Ysgol Treferthyr, Criccieth

BREEAM Pol 03:
Flood Consequences Assessment

October 2020

Waterco

Assessment | Modelling | Design

Project Information	
Project:	Ysgol Treferthyr, Criccieth
Report Title:	BREEAM Pol 03: Flood Consequences Assessment
Client:	Property Development Unit, Gwynedd Council
Instruction:	The instruction to carry out this BREEAM Pol 03: Flood Consequences Assessment was received from Mr Richard James Farmer of the Property Development Unit, Gwynedd Council
File Ref:	13263-BREEAM FCA-02

Approval Record	
Author:	Jordan Jones BSc (Hons)
Checker:	Aled Williams BSc (Hons) MCIWEM
Approver:	Victoria Griffin BSc (Hons) MSc MIEnvSc CEnv

Document History		
Revision	**Date**	**Comment**
01	12/10/2020	First issue
02	16/10/2020	Second issue – Client details updated

Contents

Appendices

Introduction

Waterco has been commissioned to undertake a Flood Consequences Assessment addressing Pol 03: Surface water runoff of BREEAM 2018 in relation to a proposed primary school on land off the A497, Criccieth, LL52 0RY.

The purpose of this report is to identify the risk of flooding to the site from all sources.

Local guidance documents including Anglesey & Gwynedd Joint Strategic Flood Consequences Assessment (SFCA) (May 2013) and the Gwynedd Council Preliminary Flood Risk Assessment (PFRA) (February 2011 and its 2017 addendum) have been reviewed for site specific information.

Existing Conditions

The site covers an area of approximately 2.24ha and is located at National Grid Reference (NGR): 249272, 338060. A location plan and an aerial image are included in Appendix A.

Online mapping (including Google Maps / Google Streetview imagery, accessed October 2020) shows that the site currently comprises undeveloped, agricultural land. The site is bordered by the A497 with undeveloped land beyond to the north, Lon Fel (road) and residential properties to the east, a railway line to the south and agricultural land to the west. Access to the site is provided from the A497.

Local Topography

Topographic levels to metres Above Ordnance Datum (m AOD) have been derived from a 1m resolution Natural Resources Wales (NRW) composite 'Light Detecting and Ranging' (LiDAR) Digital Terrain Model (DTM). A review of LiDAR data shows that the site slopes from approximately 28m AOD in the east to approximately 20m AOD in the south-west.

Topographical information is provided as Appendix B.

Development Proposals

The proposed development is for the construction of a single storey primary school with associated sports field, hard surface playing areas, Multi-use Games Area (MUGA), access and car parking. Development plans are included in Appendix C.

Flood Zone Classification

The Welsh Government Development Advice Map, included in Appendix D, shows that the site is located within Flood Zone A – an area considered to be at little or no risk of fluvial or tidal flooding, with a less than 0.1% (1 in 1000) annual probability of flooding.

The NRW 'Flood Map for Planning' (Appendix D), shows that the site is located within an area outside of the extreme flood extent (Flood Zone 1), meaning it has a less than 0.1% annual probability of flooding.

Sources of Flooding and Probability

Fluvial

The nearest watercourse is an unnamed watercourse which is located approximately 115m south-west of the site. The watercourse originates in this location and flows west parallel to the adjacent railway line. The unnamed watercourse eventually discharges into Ceredigion Bay. There are no other watercourses in the immediate vicinity of the site.

The site is located within Flood Zone 1, meaning it has a less than 1 in 1000 annual probability of flooding from rivers. The NRW 'Historical Flood Map' (Appendix D) indicates that there have been no records of fluvial flooding at or near to the site.

The unnamed watercourse south-west of the site is situated at approximately 17m AOD and is a minimum of 3m below site levels. Any potential flooding of this watercourse would therefore not affect the site.

It can therefore be concluded that the risk of fluvial flooding is very low.

Tidal

The site is situated at a minimum of 20m AOD and is significantly above sea level. Therefore, there is no risk from tidal flooding.

Surface Water

Surface water flooding occurs when rainwater does not drain away through the normal drainage system or soak into the ground. It is usually associated with high intensity rainfall events but can also occur with lower intensity rainfall or melting snow where the ground is saturated, frozen or developed, resulting in overland flow and ponding in depressions in topography. Surface water flooding can occur anywhere without warning. However, flow paths can be determined by consideration of contours and relative levels.

