



## DESIGN HAZARD ELIMINATION & RISK REDUCTION REGISTER

Document Number: 7694-CCA6\_1-P3-REG-CV-JAC-0003

Project Title: East Coast Railway - Phase 3 - CCA6.1

Project Number: D3658302

Client: Iarnród Éireann Irish Rail

Project Manager: Damian Keneghan

Design Manager: Jon Denner

Local HSEiD Advisor: \_\_\_\_\_

Revision	Issue Date	Revision Description	Prepared By	Checked By	Reviewed By	Approved By
A.1	18-Jan-24	Top Ranking Options Concept Design	David Thomas	Olwen Rowlands	Jill Gambrill	Jon Denner
A.2	9-Oct-24	Emerging Preferred Scheme Concept Design	Emily Marshall	Jill Savory (nee Gambrill)	Jon Denner	Damian Keneghan
A	12-Jun-25	FIRST ISSUE	Emily Jennings	Jill Savory	Jill Savory	Damian Keneghan

## Introduction

This provides a means of identifying design hazards and recording design mitigation and risk reduction actions taken.

All foreseeable design hazards for each discipline will be entered into the Design Hazard Elimination & Risk Reduction Register (DHERRR) by the Designers.

A single point of contact will be responsible for coordinating design stakeholder input to the DHERRR to ensure that there are no gaps in design information knowledge exchange.

The discipline lead designer(s) will be responsible for ensuring completeness and consistency of their design discipline across the project.

The full completed DHERRR shall form part of the design record for this project.

Drawings and documents which contain significant risks shall reference this document in the drawings or document notes.

Hazard / Risk Register completion		
Column 1	Risk ID	Enter the Hazard/ Risk number, this should be sequential.
Column 2	Design Hazard Review Activity Description	State what activity the design hazard was identified (from pull down menu): <ul style="list-style-type: none"> <li>- Design</li> <li>- Interactive Design Safety Session</li> <li>- Hazop Meeting</li> <li>- Hazid Meeting</li> <li>- Routine Design Team Meeting</li> <li>- Design Stage Meeting</li> <li>- Pre-Tender Design Review Meeting</li> <li>- Construction Phase Design Revision</li> <li>- HSE in Design Review</li> </ul>
Column 3	Phase	Identify what phase of the project the Hazard applies to (from pull down menu): <ul style="list-style-type: none"> <li>- P - Pre-construction</li> <li>- C - Construction</li> <li>- M - Maintain / Clean</li> <li>- U - Use as a workplace</li> <li>- D - Demolish/Decommission</li> </ul>
Column 4	Activity	Describe the Activity to be undertaken where a Hazard may be present
Column 5	Potential Hazard	Describe the Hazard associated with the described activity
Column 6	Who is at Risk	Identify who is at risk against each associated activity (from pull down menu): <ul style="list-style-type: none"> <li>- Construction</li> <li>- Commissioning</li> <li>- Operations</li> <li>- Maintenance</li> <li>- Decommissioning</li> <li>- Demolition</li> <li>- Public</li> </ul>
Column 7	Probability	Determine the Probability of the <b>unmitigated</b> Hazard (from pull down menu). <ul style="list-style-type: none"> <li>- 1 - Highly Unlikely</li> <li>- 2 - Unlikely</li> <li>- 3 - Possible</li> <li>- 4 - Likely</li> <li>- 5 - Highly Likely</li> </ul>
Column 8	Worst Potential Severity (WPS)	Determine the Worst Potential Severity (WPS) of the <b>unmitigated</b> Hazard (from pull down menu). <ul style="list-style-type: none"> <li>- 1 - Nil or slight injury / illness, property damage or environmental issue.</li> <li>- 2 - Minor injury / illness, property damage or environmental issue</li> <li>- 3 - Moderate injury or illness, property damage or environmental issue</li> <li>- 4 - Major injury or illness, property damage or environmental issue.</li> <li>- 5 - Fatal or long term disabling injury or illness. Significant property damage or environmental issue.</li> <li>- <b>10 - Multiple fatalities and catastrophic event</b></li> </ul>
Column 9	Initial Risk Rating	Calculates the Initial Risk Rating of the <b>unmitigated</b> hazard (Probability x WPS) Automatic RAG for status <ul style="list-style-type: none"> <li>- 1 - 5 - Green</li> <li>- 6 - 10 - Amber</li> <li>- &lt;10 - Red</li> </ul>
Column 10	Risk Designer	Select the design discipline raising the hazard (amend to suit in the 'Reference' tab) <ul style="list-style-type: none"> <li>- Architect</li> <li>- Mechanical</li> <li>- Electrical</li> <li>- Civil/Structural</li> <li>- Environmental</li> <li>- Control / Instrumentation</li> <li>- Piping</li> <li>- HVAC</li> <li>- Commissioning</li> <li>- Non Jacobs Designer</li> <li>- Client</li> <li>- User entry</li> <li>- All Disciplines</li> </ul>
Column 11	Design Measures To Eliminate Hazard	Describe the Design Measures to be implemented to Eliminate the Hazard as a <b>FIRST CHOICE</b>
Column 12	Design Measures To Reduce Risk	Describe the Design Measures to be implemented to <b>Reduce</b> the Risk associated with the Hazard <b>SECOND CHOICE</b>
Column 13	Residual Probability	Determine the Probability of the <b>residual risk</b> from the hazard (from pull down menu). Selection per column 7
Column 14	Residual WPS	Determine the Severity of the <b>residual risk</b> from the Hazard (from pull down menu). Selection per column 8
Column 15	Residual Risk Rating	Calculates the Residual Risk Rating from the hazard (Probability x WPS) Automatic RAG for status
Column 16	Residual Risk Description	Describe clearly the Residual Risk associated with the Hazard to be managed by those using the Design
Column 17	Included in Drawing No(s)	List the documents where the Residual Risk has been communicated to those using the Design
Column 18	Action By	State who the action is to be taken/completed ( Name or Role)
Column 19	Target Date	Insert the initial target completion date here. This date should not be revised
Column 20	Revised Target Date	Insert the latest revised target completion date here.
Column 21	Date Action Complete	Insert the date the Action was completed - or was transferred to a subsequent action
Column 22	Tracker Status	Automatic RAG rating for status. GREEN indicates that the action is ongoing with time in hand. AMBER is imminently due and RED indicates due or overdue
Column 23	Comments	Insert comments here relating to current status, whether the action is fully closed out, or is subsumed into another action etc
Column 24	Primary Legislation	Identify the primary legislation in the country where the design hazard relates to (where applicable).

