage resource.

Lincolnshire County Council's historic-environment database, the National Monuments Record database and the Lincolnshire Archives were consulted during the production of this report, along with historic mapping and aerial photographs, so that all known cultural-heritage assets lying within 500m of the proposed development could be identified. These assets were then ascribed a value, and the likely developmental impacts upon them were assessed. Published historical and archaeological syntheses were also studied in order that the potential for the presence within or adjacent to the proposed improvements of currently unidentified assets could be judged, by means of analogies drawn with similar localities within the region.

This report documents the methods and results of that process and shows that the study area contains 180 cultural heritage assets, none of which are of very high (international) or high (national) value, 20 of which are of medium (regional) value, 29 of which are of low (local) value, and 43 of which are of negligible (less than local) value. A further 88 assets are of an unknown value.

Sixteen impacts or potential impacts been identified, all but two of which affect assets believed to date from the Second World War or immediate post-war period. The latter consist of a possible infantry blockhouse, a coastal observation post and access tunnel, a possible Type 23 pillbox and access tunnel, a group of anti-tank blocks, two collapsed rectangular structures of unknown function, two causeways and associated demolition material, two dumps of structural demolition material, concrete footings of a possible pillbox and a large concrete block of unknown purpose. The remainder consist of the site of a post-Medieval coastguard station and a Grade II listed barn (visual impact only).

The data gathered during this assessment suggests that there is limited potential for the discovery of currently unknown cultural-heritage assets of Medieval or earlier date within the footprints of the proposed improvement works. North and Central Site are located entirely within an area of 19<sup>th</sup> century marsh reclamation. The same is true for much of South Site and the associated borrow pits, although the land to the south of the Haven, upon which the new embankment is proposed to be built, pre-dates this. Substantial deposits of marine alluvium underlie all three sites.

Recommendations are made for the investigation and recording, at varying levels dependent on the condition of the asset, of the impacted Second World War defence structures.

# **1 Introduction**

## **1.1 Nature of this Report**

1.1.1 This report presents the results of a cultural-heritage desk-based assessment (DBA) of the locations of three sections of proposed coastal flood defence improvement on the east Lincolnshire coast (see Figure 1 for Location Plan):

- North Site: Tetney to Grainthorpe (*c.* TA 400 687 – TA 539 504)
- Central Site: North Somercotes (*c.* TF 438 979 – TF 544 160)
- Southern Site: Saltfleet Haven (*c.* TF 393 498 – TF 546 361)

## **1.2 Commissioning Bodies**

1.2.1 Groundwork Archaeology Ltd was commissioned by the Environment Agency to undertake this desk-based assessment.

## **1.3 Project Background**

1.3.1 The Humber Estuary Flood Risk Management Strategy (Environment Agency 2008) identified the need for coastal defence improvements over the next 25 years; the proposed works form part of the resultant enhancement scheme.

1.3.2 The existing defences have been judged as inadequate due to the presence of low spots where there is a risk of water overtopping the banks with subsequent flooding of the landward areas. Steep slopes and narrow crests also make maintenance difficult and increase the risk of slumping (Environment Agency 2011).

1.3.3 Ground Investigation work to investigate the nature and composition of the existing flood defence embankments and of the underlying drift deposits was carried out between February and April 2010 (Black and Veatch 2010) leading to a set of recommendations for improvement which are summarised below.

## **1.4 Proposed Improvements**

1.4.1 The main purpose of the work is to raise the existing flood defence embankments and reduce their slope gradients. This will necessitate a widening of the embankment footprint and an increase in the width of the crest. Because of the highly sensitive habitats on the seaward side, it is proposed that the embankments will be extended on the landward side of the defences (Environment Agency 2011).

1.4.2 At all the sites the topsoil and vegetation cover will first need to be removed from the crest and landward side of the embankments. In addition, steps will be cut into the landward bank to assist in the bonding between old and new clay. The steps will be approximately 250mm high.

#### 1.4.3 **North Site**

This site is divided into two sections. Section 1 consists of an existing embankment running from Northcoates Point at the northern end to Horse Shoe Point at the southern end, a distance of approximately 2.1km. Section 2 consists of another extant embankment running from just south of Horse Shoe Point to Grainthorpe Haven at the southern end, a distance of approximately 1.7km.

The embankments run parallel to the coast and are orientated roughly NW-SE; each has a crest approximately 3m wide (Black & Veatch 2010) and a height of between 2.5m and 3.5m (c. 5.3-5.9m AOD). Drainage ditches are present along the length of the landward toe of the embankment (EA 2011).

Proposed works include infilling of the existing drainage ditches and excavation of wider channels, c. 10.5m in width, on the landward side. The material from the new channels will be used to raise the level of the crest by between 0.1 and 0.7m. The footprint of the improved embankment will be c. 3.5m to 4m wider than the current earthwork (see Figures 5 & 6 for working areas).

It is proposed that all materials borrowed from the new drainage ditch will be taken from above Groundwater levels to minimize moisture content. Groundwater levels have been shown to be variable across the Sites (Black and Veatch 2010) but extraction will be limited to a depth of approximately two metres in the North and Central Sites.

A site compound will be required but the location has yet to be confirmed. It is likely that the area will need to be stripped of topsoil and stone imported to provide hardstanding.

#### 1.4.4 **Central Site**

This consists of an existing embankment situated to the north-east of North Somercotes, approximately 1.3km in length and orientated roughly NNW-SSE, running parallel to the coast. The embankment is between 2m and 3m high (c. 5.1 to 5.8m AOD). A drainage ditch is present along part of the landward toe and the Donna Nook Ministry of Defence bombing range is situated on the seaward side.

Proposed works include infilling of the existing drainage ditch and the excavation of a wider channel, c. 10m in width and 2m in depth, on the landward side. The material from the new channel will be used to raise the level of the crest by between 0.2 and 0.9m. The

footprint of the improved embankment will be c. 3m to 7m wider than the current earthwork (see Figures 7 & 8 for working area).

A site compound will be required but the location has yet to be confirmed. It is likely that the area will need to be stripped of topsoil and stone imported to provide hardstanding.

#### 1.4.5 South Site

This consists of a curving stretch of embankment situated immediately south-east of Saltfleet and measuring approximately 0.7km in length. The existing defence is formed by earth embankments between 1 to 2m high (c. 4.9m to 5.9m AOD), situated on the north and south shores of the Saltfleet Haven. These embankments tie into high ground formed by sand dunes (EA 2011).

The proposed works include the raising and widening of the existing embankment along Haven Bank / Saltfleet Haven by between 0.55m and 1.25m. A new section of flood wall will be built on the crest of the existing embankment along Haven Bank and an existing stretch of concrete wall along main Road will also be re-built and raised. Finally, a new section of embankment will be constructed along the edge of the access track past Gowts Farm. Ancillary works will include the improvement of embankment crossings and access tracks, the installation of flood gate access and a new headwall as well as the realignment of an existing drainage channel (Environment Agency 2011).

Low points in the embankment will be raised using material from borrow pits situated on the seaward side and covering an area of roughly 4.4 hectares, (see Figures 9 & 10 for working area). Materials from the borrow areas will be excavated from above the water table to minimize the moisture content; at this section a limited thickness of approximately 1m of Cohesive Marine Alluvium is considered suitable for forming the embankment (Black and Veatch 2010).

A site compound will be required but the location has yet to be confirmed. It is likely that the area will need to be stripped of topsoil and stone imported to provide hardstanding.

- 1.4.6 Scrapes will also be excavated adjacent to the southern bank at South Site to recover clay and to provide a wetland habitat for this area which is managed by the Lincolnshire Wildlife Trust.

### 1.5 Planning History

- 1.5.1 Some of the proposed works will fall under the Environment Agency's Permitted Development rights. Some sections, however, may constitute 'development' as defined in

Section 55 of the Town and Country Planning Act 1990 (as amended) and so will require Planning Permission from East Lindsey District Council (ELDC) under section 57 of the Town and Country Planning Act (as amended) (Environment Agency 2011).

- 1.5.2 The Environment Agency is undertaking a screening exercise under the Habitat Regulations Assessment 2010 in consultation with Natural England (NE). The latter will probably indicate a 'likely significant effect' and therefore necessitate a full Habitats Regulations Assessment by ELDC in agreement with NE (Environment Agency 2011).
- 1.5.3 A formal Environmental Impact Assessment (EIA) screening opinion for the requirement for statutory EIA (under the Town and Country Planning (EIA) (England & Wales) Regulations 1999 will be sought from ELDC (Environment Agency 2011).
- 1.5.4 If no statutory EIA is required it is the intention of the Environment Agency to submit a non-statutory Environmental Report with the planning application. If a statutory EIA is required then a full Environmental Statement will be produced (Environment Agency 2011).
- 1.5.5 Before any works can go ahead the Environment Agency needs to provide compensatory habitat at an alternative location in the same part of the Humber Estuary. The latter has yet to be secured and there is currently no fixed date proposed for the works.

## **1.6 Purpose of this Report**

- 1.6.1 The purpose of this desk-based assessment is to:
  - identify, describe and depict all known cultural-heritage assets - that is archaeological remains, historic buildings and historic landscapes - that lie within a 1-km-wide study area centred upon the proposed works;
  - place these known and any currently unknown cultural-heritage assets within their local, regional and national cultural-heritage contexts;
  - provide an assessment of the value of any known cultural-heritage assets located within the study area;
  - assess the magnitude and significance of the likely impacts of the proposed works upon any known cultural-heritage assets located within the study area;
  - assist in identifying subsequent elements of field survey and mitigation works which might be required to ensure preservation of cultural-heritage assets in situ or by record.

## **1.7 Structure of this Report**

- 1.7.1 Section 1 of this report contains information on the nature of and justification for the proposed development that has occasioned this assessment, the project and planning history to date and the objectives of this report, as well as some of the limitations of the data sources drawn upon in its production.
- 1.7.2 In section 2, the reader will find a synopsis of the data sources consulted when compiling this report, along with the standards aimed at, guidance followed and methods used to assess the value of all cultural-heritage assets located within the study area.
- 1.7.3 Section 3 contains a topographical and geological description of the study area.
- 1.7.4 A discussion of some of the main cultural-heritage themes of relevance to the study areas are discussed in section 4, in period order from the Palaeolithic to the present.
- 1.7.5 In section 5, all cultural-heritage assets which may be impacted by the scheme are described, in order of their assigned value – from the highest down to unknown - and the likely levels of impact upon them assessed.
- 1.7.6 Section 6 contains an assessment, again by period, of the potential for the presence of currently unidentified assets within the study area.
- 1.7.7 A proposal for a scheme of further archaeological works is presented in section 7, while sections 8 and 9 contain acknowledgements and a bibliography respectively.
- 1.7.8 A variety of illustrations follows upon section 9 and show the locations of the proposed flood defence improvements, of the various cultural-heritage assets described and discussed in the text, and depict the underlying solid and drift geology of the study area.
- 1.7.9 Finally, Appendix 1 contains a gazetteer of all cultural-heritage assets within the study area and summarises the information in tabular form and Appendix 2 contains a collection of photographs taken during the site visit.

## **2 Method of Assessment**

### **2.1 Standards & Guidance**

- 2.1.1 This assessment has been conducted in accordance with the Institute for Archaeologists Code of Conduct (1991, revised 2008), Code of Approved Practice for the Regulation of Contractual Arrangements in Field Archaeology (1991, revised 2008), and Standards and Guidance for Archaeological Desk-Based Assessment (1991, revised 2008).

## 2.2 Study Area

2.2.1 Data collection has focused upon one-kilometre-wide study areas centred upon the proposed embankment refurbishment areas (Figures 5-9). A one-kilometre-wide study area was chosen in order to provide a sufficiently wide coverage to assist in predicting the potential for previously unidentified cultural-heritage assets.

## 2.3 Data Sources

2.3.1 Data were sought from a variety of statutory and non-statutory bodies during the assessment process. The bodies and categories of data consulted are summarised in Table 1, below.

Source	Data Category	Data Present in Study Area?
English Heritage National Monuments Record (NMR)	World Heritage Sites	No
	Scheduled Monuments	No
	Listed Buildings	Yes
	Registered Parks and Gardens	No
	NMR Archaeological Records	Yes
Lincolnshire Archives	Ordnance Survey 1:2500 mapping from 2 <sup>nd</sup> Edition	Yes
	Tithe and Enclosure Maps	Yes
	Other Historic Maps	Yes
Lincolnshire County Council Archaeology Service	Historic Environment Record (database of archaeological sites and monuments, historic buildings and landscapes and archaeological interventions or 'events' within Lincolnshire)	Yes
	Available aerial photographic cover, verticals and obliques	No
	Grey literature reports	Yes
	Publications	Yes
	Conservation areas	No
Portable Antiquities Scheme	Findspots	No
ads ArchSearch (online)	Defence of Britain database	Yes
Oldmaps.co.uk	Various Ordnance Survey mapping	Yes

**Table 1: Summary of principal data sources and data categories consulted during the assessment process**

2.3.2 Digital GIS data (in ESRI Shapefile format) pertaining to Listed Buildings and Archaeological Records were obtained from the NMR at Swindon and were imported into the project GIS. These contained point, polygon and attribute data. Fuller attribute data were also supplied by the NMR, in paper format.

