ENVIRONMENTAL CHECKLIST								
PROJECT TITLE	PDU4: Southwold	PROJECT REFERENCE						
LOCATION AND GRID REFERENCE(S)	Southwold is located on the south west coast of England in the county of Suffolk. TM510762							
DESCRIPTION	Southwold is a historic town on the north Suffolk coast, fronted by sea on its eastern edge and by the River Blyth estuary to the south. The frontage is protected from erosion and possible breach by means of seawall/promenade and timber groyne field. Present beach levels are low and becoming more volatile, particularly along the Easton Marshes frontage, where the steel toe piling has become exposed and seawall is at imminent risk from undermining.							
APPROXIMATE SITE LENGTH/AREA	Dependant on final option	Dependant on final option						

ITEM	NO	YES	?	COMMENT/ACTION REQUIRED	
1. STATUTORY DESIGNATIONS					
a) Are there any statutory designated areas (for nature conservation or landscape) in the vicinity of the site (e.g. SPA, SAC, SSSI, NNR, LNR, AONB etc.)? When judging 'vicinity' it is important to consider factors such as the level of protection afforded the protected area, as well as its sensitivity and/or vulnerability. For example a major proposal involving the potential release and subsequent transfer of pollutants into a protected area via a network of watercourses will require the assessor to consider protected areas a considerable distance (e.g. 2km) from the site.		$\boxtimes$		<ul> <li>Within a 2km buffer zone:</li> <li>Pakefield to Easton Bavents SSSI (ref. 1083279), less than 1m from the north of the site of proposed works: nationally important geological exposures of the Lower Pleistocene Norwich Crag Formations and associated Pleistocene vertebrate assemblages, and the coastal geomorphology of Benacre Ness. This site is also nationally important for its vegetated shingle, saline lagoons, flood-plain fens, an assemblage of nationally rare or nationally scarce vascular plants, scarce breeding birds, foulbreeding bird assemblages in four different habitats and wintering bittern (Botaurus stellaris). Units within study area are: 1. Unfavourable recovering earth heritage; 2. Favourable earth heritage; 9. Unfavourable no change fen, marsh and swamp – lowland; 14. Favourable fen, marsh, and swamp – lowland.</li> <li>Minsmere-Walberswick Heaths and Marshes SSSI (ref. 1001860), 240m south from the site of proposed works: complex series of habitats, notably mudflats, shingle beach, reedbeds, heathland and grazing marsh. Mudflats form sheltered feeding ground for wildfowl and shorebirds, shingle beach supports variety of scarce shingle plants and reedbeds form an important breeding habitat for birds and insects. Units within the study area are: 10. Favourable neutral grassland – lowland; 11. Unfavourable recovering neutral grassland is ediments; 84. Unfavourable no change supralittoral sediment; 85. No condition assessment undertaken supralittoral sediment; 85. No condition assessment undertaken supralittoral sediment; 85. No condition assessment undertaken supralittoral sediment and 87. Unfavourable declining supralittoral sediment; 85. No condition assessment undertaken supralittoral sediment; 85. No condition assessment undertaken supralittoral sediment; 85. No condition assessment undertaken supralittoral sediment and 87. Unfavourable declining supralittoral sediment; 9. No condition assessment undertaken supralittoral sediment and 87. Unfavourable coreoped works: designated</li></ul>	

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ITEM	NO	YES	?	COMMENT/ACTION REQUIRED
				<ul> <li>Benacre to Easton Bavents SPA (ref. UK9009291), located 1.3km north of the site of proposed works.</li> <li>Benacre NNR (ref. 1006015), located 1.8km north of site of proposed works: over 100 species of bird breeding here. Typical East Anglian shingle flora is found along the shore. Northern dunes support extensive areas of sheep-bit and rare grey hair grass. Reedbeds support variety of scarce fauna</li> <li>Suffolk Coast NNR (ref. 1009527), located 1.5km to the west of the site of proposed works: reserve has rich beach flora while wetlands are home to marsh sow thistle, bog pimpernel, sneezewort, lousewort, bog bean, frog-bit and greater bladder wort. Resident wildlife includes otters and 5 species of deer and natterjack toads have been re-introduced to the area. 280 species of bird recorded.</li> <li>Southern North Sea CSAC (ref. UK0030395), located immediately seaward of site of proposed works, identified as an area of importance for harbour porpoise (<i>Phocoena phocoena</i>)</li> <li>Outer Thames Estaury SPA (ref. UK9020309), located immediately seaward of the site of proposed works, designated for the population, common tern (<i>Sterna hirundo</i>) (2.66% of GB population), common tern (<i>Sterna hirundo</i>) (2.66% of GB population), and little tern (<i>Sternula albifrons</i>) (19.64% of GB population), those relevant to the site include: coastal market towns; low-lying freshwater marshes; the coast itself; and shingle beaches backed by sandy beaches.</li> <li>See attached constraints map for location of these designations. NB: cSAC is present up to high water line, however is omitted from the constraints plan due to inaccurate geospatial data which would not reflect its location.</li> </ul>
<ul> <li>b) Are there any non- statutory designated areas (for nature conservation)in the vicinity of the site (e.g. CWS, SINC, LWS)</li> </ul>				There are over 900 non-statutory sites of nature conservation within the county of Suffolk, exact location of these sites and their reason for citation should be requested from Suffolk Biodiversity Information Services.
c) Does the site sit within a conservation area (as designated by Local Authority)?				Southwold is a conservation area designated by the Suffolk Coastal District Council for its medieval history and fishing industry that has been present in the town for over 1000 years as well its many greens, the informal street layout, the small scale of the building, and the classical detail of the buildings, among other things. Map of conservation areas can be found in Appendix A. Conservation area does not cover the frontage, however construction works may impact on the setting of the conservation area
<ul> <li>d) Are there any trees subject to an individual or group Tree Preservation Order which may be affected by the works? (Also consider potential physical damage to tree and/or tree root protection areas as well as removal or pruning).</li> </ul>				All trees within the conservation areas will likely contribute to the value of the conservation area. Locations of trees protected by TPOs should be confirmed with Waveney District Council
e) Are there any statutory ecological designations relating to the Habitats Regulations?				There are 2 SACs and 2 SPAs as well as a cSAC present within 2km of the study area. See 1a) for further details on these.

