

DRAINAGE CALCULATIONS

**THE OAK TREE TAVERN
WREXHAM**

07555-JP-TN-002

Issue 2



JP Structural Design

Contents

- 1.0 Introduction
- 2.0 Appendices
 - 2.1 Layout Proposals
 - 2.2 Infiltration Test Results
 - 2.3 Base Notes

1.0 INTRODUCTION

1.1 Commission

In June 2020 JP Structural was commissioned to undertake the drainage design calculations for the proposed residential redevelopment of the Former Oak Tree Tavern, Ruabon Road. Wrexham.

1.2 Impermeable Area

The site covers an area of approximately 0.106 Ha, of which approximately 320m² is proposed to be impermeable area, the roof area of the properties which will continue to drain in its present format. All external areas are to be constructed of porous materials which will discharge naturally to the ground, JPS have been asked to provide verification of the substrata. The latest site proposals are shown in Appendix 2.1

1.3 Infiltration Tests

Infiltration Testing has been undertaken in accordance with BRE 365 and the results as advised to JPS are depicted in Appendix 2.2.

1.4 External Areas

As demonstrated an infiltration rate of 1.74×10^{-5} m/s has been calculated. Consulting the Interpave tables, this rate is more than adequate for a Total Infiltration system.

Table 1: Guidance on selection of a pavement system.

		System A total infiltration	System B partial infiltration	System C no infiltration
permeability of subgrade defined by coefficient of permeability k (m/s)	10^{-6} to 10^{-3}	✓	✓	✓
	10^{-8} to 10^{-6}	X	✓	✓
	10^{-10} to 10^{-8}	X	X	✓
highest recorded water table within 1000mm of formation level		X	X	✓
pollutants present in subgrade		X	X	✓

1.5 Car Park Specification

A specification such as the following should be adopted;

80mm AQUAFLOW PERMEABLE PAVING BLOCK SYSTEM
50mm PERMEABLE LAYING COURSE 2-6mm CLEAN CRUSHED STONE & JOINTING MATERIAL
1 LAYER OF INBITEX GEOTEXTILE

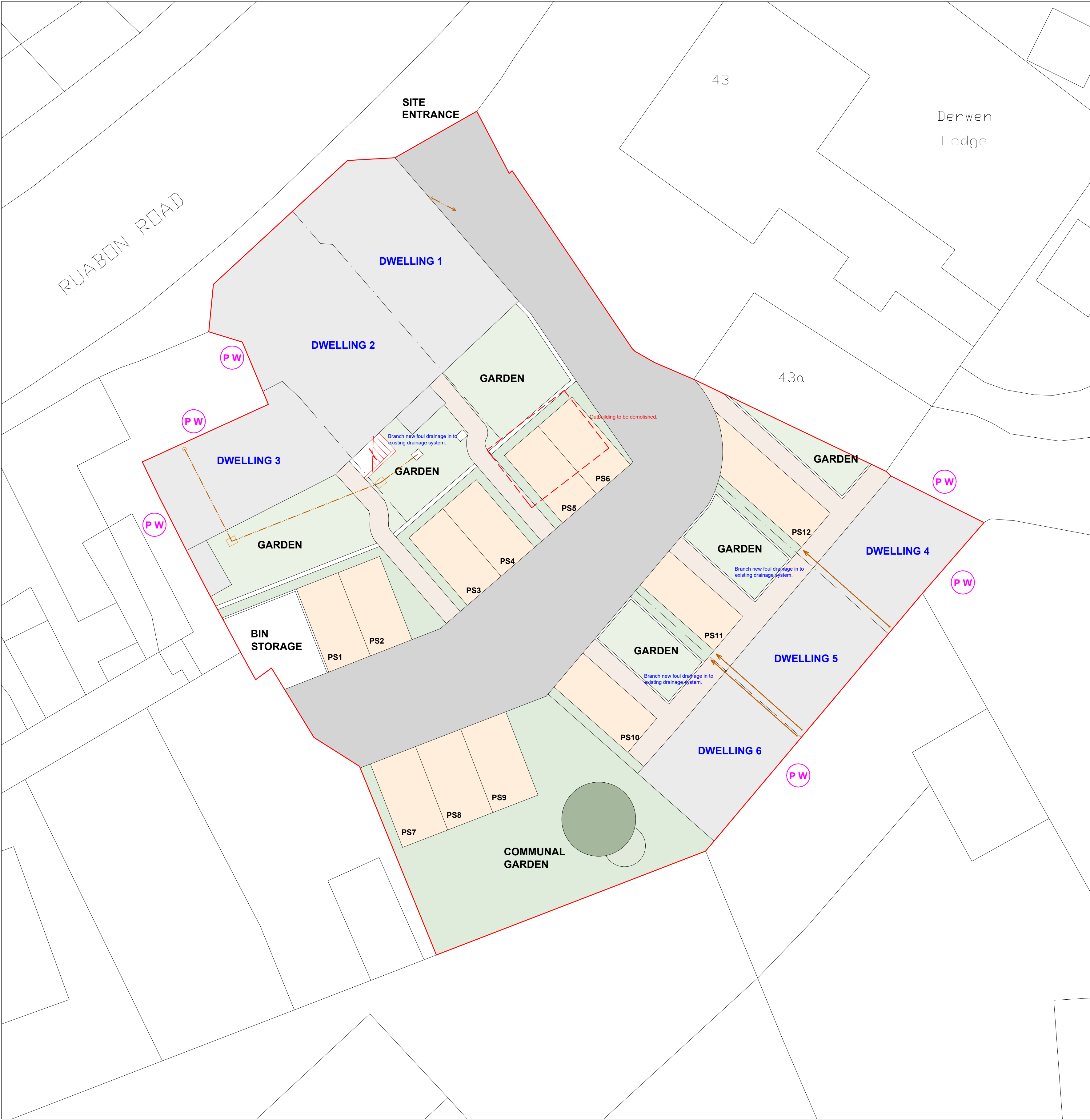
Refer to Appendix 2.3 for sub-base notes