2.3.3 A digital GIS data extract (in ESRI Shapefile format) was obtained from the Lincolnshire HER. The extract contained point, polygon and attribute data. A visit was also made in person on the 4<sup>th</sup> February 2011 to view their collection of aerial photographs, grey literature reports and publications.

- 2.3.4 Ordnance Survey (OS), Enclosure Maps, Tithe Maps and other historic mapping was consulted at the Lincolnshire Archive on the 3<sup>rd</sup>, 4<sup>th</sup> and 16<sup>th</sup> of February 2011.
- 2.3.5 Lower-resolution aerial photographs hosted on the Google Earth website were also consulted.

## **2.4 Site Visit**

- 2.4.1 A site visit was undertaken on the 18<sup>th</sup> February 2011, following completion of the desk-based assessment data collection process.
- 2.4.2 The impact zone of the proposed works was walked and all known and accessible cultural heritage assets were visited, to confirm the presence and location of each asset, to assess its condition and to judge its vulnerability to construction impacts. Hitherto unidentified assets were also sought.
- 2.4.3 Where pre-recorded or newly discovered sites were identified within the proposed working area their location was noted using a handheld Garmin (e)Trex Vista HCx. The latter provided a grid reference accurate to within three metres.
- 2.4.4 Ground cover and visibility during the site visit was varied; the embankment crests had a covering of short grass but the banks themselves were frequently obscured by a dense covering of dry grass with occasional bushes and patches of scrub. The scrub was particularly dense at the northern end of Central Site. The entire length of the embankments at all three sites was walked but the steepness and unevenness of the banks meant that some stretches at North and Central Site were viewed only from the crest for safety reasons.

## **2.5 Definitions**

- 2.5.1 The term ‘cultural-heritage asset’, commonly shortened to ‘asset’ in this report, refers to archaeological sites, monuments and artefacts, historic buildings and other components of the built environment, and historic landscapes and historic landscape elements. Together these comprise the cultural-heritage resource.

## **2.6 Reference Conventions**

- 2.6.1 Each cultural-heritage asset located within the study area, extracted from the data sources summarised in Table 1 above, has been given a unique reference number, which is used throughout the text, in the gazetteer of assets, and is depicted on the figures of this report. A unified referencing system is preferred to one utilising a mixture of NMR, HER and newly assigned numbers when neither of these was available, because of its simplicity and clarity. The corresponding NMR and HER numbers, where they exist,

have been referenced in section 5, below, where cultural heritage assets are described and development impacts assessed, and in the gazetteer of assets (Appendix 1).

## **2.7 GIS and Mapping**

- 2.7.1 The GIS vector and attribute data pertaining to each asset, along with the background mapping underpinning this assessment, were managed, and the map-based figures in this report were produced, using MapInfo 7.8, a GIS and mapping software programme.
- 2.7.2 The OS mapping used in this report was supplied by the Environment Agency and is reproduced in this report under EA's licence (No. 100026380).

## **2.8 Limitations**

- 2.8.1 A substantial amount of non-intrusive field survey has been undertaken within and around the study area of this assessment, most notably the extensive Rapid Coastal Zone Assessment Survey by Humber Field Archaeology, carried out on behalf of English Heritage in 2007, and the Defence of Britain Project, carried out under the auspices of the Council for British Archaeology and completed in 2002. Nevertheless, the assets depicted, described, assessed and discussed in this report should not be taken as a wholly reliable guide to the number and value of archaeological remains that may be present within the study area. Lack of access and poor visibility might mean that some extant assets, most likely relating to Second World War defences, may have been omitted whilst others may be buried beneath later deposits.
- 2.8.2 The second limitation in the data set available for assessment pertains to the locational accuracy of records contained within the HER and NMR. Thus, the Lincolnshire HER and the NMR commonly record the locations of cultural-heritage assets with an accuracy of plus or minus 10m, but some assets have a recorded locational accuracy of 100m or less. Grid references taken during the site visit confirmed that several of the known sites in the immediate vicinity of the embankments (checks limited to this location) were inaccurately located; where this is the case a note has been made and the asset re-located on the figures. Furthermore, some assets are represented by points rather than polygons; which means that their spatial extents are undefined. Nevertheless, for the purposes of this assessment, locational imprecision and undefined extents have not been a major constraint. All assets in the close vicinity of the proposed development were visited during the site inspection accompanying this assessment, in part to fix their locations and to assess any construction impacts upon them.
- 2.8.3 The assignment of dates, functions and, particularly, value to cultural-heritage assets is a matter of judgement, which will vary from assessor to assessor. Every effort has been made in this report to present clear and justifiable interpretations and evaluations.

## **2.9 Impact-Assessment Process**

### **2.9.1 Introduction**

2.9.1.1 The impact-assessment process determines the significance of the effects of a development upon the cultural-heritage resource. It proceeds by first evaluating the resource, then by identifying the sources and magnitudes of impacts and finally to an assessment of the significance of the impacts, which is a combination of the value of the resource and the magnitude of any impacts. This section explains this process in more detail.

### **2.9.2 Evaluating the Cultural-Heritage Resource**

2.9.2.1 Designated cultural-heritage assets, such as world heritage sites, scheduled monuments, listed buildings and gardens and designed landscapes, have an agreed value recognised in their citations. The value of undesignated assets is a matter of professional judgement founded upon an assessment of an asset's actual or potential ability, either individually or as part of a group, to contribute significantly to acknowledged international, national, regional or local research objectives. Such professional judgements are contingent upon the variable quality of the available data and the understanding of the assessor. Consequently they may be contested and may need revision, if fuller information should become available.

2.9.2.2 For the purposes of this desk-based assessment, all cultural-heritage assets have been ascribed one of the following six values:

- Very High;
- High;
- Medium;
- Low;
- Negligible; or
- Unknown.

2.9.2.3 The considerations used when ascribing these values are set out in Table 2, below.

	Criteria used for establishing cultural-heritage asset value
Very High	<ul style="list-style-type: none"> <li>• World Heritage Sites.</li> <li>• Archaeological sites and monuments, historic buildings and historic landscapes of acknowledged international importance.</li> <li>• Archaeological sites and monuments, historic buildings and historic landscapes that can contribute significantly to international research objectives.</li> <li>• Extremely well-preserved historic landscapes with exceptional coherence, time-depth or other critical factors.</li> </ul>
High	<ul style="list-style-type: none"> <li>• Scheduled Monuments.</li> <li>• Undesignated archaeological assets of schedulable quality and importance.</li> <li>• Archaeological assets that can contribute significantly to national research objectives.</li> <li>• Grade 1 Listed Buildings.</li> <li>• Other listed buildings that can be shown to have exceptional qualities in their fabric not adequately reflected in their listing grade.</li> <li>• Conservation Areas containing very important buildings.</li> <li>• Undesignated structures of clear national importance.</li> <li>• Designated and undesignated historic landscapes of outstanding interest and demonstrable national value.</li> <li>• Well-preserved historic landscapes with considerable coherence, time-depth or other critical factors.</li> </ul>
Medium	<ul style="list-style-type: none"> <li>• Designated and undesignated archaeological assets that can contribute significantly to regional research objectives.</li> <li>• Grade 2 Listed Buildings.</li> <li>• Unlisted historic buildings that can be shown to have exceptional qualities in their fabrics or historical associations.</li> <li>• Conservation Areas containing buildings which contribute significantly to their historic characters.</li> <li>• Historic Townscapes or built-up areas with important historic integrity in their built environments.</li> <li>• Designated or undesignated landscapes of regional value.</li> <li>• Averagely well-preserved historic landscapes with reasonable coherence, time-depth or other critical factors.</li> </ul>
Low	<ul style="list-style-type: none"> <li>• Undesignated archaeological assets of local importance.</li> <li>• Archaeological assets compromised by poor preservation and/or poor survival of contextual associations.</li> <li>• Archaeological assets of limited value but with potential to contribute to local research objectives.</li> <li>• Unlisted historic buildings of modest quality in their fabrics or historical associations.</li> <li>• Historic Townscapes or built-up areas with limited historic integrity in their built environments.</li> </ul>
Negligible	<ul style="list-style-type: none"> <li>• Assets with little or no surviving archaeological interest.</li> <li>• Buildings of no architectural merit and no significant historical associations.</li> <li>• Landscapes with little or no significant historical interest.</li> </ul>
Unknown	<ul style="list-style-type: none"> <li>• Cultural-heritage assets of unascertained value.</li> </ul>

**Table 2: Asset evaluation criteria**

### 2.9.3 Sources of Impacts

2.9.3.1 The following construction activities could have direct or indirect impacts on known and potential cultural-heritage remains within and immediately beyond the footprint of the proposed works:

- Construction of site compounds/importation of materials;
- Topsoil stripping of crest and landward bank;
- Stepping of landward bank;
- Soil storage;
- Excavation of new drainage channels;
- Excavation of borrow pits;
- Embankment raising/widening/creation;
- Movement of heavy machinery;

### 2.9.4 Nature of Impacts

2.9.4.1 The impacts of the development upon cultural-heritage assets can be positive, negative, neutral or non-existent, as defined in Table 3, below:

Nature of Impact	Impact Nature Definitions
Positive	Improvements to an asset or its setting; improvement to access or amenity; and improved interpretative facilities.
Negative	Damage to or destruction of an asset or its setting; impairment to access or amenity; and reduction of interpretative facilities.
Neutral	Where positive and negative impacts are considered to balance out.
None	No or negligible impact due to distance from proposed scheme, and/or the implementation of mitigation measures.

**Table 3: Definitions of impact nature**

2.9.4.2 Positive impacts are not anticipated on this project.

### 2.9.5 Types of Impacts

2.9.5.1 Impacts may affect assets and/or the settings of assets, which are the relevant surroundings of an asset. Impacts upon occupied buildings are addressed in other, dedicated reports and report sections produced as part of the works proposal (to be assessed under the Landscape and Visual Impact section of the ES).

## 2.9.6 Duration of Impacts

2.9.6.1 Impacts can be short term (that is they can be limited to duration of the construction and reinstatement works) or long term. Both short- and long-term impacts are considered in this report (see section 5, below). Unless otherwise stated, all direct impacts discussed in this assessment are long-term.

## 2.9.7 Magnitude of Impact

2.9.7.1 The magnitude of impact is the degree of change that would be experienced by the cultural-heritage asset and its setting if the scheme were to be completed, compared with a “do-nothing” situation.

2.9.7.2 The magnitude of direct and indirect impacts upon each of the cultural-heritage assets located within the 1-km-wide study area assessed during this study have been assessed against the criteria set out in Table 4, below:

Magnitude of impact	Criteria used for establishing magnitude of impact
Major	Change to most or all archaeological materials or historic building elements such that the resource is totally altered. Comprehensive change to their settings. Change to most or all key historic-landscape elements, parcels or components; extreme visual effects; gross change of noise or change to sound quality and fundamental change to use or access such that the historic-landscape unit is totally altered.
Moderate	Change to many key archaeological materials or historic-building elements such that the resource is significantly modified. Considerable changes to setting that affect the character of the archaeological or built- heritage asset. Change to many key aspects of the historic landscape; noticeable differences in noise or sound quality or considerable changes to use or access, resulting in moderate changes to historic-landscape character.
Minor	Changes to some key archaeological materials or historic-building elements such that the archaeological or built-heritage asset is slightly, though more than negligibly, altered. Slight changes to their settings. Changes to some key historic-landscape elements; limited changes to noise levels or sound quality or slight changes to use or access, resulting in limited, though more than negligible, changes to historic-landscape character.
Negligible	Very minor changes to archaeological sites and monuments or historic-building elements or their settings. Very minor change to key historic-landscape elements; virtually unchanged visual effects; very slight change in noise levels or sound quality and very slight change to use or access, resulting in a very small change to historic-landscape character. As the name indicates, negligible impacts are so small that they can reasonably be excluded from further consideration.
No change	No change to archaeological, built-environment or historic-landscape assets.

**Table 4: Impact Magnitude Criteria**

## 2.9.8 Significance of Effects

2.9.8.1 The significance of effects upon each of the cultural-heritage assets located within the 1-km-wide study area was assessed by combining the value of the asset (assessed according to the criteria set out in Table 2, above) and the magnitude of impacts (assessed according to the criteria set out in Table 4, above).