	ITEM	NO	YES	?	COMMENT/ACTION REQUIRED	
2.	NOISE					
a)	Are there likely to be noise (or vibration) levels associated with activities on the site which would adversely impact the surrounding land-users (residential, institutional, industrial or commercial)?				Levels of noise and vibration and the extent of their impacts on local population will be dependent on the preferred option. The site of works is located in close proximity to the village of Southwold, which comprises of residential properties and commercial properties, which have a reliance on tourism for their economy. Noise and vibration during construction should be mitigated against using best practice methodologies. However, there will be no noise or vibration during operation of the assets.	
3.	LOCAL AIR QUALITY					
a)	Are there likely to be significant sources of emissions to the atmosphere associated with the proposed activities or any generation of odour/dust which could be detected off- site?				Level of emissions will be dependent on the preferred option and will be related to construction phase of the scheme only. These emissions will be minimised using best practice methodologies. There will be no change in emissions in operation of the scheme.	
b)	Is the proposal in the vicinity of an AQMA?	$\boxtimes$			No.	
4.	LANDSCAPE/TOWNSC APE					
a)	Are there likely to be significant alterations to the landscape and visual character of the site and its surrounding area?				The list of options will be implementing options that will be largely similar to the defences which are currently present. Any new structures that will be constructed should be designed sympathetically with the local area. A landscape assessment should be undertaken to assess the landscape impacts of the preferred option.	
b)	Is development of the site likely to lead to changes in artificial lighting which might change the character of the site or surrounding area at night?				There will be no additional lighting during the operation of the preferred option. Any site lighting required during construction should be kept to a minimum and directed downwards to minimise impact on surrounding.	
5.	HERITAGE OF HISTORIC RESOURCES					
a)	Are there any designated or non- designated objects of historical, archaeological scientific or cultural importance on or near the site which might be affected by the proposed development of the site?				The Suffolk Historic Environment Record has 215 records of designated and undesignated items of archaeological interest within 2km of the site of proposed works.	
b)	Are there any Listed Buildings, Scheduled Monuments or World Heritage Sites within or adjacent to the site that may be affected (physically or visually) by the works?				There is a high number of Listed Building, with a high density of these within the village of Southwold. A full list of buildings are shown in Appendix B. It is unlikely that any of these will be physically impacted by works, however the setting of the assets may be impacted by changes in landscape which may occur as a result of this scheme.	
6.	BIODIVERSITY					

ITEM	NO	YES	?	COMMENT/ACTION REQUIRED
a) Has the site been assessed by a qualified ecologist to determine its ecological potential?				An ecological assessment of the site should be undertaken as part of the next stage of scheme in order to inform the optioneering process.
<ul> <li>b) Will it be necessary to cut back or remove vegetation (e.g. trees, scrub, shrubs, grass etc.) from the site, or is any physical damage to tree and/or tree root protection areas likely to occur?</li> </ul>				The extent of vegetation clearance required will be determined following selection of the preferred option and related construction methodology. Any vegetation clearance will require further assessment and potential mitigation requirements dependant on the extent and nature of the vegetation that will be removed.
c) Will any buildings, structures and/or watercourses be impacted or affected by the proposals? (If 'YES' their potential as habitat for protected species should be checked by an ecologist)?				The structures that make up the sea defences will be affected by the proposed works. They should be assessed for habitat potential in order to inform optioneering.
7. WATER ENVIRONMENT				
1. Surface Waters				
<ul> <li>a) Are there any surface water bodies on or in the immediate vicinity of the site (including year-round and seasonal streams, saltwater, lakes, ponds, wetlands)?</li> </ul>				Southwold is coastal town, on the coast of the North Sea. The River Blyth enters the North Sea to the south, the Buss Creek is located to the west. There are multiple open waterbodies in close proximity to the site. It is unlikely that any of the waterbodies will be directly impacted, other than the North Sea. Southwold boating lake is a manmade waterbody at the northern extent of Southwold and approximately 73m from the site of proposed works.
<ul> <li>Will the project require any work in or adjacent to (say within 100m) of the described waters?</li> </ul>				As the proposed works are coastal defences, so all of the short-list options are located directly adjacent to a waterbody, i.e. the North Sea.
<ul> <li>c) Will site drainage (including temporary drains) create a preferential pathway to surface waters?</li> </ul>				This will be dependent on the final option and the preferred construction methodologies.
d) Will the proposal require surface water withdrawals or diversions or use of dewatering or coffer dams?				This will be dependent on the final option and the preferred construction methodologies.
e) Does the proposal lie within an Environment Agency defined Flood Zone (as specified on EA Flood Maps)?				The extent of the flood risk is shown in appendix C.
<li>f) Does the proposal involve or pose a risk of any discharges of</li>				Risk of waste material being discharged into surface water should be minimised using best practice methodologies.

	ITEM	NO	YES	?	COMMENT/ACTION REQUIRED	
	waste materials to surface waters?					
	2. Ground Water					
a)	Will ground water be withdrawn, or will water be discharged to ground water?				This will not be required as part of this scheme.	
b)	Could the proposed project create a pathway to groundwater through previously impermeable materials (e.g. piles through clay)?				This will not be required as part of this scheme.	
c)	Are there any Environment Agency Groundwater Source Protection Zone aquifers within the site?				The closest source protection zone is approximately 1.7km north west of the site.	
	3. Water Runoff					
a)	Is there likely to be runoff, including storm water from the proposed development?				Volume of run off will be dependent on the preferred option. Beach recharge will result in a high volume of run off. The impacts of this will require mitigation and should be considered through the optioneering of this scheme.	
b)	Is the runoff likely to become contaminated by substances it encounters on site?				The extent of contamination of the site is currently unknown and will require assessment which will inform the optioneering of this scheme.	
c)	Are significant changes to the total area of impervious surfaces envisaged?				This will be dependent on the preferred option and should be minimised as part of the design. The potential impacts of additional hard standing structures must be taken into consideration during the optioneering stage.	
	4. Water Framework Directive					
a)	Are there any WFD Water bodies which may be impacted by the proposed works?				The only WFD waterbody in close proximity is Suffolk, part of Suffolk TRaC operational catchment.	
b)	What is the WFD Baseline(s) for the waterbodies stated in question 4a?				Suffolk (GB650503520002), coastal waterbody, heavily modified. The overall waterbody classification is moderate with good chemical and ecological moderate status. The moderate ecological status is a result of dissolved inorganic nitrogen which is due to poor nutrient management, sewage discharge, and livestock. This waterbody is within the Suffolk TRaC operational catchment, and the Anglian management catchment.	
c)	Are there ary WFD Protected Areas identified for the aforementioned waterbodies?				This waterbody is linked to the following WFD protected areas:Outer Thames Estuary SPA (UK9020309)661 Nitrates Vulnerable Zone (NVZ12SW016610)Minsmere to Walberswick Heaths & Marshes SAC (UK0012809)Minsmere-Walberswick SPA (UK9009101)413 Nitrates Vulnerable Zone (NVZ12SW014130)Ordfordness-Shingle Street SAC (UK0014780)Alde-Ore Estuary SPA (UK9009112)Alde-Ore Estuary SAC (UK0030076)660 Nitrates Vulnerable Zone (NVZ12SW016600)	

