

Hayling Island Defence Condition Assessment

Hayling Island Funding and Implementation Strategy

Havant Borough Council

Project number: 60593354

May 2019

Quality information

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Revision	Revision date	Details	Authorized	Name	Position
01	8 April 2019	Draft for comment		Tara-Leigh McVey	Regional Director
02	10 May 2019	Final incorporating comments		Jon Short	Associate
03	20 May 2019	Update following further comments		Jon Short	Associate

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1. Introduction

1.1 Project Background

AECOM was commissioned by the Eastern Solent Coastal Partnership (ESCP) on behalf of Havant Borough Council (HBC) to deliver the Hayling Island Funding and Implementation Strategy (HIFIS) as Part 1 of a Flood and Coastal Erosion Risk Management (FCERM) Strategy for Hayling Island. As part of the HIFIS, AECOM has undertaken a defence condition assessment.

This report provides a summary of asset condition based on visual surveys carried out by the project engineers and provides key information to underpin future management decisions.

1.2 Purpose of this document

This document details the findings of the defence condition assessment surveys undertaken by AECOM for the Hayling Island frontage. The defence condition assessment was carried out for the purpose of informing the strategic decisions within a future FCERM Strategy. The assessment was based upon a visual inspection of defences and is of sufficient detail to inform the future FCERM Strategy development with regards to future investment. No intrusive surveys or material testing was carried out as part of the assessment. The interpretation of information within this report is representative of strategic defence lengths. It should not be used to make an assessment of individual defence sections without further investigation of potential material, structural, and geotechnical defects which may be present.

The condition assessment defines the types and condition of the different defences along the 35km coastal frontage of Hayling Island. The assessment forms an important part of the baseline information required to develop the Option Development Units (ODUs); this effectively represents a present day 'snapshot' of the current coastal defences along the frontage. The findings of the defence condition assessment can also be used to identify potential areas for priority works in the shorter term.

2. Defence Condition Methodology

2.1 Walk-over Surveys

A visual inspection of the defences was carried out in order to determine their condition, effectiveness and estimated residual life. For the accessible areas of the frontage, walkover surveys were carried out between the 6th February and 12th February 2019.

The majority of the surveys were conducted from the land and advantage was taken of publicly accessible piers, jetties, access to the foreshore at low tide and high ground to assess the whole defence frontage. Despite this, in some locations access was not possible, mostly where land is privately owned and no prior agreement was in place, and where access is restricted. Where possible, these sections of defence were considered and assessed from an adjacent viewing position. These sections were also supplemented by high resolution oblique aerial photographs (Getmapping, 2008-2009; Earthstar Geographics, 2015).

The surveys were undertaken by Bernadine Maguire, Jordan Brown and Ben Taylor, and were timed to coincide where possible, with low tide. The survey was undertaken using a hand-held iPad, with data inputted via the ArcGIS Collector app. This data was subsequently transferred onto the pro-forma sheets found in this report.

Where possible, based on tidal conditions and health and safety concerns, the toe of the structures were assessed as well as the crest. In areas continually submerged, even at low tide, the defence condition was based on the area above the waterline.

The condition of the defences was assessed in line with the Environment Agency (2006) Condition Assessment Manual (Doc Ref 166_03_SD01). The manual provides a condition grading scheme and description to aid a robust and consistent approach to evaluating the condition and residual life of coastal defences.

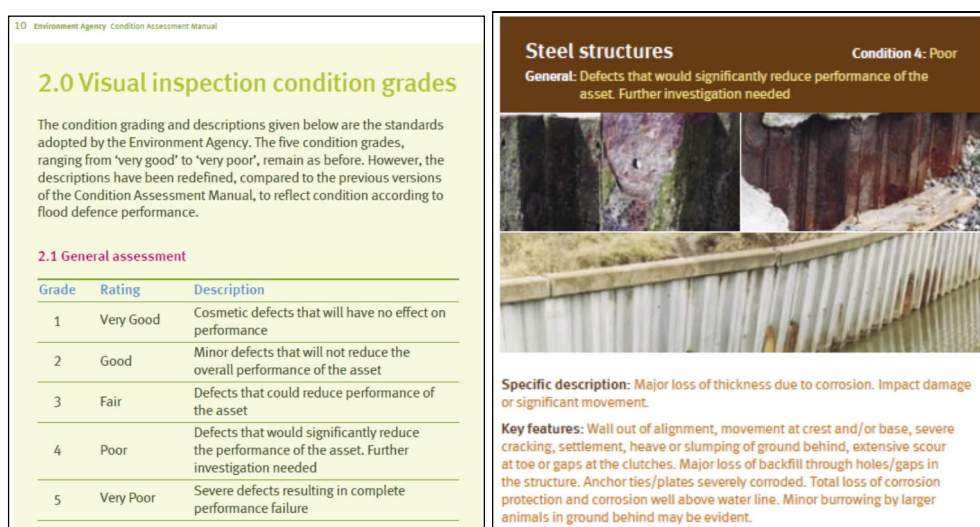


Figure 2-1. Extracts from Environment Agency (2006) Condition Assessment Manual

2.2 Condition Rankings

The condition of the defences was assessed in line with the Environment Agency (2006) Condition Assessment Manual. To facilitate the defence condition assessment the main grading categories, definitions and indicative features and characteristics of each category were summarised onto a single sheet, as given in Table 2-1. It is important to note that the estimate of defence residual life put forward in this report considers no future maintenance. This is a conservative assessment on the basis that typically only limited resources are available to repair and maintain defences, and the standard of protection of a repaired defence cannot be verified with certainty.

No assessment has been undertaken for areas without formal defences. These features have not been graded or given a residual life. Where undefended areas are low lying and are at risk of flooding, these have been highlighted, however flood and erosion risk in these areas should be assessed in more detail during the strategy development phase using methods such as numerical modelling.

Table 2-1. Summary of Condition Assessment grading and features (adapted from Environment Agency Condition Assessment Manual, 2006)

Grade	Definition	Possible features/characteristics	Typical residual life (without maintenance)
Very Good	Cosmetic defects that will have no effect on performance	<ul style="list-style-type: none"> • new or recently maintained defence • structurally sound • no rotation or bulging • no deterioration to fixings / abrasion • no wash-out or movement or downsliding • stable structure - no movement of stones • vegetation to help bind (where beneficial) • hairline cracks • joints fully sealed 	>20 years
Good	Minor defects that will not reduce overall performance of the asset.	<ul style="list-style-type: none"> • minor cosmetic defects not hindering performance • fixings present • superficial rusting • slight gaps in joints • minor abrasion • minor toe scour / erosion • no animal burrowing or foreign objects present • minor sliding • minor sealant loss 	15 – 20 years
Fair	Defects that could reduce performance of the asset.	<ul style="list-style-type: none"> • some defects and degradation cracking, spalling, rusting etc. • significant gaps in joints • signs of rotting • minor misalignment / rotation or bulging • minor settlement • minor foreign objects • small animals burrowing • minor reduction to thickness of structure • sealant loss 	10 – 15 years
Poor	Defects that would significantly reduce performance of the asset. Further investigation needed.	<ul style="list-style-type: none"> • structural defects • significant cracking and deterioration / rusting • significant undermining/toe scour • missing fixings • rotation or lateral movement inwards • animal burrows • foreign objects • drainage failed • ground saturated behind 	<10 years
Very Poor	Sever defects resulting in complete performance failure.	<ul style="list-style-type: none"> • significant / severe damage and deterioration • severe cracking / deterioration • loss or partial loss of structure • severe erosion / undermining • severe settlement of crest / behind • severe abrasion • complete or partial collapse • severe backfill washout 	Failed

2.3 Defence Sections

For the purposes of the defence condition assessment the 35km frontage was divided up into sections based on the North Solent Shoreline Management Plan (SMP2) (2010) policy units. For consistency, the policy unit naming convention applied in the SMP2 was also applied in the defence condition assessment. A map of the policy units is shown in Figure 2-2. The frontage is comprised of highly varied defence types of varying condition, therefore these policy units (which are typically of the order of a few hundred metres long) were further subdivided. Sub divisions were based on positions of notable change in defence type, defence condition or defence alignment.

During the survey the position of the defence sections and areas of concern were recorded using the ArcGIS Collector application. Data was downloaded from the device into ESRI shapefiles.

A proforma was completed for each defence section to ensure a standard approach to defence assessment. The assessment includes the following details:

- A general description of each defence element;
- Location details including frontage length;
- Identification of the construction materials/type;
- General description of the foreshore;
- An overall rating of the current defence condition (*Very Good/Good/Fair/Poor/Very Poor*);
- Estimation of the Residual Life, based on a without maintenance scenario;
- The asset owner and maintainer where known; and
- Identification of areas of significant damage, repairs, corrosion, or other aspects that could affect the performance and the residual life of the structure.

A photo of each defence section was taken using a digital camera with views typically looking along the defence line, from seaward (where possible) with specific photos of areas of concern when required. The images provide a record of the current defence condition and will allow the rate of deterioration of the defence to be appraised more accurately in subsequent studies.

The following section of this report includes an overview of the current defence condition followed by the detailed proforma sheets for each section. For the defended frontages, a visual appraisal has been undertaken to identify areas at risk of breach from the extreme water levels, to allow the critical sections in need of further study to be identified.



Figure 2-2. Map of the policy units around the island

3. Defence Condition Summary

A map showing the various defence types around the island is shown in Figure 3-1. The following defence summary tables (Table 3-2 to Table 3-9) provide an 'overview' indication of the defence type, condition grading, along with an estimate of residual life for the different defence sections. It is important to note that the residual life considers that no future maintenance will be undertaken by the defence owner.

Where private, informal or 'ad-hoc' defences are present, or where the frontage is deemed to be undefended with 'no formal defences' (NFD), no condition assessment or estimates of residual life have been made.

The defence summary tables also present the asset owner and maintainer information based on the abbreviations in Table 3-1. The asset owner and maintainer information has been derived from GIS data and maps provided by ESCP in 2018.

Table 3-1. Table of abbreviations applied in the defence condition sheets

Abbreviation	Maintainer/Owner
HA	Highways Agency
EA	Environment Agency
EH	English Heritage
HCC	Hampshire County Council
HBC	Havant Borough Council
SWS	Southern Water Services
P	Private

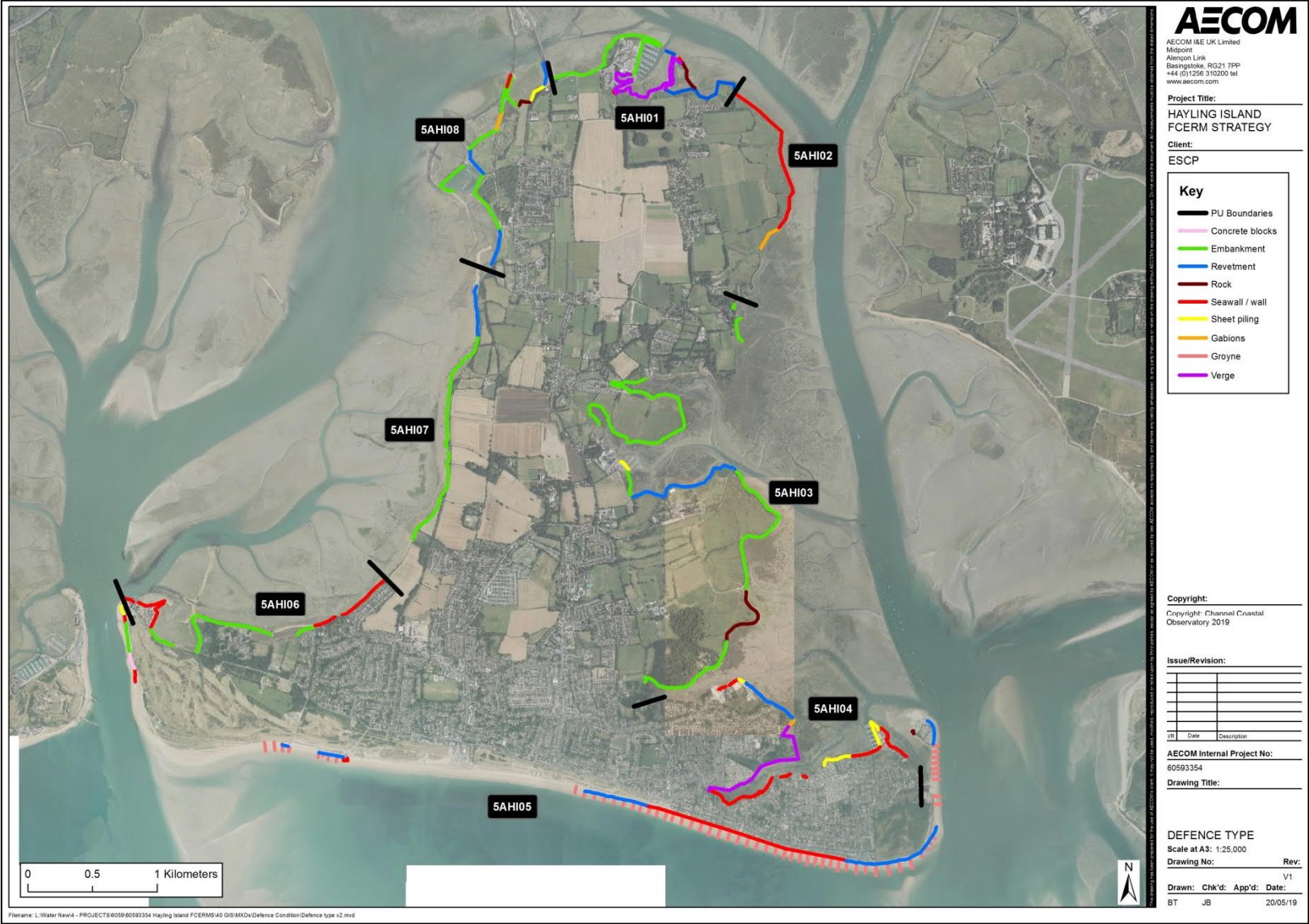


Figure 3-1. Defence types around Hayling Island

Table 3-2. Summary table of Defence Condition (without maintenance) - Policy Unit 5AHI01

Frontage ID	Centre X	Centre Y	Summary of Defence Type	Section Length (m)	Defence Grade	Residual Life (Years)	Owner	Maintainer
5AHI01_A	472312.9	104130.3	Earth Embankment	400	Fair	10-15	HA	HA
5AHI01_B	472871.8	104404.9	Earth Embankment/ Rock	1100	Good	15-20	P	P
5AHI01_C	472649.6	104071.0	Earth Embankment	465	Fair	10-15	P	P
5AHI01_D	472606.5	103988.8	Concrete Wall	30	Poor	<10	HBC	HBC
5AHI01_E	472865.0	103957.8	Earth Embankment	750	Fair	10-15	HBC	HBC
5AHI01_F	473042.8	104294.5	Rock Armour	68	Good	15-20	P	P
5AHI01_G	473118.2	104243.3	Concrete Wall	20	Poor	<10	HBC	HBC
5AHI01_H	473169.4	104095.2	Rock Armour	230	Fair	10-15	HBC	HBC
5AHI01_I	473056.3	104115.4	Earth Embankment	350	Fair	10-15	HBC	HBC
5AHI01_J	473238.1	104000.9	Armorloc revetment	445	Good	15-20	HBC	HBC/EA
5AHI01_K	473471.0	104058.9	Rubble Revetment	275	Poor	<10	HBC	EA

Table 3-3. Summary table of Defence Condition (without maintenance) - Policy Unit 5AHI02

Frontage ID	Centre X	Centre Y	Summary of Defence Type	Section Length (m)	Defence Grade	Residual Life (Years)	Owner	Maintainer
5AHI02_A	473772.0	103803.1	Concrete Wall	575	Very Poor (localised fail)	<5 - Failed	P	P
5AHI02_B	473926.4	103395.8	Blockwork Wall	300	Poor	<10	P	P
5AHI02_C	473962.6	103123.1	Concrete Bagwork	265	Poor /Very Poor	<10 - Failed	P	P
5AHI02_D	473910.0	102978.5	Blockwork Wall	85	Poor /Very Poor	<10 - Failed	P	P
5AHI02_E	473798.3	102879.9	Gabions	220	Poor	<10	P	P

Table 3-4. Summary table of Defence Condition (without maintenance) - Policy Unit 5AHI03

Frontage ID	Centre X	Centre Y	Summary of Defence Type	Section Length (m)	Defence Grade	Residual Life (Years)	Owner	Maintainer
5AHI03_A	473528.6	102320.2	Earth Embankment/ Rock Armour	45	Good	15-20	P	P
5AHI03_B	473554.7	102145.1	Earth Embankment	210	Fair	10-15	P	P
5AHI03_C	473139.2	101376.8	Earth Embankment	2210	Fair	10-15	P	EA
5AHI03_D	472692.3	101099.8	Sheet Piling	88	Fair	10-15	P	P
5AHI03_E	472731.5	100956.1	Earth Embankment	215	Good	15-20	P	P
5AHI03_F	472867.4	100888.1	Armorloc Revetment	265	Good	10-15	P	EA
5AHI03_G	473254.1	100937.8	Armorloc Revetment	680	Fair	10-15	P	EA
5AHI03_H	473810.8	100591.6	Rubble/Earth Embankment	1265	Poor	<10	P	P
5AHI03_I	473633.1	99862.4	Rock Revetment	600	Good	15-20	P	P
5AHI03_J	473463.2	99666.4	Earth Embankment	120	Poor	<10	P	P
5AHI03_K	473225.4	99423.4	Earth Embankment	775	N/A	N/A	P	P

Table 3-5. Summary table of Defence Condition (without maintenance) - Policy Unit 5AHI04

Frontage ID	Centre X	Centre Y	Summary of Defence Type	Section Length (m)	Defence Grade	Residual Life (Years)	Owner	Maintainer
5AHI04_A	473440.0	99367.7	Concrete Wall	60	Poor	<10	P	EA
5AHI04_B	473529.0	99414.2	Concrete Wall, sloped	85	Fair	10-15	P	EA
5AHI04_C	473589.1	99429.7	Sheet Piling	50	Fair	10-15	P	EA
5AHI04_D	473703.4	99346.5	Concrete Revetment	220	Fair	10-15	P	EA
5AHI04_E	473902.8	99208.9	Rock Revetment	235	Very Good	>20	P	EA
5AHI04_F	473978.4	99092.7	Gabion Baskets	60	Good	15-20	P	EA
5AHI04_G	473837.0	98796.4	Natural earth verge	1,140	Poor	<10	P/HBC	P/HBC/EA
5AHI04_H	473608.5	98529.1	Concrete Retaining Wall	655	N/A	N/A	P	P
5AHI04_I	473939.6	98689.9	Concrete Retaining Structures (varied)	80	N/A	N/A	P	P
5AHI04_J	474334.7	98819.6	Rock Armour Revetment	30	Good	15-20	P	EA
5AHI04_K	474522.6	98852.6	Concrete Wall	330	Fair	10-15	P	EA
5AHI04_L	474654.2	98951.3	Sheet Piling	295	Fair	10-15	P	P
5AHI04_M	474725.9	99001.7	Concrete Blockwork	185	Fair	10-15	P	P
5AHI04_N	474803.4	98893.2	Concrete Retaining Wall	175	Good	15-20	P	P

Table 3-6. Summary table of Defence Condition (without maintenance) - Policy Unit 5AHI05

