



**Cell 1 Regional Coastal Monitoring Programme
Coastal Walkover Inspections 2010**



**North Tyneside Council
Final Report**

October 2010

Contents

Abbreviations and Acronyms.....	ii
Asset Condition Grades	ii
Glossary of Terms.....	iii
Preamble.....	iv
1. Introduction.....	1
1.1 Study Area.....	1
1.2 Methodology	1
2. Overview.....	2
3. Condition Assessment	4
3.1 Hartley Cove to Curry’s Point.....	4
3.2 St. Mary’s Island and Headland	5
3.3 Whitley Sands and Whitley Bay	7
3.4 Table Rocks, Brown’s Bay and Brown’s Point	14
3.5 Cullercoats Bay.....	17
3.6 Tynemouth North Point	19
3.7 Tynemouth Longsands	19
3.8 Sharpness Point	22
3.9 King Edward’s Bay.....	22
3.10 Tynemouth Headland and North Pier.....	23
3.11 Prior’s Haven to Sandy Goit.....	24
3.12 Riverside.....	25
4. Comparison with Previous Assessment.....	26
5. Problems Encountered and Uncertainty in Analysis	26
6. Conclusions and Recommended Actions	26

Appendices

Appendix A Asset Locations

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Abbreviations and Acronyms

Acronym / Abbreviation	Definition
CAM	Condition Assessment Manual
NFCDD	National Flood and Coastal Defence Database

Asset Condition Grades

Grade	Condition Description
1	Very Good
2	Good
3	Fair
4	Poor
5	Very Poor

Glossary of Terms

Term	Definition
Beach nourishment	Artificial process of replenishing a beach with material from another source.
Berm crest	Ridge of sand or gravel deposited by wave action on the shore just above the normal high water mark.
Breaker zone	Area in the sea where the waves break.
Coastal squeeze	The reduction in habitat area which can arise if the natural landward migration of a habitat under sea level rise is prevented by the fixing of the high water mark, e.g. a sea wall.
Downdrift	Direction of alongshore movement of beach materials.
Ebb-tide	The falling tide, part of the tidal cycle between high water and the next low water.
Fetch	Length of water over which a given wind has blown that determines the size of the waves produced.
Flood-tide	Rising tide, part of the tidal cycle between low water and the next high water.
Foreshore	Zone between the high water and low water marks, also known as the inter-tidal zone.
Geomorphology	The branch of physical geography/geology which deals with the form of the Earth, the general configuration of its surface, the distribution of the land, water, etc.
Groyne	Shore protection structure built perpendicular to the shore; designed to trap sediment.
Mean High Water (MHW)	The average of all high waters observed over a sufficiently long period.
Mean Low Water (MLW)	The average of all low waters observed over a sufficiently long period.
Mean Sea Level (MSL)	Average height of the sea surface over a 19-year period.
Offshore zone	Extends from the low water mark to a water depth of about 15 m and is permanently covered with water.
Storm surge	A rise in the sea surface on an open coast, resulting from a storm.
Swell	Waves that have travelled out of the area in which they were generated.
Tidal prism	The volume of water within the estuary between the level of high and low tide, typically taken for mean spring tides.
Tide	Periodic rising and falling of large bodies of water resulting from the gravitational attraction of the moon and sun acting on the rotating earth.
Topography	Configuration of a surface including its relief and the position of its natural and man-made features.
Transgression	The landward movement of the shoreline in response to a rise in relative sea level.
Updrift	Direction opposite to the predominant movement of longshore transport.
Wave direction	Direction from which a wave approaches.
Wave refraction	Process by which the direction of approach of a wave changes as it moves into shallow water.

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 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 till to varying thicknesses, softer rock cliffs, and extensive landslide complexes.

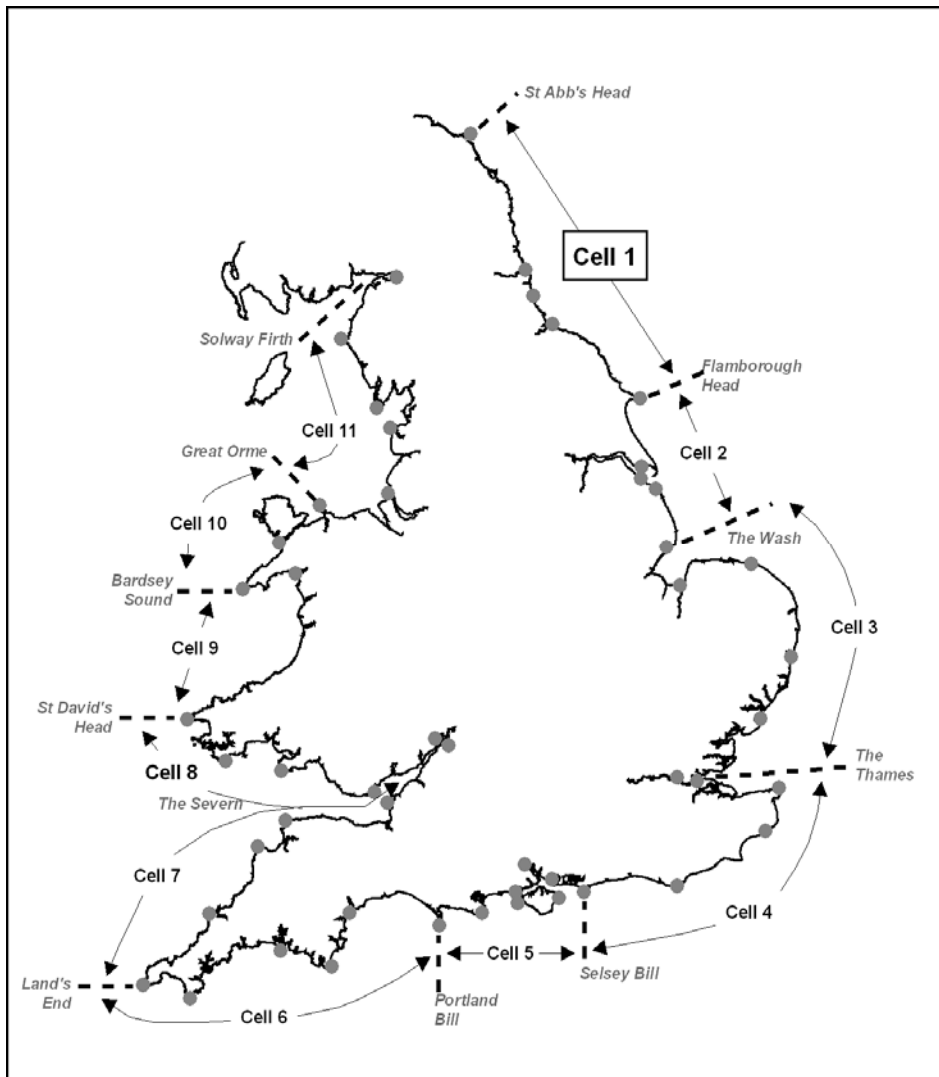


Figure 1 - Sediment Cells in England and Wales

The programme commenced in its present guise in September 2008 and is managed by Scarborough Borough Council on behalf of the North East Coastal Group. It is funded by the Environment Agency, working in partnership with the following organisations.