ITE	M	NO	YES	?	COMMENT/ACTION REQUIRED
					Lowestoft (South of Claremont Pier) Bathing Water (UK10800) Lowestoft (North of Claremont Pier) Bathing Water (UK10750) Benacre to Easton Pavents SPA (UK9009291) Southwold The Denes Bathing Water (Uk10850) Benacre to Easton Bavents Lagoons SAC (UK0013104) Southwold the Pier Bathing Water (UK10830)
d) Are there a operationa mitigation	any al or local I measures		$\boxtimes$		According to the EA Catchment Data Explorer there are no operational measures applicable to the Suffolk TRaC operational catchment.
8. CONTAMI	NATED LAND				
a) Is there ev suspicion f are contamina soils on sit	vidence or that there ated/polluted te?				There is a historic landfill approximately 1.2km west of the site. Presence/absence of contaminated material within the site of proposed works should be confirmed prior to construction phase of works. If any contaminated material is encountered during construction, then material must be assessed and disposed of appropriately. A site waste management plan should be developed by the contractor
b) Is there lik risk of pro activities of leading to contamina during cor operation	kely to be a posed on site soil ation either nstruction or ?			$\boxtimes$	All material used in the implementation of the preferred option must be confirmed to be uncontaminated. This includes any material used in beach recharge.
9. WASTE AN MATERIAI	ND LS USAGE				
a) Does the p require a S Managem	project Site Waste Jent Plan?				A site waste management plan should be produced by the contractor
<ul> <li>b) Are there to minimis arisings th recycling o site/elsew</li> </ul>	opportunities se waste prough or re-use on vhere?				This will be dependent on the preferred option but opportunities for this should be considered throughout the optioneering stage.
c) Are there to specify recycled m place of vi materials?	opportunities secondary or naterials in irgin ?				This will be dependent on the preferred option.
d) Do waste activities o require an environme or a waste	handling on site 1 ental permit 2 exemption?				This will be dependent on the preferred option, the preferred construction methodologies and the presence/absence of any contamination within the waste.
10. OTHER					
Traffic					
<ul> <li>a) Are propo constructi operation to significa in traffic (r the volum of existing the road c</li> </ul>	isals for ion or likely to lead ant increases relative to the and nature traffic and rapacity)?				Southwold is a small settlement with a road network that is built on historic tracks and lanes, the majority of which are residential. There is a significant amount of tourism to the area in the summer months due to the beaches and the access to bathing water and so local traffic will be increased by tourist traffic during the summer months. Large construction plant and regular HGV movement to and from the site will likely increase the traffic in the area.
<ul> <li>b) Are propolikely to lessignificant</li> <li>to existing</li> <li>networks</li> <li>(delays/divures)?</li> </ul>	esed activities ead to t disruption g transport versions/clos				The works will require heavy construction plant and HGV movements around Southwold which is made up of a network of narrow, residential roads which may be disrupted as a result of the construction activities. Particularly the A1095, which is the major link road into and out of Southwold.
Local Com	nmunity				

ITEM	NO	YES	?	COMMENT/ACTION REQUIRED	
a) Would the proposed development physically divide an already established community?				This will not occur as a result of this project.	
<ul> <li>b) Is development of the site likely to restrict or prohibit existing or potential recreational activities or amenity value on or near the site?</li> </ul>				As the works are related to the coastal defences, there is likely requirement to restrict access to the beaches at various points throughout the construction phase of the scheme. This will however be temporary and only required during the construction phase.	
c) Are there any other significant social or economic considerations?		$\boxtimes$		Southwold is a key tourist destination, and this makes up a significant part of the local economy. The preferred option should not limit this economic capability, additionally, the construction phase of the scheme should be undertaken at times which would minimise impacts of beach closures on the local economy. Fishing remains a significant industry within the area. There may be some disruption to static fishing gear and to fisherman if there is requirement for delivery of materials by barge.	
11. PLANNING					
a) Will the scheme require a planning application?			$\boxtimes$	This will be dependent on the final preferred option.	
b) Is the scheme likely to require EIA?			$\boxtimes$	This will be dependent on the final preferred option.	
c) Is the scheme likely to require any other consents?		$\boxtimes$		See below for full list of consents likely to be required as part of this scheme.	
ADDITIONAL INFORMATION					
Consents likely to be required	<ul> <li>Agreement with Natural England regarding works within and in close proximity to SSSI, SAC and SPA.</li> <li>CROW SSSI (Appendix 11 form) and HR01 and HR02 forms</li> <li>Landowner access consent</li> <li>MMO licence for works on the shoreline</li> <li>Environment Agency permit to work in a flood risk zone</li> </ul>				
Consultation likely to be required	<ul> <li>Natural England agreement as part of HRA process</li> <li>EIA Screening opinion from the Suffolk Coastal District Council</li> <li>Engagement with local landowners and business owners regarding access</li> <li>NEAS officers, including cultural heritage and landscape specialists.</li> <li>English Heritage and Waveney District Council conservation officer</li> <li>Suffolk Coast &amp; Heaths AONB regarding works within the AONB and to the Suffolk Coast Path</li> <li>Engagement with MMO regarding works on the shoreline</li> </ul>				
EA has a requirement for 40% reduction in carbon emission from the baseline target (between Gateway 3 and 4). Is this achievable?	A baseline carbon management tool should be populated at the next stage of assessment using details of the short-listed options in order to establish the extent of carbon reductions that can be achieved.				

