highways england

PCF STAGE 0

M6 to A1(M) Corridor Study

Risk Management Plan

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Document Control

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Contents

Appendices

1 INTRODUCTION

1.1 Context

Highways England is undertaking a corridor study to determine possible routes for a link road between the M6 and the A1(M). Scheme Designers are tasked with working collaboratively with Highways England, their agents and representatives, Delivery Partners and stakeholders to deliver this study. The main body of the Risk Management Plan (RMP) provides the overall approach to the management of risk. This RMP shall be reviewed quarterly (or as instructed by the client at other key milestones) to incorporate innovation, continual improvement and best practices.

1.2 Objectives and Constraints

The main objectives of the study is to identify a high-speed link between the M6 in the West, to the A1(M) in the East to help increase connectivity and thereby reduce congestion, improve journey time reliability and promote growth and productivity. Other objectives are:

- Support economic growth and regional growth aspirations of East Lancashire and North and West Yorkshire, promoting economic development opportunities and improving access to economically deprived areas for employment, education and training.
- Improve journey time reliability for all road users, increase road safety, reduce congestion, enhance access to non-motorised users and improve the resilience of the route to adverse weather.
- Improve access to international transport hubs and gateways such as Leeds Bradford Airport.
- Minimise adverse impacts on the environment but also optimise any environmental improvement opportunities and reduce traffic impacts on local communities.
- Reduce carbon emissions in the corridor in-line with the Government's target for net zero greenhouse gases by 2050, and with the Climate Change emergencies declared by Local Authorities.

1.3 Purpose

The RMP explains how the project team intend to manage project risk and estimate uncertainties for the full duration of the M6 to A1(M) Study. The RMP defines the:

- Risk management principles and features;
- Scope of risk management activity during all remaining project lifecycle stages;
- Levels of risk exposure the scheme is prepared to tolerate;
- Risk management methodology, techniques and tools to be applied;
- Risk management organisation, together with key risk management roles and responsibilities;
- Communication protocols, including reporting and collaboration with Highways England, Designers, Delivery partners and key stakeholders; and
- Scheduling of risk management activities in relation to the overall scheme.

Cost-effective risk management is critically important to realising the study objectives and principles. Specifically, risk management will:

- Align risk approach with risk appetite and/or tolerance: understand the study appetite for risk and ensure each risk is managed within these expectations;

- Secure predictability of study objectives: In particular, it will help to inform cost certainty and forecasts, as well as help increase the probability of meeting key/milestone dates;
- Ensure governance compliance: robust project governance through a transparent, continually improving process, and integration with the overarching programme and project governance processes; and
- Help to identify and realise cost savings as infrastructure designs develop.

2 PRINCIPLES AND FEATURES

To be effective, risk management is a structured, communicable and traceable process for identifying, assessing and managing risks to the objectives of the project. The risk management methodology therefore has the following features, namely that it:

- Is based on risk management best practice and is fully integrated into the overarching programme and project governance processes, and not just a bolt-on exercise;
- Standardises the Risk Management Process across Highways England, and their Delivery Partners;
- Allows for the sequential application of risk management elements from identification and assessment through to analysis and control measures;
- Applies to the Project Control Framework (PCF) stages;
- Identifies Risks (threats and opportunities);
- Provides for close collaboration with Highways England, Designers, Delivery Partners and other key stakeholders;
- Sets protocols for risk ownership within the risk management organisation, including escalation and delegation;
- Identifies, evaluates and prioritises risk response effort;
- Facilitates the quantification of cost and schedule risk impact to aid contingency estimating, forecasting and control; and
- Enables the timely communication and reporting of risk information within the programme and project teams, as well as the supply chain.

