

DAG FURBS TRUST
No.2 The Ironmongery,
Station Road,
Rossett
LL12 0HE

Dear David,

Technical Note 001 - Nutrient Neutrality

Background

As part of a planning application for holiday lodges on land adjacent to Park Court Lane, Rossett, nutrient neutrality has been reviewed for the proposed development in order to satisfy Natural Resources Wales (NRW). Under the Habitats Regulations, Planning Authorities must consider the phosphorus impact of proposed developments on water quality within Special Areas of Conservation (SAC) river catchments.

This note aims to illustrate that the proposals would not lead to a significant increase in nutrients draining in to the Dee and Bala SAC.

Location

The site is located 1 mile east of Marford. The site co-ordinates are E: 337976, N: 355281 and the nearest postcode is LL12 0BQ. **Figure 1** shows the site boundary. The site area is 1365m² and 4no. holiday lodges are proposed as part of the future development on site (plans are included within **Appendix A**).



Figure 1: Aerial Location Plan (Google Maps, 2024)



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Context

The River Dee SAC is subject to Habitats Regulations in which Planning Authorities must consider the phosphorus impact of proposed developments on water quality within SAC river catchments. Phosphorus is naturally present in river environments but at very low levels. Human activities such as agriculture and discharge of treated wastewater elevate levels of phosphorus in river flow. High concentrations of phosphorus lead to the process of nutrient enrichment, also known as eutrophication, and can alter the balance of plant species in our rivers causing significant ecological damage. NRW's *Compliance Assessment of Welsh Phosphorus Targets*, shows some areas of the Dee SAC fail phosphorus

As of July 2022, new development consisting of overnight accommodation must be nutrient neutral and ensure there is no increase in nutrients entering the SAC river environment or implement suitable mitigation measures.

The proposed holiday lodge development site is located opposite 4no. existing residential dwellings constructed in 2006. The development site was historically used for pig farming prior to the planning approval and construction of the adjacent dwellings (a photograph of the pig farm can be seen in **Appendix B**).

In terms of foul water flows these should drain to the public sewer network where feasible. It is understood that the foul drainage for the proposals would drain to a package treatment plant (PTP). The proposed foul water strategy is required to utilise a PTP as the nearest public foul water sewer is located over 1.3km to the north of the site within Rossett (sewer records are shown within **Appendix C**). It is therefore not feasible to connect to the public sewer system. The adjacent dwellings to the site also use a PTP to manage foul water flows (the drainage layout of the adjacent dwellings is shown in **Appendix D**). It is understood a permit may be required from NRW for any new discharge activity.

Proposed Flows

At present the site is undeveloped and 3no. new holiday lodges with associated infrastructure are proposed. The surface water flows generated from the lodges will drain to soakaways. The foul water flows generated by the lodges will drain to a Klargester Bio Disc (PTP) before discharging to a watercourse.

No specific nutrient budget calculator is available for the River Dee SAC but the methodology for calculating wastewater flows has been obtained using the Ricardo guidance which is used for budget calculators in Wales.

Table 1: Lodges Nutrient Budget (Betts Hydro, 2024)

No. of 2 bed lodges	3
No. of people per unit	2.4
Water Usage per day (litres/per person/day)	110
Water use per year (million litres/year)	0.29
Wastewater Nutrient Load without Treatment (kg/TP/year)	2.3
Klargester Biodisc Treatment Efficiency (%)	95.4
Wastewater Nutrient Load (kg/TP/year)	0.11



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Some assumptions are made within **Table 1**. The assumptions outlined below:

- The water usage is lowered from the standard 120 litres per day to 110 litres per day. Appliances are likely to be smaller and more efficient within the cabin.
- Each lodge will contain two bedrooms. The standard persons per dwelling figure of 2.4 persons has been applied, resulting in additional population of 7.2 persons. This figure is considered to be conservative for the type of accommodation.
- A non-treated wastewater load of 8mg/l for phosphorus is estimated.
- Whilst the dwellings are holiday homes and not primary residences there is no [REDACTED] on the duration that residents can stay therefore for the purpose [REDACTED] to adopt a precautionary approach they are considered to be [REDACTED] out the year.

