

Design Risk Assessment

Document control	Tata - CDM Designer's Risk Assessment				
Contributing designers	Revision	Purpose of issue	Checked	Reviewed	Date
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Health and Safety Considerations

Stage 1 Identify				Stage 2 Eliminate / Reduce	Stage 3 Inform	Stage 4 Control		
Ref. no.	Project element, material or activity	Key health and safety hazards and their possible effects	People/ environment at risk from the hazard	Design measures taken to eliminate the hazard or reduce the risk	Significant residual hazards and risks	Communication method	Risk owner(s)	Proposed control measures
Guidance	Consider all aspects involved in each stage of interface with the site, environment and structure(s).	Record the key hazards and their potential consequences.	Identify the categories of people at risk.	Include obtaining adequate data for design certainty and any further studies carried out during the risk evaluation process. Proposed measures to be taken by constructors and operators are to be included in Stage 4.	Provide details of residual hazards and risks that will need to be communicated and managed.	Record how information is provided, whether on drawings, pre-construction information, buildability statement, specification, reports or H&S File	Record the name of designers, contractors, the client or other stakeholders who are to ensure the significant residual risk is minimised and controlled.	Recommend measures to be taken by the risk owner(s) to minimise and control the significant residual risk.
Design								
Des1	Design of drainage	Hazards: Underground services crossing the site – confirmation required. Risks: Striking services, death, injury, damage to infrastructure.	Site personnel. Existing infrastructure. Public.	Hazard cannot be eliminated by design. Available information has been reviewed and mapped.	Potential unknown services.	DRA	Designer at detailed stage (identifying known risks) Contractor (construction of the scheme)	Detailed survey of services prior to construction. Liaison with utility providers.
Des2	Design of drainage	Hazard: Ground and groundwater conditions: Ground Investigations indicate groundwater levels may be shallow beneath the site. It should be noted that groundwater levels may vary due to seasonal and other effects. Possible risk of contaminated ground. Risk: Inundation or instability, injury, death, and contamination.	Site personnel. Onsite machinery. Natural Environment (watercourses).	Hazard cannot be eliminated by design. Preliminary drainage design assumes largely shallow SuDS features. Pipework may be at depth and cannot be eliminated by design.	Ground and groundwater conditions.	DRA	Designer (identifying known risks) Contractor (construction of the scheme)	Follow recommendations from the ground investigation report: Some groundwater management may be required to ensure the protection of the earthworks and materials.
Des3	Design of drainage	Hazard: Unexploded ordnance Risk: Striking ordnance, death, injury, damage to infrastructure	Site personnel. Public. Machinery. Infrastructure.	An unexploded ordnance map has been consulted at zeticauxo.com This has highlighted that there is a low risk of finding UXO across the proposed development site.	Low risk from UXO.	DRA	Designer (identifying known risks) Contractor (construction of the scheme).	Risk assessments and method statements to be prepared in case UXO is encountered on site.

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Des4	Design of above ground SuDS features	<p>Hazard: Excavated SuDS features. Water</p> <p>Risk: Injury and drowning</p>	<p>Site personnel. Vehicles Public.</p>	<p>Hazard cannot be eliminated.</p> <p>Preliminary design undertaken in accordance with CIRIA C753.</p> <p>Depth of SuDS features have been designed to facilitate hydraulic performance without increased depth of SuDS features more than required.</p>	SuDS features and water.	DRA	Owner/operator/ scheme designer	<p>Detailed design should consider the location of SuDS features next to vehicular access routes to reduce the risk of vehicles entering SuDS assets.</p> <p>Passive surveillance on all above ground SuDS features is good due to the presence of roads and well-used footpaths and good visibility.</p> <p>Maintenance schedule to be prepared.</p>
Construction								
Con1	Excavations	<p>Hazard: Working at height Excavated SuDS Features Water Underground services crossing the site: gas pipe, unidentified pipe, proposed utility cable and existing drainage. Ground and Groundwater conditions</p> <p>Risk: Death, injury, drowning, inundation, striking of services and contamination.</p>	<p>Site personnel. Public. Existing Infrastructure.</p>	<p>Hazard cannot be eliminated by design.</p> <p>Available information has been reviewed and mapped.</p> <p>Depth of SuDS features have been designed to facilitate hydraulic performance without increased depth of SuDS features more than required.</p>	Potential unknown services.	DRA	Contractor	<p>Early involvement of temporary works designer recommended.</p> <p>Risk assessments and method statements and adequate briefing of site personnel.</p> <p>Follow recommendations arising from ground investigation report.</p> <p>Detailed survey of services prior to construction.</p> <p>Liaison with utility providers.</p> <p>Edge protection/barriers and where possible harnesses.</p> <p>Use inspection chambers instead of manholes to prevent confined space risks.</p>

