MANCHESTER CITY COUNCIL

STOCKPORT METROPOLITAN BOROUGH COUNCIL

Cheshire East Council

A6 to Manchester Airport Relief Road
Quantified Risk Assessment

Method

A quantified risk assessment of the A6 to Manchester Relief Road was undertaken on 13/11/2014 led by the Martin Mulligan the Project Risk Manager. The workshop was attended by SMBC's Employer's Agent and member's of the ECI Contractor's project team.

The workshop reviewed the project risk register and identified any risk that were no longer relevant and added any new risks. Each risk was assessed in terms of minimum, maximum and most likely cost outcome together with probability of occurrence. Each risk has been allocated a risk owner and these are reviewed each month by the project risk committee.

The quantified values of risk register were run through the @Risk simulation software using Monte Carlo techniques to obtain the likely risk profile.

Output

The output from the risk simulation is attached. The P50 value is £7,753,571.50

A6 Manchester Airport Relief Road SMBC Risk Register | **Rev: 4**

Risk Status, Description and Categorisation Data			Risk Management Data				Post Mitigation Qualitative Assessment								Quantitative Risk Assessment									Risk Feedback Data								
Ref	Description of the Risk	Risk Category	Risk Owner	Appointed Risk Manager	Risk Mitigation Plan	Change Status of Residual Risk Allowanc	Probability Score	Cost Impact Score	Time Imapct Score	Series / Parallel Delay	Reputation Impact Score	Cost Impact Rating	Time Impact Rating	Reputation Impact rating	Probability	Minimum Cost	Most Likely Cost	Maximum Cost	Minimum Time (Weeks)	Most Likely Time (Weeks)	Maximum Time (Weeks)	Uncertainty Risk Allowance incl Series Time Allowance	Uncertainty Parallel Time Allowance (Weeks)	Total Risk Allowance at the Start of the Design Phase	Required Increase	Allowable Decrease	Forecast to be spent on the Risk	Estimated Cost Incurred	Risk Transfer	Current Initial Allowance Remaining	Proposed Current Uncertainty Allowance	Uncertainty Allowance to be taken forward	Forecast Final Risk Spend	Risk Variance
62	High Court Challenge leading to programme delays.	Planning	SMBC	Bill Edwards	Seek to minimise land take requirements to mitigate field of objectors. Ensure approval process is followed correctly and all documentation is simply structured and easily followed with all benefits evidenced and full ameliorative measures are included to neutralise any potential negative impact	↑	5	5	5	Parallel	4	25	25	20	80%	£1,500,000.00	£2,000,000.00	£3,000,000.00	6.0	12.0	24.0	£1,733,333.33	11.2	£8,750.00	£1,724,583.33				-£1,724,583.33	£8,750.00	£1,733,333.33	£1,733,333.33	£1,733,333.33	-£1,724,583.33
42	Delay in Works by Utility Companies - Statutory Undertakers cannot deliver to the accepted programme of works which impacts on the main construction programme.	Statutory Undertakers	SMBC	Paul Lord	Early meeting to understand and agree programme. Commence works as soon as possible to best utilise float to mitigate delay. In house capability to provide assistance or undertake diversion works directly, where possible. Adopt early warning procedure. Consider accelerated working to mitigate delay.	↔	3	5	3	Series		15	9	0	50%	£1,000,000.00	£2,000,000.00	£3,000,000.00	2.0	4.0	6.0	£1,000,000.00	0.0	£1,400,000.00		£400,000.00			£400,000.00	£1,400,000.00	£1,000,000.00	£1,000,000.00	£1,000,000.00	£400,000.00