2.0 Appendices

2.1 Proposed Layout

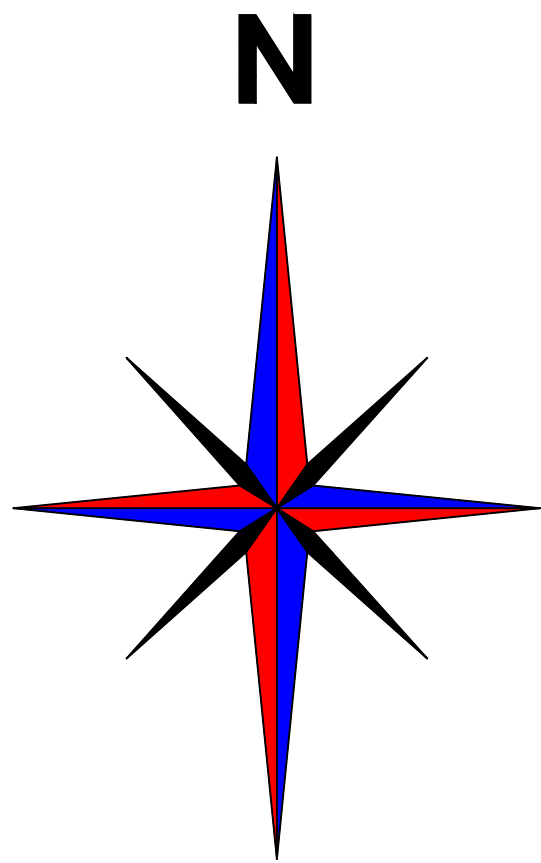
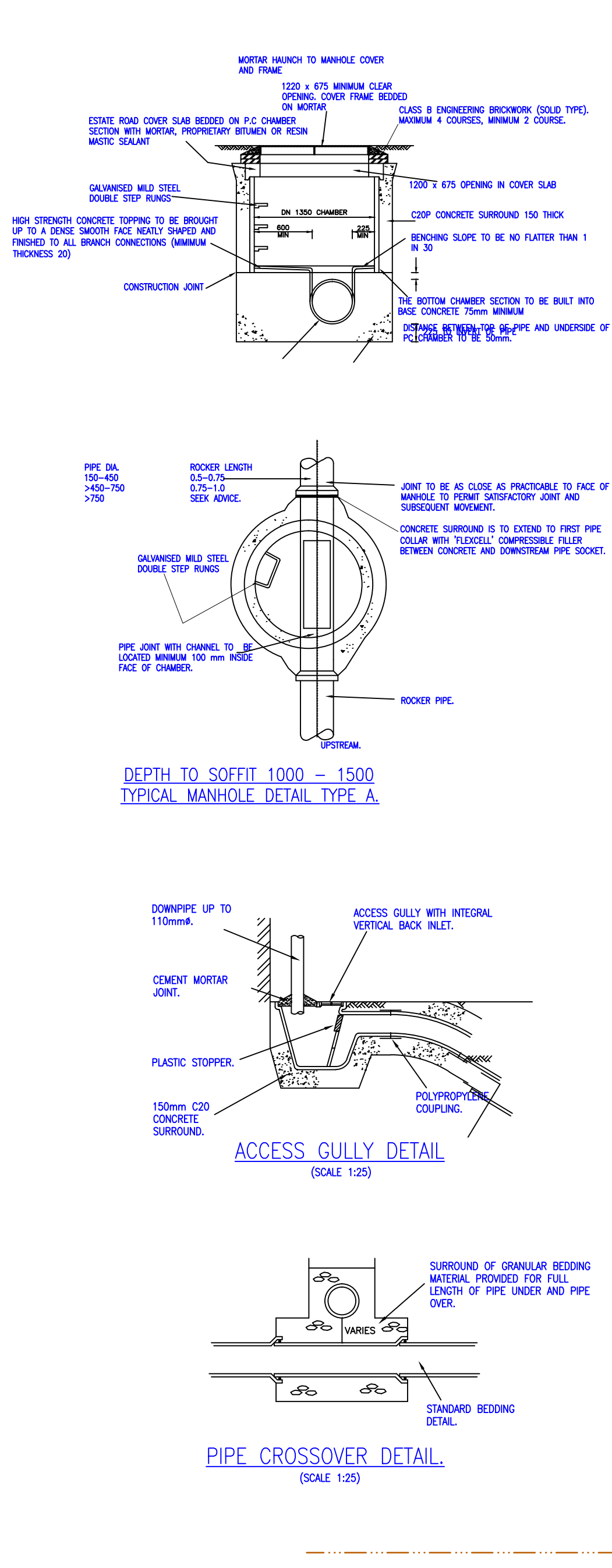
2.2 Percolation Test Results