2.9.8.2 The matrix comprising Table 5, below, was used when determining the significance of impacts:

<b>Value of Asset</b>	<b>Very High</b>	Neutral	Slight	Moderate	Large	Very Large
	<b>High</b>	Neutral	Slight	Moderate	Large	Large
	<b>Medium</b>	Neutral	Slight	Slight	Moderate	Moderate
	<b>Low</b>	Neutral	Slight	Slight	Slight	Slight
	<b>Negligible</b>	Neutral	Neutral	Slight	Slight	Slight
	<b>No change</b>	<b>Negligible</b>	<b>Minor</b>	<b>Moderate</b>	<b>Major</b>	
<b>Magnitude of Impact</b>						

**Table 5: Significance of effects matrix**

2.9.8.3 The significance of the impacts upon each of the affected cultural-heritage assets located within the study areas assessed are presented in section 5, below, and are summarised in Appendix 1.

## 3 Description of Proposed Flood Defence Improvement Areas

### 3.1 Location and Topography

3.1.1 The proposed improvements are located on the east coast of Lincolnshire between Cleethorpes and Mablethorpe, within the historic ‘Lincolnshire Marsh’, an irregular band of low-lying ground stretching along the coast south from the Humber Estuary. As the name implies, this area is made up of former wetlands created when sea levels rose significantly after the last ice age (c. 5500 BC) and then gradually receded over the subsequent millenniums.

3.1.2 The project area lies within the Lincolnshire Coast and Marshes Joint Character Area 42, a national landscape character area defined by the Countryside Commission, 1999.

3.1.3 The nearest villages to North Site are North Coates and Marshchapel, both located c. 3.2km to the west.

3.1.4 The nearest village to Central Site is North Somercotes, c. 1.5km to the south-west.

3.1.5 South Site lies immediately south of Saltfleet village.

3.1.6 The proposed embankment works are located on level ground below 10 AOD.

## **3.2 Solid Geology**

- 3.2.1 British Geological Survey mapping (1990) indicates that the solid geology throughout virtually the entire study area consists of Flamborough Chalk with Burnham Chalk present under the western half of South Site (see Figures 2-4).
- 3.2.2 The Flamborough Chalk Formation is the youngest part of the Chalk Group represented in Lincolnshire. It occurs only in the north-east coastal area where it is entirely concealed beneath Quaternary deposits. The formation is characterised by white chalk, softer than the underlying chalks, with frequent thin marl beds and negligible flint (BGS 2006).
- 3.2.3 The Burnham Chalk Formation forms some of the highest ground of the Wolds, but much of the outcrop is concealed beneath the thick Quaternary deposits of east Lincolnshire. It is characterised by hard, thinly bedded chalks with frequent tabular flints and discontinuous flint bands (BGS 2006).

## **3.3 Drift Geology**

### **3.3.1 North and Central Site**

- 3.3.1.1 British Geological Survey mapping (1990) indicates the presence of Marine and Estuarine Alluvium beneath North and Central Site. In these areas the alluvium is shown mostly as clay, silt or undifferentiated with small areas of sand, shingle or gravel also present. Coastal Blown Sand deposits are recorded on the seaward side of the embankments at North Site/Section 1 and Central Site (see Figures 2 & 3).
- 3.3.1.2 Borehole sampling (to 10m) carried out on behalf of the Environment Agency in 2010 confirmed the presence of Cohesive Marine Alluvium directly below the embankments at North and Central Site, except at the southern ends of North Site/Section 2 and Central Site where it was absent. The Cohesive Marine Alluvium varied in depth from 0.95 to 2.05m, with an average depth of c. 1.5m (Fugro 2010). Underlying this was Granular Marine Alluvium to the base of the sample; bands of Cohesive Marine Alluvium were recorded within the Granular Marine Alluvium at North Site. These variations probably indicate different depositional environments with cohesive materials being deposited in slack water areas such as lagoons and granular remains in open water or flowing channels (Black & Veatch 2010).
- 3.3.1.3 An archaeological watching brief was undertaken on geotechnical trial pits associated with the Donna Nook Managed Re-alignment Site (LAS 2008), just beyond the southern limits of the North site search area (Figure 6, Asset 130). Pits were excavated to a depth of 3.20m and remained in marine sediments. No post-glacial land surfaces were encountered.

3.3.1.4 The Alluviums at North and Central site generally contain low levels of organic material with some small but slightly richer deposits locally.

### 3.3.2 South Site

3.3.2.1 The drift geology at South Site varies along the length of the embankment. British Geological Survey mapping (1990) shows areas of Made Ground along the length of the embankment and beneath the Saltfleet Haven channel. Marine and Estuarine Alluvium is shown on the landward side and is shown as either being clay, silt or undifferentiated or as sand, shingle or gravel. Coastal Blown Sand deposits are shown at the eastern end of the embankment and Old Storm Beach deposits at the western end (see Figure 4).

3.3.2.2 Borehole sampling (to 10m) carried out on behalf of the Environment Agency in 2010 confirmed the presence of Granular Marine Alluvium beneath most of South Site but absent at the western end. No Old Storm Beach deposits were recorded.

3.3.2.3 Both boreholes produced evidence of locally organic sands with some richer deposits of black sand recorded at approximately 3m below the base of the made ground. Tests of the black sands showed an organic content of between 0.3 and 2.0% (Black & Veatch 2010).

## 3.4 Soils and Land Use

3.4.1 The landward side of the embankments is characterised by flat, open medium-scale agricultural land drained by ditches and dykes; there is a mixture of grazing and arable farming. The soils are categorized as loamy and clayey with naturally high groundwater ([www.landis.org.uk](http://www.landis.org.uk)).

3.4.2 The land to the east of the embankments is made up of a mixture of sandy beaches, dunes, saltmarsh, mudflats, ponds and creeks. There are National Nature Reserves at Donna Nook (TF429 998) and Saltfleetby-Theddlethorpe (TF 467 917) and the Humber Estuary is designated as a Special Protection Area, Special Area of Conservation, Site of Special Scientific Interest and Ramsar site (EA 2011).

3.4.3 Section 1 of North Site lies immediately east of the former North Coates RAF station, closed in 1990. The inter-tidal area at Central Site is host to the RAF Donna Nook practice bombing range.

## 4. Cultural-Heritage Background

### 4.1 Palaeolithic

- 4.1.1 The Palaeolithic or Old Stone Age encompasses the history of the tool-using genus *Homo* from its origin around 2.5 million years ago in Africa until the advent of Mesolithic culture at the end of the last ice age. The earliest evidence of hominid activity in Britain dates to about 700,000 BC, while the Mesolithic culture appears in the archaeological record in Britain by about 9,600BC.
- 4.1.2 The British Palaeolithic has traditionally been divided up into three typological phases or sub-periods, each defined by the predominant technique of stone-tool manufacture. The Lower Palaeolithic was characterised firstly by tools manufactured in the Clactonian tradition (principally simple bifacially worked core tools) and later by handaxes made in the Acheulian tradition. This typological phase was current in Britain from about 700,000 to around 200,000BC. It was then superseded (after a period of overlap) by a stone-tool tradition called the Mousterian, which was also characterised by handaxes and by tools fashioned from flakes of a predetermined shape and size. This typological phase defines the Middle Palaeolithic, which continued in existence until around 40,000BC. From then until the advent of the Mesolithic, a radically different lithic technology, comprising narrow blades struck from cores, was employed. This technology defined the Upper Palaeolithic.
- 4.1.3 The products of these lithic technologies are typically found within geological deposits that have a more or less secure relationship to past glacial and interglacial periods. Thus the British Lower Palaeolithic both preceded the Anglian Glaciation and was present during the succeeding Hoxnian Interglacial. The Middle Palaeolithic succeeded the following, Wolstonian Glaciation, existed throughout the Ipswichian Interglacial and came to an end during the final, Devensian Glaciation. The Upper Palaeolithic culture flourished during the last glaciation.
- 4.1.4 The landscape surrounding our study area was largely produced towards the end of the last ice age by the erosive movement of ice and meltwater and was subsequently buried by alluvial sediments. Any remains from this period are likely to be sealed beneath this alluvium but may be exposed in areas of active coastal erosion, outside of our study area.
- 4.1.5 Lincolnshire is considered to be at the northernmost limit of Palaeolithic occupation. Artefacts from this period are sparse and tend to be restricted to the higher ground to the west; some geologists believe that the tops of the High Wolds were elevated above the ice during the Devensian (Bee 2001). No Palaeolithic remains are recorded within the study area or nearby.

## 4.2 Mesolithic

- 4.2.1 The Mesolithic is the period of time between the end of the last Ice Age and the start of the Neolithic, *c.* 9,600 BC - 4000 BC. Mesolithic communities practiced a more-or-less itinerant hunter-gatherer lifestyle. Base camps might be established where resources were plentiful and reliable, perhaps on the coast where marine resources could be exploited. Such base camps may have accommodated fairly large groups of people from which smaller groups would have split off to exploit more distant resources in a seasonal round.
- 4.2.2 Stone-tool technology changed in step with the changing habitats exploited by Mesolithic communities, from broad-blade microlithic technologies in the earlier Mesolithic to narrow-blade, geometrical-microlithic technologies in the later Mesolithic. These would have been supplemented by organic materials that rarely survive in the archaeological record.
- 4.2.3 At the end of the last Ice Age the North Sea area was joined with the continent by the 'Doggerland', a large area of dry land which was utilised by Mesolithic hunter-gatherers. Recent research indicates a sea-level change in the Lincolnshire Marsh dating to *c.* 5500cal BC, signalled by the formation of peat deposits resulting from impeded freshwater run-off. This regional rise in sea-level is followed by a series of deposits representing periods of marine transgression and regression with sedimentation continuing into the late- or post-Roman period and perhaps on into the Middle Ages until the construction of sea-defences began (Ellis, S., M. Lillie & R. Van de Noort 2001).
- 4.2.4 Although the present day coastal area would have been at the edge of the Doggerland landmass, and might therefore contain evidence for early activity; it is likely that any such remains will be sealed beneath significant marine and estuarine alluvium deposits associated with the sea-level changes.
- 4.2.5 The Humber Wetlands Project identified a correlation between find concentrations of Mesolithic and early Neolithic date and contemporary wetland areas, probably indicating the importance of such habitats as a resource for these communities (Ellis, S., M. Lillie & R. Van de Noort 2001). These habitats would have been located inland from the present day coast, at the margins of the higher ground.
- 4.2.6 No Mesolithic remains are recorded within the study area or nearby.

## 4.3 Neolithic & Bronze Age

- 4.3.1 The Neolithic period is characterised by the shift from hunting and gathering to a more settled farming economy. Farming is believed to have developed in the county at an early date, probably no later than *c.* 4000BC (May 1993).

- 4.3.2 Evidence from the Early Neolithic is rarely encountered in the low-lying Lincolnshire Marshes. As with the Mesolithic, land surfaces from this period are likely to be sealed beneath later deposits meaning that whilst evidence from the Neolithic onwards can be seen further inland, few remains are found at the present day coastal fringe. No Neolithic remains are recorded in the study area or nearby.
- 4.3.2 Finds from the Later Neolithic and Bronze Age (*c.* 2500-700 BC) are more numerous across the Lincolnshire Marsh as a whole but are still sparse in the vicinity of the study areas. Research as part of the Humber Wetlands Project found that sites and finds from this period tended to be concentrated in extensive areas of dry land which did not develop into wetlands. It is not known if this apparent preference is actually the result of differential visibility of the archaeological record or whether it might reflect a diminished interest in the resources offered by the wetland areas and the increased importance of agriculture and the associated need to be close to free-draining land. The wetlands would have remained an important for hunting and stockbreeding but the settlements would have been located near the arable fields (Ellis, S., M. Lillie & R. Van de Noort 2001). The discovery of a barrow cemetery at Butterbump, located on a ‘peninsula’ of glacial till surrounded on three sides by wetland, suggests the latter may also have had a ritual significance.
- 4.3.4 Along the prehistoric coastline salt-production is widely recognized from the late Bronze Age onwards. A Late Bronze Age saltern was excavated at Tetney Lock in 1993, just over 3km west of North Site/Section 1, where it had been deeply buried by subsequent marine alluviation. It is likely that further buried sites exist elsewhere.
- 4.3.5 No Late Neolithic or Bronze Age remains are recorded within the study area or nearby.