The data collection, analysis and reporting is being undertaken as a partnership between the following organisations:



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 Walkover Inspections 2010** and provides a summary of the main findings from the walkover inspections of North 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 frontage extends from Hartley in the north to the River Tyne in the south.

1.2 Methodology

The walkover inspections for the North Tyneside Council frontage were undertaken on 26th July and 10th August 2010. The weather experienced during the inspections was generally calm with no access or visibility problems caused by adverse weather.

The frontage has been split into a number of 'asset lengths' (Appendix A), the location and numbering of which correlates with those defined in the National Flood and Coastal Defence Database (NFCDD) which is maintained by the Environment Agency. All maritime Local Authorities that act as Coast Protection Authorities have a duty to report findings from walkover inspections into the NFCDD.

The walkover inspections cover both built defence assets and natural defence assets such as cliffs, slopes and dunes. All assets were visually inspected, photographed and graded based on their condition in accordance with the Environment Agency's Condition Assessment Manual (CAM), with estimates made of their residual life and assessments made of the urgency of any necessary repair work.

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.

In addition to this report, all detailed inspection reports (including condition grading and residual life for each asset length) and a selection of appropriate photographs have been entered into a Microsoft Asset database (provided to the Council) and transferred to NFCDD.

2. Overview

There have been significant changes in the condition of a number of the built and natural defence assets along the North Tyneside frontage since the previous formal inspections in November 2008.

The winter of 2009/2010 was particularly harsh, with sub-zero temperatures for considerable durations and heavy snowfall and rainfall. Cycles of freeze-thaw within the rock cliffs would have weakened their structure in places, causing existing fissures to widen and perhaps creating new fissures. The thick layers of snow lying on the cliff top would then have placed increased loading on the surface and with marine action attacking the toe, especially during winter storms and high tides, failures were triggered in several locations.

In addition, the high tides during the spring equinox of March 2010 coincided with storm conditions, causing additional pressure on frontages, especially those composed of softer materials, such as sand dunes.

As a result of these weather and marine conditions, the following significant findings were observed during the 2010 inspections:

- **Hartley Cove** – a local slump has occurred in the undefended cliff close to the access steps, resulting in the erection of some temporary fencing by the Council for safety purposes.
- **Hartley Cove to Curry's Point** – the undefended cliffs have experienced rockfalls and slippages.
- **St. Mary's Island** – the causeway, including its landward intersection with the Trinity Road Sea Wall, and some walls on the eastern and northern side of the island would benefit from some maintenance to address ongoing cracking and undermining.
- **Trinity Road Sea Wall** – the wall is well maintained but requires minor ongoing maintenance. Urgent attention is needed at the southern end, where it is being outlanked by ongoing erosion of the undefended cliffs to the south.
- **Golf Course** – the undefended cliffs have experienced ongoing slumping and cut-back of the cliff top position.
- **Whitley Links Sea Wall** – the wall requires maintenance, especially at the joints between the main body and the coping, and at construction joints within the main body. Worst affected areas are typically access steps and access ramps, although the wall between the Rendezvous Café and the Panama Swimming Club is also affected.
- **Panama Gardens Sea Wall** – some coping blocks have their water-return holes blocked.
- **Boardwalk Café** – the fronting wall is being undermined at its northern end.
- **Central Lower Promenade** – the sea wall has suffered abrasion damage to its toe and coping, although the main brickwork section appears fair. Further south, the concrete wall has suffered an ongoing loss of render and exposure of underlying reinforcement bars. Towards the arched sections of wall (between Central and Southern Lower Promenades) there is missing concrete from the wall crest and undermining at the bullnose.

- **Southern Lower Promenade** – there are notable gaps between the promenade deck and the wall at the southern end.
- **Brown's Bay Sea Wall** – whilst being in generally fair condition, there is one notable area of undermining which would benefit from maintenance. The wall extending to Cullercoats North Pier is also suffering undermining, as is the blockwork 'tie-in' to the pier.
- **Cullercoats Bay** – Both the North and South Piers are in poor condition and require capital improvements. There is evidence of the onset of void formation in both piers.
- **Tynemouth Longsands** – The dunes experienced measurable damage during the winter storms of 2009/2010 but have stabilised or recovered since. Some modest maintenance would be beneficial to the walls and access ramps in the bay.
- **King Edward's Bay** – concrete is flaking away from the apron at the toe of the Lower Promenade Sea Wall and there are signs of tarmac cracking in the pathways through the coastal slope which may be indicative of movement.
- **Sandy Goit** – the masonry walls around this headland are in an actively failing condition and require attention.
- **Riverside** – the revetment leading towards the Fish Quay is suffering from undermining and the concrete slurry previously poured to provide some further protection is breaking up.

3. Condition Assessment

3.1 Hartley Cove to Curry's Point

The northern boundary of North Tyneside Council's frontage is part-way along Hartley Cove. A local slump occurred in the soft material immediately adjacent to the foreshore access steps in Hartley Cove around November 2009 (below left). This affected the top edge of the footpath and resulted in some areas being temporarily fenced-off. Evidence of this slippage remained by the time of the August 2010 inspections (below right).



In addition, the undefended cliffs between Hartley Cove and Curry's Point are subject to both rockfalls in the harder material (below left) and slippages in the overlying softer material (below right). This has in places resulted in narrow sections of footpath being relocated inland along more defined paths and low-level fencing used to keep walkers away from the most vulnerable areas.



With progression south, towards Curry's Point (below left), relict slippages are evident along much of the cliff line (below right).



3.2 St. Mary's Island and Headland

St. Mary's Island is accessed by a causeway at low water (right).

An old concrete outfall structure runs parallel with the causeway on the northern side for part of its length.



At the landward end of the access ramp to the causeway, on its northern side, rock armour protection works were constructed in 2006 (below left). Erosion of the undefended cliffs to the immediate north of the rock armour is continuing (below right) but at present outflanking of the defence is not occurring.



The causeway to St. Mary's Island is generally in a poor condition despite previous patch repairs (below left), with numerous areas of cracking, voiding, displaced edge-coping, abrasion and, in some places, undermining (below right). The causeway would benefit from some relatively minor maintenance to address these defects.