Frontage ID	Centre X	Centre Y	Summary of Defence Type	Section Length (m)	Defence Grade	Residual Life (Years)	Owner	Maintainer
5AHI05_A	474920.8	99024.2	Rock Revetment	20	Good	15-20	P	P
5AHI05_B	NA	NA	Undefended	170	NA	NA	NA	NA
5AHI05_C	475084.6	98981.5	Rock Revetment	200	Good	15-20	P	P
5AHI05_D	NA	NA	Undefended	635	NA	NA	NA	NA
5AHI05_E	475076.1	98239.5	Rock Revetment	N/A	Fair	10-15	HBC	HBC
5AHI05_F	475007.3	98142.1	Rock Revetment	107	Good	15-20	HBC	HBC
5AHI05_G	474686.4	98021.8	Rock Revetment	600	Good	15-20	HBC	HBC
5AHI05_H	473602.6	98247.4	Seawall (buried)	1,570	Unknown	Unknown	HBC	HBC
5AHI05_I	472821.5	98477.3	Timber Revetment	120	Good	15-20	HBC	HBC
5AHI05_J	472583.7	98528.9	Timber Revetment	400	Very Good	20+	HBC	HBC
5AHI05_K	NA	NA	Undefended	1,850	NA	NA	NA	NA
5AHI05_L	470526.8	98806.7	Concrete Seawall	70	Fair	10-15	P	P
5AHI05_M	470415.0	98849.7	Timber Revetment	200	Poor	<10	HBC	HBC
5AHI05_N	NA	NA	Undefended	230	NA	NA	NA	NA
5AHI05_O	470065.5	98921.4	Rock Revetment	45	Poor	<10	HBC	HBC
5AHI05_P	NA	NA	Undefended	1,485	NA	NA	NA	NA
5AHI05_Q	468896.7	99468.5	Concrete Wall	100	Good	15-20	P	P
5AHI05_R	468876.6	99545.9	Concrete Blockwork	70	Fair	10-15	P	P
5AHI05_S	468860.4	99605.8	Blockwork	20	Very Poor	Failed	P	P
5AHI05_T	468836.6	99752.1	Vegetated Embankment	240	Fair	10-15	P	P
5AHI05_U	468816.5	99898.2	Concrete Buttress Wall	65	Good	15-20	P	P
5AHI05_V	468790.7	99975.6	Sheet Piling	65	Good	15-20	P	P
5AHI05_G1-9	NA	NA	Timber Groynes	N/A	3-Good, 2-Fair, 4-N/A	Varied	P	P
5AHI05_G10	NA	NA	Rock Groyne	20	Good	15-20	HBC	HBC

Frontage ID	Centre X	Centre Y	Summary of Defence Type	Section Length (m)	Defence Grade	Residual Life (Years)	Owner	Maintainer
5AHI05_G11	NA	NA	Rock Groyne	20	Fair	10-15	HBC	HBC
5AHI05_G12	NA	NA	Rock Groyne	15-20	Good	15-20	HBC	HBC
5AHI05_G13	NA	NA	Rock Groyne	20	Very Good	20+	HBC	HBC
5AHI05_G14	NA	NA	Rock Groyne	20	Good	15-20	HBC	HBC
5AHI05_G15	NA	NA	Rock Groyne	30	Very Good	20+	HBC	HBC
5AHI05_G16	NA	NA	Rock Groyne	20	Very Good	20+	HBC	HBC
5AHI05_G17	NA	NA	Rock Groyne	20	Good	15-20	HBC	HBC
5AHI05_G18-51	NA	NA	Timber Groynes	Varied	25- Very Good, 6- Good, 2- Fair, 1- Very Poor	Varied	HBC	HBC
5AHI05_G52-55	NA	NA	Timber Groynes	N/A	3- Fair, 1- poor	10-15 <10	HBC	HBC
5AHI05_G56-59	NA	NA	Timber Groynes	N/A	3- Poor 1- Fair	<10 10-15	HBC	HBC

Table 3-7. Summary table of Defence Condition (without maintenance) - Policy Unit 5AHI06

Frontage ID	Centre X	Centre Y	Summary of Defence Type	Section Length (m)	Defence Grade	Residual Life (Years)	Owner	Maintainer
5AHI06_A	468843.2	100058.0	Concrete Quay Wall	125	Good	15-20	P	P
5AHI06_B	469089.2	100010.9	Concrete Wall (varied)	470	Fair	10-15	P	P
5AHI06_C	469098.3	99730.6	Earth Embankment/Verge	220	Good	15-20	P	P
5AHI06_D	469503.4	99887.9	Earth Embankment	940	Good	15-20	P	P
5AHI06_E	470212.4	99819.2	Earth Embankment	145	Good	15-20	P	P
5AHI06_F	470369.8	99878.9	Ad-hoc blockwork	170	Good	15-20	P	P
5AHI06_G	470670.1	100061.6	Ad-hoc blockwork	450	Fair	10-15	P	P

Table 3-8. Summary table of Defence Condition (without maintenance) - Policy Unit 5AHI07

Frontage ID	Centre X	Centre Y	Summary of Defence Type	Section Length (m)	Defence Grade	Residual Life (Years)	Owner	Maintainer
5AHI07_A	NA	NA	Undefended	373	NA	NA	NA	NA
5AHI07_B	471059.4	100561.1	Armorloc Revetment	95	Good	15-20	P	EA
5AHI07_C	471214.3	100733.9	Earth Embankment	385	Poor	<10	P	P
5AHI07_D	471322.3	101052.0	Timber Piles	285	Very Poor (localised fail)	<5 - Failed	HCC	HCC
5AHI07_E	471336.0	101684.4	Earth Embankment	935	Poor	<10	HCC	HCC
5AHI07_F	471540.3	102287.4	Earth embankment, Timber piled toe	400	Very Poor	Failed	HCC	HCC

Table 3-9. Summary table of Defence Condition (without maintenance) - Policy Unit 5AHI08

Frontage ID	Centre X	Centre Y	Summary of Defence Type	Section Length (m)	Defence Grade	Residual Life (Years)	Owner	Maintainer
5AHI08_A	471710.2	102791.3	Armorloc Revetment	275	Fair	10-15	HCC	EA
5AHI08_B	471614.8	103120.6	Earth Embankment	520	Fair	10-15	HBC	HBC
5AHI08_C	471301.4	103298.3	Earth Embankment/Rock Revetment	360	Fair	10-15	HBC	HBC
5AHI08_D	471513.7	103447.1	Rubble Revetment	235	Poor	<10	HBC	HBC
5AHI08_E	471584.5	103639.1	Earth Embankment	270	Fair	10-15	HBC	HBC
5AHI08_F	471713.0	103764.8	Gabion Mesh	145	Poor	<10	HCC	HCC
5AHI08_G	471747.7	103948.2	Rubble revetment	205	Poor	<10	HCC	HCC
5AHI08_H	471791.0	104072.4	Concrete Seawall	92	Poor	<10	HCC	HCC
5AHI08_I	471776.6	103964.1	Earth Embankment	265	Fair	10-15	HCC	HCC
5AHI08_J	471897.9	103916.4	Rock Revetment	100	Fair	10-15	HCC	HCC
5AHI08_K	472006.2	104000.6	Sheet Piling	165	Good	15-20	HCC	HCC
5AHI08_L	472079.9	104131.6	Blockwork Revetment	190	Fair	10-15	HCC	HCC

4. Defence Condition Assessment Sheets

The following tables contain the detailed defence condition assessment findings and photographs for the frontage as summarised in Table 3-2 to Table 3-9.

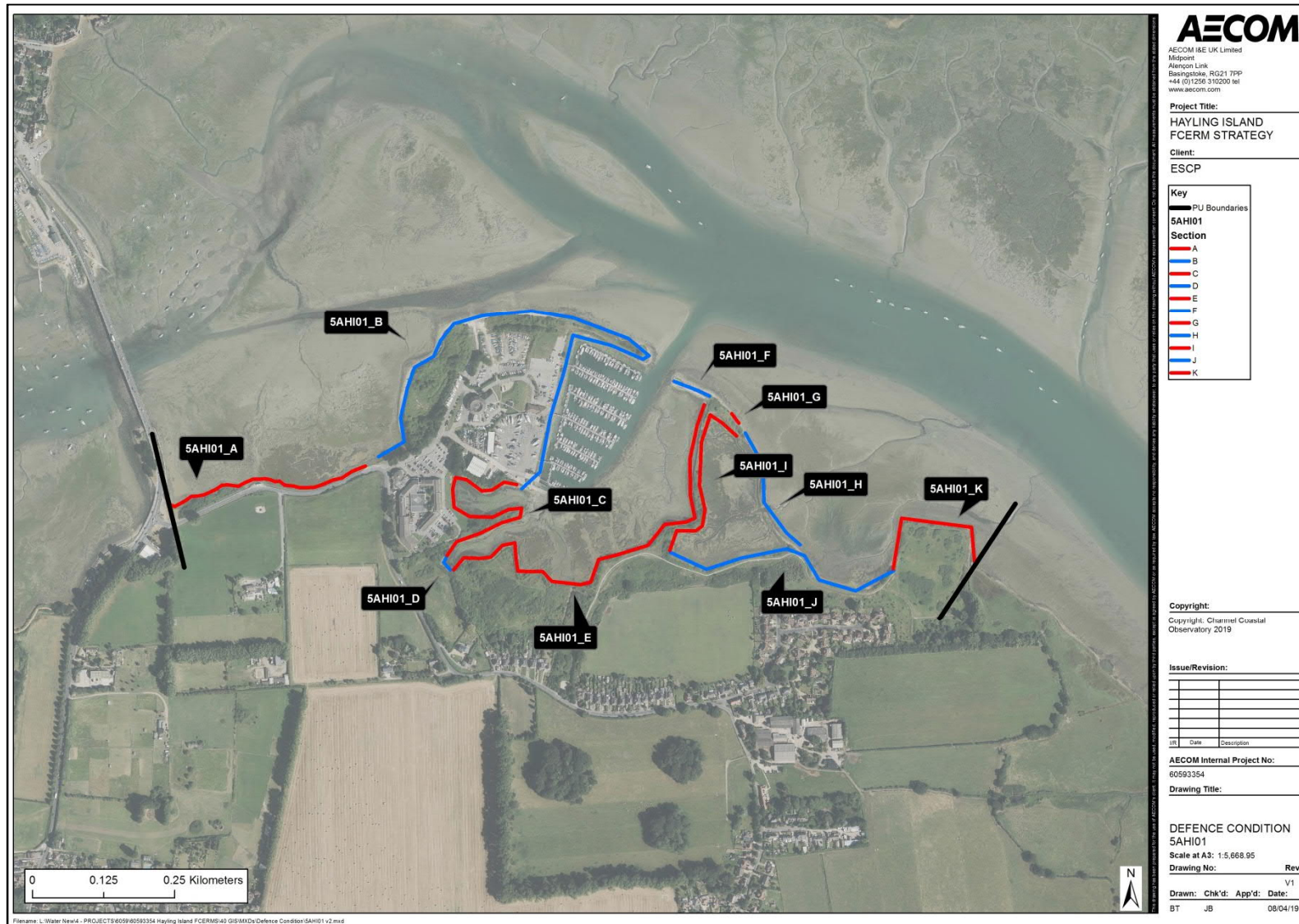










Figure 4-1. Defence Sections along Policy Unit 5AH101



Defence Element:	5AHI01 (Length: 400m)	Defence Section:	A
Location:	Northney Road	Year of Construction:	Unknown
Defence Description:			
Natural, vegetated embankment (shallow height). Runs parallel to the highway immediately behind.			
Construction Material:	Earth embankment		
Foreshore Description:			
Salt marsh & gravel to the toe of the structure. Foreshore level at the toe is very shallow.			
Defence Condition and Grade:	Fair	Residual Life (no maintenance):	10-15 years
Fair condition. Well vegetated, non-uniform structure with a low crest height. Low lying embankment with depressions across its length.			
Owner (HBC/P/HA/HCC/EA/SWS/EH):	HA	Maintainer (HBC/P/HA/HCC/EA/SWS/EH):	HA
Comments:			
Regular breaching occurs along this frontage, flooding the highway directly behind.			







Defence Element:	5AHI01 (Length: 1100m)	Defence Section:	B	
Location:	Northney Marina	Year of Construction:	Unknown	
Defence Description:				
Earth embankment (Rock armour to the toe at the entrance of Northney marina). Northern facing side with shallower slope.				
Construction Material:	Earth & Rock Armour (in places)			
Foreshore Description:				
Mixture of fine and coarse gravel.				
Defence Condition and Grade:	Good	Residual Life (no maintenance):	15-20 years	
Generally good condition. Well vegetated structure with good crest width (5m). Minimal displacement of rock armour toe, good embedment.				
Owner (HBC/P/HA/HCC/EA/SWS/EH):	P	Maintainer (HBC/P/HA/HCC/EA/SWS/EH):	P	
Comments:				



Defence Element:	5AHI01 (Length: 465m)	Defence Section:	C	
Location:	Langstone Quays Resort	Year of Construction:	Unknown	
Defence Description:				
Natural verge, heavily vegetated. 2-3 drainage outfalls along the length.				
Construction Material:	Earth (Natural)			
Foreshore Description:				
Mud flats to the toe of the structure.				
Defence Condition and Grade:	Fair	Residual Life (no maintenance):	10-15 years	
Naturalised bank. Evidence of erosion in some localised places along the frontage.				
Owner (HBC/P/HA/HCC/EA/SWS/EH):	P	Maintainer (HBC/P/HA/HCC/EA/SWS/EH):	P	
Comments:				


Defence Element:	5AHI01 (Length: 30m)	Defence Section:	D	
Location:	East of Langstone Quay Hotel	Year of Construction:	Unknown	
Defence Description:				
Concrete wall, various methods of construction.				
Construction Material:	Concrete			
Foreshore Description:				
Mud flats to the toe of the structure.				
Defence Condition and Grade:	Poor	Residual Life (no maintenance):	<10 years	
Voids. Crumbling over in places although still upright. Concrete missing with cracks. Toe erosion and undermining evident.				
Owner (HBC/P/HA/HCC/EA/SWS/EH):	HBC	Maintainer (HBC/P/HA/HCC/EA/SWS/EH):	HBC	
Comments:				





Defence Element:	5AHI01 (Length: 750m)	Defence Section:	E	
Location:	East of Northney Marina	Year of Construction:	Unknown	
Defence Description:				
Natural verge/embankment.				
Construction Material:	Earth			
Foreshore Description:				
Mud flats to the toe of structure.				
Defence Condition and Grade:	Fair	Residual Life (no maintenance):	10-15 years	
Vegetated embankment, non-uniform structure shape.				
Owner (HBC/P/HA/HCC/EA/SWS/EH):	HBC	Maintainer (HBC/P/HA/HCC/EA/SWS/EH):	HBC	
Comments:				






Defence Element:	5AHI01 (Length: 68m)	Defence Section:	F	
Location:	East of Northney Marina	Year of Construction:	Unknown	
Defence Description:				
Rock revetment on the eastern side of the entrance to marina.				
Construction Material:	Rock			
Foreshore Description:				
Coarse shingle at the toe of the structure.				
Defence Condition and Grade:	Good	Residual Life (no maintenance):	15-20 years	
Small voids but no major evidence of voiding. Uniform structure shape, no sign of settlement.				
Owner (HBC/P/HA/HCC/EA/SWS/EH):	P	Maintainer (HBC/P/HA/HCC/EA/SWS/EH):	P	
Comments:				

Defence Element:	5AHI01 (Length: 20m)	Defence Section:	G	
Location:	West of Northney Farm	Year of Construction:	Unknown	
Defence Description:				
Concrete wall, 1m-2m high.				
Construction Material:	Concrete			
Foreshore Description:				
Coarse shingle and beach material.				
Defence Condition and Grade:	Poor	Residual Life (no maintenance):	<10 years	
Large cracks within the structure. Evidence of the toe being undermined. Spalling of the concrete face.				
Owner (HBC/P/HA/HCC/EA/SWS/EH):	HBC	Maintainer (HBC/P/HA/HCC/EA/SWS/EH):	HBC	
Comments:				

Defence Element:	5AHI01 (Length: 230m)	Defence Section:	H	
Location:	West of Northney Farm	Year of Construction:	Unknown	
Defence Description:				
Rock armour, mixed with rubble.				
Construction Material:	Rock			
Foreshore Description:				
Shingle material to the toe of the structure. Mud in places.				
Defence Condition and Grade:	Fair	Residual Life (no maintenance):	10-15 years	
Majority of the rock armour has a particularly steep profile, some voids in places. Toe exposed.				
Owner (HBC/P/HA/HCC/EA/SWS/EH):	HBC	Maintainer (HBC/P/HA/HCC/EA/SWS/EH):	HBC	
Comments:				

Defence Element:	5AHI01 (Length: 350m)	Defence Section:	I	
Location:	West of Northney Farm	Year of Construction:	Unknown	
Defence Description:				
Natural verge/embankment structure.				
Construction Material:	Earth			
Foreshore Description:				
Saltmarsh and mudflats.				
Defence Condition and Grade:	Fair	Residual Life (no maintenance):	10-15 years	
Embankment is heavily vegetated.				
Owner (HBC/P/HA/HCC/EA/SWS/EH):	HBC	Maintainer (EA/LA/MOD/P):	HBC	
Comments:				

Defence Element:	5AHI01 (Length: 445m)	Defence Section:	J	
Location:	West of Northney Farm	Year of Construction:	Unknown	
Defence Description:				
Armorloc revetment structure.				
Construction Material:	Armorloc			
Foreshore Description:				
Mud to the toe of the structure.				
Defence Condition and Grade:	Good	Residual Life (no maintenance):	15-20 Years	
No sign of voids. Good shape, uniform structure. Toe well buried with lots of vegetation across the structure.				
Owner (HBC/P/HA/HCC/EA/SWS/EH):	HBC	Maintainer (EA/LA/MOD/P):	HBC/EA	
Comments:				

Defence Element:	5AHI01 (Length: 275m)	Defence Section:	K	
Location:	East of Northney Marina	Year of Construction:	Unknown	
Defence Description:				
Rubble wall / revetment.				
Construction Material:	Rubble			
Foreshore Description:				
Shingle to the toe of structure.				
Defence Condition and Grade:	Poor	Residual Life (no maintenance):	<10 years	
Toe undermined in various places, voids also present in the revetment. Loose rubble on foreshore. Contaminated land behind which is actively eroding in places.				
Owner (HBC/P/HA/HCC/EA/SWS/EH):	HBC	Maintainer (HBC/P/HA/HCC/EA/SWS/EH):	EA	
Comments:				
Contaminated land behind the structure which is actively eroding.				

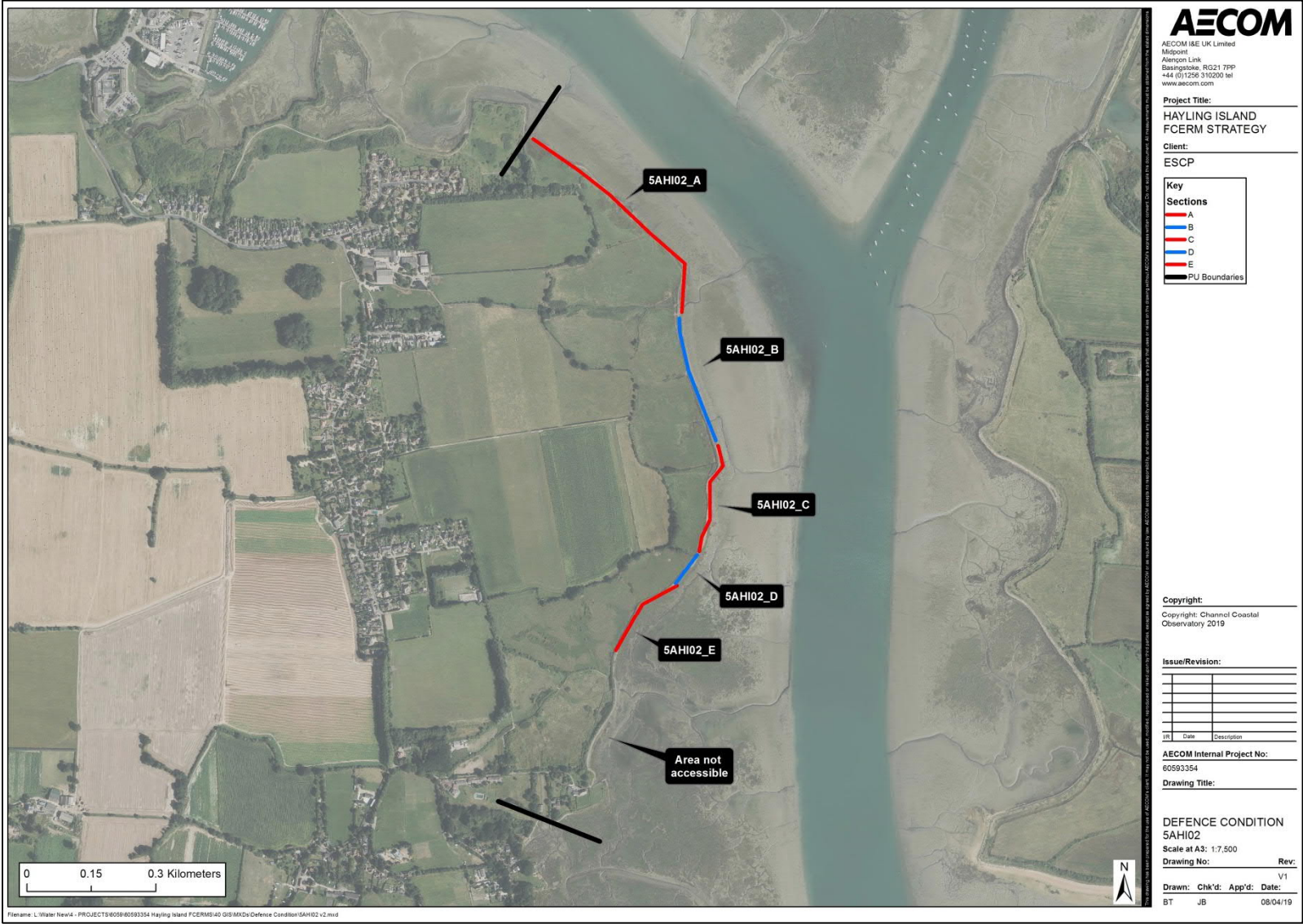







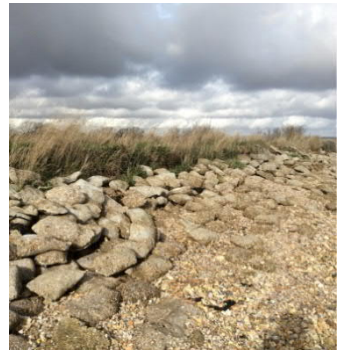






Figure 4-2. Defence Sections along Policy Unit 5AHI02

Defence Element:	5AHI02 (Length: 575m)	Defence Section:	A	
Location:	Northney Farm	Year of Construction:	Unknown	
Defence Description:				
Concrete wall of varying design.				
Construction Material:	Concrete			
Foreshore Description:				
Mud at the foreshore. Build-up of seaweed and material from tidal waters.				
Defence Condition and Grade:	Very poor	Residual Life (no maintenance):	Failed Otherwise < 5year	
Defence failed in places, exposing embankment behind to erosion. Crest level not uniform and areas with bad undermining.				
Owner (HBC/P/HA/HCC/EA/SWS/EH):	P	Maintainer (HBC/P/HA/HCC/EA/SWS/EH):	P	
Comments:				

Defence Element:	5AHI02 (Length: 300m)	Defence Section:	B	
Location:	Northney Farm	Year of Construction:	Unknown	
Defence Description:				
Blockwork wall (3-4 blocks high), with a piled toe structure.				
Construction Material:	Blockwork			
Foreshore Description:				
Mud at the foreshore. Build-up of seaweed and material from tidal waters.				
Defence Condition and Grade:	Poor	Residual Life (no maintenance):	<10yrs	
Blockwork generally in poor condition. Piling is corroded. Crest level non uniform with localised settling evident. A number of voids which require re pointing. Areas with bad undermining.				
Owner (HBC/P/HA/HCC/EA/SWS/EH):	P	Maintainer (HBC/P/HA/HCC/EA/SWS/EH):	P	
Comments:				
Wall was breached last year (2018) and repairs undertaken by infilling with clay material.				

