

Condition Discharge Statement

Plans for the disposal of foul and surface water flows

Proposed replacement outbuilding to form double garage and ancillary accommodation

Site Address: Gorsty Hill Cottage, Tean, Stoke-on-Trent, ST10 4EL

Applicant: Bruce Edgar

Application Ref: SMD/2025/0288

Condition Ref: 4

Date: June 2026

Surface Drainage

1. Purpose of This Submission

This statement is submitted to discharge the surface water drainage condition attached to the planning permission referenced above.

2. Approved Development Summary

The approved development comprises the replacement of an existing domestic garage and annex within the curtilage of an existing dwelling. The proposal is minor in scale and slightly reduces the current impermeable area. No new external impermeable areas are included in the build.

3. Surface Water Drainage Strategy

Surface water will be managed in accordance with the SuDS hierarchy, prioritising infiltration. Roof water will drain to a soakaway designed in accordance with the requirements of CIRIA C753 and located a minimum of 5 metres from buildings. No discharge to public sewer or watercourse is proposed.

4. Climate Change and Design Standards

The drainage system will be designed to accommodate a 1 in 100 year return period plus a 40% climate change allowance, in line with Environment Agency guidance.

It is noted that a water abstraction point (spring) lies within the property boundary, this has been incorporated into the design by ensuring that no drainage features are within 50m.

5. Exceedance Management

In rainfall events exceeding the design capacity, finished floor levels will remain above surrounding ground levels and exceedance flows will route across landscaped areas away from buildings.

6. Maintenance Arrangements

The surface water drainage system will be maintained by the property owner, including regular inspection of gutters, downpipes, and soakaway performance.

7. LLFA Compliance

The drainage strategy has been prepared in accordance with the Non-Statutory Technical Standards for SuDS and Staffordshire Lead Local Flood Authority guidance. The scheme manages surface water at source and results in no increase in flood risk.

8. Confirmation

This statement confirms that the approved surface water drainage measures will be implemented in full prior to first use of the development and maintained for the lifetime of the site.

10 Design information

The surface water soakaway has been designed in accordance with CIRIA C753.

The roof (93.5 m²) will discharge to a below-ground soakaway. Refer to the attached calculations for details.

Soil infiltration rates have been calculated following percolation testing undertaken at the proposed invert level of the soakaway. The soakaway has been sized to accommodate a 100-year return period and will be sited at least 2.5 m from site boundaries.

Drainage / Foul Water Statement

BS 6297:2007 + A1:2008 Referenced

Site Details

Treatment System: Graf One2Clean 9 PE Sewage Treatment Plant

Design Population: 8 Population Equivalent (PE)

1. Introduction

This statement sets out the proposed foul water drainage arrangements for the replacement of the existing garage and annex at Gorsty Hill Cottage, Tean, Stoke-on-Trent, ST10 4EL. There is no reasonably practicable connection to the public foul sewer network. Foul drainage will therefore be treated on site using a packaged sewage treatment plant, with treated effluent discharged to ground via a compliant drainage field.

In addition to serving the replacement garage and annex, foul discharge from the existing main dwelling has been incorporated into the design. This facilitates the decommissioning and removal of the existing septic tank and represents an overall improvement in foul drainage provision and environmental protection at the site.

2. Septic Tank Decommissioning

The existing septic tank serving the main dwelling, understood to date from the 1970s, will be taken out of use following commissioning of the proposed Graf One2Clean sewage treatment plant. The tank will be emptied and cleaned by a licensed contractor and subsequently either removed from the site or permanently infilled with suitable inert material once disconnected, in accordance with Building Regulations Part H.

3. Sewage Treatment Plant

All foul sewage from the main dwelling together with the replacement garage and annex will discharge to a Graf One2Clean 9 PE packaged sewage treatment plant. The system provides primary settlement, biological treatment and final clarification and is sized appropriately for an 8 PE loading.

4. Effluent Transfer Arrangement

Due to site topography, the drainage field is located approximately 90 metres horizontally and 5 metres vertically above the treatment plant outlet. Treated effluent will therefore be conveyed via a twin pumped rising main to a remote drainage field distribution chamber. Discharge will be intermittent to prevent overloading. Recommended pump sizing: 7 to 8 m head at 1 L/s.

5. Drainage Field Design (BS 6297)

The drainage field has been designed in full accordance with BS 6297:2007 + A1:2008. Infiltration testing has confirmed a percolation value (V_p) of 14 seconds per millimetre at the proposed depth of the drainage field.

6. Drainage Field Sizing Calculation

Drainage field sizing has been undertaken using the BS 6297 formula:

$$A_t = P \times V_p \times 0.25$$

Where:

A_t = effective infiltration area (m^2)

P = population equivalent (8 PE)

V_p = percolation value (14 s/mm)

Applying the formula:

$$A_t = 8 \times 18 \times 0.25 = 28 m^2$$

Using a standard 600 mm wide infiltration trench, this equates to a total required trench length of:

$$28 \div 0.6 = 47 \text{ linear metres.}$$

7. Drainage Field Arrangement

The required 47 metres of drainage trench will be laid level along the contour and evenly distributed via a distribution chamber. Trenches will be constructed with clean washed granular stone, perforated distribution pipework and permeable geotextile, and will be protected from vehicle loading and compaction.

8. Compliance

The foul drainage system complies with Building Regulations Part H, the Environment Agency General Binding Rules and BS 6297:2007 + A1:2008. No Environmental Permit is required, subject to continued compliance with siting criteria.