ITEM	NO	YES	?	COMMENT/ACTION REQUIRED				
	<ul> <li>Multiple local, national and internationally protected nature conservation sites, both terrestrial and marine <ul> <li>permission for works both within and in close proximity to these will be agreed along with required mitigation.</li> </ul> </li> <li>Historic town with a high density of Listed Buildings and a conservation area, and the frontage of Southwold is a heritage coastline – further study will be required on the impact on the seascape and the design of any</li> </ul>							
Summary of key constraints/ potential issues	<ul> <li>Beach water limit t</li> <li>Suffol const</li> <li>Road South const</li> </ul>	frontage of a of excellent he access to t k Coastal Pa rain the use o infrastructure wold to wide ruction plant	St be sympa Southwold i standard. Lo the beach fr th runs par f this path. e is made u er area (A1 will likely im	is a popular tourist destination during summer months designated bathing bocal economy is reliant on this tourist industry – proposed works shouldn't ontage and must not impact on the bathing water quality. rallel with the shoreline within Southwold. Preferred option should not up of narrow residential roads with only one major link road connecting 095) – increase in volume of traffic and movement of HGV and heavy poact on local traffic during the construction phase of any scheme.				
	<ul> <li>Site of proposed works is in close proximity to residential areas, a primary school and many small businesses such as cafes, pubs, and restaurants – noise and vibration should be minimised throughout the construction phase of works</li> <li>Works are in close proximity to a WFD waterbody that is linked to multiple protected areas – the scheme must not negatively impact the status of this waterbody or the protected area and must not constrain its</li> </ul>							
	<ul> <li>potential to reach good status.</li> <li>Southwold falls into the Suffolk Coasts and Heaths AONB – preferred option should maintain the landscape value of the site</li> <li>There may be requirements for temporary closure or diversion of PROWs during works.</li> </ul>							
Summary of key actions required	<ul> <li>Engag natior</li> <li>Under intern HR02</li> <li>Obtair record</li> <li>Under be pre</li> <li>Engag they r</li> <li>Identii invest</li> <li>Effect assess</li> <li>WFD I</li> <li>Carbo FRIC (</li> </ul>	<ul> <li>Engage with Natural England to obtain appropriate consents regarding works which may impact on the nationally and internationally designated sites.</li> <li>Undertake HRA once preferred option is decided upon to establish potential impacts on the internationally protected sites. Consents that are likely to be required are the CROW SSSI and HRO1 at HRO2 under the Habitat Regulations.</li> <li>Obtain information regarding locally designated sites of biodiversity interest and protected species records from Suffolk Biodiversity Information Service.</li> <li>Undertake ecological surveys throughout the area to identify protected habitats and species which m be present in the area which may constrain works.</li> <li>Engage with Marine Management Organisation regarding works on the shoreline and any requiremer they may have.</li> <li>Identify risk of encountering contamination on the site through desk-based assessment or ground investigation works.</li> <li>Effect of the options on the AONB must be understood, and this may require landscape and seascape assessments for the preferred option and engagement with Suffolk Council.</li> <li>WFD Preliminary Assessment is required.</li> <li>Carbon estimates to establish baseline for the preferred option must be established. Environment Ag</li> </ul>						
POTENTIAL ENVIRONMENTAL OPPORTUNITIES	ional boards regarding the protected areas throughout the site of works. mportance of site and its heritage coast designation with informational ighlighted through additional surveys and in consultation with Natural ney through the optioneering phase of the project. ffolk Coastal Path through signage and discussion boards set along the							