## 4.4 Iron Age

- 4.4.1 Finds from the Iron Age (*c.* 700 BC - 43 AD) are more commonly found in the southern part of the Lincolnshire Marshes, particularly in the Ingoldmells area. Salterns are the most common site type and salt-making could have been a seasonal activity possibly linked to permanent settlement on the Lincolnshire Wolds.
- 4.4.2 A phase of marine transgression in the Iron Age may have made the continuation of salt-making impossible in those areas utilised in the Bronze Age. At Tetney no evidence of post-Bronze Age salt-making was identified although it is possible that activities moved further inland (Ellis, S., M. Lillie & R. Van de Noort 2001).
- 4.4.3 It is thought likely that settlements from this period would have been located on the drier land to the west, or on the well-drained chalklands of the Wolds. A single possible later prehistoric (4000 BC – 43 AD) enclosure earthwork has been identified by the National

Mapping Programme, just beyond the search area for North Site/Section 2 (Asset 153). However, the grid reference places it within the saltmarsh of the Fitties which suggests there is more likely to be either a location error or the misinterpretation of bombing activities.

4.4.4 No Iron Age records exist within the study area or nearby.

## **4.5 Roman & Early Medieval (Anglo-Saxon)**

4.5.1 As with the Iron Age, the majority of Roman period sites (c. 43 AD – 410 AD) are recorded in the south of the Lincolnshire Marshes and again relate to salt-making activities. The nearest Roman remains to our study area are six coins found just beyond the search area to the west of Southern Site (Asset 10); the context of the find is unknown. In-situ features have been identified at Marshchapel and a significant pottery scatter is recorded at Tetney but no sites are known locally.

4.5.2 The vast majority of the settlements present today can be found in the Domesday Book of 1066 and it is likely that some of these villages may have been seasonal settlements in the Early Medieval period, utilised for seasonal grazing and saltmaking.

4.5.3 Finds from the Early Medieval period are rare. The Humber Wetland Project identified only one such site at Marshchapel, to the south-west of North Site. This was a late Saxon salt-making site and the first substantial archaeological evidence for Saxon salt-working in Lincolnshire (Ellis, S., M. Lillie & R. Van de Noort 2001).

## **4.6 Medieval**

4.6.1 As mentioned previously, most of the place-names which we see today are referenced in the Domesday Book, attesting to the fact that the settlements were firmly established by this time.

4.6.2 The archaeological evidence for this period (1066-1540), however, is primarily concentrated within and around the extant villages. Traces of the Medieval field systems surrounding these villages can still be seen in the existing boundary alignments and, in some areas, by surviving ridge and furrow earthworks.

### **4.6.3 South Site**

4.6.3.1 Saltfleet is recorded in the Domesday Book as *Salfluet*, meaning '(place by) the salt stream' (Mills 1998). It was an important port during the Medieval period; Medieval ships were small and capable of entering shallow havens. Saltfleet was claimed as a Royal Port in 1281 and throughout the 14<sup>th</sup> century Scandinavian, Flemish and Hanseatic vessels traded along the Lincolnshire coast importing timber, cloth, stockfish and wine and exporting locally produced grain, cloth and wool (Pawley 1993a). A Flemish cargo vessel

is recorded as being stranded at Saltfleet Haven during a storm in 1353 (Asset 76). Unsurprisingly, salt would have been a significant export, supplied by the numerous salt-making sites along the coast.

- 4.6.3.2 By the 14<sup>th</sup> century Saltfleet also had a significant fishing fleet, sending large numbers of ships to the herring 'fares' off Scarborough and Yarmouth (Pawley 1993a). They would sail with cargoes of locally produced salt and return with salted herrings.
- 4.6.3.3 The port continued to develop into the 15<sup>th</sup> century but, like many of the smaller ports along this stretch of coastline, subsequently decreased in importance as the Haven gradually filled with silt and salt production declined as the salt marshes grew and the sea retreated. These shifts in the offshore marine deposits and changes in the nature of the inter-tidal zone mean we cannot be certain of the exact form of the haven, or how it would have been utilized, during this period. A natural inlet which may have been used as a landing place in the Medieval or post Medieval period has been identified to the south of the current alignment of the Haven as part of the Lincolnshire Rapid Coastal Zone Assessment (Asset 15).
- 4.6.3.4 The development of a storm beach in the 11<sup>th</sup> – 12<sup>th</sup> centuries had allowed the growth of a permanent settlement at Saltfleet (Heritage Lincolnshire 2010). The core of the Medieval settlement itself is located on the northern edge of our search area (Asset 90); it is unlikely that settlement would have extended much further south because of the marshy conditions. Remains from this period will be sealed below the current settlement although traces of possible Medieval to Late Medieval boundary earthworks are recorded on the western and eastern sides of the village (Assets 86 and 94).
- 4.6.3.5 The growth of the village in turn led to the drainage of the marsh and establishment of strip farming patterns inland. The strip farming was aligned perpendicular to drove and access roads, which probably date from the pre-storm beach landscape (Heritage Lincolnshire 2010). Remains of these ridge and furrow field systems are recorded to the south-west of the search area (Assets 2 & 12).
- 4.6.3.6 The Skidbrooke cum Saltfleet Tithe map from 1838 assigns the name 'Marsh Bank' (Asset 13) to the field boundary immediately north of the ridge and furrow earthworks at Saltfleet (Asset 12); it is also labelled as the line of the 'Bridle Road' to Skidbrooke. The Enclosure Award and Plan from the same year assigns the name 'South Marsh Bank'. The 1889 OS maps show a separate embankment on the seaward side of the drain, the latter now known as 'Saddleback Drain', with the field to the north-east labelled 'Great Marsh'; soilmarks representing at least one palaeochannel can be seen on Google Maps (<http://maps.google.co.uk>) winding across this field. It appears likely that this boundary marks the limits of the reclaimed land here during the Medieval period. The embankment

is still shown on the 1956 1:10,560 OS map but is not recorded on the 1972 1:2500 mapping.

4.6.3.7 Salt production in the Lincolnshire Marsh appears to have had a resurgence in the eleventh century AD (Van de Noort 2004). Extensive cropmarks and some surviving earthwork mounds can be seen following the course of the Medieval coastline between Humberston and Saltfleet. These cover a considerable width, reflecting the need for the saltmakers to move ever further east as the marshlands accumulated in order to obtain their raw material. Possible Medieval saltern earthworks are identified from aerial photographs just to the north-west of our search area at South Site (Asset 85) and within the study corridor itself (Asset 14).

#### **4.6.4 Central Site**

4.6.4.1 Somercotes (North and South) is recorded in the Domesday Book as *Summercotes*, meaning the place of summer huts. As with Saltfleet, the development of a storm beach in the 11th – 12th centuries allowed the growth of a permanent settlement (Heritage Lincolnshire 2010); prior to this the name suggests it would have been used only seasonally. North Somercotes, the nearest settlement foci to Central Site, is situated over 1.5km to the south-west, well beyond our search area. It has been suggested that the Norman sea dike or bank ran through the settlement indicating that the land seaward of this feature forms part of the post-Medieval reclamation landscape (Humber Field Archaeology 2008).

4.6.4.2 The current sea bank lies at the edge of an extensive area of post-Medieval reclamation and as such no remains from this period are recorded within the study area or nearby.

#### **4.6.5 North Site**

4.6.5.1 The villages of North Coates, Marshchapel and Grainthorpe lie *c.* 3km to the south-west of North Site. Grainthorpe appears in the Domesday Book, with North Coates recorded later in *c.* 1115 and Marshchapel in *c.* 1250. As with Central Site, it is suggested that the Norman sea dike or bank ran through the settlements and in 1595 the main street of Marshchapel is described as being the former sea-bank (Humber Field Archaeology 2008). The latter indicates that the majority of land on the seaward side of A1031, including our study area, was reclaimed during the post-Medieval period.

4.6.5.2 Small ports are associated with all three settlements but probably ceased trading by the late Middle Ages, either because their havens had silted up or because the larger vessels increasingly in use were not able to enter their ports (Van de Noort 2004). Earthwork remains of Grainthorpe's port, Suine Haven, are visible adjacent to Sea Farm *c.* 1.5km inland (Start 1993). Five Medieval shipwrecks are recorded off the shore of the Marshchapel and Grainthorpe coasts and one off Northcotes Point (Assets 146-150).

- 4.6.5.3 The Grainthorpe and Marshchapel Outmarsh Enclosure Plan of 1858 show the Marshchapel Haven feeding into the Grainthorpe Haven via artificially straightened channels, both of which are accessed via the Fitties (Assets 133 & 135). A 1775 ‘Map of Tetney Haven and North Coates’ shows North Coates Haven winding parallel to Tetney Haven across what is now the Tetney Marshes Nature Reserve; it is also shown on the 1842 Tithe map for North Coates passing beneath what are now the privately owned residential and business properties on the former RAF airfield (Asset 181). How closely these courses echo their Medieval predecessors are unknown but there is a raised potential for the discovery of remains relating to their use for transportation to the west of our study area.
- 4.6.5.4 A band of saltern cropmarks can be seen between the A1031 and subsequent post-Medieval coast defences. These run NW-SE approximately 1.5km to the south-west of the current sea embankment (Asset 156). These probably represent exploitation of the Medieval and early post-Medieval salt marshes on the seaward side of the Norman sea bank.
- 4.6.5.5 The current sea bank lies entirely within an area of post-Medieval reclamation and no Medieval remains are recorded in the vicinity.

## **4.7 Post-Medieval and Modern**

- 4.7.1 The dominant feature of the Post-Medieval period (1540-1901 AD) is the extensive drainage and reclamation of the land adjacent to all three sites and the construction of a series of advancing sea defences which culminated in the embankments we see today.
- 4.7.2 In more recent times, preparations for possible German invasion in the Second World War have left their mark in the form of military structures such as pillboxes and gun emplacements. The coastal embankments themselves formed a significant part of the coastal defence plan and in some locations structures were built directly on top of, or set into, the banks.

### **4.7.3 South Site**

- 4.7.3.1 A survey of the port in 1565 showed that the haven had been totally warped up for the preceding twenty years and although it appears to have been put in order by the 1570’s it is recorded as out of use again by *c.* 1600. Extensive work to re-open the port was undertaken in 1648 (Pawley 1993b). Although trade had not ceased it had reduced significantly in volume and variety. A small amount of salt was still being produced around Marshchapel but the Lincolnshire industry is thought to have come to an end around the early 1600s (Healey 1993); it was the transport of coal for local consumption from Newcastle, and later Sunderland, which dominated the port. The Skidbrooke cum

Saltfleet Enclosure map of 1838 assigns the name ‘The Coal Green’ to the area just north of the wharves on the Haven giving an indication of the large quantity of coal passing through the port; the coastal port books record almost no other entries (Pawley 1993b). A buoyed channel, leading from deeper water into the haven, is recorded on the 1<sup>st</sup> edition OS map (Asset 80).

- 4.7.3.2 As befits a busy shipping route, several references relating to the presence of a coastguard station are present on early OS maps and the number of post-Medieval and modern shipwrecks linked to this search area, 58 in total, attest to the hazardous nature of the waters around the haven. On the 1889 OS map there is a label for a ‘Coastguard Station’ (Asset 82) opposite Coastguard Cottage which would have provided accommodation for the coastguards’ families in this relatively remote spot. A ‘Rocket House’ (Asset 83) is recorded a short distance to the north and a ‘post’ (Asset 211) is present beside the Great Eau near where it feeds into Saltfleet Haven. This post is referred to as a ‘Rocket Post’ on the 1906 edition. Lines could be attached to a rocket and fired out to vessels in distress. These were in regular use by 1825 and were an important part of the Coastguards equipment up until the last few years (<http://www.donnanookcoastguard.org.uk/page4.html>). The rockets themselves would probably have been stored at the ‘Rocket House’, a safe distance from the cottages. It is not known if the rocket post marks the location from where the rockets might have been fired into the Haven or whether, as is recorded in other parts of the country, it was used to simulate the mast of a ship in training rescue teams in the use of rocket apparatus. A ‘Watch Box’ (Asset 212) is also recorded on top of the sea wall, to the north of Saltfleet Haven.
- 4.7.3.3 Two areas of regularly arranged wooden stakes of unknown function have been recorded in the inter-tidal zone (Assets 16 and 77). These were identified during a walk over survey as part of the Yorkshire & Lincolnshire Rapid Coastal Zone Assessment and have been assigned a probable Post-Medieval or Early-Modern date.
- 4.7.3.4 As the value of Saltfleet as a commercial port declined there was a brief increase in its popularity as a sea-bathing resort during the second half of the 18<sup>th</sup> Century. The New Inn at Saltfleet (Asset 89) was a popular destination for sea-bathers but went out of favour when the marsh frontage was enclosed in 1854 (Pawley 1993b).
- 4.7.3.5 The Skidbrooke cum Saltfleet tithe map from 1838 covers the area north of Gowts Farm and Saltfleet Haven prior to this enclosure. This shows the extent of the reclaimed land at that time, with most of the land east of the Main Road shown as open and undrained. To the north of the original Medieval settlement this probably consisted of a band of sand dunes between the land and the intertidal saltmarsh or sandflats to the east; current land-use (dunes running north-west from Toby’s Hill) and the present day road names

‘Warren Road’, west of the dunes, and ‘Marsh Lane’, east of the dunes, support this interpretation. Immediately north of the Haven it appears that the marshland and/or sandflats extended further inland; unfortunately whilst the map shows two distinct bands of land-use, interpreted here as dunes and marshland, they are not listed in the apportionment. The Skidbrooke cum Saltfleet Enclosure map of the same year labels the land immediately east of the windmill, Asset 84, as ‘saltmarsh’, with ‘sandhills’ below what is now the caravan park. The approximate limit of the settlement and reclaimed ground as shown on the 1838 Tithe map is shown on Figure 9 as Asset 91 and the extent of the dunes to the north as Asset 99.