Defence Element:	5AHI02 (Length: 265m)	Defence Section:	C	
Location:	Northney Farm	Year of Construction:	Unknown	
Defence Description:				
Concrete bags with concrete blockwork/ shallow slabs to the front of the bag work.				
Construction Material:	Concrete			
Foreshore Description:				
Shingle and coarse beach material to the toe of the structure.				
Defence Condition and Grade:	Poor/Very Poor	Residual Life (no maintenance):	<10 years, failed in places	
Large cracks, profile of the structure is slumping forward. Concrete bags have no uniform structure with lots of voids. Failed in places, close to breaching in numerous locations.				
Owner (HBC/P/HA/HCC/EA/SWS/EH):	P	Maintainer (HBC/P/HA/HCC/EA/SWS/EH):	P	
Comments:				

Defence Element:	5AHI02 (Length: 85m)	Defence Section:	D	
Location:	Northney Farm	Year of Construction:	Unknown	
Defence Description:				
Blockwork Wall				
Construction Material:	Blockwork			
Foreshore Description:				
Saltmarsh along the majority of it's length.				
Defence Condition and Grade:	Poor/Very Poor	Residual Life (no maintenance):	<10 years, failed in places	
Structure has failed in places along the length, exposing embankment behind to erosion. Various types of failures.				
Owner (HBC/P/HA/HCC/EA/SWS/EH):	P	Maintainer (HBC/P/HA/HCC/EA/SWS/EH):	P	
Comments:				

Defence Element:	5AHI02 (Length: 220m)	Defence Section:	E	
Location:	Northney Farm	Year of Construction:	Unknown	
Defence Description:				
Rubble filled gabion baskets, with intermediate sheet piling to the toe.				
Construction Material:	Wire			
Foreshore Description:				
Saltmarsh and gravel to the toe. Rubble blockwork to the toe of the structure.				
Defence Condition and Grade:	Poor	Residual Life (no maintenance):	< 10 years	
Poor condition. Loss of shape and structure to the gabions. Intermediate sheet piles are attempting to maintain the toe alignment of the gabions.				
Owner (HBC/P/HA/HCC/EA/SWS/EH):	P	Maintainer (HBC/P/HA/HCC/EA/SWS/EH):	P	
Comments:				

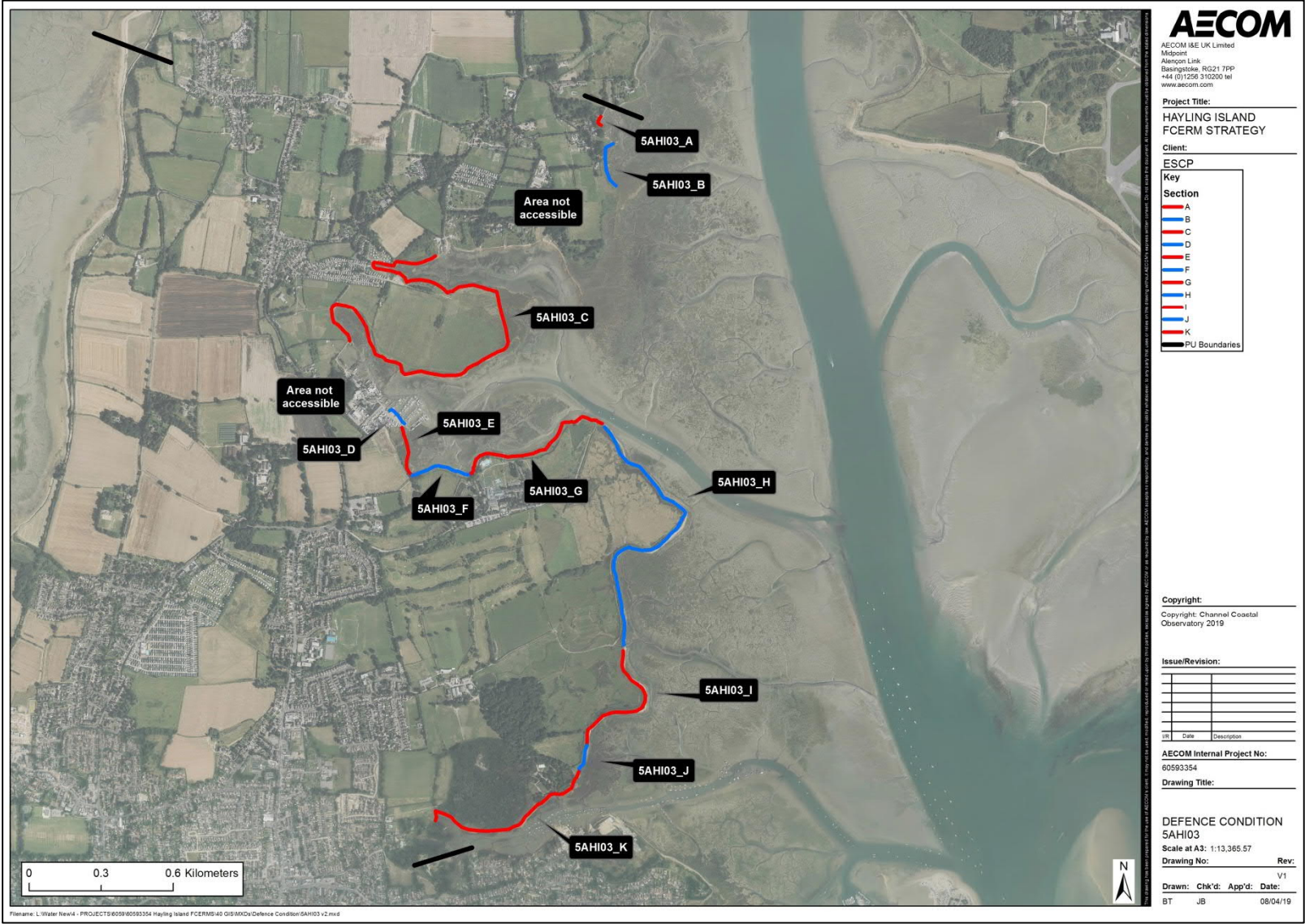



















Figure 4-3. Defence Sections along Policy Unit 5AHI03






Defence Element:	5AHI03 (Length: 45m)	Defence Section:	A	
Location:	Gutner Lane	Year of Construction:	1980/1990	
Defence Description:				
Embankment constructed by residents in 1980's. Section of rock armour constructed by Environment Agency in 1990's.				
Construction Material:	Rock			
Foreshore Description:				
Saltmarsh to the toe.				
Defence Condition and Grade:	Good	Residual Life (no maintenance):	15-20 years	
Good condition throughout. Rock armour has maintained uniform shape and profile. No obvious signs of slippage, voids or undercutting of toe. Embankment of a uniform height.				
Owner (HBC/P/HA/HCC/EA/SWS/EH):	P	Maintainer (HBC/P/HA/HCC/EA/SWS/EH):	P	
Comments:				
Outfall has a flap valve which residents report does not function properly due to the build-up of material at the invert preventing it from closing. Water ingress occurs which fills up the ditch during high tide conditions.				



Defence Element:	5AHI03 (Length: 210m)	Defence Section:	B	
Location:	Gutner Lane	Year of Construction:	Unknown	
Defence Description:				
Earth embankment.				
Construction Material:	Earth			
Foreshore Description:				
Extensive area of saltmarsh.				
Defence Condition and Grade:	Fair	Residual Life (no maintenance):	10-15 years	
Structure heavily vegetated, uniform profile and height.				
Owner (HBC/P/HA/HCC/EA/SWS/EH):	P	Maintainer (HBC/P/HA/HCC/EA/SWS/EH):	P	
Comments:				






Defence Element:	5AHI03 (Length: 2210m)	Defence Section:	C	
Location:	Fleet Farm Caravan Park	Year of Construction:	n/a	
Defence Description:				
Natural earth embankment. Well vegetated, non-uniform structure.				
Construction Material:	Earth			
Foreshore Description:				
Mud flats with light scrub to the toe for the northern extents. Possible salt marsh close to the toe in some areas. Gravelly sand at the toe for the southern extents, some seaweed at the toe.				
Defence Condition and Grade:	Fair	Residual Life (no maintenance):	10-15 years	
Fair- Good condition. Some surface slips. Heavily vegetated along full length.				
Owner (HBC/P/HA/HCC/EA/SWS/EH):	P	Maintainer (HBC/P/HA/HCC/EA/SWS/EH):	EA	
Comments:				
A number of outfalls along its length.				



Defence Element:	5AHI03 (Length: 88m)	Defence Section:	D	
Location:	Hayling Yacht Company (HYC)	Year of Construction:	Unknown	
Defence Description:				
Steel sheet piling, clad with timber panels to the front face. Pontoon attached to piles at regular intervals.				
Construction Material:	Sheet Pile			
Foreshore Description:				
Pontoon and mooring to front of piles. Mud flats visible at low tide.				
Defence Condition and Grade:	Fair	Residual Life (no maintenance):	10-15 years	
Fair – poor condition. Minor lateral movement and few gaps at clutches. Localised corrosion of the steel piles where visible, estimated to be significant.				
Owner (HBC/P/HA/HCC/EA/SWS/EH):	P	Maintainer (HBC/P/HA/HCC/EA/SWS/EH):	P	
Comments:				

Defence Element:	5AHI03 (Length: 215m)	Defence Section:	E	
Location:	Embankment South of HYC	Year of Construction:	c. 1990	
Defence Description:				
Embankment, assumed to be natural. Scrub and rubble to the toe. Tracked footpath on top.				
Construction Material:	Earth			
Foreshore Description:				
Mud flats- low tide. Scrub and rubble to the toe of the structure				
Defence Condition and Grade:	Good	Residual Life (no maintenance):	15-20 years	
Good condition- well vegetated embankment.				
Owner (HBC/P/HA/HCC/EA/SWS/EH):	P	Maintainer (HBC/P/HA/HCC/EA/SWS/EH):	P	
Comments:				
375mm diameter outfall at photo location.				

Defence Element:	5AHI03 (Length: 265m)	Defence Section:	F	
Location:	South of HYC	Year of Construction:	Unknown.	
Defence Description:				
Concrete/armorloc revetment with concrete cap running along the crest of the structure.				
Construction Material:	Concrete/armorloc			
Foreshore Description:				
Mud flats and scrub to toe of the structure. Sandy gravel in some locations.				
Defence Condition and Grade:	Good	Residual Life (no maintenance):	10-15 years	
Good- fair condition. Light grass growth across the structure. Little root penetration in most areas. Roots in two locations. Cosmetic damage to the concrete at the crest.				
Owner (HBC/P/HA/HCC/EA/SWS/EH):	P	Maintainer (HBC/P/HA/HCC/EA/SWS/EH):	EA	
Comments:				

Defence Element:	5AHI03 (Length: 680m)	Defence Section:	G	
Location:	North of Tournembury Golf Club.	Year of Construction:	Unknown. Some ancient areas, repairs ongoing.	
Defence Description:				
Steep Armorloc revetment with concrete beam at the crest. Rock armour protection to the exposed corner of the structure.				
Construction Material:	Armorloc			
Foreshore Description:				
Gravelly sand and shrub to the toe- at low tide. High water does not appear to reach much of the structure. Light rock armour protection at the toe of the structure on the exposed outcrop corner.				
Defence Condition and Grade:	Fair	Residual Life (no maintenance):	10-15 years	
Structure covered in grass vegetation. Roots in two or three locations. Minor damage and loss of material to some of the structure.				
Owner (HBC/P/HA/HCC/EA/SWS/EH):	P	Maintainer (HBC/P/HA/HCC/EA/SWS/EH):	EA	
Comments:				
Although not surveyed during visit, EA asset information indicates a setback defence is located perpendicular to the revetment, orientated south-west across the field behind.				

Defence Element:	5AHI03 (Length: 1265m)	Defence Section:	H	
Location:	Tournerbury Golf Club	Year of Construction:	Unknown. Some ancient/historic areas, repairs ongoing.	
Defence Description:				
Earth embankment. Rubble defence placed along the toe of the structure. Sandstone at the toe of the structure in the exposed outcrop.				
Construction Material:	Rubble			
Foreshore Description:				
Rubble at the upper toe. Sandy gravel along entire length at the middle. Salt marsh at one localised section on the foreshore				
Defence Condition and Grade:	Poor/Very Poor	Residual Life (no maintenance):	<10 years, failed in places	
Poor to very poor. Some sections are actively failing and eroding. Evidence of slips occurring in some areas. Owner has undertaken partial patch repairs with clay material over the past 6 months.				
Owner (HBC/P/HA/HCC/EA/SWS/EH):	P	Maintainer (EA/LA/MOD/P):	P	
Comments:				
Owner is regularly maintaining the structure as and when required (as best as possible).				

Defence Element:	5AHI03 (Length: 600m)	Defence Section:	I	
Location:	South of Tournurbury Golf Club	Year of Construction:	c. 1990	
Defence Description:				
Chalk Rock revetment.				
Construction Material:	Rock			
Foreshore Description:				
Gravel and sand to the middle. Smaller chalk rock armour to the toe of the structure.				
Defence Condition and Grade:	Good	Residual Life (no maintenance):	15-20 years	
Chalk rock revetment in good condition. Some weathered material in areas.				
Owner (HBC/P/HA/HCC/EA/SWS/EH):	P	Maintainer (HBC/P/HA/HCC/EA/SWS/EH):	P	
Comments:				

Defence Element:	5AHI03 (Length: 120m)	Defence Section:	J	No photos available
Location:	Tournerbury Woods Estate	Year of Construction:	Unknown.	
Defence Description:				
Earth embankment with rubble revetment.				
Construction Material:	Earth			
Foreshore Description:				
Sandy gravel at the toe of the structure.				
Defence Condition and Grade:	Poor	Residual Life (no maintenance):	< 5 years	
Vegetation growth on the structure. Very little shape or structure to the embankment.				
Owner (HBC/P/HA/HCC/EA/SWS/EH):	P	Maintainer (HBC/P/HA/HCC/EA/SWS/EH):	P	
Comments:				
No photographs taken as only observed from a moving vehicle with adjacent landowner.				







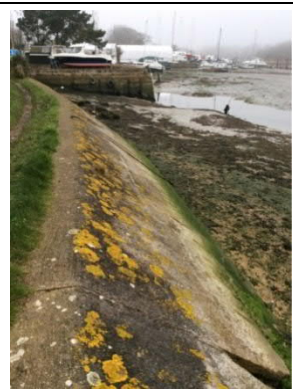






Defence Element:	5AHI03 (Length: 775m)	Defence Section:	K	
Location:	Tournerbury Woods Estate	Year of Construction:	Unknown.	
Defence Description:				
Earth embankment (predominantly natural).				
Construction Material:	Earth			
Foreshore Description:				
Gravel at the upper. Mud flats to the middle and lower.				
Defence Condition and Grade:	N/A	Residual Life (no maintenance):	N/A	
Eroding section of shoreline. No defence present, not graded.				
Owner (HBC/P/HA/HCC/EA/SWS/EH):	P	Maintainer (HBC/P/HA/HCC/EA/SWS/EH):	P	
Comments:				
No direct access granted. Photographs were taken from the opposite bank.				







Figure 4-4. Defence Sections along Policy Unit 5AHI04


Defence Element:	5AHI04 (Length: 60m)	Defence Section:	A	
Location:	Wilsons of Hayling	Year of Construction:	Unknown.	
Defence Description:				
Concrete in-situ wall, 1m high, with a short section of concrete apron.				
Construction Material:	Concrete			
Foreshore Description:				
Gravel at the toe of the structure. Mud flats at the middle.				
Defence Condition and Grade:	Poor	Residual Life (no maintenance):	<10 years	
Poor condition, structural cracks in the lateral direction. Evidence of buckling at the corner sections.				
Owner (HBC/P/HA/HCC/EA/SWS/EH):	P	Maintainer (HBC/P/HA/HCC/EA/SWS/EH):	EA	
Comments:				



Defence Element:	5AHI04 (Length 85m)	Defence Section:	B	
Location:		Year of Construction:	Unknown.	
Defence Description:				
Concrete sloped retaining wall, 2m high.				
Construction Material:	Concrete			
Foreshore Description:				
Sandy gravel at the toe of the structure. Mud flats to the middle.				
Defence Condition and Grade:	Fair	Residual Life (no maintenance):	10-15 years	
Numerous hairline cracks in the structure. One localised section with damage to the toe of the structure.				
Owner (HBC/P/HA/HCC/EA/SWS/EH):	P	Maintainer (HBC/P/HA/HCC/EA/SWS/EH):	EA	
Comments:				
Tideflex outfall at end of structure				


Defence Element:	5AHI04 (Length 50m)	Defence Section:	C	
Location:	Mengeham Rythe Sailing Club	Year of Construction:	Unknown.	
Defence Description:				
Steel sheet piles, with concrete capping beam. (1.5m above ground level).				
Construction Material:	Sheet pile			
Foreshore Description:				
Mud flats to the toe of the structure. Seaweed present along the structure.				
Defence Condition and Grade:	Fair	Residual Life (no maintenance):	10-15 years	
Sheet piles worn, salt water weathering of the piles and significant rust. Some fracturing of the steel in sections.				
Owner (HBC/P/HA/HCC/EA/SWS/EH):	P	Maintainer (HBC/P/HA/HCC/EA/SWS/EH):	EA	
Comments:				

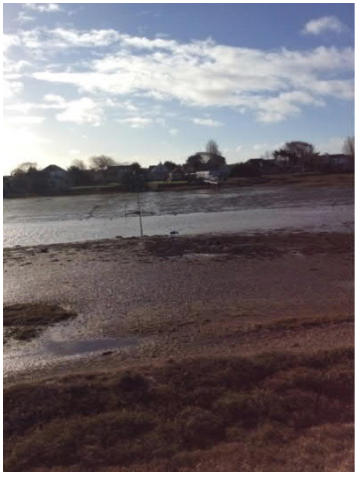
Defence Element:	5AHI04 (Length: 220m)	Defence Section:	D	
Location:	Mengeham Rythe Sailing Club	Year of Construction:	Unknown.	
Defence Description:				
Concrete revetment, 2m high.				
Construction Material:	Concrete			
Foreshore Description:				
Mud flats and gravel to the toe. Seaweed present along the structure toe.				
Defence Condition and Grade:	Fair	Residual Life (no maintenance):	10-15 years	
Poor condition. Concrete revetment sprawling in areas. Patch repairs to some areas. Root ball growth in the crest of the structure. Heave of the structure in one area. Undercutting of the toe.				
Owner (HBC/P/HA/HCC/EA/SWS/EH):	P	Maintainer (HBC/P/HA/HCC/EA/SWS/EH):	EA	
Comments:				



Defence Element:	5AHI04 (Length: 235m)	Defence Section:	E	
Location:	Marine Walk	Year of Construction:	Reconditioned in 2012	
Defence Description:				
1.5m high rick armour revetment in-front of embankment. 3m crest width.				
Construction Material:	Rock			
Foreshore Description:				
Mud flats to the toe of the structure. Salt marsh to the middle.				
Defence Condition and Grade:	Very good	Residual Life (no maintenance):	>20 years	
Very good condition. Good toe embedment and shape. No loss of material. EA carried out restoration works to the defence in 2012.				
Owner (HBC/P/HA/HCC/EA/SWS/EH):	P	Maintainer (HBC/P/HA/HCC/EA/SWS/EH):	EA	
Comments:				
Work to recondition the defence carried out in 2012 by the EA. This involved restoring the embankment, providing a new defence consisting of a limestone rock revetment on the seaward face of the existing embankment. Low points on the crest were reshaped to give a consistent level.				