Using the current Natural Resources Wales online guidance "Advice to planning authorities for planning applications affecting phosphorus sensitive river Special Areas of Conservation", we have used the above criteria in Table 1 to determine the conservative overall volumes of phosphate produced by the new proposals. This is conservative because we have utilised the national average figures of population per unit (2.4) whereas in reality this figure would be much lower given the proposals are for new 2-bedroomed holiday lodges and not likely to be at full capacity for the entire year.

Using the water usage noted in **Table 1** the site would generate an overall discharge volume of less than 2cu.m (0.79cu.m a day). Looking over the NRW guidance, if we were looking to discharge directly to ground then as this site generates less than 2cu.m per day we would be able to screen it out due to the insignificant volumes involved. Unfortunately, the underlying ground conditions do not promote a discharge to ground option, and there is limited space above ground to include the required foul water drainage field associated with discharge to ground. This means in this instance we cannot drain flows directly to ground and will be looking to use a package treatment plant, but the fact that the overall volumes generated are considered to be low enough to screen out is still worth noting in this instance (based on an overly conservative estimate).

Based on **Table 1** the nutrient loss from the proposals is 0.11kg/TP/yr. This is based on a treatment efficiency of 95.4% (the treatment efficiency for a Bio Disc). The Bio Disc treatment certificate is shown within **Appendix E**. The treatment efficiency is shown to be greater than the Five Fords WwTW phosphate treatment currently serves sewered areas in Rossett and Gresford.

Based on the nutrient budget for the proposed site there would a negligible increase in phosphorus entering the SAC as a result of the proposed lodges.

Although a negligible increase in phosphate to the Dee SAC is forecasted, it is argued that this is an insignificant amount, especially compared to the wider sites former agricultural history. The development can be considered appropriate.

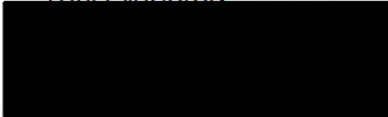
Conclusion

3no. new holiday lodges are proposed on land at Park Court Lane in Rossett. The lodge will connect foul water generated to a Klargester Bio Disc (PTP) discharging treated water to a ditch and ultimately in to the Dee and Bala SAC. This note has reviewed the proposals and calculated the potential forecasted nutrient load. Conservative estimations have been included within the nutrient budget calculated. The increase in wastewater volume is

negligible and considered insignificant and would not be detrimental to the Dee SAC. The development can be considered to be appropriate.

I trust that the above information is useful, however if you have any further queries, please do not hesitate to contact us.