The HSE in Design Review shall confirm that the Design Hazard Elimination and Risk Reduction process has been completed and that the Residual Risks are acceptable to the Project.

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**CRITICAL RISK SUMMARY REPORT**



Project Number: D365B302 Project Title: 0  
 Project Manager: Damian Keneghan  
 Design Manager: Jon Denner  
 Date of Issue: 12/08/25

OVERVIEW OF CRITICAL RISKS ASSOCIATED WITH THE PROJECT. This identifies the top 20 hazards/risks associated with design, construction, operation, maintenance and demolition of the project.

Comments		Residual Risk Summary	
. Number of completed Mitigation Actions over latest reporting period		Number of 'High' risks	
. Number of revised Mitigation Actions over latest reporting period		Number of 'Medium' risks	
. Number of new risks over latest reporting period		Number of 'Low' risks	
. Number of closed risks over latest reporting period			
. Number of risks with modified scores over latest reporting period			
<b>Suggested areas / topics for comment:</b>			
. Involvement and competency of project team members with risk management			
. Tabling and review of risk register at monthly design team meeting			
. Quality and quantity of design mitigation actions in place			

1	4	5	12	16	18	22	23
Risk ID	Activity	Potential Impact	Design Measures to Reduce Risk	Residual Risk Description	Action By (Name or Role)	Tracker Status	Comments
1	Use of vehicles/plant on site - Public	Transportation over overhead and access ramps, etc. Potential plant overturning leading to potential for injury/death to members of public with access to the foreshore.	Access points to be identified and to be incorporated during design development.	Transportation over foreshore and access ramps, etc. Potential plant overturning leading to potential for injury/death to members of public with access to the foreshore.	Contractor	ONGOING	Contractor to include appropriate traffic management and works segregation in method statements with mitigation and reduction measures to separate vehicles and public.
2	Use of vehicles/plant on site - Construction Staff	Transportation over overhead and access ramps, etc. Potential injury/death to Construction staff resulting from vehicles overturning.	Access points and restrictions to be incorporated into design.	Transportation over foreshore and access ramps, etc. Potential injury/death to Construction staff resulting from vehicles overturning.	Contractor	ONGOING	Contractor to include site access routes and working areas with mitigation and restriction in method statements. Detailed design to consider access restrictions (e.g. temp loadings).
7	Unstable ground conditions	Potential for site operatives to be injured or killed as a result of soft or loose ground. Possibility of plant working in area of low soil strength. Risk of suffocation. Crash injuries from sinking into ground/loss or damage to plant.	Inform contractor of risk of soft ground from GI and geotechnical analysis in detailed design.	Potential for site operatives or plant to become stuck in pockets of soft ground. Possibility of plant working in area of low soil strength. Risk of suffocation, crash injuries from sinking into ground/loss or damage to plant.	Designer / Contractor	ONGOING	Contractor to prepare method statement and safe systems of work. Risk to be updated following completion of GI and geotechnical analysis.
8	In temporary state the elements of the construction are to be subject to wear and tidal conditions	Failure of partially completed works leading to damage of surrounding structures. Potential failure in temporary construction leading to injury to workers.	Phase 3 Design does not require removal of any of the primary defences but works are required to be installed in the beach, further consideration as detailed design. The partially constructed new permanent works to be subject to the permanent state. The design transient states will be identified and considered in the detailed design Stage. These are to be considered to be minimal due to the new works adding to existing structures with no intentional damage to existing structures.	Damage to existing structures during construction which impacts their performance. Structural elements considered in the detailed design. Consider protection measures to the partially constructed new structure.	Designer / Contractor	ONGOING	Contractor to have competent experience of working in tidal environments. Contractor to develop safe systems of work in intertidal areas including the provision of appropriate PPE. Contractor to obtain frequent weather reports and be proactive in the assessment of weather conditions and adapt accordingly. Contractor temporary works design to include storm conditions.
15	Delivery of rock	Risk of barge being punctured.	Involvement of rock close to the shore to plan rock delivery within tidal windows and not rock dependent.	Potential for barge being punctured.	Contractor	ONGOING	Contractor to plan rock delivery with tidal restrictions. Contractor to prepare method statement and safe system of work.
16	Handling and control of rock armour	Death/injury to site operatives as a result of control of rock (movement conditions/dropped by construction plant).	Early design of the rock armour to allow for early delivery rock delivery to commence early in programme.	Death/injury to site operatives as a result of control of rock (movement due to soft ground conditions/dropped by construction plant). Risk of injury to eye as a result of rock splinters.	Contractor	ONGOING	Contractor to prepare method statement and safe system of work. Experienced Contractor and subcontractors to be appointed.
17	Delivery and storage of geotextile resulting in injury to construction personnel	Risk of falling rolls of geotextile resulting in injury to construction personnel.	Safe delivery and storage methods will be defined in the geotechnical specification during detailed design.	Risk of falling rolls of geotextile resulting in injury to construction personnel and public.	Designer / Contractor	ONGOING	Contractor to identify secure area for storage of geotextile material and in accordance with the specification and propose method of storage. Experienced Contractor and subcontractors to be appointed.
