



**Cell 1 Regional Coastal Monitoring Programme:  
Walkover Visual Inspections of Assets**



South Tyneside Council

**South Tyneside Council  
Final Report**

**August 2014**

# South Tyneside County Council

## Walkover Visual Inspection of Assets

### Contents Amendment Record

This report has been issued and amended as follows:

Issue	Revision	Description	Date	Signed
1	0	First Issue	12.01.2015	A. Parsons

# Contents

<b>Contents</b>	<b>3</b>
<b>Disclaimer</b>	<b>4</b>
<b>Preamble</b>	<b>5</b>
<b>1 Introduction</b>	<b>7</b>
1.1 <i>Study Area</i>	7
1.2 <i>Methodology</i>	7
<b>2 Overview</b>	<b>10</b>
<b>3 Condition Assessment</b>	<b>12</b>
3.1 <i>River Tyne to Rive Tyne South Pier (MA 1)</i>	12
3.2 <i>Rive Tyne South Pier to Trow Point (MA 2)</i>	14
3.3 <i>Trow Point to Frenchman's Bay (MA 3)</i>	16
3.4 <i>Frenchman's Bay to Lizard Point (MA 4)</i>	17
3.5 <i>Lizard Point to Souter Point (MA 5)</i>	21
3.6 <i>Souter Point to South Bents (MA 6)</i>	23
<b>4 Comparison with Previous Assessments</b>	<b>24</b>
<b>5 Problems Encountered &amp; Uncertainty in Analysis</b>	<b>25</b>
<b>6 Conclusions &amp; Recommended Actions</b>	<b>26</b>
<b>Appendix A – Asset Maps</b>	<b>27</b>
<b>Appendix B – Asset Condition &amp; Recommendations</b>	<b>28</b>

## Disclaimer

Halcrow Group Limited ('Halcrow') is a CH2M HILL company. Halcrow has prepared this report in accordance with the instructions of our client Scarborough Borough Council (SBC) for the client's sole and specific use. Any other persons who use any information contained herein do so at their own risk. Halcrow has used reasonable skill, care and diligence in the interpretation of data provided to them and accepts no responsibility for the content, quality or accuracy of any Third party reports, monitoring data or further information provided either to them by SBC or, via SBC from a Third party source, for analysis under this term contract.

Raw data analysed in this report is available to download via the project's webpage: [www.northeastcoastalobservatory.org.uk](http://www.northeastcoastalobservatory.org.uk). The North East Coastal Observatory does not "license" the use of images or data or sign license agreements. The North East Coastal Observatory generally has no objection to the reproduction and use of these materials (aerial photography, wave data, beach surveys, bathymetric surveys), subject to the following conditions:

1. North East Coastal Observatory material may not be used to state or imply the endorsement by North East Coastal Observatory or by any North East Coastal Observatory employee of a commercial product, service, or activity, or used in any manner that might mislead.
2. North East Coastal Observatory should be acknowledged as the source of the material in any use of images and data accessed through this website, please state "Image/Data courtesy of North East Coastal Observatory". We recommend that the caption for any image and data published includes our website, so that others can locate or obtain copies when needed. We always appreciate notification of beneficial uses of images and data within your applications. This will help us continue to maintain these freely available services. Send e-mail to [Robin.Siddle@scarborough.gov.uk](mailto:Robin.Siddle@scarborough.gov.uk)
3. It is unlawful to falsely claim copyright or other rights in North East Coastal Observatory material.
4. North East Coastal Observatory shall in no way be liable for any costs, expenses, claims, or demands arising out of the use of North East Coastal Observatory material by a recipient or a recipient's distributees.
5. North East Coastal Observatory does not indemnify nor hold harmless users of North East Coastal Observatory material, nor release such users from copyright infringement, nor grant exclusive use rights with respect to North East Coastal Observatory material.

North East Coastal Observatory material is not protected by copyright unless noted (in associated metadata). If copyrighted, permission should be obtained from the copyright owner prior to use. If not copyrighted, North East Coastal Observatory material may be reproduced and distributed without further permission from North East Coastal Observatory.

## Preamble

The Cell 1 Regional Coastal Monitoring Programme covers approximately 300km of the north east coastline, from the Scottish Border (just south of St. Abb's Head) to Flamborough Head in East Yorkshire. This coastline is often referred to as 'Coastal Sediment Cell 1' in England and Wales (*Figure 0-1*). Within this frontage the coastal landforms vary considerably, comprising low-lying tidal flats with fringing salt marshes, hard rock cliffs that are mantled with glacial sediment to varying thicknesses, softer rock cliffs and extensive landslide complexes.

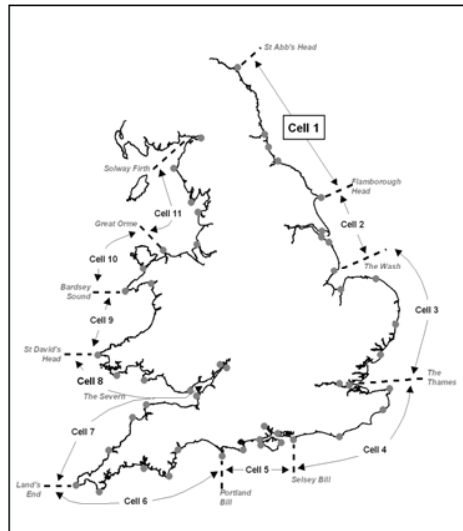


Figure 0-1: Sediment Cells in England and Wales

The work commenced with a three-year monitoring programme in September 2008 that was managed by Scarborough Borough Council on behalf of the North East Coastal Group. This initial phase has been followed by a five-year programme of work, which started in October 2011. The work is funded by the Environment Agency, working in partnership with the following organisations:



The original three year programme of work was undertaken as a partnership between Royal Haskoning, Halcrow and Academy Geomatics. For the current five year programme of work the data collection associated with beach profiles, topographic surveys and cliff top surveys is being undertaken by Academy Geomatics. The analysis and reporting for the programme is being undertaken by Halcrow Group Limited (Halcrow) a CH2M HILL company.



The main elements of the Cell 1 Regional Coastal Monitoring Programme involve:

- beach profile surveys
- topographic surveys
- cliff top recession surveys
- real-time wave data collection
- bathymetric and sea bed characterisation surveys
- aerial photography
- walk-over surveys

The present report is Coastal Walk-over visual Inspections of assets 2014 and provides a summary of the main findings from the walk-over inspections of South Tyneside Council's frontage that are undertaken once every 2 years.

In addition, separate reports are produced for other elements of the programme as and when specific components are undertaken, such as beach profile, topographic and cliff top surveys, wave data collection, bathymetric and sea bed sediment data collection, and aerial photography.

# 1 Introduction

## 1.1 Study Area

North Tyneside Council's coastal frontage is approximately 14km in length extending from the River Tyne in the north to the border with the Sunderland Council at North Bents in the south, shown in **Figure 1-1**. This frontage includes approximately 27 assets (17 man-made assets and 10 natural assets). Detailed maps showing the location of each of these NFCDD assets are presented in **Appendix A**.