Yours sincerely



Patrick Taylor BSc (Hons) FRGS
Flood Risk Modeller

Appendix A- Proposed Layout Plan

Appendix B- Historical Site Photograph

Appendix C- Sewer Records

Appendix D- Wider site Drainage Layout Plan

Appendix E- PTP Certificate



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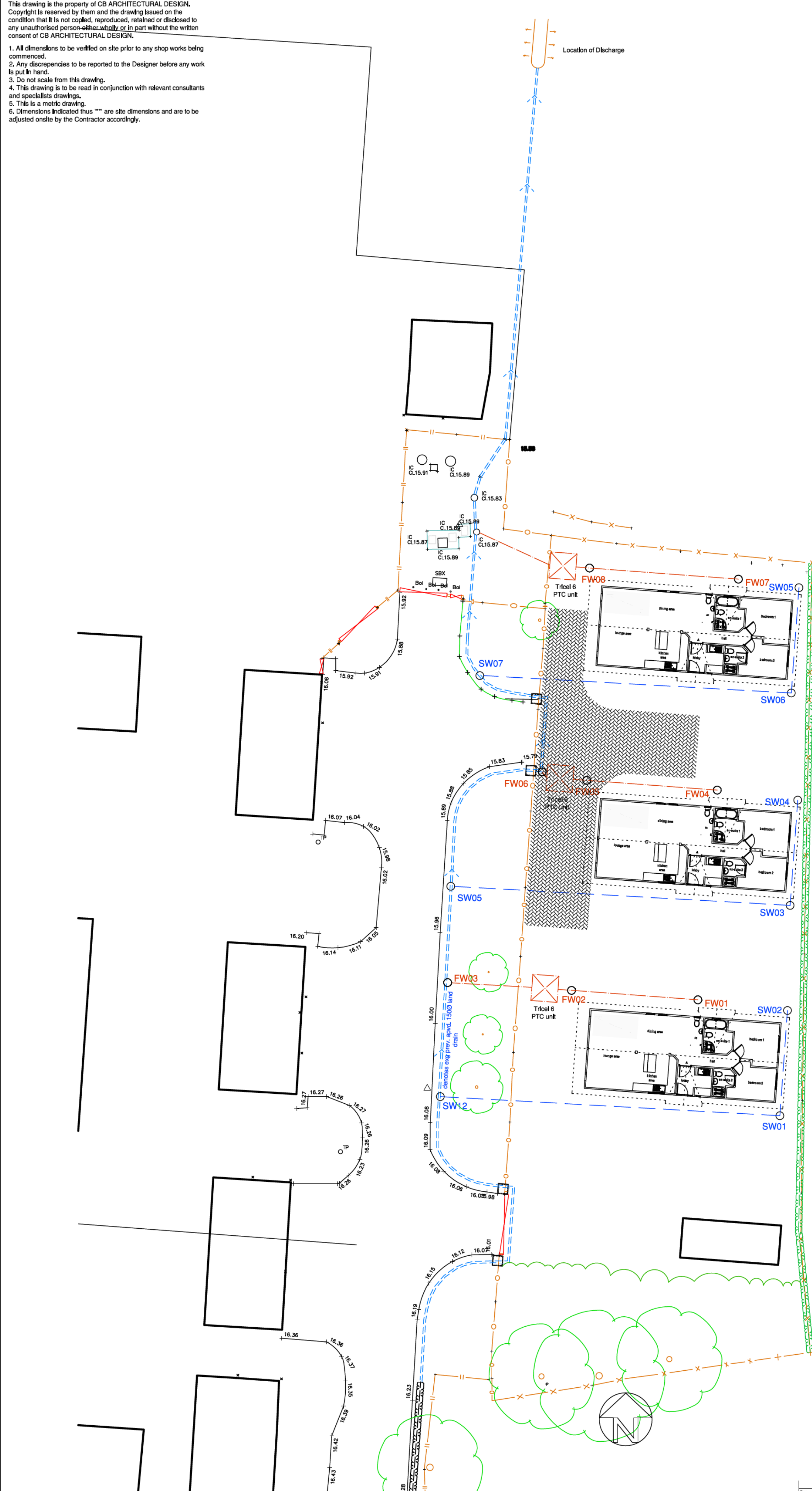
Appendix A – Proposed Layout Plan



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3. Do not scale from this drawing.
4. This drawing is to be read in conjunction with relevant consultants and specialists drawings.
5. This is a metric drawing.
6. Dimensions indicated thus "****" are site dimensions and are to be adjusted onsite by the Contractor accordingly.



0 10 20 50mm NATURAL SCALE

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Rev	Description	Rev	Description
1	1	1	1
Client	DAG FURBS TRUST	Drawn	C.B.
Project	Holiday Lodges at Land Adj. Park Lane Court Rossett LL12 0BQ	Check	C.B.
Scale	1:200	Date	27/03/24
Drawn	C.B.	Revision	C
Check	C.B.		
Date	27/03/24		
Revision	C		

ORIGINAL DRAWING SIZE 594 x 420 (A2)

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4. This drawing is to be read in conjunction with relevant consultants and specialists drawings.
5. This is a metric drawing.
6. Dimensions indicated thus "" are site dimensions and are to be adjusted onsite by the Contractor accordingly.