The buildings on St. Mary's Island are generally well protected by a variety of defences, although the low masonry wall on the western side, fronting the residential properties, suffers from voiding caused by loss of masonry, vegetation growth through the structure and, in places, undermining (below). Despite the loose bonding in places, the wall does not appear to have significantly deteriorated since the 2008 inspections. The set of small concrete access steps is heavily abraded and voided.



The masonry wall on the north-facing corner of the island is undermined in one place (below left), but this does not seem to have deteriorated since the 2006 inspections. There are several old, abraded, concrete outfall structures extending from the island across the rocky foreshore. The remaining walls on the island, which protect the lighthouse, remain in fair condition with no structural problems observed, although the whitewash has deteriorated since the 2008 inspections (below right).



At the landward end of the causeway on its southern side, there is a set of steps joining the causeway to the Trinity Road Sea Wall. At the junction between these steps and the causeway, there is some undermining (below left), although this does not seem to have worsened since the 2008 inspections. The Trinity Road Sea Wall is generally well maintained, with evidence of previous infilling of cracks and joints (below right).



There remains some minor ongoing abrasion, especially where joint sealant has been washed-out (below left), which would benefit from ongoing routine maintenance which presently would only need to be of a minor nature. The main issue with the Trinity Road Sea Wall, however, is the continued outflanking at its southern end (below right). If the undefended cliffs to the immediate south of the wall continue to cut back behind the rock armour and seawall structure, there could be more major problems caused by outflanking and therefore a more immediate remedy to this ongoing problem is recommended.



3.3 Whitley Sands and Whitley Bay

The undefended sea cliffs at the northern end of Whitley Sands are actively slumping (below left) despite the presence of a relatively high boulder beach at their toe which sits on top of the sandy foreshore. As this erosion continues, the cliffs release material, including boulders, to the foreshore (below right). This process also cuts the cliff top back, through successive slumping failures, closer to the footpath. In time, this process will start to affect the seaward edge of the Briardene Car Park and the municipal golf course. Some sections of the undefended cliff are prone to imminent slumping since the soft material is extensively cracked.



The stone blockwork wall fronting the boatyard along the otherwise undefended cliffs has received some repairs at its southern end since the last inspections in the form of concrete fill, using steel sheet piles as temporary works, following a large failure of this section (below left). Some minor unravelling of the structure continues at the southern end. In contrast to the 2008 inspections, which occurred after an intense rainfall event, the Briardene Burn was barely discharging across the foreshore at its mouth (below right). The rainfall-induced damage previously reported to the access path down the northern bank of the burn has been satisfactorily repaired, as has the previously-reported damage to the timber boardwalk.



The rock revetment (below left) to the immediate south of Briardene Burn remains in good condition and the previously-reported sink hole in the slope behind has now been infilled (below right).



The Whitley Links Sea Wall extends in front of the Northern Promenade and whilst being in an overall fair condition, would benefit from some medium priority maintenance to infill cracks (most notably between the wall and its coping; below left), reseal gaps at vertical construction joints, and repair abrasion damage. During the present inspections, beach levels at the toe of the wall were very high, so only the upper sections of the structure could be visually inspected. Some previously-photographed defects, such as to the coping stones at the very northern end of the wall, have not been addressed since the 2008 inspections. There are also now some full-height gaps in the wall at construction joints (below right).



The worst affected areas are generally where there are access steps or access ramps from the promenade to the foreshore. Many of these structures have been repaired since the 2008 inspections but in some areas those repairs are now damaged (below left) and several other areas are in need of attention otherwise further failures of the coping will occur (below right).



The access steps in front of the Rendezvous Café are particularly in need of attention (below left) and the sea wall between the Café and the Panama Swimming Club has several areas where cracks have proliferated diagonally down the wall following the gaps between adjacent blocks (below right).



The Panama Gardens Sea Wall appears to have received some maintenance repairs since the 2008 inspections, including infilling of the most notable cracks and gaps between construction joints, which have improved its overall condition (below left). Most repairs are holding well, although some infilling of the construction joints is just starting to come away in some areas and usefully could be re-filled. The maintenance repairs also include the replacement of some previously collapsed coping with water-return holes (below right), but there remain some that are blocked or where the joint between the coping and the wall has cracked and needs infilling.



The beach access steps from the sea wall remain badly damaged in places (below left), but elsewhere the wall is in fair condition overall (below right).



The yellow-painted wall fronting the Boardwalk Café has its timber piles exposed at the toe (below left) and is being undermined towards its northern end (below right).



Fronting Spanish City is a steep vegetated slope protected by a blockwork revetment and concrete wall (below left). The previously-reported missing blockwork has been repaired (below right) and the overall defence system is in fair condition.



The Central Lower Promenade is protected by various sections of sea wall. Beach levels at the toe of the walls were high at the time of the inspections, mainly with sand but locally with cobbles. The visible sections of the concrete and brickwork wall have extensive abrasion damage to the concrete at both the toe and the coping, although the brickwork appears fair (below left). The old red lifeguard box on the promenade, which was extensively cracked, has been replaced with a modern, mobile, lifeguard box (below right).



The access ramp remains extensively abraded and cracked on both its northern (below left) and southern (below right) sides and is in danger of becoming voided and collapsing.



The next section of sea wall has experienced continued loss of render from its face (below left), resulting in more exposed reinforcement bars (below right).



The access steps down this wall have missing handrailing (below left), and the wall crest has, in places, notable cracking (below right).



The masonry wall further south is in overall fair structural condition, although heavily stained. Maintenance should be undertaken to infill gaps between joints along the central, linear, section of this wall (below left) and replace the missing blockwork at the southern end of the southerly 'roundhead' (below right).



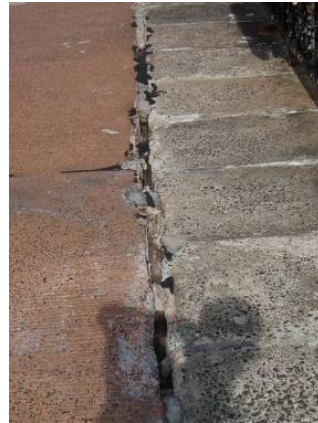
The short section of 'connecting' wall between the southern roundhead and the larger arched concrete blockwork and masonry wall has overall fair condition, but there are three sections where concrete is missing from the wall crest at construction joints (below left) and one vertical joint where the 'Expandite' sealant is exposed. The access steps are in a highly abraded condition (below right).



The concrete blockwork and masonry wall initially is arched (below left), with abrasion at the toe at the northern end. The bullnose is becoming undermined (below right) and the disused access steps are in a very poor condition and now fenced-off to the public.