267	Protester action	Third Parties	SMBC	Bill Edwards	All changes to be identified by the change control procedure and challenged as part of the change approval process.	↔	3	5				15	0	0	50%	£500,000.00	£1,000,000.00	£2,000,000.00	0.0	0.0	0.0	£583,333.33	0.0	£583,333.33						£583,333.33	£583,333.33	£583,333.33	£583,333.33	£0.00
314	Works Info does not require LED but ultimately that's probably where the project is heading. Likely additional cost of £1000/column. With 500+ columns likely additional cost of £500,000 is probable.	Civil Design Development	SMBC	Bill Edwards	All changes to be identified by the change control procedure and challenged as part of the change approval process.	↑	5	4			1	20	0	5	100%	£400,000.00	£500,000.00	£600,000.00				£500,000.00	0.0	£0.00	£500,000.00				-£500,000.00	£0.00	£500,000.00	£500,000.00	£500,000.00	-£500,000.00
83	Additional environmental / ecological mitigation measures required	Environmental Mitigation	SMBC	Bill Edwards	Implement Carillion Morgan Sindall JV Change Control procedures. Use Contract Change Management to provide maximum efficiency in following contractual procedures and follow value engineering principles to reduce impact on cost and programme.	↑	3	5				15	0	0	50%	£400,000.00	£800,000.00	£1,600,000.00	0.0	0.0	0.0	£466,666.67	0.0	£46,666.67	£420,000.00				-£420,000.00	£46,666.67	£466,666.67	£466,666.67	£466,666.67	-£420,000.00
303	Increased Thickness of thin Surfacing required along the length of the scheme.	Civil Design Development	SMBC	Bill Edwards	All changes to be identified by the change control procedure and challenged as part of the change approval process.	↔	5	4				20	0	0	90%	£250,000.00	£500,000.00	£750,000.00				£450,000.00	0.0	£0.00	£450,000.00				-£450,000.00	£0.00	£450,000.00	£450,000.00	£450,000.00	-£450,000.00
287	Statutory Undertaker diversions cost underestimated	Statutory Undertakers	SMBC	Paul Lord	All changes to be identified by the change control procedure and challenged as part of the change approval process.	↓	2	5				10	0	0	20%	£1,500,000.00	£2,000,000.00	£3,000,000.00	0.0	0.0	0.0	£433,333.33	0.0	£1,245,637.50		£812,304.17			£812,304.17	£1,245,637.50	£433,333.33	£433,333.33	£433,333.33	£812,304.17
292	Construction costs arising from unforeseen live utilities	Statutory Undertakers	SMBC	Bill Edwards	All changes to be identified by the change control procedure and challenged as part of the change approval process.	↔	3	5				15	0	0	50%	£405,000.00	£567,000.00	£810,000.00	0.0	0.0	0.0	£297,000.00	0.0	£297,000.00						£297,000.00	£297,000.00	£297,000.00	£297,000.00	£0.00
307	Nesting birds delaying the start of the works	Programme Achievability	SMBC	Bill Edwards	All changes to be identified by the change control procedure and challenged as part of the change approval process.	↔	4	3				12	0	0	70%	£100,000.00	£300,000.00	£800,000.00				£280,000.00	0.0	£0.00	£280,000.00				-£280,000.00	£0.00	£280,000.00	£280,000.00	£280,000.00	-£280,000.00
280	Additional NR track possessions required for construction/additional cost to NR possessions. Bridge 14 and 15 SMBC issues still so separate risk required. Other bridges need further review with the TC negotiations. Position will be clearer by mid August 14.	Programme Achievability	SMBC	Bill Edwards	All changes to be identified by the change control procedure and challenged as part of the change approval process.	↓	3	4				12	0	0	50%	£250,000.00	£500,000.00	£750,000.00	0.0	0.0	0.0	£250,000.00	0.0	£1,420,000.00		£1,170,000.00			£1,170,000.00	£1,420,000.00	£250,000.00	£250,000.00	£250,000.00	£1,170,000.00