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Con2	Plant/ material deliveries	Hazard: The site can be accessed via the eastern boundary. Unauthorised access by members of public. Risk: Public are struck by machinery. Death, injury.	Site personnel. Public.	Hazard cannot be eliminated by design. Inform the public of construction working hours and activities.	Site access	DRA	Contractor	Consider access to site, road width and expected levels of traffic. Risk assessments and method statements and adequate briefing of site personnel. Informing the public of construction activities. Construction compound should be fenced off to prevent public access.
Con 3	Connection of drainage outfall into the lagoon / surface water body / pumphouse	Hazard: Working near water and existing drainage networks. Risk: Striking of existing drainage pipes. Drowning and inundation.	Site personnel.	Hazard cannot be eliminated by design. Detailed survey of the existing drainage to be consulted to facilitate clash check between the existing drainage and proposed outfall locations.	Water	DRA	Contractor	The work is to be undertaken during dry low tide and/or dry weather periods when water levels are lower. Risk assessments and method statements and adequate briefing of site personnel.
Operation & Maintenance								
O&M1	Drainage system in operation	Hazard: Potential flooding Risk: Site inundation	Maintenance personnel. Employees. Infrastructure.	Hazard cannot be eliminated by design. Design drainage to an appropriate design life and design storm event. Provide safe overland routing for exceedance flows based on site levels.	Flooding during exceedance events.	Operation and maintenance manual (to be prepared) DRA	Asset owner/operator	Regular maintenance in accordance with O&M manual, normal site safety controls, designated overland flow routes.
O&M2	Maintenance and inspections of drainage system	Hazard: Water Working at height Risk: Waterborne diseases Injury and death	Maintenance personnel	Hazard cannot be eliminated by design.	Water and working at height.	Operation and maintenance manual (to be prepared)	Asset owner/operator	Edge barriers and harnesses to be used near manholes. Inspection and maintenance activities to be undertaken during dry weather periods.

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Demolition								
Dem1	Removal of drainage features requiring excavation	Hazards and risks: largely as per the construction stage, except that the removal of the drainage system will increase a risk of flooding to the site.	Site personnel. Public.	Reinstatement of site to greenfield conditions or replacement SuDS based drainage system.	Ground conditions, disturbance of services. Increase of flood risk.	DRA	Demolition contractor	Full as-built records, specifications and maintenance procedures included in O&M manual to aid in planning of demolition. Materials brought to site to be from specified providers.

Environmental Considerations

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Guidance	Consider all aspects involved in each stage of interface with the site, environment and structure(s).	Record the key hazards and their potential consequences.	Identify the categories of people, animals or environments at risk.	Include obtaining adequate data for design certainty and any further studies carried out during the risk evaluation process. Proposed measures to be taken by constructors and operators are to be included in Stage 4.	Provide details of residual hazards and risks that will need to be communicated and managed.	Record how information is provided, whether on drawings, pre-construction information, buildability statement, specification, reports or H&S File	Record the name of designers, contractors, the client or other stakeholders who are to ensure the significant residual risk is minimised and controlled.	Recommend measures to be taken by the risk owner(s) to minimise and control the significant residual risk.
Design								
EDes1	Design of drainage system	Oil spillage Pollution	Groundwater/ watercourse	SuDS including rain gardens have been used to treat flows. The Simple Index Approach has been utilised to demonstrate that the proposed SuDS features provide sufficient treatment to ensure there is no detrimental effect to water quality. Therefore, the SuDS measures are considered sufficient to control pollution within the development.	Lack of maintenance of SuDS features may mean pollution events bypass the SuDS features and pollute groundwater.	O&M manual	Asset owner/operator	Regular maintenance in accordance with O&M manual.

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Construction								
Con1	Construction of drainage system	Hazard: Sediment and Oil Risk: Pollution of watercourses/drainage systems during construction, with sediments and oils	Existing surface water drainage network and water bodies	Hazard cannot be eliminated by design.	Pollution	Construction Management Plan (to be prepared)	Contractor	Risk assessment and method statement undertaken to avoid pollution during the works. Water from excavations not to be connected to the drainage system. Use of silt curtains, bunded storage tanks, spill kits envisaged. Construction Environmental Management Plan to be prepared and followed.
Con 2	General site clearance	Risk: Decreased amenity value	Environment	Shallow SuDS features proposed such as filter strips and drains.	Existing vegetation	DRA	Contractor	Existing vegetation to be protected as much as possible during construction.
Operation & Maintenance								
O&M1	Inspection and clearance of manholes	Hazard: Oil/fuel, sediment Risk: Pollution	Environment Maintenance personnel	Hazard cannot be eliminated by design.	Pollution	Operation and maintenance manual (to be prepared)	Asset owner/operator	Regular maintenance in accordance with O&M manual, normal site safety controls. Materials/sediments removed to be treated as contaminated and disposed of to a licenced waste management facility.

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Demolition								
Dem1	Removal of the drainage system/ general demolition activities	Hazards and Risk: largely as per the construction stage.	Groundwater and water bodies	SuDS based drainage system to be provided.	Pollution	Operation and Maintenance manual	Demolition contractor	<p>Full as-built records, specifications and maintenance procedures included in O&M manual to aid in planning of demolition</p> <p>Risk assessment and method statement undertaken to avoid pollution during the works.</p> <p>Water from excavations not to be connected to the drainage system.</p> <p>Use of silt curtains, bunded storage tanks, spill kits envisaged.</p>