SuDS Geo Cellular Infiltration System Technical Appraisal Form

Version 1 (Sept 21)

United Utilities
Water for the North West

Proposed Section 104 Development at
UU Reference –

Section 1 - Information required for SuDS assessment

Note: any item selected as 'not submitted' will need to be provided to support and progress the application to Technical Acceptance.

Section 1 **Information required**	**Submitted**	**Not submitted**	**N/A**	**Designer** Tick to highlight where information noted as 'not submitted' has now been provided
• SuDS component(s) drawing / included on S104 Agreement Plan	☐	☐	☐	☐
• UU S104 SuDS Technical Appraisal Form: Infiltration viability Before Technical assessment of a system can be completed viability of infiltration must be confirm via out technical assessment form	☐	☐	☐	☐
• Sectional Drawing(s) Including any upstream pre-treatment components	☐	☐	☐	☐
• Completed CIRIA SuDS checklist See C753 The SuDS Manual Appendix B: Infiltration assessment	☐	☐	☐	☐
• Completed CIRIA SuDS health and safety checklist See C753 The SuDS Manual Appendix B: SuDS health and safety risk assessment checklist	☐	☐	☐	☐
• SuDS Component(s) Management & Maintenance document	☐	☐	☐	☐
• Maintenance inspection plan This must include access details for inspection and all maintenance requirements including machinery. The provision of tanker access must be allowed in the event of severe pollution so that emptying can be achieved.	☐	☐	☐	☐
• 1:20 sectional catch pit manhole details	☐	☐	☐	☐
• Simple Index Approach (SIA) Assessment / Mitigation Indices for Water See chapter 26.7.1 of CIRIA C753 for guidance	☐	☐	☐	☐
• Flood route plan for any exceedance flows from the SuDS Component	☐	☐	☐	☐
• Flood Risk Assessment	☐	☐	☐	☐
• Topographical survey This drawing must be a full topographical survey of the existing site, with contour to record levels at 500mm intervals as a minimum for large greenfield sites. For small/urban/very flat sites, closer level differences may be required along with spot levels for onsite surface features and changes of level.	☐	☐	☐	☐
• Construction method statement for Geo cellular system	☐	☐	☐	☐

Section 2 – High level SuDS comments

Comment number	**Engineer General comments**	**Yes**	**No**	**Designers response comments** **If marked 'NO', please amend the design or provide justification and mitigation of risks?**
1	The component is adequately distanced from any adjacent structures/features (i.e. existing sewers, pumping station, retaining walls etc.) and does not pose a risk in relation to flooding, pollution or service or structural stability? See comment 1 below for further information	☐	☐	
2	Maintenance access is acceptable for the SuDS component(s) and responsibilities detailed in management and maintenance plan (i.e. adopting body / management company) See comment 2 below for further information	☐	☐	
3	Is the component outside any area of significant flood risk? See comment 3 below for further information	☐	☐	
4	Is the topography for the site suitable for the components proposed? See comment 4 below for further information	☐	☐	

Additional Guidance notes	
1	**Location:** The siting of infiltration may affect adjacent building and services and may need to relocated See Chapter 25.2 of CIRIA C753 for guidance, Infiltration solutions should not be located within 5m of any building foundations.
2	**Maintenance** considerations must include any specific features that are likely to pose difficulties and any associated mitigation measures that have been put in place – see chapter 32 of CIRIA C753 for guidance
3	**Flood risk to existing features**: No surrounding properties or features should be at risk – see chapter 36 of CIRIA C753 for guidance.
4	**Topography:** Steep sites can result in increased velocities resulting in risks to scouring, erosion, resuspension of pollutants and health & safety – see chapter 8.4 of CIRIA C753 for guidance.

Section 3 – Infiltration system assessment design requirements

Note: any points marked as 'No' or 'TBC' will require amendments to the design / drawings.

Infiltration System

For full design requirements, please refer to **Chapter 13** of CIRIA C753.