312	The ex aircraft landing light that will be located in the new central reserve of the proposed works has to be lowered every week for maintenance checks. This will require traffic management, the provision of which Manchester Airport may object to.	Civil Design Development	SMBC	Bill Edwards	All changes to be identified by the change control procedure and challenged as part of the change approval process.	↑	5	3			3	15	0	15	90%	£150,000.00	£200,000.00	£400,000.00				£225,000.00	0.0	£0.00	£225,000.00				-£225,000.00	£0.00	£225,000.00	£225,000.00	£225,000.00	-£225,000.00
313	The proposed works clash with the location of an ENWL Sub-Station. The boundary fencing & arcing distances is the issue.	Civil Design Development	SMBC	Bill Edwards	All changes to be identified by the change control procedure and challenged as part of the change approval process.	↑	4	3			2	12	0	8	70%	£75,000.00	£150,000.00	£500,000.00				£169,166.67	0.0	£0.00	£169,166.67				-£169,166.67	£0.00	£169,166.67	£169,166.67	£169,166.67	-£169,166.67
299	Wayleaves and easements cause a delay to the start of the SU works	Statutory Undertakers	SMBC	Paul Lord	All changes to be identified by the change control procedure and challenged as part of the change approval process.	↔	3	3	3	Series		9	9	0	50%	£100,000.00	£300,000.00	£600,000.00				£166,666.67	0.0	£166,666.67						£166,666.67	£166,666.67	£166,666.67	£166,666.67	£0.00
279	Adverse inquiry result in terms of Compulsory Purchase Order / Revised Side Road Order. Adjustments in process.	Planning	SMBC	Bill Edwards	All changes to be identified by the change control procedure and challenged as part of the change approval process.	↓	2	5				10	0	0	20%	£300,000.00	£600,000.00	£1,150,000.00	0.0	0.0	0.0	£136,666.67	0.0	£273,333.33		£136,666.67			£136,666.67	£273,333.33	£136,666.67	£136,666.67	£136,666.67	£136,666.67
9	Unforeseen Statutory Undertakers diversions are required due to unchartered services being discovered	Statutory Undertakers	SMBC	Bill Edwards	Close cooperation with residents, landowners and stakeholders in relation to the phasing and sequencing of the works to be maintained. Facilitate early meetings to discuss, clarify and finalise position with respect to any of their services that require diverting. All changes to be identified by the change control procedure and challenged as part of the change approval process.	↔	2	5	3	Series		10	6	0	10%	£500,000.00	£1,000,000.00	£2,000,000.00	2.0	4.0	6.0	£116,666.67	0.0	£466,666.67		£350,000.00			£350,000.00	£466,666.67	£116,666.67	£116,666.67	£116,666.67	£350,000.00
293	Construction costs arising from dead unforeseen utilities	Statutory Undertakers	SMBC	Bill Edwards	All changes to be identified by the change control procedure and challenged as part of the change approval process.	↔	3	3				9	0	0	50%	£100,000.00	£200,000.00	£300,000.00	0.0	0.0	0.0	£100,000.00	0.0	£100,000.00						£100,000.00	£100,000.00	£100,000.00	£100,000.00	£0.00
305	Changes to earthworks balance due to land procurement not achieved	Quantities	SMBC	Bill Edwards	All changes to be identified by the change control procedure and challenged as part of the change approval process.	↔	1	5				5	0	0	5%	£2,000,000.00	£2,000,000.00	£2,000,000.00				£100,000.00	0.0	£0.00	£100,000.00				-£100,000.00	£0.00	£100,000.00	£100,000.00	£100,000.00	-£100,000.00
