Cromer to Winterton Ness Study

Appendix A: Coastal Defence Condition Survey Update

November 2012
North Norfolk District Council

NORTH NORFOLK DISTRICT COUNCIL

Mott MacDonald

A

Cromer to Winterton Ness Study

Appendix A: Coastal Defence Condition Survey Update

November 2012

North Norfolk District Council

Mott MacDonald, Mott MacDonald House, 8-10 Sydenham Road, Croydon CR0 2EE, United Kingdom
t +44 (0)20 8774 2000 f +44 (0)20 8681 5706, www.mottmac.com

Issue and revision record

Revision	Date	Originator	Checker	Approver	Description
A	6/11/2012	G Wallace	K Reay	P Phipps	Draft for comment
B	20/11/2012	G Wallace	H. Dawkins	P Phipps	Final for issue

Content

Executive Summary

A condition assessment update of the coastal defences along the North Norfolk coastline from Cromer Pier to Winterton Ness was carried out by representatives of Mott MacDonald on behalf of North Norfolk Council on 30th and 31st October 2012.

Conclusions of the assessment are that a large number of the timber defence structures have failed and many require maintenance and repair work. Many of the concrete structures have undergone a number of remedial repairs which have prolonged the life of the structures, mainly the introduction of rock armour units fronting the steel sheet piles at their footings.

The residual life of the structures varies throughout, with the timber revetment defences being the lowest at 0 years and the offshore rock armour breakwater with the highest at 40-60 years.

Groyne fields span the majority of this frontage with structures varying in material and form. The majority of the groyne fields are timber with those around Happisburgh being in worst condition.

Since the original Defence Condition Survey in 2003 the overall condition rating of structures along this stretch of coast has deteriorated, though in a few instances improved, mostly due to remedial works.

Many of the maximum residual lives of structures determined in 2003 extended to 2008-2013, but many still remain in reasonable and functioning condition.

The minimum and maximum residual lives of the coastal structures will be used in a SCAPE erosion model to assist in determining the impact coastal erosion will have on the North Norfolk coastline. This will be assessed from current conditions with a 'do nothing' approach and compared against adopting the policies identified in the Shoreline Management Plan.

1. Introduction

1.1 History

The Cromer to Winterton Ness coastline forms part of the 'Kelling to Lowestoft Ness Shoreline Management Plan' and covers approximately 35km. This stretch of coastline comprises various coastal defence assets which include a variety of groyne structures, seawalls, revetment structures, offshore breakwaters, beaches and dunes.

The frontage under consideration has a number of settlements close to the shoreline of varying density. The shoreline management plan has divided the coastline into a number of individual policy units to allow for various coastal policies to be determined through the study area. From Cromer to Winterton Ness there are 14 policy units defining the policy for adoption at each stretch from present day to medium and long term. Therefore the policies vary considerably along this stretch of coastline and some defence structures being considered as part of this condition assessment update fall under 'Hold The Line' policies, whilst others are in areas defined as 'No Active Intervention' or 'Managed Realignment'.

A previous Defence Condition Assessment was undertaken in October 2003 between Overstrand and Walcott from which an Interim Report was produced. This survey covered 15km within the area being assessed as part of this condition assessment update and also utilised trial pits and window sampling to determine local ground conditions to enable assessment of the defences below beach level.

The previous report outlines the condition of the structures from Overstrand to Walcott and generally states that they are in a deteriorating state other than those areas that have experienced minor repair works or maintenance. It determines the residual design life of the structures from 2003 which can be used as part of this outline assessment as a basis for comparison against the latest survey results.

This interim report is the most current assessment North Norfolk District Council have of their coastal defences and whilst this condition assessment update is not as detailed it is sufficient to be used as a basis for the planning of future works and maintenance regimes and identifying areas where further detailed study should be focused.

1.2 Purpose of the Defence Condition Assessment Update

The main purpose of this condition assessment update is to ascertain the residual life of the coastal defence structures and subsequent risk of erosion of the coastline if left undefended. The residual life of the existing assets is an integral element of the SCAPE model which will be used to ascertain the erosion rates between Cromer and Winterton Ness. SCAPE is a process-based model that determines the reshaping and retreat of shore profiles along the coast.

The condition assessment will consider all coastal defence structures along the frontage. However, the final output will be defined in terms of 500m sections of coast, determined by the boundaries setup within the SCAPE model. An overall assessment of the condition of structures within these 500m will then be used to formulate the SCAPE model; this will be an average condition within the sections unless there is an overarching failure or significant risk of failure within the area.

The SCAPE model is to be run based on two scenarios, no further work being undertaken to the structures and continued maintenance in accordance with the policies defined in the shoreline management plan.

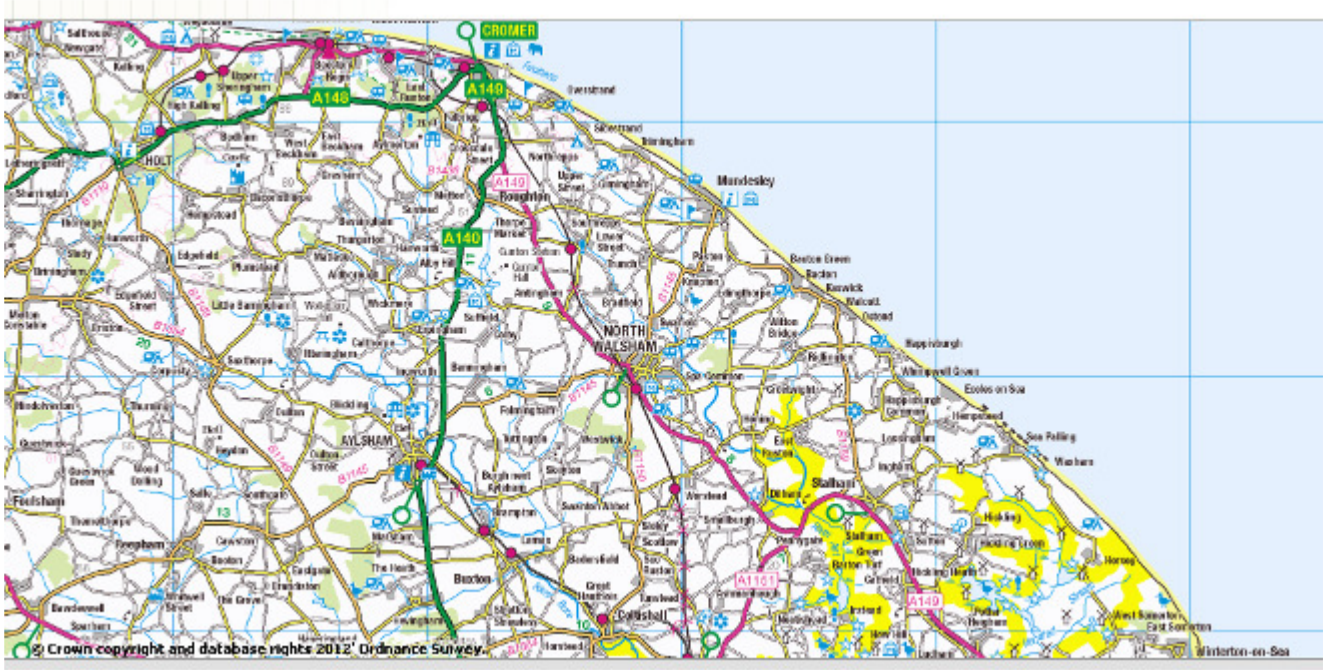
This condition assessment update will:

- consider the general condition of all coastal defence assets;
- assess the groyne fields and the current functionality in holding material;
- consider the condition of the beach;
- record the approximate length of defences and the assets protected.

2. Coastal Defence Asset Summary

This section of the report provides an overview of the types of coastal defence present along the coastline from Cromer to Winterton Ness as shown in Figure 2.1 below.

Figure 2.1: Cromer to Winterton Ness



Source: Reproduced from the Ordnance Survey Mapping with the permission of the controller of Her Majesty's Stationery Office, Crown Copyright Reserved. License No. 100026791

2.1 Revetments

The following general observations were made with respect to each revetment type:

2.1.1 Rock Revetment

- The rock revetments have mainly been constructed at the toes of concrete seawall structures. This is to provide additional protection to the steel sheet pile footings and prolong the life of the structure. Some were almost completely buried in beach material whilst others were fully exposed.
- There are isolated areas where rock armour has been used to protect the cliff face from erosion, one such example is west of Eccles-on-sea. Here the rock armour has been used to reduce erosion and prevent the outflanking of the adjacent seawall.
- Rock armour has also been placed along the foreshore in a number of places with the intention of dissipating wave energy to reduce the erosion at the cliff face or exposure of setback defences. Some areas of revetment appear to have been placed as an interim solution with no specific design profile, whilst others appear to have specific design slopes.

2.1.2 Timber Revetment

- The timber revetments have been constructed over large areas of the coastline and vary in construction.
- It is likely that the timber revetments have initially been designed to a similar overtopping datum throughout the various sections and due to varying beach levels the structural height varies from around 6 feet to 12 feet. Though through wear on the structure, the crest of the revetment has varied in places over time.
- Each construction method utilises timber boards over the seaward facing slope of the structure. Some are parallel to the shoreline and others are vertical in alignment with groynes. These two construction designs also vary in the spacings between boards; those of vertical construction have fewer boards and larger gaps between every pair of boards.
- The majority of revetments have a steel sheet piled toe (apart from a section where the toe has been damaged and replaced with timber breastwork). Occasional sections of timber revetment are fixed to the piles via a timber capping for additional protection, whilst others sit upon a concrete base approximately 0.5m high.

2.2 Seawalls

There are a variety of concrete seawalls together with two small cobble seawalls along the coast from Cromer to Winterton Ness. The cobbled walls are around Cromer and stand around 1 - 2m high; they have some degree of cracking around the edges and no obvious loss of mortar but are generally in a fair to good condition.

The concrete seawalls vary in construction:

- Around Cromer the concrete walls are quite high and comprise a vertical seawall down to the foreshore with access ramps down from the promenade.
- Further away from the pier is a small concrete wall forming a continuation of the cobbled wall standing 1 - 2m high with some cracking along the structure.
- Along the remainder of the shoreline the main sections of concrete seawall generally comprise a 3m seawall with wave return crest. Atop the crest is a small concrete revetment, usually formed of concrete slabs though sometimes a concrete mattress takes their place, this is then backed by an overtopping wall approximately 0.5m high, around 2m above the main seawall crest. The toe of the structure is normally a stepped concrete apron with varying number and dimensions of steps.
    - This construction profile forms the basis of most of the concrete seawalls, though the presence of promenades, insitu concrete repairs and varying construction methods to form the apron at the base of the main wall, have resulted in a number of arrangements along the coastline.

2.3 Offshore Breakwaters

The offshore breakwaters are of rock armour construction standing approximately 4m above beach level and 175m long. There are nine breakwaters in total situated along the Sea Palling frontage. The breakwaters are in varying depths of water increasing towards the east. The breakwaters are in very good condition and are successfully trapping sediment to their landward side. Those towards the western extent have created additional bays to the rear of the structures where tombolos now link three of the structures to the mainland during periods of low tide.

2.4 Groyne Fields

2.4.1 Timber Groynes

The timber groynes vary in their designs along the coastline; some are designed with lots of additional bracing on their eastern side whilst others have additional smaller timber supports on both sides. The majority of the timber groynes are straight, running perpendicular to the coastline, although some are set to zigzag across the foreshore.

The main body of the groynes also vary as some are of permeable construction with gaps between the timbers to prevent significant hindrance of longshore drift, whilst others are impermeable and are designed to retain more beach material and as a result are often partially buried in beach material. The impermeable groynes generally have their timbers arranged horizontally between the supports, whilst those of permeable construction are arranged vertically.

The spacing of the groynes varies between each groyne field ranging from approximately 100m to 500m.

2.4.2 Rock Groynes

The rock armour groynes spread along this length of coastline are in very good condition showing no movement of the rock armour units. The landward ends of the structures are often buried in beach material.

2.4.3 Composite Groynes

Some of the groyne fields are made of composite groynes. Some groynes, either permeable or impermeable, have steel frames supporting the timbers. The support columns are steel piles with steel fixings to hold the timber sections in place. In these instances the steel sections are often being corroded whilst the timber condition varies throughout the structures.

Other groyne fields have the landward end of the groyne constructed from timber and steel sections whilst the seaward end is constructed from rock armour units. The upper sections of these groynes are generally in a worn condition with the rock armour remaining in a very good condition.

3. 2003 Defence Condition Survey

3.1 Residual Life

The previous survey assessed the residual life of coastal defences in bands as shown in table 3.1 below:

Table 3.1 – Residual Life defined during 2003 survey

Residual Life	Defence Condition Rating
20+ years	Very Good
10 to 20 years	Good
5 to 10 years	Fair
3 to 5 years	Poor
0 to 3 years	Very Poor

Source: Overstrand to Walcott Defence Conditions Survey Interim Report 2003

The following table summarises those defence assets assessed in 2003, the structure type, location, length, condition rating as based on the ranges provided in Table 3.1 and the estimated year of failure from the date of inspection, 2003. The report individually assesses each groyne over a stretch of coast, for the purpose of Table 3.2 an average condition rating has been taken for the groyne field.

Table 3.2 – Summary of 2003 Defence Condition Survey

Location	Defence Description	Length (m)	Condition Rating	Estimated Year of Failure (min)	Estimated Year of Failure (max)
Cromer to Overstrand	Timber Breastwork	377	Poor	2006	2008
	Timber Groynes	60 (seaward)	Good	2013	2023
Overstrand	Timber Revetment	441	Poor	2006	2008
	Block Revetment	30	Poor	2006	2008
	Concrete Seawall, Apron, Steel Piled Toe.	51	Very Good	2023	-
		64	Very Poor	2003	2006
		278	Very Poor	2003	2006
		64	Good	2013	2023
		38	Poor	2006	2008
		33	Fair	2008	2013
		71	Good	2013	2023
	Timber Revetment (TR) and Rock Armour (RA)	232	TR – Poor RA – Very Good	2006 2023	2008 -
	Timber Revetment	178	Poor	2006	2008
	Timber Groynes	90-75 (seaward)	Good	2013	2023
		15m (seaward)	Poor	2006	2008
Sidestrand	Timber Revetment	747	Poor	2006	2008
	Timber Groynes	75 (seaward)	Good	2013	2023
Trimingham	Timber Revetment (TR)	1006	TR – Very Poor	2003	2006
	Concrete Wall (CW)		CW - Fair	2008	2013
	Timber Revetment	539	Very Poor	2003	2006
	Timber Groynes	70 (seaward)	Fair	2008	2013
Trimingham to Mundesley	Timber Revetment	1019	Fair	2008	2013
		587.4	Good	2013	2023
	Timber Groynes	72 (seaward)	Good	2013	2023
Mundesley	Timber Revetment	620	Fair	2008	2013
	Concrete Block Revetment	446	Fair	2008	2013
	Concrete Seawall, Apron, Steel Piled Toe	69	Poor	2006	2008
		38	Very Good	2023	-

Location	Defence Description	Length (m)	Condition Rating	Estimated Year of Failure (min)	Estimated Year of Failure (max)
	Concrete Seawall	117	Very Good	2023	-
		48	Poor	2006	2008
		41	Fair	2008	2013
		20	Poor	2006	2008
		20	Good	2013	2023
		17	Good	2013	2023
		93	Very Good	2023	-
	Timber Revetment (TR)	164	TR – Fair	2008	2013
	Reinforced Concrete Boat Park on Steel Piles (BP)		BP - Good	2013	2023
	Timber Groynes	67 (seaward)	Good	2013	2023
Mundesley to Bacton	Timber Revetment	1441	Fair	2008	2013
	Timber Groynes	90 (seaward)	Good	2013	2023
Bacton, Walcott and Ostend	Timber Revetment	1204	Fair	2008	2013
	Timber Revetment (TR), Steel & Concrete Breastwork (SB), Timber Breastwork (TB)	233	TR – Good	2013	2023
			SB – Very Good	2023	-
			TB - Poor	2006	2008
	Concrete Revetment and Wavewall (RW), Apron (A), Steel Piled Toe (SP)	1783	RW – Fair	2008	2013
			A – Fair	2008	2013
			SP - Good	2013	2023
		783	RW – Fair	2008	2013
			A – Fair	2008	2013
			SP - Good	2013	2023
		565	RW – Fair	2008	2013
			A – Fair	2008	2013
			SP - Good	2013	2023
	Timber Revetment	529	Good	2013	2023
	Timber & SSP Groynes	155 – 23 (seaward)	Good	2013	2023

Source: Overstrand to Walcott Defence Conditions Survey Interim Report 2003

4. 2012 Defence Condition Survey Update

The following tables are broken down into the 70 sections as defined by the SCAPE model from Cromer to Winterton Ness. Section 70 is located just east of Cromer Pier and Section 1 is just west of the car park at the end of Beach Road, Winterton-on-Sea.

The littoral drift of sediment along the coastline is from Cromer towards Winterton Ness (Winterton on Sea), this is also the way the strategy study has been written. Therefore the section specific tables have been produced in the same order. It should be noted that the alignment of the SCAPE model sections begin with section 1 at Winterton Ness, the site survey work was completed beginning in section 1 at Winterton Ness and the descriptions written accordingly.

The following tables present the details of the survey carried our in October 2012, including structure specific asset condition and estimated minimum and maximum residual life. Where various defences are present in one section they have been identified in the row 'Defence Type'. Each defence is followed by an abbreviation for use in the 'Condition Grade' and 'Residual Life' rows, i.e. Section 70 on the next page shows Cobble wall (CW), in the 'Defence Type' row, which is later referred to as CW – Fair in the 'Condition Grade' and CW – 10 in 'Residual Life Min'.

The survey sheets also include reference to the individual Shoreline Management Plan Policies applicable to those sections of coastline.

Following each table is a plan of the relevant section of the frontage, the boundaries of which are marked by the two red lines. A number of GIS referenced photos were taken during the condition assessment and are plotted on the plan shown by the labelled points A, B, C, D etc. These references then correspond to the pictures above each plan.

The threshold grading is primarily a tool for determining the minimum condition a structure should be allowed to deteriorate to prior to maintenance or remedial works being undertaken to bring it back to an acceptable standard. As such it has not been considered and the threshold grade has not been populated due to the main focus of the work being to determine residual lives of the coastal structures and populate the SCAPE model.

Table 4.1: SCAPE Section 70

Asset Location			
SCAPE Section No:	70	**Location:**	Cromer
		Survey Date:	30-10-12
SMP Unit:	3b04		
SMP Policy:	Short Term	Medium Term	Long Term
	Hold the line – Maintain / Replace	Hold the line – Maintain / Replace	Hold the line – Maintain / Replace
Coastal Defence Condition			
Defence Type:	Concrete defence structure (SW), Cobble wall (CW), Timber groynes (GF)		
Coastal Defence Length:	SW – 250 CW - 250 GF – 500	**Ownership:**	North Norfolk District Council
Foreshore Type:	Sand beach	**Assets Protected:**	Public open space, residential, commercial, beach huts and access
Exposure:	High	**Year Built:**	Varied
Condition Grade:	SW – Good / Fair CW – Fair GF – Good / Fair	**Threshold Grade:**	N/A
Residual life min:	SW – 15 CW – 10 GF - 8	**Residual life max:**	SW – 20 CW – 20 GF - 12
Description of the defences and the foreshore – East to West			

The cobbled wall is set back and might just be beyond the reach of high tide. The wall is quite old and has a number of cracks along its length but retains the mortar between the cobbles. There is a promenade behind the wall with a number of structures and beach huts.

At the mid point of the section there is a slipway of concrete construction which then becomes the main concrete seawall which extends up quite high to protect the town of Cromer. This wall is in good condition with some cracking and minor concrete spalling along its length.

The timber groynes are in good condition and are not missing any boards or suffering from major damage. They are also retaining a fair amount beach material and the foreshore appears to be in a stable condition.

Section no. 70
Cromer

A

B

C

D

Source: OS Maps

Table 4.2: SCAPE Section 69

Asset Location			
SCAPE Section No:	69	**Location:**	Cromer
		Survey Date:	30-10-12
SMP Unit:	3b04		
SMP Policy:	Short Term	Medium Term	Long Term
	Hold the line – Maintain / Replace	Hold the line – Maintain / Replace	Hold the line – Maintain / Replace
Coastal Defence Condition			
Defence Type:	Cobbled wall (CW), Concrete wall (SW), Timber groynes (GF)		
Coastal Defence Length:	CW – 300 SW – 200	**Ownership:**	North Norfolk District Council
Foreshore Type:	Sand beach	**Assets Protected:**	Public open space, residential
Exposure:	Medium	**Year Built:**	Varied
Condition grade	Good / Fair	**Threshold grade**	N/A
Residual life min (expected)	CW – 10 SW – 15 GF - 8	**Residual life max (potential)**	CW – 20 SW – 20 GF 12
Description of the defences and the foreshore – East to West			

Both the concrete and cobbled walls are set back with a reasonable foreshore area in front of them and might just be beyond the reach of high tide. The walls appear quite old and have a number of cracks along their lengths but the cobbled wall retains the mortar between the stones whilst the concrete wall does not have any significant damage. There is a promenade behind the wall with a number of beach huts accessible by members of the public.

There is one timber groyne at either end of the section and these are in good condition, not missing any boards or suffering from major damage. They are also retaining a fair amount beach material and the foreshore is in a stable condition.

Section no. 69
Cromer

A

B

C

D

Source: OS Maps

Section no. 69
Cromer

E

Source: OS Maps

Table 4.3: SCAPE Section 68

Asset Location			
SCAPE Section No:	68	**Location:**	Cromer to Overstrand
		Survey Date:	30-10-12
SMP Unit:	3b05		
SMP Policy:	From Present Day	Medium Term	Long Term
	Managed realignment – to allow defence ruins to be removed	No active intervention	No active intervention
Coastal Defence Condition			
Defence Type:	Timber Breastwork (TB), Timber groynes (GF)		
Defence Length (m):	500	**Ownership:**	North Norfolk District Council
Foreshore Type:	Sand beach	**Assets Protected:**	Public open space
Exposure:	Medium	**Year Built:**	TB – 1976 GF – 1935 / 1984
Condition grade	TB - Fair GF – Poor	**Threshold grade**	N/A
Residual life min (expected years)	TB - 5 GF - 2	**Residual life max (potential years)**	TB - 10 GF - 5
Description of the defences and the foreshore – East to West			

The beach front has some timber breastwork to the western end of the section in fair condition against the cliff. The timber is damaged at the ends but generally in fair condition raising the level of beach to its rear, but this is of negligible impact when considering the section as a whole.

The timber groynes in the section are well worn and showing signs of damage and corrosion of the fixtures and fittings with a number of boards missing along their length. There is a fair amount of retained beach material against the cliffs though this may be the result of recent cliff falls as the beach flattens out and becomes very shallow approximately 25m form the base of the cliffs.

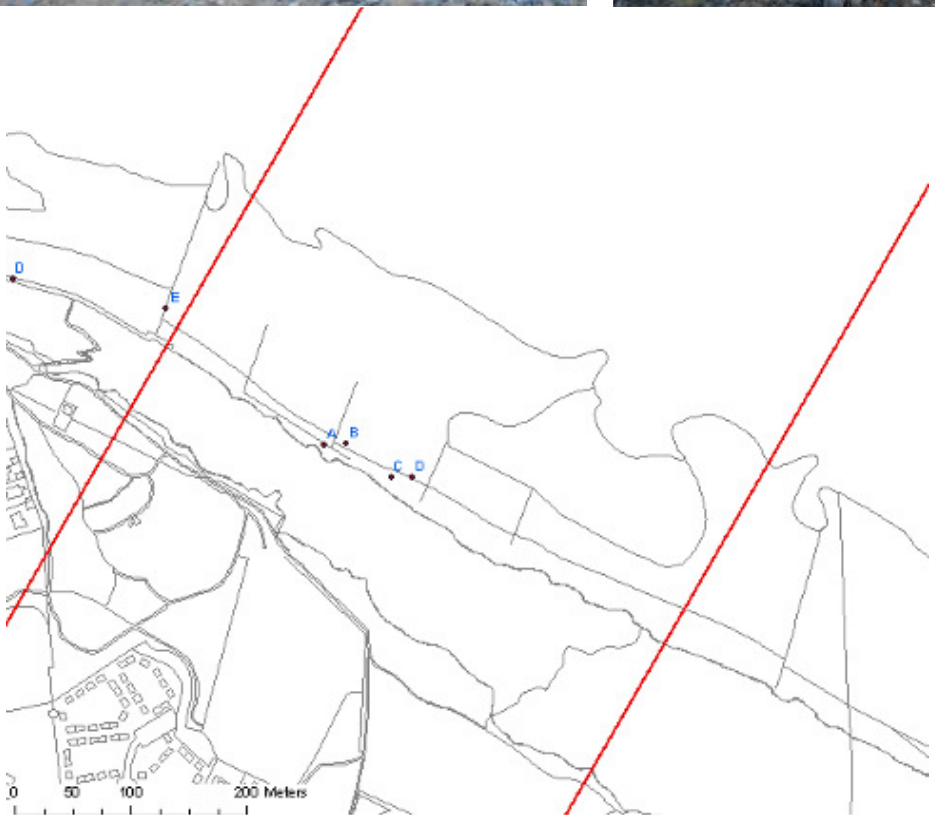
Section no. 68
Cromer to Overstrand

A

B

C

D



Source: OS Maps

Table 4.4: SCAPE Section 67

Asset Location			
SCAPE Section No:	67	**Location:**	Cromer to Overstrand
		Survey Date:	30-10-12
SMP Unit:	3b05		
SMP Policy:	From Present Day	Medium Term	Long Term
	Managed realignment – to allow defence ruins to be removed	No active intervention	No active intervention
Coastal Defence Condition			
Defence Type:	Timber groynes (GF)		
Defence Length (m):	500	**Ownership:**	North Norfolk District Council
Foreshore Type:	Sand beach	**Assets Protected:**	Golf course
Exposure:	Medium	**Year Built:**	GF – 1935 / 1984
Condition grade	GF - Good	**Threshold grade**	N/A
Residual life min (expected years)	GF - 8	**Residual life max (potential years)**	GF - 15
Description of the defences and the foreshore – East to West			

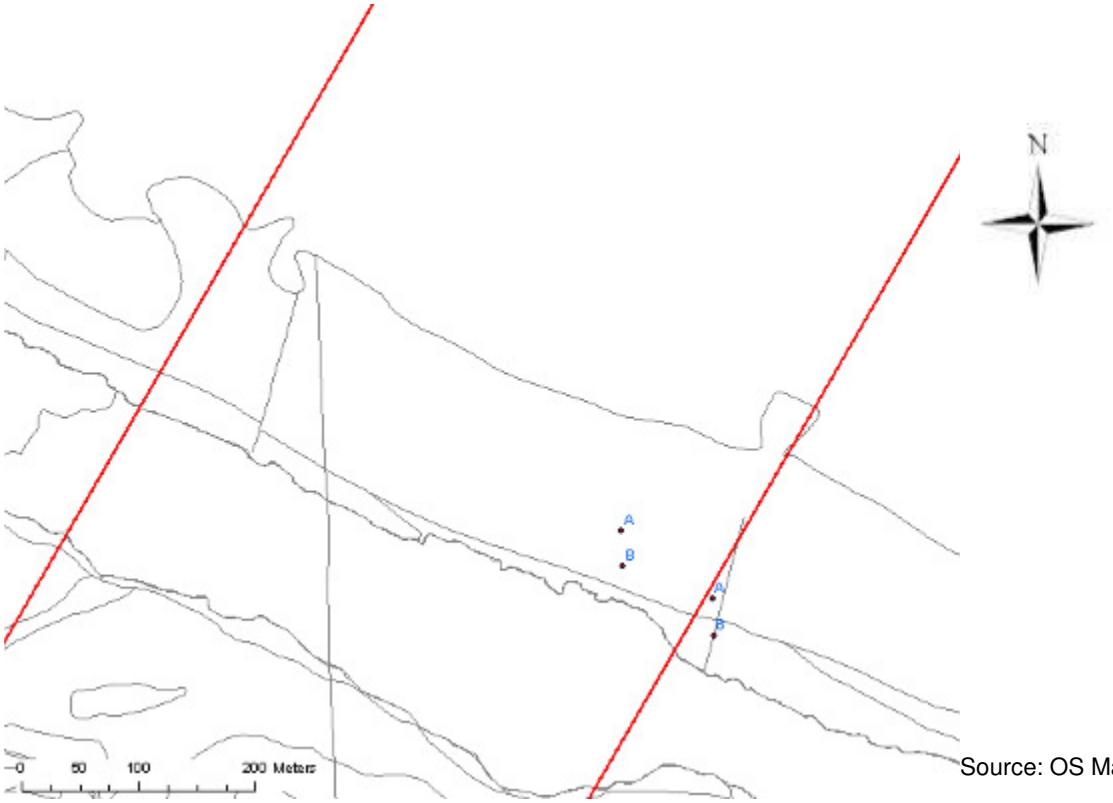
There are no shore-parallel defences in this section.

Timber groynes are present. These groynes are in a good condition with no damage to the structure or fittings. The beach appears stable and comprises sand and cobbles, there is a build up of beach material around the groynes which are buried around the upper (landward) end.

Section no. 67
Cromer to Overstrand

A

B



Source: OS Maps

Table 4.5: SCAPE Section 66

Asset Location			
SCAPE Section No:	66	**Location:**	Cromer to Overstrand
		Survey Date:	30-10-12
SMP Unit:	3b05		
SMP Policy:	From Present Day	Medium Term	Long Term
	Managed realignment – to allow defence ruins to be removed	No active intervention	No active intervention
Coastal Defence Condition			
Defence Type:	Timber groynes (GF)		
Defence Length (m):	500	**Ownership:**	North Norfolk District Council
Foreshore Type:	Sand beach	**Assets Protected:**	Golf course
Exposure:	Medium	**Year Built:**	GF – 1935 / 1984
Condition grade	GF - Good	**Threshold grade**	N/A
Residual life min (expected years)	GF - 8	**Residual life max (potential years)**	GF - 15
Description of the defences and the foreshore – East to West			

There are no shore-parallel defences in this section.

Timber groynes are present. These groynes are in a good condition with no damage to the structure or fittings. The beach appears stable and comprises sand and cobbles, there is a build up of beach material around the groynes which are buried around the upper (landward) end.

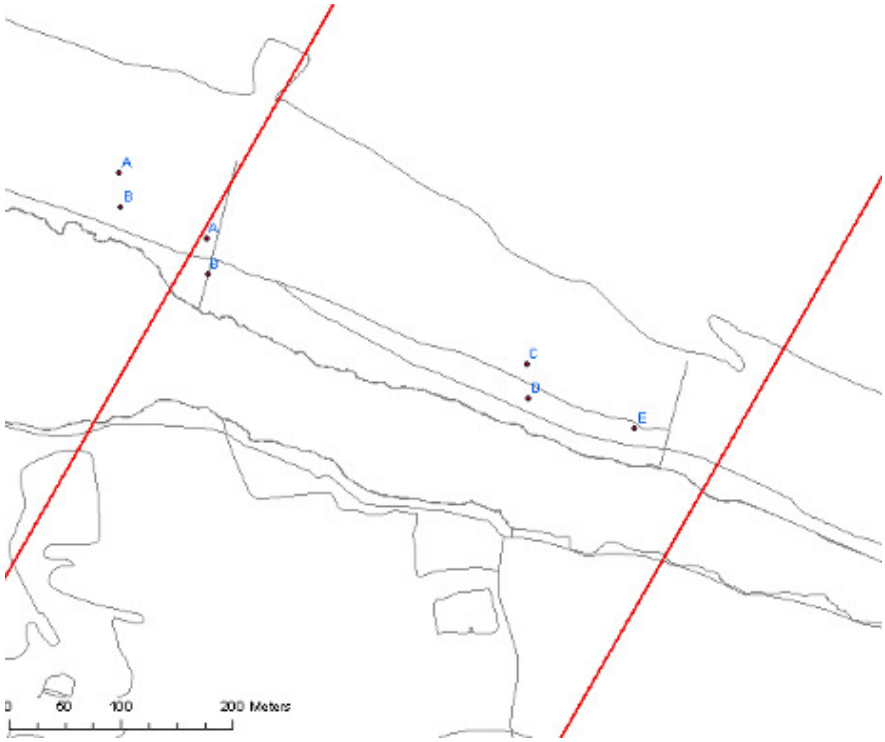
Section no. 66
Cromer to Overstrand

A

B

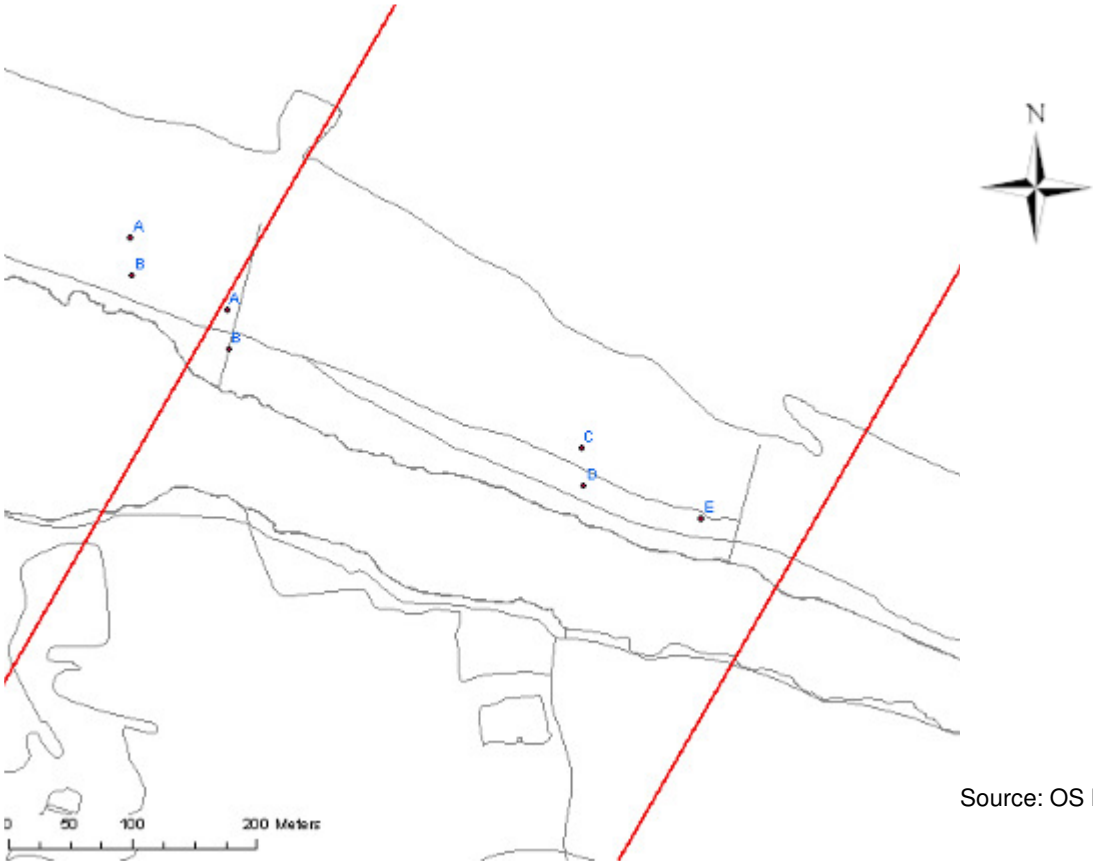
C

D



Source: OS Maps

E



Source: OS Maps

Table 4.6: SCAPE Section 65

Asset Location			
SCAPE Section No:	65	**Location:**	Cromer to Overstrand
		Survey Date:	30-10-12
SMP Unit:	3b05		
SMP Policy:	From Present Day	Medium Term	Long Term
	Managed realignment – to allow defence ruins to be removed	No active intervention	No active intervention
Coastal Defence Condition			
Defence Type:	Timber revetment (TR)Timber groynes (GF)		
Defence Length (m):	TR – 300 GF - 500	**Ownership:**	North Norfolk District Council
Foreshore Type:	Sand beach	**Assets Protected:**	Golf course, residential
Exposure:	High	**Year Built:**	GF – 1935 / 1984
Condition grade	TR – Fair / Poor GF - Good	**Threshold grade:**	N/A
Residual life min (expected years)	TR - 5 GF - 8	**Residual life max (potential years)**	TR - 10 GF - 15
Description of the defences and the foreshore – East to West			

A timber revetment spans approximately 300m from the east of this section and it is missing some boards along its face together with some sections being broken or bent. The toe of the structure comprises steel sheet piles to prevent undermining of the structure, there is also a timber capping beam to protect the tops of the piles.

The beach in front of the structure is being scoured creating a wave like profile; this exposes more of the steel piles which are corroding.

The timber groynes are in a fair condition with the timber becoming worn but not damaged and the fittings are showing some signs of corrosion. The beach appears stable but is relatively low in the area.

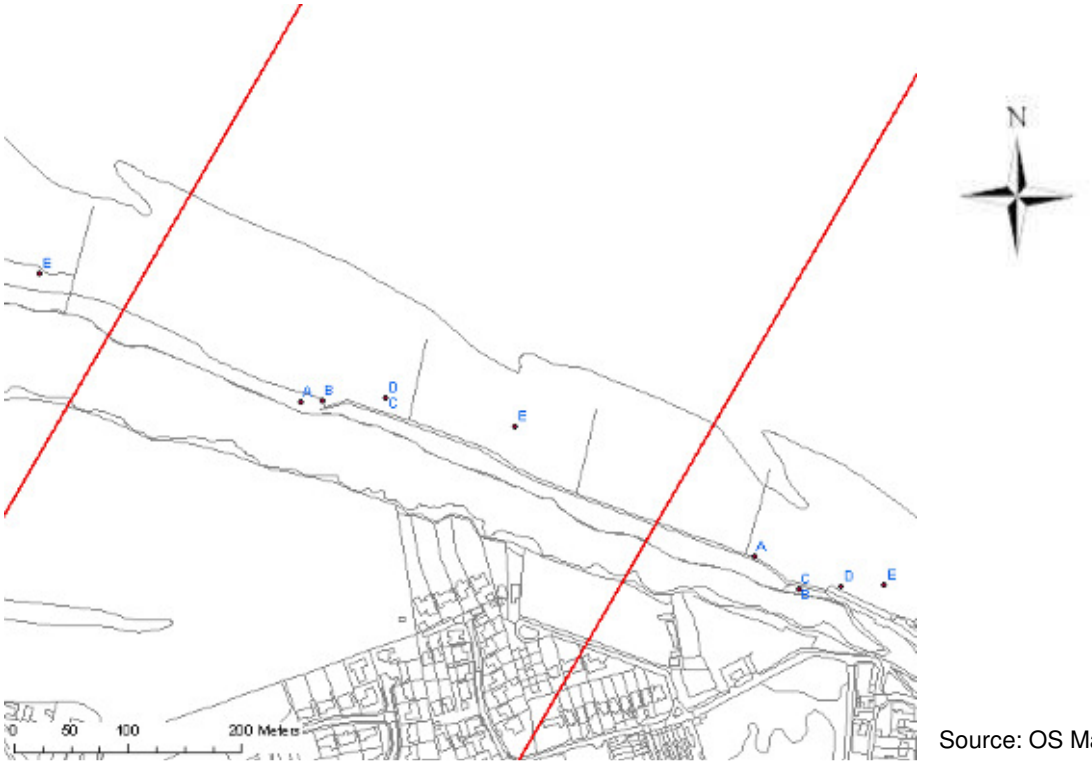
Section no. 65
Cromer to Overstrand

A

B

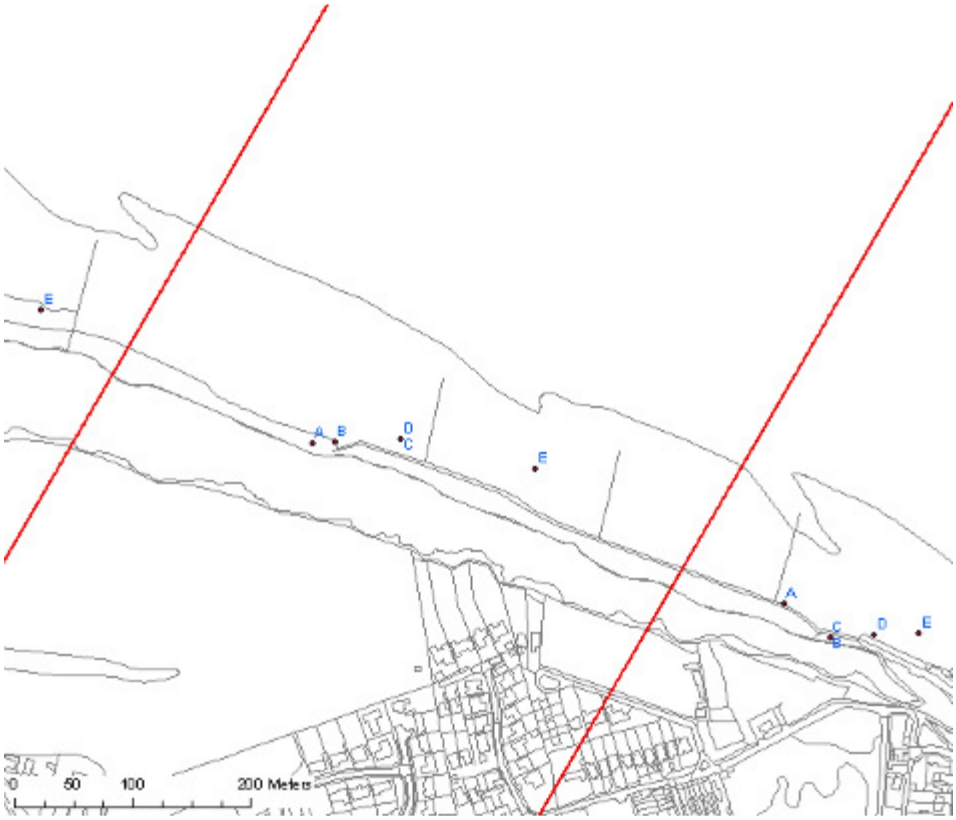
C

D



Source: OS Maps

E



Source: OS Maps

Table 4.7: SCAPE Section 64

Asset Location			
SCAPE Section No:	64	**Location:**	Overstrand
		Survey Date:	30-10-12
SMP Unit:	3b06		
SMP Policy:	From Present Day	Medium Term	Long Term
	Hold the line – Maintain Managed realignment at failure	Managed realignment	Managed realignment
Coastal Defence Condition			
Defence Type:	Timber revetment (TR), Blockwork (BW), Concrete defence structure (SW), Timber Groynes (GF)		
Defence Length (m):	TR – 100, BW – 50 SW – 350, GF – 500	**Ownership:**	North Norfolk District Council
Foreshore Type:	Sand beach	**Assets Protected:**	Residential, sewerage system including storage tank and pumping station, open space
Exposure:	High	**Year Built:**	TR – 1967 SW – 1890 / 1953 (Refurbished 1955 / 1998) BW – 1949 GF – 1967 / 1981
Condition grade	TR – Fair / Poor, SW – Very Good, BW – Poor, GF – Good	**Threshold grade:**	N/A
Residual life min (expected years)	TR – 5, BW – 2, SW – 30, GF - 8	**Residual life max (potential years)**	TR – 10, BW – 5, SW – 50, GF - 15
Description of the defences and the foreshore – East to West			

The concrete defence comprises a promenade atop a concrete recurved seawall. The wall appears to have been refurbished with an additional concrete pour to its front before a line of steel sheet piles to prevent undermining of the structure. The piles are offset from the face of the wall by a concrete capping slab. The structure is showing minimal signs of damage and the piles are buried in the beach so they are not experiencing a high degree of corrosion. There is also a concrete slipway providing access to the foreshore. The cliffs to the rear of the wall are also in places protected by a set of stepped gabion baskets which are in good condition with no obvious damage to the baskets.

The short block work section is in a poor state as the timber frame supporting the structure is corroded around the fittings and the frame is not regular with timber of varying length tied together. The blocks are held in place purely by this frame although the blocks themselves are in a reasonable condition they are very irregular and there are residual sections of steel sheet piling amongst them which constitute the previous steel frame structure.

The timber revetment is missing a number of the boards and has been damaged in places whilst some of the piled foundations are exposed and becoming corroded.

The timber groynes run through the section and are in a good condition with no missing boards and minimal wear on the timber, though the fittings are starting to corrode.

Section no. 64
Overstrand

A

B

C

D

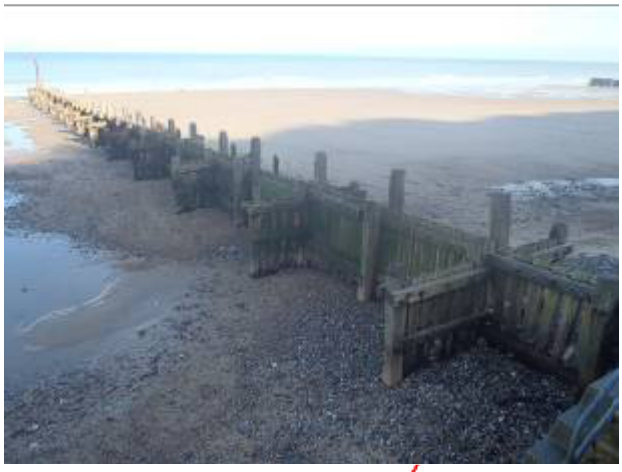
Source: OS Maps

Section no. 64
Overstrand

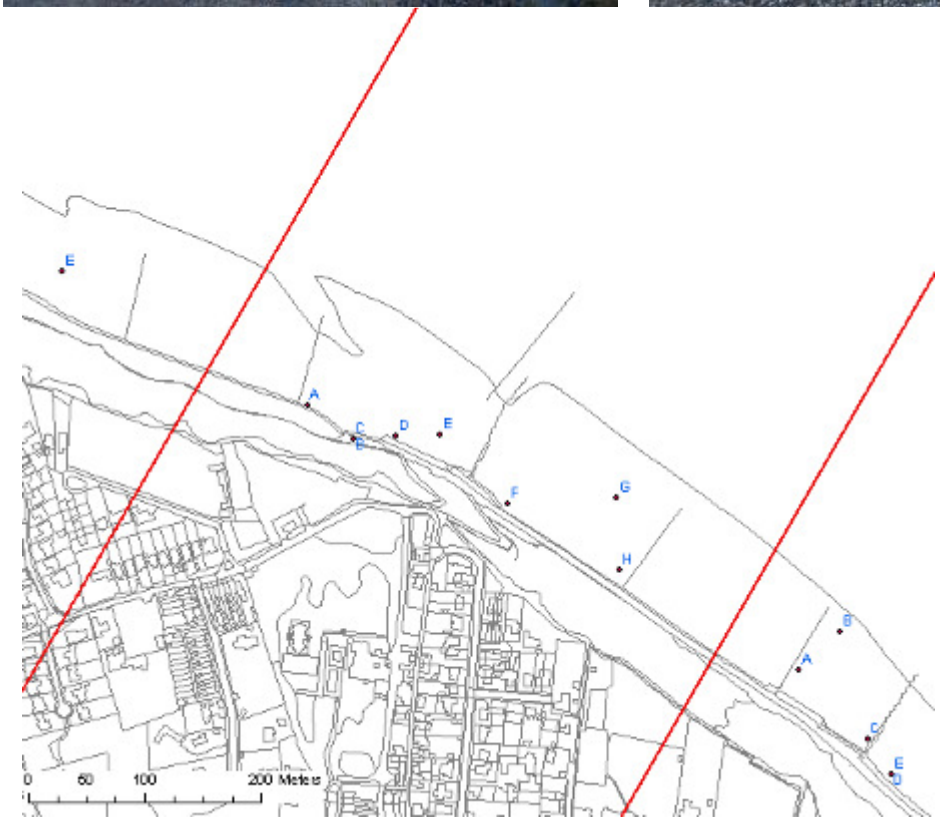
E

F

G



H



Source: OS Maps

Table 4.8: SCAPE Section 63

Asset Location			
SCAPE Section No:	63	**Location:**	Overstrand
		Survey Date:	30-10-12
SMP Unit:	3b06		
SMP Policy:	From Present Day	Medium Term	Long Term
	Hold the line – Maintain Managed realignment at failure	Managed realignment	Managed realignment
Coastal Defence Condition			
Defence Type:	Rock Revetment (RR), Timber Revetment (TR), Concrete defence structure(SW), Timber groynes (GF)		
Defence Length (m):	RR – 100m, TR – 15m, SW – 250m	**Ownership:**	North Norfolk District Council
Foreshore Type:	Sand beach	**Assets Protected:**	Residential, sewer infrastructure, public open space
Exposure:	High	**Year Built:**	TR – 1969 (refurbished with rock 1996) RR - 1996 SW – 1890 / 1955 (refurbished 1955 / 1978)
Condition grade	RR – Very Good, TR – Good SW - Fair	**Threshold grade:**	N/A
Residual life min (expected years)	RR – 25, TR – 10 SW – 10, GF - 5	**Residual life max (potential years)**	RR – 55, TR – 20 SW – 25, GF - 10
Description of the defences and the foreshore – East to West			

The concrete defence comprises a promenade atop a concrete recurved seawall. The wall appears to have been refurbished with an additional concrete pour to its front before a line of steel sheet piles to prevent undermining of the structure. The piles are offset from the face of the wall by a concrete capping slab. The structure is showing minimal signs of damage and the piles are buried in the beach so they are not experiencing a high degree of corrosion. There is also a concrete slipway providing access to the foreshore. The cliffs to the rear of the wall are also in places protected by a set of stepped gabion baskets which are in good condition with no obvious damage to the baskets.

