



Appendix A
Designer's Risk
Assessment



Hazard Identification and Risk Assessment
(Including Particular Risks & Other Significant Risks)

Job Number 268401-00

Page Number 1 of 8

Project	BusConnects - Templeogue / Rathfarnham to City Centre Core Bus Corridor Scheme	Design Issue or Element	Templeogue / Rathfarnham to City Centre Core Bus Corridor Scheme
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Stage	Scheme Stage	Pre-Tender Stage	Other (Clarify)
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	Name	Hand Initial	Date	Name	Hand Initial	Date	Name	Hand Initial	Date
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Designer / PM	David Collins	DC	06/01/23						
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Project Coordinator	Denis Crowley	DJC	06/01/23						
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Hazard	Design Mitigation measures	Other Possible Mitigation Measures (including measures by Contractor on site)	Residual Risk Assessment following mitigation measures		
			Likelihood	Severity	Risk Rating

1	Conflict between construction traffic and construction staff/members of the public/traffic.	Design involves modification to existing road – Unable to avoid the potential for conflicts. A construction strategy document has been prepared which has been used to input into the Environmental Impact Assessment Report (EIAR) construction chapter, which is being submitted as part of the planning application for this scheme. The EIA construction chapter includes details on how vehicles, cyclists and pedestrians will be impacted and safely catered for, during the works.	(a) The interface with traffic movements from any adjoining sites would need to be addressed in conjunction with adjacent landowners / tenants / contractors. (b) Detailed Control measures are to be developed by the Contractor to mitigate all risks to health and safety. (c) Contractor to submit method statements for review by the Employer's Representative.	L	H	M
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2	Delivery of construction materials on existing roads resulting in possible incidents.	Designed Works dictates the need for delivery of construction materials – Unable to avoid.	(a) Warning signage for site personnel/members of the public. (b) Adequate temporary diversion signage where required (Pedestrians /Traffic). (c) Contractor to submit traffic management proposals.	L	H	M
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3	Modifications to existing vehicular movements resulting in accidents due to unfamiliarity.	Requirements to keep roads open to traffic are stipulated in the contract. A construction strategy document has been prepared which has been used to input into the Environmental Impact Assessment Report (EIAR) construction chapter, which is being submitted as	(a) The interface with traffic movements from any adjoining sites would need to be addressed in conjunction with adjacent contractors.	L	H	M
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Likelihood of Hazard occurring
L = Low (Seldom)
M = Medium (Reasonably Likely)
H = High (Certain/Nearly certain)

Severity of Harm
L = Minor Injury/Illness
M = Injury/Illness causing short term disability
H = Fatality or major injury/illness causing long term disability

Risk Assessment
L = Low Risk (No action)
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Refer to [Arup Health & Safety Designer's Handbook](#) and Detailed Design Project Flowchart for guidance on form sign off and issue to PSDP.

Risk Table	Severity		
Likelihood	H	M	L
H	H	H	M
M	H	M	L
L	M	L	L

Hazard	Design Mitigation measures	Other Possible Mitigation Measures (including measures by Contractor on site)	Residual Risk Assessment following mitigation measures		
			Likelihood	Severity	Risk Rating
		part of the planning application for this scheme. The EIA construction chapter includes details on how vehicles, cyclists and pedestrians will be impacted and safely catered for, during the works. This construction chapter includes traffic management measures to mitigate this risk.			
4	Impact by mobile plant	No Design mitigation measures possible to reduce the risks.	L	H	M
5	Damage to mapped or unmapped existing underground services resulting in water leakage resulting in flooding with the potential to cause traffic accidents.	<p>The Specification and notes on the Tender/Contract Drawings will set out the obligations of the Contractor in identifying underground services. Accurately locate all underground services based on information available. Slit trenching to be used to identify underground services.</p> <p>Record drawings, where available, have been received from all known utility providers to ascertain the potentially affected utilities and map areas of key risk. Ground Penetrating Radar survey has been carried out where there is a risk of the scheme impacting on critical utilities (e.g. high-pressure gas mains). The survey information will be made available to tenderers and it is planned to supplement this with further utilities investigation works.</p>	L	M	L
6	Striking underground or overhead cables resulting in electrocution.	<p>All known underground and overhead services will be shown on the Tender/Contract Drawings and it is planned that slit trench surveys will be undertaken to confirm locations, where diversions are anticipated and road widening occurring.</p> <p>Ground Penetrating Radar survey has been carried out where there is a risk of the scheme impacting on critical utilities.</p>	L	H	M