304	Delay to the Oil Pipeline works	Statutory Undertakers	SMBC	Bill Edwards	All changes to be identified by the change control procedure and challenged as part of the change approval process.	↔	2	4	3	Series		8	6	0	20%	£200,000.00	£400,000.00	£600,000.00	2.0	4.0	6.0	£80,000.00	0.0	£0.00	£80,000.00				-£80,000.00	£0.00	£80,000.00	£80,000.00	£80,000.00	-£80,000.00
272	Delays during statutory powers stage leading to increase in preparation costs.	Programme Achievability	SMBC	Bill Edwards	All changes to be identified by the change control procedure and challenged as part of the change approval process.	↓	3	3				9	0	0	50%	£100,000.00	£150,000.00	£200,000.00	0.0	0.0	0.0	£75,000.00	0.0	£2,100,000.00		£2,025,000.00			£2,025,000.00	£2,100,000.00	£75,000.00	£75,000.00	£75,000.00	£2,025,000.00
156	Additional requirements associated with technical approvals from the Natural England	Environmental Design Development	SMBC	Bill Edwards	As described in Question 8, our team have the experience and relationships liaise with Natural England during DD & KS4, and value engineer the design Accordingly. Natural England review process will be used to drive approvals process.	↔	2	4	3	Series		8	6	0	20%	£180,000.00	£360,000.00	£540,000.00	2.0	4.0	6.0	£72,000.00	0.0	£8,000.00	£64,000.00				-£64,000.00	£8,000.00	£72,000.00	£72,000.00	£72,000.00	-£64,000.00
270	Additional work as a result of the Transport Assessment. Inc. additional mitigation measures.	Civil Design Development	SMBC	Bill Edwards	All changes to be identified by the change control procedure and challenged as part of the change approval process.	↔	1	5				5	0	0	5%	£800,000.00	£1,500,000.00	£2,000,000.00	0.0	0.0	0.0	£71,666.67	0.0	£420,000.00		£348,333.33			£348,333.33	£420,000.00	£71,666.67	£71,666.67	£71,666.67	£348,333.33
255	Hazel Grove to Buxton rail bridge. The bridge is to be increased in span to future proof for the removal of two rail crossing points	Unforeseen Works Instructed by SMBC	SMBC	Bill Edwards	Maintain liaison with Network Rail to ensure only required works are progressed and adopted into the scope of the works.	↓	2	5				10	0	0	10%	£300,000.00	£600,000.00	£900,000.00	0.0	0.0	0.0	£60,000.00	0.0	£210,000.00		£150,000.00			£150,000.00	£210,000.00	£60,000.00	£60,000.00	£60,000.00	£150,000.00
90	Air Quality Management Area issues identified after the Design Development assessment work.	Strategic	SMBC	Bill Edwards	Air quality management issues are related to the discharge of the planning conditions. All changes to be identified by the change control procedure and challenged as part of the change approval process.	↔	1	5				5	0	0	5%	£500,000.00	£1,000,000.00	£2,000,000.00	0.0	0.0	0.0	£58,333.33	0.0	£233,333.33		£175,000.00			£175,000.00	£233,333.33	£58,333.33	£58,333.33	£58,333.33	£175,000.00
278	Changes to the scheme as a result of the CPO Public Inquiry	Planning	SMBC	Bill Edwards	All changes to be identified by the change control procedure and challenged as part of the change approval process.	↓	1	5				5	0	0	5%	£500,000.00	£1,000,000.00	£2,000,000.00	0.0	0.0	0.0	£58,333.33	0.0	£816,666.67		£758,333.33			£758,333.33	£816,666.67	£58,333.33	£58,333.33	£58,333.33	£758,333.33

