



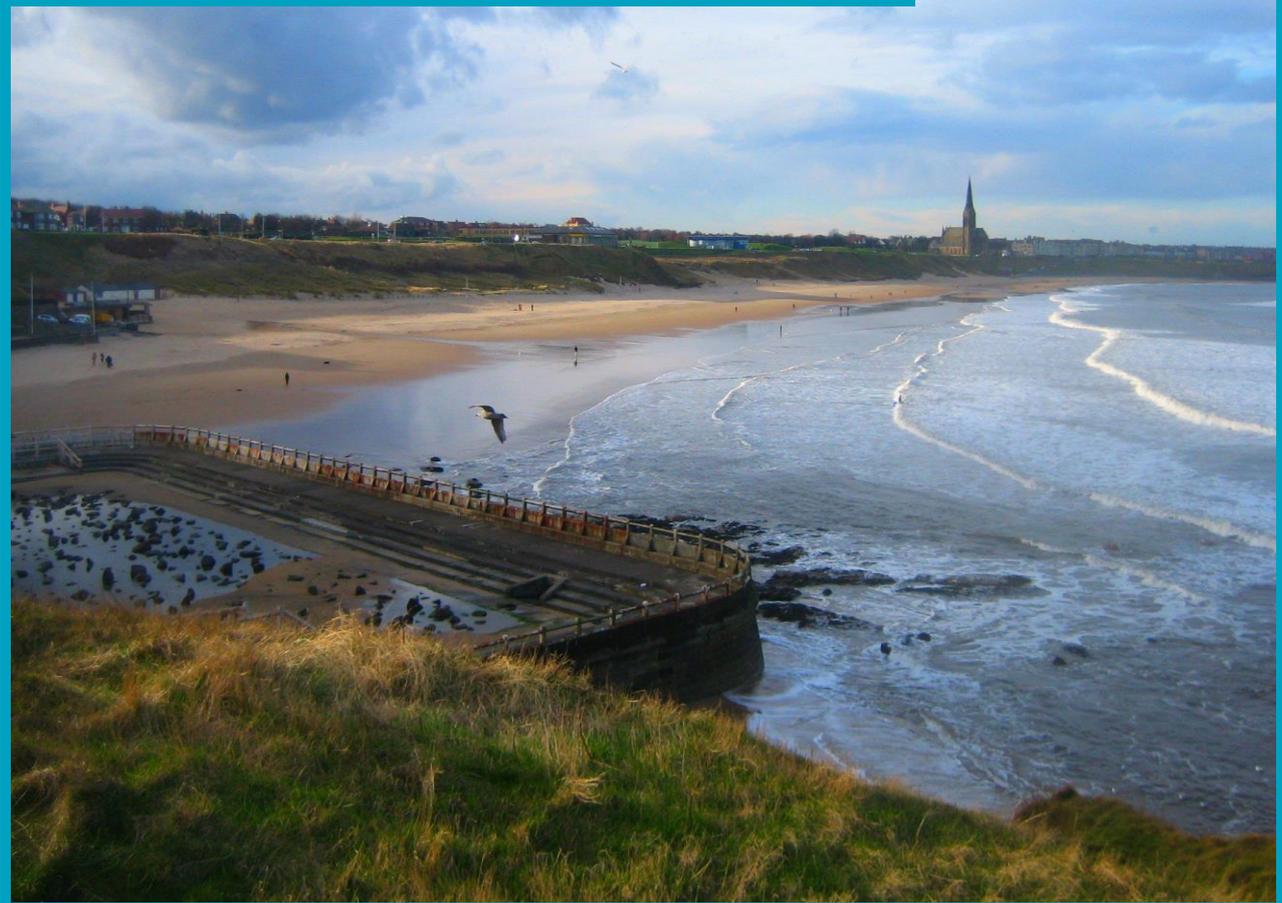
North Tyneside Council

Working in partnership with
CAPITA

Hartley Cove to the River Tyne Coastal Strategy

Technical Report 8: Risk Assessment

August 2016



Quality Management

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1. Structure of Technical Reports

- 1.1.1 The Coastal Strategy developed for the North Tyneside coastline, between Hartley Cove and the River Tyne, sets out the Council's defence management priorities for the coast.
- 1.1.2 The Strategy is presented as a series of reports, each dealing with a separate component of the plan along with a number of supporting Appendices

Technical Report No.	Title
1	Executive Summary
2	Background
3	Coastal Processes
4	Existing Defences and Historical Expenditure
5	Strategic Environmental Assessment - Environmental Report
6	Options and Economic Assessment
7	Monitoring
8	Risk Assessments
9	Public Consultation and Stakeholder Involvement
10	Glossary
Appendices	Title
Appendix A	Habitat Regulations Assessment
Appendix B	Water Framework Directive Assessment
Appendix C	Non-Technical Summary for the Strategic Environmental Assessment
Appendix D	Strategic Environmental Assessment Scoping Report

Technical Report 8: Risk Assessment

- 1.1.3 This technical report provides information on:
- Risk assessments for delivery of the Strategy, including financial and non-financial risks.