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Bef ID		Description	Initial Appraisal
TF DN	Do Nothing (No repair)	No repair, maintenance or other works would be carried out other than necessary actions to deal with immediate health and safety risks.	This would result in eventual breach of current defences and damage to property and infrastructure. Erosion would likely result in loss of beach area which may have impacts on the attractiveness of the area to tourists, resulting in an impact to the local economy of the area. This may eventually lead to a more natural set of coastal processes to establish, but this would be limited by debris of the previous defences which would remain on the shoreline.
TF DM	Do Minimum (Patch and repair)	Removal of material from area of beach that is accreting (e.g. The Denes) to feed the groyne bays that have depleted to maintain the trigger levels detailed in the Beach Management Plan.	The existing groynes would be allowed to fail under this option, which may cause debris to litter the beach for a prolonged time if it is not removed, impacting on the landscape value of the area. This debris would also present a health and safety risk to users of the beach. Regular works to maintain the beach level would require use of machinery and plant that would impact on the amenity and tranquillity of the area and be a regular input of CO <sub>2</sub> to the local area. Relies on the accretion of material at The Denes and so this option may not be viable should coastal processes alter and this accretion slows/stops. This option does not account for any change in flood or coastal erosion risk as a result of climate change and so SOP may reduce with time.
TF PAR	Implement PAR	Construction of shorter more closely spaced timber groynes with incrementally increasing beach recharge to maintain protective beach, Maintenance of seawall will continue. Assumption that timber groynes will require reconstruction every 15 years.	This will require construction within an SPA and cSAC and below the meanwater line and so engagement with Natural England and the MMO will be required to ascertain mitigation and licencing requirements for these works. Assessment of impacts of altering coastal processes further down the shoreline will have to be undertaken to ensure there are no wider implications for beaches elsewhere. The requirement for regular beach renourishment and reconstruction of timber groynes will result in repeated use of heavy plant and construction activity which will result in undesirable levels of CO <sub>2</sub> emissions and disturbance to local residents. Sea level rise has been estimated at ~6mm/year. This option may no longer be as vable in the future should this level change.
TF LL 2	Beach Nourishment (existing grading)	Beach nourishment along frontage and periodic replenishment through nourishment or recycling. Requirement likely for Pier-T8 and T8-T7 and T7-T6	Due to the multiple designations for nature conservation and WFD it is important that any dredged material used in beach recharge is confirmed as uncontaminated so as to avoid contamination of the site and wider area as material is transported through coastal processes. This option would result in fewer construction impacts compared to works to the groynes, however the requirement for works every 15 years will have impacts on this options sustainability in the long term. There will be CO <sub>2</sub> emissions related to each recharge activity.
TF LL 4	Lengthen timber groyne(s)	Lengthening the timber groynes at the WDC frontage south of the pier to reduce the amount of material lost from long-shore processes and reduce material escaping the bay under cross- shore conditions. Would require initial nourishment and periodic replenishment through nourishment or recycling. Requirement likely for bays Pier- T8, T8-T7 and T7-T6.	This will require construction within an SPA and cSAC and below the meanwater line and so engagement with Natural England and the MMO will be required to ascertain mitigation and licencing requirements for these works. Assessment of impacts of altering coastal processes further down the shoreline will have to be undertaken to ensure there are no wider implications for beaches elsewhere. As this option will reduce requirement for future nourishment, there will be reduced carbon emissions associated with it. However, the timings of renourishment should be re-evaluated over time to ensure that changes resulting from climate change are being taken into account. The requirement for marine plant may impact on fishery activity in the local area, impacting on local tourism. There may also be requirement for closures of beach area or PROW during works which may impact on the tourist economy of the area.
TF LL 5	Reduce timber groyne spacing	The introduction of shorter timber groynes at the centre of affected groyne bays to increase the beach width allowing more stable bays to form. Would require initial nourishment and periodic replenishment through nourishment or recycling. Requirement likely for Pier-T8, T8-T7 and T7-T6.	Impacts of this option are as in TF LL4
TF LL 6	Modity timber groynes (T-Head)	Introduction of I-Head feature to end of existing timber groynes (most likely with rock for reasine) to reduce effective groyne spacing and provide a sheltering effect landward of the head reducing cross-shore losses. Would require initial nourishment and periodic replenishment through nourishment or recycling. Requirement likely for bays Pier- T8, T8-T7 and T7-T6 which are	Impacts of this option would be the same as in TF LL 4 with some additions. There may be landscape and visual impacts due to alteration of the views out to sea, particularly if rock groyne used where previously there has been timber. There may be additional heritage impacts due to the designation of the frontage as a heritage coastline. There are some opportunities for habitat creation with rock groynes.

	repair)	works would be carried out other than necessary actions to deal with immediate health and safety risks.	armage to property and infrastructure. Erosion would likely result in loss of beach area which may have impacts on the attractiveness of the area to tourists, resulting in an impact to the local economy of the area. This may eventually lead to a more natural set of coastal processes to establish, but this would be limited by debris of the previous defences which would remain on the shoreline.
WEM DM	Do Minimum (Patch and repair)	Patch and repair existing seawall. Use rock from existing structures to provide stability to wall when critical beach levels are exceeded.	The existing groynes would be allowed to fail under this option, which may cause debris to litter the beach for a prolonged time if it is not removed, impacting on the landscape value of the area. This debris would also present a health and safety risk to users of the beach. Regular works to the seawall would require use of machinery and plant that would impact on the amenity and tranquillity of the area and be a regular input of CO <sub>2</sub> to the local area. This option does not account for any change in flood or coastal erosion risk as a result of climate change and so SOP may reduce with time.
WEM PAR	Implement PAR	Construction of shorter more closely spaced rock groynes with incrementally increasing beach recharge to maintain protective beach, Maintenance of seawall will continue. Assumption that timber groynes will require reconstruction every 15 years.	This will require construction within an SPA and cSAC and below the meanwater line and so engagement with Natural England and the MMO will be required to ascertain mitigation and licencing requirements for these works. Assessment of impacts of altering coastal processes further down the shoreline will have to be undertaken to ensure there are no wider implications for beaches elsewhere. The requirement for regular beach renourishment and reconstruction of timber groynes will result in repeated use of heavy plant and construction activity which will result in undesirable levels of CO <sub>2</sub> emissions and disturbance to local residents. Sea level rise has been estimated at ~6mm/year. This option may no longer be as viable in the future should this level change.
WEM LL 2	Beach Nourishment (existing grading)	Beach nourishment along frontage. Retain existing groynes unmodified. Pile plating or repiling and repairs to the concrete wall may also be required to safeguard seawall integrity against low beach levels, pile exposure and continued corrosion.	Due to the multiple designations for nature conservation and WFD it is important that any dredged material used in beach recharge is confirmed as uncontaminated so as to avoid contamination of the site and wider area as material is transported through coastal processes. This option would result in fewer construction impacts compared to works to the groynes, however the requirement for works every 15 years will have impacts on this options sustainability in the long term. There will be CO <sub>2</sub> emissions related to each recharge activity.
WEM LL 4	Modification of existing groyne length	Groynes at WDC EM could be lengthened to better hold material under long-shore conditions, and reduce material escaping the bay under cross- shore conditions. Would require nourishment. Pile plating or repiling and repairs to the concrete wall may also be required to safeguard seawall integrity against low beach levels, pile exposure and continued corrosion. Two approaches are possible depending on the approach at EA EM; remove R4 and undertake works to bays R2-R3 and R3-R4.	This will require construction within an SPA and cSAC and below the meanwater line and so engagement with Natural England and the MMO will be required to ascertain mitigation and licencing requirements for these works. Assessment of impacts of altering coastal processes further down the shoreline will have to be undertaken to ensure there are no wider implications for beaches elsewhere. As this option will reduce requirement for future nourishment, there will be reduced carbon emissions associated with it. However, the timings of renourishment should be re- evaluated over time to ensure that changes resulting from climate change are being taken into account. The requirement for marine plant may impact on fishery activity in the local area, impacting on local tourism. There may also be requirement for closures of beach area or PROW during works which may impact on the tourist economy of the area. Intensive construction activities such as piling will require further assessment related to the noise and vibration impacts on sensitive receptors within the area, particularly with regards to the SPA.
WEM LL 5	Modification of existing groyne spacing	Construction of new groynes (rock or timber) between existing rock groynes at WDC EM to create a more compressed beach plan shape. Would require nourishment. Pile plating or repiling and repairs to the concrete wall may also be required to safeguard seawall integrity against low beach levels, pile exposure and continued corrosion. Two approaches are possible depending on the approach at EA EM; remove R4 and undertake works to bays R2-R3 or leave R4 in place and undertake works to R2-R3 and R3-R4.	Impacts of this option would be as in WEM LL4. Timber groynes would be preferable over rock groynes due to reduced working area required for their installation in order to minimise impacts on surrounding environment.
WEM LL 6	Modification of existing groyne shape/type	Modify the seaward extent of WDC EM groynes to create 'T head or 'Y' shape groynes. Would require nourishment. Pile plating or repiling and repairs to the concrete wall may also be required to safeguard seawall integrity against low beach levels, pile exposure and continued corrosion. Requirement likely between R2 and R4. Two approaches are possible depending on the approach at EA EM; remove R4 and undertake works to bays R2- R3 or leave R4 in place and undertake works to R2-R3 and R3-R4	Impacts of this option would be as in WEM LL4