The short block work section is in a poor state as the timber frame supporting the structure is corroded around the fittings and the frame is not regular with timber of varying length tied together. The blocks are held in place purely by this frame although the blocks themselves are in a reasonable condition they are very irregular and there are residual sections of steel sheet piling amongst them which constitute the previous steel frame structure.

The timber revetment is missing a number of the boards and has been damaged in places whilst some of the piled foundations are exposed and becoming corroded.

The timber groynes run through the section and are in a good condition with no missing boards and minimal wear on the timber, though the fittings are starting to corrode.

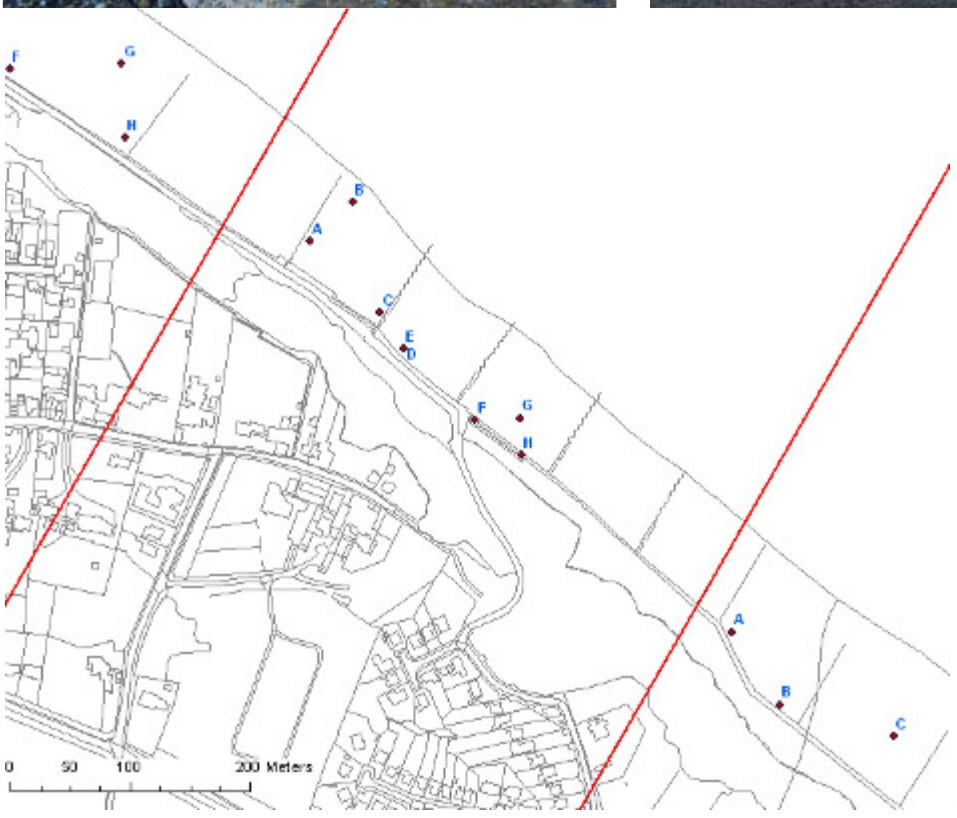
Section no. 63
Overstrand

A

B

C

D



Source: OS Maps

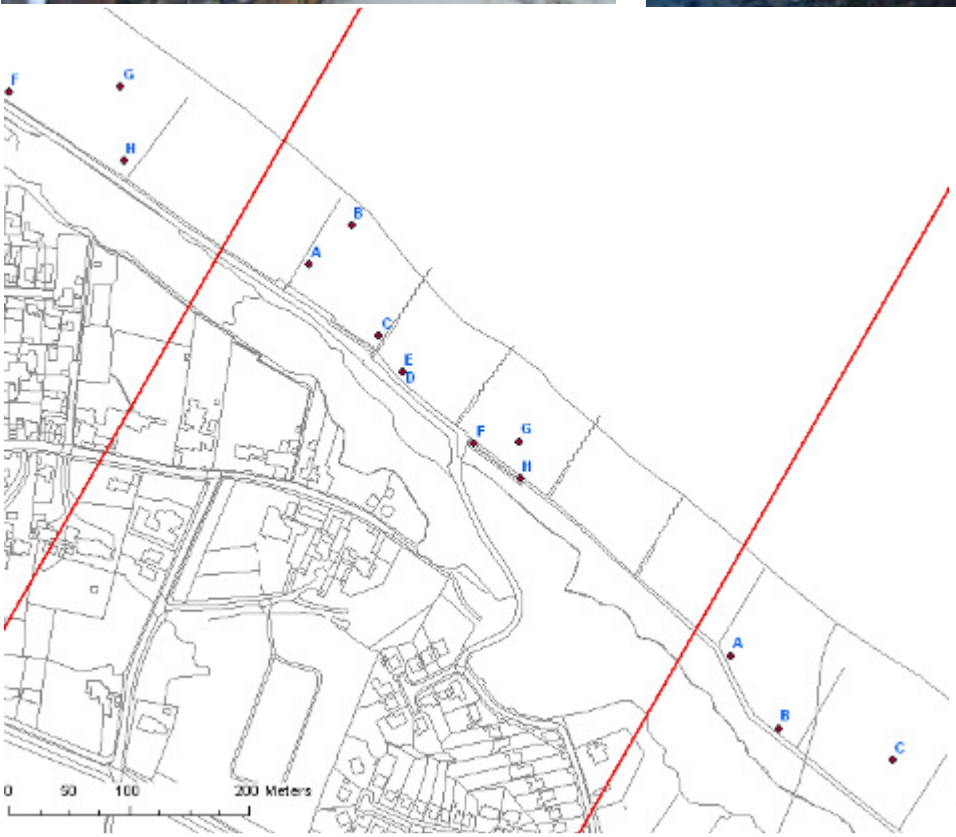
Section no. 63
Overstrand

E

F

G

H



Source: OS Maps

Table 4.9: SCAPE Section 62

Asset Location			
SCAPE Section No:	62	**Location:**	Overstrand to Mundesley (Sidestrand)
		Survey Date:	30-10-12
SMP Unit:	3b07a		
SMP Policy:	From Present Day	Medium Term	Long Term
	Managed realignment to allow for ruined defences to be removed	No active intervention	No active intervention
Coastal Defence Condition			
Defence Type:	Timber Revetment (TR), Timber groynes (GF)		
Defence Length (m):	500	**Ownership:**	North Norfolk District Council
Foreshore Type:	Sand beach	**Assets Protected:**	Rural, residential
Exposure:	High	**Year Built:**	TR – 1975 GF – 1967 / 1987
Condition grade	TR – Poor GF – Good	**Threshold grade:**	N/A
Residual life min (expected years)	TR – 1 GF - 10	**Residual life max (potential years)**	TR – 3 GF - 15
Description of the defences and the foreshore – East to West			

The timber revetment is in a varied condition which worsens significantly towards the western end of the section. The timber revetment starts intact with no missing boards and only minor damage to the main revetment; this may be due to the revetment being of a more permeable construction with larger gaps in the face of the structure. The steel sheet piles at its toe are also in good condition with just some corrosion visible in places.

Towards the west the boards on the revetment have been ripped off and the structure is providing minimal protection to the cliff face.

The overall condition has been taken as poor based on the impact that the loss of the very poor section would have on the remaining revetment.

The timber groynes are not missing any boards and are just being worn down, increasing the gaps between them. The beach level appears low in this area.

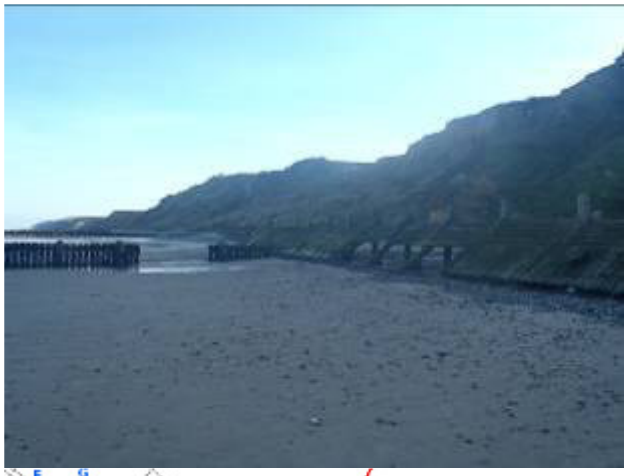
Section no. 62

Overstrand to Mundesley (Sidestrand)

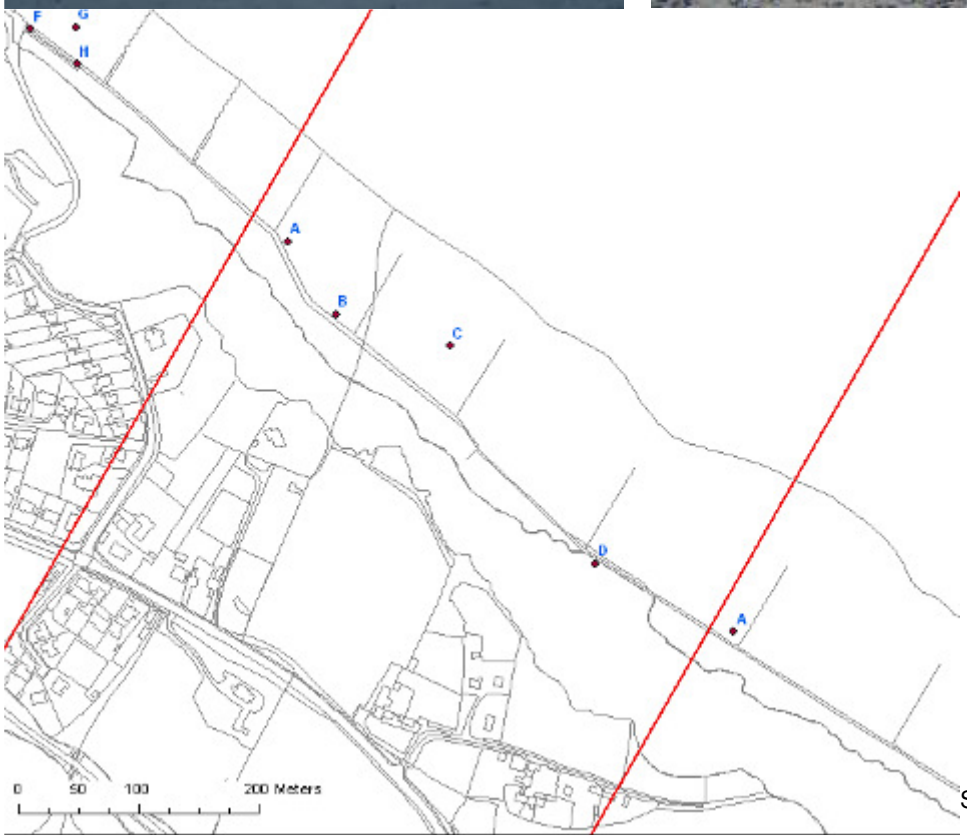
A

B

C



D



Source: OS Maps

Table 4.10: SCAPE Section 61

Asset Location			
SCAPE Section No:	61	**Location:**	Overstrand to Mundesley (Sidestrand)
		Survey Date:	30-10-12
SMP Unit:	3b07a		
SMP Policy:	From Present Day	Medium Term	Long Term
	Managed realignment to allow for ruined defences to be removed	No active intervention	No active intervention
Coastal Defence Condition			
Defence Type:	Timber Revetment (TR), Timber groynes (GF)		
Defence Length (m):	500	**Ownership:**	North Norfolk District Council
Foreshore Type:	Sand beach	**Assets Protected:**	Agricultural land
Exposure:	High	**Year Built:**	TR – 1975 GF – 1970 / 1987
Condition grade	TR – Poor GF – Good	**Threshold grade:**	N/A
Residual life min (expected years)	TR – 3 GF - 10	**Residual life max (potential years)**	TR – 5 GF - 15
Description of the defences and the foreshore – East to West			

The timber revetment is in a varied condition which worsens significantly towards the eastern end of the section. The timber revetment starts with the boards on the revetment being missing and the structure is subsequently providing minimal protection to the cliff face. The bulk of the revetment is intact with no missing boards and only minor damage, the steel sheet piles at the toe of the structure are also in good condition with just some corrosion visible in places.

A final condition of poor has been taken as the damaged section is situated at the very end of the structure which could lead to progressive failure.

The timber groynes are not missing any of the boards and are just being worn down, increasing the gaps between boards. The beach level appears to be quite low in this area but stable.

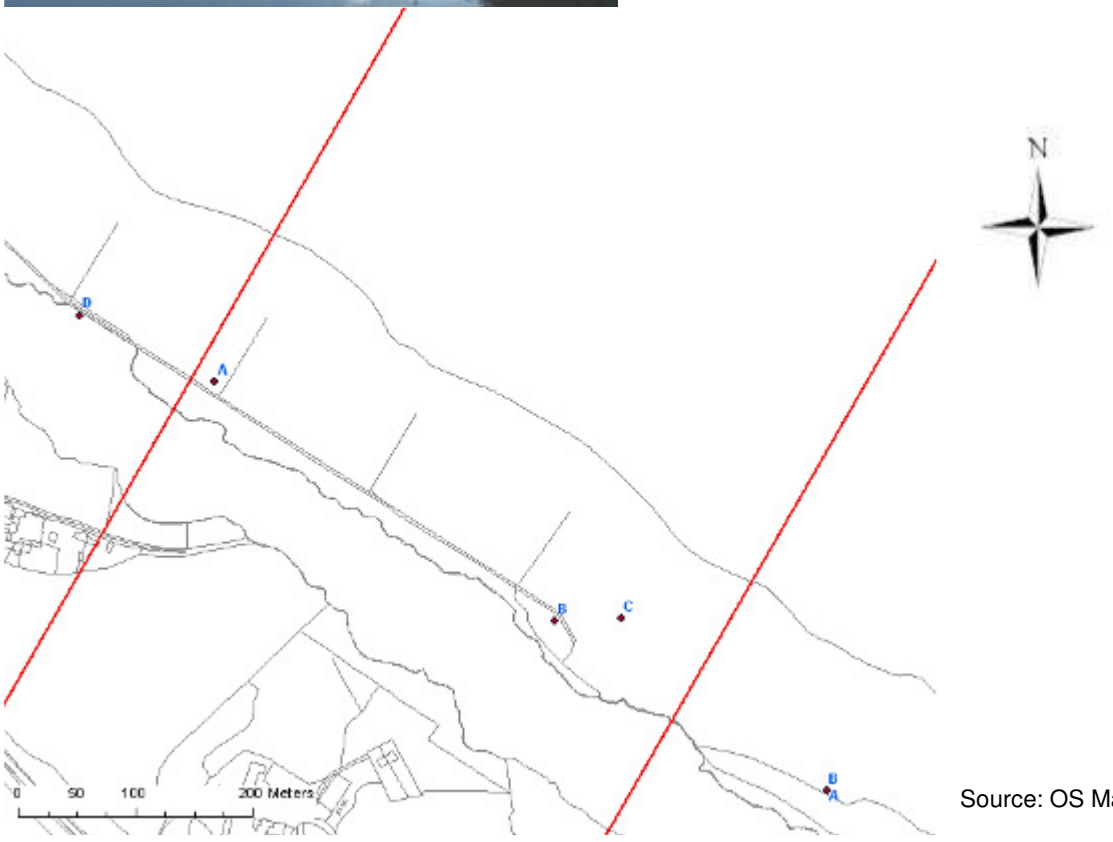
Section no. 61

Overstrand to Mundesley (Sidestrand)

A

B

C



Source: OS Maps

Table 4.11: SCAPE Section 60

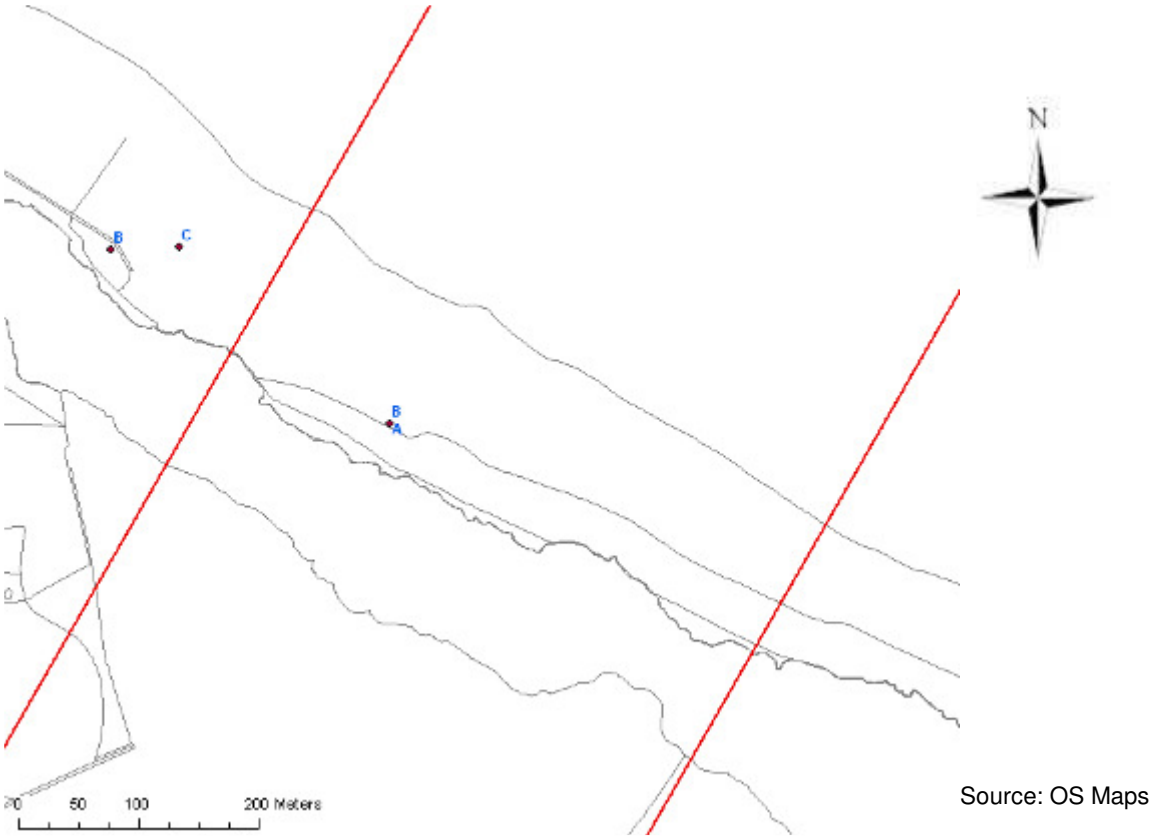
Asset Location			
SCAPE Section No:	60	**Location:**	Overstrand to Mundesley (Sidestrand)
		Survey Date:	30-10-12
SMP Unit:	3b07a		
SMP Policy:	From Present Day	Medium Term	Long Term
	Managed realignment to allow for ruined defences to be removed	No active intervention	No active intervention
Coastal Defence Condition			
Defence Type:	No defence structures		
Defence Length (m):	N/A	**Ownership:**	N/A
Foreshore Type:	Sand beach with some cobbles and clay deposits	**Assets Protected:**	Agricultural land
Exposure:	High	**Year Built:**	N/A
Condition grade	N/A	**Threshold grade:**	N/A
Residual life min (expected years)	N/A	**Residual life max (potential years)**	N/A
Description of the defences and the foreshore – East to West			
This area is fully undefended; the toe of the cliff is exposed. Erosion is evident in the cliff-fall clay deposits all along this section of coastline.			

Section no. 60

Overstrand to Mundesley (Sidestrand)

A

B



Source: OS Maps

Table 4.12: SCAPE Section 59

Asset Location			
SCAPE Section No:	59	**Location:**	Overstrand to Mundesley (Sidestrand)
		Survey Date:	30-10-12
SMP Unit:	3b07a		
SMP Policy:	From Present Day	Medium Term	Long Term
	Managed realignment to allow for ruined defences to be removed	No active intervention	No active intervention
Coastal Defence Condition			
Defence Type:	No defence structures		
Defence Length (m):	N/A	**Ownership:**	N/A
Foreshore Type:	Sand beach with some cobbles and clay deposits	**Assets Protected:**	Agricultural land
Exposure:	High	**Year Built:**	N/A
Condition grade	N/A	**Threshold grade:**	N/A
Residual life min (expected years)	N/A	**Residual life max (potential years)**	N/A
Description of the defences and the foreshore – East to West			
This area is fully undefended; the toe of the cliff is exposed. Erosion is evident in the cliff-fall clay deposits all along this section of coastline. The wave cut platform is also visible in a number of places.			

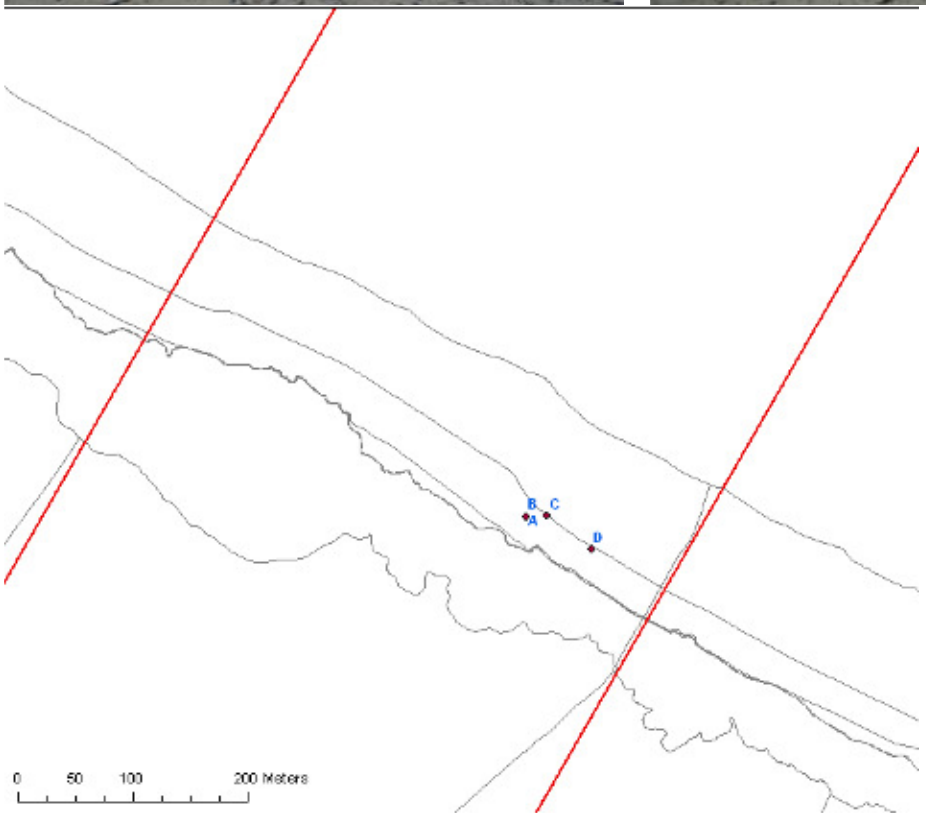
Section no. 59
Overstrand to Mundesley (Sidestrand)

A

B

C

D

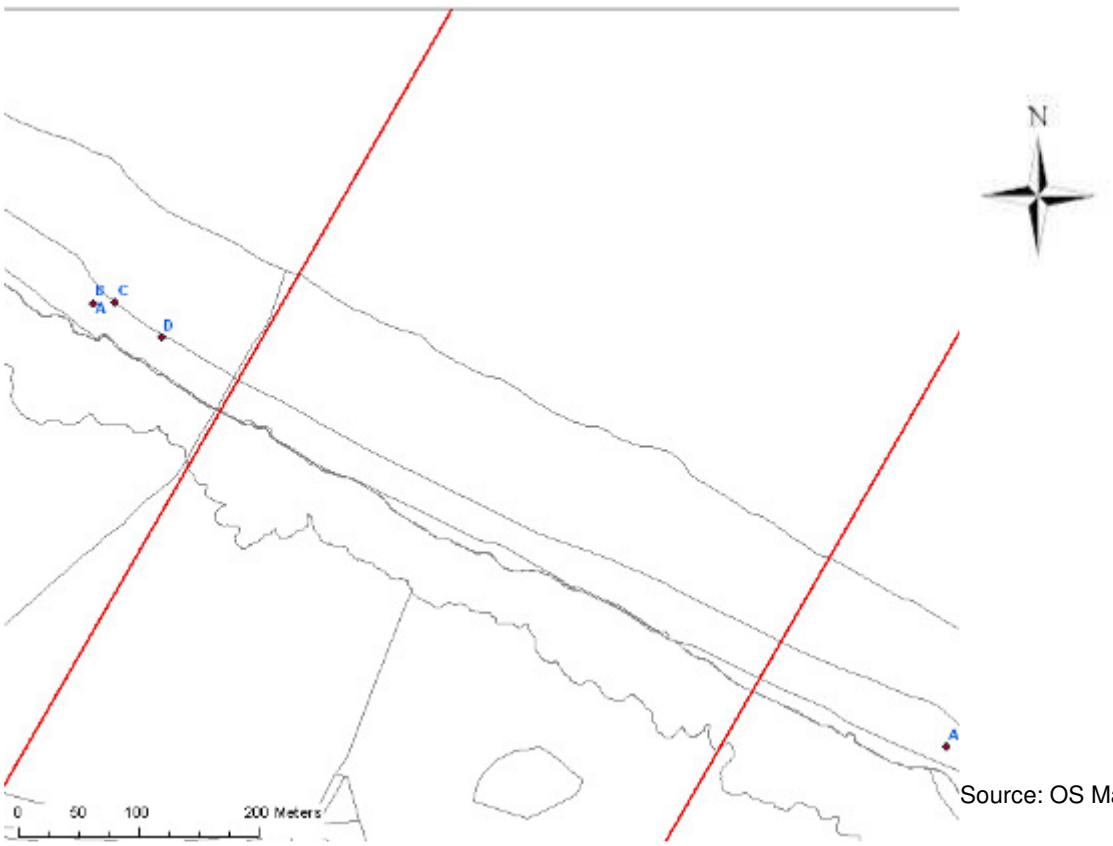


Source: OS Maps

Table 4.13: SCAPE Section 58

Asset Location			
SCAPE Section No:	58	**Location:**	Overstrand to Mundesley (Sidestrand)
		Survey Date:	30-10-12
SMP Unit:	3b07a		
SMP Policy:	From Present Day	Medium Term	Long Term
	Managed realignment to allow for ruined defences to be removed	No active intervention	No active intervention
Coastal Defence Condition			
Defence Type:	No defence structures		
Defence Length (m):	N/A	**Ownership:**	N/A
Foreshore Type:	Sand beach with some cobbles and clay deposits	**Assets Protected:**	Agricultural land
Exposure:	High	**Year Built:**	N/A
Condition grade	N/A	**Threshold grade:**	N/A
Residual life min (expected years)	N/A	**Residual life max (potential years)**	N/A
Description of the defences and the foreshore – East to West			
This area is fully undefended; the toe of the cliff is exposed. Erosion is evident in the cliff-fall clay deposits all along this section of coastline. There is a slight build up of beach material within this section when compared to the other undefended sections of 59 and 60.			

Section no. 58
Overstrand to Mundesley (Sidestrand)



Source: OS Maps

Table 4.14: SCAPE Section 57

Asset Location			
SCAPE Section No:	57	**Location:**	Overstrand to Mundesley (Sidestrand/Trimingham)
		Survey Date:	30-10-12
SMP Unit:	3b07b		
SMP Policy:	From Present Day	Medium Term	Long Term
	Managed realignment to allow for ruined defences to be removed	No active intervention	No active intervention
Coastal Defence Condition			
Defence Type:	Timber Revetment (TR), Timber Groynes(GF)		
Defence Length (m):	250	**Ownership:**	North Norfolk District Council
Foreshore Type:	Sand and cobble beach	**Assets Protected:**	Agricultural Land, residential
Exposure:	High	**Year Built:**	TR – 1975 GF – 1972 / 1975
Condition grade	TR – Fair GF – Fair	**Threshold grade:**	N/A
Residual life min (expected years)	TR – 5 GF - 5	**Residual life max (potential years)**	TR – 10 GF – 10
Description of the defences and the foreshore – East to West			

The timber revetment extends from the eastern end of the section to the mid point and is damaged in a number of places. Only a few boards are missing from the main structure, though a number are broken in places together with wearing of the main frame. The structure also has a steel sheet piled toe to improve stability and prevent undermining which is being corroded in places. The eastern extent of the timber revetment is in a very poor condition with many boards missing along a 50m length.

The timber groynes are also quite worn and experiencing some damage towards the seaward end of the structure. The beach level is stable and relatively high, providing some protection to the revetment piles.

Section no. 57

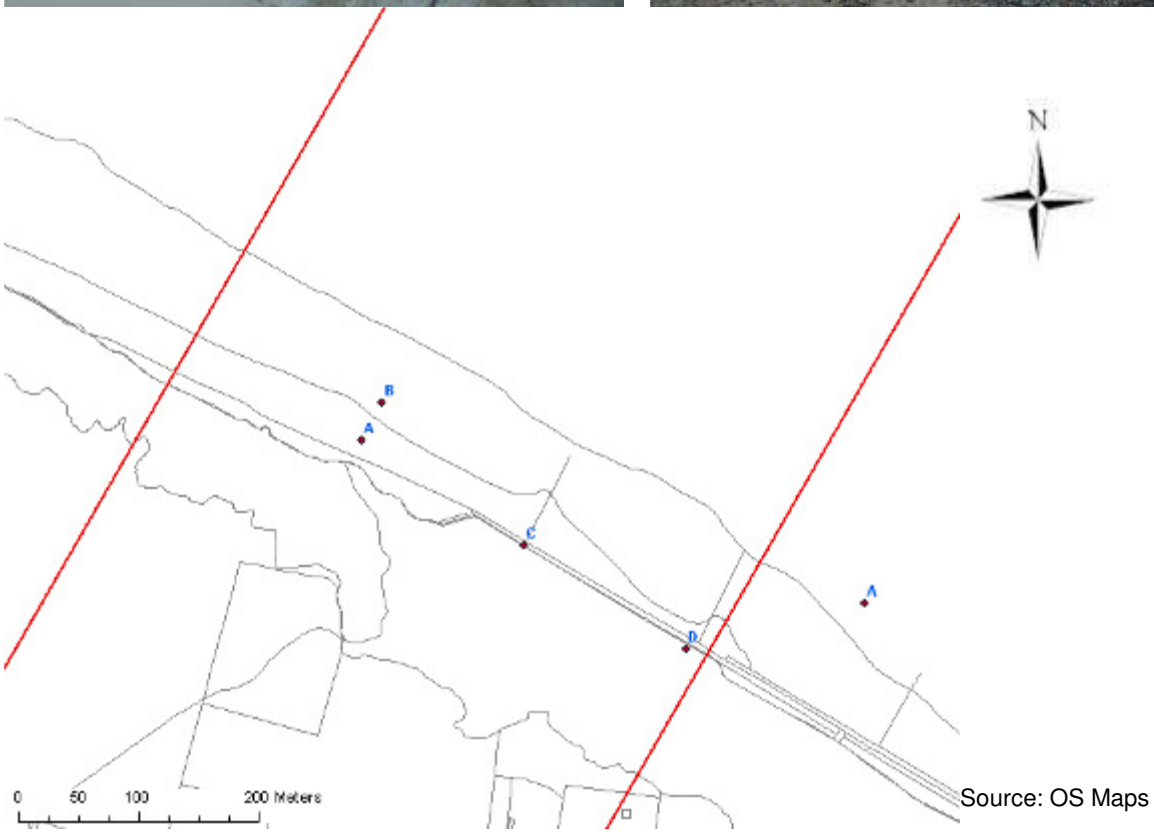
Overstrand to Mundesley (Sidestrand/Trimingham)

A

B

D

C



Source: OS Maps

Table 4.15: SCAPE Section 56

Asset Location			
SCAPE Section No:	56	**Location:**	Overstrand to Mundesley (Trimingham)
		Survey Date:	30-10-12
SMP Unit:	3b07b		
SMP Policy:	From Present Day	Medium Term	Long Term
	Managed realignment to allow for ruined defences to be removed	No active intervention	No active intervention
Coastal Defence Condition			
Defence Type:	Timber Revetment (TR), Timber Groynes(GF)		
Defence Length (m):	500	**Ownership:**	North Norfolk District Council
Foreshore Type:	Sand beach	**Assets Protected:**	Cliffs, rural SSSI, smallholdings, residential
Exposure:	High	**Year Built:**	TR – 1975 GF – 1972 / 1975
Condition grade	TR – Very Poor GF – Fair	**Threshold grade:**	N/A
Residual life min (expected years)	TR – 0 GF - 5	**Residual life max (potential years)**	TR – 0 GF - 10
Description of the defences and the foreshore – East to West			

The timber revetment in the first half of this section has been completely destroyed above the concrete footing, none of the timber structure remains and all that is in place is the concrete toe footing before the steel sheet piles which are offset from the concrete toe by a concrete capping slab. The piles are mainly buried in the beach material which appears stable. Through the second half of the section the timber revetment is in a very good condition with the timber experiencing minimal wear. Only a very few number of boards are missing. The toe is also completely buried in beach material to the western end of the section.

The timber groynes are damaged at the lower (seaward) end of the structure where a number of boards have been lost and the remaining timber is being badly worn. Conversely the upper sections of the groynes are in good condition and often buried. The groynes provide a good retention of beach material within the bays.

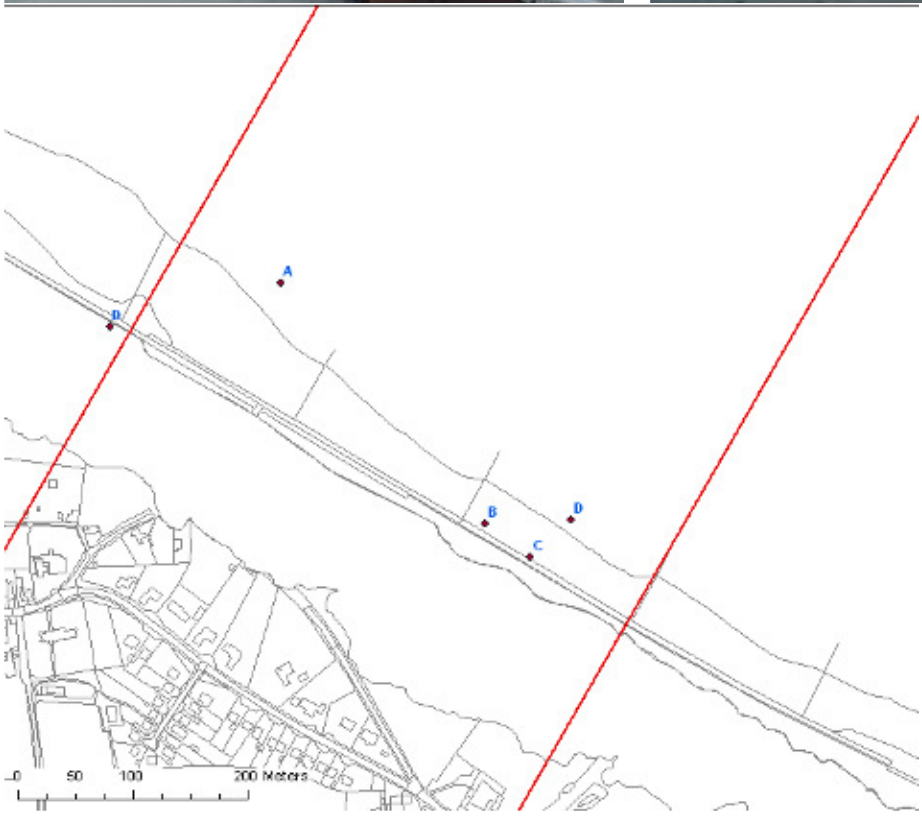
Section no. 56
Overstrand to Mundesley (Trimingham)

A

B

D

C



Source: OS Maps

Table 4.16: SCAPE Section 55

Asset Location			
SCAPE Section No:	55	**Location:**	Overstrand to Mundesley (Trimingham)
		Survey Date:	30-10-12
SMP Unit:	3b07b		
SMP Policy:	From Present Day	Medium Term	Long Term
	Managed realignment to allow for ruined defences to be removed	No active intervention	No active intervention
Coastal Defence Condition			
Defence Type:	Rock revetment (RR), Timber revetment (TR), Timber groynes (GF)		
Defence Length (m):	500	**Ownership:**	North Norfolk District Council
Foreshore Type:	Sand beach	**Assets Protected:**	Cliffs, rural SSSI, smallholdings, radar station
Exposure:	High	**Year Built:**	TR – 1975 GF – 1972 / 1975
Condition grade	RR - Fair TR – Very Poor GF – Fair	**Threshold grade:**	N/A
Residual life min (expected years)	RR - 5 TR – 0 GF - 5	**Residual life max (potential years)**	RR - 15 TR – 0 GF - 10
Description of the defences and the foreshore – East to West			

To the eastern end of this section the timber revetment has been completely destroyed, as a result some rock armour units have been placed for approximately 200m. The profile of the rock armour units does not appear to have been engineered. In places the levels vary and they are interspersed with residual timber frames of the old revetment.

For the remainder of the section all that remains of the timber revetment are the steel sheet piles within the foreshore and then the concrete footing and some of the timber frame as you approach the western end of the section. The piles are mainly buried in the beach material which appears stable.

The timber groynes are being damaged at the lower (seaward) end of the structure where a number of boards have been lost and the remaining timber is badly worn. Some sections have even broken off from the main body. The upper sections of the groynes are in a reasonable condition though the timber is very worn in places. The groynes are also retaining some beach material within the bays.

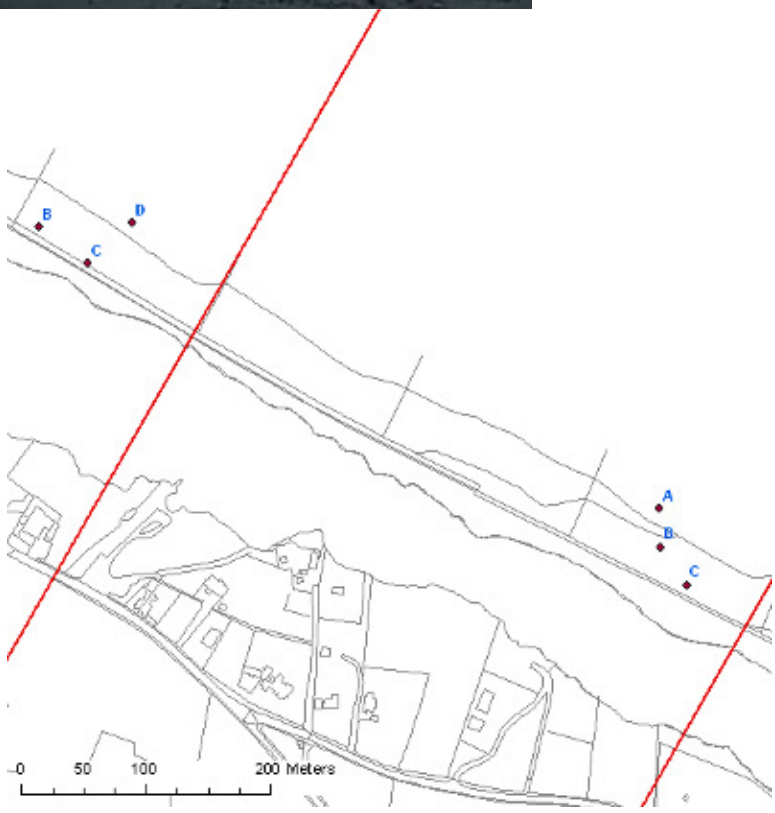
Section no. 55

Overstrand to Mundesley (Trimingham)

A

B

C



Source: OS Maps

Table 4.17: SCAPE Section 54

Asset Location			
SCAPE Section No:	54	**Location:**	Overstrand to Mundesley (Trimingham)
		Survey Date:	30-10-12
SMP Unit:	3b07b		
SMP Policy:	From Present Day	Medium Term	Long Term
	Managed realignment to allow for ruined defences to be removed	No active intervention	No active intervention
Coastal Defence Condition			
Defence Type:	Timber revetment (TR), Timber groynes (GF)		
Defence Length (m):	500	**Ownership:**	North Norfolk District Council
Foreshore Type:	Sand beach with cobbles	**Assets Protected:**	Trimingham village, agricultural land, holiday park
Exposure:	High	**Year Built:**	TR – 1975 GF – 1972 / 1975
Condition grade	TR – Fair GF – Good / Fair	**Threshold grade:**	N/A
Residual life min (expected years)	TR – 5 GF - 8	**Residual life max (potential years)**	TR – 15 GF - 15
Description of the defences and the foreshore – East to West			

The timber revetment in this section deteriorates from the east to the west, though there are intermittent sections that vary in condition. Initially the revetment is in good condition with no missing boards and the timber appears to be only slightly worn with some corrosion around the fittings. Sections are missing and there are occasionally no boards in isolated areas. The piles are not overly worn and the majority of them are buried in the beach material. They comprise a timber capping beam to tie them into the structure.

Towards the western end of the section there are areas where the piles are partially up rooted and bent as a result of the missing areas of timber revetment.

The timber groynes are in a good condition with the boards becoming worn and creating larger gaps over the length of the groyne though mainly to the seaward end. The beach appears quite stable.

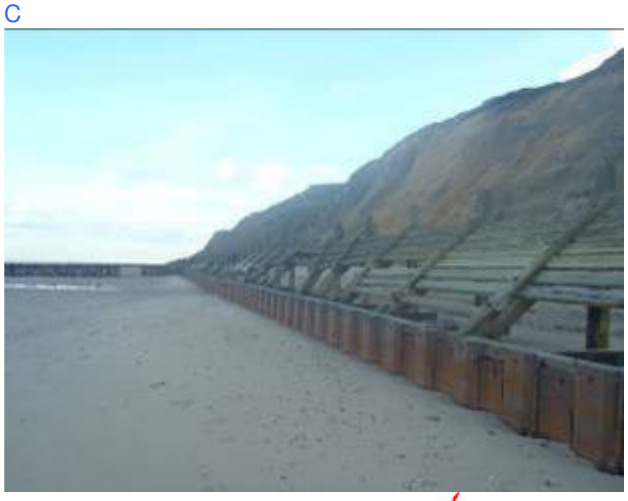
Section no. 54

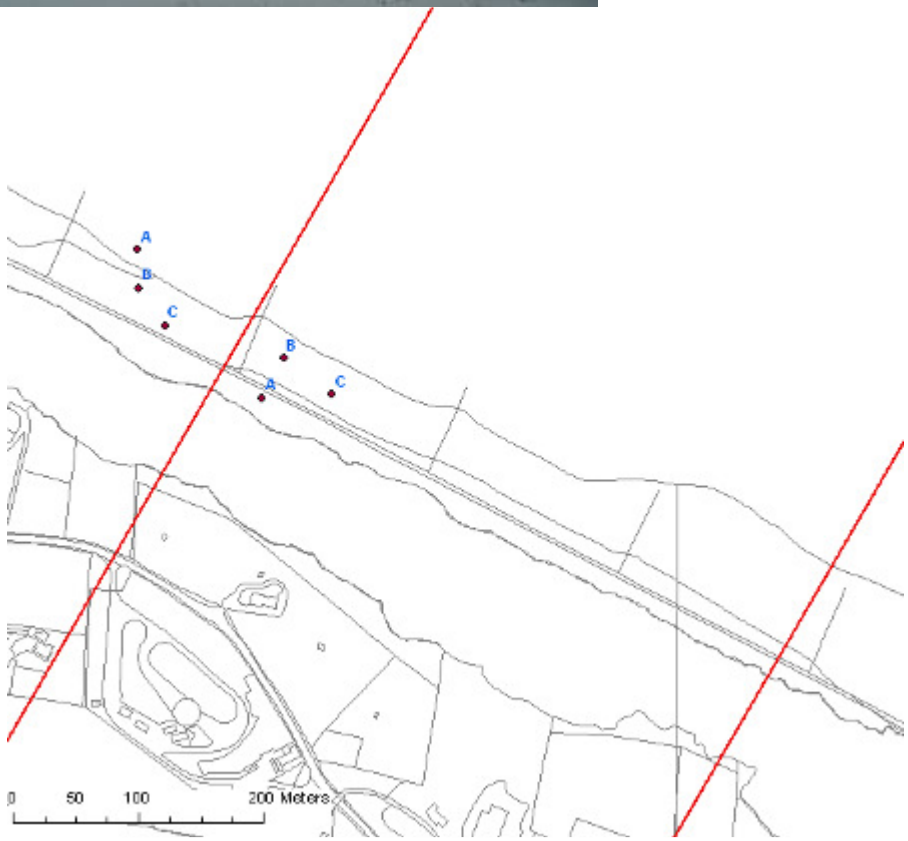
Overstrand to Mundesley (Trimingham)

A

B

C





Source: OS Maps

Table 4.18: SCAPE Section 53

Asset Location			
SCAPE Section No:	53	**Location:**	Overstrand to Mundesley (Trimingham)
		Survey Date:	30-10-12
SMP Unit:	3b07b		
SMP Policy:	From Present Day	Medium Term	Long Term
	Managed realignment to allow for ruined defences to be removed	No active intervention	No active intervention
Coastal Defence Condition			
Defence Type:	Timber revetment (TR), Timber groynes (GF)		
Defence Length (m):	500	**Ownership:**	North Norfolk District Council
Foreshore Type:	Sand beach with cobbles	**Assets Protected:**	Trimingham village, agricultural land, holiday park
Exposure:	High	**Year Built:**	TR – 1975 GF – 1972 / 1975
Condition grade	TR – Good / Fair GF – Good / Fair	**Threshold grade:**	N/A
Residual life min (expected years)	TR – 10 GF - 8	**Residual life max (potential years)**	TR – 20 GF - 15
Description of the defences and the foreshore – East to West			

The timber revetment in this section deteriorates from the east to the west, though there are intermittent sections that vary in condition. Initially the revetment is in very good condition with no missing boards and the timber appears to be only slightly worn with minimal colouration and only some corrosion around the fixtures. There are other sections which are missing and there are occasionally no boards in isolated areas. The piles are not overly worn and the majority of them are buried in the beach material though levels are slightly lower here than elsewhere. They comprise a timber capping beam to tie them into the structure.