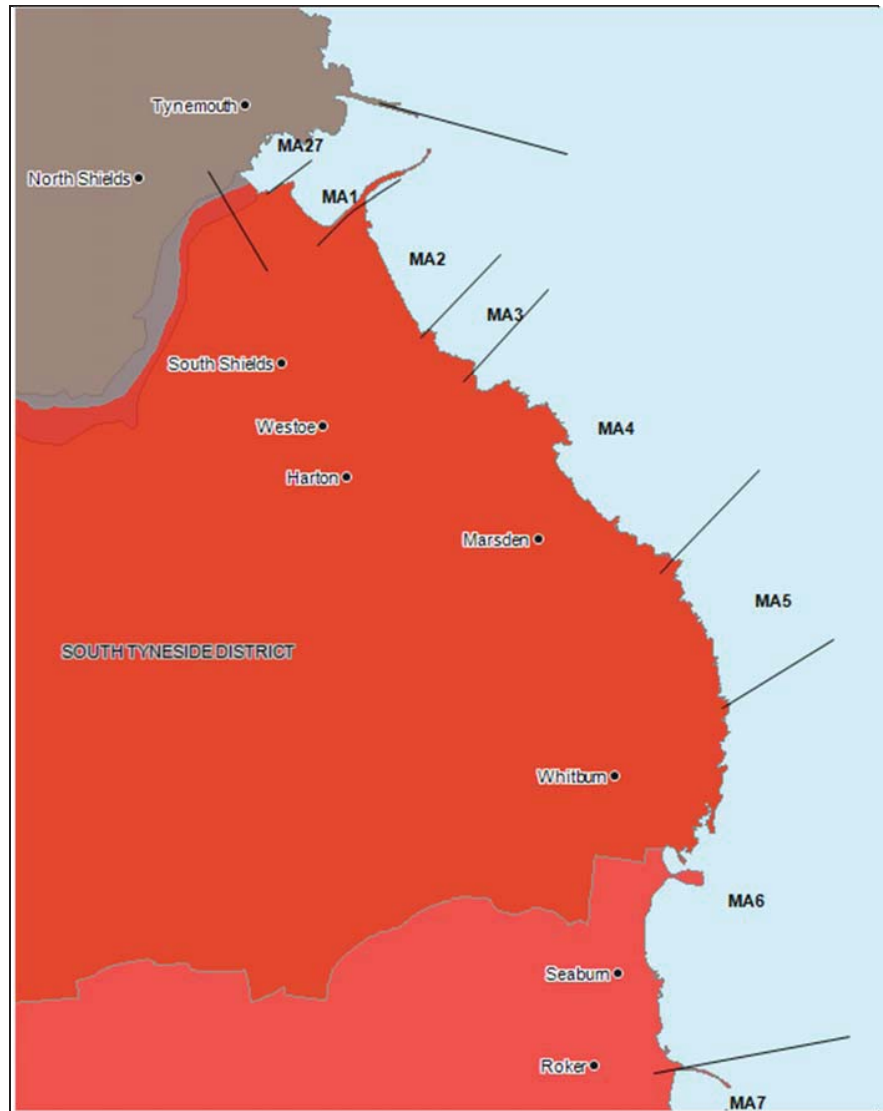


Figure 1-1: South Tyneside Council study area.

## 1.2 Methodology

This section presents the approach taken by the slope and asset inspectors respectively for the South Tyneside Council coastal frontage.

The visual assessment of both natural and built assets on the Cell 1 coastline was carried out by a team of Chartered engineers in Summer / Autumn 2014. The weather experienced during this time was generally hot and sunny with occasional

heavy showers. This inspection followed the severe storms, rainfall and flooding experienced during winter 2013/14.

The frontage has been split into a number of 'asset lengths' as defined in the National Flood and Coastal Defence Database (NFCDD) that was established by the Environment Agency (EA). These asset lengths have been used for reporting on the walkover inspections since 2008.

The walk over inspections cover both built defences assets and natural defence assets such as cliffs, slopes and dunes. All assets were visually inspected, photographed, graded based on their condition and an estimate made of their residual life.

For built assets the grading classification was undertaken in accordance with the Condition Assessment Manual (EA, 2012), with estimates made of the urgency of any necessary repairs. An extract of the grading classification for built assets is presented in *Table 1-1*. For ease of reference the photos presented in this report have also been bordered with the colours key indicated below.

Grade	Rating	Description
1	Very Good	Cosmetic defects that will have no effect on performance.
2	Good	Minor defects that will not reduce the overall performance of the asset
3	Fair	Defects that could reduce performance of the asset.
4	Poor	Defects that would significantly reduce performance of the asset. Further investigation needed.
5	Very Poor	Severe defects resulting in complete performance failure

*Table 1-1: Condition assessment grading for man-made assets.*

In addition to the above grading classification, for natural asset such as cliffs and slopes the same five point activity scale used in previous cliff activity assessments undertaken by Halcrow for Scarborough Borough Council in Cell 1 was used (Halcrow 2002, Halcrow 2005, Halcrow 2009), An extract of this grading classification is presented in *Table 1-2*. For ease of reference the photos presented in this report have also been bordered with the colours key indicated below.

Rank	Activity Class	Description
1	Dormant	Protected cliffline or landslide complex with no visible evidence of landslide activity.
2	Inactive	Relict cliffs or landslides with vegetated slopes and localised erosion of the toe or failure of the headscarp.
3	Locally	Retreating cliffline with localised small landslides or areas of erosion.
4	Partly	Retreating cliffline with very common smaller-scale landslides or areas of intense erosion.
5	Totally	Retreating cliff line almost entirely affected by large-scale landsliding or intense erosion.

*Table 1-2: Condition assessment grading used for natural assets (cliffs/ slopes).*

This report provides an overview of the findings from the walkover inspections, summarising each locality in general but also specifically identifying individual



assets in 'poor' or 'very poor' condition. It is anticipated that this summary will help identify areas for maintenance or capital investment. Full details of the inspection of each asset is provided in **Appendix B**.

In addition to this report, full details of the inspection and a selection of appropriate photographs have been entered into the SANDS database, a copy of which, along with viewing software is provided along with this report.

## 2 Overview

The following significant findings were noted during the 2014 walk over inspection. Most notably, this section attempts to highlight those assets that are in a 'poor' or 'very poor' condition or where significant changes from the previous survey were noted.

There have been significant changes in the condition of a number of the built and natural assets along the South Tyneside frontage since the previous inspections. The winter of 2013/2014 caused problems when the high tides coincided with storm conditions causing pressure on the built and natural defence assets. Problems were experienced during the construction of the Littlehaven Sea Defences.

As a result of these weather and marine conditions the following significant findings were observed during the 2014 inspections:

- **Littlehaven Seawall**

Following previous inspections major problems were identified with the coastal defences at Littlehaven. The sea wall, which dated back to the late 1930's, had major problems including exposed timber piling, cracks, abrasion and undermining. The orientation of the old seawall was also affecting the movement of beach material and causing it to deplete more quickly than it would naturally.

A new seawall at Littlehaven was completed in April 2014. It was designed to encourage deposition, with the previous 650m wall being replaced by a new 550m long structure. The height of the new wall varies from 3m to 4m but with the movement of beach material it is possible that only 1m or 2m will be visible most of the time. The new structure is formed in two parts with a lower sea wall in front and a higher rear wall connected by a concrete slab foundation and a stepped concrete revetment built over a slab to effectively join the two walls. Along its length the wall is divided into two parts. The southern 220m of wall constructed is a direct replacement for the previous structure and the northern 330m of wall is a sweeping curve wall that extends beyond the previous wall and projects out at a steeper angle. The curved section of wall included the driving of 330m of sheet piling. The scheme widened beach by 50 metres.

As noted in previous inspections the old wall was in significant disrepair and had reached the end of its serviceable life. The previous coastal defence was deteriorating rapidly, specifically along the most exposed central section of the wall. The alignment of the previous wall was such that in places it was regularly impacted by high water resulting in lower beach levels. Flooding of the car park behind was a regular occurrence.

