Wylie Architecture

Residential Architecture Design and Planning

Drainage Strategy to accompany outline planning application HPK/2022/0022 for one no. dwelling at Templemore, off Beech View Drive, Harpur Hill, Buxton

Sustainable urban drainage systems (SuDS) Any new drainage for the development should be designed in accordance with the non-statutory technical guidance for the design of sustainable drainage systems.

Surface Water Disposal Hierarchy: The disposal of surface water should be considered in the following order of priority:-

1. Discharge to be used on site.

2. Infiltration into the subsoil via soakaways or permeable paving.

3. Discharge to a water course or the sea.

4. Discharge to a surface water sewer.

5. Discharge to a combined sewer.

If it is not possible to use discharge on site or discharge to a soakaway, then surface water should be controlled with the use of Sustainable Drainage Systems (SuDS) and considered using the SuDS Hierarchy.

Surface Water Disposal Strategy

1. Use on Site

Under the Design and Construction Guidance document (2020), use of surface water generated on site is now the preferred first option in the SuDS hierarchy. Therefore, the applicant is proposing for this development to be as self-sufficient as possible and would harvest rainwater and store it for use in flushing toilets and watering the garden.

The positioning of the storage tanks is subject to detailed specialist design, but it is envisaged that rainwater will be collected from the dwelling roof and stored within a rainwater tank in the loft space. This will then generate suitable power to flush the toilets. An overflow will take surplus water into secondary storage tanks located at ground level such as water butts for an automated garden watering system or manually when required. The greywater used within the toilets would then enter the foul treatment system.

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2. Infiltration

The driveway and parking area will be constructed from permeable paving to allow water to infiltrate through the hard surfacing.

3. Discharge to a Water Course

There are no existing watercourses within the vicinity of the site boundary. The applicant is proposing a dry pond in the garden to take any excess surface water run off and create an additional wildlife habitat, before infiltrating naturally into the ground.

4. Discharge to a Surface Water Sewer

There are no suitable surface water sewers within the vicinity of the development.

5. Combined/ Foul Sewer

There is a foul sewer which runs along Beech View Drive and there is the opportunity to connect into the existing foul sewerage system of the existing houses at Templemore and through to Harpur Hill Road. However, the strategy is to avoid any impact on the existing sewerage system.

Drainage strategy

Surface Water Drainage

- The site is currently garden land and is greenfield with a run-off rate of 5l/s/hectare.
- The applicant will store and re-use on site as much rainwater as possible.
- The roof is the only impermeable surface - 42m2 of a site area 622m2 or approximately 6.7% of the total site area.
- The rainwater falling on the roof is to be collected and stored in tanks hidden within the loft space to be used to flush the toilets with the subsequent foul water then entering the foul system treatment tank.
- An overflow will be provided on the rainwater harvesting tank to subsequently transfer any additional volume into above ground tanks located externally. These are likely to be water butts and will be used to water the garden.
- A new dry pond will be created in the garden to take any excess surface water.

Foul Water Drainage

- Foul water will be collected in a separate system to surface water. This will be collected via pipes and inspection chambers.

- Due to Natural England's nutrient neutrality requirements, the volume of water entering the mains sewer must be reduced. The Nutrient input is governed by the volume of water entering the sewage treatment works and not the phosphorus content in it.
- Foul water will be collected from the property and pass through a sewage treatment plant (also known as Package Treatment Plant (PTP)) before dispersing – via an inspection chamber (for water testing collection) – into a drainage field or mound located in the garden.
- A PTP allows for a small drainage field arrangement and the PTP option will offer a cleaner discharge.
- The system will be designed in accordance with the criteria set out in Annex F of Natural England's letters to LPAs regarding Nutrient Neutrality.
- Further guidance regarding set out and preliminary design of the drainage field or mound is provided with Part H of the Building Regulations.
- Annex F references thresholds which need to be adhered to – all of which the development complies with.
- The Klargester BioDisc® by Kingspan is proposed by the applicant and can support up to 8 people. This allows aerobic micro-organisms, naturally found in sewage, to establish on a biologically active film or biomass. Natural breakdown of sewage can then occur. Wastewater and sewage flow into the primary settlement zone where solids are settled out and retained. This accumulated sludge is drawn out (by pump) periodically. Partially clarified liquor containing fine suspended solids flows upwards into the first stage Biozone for breaking down by micro-organisms. Suspended solids return to the primary settlement zone and the liquor is transferred to the second stage Biozone for further treatment. Any solids remaining are settled out in the final settlement tank. The very high effluent quality is discharged to a drainage field (network of perforated pipes buried below ground to allow natural infiltration into the ground). The system uses slowly rotating mechanism to agitate the treatment process and so there is a low energy consumption electric motor within the system. The discharge will then enter into a drainage field or mound.
- Preliminary nutrient calculations are included with the submission.
- All proposed below ground foul water drainage will comply with Building Regulations Part H:2010, BS EN 12056-2:2000 and BS EN 752:2008.
- The Klargester BioDisc by Kingspan literature is attached.
- The setting out guidance from Part H of The Building Regulations is included below:

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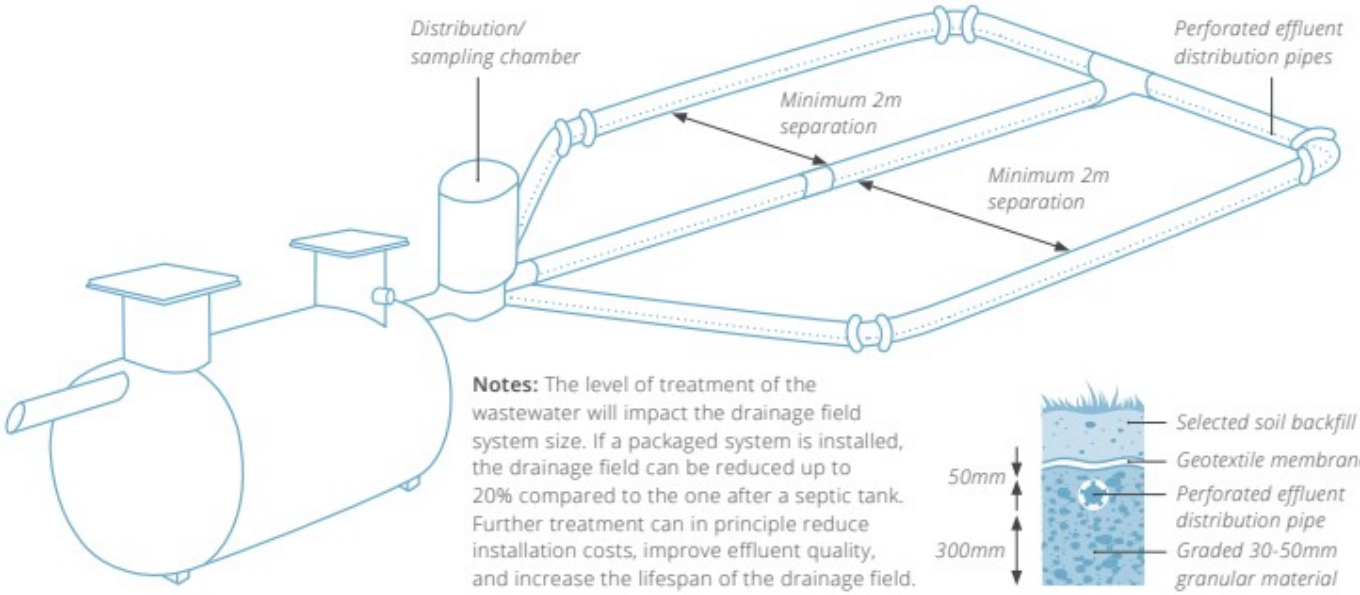
DRAINAGE FIELD

(The Building Regulations 2010- Drainage and Waste Disposal). In Scotland drainage fields need to be designed in accordance with the Building Control Technical Handbook.



Notes: The level of treatment of the wastewater will impact the drainage field system size. If a packaged system is installed, the drainage field can be reduced up to 20% compared to the one after a septic tank. Further treatment can in principle reduce installation costs, improve effluent quality, and increase the lifespan of the drainage field.

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