The timber groynes are in a good condition with the boards becoming worn and creating larger gaps over the length of the groyne though mainly toward the seaward end. The beach appears quite stable.

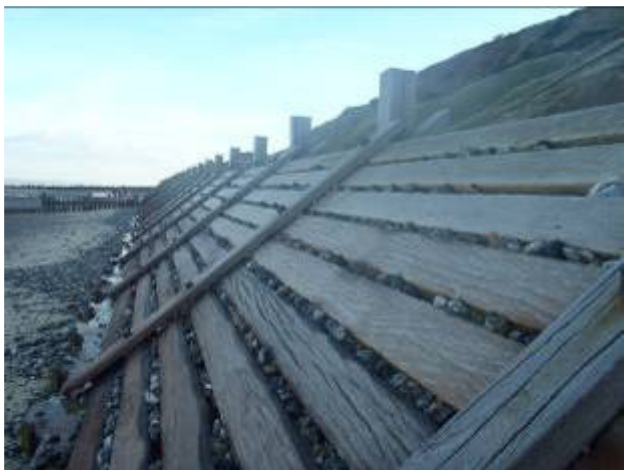
Section no. 53
Overstrand to Mundesley (Trimingham)

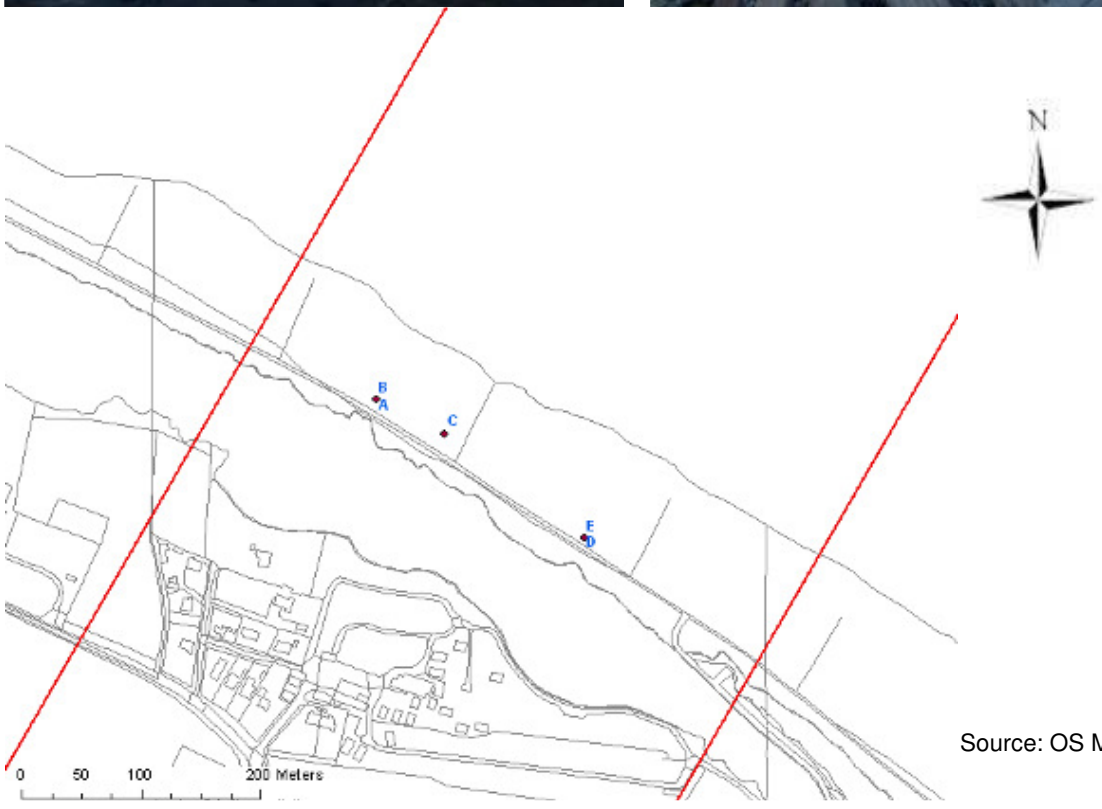
A

B

C

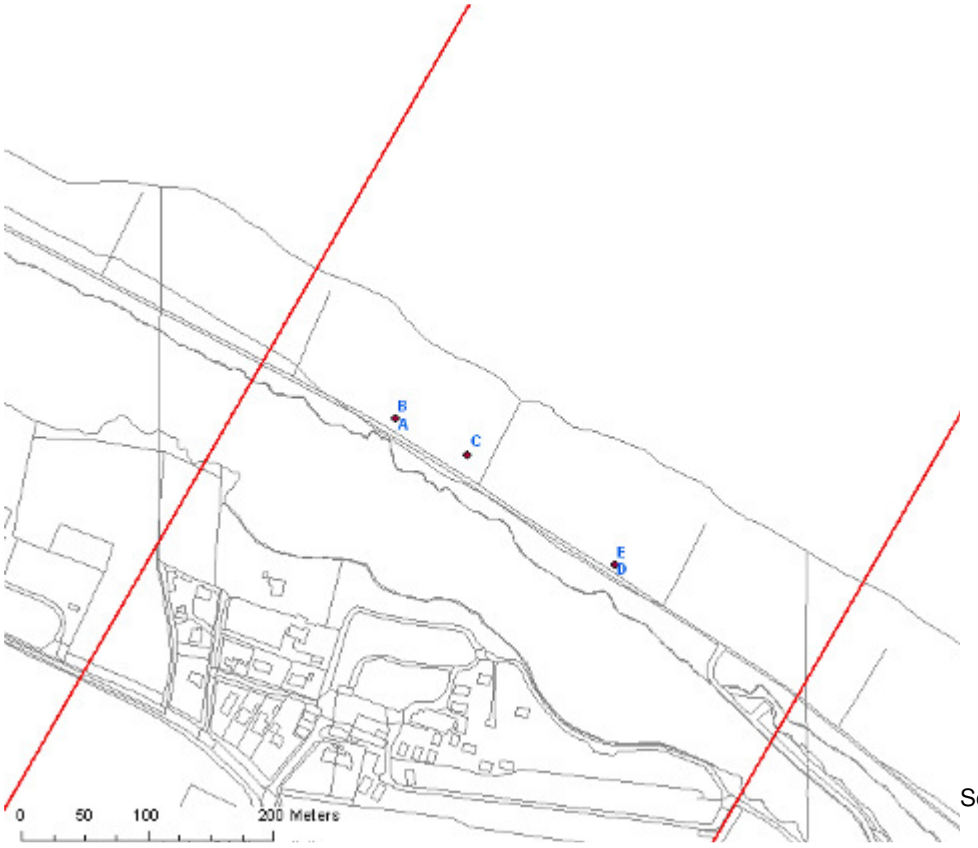
D





Source: OS Maps

E



Source: OS Maps

Table 4.19: SCAPE Section 52

Asset Location			
SCAPE Section No:	52	**Location:**	Overstrand to Mundesley (Vale Road)
		Survey Date:	30-10-12
SMP Unit:	3b07c		
SMP Policy:	From Present Day	Medium Term	Long Term
	Managed realignment to allow for ruined defences to be removed	No active intervention	No active intervention
Coastal Defence Condition			
Defence Type:	Timber revetment (TR), Timber groynes (GF)		
Defence Length (m):	500	**Ownership:**	North Norfolk District Council
Foreshore Type:	Sand beach with cobbles	**Assets Protected:**	SSSI cliffs, caravan park, residential, beach access
Exposure:	High	**Year Built:**	TR – 1972 GF – 1967 / 1972
Condition grade	TR – Good GF – Good / Fair	**Threshold grade:**	N/A
Residual life min (expected years)	TR – 15 GF - 8	**Residual life max (potential years)**	TR – 25 GF - 15
Description of the defences and the foreshore – East to West			

The timber revetment in this section is in a good condition with no missing boards and the timber appears to be only slightly worn with minimal colouration and only some corrosion around the fixtures. The piles are not overly worn and the majority of them are buried in the beach material though levels are slightly lower here than elsewhere. They comprise a timber capping beam to tie them into the structure.

The timber groynes are in a good condition with the boards becoming worn and creating larger gaps over the length of the groyne though mainly toward the seaward end. The beach appears quite stable.

Section no. 52

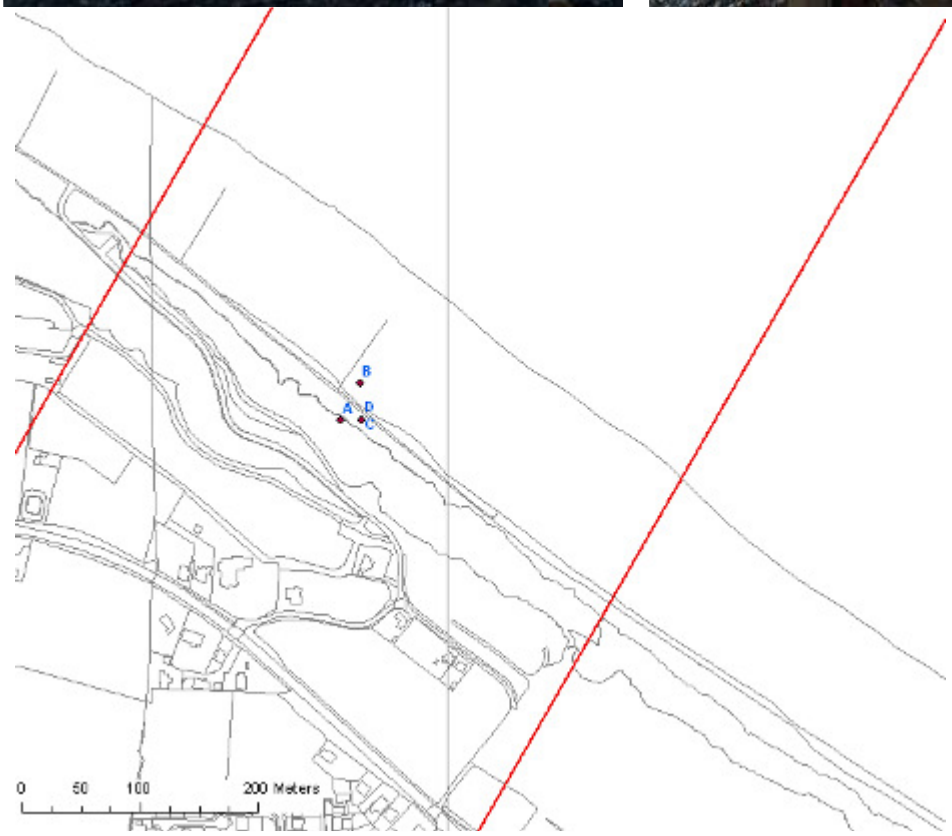
Overstrand to Mundesley (Vale Road)r

A

B

C

D



Source: OS Maps

Table 4.20: SCAPE Section 51

Asset Location			
SCAPE Section No:	51	**Location:**	Overstrand to Mundesley (Vale Road)
		Survey Date:	30-10-12
SMP Unit:	3b07c		
SMP Policy:	From Present Day	Medium Term	Long Term
	Managed realignment to allow for ruined defences to be removed	No active intervention	No active intervention
Coastal Defence Condition			
Defence Type:	Timber revetment (TR), Timber groynes (GF)		
Defence Length (m):	500	**Ownership:**	North Norfolk District Council
Foreshore Type:	Sand beach with cobbles	**Assets Protected:**	Cliffs, residential, Caravan Site
Exposure:	High	**Year Built:**	TR – 1967 GF – 1967 / 1972
Condition grade	TR – Good GF – Good / Fair	**Threshold grade:**	N/A
Residual life min (expected years)	TR – 15 GF - 8	**Residual life max (potential years)**	TR – 25 GF - 15
Description of the defences and the foreshore – East to West			

The timber revetment in this section is in a good condition with no missing boards and the timber appears to be only slightly worn with minimal colouration and only some corrosion around the fixtures. The piles are not overly worn and the majority of them are buried in the beach material though levels are slightly lower here than elsewhere. They comprise a timber capping beam to tie them into the structure.

The timber groynes are in a good condition with the boards becoming worn and creating larger gaps over the length of the groyne though mainly toward the seaward end. The beach appears quite stable.

Section no. 51
Overstrand to Mundesley (Vale Road)

Source: OS Maps

Table 4.21: SCAPE Section 50

Asset Location			
SCAPE Section No:	50	**Location:**	Mundesley
		Survey Date:	30-10-12
SMP Unit:	3b08		
SMP Policy:	From Present Day	Medium Term	Long Term
	Hold the line – Maintain / Replace	Hold the line – Maintain Managed realignment at failure	Managed realignment
Coastal Defence Condition			
Defence Type:	Timber revetment (TR), Timber groynes (GF)		
Defence Length (m):	500	**Ownership:**	North Norfolk District Council
Foreshore Type:	Sand beach with cobbles	**Assets Protected:**	Cliffs, residential
Exposure:	High	**Year Built:**	TR – 1967 GF – 1930 / 1988
Condition grade	TR – Good GF – Good / Fair	**Threshold grade:**	N/A
Residual life min (expected years)	TR – 15 GF - 8	**Residual life max (potential years)**	TR – 25 GF - 15
Description of the defences and the foreshore – East to West			

The timber revetment in this section is in a good condition with no missing boards and the timber appears to be only slightly worn with minimal colouration and only some corrosion around the fixtures. The piles are not overly worn and the majority of them are buried in the beach material though levels are slightly lower here than elsewhere. They comprise a timber capping beam to tie them into the structure.

The timber groynes are in a good condition with the boards becoming worn and creating larger gaps over the length of the groyne though mainly toward the seaward end. The beach appears quite stable.

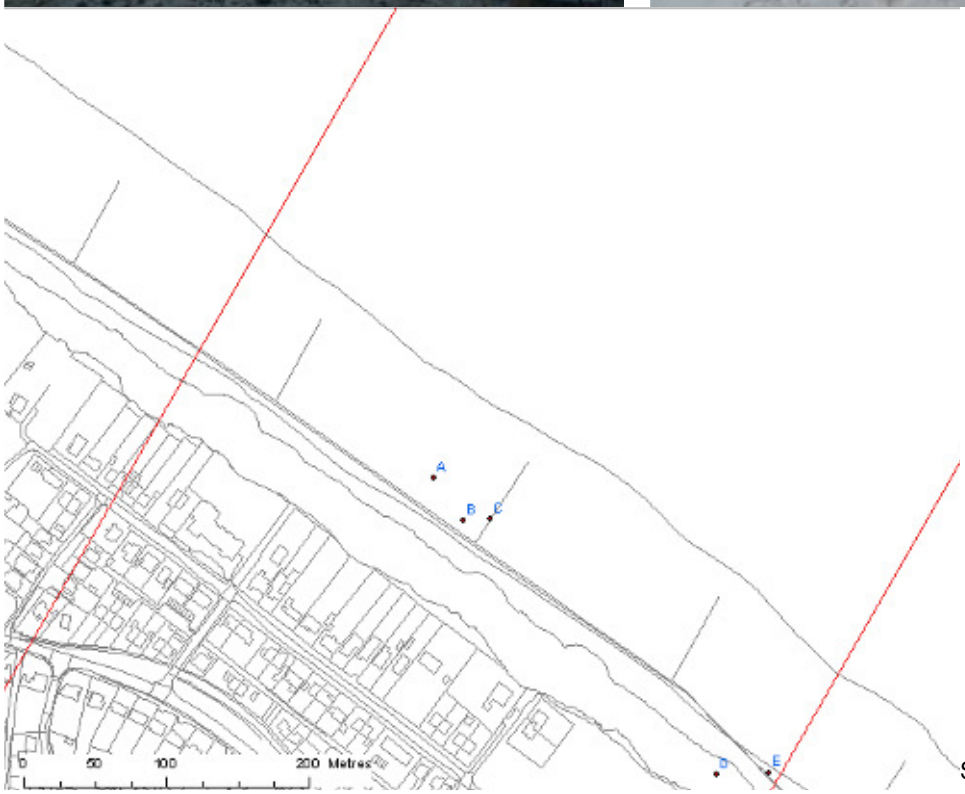
Section no. 50
Mundesley

A

B

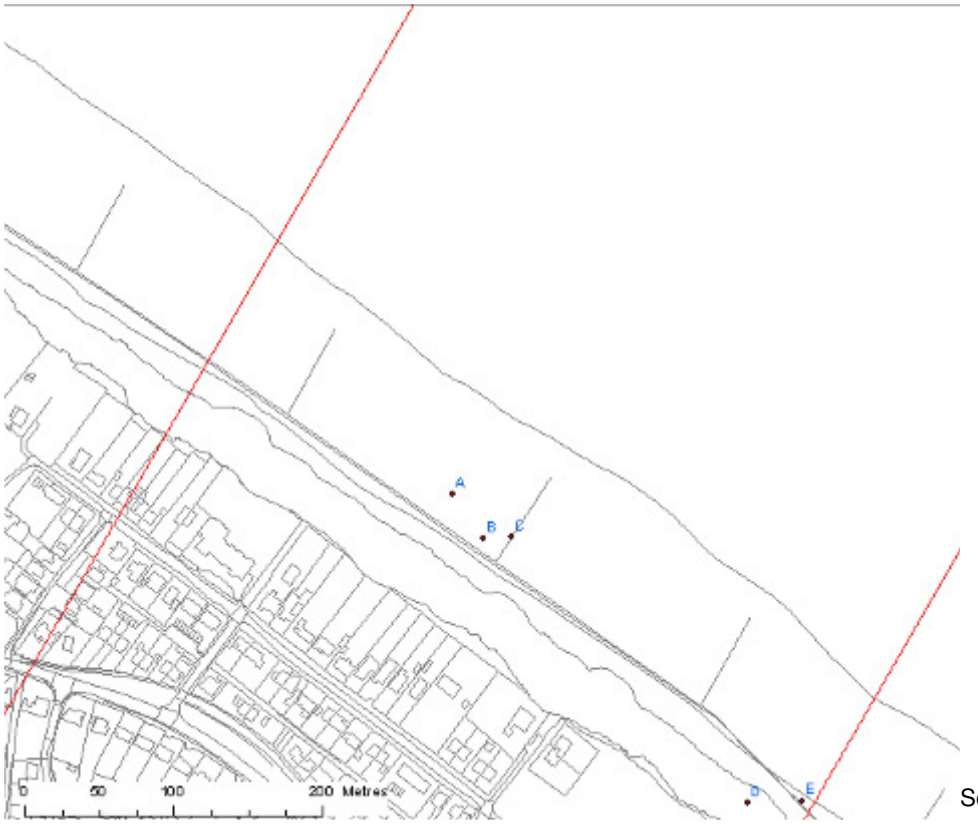
C

D



Source: OS Maps

E



Source: OS Maps

Table 4.22: SCAPE Section 49

Asset Location			
SCAPE Section No:	49	**Location:**	Mundesley
		Survey Date:	30-10-12
SMP Unit:	3b08		
SMP Policy:	From Present Day	Medium Term	Long Term
	Hold the line – Maintain / Replace	Hold the line – Maintain Managed realignment at failure	Managed realignment
Coastal Defence Condition			
Defence Type:	Steel block work defence structure (BW), Timber groynes (GF)		
Defence Length (m):	500	**Ownership:**	North Norfolk District Council
Foreshore Type:	Sand beach	**Assets Protected:**	Cliffs, residential, public open space
Exposure:	Medium	**Year Built:**	BW – 1955 GF – 1930 / 1988
Condition grade	BW – Poor GF – Good	**Threshold grade:**	N/A
Residual life min (expected years)	BW – 2 GF - 10	**Residual life max (potential years)**	BW – 5 GF - 15
Description of the defences and the foreshore – East to West			

The defences in this section comprise a blockwork structure contained within a steel frame. The blocks are concrete cubes that are quite worn but still maintain their shape. There are not enough blocks to create a significant revetment structure, though they have been placed within a steel frame to raise them up to dissipate wave energy before waves reach the base of the cliff. The steel frame is severely corroded with a number of the bars being bent in places. The steel frame comprises one bracing bar to the front and forms a grid pattern with the armour units inside. There is some additional support towards the eastern end but this does not extend very far.

There are some open-top gabion baskets installed at the base of the cliff to provide some additional stability and protection.

The timber groynes are retaining a reasonable amount of beach material and the foreshore begins to extend out further in this location than that fronting the timber revetment to the west. The groynes are partially buried toward the landward end and generally intact with only minimal damage toward the seaward section where the timber is worn and larger gaps are forming in the structure.

Section no. 49
Mundesley

A

B

C

D

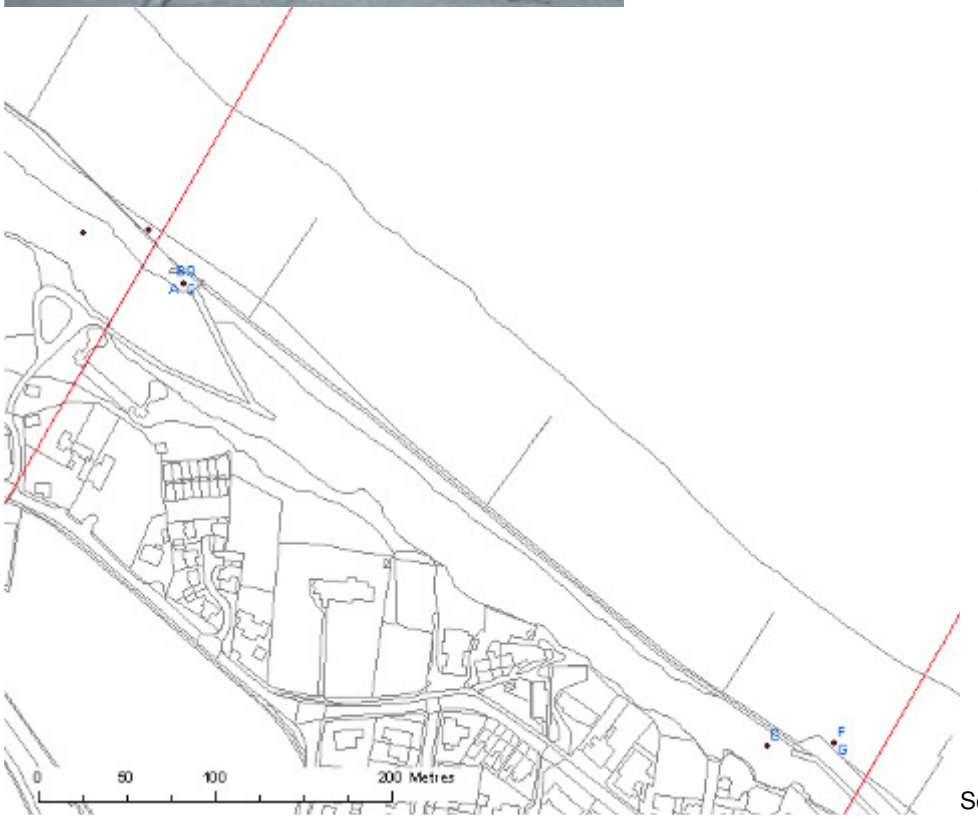
Source: OS Maps

Section no. 49
Mundesley

E

F

G



Source: OS Maps

Table 4.23: SCAPE Section 48

Asset Location			
SCAPE Section No:	48	**Location:**	Mundesley
		Survey Date:	30-10-12
SMP Unit:	3b08		
SMP Policy:	From Present Day	Medium Term	Long Term
	Hold the line – Maintain / Replace	Hold the line – Maintain Managed realignment at failure	Managed realignment
Coastal Defence Condition			
Defence Type:	Concrete seawall (SW), Timber groynes (GF)		
Defence Length (m):	500	**Ownership:**	North Norfolk District Council
Foreshore Type:	Sand beach	**Assets Protected:**	Urban, residential, commercial, public open space
Exposure:	Medium	**Year Built:**	SW – 1880 / 1910 (refurbished 1950 / 1970) GF – 1930 / 1988
Condition grade	SW – Fair GF – Good / Fair	**Threshold grade:**	N/A
Residual life min (expected years)	SW – 15 GF - 8	**Residual life max (potential years)**	SW – 25 GF - 15
Description of the defences and the foreshore – East to West			

The concrete structure through this section comprises a seawall with wave return at its crest, there is also a hand railing atop the structure as the wall forms the front of a concrete promenade. At the base of the toe is a concrete capping slab that is fronted by steel sheet piles. The piles are buried nearly to the top with beach material and are therefore only appear to be corroding significantly at their very tops. Toward the east the piles are completely buried. The seawall is in good condition with only minor damage in some areas and very little abrasion or cracking.

Some sections of wall around the slipways are experiencing cracking and concrete spalling and do not include a recurved structure at its crest.

The timber groynes are retaining a significant amount of beach material in the area and are partially buried toward the landward end. The structures are in good condition with only general wear to the timber and corrosion of the fixtures and fittings.

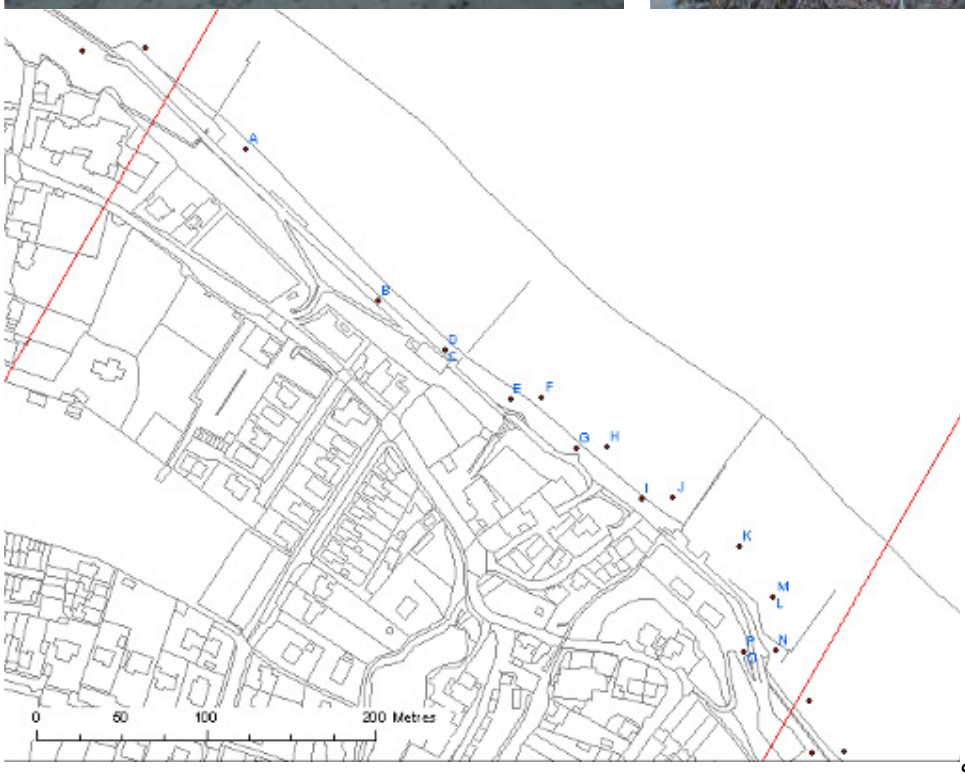
Section no. 48
Mundesley

A

B

C

D



Source: OS Maps

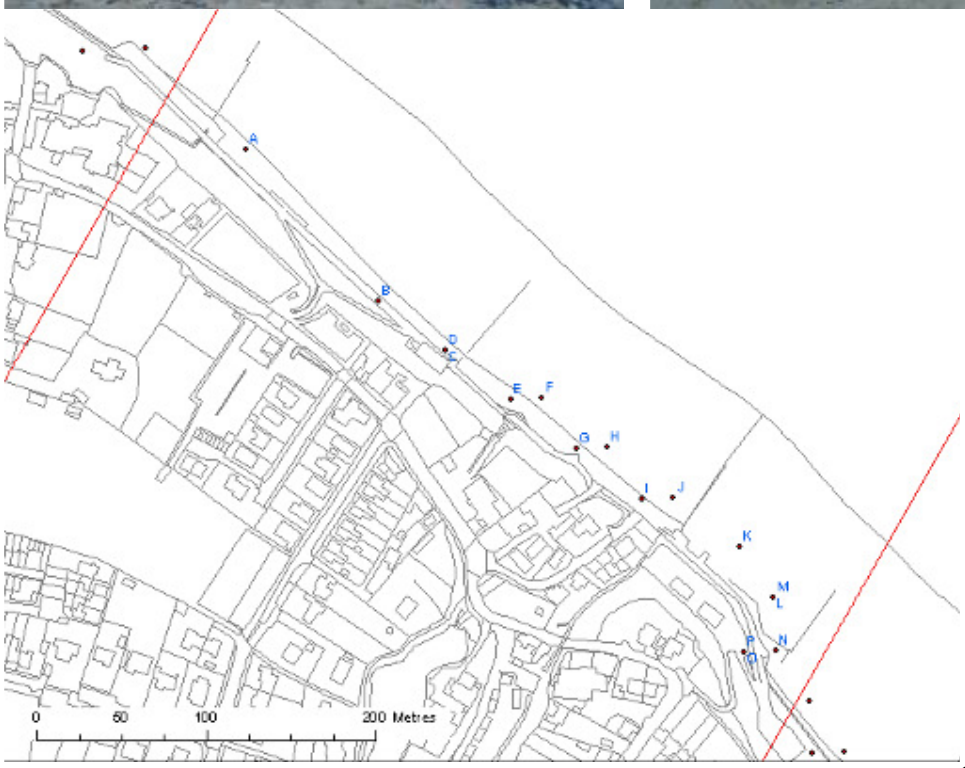
Section no. 48
Mundesley

E

F

G

H



Source: OS Maps

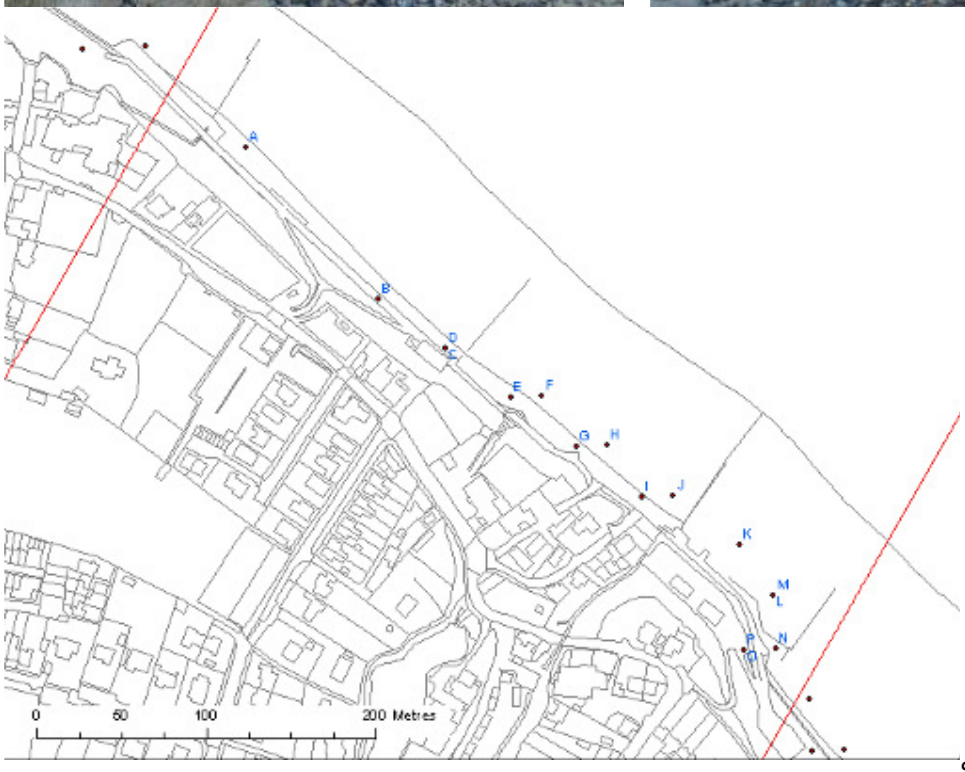
Section no. 48
Mundesley

I

J

K

L



Source: OS Maps

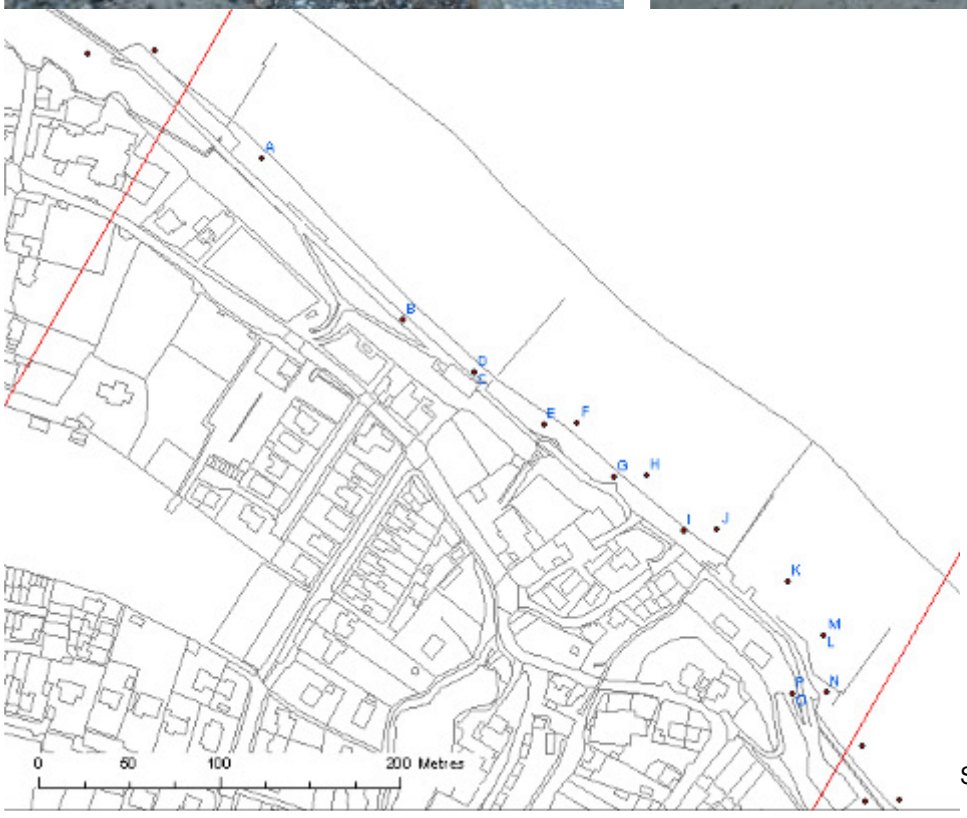
Section no. 48
Mundesley

M

N

O

P



Source: OS Maps

Table 4.24: SCAPE Section 47

Asset Location			
SCAPE Section No:	47	**Location:**	Mundesley to Bacton Gas Terminal
		Survey Date:	30-10-12
SMP Unit:	3b09		
SMP Policy:	From Present Day	Medium Term	Long Term
	Managed realignment to safely remove defences	No active intervention	No active intervention
Coastal Defence Condition			
Defence Type:	Concrete seawall (SW), Timber revetment (TR), Timber groynes (GF)		
Defence Length (m):	500	**Ownership:**	North Norfolk District Council
Foreshore Type:	Sand beach with shingle	**Assets Protected:**	Urban, cliff top residential, commercial, boat park
Exposure:	Medium	**Year Built:**	SW – 1880 / 1910 (refurbished 1950 / 1970) TR – 1958 & 1964 GF – 1930 / 1988
Condition grade	SW – Good TR - Good GF – Good / Fair	**Threshold grade:**	N/A
Residual life min (expected years)	SW – 15 TR - 15 GF - 8	**Residual life max (potential years)**	SW – 25 TR - 20 GF - 15
Description of the defences and the foreshore – East to West			

The concrete structure through this section comprises a seawall with wave return at its crest, there is also a hand railing atop the structure as the wall forms the front of a concrete promenade. At the base of the toe is a stepped concrete apron before a capping slab that is fronted by steel sheet piles. The piles are buried with beach material. The seawall is in good condition with only minor damage in some areas and very little abrasion or cracking. Near the access ramps there is some evidence of steel corrosion in the base of the wall which can be seen through the face of the structure.

The main defence is the timber revetment which is in a good condition with no missing boards and additional bracing on the face of the structure. The timber is in good condition with some corrosion to the fixtures and fittings. The steel sheet piles at the toe are quite corroded but the beach level appears high and only the tops of the piles are visible.

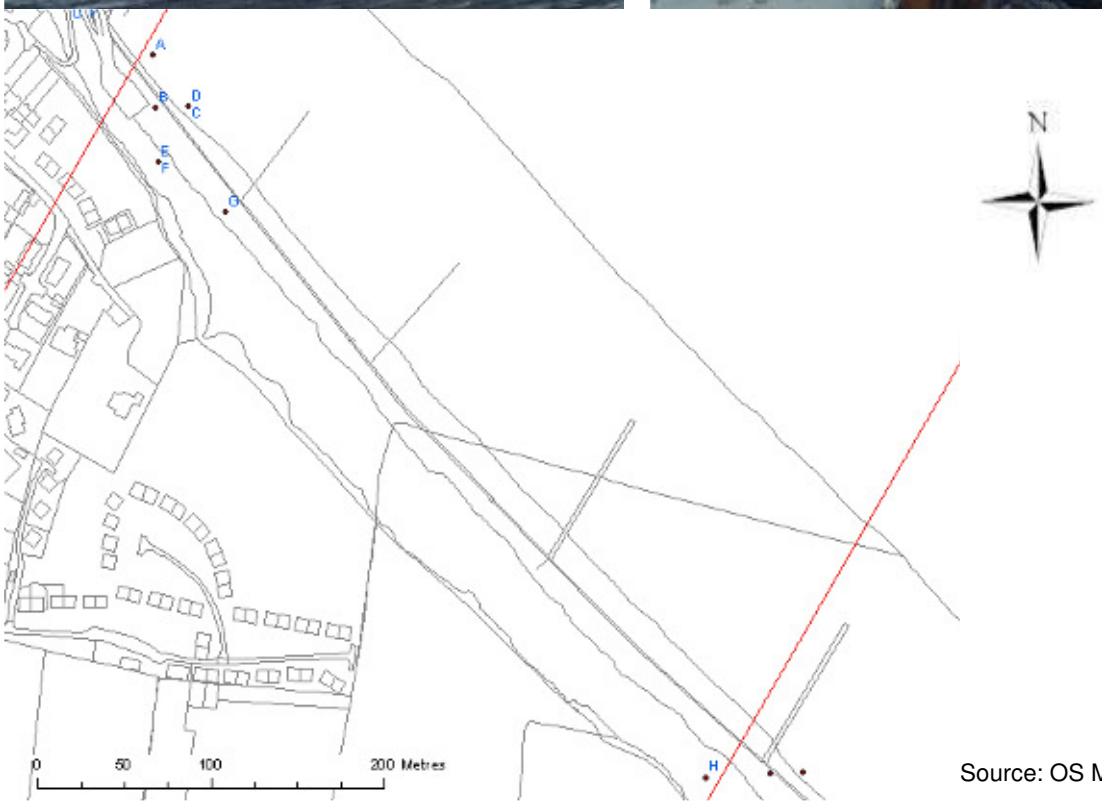
The timber groynes are retaining a significant amount of beach material in the area and are partially buried toward the landward end. The structures are in a good condition with general and expected wear to the timber and corrosion of the fixtures and fittings. There are a limited number of boards missing towards the seaward end of the structures.

A

B

C

D



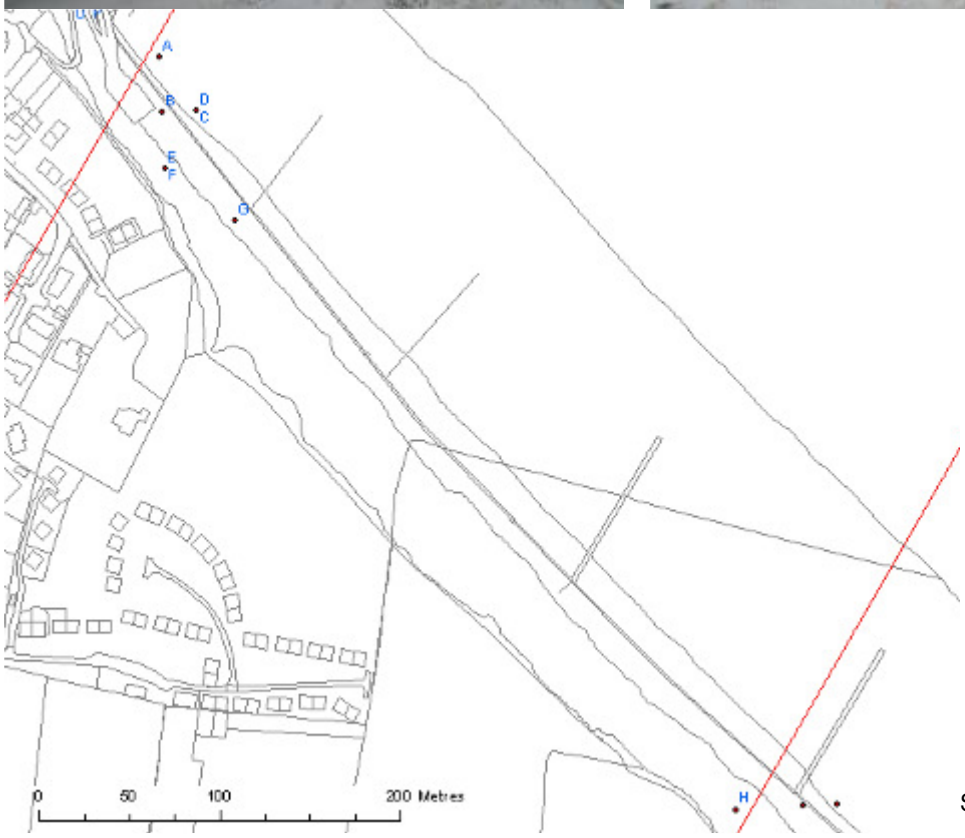
Source: OS Maps

E

F

G

H



Source: OS Maps

Table 4.25: SCAPE Section 46

Asset Location			
SCAPE Section No:	46	**Location:**	Mundesley to Bacton Gas Terminal
		Survey Date:	30-10-12
SMP Unit:	3b09		
SMP Policy:	From Present Day	Medium Term	Long Term
	Managed realignment to safely remove defences	No active intervention	No active intervention
Coastal Defence Condition			
Defence Type:	Timber revetment (TR), Timber groynes (GF)		
Defence Length (m):	500	**Ownership:**	North Norfolk District Council
Foreshore Type:	Sand beach with shingle	**Assets Protected:**	Agricultural land
Exposure:	Medium	**Year Built:**	TR – 1964 / 1966 GF – 1964 / 1966
Condition grade	TR - Good GF – Good / Fair	**Threshold grade:**	N/A
Residual life min (expected years)	TR - 15 GF - 8	**Residual life max (potential years)**	TR - 20 GF - 15
Description of the defences and the foreshore – East to West			

The main defence is the timber revetment which is in a good condition with no missing boards and additional bracing on the face of the structure. The timber is in good condition with some corrosion to the fixtures and fittings. The steel sheet piles at the toe are buried due to high beach levels and occasionally only the tops of the piles are visible.

In places the steel pile toe of the structure has been replaced with some timber bracing, it is not clear if the piles exist further down due to the level of beach material, though the timber bracing appears to be in a good condition.

The timber groynes are retaining a significant amount of beach material in the area and are partially buried toward the landward end. The structures are in a good condition with general and expected wear to the timber and corrosion of the fixtures and fittings.

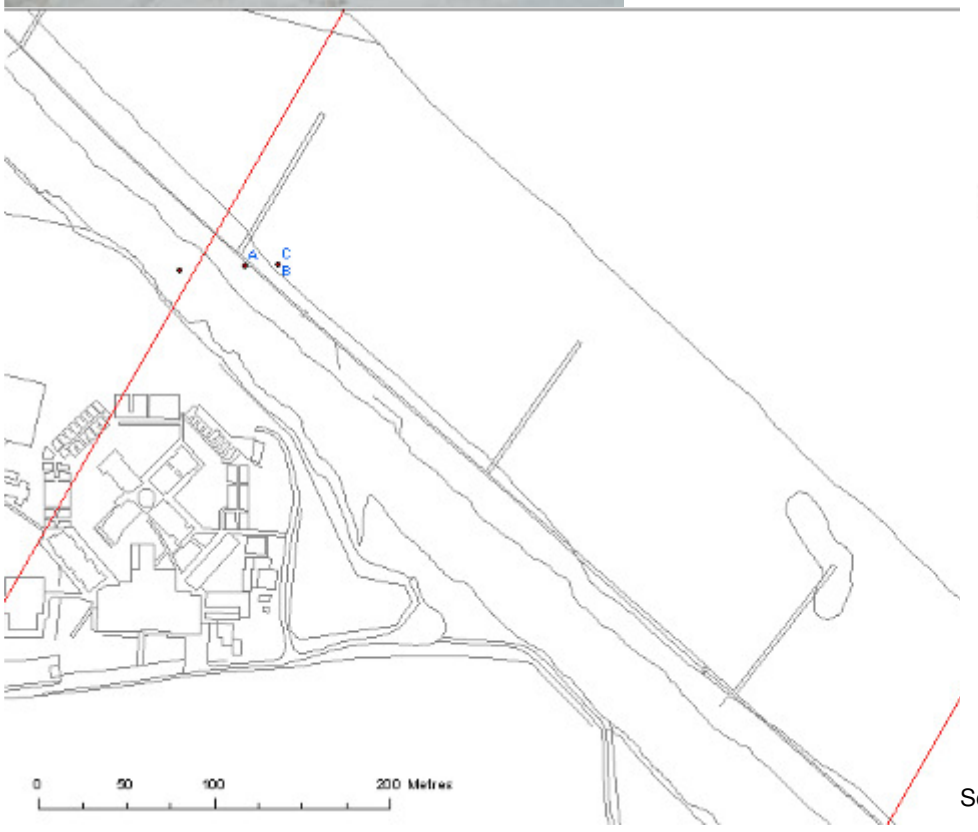
Section no. 46

Mundesley to Bacton Gas Terminal

A

B

C



Source: OS Maps

Table 4.26: SCAPE Section 45

Asset Location			
SCAPE Section No:	45	**Location:**	Mundesley to Bacton Gas Terminal
		Survey Date:	30-10-12
SMP Unit:	3b09		
SMP Policy:	From Present Day	Medium Term	Long Term
	Managed realignment to safely remove defences	No active intervention	No active intervention
Coastal Defence Condition			
Defence Type:	Timber revetment (TR), Timber groynes (GF)		
Defence Length (m):	500	**Ownership:**	North Norfolk District Council
Foreshore Type:	Sand beach	**Assets Protected:**	Agricultural land, gas terminal
Exposure:	Medium	**Year Built:**	TR – 1964 / 1966 GF – 1964 / 1966
Condition grade	TR – Good GF – Good / Fair	**Threshold grade:**	N/A
Residual life min (expected years)	TR – 15 GF - 8	**Residual life max (potential years)**	TR - 20 GF - 15
Description of the defences and the foreshore – East to West			

The main defence is the timber revetment which is in a good condition with no missing boards and additional bracing on the face of the structure. The timber is in good condition with some corrosion to the fixtures and fittings. The steel sheet piles at the toe are buried due to high beach levels and occasionally only the tops of the piles are visible.

The timber groynes are retaining a significant amount of beach material in the area and are partially buried toward the landward end. The structures are in a good condition with general and expected wear to the timber and corrosion of the fixtures and fittings.

