

Robin Hood's Bay Project Appraisal Report

Appendix L: Risk Register

February 2016

Scarborough Borough Council

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Appendix L: Risk Register

This document provides information regarding the assessment of risks within the development of the PAR. This Appendix presents information regarding the methodology used to assess risks, detailing the risk numbers used within the PAR development and presents the Project Risk Register (attached as Section 1.4) and the Monte Carlo Risk Register (attached in Section 1.5).

1.1 Introduction

This Project Risk Register compiles the key project risks identified for the Robin Hood's Bay Seawall Capital Maintenance Scheme. It is intended that the Risk Register is a live document that all parties involved in the Project use and update throughout the life of the Project.

Risk has been identified within the Risk Register as **'the potential occurrence of a threat or opportunity, which could affect (positively or negatively) the achievement of the project objectives'**.

RISK = CONSEQUENCE x LIKELIHOOD

The **likelihood** is defined as the chance (or probability) of the risk event occurring within the a defined time period (project time frame). Here the risk event is defined as either the threat occurring or the opportunity being lost.

The **consequence** is defined as the effect of the risk event on one or more objectives if it occurs. The effect could be measured in financial value, project delay in weeks, lost turnover due to damage reputation etc. (Note: Sometimes the term 'impact' is used instead of consequence).

The objectives of the project were identified in the design brief including technical, economic, social, environmental, strategic and safety. This allowed the team to define the context for the risk assessment which has been split into the following sections:

- Strategic risks
- Investigation/ existing wall condition risks
- Design/ options risks
- Disturbance during construction/ maintenance works risks
- Environmental risks
- Financial risks

1.2 Methodology

1.2.1 Project Risk Register

The Project Risk Register is presented below (Section 1.4) which defines:

- Key risks
- Likely consequences of the risks
- The impact, likelihood and overall risks
- Risk type – split into health and safety, time, cost, reputation and environment

- Mitigation and control measures which have been or will be implemented throughout the project
- The residual impact, likelihood and risk.

The overall risk has been calculated using a matrix approach; combining the impact of the risk and the likelihood of the risk (Figure 1).

Figure 1: Risk matrix used to define overall risk of Scheme

			Likelihood				
			Very Low	Low	Medium	High	Very High
Score			1	2	3	4	5
Negative Consequences	Very Low	1	n	n	n	n	t
	Low	2	n	n	t	t	s
	Medium	3	n	t	t	s	s
	High	4	n	t	s	s	i
	Very High	5	t	s	s	i	i

Risk Key

intolerable
significant
tolerable
negligible / trivial

RED
AMBER
YELLOW
GREEN

i
s
t
n

1.2.2 Monte Carlo Analysis

The Project Risk Register has been used to define the residual risks to be in the in Monte Carlo Analysis. The analysis uses the best estimate cost for the works to then define maximum and minimum risks on the various potential impacts that have been identified. The results are then input into a Monte Carlo simulation providing distributions of overall potential risk value profiles.

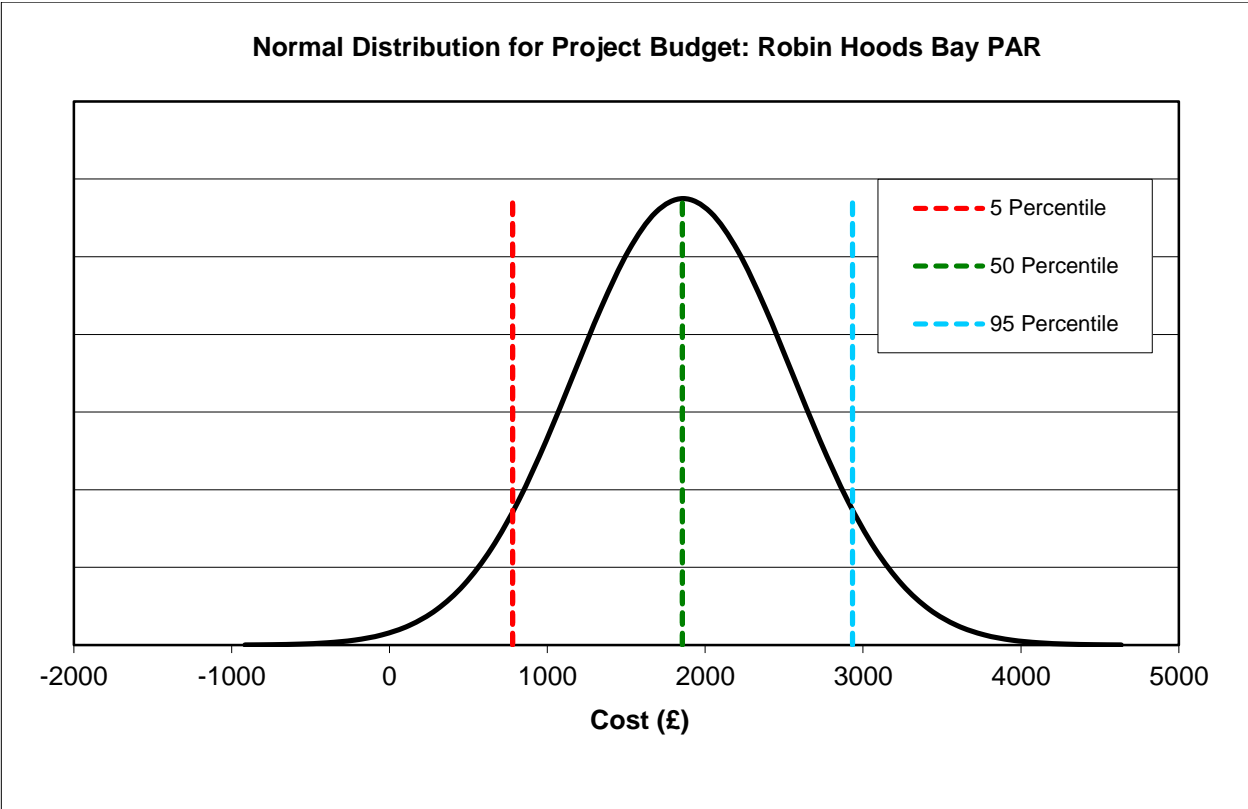
1.3 Risk Applied in PAR

Two different risk values have been used within the PAR: one for the economic analysis and one for the FSoD approval project cost.

1.3.1 Risk for FSoD Approval Cost

The 95%ile from the Monte Carlo risk distribution has been used for the FSoD Approval Cost. This is to ensure that a worst likely case scenario is taken when allocating funding for the Project. Through value engineering and careful management of the key risks, the total risk allowance is unlikely to be used. The 95%ile used within the FSoD approval cost is £ 743,521.33, which is equivalent to 8% of the project budget of £ 9,082k.

Figure 2: Normal Distribution for Project Budget showing 5th, 50th and 95th percentiles



1.3.2 Risk for economic analysis

A 30% optimism Bias has been included with in the PV costs as is recommended in EA Guidance for the PAR process where contractor input and previous experience enavles more realistic cost estimates to be produced. The optimism bias is incorporated within the economic assessment to ensure a rovuust cost is

presented. This allows confidence that the scheme is economically justifiable. The 30% Optimism Bias risk allowance has been used within the economic assessment and partnership funding calculations as it allows consideration of risks within the costs associated with not just the capital works, but also future maintenance works over the 50 years life of the Scheme.

1.4 Project Risk Register

The project risk register has been developed throughout the development of the project. This is a live document that will need to continue to be updated throughout the future development of the scheme.

1.5 Monte Carlo Risk Register

The Monte Carlo Risk Register has been developed based on the risk register and is used to add an economic value to the risks