



DRAINAGE REPORT

PROPOSED DEVELOPMENT AT MAESTEG, GWYNFRYN, WREXHAM

October 2016

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1.0 General Overview

The proposal is located upon a vacant Greenfield site, which is a corner plot between Ffordd Isaf, and Allt Y Pentref, Coedpoeth Gwynfryn, Wrexham, LL11 5YU. The site is located at ordnance survey Grid Reference: SJ 25724 52496. Refer to **(Appendix A)** 3597 – 531 for the site location plan.

Presently the site is being used as a paddock for horses for one of the neighbouring properties. The site has total surface area of approximately 1573m², the site slopes from the North to the South at a gradient of 1 in 13.3 and slopes at a gradient of 1 in 15.5 from East to West.

The proposal involves the construction of a 4 semidetached dwellings and 1 detached dwelling with associated parking and an approx. 28m access road through the centre of the site.

The purpose of these calculations and accompanying details are to produce a drainage layout that complies with the relevant legislation of PPS25, SuDS hierarchy and Approved Document H of the Building Regulations 2010.

2.0 Porosity Tests

Porosity tests were undertaken on site by W D Stants Limited and were conducted on the 30th September 2016, 1 porosity test was carried out on site. Refer to **(Appendix F - Page 2)** for location plan of porosity tests. Reference is made to the Porosity report contained in **(Appendix F)** the report concludes that the use of infiltration system such as soakaways for the disposal of surface water run off generated from the development proposal would not be a suitable option as the water failed to infiltrate at all over 4 hours and the test was abandoned.

3.0 Design Philosophy

The disposal of surface water should be designed in strict accordance with the provision of TAN15, the Flood and Water Management Act 2010 and best practice documents such as the recently published SUDS Manual from CIRIA.

In accordance with the SuDS Hierarchy surface water should be designed and constructed disposing of run off volumes into the ground via infiltration systems where possible. As infiltration is not a viable method of disposal of surface water consideration should be given to the following in order of preference:

- Disposal to land drain,
- Disposal to watercourse,
- Disposal to surface water sewer, and
- Disposal to combined sewer.

3.1 Existing Arrangement

From a site walkover and inspection of both historical mapping and available flood mapping from the NRW it is evident that a culverted land drain is present in Ffordd Isaf, the culverted land drain in question conveys land drainage from an agricultural holding to the north of the proposal site, along Ffordd Isaf south to a subsequent discharge point with the main river.



The highway authority as riparian owner has recently re-laid the culverted land drain using UPVC pipework and gully chambers as access points.



There's a culverted land drain also accommodates highway surface run off.

Reference is made to (Appendix H) for further evidence

Due to the topography of the site the existing above ground flood routing, as indicated on drawing 04716 – EL (9-) 02 (**Appendix E**), Indicates that surface water ran off the existing site onto the Ffordd Isaf highway fronting the site and inevitably into the culverted land drain beneath the highway. The right to discharge under the land drainage act is therefore established.

3.2 Proposed Philosophy

Based upon the existing site information the proposed method of surface water discharge will be into the existing land drain as there is an established right of connection.

An assessment of run-off is to be undertaken to quantify existing and proposed run off based upon the existing and proposed hard standing areas. The assessment of run off will be in accordance with IHR 124 is to be undertaken.

The tables on the following page summarise the existing and proposed effective areas with their corresponding run off coefficients as per the Wallingford procedure, IHR 124 and the Modified Rational Method.

Existing Areas

Surface	Coefficient	Effective Area
Grassed	0.35	550.55

Proposed Areas

Surface	Coefficient	Effective Area
Grassed	0.35	162.41
Roads & Parking	0.75	204.15
Roofs & House Paths	1.00	524.23

Reference should be made to the attached calculations (**Appendix D**) for run off volumes which are summarised on the following page.

Reference	1 in 1 year	1 in 100 year
Existing	0.134 L/s	0.343 L/s
Proposed + 30%	0.282 L/s	0.722 L/s

Reference	Volume run off 1 in 100 year
Existing	41.4312 m ³
Proposed	67.0359m ³

The above output is based upon the use of 30% climate change and the design storm events as shown. The volume of run off is also calculated to the 1 in 1 year storm and 1 in 100 year storm events with a climate change factor, as above, included. The increase of volumetric run off equates to: **25.60467m³**. TAN15 requires no increase in volumetric run off as a result of the proposed development and the risk of flooding on site and adjacent properties must not increase. To mitigate the increase in run off, storage must be provided on site

equating to the increase. Therefore, a minimum storage requirement for each of the storm events as shown above should be provided to mitigate against the increase of run off.

3.3 Climate Change

TAN15 states that a value for climate change should be included within the attenuation system on site, however TAN15 does not provide a table of the percentage which should be taken for climate change for the age of the building. PPS25 is the English equivalent of TAN15. PPS25 contains a table derived from *Defra FCDPAG3 Economic Appraisal Supplementary Note to Operating Authorities – Climate Change Impacts, October 2006*, which considers the effects of climate change for different design criteria.

The proposed housing development will have a design life of 100 years, Based upon the table B.2 below this would equate to a climate change factor of 30% applied to peak rainfall intensity.

Parameter	1990 to 2025	2025 to 2055	2055 to 2085	2085 to 2115
Peak rainfall intensity	+5%	+10%	+20%	+30%
Peak river flow	+10%	+20%		
Offshore wind speed	+5%		+10%	
Extreme wave height	+5%		+10%	

Design storm Event - 1 in 100 year

Climate Change Factor - 30 %

3.4 Design Criteria

The system is to be designed to the following criteria:

- The 1 in 100 year event plus an additional 30% for climate change is to be accommodated on site with the possibility of allowing above ground storage.
- To discharge all surface water run off generated from the proposed development into the existing land drain running along the Western side of Ffordd Isaf.
- No surface water from the development will leave the site up to the threshold event.

The following design criteria will apply for the surface water run-off and foul discharge design of the site:

- Approved Document H, Building Regulations
- BRE Digest 365
- Flood And Water Management Act
- IHR 124
- Modified Rational Method
- Wallingford Procedure
- TAN15

4.0 Surface Water Design

As the proposals include the construction of 5 residential dwellings, a surface water drainage layout designed in accordance with Approved Document H of the Building Regulations 2010 will be applied in line with National Resources Wales recommendations.

The surface water run-off will be collected by a series of rainwater gutters and gullies, which will discharge, via the proposed drainage system, into the existing land drain located as per the attached drainage layout, drawing 3597 - 532 (**Appendix B**).

The surface water drainage system, as designed will accommodate the surface water run-off generated by the proposed developed area of the site, including the parking areas, roofed areas and house paths areas. Attenuation will be provided within a Wavin Aquacell System, chambers and pipework for the 1 in 100 year event plus an allowance of 30% for climate change. Refer to (**Appendix C**) run off calculation.

A summary of the calculations attached in (**Appendix D**) is found below:

System 1

Effective Area:	=	728.384m ²
Storage Requirement 1 in 30yr event	=	6.55m ³
Storage Requirement 1 in 30yr event + 30% (c.c)	=	10.26m ³
Storage Requirement 1 in 100yr event + 30% (c.c)	=	16.21m ³

Proposed Attenuation Method – Wavin Aquacell

AquaCell Provision = 4.5m x 3.0m x 0.8m x 95%

Storage provided = 15.96m³

Remaining **43.360m³** is found in chambers, pipework and Granular Material.

Pipework

Ø 150mm x 24.412 = **0.431m³**

Chambers

S2 – Ø 1500mm x 2.136m DEEP = **3.775m³**

S3 – Ø 1200mm x 1.076m DEEP = **1.217m³**

S3 – Ø 1200mm x 0.800m DEEP = **0.904m³**

Total Storage Provided = **6.327m³**

4.1 Extreme Event

The Extreme event relates to an event over and above the threshold event (1 in 100 year plus climate change). Surface water run-off generated up to the extreme event shall flow into the drainage system and discharge at a rate of 5 L/s into the existing drainage ditch.