- **Sandhaven**

The beach levels are good and are for long sections have partially covered the promenade. The dunes have good accumulations of sand. However, there is a general lack of vegetation and would benefit from a planting programme to retain the dunes. Vermin control is recommended at the southern end and as identified in the previous report remedial work to the concrete slipway adjacent to Trow Point is required to prevent its failure. The access ramp and associated gabions continue to be in disrepair and were affected in the December 2013 tidal surge.

- **Trow Point and Target Rock**

The Local Authority continue to monitor the headlands which have experienced rock falls and erosion. Should changes occur it may be necessary to replenish the rock armour. There is concern that changes to the headlands may cause outflanking of the defence in the long term. Vermin continue to be an issue and some vermin control is recommended at Trow Quarry to prevent burrowing from destabilising the re-graded coastal strips.

- **Frenchman's Bay and Man Haven Bay**

A 50m section of cliff collapsed in March 2010 and since then there is evidence of regular rock falls and slumps due to the formation of caves and overhangs in the cliff face. At Man Haven Bay the vegetation makes it difficult to determine the extent of depressions or cracking on the surface. There have been notifications regarding a depression opening at the surface adjacent to Man Haven Bay. This may potentially be a crown hole opening. There appears to be some connectivity with caves underneath it. The area was previously fenced off. However there is concern that the fence has been taken down by the National Trust, who own the land at this point, and not replaced, although warning signs exist. The coastline at this point and southward is very active and it is important that fencing and signage is improved and inspected on a regular basis.

- **Marsden Bay**

There is evidence of localised rock falls, caves and residual rock overhangs throughout most of the bay. There is concern that the cliff is retreating adjacent to the coast road, in particular the two pinch points towards the south of the bay. The Local Authority is looking to carry out further assessment in this location to try and accurately understand erosion rates.

Areas of concern continue to be the fissured rock near Lot's Wife and south of Pompey's Pillar. The concrete bunker near the cliff top, the wall at the toe of the disused lifeguard station, and the apron to the Redwell Steps are in poor condition and present a safety hazard to the public. The building at the south of the steps is deteriorating.

- **Lizard Point**

The south east corner of the Lizard Point car park is located in close proximity to cliffs that continue to experience significant failures. Across the whole Lizard Point headland, including the section along the access road to the car park, the cliffs are in a very unstable condition due to extensive cave formation, overhangs and fissures and further failures are expected. The car park should remain closed to safeguard public from further significant rock falls.

- **Whitburn Coastal Park and Rifle Ranges**

Local slumps have eroded the cliff top back to the coastal path in places. The Local Authority are aware of the crown hole but have no plans to do anything long term other than maintaining management measures.

- **General Issues**

There are three general issues that were evident during the inspection:

- Land Drainage – there are a number of land drainage pipes which come through the cliff face which have contributed to the erosion over the years.
- Signage – The coastline south of Sandhaven is very active and rock falls and slumping is common. There is signage and fencing in place. However, there can be no complacency. Signage should be renewed and increased to ensure the public are aware of the dangers. Fencing should also be monitored and repaired or repositioned where required.

### 3 Condition Assessment

This section provides an account of observations made on the condition of cliffs and coastal assets within South Tyneside Council's coastline, running from north to south.

#### 3.1 River Tyne to Rive Tyne South Pier (MA 1)

This management unit extends from the entrance to the River Tyne at the South Groyne to the South Pier. This frontage is approximately 4.9km in length (including the South Pier) and includes 7 man-made coastal defence assets, comprising revetments and seawall as well as the 2.8km long South Pier.

The grouted masonry revetment starts at the boat slipway and extends along the eastern side of the wave basin to join the landward root of the South Groyne. It is the responsibility of the Port of Tyne. The revetment was in fair condition, although voids were observed at the toe due to erosion of mortar and missing masonry blocks. Local repairs to infill voids previously recommended do not appear to have been carried out, but the voids have only marginally worsened. However, small holes were observed in the ground at the top of the revetment behind the upper layer of stonework. This may be indicative of wash-out of core material and as previously recommended void filling, especially at the toe, needs to be undertaken. This should be accompanied by the general replacement of missing masonry blocks and filling of cracked mortar where this occurs throughout structure.



*Grouted masonry revetment on south side of wave basin.*



*Voids along toe of revetment.*

Along the northern (river-facing) side of the South Groyne there has been resurfacing of the bitmac deck. Elsewhere along the river-facing side there is occasional missing stonework and a small area of armour stone placed on the river bed in front of the structure has been displaced. The southern side of the South Groyne faces into Littlehaven and is generally less exposed and in better condition than river-facing side. Near the landward root there is evidence of cracking and the onset of voiding in the concrete.



*Resurfacing of the bitmac deck of the South Groyne.*



*Cracking and onset of voiding in concrete on south facing side.*

The strand line at the Littlehaven dunes was a reasonable distance down the foreshore, indicating a wide and healthy beach at this location. The beach width increases in the lee of the South Groyne. There was no evidence of dune erosion and sand levels were very good. The vegetation was well established and some

informal access tracks have been created by visitors. Fencing and more replanting would prove beneficial. Beach profile data and inspection of this area suggests that the area is accreting with sediment, showing effectiveness of the South Groyne in preventing material from entering the navigation channel of the River Tyne estuary.



*Wide healthy beach at Littlehaven Dunes*



*No evidence of dune erosion.*

Since the previous inspection, when it was determined that the section of Littlehaven seawall between its protruding 'nose' and the dunes was in a very poor condition and at real risk of imminent failure, new defence works have been completed. The new structure is formed in two parts with the lower sea wall in front and a higher rear wall connected by a concrete slab foundation and a stepped concrete revetment built over a slab to effectively join the two walls. The wall is divided into two lengths, the southern 220m of wall constructed is a direct replacement for the previous structure and the northern 330m of wall a sweeping curve wall that extends beyond the previous wall and projects out at a steeper angle. The new wall, completed in early 2014, was designed to encourage deposition and early signs are that this is being achieved. Sand levels along the beach are generally good. (3 steps down from promenade) and the wall is in very good condition (contract snagging is due to take place).



*Northern section of new seawall at Littlehaven.*



*Setback crest wall along northern section of new seawall.*



*Southern section of new seawall promontory.*



*Southern section of new seawall.*

As in the previous inspection, access to the South Pier was restricted. The landward end of South Pier remains in good condition with minor re-pointing and repairs having been carried out. The structure is privately owned and maintained by the Port of Tyne.



*Minor re-pointing and repairs to South Pier.*



*Minor re-pointing and repairs to South Pier.*

### **3.2 Rive Tyne South Pier to Trow Point (MA 2)**

This management unit is approximately 1.7km in length and extends from the River Tyne South Pier to Trow Point in the south. This frontage includes approximately 7 assets, comprising a mix of seawalls, promenades and revetments as well as natural beaches backed by vegetated dunes.

The northern section of Sandhaven between South Pier and the children's play area has a cobble berm in front of the dunes at its northern end which narrows and thins with progression south. At the previous inspection reference was made to the 'donkey track' which extends from the South Pier, initially behind the dunes then switching to seaward of the dunes to meet the Lifeguard Station. Work was being carried out at that time to protect and enhance the dune system. In addition to this, works have been carried out on the provision of boardwalk areas, improved walls and improved access to the beach. The 'donkey track' has been re-surfaced and is now in good condition, although still covered by sand in places. The dunes north of the Lifeguard Station have accumulated large amounts of sand but have areas barren of vegetation and there is evidence of recreational activity. They provide a good buffer in front of the promenade and the backing amenity assets. The brushwood fencing is proving to be successful and a replanting programme should be increased to stabilise the dune system.