20	Use of concrete or other potentially contaminating materials	Injury to site operatives.	Volume of mists concrete minimised; pre cast units selected where possible. During detailed design, where required, joints to be clearly spaced to allow for preparation, setting and adequate curing within tides.	Contamination of the environment.	Contractor	ONGOING	Designer to minimise concrete mists works. Contractor to train experienced and trained personnel to handle potentially contaminating materials. Contractor to provide thorough method statement and safe system of work.
21	Use of concrete or other potentially contaminating materials	Contamination of the environment.	Volume of mists concrete minimised; pre cast units selected where possible. During detailed design, where required, joints to be clearly spaced to allow for preparation, setting and adequate curing within tides.	Contamination of the environment.	Contractor	ONGOING	Designer to minimise concrete mists works. Contractor to train experienced and trained personnel to handle potentially contaminating materials. Contractor to provide thorough method statement and safe system of work.
22	Use of concrete or other potentially contaminating materials	Injury to operatives (burns...)	Volume of mists concrete minimised; pre cast units selected where possible. During detailed design, where required, joints to be clearly spaced to allow for preparation, setting and adequate curing within tides.	Injury to operatives (burns...)	Contractor	ONGOING	Designer to minimise concrete mists works. Contractor to train experienced and trained personnel to handle potentially hazardous materials and provide adequate PPE. Contractor to provide thorough method statement and safe system of work.
23	Use of concrete or other potentially contaminating materials	Risk of unstable formwork and falsework on existing concrete reinforcement.	Phase 3 Concrete reinforcement extent and length reduced as much as reasonably practicable. Volume of mists concrete minimised. Consideration given to introducing horizontal joints reducing the length of those being poured at a time. Further consideration at detailed design.	Risk of unstable formwork remains. Contractor to undertake temporary works design and consider staging the concrete pours at detailed design stage.	Designer	ONGOING	Designer to minimise volume of mists concrete during detailed design. Contractor to provide thorough method statement and safe system of work.
24	Works between construction phases	Risk of cutting, trip, hazard	Intensive mists water connections by using precast where feasible or considering alternative connections at detailed design.	Risk of cutting, trip, hazard. The precast connection may be made down from the ground or starter bar protruding out from concrete.	Designer / Contractor	ONGOING	Designer to design and minimise above connections during detailed design stage. Contractor to provide coloured plastic caps to every protruding bar.
27	Lifting operations	Risk of plant overturning during mooring or lifting on slope.	The proposed Concept design solutions can be adjusted to reduce the risk following results of the GI and geotechnical analysis. Allowable bearing capacity of slope exposure to be checked and shared with Contractor for temporary works design.	Risk of plant overturning on slope or temporary working platform. Contractor to provide safe working practices.	Designer / Contractor	ONGOING	Designer to assess the bearing capacity of the existing concrete structures. Contractor to prepare method statement of lifting and safe temporary working platform.
31	Transportation of bridging of bus services	Overhead rail cables causing electrocution, and/or explosion.	Phase 3 The overhead rail cables are present at this location. Buson services identified on drawings.	Bringing of the services overhead rail cables causing electrocution and/or explosion.	Contractor	ONGOING	Client to agree procedures for cable isolation. Contractor to provide thorough method statement and safe system of work.
33	Transportation of bridging of bus services	Overhead rail cables causing electrocution, and/or explosion.	Phase 3 The overhead rail cables are present at this location. Buson services identified on drawings.	Bringing of the services overhead rail cables causing electrocution and/or explosion.	Contractor	ONGOING	Client to agree procedures for cable isolation. Contractor to provide thorough method statement and safe system of work.
42	Working within designated site	Risk of environmental damage through movement of material, placement of tools etc.	Correct permissions etc obtained in order to complete work. Contractor will allow for protection of habitats/wetlands if required.	Environmental damage.	Designer / Contractor	ONGOING	Contractor to provide thorough method statement and safe system of work. EA provided at detailed design stage.
43	Noise/vibration impacts on marine habitats	Disruption to wildlife due to the presence activities, in relation to noise and vibration caused.	Correct permissions etc obtained in order to complete work. Conditions of permits will allow for protection of habitats/wetlands if required. Works are generally high up the beach and therefore present less of a concern for marine life.	Disruption to marine life.	Designer / Contractor	ONGOING	Contractor to provide thorough method statement and safe system of work. EA provided at detailed design stage.
44	Managing public access to the beach	Potential for public to be injured or killed as a result of access to site while working.	At detailed design stage, Contractor to obtain appropriate access concerns as part of method statements.	Risk of injury to public due to access gained to site.	Designer / Contractor	ONGOING	Contractor to prepare method statement and safe systems of work. These will ensure that the danger of public access to the site is limited as much as practically possible.
46	Public access to the beach	Risk of public being injured or killed as a result of access to site while working.	Phase 3 Beach access points have been included to reduce the likelihood of becoming cut off by the tide. The presence of the rearmenets has been minimised as much as possible at this stage, including burying the line rather than an exposed line.	People becoming trapped during changing tides.	Designer / Client	ONGOING	Designer to involve beach access points during detailed design development. Consider installing warning signs at access points to highlight risk to the public.