Defence Element:	5AHI04 (Length: 60m)	Defence Section:	F	
Location:	Marine Walk	Year of Construction:	Unknown.	
Defence Description:				
Gabion basket structure (coarse rock filled). 1.5m high				
Construction Material:	Wire			
Foreshore Description:				
Mud flats & salt marsh to the toe of structure.				
Defence Condition and Grade:	Good	Residual Life (no maintenance):	15-20 years	
Good condition. Plastic coated protection to the mesh baskets. Evidence of buckling in some areas (non-critical).				
Owner (HBC/P/HA/HCC/EA/SWS/EH):	P	Maintainer (HBC/P/HA/HCC/EA/SWS/EH):	EA	
Comments:				

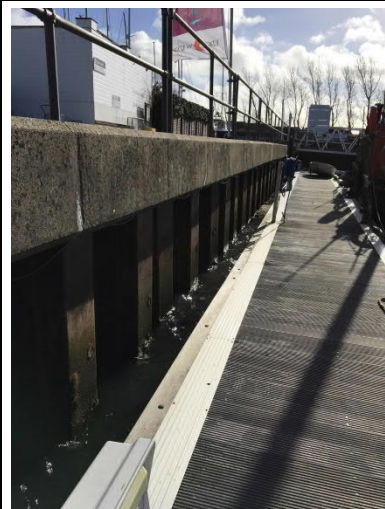
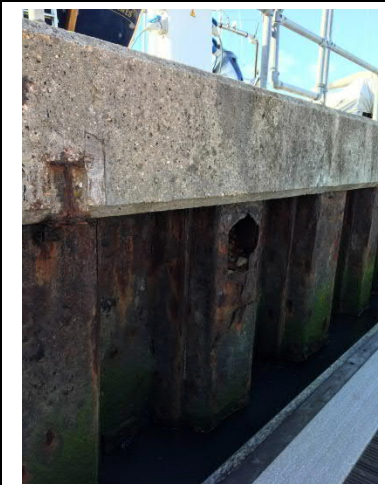
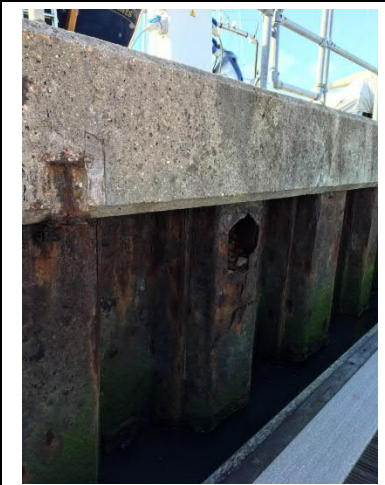
Defence Element:	5AHI04 (Length: 1,140m)	Defence Section:	G	
Location:	Lakeside coastal village and Fishery Creek Touring Park	Year of Construction:	N/A	
Defence Description:				
Natural earth verge along the tidal creek with vegetation in places. The verge is approximately 1m high compared to the foreshore which acts to reduce flood risk to the area behind. No hard defence present.				
Construction Material:	Earth			
Foreshore Description:				
Saltmarsh to upper. Mud flats to the middle and lower.				
Defence Condition and Grade:	Poor	Residual Life (no maintenance):	<10 years Local areas where verge is actively eroding	
Earth verge is generally in a poor condition, showing signs of slippage and local erosion.				
Owner (HBC/P/HA/HCC/EA/SWS/EH):	P HBC	Maintainer (HBC/P/HA/HCC/EA/SWS/EH):	P / HBC / EA (EA: north / east section)	
Comments:				
Number of outfalls are present along the tidal creek. Contaminated land located along the north section of frontage. EA maintain north and east section of the frontage; spanning from the eastern end of the defence to the Camp site.				

Defence Element:	5AHI04 (Length: 655m)	Defence Section:	H	
Location:	Eastoke Avenue	Year of Construction:	Unknown	
Defence Description:				
Combination of concrete retaining structures and brick retaining structure. (1.5m high). A number of slipways along the frontage.				
Construction Material:	Concrete			
Foreshore Description:				
Mud flats & salt marsh				
Defence Condition and Grade:	Unknown	Residual Life (no maintenance):	N/A	
Unknown, unable to access				
Owner (HBC/P/HA/HCC/EA/SWS/EH):	P	Maintainer (HBC/P/HA/HCC/EA/SWS/EH):	P	
Comments:				
Access was not granted and could only be photographed from the opposite bank.				

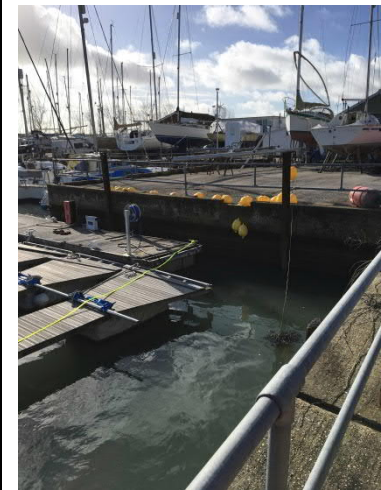
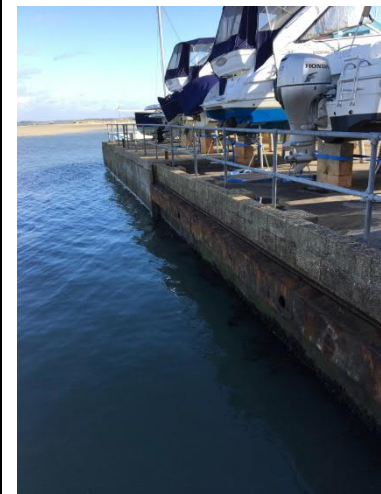
Defence Element:	5AHI04 (Length: 80m)	Defence Section:	I	
Location:	Eastoke Avenue	Year of Construction:	Unknown.	
Defence Description:				
Predominantly concrete retaining wall structures (1.5m high).				
Construction Material:	Concrete			
Foreshore Description:				
Mud flats.				
Defence Condition and Grade:	N/A	Residual Life (no maintenance):	N/A	
Unknown. Unable to assess.				
Owner (HBC/P/HA/HCC/EA/SWS/EH):	P	Maintainer (HBC/P/HA/HCC/EA/SWS/EH):	P	
Comments:				
Access was not granted and could only be photographed from the opposite bank.				






Defence Element:	5AHI04 (Length: 30m)	Defence Section:	J	
Location:	West of Sparkes Marina	Year of Construction:	2005	
Defence Description:				
Rock armour protection with a sheet piled wall, 2m high. Sheet piling clad with a timber facing.				
Construction Material:	Rock			
Foreshore Description:				
Gravel to the upper. Salt marsh and mud flats to the middle.				
Defence Condition and Grade:	Good	Residual Life (no maintenance):	15-20 years	
Rock armour is in good condition. Sheet piling in fair condition (secondary defence), some corrosion with loss of material thickness.				
Owner (HBC/P/HA/HCC/EA/SWS/EH):	P	Maintainer (HBC/P/HA/HCC/EA/SWS/EH):	EA	
Comments:				
Rock armour protection and sheet piled wall is interspersed with sections of raised blockwork walls which have evidence of lowering foreshore and exposure/scour at the toe in some locations.				

Defence Element:	5AHI04 (Length: 330m)	Defence Section:	K	
Location:	West of Sparkes Marina	Year of Construction:	2005	
Defence Description:				
Concrete retaining wall, with a recently raised cap of 3 breeze blocks in height along one section. Sheet piling and concrete toe protection.				
Construction Material:	Concrete			
Foreshore Description:				
Gravel at the upper. Salt marsh to the middle. Mud flats to the lower.				
Defence Condition and Grade:	Fair	Residual Life (no maintenance):	10-15 years	
Fair condition overall. Recently raised section of breeze blocks is in good condition. Lateral cracks to the concrete wall. Holes in structure, resulting in loss of aggregate. Sheet pile toe has corroded (minor reduction in thickness). Eastern end of concrete structure has some reinforcement exposed.				
Owner (HBC/P/HA/HCC/EA/SWS/EH):	P	Maintainer (HBC/P/HA/HCC/EA/SWS/EH):	EA	
Comments:				

Defence Element:	5AHI04 (Length: 295m)	Defence Section:	L	
Location:	Sparkes Marina	Year of Construction:	Unknown	
Defence Description:				
Steel sheet piles with concrete capping beam.				
Construction Material:	Steel			
Foreshore Description:				
Unable to assess due to high water level.				
Defence Condition and Grade:	Fair	Residual Life (no maintenance):	10-15 years	
Fair condition. Signs of corrosion and damage to piles in some locations.				
Owner (HBC/P/HA/HCC/EA/SWS/EH):	P	Maintainer (HBC/P/HA/HCC/EA/SWS/EH):	P	
Comments:				
Unable to assess toe of structure due to high tide conditions.				

Defence Element:	5AHI04 (Length: 185m)	Defence Section:	M
Location:	Sparkes marina	Year of Construction:	Unknown.
Defence Description:			
Concrete block work structure. Depth unknown. Wailing beam across the front face of the block work (corroded).			
Construction Material:	Blockwork		
Foreshore Description:			
Unknown, unable to assess.			
Defence Condition and Grade:	Fair	Residual Life (no maintenance):	10-15 years
Joint cracking in structure. Evidence of heave and subsidence in some areas of the structure. Settlement of some land behind the structure. Wailing beam very corroded.			
Owner (HBC/P/HA/HCC/EA/SWS/EH):	P	Maintainer (HBC/P/HA/HCC/EA/SWS/EH):	P
Comments:			
Unable to assess toe of structure due to high tide conditions.			



Defence Element:	5AHI04 (Length: 175m)	Defence Section:	N	
Location:	East of Sparkes Marina	Year of Construction:	Unknown.	
Defence Description:				
Concrete retaining wall (varies in height). Flood gates to the western extent of the wall. Areas of the concrete wall appear to have been raised recently.				
Construction Material:	Concrete			
Foreshore Description:				
Unknown, unable to assess due to high water level.				
Defence Condition and Grade:	Good	Residual Life (no maintenance):	15-20 years	
Good condition. Minor surface cracks to the lower (older) part of the structure. Light abrasion evident, but no defects to the structure integrity.				
Owner (HBC/P/HA/HCC/EA/SWS/EH):	P	Maintainer (HBC/P/HA/HCC/EA/SWS/EH):	P	
Comments:				

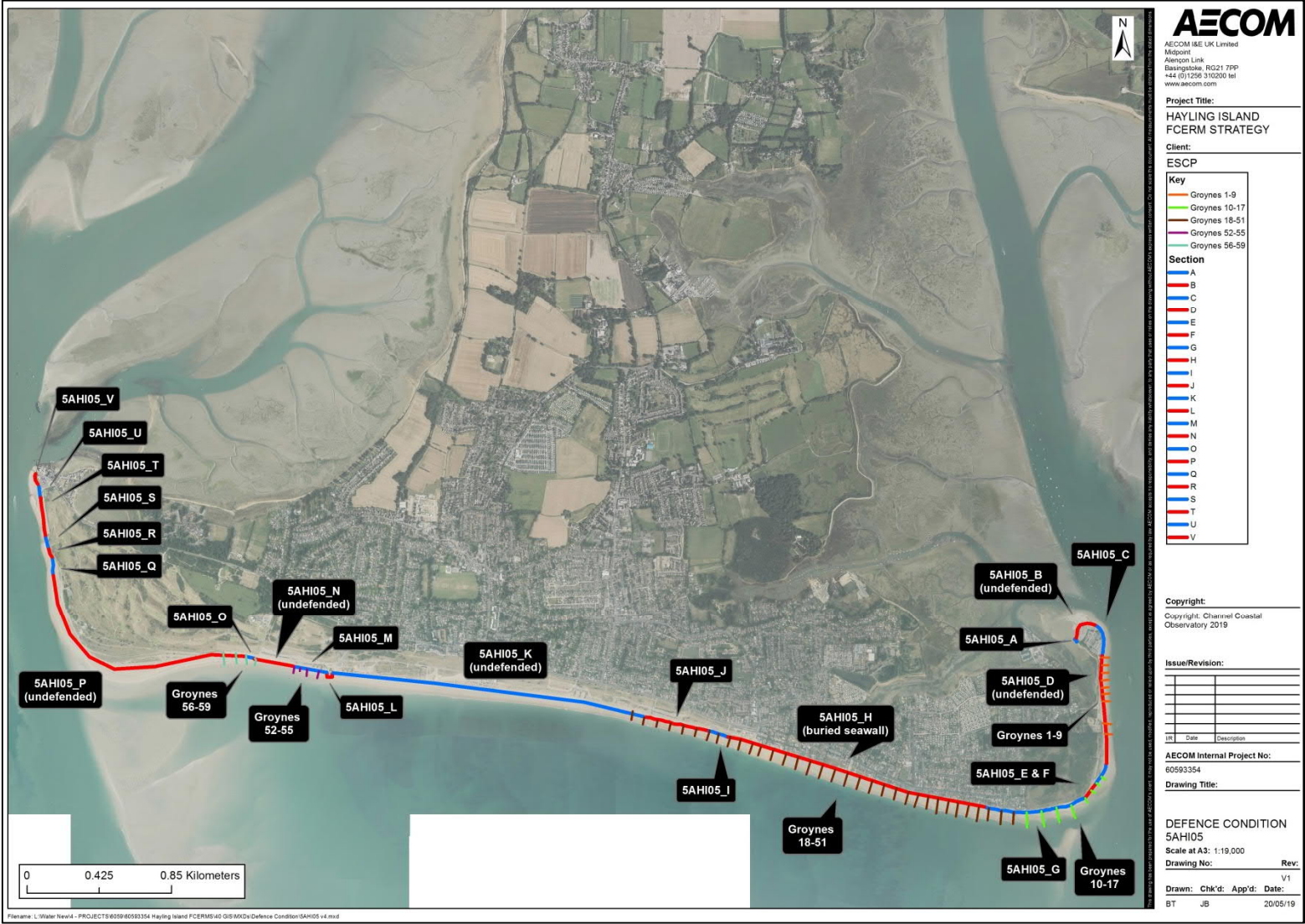





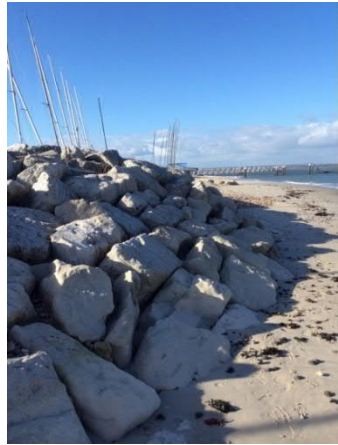
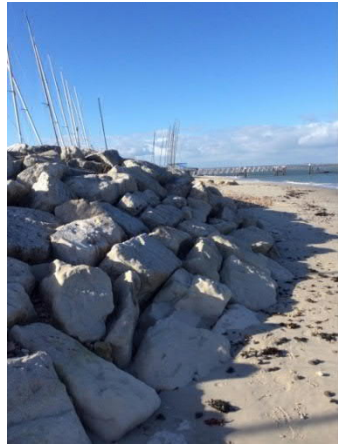



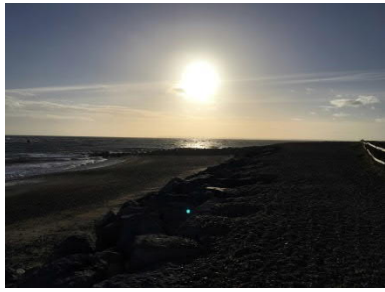

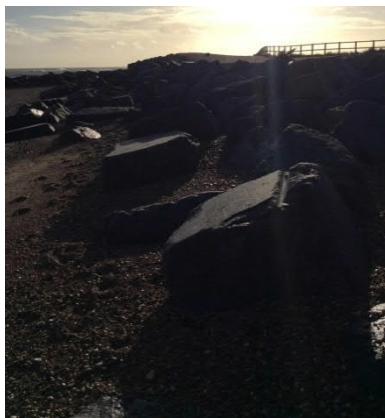
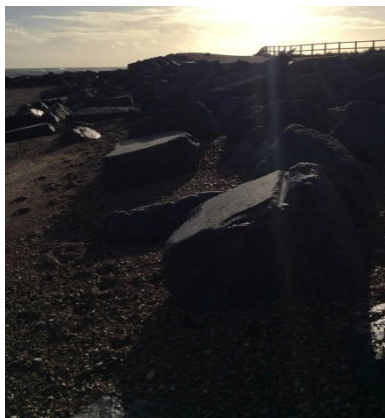
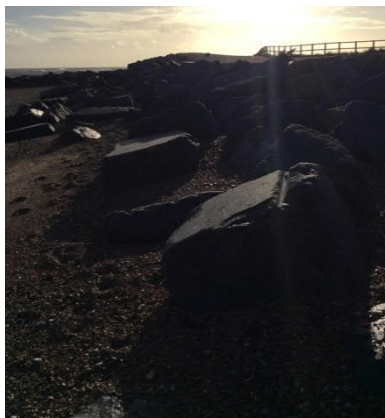
Figure 4-5. Defence Sections along Policy Unit 5AHI05


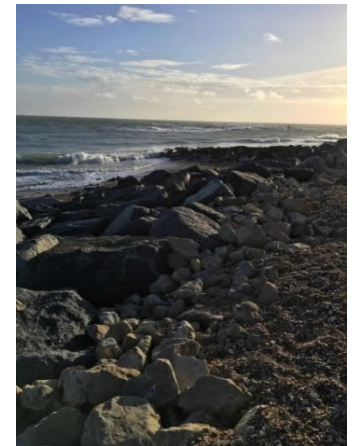
Defence Element:	5AHI05 (Length: 20m)	Defence Section:	A	
Location:	Hayling Island Sailing Club (HISC)	Year of Construction:	Unknown	
Defence Description:				
Rock revetment on outcrop of land, 20m total length.				
Construction Material:	Rock			
Foreshore Description:				
Wide, sandy beach to the toe- sheltered.				
Defence Condition and Grade:	Good	Residual Life (no maintenance):	15-20 years	
Good condition.				
Owner (HBC/P/HA/HCC/EA/SWS/EH):	P	Maintainer (HBC/P/HA/HCC/EA/SWS/EH):	P	
Comments:				