Section no. 45
Mundesley to Bacton Gas Terminal

Source: OS Maps

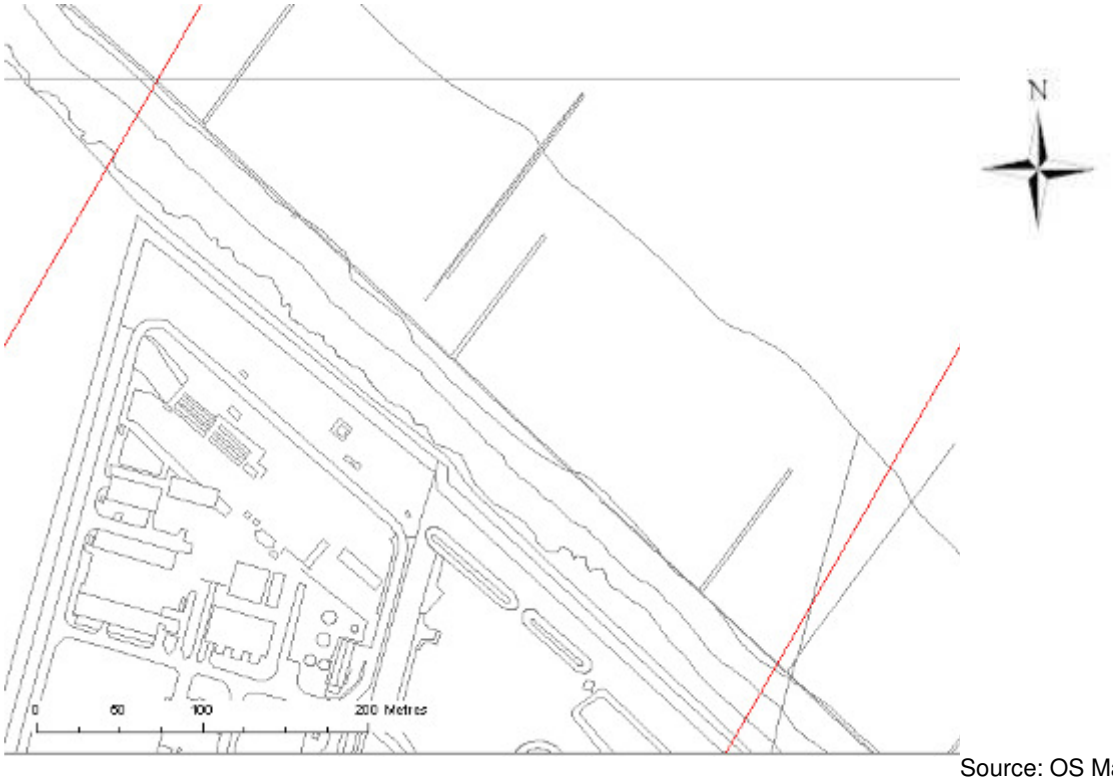
Table 4.27: SCAPE Section 44

Asset Location			
SCAPE Section No:	44	**Location:**	Bacton Gas Terminal
		Survey Date:	30-10-12
SMP Unit:	3b10		
SMP Policy:	From Present Day	Medium Term	Long Term
	Hold the line - Maintain	Hold the line Maintain / Upgrade. Dependent on decommissioning date	Hold the line Maintain / Upgrade. Dependent on decommissioning date
Coastal Defence Condition			
Defence Type:	Timber revetment (TR), Timber groynes (GF)		
Defence Length (m):	500	**Ownership:**	North Norfolk District Council
Foreshore Type:	Sand beach	**Assets Protected:**	Gas terminal
Exposure:	Medium	**Year Built:**	TR – 1964 / 1966 GF – 1964 / 1966
Condition grade	TR – Good GF – Good / Fair	**Threshold grade:**	N/A
Residual life min (expected years)	TR – 15 GF - 8	**Residual life max (potential years)**	TR - 20 GF - 15
Description of the defences and the foreshore – East to West			

The main defence is the timber revetment which is in a good condition with no missing boards and additional bracing on the face of the structure. The timber is in good condition with some corrosion to the fixtures and fittings. The steel sheet piles at the toe are buried due to high beach levels and occasionally only the tops of the piles are visible.

The timber groynes are retaining a significant amount of beach material in the area and are partially buried toward the landward end. The structures are in a good condition with general and expected wear to the timber and corrosion of the fixtures and fittings.

Section no. 44
Bacton Gas Terminal



Source: OS Maps

Table 4.28: SCAPE Section 43

Asset Location			
SCAPE Section No:	43	**Location:**	Bacton Gas Terminal
		Survey Date:	30-10-12
SMP Unit:	3b10		
SMP Policy:	From Present Day	Medium Term	Long Term
	Hold the line - Maintain	Hold the line Maintain / Upgrade. Dependent on decommissioning date	Hold the line Maintain / Upgrade. Dependent on decommissioning date
Coastal Defence Condition			
Defence Type:	Timber revetment (TR), Timber groynes (GF)		
Defence Length (m):	500	**Ownership:**	North Norfolk District Council
Foreshore Type:	Sand beach	**Assets Protected:**	Gas terminal
Exposure:	Medium	**Year Built:**	TR – 1964 / 1966 GF – 1964 / 1966
Condition grade	TR – Good / Fair GF – Good / Fair	**Threshold grade:**	N/A
Residual life min (expected years)	TR – 12 GF - 8	**Residual life max (potential years)**	TR - 20 GF - 15
Description of the defences and the foreshore – East to West			

The main defence is the timber revetment which is in a good condition additional bracing on the face of the structure. The timber is in good condition with some corrosion to the fixtures and fittings with only a few missing and damaged boards in places. The steel sheet piles at the toe are buried due to high beach levels and occasionally only the tops of the piles are visible.

The timber groynes are retaining a significant amount of beach material in the area and are partially buried toward the landward end. The structures are in a good condition with general and expected wear to the timber and corrosion of the fixtures and fittings.

Source: OS Maps

Table 4.29: SCAPE Section 42

Asset Location			
SCAPE Section No:	42	**Location:**	Bacton, Walcott and Ostend (Bacton)
		Survey Date:	30-10-12
SMP Unit:	3b11a		
SMP Policy:	From Present Day	Medium Term	Long Term
	Hold the line - Maintain	Managed realignment upon defence failure	Managed realignment
Coastal Defence Condition			
Defence Type:	Timber revetment (TR), Timber groynes (GF)		
Defence Length (m):	500	**Ownership:**	North Norfolk District Council
Foreshore Type:	Sand beach	**Assets Protected:**	Low cliffs, caravan site, residential, agricultural
Exposure:	Medium	**Year Built:**	TR – 1966 GF – 1964 / 1987
Condition grade	TR –Fair GF –Fair	**Threshold grade:**	N/A
Residual life min (expected years)	TR – 5 GF - 5	**Residual life max (potential years)**	TR - 15 GF - 10
Description of the defences and the foreshore – East to West			

The main defence is the timber revetment which is in a fair condition with additional bracing on the face of the structure. The timber is in good condition with some corrosion to the fixtures and fittings with only a few missing and damaged boards in places. The steel sheet piles at the toe are more exposed towards the eastern end of the revetment due to lower beach levels. There are also some rock armour units that have been place to the rear of the timber revetment against the cliff to reduce further erosion of the cliff.

The timber groynes are retaining some beach material in the area and are partially buried toward the landward end. The structures are in a good condition with general and expected wear to the timber and corrosion of the fixtures and fittings.

Section no. 42
Bacton, Walcott and Ostend (Bacton)

Source: OS Maps

Table 4.30: SCAPE Section 41

Asset Location			
SCAPE Section No:	41	**Location:**	Bacton, Walcott and Ostend (Bacton)
		Survey Date:	31-10-12
SMP Unit:	3b11a		
SMP Policy:	From Present Day	Medium Term	Long Term
	Hold the line - Maintain	Managed realignment upon defence failure	Managed realignment
Coastal Defence Condition			
Defence Type:	Concrete defence structure (SW), Timber groynes (GF)		
Defence Length (m):	500	**Ownership:**	North Norfolk District Council
Foreshore Type:	Sand beach	**Assets Protected:**	Low cliffs, residential
Exposure:	High	**Year Built:**	SW – 1978 GF – 1964 / 1987
Condition grade	SW – Fair GF – Good	**Threshold grade:**	N/A
Residual life min (expected years)	SW – 10 GF - 10	**Residual life max (potential years)**	SW – 25 GF - 15
Description of the defences and the foreshore – East to West			

The concrete wall comprises a small seawall to the rear of a concrete revetment, this sits atop the main concrete seawall with wave recurve at the crest. The wall then has a stepped concrete apron at its toe before turning into a concrete promenade with access point down the revetment for members of the public. There is concrete spalling along the face of the upper revetment and some other areas of minor damage to the structure. The promenade has been recently recapped with an additional concrete slab providing a more robust promenade and also providing some additional protection to the tops of the steel piles though this only extends to the middle of the section from the eastern end.

The beach levels in this section appear to have increased slightly providing some additional protection to the steel piles though the additional damage experienced on the structure has kept the overall condition grading as 'Fair'. The last bay within this section has a lot more beach material retained and the promenade also has steps down at this location.

The timber groynes are in a reasonable condition and are retaining beach material. The structures are quite intact with minimal damage other than general and expected wear from being situated in the intertidal zone.

Section no. 41

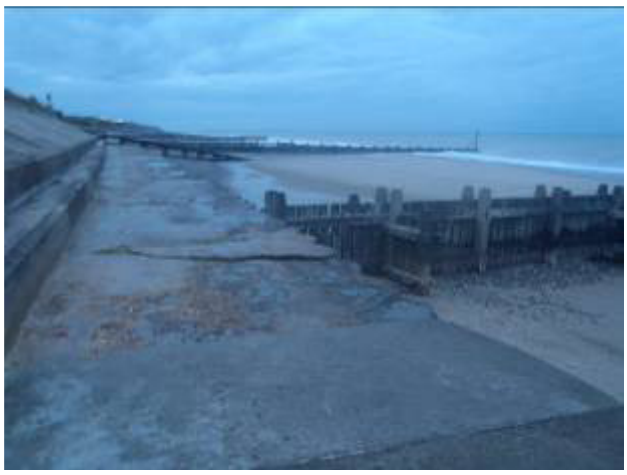
Bacton, Walcott and Ostend (Bacton)

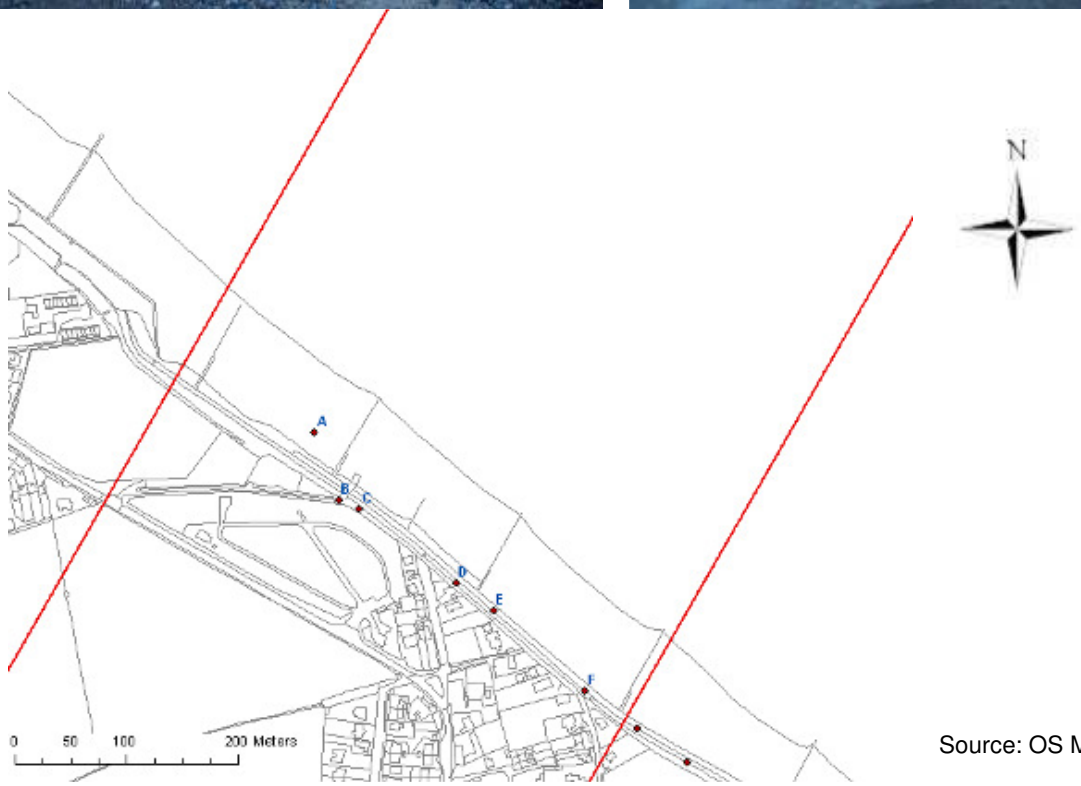
A

B

C

D





Source: OS Maps

Section no. 41
Bacton, Walcott and Ostend (Bacton)

E

F

Source: OS Maps

Table 4.31: SCAPE Section 40

Asset Location			
SCAPE Section No:	40	**Location:**	Bacton, Walcott and Ostend (Bacton)
		Survey Date:	31-10-12
SMP Unit:	3b11a		
SMP Policy:	From Present Day	Medium Term	Long Term
	Hold the line - Maintain	Managed realignment upon defence failure	Managed realignment
Coastal Defence Condition			
Defence Type:	Concrete defence structure (SW), Timber groynes (GF)		
Defence Length (m):	500	**Ownership:**	North Norfolk District Council
Foreshore Type:	Sand beach	**Assets Protected:**	Low cliffs, residential, agricultural
Exposure:	High	**Year Built:**	SW – 1978 GF – 1964 / 1987
Condition grade	SW – Fair GF – Good	**Threshold grade:**	N/A
Residual life min (expected years)	SW – 10 GF - 10	**Residual life max (potential years)**	SW – 25 GF - 15
Description of the defences and the foreshore – East to West			

The concrete wall comprises a small seawall to the rear of a concrete revetment, this sits atop the main concrete seawall with wave recurve at its crest. This then has a stepped concrete apron at its toe before turning into a concrete promenade with access point down the revetment for members of the public. There is concrete spalling along the face of the upper revetment and some other areas of minor damage to the structure. The promenade has been recently recapped with an additional concrete slab providing a more robust promenade and also providing some additional protection to the tops of the steel piles.

The beach levels in this section appear to have increased slightly providing some additional protection to the steel piles though the additional damage experienced on the structure has kept the overall condition grading as 'Fair'.

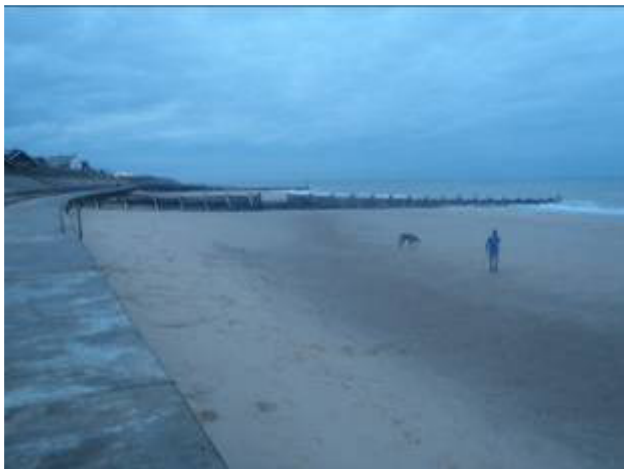
The timber groynes are in a reasonable condition and are retaining more beach material. The structures are quite intact with minimal damage other than general wear from being situated in the intertidal zone.

Section no. 40

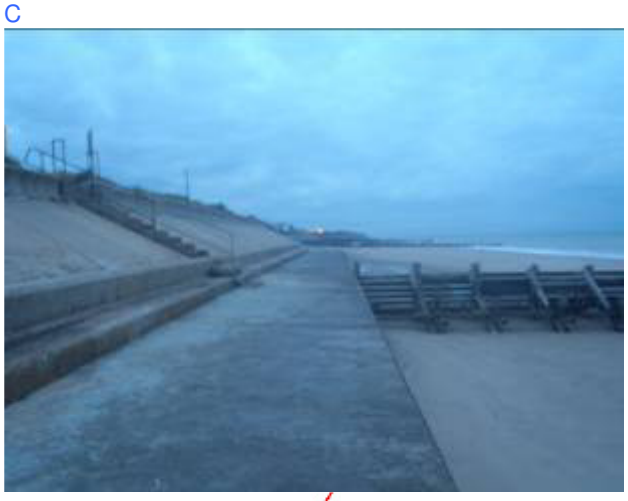
Bacton, Walcott and Ostend (Bacton)

A

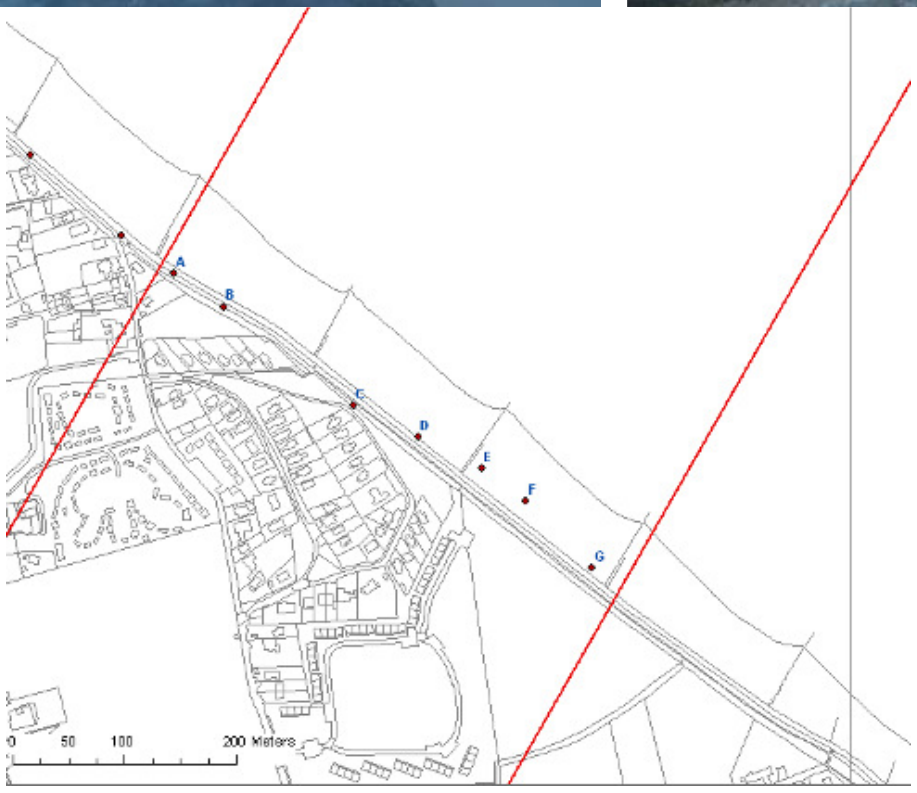
B



C



D



Source: OS Maps

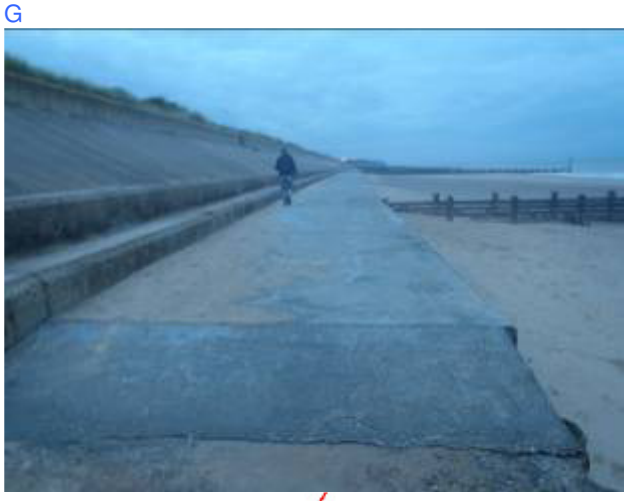
Section no. 40

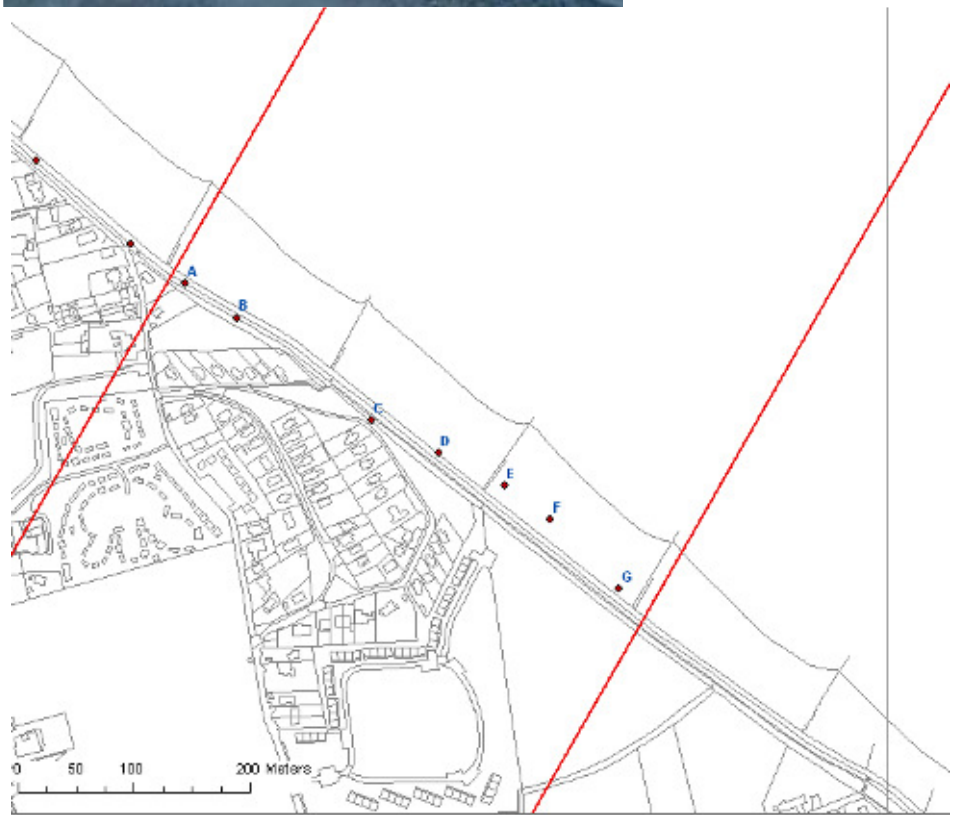
Bacton, Walcott and Ostend (Bacton)

E

F

G





Source: OS Maps

Table 4.32: SCAPE Section 39

Asset Location			
SCAPE Section No:	39	**Location:**	Bacton, Walcott and Ostend (Bacton)
		Survey Date:	31-10-12
SMP Unit:	3b11a		
SMP Policy:	From Present Day	Medium Term	Long Term
	Hold the line - Maintain	Managed realignment upon defence failure	Managed realignment
Coastal Defence Condition			
Defence Type:	Concrete defence structure (SW), Timber groynes (GF)		
Defence Length (m):	500	**Ownership:**	North Norfolk District Council
Foreshore Type:	Sand beach	**Assets Protected:**	Low cliffs, residential
Exposure:	High	**Year Built:**	SW – 1978 GF – 1964 / 1987
Condition grade	SW – Fair GF – Good	**Threshold grade:**	N/A
Residual life min (expected years)	SW – 10 GF - 10	**Residual life max (potential years)**	SW – 25 GF - 15
Description of the defences and the foreshore – East to West			

The concrete wall comprises a small seawall to the rear of a concrete revetment, this sits atop the main concrete seawall with wave recurve at its crest. The wall then has a stepped concrete apron at its toe before turning into a concrete promenade with access point down the revetment for members of the public. The additional concrete slab provides a more robust promenade and also provides some additional protection to the tops of the steel piles ends just inside this section.

The beach levels in this section appear to have reduced which is exposing more of the steel sheet piles resulting in further corrosion. The beach levels begin to lower again towards the western end of the section.

The timber groynes are in a reasonable condition and are retaining more beach material. The structures are quite intact with minimal damage other than general wear from being situated in the intertidal zone.

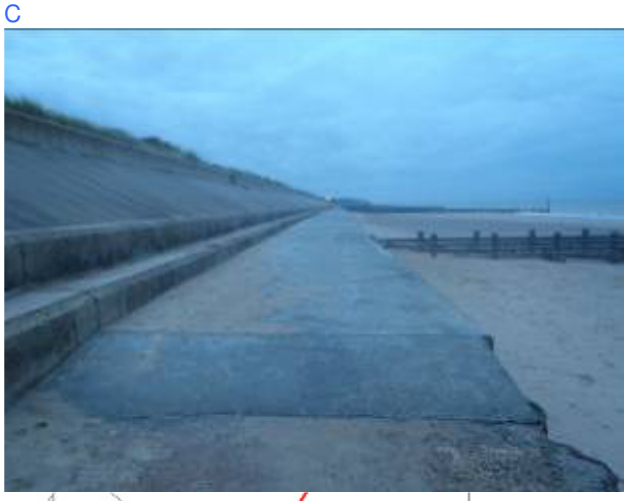
Section no. 39

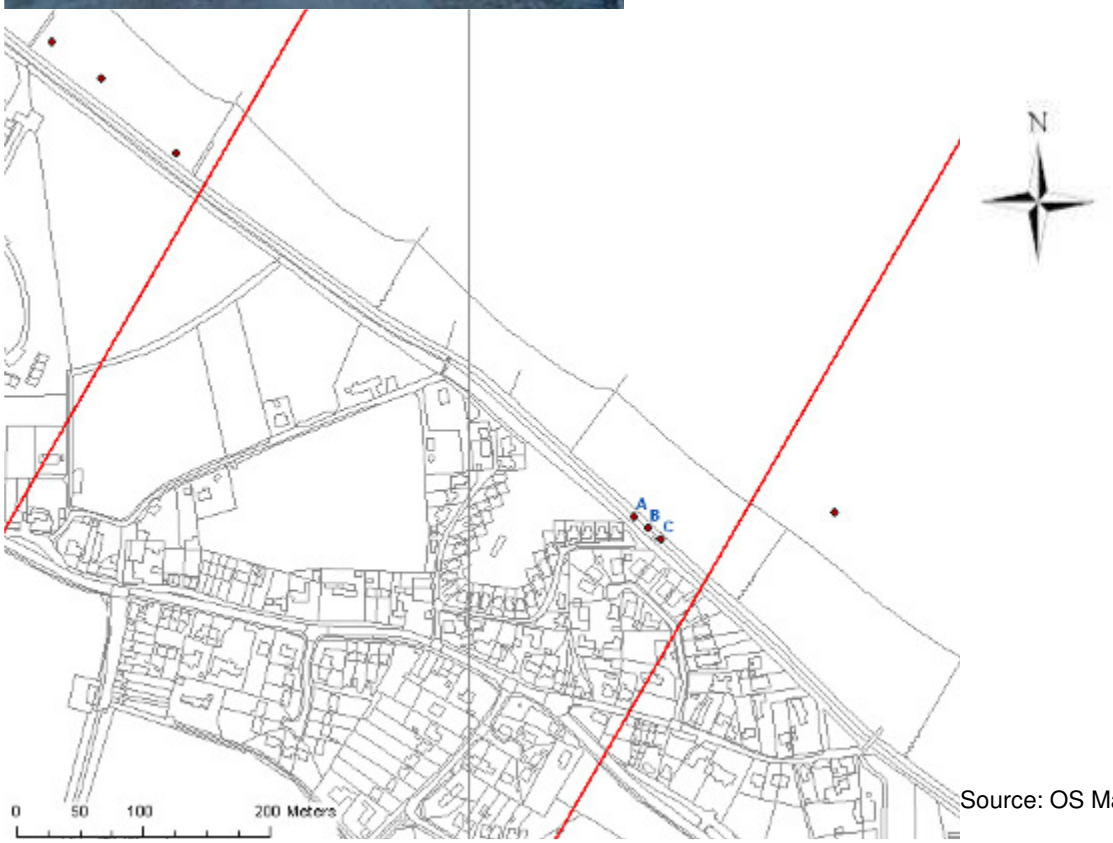
Bacton, Walcott and Ostend (Bacton)

A

B

C





Source: OS Maps

Table 4.33: SCAPE Section 38

Asset Location			
SCAPE Section No:	38	**Location:**	Bacton, Walcott and Ostend (Bacton)
		Survey Date:	31-10-12
SMP Unit:	3b11a		
SMP Policy:	From Present Day	Medium Term	Long Term
	Hold the line - Maintain	Managed realignment upon defence failure	Managed realignment
Coastal Defence Condition			
Defence Type:	Concrete defence structure (SW), Timber groynes (GF)		
Defence Length (m):	500	**Ownership:**	North Norfolk District Council
Foreshore Type:	Sand beach	**Assets Protected:**	Low cliffs, residential, coastal road, agricultural
Exposure:	High	**Year Built:**	SW – 1954 / 1978 GF – 1964 / 1987
Condition grade	SW – Good GF – Good	**Threshold grade:**	N/A
Residual life min (expected years)	SW – 20 GF - 10	**Residual life max (potential years)**	SW – 30 GF - 15
Description of the defences and the foreshore – East to West			

The concrete wall comprises a small seawall to the rear of a concrete revetment, this sits atop the main concrete seawall with wave recurve at its crest. This then has a stepped concrete apron at its toe before turning into a concrete promenade with access point down the revetment for members of the public. The promenade has been recently recapped with an additional concrete slab providing a more robust promenade and also providing some additional protection to the tops of the steel piles.

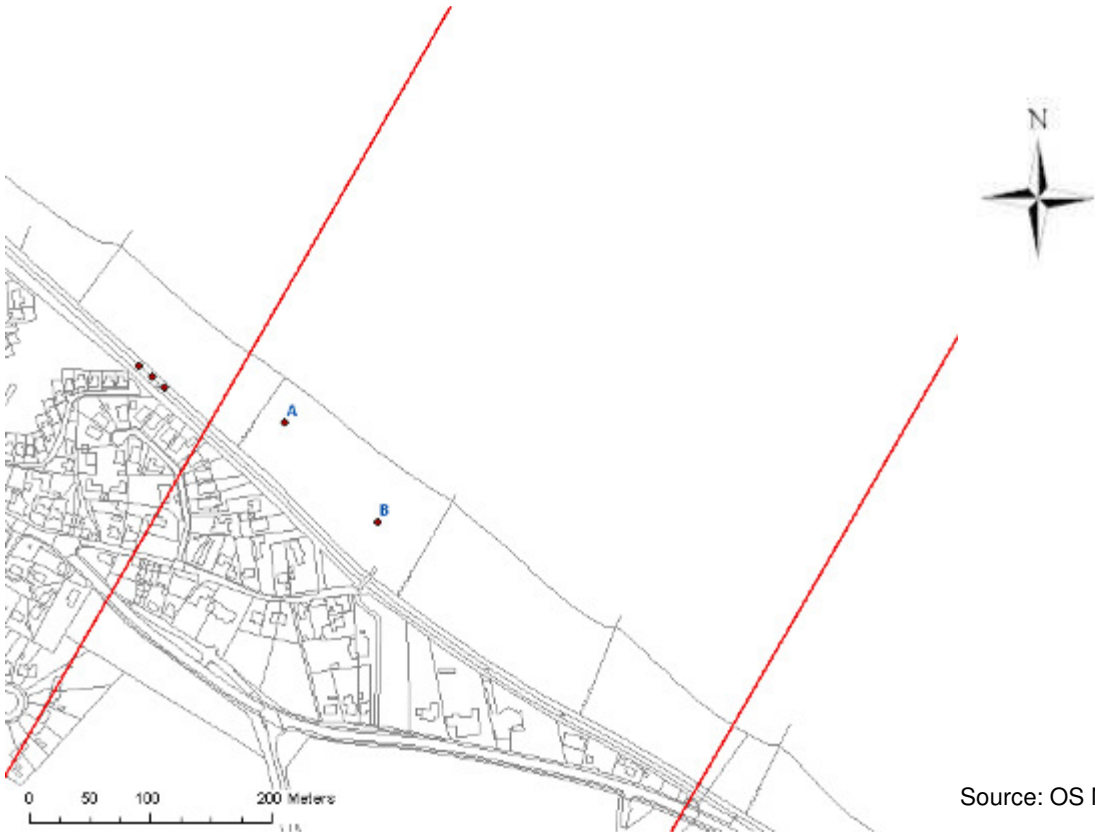
The beach levels in this section appear higher providing some additional protection to the toe of the promenade which is constructed from steel sheet piles, the tops of which are heavily corroded. The beach levels begin to lower again towards the western end of the section.

The timber groynes are in a reasonable condition and are retaining more beach material. The structures are quite intact with minimal damage other than general wear from being situated in the intertidal zone.

Section no. 38
Bacton, Walcott and Ostend (Bacton)

A

B



Source: OS Maps

Table 4.34: SCAPE Section 37

Asset Location			
SCAPE Section No:	37	**Location:**	Bacton, Walcott and Ostend (Bacton)
		Survey Date:	31-10-12
SMP Unit:	3b11a		
SMP Policy:	From Present Day	Medium Term	Long Term
	Hold the line - Maintain	Managed realignment upon defence failure	Managed realignment
Coastal Defence Condition			
Defence Type:	Concrete defence structure (SW), Timber groynes (GF)		
Defence Length (m):	500	**Ownership:**	North Norfolk District Council
Foreshore Type:	Sand beach	**Assets Protected:**	Low cliffs, residential, coastal road
Exposure:	High	**Year Built:**	SW – 1954 GF – 1964 / 1987
Condition grade	SW – Fair GF – Fair	**Threshold grade:**	N/A
Residual life min (expected years)	SW – 10 GF - 5	**Residual life max (potential years)**	SW – 25 GF - 10
Description of the defences and the foreshore – East to West			

The concrete wall comprises a small seawall to the rear of a concrete revetment, this sits atop the main concrete seawall with wave recurve at its crest. This then has a stepped concrete apron at its toe before turning into a concrete promenade with access point down the revetment for members of the public. The promenade has been recently recapped with an additional concrete slab providing a more robust promenade and also providing some additional protection to the tops of the steel piles.

The beach levels in this section appear to be quite low and expose the toe of the promenade which is constructed from steel sheet piles which are heavily corroded due to the lack of beach material in the bays.

The timber groynes are not retaining much beach material and the seaward end is in a poor state of repair with the timber being quite worn and the fixtures and fittings being corroded.

Section no. 37
Bacton, Walcott and Ostend (Bacton)

Source: OS Maps

Table 4.35: SCAPE Section 36

Asset Location			
SCAPE Section No:	36	**Location:**	Bacton, Walcott and Ostend (Walcott)
		Survey Date:	31-10-12
SMP Unit:	3b11b		
SMP Policy:	From Present Day	Medium Term	Long Term
	Hold the line - Maintain	Managed realignment upon defence failure	Managed realignment
Coastal Defence Condition			
Defence Type:	Concrete defence structure (SW), Timber groynes (GF)		
Defence Length (m):	500	**Ownership:**	North Norfolk District Council
Foreshore Type:	Sand beach	**Assets Protected:**	Low cliffs, residential, beach access
Exposure:	High	**Year Built:**	SW – 1954 GF – 1964 / 1987
Condition grade	SW – Fair GF – Fair	**Threshold grade:**	N/A
Residual life min (expected years)	SW – 10 GF - 5	**Residual life max (potential years)**	SW – 25 GF - 10
Description of the defences and the foreshore – East to West			

The concrete wall comprises a small seawall to the rear of a concrete revetment, this sits atop the main concrete seawall with wave recurve at its crest. This then has a stepped concrete apron at its toe before turning into a concrete promenade with access point down the revetment for members of the public. Approximately 100m into the section the promenade has been recently recapped with an additional concrete slab. This provides a more robust promenade and also some additional protection to the tops of the steel piles.

The beach levels in this section appear to be quite low and expose the toe of the promenade which is constructed from steel sheet piles which are heavily corroded due to the lack of beach material in the bays.

The timber groynes are not retaining much beach material and the seaward end is in a poor state of repair with the timber being quite worn and the fixtures and fittings being corroded.

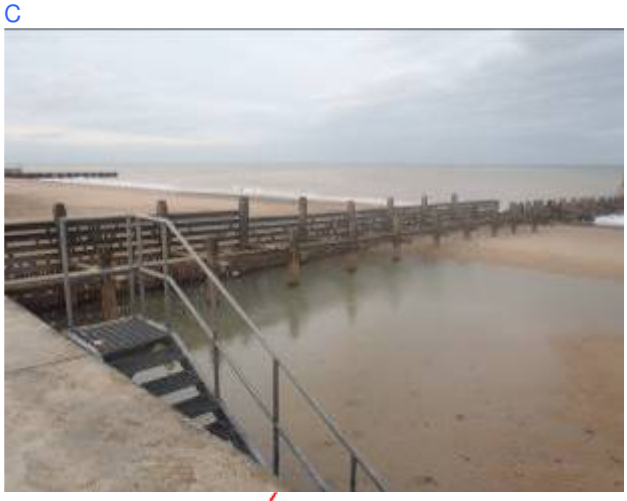
Section no. 36

Bacton, Walcott and Ostend (Walcott)

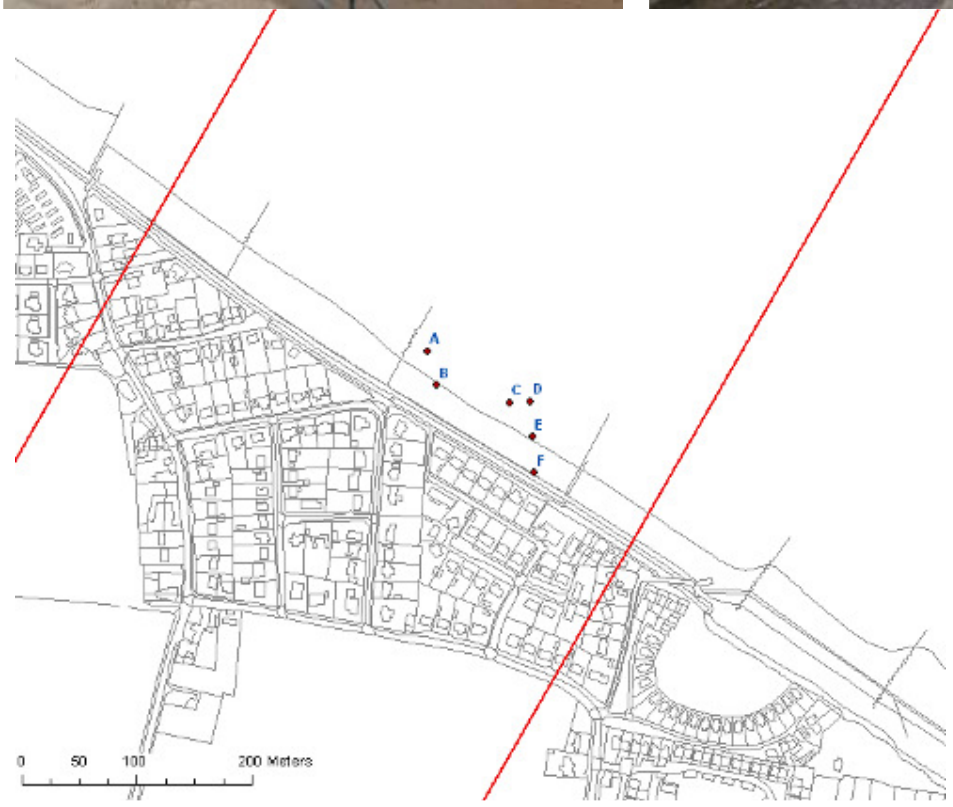
A

B

C



D



Source: OS Maps

Section no. 36
Bacton, Walcott and Ostend (Walcott)

E

F

Source: OS Maps

Table 4.36: SCAPE Section 35

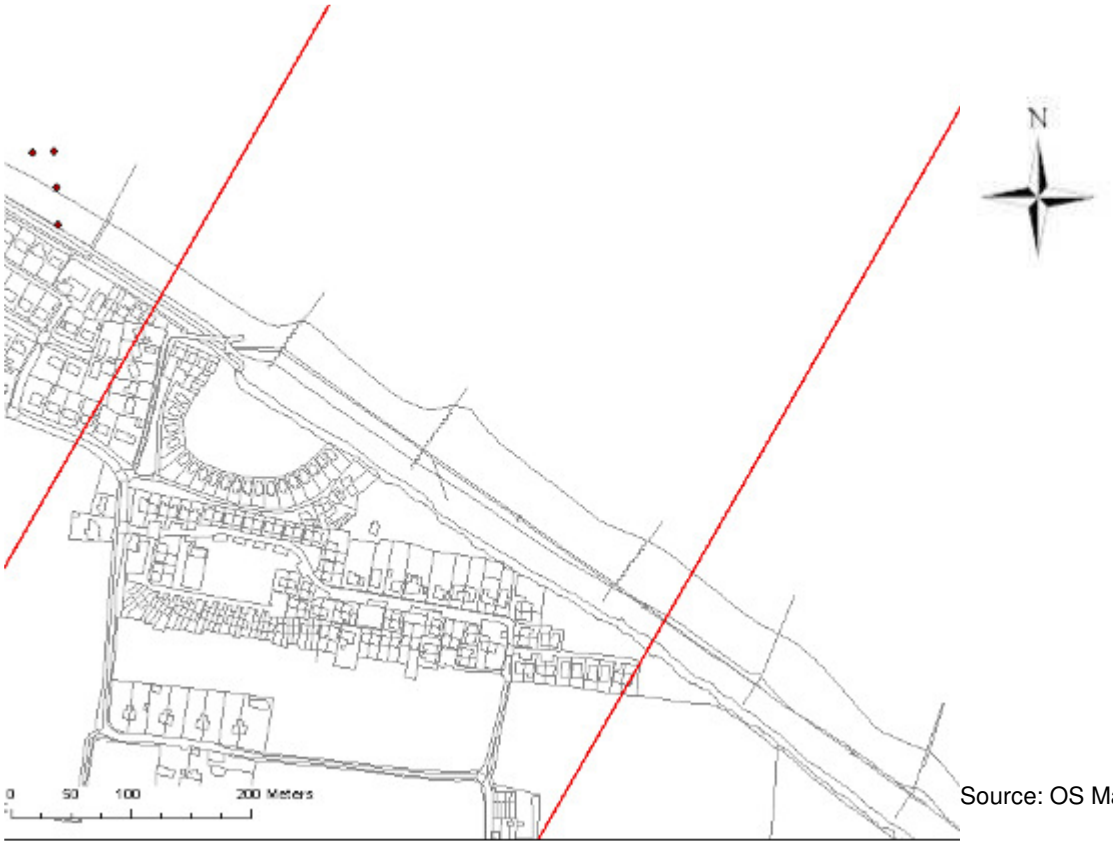
Asset Location			
SCAPE Section No:	35	**Location:**	Bacton, Walcott and Ostend (Walcott)
		Survey Date:	31-10-12
SMP Unit:	3b11b		
SMP Policy:	From Present Day	Medium Term	Long Term
	Hold the line - Maintain	Managed realignment upon defence failure	Managed realignment
Coastal Defence Condition			
Defence Type:	Timber revetment (TR), Timber groynes (GF)		
Defence Length (m):	500	**Ownership:**	North Norfolk District Council
Foreshore Type:	Sand and shingle beach	**Assets Protected:**	Holiday accommodation, residential, agricultural
Exposure:	High	**Year Built:**	TR – 1961 (refurbished 1994) GF – 1964 / 1987
Condition grade	Good / Fair	**Threshold grade:**	N/A
Residual life min (expected years)	TR – 12 GF - 8	**Residual life max (potential years)**	TR – 20 GF - 15
Description of the defences and the foreshore – East to West			

Timber revetment with access stairs over the main structure, there are also steel sheet piles at the base of the structure to prevent undermining. There is a timber capping beam over the top of the piles. The piles are corroded and some of the timbers are beginning to bow but otherwise it is in a reasonable condition.

The timber groynes are fairly intact with only a few areas being worn down whilst the fixtures and fittings are beginning to corrode. The beach levels appear to have increased in the vicinity of these structures providing some additional protection to the piles.

The end of this section changes back to a concrete construction with steel piles at the toe of the structure, though in this section it will not have a bearing on the overall condition rating.

Section no. 35
Bacton, Walcott and Ostend (Walcott)



Source: OS Maps

Table 4.37: SCAPE Section 34

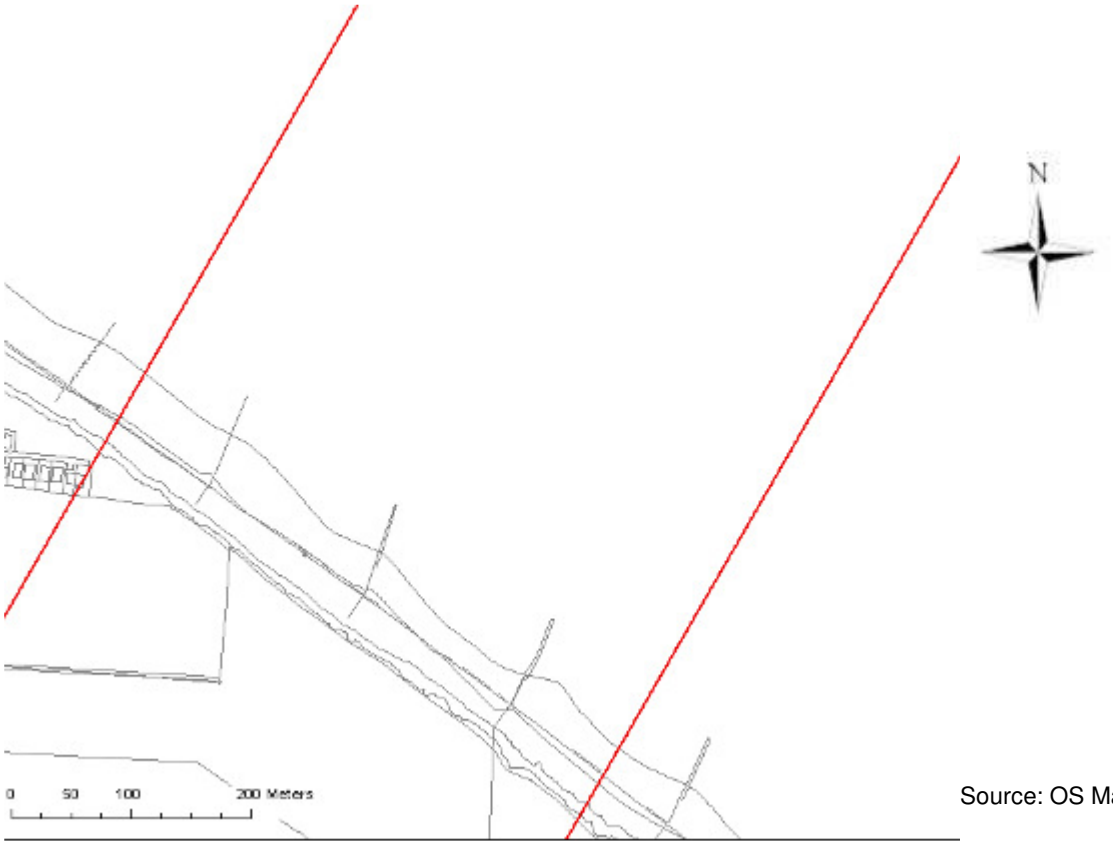
Asset Location			
SCAPE Section No:	34	**Location:**	Bacton, Walcott and Ostend (Walcott)
		Survey Date:	31-10-12
SMP Unit:	3b11b		
SMP Policy:	From Present Day	Medium Term	Long Term
	Hold the line - Maintain	Managed realignment upon defence failure	Managed realignment
Coastal Defence Condition			
Defence Type:	Timber revetment (TR), Timber groynes (GF)		
Defence Length (m):	500	**Ownership:**	North Norfolk District Council
Foreshore Type:	Sand and shingle beach	**Assets Protected:**	Agricultural land
Exposure:	High	**Year Built:**	Unknown
Condition grade	Very Poor	**Threshold grade:**	N/A
Residual life min	TR – 0	**Residual life max**	TR – 0
(expected years)	GF - 0	**(potential years)**	GF - 3
Description of the defences and the foreshore – East to West			

Timber revetment with access stairs over the main structure, there are also steel sheet piles at the base of the structure to prevent undermining. There is a timber capping beam over the top of the piles. The piles are corroded and some of the timbers are beginning to bow but otherwise the revetment is in a reasonable condition.