ITEM	NO	YES	?		COMMENT/ACTION REQUIRED
	Ref ID	Option		Description	Initial Appraisal
	EAEM DN	Do Nothing (M repair)		No repair, maintenance or other works would be carried out other than necessary actions to deal with immediate health and safety risks	This would result in eventual breach of current defences and damage to property and infrastructure. Erosion would likely result in loss of beach area which may have impacts on the attractiveness of the area to tourists, resulting in an impact to the local economy of the area. This may eventually lead to a more natural set of coastal processes to establish, but this would be limited by debris of the previous defences which would remain on the shoreline. This debris would have impacts on the nature conservation sites in close proximity to the site.
	EAEM DM	Do Minimum and repair)	(Patch F	Patch and repair existing seawall. Use rock from existing structures to provide stability to wall when critical beach levels are exceeded.	The existing groynes would be allowed to fail under this option, which may cause debris to litter the beach for a prolonged time if it is not removed, impacting on the landscape value of the area. This debris would also present a health and safety risk to users of the beach. Regular works to the seawall would require use of machinery and plant that would impact on the amenity and tranquillity of the area and be a regular input of CO <sub>2</sub> to the local area. This option does not account for any change in flood or coastal erosion risk as a result of climate change and so SOP may reduce with time.
	EAEM	Implement PA	AR (	Construction of shorter more	This will require construction within an SPA and cSAC and below
	PAR			closely spaced rock groynes with incrementally increasing beach recharge to maintain protective beach, Maintenance of seawall will continue. Assumption that timber groynes will require reconstruction every 15 years.	the meanwater line and so engagement with Natural England and the MMO will be required to ascertain mitigation and licencing requirements for these works. Assessment of impacts of altering coastal processes further down the shoreline will have to be undertaken to ensure there are no wider implications for beaches elsewhere. The requirement for regular beach renourishment and reconstruction of timber groynes will result in repeated use of heavy plant and construction activity which will result in undesirable levels of CO <sub>2</sub> emissions and disturbance to local residents. Sea level rise has been estimated at ~6mm/year. This option may no longer be as viable should this estimate change in the future.
	EAEM LL 8	Retain existin groynes, crea rock revetmen construct new northern cont structure (J G	g   tte new ( rol e rol e iroyne) f E t t t t t t t t t t t t t	Install modified/J-shape groyne at northerm extent of EA EM wall to promote formation of a stable embayment within the cliff frontage to the north and facilitate maintenance access. Extend across toe of cliff to reduce EA EM wall outflanking risk. Install rock revetment between groyne bay(s) affected by beach drawdown to provide support to the seawall and scour protection to the toe of the structure. The devel pelow future predicted beach levels. Pile plating or repuiling and repairs to the concrete wall may also be required to safeguard seawall integrity against low beach levels, pile exposure and continued corrosion.	This will require construction within an SPA and cSAC, and in close proximity to a SSSI, and below the meanwater line and so engagement with Natural England and the MMO will be required to ascertain mitigation and licencing requirements for these works. Assessment of impacts of altering coastal processes further down the shoreline will have to be undertaken to ensure there are no wider implications for beaches elsewhere. There is the potential for landscape features on the landscape and seascape features. As this option will reduce requirement for future nourishment, there will be reduced carbon emissions associated with it. However, the timings of renourishment should be re-evaluated over time to ensure that changes resulting from climate change are being taken into account. The cliffs in this area are an important source of material for beaches along this frontage and it is important to ensure they continue to erode as naturally as possible to maintain this and the SSSI status of the cliffs. The requirement for marine plant may impact on fishery activity in the local area, impacting on local tourism. There may also be requirement for closures of beach area or PROW during works which may impact on the tourist economy of the area. Intensive construction activities such as piling will require further assessment related to the noise and vibration impacts on sensitive receptors within the area, particularly with regards to the SPA.
	EAEM LL 9	Dismantle exi groynes, crea rock revetmen construct new northern cont structure (J G	sting i te new c nt ad i rol e iroyne) f t c c c c c c c c c c c c c	Install modified/J-shape groyne at northern extent of EA EM wall to promote formation of a stable embayment within the cliff frontage to the north and facilitate maintenance access through modification of existing cliff face. Extend across toe of cliff to reduce EA EM wall outflanking risk. Dismantle existing rock groynes and use the rock to construct a rock revetment across the EA EM frontage to provide support to the seawall and scour protection to the toe of the structure. The toe of the revetment should be designed to be installed at a level below future predicted beach levels. Pile plating or repiling and repairs to the concrete wall may also be required to safeguard seawall integrity against low beach levels, pile exposure and continued corrosion.	This will require construction within an SPA and cSAC and below the meanwater line and so engagement with Natural England and the MMO will be required to ascertain mitigation and licencing requirements for these works. Assessment of impacts of altering coastal processes further down the shoreline will have to be undertaken to ensure there are no wider implications for beaches elsewhere. The cliffs in this area are an important source of material for beaches along this frontage and it is important to ensure they continue to erode as naturally as possible to maintain this and the SSSI status of the cliffs. As this option will reduce requirement for future nourishment, there will be reduced carbon emissions associated with it. However, the timings of renourishment should be re-evaluated over time to ensure that changes resulting from climate change are being taken into account. The requirement for marine plant may impact on fishery activity in the local area, impacting on local tourism. There may also be requirement for closures of beach area or PROW during works which may impact on the tourist economy of the area. Intensive construction activities such as piling will require further assessment related to the noise and vibration impacts on sensitive receptors within the area, particularly with regards to the SPA. Removal and associated transport of the dismantled groynes should be carefully considered.