2.3 Sub-Base Notes



PROPOSED SITE PLAN

INDICATES LOCATIONS OF LIKELY PARTY WALL ISSUES.
THE SITE *** OWNER *** MUST SERVE PARTY WALL NOTICES,
EITHER DIRECT OR THROUGH A 3rd PARTY CONSULTANT
TO ENSURE THAT THE DEVELOPMENT & THE CORRECT
LEGAL PERMISSIONS ARE IN PLACE TO ALLOW CONSTRUCTION



This drawing is provided as a document to gain either Planning Permission or Building Regulation approval purposes only. It is not a guarantee that Planning Permission will be granted.
This drawing and all contents are the copyright of James Campbell Associates Ltd. No copies to be made from the drawing & details within unless authorised by James Campbell Associates Ltd.
The contract for the works is between the client and his / her contractor. Contractor to visit site, study the details provided within the drawing and be familiar with both the work to be carried out in accordance with the details provided. Any stated dimension must be checked prior to any form of construction. All works and materials to comply with all relevant British Standards and carry a genuine BBA certificate. The materials specified within this drawing are a guide for the contractor as they are recognised materials with genuine BBA certificates etc. Any contractor who decides to use any different materials than that noted on the drawing must inform James Campbell Associates Ltd.
Any discrepancies discovered or items found that were not visible at the time of the initial survey should be reported to James Campbell Associates Ltd for consultation with our client.

CONSTRUCTION NOTES:-

All drainage under building floor slabs within 400mm of the top of the slab to be encased in min 150mm concrete.

All new foundations to be constructed below invert level of new & existing drainage. Finally contractor to check existing mth depths to verify that new drainage will run into the existing on site gravity system.

All pathways to dwelling entrances to be 1 in 12 gradient ramp to front & rear entrances or stepped down with 100mm brickwork walling topped with 900 x 600mm concrete flags with min 25mm overhang all to Detail 1.

ANY EXISTING FW / SW SYSTEMS IN EXISTENCE ARE TO BE MAINTAINED IF POSSIBLE. DRAINS ARE TO BE TRACED ACCURATELY PRIOR TO COMMENCING DRAINAGE WORKS. TO ENABLE NATURE OF DRAINAGE (SEPARATE OR COMBINED) A CCTV SURVEY SHOULD BE UNDERTAKEN.