During the extreme event when the system has achieved capacity the surface water run-off will surcharge run along the highway and down the existing highway and into the land drainage system mimicking the existing flood flow direction.

For existing and proposed flood routing refer to **(Appendix E)**.

5.0 Foul Design

The foul drainage will discharge to the existing foul public sewer currently located within the Highway fronting the site.

The design of the Surface Water and Foul drainage is illustrated on the enclosed drawing 3597 - 532 (**Appendix B**).

Design of the foul sewers included within the proposal from domestic units have been carried out in accordance with BS EN 12056 Part 2.

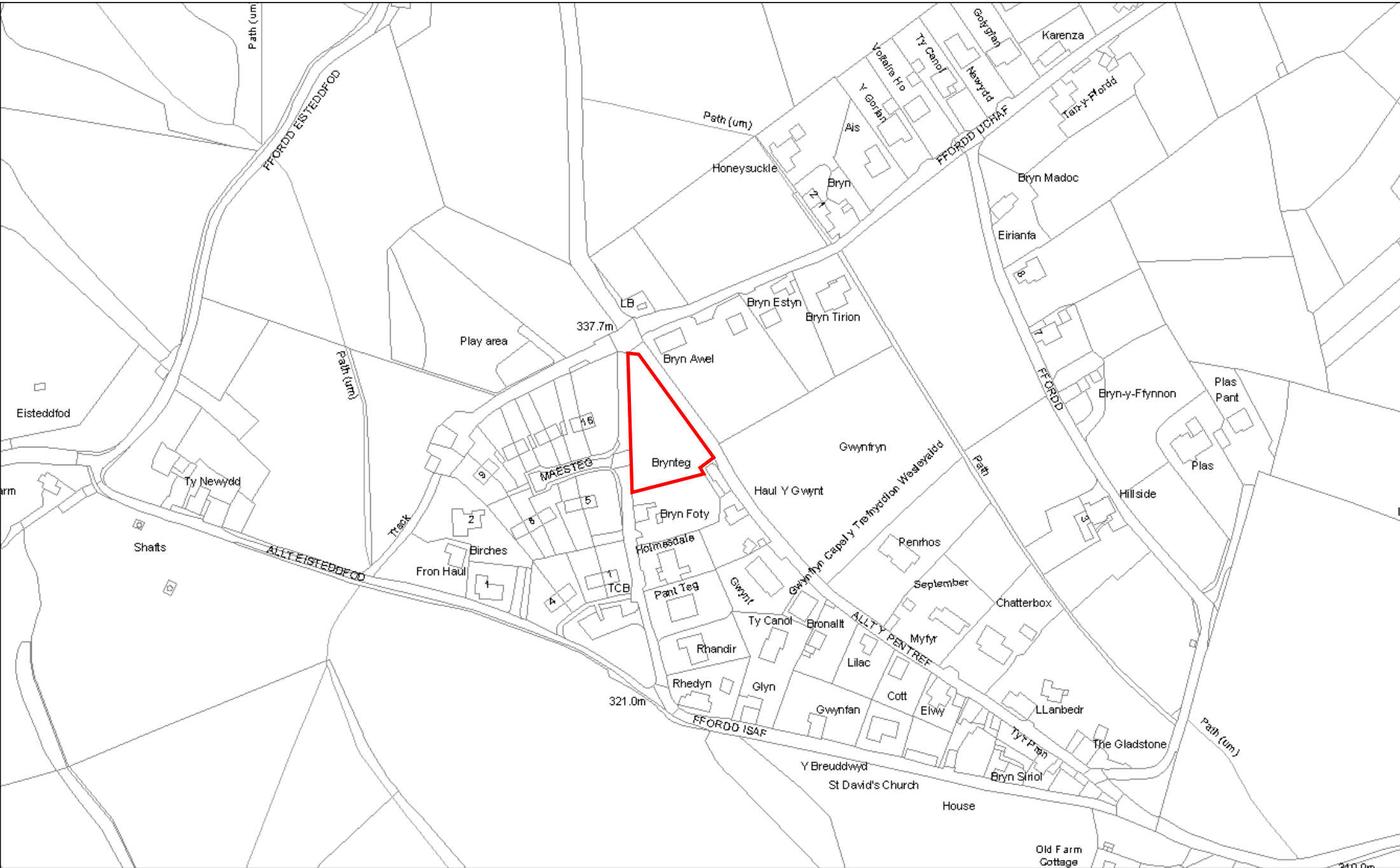
Please refer to the design calculations (**Appendix G**) for illustration.

