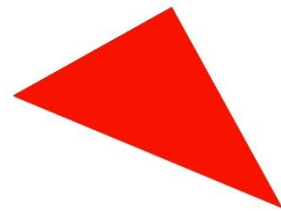


**13947 – FLETCHER FOLD ROAD, BURY.
SuDS SUITABILITY ASSESSMENT**

METHOD	COMMENT	SUITABILITY FOR DEVELOPMENT
Green Roofs	Can be used on suitable low rise buildings to provide retention, attenuation and treatment of rainwater, and promotes evaporation and local biodiversity	<u>Not suitable:</u> Architectural proposals for the development involve a pitched roof arrangement, which are not suitable for green roofs.
Rainwater Harvesting	Rainwater harvesting reduces the total run-off volume from the developed site, and reduces treated water consumption.	<u>Not suitable:</u> - Additional costs of installation would have severe effect on viability of the development. - Running and maintenance costs would not be acceptable to our client and future occupiers. - The ability to restrict peak flow rates and short term peak columns is non-existent where a critical storm event occurs. - Lack of available space on site to store storm water, not feasible.
Infiltration Options	Reduces total run-off volume from the development.	<u>Not suitable:</u> Ground intrusive investigations <i>are likely to</i> indicate that the underlying ground is not suitable for infiltration.
Permeable Surfacing (Infiltration)	- Reduces total run-off volume from the development. - Can be used to enhance water quality.	<u>Not suitable:</u> Ground intrusive investigations <i>are likely to</i> indicate that the underlying ground is not suitable for infiltration.
Swales, Basins & Ponds	- Provide areas for above ground surface run-off storage. - Swales also allow filtering of particulate matter, improving water quality.	<u>Not suitable:</u> - Space constraints on site do not permit large above ground areas for flood storage. - No scope to reduce development area due to site viability.
Bio-Retention	Collect and retain run-off to help improve water quality, prior to	<u>Not suitable:</u>



	discharge in piped system on infiltration.	• Space constraints on site do not permit large above ground areas for flood storage. • No scope to reduce development area due to site viability.
Geocellular Storage	• Suitable for sites within insufficient space for basins etc. • Suitable for sites where topography prevents the use of open basins etc. • Can be very effective infiltration devices subject to ground conditions.	<u>Suitable:</u> • Subject to detailed design and drainage layout geocellular storage can be utilized below private car parking areas. • United Utilities and Sewers For Adoption would require storms up to and including 1:30 year to remain in adoptable system, with geocellular storage provided for storms from 1:30 up to 1:100 +40%cc.
Large Diameter Pipes, Culverts or Tanks	• Suitable for sites with insufficient space for basins etc. • Provide a volume of below ground storage with a high void ratio and good man entry provision to allow for future maintenance and cleaning. • Generally be suitable for adoption by the water company (e.g. United Utilities).	<u>Suitable</u> • Oversized pipes and manholes can be readily accommodated on-site and provide a viable and cost efficient drainage solution by attenuation. • Off line storage will be utilized for storms above 1:30 year, where layout and design permits.

Based on the SuDS assessment above, plus an assessment of the local site conditions, the SuDS hierarchal approach for discharge of surface water at the development site is considered in greater detail below:

METHOD	SUITABILITY	SUITABILITY FOR DEVELOPMENT
Infiltration to ground	No	The ground intrusive Phase 2 site investigation suggests that ground conditions are not suitable for infiltration. On the basis of these findings, we shall explore further options of the SuDS hierarchy in anticipation.
Connection to Watercourse	No	There is NO watercourse or culvert within close proximity to the site, therefore we shall explore further options of the SuDS hierarchy.
Connection to Surface Water Sewer	No	There are no dedicated surface water public sewers within the vicinity of the site. Therefore, based on this, we shall explore further options of the SuDS hierarchy.
Connection to a Combined Sewer	Yes	There is a 225mm dia combined sewer north of the site in Fletcher Fold Road, and a 990 x 1400 combined sewer in the southern part of the site boundary. The preferred point of discharge, due to invert levels, is the southern sewer. The general advice from United Utilities suggests that should the above orders of the SuDS hierarchy be explored and discounted, then they would consider a surface water connection to the combined sewer at a controlled flow rate which does not exceed 5l/s. Due to the site being unsuitable for infiltration, and there being no presence of a watercourse or public surface water sewer to site, a discharge into the combined public sewer near to the site, utilising an existing connection point in private land, has been opted for as a last resort, ensuring the maximum flow rate from UU of 5l/s is adhered to via the use of attenuation and a HydroBrake.

As the site is not suitable for infiltration based on the above, and the lack of any water courses or culverts or a public surface water sewer on or near to site, the final order of the SuDS hierarchy has been explored – the connection to a public combined water sewer.

There is a 900 x 1400mm combined water public sewer within the site boundary to the south of the proposed development. Upon providing evidence that the former orders of the hierarchy are not possible, the drainage proposals shall be developed on the basis that surface water from the site is proposed to discharge into the existing combined water sewer system, at the flow rate agreed by United Utilities, and set at a generally considered minimum of 5l/s. There will a HydroBrake installed within the separate surface water drainage system, restricting flow to the agreed rate, ensuring the maximum SW flow off site will be no greater than 5l/s. This is a betterment on the existing arrangement.

SuDS elements which are appropriate to the site have been explored above and shall be used where suitable and practical. In this instance the drainage systems will comprise of: separate foul and surface water systems up to the point of discharge; the use of a below ground geocellular attenuation tank to accommodate storms up to and including 1:100 years +45% climate change; and the use of a HydroBrake flow control to restrict overall discharge off site to a maximum rate of 5l/s.