DRAINAGE NOTES

- All works are to be in accordance with "sewers for adoption" - 3rd edition.
- All drainage is to be in accordance with BS8301 - code of practice for building drainage.
- The contractor is responsible for setting out and for the correctness of the position and dimensions of all parts of the works.
- The contractor shall give at least one clear working days notice to the engineer /building inspector before any formation is covered with permanent work and before testing any pipeline.
- Vitrified clay pipes and pipeline fittings for sewers shall comply with the relevant requirements of BS65 and be of 'normal' type with flexible mechanical joints.
- Unreinforced and reinforced concrete pipes and fittings with flexible joints shall comply with the relevant provisions of BS5911 part 100.
- Manhole covers and frames shall comply with the relevant provisions of bs497 part 1.
- All structural concrete is to be grade c35 with a minimum compressive strength of 35N/mm at 28 days. Minimum cement content is to be 200kg/m and maximum free water cement ratio is to be 0.6. Maximum aggregate size is to be 20mm nominal.
- Blinding concrete is to be grade c15 with a minimum compressive strength of 15N/mm at 28 days. Minimum cement content is to be 200kg/m and maximum free water cement ratio is to be 0.6. Maximum aggregate size is to be 20mm nominal.
- Mass concrete and concrete surrounding drains gullies and manholes is to be grade C25 with a minimum compressive strength of 25N/mm at 28 days. minimum cement content is to be 0.55. Maximum aggregate size is to be 20mm nominal.
- All brickwork below dpc level is to have a minimum compressive strength of 27N/mm and a maximum water absorption of 7%.
- All mortar below dpc level is to be 1:3 cement:sand (grade 3) - no additives will be permitted without the prior written consent of the engineer.

DRAWING TITLE

PROPOSED SITE PLAN



Campbell House
173 Rochdale Road
Fingrove
Rochdale
OL16 3BN

Tel: 01706 354888
Mob: 07817 623183

Email: admin@jamescampbellassociates.co.uk
Web: www.jamescampbellassociates.co.uk

PROJECT

REISIDENTIAL DEVELOPMENT - 6No DWELLINGS

LOCATION

Oak Tree Tavern
45 To 47
Ruaben Road
Wrexham

DRAWN:- Aiden Phillips Whalley

DATE:- October 2019

SCALE:- 1:125 @ A1

ISSUE:-

DRAWING NUMBER:-

19.2109.16

--

TEST PIT (mm)

Number :	1
Length :	2000
Width :	300
Depth :	1500

RUN 3

[illegible]

BRE 365 RESULTS SHEET

DETAILS

Ref : 07555
Project : Oak Tree Tavern - Wrexham

Date : 25/06/2020
Conditions : Warm / Sunny
Substrata : -

TEST PIT (mm)

Number : 1

Length : 2000
Width : 300
Effective Depth : 250

Infiltration Rate

		Run 1	
Time to Drop from 75% - 25%			
Minutes			32.00
		Run 2	
Time to Drop from 75% - 25%			
Minutes			90.00
		Run 3	
Time to Drop from 75% - 25%			
Minutes			
		Average Tp (75-25)	(mins) 61.00
		Vp (75-25)	(m ³) 0.075
		As50	(m ²) 1.175

Infiltration Rate

m/s	0.0000174
m/s	1.74E-05
m/hr	0.063

Aqua Flow Sub-base specification*

All granular sub-base material shall comprise crushed clean stone, rock or concrete possessing well defined edges. It must be sound, clean, non friable and free from clay or other deleterious matter.

The material must be non plastic when tested in accordance with BS1377 Test No. 4

The crushed stone used for the laying course and sub-base must have a minimum 10% fines value of 150kN when tested in accordance with BS812 Part 111.

The selected test samples shall not be oven dried and should be soaked in water at room temperature for 48 hours before the test.

The 100mm deep upper layer of sub-base material should be graded 5mm-20mm to BS EN 13242: 2002.

Grading of lower layer of sub-base stone:

BS EN Sieve size	% passing
80mm	100
63mm	90-100
40mm	60-80
20mm	15-30
10mm	0-5

Depth of Sub-base

A total depth subbase depth of 350mm should be used on a layer of INBITEX AP SC 1000 geotextile.

Capping Layer

The subgrade will need to achieve a minimum CBR of 15% prior to the installation of the Aquaflow system granular 6F5 capping material in accordance with clause 613 of the Highways Agency specification is to be used in accordance with the table below.

SUBGRADE CBR (%) RANGE	< 2	2 - 2.5	2.5 - 3	3 - 4	4 - 5	5 - 7.5	7.5 - 10	10 - 12.5	12.5 - 15
CAPPING LAYER	* 600	450	400	350	300	250	225	200	150

* - PLUS GROUND STABILISATION
TO BE DISCUSSED WITH ENGINEER