As the wall fronts the Southern Lower Promenade it is generally in fair condition (below left), although the incidences of gaps between the wall and the promenade deck increase to the southern end (below right). There are also cracks and small voids in the promenade deck, areas of damaged or missing kerbing, and one area where only temporary fencing is installed to fill a gap left by missing handrailing.



3.4 Table Rocks, Brown's Bay and Brown's Point

The northern end of Brown's Bay is marked by cliffs (below left) which appear totally unchanged since the 2008 inspections due to the protection afforded by the extensive fronting rock platform of Table Rocks (below right).



Brown's Bay has two separate sections of seawall. In the northern part of the bay, the wall is generally in fair condition (below left), although the cracks, joint gaps and abrasion around joint gaps increase in frequency to the south. The high beach levels at the time of the survey meant that the abrasion previously reported to the access steps at the southern end of this wall could not be observed. The southern wall is also generally in fair condition, although there is one area of toe undermining towards the southern end (below right). The rock netting to the cliffs behind the wall remains in good condition.



The cliffs at Brown's Point initially are composed of hard rock with a small capping of softer till. The hard rock is quite highly fractured and there is evidence of several local rock falls on the foreshore, with overhangs left in the hard rock above (below left), and some cave formation at the base of the cliffs. South of Brown's Point the hard rock dips, leaving a greater thickness of capping softer material. Three areas of rockfall have led to slippage in the overlying till, including one area close to a cliff-top property. There are three other areas where large individual rocks have fallen (below right).



There are three sections of sea wall extending southwards to meet the North Pier of Cullercoats Bay. The first section is a concrete recurve wall in good condition (below left), although there is abrasion at the toe of the access steps. The mid section is a concrete blockwork wall which again is in overall good condition, but the poured concrete apron is being undermined in places (below right). There has been some deterioration in condition since the 2008 inspections since the toe apron is now in places breaking up, with concrete debris remaining on the foreshore and medium urgency maintenance would be beneficial.



The final section, extending to the North Pier, is also experiencing undermining of the concrete apron, requiring medium urgency maintenance action (below left). This includes the blockwork 'tie-in' to the North Pier, where some large masonry has been removed from the concrete apron to the pier, leaving the adjacent smaller blockwork at risk of unravelling (below right).



3.5 Cullercoats Bay

The North Pier has previously been breached during a storm, and the breach was subsequently infilled with rock armour (below left). The pier can significantly be over-washed during high spring tides that combine with storms. The concrete apron at the seaward toe is being undermined and there are several missing or settled blocks, and gaps between blocks, on the seaward face. There may be the onset of voiding adjacent to the previous rock armour repairs, part-way up the face to the northern side of the seaward-facing repair (below right). The leeward face is in better condition, although suffering from abrasion, especially around the head.



The wall fronting the lifeguard station in the north of the bay is in fair condition, but the lifeboat access ramp is starting to become abraded at the edges. The low wall fronting the sloping concrete area (below left) and the seaward end of the main pedestrian/vehicle access ramp to the bay (below right) are cracked and voided and in need of fairly urgent repair due to their continued heavy use.



The wall fronting the Dove Marine Laboratory has several minor cracks that have been infilled (below left) and will probably need re-filling before the next inspections in 2012. The brick wall and cliffs to the south of the Dove Marine Laboratory appear in fair condition (below right).



The cliffs in the centre of the bay appear stable, although there are extensive caves formed at the base. The two separate sea walls south of the cliffs also appear in fair condition with no notable defects. The defects previously recorded at the sloping concrete apron (below left) that leads to the South Pier were not observed due to high beach levels, although abrasion above the steps was still noted (below right).



The South Pier remains in poor condition, with render breaking off the leeward face of the structure and laying on the foreshore as debris (below left). Other sections have the render 'bowing' away from the wall. In areas where the render is no longer present, the reinforcement bars are often exposed, and in one area a void has opened in the face (below right).



3.6 Tynemouth North Point

The cliffs around Tynemouth North Point have arches and caves at their base (below left). There is one area near the landward root of the headland on the southern side where there has been a minor rockfall (below right), otherwise there have been the characteristic occasional local slumps in the overlying softer material.



3.7 Tynemouth Longsands

The large gap previously identified at the northern end of the masonry wall in the north of Tynemouth Longsands has been repaired (below left). There is one area, however, where part of the concrete toe apron has now broken away (below right).



The sea wall protecting the promenade and vegetated coastal slope remains in fair condition despite some abrasion (below left). Along the neighbouring sloping blockwork revetment, there is some damage to the crest of the splash wall, although the structure overall remains in fair condition (below right).



The undefended dunes along Longsands experienced notable erosion during the winter of 2009/2010, as shown in the pictures below from 16th May 2010.



During the 2010 inspections, beach levels at the toe of the dunes were high which has helped the dunes to stabilise (below left) or recover, although in the worst affected area slumps in the face of the dune remain visible and just south of there a distinct 'clifflet' remains at the toe of the dunes (below right). The erosion that was recorded, and the subsequent general recovery, is characteristic of the interactions that occur between beaches and dunes during different seasons and is within the bounds of usual behaviour, although the erosion was particularly notable because of the severity of the winter 2009/10 storms.



The access ramp at the foot of the Spa Car Park has one coping stone still missing but now another has broken away and some blocks from the ramp deck have become washed out (below left). The concrete access steps south of the newer concrete platform have cracked, with some concrete breaking away (below right). The wall extending to the Tynemouth Pool is generally in fair condition, although there are many gaps between the blocks which could usefully be infilled.



Around Tynemouth Pool, the wall on the northern-facing side has cracks and some previous repairs are now coming away. The eastern- and southern-facing walls mainly suffer from abrasion and cracks at the join between the masonry wall and the concrete wave return wall.



The short section of wall at the southern landward tie-in has its concrete apron cantilevered off the foreshore (below), although the wall behind appears sound.



3.8 Sharpness Point

The cliffs around Sharpness Point are highly fractured and have experienced several rockfalls (below left). Some failures are known to be relatively recent due to the presence of dying vegetation in clumps of softer material which has slumped following a lower level rockfall (below right).



The access steps to the foreshore at the southern end of the cliffs are very heavily abraded.

3.9 King Edward's Bay

The sea wall that protects the Lower Promenade in King Edward's Bay has at its northern end a concrete apron tie-in to the cliffs of Sharpness Point. This apron has concrete breaking off in flakes and being deposited on the foreshore (below left). The main body of the wall appears to have received some patch repairs since the 2008 inspections, but there are still considerable areas of abrasion at the toe and on the sloping revetment face, in places exposing the reinforcement bars (below right). The access steps at the southern end of the wall are heavily abraded.