The timber groynes are fairly intact with only a few areas being worn down whilst the fixtures and fittings are beginning to wear and corrode. The beach levels appear to have increased in the vicinity of these structures providing some additional protection to the piles.

The end of this section changes back to a concrete construction with steel piles at the toe of the structure, though in this section it will not have a bearing on the overall condition rating.

Section no. 34
Bacton, Walcott and Ostend (Walcott)



Source: OS Maps

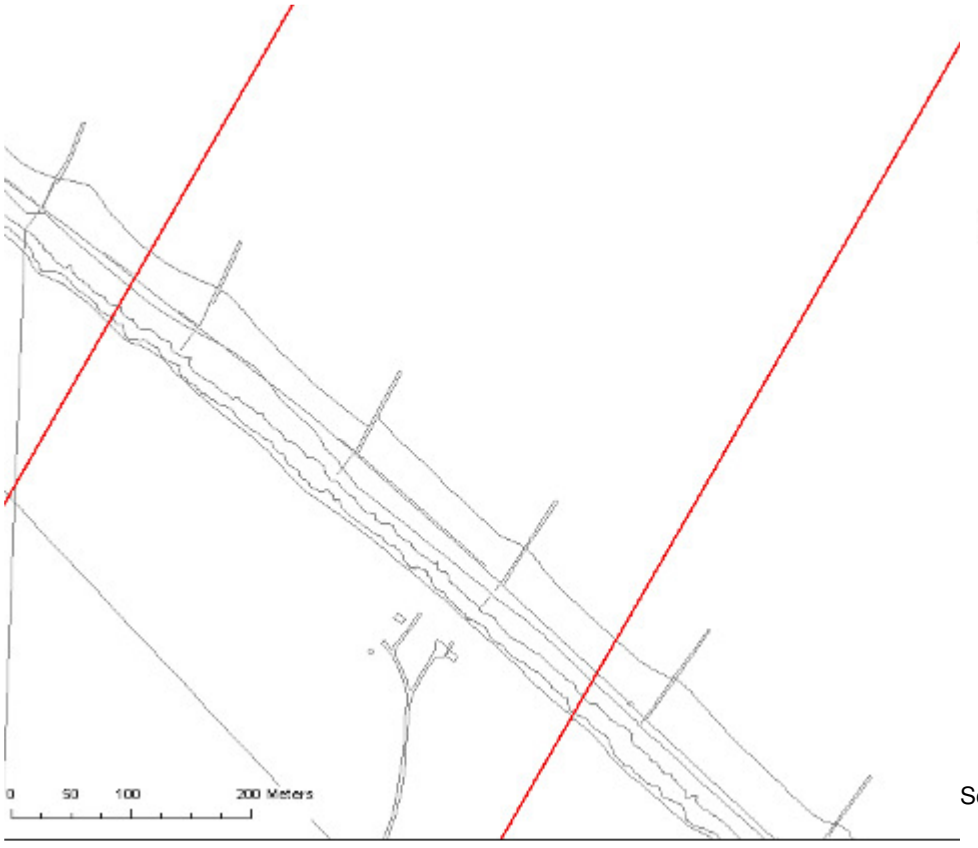
Table 4.38: SCAPE Section 33

Asset Location			
SCAPE Section No:	33	**Location:**	Ostend to Eccles (Happisburgh North)
		Survey Date:	31-10-12
SMP Unit:	3b12a		
SMP Policy:	From Present Day	Medium Term	Long Term
	Managed realignment to maintain defences where physically possible and funding available.	Managed realignment following identification of impact mitigation measures	Managed realignment to help beach retention without impacting on longshore drift.
Coastal Defence Condition			
Defence Type:	Timber Revetment (TR), Timber groynes (GF)		
Defence Length (m):	500	**Ownership:**	North Norfolk District Council
Foreshore Type:	Sand and shingle beach	**Assets Protected:**	Agricultural land and farm buildings
Exposure:	High	**Year Built:**	Unknown
Condition grade	Very Poor	**Threshold grade:**	N/A
Residual life min	TR – 0	**Residual life max**	TR – 0
(expected years)	GF - 0	**(potential years)**	GF - 3
Description of the defences and the foreshore – East to West			

A timber revetment spans the whole section but is missing all the facing horizontal boards and only the timber frame remains offering no protection to the coastline.

Residual timber groynes span the section but only a few boards remain at the landward ends; they subsequently fail to retain beach material.

Section no. 33
Ostend to Eccles (Happisburgh North)



Source: OS Maps

Table 4.39: SCAPE Section 32

Asset Location			
SCAPE Section No:	32	**Location:**	Ostend to Eccles (Happisburgh North)
		Survey Date:	31-10-12
SMP Unit:	3b12a		
SMP Policy:	From Present Day	Medium Term	Long Term
	Managed realignment to maintain defences where physically possible and funding available.	Managed realignment following identification of impact mitigation measures	Managed realignment to help beach retention without impacting on longshore drift.
Coastal Defence Condition			
Defence Type:	Timber Revetment (TR), Timber groynes (GF)		
Defence Length (m):	500	**Ownership:**	North Norfolk District Council
Foreshore Type:	Sand and shingle beach	**Assets Protected:**	Agricultural land
Exposure:	High	**Year Built:**	Unknown
Condition grade	Very Poor	**Threshold grade:**	N/A
Residual life min (expected years)	TR – 0 GF - 0	**Residual life max (potential years)**	TR – 0 GF - 3
Description of the defences and the foreshore – East to West			
A timber revetment spans the whole section but is missing all the facing horizontal boards and only the timber frame remains offering no protection to the coastline. Residual timber groynes span the section but only a few boards remain at the landward ends; they subsequently fail to retain beach material.			

Section no. 32
Ostend to Eccles (Happisburgh North)

Source: OS Maps

Table 4.40: SCAPE Section 31

Asset Location			
SCAPE Section No:	31	**Location:**	Ostend to Eccles (Happisburgh North)
		Survey Date:	31-10-12
SMP Unit:	3b12a		
SMP Policy:	From Present Day	Medium Term	Long Term
	Managed realignment to maintain defences where physically possible and funding available.	Managed realignment following identification of impact mitigation measures	Managed realignment to help beach retention without impacting on longshore drift.
Coastal Defence Condition			
Defence Type:	Timber Revetment (TR), Timber groynes (GF)		
Defence Length (m):	500	**Ownership:**	North Norfolk District Council
Foreshore Type:	Sand and shingle beach	**Assets Protected:**	Agricultural land, residential, caravan park
Exposure:	High	**Year Built:**	Unknown
Condition grade	Very Poor	**Threshold grade:**	N/A
Residual life min	TR – 0	**Residual life max**	TR – 0
(expected years)	GF - 0	**(potential years)**	GF - 3
Description of the defences and the foreshore – East to West			

A timber revetment spans the whole section but is missing all the facing horizontal boards and only the timber frame remains offering no protection to the coastline.

Residual timber groynes span the section but only a few boards remain at the landward ends; they subsequently fail to retain beach material.

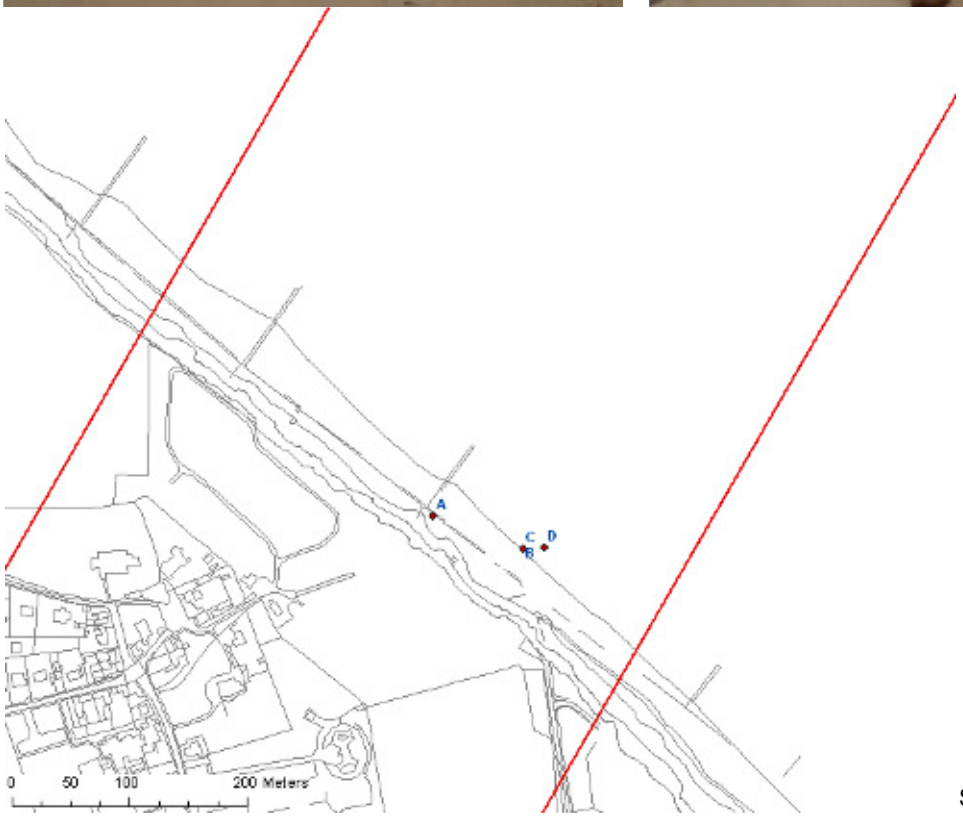
Section no. 31
Ostend to Eccles (Happisburgh North)

A

B

C

D



Source: OS Maps

Table 4.41: SCAPE Section 30

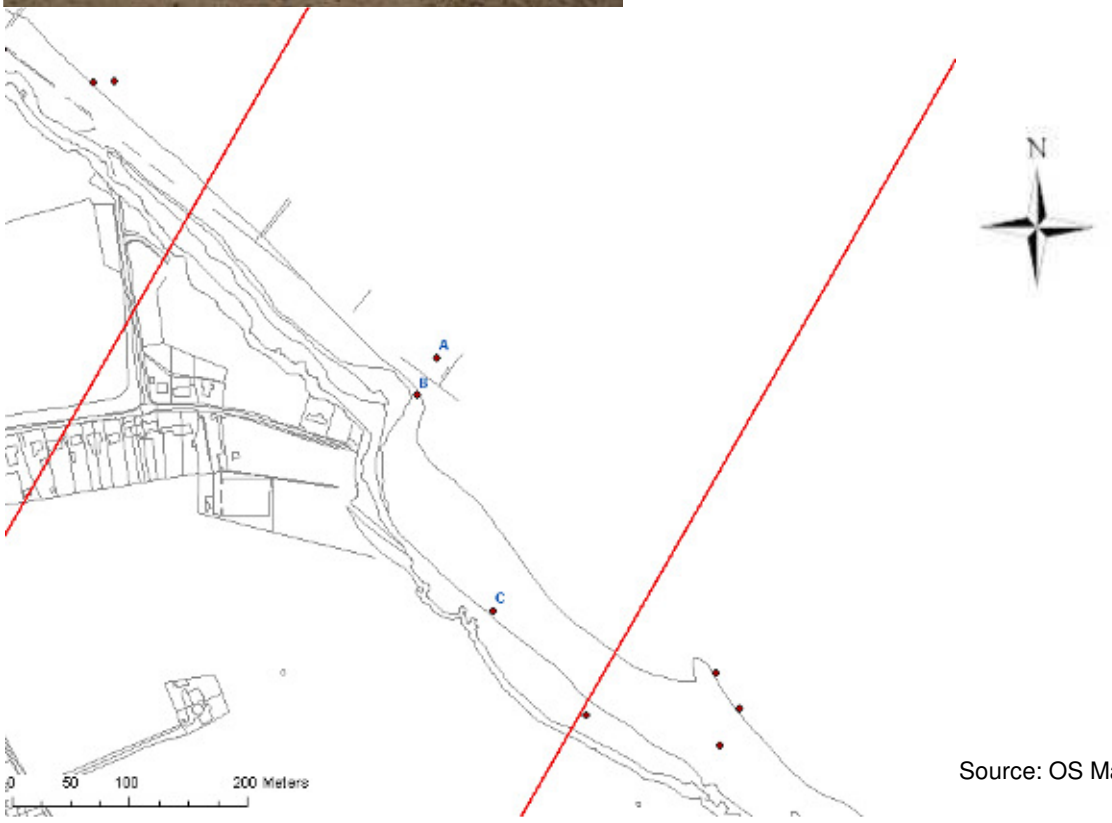
Asset Location			
SCAPE Section No:	30	**Location:**	Ostend to Eccles (Happisburgh South)
		Survey Date:	31-10-12
SMP Unit:	3b12b		
SMP Policy:	From Present Day	Medium Term	Long Term
	Managed realignment to maintain defences where physically possible and funding available.	Managed realignment following identification of impact mitigation measures	Managed realignment to help beach retention without impacting on longshore drift.
Coastal Defence Condition			
Defence Type:	Partial rock armour revetment (RR), Timber groynes (GF)		
Defence Length (m):	250	**Ownership:**	North Norfolk District Council
Foreshore Type:	Sand and some shingle on beach	**Assets Protected:**	Agricultural land, residential
Exposure:	High	**Year Built:**	Unknown
Condition grade	Very Poor	**Threshold grade:**	N/A
Residual life min	RR – 2	**Residual life max**	RR – 5
(expected years)	GF - 0	**(potential years)**	GF - 3
Description of the defences and the foreshore – East to West			
A rock armour revetment has been placed along half the length of this section, although it is inter-mixed with debris from the foreshore where steel piles have corroded and broken including residual structures such as a base of an access stairway. The redundant revetment frames toward the north west of the section have very little effect on dissipating wave energy.			

Section no. 30
Ostend to Eccles (Happisburgh South)

A

B

C



Source: OS Maps

Table 4.42: SCAPE Section 29

Asset Location			
SCAPE Section No:	29	**Location:**	Ostend to Eccles (Happisburgh South)
		Survey Date:	31-10-12
SMP Unit:	3b12b		
SMP Policy:	From Present Day	Medium Term	Long Term
	Managed realignment to maintain defences where physically possible and funding available.	Managed realignment following identification of impact mitigation measures	Managed realignment to help beach retention without impacting on longshore drift.
Coastal Defence Condition			
Defence Type:	No defence's present, old timber groyne field destroyed.		
Defence Length (m):	N/A	**Ownership:**	N/A
Foreshore Type:	Sand and shingle beach	**Assets Protected:**	Agricultural land
Exposure:	High	**Year Built:**	N/A
Condition grade	N/A	**Threshold grade:**	N/A
Residual life min (expected years)	N/A	**Residual life max (potential years)**	N/A
Description of the defences and the foreshore – East to West			
There is evidence of cliff erosion throughout this section.			

Section no. 29

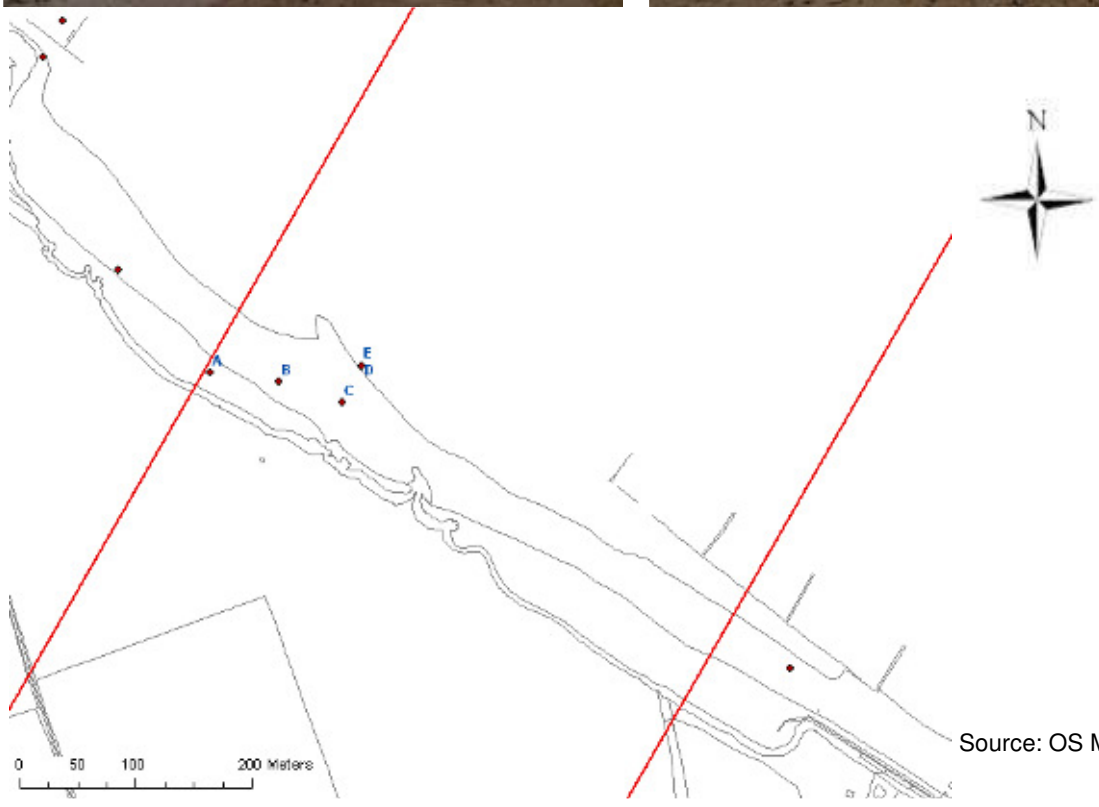
Ostend to Eccles (Happisburgh South)

A

B

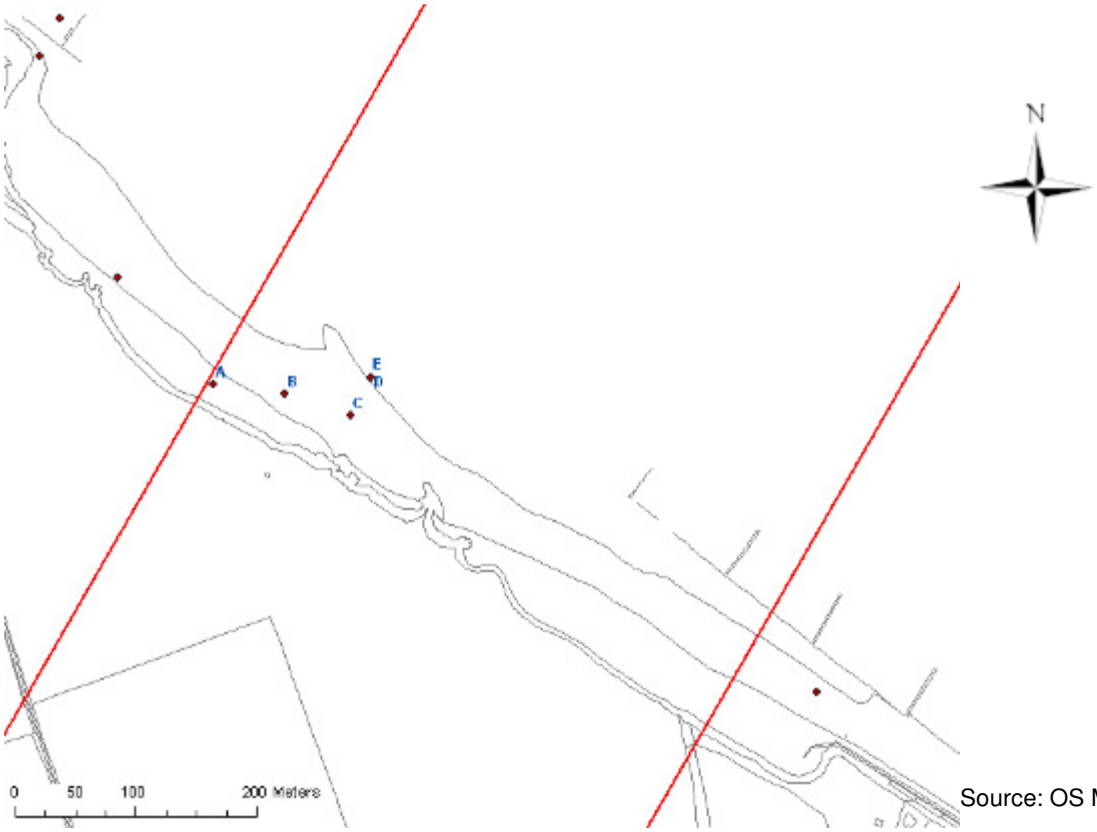
C

D



Source: OS Maps

E



Source: OS Maps

Table 4.43: SCAPE Section 28

Asset Location			
SCAPE Section No:	28	**Location:**	Eccles to Winterton Beach Road
		Survey Date:	31-10-12
SMP Unit:	3b13		
SMP Policy:	From Present Day	Medium Term	Long Term
	Hold the line – Maintain whilst studies are on going to consider long term managed realignment	Hold the line – Maintain whilst studies are on going to consider long term managed realignment	Hold the line – Maintain, view to setback managed realignment once hold the line is no longer sustainable
Coastal Defence Condition			
Defence Type:	Concrete defence structure (SW), Timber groynes (GF)		
Defence Length (m):	500	**Ownership:**	North Norfolk District Council
Foreshore Type:	Sand beach	**Assets Protected:**	Residential, Agricultural land
Exposure:	High	**Year Built:**	Unknown
Condition grade	SW – Very Good GF – Very Poor	**Threshold grade:**	N/A
Residual life min (expected years)	SW – 30 GF – 1	**Residual life max (potential years)**	SW – 45 GF – 3
Description of the defences and the foreshore – East to West			

The structure comprises a concrete wave return seawall with a stepped concrete apron, with the apron fronted by steel sheet piles to prevent undermining. Above the seawall crest is a revetment formed of a concrete mattress grid. The beach has narrowed in this section most likely as a result of the poor condition of the timber groynes.

The timber groynes are in a deteriorating state with large sections missing or damaged. The remaining timber is bent and bowed in places and does not retain beach material.

Towards the western end of the section the seawall ties into some steel piles with a concrete cap before becoming a rock armour revetment, the purpose of which is to prevent the concrete seawall from being outflanked. The rock armour is in a very good condition. However, the steel piles are corroded and have low beach levels at their face. The western most 50m of the section are undefended.

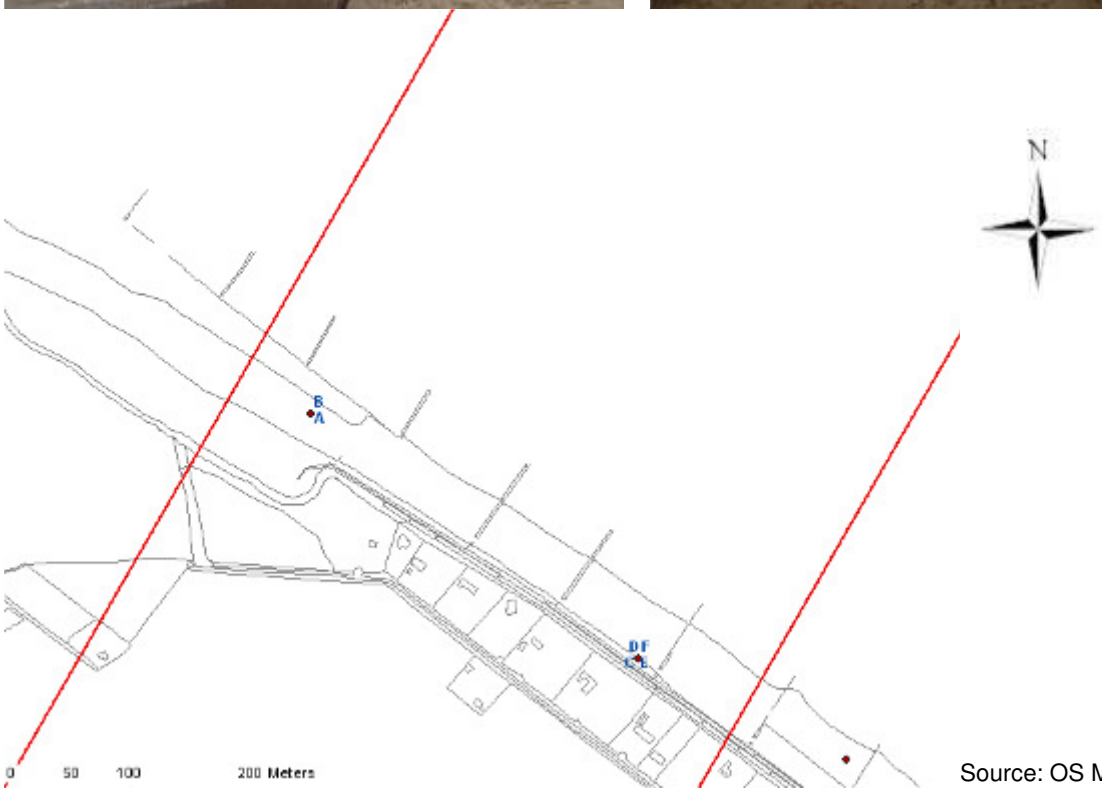
Section no. 28
Eccles to Winterton Beach Road

A

B

C

D

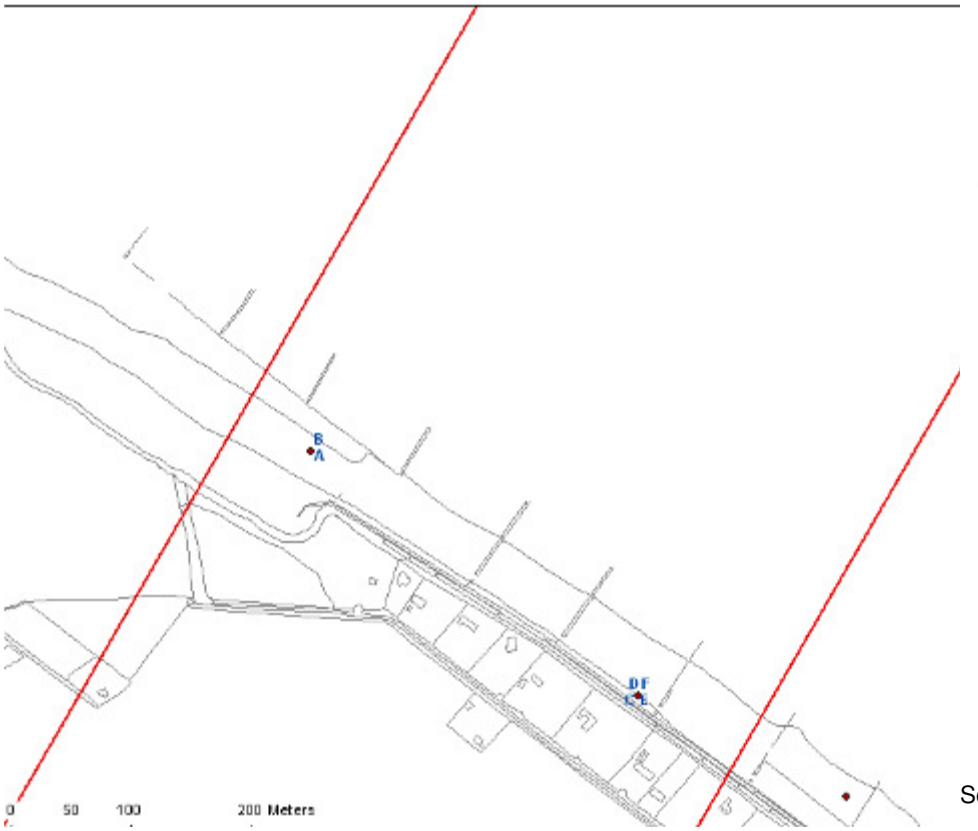


Source: OS Maps

Section no. 28
Eccles to Winterton Beach Road

E

F



Source: OS Maps

Table 4.44: SCAPE Section 27

Asset Location			
SCAPE Section No:	27	**Location:**	Eccles to Winterton Beach Road
		Survey Date:	31-10-12
SMP Unit:	3b13		
SMP Policy:	From Present Day	Medium Term	Long Term
	Hold the line – Maintain whilst studies are on going to consider long term managed realignment	Hold the line – Maintain whilst studies are on going to consider long term managed realignment	Hold the line – Maintain, view to setback managed realignment once hold the line is no longer sustainable
Coastal Defence Condition			
Defence Type:	Concrete defence structure (SW), Composite timber / rock groynes (GF1), Timber groynes (GF2)		
Defence Length (m):	500	**Ownership:**	Western half -North Norfolk District Council, Eastern half – Environment Agency
Foreshore Type:	Sand beach	**Assets Protected:**	Residential, agricultural land, commercial
Exposure:	High	**Year Built:**	Unknown
Condition grade	SW – Good / Fair GF1 – Fair GF2 – Fair / Poor	**Threshold grade:**	N/A
Residual life min (expected years)	SW – 20 GF1 – 5 GF2 - 3	**Residual life max (potential years)**	SW – 35 GF1 – 10 GF2 - 5
Description of the defences and the foreshore – East to West			

The defences comprise a concrete wave return seawall with a stepped concrete apron, with the apron fronted by steel sheet piles to prevent undermining. Rock armour has been placed in front of the steel piles as they are corroding and this will extend the life of the structure. The width of beach has also reduced throughout this section although the beach appears stable. The rock is in a very good condition but the overall assessment is good to fair based on the level of beach material and corroded nature of the piles. A slipway has been constructed in this section which is in a good condition. The slipway marks the end of the rock armour fronting the seawall, the revetment on the crest changes to a grid form from a solid concrete mattress.

The composite groynes are in a fair condition with the timber sections fitted to steel support piles, the steel is corroding and the timber is wearing. The seaward sections of the groynes are constructed with rock armour units which are in a very good condition.

The timber groynes are in a deteriorating state worsening towards the west. They have suffered a lot of wave damage and the timber is well worn with the fixtures and fittings heavily corroded. The groyne fields fail to effectively retain beach material.

There are remains of a timber revetment fronting the seawall but this has been destroyed beyond any form of repair and has been left redundant on the foreshore.

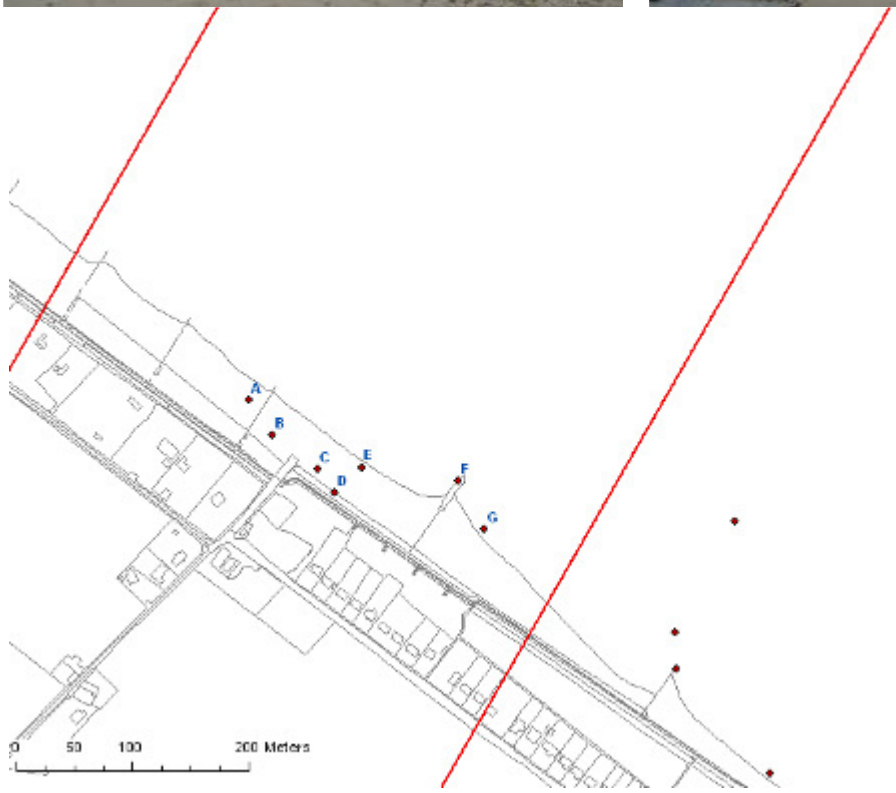
Section no. 27
Eccles to Winterton Beach Road

A

B

C

D



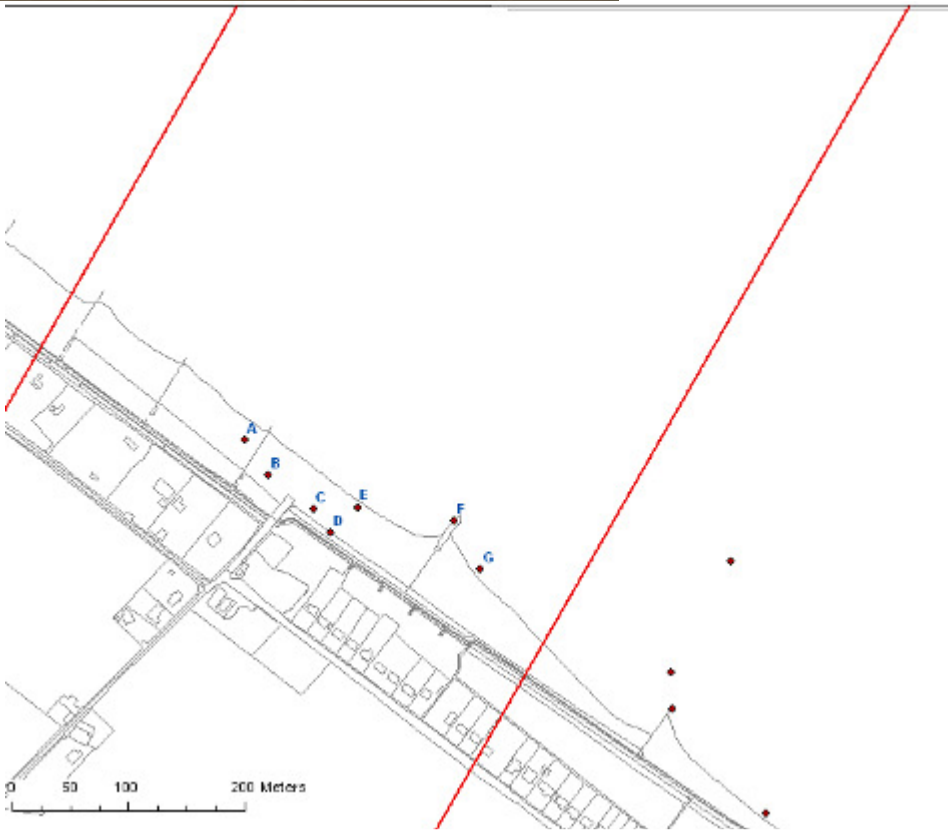
Source: OS Maps

Section no. 27
Eccles to Winterton Beach Road

E

F

G



Source: OS Maps

Table 4.45: SCAPE Section 26

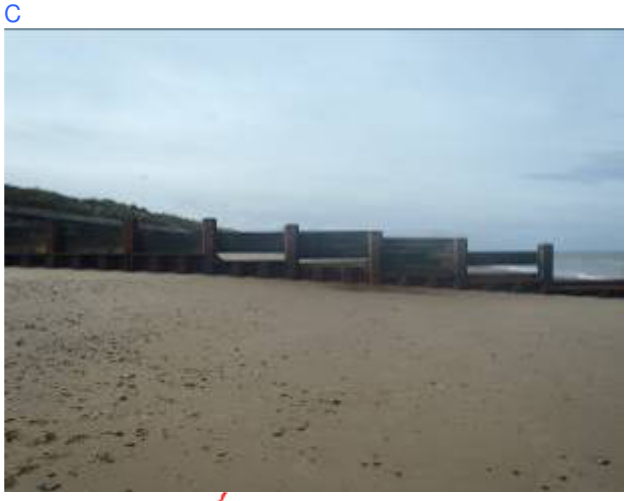
Asset Location			
SCAPE Section No:	26	**Location:**	Eccles to Winterton Beach Road
		Survey Date:	31-10-12
SMP Unit:	3b13		
SMP Policy:	From Present Day	Medium Term	Long Term
	Hold the line – Maintain whilst studies are on going to consider long term managed realignment	Hold the line – Maintain whilst studies are on going to consider long term managed realignment	Hold the line – Maintain, view to setback managed realignment once hold the line is no longer sustainable
Coastal Defence Condition			
Defence Type:	Concrete defence structure (SW), Composite timber / rock groynes (GF)		
Defence Length (m):	500	**Ownership:**	Environment Agency
Foreshore Type:	Sand beach	**Assets Protected:**	Residential, agricultural land,
Exposure:	High	**Year Built:**	Unknown
Condition grade	SW – Good / Fair GF – Fair	**Threshold grade:**	N/A
Residual life min (expected years)	SW – 20 GF - 5	**Residual life max (potential years)**	SW – 35 GF - 10
Description of the defences and the foreshore – East to West			
The defences comprise a concrete wave return seawall with a stepped concrete apron, with the apron fronted by steel sheet piles to prevent undermining. Rock armour has been placed in front of the steel piles as they are corroding and this will extend the life of the structure. The width of beach has also reduced throughout this section although it appears stable. The rock is in very good condition but the overall assessment is good to fair based on the level of beach material and corroded nature of the piles. The groynes are in fair condition with the timber sections fitted to steel support piles, the steel is corroding and the timber is wearing. The seaward sections of the groynes are constructed with rock armour units which are in very good condition. However, the groyne field fail to effectively retain beach material.			

Section no. 26
Eccles to Winterton Beach Road

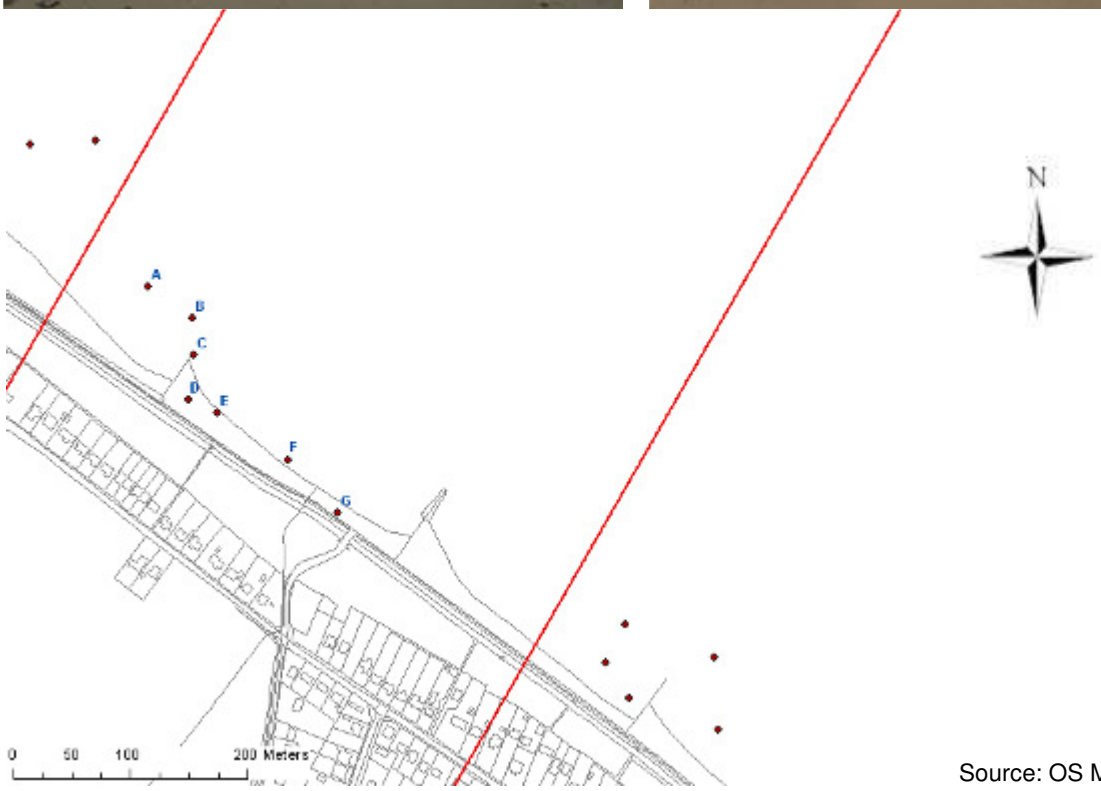
A

B

C



D

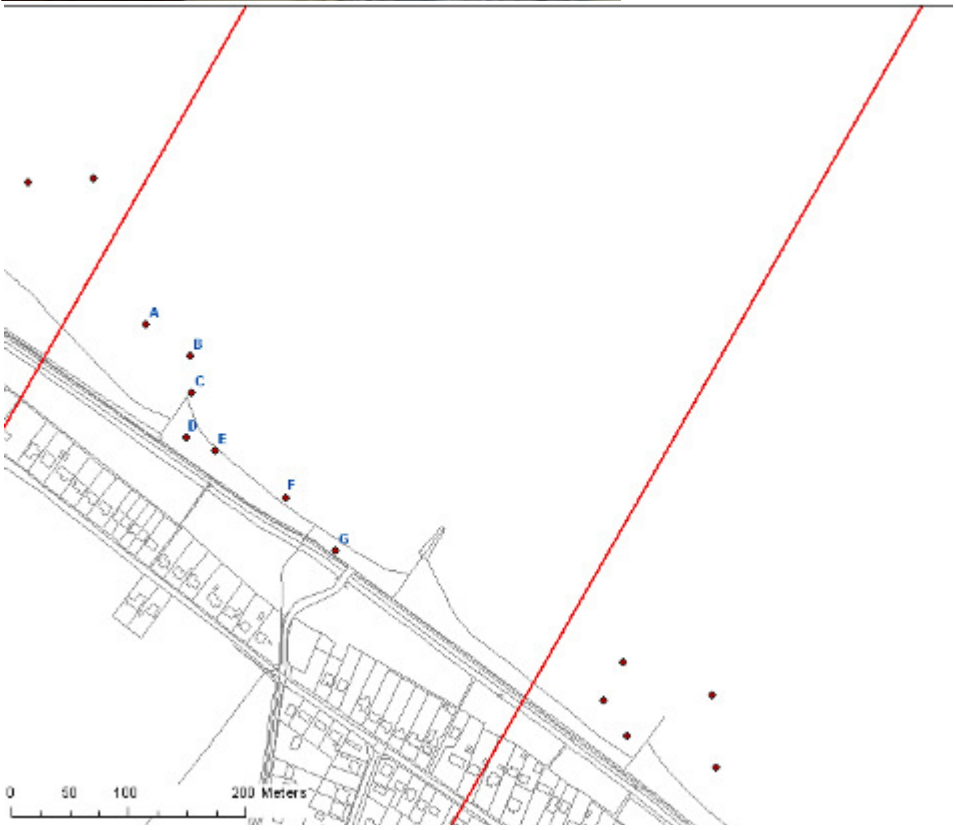


Source: OS Maps

E

F

G



Source: OS Maps

Table 4.46: SCAPE Section 25

Asset Location			
SCAPE Section No:	25	**Location:**	Eccles to Winterton Beach Road
		Survey Date:	31-10-12
SMP Unit:	3b13		
SMP Policy:	From Present Day	Medium Term	Long Term
	Hold the line – Maintain whilst studies are on going to consider long term managed realignment	Hold the line – Maintain whilst studies are on going to consider long term managed realignment	Hold the line – Maintain, view to setback managed realignment once hold the line is no longer sustainable
Coastal Defence Condition			
Defence Type:	Concrete defence structure (SW), Composite timber / rock groynes (GF)		
Defence Length (m):	500	**Ownership:**	Environment Agency
Foreshore Type:	Sand beach	**Assets Protected:**	Residential, commercial, caravan park, agricultural land
Exposure:	High	**Year Built:**	Unknown
Condition grade	SW – Good / Fair GF – Fair	**Threshold grade:**	N/A
Residual life min (expected years)	SW – 20 GF - 5	**Residual life max (potential years)**	SW – 35 GF - 10
Description of the defences and the foreshore – East to West			

The structure comprises a concrete wave return seawall with a stepped concrete apron, with the apron fronted by steel sheet piles to prevent undermining. Rock armour has been placed in front of the steel piles as they are corroding and this will extend the life of the structure. The width of beach has also reduced throughout this section though it is stable. The rock is in a very good condition but the overall assessment is good to fair based on the level of beach material and corroded nature of the piles.

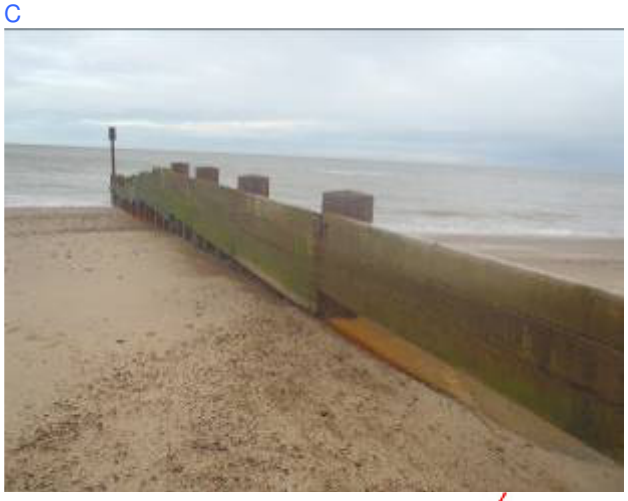
The groynes are in fair condition with the timber sections fitted to steel support piles, the steel is corroding and the timber is wearing. The seaward sections of the groynes are constructed with rock armour units which are in very good condition, though the groyne field fails to retain beach material.