- 4.7.3.6 Both Tithe maps show only a small number of dwellings in the vicinity of the Haven itself, the majority of settlement still being centred on the original Medieval core to the north. The 1841 map shows only a single dwelling between the Main Road/Greyfleet Bank and the South Creek Drain and the 1838 map shows only the windmill (Asset 84) to the east of Main Road up to Mill lane. Gowts Farm (listed barn, Asset 17) is present as is at least one building in the area of the wharves where the channel divides. The majority of the present day dwellings in the vicinity of the Haven are 20<sup>th</sup> century in date, first appearing on 1951 and subsequent OS maps.
- 4.7.3.7 Six Grade II listed structures fall within the search area. These include a late 18<sup>th</sup> century barn at Gowts Farm (Asset 17), a late 18<sup>th</sup> century windmill (Asset 84), a late 17<sup>th</sup> century Manor House (Asset 87), an early 19<sup>th</sup> century chapel (Asset 88), a 17<sup>th</sup> century Inn (Asset 89) and a late 19<sup>th</sup> century water pump (Asset 92). All bar the barn and the windmill are located close to the Medieval core of the village; only the barn lies in close proximity to the proposed flood defence improvements
- 4.7.3.8 To the south of the Haven the St Clement Tithe map from 1841 suggests that the current alignment of the Great Eau between Saltfleet Haven and Mallard Ings was engineered after that date but before the 1889 OS survey. In the 1841 survey the main channel still curves to the west of Gowts Farm. In 1841 land use to either side of the track between Gowts Farm and the dunes is recorded as wood plantation and grassland with warrens/grassland extending along the coastline to the south.
- 4.7.3.9 OS maps show that by 1889 the current sea wall had been erected and the intermediate ground drained north of the Saltfleet Haven; Pawsey dates the enclosure of the marsh to 1854. What now lies beneath the extensive caravan and holiday park to the east and north-east of Saltfleet was a series of rectilinear fields, a small number of which survive immediately north of the Haven and form the proposed borrow areas for the embankment improvement works.
- 4.7.3.10 A rough stone built causeway with a possible modern tarmac top surface is recorded beyond the limits of the existing sea bank but on the same alignment as the

current Haven Bank track (Asset 79). This was initially identified from the 1st edition Ordnance Survey map.

4.7.3.11 The next significant phase of activity dates to the mid 20<sup>th</sup> century and the construction of extensive Second World War coastal defences. Following the defeat at Dunkirk at the end of May 1940, invasion by Germany appeared imminent and defences were quickly erected along the East Coast with the aim of preventing the enemy landing by sea. The coastal defences were made up of fixed defences and emergency batteries, with defences consisting of weapon emplacements and anti-tank obstacles, as well as minefields, anti-tank scaffolding, anti-tank ditches, fire trenches, weapon pits, and other earthworks, and barbed wire entanglements (Foot 2006). The structures which survive today represent only a small fraction of the defences which would have been constructed along the seafront.

4.7.3.12 The search area at South Site includes an extant three-bay Lincolnshire-type pillbox to the south of the Haven (Asset 9), a former minefield near Mallard Ings (Asset 8), a probable concrete obstruction block on the Haven embankment itself (Asset 78), cropmark evidence for a possible practice firing range and slit trenches to the north-east of Saltfleet (Asset 95) as well as various enclosure cropmarks and earthworks which may date to this period (Assets 6, 7, 11, 93, 96, 97). The remains of a possible former pillbox (Asset 81) were also recorded during the site visit on the northern bank of the Saltfleet Haven, between the track and the channel itself. These consist of traces of wall footings for a concrete structure with internal divisions, measuring approximately 2m by 6m; the location would have provided a clear view of shipping or landing craft attempting to access the Haven.

4.7.3.13 Further pillboxes and anti-tank defences are recorded within close proximity of the search area (Assets 3, 4, 7 & 100), mostly to the south in the area of Sea View Farm and Rimac where a group of particularly coherent and well preserved structures were selected for more in depth study as part of the selective Defence Areas project arising out of the Defence of Britain project (Saltfleetby Coastal Defence area).

#### **4.7.4 Central Site**

4.7.4.1 The area to the west of Central Site was subject to planned enclosure indicating reclamation in the 18<sup>th</sup>-19<sup>th</sup> centuries. Archive records and surviving earthworks indicate at least two successive stretches of sea bank running roughly parallel to the existing embankment. A 'Map of the Sea bank and part of the Out Marsh, in the Parish of North Somercotes' dating to 1836 shows an early bank which is still clearly discernible in the alignment of the present-day field drains (see Asset 121). The same alignment is also recorded on the 1842 North Somercotes Enclosure map. The land situated between this and the present day sea bank is described as on the 1836 map as 'Outmarsh' with the

‘Sandhaile Flat’ beyond. Traces of this earlier embankment are recorded on the 1906 Ordnance Survey map and were recorded as cropmarks and earthworks as part of the National Mapping Programme (Asset 104).

- 4.7.4.2 A second sea embankment is recorded on the 1906 OS maps and this too can be traced, to a lesser extent, in the surviving field divisions (Asset 109). The land situated between this second embankment and the present day sea bank is described as ‘New East Marsh’ with Samphire beds beyond. RAF photographs from 1940 show a broad bank or sea wall, visible as an earthwork over a distance of *c.* 1km and utilised during WWII to accommodate military structures (Asset 126). Although the grid reference puts the latter slightly west of the OS recorded bank, these may be the same feature. During the site visit a small stretch of very faint earthwork was visible towards the northern end but no other remains were visible.
- 4.7.4.3 There appears to have been little change in the search area since the final phase of reclamation; the basic layout of the field boundaries remains the same with fairly minimal merging. The major subsequent development along this stretch of the sea bank relates to the construction of Second World War coastal defences. RAF aerial photographs from the 1940s record numerous military sites within the search area including a minefield, Nissen huts, buildings (including possible pillboxes), targets, weapon pits, trenches and numerous barbed wire obstacles (Assets 110, 112-114, 116-117 and 122-125), many associated with the former RAF Donna Nook airfield (Asset 120) to the north-west. This site was used as a bombing range and relief landing ground for RAF North Coates from 1927. From June 1940 it acted as a decoy airfield for RAF North Coates but was converted to a genuine satellite airfield in January 1941, continuing in use until 1945. The site was also used as a German prisoner of war camp (Asset 119). A few buildings and a section of perimeter track/runway survive.
- 4.7.4.4 RAF Donna Nook is now the name for the operational NATO bombing range on the sandflats to the east.
- 4.7.4.5 The majority of the surviving Second World War structures are pillboxes set in the dunes to the north-east; an irregular band of saltmarsh separates the embankment from the dunes and so they were not inspected as part of the site visit (Assets 107-108, 111, 115 & 118). Two possible concrete obstructions (or demolition material) were recorded during the site visit towards the southern end of the search area (Asset 105). The latter consisted of irregular blocks of concrete at the base of the seaward bank, each roughly 2m in diameter and situated only a few metres apart. The only surviving remains which fall within the proposed working area are a group of anti-tank blocks (Asset 106, Plate 1) which once closed-off a track leading from the embankment to the A1031, south of

North Somercotes; the majority of these blocks have subsequently been pushed to one side of the track.

4.7.4.6 Further pillboxes and a radar station and gun emplacement lie just beyond the search area to the north (Assets 127-128) and south (Assets 101-102).

#### **4.7.5 North Site**

4.7.5.1 The course of an historic sea bank (Asset 157) is visible within the extant alignment of field boundaries and a short length of road, and further north as soilmarks and possible earthworks. On the Grainthorpe & Marshchapel Outmarsh enclosure map of 1858 this is labelled 'Old Seabank' and can be traced nearly 1.5km inshore from the current coastline. It meets the present day coast at Horse Shoe Point and appears to be the progenitor of the extant embankment at North Site/Section 1. Previous studies have assigned a date of 1770 to this section (Grady 1998).

4.7.5.2 The 1858 North Cotes Enclosure Plan shows this feature continuing along the same line as the current embankment for a short distance then swinging west, where it is now defined by a change in topsoil colour, across the former airfield (Asset 165), before finally turning north-west towards Tetney Haven; possible earthwork remains are visible beyond the western end of the extant runway on Google maps (Asset 161, not captured on figures). The land to the north of the sea bank is labelled 'Fitties or Outmarsh' with the bank itself being called 'North Coates Old Seabank'. A further stretch is shown on the edge of the North Cotes tithe map of 1842 (Asset 177). A short length of the 'Old Seabank' is recorded as an embankment on the 1907 OS map immediately south of Horse Shoe Point but was not seen during the site visit.

4.7.5.3 The North Coates tithe map of 1842 illustrates the course of the North Coates Haven and the extensive 'fitties' north of the 'Old Seabank'. The 1775 'Map of Tetney Haven and North Coates' also records a large open area described as 'North Coates Fittys'. These fitties extend over an area very similar to that which eventually became RAF North Coates and are shown as being bordered on the seaward side by 'Sea Sands'. On the 1779 Tetney Enclosure Award the equivalent area falling within this parish is recorded as part of the sea (Asset 208). The enclosure maps of 1858 show what look like the beginning of tracks or road into the marshland but no further detail is given – presumably because the area was not considered suitable for enclosure at that time. By 1907 the OS map shows the existing sea embankment in place along the modern seafront and continuing west from Northcoates Point (Asset 187) to join up with the 'Old Sea Bank' shown on the 1842 map (Asset 177). The reclamation of the land to the west of Northcoates Point, directly south of the Tetney Nature Reserve, post-dates the 1907 OS map, where it is labelled 'mud'.

- 4.7.5.4 While the author has been unable to find any early maps which show the area in detail, it is interesting to note that both the ‘Survey of North Coates Marsh’ dating to 1796 and the North Cotes enclosure map of 1858 appear to show a continuation of some type of track to the north of Horseshoe point which may follow a similar alignment to the extant embankment. Only a short length of the feature is illustrated but it suggests that the current bank follows the line of an earlier route seaward of the marshland, along the edge of the ‘Sea Sands’. This track may have taken advantage of a natural sandbank.
- 4.7.5.5 The Grainthorpe & Marshchapel Outmarsh 1858 enclosure plan includes the present day sea bank to the south of Horse Shoe point (North Site/Section 2) (Asset 137), describing it as ‘New Sea Embankment’. This is illustrated running south-east until it joins the line of ‘Mr Pye’s New Bank’. Henry Pye reclaimed a large area of the Grainthorpe and North Somercotes fitties in 1843 and presumably the latter formed part of those works. Other relict embankments are visible to the south of the search area (Assets 131 & 134).
- 4.7.5.6 Numerous shipwrecks are associated with this stretch of the coastline although no exact grid references are known. These include seven wrecks in the Marshchapel and Grainthorpe Haven area (Assets 139-145), three off Horse Shoe Point (Assets 162-164) and ten off Northcotes Point (Assets 192-201). A former coastguard station is recorded on the 1907 Ordnance Survey map near Horse Shoe Point (Asset 170) but no trace of any surviving structure was visible during the site visit.
- 4.7.5.7 As with Central Site, the most significant post-reclamation development relates to military activity. At the northern end of the search area are the remains of RAF North Coates, a former military airfield used in both World Wars (Asset 174). After the Second World War the station was put on Care and Maintenance but in 1957 it was re-opened as a base for surface to air missiles. It was again put on Care and Maintenance between 1970 and 1976 before once more re-opening as a missile base and radar station. In 1990, following the end of the Cold War, the site was de-commissioned and sold off (Turner, 2003). A site visit in 2002 (Asset 176) found buildings being removed and none could be seen in the vicinity of the embankment during the site visit. Eighteen plane crash sites are linked to the station but their exact locations are not recorded (Asset 203). Several soil marks and earthworks indicative of bomb craters are also recorded (Assets 151, 154 & 186).
- 4.7.5.8 RAF aerial photographs from the 1940s again show numerous defences and structures, especially in the vicinity of the airfield itself, the majority of which no longer survive. The bulk of these consist of buildings, including possible pillboxes, and barbed-wire defences (Assets 132, 136, 155, 158, 160, 171, 180, 183-184, 188, 204 and 209). Unlike Central Site the fixed defences at North Site are focussed mostly on the sea bank itself, with structures built into the sides of the bank and sometimes passing through it via tunnels.