*Cobble berm at northern section of Sandhaven.*



*Donkey-track covered with sand, in places.*

South of the Lifeguard Station the situation is similar. The dunes are healthy for levels of sand but are also barren of vegetation and have become 'hollowed' by intensive recreational activity. This area would also benefit from a replanting programme. At the time of inspection the new boardwalks and access routes were substantially covered in sand.



*Dunes healthy but barren of vegetation and 'hollowed'.*



*Boardwalks and access routes substantially covering in sand.*

The promenade has been regenerated as part of the Sea Change Project. The project included the placement of new promenade furniture and new patterned promenade paving. Beach levels were level with the promenade covering the sea wall. At the time of inspection Local Authority staff were clearing sand from the promenade.



*Local Authority staff clearing sand from promenade.*



*Beach crest level with promenade.*

The sloping concrete revetment that extends further south is in fair condition with minor spalling and abrasion. The Lifeguard Station area has new concrete walls and beach levels are good. The last section of revetment, south of Lifeguard Station shows some signs of minor settlement due to discontinuity in slope form, but no cracks have opened.



*New concrete wall at the lifeguard station.*



*Minor spalling and abrasion to sloping concrete south of lifeguard station.*



*Minor spalling and abrasion to sloping concrete south of lifeguard station.*



*Minor settlement to revetment but no cracking visible.*

The dunes at the southern end of Sandhaven are narrow but generally in good condition covering buried gabions. There are several informal access routes formed

by pedestrian activity (especially to Mangos Public House) and along dune crest. In two areas there is poured concrete and rubble underlying the sand and rabbit holes were observed suggesting that some vermin control would be appropriate. The concrete ramp at the south end of the bay is in poor condition with extensive cracking and sections of concrete missing. It is undermined and the gabion baskets adjacent to the ramp have been badly damaged. Remedial work is required on the ramp and a possible alternative to the gabion baskets should be investigated.



*Narrow dunes burying gabions at southern end of Sandhaven.*



*Exposed gabions at access points across dunes.*



*Breaking up of gabions adjacent to ramp at south end of dunes.*



*Breaking up of ramp at south end of dunes.*

### **3.3 Trow Point to Frenchman's Bay (MA 3)**

This management unit is approximately 1km in length and extends from Trow Point in the north to Frenchman's Bay in the south. This frontage includes approximately 4 assets, comprising a mix of undefended cliff headlands and rock revetments.

Since the previous inspection further local rock falls within the harder rock at Trow Quarry and local slumps in the overlying material have occurred. Despite this, the headland remains as a competent mass controlling evolution of the bay to its south, Grahams Sand. Some areas of softer material remain in an over-steep condition and therefore local slumps should be expected. This area should be monitored at regular intervals. Vermin continues to be a problem in this area.



*Local slumps in the overlying material at Trow Point.*



*Further rockfalls within the harder rock cliff.*

The rock revetment and re-graded slope at Graham Sand was in a very good condition. Some very large (natural) rocks were noted on the foreshore adjacent to the permanent rocky outcrop within the bay, similar to the situation at the previous inspection. There were signs that rabbits were still active in the area. Vermin control



should be implemented to avoid them burrowing in the re-graded slope and destabilising it.



*Rock revetment in very good condition.*



*Graded slope in very good condition*

The headland at Target Rock has always been the most vulnerable of the three headlands at Trow Quarry due to its partly fragmented state, with undercutting at lower levels and caves forming at the base. The material between the rock masses continues to erode, with rock debris and brickwork evident on the foreshore. As in previous inspections, there is sufficient residual rock headland not to cause a concern relating to the potential outflanking of the defences in Grahams Sand and Southern Bay. However, this situation should be closely monitored. In the previous Trow Quarry Coastal Defence Scheme Monitoring Plan – Year 0 (Baseline) a recommendation was made for Local Authority staff to visit Target Rock quarterly and take notes and fixed aspect photographic records. This recommendation continues to remain valid in light of ongoing changes.



*Target Rock partially fragmented.*



*Undercutting of lower levels and caves forming at the base of Target Rock.*

The rock revetment and re-graded slope at Southern Bay was in very good condition.



*Rock revetment and re-graded slope at Southern Bay in very good condition.*



*Rock revetment and re-graded slope in very good condition.*

### **3.4 Frenchman's Bay to Lizard Point (MA 4)**

This management unit is approximately 5km in length and extends from the north end of Frenchman's Bay to Lizard Point in the south, encompassing Marsden Bay. This frontage includes 6 assets, comprising largely undefended high rock cliffs with two short sections of masonry walls at access points.

The rock headland at Frenchman's Point was in a competent form.

Just to the south of Frenchman's Point, the cliffs have a number of arches formed at their toe and there is evidence of major rock falls. This has resulted in the cliff face moving closer to the coastal path. The National Trust are active in monitoring the area and react by realigning the fencing and installing new warning signs. The rock debris at the toe of the cliffs will now provide a degree of protection to the cliff toe until the material is moved away by marine action and the process will start again.



Arches formed in the toe of cliffs south of Frenchman's Point.



Cliff face moving close to coastal path.

Further south of the collapsed cliff there are many very precarious locations within Frenchman's Bay and between here and Man Haven. Arches and caves have formed at the cliff toe with overhanging rocks and recent slumps in the overlying softer material, including several locations where the footpath and fencing is close to the cliff edge. Further local falls and slumps are expected on a regular basis.



Rock falls and cave formations between Frenchmans Bay and Manhaven.



Recent slumps in overlying soft material.

Within Man Haven Bay and within the northern most of the three mini-bays between here and Camel Island, there appears to be evidence of debris flow. This was also observed during the last inspection.



Slippage of soft material.



Voids in cliff face.

Between Man Haven and Camel Island the frontage is heavily affected by cave and arch formation at the toe of the cliffs in places. The cliff face is within a few metres of the coastal path. These sections should be monitored closely and signage enhanced where required.



Erosion and voids in base of cliff at Man Haven Slippage close to footpath.

At the northern end of Marsden Bay the cliff and arch formation at the toe of the cliff continues and there is evidence of relatively recent rock falls and residual rock overhangs. This was the case at the previous inspection and the process will continue. The National Trust continue to re-align the public footpath at the top of the cliffs landwards as required responding to ongoing localised failures.

In other places the rock structure has become fractured and one area of cliff, identified in previous inspection, has cracked with failure due to this likely to occur.



Cracking of cliff face and undermining of structure at north end of Marsden Bay. Voids in cliff face.

Also within the northern end of Marsden Bay there are three structures all of which are in poor condition, all as identified in previous inspection. Along the access ramp to the northern end of Marsden Bay (by Camel Island) there is a concrete bunker located high up the cliff, a corner of which is ever changing.

The stone-faced wall at the base of the disused Lifeboat Station is undermined and the brickwork identified in the previous inspection has been washed away. Along the stone-faced section of the wall there are numerous notable gaps between the stonework and coping. The buttress to the Redwell Steps is badly damaged along its length. The National Trust has guided access down the steps along specified routes, using hand railing in order to ensure the public avoids the worst affected areas. They have also bolted a temporary metal step at the base of the concrete steps to ease access to the beach (buried at this inspection due to beach level). In many places along the toe, the buttress is undermined and badly abraded. At this inspection the sand levels covered some of these problems. The structure south of the Redwell Steps is damaged at the corner and shows signs of cracking and gaps in the stonework. The building is being undermined and in danger of collapse. The building should be monitored at regular intervals.