Domestic Flows

5 Units = 5.4 L/s

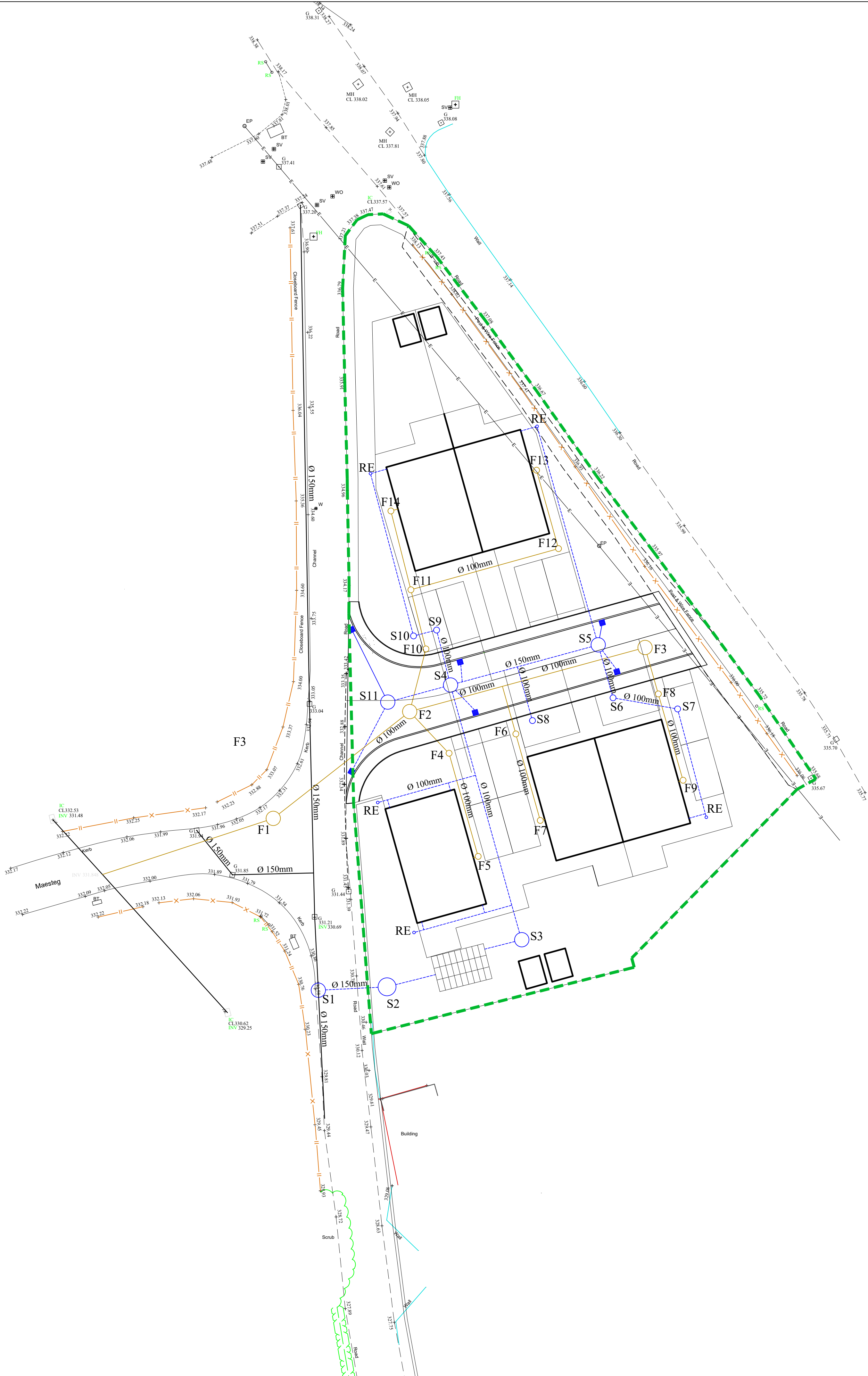
APPENDICES

APPENDIX A – SITE LOCATION PLAN



Project:		Title:		Job Ref:	Date:	Scale:	Revision:	b.r.p. Bingham Rawlings Partnership Limited Bingham Rawlings Partnership Limited Consulting Civil & Structural Engineers The Stables 1 Grosvenor Road Wrexham LL11 1BS Telephone:(01978) 353522 Fax:(01978) 355177 e-mail : consult@brp2000.co.uk
MAESTEG, WREXHAM		SITE LOCATION PLAN		3597-540	07/10/16	NTS	*	
				Drawn by:	Checked by:	Paper Size:		
				K.B.	- . -	A4		

APPENDIX B – SITE LAYOUT



- NOTES
- ALL LEVELS IN METERS UNLESS NOTED OTHERWISE ON DRAWING.
 - THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL OTHER RELEVANT ENGINEERS' AND ARCHITECTS' DRAWINGS AND RELEVANT SPECIFICATION CLAUSES.
 - PLEASE REFER TO ARCHITECTS DRAWINGS FOR FINAL BUILDING LOCATION.
 - ALL DRAINAGE COMPONENTS ARE TO COMPLY WITH CURRENT BRITISH STANDARDS AND BUILDING REGULATIONS REQUIREMENTS.
 - ALL WORKS TO IN ACCORDANCE WITH ROADS FOR ADOPTION IN GWYNEDD.
 - ALL WORKS AND MATERIALS TO BE IN ACCORDANCE WITH THE SPECIFICATION FOR HIGHWAY WORKS (SHW SERIES 500).
 - DRAIN PIPE THROUGH WALLS OR BENEATH FOUNDATIONS (SPREAD ONLY) TO HAVE R.C BRIDGE LINTELS OVER AND PIPE SURROUNDED IN FLEXIBLE MATERIAL (50mm).
 - FINAL LOCATIONS AND DETAILS OF SOIL VENT PIPES, STUB STACKS, RAINWATER DOWN PIPES, GULLIES ETC. TO BE CONFIRMED BY REFERENCE TO ARCHITECT DRAWINGS.
 - ALL THRESHOLD DRAIN DETAILS TO BE TO ARCHITECT DETAILS.
 - ALL PIPES INTO CHAMBERS TO SOFFIT TO SOFFIT U.N.O.
 - AT ALL OUTFALL POINTS TO AN EXISTING NETWORK, THE POSITION AND INVERT LEVEL OF EXISTING DRAINS MUST BE CONFIRMED WELL IN ADVANCE OF THE PROGRAMMED DATE FOR INSTALLING ANY OF THE UPSTREAM DRAINAGE, OR ORDERING OF ANY MATERIALS IN ORDER TO ALLOW TIME FOR ANY NECESSARY REVISIONS TO THE HYDRAULIC DESIGN.
 - ALL GRAVITY UPVC PIPEWORK TO BE TO BS 4660 OR BS 5481 WHERE RELEVANT UNLESS NOTED OTHERWISE.
 - ALL NON ADOPTABLE DOMESTIC FOUL AND SURFACE WATER PIPE RUNS SHALL CONSIST OF 100mm DIA. PIPES LAID AT NO FLATTER THAN 1 IN 80 FALLS U.N.O.
 - ALL CONNECTIONS FROM HIGHWAY GULLIES TO BE 150mm DIA. LAID AT FALLS OF BETWEEN 1 IN 20 AND 1 IN 100 WITH TYPE S BED AND SURROUND TO ALL CONNECTIONS WITH MIN. 120mm COVER, TYPE Z BED AND SURROUND TO ALL OTHER CONNECTIONS.
 - ALL PLOT DRAINAGE TO BE Ø 100mm LAID AT A MAXIMUM OF 1 IN 80 FALLS UNLESS NOTED OTHERWISE.
 - THERMOPLASTIC PIPES & FITTINGS:**
THERMOPLASTIC PIPES, JOINTS & FITTINGS FOR GRAVITY SEWERS SHALL COMPLY WITH THE RELEVANT PROVISIONS OF BS EN 1401-1, BS EN 1352 & BS EN 12666-1.
 - THERMOPLASTIC STRUCTURED WALL PIPE:**
THERMOPLASTIC STRUCTURED WALL SEWER PIPE SHALL COMPLY WITH THE RELEVANT PROVISIONS OF BS EN 13476-1 & WIS 4-35-01 AND BS EN 13476-2 OR BS EN 13476-3. PIPES SHALL BE BSI KITEMARKED OR HAVE EQUIVALENT THIRD PART CERTIFICATION. PIPES LESS THAN OR EQUAL TO 500mm IN DIAMETER SHALL HAVE NOMINAL SHORT TERM RING STIFFNESS NOT LESS THAN 8kN/m² (SN8) OR BE SUBJECT TO A QUALITY SYSTEM FOR STORAGE & EMBEDMENT.

Nom. SHORT TERM RING STIFFNESS OF 2kN/m² (SN2) IS ACCEPTABLE FOR PIPES GREATER THAN Ø500mm, SUBJECT TO SUPPORTING STRUCTURAL DESIGN LOAD CALCULATIONS BEING PROVIDED.

TRANSPORTATION, HANDLING, STORAGE AND LAYING SHALL BE IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS.

WHERE A FITTING IS INSTALLED ON A SEWER LENGTH, IT SHALL HAVE THE SAME INTERNAL BORE AS THE SEWER. Max. LENGTH OF PIPE FOR LAYING IS 3.0m OR Ø x 10, WHICHEVER IS THE GREATER, UNLESS WELDED JOINTS ARE USED.
 - CONNECTION TO THE PUBLIC SEWER**
A SECTION 106 APPLICATION TO CONNECT MUST BE MADE TO DCWW. THE DEVELOPER SHALL GIVE 21 DAYS NOTICE PRIOR TO CONNECTION, THE WORKS MAY ONLY BE UNDERTAKEN BY A DCWW HEALTH AND SAFETY APPROVED CONTRACTOR.
 - OPTIMUM TRENCH WIDTH**
OPTIMUM TRENCH WIDTH = PIPE + 300mm. CONTRACTOR TO ENSURE TRENCH WALLS ARE SUITABLY PROPPED.

- KEY
-  DENOTES PROPOSED NON-ADOPTABLE SURFACE WATER CHAMBER & PIPE RUN.
 -  DENOTES PROPOSED NON-ADOPTABLE FOUL CHAMBER & PIPE RUN.
 -  DENOTES EXISTING COMBINED CHAMBER & PIPE RUN.