3 RISK MANAGEMENT PROCESS

3.1 Governing Documentation

The risk management methodology is based on recognised risk management guidance, including ISO 31000:2018; BSI 31100:2011 and Office of Government Commerce's (OGC) *Management of Risk*. It includes the essential elements within the management systems approach to risk, namely identification, assessment, control, monitoring and review. Although each will typically be applied sequentially, the methodology does allow for them to occur continually, concurrently (e.g. risks are monitored in parallel with new risks being identified and assessed) and iteratively (e.g. mitigation plan for one risk may yield another, secondary risk). More definition on each element is provided in the following subsections. The methodology is illustrated in Figure 3-1.

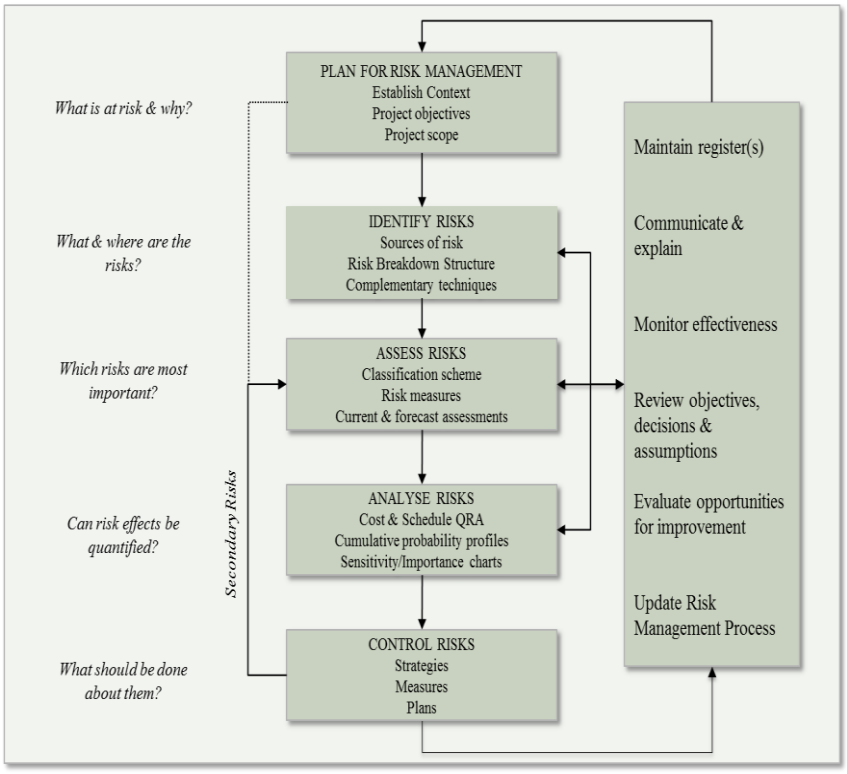

Figure 3-1 Risk Management Process

3.2 Risk Identification

Complementary methods will be used to ensure a comprehensive list of threats and opportunities are identified. These Risk Identification methods may include:

- Scheme-specific risk workshops: e.g. on PCF stage handover;
- Risk workshops: to identify risks arising from interfaces between projects as well as to agree common risks;
- Monthly risk reviews with risk and action owners: these will build on the inception risk workshop and every following risk workshop effort, providing more focused opportunities to identify risks associated with the individual design disciplines;
- Continual project team risk identification (ad hoc): all project team members are encouraged to identify risks and to communicate them to the Project Risk Manager;
- Early warnings (ad hoc);
- Identifying and reviewing project assumptions;

- Review of the schedule, considering what could go right or wrong during each activity;
- Risk reduction meetings (monthly, or more regularly if required);
- Project progress meetings (monthly); and
- Communication, via Highways England and Design and Delivery Partners, of risks from other relevant schemes or strategic studies (ad hoc).

3.3 Qualitative Risk Assessment

3.3.1 Once risks have been identified, their significance will be gauged in order to prioritise risk response and risk quantification effort. Each identified risk should be assessed in terms of its probability and impact.

3.3.2 Two assessments should be made:

- Pre-mitigation assessments account for the risk reduction potential of existing control measures only.
- Post-mitigation assessments account for the risk reduction potential of any additional risk response measures.