The aerial photographs also record structures straddling the bank but none, bar the observation point (Asset 169, Plates 2-5), survive in-situ on the crest; two dumps of demolition material (Assets 152 & 168, Plates 5 & 6) were recorded during the site visit which may represent remains of such structures which have been pushed down the landward bank.

4.7.5.9 The site visit was able to confirm the survival of several features in close proximity to the embankments, as well as seven potentially new features, or aspects of known features, which were previously unrecorded. The latter include a large concrete block of unknown function adjacent to Grainthorpe haven (Asset 138, Plate 7), a causeway and associated concrete structure (Asset 172-173), a possible pillbox (Asset 178, Plate 8), a collapsed rectangular structure of unknown function (Asset 182, Plate 9), the remains of a ‘turret’ style defensive structure (Asset 190, Plate 10) and the entrance tunnel access for pillbox Asset 207 (Asset 206). A further four extant pillboxes are recorded in the study area but lie beyond the area covered by the site visit and so are unconfirmed (Assets 175, 179, 185 & 205).

4.7.5.10 Of the pre-recorded assets visited, most were in a fair or good condition. These included a possible infantry blockhouse or pillbox (Asset 167, Plates 11-13), a coastal observation point (Asset 169, Plates 2-5), a 20<sup>th</sup> century causeway and associated rubble (Assets 188-189 & 191) and a pillbox (Asset 207, Plate 14). Further details can be found in the gazetteer and, where impacted by the development, in Section 5.

## **4.8 Historic Landscape**

4.8.1 The Lincolnshire Historic Landscape Characterisation project has completed the mapping of our study area but the data has yet to be interpreted and no results have been published.

4.8.2 The Lincolnshire Coastal Grazing Marshes Project (Heritage Lincolnshire 2010) has classified the wider area as ‘Ancient Enclosed Marshland’ but with evidence of planned enclosure, indicating 18<sup>th</sup>-19<sup>th</sup> century marshland reclamation, in our search area. The latter is particularly evident at North and Central Site

## **4.9 Previous Archaeological Work within the Study Area**

4.9.1 This area of Lincolnshire has been the subject of several in-depth studies looking at the landscape and its use from prehistory onwards. As is often the case in rural areas, there is very little in the way of fieldwork. A summary of the principal works over the last decade follows, ordered from the most recently published and working backwards.

- 4.9.2 A Heritage Landscape Character Assessment was commissioned in 2010 across the Lincolnshire Coastal Grazing Marshes. The project was financed by the Heritage Lottery Fund and carried out by Heritage Lincolnshire on behalf of Lincolnshire County Council. Three core project areas were identified, one of which included Saltfleet. The study included a review of the heritage of the target areas set within the context of the wider landscape, together with assessment of the condition of, and access to, certain heritage assets and community based research on perceptions and memories of the Grazing Marshes (Heritage Lincolnshire 2010).
- 4.9.3 An archaeological watching brief was undertaken on geotechnical trial pits associated with the Donna Nook Managed Re-alignment Site (LAS 2008), just beyond the southern limits of the North site search area (Figure 6, Asset 130). Pits were excavated to a depth of 3.20m and remained in marine sediments. No post-glacial land surfaces were encountered.
- 4.9.4 This area formed part of the Rapid Coastal Zone Assessment (RCZA) undertaken by Humber Field Archaeology (HFA) on behalf of English Heritage, in order to assess the archaeological potential of the coast between Whitby, North Yorkshire and the Norfolk border. Survey work between April 2006 and May 2007 covered the coastal sector between Flamborough Head and Donna Nook (HFA 2008) and further surveys between July and October 2007 covered the coastal sector between Donna Nook and Gibraltar Point (HFA 2007).

The survey covered the extensive intertidal zone and the coastal hinterland from high tide level for a distance of up to 1km inland. The aim of the project was ‘to establish a more comprehensive and reliable database assessment of the range and scope of the archaeological resource than is currently available.’

- 4.9.5 A site visit to the former RAF North Coates missile site was undertaken in 2002 and found that the majority of the structures were in the process of being demolished (Turner 2003).
- 4.9.6 A survey of the Lincolnshire Marsh was undertaken between 1999 and 2000 as part of the broader Humber Wetlands studies. The survey included field walking, dyke survey, coring, geophysical survey, excavation and the study of aerial photographs. The survey found 76 finds concentrations and datable find spots, plus a further 173 undated find spots, mostly in the area of the southern marsh but with significant Roman and Anglo-Saxon finds in the Marshchapel area (Ellis, S., M. Lillie & R. Van de Noort 2001).
- 4.9.7 The Defence of Britain Project, carried out between 1995 and 2001, focused on anti-invasion defences of the 20<sup>th</sup> century with the aim of informing heritage agencies at both a local and regional level with a view to the preservation of surviving structures. The

Defence of Britain Project was administered by the Council for British Archaeology and funded by the Department of National Heritage and the Heritage Lottery Fund.

Building on this foundation, further study was undertaken as part of the Defence Areas Project. Carried out between April 2002 and June 2004, this looked in more detail at anti-invasion defence works that form a coherent and legible grouping. The purpose of this work was to promote people's understanding and enjoyment of these defence landscapes and to ensure greater recognition of the value of these well-preserved landscapes and the need to conserve the components they include. Some of the surviving components within the landscapes will be recommended for statutory protection. The results of this work have been published as a monograph (Foot, W. 2006) and include the military coastal defences at Saltfleetby.

## **5 Description of and Assessment of Impacts upon Known Cultural-Heritage Assets**

### **5.1 Introduction**

- 5.1.1 Cultural-heritage assets impacted by the proposed development are presented in this section, in order of their perceived sensitivity, from Very High to Negligible, and the long-term impacts upon them are assessed. This information is also presented in order of asset reference number, in the Gazetteer of Cultural-Heritage Assets (Appendix 1).
- 5.1.2 In the case of World War Two military structures where it has not been possible to access the site and their condition has not been noted within the original record, an assumption has been made that preservation is good. All the sites which will be impacted by this development were visited.
- 5.1.3 Where reference has been made to the wider archive database produced by the Defence of Britain project it should be noted that these records are not comprehensive and the wide variation in pillbox form can, if the exact type of monument in question is unknown, make comparative searches unreliable.
- 5.1.4 There are numerous records for shipwrecks across all three sites and for airplane crashes in the area of North Site. None of these records includes a detailed grid reference and their precise locations are unknown. Because the probability of encountering any such remains is extremely low, it has been decided to assign them a 'neutral' impact in Appendix 1.

### **5.2 Cultural-Heritage Assets of Very-High Value**

- 5.2.1 There are no cultural-heritage assets of very high (international) value within the study area.

### 5.3 Cultural-Heritage Assets of High Value

5.3.1 There are no cultural-heritage assets of high (national) value within the study area.

### 5.4 Cultural-Heritage Assets of Medium Value

5.4.1 There are twenty cultural-heritage assets judged to be of medium (regional) value within the study area (ten further sites have been plotted on the figures but fall outside the 1km corridor). Of those sites within the study corridor, thirteen are World War Two military structures which survive in good condition, five are Grade II listed buildings, one is a Grade II listed pump and one is the Medieval village core of Saltfleet.

Of these twenty assets, five will be impacted upon by the development. Four of the sites are military structures located within North Site and will be directly impacted. The fifth relates to an alteration in the setting of a listed building at South Site. Details are as follows:

#### 5.4.2 South Site

5.4.2.1 **Asset 17** (Figures 9 & 10, TF 545616 393312).

**Data source reference information:** NMR 1506742, LB UID:195510, HER: MLI192960

**Description:** A Grade II listed barn at Gouts Farm dating from the late 18th century. Constructed of brown brick with a pantile roof and brick coped and tumbled gables, two storeys high. Gouts Farmhouse is not of listable quality.

**Impacts:** The asset lies approximately 60m SSW of the track heading south-west from the bridge across Mar Dike Drain from Main Road. To the west of the property is the Mar Dike, with the Main Road and modern housing beyond; to the east there is rough grassland with the Great Eau drain approximately 250m distant.

The current proposal is to create a new embankment along the line of the existing track from Main Road. The proposed dimensions of the embankment are not known at present but it is likely to interrupt the view to and from the north-east. However, the embankment itself will not be out of character with the surrounding landscape features and the long-term impact on the setting is not judged to be major.

This impact will be assessed in greater detail under the Landscape and Visual Impact section of the ES.

Therefore:

**Asset Value:** Medium

**Magnitude of Impact:** Minor

**Significance of Impact:** Slight.

### 5.4.3 North Site

#### 5.4.3.1 Asset 167 (Figure 6, Plates 11-13, TA 538119 401863).

**Data source reference information:** NMR: 1418134, HER: MLI43252, DoB: S0002069

**Description:** An extant World War Two concrete and brick structure is located on the landward side of the embankment, within the curve of the bank to the rear of the Horse Shoe Point car park. This building has been described in the records as both a pillbox and an infantry post but may be a variant described as an ‘infantry blockhouse’. The author was unable to gain direct access to the building as it is situated on private land.

The structure has a door at each end, each with a half height blast wall, both with adjacent embrasures. Three further embrasures face inland and a hook is present above each one.

A search of the Defence of Britain project database reveals no extant infantry posts in Lincolnshire, North-East Lincolnshire or North Lincolnshire or pillboxes of a similar build or material within the condition category ‘Good’ or ‘Fair’ (88 in total). In Mike Osborne’s book ‘Pillboxes of Britain and Ireland’, however, he states that nine or ten examples of ‘infantry blockhouses’ exist on the Lincolnshire coast. These usually consist of buildings with three loopholes in each long side, a loophole and doorway in each end and with an open mortar/LAA pit attached to a low, L-shaped blast-wall outside each door (Osborne 2008). The latter pit could not be seen from the embankment but traces may be hidden in the long grass. This is the nearest parallel the author has been able to find.

The Defence of Britain project records the building as being in good condition but photographs taken with a zoom lens suggest it may only be fair, with some of the exterior brickwork in a poor state of repair.

**Impacts:** The asset currently lies within the corner of an arable field, on the landward side of the existing drain which lies at the toe of the current embankment. The proposed development would see the structure lying between the extended landward toe of the embankment and the seaward side of the new drainage channel. The latter would extend to the very edge of the structure.

The current proposal is to remove the pillbox, presumably because it would potentially de-stabilise the edge of the new channel and cause ongoing problems with maintenance of the same. It would also be a significant physical obstruction during construction.

Therefore:

***Asset Value:*** Medium

***Magnitude of Impact:*** Major (assuming removal)

***Significance of Impact:*** Moderate.

#### 5.4.3.2 **Asset 169** (Figure 6, Plates 2-5, TA 538104 401933).

***Data source reference information:*** NMR: 1418136, HER: MLI43252, DoB: S0002071

***Description:*** An extant World War Two coastal observation post is located on the seaward edge of the embankment crest, near Horse Shoe Point. The above ground section consists of a square concrete box with horizontal slits on each side. Access is gained via a tunnel which is set into the landward side of the bank. The access point was seen to be almost entirely silted up during the site visit with only the upper lintel and door frame visible (see Plate 2 for access point). There is a spread of structural debris on the seaward side of the embankment, below the observation point, but its origin is unknown. The structure survives in fair condition.

A search of the Defence of Britain project database reveals only one similar description in Lincolnshire for a coastal observation point at Skegness (DoB Ref: S0005153). The latter reference notes the existence of another at Tetney but this is listed as a pillbox and is attached to a Stanton type shelter (DoB Ref: S0002070). About half a dozen square observation points associated with Ruck pillboxes/Stanton shelters survive on the Lincolnshire coast (Osborne 2008) but the author has found only the one additional reference, mentioned above, for stand-alone observation posts accessed by tunnels.

***Impacts:*** The above ground component currently occupies a prominent position on the embankment whilst the entrance is barely visible and inaccessible. The proposed development includes the removal of the observation box and the burial of the access tunnel and entranceway beneath the raised embankment and extended landward toe.

