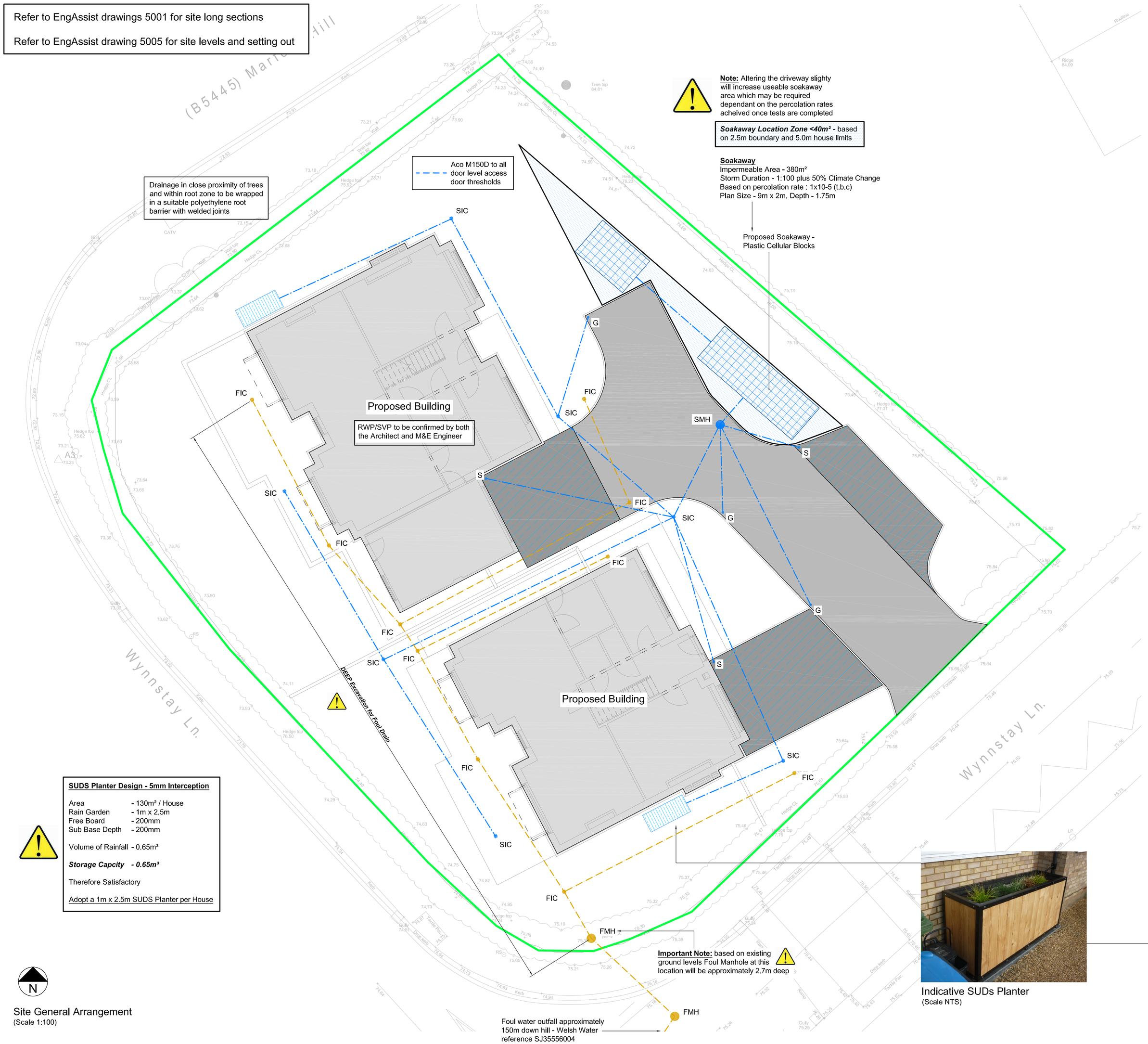
Refer to EngAssist drawings 5001 for site long sections