3.3.3 Risk Rating (RR) is the product of probability and impact. Values of RR will be mapped onto a Risk Matrix; the latter's different coloured regions representing varying levels of risk exposure and tolerability. The Risk Matrix will therefore be used to prioritise risks for more detailed quantitative analysis and risk response planning.

Table 3-1 Risk Matrix Scoring - Threat

	Very Low	Low	Medium	High	Very High
Cost - *Note 1*	*< £100k*	*£100-500k*	*£500k - £1m*	*£1 – 5m*	*>£5m*
Time (weeks) - *Note 1*	*0–1*	*1-4*	*4-8*	*8-12*	*>12*
Quality	*Meets or exceeds mandatory requirements.*	*A few minor shortfalls, some small changes required to rectify.*	*Some shortfalls requiring moderate changes to rectify but not impacting on delivery of an objective.*	*A large shortfall with an objective not being met, significant change required to rectify.*	*Public criticism over three to four weeks and/or requiring a Secretary of State response.*
Reputation	*Public criticism of less than one day requiring minimal additional press office involvement.*	*Public criticism of over one day to one week and/or requiring a project team response.*	*Public criticism of over one to two weeks and/or requiring a significant project team response*	*Public criticism of over one to two weeks and/or requiring a Chief Executive response.*	*Public criticism over three to four weeks and/or requiring a Secretary of State response*
Health & Safety	*Minor injuries (non reportable); minor health or welfare issue (non-reportable)*	*Reportable < 3 day incident; health or welfare issue affecting < 100 people for < 3 days; significant near miss*	*Reportable: major injury or dangerous occurrence; health or welfare issue affecting >100 people < 3 days or <100 people > 3 days.*	*Single fatality; health or welfare issue affecting >100 people > 3 days.*	*Multiple fatalities or single fatality and multiple injuries. health or welfare issue affecting > 1000 people > 3 days.*
Environmental	*Minor pollution event contained within site. Failure to achieve local sustainability measures.*	*Contamination off site - no lasting damage; failure to achieve Highways England sustainability targets < 1 week.*	*Contamination off site - damage < 1 month); failure to achieve Highways England sustainability targets < 1 month.*	*Contamination off site - damage < 1 year; failure to achieve Highways England sustainability targets < 1 year.*	*Contamination off site - damage > 1 year; failure to achieve Highways England sustainability targets > 1 year.*
Availability	*At least one asset/service/process with Low severity /criticality is disrupted for a Short period of time.*	*At least one asset/service/process with Medium severity /criticality is disrupted for a Short period of time, or Low severity /criticality is disrupted for a Long period of time. e.g. 2 lane closed / ICT-control system failure*	*At least one asset/service/process with Medium severity /criticality is disrupted for a Long period of time. e.g. 1 direction of the motorway Closed / ICT-control system failure across area*	*At least one asset/service/process with High severity /criticality is disrupted for a Short period of time. e.g. Motorway closed both directions, Failure of ICT in area for extended period (days)*	*At least one asset/service/process with High severity /criticality is disrupted for a Long period of time. e.g. Motorway or ICT system failure which affects other Motorways transport systems*