Revisions.				
Revision	Made by	Date	Checked	

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Project		MAESTEG, WREXHAM.				
Drawing Title		PROPOSED DRAINAGE LAYOUT				
Architect		D2 ARCHITECTS				
Client		D.W.STANTS				
Scale		1:200		Revision		
Drawn		ER				
Date		24/09/2016				
Checked		DP				

APPENDIX C – COEFFICIENT RUN OFF CALCULATIONS

SITE	Maesteg, Gwynfryn, Wrexham	Job No.	04716
PAGE	1	Date	17/09/2016

The following design calculations summarise the peak Greenfield Run-off rates for the following various storm events as summarised below. The design calculations have been compiled in strict compliance with IHR 124 - flood estimation for small catchments.

Storm Events:

1 in 1 Year return period

1 in 100 Year return period

Due to the location of the proposal being classed as 'RURAL' the peak run-off is calculated using the following -:

$$Q_{BAR} = 0.00108 \times AREA^{(0.89)} \times SAAR^{(1.17)} \times SOIL^{(2.17)}$$

The site specific data has been collated using the FEH and is summarised as follows :

Site Area -	50	SAAR -	1029	SOIL	2
Ms-60 -	17mm	r -	0.3	SPR	0.3

Pre Development:

$$Q_{BAR} (RURAL) = (0.00108 \times (50^{0.89}) \times (1035^{1.17}) \times (0.3^{2.17}))$$

$$= 143.02 \text{ L/S/50Ha}$$

$$= 2.86 \text{ L/S/Ha}$$

The pre development site Run-off coefficients are as follows :-

Greenfield = 0.35 = 35% Macadam = 0.75 = 75% Hardstanding = 1.0 = 100%

The pre development site area measures as follows:-

Greenfield	1,573	0.35	550.55	m ²
Total Site measures :	550.55	m ² or	0.055	Ha

SITE	Maesteg, Gwynfryn, Wrexham	Job No.	04716
PAGE	2	Date	17/09/2016

Post Development:

The post development site run-off coefficients are as follows :-

Greenfield - 0.35 = 35%
Roofs - 1.0 = 100%
Footpaths - 0.75 = 75%
Housepaths - 1.0 = 100%
Roads - 0.75 = 75%

The proposal site areas measures as follows :

	Area	Coefficient	
Grassed	464.024	0.35	162.41 m ²
Parking & Roads	272.200	0.75	204.15 m ²
Roofs & Hosue Paths	524.234	1.00	524.23 m ²

Total Site measures :	890.792 m ²	or	0.089 Ha
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Run-off

Using growth charts the actual predicted run-off can be calculated for both storm events Pre and Post development.

In accordance with PPS25 a climate change factor should be included :

$$Q_{BAR} (RURAL) = 0.089 \times 1.30 = 0.1175 \text{ (30\% Climate change)}$$

Pre Development

1 in 1 Year =	$0.85 \times (2.86 \times 0.055) =$	0.134	L/S
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1 in 100 Year =	$2.18 \times (2.86 \times 0.055) =$	0.343	L/S
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Post Development

1 in 1 Year =	$0.85 \times (2.86 \times 0.1175) =$	0.282	L/S
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1 in 100 Year =	$2.18 \times (2.86 \times 0.1175) =$	0.722	L/S
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The resulted increase in run-off will need to be mitigated.

SITE	Maesteg, Gwynfryn, Wrexham	Job No.	04716
PAGE	3	Date	17/09/2016

Run-off Volume

The increase in run-off demonstrated through calculation will lead to an inevitable increase in the volumetric run-off. The volumetric run-off, both pre and post development are calculated using the modified rational method. Reference is made to the attached calculations summarised below:

Pre development volume run-off =	41.4312 m ³
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Post development volume run-off =	67.0359 m ³
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Note:- The above volumetric run-off's are calculated for the 6 hour 1 in 100 year event.

The increase in Volumetric run-off is calculated as:- 25.60467 m³

The volumetric increase must be contained within site. Therefore the proposed attenuation must be sized such to accommodate the calculated additional volume.

APPENDIX D – SURFACE WATER ATTENUATION CALCULATIONS

ATTENUATION DESIGN

SITE
PAGE

Maesteg, Gwynfryn, Wrexham
1

DEVELOPED STORAGE

30 Year Return Period (No climate change)

Return Period 30 years

M5-60min 17 mm
r 0.3

Hydrobrake outflow 5 l/s

PROPOSED NEW DEVELOPMENT

Volumetric run-off coefficient

Permeable area 464 m²
Roads and Parking 272.2 m²
Roofing / Paths 524.234 m²

Volumetric Run-off Coefficient	
0	Greenfield
0.75	Roads/Parking
1	Roofs/Paths
1260	

Total Effective Area 728.384 sqm

Duration min	Z1	M5-D mm	Z2	M30-D mm	Total Vol cu m	Total out cu m	Storage cu m	Qmax l/s
5	0.34	5.78	1.46	8.43	6.14	1.50	4.64	20.47
10	0.495	8.42	1.50	12.60	9.17	3.00	6.17	15.29
15	0.59	10.03	1.51	15.17	11.05	4.50	6.55	12.28
30	0.78	13.26	1.53	20.34	14.82	9.00	5.82	8.23
60	1	17.00	1.54	26.17	19.06	18.00	1.06	5.29
120	1.24	21.08	1.52	32.12	23.40	36.00	-12.60	3.25
240	1.55	26.35	1.49	39.32	28.64	72.00	-43.36	1.99
360	1.8	30.60	1.47	44.91	32.71	108.00	-75.29	1.51
600	2.13	36.21	1.43	51.91	37.81	180.00	-142.19	1.05
1440	2.79	47.43	1.38	65.65	47.82	432.00	-384.18	0.55
2880	3.5	59.50	1.34	79.69	58.04	864.00	-805.96	0.34



ATTENUATION DESIGN

SITE
PAGE

Maesteg, Gwynfryn, Wrexham
2

DEVELOPED STORAGE

30 Year Return Period

Return Period 30 years
M5-60min 17 mm
M5-60min 22.1 mm
r 0.3

30% Climate Change Allowance

Hydrobrake outflow 5 l/s

PROPOSED NEW DEVELOPMENT

Volumetric run-off coefficient

Permeable area 464 m²
Roads and Parking 272.2 m²
Roofing / Paths 524.234 m²

Volumetric Run-off Coefficient	
0	Greenfield
0.75	Roads/Parking
1	Roofs/Paths
1260	

Total Effective Area 728.384 sqm

Duration min	Z1	M5-D mm	Z2	M30-D mm	Total Vol cu m	Total out cu m	Storage cu m	Qmax l/s
5	0.34	7.51	1.46	10.96	7.98	1.50	6.48	26.61
10	0.495	10.94	1.50	16.38	11.93	3.00	8.93	19.88
15	0.59	13.04	1.51	19.72	14.36	4.50	9.86	15.96
30	0.78	17.24	1.53	26.45	19.26	9.00	10.26	10.70
60	1	22.10	1.54	34.01	24.78	18.00	6.78	6.88
120	1.24	27.40	1.52	41.76	30.41	36.00	-5.59	4.22
240	1.55	34.26	1.49	51.12	37.23	72.00	-34.77	2.59
360	1.8	39.78	1.47	58.38	42.53	108.00	-65.47	1.97
600	2.13	47.07	1.43	67.49	49.16	180.00	-130.84	1.37
1440	2.79	61.66	1.38	85.35	62.17	432.00	-369.83	0.72
2880	3.5	77.35	1.34	103.59	75.45	864.00	-788.55	0.44