Although the backing slope appears stable, there is evidence in the pathways of cracking of the asphalt which may be indicative of some slope movement (below).



There is a longitudinal crack in the wall at the rear of the access slope near the lifeguard station (below left), and missing bricks at the short set of access steps (below right).



3.10 Tynemouth Headland and North Pier

The cliffs at Tynemouth headland have a highly fractured rock structure and there are several areas with rockfalls on the foreshore (below left). In places this has left overhangs in the cliff face, with boundary walls of the Tynemouth Priory close to the cliff edge. The high arched retaining walls which extend along a short length close to the northern side of the landward end of the North Pier remain in fair condition (below right).



The North Pier (below left) appears well maintained, despite the apparent cosmetic defects on its deck, which shows considerable cracking. There are clearly areas on the outer face where maintenance has been undertaken (below right). It is anticipated that the Port of Tyne undertakes its own vessel-based inspections of the structure and plans maintenance work accordingly.



3.11 Prior's Haven to Sandy Goit

The revetment at Prior's Haven (below left) and the sandy bay backed with a coastal slope (below right) remain in good condition.



The rock headland Freestone Point is highly fractured but only experiencing occasional very local rock falls (below left). The arched retaining wall is in fair structural condition, although there is some abrasion and flaking of render (below right).



The adjacent masonry wall, however, has blocks missing from the toe (below left) and outflanking at its southern end (below right), leaving it in poor overall condition.



The masonry wall with a sloping concrete revetment at Sandy Goit is in very poor condition, with voids in both the wall and revetment (below), and erosion of the slope above the revetment. The structure is actively failing.



3.12 Riverside

The concrete sloping revetment with a concrete toe wall (below left) that runs along the riverside towards The Flats is generally in a fair condition, although there are gaps between revetment panels along the eastern section of defence, and then increasing incidences of abrasion damage to the toe wall in particular (below right) but also the crest of the structure with progression upstream along the western section of defence.



The rock revetment (below left) extending to the jetty downstream of the Fish Quay suffers from settlement of rock and in places the concrete slurry that has been poured to address this is now being undermined and in places breaking up (below right).



4. Comparison with Previous Assessment

The previous formal assessment across the whole study frontage was undertaken in November 2008. Since that time it is notable that several areas have benefited from maintenance repairs. Of the remaining areas, the most major changes since 2008 exist along undefended cliffs and dunes, which have suffered damage during winter storms, and in terms of further deterioration of some sections of sea wall or pier structures, especially along Whitley Links, Central Lower Promenade, Cullercoats North Pier, Cullercoats South Pier, Spa Car Park access ramp, King Edward's Bay and Sandy Goit. Other reported defects have not notably deteriorated further since the 2008 inspections.

5. Problems Encountered and Uncertainty in Analysis

All assets were inspected at suitable stages of the tide and therefore there were no major problems encountered.

6. Conclusions and Recommended Actions

There is an urgent need for capital works to address outflanking at the southern Trinity Road Sea Wall, and to improve the condition of the North and South Piers at Cullercoats Bay.

There is also an urgent need for maintenance to repair the failing structures at Sandy Goit, and the damaged structures in King Edward's Bay.

Routine maintenance should focus on rectifying other recorded defects, especially in Whitley Links, Central Lower Promenade and Southern Lower Promenade.

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

Specific recommendations for individual assets are given in the table below:

Defence	Location	Description	Priority	Recommended Action Date	Recommended Action	Details
121AA901 A4401C22	The Steadings	Cliff	no repairs	ongoing	continue active monitoring	
121AA901 A4401C23	Hartley	Steps	no repairs	ongoing	continue active monitoring	Maintain awareness of slippages and their effect on path and steps for H&S and access purposes
121AA901 A4401C24	Hartley	Cliff	no repairs	ongoing	continue active monitoring	
121AA901 A4401C25	St Marys Island Causeway	Embankment	no repairs	ongoing	continue active monitoring	Monitor for outflanking of rock armour
121AA901 A4501C01	St Mary's Island	Sea Wall	routine	2012	improve condition through maintenance	Repair/replace displaced wall
121AA901 A4501C02	St Mary's Island	Sea Wall	routine	2012	improve condition through maintenance	Infill undermined section.
121AA901 A4501C03	St Mary's Island	Sea Wall	no repairs	ongoing	continue active monitoring	Continue active monitoring.
121AA901 A4501C04	Whitley Sands	Sea Wall	urgent	2010	include in capital programme	Address notable outflanking at southern end (see below). Also (less urgent) fill gaps near steps at causeway end.
121AA901 A4501C05	Whitley Sands	Cliff	urgent	2010	include in capital programme	Stop erosion causing outflanking of Trinity Road Sea Wall.
121AA901 A4501C06	Whitley Sands	Revetment	no repairs	ongoing	continue active monitoring	

Defence	Location	Description	Priority	Recommended Action Date	Recommended Action	Details
121AA901 A4501C07	Whitley Bay Links	Sea Wall	routine	2012	improve condition through maintenance	Fill cracks, gaps and areas of abrasion. Repair damaged access steps and ramps.
121AA901 A4501C08	Whitley Sands	Sea Wall	routine	2012	improve condition through maintenance	Minor maintenance to fill cracks, joints and abrasion damage.
121AA901 A4501C09	Whitley Bay	Sea Wall	routine	2012	improve condition through maintenance	Infill undermined sections.
121AA901 A4601C01	Whitley Bay	Sea Wall	no repairs	ongoing	continue active monitoring	Continue active monitoring
121AA901 A4601C02	Whitley Sands	Sea Wall	routine	2012	improve condition through maintenance	Repairs to cracked and abraded sections of wall, ramp and steps.
121AA901 A4601C03	Whitley Sands	Sea Wall	routine	2012	improve condition through maintenance	Repairs to render. Fill cracks.
121AA901 A4601C04	Whitley Sands	Sea Wall	routine	ongoing	continue active monitoring	Continue monitoring
121AA901 A4601C05	Whitley Sands	Sea Wall	routine	2012	improve condition through maintenance	Infill joint gaps.
121AA901 A4601C06	Whitley Sands	Sea Wall	routine	2012	improve condition through maintenance	Replace missing blockwork at southern end.

