Iarnród Éireann
Irish Rail

Rosslare ORE Hub

EIAR Technical Appendices

Technical Appendix 7:

Soils, Geology, Hydrogeology and Contamination

Appendix E: Design Risk Assessment

venterra | GDG GAVIN & DOHERTY GEOSOLUTIONS | NICHOLAS O'DWYER an RSK company

Co-funded by the European Union

IMS Document Reference: GDG-GL-HS-0002-01

DESIGNER'S ASSESSMENT OF SAFETY AND HEALTH HAZARDS/RISKS			
Designer Company	**Project: Rosslare Europort**	**Designer: Stephen Curtis**	**Date: 24/05/2024**
Gavin & Doherty Geosolutions	**Project No:23170**	**Checker: William Brown**	**Sheet No: 1**
Design Stage:			

No.	Key construction hazards (or risks) identified	Evaluations, Design decisions made (or alternative actions)
1	Works encountering buried utilities or services	This GIR has not assessed the local buried utilities and servuices. The surveys carried out as part of the project ground investigations encountered no buried survies. The detailed design and construction teams will be responsible for carrying out their own desk based assessments, surveys, and consultation with service suppliers to ensure adequate cable and buried services avoidance.
2	Failure or collapse of proposed structures due to overestimation of overburden soils strength	An extensive ground investigation campaign comprised of land and overwater sonic and rotary boreholes, CPTs, vibrocore sampling and geophysical surveying has been carrid out as part of the project. The findings of these surveys have been outlined in this GIR. Testing in the overburden materials has been carried out including CPTs, SPTs and laboratory testing for characterisation and strength assessments including PSDs, moisture content, atterburg limits, organic content, lab shear vanes, triaxials, shear box and oedometer testing. The details outlined in this GIR have summarised the findings of this testing, outlining results and interpreting characteristic values and assessing potential hazardous results. The results have been assess with literature values from British Standards and local publish information, and valuess typical of similar Irish deposits. The findings of this report are a site-wide groundmodel and engineering characteristic parameters. The Designers' of the detailed design stage assessments and structures specific design assessments will need to verify and sensitivty check the findings of this report against the requirements of their design and the results local to their relevant designs.
3	Failure or collapse of proposed structures due to overstimation of bedrock strength	An extensive ground investigation campaign comprised of land and overwater sonic and rotary boreholes, CPTs, vibrocore sampling and geophysical surveying has been carrid out as part of the project. The findings of these surveys have been outlined in this GIR. Testing in the bedrock materials has been carried out including CPTs in the upper weathered material before refusal, SPTs and laboratory testing for characterisation and strength assessments including UCS, point load, shearbox testing. The details outlined in this GIR have summarised the foindings of this testing, outlining results and interpreting characteristic values and assessing potential hazardous results. The results have been assess with literature values from British Standards and local publish information, and valuess typical of similar Irish deposits. The findings of this report are a site-wide groundmodel and engineering characteristic parameters with the parameters outlined being characteristic ranges. The Designers' of the detailed design stage assessments and structures specific design assessments will need to verify and sensitivty check the findings of this report against the requirements of their design and the groundmodel results local to their relevant designs. Particular attention has been drawn to the variation within the mudstone bedrock and the difficulties in the approapriate lab testing due to it's blocky and deformed nature. Further assessment and refinement of these parameters and due consideration to the variability of the material will be critical in the design of any structure bearing within the mudstone bedrock.
4	Variation in stratigraphy thicknesses and depths outlined in ground model resulting in design alterations or failure of structrues	An extensive ground investigation campaign comprised of land and overwater sonic and rotary boreholes, CPTs, vibrocore sampling and geophysical surveying has been carrid out as part of the project. The findings of these surveys have been outlined in this GIR. Testing in the overburden materials has been carried out including CPTs, SPTs and laboratory testing for characterisation and strength assessments. The details outlined in this GIR have summarised the findings of the intrucive borehole locations and the thickness, depths and elevation of the materials encountered. The material units can vary locally laterially and due consideration needs to be given to this occurring between the ground investigation locations. The geophysical surveys should be used to examine laterial and spatial variation in strata horizons both within the overburden and the bedrock materials. The findings of this report are a site-wide groundmodel with identified material units and interpreted depths, elevations and thicknesses. The Designers' of the detailed design stage assessments and structures specific design assessments will need to verify and sensitivty check the findings of this report against the requirements of their design and the results local to their relevant designs.

