

CDM DESIGNER'S RISK ASSESSMENT

Project	Philpots Manor School - Grasscrete Car Park	HGC Ref.	RH100301
Site	Philpots Manor School, West Hoathly, East Grinstead, RH19 4PR	Designer	HydroGround Civils Ltd
Design element	Grasscrete car park / surface water drainage	Assessment basis	CDM Regulations 2015 - designer residual risks

1. Purpose and Scope

This Designer's Risk Assessment records significant or unusual foreseeable residual risks associated with HydroGround Civils' detailed surface water drainage and Grasscrete car park design. The assessment considers construction, use, maintenance and future alteration of the works. It is not intended to replace the Principal Contractor's construction phase risk assessments, method statements or normal controls for routine construction hazards.

2. Design Basis

The drainage design comprises a permeable Grasscrete car park with a granular pavement build-up and a 400 mm drainage/storage blanket providing distributed subsurface storage and infiltration. The hydraulic design adopts a site-specific infiltration coefficient of 1.48×10^{-6} m/s (0.00533 m/hr). The system is designed as a large-area infiltration feature without conventional buried drainage pipework or a concentrated soakaway.

3. Significant Designer Residual Risks

Ref.	Hazard / Design Risk	Persons at Risk	Design Mitigation / Risk Reduction	Residual Risk / Information for Construction
01	Excavation for pavement construction - formation excavation may create unstable edges, falls and plant interaction.	Construction operatives	A relatively shallow, widespread pavement excavation is used rather than deep soakaway excavations or drainage trenches.	Principal Contractor to provide a safe excavation methodology, control plant movements and provide edge protection, battering or support where ground conditions require.
02	Existing underground services - unidentified buried services may be present within the car park footprint.	Construction operatives	The design avoids unnecessary deep pipe trenches and buried chambers.	Utility information to be reviewed before excavation. Contractor to undertake appropriate service detection, marking and safe-dig procedures before breaking ground.
03	Ground conditions / formation instability - variable, softened or disturbed formation may be encountered, particularly following rainfall.	Construction operatives; future pavement users	Granular pavement construction is proposed and formation is to support the specified pavement build-up.	Formation to be inspected during construction. Soft or unsuitable material is to be reported and treated appropriately before pavement layers are placed.
04	Damage to infiltration formation - trafficking, smearing or excessive compaction could materially reduce infiltration performance.	Future users; site operator	Infiltration is distributed over the large car park footprint rather than concentrated in a deep soakaway.	Significant design requirement: protect the exposed infiltration formation from construction traffic, contamination and unnecessary compaction. Avoid smearing; scarify affected formation where necessary before covering.
05	Slow infiltration / temporary stormwater storage - field testing established relatively slow infiltration.	Future users; site occupants	A conservative site-specific infiltration coefficient of 1.48×10^{-6} m/s is adopted and storage is provided within the permeable pavement construction.	Pavement storage depth, porosity, infiltration area and formation level must not be reduced or altered without hydraulic review.
06	Incorrect granular material / reduced void storage - unsuitable substitution could reduce storage or permeability.	Future users; site occupants	A 400 mm single-sized granular drainage/storage blanket is incorporated into the design.	Do not substitute the drainage/storage material without Designer approval. Installed material must satisfy the specified hydraulic and storage characteristics.