2. Generic Risk Assessments

- 2.1.1 The principal risks to delivery of the Strategy by North Tyneside Council are set out in this report. For reasons of continuity the risk assessments and definitions are largely carried forward from the 2007 Strategy. They should be read in the context of the overall Strategy and in conjunction with the other technical reports. Tables 4-1 to 4-3 below set out financial and non-financial risks for three phases of the Strategy implementation: pre-construction, construction and post-construction. These risks are applicable to the policy units where the preferred option is Maintain or Managed Realignment.
- 2.1.2 Where the preferred option is Do Minimum this involves reactive maintenance and the pre-construction risks are thus different. These are presented in Table 4-4.
- 2.1.3 In contrast to the 2007 Strategy, this Strategy does not include health and safety risk assessments for implementation of the preferred options. These are better defined and assessed beginning at scheme level as designs are identified and developed.

3. Definitions

3.1.1 The following definitions set out the terms used in the risk assessment summary tables.

- Pre-construction: risks to the client during the period prior to award of contract for the works, including definition of the business case and design and planning phases
- Construction: risks to the client during construction
- Post-construction: risks to the client extending over an assumed life of the structure of 50 years.
- Residual risk: risk after implementing available mitigation measures
 - High: likely to be an issue (probability greater than 70%)
 - Medium: possibly and issue (probability 30% to 70%)
 - Low: unlikely to be an issue (probability less than 30%)
- Effect on costs to the client: likely effect after implementing available mitigation measures
 - Potential cost increase: percentage cost increase of an event
 - Probability of increase: probability that the event may occur
 - Required contingency: expected value of an event, calculated as potential cost increase multiplied by the probability of the event
 - Review: indicates that there is a cost implication but there is insufficient information on which to propose a contingency at this stage.
 - Total: total contingency for phase. It should be noted that contingency sums would be required for any construction project in any case.
- Effect on the programme: likely effect after implementing available mitigation measures
 - Major: consequence of risk occurring will delay the programme by months or years
 - Significant: consequence of risk actually occurring will delay programme by weeks or months
- Effect on performance: likely effect after implementing available mitigation measures
 - Major: consequence of risk actually occurring will affect performance such that works may be ineffective or environmental impact unacceptable
 - Significant: consequence of risk actually occurring will affect performance such that works will fail to achieve designed performance levels or have undesirable environmental impact

4. Risk Assessments

Table 4-1 Pre-construction risk assessment

Risk	Description of effect	Mitigation measures	Residual risk	Effect on costs			Effect on programme	Effect on performance
				Potential cost increase (%)	Probability of increase	Required contingency (%)		
Strategy approval or decision to implement delayed	In the longer term defences will continue to deteriorate and risk of failure and consequent risk to property and life will increase	<ul style="list-style-type: none"> Maintain defences until Strategy is implemented Make contingency for emergency works Adopt environmentally non-contentious approach 	High until Strategy approved and implemented, then n/a	>20%	Unknown	Review	Major	Major
Funding not available, either from grant-in-aid or from partnership funding sources	In the longer term defences will continue to deteriorate and risk of failure and consequent risk to property and life will increase	<ul style="list-style-type: none"> Maintain defences until funding is obtained Identify sources of funding early in the implementation process and obtain commitments for contributions 	High	Not possible to quantify as it will vary on a scheme by scheme basis	Unknown	N/A	Major	Major
Environmental issues prevent implementation	Delay or change to preferred options	<ul style="list-style-type: none"> SEA (done as part of this Strategy) Consultation (done as part of this Strategy) 	Low	N/A	N/A	N/A	Significant	N/A
Changes in schemes to implement preferred policies	Cost changes	<ul style="list-style-type: none"> Undertake preliminary investigations (e.g. ground investigation) to ensure the option chosen is appropriate and technically feasible 	Medium	10	0.5	5	Major	Major