Table 3-2 Risk Matrix Scoring - Opportunity

	Very Low	Low	Medium	High	Very High
Cost	*< £100k*	*£100-500k*	*£500k - £1m*	*£1 – 5m*	*>£5m*
Time (weeks) - *Note 1*	*0–1*	*1-4*	*4-8*	*8-12*	*>12*
Quality	*Meets or exceeds mandatory requirements.*	*Slight improvement against mandatory requirements*	*Moderate improvement against mandatory requirements*	*Significant improvement in quality against mandatory requirements*	*Outstanding improvement in quality against mandatory requirements*
Reputation	*Public or Stakeholder praise of less than one day requiring minimal additional press office involvement.*	*Public or Stakeholder praise of over two weeks or increase in reputation with Stakeholders*	*Public or Stakeholder praise of over one month or moderate increase in reputation with Stakeholders*	*Public or Stakeholder praise of over two months or significant increase in reputation with Stakeholders*	*Public or Stakeholder praise of over two months or outstanding increase in reputation with Stakeholders*
Health & Safety	*Very Minor improvement in H&S - very slight decrease in Minor injuries (non-reportable); minor health or welfare issue (non-reportable)*	*Minor improvement in H&S - slight decrease in Minor injuries (non-reportable); minor health or welfare issue (non-reportable)*	*Moderate improvement in H&S - moderate decrease in Minor injuries (non-reportable); minor health or welfare issue (non-reportable)*	*Significant improvement in H&S - significant decrease in injuries (reportable) or health or welfare issue (reportable)*	*Outstanding improvement in H&S - Outstanding decrease in injuries (reportable) or health or welfare issue (reportable)*
Environmental	*Very minor improvement to environment*	*Minor improvement to environment*	*Moderate improvement to environment*	*Significant improvement to environment*	*Outstanding improvement to environment*
Availability	*At least one asset / service / process with Low severity /criticality has increased availability for a Short period of time e.g. 1 lane opened early*	*At least one asset / service / process with Medium severity /criticality available for a Short period of time, or Low severity /criticality is available for a Long period of time e.g. 2-lane opened early*	*At least one asset / service / process with Medium severity /criticality is available for a Long period of time e.g. 1 direction of the motorway opened / ICT-control system improved across area*	*At least one asset / service / process with High severity /criticality is available for a Short period of time e.g. entire motorway opened / ICT-control system improved across area*	*At least one asset / service / process with High severity /criticality is available for a Long period of time e.g. entire opened / ICT-control system improved across area*

3.3.4 Highways England's latest Risk Matrix and Probability-Impact Diagram (PID) will be used for assessment of the project risks.

Table 3-3 Probability Impact Diagram

Probability	Opportunities					Threats				
Very High 5	25	20	15	10	5	5	10	15	20	25
High 4	20	16	12	8	4	4	8	12	16	20
Medium 3	15	12	9	6	3	3	6	9	12	15
Low 2	10	8	6	4	2	2	4	6	8	10
Very Low 1	5	4	3	2	1	1	2	3	4	5
	5 Very High	4 High	3 Medium	2 Low	1 Very Low	1 Very Low	2 Low	3 Medium	4 High	5 Very High
	Impact									

3.4 Risk Mitigation Planning

3.4.1 Risk assessment determines the need and urgency for risk response planning; the aim being to ensure that levels of risk exposure remain within tolerable limits. Once the most appropriate strategy (e.g. avoid, transfer, treat or tolerate) has been determined, risk response plans, with which to realise the chosen strategy, will be agreed. Each

plan will have at least one action or risk response measure, action owner(s) (and if deemed necessary a cost estimate) and target completion dates. Risk owners will be responsible for identifying suitably qualified and experienced action owners. They are accountable for all risk response plans they own. Action owners are responsible for the timely completion of risk mitigation actions they own.

3.4.2 Risk mitigation planning has a clear relationship with change control. Before being implemented, a risk response measure must first be sanctioned by Highways England or Design Project Manager (PM). For this to happen, consideration will be given to the cost-effectiveness of the measure, which should compare:

- The cost of implementing the measure, including the introduction of any secondary risks; with
- The measure's risk potential, which can be illustrated by the post mitigation risk assessment.

3.4.3 Once sanctioned, the cost of implementing risk mitigation measures should be communicated to cost/contract management for them to manage change to the cost baselines. The mitigation plan will then be added to the baseline schedule.

3.5 Risk Monitoring and Review

3.5.1 It is critical that the risk management process monitors the project's risk profile and the actions taken to manage it. Risk exposure can change over time owing to the:

- Implementation of risk mitigations;
- Emergence of new risks;
- Occurrence or non-occurrence of risk events;
- The passing of risk impact timeframes (changing risk proximity); and
- Agreed changes/trends.