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			Likelihood	Severity	Risk Rating
7	Testing and commissioning of power cables resulting in electrocution.	No Design mitigation measures possible to reduce the risks.			
		(a) Contractor to submit method statements for inspection by the Employer's Representative.	L	H	M
8	Damage to existing gas pipes causing leakage, explosion and / or illness to operative.	Record drawings have been requested from all known utility providers to ascertain the potentially affected utilities and map areas of key risk. Ground Penetrating Radar survey has been carried out where there is a risk of the scheme impacting on critical utilities (e.g. high-pressure gas mains). The survey information will be made available to tenderers and it is planned to supplement this with further utilities investigation works.			
		(a) Detailed Control measures are to be developed by the Contractor to mitigate all risks to health and safety. (b) Ensure that where necessary, appropriate utility provider personnel are present on site during exploration works. (c) Contractor to liaise with the statutory utilities.	L	H	M
9	Damage to existing asbestos water main requiring repair resulting in exposure to asbestos dust.	Asbestos main locations have been mapped from record drawings. It is not intended to undertake any diversion of asbestos water mains.			
		(a) Specialist Contractor to be appointed if asbestos main is damaged.	L	H	M
10	Conflicts and damage to existing structures.	Existing structures along the route which will be impacted have been identified. Following this a further exercise has determined the impact of the scheme on these structures, e.g. from changes to kerb alignment etc. An assessment of these structures has been carried out to determine their suitability for the intended use and where modifications to the structure are required, a preliminary design has been carried out.			
		(a) Detailed Control measures are to be developed by the Contractor to mitigate all risks to health and safety., in particular where working over water is required for example.	M	M	M
11	Trespassing by public/local residents or other third parties when site is unattended.	Tender documents will specify the need for signage to direct pedestrians away from works. Tender documents will specify the need for fencing of site and maintaining a secure site. .			
		(a) Detailed Control measures are to be developed by the Contractor to mitigate all risks to health and safety. (b) Sides of all open excavations to be protected with warning tape/fencing as appropriate. (c) Work to be carried out in accordance with contract documents.	M	M	M

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Hazard	Design Mitigation measures	Other Possible Mitigation Measures (including measures by Contractor on site)	Residual Risk Assessment following mitigation measures		
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12	Unauthorised access during working hours.	Tender documents will specify the need for signage to direct pedestrians away from works. Tender documents will specify the need for fencing of site and maintaining a secure site.	M	M	M
13	Interference with fuel, construction materials, flammable materials.	Tender documents will specify the need for fencing of site and maintaining a secure site.	L	H	M
14	Visitors to site could be at risk of injury due to unfamiliarity.	No Design mitigation measures possible to reduce the risks	L	M	L
15	Excavating in areas which could be accessed by members of the public.	Traffic management plan to be put in place for delivery/removal of plant to/from the site. This will include details on how property owners can safely enter and exit their property. Site to be secured each evening before finishing of works for the day.	L	H	M
16	Construction personnel falling into excavation.	Excavation depths will be minimised as standard.	L	H	M
17	Health Hazards: Noise/Vibration, Dust Inhalation, Manual Handling	The specification for the works will require road wetting and sweeping to reduce the level of dust generated. The level of noise generated will also be required to adhere to the relevant guidance and legislation and monitoring will be specified where required. The detailed design shall ensure that	L	M	L

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	appropriately sized precast/preformed elements for manual handling are specified.					
18	<p>Risk of exposure to chemicals, solvents or biological substances while carrying out the works.</p> <p>Risks associated with working with bitumen, bituminous liquids i.e. tack coat, sealing joints with molten bitumen, cementitious products, thermoplastics and road marking materials on the project.</p> <p>Risks associated with removal of road markings i.e. inhalation of dust and fumes by Contractor personnel and by members of the public.</p> <p>Risk of exposure to Weil's disease</p> <p>Risk of exposure to asbestos during demolition</p>	<p>It is not possible to eliminate the risks associated with chemical or biological substances by design.</p> <p>The Contractor's welfare facilities should have a hot water supply for washing purposes.</p> <p>Contractor to continuously monitor excavated soil for possible contaminants.</p> <p>Detailed control measures are to be developed by the Contractor to mitigate all risks to health and safety, including a planned sequence of work, suitable emergency plans, and issue of suitable PPE as per the requirements of:</p> <ul style="list-style-type: none"> • Safety Health and Welfare at Work (Construction) Regulations 2013 • Safety Health and Welfare at Work (General Application) Regulations 2007 • Safety, Health and Welfare at Work (Chemical Agents) Regulations, 2001 • Chemicals Act 2008 and Chemicals Amendments 2010 	L	M	L	
19	<p>Risk of injury or death to operatives and members of the public due to trees, branches or felling materials (i.e. chainsaws) falling during the felling of trees.</p> <p>Risk of injury or death to operatives due to falling from a height during the felling of trees.</p> <p>Risk of injury or death to operatives and members of the public due falling trees coming into contact with overhead line.</p>	<p>It is not possible to eliminate the hazards associated with the felling of trees in a scheme of this nature.</p> <p>The works specified are considered capable of safe execution by a competent contractor using safe systems of work and the appropriate levels of resources and equipment.</p>	<p>It is considered that these risks should be capable of safe management and control by a competent contractor using safe systems of work and the appropriate levels of resources and equipment.</p>	L	H	M
20	Conflict between cyclists and pedestrians at bus-stops.	<p>A standardised design guidance booklet has been created as part of the preliminary design suite of documents. This standardises the approach to the design of, among various other elements, bus stops.</p> <p>New Bus stop arrangement to be trialled prior to implementation.</p>	M	M	M	