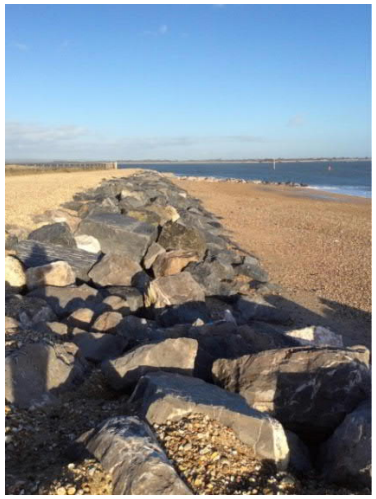
Defence Element:	5AHI05 (Length: 170m)	Defence Section:	B	
Location:	Hayling Island Sailing Club (HISC)	Year of Construction:	NA	
Defence Description:				
No formal defence - undefended				
Construction Material:	NA			
Foreshore Description:				
Defence Condition and Grade:	NA	Residual Life (no maintenance):	NA	
NA				
Owner (HBC/P/HA/HCC/EA/SWS/EH):	NA	Maintainer (HBC/P/HA/HCC/EA/SWS/EH):	NA	
Comments:				

Defence Element:	5AHI05 (Length: 200m)	Defence Section:	C	
Location:	Hayling Island Sailing Club (HISC)	Year of Construction:	Unknown	
Defence Description:				
Rock Armour revetment, 5m total width.				
Construction Material:	Rock			
Foreshore Description:				
Fine sand and gravel to the toe of the structure. One slip way with a flood gate installed at low level.				
Defence Condition and Grade:	Good	Residual Life (no maintenance):	15-20 years	
Minor movement of structure. Rock density consistent. Crest height still in-tact. Minor movement in the toe alignment.				
Owner (HBC/P/HA/HCC/EA/SWS/EH):	P	Maintainer (HBC/P/HA/HCC/EA/SWS/EH):	P	
Comments:				

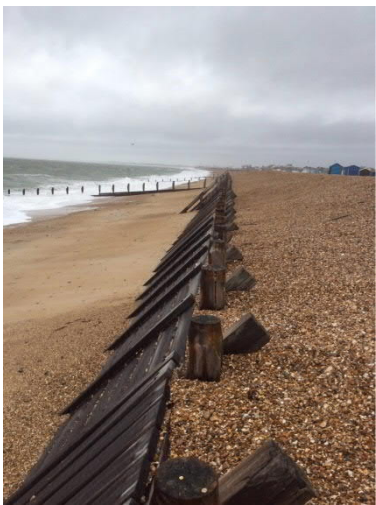
Defence Element:	5AHI05 (Length: 635m)	Defence Section:	D	
Location:	Beach area to the south of Hayling Island Sailing Club	Year of Construction:	NA	
Defence Description:				
No formal defence - undefended				
Construction Material:	NA			
Foreshore Description:				
Defence Condition and Grade:	NA	Residual Life (no maintenance):	NA	
NA				
Owner (HBC/P/HA/HCC/EA/SWS/EH):	NA	Maintainer (HBC/P/HA/HCC/EA/SWS/EH):	NA	
Comments:				

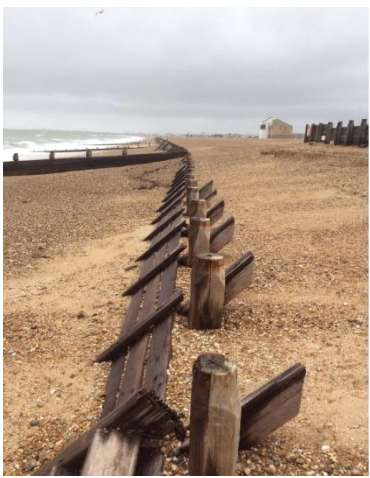
Defence Element:	5AHI05 (Length: 129m)	Defence Section:	E	
Location:	Hayling beach	Year of Construction:	Unknown.	
Defence Description:				
Rock armour revetment.				
Construction Material:	Rock			
Foreshore Description:				
Sand & shingle to the toe. Sand & Shingle to the rear of the structure.				
Defence Condition and Grade:	Fair	Residual Life (no maintenance):	10-15 years	
Fair. Deformation and movement of structure. Loss of retained material at the crest of the structure and loss of rock material at the crest. Clinging of retained material behind structure- evidence of erosion.				
Owner (HBC/P/HA/HCC/EA/SWS/EH):	HBC	Maintainer (HBC/P/HA/HCC/EA/SWS/EH):	HBC	
Comments:				

Defence Element:	5AHI05 (Length: 107m)	Defence Section:	F	
Location:	Hayling Beach	Year of Construction:	Unknown.	
Defence Description:				
Rock armour revetment. Repairs to the crest of the structure in some areas, with smaller rock armour material.				
Construction Material:	Rock			
Foreshore Description:				
Sand and shingle to the toe and rear of the structure.				
Defence Condition and Grade:	Good	Residual Life (no maintenance):	15-20 years	
Good. Minor settlement of crest. Localised undermining of the structure in one location, with short section of sliding. Good coverage of rock material across the width.				
Owner (HBC/P/HA/HCC/EA/SWS/EH):	HBC	Maintainer (HBC/P/HA/HCC/EA/SWS/EH):	HBC	
Comments:				

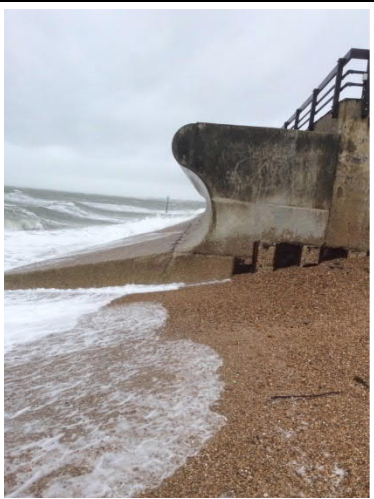
Defence Element:	5AHI05 (Length: 600m)	Defence Section:	G	
Location:	Hayling Beach	Year of Construction:	Unknown	
Defence Description:				
Rock armour revetment.				
Construction Material:	Rock			
Foreshore Description:				
Sand and shingle to the toe and crest of the structure.				
Defence Condition and Grade:	Good	Residual Life (no maintenance):	15-20 years	
Minor movement of structure. Rock density consistent. Crest height still in-tact. Minor movement in the toe alignment.				
Owner (HBC/P/HA/HCC/EA/SWS/EH):	HBC	Maintainer (HBC/P/HA/HCC/EA/SWS/EH):	HBC	
Comments:				



Defence Element:	5AHI05 (Length: 1,570m)	Defence Section:	H	No pictures of the wall available as it was buried beneath the shingle beach at the time of survey
Location:	Eastoke – south waterfront	Year of Construction:	NA	
Defence Description:				
Seawall buried beneath shingle beach.				
Construction Material:	Concrete			
Foreshore Description:				
Shingle beach. The shingle beach in this location is built up annually through the ongoing beach management works.				
Defence Condition and Grade:	Unknown	Residual Life (no maintenance):	Unknown	
Seawall buried beneath the beach along the entire length of this unit. Therefore, it was not possible to determine the residual life of the wall from a visual inspection.				
Owner (HBC/P/HA/HCC/EA/SWS/EH):	HBC	Maintainer (HBC/P/HA/HCC/EA/SWS/EH):	HBC	
Comments:				
Seawall was buried, therefore, unable to determine form, size or condition of the structure.				

Defence Element:	5AHI05 (Length: 120m)	Defence Section:	I	
Location:	Pebble Beach	Year of Construction:	Unknown	
Defence Description:				
Timber revetment, 1m high.				
Construction Material:	Timber			
Foreshore Description:				
Sand and gravel to the toe and crest of the structure.				
Defence Condition and Grade:	Good	Residual Life (no maintenance):	15-20 years	
Good condition. Missing planks in some areas. Gaps within structure due to weathering. Splitting of some piles.				
Owner (HBC/P/HA/HCC/EA/SWS/EH):	HBC	Maintainer (HBC/P/HA/HCC/EA/SWS/EH):	HBC	
Comments:				

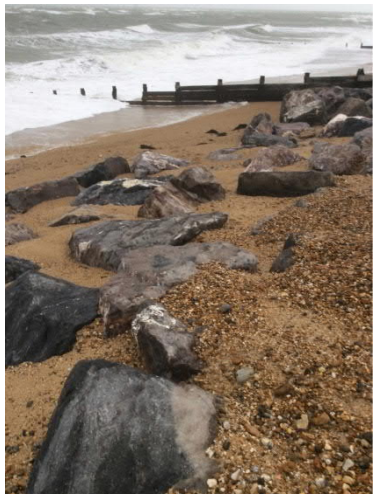
Defence Element:	5AHI05 (Length: 400m)	Defence Section:	J	
Location:	Pebble Beach	Year of Construction:	Unknown	
Defence Description:				
Timber revetment, approximately 1m high.				
Construction Material:	Timber			
Foreshore Description:				
Sandy beach material to the toe. Gravel/shingle material built up at the crest				
Defence Condition and Grade:	Very Good	Residual Life (no maintenance):	>20 years	
Very good. Good toe embedment. No planks missing with limited gaps between boards.				
Owner (HBC/P/HA/HCC/EA/SWS/EH):	HBC	Maintainer (HBC/P/HA/HCC/EA/SWS/EH):	HBC	
Comments:				

Defence Element:	5AHI05 (Length: 1,850m)	Defence Section:	K	
Location:	Central waterfront	Year of Construction:	NA	
Defence Description:				
No formal defence - undefended				
Construction Material:	NA			
Foreshore Description:				
Defence Condition and Grade:	NA	Residual Life (no maintenance):	NA	
NA				
Owner (HBC/P/HA/HCC/EA/SWS/EH):	NA	Maintainer (HBC/P/HA/HCC/EA/SWS/EH):	NA	
Comments:				


Defence Element:	5AHI05 (Length: 70m)	Defence Section:	L	
Location:	Inn on the Beach	Year of Construction:	Unknown	
Defence Description:				
Concrete recurve wave wall 3m high. Sheet piles to the east and west face.				
Construction Material:	Concrete			
Foreshore Description:				
Sand at the toe. High wave action during the survey date.				
Defence Condition and Grade:	Fair	Residual Life (no maintenance):	10-15 years	
Fair-good. Minor cracks and spawling of concrete in the face. Depression visible in the apron of the structure. Unknown if toe is undermined- unable to access due to stormy conditions. Sheet piling on east and west walls corroded, still intact.				
Owner (HBC/P/HA/HCC/EA/SWS/EH):	P	Maintainer (HBC/P/HA/HCC/EA/SWS/EH):	P	
Comments:				


Defence Element:	5AHI05 (Length 200m)	Defence Section:	M	
Location:	South of Hayling Golf Club	Year of Construction:	Unknown	
Defence Description:				
Timber revetment, approx. 1-2m high.				
Construction Material:	Timber			
Foreshore Description:				
Shingle beach.				
Defence Condition and Grade:	Poor	Residual Life (no maintenance):	<10 years	
Poor condition. Numerous planks missing in areas, rotted material. End section appears to have been removed.				
Owner (HBC/P/HA/HCC/EA/SWS/EH):	HBC	Maintainer (HBC/P/HA/HCC/EA/SWS/EH):	HBC	
Comments:				

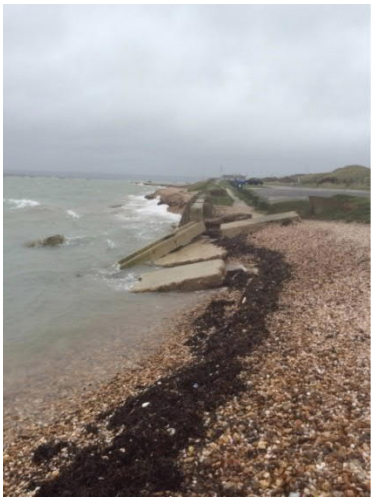
Defence Element:	5AHI05 (Length: 230m)	Defence Section:	N	
Location:	Car park to the east of the Golf Course	Year of Construction:	NA	
Defence Description:				
No formal defence - undefended				
Construction Material:	NA			
Foreshore Description:				
Defence Condition and Grade:	NA	Residual Life (no maintenance):	NA	
NA				
Owner (HBC/P/HA/HCC/EA/SWS/EH):	NA	Maintainer (HBC/P/HA/HCC/EA/SWS/EH):	NA	
Comments:				



Defence Element:	5AHI05 (Length: 45m)	Defence Section:	O	
Location:	South of Hayling Golf Club	Year of Construction:	Unknown	
Defence Description:				
Rock armour revetment, approximately 1m high.				
Construction Material:	Rock			
Foreshore Description:				
Sand and gravel to the toe of the structure.				
Defence Condition and Grade:	Poor	Residual Life (no maintenance):	<10 years	
Loss of structure shape and alignment. Toe undermined. Sporadic coverage of stones.				
Owner (HBC/P/HA/HCC/EA/SWS/EH):	HBC	Maintainer (HBC/P/HA/HCC/EA/SWS/EH):	HBC	
Comments:				


Defence Element:	5AHI05 (Length: 1,485m)	Defence Section:	P	
Location:	Golf course	Year of Construction:	NA	
Defence Description:				
No formal defence - undefended				
Construction Material:	NA			
Foreshore Description:				
Defence Condition and Grade:	NA	Residual Life (no maintenance):	NA	
NA				
Owner (HBC/P/HA/HCC/EA/SWS/EH):	NA	Maintainer (HBC/P/HA/HCC/EA/SWS/EH):	NA	
Comments:				


Defence Element:	5AHI05 (Length: 100m)	Defence Section:	Q	
Location:	Hayling Ferry Sailing Club	Year of Construction:	Unknown	
Defence Description:				
0.5m high concrete wall.				
Construction Material:	Concrete			
Foreshore Description:				
Gravel to the toe and crest.				
Defence Condition and Grade:	Good	Residual Life (no maintenance):	15-20 years	
Good condition. Some loss of material at the joints. Minor damage to the surface face.				
Owner (HBC/P/HA/HCC/EA/SWS/EH):	P	Maintainer (HBC/P/HA/HCC/EA/SWS/EH):	P	
Comments:				



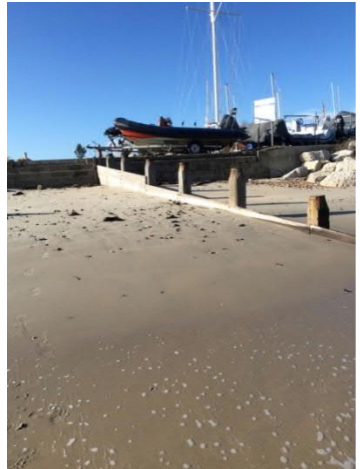
Defence Element:	5AHI05 (Length: 70m)	Defence Section:	R	
Location:	Hayling Ferry Sailing Club	Year of Construction:	Unknown	
Defence Description:				
Concrete blockwork. 1m wide x 0.5m high.				
Construction Material:	Blockwork			
Foreshore Description:				
Gravel.				
Defence Condition and Grade:	Fair	Residual Life (no maintenance):	10-15 years	
Fair condition. Surface damage to the concrete. Lateral cracks within the structure. Some localised holes in the structure.				
Owner (HBC/P/HA/HCC/EA/SWS/EH):	P	Maintainer (HBC/P/HA/HCC/EA/SWS/EH):	P	
Comments:				

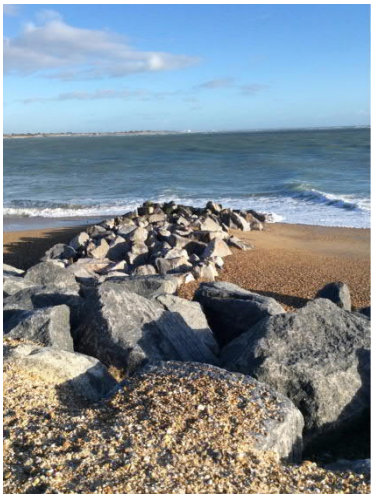
Defence Element:	5AHI05 (Length: 20m)	Defence Section:	S	
Location:	Hayling Ferry Sailing Club	Year of Construction:	Unknown	
Defence Description:				
Pre-cast concrete blocks.				
Construction Material:	Blockwork			
Foreshore Description:				
Gravel and shingle material to the toe.				
Defence Condition and Grade:	Very Poor	Residual Life (no maintenance):	Failed	
Failed. Structure has breached in multiple locations with a loss of form. Blockwork now appears to be randomly positioned.				
Owner (HBC/P/HA/HCC/EA/SWS/EH):	P	Maintainer (HBC/P/HA/HCC/EA/SWS/EH):	P	
Comments:				

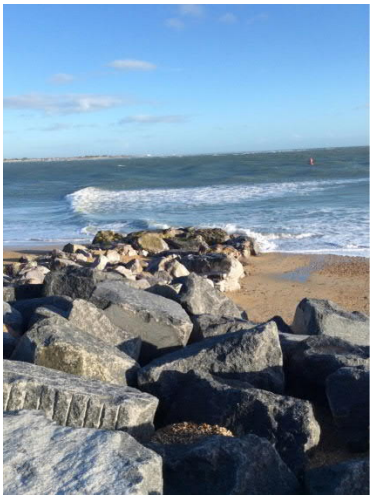
Defence Element:	5AHI05 (Length: 240m)	Defence Section:	T	
Location:	West of Hayling Golf Club	Year of Construction:	Unknown	
Defence Description:				
Vegetated embankment. 2m crest width.				
Construction Material:	Earth			
Foreshore Description:				
Shingle to the toe.				
Defence Condition and Grade:	Fair	Residual Life (no maintenance):	10-15 years	
Fair condition, locally poor. Toe has been eroded in areas. Non-uniform embankment throughout. Gravel to the toe in many areas.				
Owner (HBC/P/HA/HCC/EA/SWS/EH):	P	Maintainer (HBC/P/HA/HCC/EA/SWS/EH):	P	
Comments:				

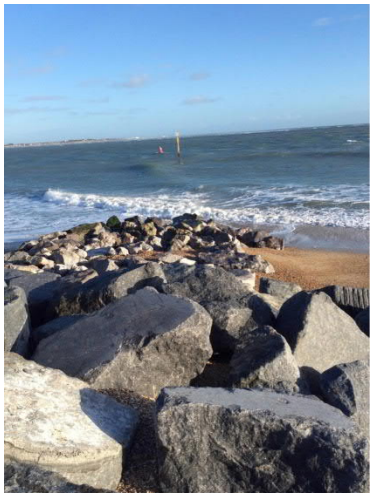
Defence Element:	5AHI05 (Length: 65m)	Defence Section:	U	
Location:	Ferryboat Inn	Year of Construction:	Unknown	
Defence Description:				
Concrete buttress wall.				
Construction Material:	Concrete			
Foreshore Description:				
Unable to view due to high water level.				
Defence Condition and Grade:	Good	Residual Life (no maintenance):	15-20 years	
Good condition. One section missing, risk of breach at high level.				
Owner (HBC/P/HA/HCC/EA/SWS/EH):	P	Maintainer (HBC/P/HA/HCC/EA/SWS/EH):	P	
Comments:				

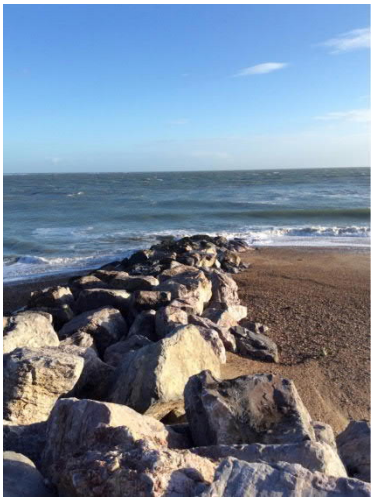
Defence Element:	5AHI05 (Length: 65m)	Defence Section:	V	
Location:	Ferryboat Inn	Year of Construction:	Unknown	
Defence Description:				
Sheet piles with concrete cap.				
Construction Material:	Steel			
Foreshore Description:				
Gravel and beach shingle material.				
Defence Condition and Grade:	Good	Residual Life (no maintenance):	15-20 years	
Good condition. Concrete capping beam in very good condition. Minimal rust to the piles, no loss of thickness.				
Owner (HBC/P/HA/HCC/EA/SWS/EH):	P	Maintainer (HBC/P/HA/HCC/EA/SWS/EH):	P	
Comments:				

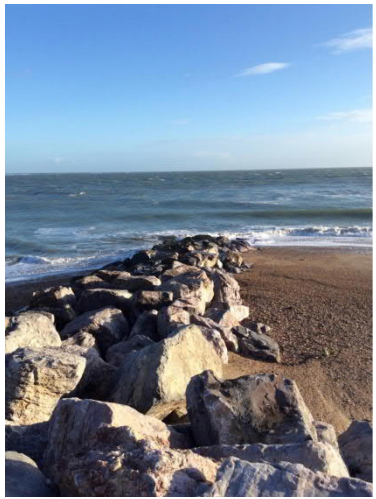
Defence Element:	5AHI05 (Length: N/A)	Defence Section:	Groynes 1-9	
Location:	RNLI Beach	Year of Construction:	Unknown	
Defence Description:				
9 No. timber groynes.				
Construction Material:	Timber			
Foreshore Description:				
Fine sand and shingle along each of the structures. Some structures buried with beach material at a high level.				
Defence Condition and Grade:	3- Good 2- Fair 4- N/A (Buried)	Residual Life (no maintenance) Yrs:	15-20 years 10-15 years N/A	
Good – Fair Condition throughout. No Missing planks or gaps between panels. Minor defects to the timber, but no severe rot. Timber panels buckling in some areas.				
Owner (HBC/P/HA/HCC/EA/SWS/EH):	P	Maintainer (HBC/P/HA/HCC/EA/SWS/EH):	P	
Comments:				
4 timber groynes were unable to be surveyed due to high beach level.				