Latest Meeting Date:	
None	
Project Name: East Coast Railway - Phase 3 - CCA1	
Project Number: D3658302	
Client: Sarned Eraman (Ind Rail)	

Update Critical Risk Summary Tab

Probability	Worst Potential Severity (WPS) of Impact	Risk Rating
1. Highly Unlikely	1. Nil or slight injury / illness, property damage or environmental issue.	
2. Unlikely	2. Minor injury / illness, property damage or environmental issue.	
3. Possible	3. Moderate injury or illness, property damage or environmental issue.	
4. Likely	4. Major injury or illness, property damage or environmental issue.	
5. Highly Likely	5. Fatal or long term disabling injury or illness. Significant property damage or environmental issue.	
10. Multiple fatalities and catastrophic event		10 Total High risks
		10 Total med risks
		33 Total low risks

NOTE: The purpose of Risk Rating is to determine which risks are significant. It is a subjective assessment and not an absolute or precise determination.

HSE risk resulting from design is unacceptably high. Review design to reduce HSE residual risk to an acceptable and manageable level.

HSE risk resulting from design is not acceptable and management oversight is planned.

HSE risk resulting from design is permitted.

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
ID	Design Hazard Review Stage	Phase	Activity	Potential Hazard	Person(s) Most at Risk	Prob	WPS	Rating	designer	design Measures to Eliminate Hazards	design Measures to Reduce Risk	Residual Risk	Residual WPS	Residual Risk	Residual Risk Description	Included on Drawing (NOC) or other doc. (date ref.)	Action by Name or Role	Target Date	Revised Target Date	Date Action Complete	Tracker Status	Comments	Primary Location
1	S design Stage Review	C	Use of vehicles/pallet on site - Public	Transportation over footpaths and access ramps, etc. Potential plant overturning leading to potential for injury/death to members of public with access to the footpaths.	Public	2	5	10	Civil / Structural	Risk not eliminated at Phase 3 design Stage.	Clear pedestrian routes within the site and fencing of all working areas to be considered during design development.	2	5	10	Transportation over footpaths and access ramps, etc. Potential plant overturning leading to potential for injury/death to members of public with access to the footpaths.	Contractor Subability/Method Statement (this is not a Jacobs document)	Contractor	Phase 5			ONGOING	Contractor to include appropriate traffic management and works arrangements in method statements with mitigation and reduction measures to separate vehicles and public.	RSA
2	S design Stage Review	C	Use of vehicles/pallet on site - Construction Staff	Transportation over footpaths and access ramps, etc. Potential plant overturning leading to potential for injury/death to Construction Staff resulting from vehicles overturning.	Staff	2	5	10	Civil / Structural	Risk not eliminated at Phase 3 design Stage.	Clear pedestrian routes within the site and fencing of all working areas to be considered during design development.	2	5	10	Transportation over footpaths and access ramps, etc. Potential plant overturning leading to potential for injury/death to Construction Staff resulting from vehicles overturning.	Contractor Subability/Method Statement (this is not a Jacobs document)	Contractor	Phase 5			ONGOING	Contractor to include site access routes and working areas with mitigation and reduction measures in method statements. Detailed design to consider access restrictions (e.g. ramp loading)	RSA
3	S design Stage Review	C	Discovery of Unexploded Ordnance (UXO)	Possible presence on site of unexploded ordnance. Loss of life, injury (including hearing damage) due to explosion.	Staff	1	5	5	Civil / Structural	Risk not eliminated at Phase 3 design Stage.	UXO Desk study to be undertaken during detailed design development.	1	5	5	Possible presence on site of unexploded ordnance. Loss of life, injury (including hearing damage) due to explosion.	Drawings & Documents (to be prepared at CD stage) Contractor Subability/Method Statement (this is not a Jacobs document)	designer / Contractor	Phase 5			ONGOING	Risk Assessment to be updated after undertaking UXO survey.	RSA