Table 4-2 Construction phase risk assessment

Risk	Description of effect	Mitigation measures	Residual risk	Effect on costs			Effect on programme	Effect on performance
				Potential cost increase (%)	Probability of increase	Required contingency (%)		
Changes in design	Delays to contract and increased costs	<ul style="list-style-type: none"> • Early contractor involvement to assess buildability • Use of design and build type contract • Performance type specifications 	Low	10	0.2	2	Major	None
Delay in access approvals	Delays to contract	<ul style="list-style-type: none"> • Obtain approvals prior to contract award 	Low	5	0.1	0.5	Major	None
Unforeseen ground conditions	Changes in design, delays	<ul style="list-style-type: none"> • Undertake appropriate ground investigation prior to works 	Low	10	0.2	2	Major	None
Damage to existing defences during construction	Increased costs and delays	<ul style="list-style-type: none"> • Specify construction methods and sequences to minimise risks • Undertake appropriate ground investigation prior to works 	Low	3	0.2	0.6	Major	None
Adverse weather	Delays, loss of plant/materials	<ul style="list-style-type: none"> • Undertake works in summer • Include allowances for downtime due to adverse weather 	Medium	20	0.2	4	Major	None
Adverse environmental impacts	Contamination, spillages, pollution, noise, damage to protected sites	<ul style="list-style-type: none"> • SEA • Prepare environmental action plans for construction phase • Close liaison with environmental bodies 	Low	5	0.1	0.5	Major	None
Disruption to commercial activities, such as fishing	Interruption of access to beaches, boat launching points	<ul style="list-style-type: none"> • Liaison with fishermen • Advance warning of works • Avoid peak season(s) 	Low	5	0.2	1	None	None
Interference with Port operations	Obstruction of navigation and/or land access	<ul style="list-style-type: none"> • Liaison with Port 	Low	2	0.05	0.1	Major	None
Disruption of tourism and leisure	Obstruction of accesses to beaches, closure of promenades, disruption due to works	<ul style="list-style-type: none"> • Avoid peak seasons • Minimise areas required for works • Advance warning and explanatory signage 	Low	2	0.1	0.2	None	None

Table 4-3 Post-construction risk assessment

Risk	Description of effect	Mitigation measures	Residual risk	Effect on costs			Effect on programme	Effect on performance
				Potential cost increase (%)	Probability of increase	Required contingency (%)		
Erosion rates higher than predicted	Existing assets at risk earlier than anticipated	<ul style="list-style-type: none"> Consider range of recession rates (done in this Strategy) Monitor erosion Undertake ground investigation if necessary Review Strategy on a regular basis to update conclusions 	Low	1	0.5	0.5	None	None
Beach levels lower rapidly	Risk of failure of defences increases	<ul style="list-style-type: none"> Monitor beach levels Identify possible solutions to beach lowering, e.g. toe protections 	Medium	10	0.3	3	None	Major
Sea level rise exceeds allowances	Wave heights increase, overtopping increases, scour increases, frequency and severity of flooding increases	<ul style="list-style-type: none"> Design to recommendation for increases in sea levels Monitor performance and adjust designs if necessary Undertake sensitivity in designs 	Low	10	0.3	3	None	Significant
Changes to wave climate	Damage to structures due to design not being adequate for changes conditions	<ul style="list-style-type: none"> Monitor coastal processes to identify changes Review Strategy on a regular basis to take account of changes 	Low	5	0.3	1.5	None	Significant

Table 4-4 Pre-construction risk assessment for reactive maintenance

Risk	Description of effect	Mitigation measures	Residual risk	Effect on costs			Effect on programme	Effect on performance
				Potential cost increase (%)	Probability of increase	Required contingency (%)		
Funding not available	Existing defences deteriorate and fail sooner than anticipated, possibility of severe damage to property and risk to life	<ul style="list-style-type: none"> • Prioritise maintenance funding to higher risk areas • Identify alternative sources of funding • Set aside contingency funds 	Low	N/A	N/A	N/A	Major	Major
Requirements change for specific defences	Cost increases	<ul style="list-style-type: none"> • Monitor defence condition and undertake proactive maintenance where possible 	Low	30	0.5	15	Major	Major
Exposure conditions worsen	Increased risk of defence damage and failure	<ul style="list-style-type: none"> • Monitor coastal processes • Review Strategy on a regular basis 	Low	20	0.5	10	Major	Major

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