3.5.2 Risk monitoring will be an iterative process that will occur continually until study completion. Methods of risk monitoring have already been mentioned and include monthly reviews with risk owners, risk workshops, risk reduction meetings and progress meetings.

3.5.3 A risk register template has been produced by the design team and agreed with the Highways England PM. This risk register spreadsheet will be the primary means of recording risk information and monitoring risk exposure on a project.

3.5.4 The latest project risk registers will be reviewed monthly by the teams and the status, pre and post mitigation assessments and response actions will be updated by the risk and response owners.

3.5.5 Any new risks will be added and assessed, and risk closed if they no longer impact the project.

3.5.6 Risk reduction meetings will be held in conjunction with the Change Control Lead to ensure that any change is captured, contingency funds allocated and reported back to the baseline estimate.

4 RISK COMMUNICATION

4.1 Risk Reporting

4.1.1 This RMP provides for regular risk reporting to different programme stakeholders, including project governance boards, executives and management team. Scheme Risk Managers will provide the necessary information for their project managers and commercial managers to include in the reports for which they are responsible.

- **Monthly risk reports**: these will be via the monthly progress report produced by the design team PM. The monthly risk report will identify the top 10 threats and opportunities and progress from the previous month. These will be presented for discussion at the monthly Project Boards
- **Month-end project risk registers** (MS Excel format): these will be provided to the Highways England PM or Programme Risk Manager at the end of each calendar month (WD-6) as detailed in the Risk calendar (see Section 7).

4.2 Project Risk Transfer

4.2.1 For the purposes of this plan, risk transfer refers to ensuring risk is managed at the appropriate level (i.e. strategic, programme, project) and by the party (e.g. Highways England, Designer and/or Delivery Partners) best placed to manage it. For example, a risk identified during a scheme risk workshop may be more cost-effectively managed at the programme level. In which case, the risk is transferred or rather escalated to the programme risk register. **Note**: This does not refer to any contractual risk transfer as this will be defined in the individual contract terms.

5 ROLES & RESPONSIBILITIES

5.1.1 The project risk management function is illustrated in Figure 5-1. The principal risk management responsibilities and duties are shown in Appendix A. The Risk Manager is tasked with ensuring all risk management activities are undertaken in accordance with this RMP. The risk management function will liaise closely with the following post holders:

- Programme Risk Manager;
- Client Project Lead;
- Project Controls Manager;
- Supplier Project Manager;
- Project Commercial Manager; and
- Discipline Leaders.