Defence Element:	5AHI05 (Length: 20m)	Defence Section:	Groyne 10	
Location:	Hayling beach	Year of Construction:	Unknown.	
Defence Description:				
Rock groyne.				
Construction Material:	Rock			
Foreshore Description:				
Sand and shingle to the toe of the structure.				
Defence Condition and Grade:	Good	Residual Life (no maintenance):	15-20 years	
Good condition. Occasional voids in the structure. Rock of regular shape, infilled with beach material & shingle in the structure due to displacement of the rock stones.				
Owner (HBC/P/HA/HCC/EA/SWS/EH):	HBC	Maintainer (HBC/P/HA/HCC/EA/SWS/EH):	HBC	
Comments:				

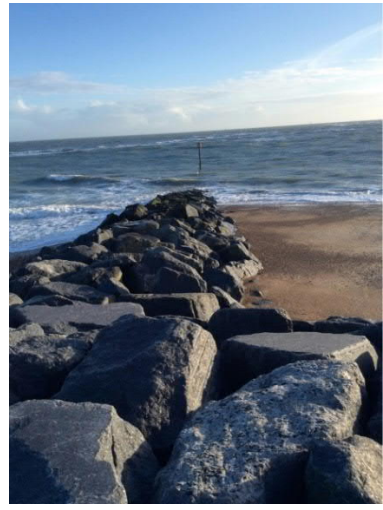
Defence Element:	5AHI05 (Length: 20m)	Defence Section:	Groyne 11	
Location:	Hayling beach	Year of Construction:	Unknown.	
Defence Description:				
Rock groyne.				
Construction Material:	Rock			
Foreshore Description:				
Sand and shingle to the toe of the structure.				
Defence Condition and Grade:	Fair	Residual Life (no maintenance):	10-15 years	
Fair condition. Occasional voids in structure. Rock of regular shape, infill of shingle within structure due to displacement of rocks				
Owner (HBC/P/HA/HCC/EA/SWS/EH):	HBC	Maintainer (HBC/P/HA/HCC/EA/SWS/EH):	HBC	
Comments:				

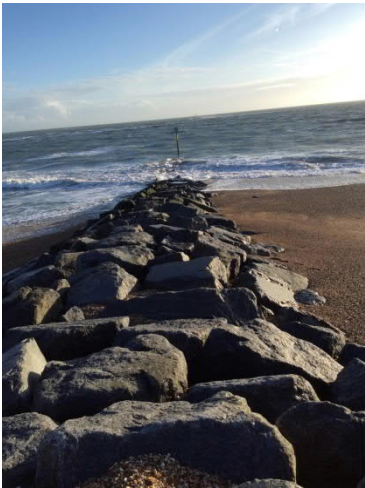
Defence Element:	5AHI05 (Length: 20m)	Defence Section:	Groyne 12	
Location:	Hayling beach	Year of Construction:	Unknown.	
Defence Description:				
Rock groyne.				
Construction Material:	Rock			
Foreshore Description:				
Sand and shingle to the toe of the structure.				
Defence Condition and Grade:	Good	Residual Life (no maintenance):	15-20 years	
Good condition. Occasional voids in the structure. Rock of regular shape, infilled with beach material & shingle in the structure due to minor displacement of the rock stones.				
Owner (HBC/P/HA/HCC/EA/SWS/EH):	HBC	Maintainer (HBC/P/HA/HCC/EA/SWS/EH):	HBC	
Comments:				

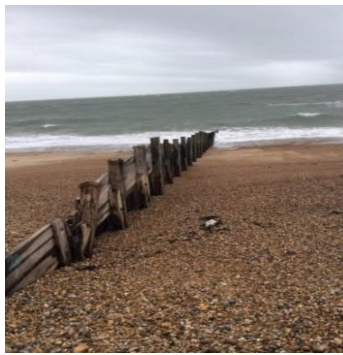
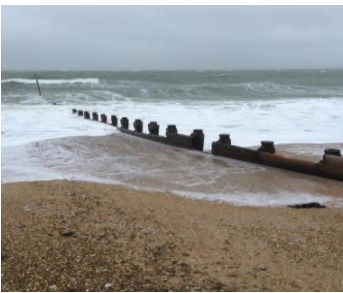


Defence Element:	5AHI05 (Length: 20m)	Defence Section:	Groyne 13	
Location:	Hayling Beach	Year of Construction:	Unknown	
Defence Description:				
Rock groyne.				
Construction Material:	Rock			
Foreshore Description:				
Sand and shingle to the toe of the structure.				
Defence Condition and Grade:	Very Good	Residual Life (no maintenance):	>20 years	
Hard angular rock, well compacted. No toe erosion				
Owner (HBC/P/HA/HCC/EA/SWS/EH):	HBC	Maintainer (HBC/P/HA/HCC/EA/SWS/EH):	HBC	
Comments:				

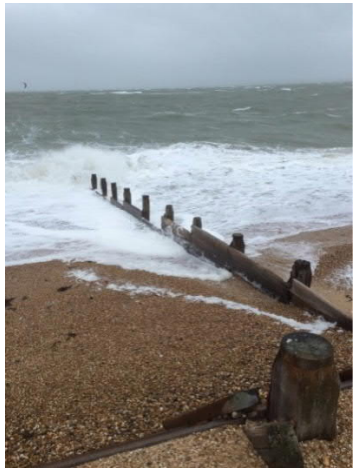

Defence Element:	5AHI05 (Length: 20m)	Defence Section:	Groyne 14	
Location:	Hayling Beach	Year of Construction:	Unknown.	
Defence Description:				
Rock groyne.				
Construction Material:	Rock			
Foreshore Description:				
Sand and shingle to the toe of the structure.				
Defence Condition and Grade:	Good	Residual Life (no maintenance):	15-20 years	
Minor displacement of rocks creating some voids. Generally well packed structure, loss of toe alignment and erosion in some areas.				
Owner (HBC/P/HA/HCC/EA/SWS/EH):	HBC	Maintainer (HBC/P/HA/HCC/EA/SWS/EH):	HBC	
Comments:				

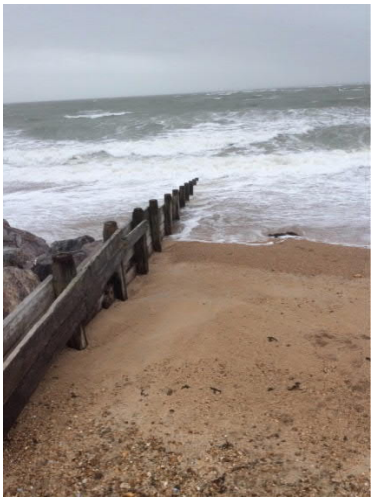

Defence Element:	5AHI05 (Length: 20m)	Defence Section:	Groyne 15	
Location:	Hayling Beach	Year of Construction:	Unknown.	
Defence Description:				
Rock groyne.				
Construction Material:	Rock			
Foreshore Description:				
Sand & shingle to the toe of the structure.				
Defence Condition and Grade:	Very Good	Residual Life (no maintenance):	>20 years	
Large angular rock, well compacted with good density. No evidence of erosion at the toe.				
Owner (HBC/P/HA/HCC/EA/SWS/EH):	HBC	Maintainer (HBC/P/HA/HCC/EA/SWS/EH):	HBC	
Comments:				

Defence Element:	5AHI05 (Length: 20m)	Defence Section:	Groyne 16	
Location:	Hayling Beach	Year of Construction:	Unknown.	
Defence Description:				
Rock groyne.				
Construction Material:	Rock			
Foreshore Description:				
Sand & shingle to the toe of the structure.				
Defence Condition and Grade:	Very Good	Residual Life (no maintenance):	>20 years	
Large angular rock, well compacted with good density. No evidence of erosion at the toe.				
Owner (HBC/P/HA/HCC/EA/SWS/EH):	HBC	Maintainer (HBC/P/HA/HCC/EA/SWS/EH):	HBC	
Comments:				

Defence Element:	5AHI05 (Length: 20m)	Defence Section:	Groyne 17	
Location:	Hayling Beach	Year of Construction:	Unknown.	
Defence Description:				
Rock groyne.				
Construction Material:	Rock			
Foreshore Description:				
Sand & shingle to the toe of the structure.				
Defence Condition and Grade:	Good	Residual Life (no maintenance):	15-20 years	
Minor displacement of rocks, creating some voids within the structure. Shingle and beach material has deposited in these pockets. Generally good density to the structure, some minor loss of the toe alignment.				
Owner (HBC/P/HA/HCC/EA/SWS/EH):	HBC	Maintainer (HBC/P/HA/HCC/EA/SWS/EH):	HBC	
Comments:				

Defence Element:	5AHI05 (Length: N/A)	Defence Section:	Groynes 18 - 51	
Location:	Hayling Beach	Year of Construction:	Unknown	
Defence Description:				
34 Timber groynes, along Hayling Beach frontage.				
Construction Material:	Timber			
Foreshore Description:				
Fine sand and shingle along the structures to the east. Large shingle at the structures along the central and western end.				
Defence Condition and Grade:	25 – Very Good 6- Good 2- Fair 1- Very Poor	Residual Life (no maintenance):	>20 years 15-20 years 10-15 years <5 years	
Very Good – Very Poor Condition throughout. Generally very good condition. Very poor graded groyne due to broken or rotten panels.				
Owner (HBC/P/HA/HCC/EA/SWS/EH):	HBC	Maintainer (EA/LA/MOD/P):	HBC	
Comments:				
Very good groynes; 19, 20, 21, 22, 23, 24, 25, 29, 30, 31, 32, 33, 34, 36, 37, 40 ,41, 42, 44, 45, 46, 47, 48, 50, 51 Good groynes; 18, 27, 38, 39, 43, 49 Fair groynes; 26, 28 Very poor groyne; 35				

Defence Element:	5AHI05 (N/A)	Defence Section:	Groynes 52 - 55	
Location:	South of car park adjacent to Hayling Golf Club	Year of Construction:	Unknown	
Defence Description:				
4 No. timber groyne.				
Construction Material:	Timber			
Foreshore Description:				
Sand at the toe. High wave action during the survey date.				
Defence Condition and Grade:	3 - Fair 1 - Poor	Residual Life (no maintenance):	10-15 years <10 years	
3 fair condition groynes. Some planks missing, due to weathering or damage. Stable beach level either side. 1 poor condition groyne.				
Owner (HBC/P/HA/HCC/EA/SWS/EH):	HBC	Maintainer (EA/LA/MOD/P):	HBC	
Comments:				
Fair groynes; 52, 53, 54 Poor groyne; 55				

Defence Element:	5AHI05 (Length: N/A)	Defence Section:	Groynes 56 - 59	
Location:	South of Hayling Golf Club	Year of Construction:	Unknown	
Defence Description:				
4 No. timber groynes				
Construction Material:	Timber			
Foreshore Description:				
Sand and gravel to the toe of the structure.				
Defence Condition and Grade:	1- Fair 3- Poor	Residual Life (no maintenance):	10 -15 years < 10 years	
3 groynes in poor condition. 1 groyne in fair condition. Appears to be some dismantling of the groynes taking place along the frontage. Some planks missing, minor rotting of wood in some areas.				
Owner (HBC/P/HA/HCC/EA/SWS/EH):	HBC	Maintainer (HBC/P/HA/HCC/EA/SWS/EH):	HBC	
Comments:				
Fair groyne; 55 Poor groynes; 56, 57, 59				

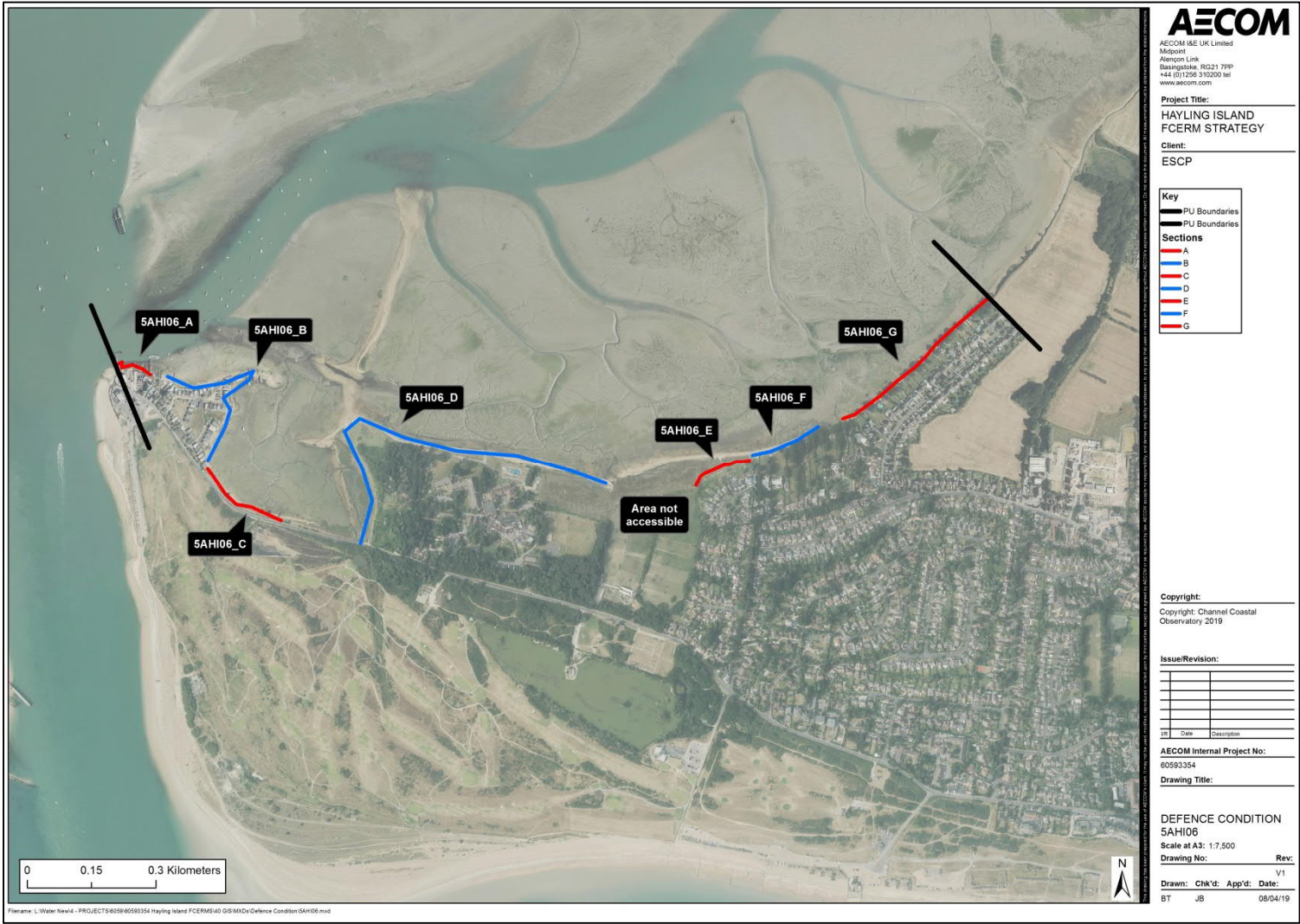
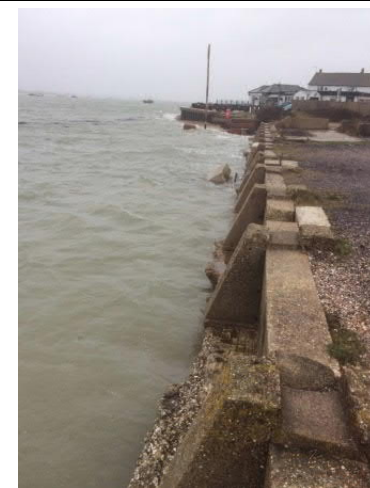


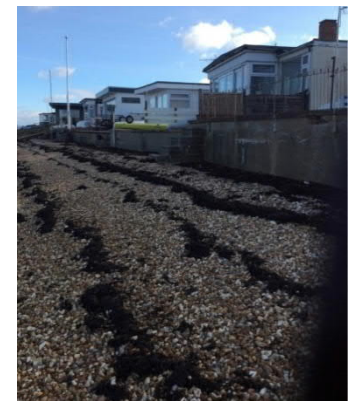
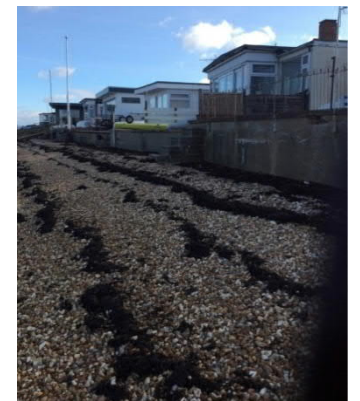







Figure 4-6. Defence Sections along Policy Unit 5AHI06


Defence Element:	5AHI06 (Length: 125m)	Defence Section:	A
Location:	Langstone Harbour Board	Year of Construction:	Unknown
Defence Description:			
Concrete quay wall. Frontage shown in distance of attached photo.			
Construction Material:	Concrete		
Foreshore Description:			
Unknown - not visible at high tide during survey. Expected to be gravel and shingle, as per adjacent areas			
Defence Condition and Grade:	Good	Residual Life (no maintenance):	15-20 years
Good condition throughout. Minor surface defects and loss of mortar at joints. Section of sheet piling in the middle of the frontage- fair condition (amount of corrosion).			
Owner (HBC/P/HA/HCC/EA/SWS/EH):	P	Maintainer (HBC/P/HA/HCC/EA/SWS/EH):	P
Comments:			










Defence Element:	5AHI06 (Length: 470m)	Defence Section:	B	
Location:	Ferry Road	Year of Construction:	Unknown	
Defence Description:				
Concrete wall.				
Construction Material:	Concrete			
Foreshore Description:				
Gravel (where visible). Shallow foreshore.				
Defence Condition and Grade:	Fair	Residual Life (no maintenance):	10-15 years	
Fair condition where visible. Unable to access majority of length.				
Owner (HBC/P/HA/HCC/EA/SWS/EH):	P	Maintainer (HBC/P/HA/HCC/EA/SWS/EH):	P	
Comments:				

Defence Element:	5AHI06 (Length: 220m)	Defence Section:	C	
Location:	Ferry Road	Year of Construction:	Unknown	
Defence Description:				
Embankment or natural verge. Ferry access road behind at the same level as the crest of the verge. Timber piling at the western end, 30m long.				
Construction Material:	Earth			
Foreshore Description:				
Gravel at the foreshore.				
Defence Condition and Grade:	Good	Residual Life (no maintenance):	15-20 years	
Good condition. Natural profile, 0.5m high.				
Owner (HBC/P/HA/HCC/EA/SWS/EH):	P	Maintainer (HBC/P/HA/HCC/EA/SWS/EH):	P	
Comments:				

Defence Element:	5AHI06 (Length: 940m)	Defence Section:	D	
Location:	West of Sinah Warren Hotel	Year of Construction:	Unknown	
Defence Description:				
Shallow embankment with good vegetation. Looks like a natural verge, not man made. 2-3m crest width, with an additional verge behind.				
Construction Material:	Earth			
Foreshore Description:				
Long stretch of Saltmarsh to the toe.				
Defence Condition and Grade:	Good	Residual Life (no maintenance):	15-20 years	
Good condition. Shallow natural structure, but well vegetated. Small signs of undercutting at the toe.				
Owner (HBC/P/HA/HCC/EA/SWS/EH):	P	Maintainer (HBC/P/HA/HCC/EA/SWS/EH):	P	
Comments:				