The NRW 'Flood Risk from Surface Water' map (Appendix D) indicates that the site is at very low risk of surface water flooding, meaning it has a less than 0.1% annual probability of flooding.

There are no records of surface water flooding at the site. Any potential surface water flooding arising at or near to the site would be directed south-west, away from the site, following the local topography. There are no distinct flow routes in the area which would direct any potential surface water flooding towards the site.

It can therefore be concluded that the risk of surface water flooding is very low.

Sewer

Flooding from sewers can occur when a sewer is overwhelmed by heavy rainfall, becomes blocked, is damaged, or is of inadequate capacity. Flooding is mostly applicable to combined and surface water sewers.

Dwr Cymru Welsh Water sewer records (Appendix E) identify a 225mm public combined sewer in the A497 immediately east of the site. There are no other sewers within the immediate vicinity of the site.

There are no records of sewer flooding at the site. Any potential flooding arising from the public combined sewer in the A497 east of the site would be directed south, away from the site, following the local topography.

It can therefore be concluded that the risk of sewer flooding is very low.

Groundwater

Groundwater flooding occurs when water levels underneath the ground rise above normal levels. Prolonged heavy rainfall soaks into the ground and can cause the ground to become saturated. This results in rising groundwater levels which leads to flooding above ground.

The PFRA states that *'groundwater flooding is not considered to be a significant source of flooding across the joint local development plan (JLDP) area although there might be local issues.'* There are no records of groundwater flooding at or near to the site.

It can therefore be concluded that the risk of groundwater flooding is low.

Artificial Sources

There are no canals within the vicinity of the site. The NRW online reservoir flood risk map shows that the site is not at risk of flooding from reservoirs. It can therefore be concluded that the risk of flooding from artificial sources is very low.

Summary of Code Compliance

It can be concluded that the risk of flooding from all sources is very low. Therefore, the development is entitled to two flood risk credits under Pol 03 of BREEAM 2018.

Conclusions

The proposed development is for the construction of a single storey primary school with associated sports field, hard surface play area, Multi-use Games Area (MUGA), access and car parking.

The site is located within Flood Zone A on the Welsh Government Development Advice Map – an area considered to be at little or no risk of fluvial or tidal flooding, with a less than 0.1% (1 in 1000) annual probability of flooding.

The risk of flooding from all sources has been assessed and the flood risk to the site is considered to be very low. Therefore, the development is entitled to the **two credits** available for flood risk under Pol 03 of BREEAM 2018.

Recommendation

Submit a copy of this report to the BREEAM Assessor to confirm that this report satisfies the evidence relating to flood risk under Pol 03 of BREEAM 2018 and that the development qualifies for a total of two Pol 03 credits.

Appendix A Location Plan and Aerial Image

N

CRICIETH / CRICCIETH

Medical Care

LON FEL

CAE RHYS

A497

STRYD FAWR / HIGH STREET

B4411

STAD GORSEDDFA

Library

PO

Criccieth

PW

PW

PEN-Y-BRYN

WELLINGTON TERRACE

GWAUN GANOL

Education Facility

PENABER

MURIAU

GERDDI ABERFEISTEDD

RHOS BACH

MIN Y MOR / MARINE TERRACE

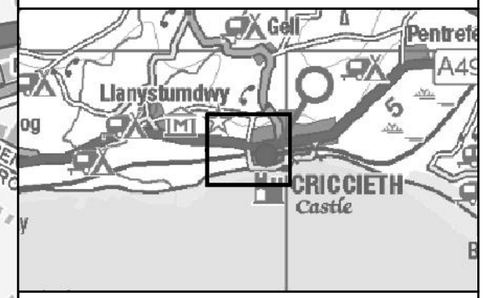
MARINE CRESCENT

0 50 100 200 300 400 500 m

NOTES:
1) ALL DIMENSIONS ARE IN METRES AND ALL LEVELS IN METRES ABOVE ORDNANCE DATUM UNLESS STATED OTHERWISE

LEGEND

- Site Boundary
- Watercourses / Water Bodies



CLIENT:

PROPERTY DEVELOPMENT UNIT, GWYNEDD COUNCIL

waterco

www.waterco.co.uk

SCHEME:

YSGOL TREFERTHYR, CRICCIETH

PLOT TITLE:

LOCATION PLAN

PLOT STATUS:	DATE:
FINAL	29/07/2020

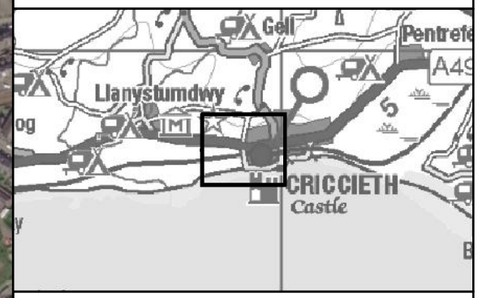
DRAWN:	CHECKED:	APPROVED:	PLOT SCALE @ A3:
VJ	JW	AW	1:5,000 (UNLESS STATED OTHERWISE)

PLOT NAME:	REV:
13263-Location_Plan	-

NOTES:
1) ALL DIMENSIONS ARE IN METRES AND ALL LEVELS IN METRES ABOVE ORDNANCE DATUM UNLESS STATED OTHERWISE

LEGEND

Site Boundary



CLIENT:

PROPERTY DEVELOPMENT UNIT, GWYNEDD COUNCIL

waterco

www.waterco.co.uk

SCHEME:

YSGOL TREFERTHYR, CRICCIETH

PLOT TITLE:

LOCATION PLAN

PLOT STATUS:	DATE:
FINAL	29/07/2020

DRAWN:	CHECKED:	APPROVED:	PLOT SCALE @ A3:
VJ	JW	AW	1:5,000 (UNLESS STATED OTHERWISE)

PLOT NAME:	REV:
13263-Aerial_Plan	-

0 50 100 200 300 400 500 m

Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Appendix B Topographical Data

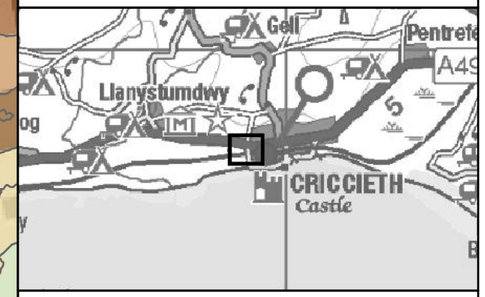
NOTES:
1) ALL DIMENSIONS ARE IN METRES AND ALL LEVELS IN METRES ABOVE ORDNANCE DATUM UNLESS STATED OTHERWISE

LEGEND

- Site Boundary
- Site Levels

Ground Elevation (m AOD)

- < 22
- 22 - 24
- 24 - 26
- 26 - 28
- 28 - 30
- > 30



CLIENT:

PROPERTY DEVELOPMENT UNIT, GWYNEDD COUNCIL

waterco

www.waterco.co.uk

SCHEME:

YSGOL TREFERTHYR, CRICCIETH

PLOT TITLE:

LIDAR ELEVATIONS

1m RESOLUTION

PLOT STATUS:	DATE:
FINAL	09/10/2020

DRAWN:	CHECKED:	APPROVED:	PLOT SCALE @ A3:
VJ	JW	AW	1:2,000 (UNLESS STATED OTHERWISE)

PLOT NAME:	REV:
13263-Lidar	-

0 20 40 80 120 160 200 m

Appendix C Proposed Development Plans

1 | 00 - GROUND FLOOR

SCALE1 : 150

0m 3m 6m 9m 12m 15m

VISUAL SCALE 1:150 @ A1

REV	DESCRIPTION	DATE	BY
P1	CHANGES FOLLOWING DTM 3	25.09.20	GJ

PROJECT

Ysgol Treferthyr Cricieth
for Cyngor Gwynedd

DRAWING TITLE

GROUND FLOOR PLAN

SCALE @A1	DATE	DRAWN	CHECKED
1 : 150	16/09/20	MR	GJ

JOB No	DRAWING No	REV
C991	YTC-AGA-XX-00-DR-A-0004	P1

AG|A AINSLEY GOMMON ARCHITECTS
THE OLD POLICE STATION, 15 GLYNNE WAY, HAWARDEN, CH5 3NS
Tel: 01244 537 100 | wales@agarchitects.co.uk | www.agarchitects.co.uk
Ainsley Gommon Architects Ltd. Registered in England & Wales No.4187948
Registered Office: 1 Price Street, Hamilton Square, Birkenhead CH41 6JN