Section no. 25
Eccles to Winterton Beach Road

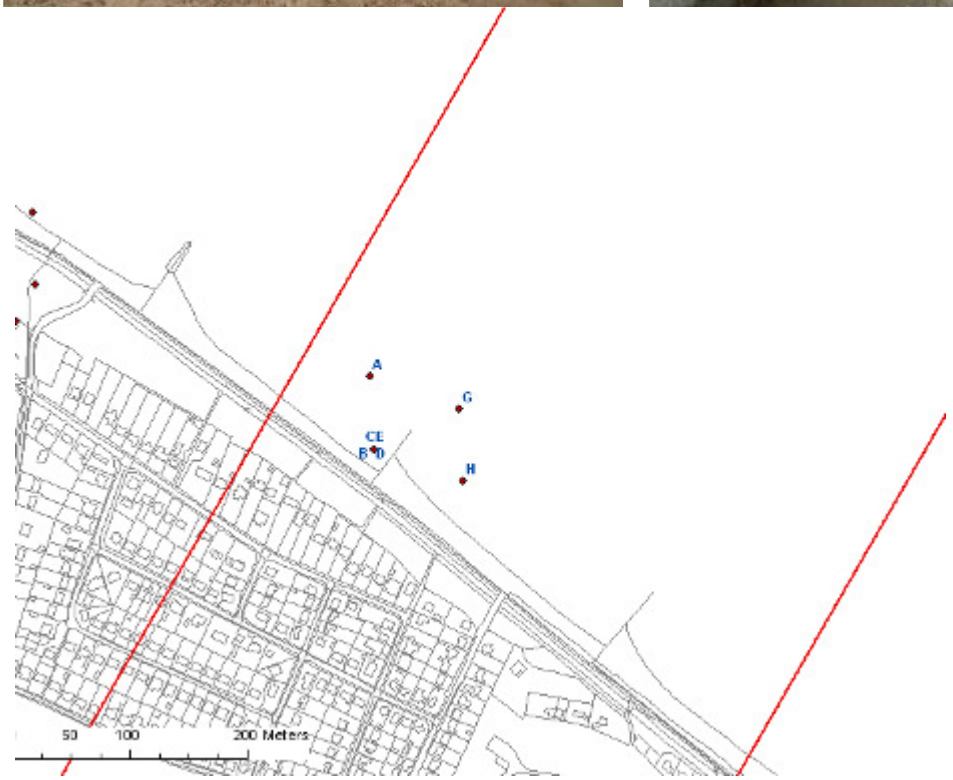
A

B

C



D



Source: OS Maps

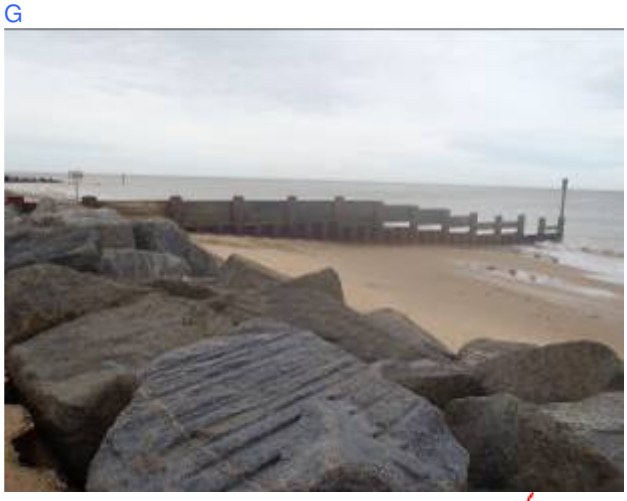
Section no. 25

Eccles to Winterton Beach Road

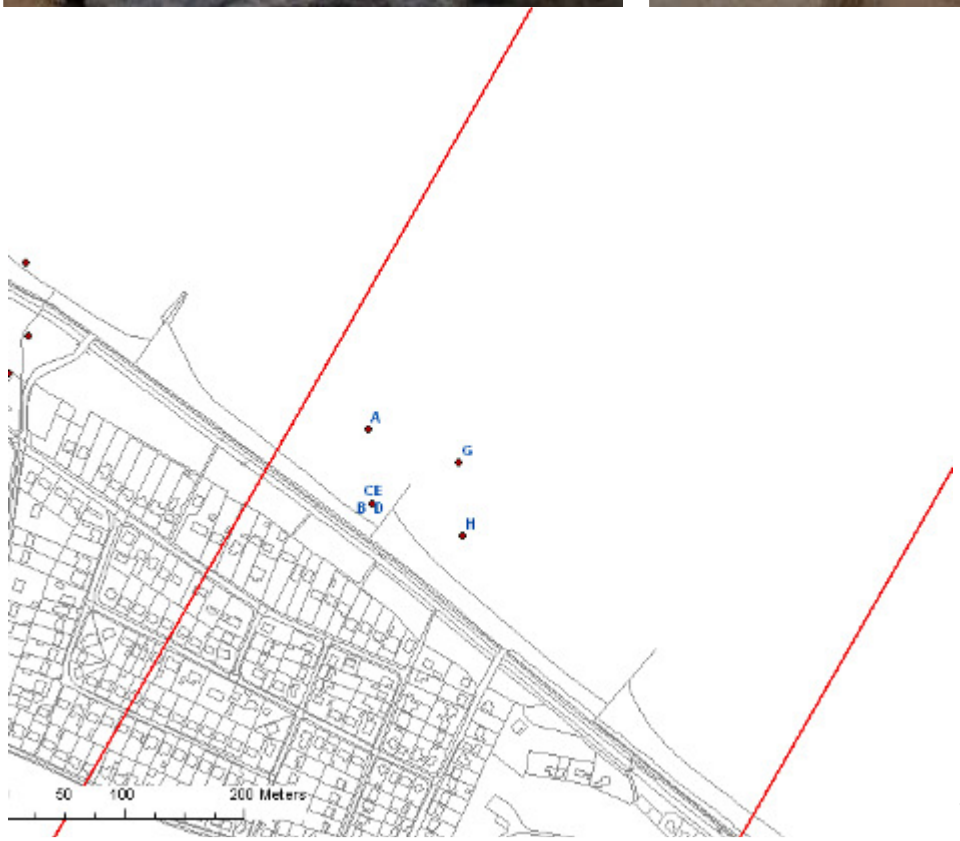
E

F

G



H



Source: OS Maps

Table 4.47: SCAPE Section 24

Asset Location			
SCAPE Section No:	24	**Location:**	Eccles to Winterton Beach Road
		Survey Date:	31-10-12
SMP Unit:	3b13		
SMP Policy:	From Present Day	Medium Term	Long Term
	Hold the line – Maintain whilst studies are on going to consider long term managed realignment	Hold the line – Maintain whilst studies are on going to consider long term managed realignment	Hold the line – Maintain, view to setback managed realignment once hold the line is no longer sustainable
Coastal Defence Condition			
Defence Type:	Concrete defence structure (SW), Composite timber / rock groynes (GF)		
Defence Length (m):	500	**Ownership:**	Environment Agency
Foreshore Type:	Sand beach	**Assets Protected:**	Residential, agricultural land
Exposure:	Medium	**Year Built:**	Unknown
Condition grade	SW – Good GF – Good	**Threshold grade:**	N/A
Residual life min (expected years)	SW – 30 GF - 8	**Residual life max (potential years)**	SW – 50 GF - 12
Description of the defences and the foreshore – East to West			

Two thirds of the defence structure has been buried within the natural dune system. The western end of the section exposes the seawall formation confirming that the structure comprises a concrete wave return seawall with a stepped concrete apron, with the apron fronted by steel sheet piles to prevent undermining. The exposed section is in very good condition and also has lots of rock armour placed in front of the steel piles as they are corroding and this will extend the life of the structure. The rock is in very good condition but the overall assessment is good based on the lack of knowledge of the wall beneath the dunes, though it is assumed that the sand will provide protection to the structure and it is not under direct wave impact.

The beach level appears stable and the foreshore narrows towards the western end of the section by the rock armour.

The groynes are in good condition with the timber sections fitted to steel support piles, the steel is corroding but the structure is quite stable with sand built up around the upper section. The seaward sections of the groynes are constructed with rock armour units which are in very good condition.

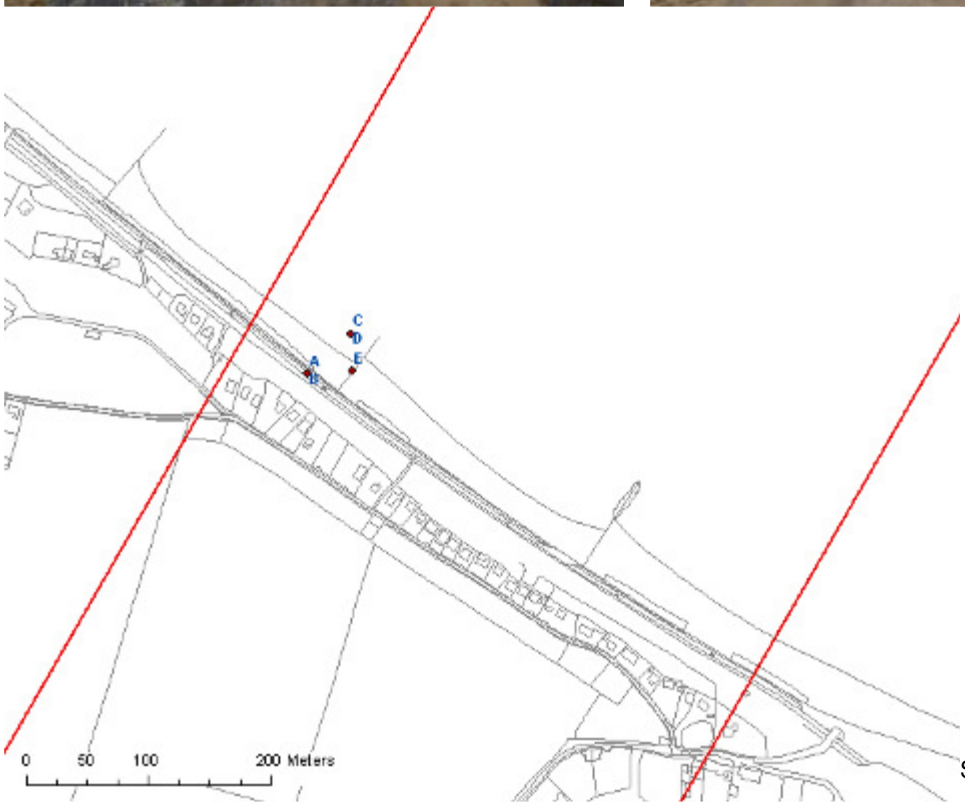
Section no. 24
Eccles to Winterton Beach Road

A

B

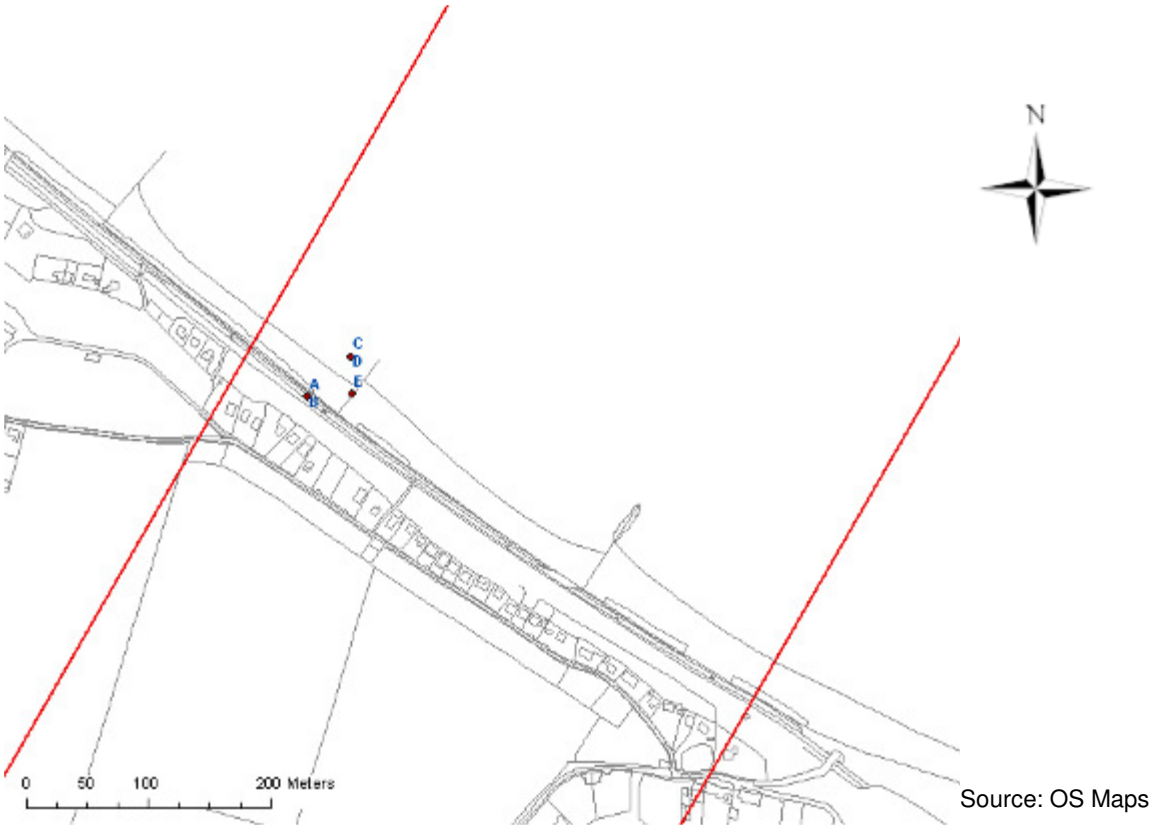
C

D



Source: OS Maps

E



Source: OS Maps

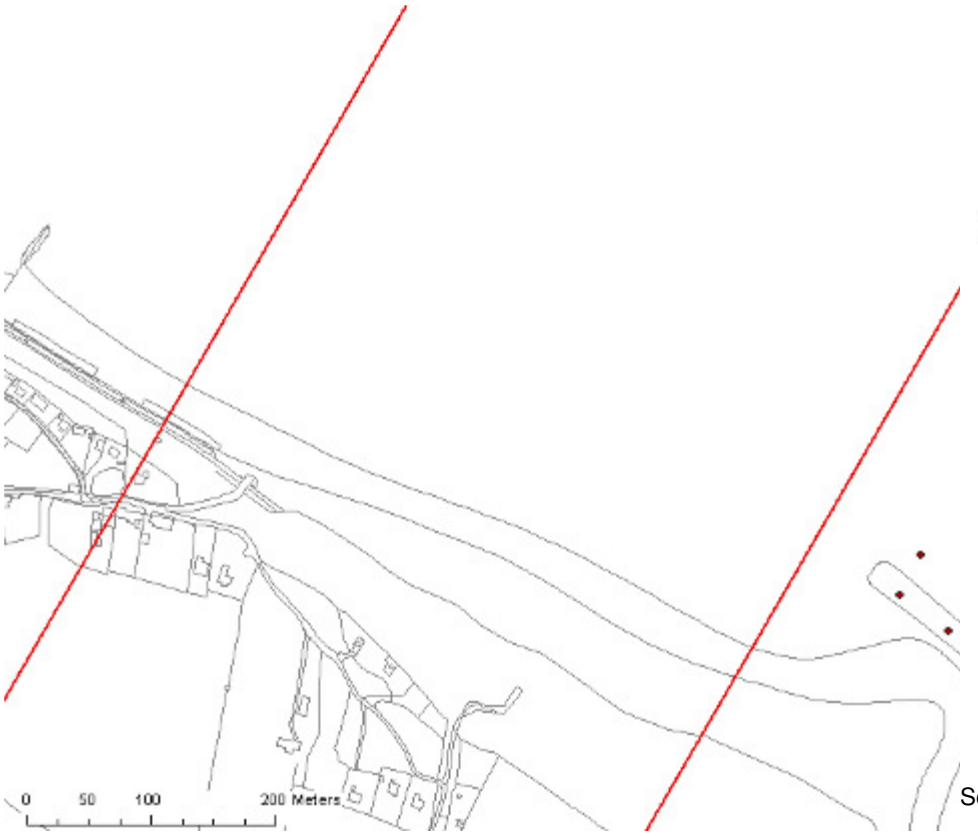
Table 4.48: SCAPE Section 23

Asset Location			
SCAPE Section No:	23	**Location:**	Eccles to Winterton Beach Road
		Survey Date:	31-10-12
SMP Unit:	3b13		
SMP Policy:	From Present Day	Medium Term	Long Term
	Hold the line – Maintain whilst studies are on going to consider long term managed realignment	Hold the line – Maintain whilst studies are on going to consider long term managed realignment	Hold the line – Maintain, view to setback managed realignment once hold the line is no longer sustainable
Coastal Defence Condition			
Defence Type:	Concrete defence structure (SW), Natural sand dunes		
Defence Length (m):	SW – 500	**Ownership:**	Environment Agency
Foreshore Type:	Sand beach	**Assets Protected:**	Residential, agricultural land, public open space
Exposure:	SW – Low	**Year Built:**	Unknown
Condition grade	SW – Good	**Threshold grade:**	N/A
Residual life min (expected years)	SW – 30	**Residual life max (potential years)**	SW – 50
Description of the defences and the foreshore – East to West			

The entire defence structure has been buried within the natural dune system and accretion from the rear of the western most offshore breakwater has extended the foreshore towards the east of the section. There is one access point through the dune system and buried seawall where it can be confirmed that the structure comprises a concrete wave return seawall with a stepped concrete apron, with the apron fronted by steel sheet piles to prevent undermining similar to that exposed in section 21. It is assumed that the condition will be good as the sand will provide protection to the structure and it is not under direct wave impact.

The beach level appears stable and the foreshore narrows towards the western end of the section by the access point.

Section no. 23
Eccles to Winterton Beach Road



Source: OS Maps

Table 4.49: SCAPE Section 22

Asset Location			
SCAPE Section No:	22	**Location:**	Eccles to Winterton Beach Road
		Survey Date:	31-10-12
SMP Unit:	3b13		
SMP Policy:	From Present Day	Medium Term	Long Term
	Hold the line – Maintain whilst studies are on going to consider long term managed realignment	Hold the line – Maintain whilst studies are on going to consider long term managed realignment	Hold the line – Maintain, view to setback managed realignment once hold the line is no longer sustainable
Coastal Defence Condition			
Defence Type:	Concrete defence structure (SW), Offshore breakwater (BW)		
Defence Length (m):	SW – 500 BW – 200 approx	**Ownership:**	Environment Agency
Foreshore Type:	Sand beach	**Assets Protected:**	Residential, agricultural land, public open space
Exposure:	SW – Low BW – High	**Year Built:**	Unknown
Condition grade	SW – Good BW – Very Good	**Threshold grade:**	N/A
Residual life min (expected years)	SW – 30 BW - 40	**Residual life max (potential years)**	SW – 50 BW - 60
Description of the defences and the foreshore – East to West			

The entire defence structure has been buried within the natural dune system and accretion to the rear of the western most offshore breakwater. The structure most likely comprises a concrete wave return seawall with a stepped concrete apron, with the apron fronted by steel sheet piles to prevent undermining similar to that exposed in section 21. It is assumed that the condition will be good as the sand will provide protection to the structure and it is not under direct wave impact.

There is one offshore breakwater of rock armour construction forming the western most of the series of nine breakwaters along the coastline. The rock appears stable with minimal movement of units. This structure was fully exposed at the time of inspection; sediment had built up to the rear of the structure joining it to the shoreline at low tide and the largest build up of accretion occurs at this location. The toe of the structure was also intact and in very good condition with no movement of the armour units.

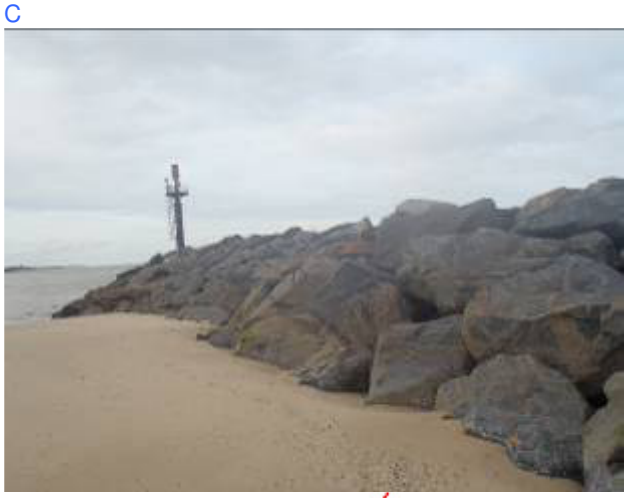
The beach level appears stable and the foreshore extends to twice the width of the beach to the west.

Section no. 22
Eccles to Winterton Beach Road

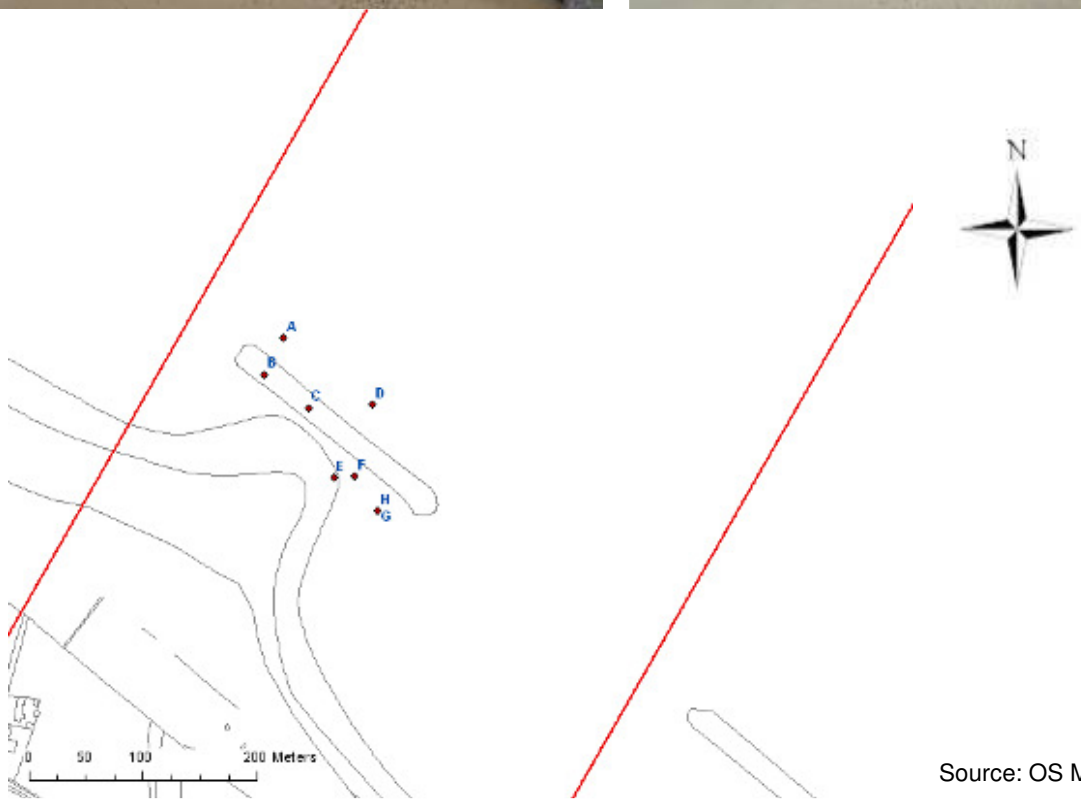
A

B

C



D



Source: OS Maps

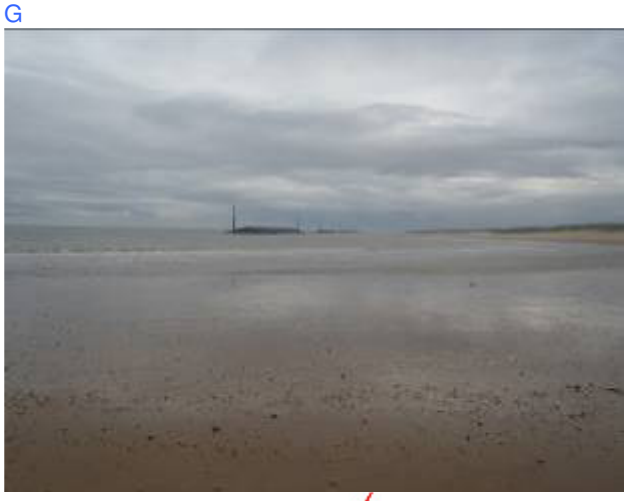
Section no. 22

Eccles to Winterton Beach Road

E

F

G



H

Source: OS Maps

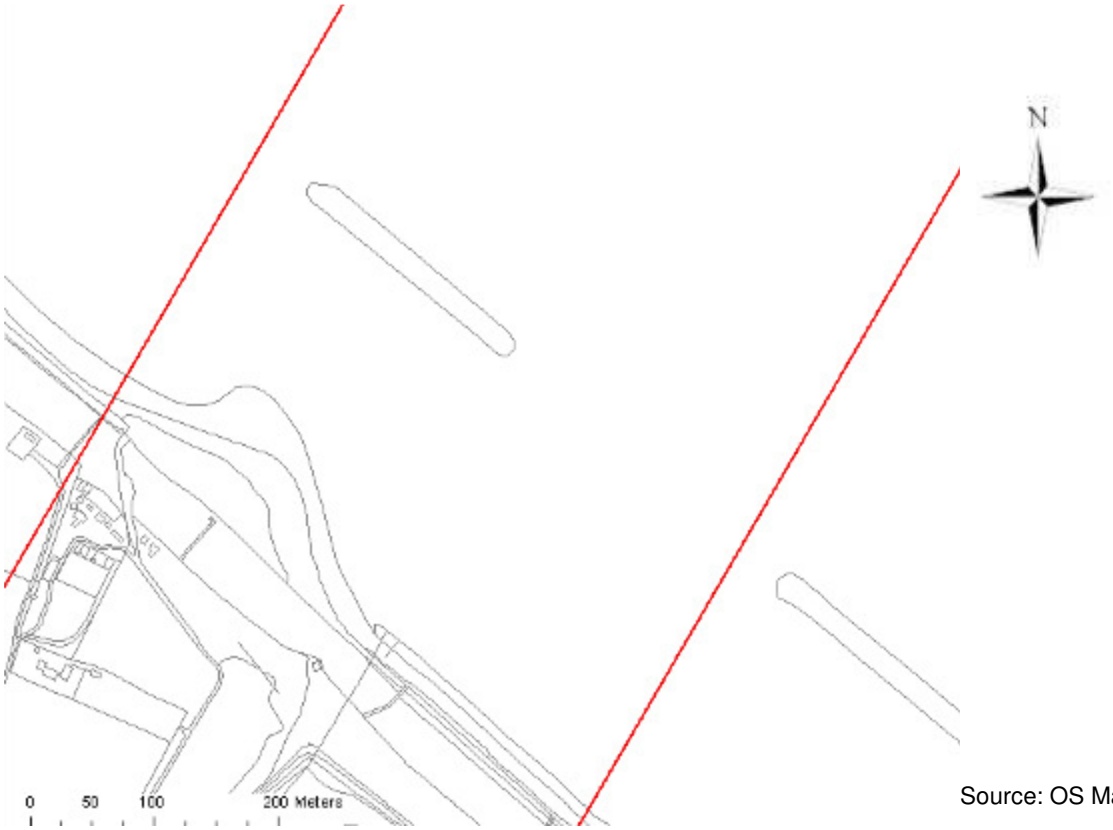
Table 4.50: SCAPE Section 21

Asset Location			
SCAPE Section No:	21	**Location:**	Eccles to Winterton Beach Road
		Survey Date:	31-10-12
SMP Unit:	3b13		
SMP Policy:	From Present Day	Medium Term	Long Term
	Hold the line – Maintain whilst studies are on going to consider long term managed realignment	Hold the line – Maintain whilst studies are on going to consider long term managed realignment	Hold the line – Maintain, view to setback managed realignment once hold the line is no longer sustainable
Coastal Defence Condition			
Defence Type:	Concrete defence structure (SW), Offshore breakwater (BW)		
Defence Length (m):	SW – 500 BW – 200 approx	**Ownership:**	Environment Agency
Foreshore Type:	Sand beach	**Assets Protected:**	Residential, agricultural land, public open space
Exposure:	SW – Low BW – High	**Year Built:**	Unknown
Condition grade	SW – Good BW – Very Good	**Threshold grade:**	N/A
Residual life min (expected years)	SW – 30 BW - 40	**Residual life max (potential years)**	SW – 50 BW - 60
Description of the defences and the foreshore – East to West			

The concrete seawall has been uncovered from within the natural dune system and comprises a concrete wave return seawall with a stepped concrete apron. The apron is then fronted by steep sheet piles to prevent undermining. The piles have become corroded in the tidal environment and also as a result of the lowered beach level in this location a layer of rock armour has been placed at the toe of the structure to prolong its life. However an additional layer of rock armour has also been placed 10m in front of the initial layer to further breakup the approaching waves. The main body of the structure is in good condition with a slightly higher max residual life based on the evidence that the offshore breakwaters will increase accretion in the section.

There is one offshore breakwater of rock armour construction forming part of the series of nine along the coastline. The rock appears stable with minimal movement of units. The structures are decreasing in depth heading west and this one was fully exposed at the time of inspection, sediment had built up to the rear of the structure joining it to the shoreline at low tide. The toe of the structure was also intact and in very good condition with no movement of the armour units.

Section no. 21
Eccles to Winterton Beach Road



Source: OS Maps

Table 4.51: SCAPE Section 20

Asset Location			
SCAPE Section No:	20	**Location:**	Eccles to Winterton Beach Road
		Survey Date:	31-10-12
SMP Unit:	3b13		
SMP Policy:	From Present Day	Medium Term	Long Term
	Hold the line – Maintain whilst studies are on going to consider long term managed realignment	Hold the line – Maintain whilst studies are on going to consider long term managed realignment	Hold the line – Maintain, view to setback managed realignment once hold the line is no longer sustainable
Coastal Defence Condition			
Defence Type:	Concrete defence structure (SW), Offshore breakwater (BW)		
Defence Length (m):	SW – 500 BW – 200 approx	**Ownership:**	Environment Agency
Foreshore Type:	Sand beach	**Assets Protected:**	Residential, agricultural land, public open space
Exposure:	SW – Low BW – High	**Year Built:**	Unknown
Condition grade	SW – Good BW – Very Good	**Threshold grade:**	N/A
Residual life min (expected years)	SW – 30 BW - 40	**Residual life max (potential years)**	SW – 50 BW - 60
Description of the defences and the foreshore – East to West			

The concrete seawall has been uncovered from within the natural dune system and comprises a concrete wave return seawall with a stepped concrete apron. The apron is then fronted by steel sheet piles to prevent undermining. The piles have become corroded in the tidal environment and also as a result of the lowered beach level in this location a layer of rock armour has been placed at the toe of the structure to prolong its life. However an additional layer of rock armour has also been placed 10m in front of the initial layer to further breakup the approaching waves. The main body of the structure is in good condition with a slightly higher maximum residual life based on the evidence that the offshore breakwaters will increase accretion in the section.

There is one offshore breakwater of rock armour construction forming part of the series of nine along the coastline. The rock appears stable with minimal movement of units. The structures are decreasing in depth heading west and this one was partially submerged at the time of inspection, but sediment was gradually building up to the rear of the structure creating a spit out to sea.

Section no. 20
Eccles to Winterton Beach Road

A

Source: OS Maps

Table 4.52: SCAPE Section 19

Asset Location			
SCAPE Section No:	19	**Location:**	Eccles to Winterton Beach Road
		Survey Date:	31-10-12
SMP Unit:	3b13		
SMP Policy:	From Present Day	Medium Term	Long Term
	Hold the line – Maintain whilst studies are on going to consider long term managed realignment	Hold the line – Maintain whilst studies are on going to consider long term managed realignment	Hold the line – Maintain, view to setback managed realignment once hold the line is no longer sustainable
Coastal Defence Condition			
Defence Type:	Concrete defence structure (SW), Offshore breakwater (BW)		
Defence Length (m):	SW – 500 BW – 2x 200 approx	**Ownership:**	Environment Agency
Foreshore Type:	Sand beach	**Assets Protected:**	Residential, agricultural land, public open space, caravan park
Exposure:	SW – Low BW – High	**Year Built:**	Unknown
Condition grade	SW – Good BW – Very Good	**Threshold grade:**	N/A
Residual life min (expected years)	SW – 30 BW - 40	**Residual life max (potential years)**	SW – 50 BW - 60
Description of the defences and the foreshore – East to West			

The eastern half of the concrete seawall has been uncovered from within the natural dune system and comprises a concrete wave return seawall with a stepped concrete apron. The apron is then fronted by steel sheet piles to prevent undermining. The western half of the defence was buried under the natural sand dunes formed at the rear of the structure. The main body of the structure is in good condition.

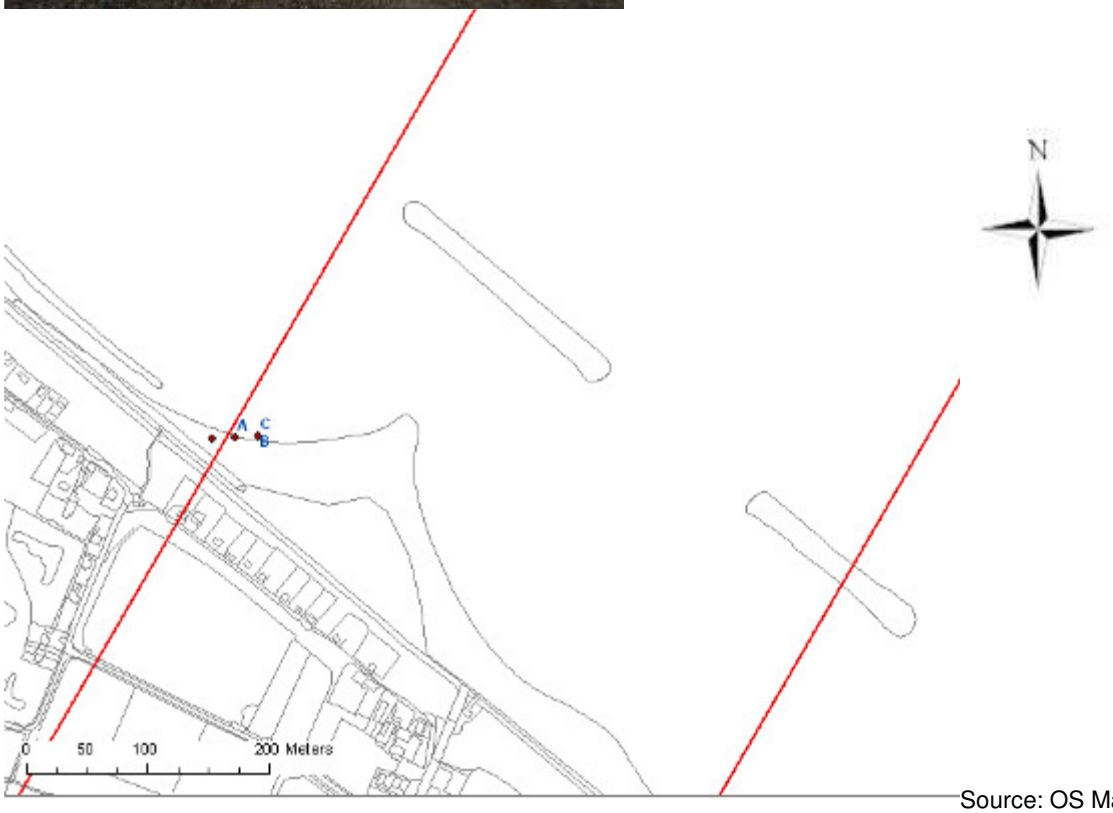
There are two offshore breakwaters of rock armour construction forming part of the series of nine along the coastline. The rock appears stable with minimal movement of units. The structures are decreasing in depth heading west and the toes of the structures were partially submerged at the time of inspection.

Section no. 19
Eccles to Winterton Beach Road

A

B

C



Source: OS Maps

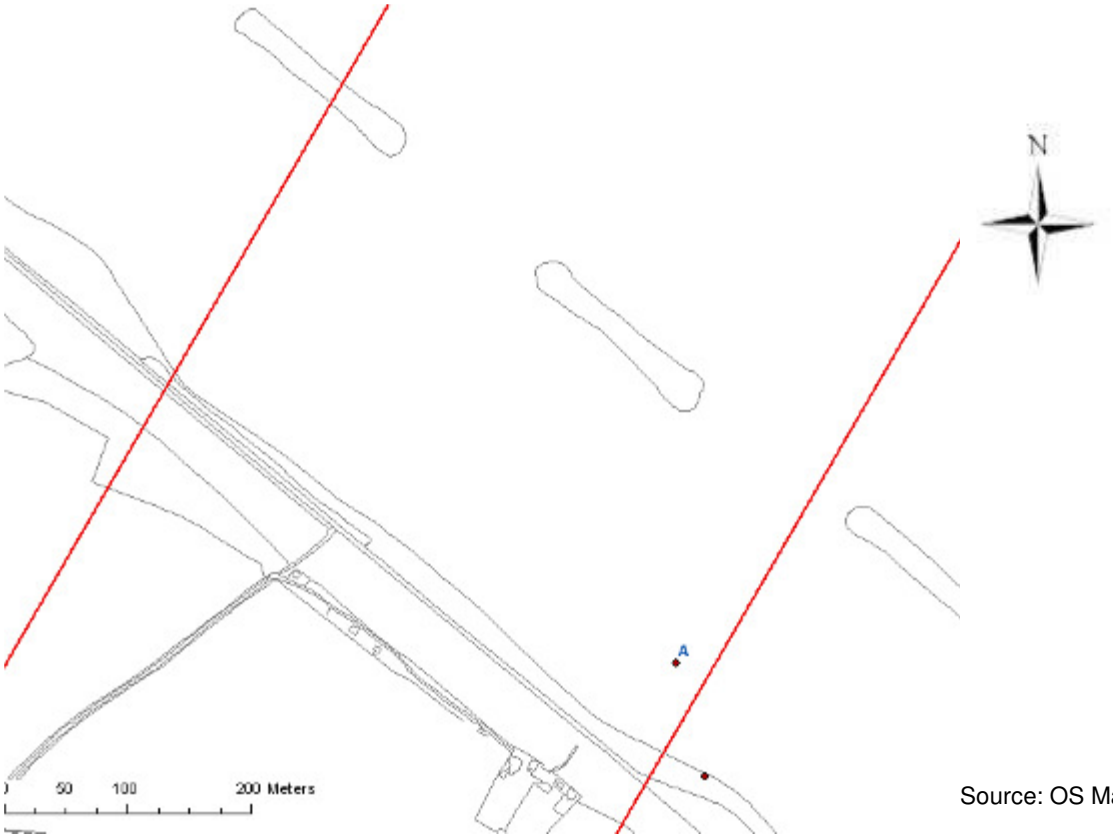
Table 4.53: SCAPE Section 18

Asset Location			
SCAPE Section No:	18	**Location:**	Eccles to Winterton Beach Road
		Survey Date:	31-10-12
SMP Unit:	3b13		
SMP Policy:	From Present Day	Medium Term	Long Term
	Hold the line – Maintain whilst studies are on going to consider long term managed realignment	Hold the line – Maintain whilst studies are on going to consider long term managed realignment	Hold the line – Maintain, view to setback managed realignment once hold the line is no longer sustainable
Coastal Defence Condition			
Defence Type:	Concrete defence structure (SW), Offshore breakwater (BW)		
Defence Length (m):	SW – 500 BW – 200 approx	**Ownership:**	Environment Agency
Foreshore Type:	Sand beach	**Assets Protected:**	Residential, agricultural land, public open space
Exposure:	SW – Low BW – High	**Year Built:**	Unknown
Condition grade	SW – Good BW – Very Good	**Threshold grade:**	N/A
Residual life min (expected years)	SW – 30 BW - 40	**Residual life max (potential years)**	SW – 50 BW - 60
Description of the defences and the foreshore – East to West			

The concrete seawall has been uncovered from within the natural dune system and comprises a concrete wave return seawall with a stepped concrete apron. The apron is then fronted by steel sheet piles to prevent undermining. The piles have become corroded in the tidal environment and also as a result of the lowered beach level in this location a layer of rock armour has been placed at the toe of the structure to prolong its life. The main body of the structure is in good condition with a slightly higher max residual life based on the evidence that the offshore breakwaters will increase accretion in the section.

Within this section there is one offshore breakwater of rock armour construction forming part of the series of nine along the coastline. The rock appears stable with minimal movement of units. The structures are decreasing in depth heading west and this breakwater was partially submerged at the time of inspection.

A



Source: OS Maps

Table 4.54: SCAPE Section 17

Asset Location			
SCAPE Section No:	17	**Location:**	Eccles to Winterton Beach Road
		Survey Date:	31-10-12
SMP Unit:	3b13		
SMP Policy:	From Present Day	Medium Term	Long Term
	Hold the line – Maintain whilst studies are on going to consider long term managed realignment	Hold the line – Maintain whilst studies are on going to consider long term managed realignment	Hold the line – Maintain, view to setback managed realignment once hold the line is no longer sustainable
Coastal Defence Condition			
Defence Type:	Concrete defence structure (SW), Offshore rock armour breakwaters (BW), single rock armour groyne (GF)		
Defence Length (m):	SW - 500 BW – 2x 200 approx	**Ownership:**	Environment Agency
Foreshore Type:	Sand beach	**Assets Protected:**	Agricultural land, public open space
Exposure:	SW – Low GF - Medium BW – High	**Year Built:**	Unknown
Condition grade	SW – Good GF - Good BW – Very Good	**Threshold grade:**	N/A
Residual life min (expected years)	SW – 30 GF – 40 BW - 40	**Residual life max (potential years)**	SW – 50 GF – 60 BW - 60
Descrip tion of the defences and the foreshore – East to West			

Beach levels are increasing and the entire seawall is buried beneath the natural sand dunes to the rear of the structure, only the crest of the wall is visible in the middle of the section. The structure is likely to be similar to that in section 16, comprising a concrete wave return seawall with a stepped concrete apron. The apron is then fronted by steel sheet piles to prevent undermining.

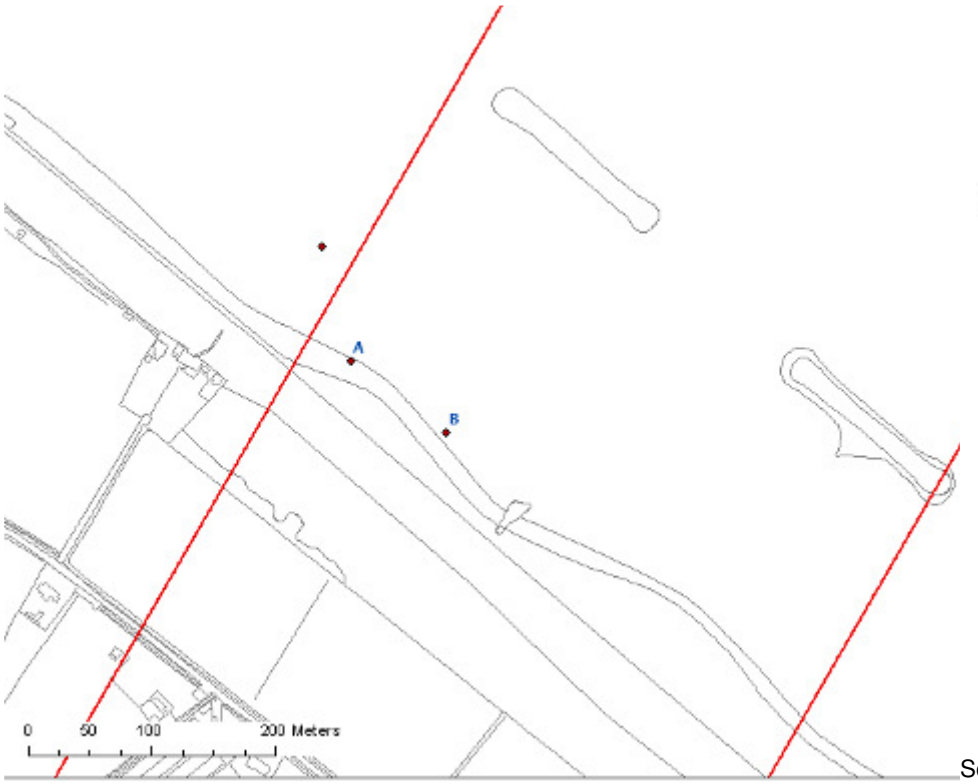
There are two offshore breakwaters of rock armour construction forming part of the series of nine along the coastline. The rock appears stable with minimal movement of units. The structures are decreasing in depth heading west and were still partially submerged at the time of inspection.

The single groyne was situated in the centre of the section and was in very good condition partially covered in sand as the beach appears to be in a stable condition.

Section no. 17
Eccles to Winterton Beach Road

A

B



Source: OS Maps

Table 4.55: SCAPE Section 16

Asset Location			
SCAPE Section No:	16	**Location:**	Eccles to Winterton Beach Road
		Survey Date:	31-10-12
SMP Unit:	3b13		
SMP Policy:	From Present Day	Medium Term	Long Term
	Hold the line – Maintain whilst studies are on going to consider long term managed realignment	Hold the line – Maintain whilst studies are on going to consider long term managed realignment	Hold the line – Maintain, view to setback managed realignment once hold the line is no longer sustainable
Coastal Defence Condition			
Defence Type:	Concrete defence structure (SW), Offshore rock armour breakwaters (BW)		
Defence Length (m):	SW - 500 BW – 200 approx	**Ownership:**	Environment Agency
Foreshore Type:	Sand beach	**Assets Protected:**	Agricultural land, public open space
Exposure:	SW – Low BW - High	**Year Built:**	Unknown
Condition grade	SW – Good BW – Very Good	**Threshold grade:**	N/A
Residual life min (expected years)	SW – 30 BW - 40	**Residual life max (potential years)**	SW – 50 BW - 60
Description of the defences and the foreshore – East to West			

The defences comprise a concrete wave return seawall with a stepped concrete apron. The apron is then fronted by steel sheet piles to prevent undermining. Beach levels are increasing and the entire seawall is buried beneath the natural sand dunes to the rear of the structure for the western half of the section.

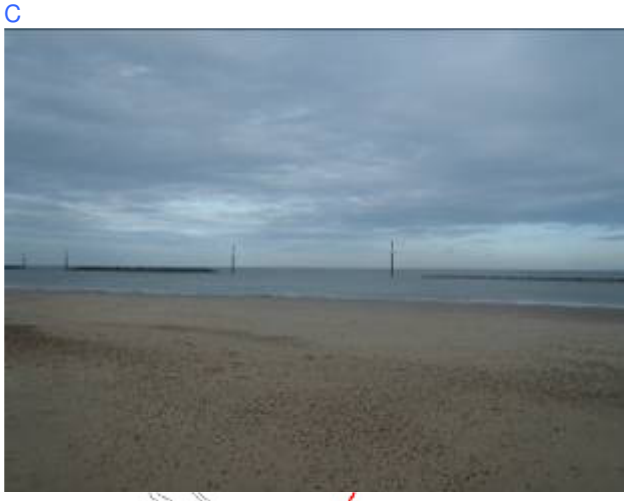
The offshore breakwater is of rock armour construction forming the last of a series of nine along the coastline. The rock appears stable with minimal movement of units. This structure is deeper than the others and was still partially submerged at the time of inspection.