Defence Element:	5AHI06 (Length: 145m)	Defence Section:	E	
Location:	Northshore Road (South)	Year of Construction:	Unknown	
Defence Description:				
Vegetated embankment. 1m above top of creek level. Appears to be protecting private properties behind.				
Construction Material:	Earth			
Foreshore Description:				
Mud flats/ Creek to the upper. Shingle beach to the middle.				
Defence Condition and Grade:	Good	Residual Life (no maintenance):	15-20 years	
Good condition. Well vegetated structure, protected by the creek.				
Owner (HBC/P/HA/HCC/EA/SWS/EH):	P	Maintainer (HBC/P/HA/HCC/EA/SWS/EH):	P	
Comments:				

Defence Element:	5AHI06 (Length: 170m)	Defence Section:	F	
Location:	Northshore Road (Middle)	Year of Construction:	Unknown	
Defence Description:				
Ad-hoc breeze blockwork structures. Build-up of shingle has developed at the toe of the structure. Walls vary in height (around 1m high).				
Construction Material:	Blockwork			
Foreshore Description:				
Build-up of shingle. Some seaweed.				
Defence Condition and Grade:	Good	Residual Life (no maintenance):	15-20 years	
Walls in good condition. Many have been raised over the past 30 years				
Owner (HBC/P/HA/HCC/EA/SWS/EH):	P	Maintainer (HBC/P/HA/HCC/EA/SWS/EH):	P	
Comments:				

Defence Element:	5AHI06 (Length: 450m)	Defence Section:	G	
Location:	Northshore Road (North)	Year of Construction:	Unknown	
Defence Description:				
Ad-hoc breeze block and stone structures. One small section of sheet piling. Generally 1- 2m high. Shallow gravel profile to the toe. High tide appears to be close to the toe.				
Construction Material:	Stone masonry			
Foreshore Description:				
Gravel to the toe. Sea weed build up 1m away from the toe.				
Defence Condition and Grade:	Fair	Residual Life (no maintenance):	10-15 years	
Fair condition (some good). Cracking of the stonework structure. Loss of mortar. Some lowered sections of the wall at risk of being out flanked.				
Owner (HBC/P/HA/HCC/EA/SWS/EH):	P	Maintainer (HBC/P/HA/HCC/EA/SWS/EH):	P	
Comments:				

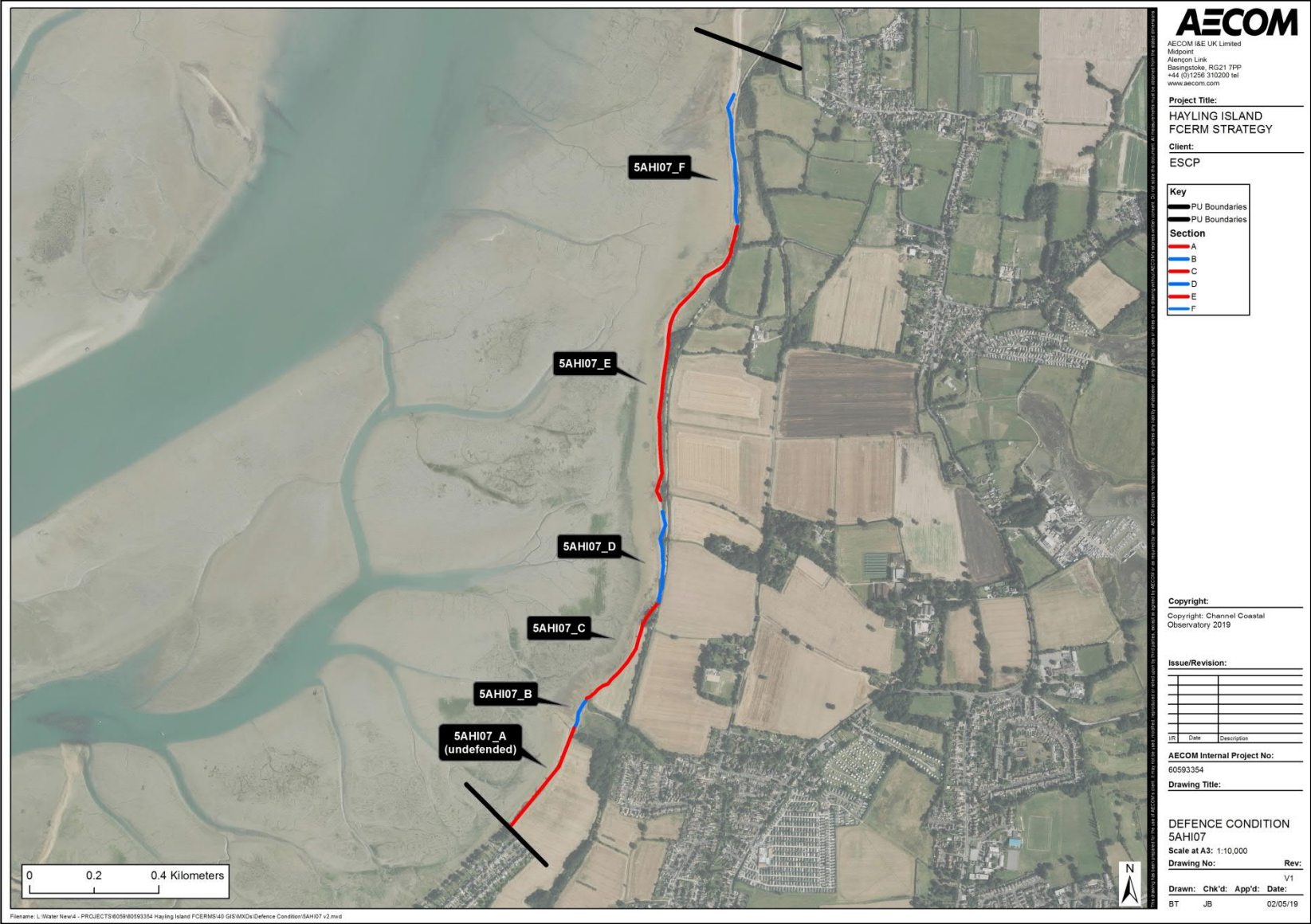











Figure 4-7. Defence Sections along Policy Unit 5AH107



Defence Element:	5AHI07 (Length: 380m)	Defence Section:	A	
Location:	CCMA	Year of Construction:	NA	
Defence Description:				
No formal defence - undefended				
Construction Material:	NA			
Foreshore Description:				
Defence Condition and Grade:	NA	Residual Life (no maintenance):	NA	
NA				
Owner (HBC/P/HA/HCC/EA/SWS/EH):	NA	Maintainer (HBC/P/HA/HCC/EA/SWS/EH):	NA	
Comments:				

Defence Element:	5AHI07 (Length: 95m)	Defence Section:	B	
Location:	Saltmarsh Lane	Year of Construction:	Unknown	
Defence Description:				
Armorloc embankment with 2.5m crest width. Well vegetated on both sides, 1.5m high. Drainage ditch to the rear, leading to the outfall. Assuming to drain the field behind during high tides/events.				
Construction Material:	Armorloc			
Foreshore Description:				
Shingle beach to the toe. Sand and gravel to the middle.				
Defence Condition and Grade:	Good	Residual Life (no maintenance):	15-20 years	
Good (locally fair). Minor settle of crest. Minor movement of the embankment profile. No loss of material. Well vegetated. Small section of the toe has been undermined and in fair condition.				
Owner (HBC/P/HA/HCC/EA/SWS/EH):	P	Maintainer (HBC/P/HA/HCC/EA/SWS/EH):	EA	
Comments:				

Defence Element:	5AHI07 (Length: 385m)	Defence Section:	C	
Location:	Saltmarsh Lane	Year of Construction:	Unknown	
Defence Description:				
Earth embankment with a vertical front face.				
Construction Material:	Earth			
Foreshore Description:				
Gravel and sand to the toe.				
Defence Condition and Grade:	Poor	Residual Life (no maintenance):	<5 years	
Poor condition. Signs of erosion, with cliffing occurring along the whole structure. No vegetation on the front face. Rotational slip of material evident in many locations.				
Owner (HBC/P/HA/HCC/EA/SWS/EH):	P	Maintainer (HBC/P/HA/HCC/EA/SWS/EH):	P	
Comments:				

Defence Element:	5AHI07 (Length: 285m)	Defence Section:	D	
Location:	Billy Trail	Year of Construction:	Unknown	
Defence Description:				
Timber piles with a rear timber backboard				
Construction Material:	Timber			
Foreshore Description:				
Shingle material to the toe.				
Defence Condition and Grade:	Very poor	Residual Life (no maintenance):	<5 years, failed in places	
Very poor. Rear backboard is failing in retaining the billy line path and its embankment material. Timber piles are fair-poor. Number of piles have failed, many are out of alignment. Wet rot in some piles.				
Owner (HBC/P/HA/HCC/EA/SWS/EH):	HCC	Maintainer (HBC/P/HA/HCC/EA/SWS/EH):	HCC	
Comments:				

Defence Element:	5AHI07 (Length: 935m)	Defence Section:	E	
Location:	Billy Trail	Year of Construction:	Unknown	
Defence Description:				
Earth embankment 2-3m high. Vegetated.				
Construction Material:	Earth			
Foreshore Description:				
Shingle to the toe. Seaweed line 1m away from the toe.				
Defence Condition and Grade:	Poor	Residual Life (no maintenance):	<10 years	
Poor. Undermining of the toe. Well vegetated. Local slips of the embankment occurring. Clifing of the crest in many areas.				
Owner (HBC/P/HA/HCC/EA/SWS/EH):	HCC	Maintainer (HBC/P/HA/HCC/EA/SWS/EH):	HCC	
Comments:				

Defence Element:	5AHI07 (Length: 400m)	Defence Section:	F	
Location:	Billy Trail	Year of Construction:	Unknown	
Defence Description:				
Timber pile revetment.				
Construction Material:	Timber			
Foreshore Description:				
Shingle to the toe.				
Defence Condition and Grade:	Very Poor	Residual Life (no maintenance):	Failed	
Failed. Slope behind the revetment has collapsed. Timber piles have been displaced and removed from their alignment vertically and horizontally. 0.5m of land left between the foreshore and billy line trail in some locations.				
Owner (HBC/P/HA/HCC/EA/SWS/EH):	HCC	Maintainer (HBC/P/HA/HCC/EA/SWS/EH):	HCC	
Comments:				

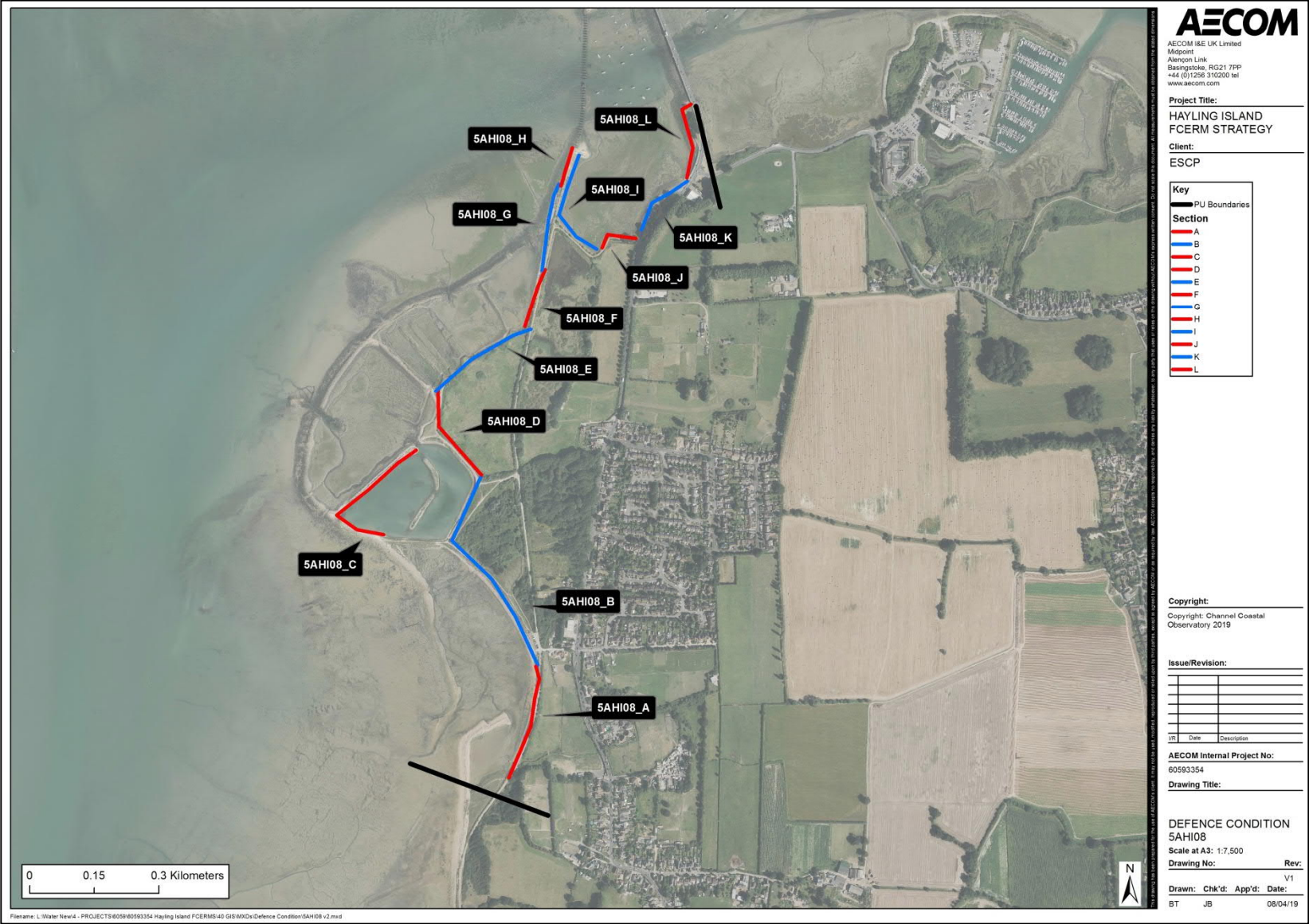









Figure 4-8. Defence Sections along Policy Unit 5AH108


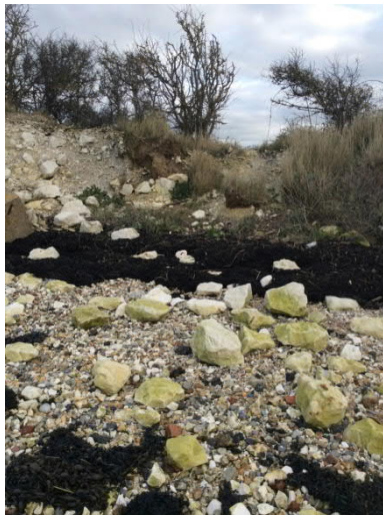
Defence Element:	5AHI08 (Length: 275m)	Defence Section:	A	
Location:	Billy Trail	Year of Construction:	Unknown	
Defence Description:				
Armour lock revetment 2m high.				
Construction Material:	Concrete			
Foreshore Description:				
Grasslands and coarse material at the toe.				
Defence Condition and Grade:	Fair	Residual Life (no maintenance):	10-15 years	
Non uniform. Minor movement and root growth. Toe exposed.				
Owner (HBC/P/HA/HCC/EA/SWS/EH):	HCC	Maintainer (HBC/P/HA/HCC/EA/SWS/EH):	EA	
Comments:				



Defence Element:	5AHI08 (Length: 520m)	Defence Section:	B	
Location:	Oyster Beds	Year of Construction:	Unknown	
Defence Description:				
Vegetated earth embankment.				
Construction Material:	Earth			
Foreshore Description:				
Shingle.				
Defence Condition and Grade:	Fair	Residual Life (no maintenance):	10-15 years	
Unevenly vegetated, locally poor. Clifing of the embankment in many areas. Contaminated land located behind defence.				
Owner (HBC/P/HA/HCC/EA/SWS/EH):	HBC	Maintainer (HBC/P/HA/HCC/EA/SWS/EH):	HBC	
Comments:				

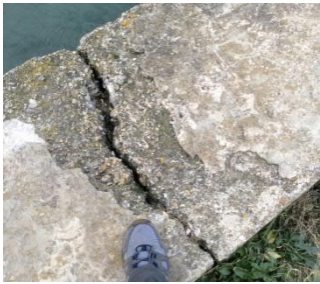



Defence Element:	5AHI08 (Length: 360m)	Defence Section:	C	
Location:	Oyster Beds	Year of Construction:	Unknown	
Defence Description:				
Rock armour breakwater / embankment.				
Construction Material:	Rock			
Foreshore Description:				
Grasslands and coarse gravel material.				
Defence Condition and Grade:	Fair	Residual Life (no maintenance):	10-15 years	
Lack of coherent structure. Missing boulders and voids.				
Owner (HBC/P/HA/HCC/EA/SWS/EH):	HBC	Maintainer (HBC/P/HA/HCC/EA/SWS/EH):	HBC	
Comments:				


Defence Element:	5AHI08 (Length 235m)	Defence Section:	D	
Location:	Oyster Beds	Year of Construction:	Unknown	
Defence Description:				
Rubble revetment.				
Construction Material:	Rubble			
Foreshore Description:				
Coarse shingle material at the toe.				
Defence Condition and Grade:	Poor	Residual Life (no maintenance):	<5 years	
Eroded, overhang. Toe exposed. Contaminated land located behind defence.				
Owner (HBC/P/HA/HCC/EA/SWS/EH):	HBC	Maintainer (HBC/P/HA/HCC/EA/SWS/EH):	HBC	
Comments:				

Defence Element:	5AHI08 (Length: 270m)	Defence Section:	E	
Location:	North-West Hayling/Oyster Beds	Year of Construction:	Unknown	
Defence Description:				
Earth Embankment – 2m high.				
Construction Material:	Rubble			
Foreshore Description:				
Oyster beds, silty mud flats / marsh.				
Defence Condition and Grade:	Fair	Residual Life (no maintenance):	10-15 years	
Vegetated, Locally poor, footpath eroding.				
Owner (HBC/P/HA/HCC/EA/SWS/EH):	HBC	Maintainer (HBC/P/HA/HCC/EA/SWS/EH):	HBC	
Comments:				





Defence Element:	5AHI08 (Length: 145m)	Defence Section:	F	
Location:	North West Hayling	Year of Construction:	Unknown	
Defence Description:				
Rock filled gabion mesh.				
Construction Material:	Wire/rock			
Foreshore Description:				
Shingle material at the toe of structure				
Defence Condition and Grade:	Poor	Residual Life (no maintenance):	<5 years	
Wire split in places, loss of form and shape. Failed in some locations.				
Owner (HBC/P/HA/HCC/EA/SWS/EH):	HCC	Maintainer (HBC/P/HA/HCC/EA/SWS/EH):	HCC	
Comments:				

Defence Element:	5AHI08 (Length: 205m)	Defence Section:	G	
Location:	North West Hayling	Year of Construction:	Unknown	
Defence Description:				
Rubble revetment, 2m high.				
Construction Material:	Rubble			
Foreshore Description:				
Shingle material at the toe.				
Defence Condition and Grade:	Poor	Residual Life (no maintenance):	5-10 years	
Missing sections of rubble blockwork. Evidence of erosion in these locations.				
Owner (HBC/P/HA/HCC/EA/SWS/EH):	HCC	Maintainer (HBC/P/HA/HCC/EA/SWS/EH):	HCC	
Comments:				

Defence Element:	5AHI08 (Length: 92m)	Defence Section:	H	
Location:	North West Hayling	Year of Construction:	Unknown	
Defence Description:				
Concrete Sea wall.				
Construction Material:	Concrete			
Foreshore Description:				
Not visible beneath water level.				
Defence Condition and Grade:	Poor	Residual Life (no maintenance):	5-10 years	
Toe in poor condition, otherwise fair.				
Owner (HBC/P/HA/HCC/EA/SWS/EH):	HCC	Maintainer (HBC/P/HA/HCC/EA/SWS/EH):	HCC	
Comments:				

Defence Element:	5AHI08 (Length: 265m)	Defence Section:	I	
Location:	North Hayling	Year of Construction:	Unknown	
Defence Description:				
Vegetated earthwork embankment.				
Construction Material:	Earth			
Foreshore Description:				
Unable to assess due to water level.				
Defence Condition and Grade:	Fair	Residual Life (no maintenance):	10-15 years	
Fair condition. Non-uniform structure and shape, well vegetated.				
Owner (HBC/P/HA/HCC/EA/SWS/EH):	HCC	Maintainer (HBC/P/HA/HCC/EA/SWS/EH):	HCC	
Comments:				

Defence Element:	5AHI08 (Length: 100m)	Defence Section:	J	No photos available
Location:	North Hayling	Year of Construction:	Unknown	
Defence Description:				
Rock / rubble protection.				
Construction Material:	Rock			
Foreshore Description:				
Shingle material on the foreshore, but unable to access the foreshore due to high water level at time of survey. Therefore a detailed description not possible.				
Defence Condition and Grade:	Fair	Residual Life (no maintenance):	10-15 years	
Scour at toe in places.				
Owner (HBC/P/HA/HCC/EA/SWS/EH):	HCC	Maintainer (HBC/P/HA/HCC/EA/SWS/EH):	HCC	
Comments:				
Areas of the unit are vegetated behind the defence which limits visibility.				