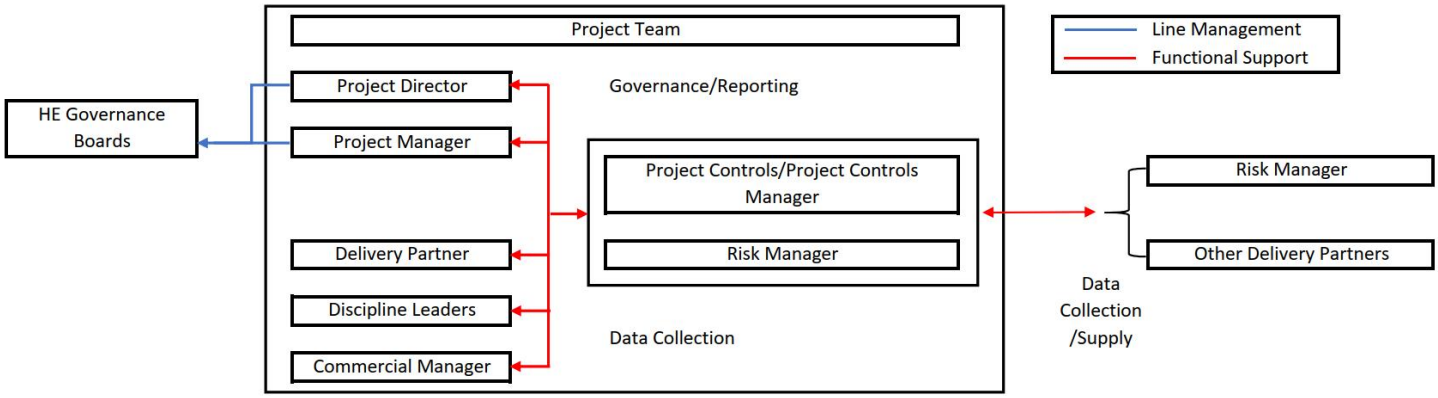

Figure 5-2 Risk Management Organisation

5.1.2 It should be noted that the roles shown in the organisational chart above are not limited to one organisation. For example there will be a Highways England Project Manager and Design Team PM.

6 FURTHER REFERENCE

6.1.1 Further detail on the Risk Management procedures can be found in the documents identified below.

- Highways Agency Risk Management Policy & Guidance, v3.3 (July 13), P. Bohan.
    - Corporate level policy document on risk management including assurance, appetite, process and responsibilities.
- Major Projects Risk Management Manual, v2.0 (May 10), R. Jude.
    - Detailed explanation of the MP approach to risk management including RACIs. References the PCF products required with associated RACI, the development of risk estimates through the lifecycle. Specific escalation section for managed motorways and identifies programme level risks. The approved template for capturing and reporting of risk at project and programme level.

7 SCHEDULE OF ACTIVITIES

Table 7-1 is a plan of risk management activities. The frequencies are dependent on the start date of the project and omission and addition to this schedule will be with agreement of the Highways England PM.

Table 7-1 Schedule of Risk Management Activities

Risk Management Activity	Rationale	Frequency
Issue RMP	Using generic HE Risk Management Plan	Week 4
Project team awareness training	Series of ½ hour sessions within Discipline Leads to explain project risk management objectives, process and project contribution, and hence to encourage engagement in the risk management process	Week 6 (if required)
Inception scheme-specific risk workshops	Initial workshop to be attended by Client Project Lead, Supplier Project Manager, Designer Discipline Leads, and Delivery Partner(s).	Week 6
Risk interviews with project risk owners	Held to: Identify any new risks Agree likely risk ownership/allocation Identify and evaluate risk response plans Monitor progress on existing risk response plans	Monthly
Project-specific risk workshops	Held to: Check/normalise semi-quantitative risk assessments Identify any additional capital cost & schedule risks Assign risk ownership of any new risks Identify & evaluate risk response plans	Quarterly
Risk Reduction Meetings	To consider potential additional risks identified via the Early Warnings process.	Monthly
Month-end Risk Register Submissions	The Risk Register will be submitted to Highways England. The provision of Risk Registers is directed to the Scheme Risk Manager.	Monthly (to be submitted by WD-6)

Appendix A RACI Matrix

Risk Management Steps & Activities	Project Director	Project Manager	Commercial Manager	Project Controls	Risk Manager	Discipline Leaders	Planner	Risk Owner	Action Owner
Plan									
Agree risk management objectives and strategy	A	C	C	C	R	I	I	I	I
Agree risk management KPIs	A	C	C	C	R	I	I	I	I
Agree risk categories and Risk Breakdown Structure (RBS)	I	A	I	I	R	I	I	I	I
Agree EW cross-referencing protocol	I	A	I	I	R	I	I	I	I
Illustrate RM organisation & relationship with contractor's equivalent	C	A	I	I	R	I	I	I	I
Define key RM roles and responsibilities	C	A	I	I	R	I	I	I	I
Develop Risk Management Plan (RMP)	C	A	C	C	R	I	I	I	I
Identify, Assess, Respond, Review									
Hold inception workshop	C	A	C	C	R	C	C	C	I
Confirm responsibility for individual risk ownership	C	A	C	C	R	C	I	C	I
Review qualitative risk assessments (current and forecast)	C	A	C	C	R	C	C	C	I
Monthly risk reviews with risk owners	I	A	C	C	R	C	C	C	I
Report									
Produce Risk Reporting for monthly progress report	I	A	I	I	R	I	I	I	I
Maintenance and Continual Improvement									
Maintenance of the risk management process	C	A	C	C	R	I	I	I	I
Maintenance of risk register	I	A	I	I	R	I	I	I	I
Recording of risk management activity (for audit purposes)	I	A	I	I	R	I	I	I	I
Contribute to lessons learnt	C	A	C	C	R	C	C	C	C