Section no. 16
Eccles to Winterton Beach Road

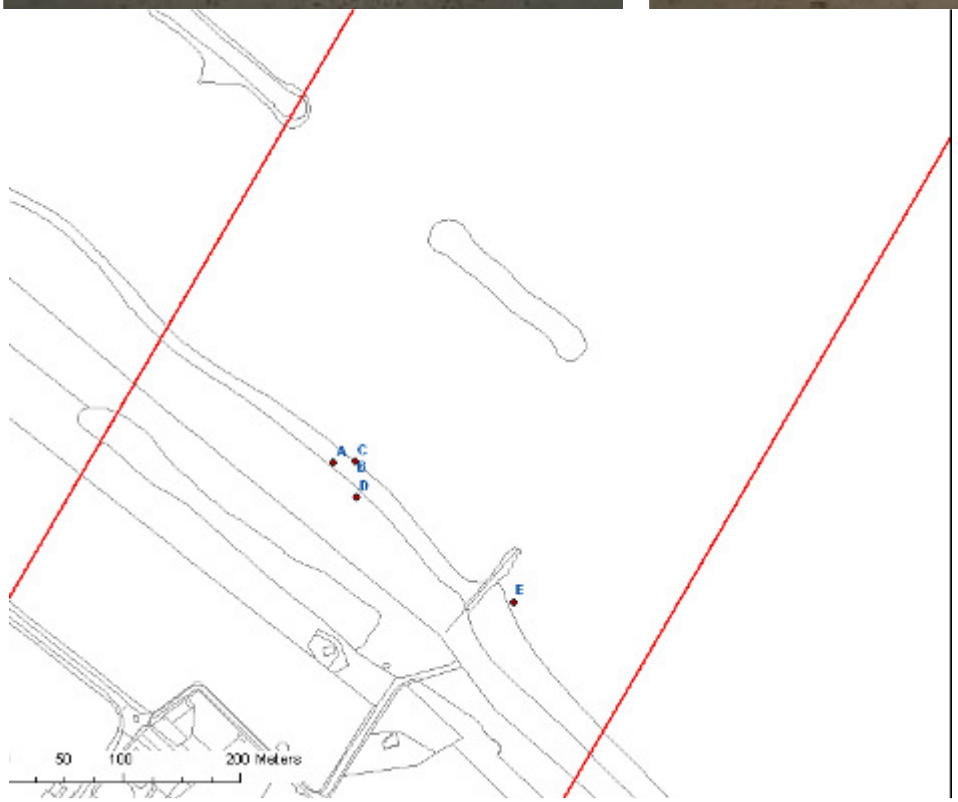
A

B

C

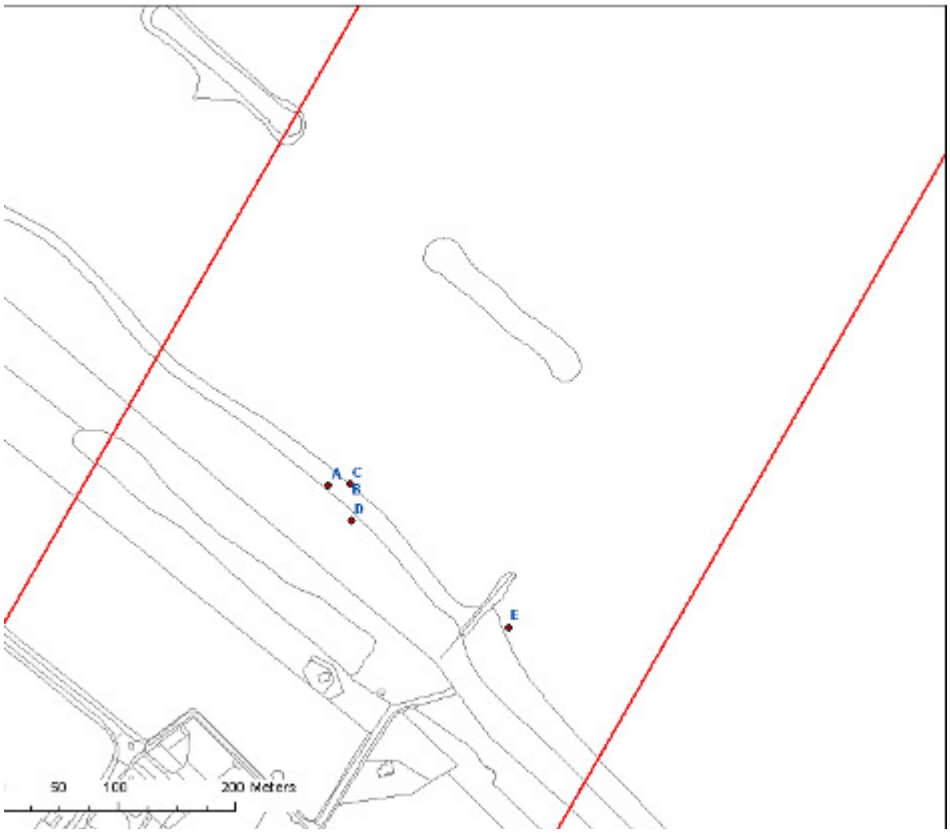


D



Source: OS Maps

E



Source: OS Maps

Table 4.56: SCAPE Section 15

Asset Location			
SCAPE Section No:	15	**Location:**	Eccles to Winterton Beach Road
		Survey Date:	31-10-12
SMP Unit:	3b13		
SMP Policy:	From Present Day	Medium Term	Long Term
	Hold the line – Maintain whilst studies are on going to consider long term managed realignment	Hold the line – Maintain whilst studies are on going to consider long term managed realignment	Hold the line – Maintain, view to setback managed realignment once hold the line is no longer sustainable
Coastal Defence Condition			
Defence Type:	Concrete defence structure (SW), Composite timber / rock groynes (GF)		
Defence Length (m):	500	**Ownership:**	Environment Agency
Foreshore Type:	Sand beach	**Assets Protected:**	Agricultural land, public open space
Exposure:	Medium	**Year Built:**	Unknown
Condition grade	SW – Good GF – Good	**Threshold grade:**	N/A
Residual life min (expected years)	SW – 30 GF - 10	**Residual life max (potential years)**	SW – 50 GF - 20
Description of the defences and the foreshore – East to West			

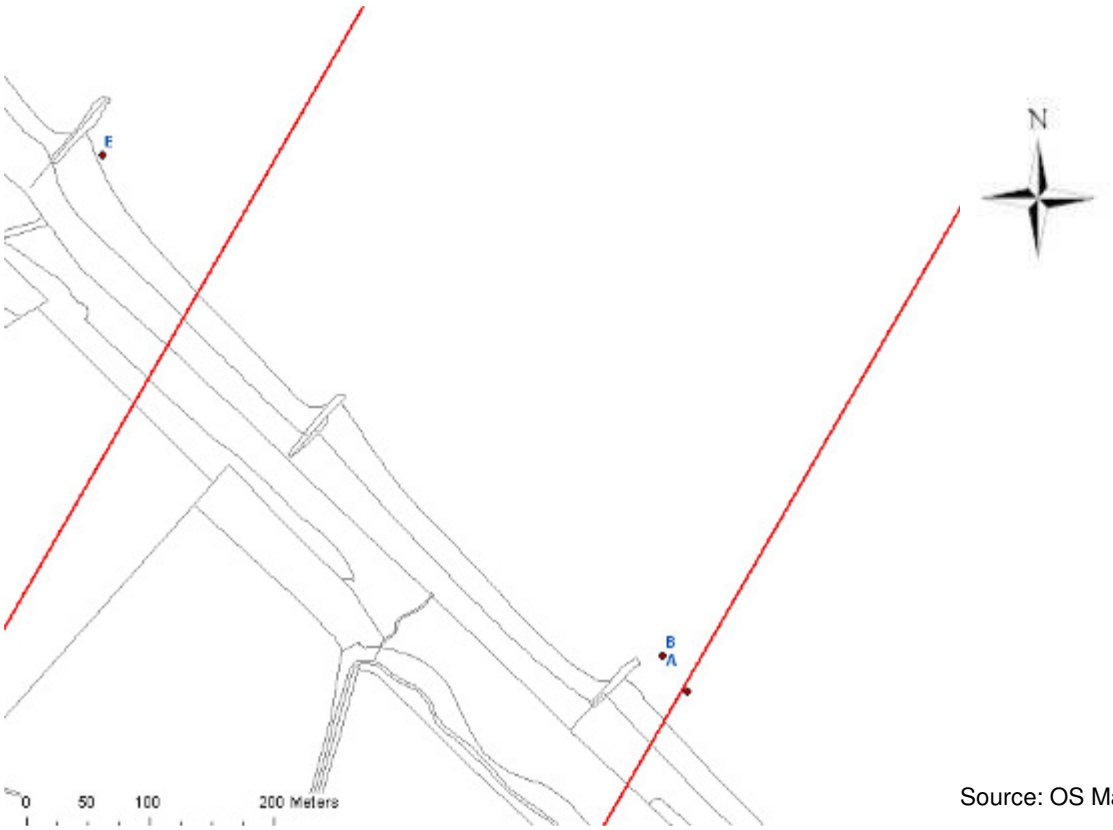
The defences comprise a concrete wave return seawall with a stepped concrete apron. The apron is then fronted by steel sheet piles to prevent undermining. However the piles are corroding and additional rock armour has been placed in front of these to extend the life of the structure which extends throughout this section.

The composite groynes are timber fixed to steel supports along the landward section of the groyne, before becoming rock armour construction for the seaward section. The timber and steel sections are worn and corroding whilst the rock armour is in a very good condition.

Section no. 15
Eccles to Winterton Beach Road

A

B



Source: OS Maps

Table 4.57: SCAPE Section 14

Asset Location			
SCAPE Section No:	14	**Location:**	Eccles to Winterton Beach Road
		Survey Date:	31-10-12
SMP Unit:	3b13		
SMP Policy:	From Present Day	Medium Term	Long Term
	Hold the line – Maintain whilst studies are on going to consider long term managed realignment	Hold the line – Maintain whilst studies are on going to consider long term managed realignment	Hold the line – Maintain, view to setback managed realignment once hold the line is no longer sustainable
Coastal Defence Condition			
Defence Type:	Concrete seawall structure (SW), Rock groynes (GF)		
Defence Length (m):	500	**Ownership:**	Environment Agency
Foreshore Type:	Sand beach	**Assets Protected:**	Agricultural land, public open space
Exposure:	Medium	**Year Built:**	Unknown
Condition grade	SW – Very Good GF – Very Good	**Threshold grade:**	N/A
Residual life min (expected years)	SW – 40 GF - 40	**Residual life max (potential years)**	SW – 60 GF - 60
Description of the defences and the foreshore – East to West			

The seawall comprised a concrete wave return wall with stepped concrete apron at its toe. The apron was fronted by steel sheet piles to prevent undermining of the structure. The piles are corroding and rock armour has been placed in front of the piles to extend the overall residual life of the structure for the majority of the section. The piles become buried in sand towards the western end of the section.

An additional overtopping wall and sloped concrete revetment was fitted above the crest of the main wall.

The groyne field was constructed with rock armour and the beach condition appeared stable with reasonable beach levels throughout. All rock armour through this section is in very good condition.

Section no. 14

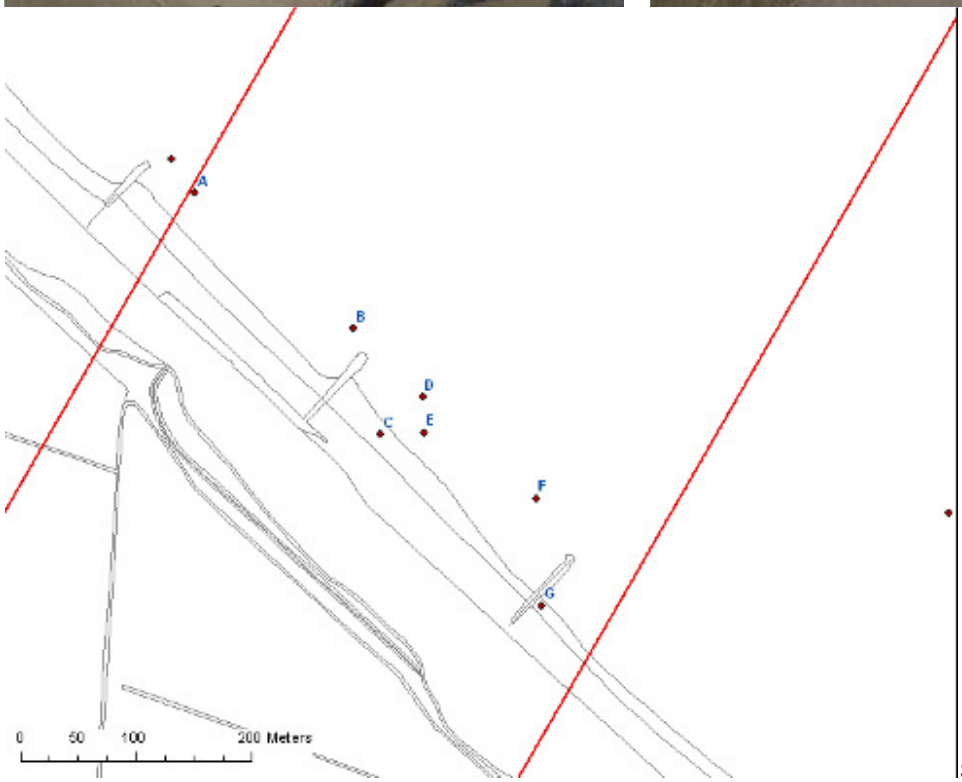
Eccles to Winterton Beach Road

A

B

C

D

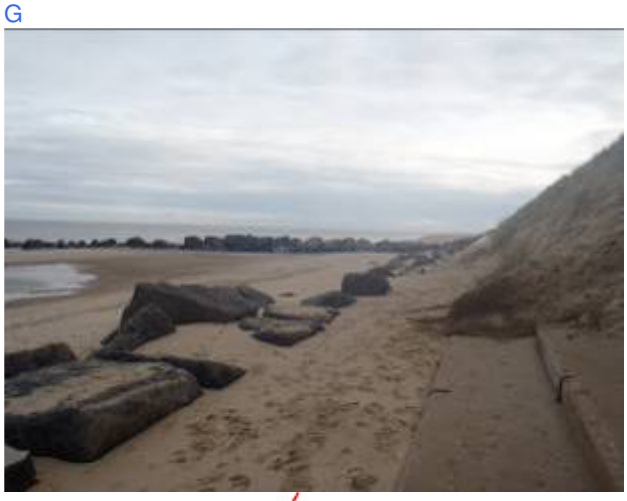


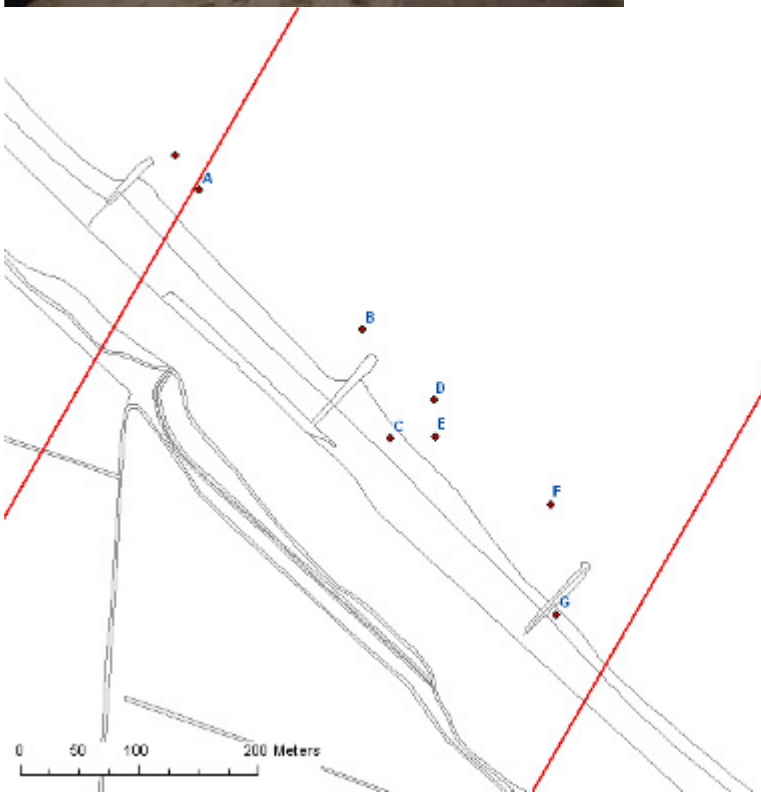
Source: OS Maps

E

F

G





Source: OS Maps

Table 4.58: SCAPE Section 13

Asset Location			
SCAPE Section No:	13	**Location:**	Eccles to Winterton Beach Road
		Survey Date:	31-10-12
SMP Unit:	3b13		
SMP Policy:	From Present Day	Medium Term	Long Term
	Hold the line – Maintain whilst studies are on going to consider long term managed realignment	Hold the line – Maintain whilst studies are on going to consider long term managed realignment	Hold the line – Maintain, view to setback managed realignment once hold the line is no longer sustainable
Coastal Defence Condition			
Defence Type:	Concrete seawall structure (SW), Steel and timber groynes (GF)		
Defence Length (m):	500	**Ownership:**	Environment Agency
Foreshore Type:	Sand beach	**Assets Protected:**	Agricultural land, public open space
Exposure:	Low	**Year Built:**	Unknown
Condition grade	SW – Good GF – Fair	**Threshold grade:**	N/A
Residual life min (expected years)	SW – 20 GF - 8	**Residual life max (potential years)**	SW – 40 GF - 12
Description of the defences and the foreshore – East to West			

The concrete seawall is engulfed by the sand dunes to the rear of the structure through sedimentation and the condition grade is assumed to be similar to that of section 6 as the dunes will provide protection to the structure and it is not subject to direct wave impact.

In section 6 the defence comprised a concrete wave return seawall with stepped concrete apron at its toe. The apron was fronted by steel sheet piles to prevent undermining of the structure.

An additional overtopping wall and sloped concrete revetment was fitted above the crest of the main wall. Some of the seawall crest is visible at points through the dunes.

The groyne field was constructed with timber fixed to steel piled posts. The beach condition was stable with high levels of sand throughout often burying the upper parts of the groynes. The upper boards of the buried sections appeared in good condition where as the lower sections exposed to tidal conditions were worn and the steel supports were corroding.

Section no. 13
Eccles to Winterton Beach Road

A

B

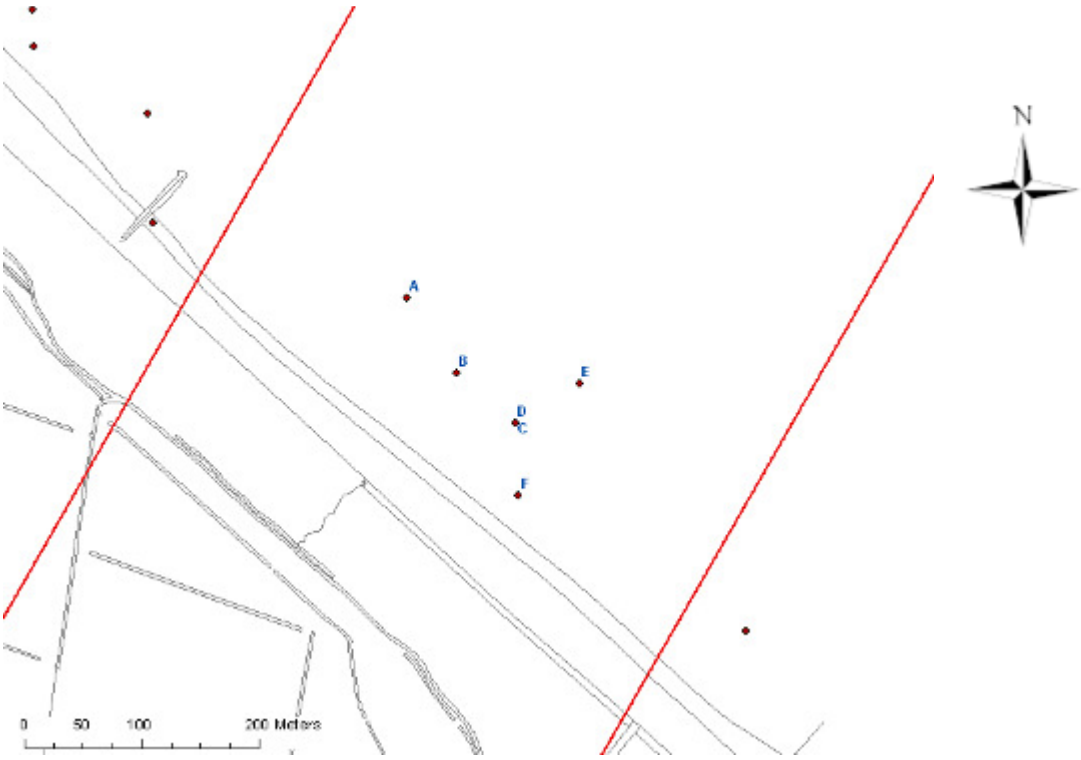
C

D

Source: OS Maps

E

F



Source: OS Maps

Table 4.59: SCAPE Section 12

Asset Location			
SCAPE Section No:	12	**Location:**	Eccles to Winterton Beach Road
		Survey Date:	31-10-12
SMP Unit:	3b13		
SMP Policy:	From Present Day	Medium Term	Long Term
	Hold the line – Maintain whilst studies are on going to consider long term managed realignment	Hold the line – Maintain whilst studies are on going to consider long term managed realignment	Hold the line – Maintain, view to setback managed realignment once hold the line is no longer sustainable
Coastal Defence Condition			
Defence Type:	Concrete seawall structure (SW), Steel and timber groynes (GF)		
Defence Length (m):	500	**Ownership:**	Environment Agency
Foreshore Type:	Sand beach	**Assets Protected:**	Agricultural land, public open space
Exposure:	Low	**Year Built:**	Unknown
Condition grade	SW – Good GF – Good / Fair	**Threshold grade:**	N/A
Residual life min (expected years)	SW – 20 GF - 10	**Residual life max (potential years)**	SW – 40 GF - 15
Description of the defences and the foreshore – East to West			

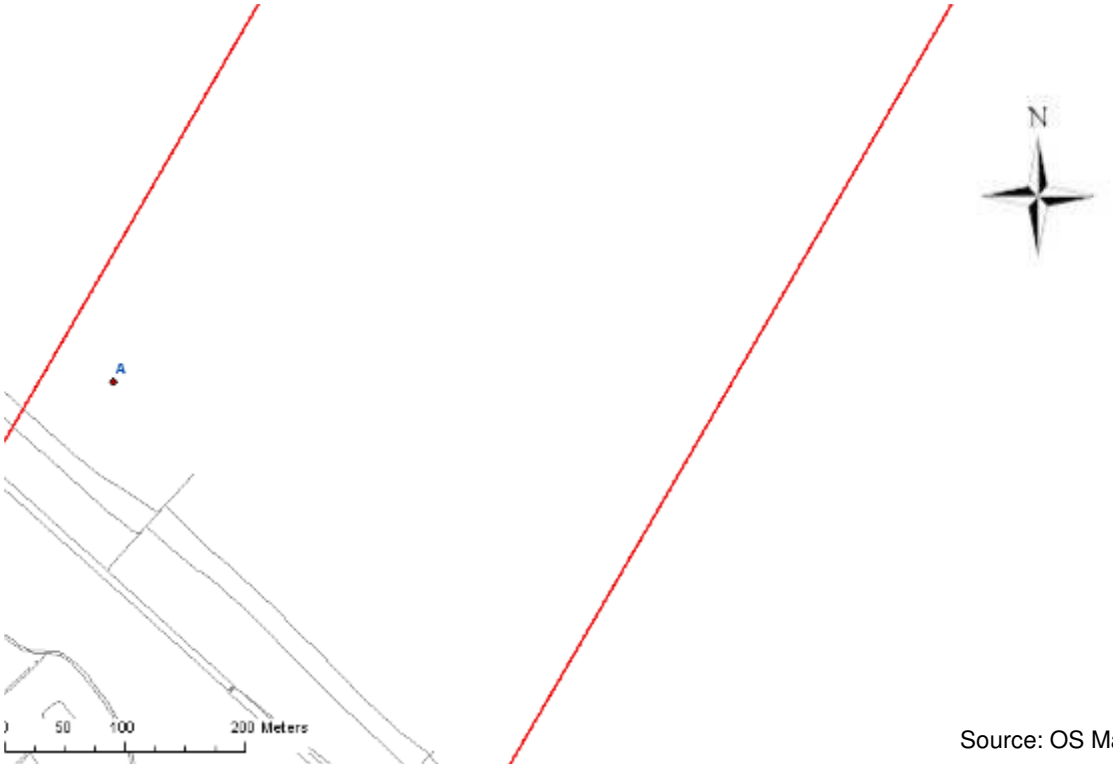
The majority of the concrete seawall is engulfed by the sand dunes to the rear of the structure through sedimentation. At the section centre beach levels are reduced in a scoured dip to the rear of the beach uncovering the seawall, apron and top of the piled toe. Based on the condition of the uncovered section the buried seawall has been taken as good as the dunes will provide protection to the structure and it is not subject to direct wave impact.

The defence comprised a concrete wave return seawall with stepped concrete apron at its toe. The apron was fronted by steel sheet piles to prevent undermining of the structure.

An additional overtopping wall and sloped concrete revetment was fitted above the crest of the main wall. Some of the seawall crest is visible at points through the dunes.

The groyne field was constructed with timber fixed to steel piled posts. The beach condition was stable with high levels of sand throughout often burying the upper parts of the groynes. The upper boards of the buried sections appeared in good condition where as the lower sections exposed to tidal conditions were worn and the steel supports were corroding.

A



Source: OS Maps

Table 4.60: SCAPE Section 11

Asset Location			
SCAPE Section No:	11	**Location:**	Eccles to Winterton Beach Road
		Survey Date:	31-10-12
SMP Unit:	3b13		
SMP Policy:	From Present Day	Medium Term	Long Term
	Hold the line – Maintain whilst studies are on going to consider long term managed realignment	Hold the line – Maintain whilst studies are on going to consider long term managed realignment	Hold the line – Maintain, view to setback managed realignment once hold the line is no longer sustainable
Coastal Defence Condition			
Defence Type:	Concrete seawall structure (SW), Steel and timber groynes (GF)		
Defence Length (m):	500	**Ownership:**	Environment Agency
Foreshore Type:	Sand beach	**Assets Protected:**	Agricultural land, public open space
Exposure:	Low	**Year Built:**	Unknown
Condition grade	SW – Good GF – Good / Fair	**Threshold grade:**	N/A
Residual life min (expected years)	SW – 20 GF - 10	**Residual life max (potential years)**	SW – 40 GF - 15
Description of the defences and the foreshore – East to West			

The concrete seawall is engulfed by the sand dunes to the rear of the structure through sedimentation and the condition grade is assumed to be similar to that of section 6 as the dunes will provide protection to the structure and it is not subject to direct wave impact.

In section 6 the defence comprised a concrete wave return seawall with stepped concrete apron at its toe. The apron was fronted by steel sheet piles to prevent undermining of the structure.

An additional overtopping wall and sloped concrete revetment was fitted above the crest of the main wall. Some of the seawall crest is visible at points through the dunes.

The groyne field was constructed with timber fixed to steel piled posts. The beach condition was stable with high levels of sand throughout often burying the upper parts of the groynes. The upper boards of the buried sections appeared in good condition where as the lower sections exposed to tidal conditions were worn and the steel supports were corroding.

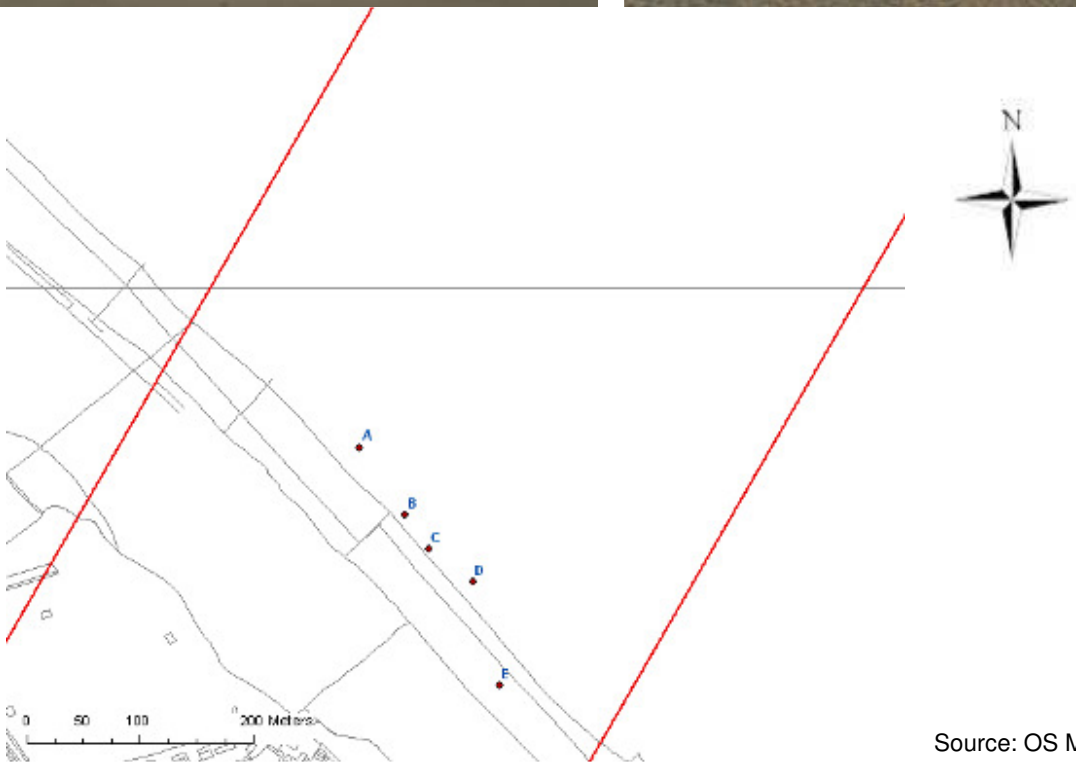
Section no. 11
Eccles to Winterton Beach Road

A

B

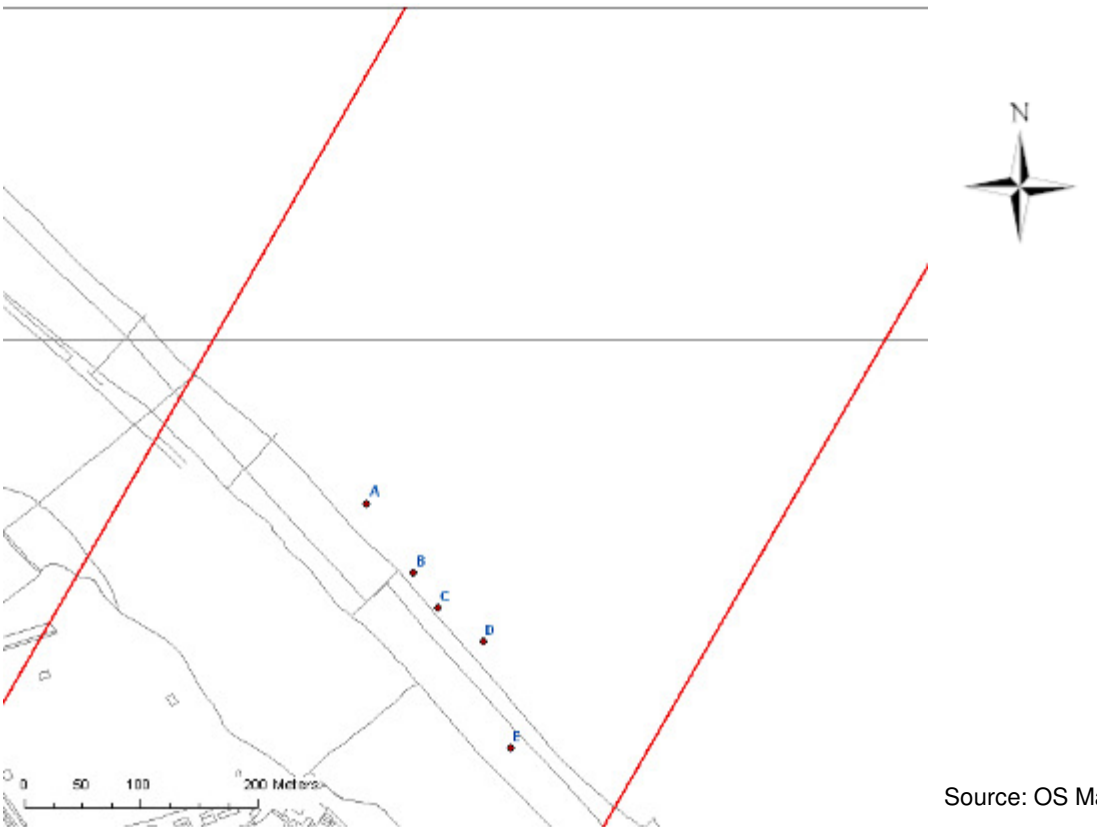
C

D



Source: OS Maps

E



Source: OS Maps

Table 4.61: SCAPE Section 10

Asset Location			
SCAPE Section No:	10	**Location:**	Eccles to Winterton Beach Road
		Survey Date:	31-10-12
SMP Unit:	3b13		
SMP Policy:	From Present Day	Medium Term	Long Term
	Hold the line – Maintain whilst studies are on going to consider long term managed realignment	Hold the line – Maintain whilst studies are on going to consider long term managed realignment	Hold the line – Maintain, view to setback managed realignment once hold the line is no longer sustainable
Coastal Defence Condition			
Defence Type:	Concrete seawall structure (SW), Steel and timber groynes (GF)		
Defence Length (m):	500	**Ownership:**	Environment Agency
Foreshore Type:	Sand beach	**Assets Protected:**	Agricultural land, public open space
Exposure:	Low	**Year Built:**	Unknown
Condition grade	SW – Good GF – Good / Fair	**Threshold grade:**	N/A
Residual life min (expected years)	SW – 20 GF - 10	**Residual life max (potential years)**	SW – 40 GF - 15
Description of the defences and the foreshore – East to West			

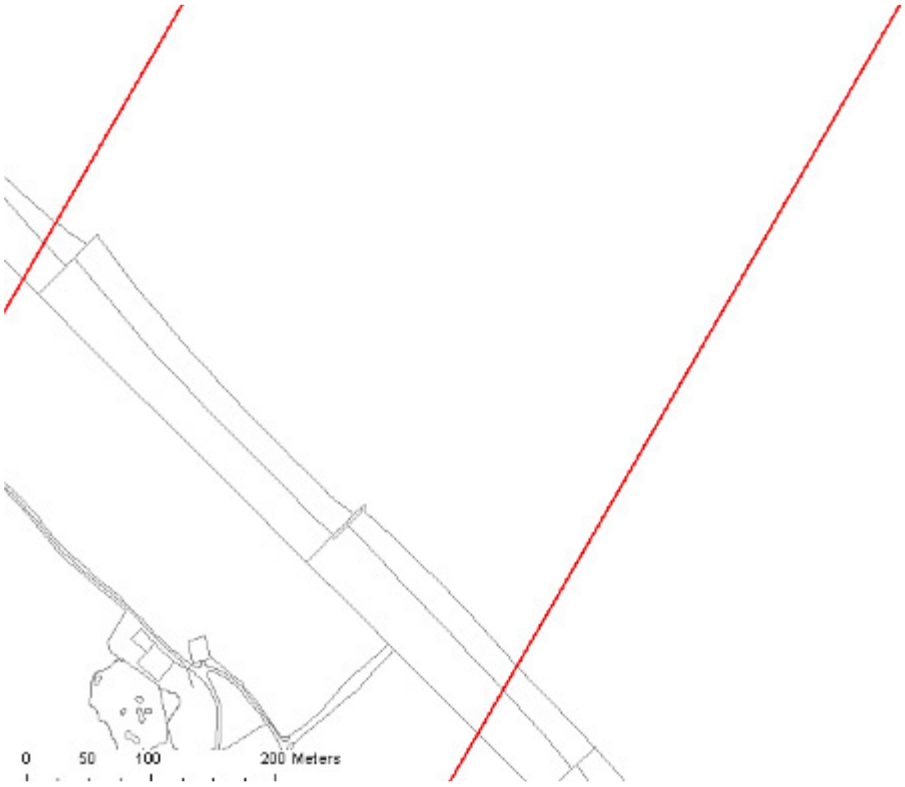
The concrete seawall is engulfed by the sand dunes to the rear of the structure through sedimentation and the condition grade is assumed to be similar to that of section 6 as the dunes will provide protection to the structure and it is not subject to direct wave impact.

In section 6 the defence comprised a concrete wave return seawall with stepped concrete apron at its toe. The apron was fronted by steel sheet piles to prevent undermining of the structure.

An additional overtopping wall and sloped concrete revetment was fitted above the crest of the main wall. Some of the seawall crest is visible at points through the dunes. An access point through the seawall comprising concrete revetments / wing walls was also present within this section. Some cracking was evident here at the rear of the wave return wall.

The groyne field was constructed with timber fixed to steel piled posts. The beach condition was stable with high levels of sand throughout often burying the upper parts of the groynes. The upper boards of the buried sections appeared in good condition where as the lower sections exposed to tidal conditions were worn and the steel supports were corroding.

Section no. 10
Eccles to Winterton Beach Road



Source: OS Maps

Table 4.62: SCAPE Section 9

Asset Location			
SCAPE Section No:	9	**Location:**	Eccles to Winterton Beach Road
		Survey Date:	31-10-12
SMP Unit:	3b13		
SMP Policy:	From Present Day	Medium Term	Long Term
	Hold the line – Maintain whilst studies are on going to consider long term managed realignment	Hold the line – Maintain whilst studies are on going to consider long term managed realignment	Hold the line – Maintain, view to setback managed realignment once hold the line is no longer sustainable
Coastal Defence Condition			
Defence Type:	Concrete seawall structure (SW), Rock groynes (RG)		
Defence Length (m):	500	**Ownership:**	Environment Agency
Foreshore Type:	Sand beach	**Assets Protected:**	Agricultural land, public open space
Exposure:	Low	**Year Built:**	Unknown
Condition grade	SW – Good RG – Very Good	**Threshold grade:**	N/A
Residual life min (expected years)	SW – 20 RG - 40	**Residual life max (potential years)**	SW – 40 RG - 60
Description of the defences and the foreshore – East to West			

The concrete seawall is engulfed by the sand dunes to the rear of the structure through sedimentation and the condition grade is assumed to be similar to that of section 6 as the dunes will provide protection to the structure and it is not subject to direct wave impact.

In section 6 the defence comprised a concrete wave return seawall with stepped concrete apron at its toe. The apron was fronted by steel sheet piles to prevent undermining of the structure.

An additional overtopping wall and sloped concrete revetment was fitted above the crest of the main wall. Some of the seawall crest is visible at points through the dunes.

The groyne field was constructed with rock groynes which showed no signs of damage, effectively building up beach material along the foreshore. The beach condition was stable with high levels of sand throughout.

Source: OS Maps

Table 4.63: SCAPE Section 8

Asset Location			
SCAPE Section No:	8	**Location:**	Eccles to Winterton Beach Road
		Survey Date:	31-10-12
SMP Unit:	3b13		
SMP Policy:	From Present Day	Medium Term	Long Term
	Hold the line – Maintain whilst studies are on going to consider long term managed realignment	Hold the line – Maintain whilst studies are on going to consider long term managed realignment	Hold the line – Maintain, view to setback managed realignment once hold the line is no longer sustainable
Coastal Defence Condition			
Defence Type:	Concrete seawall structure (SW), Rock groynes (RG)		
Defence Length (m):	500	**Ownership:**	Environment Agency
Foreshore Type:	Sand beach	**Assets Protected:**	Agricultural land, public open space
Exposure:	Low	**Year Built:**	Unknown
Condition grade	SW – Good RG – Very Good	**Threshold grade:**	N/A
Residual life min (expected years)	SW – 30 RG - 40	**Residual life max (potential years)**	SW – 50 RG - 60
Description of the defences and the foreshore – East to West			

The concrete seawall is engulfed by the sand dunes to the rear of the structure through sedimentation and the condition grade is assumed to be similar to that of section 6 as the dunes will provide protection to the structure and it is not subject to direct wave impact.

In section 6 the defence comprised a concrete wave return seawall with stepped concrete apron at its toe. The apron was fronted by steel sheet piles to prevent undermining of the structure.

An additional overtopping wall and sloped concrete revetment was fitted above the crest of the main wall. Some of the seawall crest is visible at points through the dunes.

The groyne field was constructed with rock groynes which showed no signs of damage, effectively building up beach material along the foreshore. The beach condition was stable with high levels of sand throughout.

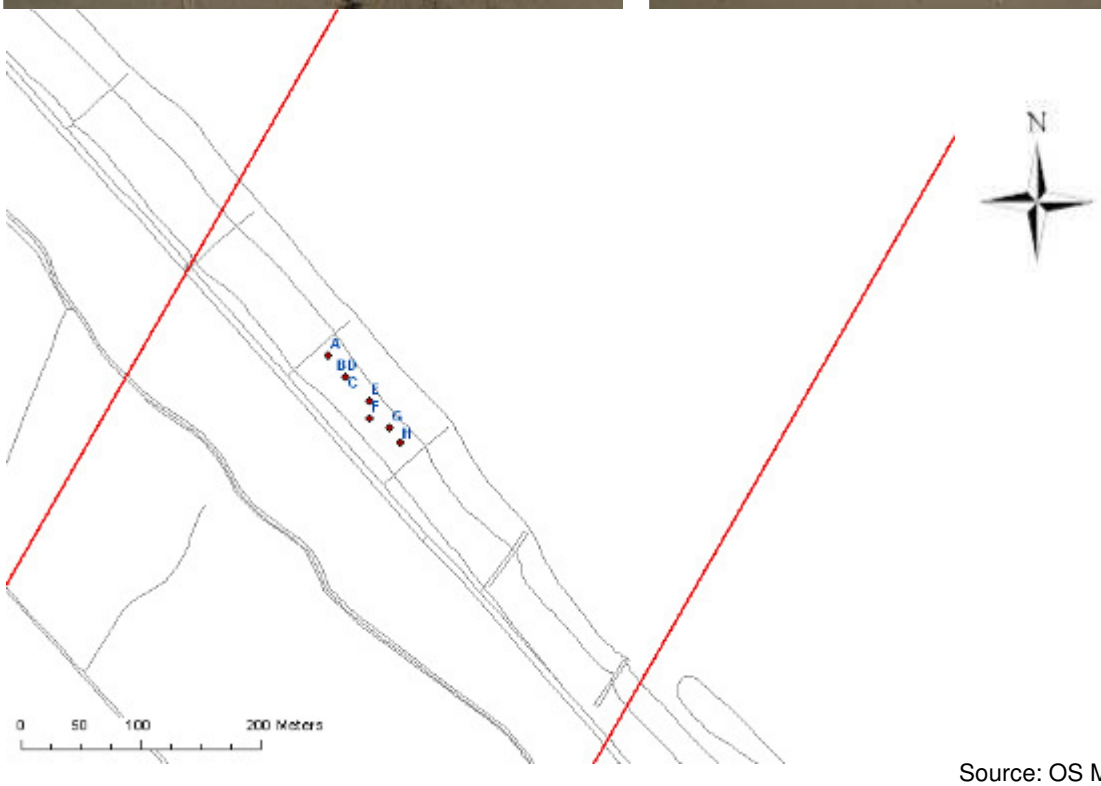
Section no. 8
Eccles to Winterton Beach Road

A

B

C

D



Source: OS Maps

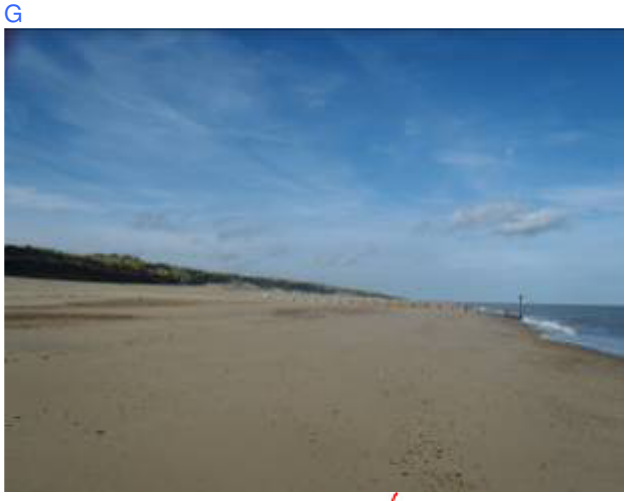
Section no. 8

Eccles to Winterton Beach Road

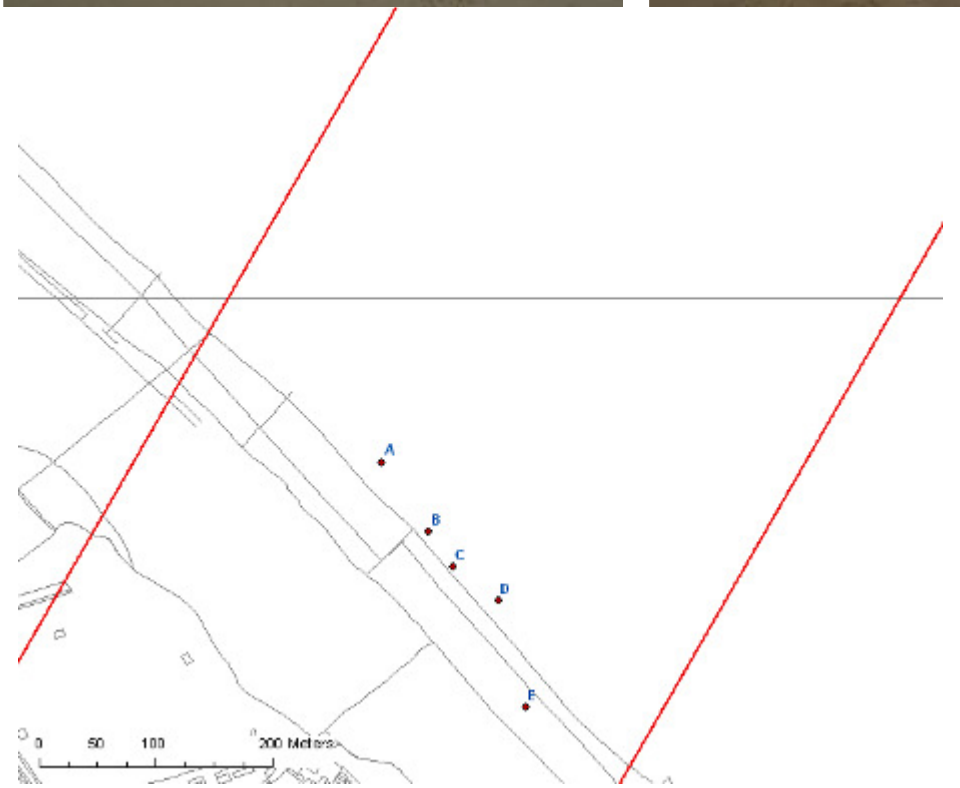
E

F

G



H



Source: OS Maps

Table 4.64: SCAPE Section 7

Asset Location			
SCAPE Section No:	7	**Location:**	Eccles to Winterton Beach Road
		Survey Date:	31-10-12
SMP Unit:	3b13		
SMP Policy:	From Present Day	Medium Term	Long Term
	Hold the line – Maintain whilst studies are on going to consider long term managed realignment	Hold the line – Maintain whilst studies are on going to consider long term managed realignment	Hold the line – Maintain, view to setback managed realignment once hold the line is no longer sustainable
Coastal Defence Condition			
Defence Type:	Concrete seawall structure (SW), Rock groynes (RG)		
Defence Length (m):	500	**Ownership:**	Environment Agency
Foreshore Type:	Sand beach	**Assets Protected:**	Agricultural land, public open space
Exposure:	Low	**Year Built:**	Unknown
Condition grade	SW – Good RG – Very Good	**Threshold grade:**	N/A
Residual life min (expected years)	SW – 20 RG - 40	**Residual life max (potential years)**	SW – 40 RG - 60
Description of the defences and the foreshore – East to West			

The concrete seawall is engulfed by the sand dunes to the rear of the structure through sedimentation and the condition grade is assumed to be similar to that of section 6 as the dunes will provide protection to the structure and it is not subject to direct wave impact.

In section 6 the defence comprised a concrete wave return seawall with stepped concrete apron at its toe. The apron was fronted by steel sheet piles to prevent undermining of the structure.

An additional overtopping wall and sloped concrete revetment was fitted above the crest of the main wall. Some of the seawall crest is visible at points through the dunes. An access point through the seawall comprising concrete revetments / wing walls was also present within this section. Some cracking was evident here at the rear of the wave return wall.

The groyne field was constructed with rock groynes which showed no signs of damage, effectively building up beach material along the foreshore. The beach condition was stable with high levels of sand throughout.