Defence Element:	5AHI08 (Length: 165m)	Defence Section:	K	
Location:	North Hayling	Year of Construction:	Unknown.	
Defence Description:				
Steel sheet piles, cladded on the roadside. Concrete blocks placed at intervals along the seaward side of the piles.				
Construction Material:	Steel			
Foreshore Description:				
Shingle material on the foreshore.				
Defence Condition and Grade:	Good	Residual Life (no maintenance):	15-20 years	
Wear, some minor corrosion to the piles.				
Owner (HBC/P/HA/HCC/EA/SWS/EH):	HCC	Maintainer (HBC/P/HA/HCC/EA/SWS/EH):	HCC	
Comments:				
EA installed sheet piling (cladded in timber) to reduce the risk of erosion to many of the key utilities which serve the island. Estimated cost of £200k.				

Defence Element:	5AHI08 (Length: 190m)	Defence Section:	L	No photos available
Location:	North Hayling	Year of Construction:		
Defence Description:				
Blockwork revetment 2m high.				
Construction Material:	Blockwork			
Foreshore Description:				
Submerged, unable to access.				
Defence Condition and Grade:	Fair	Residual Life (no maintenance):	10-15 years	
Evidence of movement, some blocks missing. Toe submerged.				
Owner (HBC/P/HA/HCC/EA/SWS/EH):	HCC	Maintainer (HBC/P/HA/HCC/EA/SWS/EH):	HCC	
Comments:				
No photos available for this section due to restricted access.				

5. Standard of Protection

To provide an insight into the standard of protection (SoP) of the defences around Hayling Island, with respect to tidal flood risk, the flood model outputs for the present day scenarios (with defences in place) have been interrogated in GIS. Where the flood water from the different return periods appears to flow over the defences, an indicative standard of protection has been identified based on the onset of risk. It should be noted that whilst interrogation of the model outputs in this way can provide an indication of the SoP, no consideration has been made as to how the flooding propagates when behind the defences and the wider flood cell has not been considered.

Equivalencies and estimated rates of sea level rise have been used to project how the standard of protection will decrease over time. For example, should the indicative SoP for the present day be around 75yrs, then this corresponds to approximately a 5yr SoP in 2070. This approach assumes that the defence structures will not be breached over this time period. Should a defence breach, the standard of protection will fall further although the severity of flooding will be related to the land levels behind the defence.

Table 5-1 below shows the lowest return period for each defence where the water appears to overtop the defence structure. This has been used to indicate the present day and future standard of protection of the different defence sections. Where the future SoP is 'unknown', this is because the existing SoP is greater than 200yrs and there is insufficient modelling available for future epochs (simulations with defences in place) to determine how the SoP reduces over time.

The analysis shows that the present day SoP around Hayling Island is highly varied. There are a number of areas where the SoP is below 1:2 years. This is typically found in areas where there are few assets at risk of flooding behind the defences. For example, in policy unit 5AHI02, each of the defence sections is inundated or overtopped by a present day 1 in 2 year event. However, the land immediately behind the defences in this location is agricultural land and fields and few properties are at risk.

By 2120, the vast majority of the existing defences are expected to provide a SoP less than 1:2 years. This is due to climate change and rising sea levels which will increase the frequency that the existing defences are inundated and/or overtopped.

A number of the defences around Hayling Island are outflanked by flood waters from adjacent areas during low return period events. For example, a number of the defence sections in 5AHI04 have defence standards of protection ranging between 20-200 year, but the land behind is flooded regardless from 1:2 year events due to adjacent areas having lower a SoP, allowing the flood water to flow behind the defences. This demonstrates the importance of strategic thinking should long term management options be developed for the frontages.

Table 5-1. Indicative standard of protection

Policy Unit	Defence section	Onset of flooding over defence	Indicative SoP	Notes	Indicative 2040 SoP	Indicative 2070 SoP	Indicative 2120 SoP
5AHI01	A	2yr	<2yr		<2yr	<2yr	<2yr
	B	20yr	5-20yr		2-5yr	<2yr	<2yr
	C	20yr	5-20yr		2-5yr	<2yr	<2yr
	D	50yr	20-50yr		5-20yr	<2yr	<2yr
	E	50yr	20-50yr		5-20yr	<2yr	<2yr
	F	200yr	75-200yr		50-75yr	2-5yr	<2yr
	G	>200yr	>200yr		Unknown	Unknown	Unknown
	H	Unknown – buried by beach	Unknown		Unknown	Unknown	Unknown
	I	75yr	50-75yr		5-20yr	2-5yr	<2yr
	J	500yr	500yr		Unknown	Unknown	Unknown
	K	2yr	<2yr		<2yr	<2yr	<2yr
5AHI02	A	2yr	<2yr		<2yr	<2yr	<2yr

Policy Unit	Defence section	Onset of flooding over defence	Indicative SoP	Notes	Indicative 2040 SoP	Indicative 2070 SoP	Indicative 2120 SoP
5AHI03	B	2yr	<2yr		<2yr	<2yr	<2yr
	C	2yr	<2yr		<2yr	<2yr	<2yr
	D	2yr	<2yr		<2yr	<2yr	<2yr
	E	2yr	<2yr		<2yr	<2yr	<2yr
	A	>200yr	>200yr	Outflanking from 5-20yr	Unknown	Unknown	Unknown
	C	2yr	<2yr		<2yr	<2yr	<2yr
	D	2yr	<2yr		<2yr	<2yr	<2yr
	E	2yr	<2yr		<2yr	<2yr	<2yr
	F	20yr	5-20yr		2-5yr	<2yr	<2yr
	G	20yr	5-20yr		2-5yr	<2yr	<2yr
	H	75yr	50-75yr	Outflanking from 20yr	5-20yr	2-5yr	<2yr
	I	20yr	5-20yr	Source from creek/outfall	2-5yr	<2yr	<2yr
	J	20yr	5-20yr		2-5yr	<2yr	<2yr
	K	20yr	5-20yr		2-5yr	<2yr	<2yr
	A	2yr	<2yr		<2yr	<2yr	<2yr
	B	20yr	5-20yr		2-5yr	<2yr	<2yr
	C	200yr	75-200yr	Outflanking from 2yr	50-75yr	2-5yr	<2yr
	D	20yr	5-20yr	Outflanking from 2yr	2-5yr	<2yr	<2yr
	E	50yr	20-50yr	Outflanking from 2yr	5-20yr	<2yr	<2yr
5AHI04	F	20yr	5-20yr	Outflanking from 2yr	2-5yr	<2yr	<2yr
	H	2yr	<2yr		<2yr	<2yr	<2yr
	I	2yr	<2yr		<2yr	<2yr	<2yr
	J	>200yr	>200yr		Unknown	Unknown	Unknown
	K	>200yr	>200yr		Unknown	Unknown	Unknown
	L	2yr	<2yr		<2yr	<2yr	<2yr
	M	2yr	<2yr		<2yr	<2yr	<2yr
	N	500yr	500yr		Unknown	Unknown	Unknown
	A	2yr	<2yr		<2yr	<2yr	<2yr
	C	2yr	<2yr		<2yr	<2yr	<2yr
	E	>200yr	>200yr		Unknown	Unknown	Unknown
5AHI05	F	>200yr	>200yr		Unknown	Unknown	Unknown
	G	>200yr	>200yr		Unknown	Unknown	Unknown
	I	>200yr	>200yr		Unknown	Unknown	Unknown
	J	>200yr	>200yr		Unknown	Unknown	Unknown
	L	200yr	75-200yr		50-75yr	2-5yr	<2yr
	O	2yr	<2yr		<2yr	<2yr	<2yr
	Q	2yr	<2yr		<2yr	<2yr	<2yr
	R	2yr	<2yr		<2yr	<2yr	<2yr
	T	20yr	5-20yr		2-5yr	<2yr	<2yr
	U	5yr	2-5yr		<2yr	<2yr	<2yr
	V	2yr	<2yr		<2yr	<2yr	<2yr

Policy Unit	Defence section	Onset of flooding over defence	Indicative SoP	Notes	Indicative 2040 SoP	Indicative 2070 SoP	Indicative 2120 SoP
5AHI06	A	2yr	<2yr		<2yr	<2yr	<2yr
	B	5yr	2-5yr		<2yr	<2yr	<2yr
	C	5yr	2-5yr		<2yr	<2yr	<2yr
	D	2yr	<2yr		<2yr	<2yr	<2yr
	E	2yr	<2yr		<2yr	<2yr	<2yr
	F	2yr	<2yr		<2yr	<2yr	<2yr
	G	5yr	2-5yr		<2yr	<2yr	<2yr
5AHI07	B	2yr	<2yr		<2yr	<2yr	<2yr
	C	20yr	5-20yr		2-5yr	<2yr	<2yr
	D	20yr	5-20yr		2-5yr	<2yr	<2yr
	E	20yr	5-20yr		2-5yr	<2yr	<2yr
	F	20yr	5-20yr		2-5yr	<2yr	<2yr
5AHI08	A	2yr	<2yr		<2yr	<2yr	<2yr
	B	2yr	<2yr		<2yr	<2yr	<2yr
	C	Not in model	Not in model		Not in model	Not in model	Not in model
	D	200yr	75-200yr		50-75yr	2-5yr	<2yr
	E	500yr	>200yr		Unknown	Unknown	Unknown
	F	50yr	20-50yr	Outflanking from 2yr	5-20yr	<2yr	<2yr
	G	50yr	20-50yr		5-20yr	<2yr	<2yr
	H	Not in model	Not in model		Not in model	Not in model	Not in model
	I	5yr	2-5yr		<2yr	<2yr	<2yr
	J	5yr	2-5yr		<2yr	<2yr	<2yr
	K	2yr	<2yr		<2yr	<2yr	<2yr
	L	500yr	>200yr		Unknown	Unknown	Unknown

6. Residual life

The estimated residual life of the defences around the island is summarised in Figure 6-1 overleaf. Table 6-1 below presents a percentage breakdown of the defences on the island by defence length and condition. Note that this does not include the undefended or inaccessible areas and the groynes as the length of these sections and the groynes was not measured during the survey. In addition, the buried seawall in section 5aHI05_H is also not included in the percentage breakdown or in Figure 6-1 as the defence condition and residual life are not known.

Approximately 30% of the defence are estimated to be in a poor or very poor condition, 41% in a fair condition and approximately 29% in a good or very good condition (%'s by defence length).

Table 6-1. Defence condition lengths (excluding groynes)

Defence condition	Length (m)	Length (%)
Very Poor	1,500	6
Poor	5,800	24
Fair	9,850	41
Good	6,200	26
Very Good	700	3



Figure 6-1. Estimated residual life of the defences

7. Discussion of Critical Areas

7.1 Introduction

Based on the information presented in the previous chapters, the following frontages have been identified as critical areas which warrant further attention from the landowners and will also require consideration as part of the development of an FCERM Strategy. Critical areas have been identified where:

- extensive lengths of defence are in a poor or very poor condition;
- there is evidence of recent or potential future defence failure;
- Areas are currently undefended and the hinterland contains residential buildings or contaminated land.

At this stage, identification of critical areas has not considered the standard of protection or flood risk behind the defences. This is considered as a separate issue to the condition of the defences, and prioritising areas where it is recommended that defences are raised will be informed by an economic appraisal.

7.2 5AHI01 – sections D, G and K

Section D, G and K are considered to be critical areas as the defence condition is poor. In each area there are no properties immediately behind the existing defences. However, each area is publicly accessible and therefore if the defence was to fail it could create a hazard from a health and safety perspective. In addition, section K has an area of contaminated land behind the defence and in order to prevent the exposure of the potentially contaminated materials in this location it will be necessary to maintain or improve the defence. Currently the defence has failed in a number of locations (see Figure 7-1) and there is evidence of contaminated land eroding behind.



Figure 7-1. Photographs of defences in 5AHI01 K

7.3 5AHI02 – sections A-E

The frontage between Sections A and E (Northney Farm) is considered to be a critical area. Here the privately-owned defences have already failed in places as demonstrated by the photographs in Figure 7-2. Whilst there are no properties immediately behind the defences which would be at risk of erosion, should the defences breach there is a large area of relatively low lying farm land behind which could be inundated frequently. In addition, should a large flood event occur there is potential for the flood cell to extend westwards increasing flood risk to properties in Northney. The owners of the defence have undertaken patch and repair works but this is not considered to be a sustainable long term approach.



Figure 7-2. Photographs of failed defences between 5AH102 A-E

7.4 5AH103 – section H and J

Parts of the defences at section H (Tournurbury Golf Club) and section J (Tournurbury Woods Estate) are in a poor condition. The defence consists of an earth embankment with rubble placed along the toe of the structure. Some sections of the defence are actively eroding and there is evidence of slips occurring in some areas along section H. The defences are privately owned and for section H the owner regularly maintains the structure as and when required; for example, the owner has undertaken partial patch repairs with clay material over the past 6 months to prevent a breach of the embankment.

7.5 5AH104 – section A and G

The defence along Section A at Wilsons Boatyard is a concrete in-situ wall. The structure is in a poor condition with significant structural cracks in the lateral direction. The boatyard area is situated immediately behind the defence and would be at risk of erosion should the defence fail.

Section G is comprised of a natural verge and there is not a formal defence in this location. It is difficult to provide a condition grade to a natural verge but it is showing signs of erosion in many locations. In this unit there are areas of contaminated land and therefore given the actively eroding shoreline this area has been included within the critical areas.



Figure 7-3. Photograph of 5AH104 section A showing lateral crack

7.6 5AH105 – numerous sections

Rock armour revetment E

The rock armour revetment in section E is in a poor/fair condition; there is evidence of deformation and movement of the structure and a loss of retained material and rocks at the crest. During the survey cliffing of the material immediately behind the structure was observed which indicates erosion and could pose a risk to public health and safety.

Timber revetment M

The timber revetment in section M is in a poor condition with numerous planks missing and rotten material. The revetment is located mid-way up the beach and is acting to hold back material from the lower beach. Should the structure fail, a greater proportion of the upper beach material could be drawn down onto the lower beach, potentially exposing the area behind to greater erosion.

Rock armour and concrete blockwork O and S

In section O the rock armour revetment has lost its structure and intended alignment. The toe has been undermined and there is sporadic coverage of rocks across the beach area. In section S the concrete blockwork has failed, and the structure has lost its integrity and breached in several locations. The car park behind the defence appears to be at risk of erosion. The photographs in Figure 7-4 show the poor condition of the defences in these locations.



Figure 7-4. Photographs of rock revetment and concrete blockwork in 5AH105

Timber groynes 35, 55, 56, 57 and 59

Generally the timber groynes in unit 5AH105 are in a good or very good condition. However, there are exceptions where individual groynes are in a poor or very poor condition due to broken or rotted panels; the photographs shown in Figure 7-5 show examples where panels are missing. Whilst a small number of individual panels missing from a limited number of the groynes is unlikely to significantly reduce the performance of the groyne field, exposed bolts and fittings or splintered timber could pose a risk to public health and safety. Since undertaking the survey it is understood that repair work has been undertaken on the HBC owned groynes to reduce the H&S risk in the identified locations.

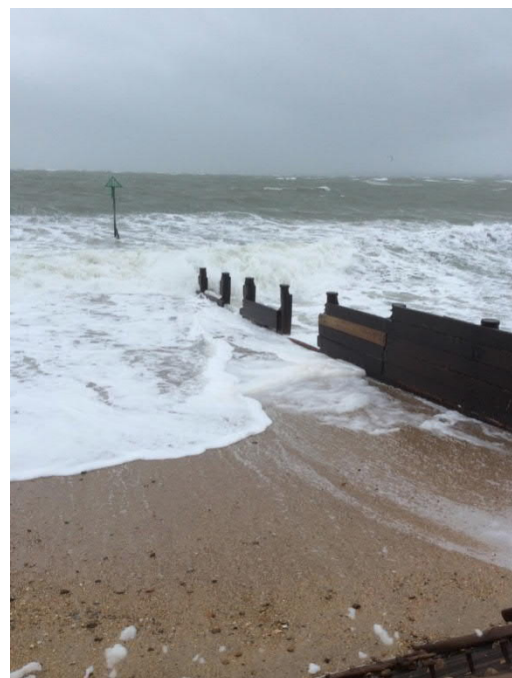
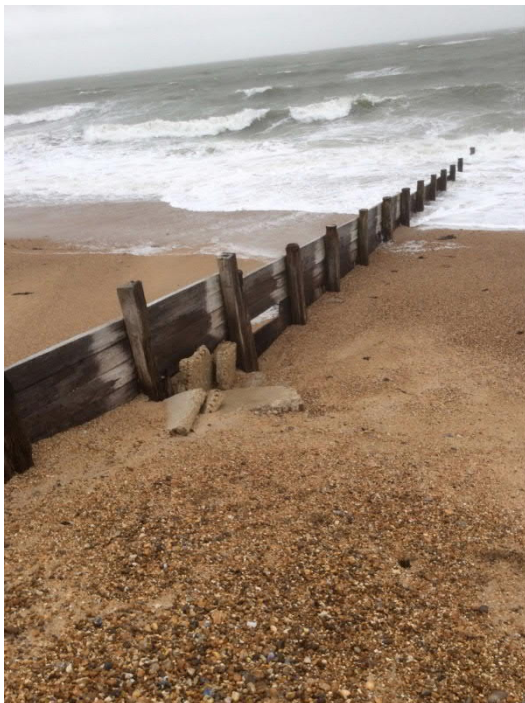


Figure 7-5. Photographs of groynes in unit 5AH105

7.7 5AH107 – sections C-F

The defences in 5AH107 along sections C to F are in a poor or very poor condition. The majority of the frontage is comprised of an earth embankment which is generally well vegetated. However, the embankment is showing signs of undermining at the toe and there are numerous slips that have occurred.

In sections D and F timber defences have been installed to help reduce erosion of the embankment. However, the timber defences have largely failed, rotated or undermined and the embankment behind has continued to erode. The photographs in Figure 7-6 demonstrate this.

The Billy Line footpath runs parallel to the defences in this unit and is likely to be at risk of erosion when the defences fail. Given the poor condition of the defences here, the area has been identified as a critical area. However, the SMP policy for this section of frontage is NAI and therefore, should this management approach be implemented, it will not be necessary to maintain or improve the defences to protect the Billy Line footpath. The Strategy will explore the options in this area and identify the most suitable way forward.



Figure 7-6. Timber defences in sections D and F

7.8 5AH108 – numerous sections

Rubble revetment D and G

The rubble revetment in sections D and G are in a poor condition. The toe of the structure is exposed and the residual life is expected to be less than 5 years. The Billy Line footpath is adjacent to this defence and would be at risk of erosion should the defence fail.

Gabions F

In section F the earth embankment is protected by rock gabions at its toe. These gabions are in a poor condition with the wire split in numerous places and the form of the structure is being lost. Figure 7-7 illustrates a section of the failed gabions, alongside a photograph of the rubble revetment in section D.

Seawall H

The toe of the seawall in section H is in a poor condition. There are substantial structural cracks and a loss of fill material behind the seawall.

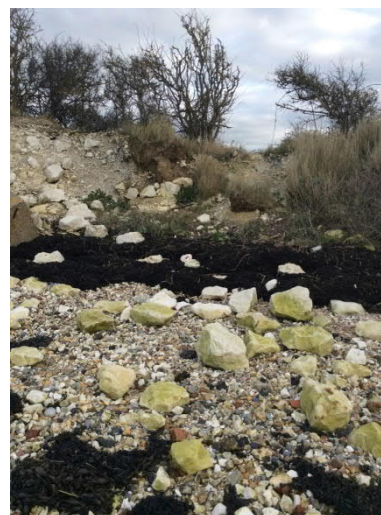


Figure 7-7. Defence in section D and gabions in section F

7.9 Summary

A map showing the critical area locations around Hayling Island is provided in Figure 7-8. The critical areas are where the defence condition is considered to be poor. No consideration of the standard of protection or the flood risk behind the defences has been made in the definition of the critical areas.



Figure 7-8. Location of critical areas