ATTENUATION DESIGN

SITE
PAGE

Maesteg, Gwynfryn, Wrexham
3

DEVELOPED STORAGE

100 Year Return Period

30% Climate Change Allowance

Return Period	100	years
M5-60min	17	mm
M5-60min	22.1	mm
r	0.3	

Hydrobrake outflow 5 l/s

PROPOSED NEW DEVELOPMENT

Volumetric run-off coefficient

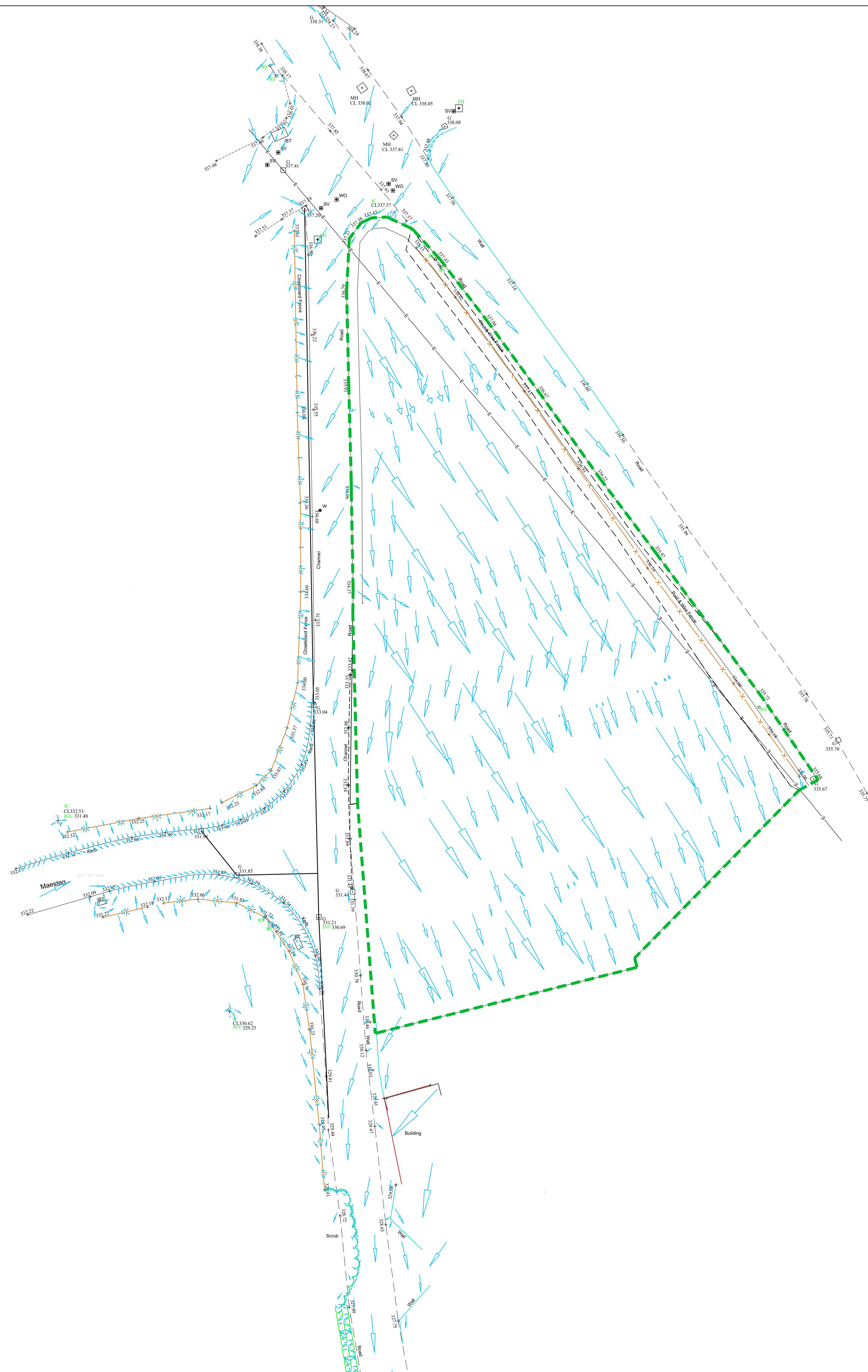
Permeable area	464 m ²
Roads and Parking	272.2 m ²
Roofing / Paths	524.234 m ²

Volumetric Run-off Coefficient	
0	Greenfield
0.75	Roads/Parking
1	Roofs/Paths

Total Effective Area	728.384 sqm	1260
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Duration min	Z1	M5-D mm	Z2	M100-D mm	Total Vol cu m	Total out cu m	Storage cu m	Qmax l/s
5	0.34	7.51	1.85	13.90	10.13	1.50	8.63	33.76
10	0.495	10.94	1.93	21.06	15.34	3.00	12.34	25.56
15	0.59	13.04	1.96	25.54	18.60	4.50	14.10	20.67
30	0.78	17.24	2.01	34.61	25.21	9.00	16.21	14.01
60	1	22.10	2.02	44.68	32.54	18.00	14.54	9.04
120	1.24	27.40	1.99	54.56	39.74	36.00	3.74	5.52
240	1.55	34.26	1.94	66.32	48.30	72.00	-23.70	3.35
360	1.8	39.78	1.89	75.25	54.81	108.00	-53.19	2.54
600	2.13	47.07	1.83	86.30	62.86	180.00	-117.14	1.75
1440	2.79	61.66	1.73	106.71	77.73	432.00	-354.27	0.90
2880	3.5	77.35	1.63	126.13	91.87	864.00	-772.13	0.53

APPENDIX E – FLOOD ROUTING



NOTES

1. ALL LEVELS IN METERS UNLESS NOTED OTHERWISE ON DRAWING.
2. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL OTHER RELEVANT ENGINEERS AND ARCHITECTS DRAWINGS AND RELEVANT SPECIFICATION CLAUSES.
3. PLEASE REFER TO ARCHITECTS DRAWINGS FOR FINAL BUILDING LOCATION.

Revisions.

Revision	Made by	Date	Checked	

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Project MAESTEG, WREXHAM.

Drawing Title EXISTING FLOOD FOUTING

Architect	D2 ARCHITECTS				
Client	D.W.STANTS				
Scale	1:200	3597 541	Revision		
Drawn	K.B.				
Date	07/10/2016				
Checked	B.T.				



- NOTES
1. ALL LEVELS IN METERS UNLESS NOTED OTHERWISE ON DRAWING.
 2. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL OTHER RELEVANT ENGINEERS AND ARCHITECTS DRAWINGS AND RELEVANT SPECIFICATION CLAUSES.
 3. PLEASE REFER TO ARCHITECTS DRAWINGS FOR FINAL BUILDING LOCATION.

Revisions.

Revision	Made by	Date	Checked	

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Project MAESTEG, WREXHAM.

Drawing Title PROPOSED FLOOD ROUTING

Architect	D2 ARCHITECTS		
Client	D.W.STANTS		
Scale	1:200	3597 542	Revision
Drawn	K.B.		
Date	07/10/2016		
Checked	B.T.		

APPENDIX F – POROSITY REPORT



POROSITY REPORT

PROPOSED DEVELOPMENT MAESTEG, WREXHAM

INFILTRATION TEST

OCTOBER 2016

Prepared for:

W D Stants Limited
Rivulet Road,
Wrexham,
LL13 8DY

Tel 01978 266123
E mail John.Haughton@wdstant.co.uk

Prepared by:

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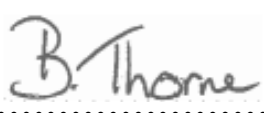
Tel 01407 730912
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Prepared by:


Signed:

Date: 07/10/2016

Checked by:


Signed:

Date: 07/10/2016

Appraised by:


Signed:

Date: 07/10/2016

CONTENTS

- 1.0 Revision Sheet**
- 2.0 General Overview**
- 2.0 Site Conditions**
- 3.0 Soil Infiltration Results**
- 4.0 Conclusions**

Appendices

- A Trial Pit Location Plan**
- B Porosity Test Calculations**
- C Trial Pit Log**

REVISION	DATE	DESCRIPTION	BY	CHECKED	REVIEWED

1.0 General Overview

The main purpose of the investigation was to undertake Soil Infiltration tests in accordance with BRE Digest 365 and Approved Document H of the Building Regulations 2010

On the 30th September 2016, 1 soakaway pit was excavated to a maximum depth of 1200mm using a JCB. The infiltration tests were undertaken strictly in accordance with BRE Digest 365. The trial pits were located as per the attached plan (**Appendix A**).