Defence	Location	Description	Priority	Recommended Action Date	Recommended Action	Details
121AA901 A4601C07	Whitley Sands	Sea Wall	routine	2012	improve condition through maintenance	Fill cracks and gaps.
121AA901 A4601C08	Whitley Sands	Sea Wall	routine	2012	improve condition through maintenance	Fill gaps and cracks especially towards southern end.
121AA901 A4601C09	Brown's Bay	Cliff	no repairs	ongoing	continue active monitoring	Continue monitoring.
121AA901 A4601C10	Brown's Bay	Sea Wall	routine	2012	improve condition through maintenance	Fill gaps in joints.
121AA901 A4701C01	Brown's Bay	Sea Wall	routine	2012	improve condition through maintenance	Infill undermining at toe.
121AA901 A4701C02	Brown's Point	Cliff	no repairs	ongoing	continue active monitoring	Continue monitoring.
121AA901 A4701C03	Brown's Point	Cliff	no repairs	ongoing	continue active monitoring	Monitor erosion
121AA901 A4701C04	Cullercoats	Sea Wall	no repairs	ongoing	continue active monitoring	Continue monitoring.
121AA901 A4701C05	Cullercoats	Sea Wall	routine	2012	improve condition through maintenance	Maintenance at toe apron.
121AA901	Cullercoats	Sea Wall	routine	2012	improve condition through	Maintenance at toe apron.

Defence	Location	Description	Priority	Recommended Action Date	Recommended Action	Details
A4701C06					maintenance	
121AA901 A4701C07	North Pier, Cullercoats	Breakwater	urgent	2010	include in capital programme	Investigate options to upgrade the pier structure.
121AA901 A4701C08	Cullercoats Bay	Sea Wall	routine	2012	improve condition through maintenance	Repairs to damaged low wall and access ramp.
121AA901 A4701C09	Cullercoats Bay	Sea Wall	routine	2012	improve condition through maintenance	Re-fill minor cracks
121AA901 A4701C10	Cullercoats Bay	Cliff	no repairs	ongoing	continue active monitoring	Continue monitoring.
121AA901 A4701C11	Cullercoats Bay	Cliff	no repairs	ongoing	continue active monitoring	Continue monitoring.
121AA901 A4701C12	Cullercoats Bay	Sea Wall	no repairs	ongoing	continue active monitoring	Continue monitoring.
121AA901 A4701C13	Cullercoats Bay	Sea Wall	no repairs	ongoing	continue active monitoring	Continue monitoring.
121AA901 A4701C14	Cullercoats Bay	Revetment	routine	2012	improve condition through maintenance	Improve facing of the apron
121AA901 A4701C15	South Pier, Cullercoats	Breakwater	urgent	2010	include in capital programme	Investigate options to upgrade the pier structure.
121AA901 A4701C16	Tynemouth North Point	Cliff	no repairs	ongoing	continue active monitoring	Continue monitoring.

Defence	Location	Description	Priority	Recommended Action Date	Recommended Action	Details
121AA901 A4701C17	Long Sands	Sea Wall	routine	2012	improve condition through maintenance	Repair concrete toe apron.
121AA901 A4701C18	Long Sands	Sea Wall	routine	2012	improve condition through maintenance	Consider toe works to prevent undermining.
121AA901 A4701C19	Long Sands	Revetment	routine	2012	improve condition through maintenance	Repair wall crest. Fill gaps between blocks.
121AA901 A4701C20	Long Sands	Sea Wall	no repairs	ongoing	continue active monitoring	Continue monitoring.
121AA901 A4701C21	Long Sands	Dunes	no repairs	ongoing	continue active monitoring	Continue monitoring.
121AA901 A4701C22	Long Sands	Revetment	routine	2012	improve condition through maintenance	Repair/replace coping stones to revetment and ramp deck
121AA901 A4701C23	Long Sands	Sea Wall	routine	2012	improve condition through maintenance	Repoint joints in masonry seawall
121AA901 A4701C24	Long Sands	Sea Wall	routine	2012	improve condition through maintenance	Patch up previous repairs and infill remaining cracks.
121AA901 A4701C25	Sharpness Point	Sea Wall	routine	2012	improve condition through maintenance	Repair/ patch lower portion of brick wall.

Defence	Location	Description	Priority	Recommended Action Date	Recommended Action	Details
121AA901 A4701C26	Sharpness Point	Cliff	no repairs	ongoing	continue active monitoring	Continue monitoring.
121AA901 A4701C27	King Edwards Bay	Revetment	urgent	2010	improve condition through maintenance	Repairs to damaged sections of wall, revetment and apron.
121AA901 A4701C28	King Edwards Bay	Sea Wall	routine	2012	improve condition through maintenance	Re-pointing of joints, filling of longitudinal crack in backing wall.
121AA901 A4701C29	King Edwards Bay	Sea Wall	routine	2012	improve condition through maintenance	Replace missing bricks.
121AA901 A4701C30	King Edwards Bay	Cliff	no repairs	ongoing	continue active monitoring	Continue monitoring.
121AA901 A4701C31	Tynemouth Castle	Cliff	no repairs	ongoing	continue active monitoring	Continue monitoring.
121AA901 A4701C33	Tynemouth	Sea Wall	routine	2012	improve condition through maintenance	Fill cracks.
121AA901 A4801C01	North Pier, Tynemouth	Breakwater	no repairs	ongoing	continue active monitoring	Continue monitoring.
121AA901 A4801C02	Priors Haven	Revetment	no repairs	ongoing	continue active monitoring	Continue monitoring.
121AA901 A4801C03	Prior's Haven	Coastal slope	no repairs	ongoing	continue active monitoring	Continue monitoring.

Defence	Location	Description	Priority	Recommended Action Date	Recommended Action	Details
121AA901 A4801C11	Freestone Point	Sea Wall	no repairs	ongoing	continue active monitoring	Continue monitoring.
121AA901 A4801C04	Freestone Point	Sea Wall	no repairs	ongoing	continue active monitoring	Continue monitoring.
121AA901 A4801C05	Sandy Goit	Sea Wall	no repairs	2012	improve condition through maintenance	Protection to area of outflanking and infill missing blocks at toe.
121AA901 A4801C06	Sandy Goit	Sea Wall	urgent	2010	improve condition through maintenance	Repairs to revetment and wall
121AA901 A4801C07	Black Maiden	Revetment	routine	2012	improve condition through maintenance	Minor maintenance.
121AA901 A4801C08	The Flats	Revetment	routine	2012	improve condition through maintenance	Repair apron damage.
121AA901 A4801C09	Mussel Scarp	Revetment	routine	2012	improve condition through maintenance	Maintenance/repairs to revetment
121AA901 A4801C10	Low Lights	Revetment	routine	2012	improve condition through maintenance	Maintenance/repairs to revetment.