Refer to EngAssist drawing 5005 for site levels and setting out



Site General Arrangement
(Scale 1:100)

SUDS Planter Design - 5mm Interception

Area	- 130m² / House
Rain Garden	- 1m x 2.5m
Free Board	- 200mm
Sub Base Depth	- 200mm

Volume of Rainfall - 0.65m³

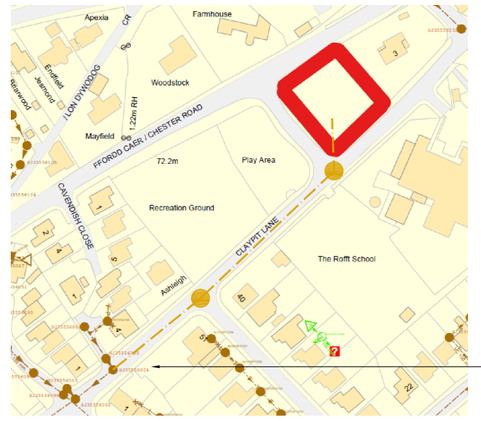
Storage Capcity - 0.65m³

Therefore Satisfactory

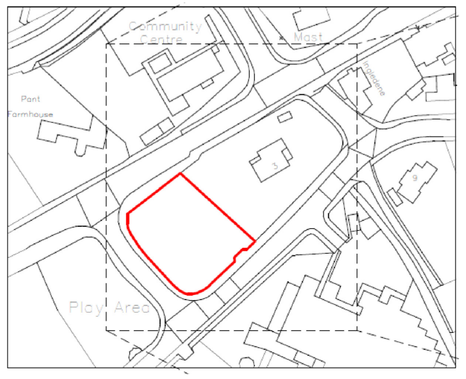
Adopt a 1m x 2.5m SUDS Planter per House

Indicative SUDs Planter
(Scale NTS)

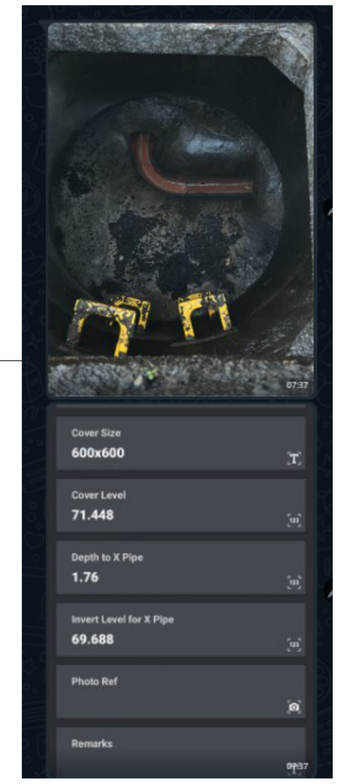
SMH — Surface Water Manhole
SIC — Surface Water Inspection Chamber
Surface Water Drain
Aco Drain - MultiDrain M150D (185mm Invert)
G G S — SVP, RWP, Road and Aco Drain Gully
Permeable Paving Sump
Soakaway
Permeable Surface - Gravel/Tarmac/Block Paving
SUDs Planter
FMH — Foul Water Manhole
FIC — Foul Water Inspection Chamber
Foul Water Drain
Surface and Foul Water Flow Direction
Site Boundary



Welsh Water Sewer Plan
(Scale NTS)



Site Location Plan
(Scale NTS)



Claypit Lane - Foul (Welsh Water Reference SJ35556004)
Proposed point of connection at Existing Manhole

Conclusions & Recommendations

No particular precautions are considered necessary for contamination at the site, apart from standard good hygiene practices during construction.

Shallow spread footings are likely to be appropriate for the proposed building. Although there are former and existing trees it is unlikely that heave or shrinkage will need to be taken into consideration because the near surface deposits are glaciofluvial sands and gravels. However, whilst these deposits are mainly granular, they can have localised beds of clay which can become desiccated due to trees and cause problems with heave or shrinkage accordingly.