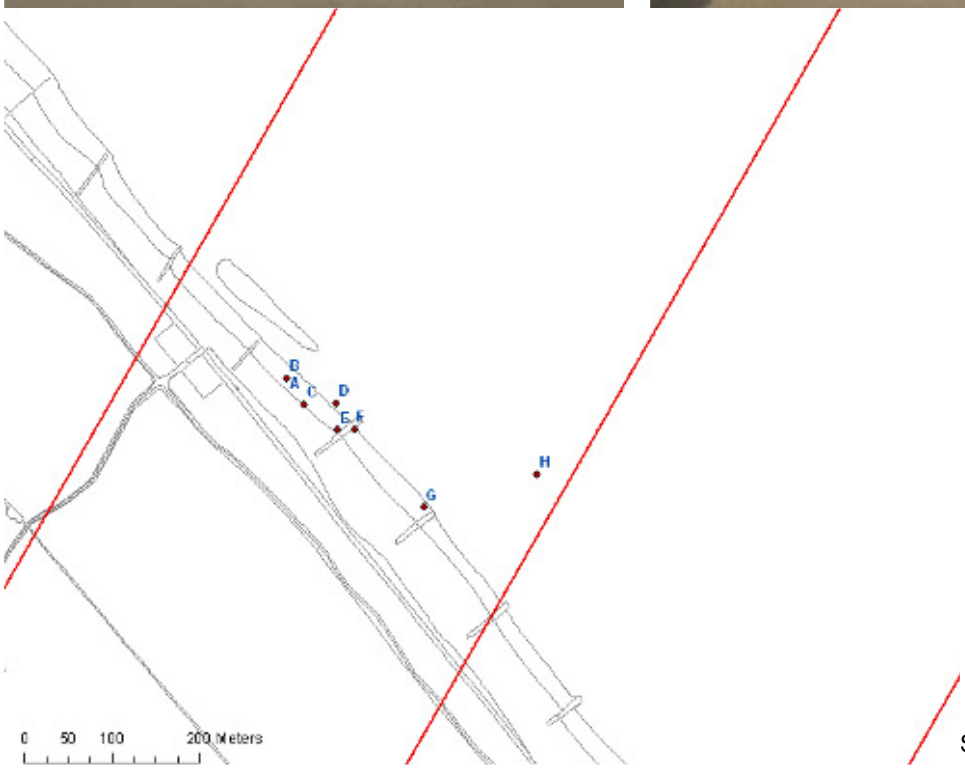
Section no. 7
Eccles to Winterton Beach Road

A

B

C

D



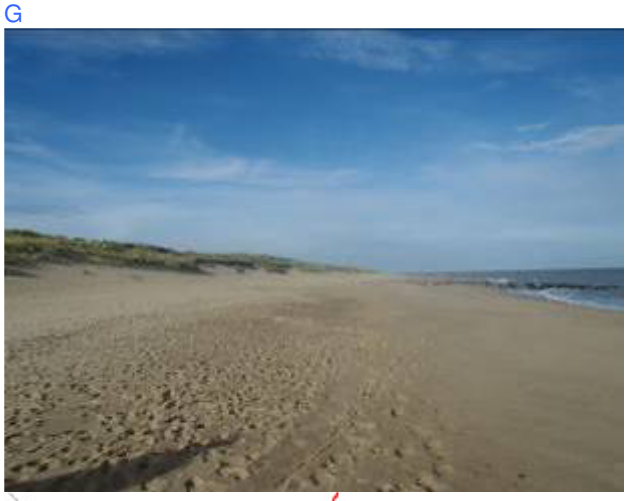
Source: OS Maps

Section no. 7
Eccles to Winterton Beach Road

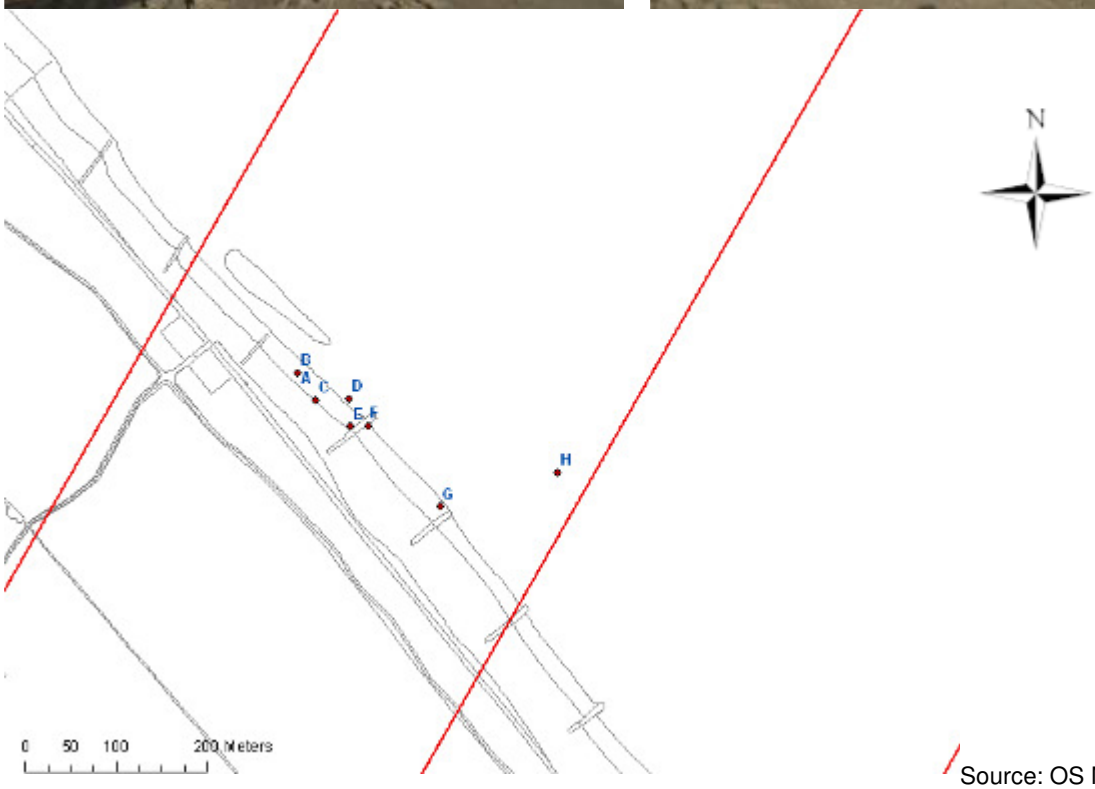
E

F

G



H



Source: OS Maps

Table 4.65: SCAPE Section 6

Asset Location			
SCAPE Section No:	6	**Location:**	Eccles to Winterton Beach Road
		Survey Date:	31-10-12
SMP Unit:	3b13		
SMP Policy:	From Present Day	Medium Term	Long Term
	Hold the line – Maintain whilst studies are on going to consider long term managed realignment	Hold the line – Maintain whilst studies are on going to consider long term managed realignment	Hold the line – Maintain, view to setback managed realignment once hold the line is no longer sustainable
Coastal Defence Condition			
Defence Type:	Concrete seawall structure (SW), Rock Groynes (RG)		
Defence Length (m):	500	**Ownership:**	Environment Agency
Foreshore Type:	Sand beach	**Assets Protected:**	Agricultural land, public open space
Exposure:	Medium	**Year Built:**	Unknown
Condition grade	SW – Good RG – Very Good	**Threshold grade:**	N/A
Residual life min (expected years)	SW – 20 RG - 40	**Residual life max (potential years)**	SW – 40 RG - 60
Description of the defences and the foreshore – East to West			

Defences comprise a concrete wave return seawall with stepped concrete apron at its toe. The apron was fronted by steel sheet piles to prevent undermining of the structure.

An additional overtopping wall and sloped concrete revetment was fitted above the crest of the main wall.

Minimal damage was evident on the structure, though the last 100m was engulfed by the sand dunes to the rear of the structure through sedimentation.

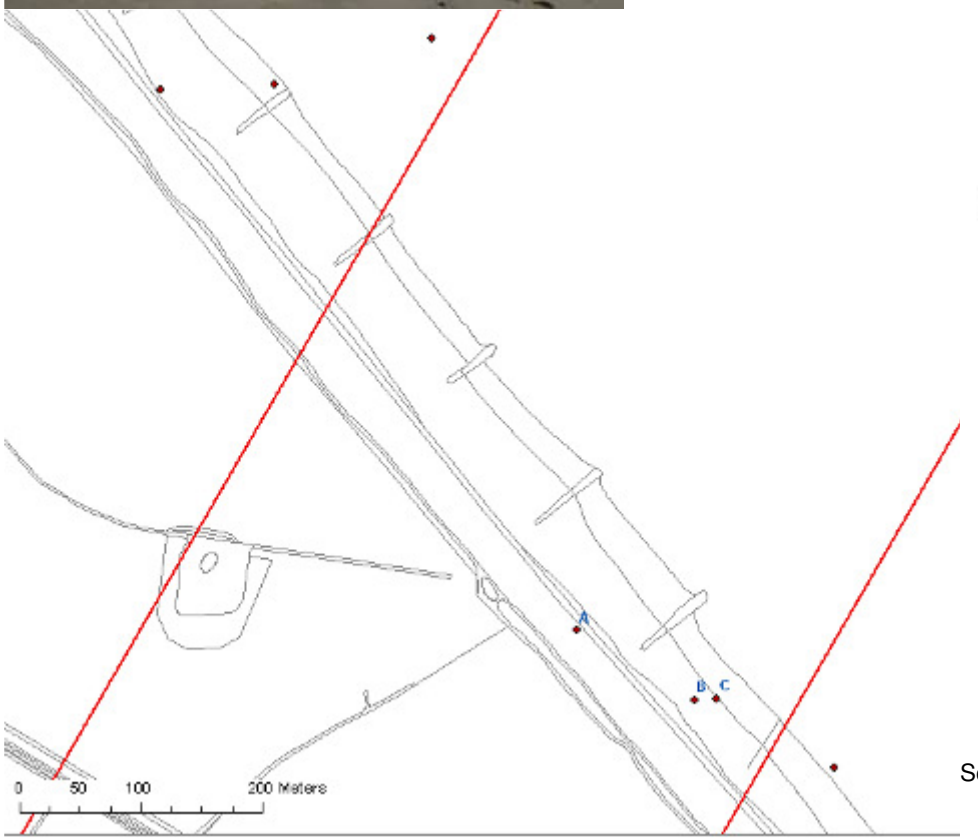
The groyne field was constructed with rock groynes which showed no signs of damage, effectively building up beach material along the foreshore. The beach condition was stable with high levels of sand throughout.

Section no. 6
Eccles to Winterton Beach Road

A

B

C



Source: OS Maps

Table 4.66: SCAPE Section 5

Asset Location			
SCAPE Section No:	5	**Location:**	Eccles to Winterton Beach Road
		Survey Date:	31-10-12
SMP Unit:	3b13		
SMP Policy:	From Present Day	Medium Term	Long Term
	Hold the line – Maintain whilst studies are on going to consider long term managed realignment	Hold the line – Maintain whilst studies are on going to consider long term managed realignment	Hold the line – Maintain, view to setback managed realignment once hold the line is no longer sustainable
Coastal Defence Condition			
Defence Type:	Concrete seawall structure (SW) and timber groyne field (GF)		
Defence Length (m):	500	**Ownership:**	Environment Agency
Foreshore Type:	Sand beach	**Assets Protected:**	Agricultural land, public open space
Exposure:	High	**Year Built:**	Unknown
Condition grade	SW – Good GF - Good	**Threshold grade:**	N/A
Residual life min (expected years)	SW – 30 GF - 10	**Residual life max (potential years)**	SW – 50 GF - 15
Description of the defences and the foreshore – East to West			

Defences comprise a concrete wave return seawall with stepped concrete apron at its toe. The apron was fronted by steel sheet piles to prevent undermining of the structure.

An additional overtopping wall and sloped concrete revetment was fitted above the crest of the main wall.

Minimal damage was evident on the structure.

The groyne field was constructed with timber groynes experiencing some wear throughout the structure.

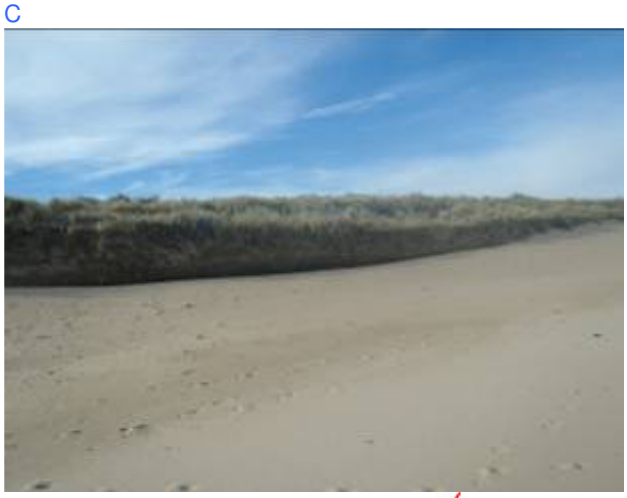
The beach condition was stable with very high levels of sand throughout.

Section no. 5
Eccles to Winterton Beach Road

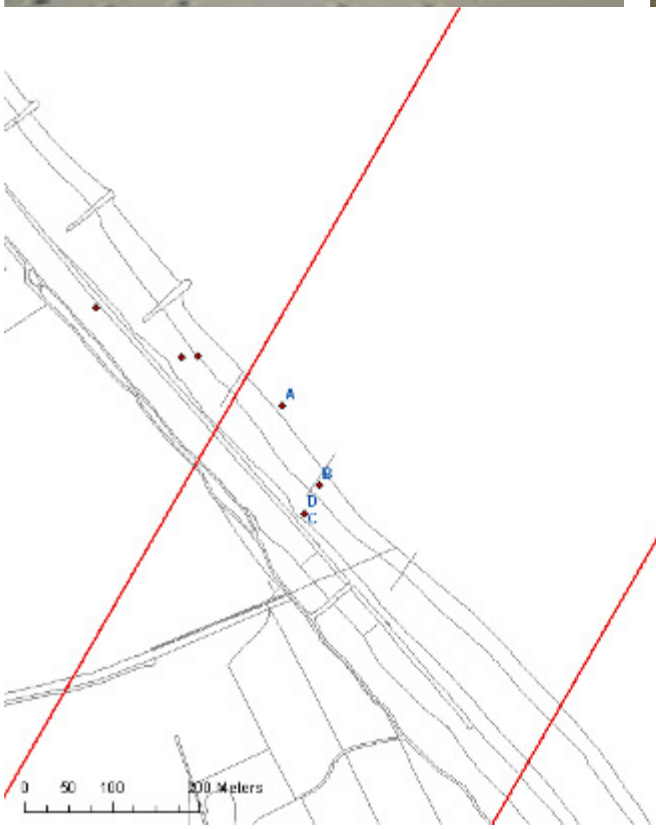
A

B

C



D



Source: OS Maps

Table 4.67: SCAPE Section 4

Asset Location			
SCAPE Section No:	4	**Location:**	Eccles to Winterton Beach Road
		Survey Date:	31-10-12
SMP Unit:	3b13		
SMP Policy:	From Present Day	Medium Term	Long Term
	Hold the line – Maintain whilst studies are on going to consider long term managed realignment	Hold the line – Maintain whilst studies are on going to consider long term managed realignment	Hold the line – Maintain, view to setback managed realignment once hold the line is no longer sustainable
Coastal Defence Condition			
Defence Type:	Concrete seawall structure (SW) and timber groyne field (GF)		
Defence Length (m):	500	**Ownership:**	Environment Agency
Foreshore Type:	Sand beach	**Assets Protected:**	Agricultural land, public open space
Exposure:	High	**Year Built:**	Unknown
Condition grade	SW – Good GF - Good	**Threshold grade:**	N/A
Residual life min (expected years)	SW – 30 GF - 10	**Residual life max (potential years)**	SW – 50 GF - 15
Description of the defences and the foreshore – East to West			

Defences comprised a concrete wave return seawall with stepped concrete apron at its toe. The apron was fronted by steel sheet piles to prevent undermining of the structure.

An additional overtopping wall and sloped concrete revetment was fitted above the crest of the main wall.

Minimal damage was evident on the structure.

The groyne field was constructed with timber groynes experiencing some wear throughout the structure.

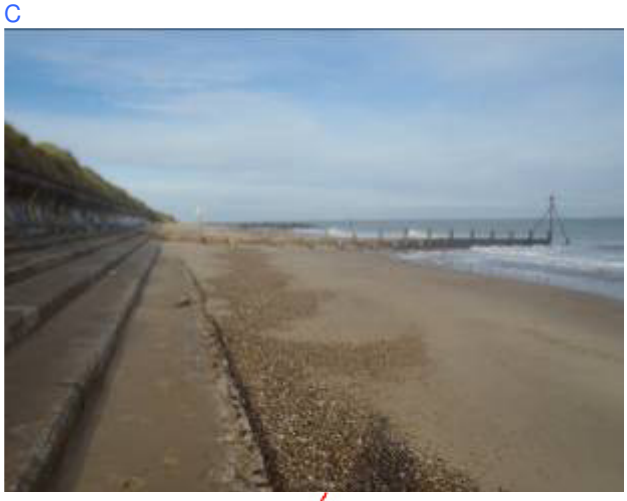
The beach condition was variable but high levels of sand were present throughout.

Section no. 4
Eccles to Winterton Beach Road

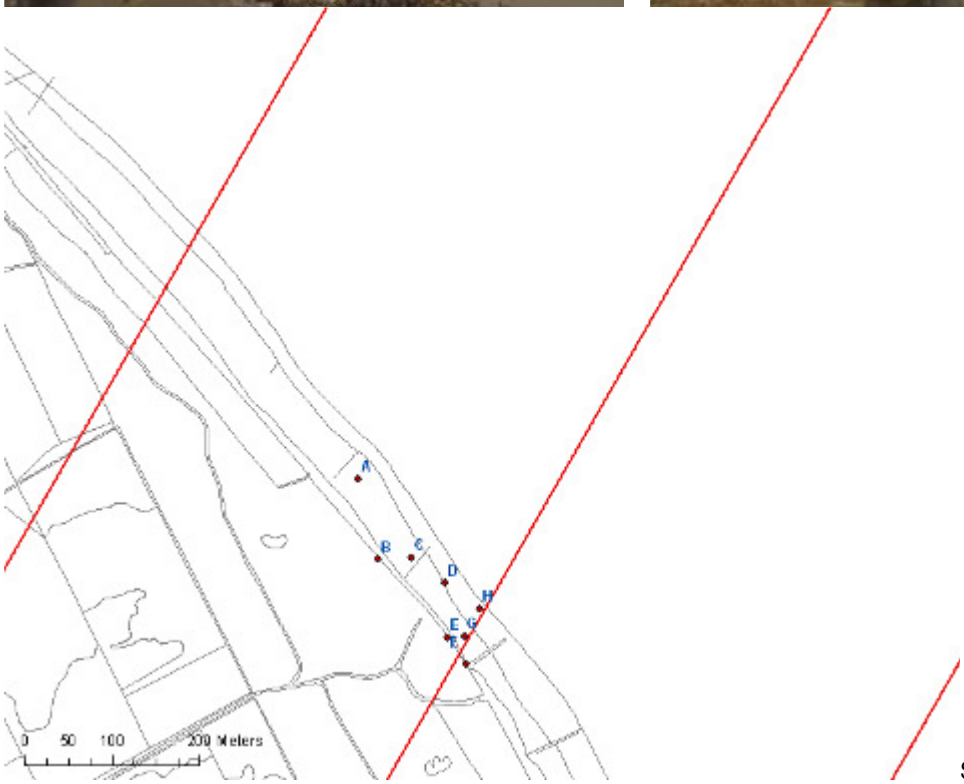
A

B

C



D



Source: OS Maps

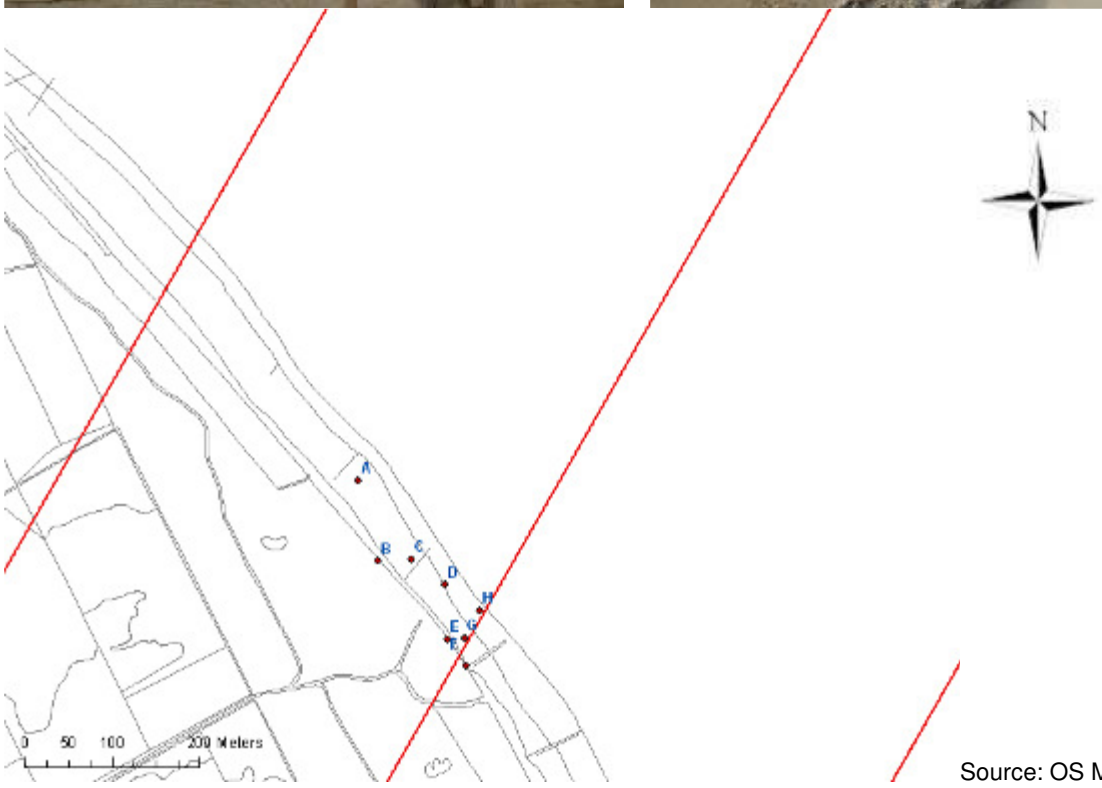
Section no. 4
Eccles to Winterton Beach Road

E

F

G

H



Source: OS Maps

Table 4.68: SCAPE Section 3

Asset Location			
SCAPE Section No:	3	**Location:**	Eccles to Winterton Beach Road
		Survey Date:	31-10-12
SMP Unit:	3b13		
SMP Policy:	From Present Day	Medium Term	Long Term
	Hold the line – Maintain whilst studies are on going to consider long term managed realignment	Hold the line – Maintain whilst studies are on going to consider long term managed realignment	Hold the line – Maintain, view to setback managed realignment once hold the line is no longer sustainable
Coastal Defence Condition			
Defence Type:	Concrete seawall structure (SW) and timber groyne field (GF)		
Defence Length (m):	500	**Ownership:**	Environment Agency
Foreshore Type:	Sand beach, some shingle	**Assets Protected:**	Agricultural land, public open space
Exposure:	High	**Year Built:**	Unknown
Condition grade	SW - Very good GF – Fair	**Threshold grade:**	N/A
Residual life min (expected years)	Seawall – 30 GF - 5	**Residual life max (potential years)**	SW – 50 GF - 10
Description of the defences and the foreshore – East to West			

Defences comprise a concrete wave return seawall with stepped concrete apron at its toe. The apron is fronted by steel sheet piles to prevent undermining of the structure.

An additional overtopping wall and sloped concrete revetment is fitted above the crest of the main wall.

Minimal damage is evident on the structure. An access point through the seawall comprising concrete revetments / wing walls is also present within this section. Some cracking was evident here at the rear of the wave return wall.

The groyne field was constructed with timber groynes experiencing some damage throughout the structure.

The beach condition was variable with some shingle present towards the eastern end.

Section no. 3

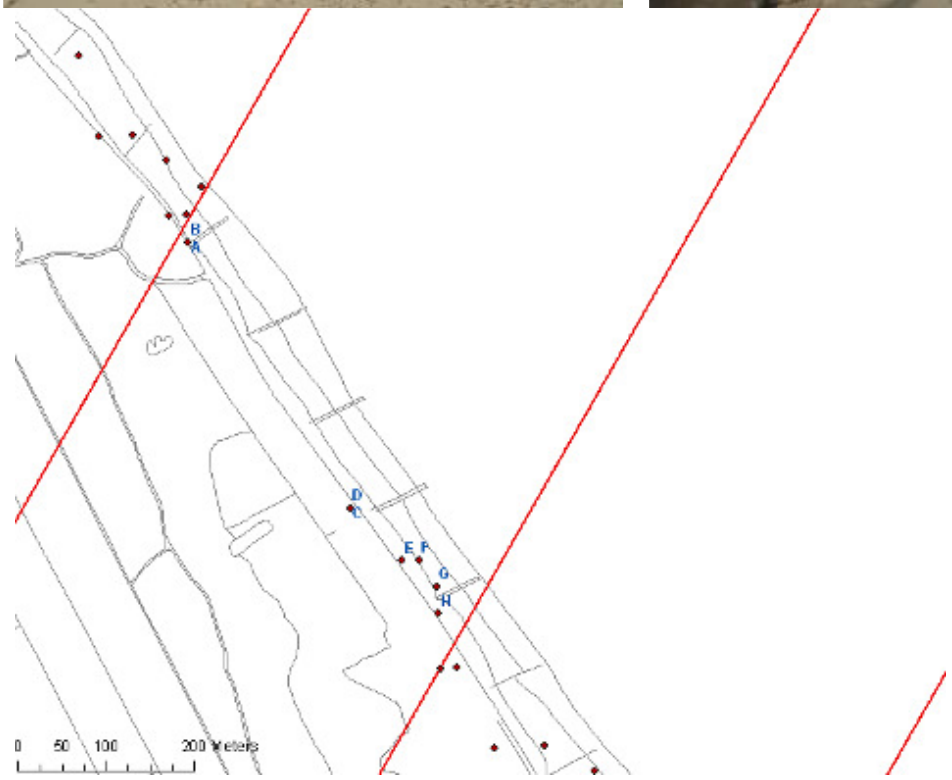
Eccles to Winterton Beach Road

A

B

C

D

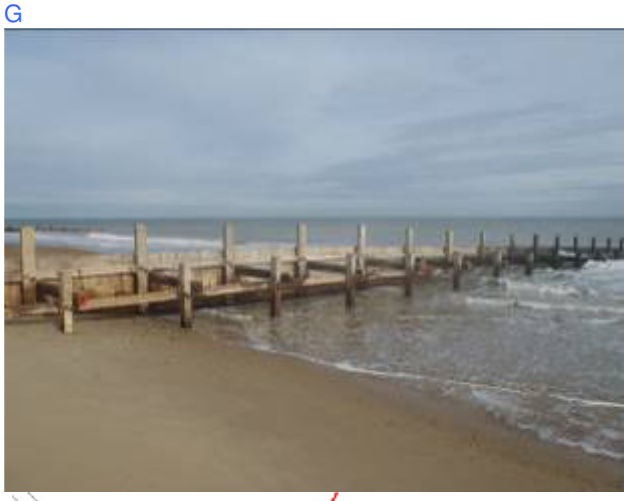


Source: OS Maps

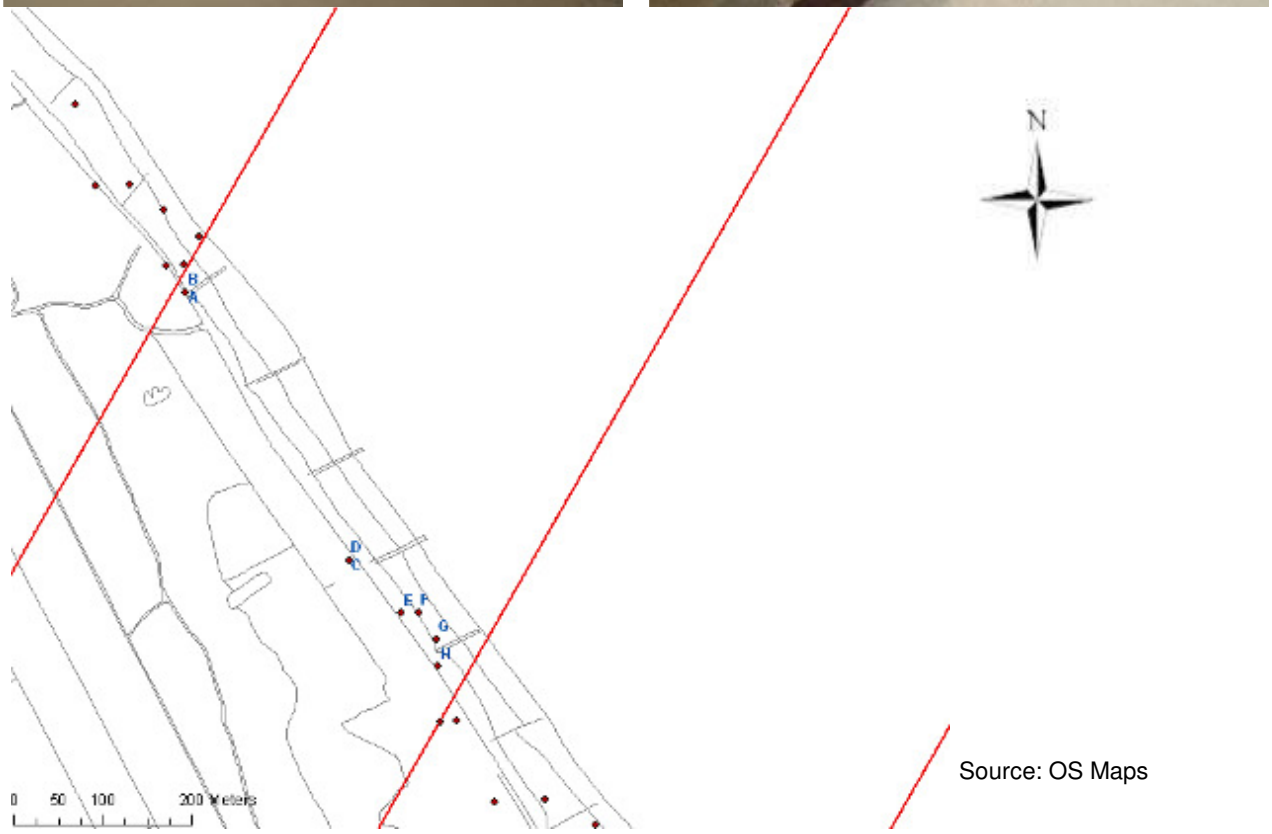
E

F

G



H



Source: OS Maps

Table 4.69: SCAPE Section 2

Asset Location			
SCAPE Section No:	2	**Location:**	Eccles to Winterton Beach Road
		Survey Date:	31-10-12
SMP Unit:	3b13		
SMP Policy:	From Present Day	Medium Term	Long Term
	Hold the line – Maintain whilst studies are on going to consider long term managed realignment	Hold the line – Maintain whilst studies are on going to consider long term managed realignment	Hold the line – Maintain, view to setback managed realignment once hold the line is no longer sustainable
Coastal Defence Condition			
Defence Type:	Natural sand dunes		
Defence Length (m):	500	**Ownership:**	Environment Agency
Foreshore Type:	Sand beach	**Assets Protected:**	Agricultural land, public open space
Exposure:	High	**Year Built:**	Unknown
Condition grade	Good	**Threshold grade:**	N/A
Residual life min (expected years)	N/A	**Residual life max (potential years)**	N/A
Description of the defences and the foreshore – East to West			

The natural sand dunes are situated at the rear of the sand foreshore which narrows towards the western end of the section by almost half. The dunes continue to decrease in height towards the west of the section.

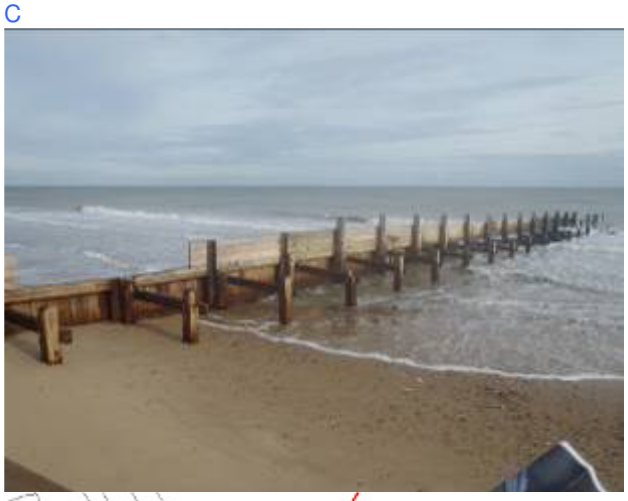
There are some manmade repairs within the dunes comprising concrete support structures to prevent breach points occurring.

Section no. 2
Eccles to Winterton Beach Road

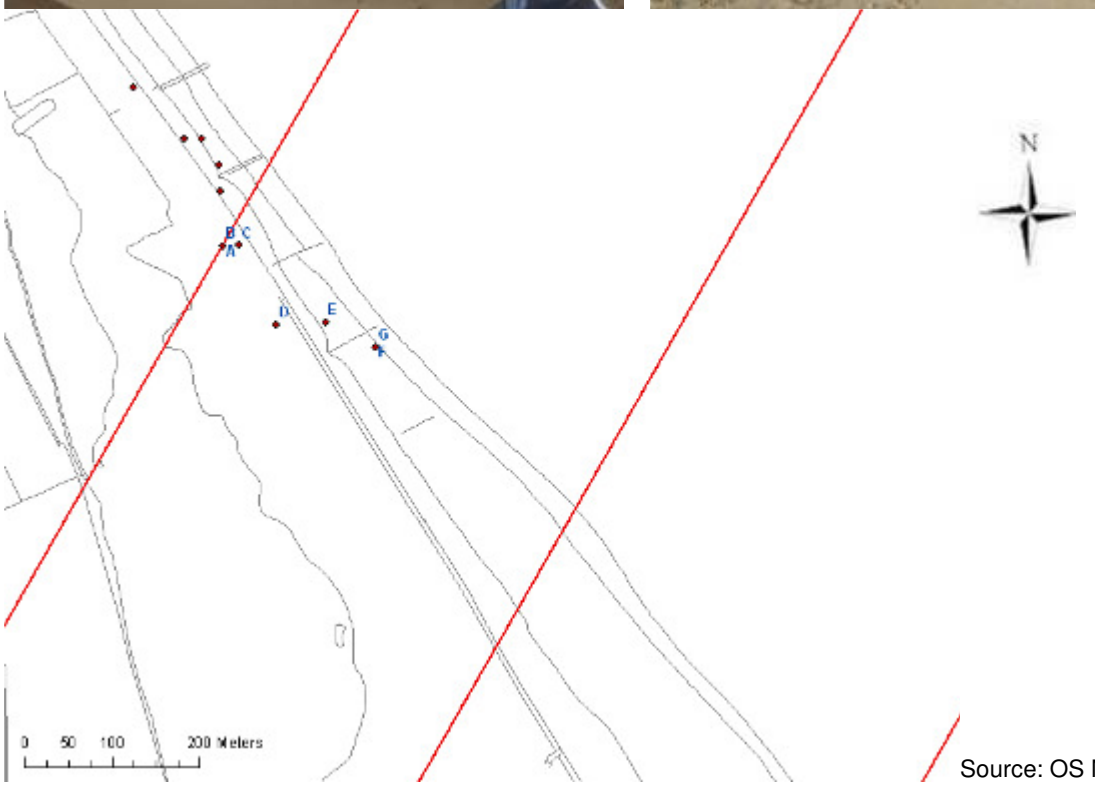
A

B

C



D

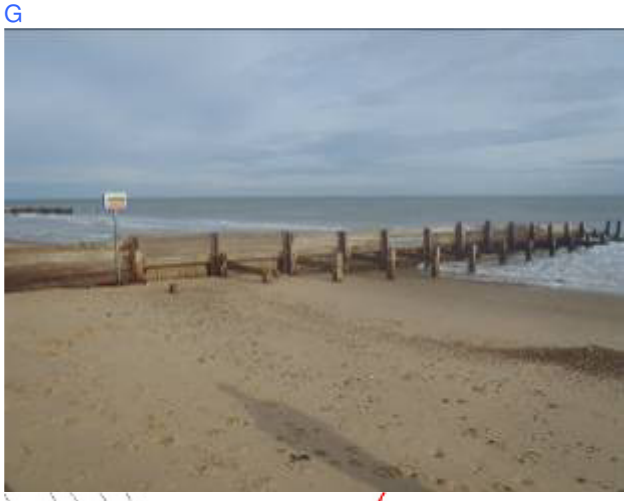


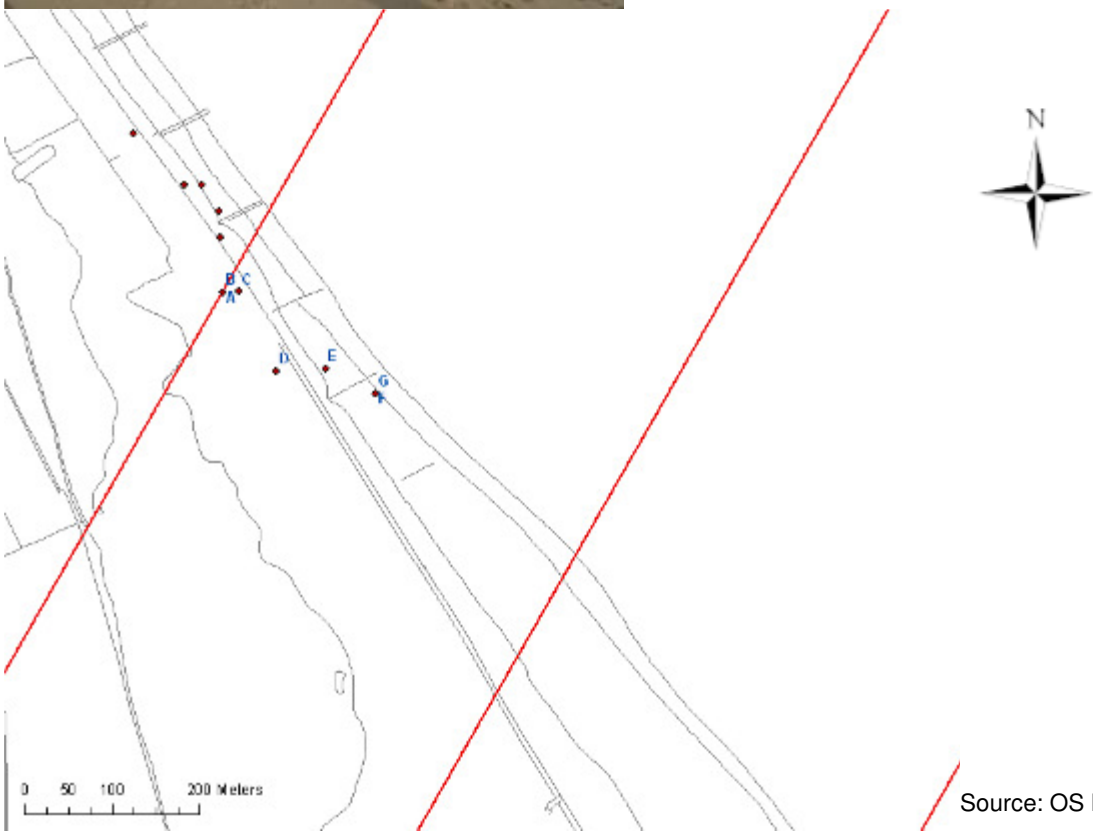
Source: OS Maps

E

F

G





Source: OS Maps

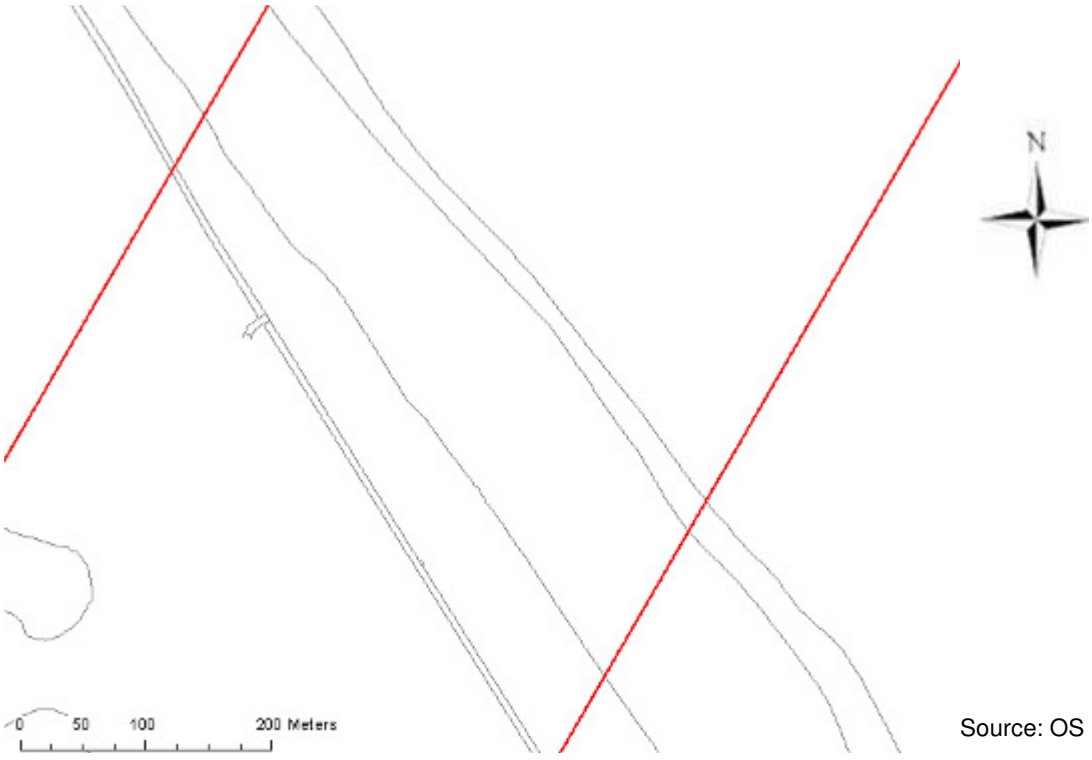
Table 4.70: SCAPE Section 1

Asset Location			
SCAPE Section No:	1	**Location:**	Eccles to Winterton Beach Road
		Survey Date:	31-10-12
SMP Unit:	3b13		
SMP Policy:	From Present Day	Medium Term	Long Term
	Hold the line – Maintain whilst studies are on going to consider long term managed realignment	Hold the line – Maintain whilst studies are on going to consider long term managed realignment	Hold the line – Maintain, view to setback managed realignment once hold the line is no longer sustainable
Coastal Defence Condition			
Defence Type:	Natural sand dunes		
Defence Length (m):	500	**Ownership:**	Environment Agency
Foreshore Type:	Sand beach	**Assets Protected:**	Agricultural land, public open space
Exposure:	Medium	**Year Built:**	Unknown
Condition grade	Very Good	**Threshold grade:**	N/A
Residual life min (expected years)	N/A	**Residual life max (potential years)**	N/A
Description of the defences and the foreshore – East to West			

The natural sand dunes are situated at the rear of a wide sand foreshore. The dunes begin to decrease in height towards the west of the section.

There are some manmade repairs within the dunes comprising concrete support structures to prevent breach points occurring, most likely caused by public access over the dunes.

Section no. 1
Eccles to Winterton Beach Road



Source: OS Maps

5. Summary of Residual Life

The following table highlights those defence conditions that have altered since the previous condition survey in 2003. Red cells indicate that the condition has deteriorated, amber that the condition remains unchanged and green is an assessed improvement from that previously recorded.

The variations in the condition rating of the structures can be down to a number of things from individual judgement, recent storm damage (or in this case storms occurring over the last 9 years), impact through debris in the tidal environment to even recent improvement works and maintenance.

The table also outlines the residual life anticipated for the structures, the columns in grey are those previously estimated in the 2003 survey whilst those in yellow have been determined from the recent condition assessment update.

SCAPE Section	Location	2003 Identified Defence	Length (m)	2003 Condition Rating	2012 Condition Rating	Estimated Year of Failure 2003 (min)	Estimated Year of Failure 2012 (yrs) (min)	Estimated Year of Failure 2003 (max)	Estimated Year of Failure 2012 (yrs) (max)
68	Cromer to Overstrand	Timber Breastwork	377	Poor	Fair	2006	2017 (5)	2008	2022 (10)
68-65		Timber Groynes	60 (long)	Good	Good	2013	2020 (8)	2023	2027 (15)
64	Overstrand	Timber Revetment	441	Poor	Fair / Poor	2006	2017 (5)	2008	2022 (10)
64		Block Revetment	30	Poor	Poor	2006	2014 (2)	2008	2017 (5)
		Concrete Seawall, Apron, Steel Piled Toe.	51	Very Good		2023	2042 (30)	-	2052 (40)
			64	Very Poor		2003		2006	
			278	Very Poor		2003		2006	
63			64	Good	Fair	2013	2022 (10)	2023	2027 (25)
			38	Poor		2006		2008	
			33	Fair		2008		2013	
			71	Good		2013		2023	
63		Timber Revetment (TR) and Rock Armour (RA)	232	TR – Poor RA – Very Good	Good Very Good	2006 2023	2022 (10) 2037 (25)	2008 -	2032 (20) 2067 (55)
62		Timber Revetment	178	Poor	Poor	2006	2013 (1)	2008	2015 (3)
64 62		Timber Groynes	90-75 (long) 15m (long)	Good Poor	Good	2013 2006	2022 (10)	2023 2008	2027 (15)
62 61	Sidestrand	Timber Revetment	747	Poor	Poor	2006	2015 (3)	2008	2017 (5)
62 61		Timber Groynes	75 (long)	Good	Good	2013	2022 (10)	2023	2027 (15)
57 54 53	Trimingham	Timber Revetment (TR) Concrete Wall (CW)	1006	TR – Very Poor CW - Fair	Fair	2003 2008	2017 (5)	2006 2013	2027 (15)
56 55		Timber Revetment	539	Very Poor	Very Poor	2003	-	2006	-
55		NEW Rock Revetment			Fair	-	2017 (5)	-	2027 (15)
57-54 53		Timber Groynes	70 (long)	Fair	Fair	2008	2017 (5)	2013	2022 (10)

SCAPE Section	Location	2003 Identified Defence	Length (m)	2003 Condition Rating	2012 Condition Rating	Estimated Year of Failure 2003 (min)	Estimated Year of Failure 2012 (yrs) (min)	Estimated Year of Failure 2003 (max)	Estimated Year of Failure 2012 (yrs) (max)
52	Trimingham to Mundesley	Timber Revetment	1019	Fair	Good	2008	2027 (15)	2013	2037 (25)
51			587.4	Good	Good	2013	2027 (15)	2023	2037 (25)
52 51		Timber Groynes	72 (long)	Good	Good / Fair	2013	2020(8,)	2023	2027 (15)
50	Mundesley	Timber Revetment	620	Fair	Good	2008	2027 (15)	2013	2037 (25)
49		Concrete Block Revetment	446	Fair	Poor	2008	2014(2)	2013	2017 (5)
48 47		Concrete Seawall, Apron, Steel Piled Toe	69	Poor	Good	2006		2008	
			38	Very Good		2023		-	
		Concrete Seawall	117	Very Good		2023	2027 (15)	-	2037 (25)
			48	Poor		2006		2008	
			41	Fair		2008		2013	
			20	Poor		2006		2008	
			20	Good		2013		2023	
			17	Good		2013		2023	
			93	Very Good		2023		-	
47		Timber Revetment (TR)	164	TR – Fair	Good	2008	2027 (15)	2013	2032 (20)
		Reinforced Concrete Boat Park on Steel Piles (BP)		BP - Good		2013		2023	
50-47		Timber Groynes	67 (long)	Good	Good / Fair	2013	2020 (8)	2023	2027 (15)
46-44, 43	Mundesley to Bacton	Timber Revetment	1441	Fair	Good	2008	2027 (15)	2013	2032 (20)
46-44, 43		Timber Groynes	90 (long)	Good	Good / Fair	2013	2020 (8)	2023	2027 (15)

SCAPE Section	Location	2003 Identified Defence	Length (m)	2003 Condition Rating	2012 Condition Rating	Estimated Year of Failure 2003 (min)	Estimated Year of Failure 2012 (yrs) (min)	Estimated Year of Failure 2003 (max)	Estimated Year of Failure 2012 (yrs) (max)
42 35	Bacton, Walcott and Ostend	Timber Revetment	1204	Fair	Fair	2008	2017 (5)	2013	2027 (15)
		Timber Revetment (TR), Steel & Concrete Breastwork (SB), Timber Breastwork (TB)	233	TR – Good SB – Very Good TB - Poor		2013 2023 2006		2023 - 2008	
41- 39 38 37- 36		Concrete Revetment and Wavewall (RW), Apron (A), Steel Piled Toe (SP)	1783	RW – Fair A – Fair SP - Good	Fair	2008 2008 2013	2022 (10)	2013 2013 2023	2037 (25)
			783	RW – Fair A – Fair SP - Good		2008 2008 2013		2013 2013 2023	
			565	RW – Fair A – Fair SP - Good		2008 2008 2013		2013 2013 2023	
35		Timber Revetment	529	Good		2013		2023	
42 41- 38 37- 35		Timber & SSP Groynes	155 – 23 (long)	Good	Good / Fair	2013	2020 (8)	2023	(15)