Hydraulics (Chapter 13.4), Maintenance (Chapter 32) & Health and safety (Chapter 36)	**Yes**	**No**	**TBC**	**N/A**	**(Designer)** Tick to confirm addressed with resubmission
SuDS assessment acceptable?	☐	☐			
Type of system acceptable? See comment 1 below for further information	☐	☐	☐	☐	☐
Size & shape acceptable? See comment 2 below for further information	☐	☐	☐	☐	☐
Pre Treatment acceptable? See comment 3 below for further information	☐	☐	☐	☐	☐
Structural design acceptable? See comment 4 below for further information	☐	☐	☐	☐	☐
Hydraulic design acceptable? See comment 5 below for further information	☐	☐	☐	☐	☐
Materials acceptable? See comment 6 below for further information	☐	☐	☐	☐	☐
Maintenance proposals acceptable? See comment 7 below for further information	☐	☐	☐	☐	☐
Construction method statement acceptable? See comment 8 below for further information	☐	☐	☐	☐	☐

Additional Guidance notes	
1	**Type of system**: Products should be designed in line with CIRIA 737 'Structural Design of Modular Geo cellular Drainage Systems' and verified product performance data should be used for the engineer to make their assessment (see DCG E2.48).
2	**Sizing:** In line with the CIRIA guidance as a secondary precaution for siltation, the tank should be over sized by 7% for loss of volume caused by siltation ensuring the system is as sustainable as possible in the long term. Please see example C5.1 and chapter 25 of CIRIA C753 for guidance. **Base of tank:** The bottom of the system must be flat the guidance states that the tolerance should be 10mm in 3m. See chapter 13 of CIRIA C753 for guidance in particular page 261
3	**Pre Treatment:** This should be another SuDS component running in series with the infiltration system. Silt management systems are acceptable as an alternative
4	**Structural design:** Infiltration systems are below ground structures and as such are subject to standard design the relevant standards can be found in Chapter 21 of CIRIA C753. Loadings must be considered on an underground infiltration system regardless of its location. See chapter 21 and sections 21.16 & 21.17 of CIRIA C753 for guidance.
5	**Hydraulic Performance:** The infiltration system should be designed drain from full to half full in 24 hours. See chapter 25 of CIRIA C753 for guidance the relevant section is 25.7 **Exceedance:** See chapter 36 (table 36.1) of CIRIA C753 for guidance on acceptable velocities for exceedance.
6	**Material selection:** Infiltration tanks will require good quality backfill/bedding/surround to ensure that adequate protection is offered to the tank solution. We would expect to see details for all materials including aggregates, engineered soils, liners etc. See Chapter 21 of the CIRIA guidance, in particular section 21.10 **Linings/surround:** Geo cellular tanks will require Geo synthetics and surround. There are set standards for the Geo synthetics and the requirements for fill. See Chapter 30 In particular sections 30.4 and 30.5 of CIRIA C753 for guidance.
7	**Maintenance access** provision for safe inspection and cleaning should be provided for means of trapping and removing sediment to prevent it being washed downstream during cleaning operations, it is expected that there will be multiple access points with visibility of the base of the system, but will be determined by the designer depending on shape and size, and location.
8	**Construction Method:** Many failures of infiltration systems can be attributed to careless construction The construction process therefore needs careful planning and implementation – See Chapter 31 of CIRIA C753 for guidance.

Section 4 – Drawing requirements

S104 Agreement Plan and Land Registry Plan requirements	Yes	No	TBC	N/A	(Designer) Tick to confirm addressed with resubmission
Both drawings contain all relevant component information?	☐	☐			
If the component is to be offered for adoption then the following will be required;					
Component offered for adoption is coloured purple	☐	☐	☐	☐	☐
A 2m easement is be applied around the full perimeter of the component, coloured in yellow and dimensioned	☐	☐	☐	☐	☐

The following requirements are relevant to the S104 Agreement Plan only;					
Component type noted correctly (i.e. geo cellular tank)	☐	☐	☐	☐	☐
Dimensions shown	☐	☐	☐	☐	☐
The area of the system in m^2 noted on the drawing	☐	☐	☐	☐	☐
The inlet level are to be clearly noted and unimpeded by the system walls	☐	☐	☐	☐	☐
Component area (m2) and depth (m) matches the hydraulic model	☐	☐	☐	☐	☐
The position of boreholes used to confirm and understand geotechnical conditions are shown and referenced in accordance with the ground condition investigation report	☐	☐	☐	☐	☐
Full design detail shown for pre-treatment	☐	☐	☐	☐	☐
Ancillaries are clearly identified (i.e. catch pit manholes and flow control manholes)	☐	☐	☐	☐	☐

Sectional view drawing	Yes	No	TBC	N/A	(Designer) Tick to confirm addressed with resubmission
Maximum water depth shown	☐	☐	☐	☐	☐
The inlet level to be clearly noted	☐	☐	☐	☐	☐
Full design detail shown for pre-treatment	☐	☐	☐	☐	☐
Materials to be clearly shown and specified on the drawing	☐	☐	☐	☐	☐