ITEM	NO	YES	?	COMMENT/A	CTION REQUIRED	)	
The above information is primarily based on a desk-based review from the following sources:							
<ul> <li>British Geological Survey - http://www.bgs.ac.uk/data/mapViewers/home.html?src=topNav</li> <li>Catchment Explorer - www.environment.data.gov.uk/catchment-planning</li> </ul>							
<ul> <li>Department for Environment Food and Rural Affairs AQMA's Interactive Map - <u>https://uk-air.defra.gov.uk/agma/maps</u></li> <li>Environment Agency website, multiple sources can be found in (including flood maps and groundwater information) – <u>www.gov.uk/government/organisations/environment-agency</u> and <u>http://maps.environment-</u></li> </ul>							
<ul> <li>agency.gov.uk/wiyby/wiybyController?ep=maptopics⟨=_e</li> <li>Flood Map https://flood-map-for-planning.service.gov.uk/</li> <li>Heritage Gateway - <u>http://www.heritagegateway.org.uk/gateway/</u></li> <li>The Multi-Agency Geographic Information System for the Countryside (MAGIC) website - <u>http://www.magic.gov.uk/MagicMap.aspx</u></li> <li>Natural England Designates sites views- https://designatedsites.naturalengland.org.uk/SiteDetail.aspx?SiteCode=S1002591&amp;SiteName=the</li> </ul>							
<ul> <li>wash&amp;countyCode=&amp;responsiblePerson=&amp;SeaArea=&amp;IFCAArea=</li> <li>Chelmsford Borough Council Website - https://www.chelmsford.gov.uk</li> </ul>							
PREPARED BY		Emily Foster		DATE	16/10/18		
APPROVED BY		Kripa Dwaraka	nath		DATE	19/10/18	





Figure 1 Southwold Conservation Area

## Appendix B

Reference	Name	Status
1032138	Blackshore Windpump	Grade II Listed Building
1032139	Almshouses (including attached walling and	Grade II Listed Building
	gateway on convert road frontage)	6
1030683	The Bell House	Grade II Listed Building
1030684	Valley Farmhouse	Grade II Listed Building
1030685	Thorpe View	Grade II Listed Building
1030686	The Mercers Hall	Grade II Listed Building
1182317	Tudor Cottage	Grade II Listed Building
1198477	Bell Cottage	Grade II Listed Building
1198499	Barn 30m metres west of Thorpe View	Grade II Listed Building
1240151	Front garden wall to east of number 59, Reydon	Grade II Listed Building
1352562	Reydon Cottage	Grade II Listed Building
1377224	The Potter's Wheel	Grade II Listed Building
1377225	The Old Corner house	Grade II Listed Building
1380274	The Studio	Grade II Listed Building
1384310	Old Water Tower	Grade II Listed Building
1384311	15 and 16 Barnaby Green	Grade II Listed Building
1384312	17, Barnaby Green	Grade II Listed Building
1384313	1 and 2, Bartholomew Green	Grade II Listed Building
1384314	3 and 4, Bartholomew Green	Grade II Listed Building
1384315	5 and 6, Bartholomew Green	Grade II Listed Building
1384316	Iona	Grade II Listed Building
1384317	Vanessa Villa	Grade II Listed Building
1384318	Oak Cottage	Grade II Listed Building
1384319	Churchyard gates approximately 15 metres	Grade II Listed Building
	south of Church of St Edmund's	
1384321	Church of St Edmund	Grade I Listed Building
1384322	Chest tomb approximately 5 metres south east	Grade II Listed Building
1004000	of Church of Ste Edmund's	Our de UL iste d De listice
1384323	south of Chancel of Church of St Edmunds	Grade II Listed Building
1384324	2 Headstones approximately 12 metres south	Grade II Listed Building
1384326	Pair of headstones approximately 5 metres	Grade II Listed Building
1004020	south of porch of Church of St Edmund	Chade in Listed Building
1384327	Bardwell monument approximately 15 metres	Grade II Listed Building
	south of chancel of Church of St Edmund	
1384328	Headstone approximately 10 metres south of	Grade II Listed Building
	porch of Church of St Edmund	5
1384329	1-19, Church Street	Grade II Listed Building
1384330	24 and 26, Church Street	Grade II Listed Building
1384331	Headstone approximately 7 metres south of	Grade II Listed Building
	porch of Church of St Edmund	
1384332	Iona Cottage and Iona Flat	Grade II Listed Building
1384334	Rowan Cottage	Grade II Listed Building
1384335	Cliff House and Shrimp Cottage	Grade II Listed Building
1384336	5 and 6, East Cliff	Grade II Listed Building
1384337	7, East Cliff	Grade II Listed Building
1384338	East Cliff Cottage	Grade II Listed Building
1384339	Back to front cottage East Cliff House	Grade II Listed Building
1384340	Bay View (number 14) and East Cliff (number	Grade II Listed Building
	15) and railings attached to front	
1384341	Sailor's Reading Room	Grade II Listed Building
1384342	3-6, East Green	Grade II Listed Building
1384343	Sole Bay Inn	Grade II Listed Building
1384344	8 and 9, East Green	Grade II Listed Building
1384345	10, East Green	Grade II Listed Building
1384346	2, East Street	Grade II Listed Building