Ref.	Hazard / Design Risk	Persons at Risk	Design Mitigation / Risk Reduction	Residual Risk / Information for Construction
07	Geotextile damage or incorrect installation - tearing, puncturing, contamination or poor installation could impair performance.	Future users; maintenance personnel	Geotextile separator and formation geotextile are specified within the pavement build-up.	Install in accordance with the design and manufacturer's requirements. Protect before covering and repair or replace damaged areas.
08	Polluted runoff from vehicle parking - hydrocarbons, sediment and other contaminants may enter the infiltration system.	Environment; groundwater	Treatment is provided through the permeable pavement construction and specified hydrocarbon-adsorbing geotextile / treatment media.	Specified treatment components must not be omitted or substituted without approval. Prevent construction-stage sediment and pollutants entering the completed system.
09	Construction sediment clogging the permeable pavement - mud, fines and cementitious material could cause premature loss of permeability.	Future users; site operator	The completed Grasscrete pavement forms part of the permanent SuDS treatment and infiltration system.	Protect completed permeable areas from dirty construction runoff and trafficking. Clean contaminated areas before handover.
10	Pedestrian / vehicle interface and local level changes within the completed car park.	Pupils; staff; visitors	The design provides defined parking and circulation areas.	Construct finished levels to avoid abrupt level changes, trip hazards and unintended local depressions. Particular care is required because the site is a school.
11	Construction within an operational school - interaction between pupils/staff and construction vehicles, plant and excavations.	Pupils; staff; visitors; construction operatives	Construction sequencing and site management remain with the Principal Contractor / Principal Designer.	Significant site-specific risk: maintain secure segregation between the works and school users. Coordinate deliveries and vehicle movements with the school and prevent unauthorised access to excavations.
12	Future maintenance of Grasscrete / permeable pavement - sediment accumulation, inappropriate repairs or vegetation condition could reduce permeability.	Maintenance personnel; future users	A surface-based, accessible SuDS system is adopted without buried flow controls or deep soakaway chambers.	Maintain in accordance with the project maintenance requirements and Grasscrete manufacturer's recommendations. Repairs must preserve permeability and hydraulic function.
13	Exceedance during exceptional events or reduced infiltration performance.	Site users; surrounding areas	The pavement provides distributed storage and infiltration and has been hydraulically assessed for the design rainfall events.	Finished levels and surrounding features must preserve intended exceedance routes. Do not introduce kerbs, landscaping or other obstructions that create unintended flow paths or trapped water.
14	Changes to pavement footprint, levels or build-up during construction could invalidate the hydraulic design.	Future users; surrounding property	Hydraulic performance is based on the defined infiltration area, formation level, 400 mm drainage/storage blanket and design storage parameters.	Do not alter the car park footprint, formation level, drainage/storage blanket thickness, pavement build-up or infiltration area without referral to HydroGround Civils for hydraulic review.

4. General CDM Notes

1. This assessment identifies significant or unusual residual risks associated with the surface water drainage and permeable pavement design. It does not seek to identify routine construction hazards that a competent contractor would normally be expected to manage.
2. The Principal Contractor shall develop appropriate construction methods, risk assessments and method statements and shall verify the location of existing utilities before excavation.
3. The contractor shall notify the Designer where actual ground conditions, groundwater, existing services or other site conditions differ materially from those assumed or indicated by the design.
4. The infiltration formation shall be protected against compaction, contamination and smearing. Construction traffic shall not traffic the exposed infiltration formation unless specifically allowed for within an agreed construction methodology.
5. No material change to the infiltration area, formation level, pavement construction, 400 mm drainage/storage blanket, material porosity or adopted infiltration characteristics shall be made without hydraulic review.
6. The site infiltration testing indicated relatively slow infiltration. No groundwater was observed entering the trial pit during excavation or testing. If groundwater or materially different ground conditions are encountered during construction, works affecting the drainage design should be referred back to the Designer.
7. The Health and Safety File should include final as-built pavement/drainage information, relevant product information and the inspection and maintenance requirements for the Grasscrete and infiltration system.

5. Designer's Residual Risk Summary

The principal design-sensitive residual risks are protection of the infiltration formation; preservation of the designed storage volume and infiltration area; correct installation of the granular and geotextile layers; protection of groundwater from vehicle-derived pollutants; safe construction within an operational school environment; and avoidance of unreviewed changes to the pavement geometry or build-up. These matters should be carried forward into the pre-construction information, construction phase planning and Health and Safety File as appropriate.

Prepared by	HydroGround Civils Ltd	Project Ref.	RH100301
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