4	S design Stage Review	C	Existing Services	Damage to existing services during construction leading to death or injury to site personnel.	Staff	2	5	10	Civil / Structural	Risk not eliminated at Phase 3 design Stage.	Phase 3: Preliminary identification of services included on Plan drawings. Very little service survey to be undertaken during detailed design development. Full service survey to be undertaken during design development.	1	5	5	Damage to existing services during construction leading to death or injury to site personnel.	Drawings & Documents (to be prepared at CD stage) Contractor Subability/Method Statement (this is not a Jacobs document)	designer / Contractor	Phase 5			ONGOING	Full services search to be undertaken at detailed design stage. Contractor to survey location prior to excavation works, where reasonable.	RSA
5	S design Stage Review	C	Unfinished services present	Striking of live services causing electrocution, explosion, flooding and/or disruption of services.	Staff	2	5	10	Civil / Structural	Risk not eliminated at Phase 3 design Stage.	Phase 3: Risk to service retained in the storage, very limited access present in the storage. Excavations expected to be in natural beach deposits where no services are expected to be present. Full service survey to be undertaken during design development.	1	5	5	Striking of live services causing electrocution, explosion, flooding and/or disruption of services.	Contractor Subability/Method Statement (this is not a Jacobs document)	Contractor	Phase 5			ONGOING	Full services search to be undertaken at detailed design stage. Contractor to survey location prior to excavation works, where reasonable.	RSA
6	S design Stage Review	C	Working on the coast. Working in the tidal range, working site level can rise rapidly	Tidal working on an exposed coast has a heightened risk of drowning and loss of equipment due to unexpected storm or wave/current regime.	Staff	3	5	15	Civil / Structural	Risk not eliminated at Phase 3 design Stage.	Construction in tidal zone unavoidable, but minimized and amplified as far as possible.	1	5	5	Tidal working on an exposed coast has a heightened risk of drowning and loss of equipment due to unexpected storm or wave/current regime.	Contractor Subability/Method Statement (this is not a Jacobs document)	Contractor	Phase 5			ONGOING	Contractor to obtain tidal information to be able to plan work accordingly. Contractor to issue competent supervisors of working in tidal environment. Contractor to develop safe systems of work in essential areas including the provision of appropriate PPE and identification of access points. Obtain frequent weather reports to predict tidal conditions. Tidal monitoring to be undertaken.	RSA
7	S design Stage Review	C	Unstable ground conditions	Potential for site operatives or plant to become stuck in pockets of soft or loose ground. Instability of plant working in areas of low soil strength. Risk of subsidence, coach injuries from sinking into ground/voids or damage to plant.	Staff	3	5	15	Civil / Structural	Risk not eliminated at Phase 3 design Stage.	Hydro-contrast of risk of soft ground from GI and geotechnical analysis in detailed design.	2	5	10	Potential for site operatives or plant to become stuck in pockets of soft ground. Instability of plant working in areas of low soil strength. Risk of subsidence, coach injuries from sinking into ground/voids or damage to plant.	Drawings & Documents (to be prepared at CD stage) Contractor Subability/Method Statement (this is not a Jacobs document)	designer / Contractor	Phase 5			ONGOING	Contractor to prepare method statement and safe systems of work. Risk to be updated following completion GI and geotechnical analysis.	RSA