The stripping of the topsoil in advance of the improvement works will reveal more of the access tunnel opening; it should be possible to carry this out in a sensitive manner so as not to damage any below-ground remains. The long-term effects of burial on this type of material is unknown but what little could be seen of the surviving structure suggests it is robust.

Therefore:

**Asset Value:** Medium

**Magnitude of Impact:** Major (assuming observation box removed)

**Significance of Impact:** Moderate.

#### 5.4.3.3 Assets 206 and 207 (Figure 5, Plate 14, TA 536982 403527 & 536985 403535).

**Data source reference information:** NMR: 1406839, DoB: S0006939

**Description:** Part of a concrete door lintel and upper frame were recorded on the landward side of the embankment, immediately opposite World War Two pillbox Asset 207. This doorway appears to be an entrance to an access tunnel for the latter pillbox which is set into the seaward side of the embankment; further investigation would be required to confirm this.

The access point is almost entirely obscured by soil creep but appears to be in good condition. A small amount of demolition rubble, from an unknown source, is present down-slope.

The pillbox and tunnel may have been constructed between 1940-1941 and acted as both part of the airfield's ground defences and as part of the local Lincolnshire Coastal anti-invasion defences. The pillbox occupies a prominent position just off the edge of the crest and is in good condition. Single gun embrasures are visible on the seaward and northern side of the pillbox; none was visible on the southern side but it may have been concealed by soil build up. A possible open annex may exist at the rear; further investigation would be required to confirm this.

The records do not note the exact typology of the pillbox and it is not, therefore, possible to confidently comment on its rarity or otherwise. At least two Type 23 pillboxes (Assets 185 & 205), however, are recorded close by on the northern perimeter of the airfield and it is possible that this is a contemporary variant. Type 23 pillboxes are generally rectangular in plan, essentially consisting of two squares, one of which is roofed and the other open, with embrasures in each of the available sides of the covered section. The embrasures are suitable for rifles or light machine guns. The open section was for light anti-aircraft defence. Usually, there is no ground level entrance, to get in one had to climb over the wall into the open section and then pass through a door to the covered section ([http://en.wikipedia.org/wiki/British\\_hardened\\_field\\_defences\\_of\\_World\\_War\\_II](http://en.wikipedia.org/wiki/British_hardened_field_defences_of_World_War_II)).

In Mike Osborne's book 'Pillboxes of Britain and Ireland', he states that the Type 23 is quite a common design (Osborne 2008) and a search of the Defence of Britain database

produces 42 records for extant examples in Lincolnshire however none are recorded as being accessed via a tunnel.

**Impacts:** It is proposed that both the pillbox and tunnel will be demolished and the embankment reconstructed.

Therefore:

**Asset Value:** Medium

**Magnitude of Impact:** Major

**Significance of Impact:** Moderate.

## 5.5 Cultural-Heritage Assets of Low Value

5.5.1 All three sites have extant embankments which will be impacted by the proposed improvements, all of which are considered of local value only. Given their late dates and ubiquitous nature, however, it has not been felt necessary to individually assess the impact of the development on these features. Bar a short stretch of embankment in the area of Horse Shoe Point (North Site), where Asset 157/165 is thought to date to the late 18<sup>th</sup> century, all the extant embankments have been shown to be 19<sup>th</sup> century in date (See section 4 for details). Collectively the impact is considered to be minor and the significance of impact to be slight.

5.5.2 There are 29 further cultural-heritage assets, excluding the extant embankments mentioned in 5.5.1, judged to be of low (local) value within the study area (eight additional sites have been plotted on the figures but falls outside the 1km corridor). The majority of the sites within the study area relate to confirmed or potential World War Two military sites and structures which survive in poor condition (15 in total) or post-medieval sea bank defences (six in total). Three relate to historic land-use and natural pre-reclamation features such as havens and sand dunes, two to post-Medieval or modern wooden stakes recorded in the inter-tidal zone at Saltfleet, one to a possible Medieval landing place in the Saltfleet marsh and another to a possible Medieval boundary ditch in the village of Saltfleet.

Of these 29 assets, nine will be physically impacted upon by the development. Details are as follows:

### 5.5.3 South Site

#### 5.5.3.1 Asset 81 (Figures 9 & 10, TF 545650 393507)

**Data source reference information:** Site visit only

**Description:** The outline foundations of a small rectangular structure were noted on the grassed over area between the extant Haven Bank track and northern bank. The structure measures approximately 6m by 2m, with at least one internal subdivision across its width, and has thick concrete walls. The structure appears to have been demolished and the debris removed.

The location would have provided a clear view of shipping or landing craft attempting to access the Haven and it is suggested that these foundations mark the location of a former pillbox.

**Impacts:** A new concrete sea wall is to be constructed in this area and is likely to result in the disturbance or removal of these remains.

Therefore:

**Asset Value:** Low

**Magnitude of Impact:** Major

**Significance of Impact:** Slight.

### 5.5.4 Central Site

#### 5.5.4.1 Asset 106 (Figure 8, Plate 1, TF 544150 396795)

**Data source reference information:** NMR: 1419813, HER: MLI143256, DoB: S0005124

**Description:** Ten 4ft x 4ft Second World War anti-tank blocks are recorded on the landward side of the embankment, at the top of a track leading towards North Somercotes. The blocks are on private land so it was not possible to inspect them closely but from a distance there appeared to be a small number of large irregular concrete slabs in addition to the square blocks. It was not possible to tell if these were purpose made obstructions or merely demolition debris. The blocks themselves appeared in fair or good condition but are not in their original positions.

The majority of the blocks have been moved and placed at the side of the track, re-opening access to the embankment causeway and the seafront beyond. A group of similar anti-tank blocks are present to the south of the search area and have retained their original alignment in rows across the access point. Combined with the obstacle of the

embankment itself, these blocks would have formed part of a heavily defended stop line intended to slow and channel the progress of armoured vehicles.

Concrete anti-tank blocks are not that uncommon. A search of the Defence of Britain database for Lincolnshire produces two other groups in the North Somercotes area and fourteen extant records in total.

**Impacts:** The blocks lie at the southern end of the proposed improvement works with the track marking the limit of the extended drainage channel. Only two of the ten blocks are situated on the north side of the track and towards the embankment. The site will need to be measured but it is possible that only these two blocks will be directly affected and it should be possible to relocate them, with the landowner's co-operation, to a nearby location. As the majority of the blocks have already been moved, this relocation is not considered a significant impact. The track will remain open and it is not, therefore, considered that their setting will be compromised.

Therefore:

**Asset Value:** Low

**Magnitude of Impact:** Minor

**Significance of Impact:** Slight.

### 5.5.5 North Site

#### 5.5.5.1 Asset 138 (Figure 6, Plate 7, TA 539467 400728)

**Data source reference information:** Site visit only

**Description:** A large concrete block of uncertain date and function, located to one side of the sluice gate at Grainthorpe Haven, was noted during the field visit. It measures approximately 2m by 2m in plan and has a very rough surface appearance which may represent an attempt at camouflage. No embrasures were visible, although it is possible that these may be concealed below the present ground level. The upper surface was overgrown so it was not possible to confirm the presence or absence of any surface fixtures. Traces of further concrete and brick foundations were visible on the ground surface of the adjacent crest.

Nearby Asset 136 relates to a cluster of twentieth century military buildings, including a possible pillbox, seen as structures straddling the sea wall on 1941 RAF air photographs. Assuming this is an approximate grid reference these records may be related.

**Impacts:** Although the large block falls within the proposed limits of the working area it is situated on the seaward side and so would not be affected by plans to extend the

embankment. However, it has yet to be decided how the embankment will be tied into the existing flood defence wall and an impact cannot be entirely ruled out at this stage. The traces of concrete and brick foundations on the crest will be disturbed and probably removed during stripping.

Therefore:

***Asset Value:*** Low

***Magnitude of Impact:*** Minor

***Significance of impact:*** Slight.

#### 5.5.5.2 **Asset 170** (Figure 6, TA 538078 401963)

***Data source reference information:*** Ordnance Survey Maps

***Description:*** A coastguard station is recorded at this approximate location on the 1888 and 1907 Ordnance Survey map. The 1888 1:2500 map shows a building on the landward side of the embankment set within a small enclosure ([www.old-maps.co.uk](http://www.old-maps.co.uk)). The enclosure and building are still present on the 1907 map, along with a probable well, but only the enclosure and well are present on the 1951, 1:10560 map ([www.old-maps.co.uk](http://www.old-maps.co.uk)). Nothing is recorded on the 1973 1:2500 map ([www.old-maps.co.uk](http://www.old-maps.co.uk)). No signs of any potential remains were seen during the site visit.

***Impacts:*** This stretch of the embankment will be subject to the infilling of the existing ditch on the landward side, the extension and raising of the current embankment and the excavation of a new drainage channel on the landward side. The excavation of the latter may reveal below ground remains associated with the coastguard station but is unlikely to impact on the main building location itself.

Therefore:

***Asset Value:*** Low

***Magnitude of Impact:*** Minor

***Significance of Impact:*** Slight.

#### 5.5.5.3 **Asset 172** (Figure 5, Plate 15, TA 537819 402385)

***Data source reference information:*** Site visit only

***Description:*** An extant ditch crossing on the landward side of the embankment appears to be situated on the alignment of a causeway leading from the former airfield to the beach. Traces of concrete surfacing are visible on the adjacent crest and at the edge of the beach. The remains of a possible flanking pillbox roof visible in the adjacent dunes

(Asset 173) support this theory. The construction date of the causeway is unknown but is likely to be during the Second World War; the current bridge structure, whilst undated, might be later as it has what may be a more recent concrete finish.

**Impacts:** It is proposed to install a new ditch crossing at this location; this will involve the removal of the existing structure. The drainage channel will be extended landward on the south side of the crossing only but the landward toe of the embankment will be brought forward on both sides. The latter will necessitate the removal of topsoil from the bank and crest as well as the cutting of small surface steps to aid cohesion of the new bank material. This process may reveal in-situ remains associated with the original causeway and will ultimately result in their removal (most likely) or burial. The proposed works will not affect the continuation of the causeway and any potentially associated structures on the seaward side.

Therefore:

**Asset Value:** Low

**Magnitude of Impact:** Moderate

**Significance of Impact:** Slight.

#### 5.5.5.4 **Asset 178** (Figure 5, Plate 8, TA 537656 402732)

**Data source reference information:** Site visit only

**Description:** The remains of unidentified structure lie immediately adjacent to the current drain, set into the base of the landward toe. The structure, which is in very poor condition, has an outer surface of brick and a concrete cap. Only approximately six courses of brick were visible and a cavity on the landward side may represent an embrasure or a construction slot of some type; the precarious condition and position of the structure prevented close inspection. The proximity of the feature to the drain initially suggested it might represent the remains of a bridge abutment but no trace of a similar structure was visible on the other side and there appears to be no break in the embankment itself. It is possible that the extant drain post-dates the structure at this location which would make an alternative interpretation more likely.

A pillbox was recorded in the area during the Defence of Britain project but the grid reference places it on the seaward side of the embankment (Asset 179). A rapid check of the area during the site visit, however, failed to identify any structure at that location. Assuming the reference is only approximate, Asset 178 may be the same structure as Asset 179.

A length of twisted metal of unknown origin and function is situated on the bank nearby.

**Impacts:** The precise nature of the works in this area has yet to be defined but it is likely that the structure will need to be removed in its entirety.

Therefore:

**Asset Value:** Low

**Magnitude of Impact:** Major (assuming removal)

**Significance of Impact:** Slight.

#### 5.5.5.5 **Asset 182** (Figure 5, Plate 9, TA 537656 402732)

**Data source reference information:** Site visit only

**Description:** A sunken rectangular feature was noted at the base of the landward bank. It was visible as a depression against the bank and on closer inspection appears to be a concrete lined structure, possibly with a collapsed roof; the feature is in poor condition.

The date and function of the structure are unknown but it could well be associated with the airfield's Second World War perimeter defences. It does not appear as substantial in its construction as Asset 178 to the south but further investigation would be needed to ascertain its function.

**Impacts:** This stretch of the embankment will be subject to the infilling of the existing ditch, the extension and raising of the current embankment and the excavation of a new drainage channel on the landward side. This process will necessitate the removal of the debris and topsoil from the bank and crest as well as the cutting of small surface steps to aid cohesion of the new bank material. This will reveal further in-situ remains which may enable the structure's identity to be confirmed. It is likely that any structural remains will be removed.