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	Calcs for Soakaway				Start page no./Revision 1	
	Calcs by	Calcs date 10/06/2026	Checked by	Checked date	Approved by	Approved date

SOAKAWAY DESIGN

In accordance with CIRIA C753 SUDS

Tedds calculation version 2.0.06

Design rainfall intensity

Location of catchment area	Stoke
Impermeable area drained to the system	$A = 93.5 \text{ m}^2$
Return period	Period = 100 yr
Ratio 60 min to 2 day rainfall of 5 yr return period	$r = 0.360$
5-year return period rainfall of 60 minutes duration	$M5_60\text{min} = 19.0 \text{ mm}$
Increase of rainfall intensity due to global warming	$p_{\text{climate}} = 30 \%$

Soakaway / infiltration trench details

Soakaway type	Rectangular
Width of pit	$w = 4000 \text{ mm}$
Length of pit	$l = 2000 \text{ mm}$
Percentage free volume	$V_{\text{free}} = 95 \%$

Soil infiltration rate (BRE digest 365)

Length of trial pit	$l_{\text{trial}} = 300 \text{ mm}$
Width of trial pit	$b_{\text{trial}} = 300 \text{ mm}$
Depth of trial pit (below invert)	$d_{\text{trial}} = 300 \text{ mm}$
Free volume (if fill used)	$V_{\text{trial}} = 100 \%$
75% depth of pit	$d_{75} = (d_{\text{trial}} \times 0.75) = 225.00 \text{ mm}$
50% depth of pit	$d_{50} = (d_{\text{trial}} \times 0.50) = 150.00 \text{ mm}$
25% depth of pit	$d_{25} = (d_{\text{trial}} \times 0.25) = 75.00 \text{ mm}$
Test 1 - time to fall from 75% depth to 25% depth	$T1 = 112 \text{ min}$
Test 2 - time to fall from 75% depth to 25% depth	$T2 = 98 \text{ min}$
Test 3 - time to fall from 75% depth to 25% depth	$T3 = 101 \text{ min}$
Longest time to fall from 75% depth to 25% depth	$t_{\text{lg}} = \max(T1, T2, T3) = 112 \text{ min}$
Storage volume from 75% to 25% depth	$V_{p75_25} = (l_{\text{trial}} \times b_{\text{trial}} \times (d_{75} - d_{25})) \times V_{\text{trial}} = 0.01 \text{ m}^3$
Internal surface area to 50% depth	$a_{p50} = ((l_{\text{trial}} \times b_{\text{trial}}) + (l_{\text{trial}} + b_{\text{trial}}) \times 2 \times d_{50}) = 0.27 \text{ m}^2$
Surface area of soakaway to 50% storage depth	$A_{s50} = 2 \times (l_{\text{trial}} + b_{\text{trial}}) \times d_{\text{trial}} / 2 = 0.180 \text{ m}^2$
Soil infiltration rate	$f = V_{p75_25} / (a_{p50} \times t_{\text{lg}}) = 7.44 \times 10^{-6} \text{ m/s}$
Factor of safety	$\text{FOS} = 1.5$
Infiltration coefficient	$q = f / \text{FOS} = 4.96 \times 10^{-6} \text{ m/s}$
Base area	$A_b = w \times l = 8000000 \text{ mm}^2$
Perimeter	$P = 2 \times (w + l) = 12000 \text{ mm}$
Coefficient b	$b = P \times q / (A_b \times V_{\text{free}}) = 0.03 \text{ hr}^{-1}$

Table equations (Eq. 25.4)

Rainfall intensity	$i = M100 / D$
Coefficient a	$a = A_b / P - (A \times i / (P \times q))$
Minimum depth required	$H = a \times (e^{(-bD)} - 1)$

Duration, D (min)	Growth factor Z1	M5 rainfalls (mm)	Growth factor Z2	100 year rainfall, M100 (mm)	Intensity, i (mm/hr)	a (mm)	Min depth req (mm)
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 Primary Power First Floor Mutual House 8 High Street Cheadle	Project Gorsty Hill Cottage				Job no.	
	Calcs for Soakaway				Start page no./Revision 2	
	Calcs by	Calcs date 10/06/2026	Checked by	Checked date	Approved by	Approved date

Duration, D (min)	Growth factor Z1	M5 rainfalls (mm)	Growth factor Z2	100 year rainfall, M100 (mm)	Intensity, i (mm/hr)	a (mm)	Min depth req (mm)
5	0.36;	8.9;	1.88;	16.7;	200.97;	-87022;	204
10	0.51;	12.6;	1.95;	24.6;	147.50;	-63693;	299
15	0.62;	15.3;	1.99;	30.5;	122.05;	-52589;	369
30	0.79;	19.5;	2.03;	39.5;	79.07;	-33835;	474
60	1.00;	24.7;	2.01;	49.7;	49.68;	-21009;	584
120	1.22;	30.1;	1.97;	59.3;	29.67;	-12278;	673
240	1.48;	36.6;	1.92;	70.1;	17.52;	-6980;	744
360	1.67;	41.2;	1.88;	77.5;	12.92;	-4973;	774
600	1.90;	46.9;	1.83;	86.1;	8.61;	-3090;	759
1440	2.42;	59.8;	1.74;	104.2;	4.34;	-1228;	604

Minimum depth of soakaway

$H_{max} = 774$ mm

Time to empty soakaway to half vol. - Eq.24.6(2)

$t_{s50} = V_{free} \times A_b / (q \times P) \times \ln((H_{max} + A_b / P) / (H_{max} / 2 + A_b / P)) = 11\text{hr}$
5min 41s

PASS - Soakaway discharge time less than or equal to 24 hours

30% climate change allowance adopted; additional capacity provided through FoS (1.5) and increased depth (800 mm vs 774 mm required).