5	Excavated or dredged material being unsuitable for reuse in the proposed development resulting in excessive settlement or unsuitable stiffnesses in the proposed development.	The ground investigations have been carried out throughout the dredge material area with visual assessment as well as laboratory and CPT material characterisations. Laboratory testing to assess the material reusability include moisture content, atterburgs limits, PSDs, MCV and CBR testing of the proposed marine and cohesive glacial till overburden material proposed for dredging. The preliminary assessment of the results outlined in this report have outlined that the material should be suitable for reuse with some ground improvement likely being required. Further assessment will be required in by the relevant Designers'. Designers' will need to give consideration to the changes in the material's physical characteristics during excavation/ dredging, transport and placement and the variation within the proposed dredge material.
6	Failure of the proposed sheetpile wall due to encountering boulders in the overburden soils	An extensive ground investigation campaign comprised of land and overwater sonic and rotary boreholes, CPTs, vibrocore sampling and geophysical surveying has been carrid out as part of the project. The findings of these surveys have been outlined in this GIR. A geophysical survay has also been carried out to capture any laterial variation within the material between the ground investigation locations. No boulders have been identified within the borehole locations within the marine or glacial till cohesive materials. Further assessment and confirmation as to the absence of boulders will be required in by the relevant Designers' to the sensitivty criteria of their proposed structure or design.
7	Failure of the proposed piled structures due to inefficient penetration into the bedrock material due to underestimation of bedrock strength	An extensive ground investigation campaign comprised of land and overwater sonic and rotary boreholes, CPTs, vibrocore sampling and geophysical surveying has been carried out as part of the project. The findings of these surveys have been outlined in this GIR. Testing in the bedrock materials has been carried out including CPTs in the upper weathered material before refusal, SPTs and laboratory testing for characterisation and strength assessments including UCS, point load, shearbox testing. The details outlined in this GIR have summarised the findings of this testing, outlining results and interpreting characteristic values and assessing potential hazardous results. The results have been assess with literature values from British Standards and local publish information, and values typical of similar Irish deposits. The findings of this report are a site-wide ground model and engineering characteristic parameters with the parameters outlined being characteristic ranges. The Designers' of the detailed design stage assessments and structures specific design assessments will need to verify and sensitivity check the findings of this report against the requirements of their design and the ground model results local to their relevant designs. Particular attention has been drawn to the variation with depth within the metamorphic bedrock identified at the site. Further assessment and refinement of these parameters and due consideration to the variability of the material will be critical in the design of any structure bearing within the mudstone bedrock.
8	Work encountering contaminated ground conditions during the proposed works	Geoenvironemental testing has been carried out across the site. Limited potential visual or olfactory contamination was identified at the site during the ground investigations. The material has been tested for disposal at sea criteria although at the time of reporting this is not considered to be the proposed design. The results of the Marine Institute disposal at sea testing suite suggest that the material has no contamination exceeding their allowances outlined in Cronin et al. 2006. A geoenvironmental screening suite for soils and leachates ahs also been carried out at 23nr. locations throughout the site (results still outstanding at the time of reporting). These results will assess if contamination is present at the site and what screening or material handling procedures will be required. The Detail Designers will be required to carryout their own assessment of the geoenvironmental results and consider what contamination risks may be present in their proposed designs.
9		

	Notes re providing information	Item Nos. (from above)	Remarks
	Particular Risks	**1, 2,3,4**	

Other parties please take note: These are designer's risk evaluations of the design options carried out in-house for the purpose of our complying with designers' duties under the Construction Health and Safety at Work Regulations 2013. The evaluations relate only to those aspects/elements of the project which we are responsible for designing under the terms of our appointment by our client.
Other parties should not rely on these evaluations for their own purposes; in particular, contractors, who must deal with and control all risks arising during construction, must carry out their own definitive risk assessments ab initio for that purpose.