Reference	Name	Status
1384347	Gordon House	Grade II Listed Building
1384348	Trafalgar Cottage	Grade II Listed Building
1384349	Spindrift	Grade II Listed Building
1384350	Reading Room Cottage	Grade II Listed Building
1384351	Salt Works Cottage	Grade II Listed Building
1384352	Park Lane Cottage Park Lane Cottage West	Grade II Listed Building
1384353	Gun Hill Place	Grade II Listed Building
1384354	Stone House	Grade II Listed Building
1384355	Watch House	Grade II Listed Building
1384356	Ferndale Cottage	Grade II Listed Building
1384357	13 and 15. High Street	Grade II Listed Building
1384358	Barnaby Cottage	Grade II Listed Building
1384359	White Horse Cottage	Grade II Listed Building
1384360	20. High Street	Grade II Listed Building
1384361	22. High Street	Grade II Listed Building
1384362	King's Head Hotel	Grade II Listed Building
1384363	25. High Street	Grade II Listed Building
1384364	Montague House and railings attached at front	Grade II Listed Building
1384365	38 and 60. High Street	Grade II Listed Building
1384366	The Old House (number 49)	Grade II Listed Building
1384368	55-63. High Street	Grade II Listed Building
1384369	Sutherland House	Grade II* Listed Building
1384370	Manor House and Manor Gate including	Grade II* Listed Building
	forecourt walls	
1384371	66. High Street	Grade II Listed Building
1384372	Olde Banke House	Grade II Listed Building
1384374	Rutland House	Grade II Listed Building
1384375	Buckenham House	Grade II* Listed Building
1384376	82, 84, and 86. Hight Street	Grade II Listed Building
1384378	94. High Street	Grade II Listed Building
1384380	98. 98A and 100m High Street	Grade II Listed Building
1384381	United Reformed Church	Grade II Listed Building
1384382	3. Market Place	Grade II Listed Building
1384383	10. Market Place	Grade II Listed Building
1384384	11 and 13. Market Place	Grade II Listed Building
1384385	15. Market Place	Grade II Listed Building
1384386	Llovds Bank	Grade II* Listed Building
1384387	19, Market Place	Grade II Listed Building
1384388	21, Market Place	Grade II Listed Building
1384389	23, Market Place	Grade II Listed Building
1384390	25, Market Place	Grade II Listed Building
1384391	Swan Hotel	Grade II Listed Building
1384392	Town Hall	Grade II Listed Building
1384393	Town Pump	Grade II Listed Building
1384394	Rosemary Cottages	Grade II Listed Building
1384395	The Old Chapel	Grade II Listed Building
1384396	Primrose Cottage and Dolphin Cottage	Grade II Listed Building
1384397	Bradwell House (number 6)	Grade II Listed Building
1384398	9, Park Lane	Grade II Listed Building
1384399	10 and 12. Park Lane	Grade II Listed Building
1384400	13 and 15. Park Lane	Grade II Listed Building
1384401	14, Park Lane	Grade II Listed Building
1384402	16 and 18, Park Lane	Grade II Listed Building
1384403	Honeysuckle Cottage (number 17)	Grade II Listed Building
1384404	20, Park Lane	Grade II Listed Building
1384405	21 and 23, Park Lane	Grade II Listed Building
1384406	Strickland House	Grade II Listed Building
1384407	Park Lane Cottage Park Lane Cottage West	Grade II Listed Building
1384408	6, Pinkney's Lane	Grade II Listed Building
1384409	The Elms (number 1)	Grade II Listed Building
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Reference	Name	Status
1384410	4 and 6, Queen Street	Grade II Listed Building
1384411	Evington	Grade II Listed Building
1384412	Holmwood	Grade II Listed Building
1384413	10, Queen Street	Grade II Listed Building
1384415	14, Queen Street	Grade II Listed Building
1384416	16, Queen Street	Grade II Listed Building
1384417	18, Queen Street	Grade II Listed Building
1384419	6, Queen Street	Grade II Listed Building
1384421	The Bolt Hole and Wayside Cottage	Grade II Listed Building
1384422	Whitehall and Guardship	Grade II Listed Building
1384423	Greyfriars north and Greyfriars south and	Grade II Listed Building
	Regency House	
1384424	Red Lion Inn	Grade II Listed Building
1384425	Sole Bay Cottage	Grade II Listed Building
1384427	7, South Green	Grade II Listed Building
1384428	South Green House	Grade II Listed Building
1384429	10A, 10B, 10C and 10D, South Green	Grade II Listed Building
1384430	Dartmouth Cottage	Grade II Listed Building
1384431	South House	Grade II Listed Building
1384432	Wellesley Cottage	Grade II Listed Building
1384433	14 and 14A, South Green	Grade II Listed Building
1384434	Providence Cottage	Grade II Listed Building
1384435	The Retreat and Pin Cottage	Grade II Listed Building
1384436	24, South Green	Grade II Listed Building
1384437	Tudor Cottage	Grade II Listed Building
1384438	Hill House and Woldside	Grade II Listed Building
1384439	Adnams Wine Merchants	Grade II Listed Building
1384440	Cannon Lodge	Grade II Listed Building
1384441	Centre Cliff	Grade II Listed Building
1384442	Centre Cliff	Grade II Listed Building
1384443	May Place May Place Cottage (number 7A)	Grade II Listed Building
1384444	The Lighthouse	Grade II Listed Building
1384445	8, Trinity Street	Grade II Listed Building
1384446	10, Trinity Street	Grade II Listed Building
1384447	Trinity Cottage	Grade II Listed Building
1384448	Lantern Cottage (number 52)	Grade II Listed Building
1384449	75 and 77, Victoria Street	Grade II Listed Building
1384450	Southwold Museum	Grade II Listed Building
1384451	Church of the Sacred Heart and attached Presbytery	Grade II Listed Building
1450072	Southwold War Memorial	Grade II Listed Building
1032124	Depewell	Grade II Listed Building
1384320	Harbour Inn	Grade II Listed Building
1384325	2 Headstones approximately 15 metres east	Grade II Listed Building
	south east of Church of St Edmund	
1384333	Lydstep House and Coign	Grade II listed Building
1384367	54 and 54A, High Street	Grade II Listed Building
1384373	71, High Street	Grade II Listed Building
1384379	96, High Street	Grade II Listed Building
1384414	12, Queen Street	Grade II Listed Building
1384420	8, Queen's Road	Grade II Listed Building
1384426	South Green Cottage	Grade II Listed Building
1384377	Crown Hotel	Grade II Listed Building
1384418	Coachman's Cottage	Grade II Listed Building

## Appendix C