Ref	Description of the Risk	Risk Category	Risk Owner	Appointed Risk Manager	Risk Mitigation Plan	Change Status of Residual Risk Allowanc	Probability Score	Cost Impact Score	Time Imapct Score	Series / Parallel Delay	Reputation Impact Score	Cost Impact Rating	Time Impact Rating	Reputation Impact rating	Probability	Minimum Cost	Most Likely Cost	Maximum Cost	Minimum Time (Weeks)	Most Likely Time (Weeks)	Maximum Time (Weeks)	Uncertainty Risk Allowance incl Series Time Allowance	Uncertainty Parallel Time Allowance (Weeks)	Total Risk Allowance at the Start of the Design Phase	Required Increase	Allowable Decrease	Forecast to be spent on the Risk	Estimated Cost Incurred	Risk Transfer	Current Initial Allowance Remaining	Proposed Current Uncertainty Allowance	Uncertainty Allowance to be taken forward	Forecast Final Risk Spend	Risk Variance
285	Additional accommodation works beyond estimate	Civil Design Development	SMBC	Bill Edwards	All changes to be identified by the change control procedure and challenged as part of the change approval process.	↔	2	3				6	0	0	20%	£50,000.00	£200,000.00	£400,000.00	0.0	0.0	0.0	£43,333.33	0.0	£43,333.33						£43,333.33	£43,333.33	£43,333.33	£43,333.33	£0.00
264	Errors in topographical survey information	Civil Design Development	SMBC	Bill Edwards	Topo survey will be carried out by Dec 14. All changes to be identified by the change control procedure and challenged as part of the change approval process.	↓	2	3				6	0	0	20%	£100,000.00	£200,000.00	£300,000.00	0.0	0.0	0.0	£40,000.00	0.0	£160,000.00		£120,000.00			£120,000.00	£160,000.00	£40,000.00	£40,000.00	£40,000.00	£120,000.00
277	Additional requirements associated with technical approvals from Network Rail	Third Parties	SMBC	Bill Edwards	All changes to be identified by the change control procedure and challenged as part of the change approval process.	↔	2	3				6	0	0	20%	£100,000.00	£200,000.00	£300,000.00	0.0	0.0	0.0	£40,000.00	0.0	£140,000.00		£100,000.00			£100,000.00	£140,000.00	£40,000.00	£40,000.00	£40,000.00	£100,000.00
276	Additional unknown requirements associated with technical approvals from external authorities (e.g. MAG, CAA)	Third Parties	SMBC	Bill Edwards	All changes to be identified by the change control procedure and challenged as part of the change approval process.	↔	2	3				6	0	0	10%	£10,000.00	£250,000.00	£500,000.00	0.0	0.0	0.0	£25,333.33	0.0	£126,666.67		£101,333.33			£101,333.33	£126,666.67	£25,333.33	£25,333.33	£25,333.33	£101,333.33
63	Aggregate tax (increase beyond inflation)	Supply Chain and Commercial Issues	SMBC	Bill Edwards	Collaborative monitoring of volatility in tax policy. If required CMS would procure material in advance of increase and stockpile to support in mitigating this risk.	↔	1	4				4	0	0	5%	£250,000.00	£500,000.00	£750,000.00	0.0	0.0	0.0	£25,000.00	0.0	£25,000.00						£25,000.00	£25,000.00	£25,000.00	£25,000.00	£0.00
64	Landfill tax (increase beyond inflation)	Supply Chain and Commercial Issues	SMBC	Bill Edwards	Collaborative monitoring of volatility in tax policy. CMS will explore exemptions and maximise material on site as current methodology to mitigate this risk.	↔	1	4				4	0	0	5%	£250,000.00	£500,000.00	£750,000.00	0.0	0.0	0.0	£25,000.00	0.0	£25,000.00						£25,000.00	£25,000.00	£25,000.00	£25,000.00	£0.00
22	Condition of existing drainage (incl land and road) not serviceable for connection into as required by the design. Existing network not in a sufficiently serviceable condition or of sufficient capacity.	Civil Design Development	SMBC	Rosie Simon	Carry out early validation surveys and advise the Authority accordingly. Carry out early condition surveys and include appropriate measurement contingency. Undertake earliest jetting and CCTV surveys of existing network. Agree scope of works and mitigation measures if unacceptable with LA. Obtain survey information for A34 outfall, Manchester Airport outfall.	↔	2	2				4	0	0	20%	£50,000.00	£100,000.00	£200,000.00	0.0	0.0	0.0	£23,333.33	0.0	£23,333.33						£23,333.33	£23,333.33	£23,333.33	£23,333.33	£0.00
294	Defined Cost greater than target	Supply Chain and Commercial Issues	SMBC	Bill Edwards	All changes to be identified by the change control procedure and challenged as part of the change approval process.	↔	2	3				6	0	0	10%	£50,000.00	£200,000.00	£400,000.00	0.0	0.0	0.0	£21,666.67	0.0	£21,666.67						£21,666.67	£21,666.67	£21,666.67	£21,666.67	£0.00