- [illegible]

Per:	Chadwick	1000	Chad
Client:	DAG FURBS TRUST	Orig. Title:	Block Plan AS PROPOSED
Project:	Holiday Lodges at Land Adj. Park Lane Court Rossett LL12 0BQ	Scale:	1:2000
		Drawn:	C.L.B.
		Checked:	C.B.
		Date:	07/10/23
		Drawn No.:	894/L(9)01
		Revision:	F



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Appendix B – Historical Site Photograph



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Appendix C – Sewer Records



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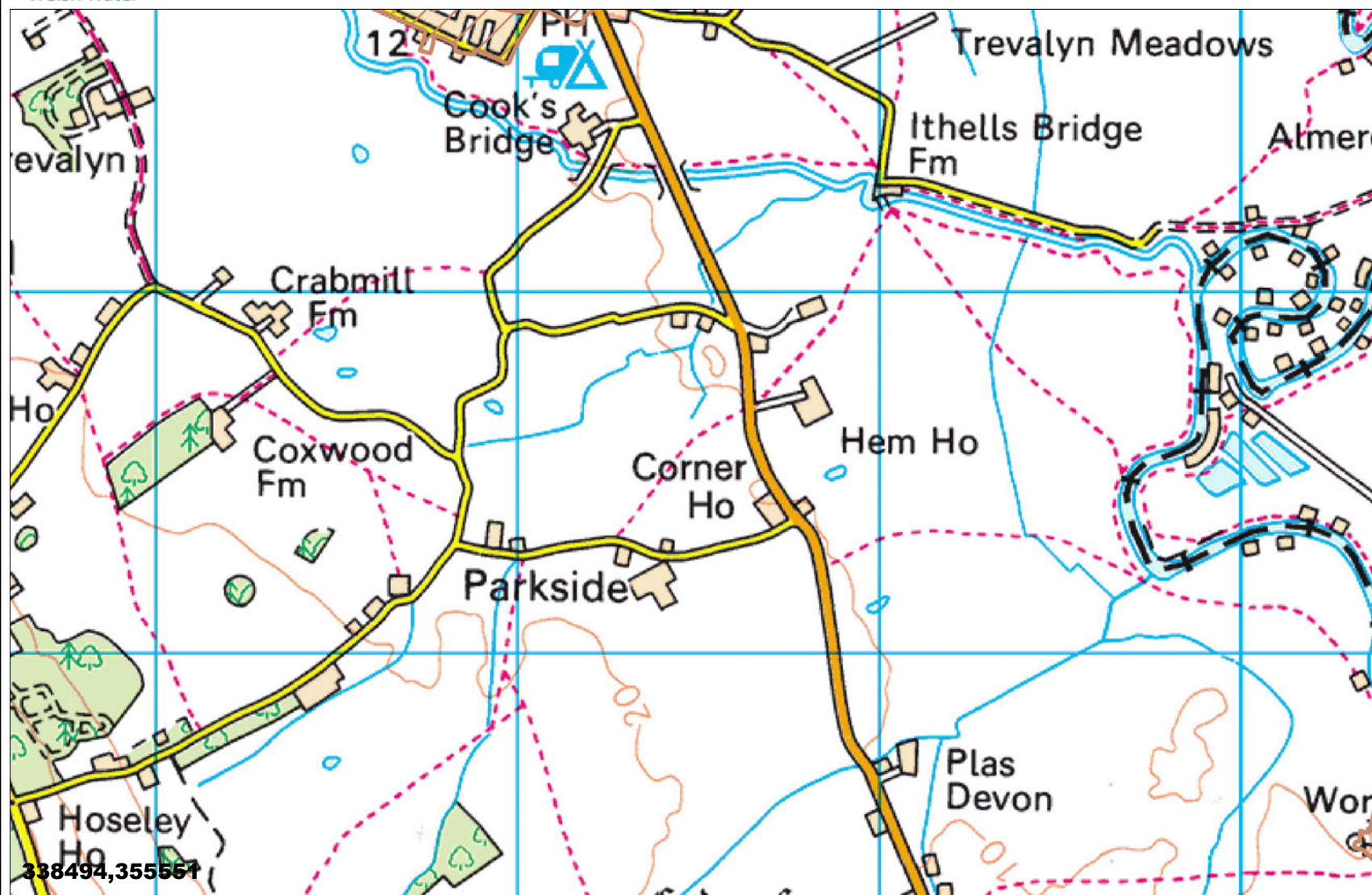