Appendices

Appendix A

Asset Locations

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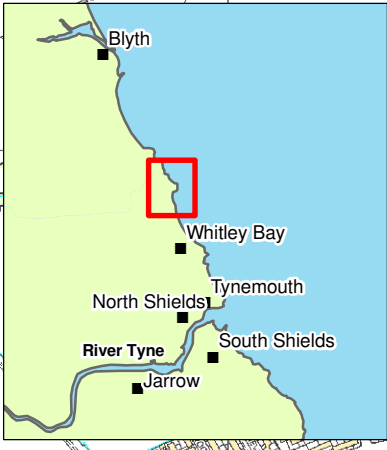
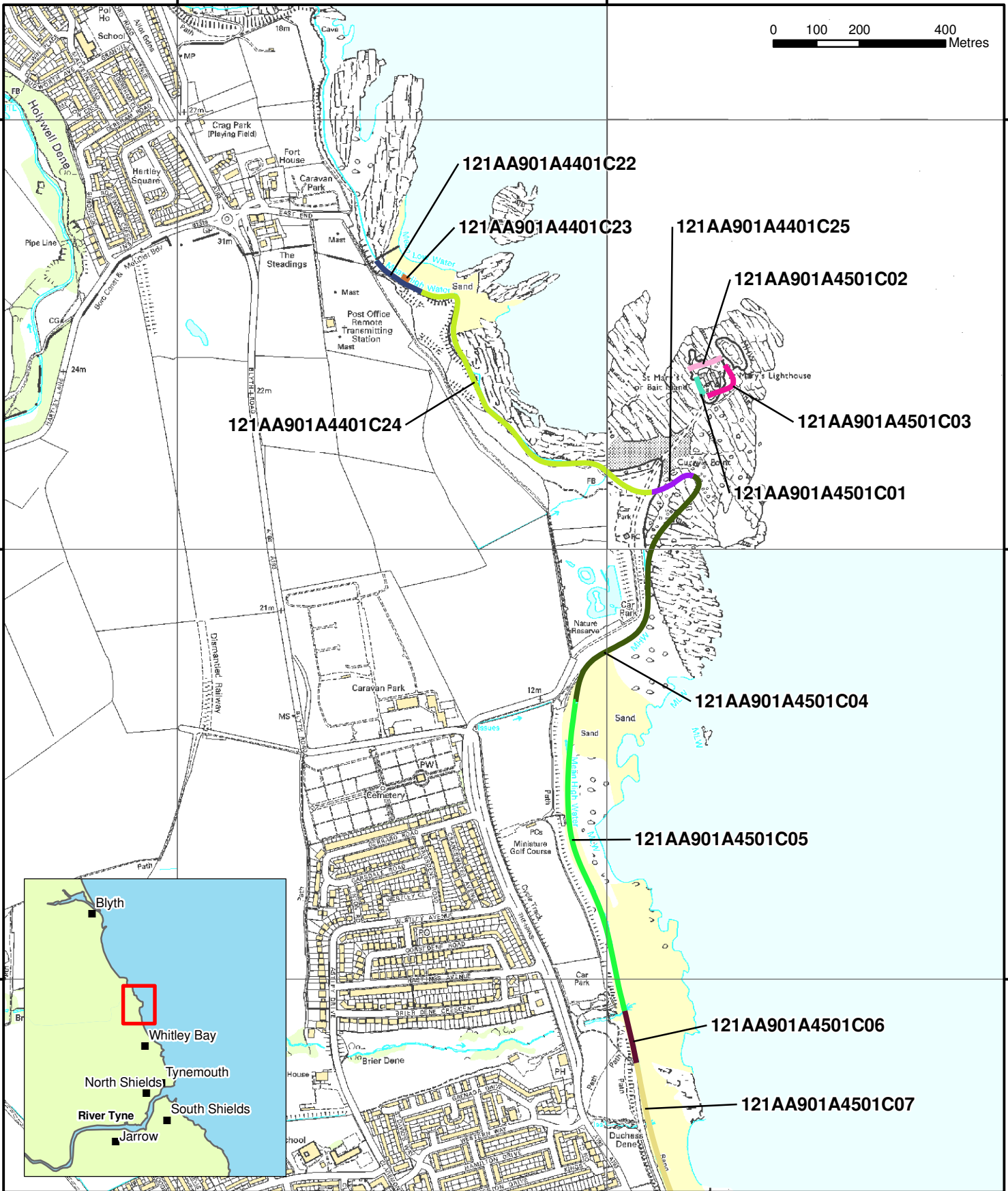
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0 100 200 400 Metres



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Legend

 Asset location
 NFCDD Asset Number

Client: North East Coastal Group
 Project: Cell 1 Regional Coastal Monitoring Programme

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

Asset Inspection
 Report 2010

Drawing Scale 1:12,000 at A4



Royal Haskoning
 Marlborough House
 Marlborough Crescent
 Newcastle upon Tyne
 NE1 4EE