PRINTED 25/09/2020 16:27:09

A1

1 | PROPOSED SITE LAYOUT
SCALE:1 : 500

0m 10m 20m 30m 40m 50m

VISUAL SCALE 1:500 @ A1

N

REV	DESCRIPTION	DATE	BY
P1	CHANGES FOLLOWING DTM 3	25.09.20	GJ

PROJECT

Ysgol Treferthyr Cricieth
for Cyngor Gwynedd

DRAWING TITLE

PROPOSED SITE LAYOUT

SCALE	@A1	DATE	DRAWN	CHECKED
	1 : 500	25/09/20	MR	GJ

JOB No | DRAWING No | REV
C991 | YTC-AGA-XX-XX-DR-A-0003 | P1

AINSLEY GOMMON ARCHITECTS
THE OLD POLICE STATION, 15 GLYNNE WAY, HAWARDEN, CH5 3NS
Tel: 01244 537 100 | wales@agarchitects.co.uk | www.agarchitects.co.uk
Ainsley Gommon Architects Ltd. Registered in England & Wales No.4187948
Registered Office: 1 Price Street, Hamilton Square, Birkenhead CH41 6JN

PRINTED 25/09/2020 16:38:50

A1

Appendix D NRW Flood Maps

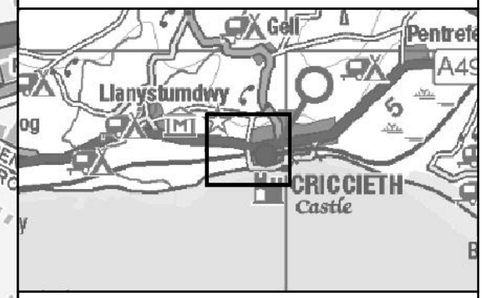
NOTES:
1) ALL DIMENSIONS ARE IN METRES AND ALL LEVELS IN METRES ABOVE ORDNANCE DATUM UNLESS STATED OTHERWISE

LEGEND

Site Boundary

TAN15 Classification

- Zone A
- Zone B
- Zone C1
- Zone C2



CLIENT:

PROPERTY DEVELOPMENT UNIT, GWYNEDD COUNCIL

waterco

www waterco.co.uk

SCHEME:

YSGOL TREFERTHYR, CRICCIETH

PLOT TITLE:

WELSH GOVERNMENT DEVELOPMENT ADVICE MAP

DATA ACCESSED OCTOBER 2020

PLOT STATUS:	DATE:
FINAL	09/10/2020

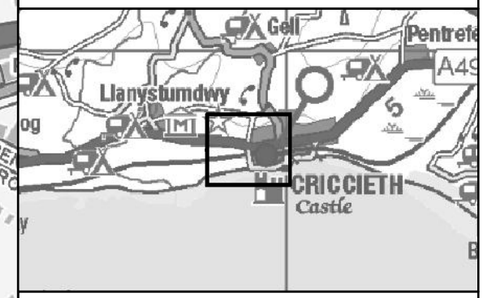
DRAWN:	CHECKED:	APPROVED:	PLOT SCALE @ A3:
VJ	JW	AW	1:5,000 (UNLESS STATED OTHERWISE)

PLOT NAME:	REV:
13263-TAN_15	-

NOTES:
1) ALL DIMENSIONS ARE IN METRES AND ALL LEVELS IN METRES ABOVE ORDNANCE DATUM UNLESS STATED OTHERWISE

LEGEND

- Site Boundary
- NRW Flood Zone 3
- NRW Flood Zone 2



CLIENT:

PROPERTY DEVELOPMENT UNIT, GWYNEDD COUNCIL

waterco

www.waterco.co.uk

SCHEME:

YSGOL TREFERTHYR, CRICCIETH

PLOT TITLE:

NRW FLOOD MAP FOR PLANNING

DATA ACCESSED JULY 2020

PLOT STATUS:	DATE:
FINAL	30/07/2020

DRAWN:	CHECKED:	APPROVED:	PLOT SCALE @ A3:
VJ	JW	AW	1:5,000 (UNLESS STATED OTHERWISE)