297	SU diversion works affected by resources pulled off due to the emergency works	Statutory Undertakers	SMBC	Bill Edwards	All changes to be identified by the change control procedure and challenged as part of the change approval process.	↔	2	2				4	0	0	20%	£50,000.00	£100,000.00	£150,000.00				£20,000.00	0.0	£20,000.00						£20,000.00	£20,000.00	£20,000.00	£20,000.00	£0.00
151	LA resources unavailable for consultation and to deal with approvals	Programme Achievability	SMBC	Bill Edwards	Engage with LA and identify all elements requiring LA approval and hold workshops to fast track approvals. Possible mitigation employ/fund authority approvals resource as a partner, so local authority resource/budget issues do not become an issue. (Being considered for Northern Hub) Costs less likely to change.	↔	1	3				3	0	0	5%	£50,000.00	£300,000.00	£800,000.00	0.0	0.0	0.0	£19,166.67	0.0	£19,166.67						£19,166.67	£19,166.67	£19,166.67	£19,166.67	£0.00
300	Design interfaces with 3rd parties design e.g. Network rail parapet extent affects utility design	Statutory Undertakers	SMBC	Bill Edwards	All changes to be identified by the change control procedure and challenged as part of the change approval process.	↔	1	3				3	0	0	5%	£100,000.00	£300,000.00	£600,000.00				£16,666.67	0.0	£66,666.67		£50,000.00			£50,000.00	£66,666.67	£16,666.67	£16,666.67	£16,666.67	£50,000.00
310	Design of clay lane access. Liability has to be Cheshire East.	Civil Design Development	SMBC	Bill Edwards	All changes to be identified by the change control procedure and challenged as part of the change approval process.	↑	2	2				4	0	0	20%	£35,000.00	£75,000.00	£130,000.00				£16,000.00	0.0	£0.00	£16,000.00				-£16,000.00	£0.00	£16,000.00	£16,000.00	£16,000.00	-£16,000.00
164	Environment Agency Approvals:	Statutory Consultees	SMBC	Jamie Bardot	Early engagement and regular dialogue in agreeing proposals in principle before submitting formally. Ensure approval process is followed is correctly followed and all benefits are evidenced with full ameliorative measures to neutralise any potential negative impact	↔	2	1				2	0	0	20%	£20,000.00	£40,000.00	£60,000.00	0.0	0.0	0.0	£8,000.00	0.0	£8,000.00						£8,000.00	£8,000.00	£8,000.00	£8,000.00	£0.00
281	Local flooding problems exacerbated by the scheme or post construction disturbance of existing land drainage systems	Civil Design Development	SMBC	Bill Edwards	All changes to be identified by the change control procedure and challenged as part of the change approval process.	↔	1	2				2	0	0	5%	£80,000.00	£120,000.00	£160,000.00	0.0	0.0	0.0	£6,000.00	0.0	£60,000.00		£54,000.00			£54,000.00	£60,000.00	£6,000.00	£6,000.00	£6,000.00	£54,000.00
124	Additional works resulting from liaison with the Highways Agency. Signage is the only area that remains an issue.	Civil Design Development	SMBC	Bill Edwards	Mitigated by our KS4 team with their experience and relationships with HA.	↔	1	2				2	0	0	5%	£50,000.00	£100,000.00	£150,000.00	0.0	0.0	0.0	£5,000.00	0.0	£5,000.00						£5,000.00	£5,000.00	£5,000.00	£5,000.00	£0.00
129	Failure to identify / ensure that all local access requirements are resolved / met including rights of way diversions and private means of access	Construction Issues	SMBC	Bill Edwards	Through our approach to Stakeholder management as described in Question 4, details of requirements of stakeholders will be identified early in KS4, allowing clarification of exposure and time to value engineer design to mitigate the risk. The team have demonstrated the ability to do this on previous ECI projects (A1D2B) and expertise available through KS4.	↔	1	2				2	0	0	5%	£25,000.00	£50,000.00	£75,000.00	0.0	0.0	0.0	£2,500.00	0.0	£2,500.00						£2,500.00	£2,500.00	£2,500.00	£2,500.00	£0.00
												0	0	0	0%							£0.00	0.0											
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												0	0	0	0%							£0.00	0.0											
												0	0	0	0%							£0.00	0.0											
																£13,380,000.00	**£22,862,000.00**	**£37,225,000.00**	**15.0**	**30.0**	**51.0**	**£7,820,166.67**	**11.2000**	**£30,000,000.00**	**£12,365,916.67**	**£23,462,416.67**	**£10,990,000.00**	**£660,000.00**	**£11,096,500.00**	**£18,983,833.33**	**£7,820,166.67**	**£7,820,166.67**	**£18,903,500.00**	**£11,189,833.33**
																											(G)					**(A)**		
																																£25,000.00		