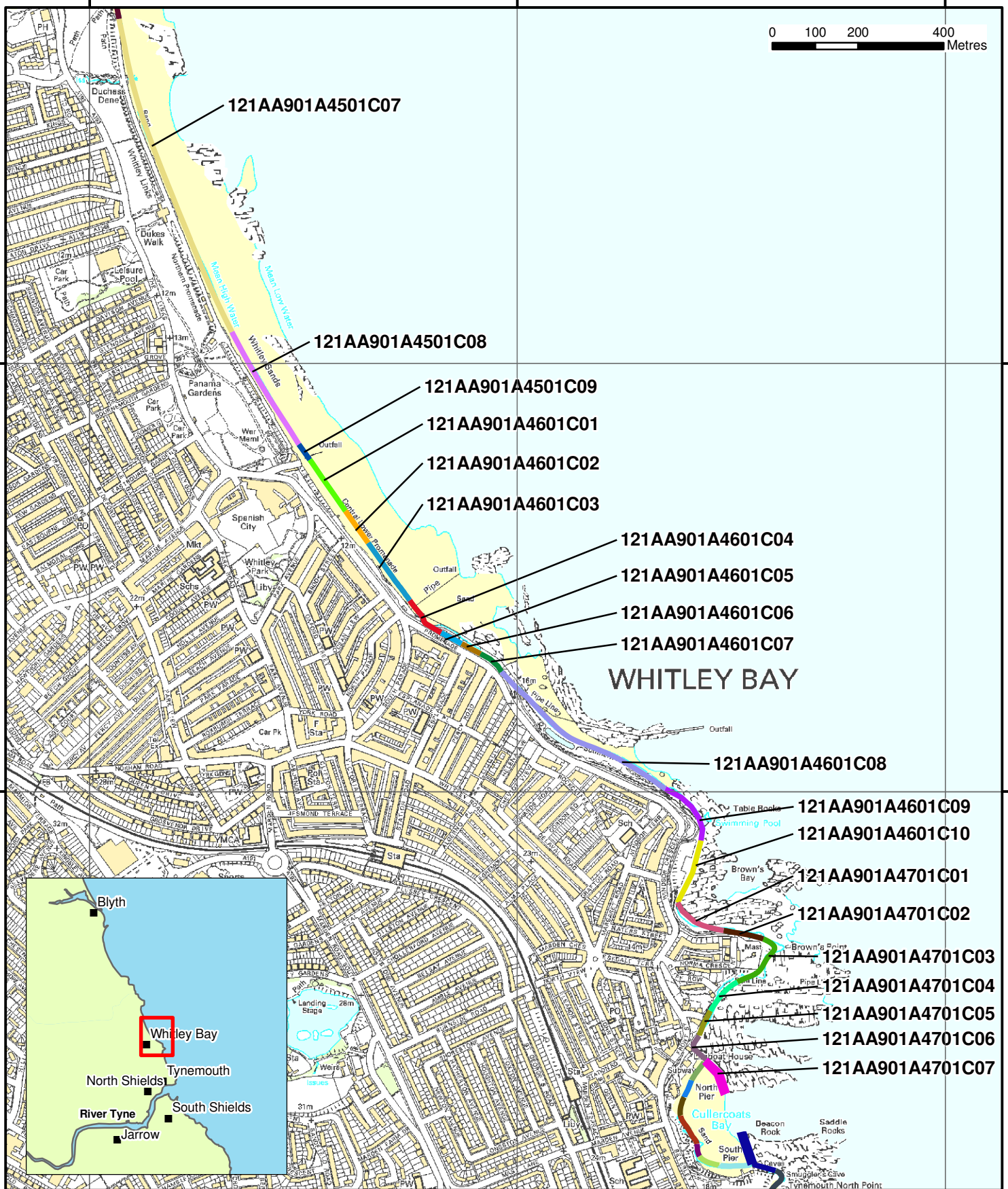
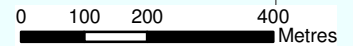
Tel: +44 (0)191 211 1300
 Fax: +44 (0)191 211 1313
 www.royalhaskoning.com

Drawn by: TC Date: 07/08/2010
 Checked by: MD Date: 15/08/2010
 Approved by: NC Date: 15/08/2010

435000

436000

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572000



Legend

- Asset location
- NFCDD Asset Number

Client: North East Coastal Group
 Project: Cell 1 Regional Coastal Monitoring Programme

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

Asset Inspection
 Report 2010

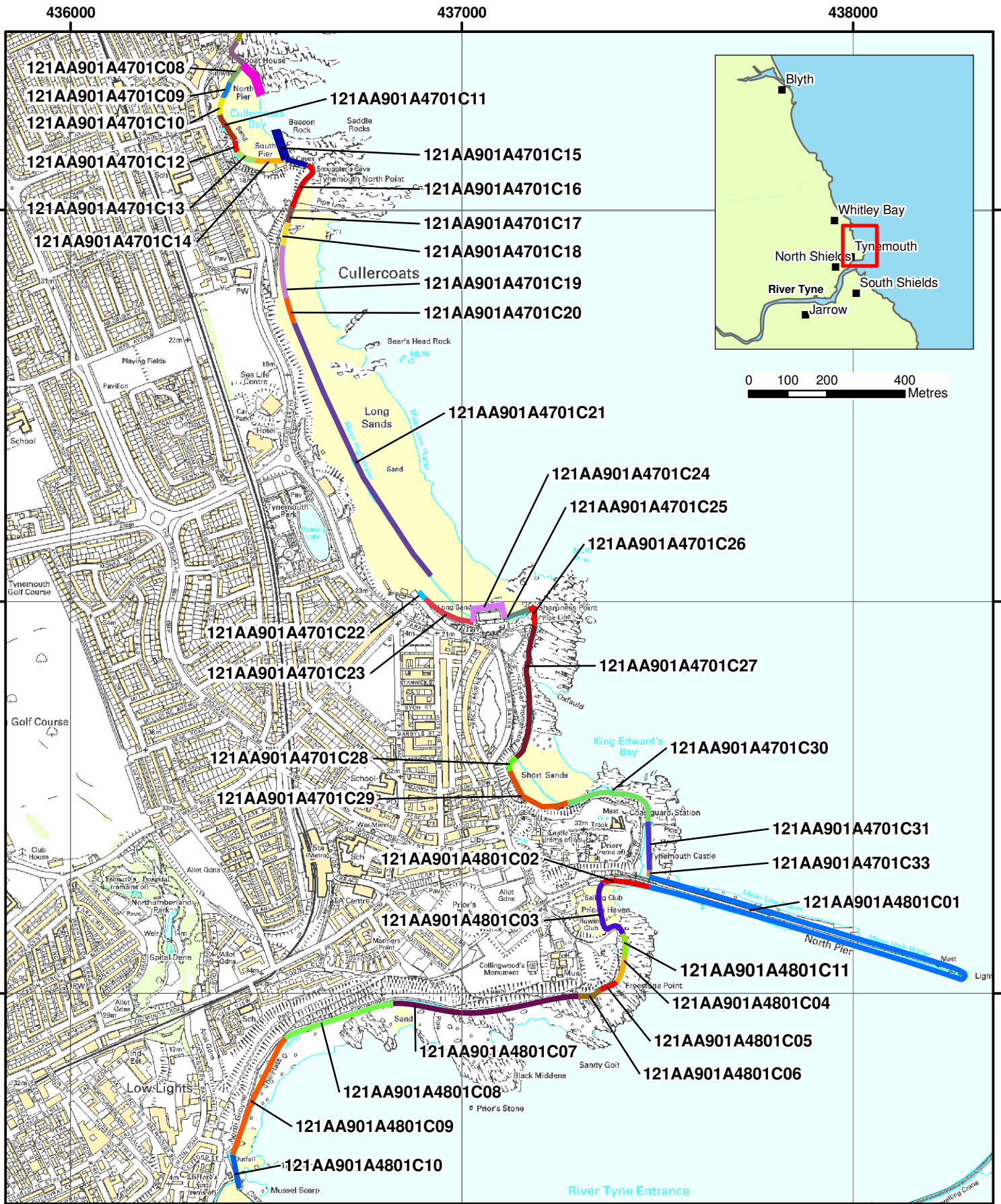
Drawing Scale 1:12,000 at A4



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 Checked by: MD Date: 15/08/2010
 Approved by: NC Date: 15/08/2010



Legend

- Asset location
- NFCDD Asset Number

Client: North East Coastal Group
 Project: Cell 1 Regional Coastal Monitoring Programme

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

Asset Inspection
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