8	S design Stage Review	C	In temporary state the elements of the construction will be subject to wear and tidal conditions	Failure of partially completed works leading to damage of surrounding structures. Potential future in temporary condition leading to injury to workers.	Construction	3	4	12	Civil / Structural	Risk not eliminated at Phase 3 design Stage.	Phase 3: Design does not require removal of any of the existing defences but works are required adjacent to the bridge at the Beaches, further consideration at detailed design. The newly constructed new structure will be subject to the temporary loading in a transition state. The design transition state will be identified and considered in the detailed design Stage. There are considered to be no residual risks to existing structures, with no intentional damage to existing structures.	2	4	8	Damage to existing structures during construction which impacts their performance.	Drawings & Documents (to be prepared at CD stage) Contractor Subability/Method Statement (this is not a Jacobs document)	designer / Contractor	Phase 5			ONGOING	Contractor to develop competent experience of working in tidal environment. Contractor to issue safe systems of work in essential areas including the provision of appropriate PPE and identification of access points. Obtain frequent weather reports and be proactive in the assessment of weather conditions and adapt accordingly. Contractor's temporary works design to include storm conditions.	RSA
9	S design Stage Review	C	Understrength/ability of existing structures leading to collapse	Collapse of existing structures and/or crushing/injury to personnel and plant.	Staff	2	5	10	Civil / Structural	Risk not eliminated at Phase 3 design Stage.	Phase 3: Considered to be very unlikely given very limited works adjacent to existing structures. The proposed Concept design solution can be adjusted to reduce the risk following results of the GI and geotechnical analysis, during detailed design.	1	5	5	Understrength/overloading of existing structures leading to damage/collapse. Assessment of access routes and temporary works (by Contractor).	Drawings & Documents (to be prepared at CD stage) Contractor Subability/Method Statement (this is not a Jacobs document)	designer / Contractor	Phase 5			ONGOING	Risk to be updated following completion GI and geotechnical analysis. These data and visual inspection continued will support the determination of the tolerable loading.	RSA
10	S design Stage Review	C	Falls from movement	Injury to site personnel.	Staff	2	4	8	Civil / Structural	Risk not eliminated at Phase 3 design Stage.	Design releases need for personnel working on overheads. Risk assessment enables placement of rigging of works by use of long-reach excavator working from beach.	1	4	4	Falls to site personnel.	Contractor Subability/Method Statement (this is not a Jacobs document)	designer / Contractor	Phase 5			ONGOING	Contractor to prepare method statement and safe systems of work	RSA
11	S design Stage Review	C	Excavations and Foundations	Rapid ingress of water, causing possible equipment leading to injury/death of site personnel.	Staff	2	5	10	Civil / Structural	Risk not eliminated at Phase 3 design Stage.	Phase 3: Limited excavations needed to correct proposed drainage, rigging of works in shallow excavations within the tidal range, rapid ingress of water critical to scope. The sea excavation has been minimized with the required structure stability. The proposed Concept design solution can be adjusted to reduce the risk following results of the GI and geotechnical analysis, during detailed design.	1	5	5	Rapid ingress of water, causing possible equipment leading to injury/death of site personnel.	Drawings to be prepared at CD stage Contractor Subability/Method Statement (this is not a Jacobs document)	designer / Contractor	Phase 5			ONGOING	Contractor to prepare method statement and safe systems of work and plan works to minimize access to the excavated area.	RSA
12	S design Stage Review	C	Public climbing on rock piles, being tripped or voids or crushed by falling rock	Risk of injury to site personnel.	Public	2	5	10	Civil / Structural	Risk not eliminated at Phase 3 design Stage.	Rock stockpiles to be fenced off to prevent public access	1	5	5	Public climbing on rock piles, being tripped in voids or crushed by falling rock.	Contractor Subability/Method Statement (this is not a Jacobs document)	Contractor	Phase 5			ONGOING	Contractor to identify secure areas for storage of rock and in accordance with the specification and propose method for storage. Experienced Contractor and subcontractors to be appointed.	RSA