Therefore:

**Asset Value:** Low

**Magnitude of Impact:** Major

**Significance of impact:** Slight.

#### 5.5.5.6 **Assets 188 and 189** (Figure 5, Plates 10 & 16-17, TA 537110 403411 and 537103 403417)

**Data source reference information:** NMR: 1450323 and site visit

**Description:** A twentieth century causeway, trackway and two small military buildings are recorded in this area on 1946/47 air photographs (Asset 188). The causeway post-

dates 1943 but pre-dates 1946; the buildings appear to have been built after 1947 but before 1955. The causeway runs from near the north-east corner of RAF North Coates and seaward across uneven ground to the sand.

Fragmented structural remains of uncertain date and function were recorded during the site visit (Asset 189). A breeze block 'zig-zag' shaped wall fragment was noted at the base of the landward bank and steel rivetted girder and cement debris were also visible in area (Plate 16). It is likely that these remains are associated in some way with the causeway.

Significant amounts of reinforced cement building rubble (Asset 191, Plate 17) and remains of defensive gun positions (Asset 190, Plate 10) are present on the landward side of the embankment suggesting the causeway was considered an important defensive position in the period just after the Second World War.

**Impacts:** This stretch of the embankment will be subject to the infilling of the existing ditch, the extension and raising of the current embankment and the excavation of a new drainage channel on the landward side. This process will necessitate the removal of topsoil from the bank and crest as well as the cutting of small surface steps to aid cohesion of the new bank material. This may reveal in-situ remains associated with the original causeway in the vicinity of the embankment and will ultimately result in their removal (most likely) or burial. The proposed works will not affect the continuation of the causeway and the flanking structural remains on the seaward side.

Therefore:

**Asset Value:** Low

**Magnitude of Impact:** Moderate

**Significance of Impact:** Slight.

## 5.6 Cultural-Heritage Assets of Negligible Value

- 5.6.1 There are 43 cultural-heritage assets judged to be of negligible (less than local) value within the study area (two additional sites have been plotted on the figures but fall outside the 1km corridor). The vast majority of these refer to approximate locations of military structures noted on 1940's RAF aerial photographs, which have since been removed, or to former military sites, also removed, which have been identified from more recent crop or soil marks (25 in total). Three more references relate to demolition material, probably relating to former military structures, but whose origin and form is unknown. Eight references relate to records of shipwrecks which were later recovered and two relate to coastguard installations. Of the five remaining assets, two relate to

former land-use, one to post-Medieval earthworks, one to the buoyed Saltfleet Haven channel and one to the denuded remains of a modern causeway.

Of these 43 assets, only two will be physically impacted upon by the development. Details are as follows:

## 5.6.2 North Site

### 5.6.2.1 Asset 152 (Figure 6, Plate 6, TA 538991 401088)

**Data source reference information:** NMR: 1450342, Site visit

**Description:** A quantity of demolition material was noted lying against the landward side of the embankment; this consisted of several large fragments of reinforced concrete partially concealed by soil creep and vegetation. These are probably associated with a former pillbox, and possibly other buildings, visible on 1941 aerial photographs straddling the sea wall. The grid reference supplied with the photographic data was clearly approximate as it placed the remains within the landward fields. Having taken this into account it seems likely they are linked. Given the size and weight of the debris it is unlikely that it will have moved far from its original position.

**Impacts:** This stretch of the embankment will be subject to the infilling of the existing ditch, the extension and raising of the current embankment and the excavation of a new drainage channel on the landward side. This process will necessitate the removal of the debris and topsoil from the bank and crest as well as the cutting of small surface steps to aid cohesion of the new bank material. This may reveal further rubble or in-situ remains associated with the original structures and will ultimately result in their removal (most likely) or burial.

Therefore:

**Asset Value:** Low

**Magnitude of Impact:** Major

**Significance of Impact:** Slight.

### 5.6.2.2 Asset 168 (Figure 6, Plate 5, TA 538111 401919)

**Data source reference information:** Site visit

**Description:** A quantity of demolition material was noted lying on the landward side of the embankment crest, not far from Coastal Observation point Asset 169; this consisted of a small number of large reinforced concrete fragments, partially concealed by vegetation. Although there is no record of former military structures in the immediate area, it seems likely that these represent the remains of structures which would have

formed part of the defences around this key access point. Given the size and weight of the debris it is unlikely that it has moved far from its original position.

**Impacts:** This stretch of the embankment will be subject to the infilling of the existing ditch, the extension and raising of the current embankment and the excavation of a new drainage channel on the landward side. This process will necessitate the removal of the debris and topsoil from the bank and crest as well as the cutting of small surface steps to aid cohesion of the new bank material. This may reveal further rubble or in-situ remains associated with the original structures and will ultimately result in their removal (most likely) or burial.

Therefore:

**Asset Value:** Low

**Magnitude of Impact:** Major

**Significance of Impact:** Slight.

## **5.7 Cultural-Heritage Assets of Unknown Value**

- 5.7.1 There are 88 cultural-heritage assets judged to be of unknown value (where the location and/or nature of the asset is unconfirmed) within the study area (five additional sites have been plotted on the figures but fall outside the 1km corridor). The vast majority of these refer to recorded shipwrecks or plane crashes in the local area (78 in total); no specific grid references are known. Of the eight remaining assets, six relate to potential Second World War military sites, two to coastguard installations, one to a possible Late Medieval boundary earthwork and one to a potential saltern site; none of these will be impacted upon by the development.
- 5.7.2 Because the probability of encountering any remains associated with either the shipwrecks or plane crash sites is so low, it has been decided to assign them a 'neutral' impact in Appendix 1.

## **6 Potential for Currently Unrecorded Archaeological Remains within the Study Area**

### **6.1 Prehistoric (Palaeolithic, Mesolithic, Neolithic, Bronze Age & Iron Age)**

- 6.1.1 Prehistory is, in general, poorly represented along the outlying coastal marsh in this area and especially so in the locality of the proposed bank improvements. There is potential for remains from this period to be sealed beneath later alluvial and marine sediments but

the likely depth of these buried land surfaces and the distribution of associated sites is uncertain. The boreholes to date have identified marine alluviums to a depth well in excess of the proposed new drainage channels and borrow pits. No remains have been identified in the locality and the likelihood of encountering such sites during the proposed works is considered extremely low.

## **6.2 Roman and Early Medieval (Anglo-Saxon)**

6.2.1 As with the prehistoric period, very few records relating to either of these periods are recorded along this part of the coast. No records, other than a find of six Roman coins a short distance outside the study area at Saltfleet, exist in the local area. Although there is still the potential for remains to be sealed beneath later sediments, the likelihood of encountering such sites during the proposed works is considered low.

## **6.3 Medieval**

6.3.1 There is an increased potential at South Site for the existence of remains associated with Saltfleet Haven's long history as a port as well as the use of the area surrounding Medieval Saltfleet for subsistence e.g. fish weirs, or industry e.g. salt making. Any such remains, however, are likely to be sealed beneath later post-Medieval and modern deposits associated with natural sedimentation and the construction of the embankments and reclamation of the former marshland in the 19<sup>th</sup> century. The shallow nature of the excavations (up to 1m) associated with the borrow pits means the probability of encountering remains is low.

6.3.2 At North and Central Site, the large expanse of reclaimed land between the extant embankments and the Medieval sea defences minimizes the potential for Medieval remains. Wreckage or activity associated with shipping around the port havens at North Coates, Marshchapel and Grainthorpe is a possibility but the probability of encountering anything within the small footprint of the proposed channel works is considered extremely low.

## **6.4 Post-Medieval and Modern**

6.4.1 There is a moderate potential for encountering remains associated with the reclamation of the marshland and the construction of the extant embankments. At North Site the earliest length of bank in the vicinity of Horse Shoe Point dates to the late 18<sup>th</sup> century. The remaining extant banks are all 19<sup>th</sup> century in date. The embankments, especially the earliest sections, are likely to have had several phases of replenishment but without a complete section these would be difficult to identify and interpret.

- 6.4.2 At Saltfleet Haven there is again a possibility that remains may be encountered relating to its use a port, be it a port in decline, as well as wreckage or activity associated with shipping along the coast at Central and North Site. The probability of encountering the latter is considered low.
- 6.4.3 By far the greatest potential for currently unrecorded remains lies with structures or debris dating from the Second World War; this is most likely at North Site where the defences are focussed on the banks themselves. We know from contemporary photographs that the fortifications along this stretch of the coast were numerous and varied and that occasionally they were placed directly on, or set into or against, the embankments. In these instances the proposed improvements might reveal remnants of these structures or debris which has survived below ground level.
- 6.4.4 Bomb craters in the vicinity of North Site and the presence of possible Second World War targets at Central Site raise the possibility of previously unrecorded ordnance resulting either from enemy action or from activity associated with the bombing range. There is also potential for remains associated with the numerous crash sites at North Site, the exact details of which are unknown. The probability of encountering these types of remains is considered low.

## **7. Further Survey Works and Proposed Mitigation**

- 7.1 Various field-survey and evaluation techniques could be applied to test the potential for buried remains but none of them are likely to yield worthwhile and definitive results due to the significant depths of alluvium at all three sites. Fieldwalking of the adjacent reclaimed agricultural land is unlikely to reveal the presence of more deeply buried remains (exceptions might be where dyke clearance has brought up earlier deposits) and the difficulties involved in attempting to excavate deep evaluation trenches in such ground conditions, and with so little identified potential, makes this approach impracticable. Whilst geophysical survey can sometimes be effective in identifying buried remains it is likely that the highly variable sediment patterns resulting from a variety of depositional environments would make interpretation of those results, especially over a relatively narrow corridor, problematic for all but the strongest anomalies e.g. Second World War defence structures. There is no evidence to suggest that salt-making activities, which might also produce a strong response in a magnetometer survey, extend as far as the proposed works. Consequently, geophysics is not recommended for deployment on this project.
- 7.2 Although general low levels of organic remains have been identified in the majority of the boreholes the richer samples are located beneath the proposed level of disturbance.

No further boreholes are currently planned which could be made available for archaeological study.

- 7.3 The results of the field visit suggest we are unlikely to encounter unexpected but well-preserved Second World War structures as a result of the improvement works. The latter is especially true of Central and South Site where the first defence lines are either further forward or largely absent. The post-Medieval date of the embankments and the re-claimed nature of the adjacent land also make it unlikely that any significant Medieval or earlier remains will be encountered. For this reason a general watching brief of ground disturbing activities is not recommended.
- 7.4 The Environment Agency have consulted Lincolnshire County Council Archaeology Service who have confirmed that the borrow areas and embankment works at Saltfleet will require no mitigation.
- 7.5 English Heritage, through the Rapid Coastal Zone Assessment projects (Humber Field Archaeology 2007 & 2008), has outlined a number of further works for consideration including the detailed survey of remaining military structures.
- 7.6 Several of the surviving military structures will be directly impacted by the proposed works. Although the impacted structures do not form part of a recognized group of national significance, such as the Defence Area at Saltfleetby, they are still highly significant survivors in what is becoming an increasingly rare heritage asset.

Within English Heritage's *Shoreline Management Plan Review and the Historic Environment* guidance note (English Heritage 2006) it is suggested that mitigation for historic buildings might involve 'preservation by investigation' for archaeological sites (i.e. survey, excavation and recording) or recording, (followed by controlled dismantling and/or relocation in some cases). In the case of the directly affected structures which remain in a fair or good condition (Assets 106, 167, 169 and 206-207) it is recommended that a measured and photographic survey is carried out by suitably experienced staff with a knowledge of World War Two defence structures (or with access to a suitably experienced consultant). Prior to this survey it may be necessary to carry out clearance work and limited excavation to maximize the data recovery.

For known but poorly preserved in-situ structures (Assets 138, 152, 168, 172, 178, 182 and 188/189), it is recommended that a watching brief is undertaken as part of their archaeologically managed removal and that a basic measured and photographic survey forms part of this process.

Once recording is complete consideration should be given to the possible relocation of well-preserved structures, or parts thereof, to a suitable location or, once works are complete, to a position as close as possible to the original. This should be straightforward

in the case of the anti-tank blocks at Central Site (Asset 106) and could be an option for the above ground Coastal Observation Point tower (Asset 169) at North Site; the author is not qualified to judge if the latter is practicable and further advice would need to be sought. Thought could also be given as to whether the possible Infantry Blockhouse at North Site (Asset 167) could be preserved by re-locating the proposed new drainage channel further to the south-west. Where re-location is impracticable, consideration should be given to their in-situ burial, if safe to do so, within the extended embankments.

The details of any survey or excavation work should be agreed in writing with the Lincolnshire County Council's Archaeology Service.

## **8. Acknowledgements**

- 8.1 Groundwork Archaeology would like to thank the Environment Agency for commissioning this survey. Particular thanks are due to Lesley Clarke of the Environment Agency for her assistance throughout this assessment.
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## **Appendix 1**

### **Gazetteer of Cultural-Heritage Assets**