2.0 Site Conditions

The weather at the time of the investigation was cloudy with light showers.

There was a light South Western breeze of 4 knots. The average air temperature was 15.0°C.

3.0 Soil infiltration results

The data from the soakaway trial pits may be summarised as follows:

<u>Ref</u>	<u>Depth</u>	<u>Ground Water</u> <u>Depth</u>	<u>Soil Infiltration Rate</u>
TP-1	1200mm	N/A	Test Abandoned

The soil infiltration calculation is summarised below. Refer to the porosity test calculation sheet (**Appendix B**) for further information.

Trial Pit 1 was founded on organic overburden of at a depth of 300mm of topsoil which overlaid a silty clay material for a constant depth throughout the site. The trial pit material was dry and cohesionless, however compacted in place. Refer to trial pit log for illustration of underlying strata (**Appendix B**).

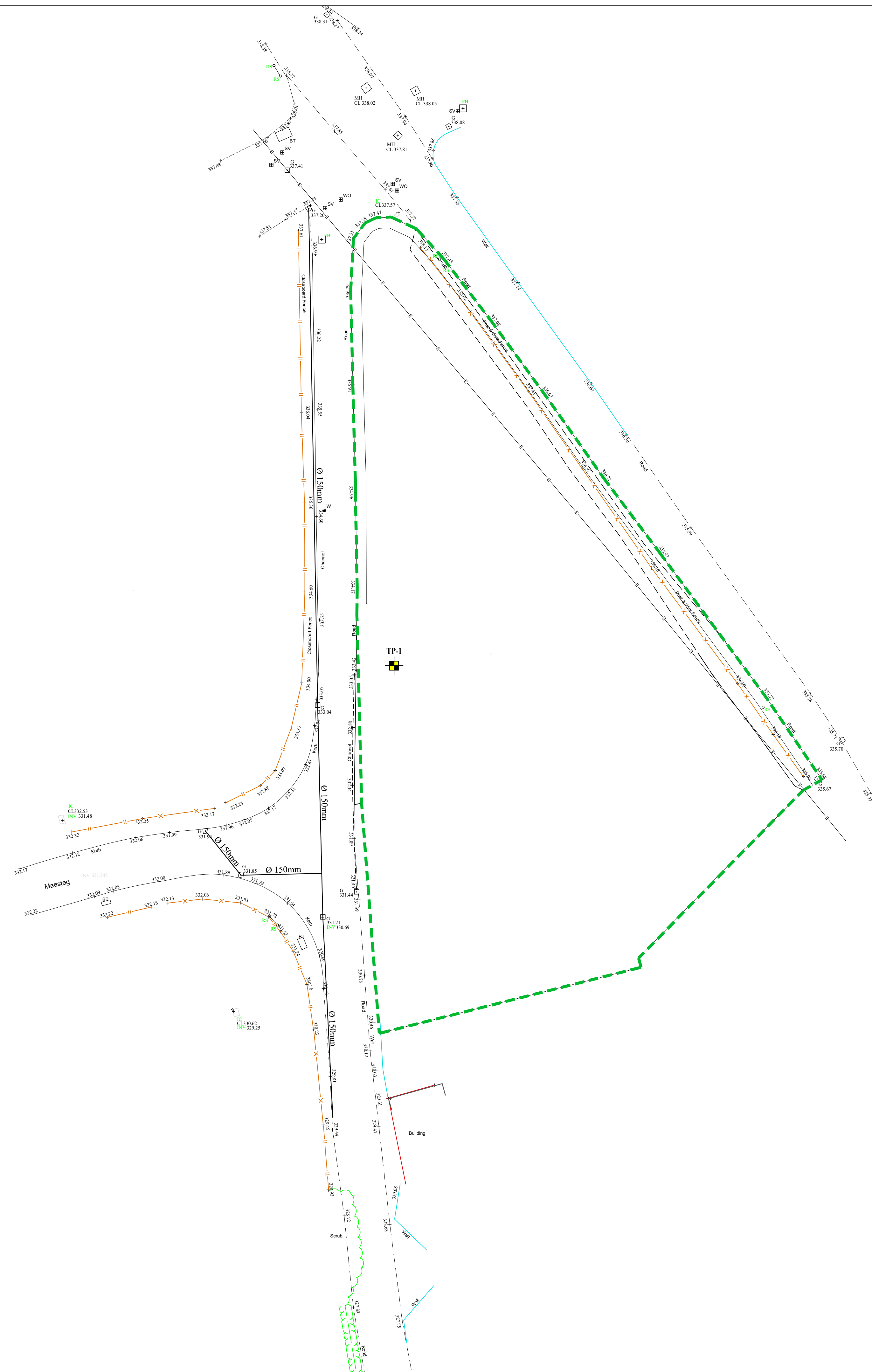
4.0 Conclusions

The findings indicate that the use of a soakaway as an infiltration method is not suitable. TP-1 was abandoned after 4 hours, having not drained throughout the test.

Alternative methods of disposing of surface water discharge have been explored which indicated that there are no existing combined sewer networks within the site. Therefore, our proposal involves a connection into the existing culverted land drain located beneath the highway fronting the site. A section 104 agreement will be sought offering the sewerage undertaker (Dwr Cymru/Welsh Water) the foul drainage system within the site boundary up for adoption.

APPENDICES

APPENDIX A – TRIAL PIT LOCATION PLAN



NOTES

1. ALL LEVELS IN METERS UNLESS NOTED OTHERWISE ON DRAWING.
2. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL OTHER RELEVANT ENGINEER'S AND ARCHITECT'S DRAWINGS AND RELEVANT SPECIFICATION CLAUSES.
3. PLEASE REFER TO ARCHITECTS DRAWINGS FOR FINAL BUILDING LOCATION.

Revisions.

Revision	Made by	Date	Checked	

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Project MAESTEG, WREXHAM.

Drawing Title **PROPOSED DRAINAGE LAYOUT**

Architect	D2 ARCHITECTS				
Client	D.W.STANTS				
Scale	1:200	Revision			
Drawn	K.B.				
Date	07/10/2016				
Checked	B.T.				