Undermining of structure at disused lifeboat station.



Damage to corner of stone building, vertical cracking.

Between the Redwell Steps and the Grotto Public House, the cliffs have small arches and caves along their base in places. There is cracked rock near Lot's Wife which is likely to fall due to toppling. There is also evidence of vertical cracking in Lot's Wife stack which requires monitoring.



Cave formation in cliffs south of Redwell Steps.



Cave formation and vertical cracking in Lot's Wife stack.

At Marsden Grotto, the masonry wall is well protected by a cobble berm on the upper beach and the rock netting constructed in 2007 remains in very good condition. Marsden Rock remains stable with cave formations at its base.



Marsden Grotto protected by cobble beach.



Caves at base of Marsden Rock,

Between the Grotto and the access road to Lizard Point car park the cliffs generally appear more stable than those in the north of the bay and in places are fronted by small cobble berms. However, occasional rock falls and numerous caves and arches at the base of the cliffs are still evident. Elsewhere along this southern section of Marsden Bay there are several other areas where small and localised toppling or slumping has occurred in the softer material that overlays the harder rock structure, including several areas where further local slumping is imminent. Additionally there is evidence of vertical cracking in the cliff face.



Cliffs at south end of Marsden Bay fronted by small cobble berms



Slippage of soft material and further slumping imminent.

The section of cliff that extends along the access road to Lizard Point Car Park currently appears generally stable along most of its length, but does have caves formed along its base. There is evidence of recent rock falls. However, along the section immediately fronting Lizard Point Car Park, there continues to be cliff failures. The condition of the cliff in the section fronting the car park, extending along to concrete pillar, is still highly unstable. The worst affected section is in the lee of Jack Rock (the area immediately in front of the south east corner of the car park) where rock falls were identified at the previous inspection. The rock falls have left extensive sections of cliff as shear overhands or in a high fissured state and this section will continue to experience failures. The timescale of this is uncertain and depends largely on storm conditions acting at the toe of the cliff as well as general meteorological conditions. In between the area of the rock falls caves have formed, with overhanging rock.



Cliff failure in cliffs fronting Lizard point Car Park.



Recent rock falls in cliffs at Lizard Point Carpark.

Further south of Jack Rock the cliff remains active. There are areas where there have been recent cliff failures of a more local nature. The whole section south of Lizard Point remains highly unstable and further failures are expected due to overhangs, caves and extensive fissures in the rock structure.



Cave formations at Lizard Point



Rock falls and voids at base of cliff south of Lizard Point.

### 3.5 Lizard Point to Souter Point (MA 5)

This management unit is approximately 2.4km in length and extends from Lizard Point in the north to Souter Point in the south, encompassing the bays of Byer's Hole and Potter's Hole. This frontage includes 3 assets, comprising undefended high rock cliffs.

South of Lizard Point itself to the southern end of Potters Hole, the frontage is typically characterised by the formation of caves, arches and sea stacks caused by erosion of the cliffs. Whitburn Coastal Park covers the area of the former Old Harbour Quarry, which has subsequently been filled with waste material. The headland separating Byer's Hole from Potter's Hole cave formation has breached the limestone ridge that was left at the seaward edge of the former quarry, causing the wash out of fill material and in one location creating a sink hole. The National Trust fenced off this area, but at the time of inspection this was being ignored by the public. The National Trust have placed warning signs and diverted the public coastal footpath. The cave formation identified in previous inspections does not appear to have increased and the adjacent caves still have not breached through limestone ridge. The existing concrete defences, previously used to 'plug' two nearby caves at this headland, are continuing to be undermined, possibly contributing to the wash out.



Caves at base of cliffs between Lizard Point and Potters Hole.



Slippage of soft material at Potters Hole.



Collapsed ground between cliff face and coastal path



Undermining of concrete defences used to 'plug' caves.

Along the Whitburn Nature Reserve, erosion has in a small number of locations caused the cliff top to come in close proximity to the public footpath. Low level fencing and warning signs have been erected by the National Trust in these areas. Elsewhere the cliffs remain stable.



Rock fall bringing cliff face close to coastal path.



Rock fall bringing cliff face close to coastal path.

The northern section of the Rifle Ranges frontage (extending southwards to Souter Point) exhibits a different character to adjacent sections of the coast and therefore has been separated out as a discrete 'asset length' in NFCDD. This is because the frontage comprises a wide raised beach (possibly comprising colliery spoil, although this is unconfirmed). As a result of this, the coastal slopes behind the raised beach are not currently exposed to marine action and therefore are highly stable at present.

The southern section of the Rifle Ranges is actively experiencing small and localised slumps, a few of which are becoming close to the public coastal footpath, but still nothing of major concern. In one area, close to the mound and military building, concrete blocks appear to have been dumped at the toe of the cliffs to slow recession.



Coastal slopes not exposed to marine action at north end of rifle ranges.



Small localised slumps at southern section of rifle ranges.

### 3.6 Souter Point to South Bents (MA 6)

The South Tyneside portion of this Management Area (MA) is approximately 1.7km in length and extends from Souter Point in the north to the border with Sunderland at South Bents at the north of Whitburn Bay. This frontage includes 2 assets, comprising eroding sandstone cliffs.

South of the Rifle Ranges to the outfall at the southern end of Whitburn, the cliffs are locally active, with some slumping observed, but again there are no issues of major concern.



Some slumps in cliffs south of Rifle Ranges.



Some slumps in cliffs south of Rifle Ranges

The storm outfall structure located close to the local authority boundary with Sunderland that was noted to have failed scour protection in the 2012 report has been reconstructed on a slightly different alignment, see photographs below.



Photo from 2012 report showing failed outfall scour protection south end of frontage.



Outfall has been reconstructed at south end of frontage.

## 4 Comparison with Previous Assessments

The previous formal assessment across the whole study frontage was undertaken in summer 2012. The major changes since the previous inspection have been the schemes at Littlehaven and Sandhaven. These major schemes have addressed the majority of issues raised in the 2012 report.

At Littlehaven, the main priority over the past two years, all the works are now complete to the defence, although there are a few minor pieces of amenity works to complete to ensure full design has been implemented.

At Sandhaven Dunes as part of the management plan fencing and replanting is ongoing. Due to the soft engineering nature of the works this area will need to be revised on a regular basis.

At the southern end of Sandhaven Beach the access ramp and associated gabions continue to be in disrepair and were affected by the December 2013 tidal surge. A bid has been submitted to the E.A. to carry out emergency works.

At Trow Quarry the situation continues to be monitored with the possibility that the rock armour may need to be replenished should changes occur. There is concern that changes to the headland may cause outflanking of defence in the long term.

Along the cliffs to the south of Trow Quarry there have been notifications regarding a depression opening at the surface adjacent to Man Haven Bay. This may be potentially a crown hole opening. There appeared to be connectivity with the caves underneath it. The area was previously fenced off but the fence has been taken down and not replaced by the National Trust, owners of the land, although warning signs do exist.

In Marsden Bay there are concerns that the cliff is retreating adjacent to the Coast Road, in particular the two pinch points towards the south of the bay.

The Authority is looking to do further assessment in this location to try to more accurately understand erosion rates, although it is appreciated that erosion often occurs in an episodic nature in locations like this.