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Hazard	Design Mitigation measures	Other Possible Mitigation Measures (including measures by Contractor on site)	Residual Risk Assessment following mitigation measures		
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	Where possible, island bus stop arrangements are the preferred option as they reduce the level of potential conflict between cyclists and pedestrians at bus stops.				
21	Conflict between buses and cyclists at bus-stops. Where possible, island bus stop arrangements are the preferred option as they reduce the level of potential conflict between cyclists and pedestrians at bus stops. Where space constraints do not allow for the island bus stop arrangement, an alternative arrangement is proposed, with cyclists to be stopped by a signal when a bus is approaching.	Ensure that bus drivers are adequately trained in interacting with cyclists at bus stop locations.	L	H	M
22	Conflict between left turning cars and straight-ahead cyclists at junctions. Segregated 'Protected-style' junctions are preferred where feasible, providing physical protection for cyclists from turning vehicles. A flashing amber signal will be used to alert motorists to potential conflict as set out in the BusConnects Preliminary Design Guidance Booklet.	No other mitigation measures	M	M	M
23	Road users' understanding and adoption of new traffic management measures such as proposed Bus Gates, one-way systems and turn bans.	Signage and road marking strategy has been developed to ensure that new traffic management measures are legible.	M	L	L
24	Coordination with external projects e.g. Dodder Greenway, Wellington Lane Cycle Scheme Direct contact has been made with the individual designers to agree tie-in details.	No other mitigation measures	L	L	L

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25	Coordination with stakeholders along the route i.e. St Marys College, Rathfarnham Church of the Annunciation	<p>Consultation has taken place with key stakeholders to identify potential issues and to mitigate these through design where feasible.</p> <p>A problem identification audit has been carried out on the route to identify potential issues with the existing arrangement.</p>	No other mitigation measures	L	L	L
26	Coordination with Seveso Sites.	No Seveso site have been identified which are within the consultation distance.	No other mitigation measures	L	L	L
27	Existing cellars along the route.	A cellar survey has been carried out to identify the location of cellars and the potential impact on them has been assessed as part of the preliminary design. Some landowners have also been consulted with respect to potential cellars. Two no coal holes are proposed to be relocated on Richmond Street South, however no structural impact on any known cellars is required.	No other mitigation measures	L	M	L
28	Conflict between right turning cyclists and other traffic.	<p>A standardised design guidance booklet has been created as part of the preliminary design suite of documents. This standardises the approach to the design of, among various other elements, signalised junctions.</p> <p>Segregated 'Protected-style' junctions are preferred where feasible, providing physical protection for cyclists from turning vehicles.</p>	No other mitigation measures	M	M	M
29	Knock-on effect of proposed traffic management measures on the adjoining road network.	<p>The safety implication of any proposed traffic management measures must be fully taken into account with mitigation measures such as:</p> <ul style="list-style-type: none"> Traffic calming measures for residential streets; and Turning bans and cul de sacs to mitigate rat-running. <p>A study has been carried out identifying the areas where traffic will likely redirect to. Detailed traffic modelling has been carried out to more accurately quantify the likely increase in traffic on the adjoining road network.</p>	Appropriate monitoring of traffic management measures should be put in place to ensure that they are adhered to.	M	L	L

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30 Conflict between cars and pedestrians/cyclists at priority junctions.	<p>A standardised design guidance booklet has been created as part of the preliminary design suite of documents This standardises the approach to the design of, among various other elements, priority junctions.</p> <p>This guidance provides a suite of options for designers to consider with pedestrian and cyclist safety at the core of the decision-making process. Where possible, raised table treatment at priority junctions should be provided, with reduced corner radii as per DMURS.</p>	No other mitigation measures	M	M	M
31 Coordination of tie-in point to Kimmage CBC 11 Scheme with other designers.	Direct contact has been made with the designers of the Kimmage CBC 11 Scheme in order to coordinate the tie in of the schemes.	Control / tie-in points to be agreed by contractor on-site.	L	L	L

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