The site is likely to be suitable for soakaway drainage because the near surface deposits are glaciofluvial sands and gravels

The ground conditions should be confirmed by a short ground investigation which should comprise of the following minimum requirements:

- 3 to 4 no machine excavated trial pits or window sample boreholes to minimum 3m depth to obtain information for foundation design, and if clays are present including depth of desiccation.
- 2 no. Atterberg limit tests if clay present to confirm the clay plasticity, in the presence of trees.
- 1 no pH and sulphate chemical test for design of buried concrete in accordance with BRE SD1.
- 2 no shallow soil samples to confirm chemical suitability for use in garden areas.
- Infiltration tests if soakaways are proposed.

Phase 1 Report - Extract
Eccles Associates Limited

SOAKAWAY DESIGN

In accordance with BRE Digest 365 - Soakaway design

Tadds calculation version 2.0.06

Design rainfall intensity

Location of catchment area	Other
Impermeable area drained to the system	A = **380.0** m²
Return period	Period = **100** yr
Ratio 60 min to 2 day rainfall of 5 yr return period	r = **0.341**
5-year return period rainfall of 60 minutes duration	M5_60min = **18.0** mm
Increase of rainfall intensity due to global warming	$p_{climate}$ = **50 %**

Soakaway / infiltration trench details

Soakaway type	Rectangular
Minimum depth of pit (below incoming invert)	d = **1750** mm
Width of pit	w = **2000** mm
Length of pit	l = **9000** mm
Percentage free volume	V_{free} = **95 %**
Soil infiltration rate	f = **10.0×10-6** m/s
Wetted area of pit 50% full	a_{s50} = l × d × w × d = **19250000** mm²

Table equations

Inflow (cl.3.3.1)	I = M100 × A
Outflow (cl.3.3.2)	O = a_{s50} × f × D
Storage (cl.3.3.3)	S = I - O

Duration, D (min)	Growth factor Cl	M5 rainfall (mm)	Growth factor Cl	100 year rainfall, M100 (mm)	Inflow (m³)	Outflow (m³)	Storage required (m³)
5	0.35;	9.5;	1.90;	18.1;	6.89;	0.06;	6.83
10	0.50;	13.6;	1.97;	26.8;	10.17;	0.12;	10.05
15	0.61;	16.6;	2.00;	33.2;	12.61;	0.17;	12.44
30	0.78;	21.2;	2.03;	42.9;	16.28;	0.35;	15.94
60	1.00;	27.0;	1.99;	53.8;	20.46;	0.69;	19.77
120	1.23;	33.1;	1.95;	64.4;	24.47;	1.39;	23.09
240	1.51;	40.8;	1.88;	76.9;	29.21;	2.77;	26.44
360	1.71;	46.1;	1.84;	84.9;	32.26;	4.16;	28.11
600	1.99;	53.7;	1.78;	95.8;	36.42;	6.93;	29.49
1440	2.53;	68.4;	1.68;	115.3;	43.80;	16.63;	27.17

Required storage volume — S_{req} = **29.49** m³
Soakaway storage volume — S_{sto} = l × d × w × V_{free} = **29.93** m³

PASS - Soakaway storage volume

Time for emptying soakaway to half volume — t_{50} = S_{sto} × 0.5 / (a_{s50} × f) = 21hr 16min 38s

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

Soakaway Design
Based on a percolation rate of 1x10-5 (to be confirmed)
Note: Tank size could increase or decrease

Client: **AMG Developments (Marford) Ltd**	Project: **Marford Gate, Gresford**	Drawing Title: **Site General Arrangement**	Drawing Number: **MGT-ENA-XX-XX-DR-C-5600**					
			Purpose of Issue: **Planning**					
			Revision: **PL1**	PL1	13.12.23	DRB	DRB	***Updated*** - Planning Information Issue
			Status: **PL**	Rev	Date	Drn	Chk	Details

Eng Assist
STRUCTURAL AND CIVIL ENGINEERING ASSISTANCE
Phone : **07763993213**
Email : **dave.barwell@engassist.co.uk**
Website : **engineeringassist.co.uk**