In the Whitburn Coastal Park, the Local Authority is aware of the crown hole but at present have no plans to do anything other than maintain management measures.

Areas of change continue along the coastline, in particular Frenchman's Bay where cliff failures continue to occur and Lizard Point Car Park. Changes continue to be identified at Trow Point and Target Rock (rock falls) Marsden Rock (rock falls and very poor condition of local structures) Old Harbour Quarry (sink hole) and Whitburn Nature Reserve and Rifle Ranges (local slumping).

There is also the need for continued actions with respect to public safety in areas where cliffs are susceptible to collapse, especially Frenchman's Bay, Marsden Bay, Lizard Point Car Park, Marsden Lifeguard Station and access steps. Improved signage should be considered.

It is highly recommended that continued monitoring is undertaken for all assets.



## 5 Problems Encountered & Uncertainty in Analysis

As with the previous inspection in 2012 no significant problems were encountered during the 2014 inspections. However, the following should be noted:

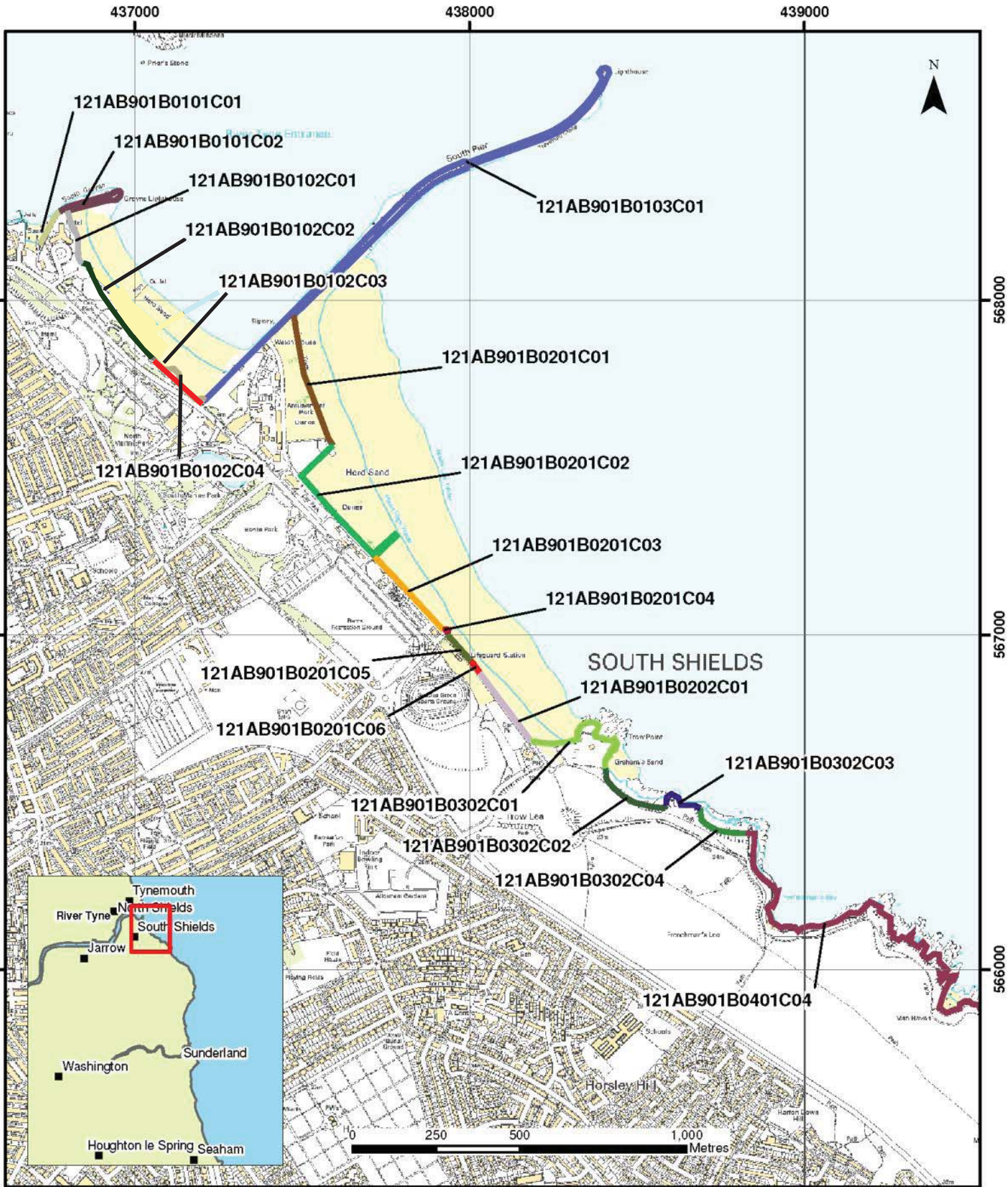
- Local tide tables were used to provide key information to plan inspection of tidal structures at low water, and where possible during spring tides, to ensure that as much of the structure as possible was visible for the inspection. Where structures fully dry out at low tide a full visual inspection was undertaken. However, where structures extend into deeper water and do not dry out at low tide no inspection was possible below the waterline. This was particularly notable at River Tyne South Groyne and South Pier.
- All assets could be accessed without problem, apart from South Pier, which is private property owned and maintained by the Port of Tyne. Although this is often open to the public access was restricted on the day of inspection. However it should be noted that South Pier is private property owned and maintained by the Port of Tyne and is occasionally closed due to due to stormy conditions and danger from wave overtopping.
- High beach levels in a number of locations resulted in some structures being partially buried and as such the buried portion of these structures could not be inspected. This was particular notable at Littlehaven Seawall, where the beach levels are quite volatile and at Herd Sands Seawalls.

## 6 Conclusions & Recommended Actions


Further to the visual inspection of all NFCDD assets, specific conclusions and recommendations for individual assets are given in **Appendix B**.


As with the previous inspection, all condition assessment data and selected photographs have been uploaded to Shore And Neashore Database (SANDS). A copy of the SANDS database and viewer software is provided along with this report.

## **Appendix A – Asset Maps**



**Legend**

 Asset location

 NFCDD Asset Number

Lead Authority: Scarborough Borough Council  
 Project: Cell 1 Regional Coastal Monitoring Programme

**Figure 1 - Map 1**  
**South Tyneside Council**  
**Frontage**

Coastal Walkover  
 Inspection Report

Drawing Scale 1:15,000 at A4

**Halcrow Group Limited**  
 Burderop Park  
 Swindon  
 Wiltshire  
 SN4 0QD

+44 (0)1793 812479

  
 A CH2M HILL COMPANY

**Notes:**

All maps taken from 2010 Asset Inspection Reports and updated where necessary

440000

441000

442000

0 250 500 1,000 Metres



566000

565000

564000

563000

121AB901B0401C04

121AB901B0401C01

121AB901B0401C03

121AB901B0401C02

121AB901B0401C05



121AB901B0402C01

121AB901B0501C01

121AB901B0502C01



**Legend**

-  Asset location
-  NFCDD Asset Number

Lead Authority: Scarborough Borough Council  
 Project: Cell 1 Regional Coastal Monitoring Programme