13	S design Stage Review	C	Delivery of rock	Risk of large being grounded.	Staff	3	3	9	Civil / Structural	Risk not eliminated at Phase 3 design Stage.	Stockpiling of rock close to the shoreline to plan rock delivery within tidal windows and not work dependent.	3	3	9	Potential for large being grounded.	Contractor Subability/Method Statement (this is not a Jacobs document)	Contractor	Phase 5			ONGOING	Contractor to plan rock delivery with tidal restrictions. Contractor to prepare method statement and safe system of work. Experienced Contractor and subcontractors to be appointed.	RSA
14	S design Stage Review	C	Delivery of rock misalignment headers	Grounding of large leading to oil spill	Environment	2	5	10	Civil / Structural	Risk not eliminated at Phase 3 design Stage.	Barge is designed to be partially beached. Suitable use at current tide times can limit the likelihood of grounding significantly.	1	3	3	Potential for large being grounded.	Contractor Subability/Method Statement (this is not a Jacobs document)	Contractor	Phase 5			ONGOING	Contractor to plan rock delivery with tidal restrictions. Contractor to prepare method statement and safe system of work. Experienced Contractor and subcontractors to be appointed.	RSA
15	S design Stage Review	C	Delivery of rock	Falling rocks leading to injury/death of site personnel. Risk of injury to eye as a result of rock splinters.	Staff	2	5	10	Civil / Structural	Risk not eliminated at Phase 3 design Stage.	Early design of the rock structures & grading to allow delivery rock delivery to commence early in programme.	1	5	5	Falling objects leading to injury/death of site personnel. Risk of injury to eye as a result of rock splinters.	Contractor Subability/Method Statement (this is not a Jacobs document)	Contractor	Phase 5			ONGOING	Contractor to prepare method statement and safe system of work. Experienced Contractor and subcontractors to be appointed.	RSA
16	S design Stage Review	C	Handling and placement of rock armor	Challenger to site personnel from loss of control of rocks (movement to soft ground conditions/stepped by construction plant).	Staff	2	5	10	Civil / Structural	Risk not eliminated at Phase 3 design Stage.	Early design of the rock structures & grading to allow delivery rock delivery to commence early in programme.	2	5	10	Challenger to site personnel from loss of control of rocks (movement due to soft ground conditions/stepped by construction plant). Risk of injury to eye as a result of rock splinters.	Contractor Subability/Method Statement (this is not a Jacobs document)	Contractor	Phase 5			ONGOING	Contractor to prepare method statement and safe system of work. Experienced Contractor and subcontractors to be appointed.	RSA
17	S design Stage Review	C	Delivery and storage of geotextile material	Risk of falling rolls of geotextile resulting in injury to construction personnel.	Staff	3	3	9	Civil / Structural	Risk not eliminated at Phase 3 design Stage.	Safe delivery and storage methods will be defined in the geotextile specification during detailed design.	2	3	6	Risk of falling rolls of geotextile resulting in injury to construction personnel and public.	Specifications to be prepared at CD stage Contractor Subability/Method Statement (this is not a Jacobs document)	designer / Contractor	Phase 5			ONGOING	Contractor to identify secure areas for storage of geotextile material and in accordance with the specification and propose method for storage. Experienced Contractor and subcontractors to be appointed.	RSA
18	S design Stage Review	C	Delivery and storage of geotextile material	Risk of falling rolls of geotextile resulting in injury to public.	Public	3	3	9	Civil / Structural	Risk not eliminated at Phase 3 design Stage.	Safe delivery and storage methods will be defined in the geotextile specification during detailed design. Ensure storage of geotextile in areas not accessible to the public.	1	3	3	Risk of falling rolls of geotextile resulting in injury to construction personnel and public.	Specifications to be prepared at CD stage Contractor Subability/Method Statement (this is not a Jacobs document)	designer / Contractor	Phase 5			ONGOING	Contractor to identify secure areas for storage of geotextile material and in accordance with the specification and propose method for storage. Experienced Contractor and subcontractors to be appointed.	RSA