Parallel Time Factor = **3**

Parallel Time Risk Allowance **£93,333.33** **(B)**

Total residual Uncertainty Allowance = ((cost + series time) + Parallel Time Allowance) **£7,913,500.00** **(=(A+B)=C)**

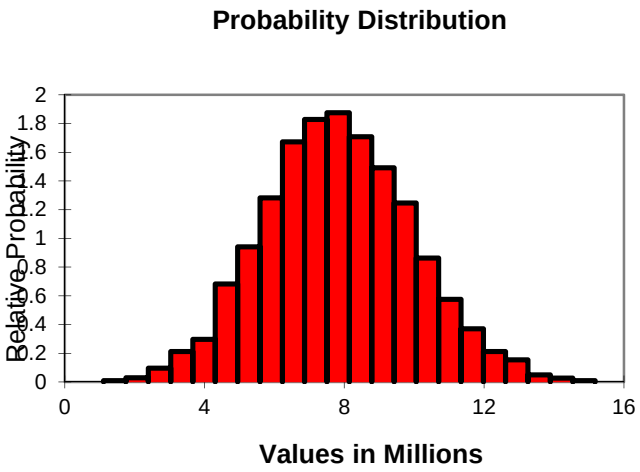
Risk Occurrence Allowance to go (from Risk Occurrence Report) **£0.00** **(D)**

Total SMBC Project Residual Risk Allowance to Go **£7,913,500.00** **(=C+D)=(E)**

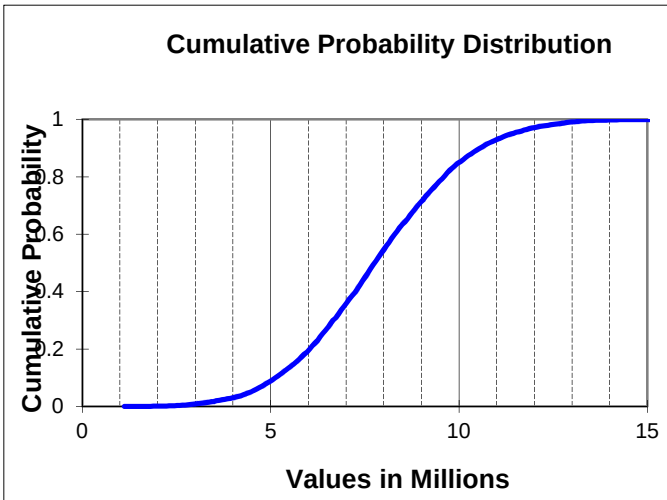
Ref	Description of the Risk	Risk Category	Risk Owner	Appointed Risk Manager	Risk Mitigation Plan	Change Status of Residual Risk Allowanc	Probability Score	Cost Impact Score	Time Imapct Score	Series / Parallel Delay	Reputation Impact Score	Cost Impact Rating	Time Impact Rating	Reputation Impact rating	Probability	Minimum Cost	Most Likely Cost	Maximum Cost	Minimum Time (Weeks)	Most Likely Time (Weeks)	Maximum Time (Weeks)	Uncertainty Risk Allowance incl Series Time Allowance	Uncertainty Parallel Time Allowance (Weeks)	Total Risk Allowance at the Start of the Design Phase	Required Increase	Allowable Decrease	Forecast to be spent on the Risk	Estimated Cost Incurred	Risk Transfer	Current Initial Allowance Remaining	Proposed Current Uncertainty Allowance	Uncertainty Allowance to be taken forward	Forecast Final Risk Spend	Risk Variance
																								£11,096,500.00	Variance from the Total Project Risk Allowance at the Start of the Design Phase					£18,903,500.00				

Forecast Final SMBC Project Risk Expenditure	£18,903,500.00	(=C+G)
SMBC Strategic Risk	£8,510,500.00	(F)
Total SMBC Residual Risk Allowance	£16,424,000.00	(=E+F)

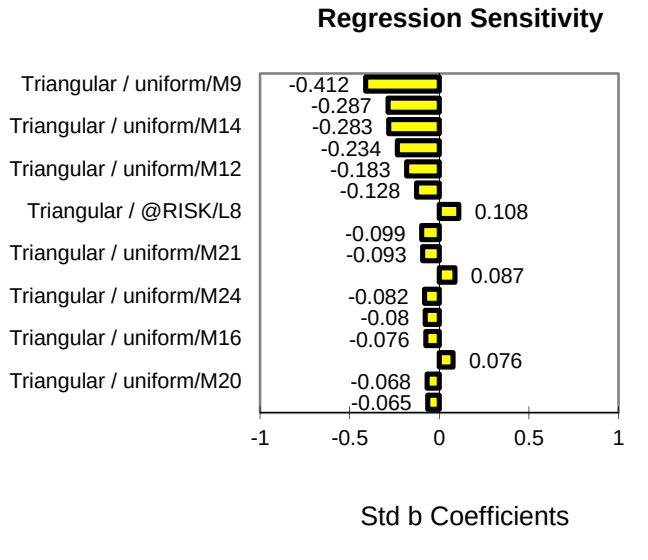
SMBC
A6MARR
SMBC Risk Register
Risk Assessment Model