**Figure 1 - Map 2**  
**South Tyneside Council**  
**Frontage**

Coastal Walkover  
 Inspection Report  
 Drawing Scale 1:15,000 at A4

**Halcrow Group Limited**

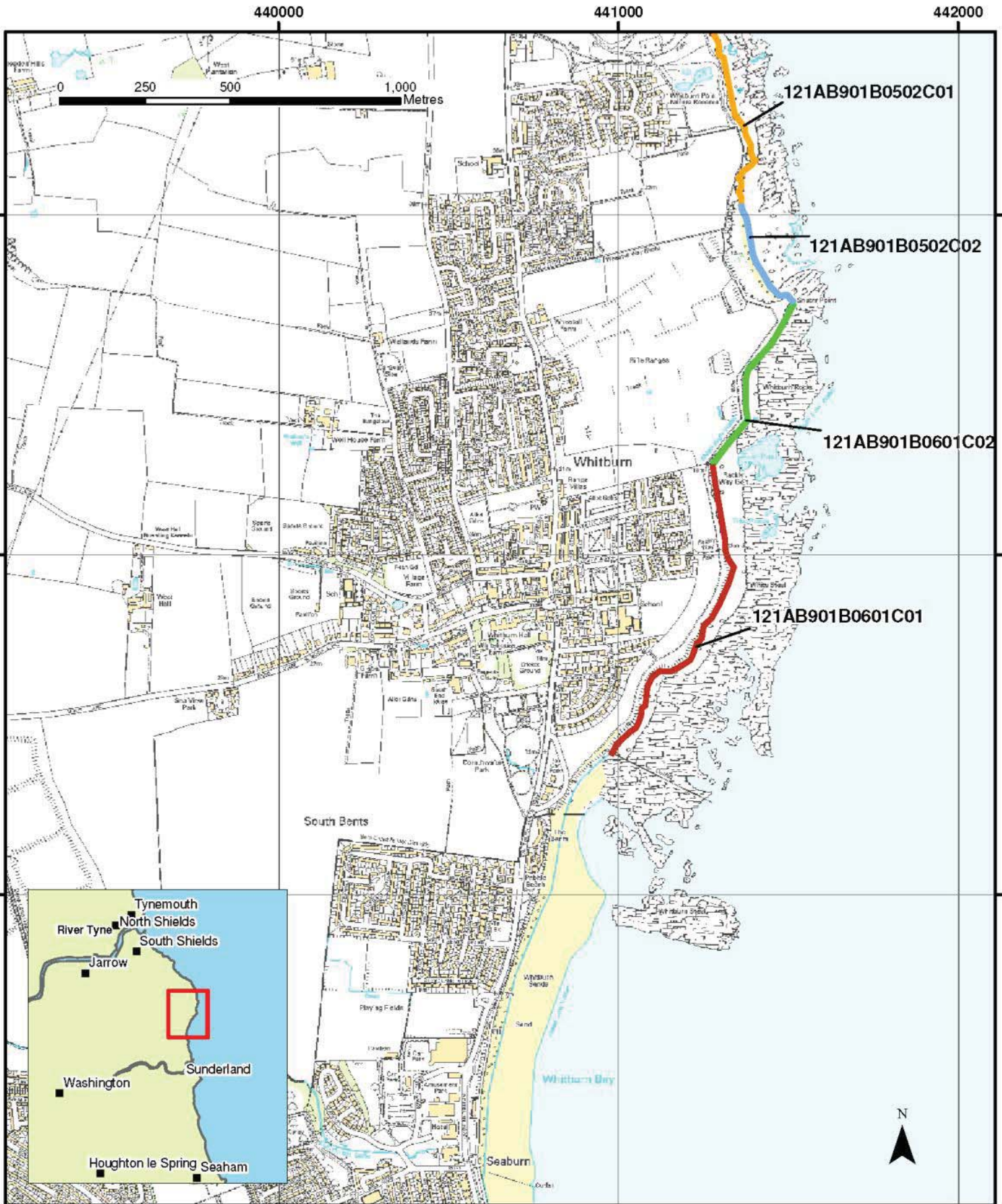
Burderop Park  
 Swindon  
 Wiltshire  
 SN4 0QD

+44 (0)1793 812479





**Notes:**

All maps taken from  
 2010 Asset Inspection Reports  
 and updated where necessary



**Legend**

-  Asset location
-  NFCDD Asset Number

Lead Authority: Scarborough Borough Council  
 Project: Cell 1 Regional Coastal Monitoring Programme

**Figure 1 - Map 3  
 South Tyneside Council  
 Frontage**

Coastal Walkover  
 Inspection Report  
 Drawing Scale 1:15,000 at A4

**Halcrow Group Limited**

Burderop Park  
 Swindon  
 Wiltshire  
 SN4 0QD

+44 (0)1793 812479



**Notes:**

All maps taken from  
 2010 Asset Inspection Reports  
 and updated where necessary

## **Appendix B – Asset Condition & Recommendations**

Name	Type	Description	Length	Inspection Date	Inspector	Comment	Overall Condition	Residual Life	Recommendations	Urgency
121AB901B0101C01	Revetment	700101 Grouted masonry revetment badly voided in places especially at toe. Crest wall behind	115.3	12-Aug-14	Halcrow TG	voids at toe due to erosion of mortar and missing masonry. Cracking of mortar towards crest of revetment. Does not appear to have significantly deteriorated since 2008 inspection. Gen fair to good cond, apart from voids	3	11 - 20	Infill voids - prioritise work at toe	routine
121AB901B0101C02	Breakwater	700201 Grouted stone jetty with concrete deck. Acts to retain beach to Herd Sand.	372.1	12-Aug-14	Halcrow TG	Minor voids and missing masonry (worse condition on north side) but also some concrete voiding on southern side near landward root. Large cracks in tarmac at seaward end of structure. No sig. change since last inspection.	3	>20	Infill cracks in deck. Patch repairs to missing mortar and blocks.	routine
121AB901B0102C01	Beach Ridge	700301 Picket fencing to build dune. Splash wall behind (02).	170.8	12-Aug-14	Halcrow TG	Healthy and accreting / stable frontage. storm during survey, some beach cliffing. strandline 30m from dune toe.	2	>20	continue to monitor	no repairs
121AB901B0102C02	Wall	700401 Concrete wall to promenade and carparks. Sand levels decrease as wall advances to Sout	279.2	12-Aug-14	Halcrow TG	Asset realigned and replaced with a new reinforced concrete seawall in 2014, sheet pile toe, stepped apron, promenade and splash wall.	1	>20	none	routine
121AB901B0102C03	Wall	700402 Newer section of wall.	128.5	12-Aug-14	Halcrow TG	Asset realigned and replaced with a new reinforced concrete seawall in 2014, toe wall, promenade and splash wall.	1	>20	none	routine
121AB901B0102C04	Wall	700501 Concrete wall to root of South Pier and protecting promenade and amenity land.	222	12-Aug-14	Halcrow TG	Asset upgraded and realigned.	1	>20	none	routine
121AB901B0103C01	Breakwater	700601 South Pier important to general protection both North and South.	2839.9	12-Aug-14	Halcrow TG	No Change from prev inspect. Masonry pier with local rock armour protection. Landward end in Good condition seaward end not inspected due to access restrictions.	2	>20	Port owned & to continue to maintain structure	routine
121AB901B0201C01	Embankment	700701 Stone embankment in front of dunes and fairground.	408.8	12-Aug-14	Halcrow TG	Stone revetment largely covered, burying stones, but appear thin / scattered. Well established beach with dunes provide protection. Dunes behind are well established with vegetation cover.	4	>20		no repairs
121AB901B0201C02	Cliff / Scarp	Undefended Frontage	632.9	12-Aug-14	Halcrow TG	Dune repairs, fencing and recent planting since last inspection. Fencing appears to be successfully retaining sand.	3	>20	Continue to monitor and maintain sand fencing and control public access	no repairs
121AB901B0201C03	Apron	700801 Concrete toe wall and paved apron to front of amenity building and carpark.	299.2	12-Aug-14	Halcrow TG	Beach levels flush with promenade. Lots of wind-blown sand on promenade.	2	>20		no repairs
121AB901B0201C04	Cliff / Scarp	Undefended Frontage	29.3	12-Aug-14	Halcrow TG	New structure as part of 2010 promenade works. High beach levels causing some wind-blown sand on promenade	1	>20	Control of wind-blown sand required	no repairs