Dwr Cymru
Welsh Water

22/02/2024



Scale: 1: 16834



LEGEND

Clean Water

- Sluiice Val
- Air Val, SINGLE
- Tap
- Pressure Reducing Valve
- Meter
- BULK Meter
- FH
- Cap
- Existing Main
- NON COMPANY

Sewerage External

- Foul
- Surface Water
- Combined
- Rising Main
- Private
- Treatment Works
- Pumping Station
- Special Purpose
- Unknown End
- Change, Combined Overflow
- Outfall, FOUL
- Lamp Hole, Foul
- Private Sewer Transfer
- Lateral Drain
- Inspection Chamber

338494,355561

Dwr 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 and any onus of locating the apparatus before carrying out any excavations rests entirely on you. The information which is supplied hereby the company, is done so in accordance with statutory requirements of sections 198 and 199 of the water industry Act 1991 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 drain sewer or disposal main 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.

EXACT LOCATION OF
ALL APPARATUS TO
BE DETERMINED ON
SITE

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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

Appendix D – Wider Site Drainage Layout Plan



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LOCATION OF DRAINAGE
AGREED WITH THE L.A.
CL = 99.842
CL = 99.842

Surface Water Run
is actually bad run !!

Exig. wall

- NOTES
- Foul Water Drainage
 - Surface Water Drainage
 - ==> Land Drain with 150 # Perforated Pipe
1. ALL LEVELS TO BE CHECKED ON SITE PRIOR TO CONSTRUCTION
 2. FOR DETAILS ON TREATMENT PLANT SEE 'WATERSEWER TREATMENT SYSTEMS - BUILDING BC - BC'

A MINOR AMENDMENTS, LEVELS		JUNES	189	125
Date	Details	Revisions	Date	Drawn By
Status CONSTRUCTION.				
Client BALFOUR HOMES.				
Project MOORSIDE FARM, PARKSIDE, ROSSETT.				
Site DRAINAGE LAYOUT.				
ADAMS CONSULTING ENGINEERS LTD From Dep. Clayton Road, Mold, Flintshire Tel: 01352 754334 Fax: 01352 754331 email: z.mold@adamsconsultingengineers.co.uk				
Cost Ref	Scale	1:200		
Date JUNES	Drawn 1.8	Checked 189	Approved 189	
Project Ref	DAG115	200	A	

Appendix E – PTP Certificate



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Certificate

353.02C02

Kingspan Water & Energy Ltd.

College Road North, Aston Clinton, Aylesbury, HP22 5EW, UK

EN 12566-3, Annex B

Small wastewater treatment systems for up to 50 PT

Small wastewater treatment system BioDisc +P

Rotating Biological Contactor (RBC) in a GRP tank with chemical dosing equipment

Test report PIA2019-353B47.02

This test certificate is a revised version of test certificate no. 353.02C01.

Nominal organic daily load (influent)	0.28 kg BOD ₅ /d		
Nominal hydraulic daily load	0.9 m ³ /d		
Material	GRP		
Treatment efficiency (nominal sequences)		Efficiency	Effluent
	COD	95.9 %	31 mg/l
	BOD ₅	98.0 %	6 mg/l
	N _{tot} *	71.1 %	17.9 mg/l
	NH ₄ -N*	92.1 %	3.0 mg/l
	P _{tot}	95.4 %	0.3 mg/l
	SS	95.6 %	15 mg/l
Electrical consumption	1.5 kWh/d		

**determined for temperatures $\geq 12^{\circ}$ C in the bioreactor*

Performance tested by:

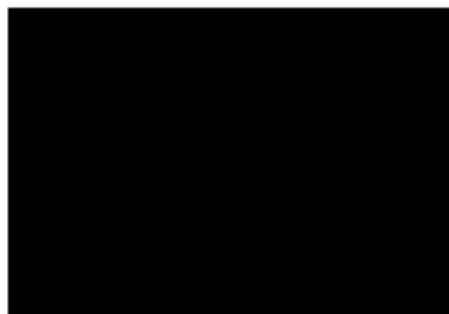
PIA – Prüfinstitut für Abwassertechnik GmbH

Hergenrather Weg 30

52074 Aachen

Germany

This document replaces neither the declaration of performance nor the CE marking.



Martina Wermter

December 2020



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