Summary Information	
Workbook Name	QRA_13-11-2014
Number of Simulations	1
Number of Iterations	10000
Number of Inputs	80
Number of Outputs	1
Sampling Type	Latin Hypercube
Simulation Start Time	18/11/2014 16:06
Simulation Stop Time	18/11/2014 16:07
Simulation Duration	00:00:35
Random Seed	198837953



Summary Statistics			
Statistic	Value	%tile	Value
Minimum	1,111,319	5%	4,471,369
Maximum	15,175,910	10%	5,128,185
Mean	7,819,851	15%	5,638,043
Std Dev	2,108,491	20%	6,034,052
Variance	4.44573E+12	25%	6,361,559
Skewness	0.128844045	30%	6,659,745
Kurtosis	2.900235704	35%	6,954,541
Median	7,753,572	40%	7,244,778
Mode	6,817,640	45%	7,500,328
Left X	4,471,369	50%	7,753,572
Left P	5%	55%	8,021,914
Right X	11,400,952	60%	8,290,358
Right P	95%	65%	8,606,086
Diff X	6,929,583	70%	8,906,477
Diff P	90%	75%	9,243,069
#Errors	0	80%	9,596,415
Filter Min		85%	9,994,953
Filter Max		90%	10,573,287
#Filtered	0	95%	11,400,952



Sensitivity			
Rank	Name	Regr	Corr
#1	Triangular / unif	-0.412	-0.416
#2	Triangular / unif	-0.287	-0.279
#3	Triangular / unif	-0.283	-0.271
#4	Triangular / unif	-0.234	-0.223
#5	Triangular / unif	-0.183	-0.177
#6	Triangular / unif	-0.128	-0.127
#7	Triangular / @R	0.108	0.112
#8	Triangular / unif	-0.099	-0.097
#9	Triangular / unif	-0.093	-0.082
#10	Triangular / @R	0.087	0.085
#11	Triangular / unif	-0.082	-0.079
#12	Triangular / unif	-0.080	-0.075
#13	Triangular / unif	-0.076	-0.072
#14	Triangular / @R	0.076	0.070
#15	Triangular / unif	-0.068	-0.058
#16	Triangular / unif	-0.065	-0.071

A6MARR Risk Register Validation Data

Risk Category
Strategic
Network Rail Interface
Civil Design Development
Construction Issues
Planning
Environmental Design Development
Environmental Mitigation
Weather
Logistics
Programme Achievability
Quantities Risk
Quality Issues
Statutory Consultees
Demolition
Statutory Undertakers
Supply Chain and Commercial Issues
Temporary Works
Third Parties
Unforeseen Ground Conditions
Unforeseen Works Instructed by SMBC
Health and Safety
Handover
Operation and Maintenance
Legislation
Traffic Management
Technology

Tender Assessment
CMS item to be priced in the Risk Register
CMS item not priced in the Risk Register
Needs to be included in the Works Cost Estimate
Needs to be included in the SU Cost Estimate
Not an Issue for the Risk Register or the Estimate
SMBC Risk Item not priced
SMBC Risk Item for pricing

Phase
Stage 3
Stage 4
Stage 5
Stage 6

Owner
SMBC
CMSJV

Change Status
#
$
£

Risk Assessment Matrix July 2014

	PROBABILITY	Very High 5	5	10	15	20	25
	>70%						
	51 to 70%	High 4	4	8	12	16	20
	21 to 50%	Most Likely 3	3	6	9	12	15
	6 - 20%	Low 2	2	4	6	8	10
	0 - 5%	Very Low 1	1	2	3	4	5
		IMPACT	Very Low 1	Low 2	Medium 3	High 4	Very High 5
	CRITICAL RISK						
	HIGH RISK	Cost	Less than £50k	£50 - 100k	£101k - 300k	£301 - 500k	> £500k
	MEDIUM RISK	Time	Less than 1 week	1 - 2 weeks	3 - 4 weeks	5 - 6 weeks	> 6 weeks
	LOW RISK	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.