Name	Type	Description	Length	Inspection Date	Inspector	Comment	Overall Condition	Residual Life	Recommendations	Urgency
121AB901B 0201C05	Revetment	700901 Concrete revetment to promenade and various buildings.	106.9	12-Aug-14	Halcrow TG	Lower elements of structure not inspected due to high beach levels.	2	>20	Monitor beach levels, inspect lower elements of structure if exposed.	no repairs
121AB901B 0201C06	Revetment	701001 Concrete revetment of varying level to road and buildings. Concrete toe.	43.1	12-Aug-14	Halcrow TG	Concrete generally in fair condition, minor signs of settlement not observed, no cracks. Concrete wall at seaward edge abraded. Lower elements of structure not inspected due to high beach levels.	3	>20	Monitor beach levels and inspect revetment toe if beach levels fall.	routine
121AB901B 0202C01	Gabions	701301	254.1	12-Aug-14	Halcrow TG	Well vegetated but narrow dunes with numerous blown through sections, some of which have recent cobblestone armouring. Some poor and good gabions visible at northern and southern ends only. Wind-blown sand on promenade.	3	6 - 10	Consider fencing to prevent public access to dunes and encourage vegetation.	routine
121AB901B 0302C01	Cliff / Scarp	Undefended Frontage	464.7	12-Aug-14	Halcrow TG	Local rock falls and local slumping in soft material following severe winter in 2013/14 and more recent activity evident. Undermining of concrete slipway at root of headland not observed during this inspection.	2	>20	Monitor for safety of public access	routine
121AB901B 0302C02	Graham's Sands and Souther Bay	Rock revetment	241.1	12-Aug-14	Halcrow TG	No change evident since previous survey. Rock armour toe revetment in front of regraded coastal slope. Granite rock armour ties into existing headlands. Scheme complete in Nov-08. Additional protection provided by rock outcrops on foreshore.	1	>20	None.	no repairs
121AB901B 0302C03	Cliff / Scarp Targe t rock	Undefended Frontage. Significant erosion of outcrop at lower levels. Voids & arches formed. Undercutting of material above has left fractured rock with overhanging material.	147.3	12-Aug-14	Halcrow TG	Continued local rock falls and onset of erosion of coarse material. Caves an overhands at base of cliffs not observed during this inspection. Sinkhole infilled in 2008, not observed during this inspection.	3	>20	Regular monitoring of erosion areas for safety to pedestrians	routine
121AB901B 0302C04	Cliff/Scarp Graham's Sand and Southern Bay	Rock Revetment	175.3	12-Aug-14	Halcrow TG	No change evident since last survey. Rock armour toe revetment in front of regraded landfill embankment. Granite rock armour ties into existing headlands. Scheme completed Nov-08. Additional protection provided by rock outcrops on foreshore.	1	>20	None.	no repairs
121AB901B 0401C01	Wall	701102 Masonry faced concrete wall to access and Lifeguard Station. Buttressed by steps.	54.4	12-Aug-14	Halcrow TG	No change evident since last inspection. Masonry wall in fair condition although concrete steps missing/damaged at toe. Previous repairs have been undercut and eroded to reveal reinforcement. Cracking and opening of voids evident in masonry infill.	3	6 - 10	Routine maintenance to steps and hand railing, repair cracks in masonry walls.	routine

Name	Type	Description	Length	Inspection Date	Inspector	Comment	Overall Condition	Residual Life	Recommendations	Urgency
121AB901B 0401C02	Wall	701103 Old masonry wall to Public House at base of eroding cliff.	67.2	12-Aug-14	Halcrow TG	No significant change from last inspection: Masonry wall in good condition, protected by high cobble berm. Rock netting in very good condition. Note: Mapping for this asset appears incorrect and needs revision. Netting is above steps to Marsden Grotto.	3	>20		no repairs
121AB901B 0401C03	Cliff / Scarp	701101 Eroding Sandstone cliff under National Trust. Path to crest retreated as required. Tw	655.7	12-Aug-14	Halcrow TG	Sandstone cliff with numerous caves and arches at toe and stacks (Lot's Wife, Marsden Rock) on foreshore. One section near Lot's Wife severely cracked and likely to topple.	3	>20		routine
121AB901B 0401C04	Cliff / Scarp	Undefended Frontage	2613.1	12-Aug-14	Halcrow TG	No significant change evident since last survey. Failure along 50m section in Mar-10 causing loss of footpath. Other areas of arches, caves, overhangs and slumps.	4	>20	Realign footpath landward. Public information/warning signs.	routine
121AB901B 0401C05	Cliff / Scarp	Undefended Frontage	691.9	13-Aug-14	Halcrow TG	Cliffs locally unstable with local cliff falls. Some locally unstable sections are close to cliff edge. Photo sixty six	3	6 - 10	Move safety rails and warning back when necessary.	routine
121AB901B 0402C01	Cliff / Scarp	Undefended Frontage	408.2	13-Aug-14	Halcrow TG	Cliffs regularly failing, with recent rock falls between lighthouse and Lizard Point Car Park. Remaining sections are unstable, with overhangs, caves and extensive fissures. Further cliff failures to be expected.	5	1 - 5	Warn public. keep Lizard Point CP closed. Realign fencing /warning as necessary.	urgent
121AB901B 0501C01	Cliff / Scarp	Undefended Frontage	1039.8	13-Aug-14	Halcrow TG	Extensive cave, arch and stack features. Sink hole has not enlarged much since 2010, but warning signs and hand rails have been relocated.	4	1 - 5	Monitor for sink holes / collapses & relocate warning signs and railing as necessary.	urgent
121AB901B 0502C01	Cliff / Scarp	Undefended Frontage	1007.7	13-Aug-14	Halcrow TG	Localised erosion and cave formation cutting back cliff top near to path.	3	>20	longer term realignment of footpath, railing and warning signs if necessary.	routine
121AB901B 0502C02	Cliff / Scarp - Rifle Ranges (North)	Coastal slope behind a wide raised beach	354	13-Aug-14	Halcrow TG	Relict cliff behind healthy raised beach of coarse material	2	>20	Continue active monitoring	routine
121AB901B 0601C01	Cliff / Scarp - Whitburn	Eroding sandstone cliff.	1018.1	13-Aug-14	Halcrow TG	Largely active cliff. Note failed outfall spillway scour protection near southern end. Erosion getting close to path in places	4	>20	Warning signs reqd where cliff edge close to path re-align footpath when needed.	routine

Name	Type	Description	Length	Inspection Date	Inspector	Comment	Overall Condition	Residual Life	Recommendations	Urgency
121AB901B 0601C02	Cliff / Scarp - Rifle Ranges (South)	Eroding sandstone cliff.	555.5	13-Aug-14	Halcrow TG	Many areas eroding with active local slumps, some very close to footpath, localised erosion by land drainage outfall impinging on footpath.	3	11 - 20	Warning signs and re-align footpath when needed.	routine