PLOT NAME:	REV:
13263-NRW_FZ_FM	-

N

CRICIETH / CRICCIETH

Medical Care

LON FEL

CAE RHYS

A497

STRYD FAWR / HIGH STREET

B4411

STAD GORSEDDFA

Library

PO

Criccieth

PW

PW

WELLINGTON TERRACE

GWAUN GANOL

Education Facility

PENABER

MURIAU

GERDDI ABEREISTEDD

RHOS BACH

MIN Y MOR / MARINE TERRACE

MARINE CRESCENT

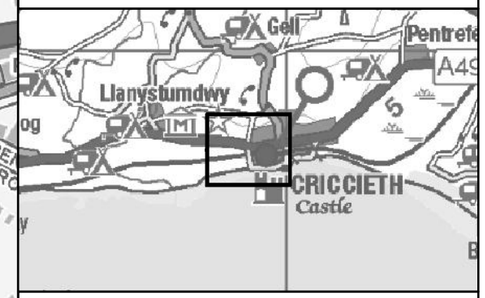
No Data Coverage - Area at Low Risk

0 50 100 200 300 400 500 m

NOTES:
1) ALL DIMENSIONS ARE IN METRES AND ALL LEVELS IN METRES ABOVE ORDNANCE DATUM UNLESS STATED OTHERWISE

LEGEND

- Site Boundary
- Historical Flood Map



CLIENT:

PROPERTY DEVELOPMENT UNIT, GWYNEDD COUNCIL

waterco

www.waterco.co.uk

SCHEME:

YSGOL TREFERTHYR, CRICCIETH

PLOT TITLE:

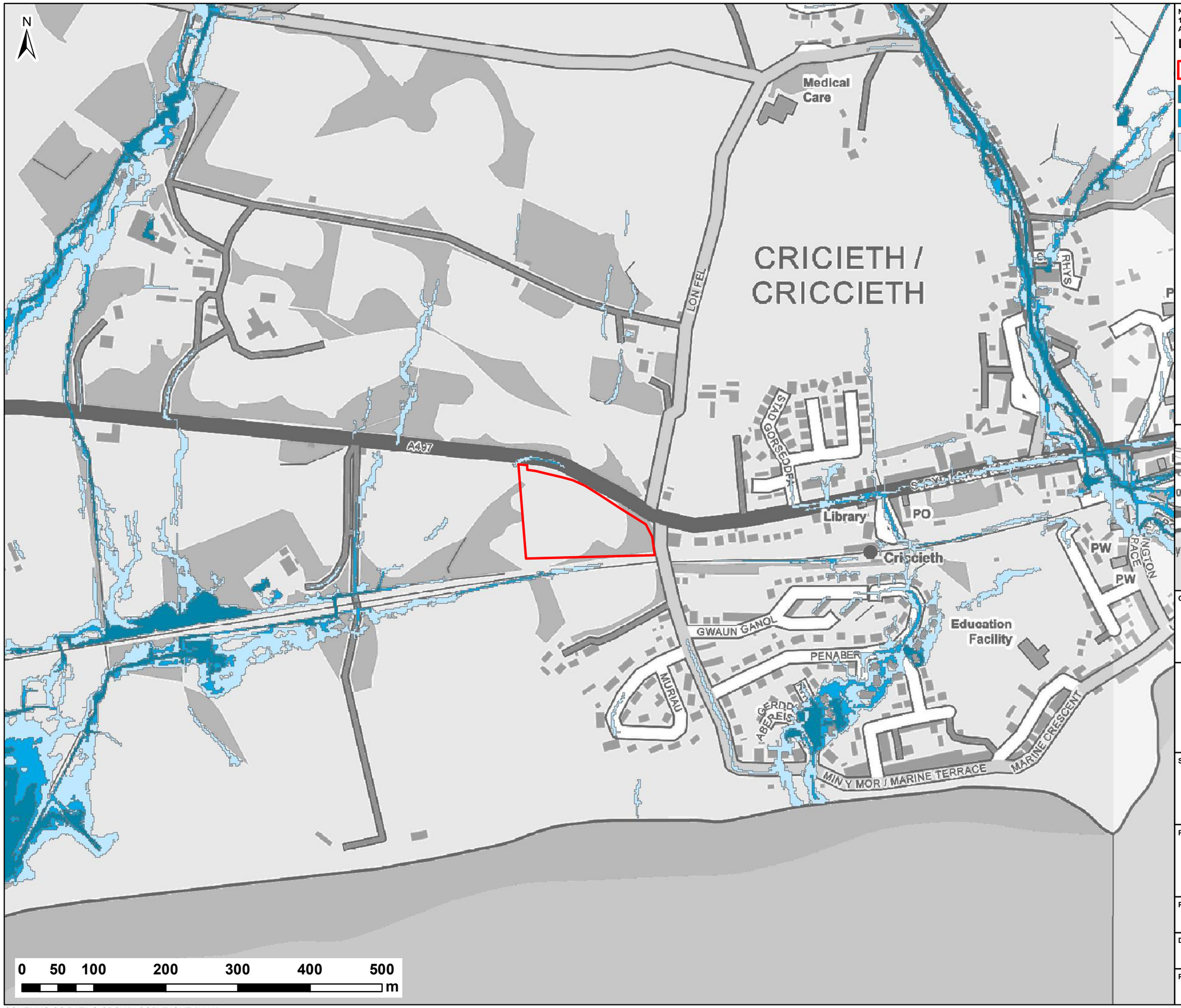
NRW HISTORICAL FLOOD MAP

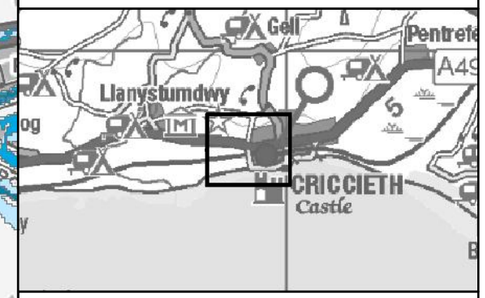
DATA ACCESSED JULY 2020

PLOT STATUS:	DATE:
FINAL	30/07/2020

DRAWN:	CHECKED:	APPROVED:	PLOT SCALE @ A3:
VJ	JW	AW	1:5,000 (UNLESS STATED OTHERWISE)

PLOT NAME:	REV:
13263-NRW_Hist	-





NOTES:
1) ALL DIMENSIONS ARE IN METRES AND ALL LEVELS IN METRES ABOVE ORDNANCE DATUM UNLESS STATED OTHERWISE

LEGEND

- Site Boundary
- High (3.3% or greater)
- Medium (between 1.0% and 3.3%)
- Low (between 0.1% and 1.0%)

CLIENT:

PROPERTY DEVELOPMENT UNIT, GWYNEDD COUNCIL

waterco

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SCHEME:

YSGOL TREFERTHYR, CRICCIETH

PLOT TITLE:

NRW FLOOD RISK FROM SURFACE WATER

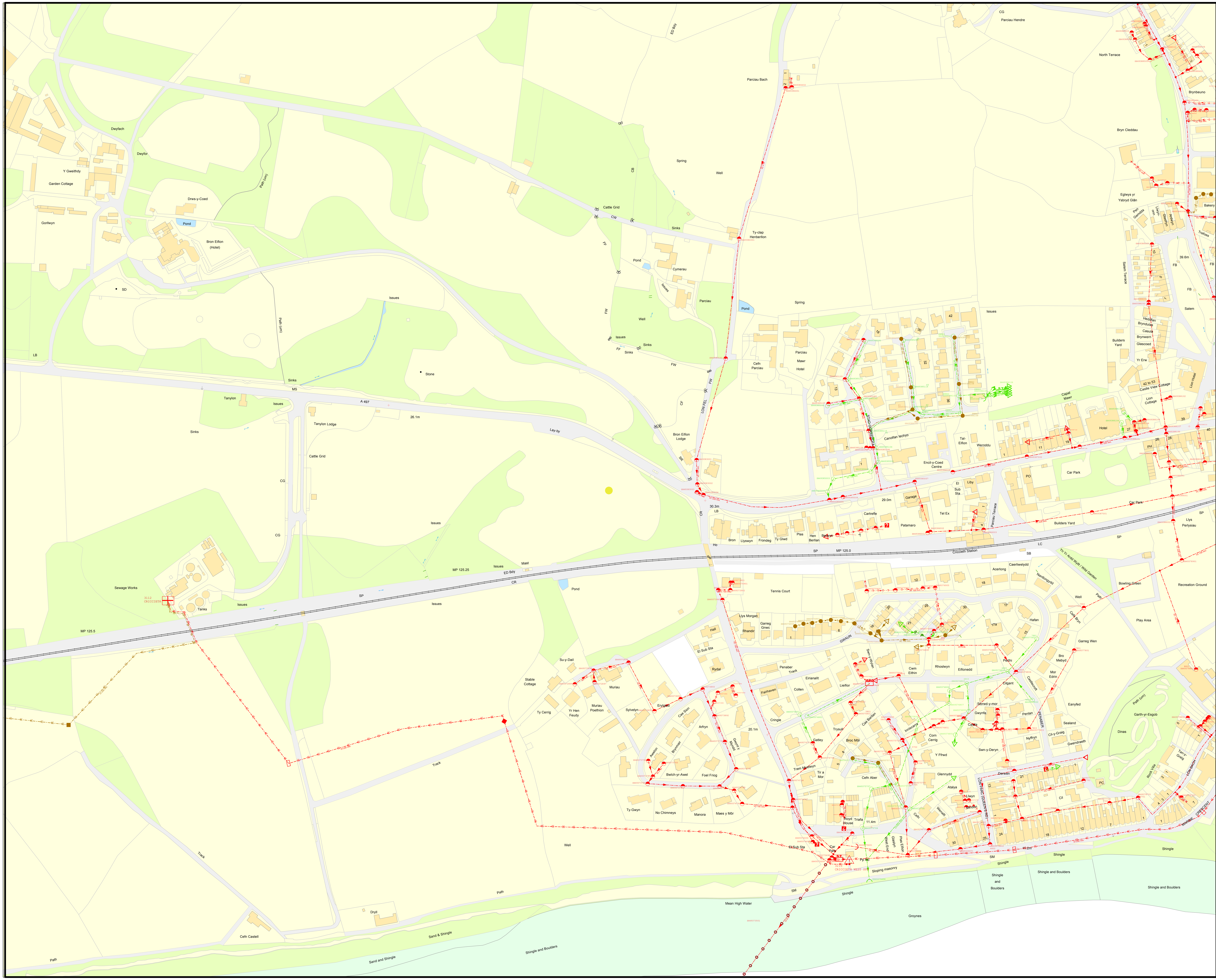
JULY 2020

PLOT STATUS:	DATE:
FINAL	30/07/2020

DRAWN:	CHECKED:	APPROVED:	PLOT SCALE @ A3:
VJ	JW	AW	1:5,000 (UNLESS STATED OTHERWISE)

PLOT NAME:	REV:
13263-NRW_SF_FM	-

Appendix E DCWW Sewer Plan



Ysgol Ardal, Criccieth, Gwynedd, LL52 0RY

N
W E
S

LEGEND(Representative of most common features)

Waste network:

- Foul chamber
- Surface water chamber
- Combined chamber
- Combined sewer overflow
- Special purpose chamber
- Treatment works
- Pumping station
- Outfall
- Lamphole
- Storm Overflow
- Rising main
- Gravity sewer
- Private sewer
- S 104 Private sewer subject to Sect. 104 adoption agreement
- Private Sewer Transfer
- Lateral Drain
- Inspection Chamber

NB: Sewer symbol colour indicates the type.

RED - Combined
GREEN - Surface Water
BROWN - Foul
Purple - Former S24 sewers (for indicative purposes only)

Notes:

Whilst every reasonable effort has been taken to correctly record the pipe material of DCWW assets, there is a possibility that in some cases, pipe material (other than Asbestos Cement or Pitch Fibre) may be found to be asbestos cement (AC) or Pitch Fibre (PF) . It is therefore advisable that the possible presence of AC or PF pipes be anticipated and considered as part of any risk assessment prior to excavation

Dŵr Cymru Cyfyngedig ('the Company') gives this information as to the position of its underground apparatus by way of general guidance only and on the strict understanding that it is based on the best information available and no warranty as to its correctness is relied upon in the event of excavations or other works made in the vicinity of the company's apparatus. The onus of locating apparatus before carrying out any excavations rests entirely on you. The information which is supplied by the Company, is done so in accordance with statutory requirements of sections 198 and 199 of the Water Industry Act 1991 which is based upon the best Information available and, in particular, but without prejudice to the generality of the foregoing, it should be noted that the records that are available to the Company may not disclose the existence of a water main, service pipe, sewer, lateral drain or disposal main and any associated apparatus laid before 1 September 1989, or, if they do, the particulars thereof including their position underground may not be accurate. It must be understood that the furnishing of this information is entirely without prejudice to the provision of the New Roads and Street Works Act 1991 and the Company's right to be compensated for any damage to its apparatus.

Service pipes are not generally shown but their presence should be anticipated.

EXACT LOCATIONS OF ALL APPARATUS TO BE DETERMINED ON SITE.

Map Ref: 249272,338061
Map scale: 1:1250
Printed by: Asamoah Akwasi
Printed on: 15 Oct 2020