APPENDIX B – PROSITY TEST CALCULATIONS

POROSITY TEST

SITE Maesteg, Wrexham
 PAGE 1
 REFERENCE TP 1
 TEST DATE 30/09/16

Calculation of percolation rate using obtained data

Trial Pit Dimensions:	Length (m)	1.000	Width (m)	1.200	Depth (m)	1.200
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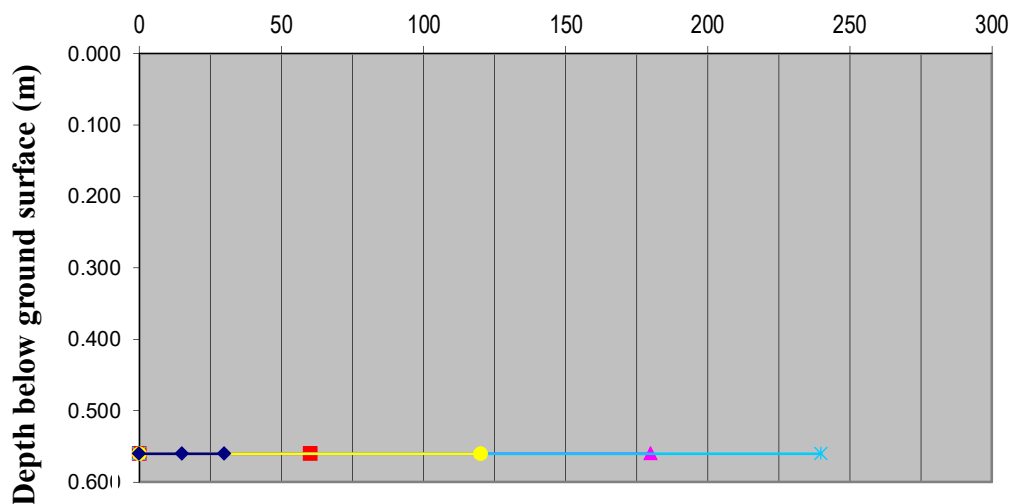
Inlet pipe Invert depth (m):	0.60	Depth of Groundwater from GL (m):	N/A
Thus Depth of Groundwater (m) =	N/A	Thus Effective depth (m) =	0.64

Time (mins)	Depth to top of water. (m)	Rate of change (m/min)
0	0.560	
15	0.560	0.00000
30	0.560	0.00000
45	0.560	0.00000
60	0.560	0.00000
75	0.560	0.00000
90	0.560	0.00000
105	0.560	0.00000
120	0.560	0.00000
135	0.560	0.00000
150	0.560	0.00000
165	0.560	0.00000
180	0.560	0.00000
195	0.560	0.00000
210	0.560	0.00000
225	0.560	0.00000
240	0.560	0.00000

Volume Outflow, Vp75-25	0.38	m3
Surface Area, ap50	2.61	m2
Time Taken, tp75-25	120.00	min
Soil Infiltration Rate, f	Test Abandoned	
Over Effective depth of	#REF!	m
Part H Vp	0.00	s/mm
depth (%Full)	depth (m)	time (min)
0	0.560	0
	0.560	240.00
25	0.560	0
	0.560	180.00
50	0.560	0
	0.560	120.00
75	0.560	0
	0.560	60.00
100	0.560	0
	0.560	0.00

TP-1

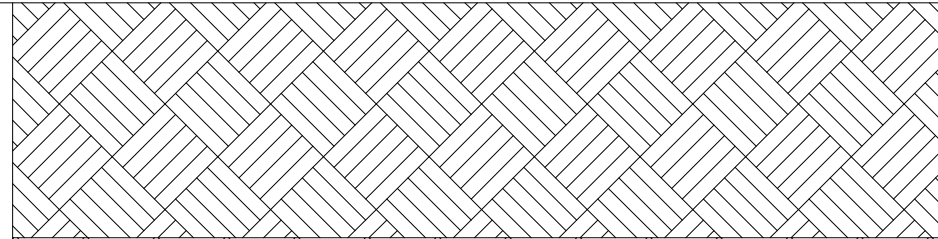
Time from filling to max. eff. depth (mins)



APPENDIX C – TRIAL PIT LOG

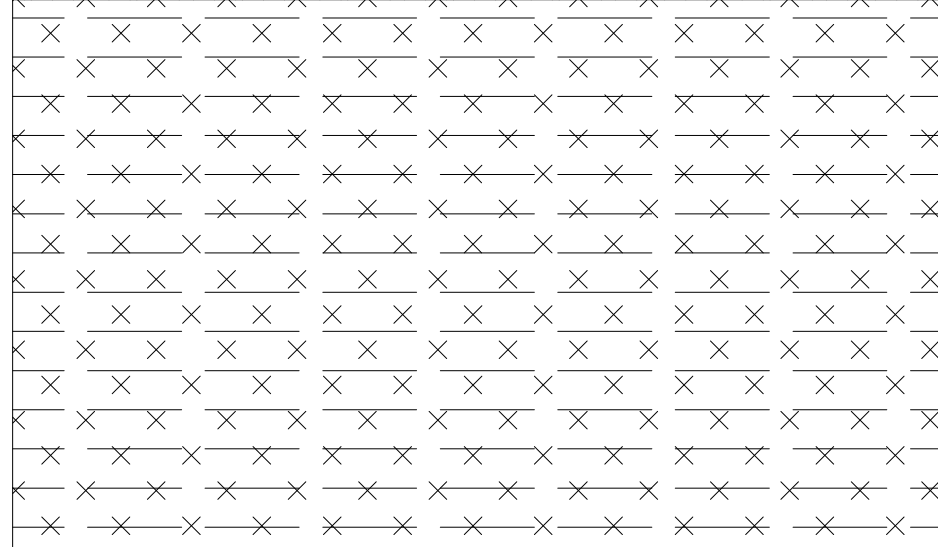
TP-1

ORGANIC OVERBURDEN



300

WELL GRADED MATERIAL IN A STRONG
CLAY SILT MATRIX. LIGHT BROWN IN
COLOUR.



700

Project:

MAESTEG, WREXHAM

Title:

TRIAL PIT LOG

Job Ref:

3597-539

Date:

07/10/16

Scale:

1/10

Revision:

*

Drawn by:

K.B.

Checked by:

- . - .

Paper Size:

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APPENDIX G – FOUL CALCULATIONS

JOB No. 04716

PROJECT: Maesteg, Gwynfryn.

TITLE: Foul calculations

DATE: 07/10/16 SHEET No: 1 of 1

BY: ER. CHECKED: REV:

CADARN

CONSULTING ENGINEERSAddress: CADARN Consulting
Engineers Yr Adwy
Llanddeusant
Holyhead
Anglesey
LL65 4ADtel: 01407 730912
mob: 07890 382979
e-mail: ifan@cadarnconsulting.co.uk

REF :

CALCULATIONS :

OUTPUT :

The proposal includes the following :

- Connection to foul sewer
- Construction of 5 dwellings.

Domestic Flow.

Calculations are compiled in accordance with BS EN 1206 PT 2. and assume that each dwelling will contain the following.