<b>Project Name:</b>	East Coast Railway - Phase 3 - CCA6.1
<b>Project Number:</b>	D3658302
<b>Client:</b>	Iarnród Éireann Irish Rail

**DESIGN HAZARD ELIMINATION & RISK REDUCTION  
SET UP PAGE**

PERSON AT RISK	DESIGNER (Amend to suit)
Construction	Architect
Commissioning	Mechanical/ Electrical
Operations	Process
Maintenance	Civil / Structural
Decommissioning	Environmental
Demolition	Control & Instrumentation
Public	Piping
User Entry	HVAC
User Entry	Commissioning
	Non Jacobs Designer
	Client
	User entry
	User entry
	User entry
	All Disciplines

Review List
1: Design
2: Interactive Design Safety Session
3: HAZOP Meeting
4: HAZID Meeting
5: Routine Design Team Meeting
6: Design Stage Review
7: Pre-Tender Design Review
8: Construction Phase Design Revision
9: HSE in Design Review

Phase List
P Pre-construction
C Construction
M Maintain / Clean
U Use as a workplace
D Demolish/Decommission

Severity of Injury	
1	Nil or slight injury / illness, property damage or environmental issue.
2	Minor injury / illness, property damage or environmental issue.
3	Moderate injury or illness, property damage or environmental issue.
4	Major injury or illness, property damage or environmental issue.
5	Fatal or long term disabling injury or illness. Massive property damage or environmental issue.
10	Multiple fatality and catastrophic event

Probability	
1	Highly Unlikely
2	Unlikely
3	Possible
4	Likely
5	Highly Likely

<b>Residual Risk</b>
Yes
No

## DESIGN HAZARD WHEEL

The deSign Hazard Wheel has been developed to assist technical design teams identify health, safety and environment in design hazards, considering the asset's whole lifecycle.

Refer to the [deSign Manual](#) to download the most up to date interactive version of this tool.