R	Responsible
A	Accountable
C	Consulted
I	Informed

Appendix B M6-A1 Study

Introduction

This Annex provides a project specific risk statement for the M6-A1 study. This statement is compliant with Section 5.1 – Risk Products and the Project Control Framework of the Highways England MPD Risk and Issue Management Manual version 1 dated May 2018.

The project specific risk statement references general risk management processes and procedures that are already discussed in the Risk Management Plan.

This statement provides additional detail required to supplement the Major Projects risk statement, including the specific methods, tools, context, strategy and approach to risk management adopted in the delivery of the M6-A1 study.

This document will be updated at least quarterly in line with project progress, current risk profile status and current risk exposure.

Risk Management Process

The Risk Management Plan (RMP) details the risk management process, including the reference governing documentation, the methods used for risk identification, qualitative analysis and scoring of risks, quantitative risk analysis and risk response planning methods. These cover the overall process for risk management.

The project will also undertake an analysis of assumptions to identify the potential an assumption could develop as a risk and therefore to be included in the risk register. The assumptions analysis will also be issued in line with the WD-6 risk register issue.

The risks identified and the approach used will be compared to similar study schemes to ensure best practice is learnt from others and shared.

Risks associated with construction delays are treated within the risk register as a single risk that encapsulates the aggregation of construction time impacts across all the risks within the register influencing construction completion date. This allows each risk to be costed directly and purely on impact of change

Key Roles and Contacts

The key people within the Risk Management Process are listed below. These people will undertake the duties and responsibilities identified in Appendix A of the Risk Management Plan

- [redacted] – Highways England Project Manager
- [redacted] – Design Team Project Director
- [redacted] – Design Team Project Manager
- [redacted] – Highways England Assistant Planning Manager
- [redacted] Highways England Apprentice Project Manager
- [redacted] – Design Team Risk Manager
- [redacted] – Design Team Quality Assurance Lead
- [redacted] – Design Team Highways Lead
- [redacted] – Design Team Environment Lead
- [redacted] – Design Team Strategy Lead
- [redacted] – Design Team Modelling Lead

- [redacted] – Design Team PCF Product Lead
- [redacted] – Design Team Stakeholder Lead

Sources of Risk Categories

The top level sources of risk sub-categories for risks are listed below. These include risks to delivery of the construction phase which are being identified alongside design risks or interface risks which could impact operations, maintenance or construction. Note that not all the risk categories available are applicable for this phase of work.

- Design
  - Interface with existing site
  - Interface with third parties
  - Design development
  - Design approvals
  - Buildability
- Construction
  - Environmental contamination caused by construction activities
  - Health and safety
  - Public liaison
  - Resource availability and logistics
  - Re-work / remedial works
  - Uncharted services
  - Unforeseen physical conditions
- Operational / Maintenance
  - Integration into network
  - Maintenance of existing highway
  - Interface with the Area Team during construction
  - Traffic safety and management
- Statutory Process / Planning
  - Third party agreements
  - Traffic assessment
  - Environmental assessment
  - Public consultation
  - Economic assessment
- Strategic / Programme
  - Change in client's brief
  - Change in standards
  - External transport policy
  - Procurement strategy and schedule
  - Programme prioritisation
- Organisation / Human Factors
  - External stakeholder coordination
  - Ineffective internal relationships
  - Non-performance by employer
- Statutory undertakers / third parties
  - Failure to perform
- Ecology/Archaeology
  - Protected fauna
- Financial