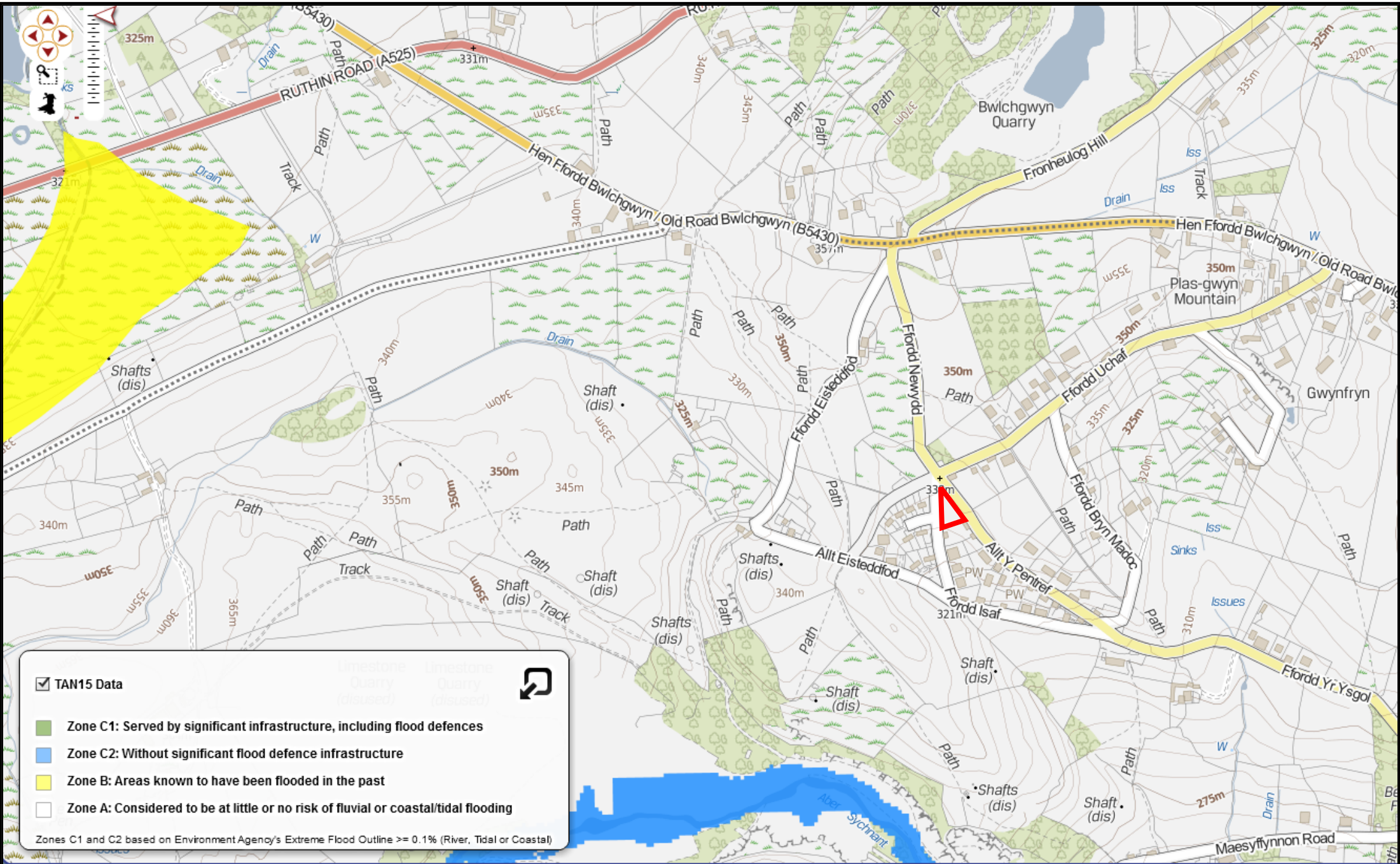
2 x	W.C's	=	5
2 x	Shower	=	1.6
1 x	Dishwasher	=	0.8
1 x	Washing machine	=	1.5
2 x	Hand Basin	=	1.0
1 x	Kitchen Sink	=	1.3
			<u>11.2 1/2</u>

Frequency factor(K)=0.5 (Domestic Dwelling)

$$\text{Waste Water Flow rate} = 0.5 \sqrt{56.25}$$

$$= 3.74 \text{ l/s}$$

APPENDIX G – NRW FLOOD MAPS



Project:	Title:	Job Ref:	Date:	Scale:	Revision:	 Bingham Rawlings Partnership Limited 1 Grosvenor Road Wrexham LL11 1BS Telephone: (01978) 353522 Fax: (01978) 355177 e-mail: consult@brp2000.co.uk
MAESTEG, WREXHAM	NRW FLOOD MAPPING	3597-543	07/10/16	NTS	*	
		Drawn by:	Checked by:	Paper Size:		
		K.B.	-.-	A4		

Legend

- Main rivers
- Flood defences
-  Areas benefitting from flood defences
- Shoreline Management Plan & Coastal Erosion
- Flood warning areas
- Flood alert areas
- Risk of flooding from reservoirs

— Risk of flooding from rivers and the sea

— Risk of Flooding from Rivers and the Sea

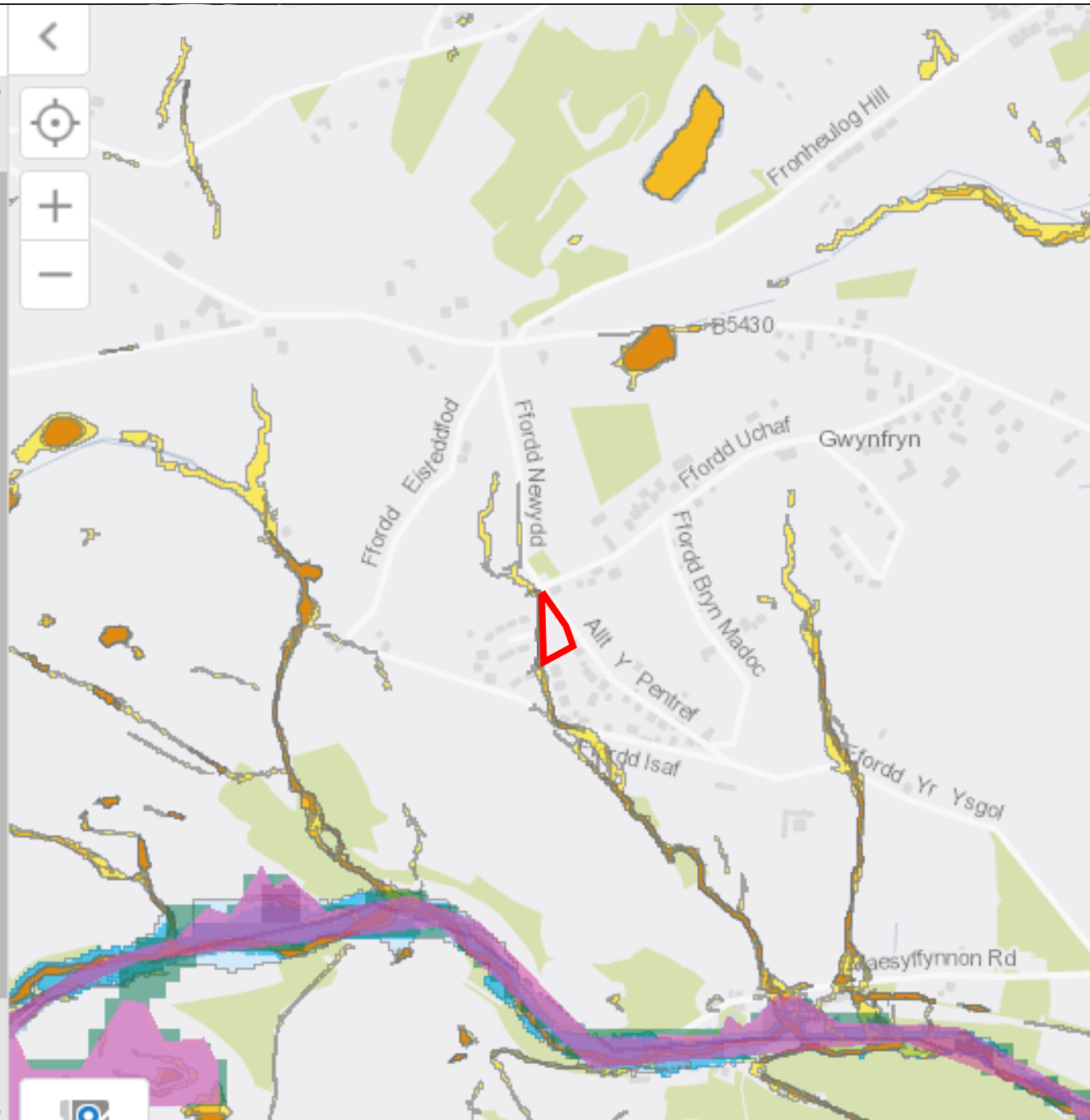
- High
- Medium
- Low
- Very Low

— High

- Risk of flooding from surface water - High

— Medium

- Risk of flooding from surface water - Medium



Project:

MAESTEG, WREXHAM

Title:

NRW MAPPING

Job Ref:

3597-544

Date:

07/10/16

Scale:

NTS

Revision:

*

Drawn by:

K.B.

Checked by:

- . - .

Paper Size:

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