Wheatsheaf Workshops, Rhosymedre

Foul Drainage - Nutrient Neutrality Assessment

November 2025



Waterco

Assessment | Modelling | Design

Project Information	
Project:	Wheatsheaf Workshops, Rhosymedre
Report Title:	Foul Drainage - Nutrient Neutrality Assessment
Client:	Finchfield Homes Ltd
Instruction:	The instruction to undertake this Foul Drainage - Nutrient Neutrality Assessment Report was received from Carl Hughs of HDS Architectural Services acting on behalf of the Client
File Ref:	17176 - Foul Drainage- Neutrient Neutrality Assessment - 01

Approval Record	
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Approver:	Nigel Jones BEng (Hons) CEng MICE

Document History		
Revision	**Date**	**Comment**
01	07/11/2025	First issue

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Introduction

Waterco have been commissioned to prepare a Foul Drainage Nutrient Neutrality Assessment in relation to the proposed conversion of a mixed-use commercial building to a proposed apartment block at Wheatsheaf Workshops, Rhosymedre, Wrexham, LL14 3YP.

Site Overview

The site covers an area of approximately 1,430m^2 and is located at National Grid Reference (NGR): 328429, 342576. A location plan and aerial image are included in Appendix A.

Online mapping (including Google Maps / Google Streetview imagery, accessed November 2025) shows that the site comprises an existing mixed-use commercial building with associated outbuildings, parking and courtyard. The site is bordered by Chapel Street with residential properties beyond to the north and east, High Street with residential properties beyond to the south, and a railway line to the west. Access to the site is provided from Chapel Street to the north and High Street to the south.

Existing Drainage

Public sewer records have been obtained from Dŵr Cymru Welsh Water (DCWW) and are included in Appendix B. The DCWW sewer records show that there is a public combined sewer immediately south of the site within High Street flowing east. There is also a public combined sewer immediately east of the site within Chapel Street. The combined sewer east of the site flows south-east and connects with the public combined sewer within High Street.

Foul flows from the site currently discharge to the public combined sewer. Foul flows will continue to discharge to the public combined sewer (via the existing connection) post-development.

Nutrient Neutrality Assessment

In order to determine whether the development will be nutrient neutral, the existing and proposed foul flows have been estimated.

Existing Foul Flows

The first stage of the Welsh Government Nutrient Budget Calculator has been used to estimate the existing daily foul flows and is included as Appendix C.

The existing commercial building comprised 24no. businesses which included but are not limited to:

- Computer service and repair store
- Holistic medicine practitioner
- Fabric and costume store

- Home care and support service
- Locksmith
- Furniture store
- Demolition and dismantling service
- Animal grooming service
- Alcohol store
- Takeaway food store
- Dance school

Based on the sites previous commercial use, there would have been a significant number of staff and customers. Therefore, existing foul flows have been estimated based on:

- A staff population of 120 (an average of 5 per business).
- A daily flow of 50 litres per person per day (taken from British Water Flows and Loads 4 and is applicable for an office without canteen).
- A customer population of 48 (an average of 2 per business).
- A daily flow of 10 litres per customer per day (typical toilet water use per customer taken from British Water Flows and Loads 4).

Based on the above, the estimated daily flow from the existing building is 6484.4 litres (2,366,820 litres per year).

Proposed Foul Flows

The proposed development includes the conversion of the office building into residential apartments. 16no. apartments are proposed, comprising 9no 1 bed apartments and 7no. 2 bed apartments. Existing and proposed development plans are included as Appendix D.

In accordance with British Water Flows and Loads 4, a population of 4 is estimated for a 2 bed apartment. A population of 3 is estimated for a 1 bed apartment. The total population is therefore 55. Where the population exceeds 25, British Water Flows and Loads 4 recommends applying a reduction factor whereby the estimated population is be multiplied by 0.8. This represents the scenario where not all units will be at full occupation. With the reduction factor applied, a total population of 44 is estimated.

In accordance with the Welsh Government Nutrient Budget Calculator Guidance (2025), 'the estimated average water usage per person is set to a default of 120 litres/person/day which is 10 litres higher than the Building Regulations standard set by the Welsh Ministers of 110 litres/person/day of wholesome water where a dwelling/unit is erected. The standard is based on a 'fittings approach' where water efficiency compliance is achieved through water efficient fittings. The extra 10 litres/person/day is a precautionary approach to account for water usage variations and account for any potential future changes to the water

fittings in perpetuity. If a dwelling/unit is formed by a material change of use of a building, then this value should be changed to 135 litres/person/day. Again, this value is 10 litres/person/day above the Building Regulations standard of 125 litres/person/day in order to be precautionary for the same reasons identified above.'

A daily water usage of 135 litres per person per day has therefore been applied. Based on a population of 44 and a water usage of 135 litres per person per day, the estimated daily water usage for the proposed development is 5,940 litres.

Table 1 summarises the existing and proposed foul flow quantities (which are based on estimated water usage)

Table 1 – Existing and Proposed Foul Flow Quantities

	Existing	Proposed
Foul Flows (litres per day)	6484.4	5940

The phosphate concentration (mg/l) discharged into the River Dee Special Area of Conservation (SAC) is controlled by the performance of the receiving Welsh Water wastewater treatment works and is not influenced by the proposed development use. Therefore, where a development results in a reduction in wastewater flow entering the public sewer and downstream wastewater treatment works, it will also reduce the phosphate quantity discharged from the wastewater treatment works into the River Dee.

As the development will reduce the quantity of foul flows, it will also reduce the phosphate quantity entering the River Dee. The development is therefore phosphate neutral and will not cause detriment to the River Dee SAC.

Conclusions

Foul flows from the proposed development will continue to discharge to the public combined sewer.

Foul flows from the proposed development will reduce when compared with the existing situation. As the development will reduce the quantity of foul flows, it will also reduce the phosphate quantity entering the River Dee. The development is therefore phosphate neutral and will not cause detriment to the River Dee SAC.

Appendix A Location Plan & Aerial Image



Notes:
1) All dimensions are in metres and all levels in metres above Ordnance Datum unless stated otherwise

LEGEND

- Site Boundary
- Watercourses
- Waterbodies



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waterco
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SCHEME:
Wheatsheaf Workshops, Rhosymedre

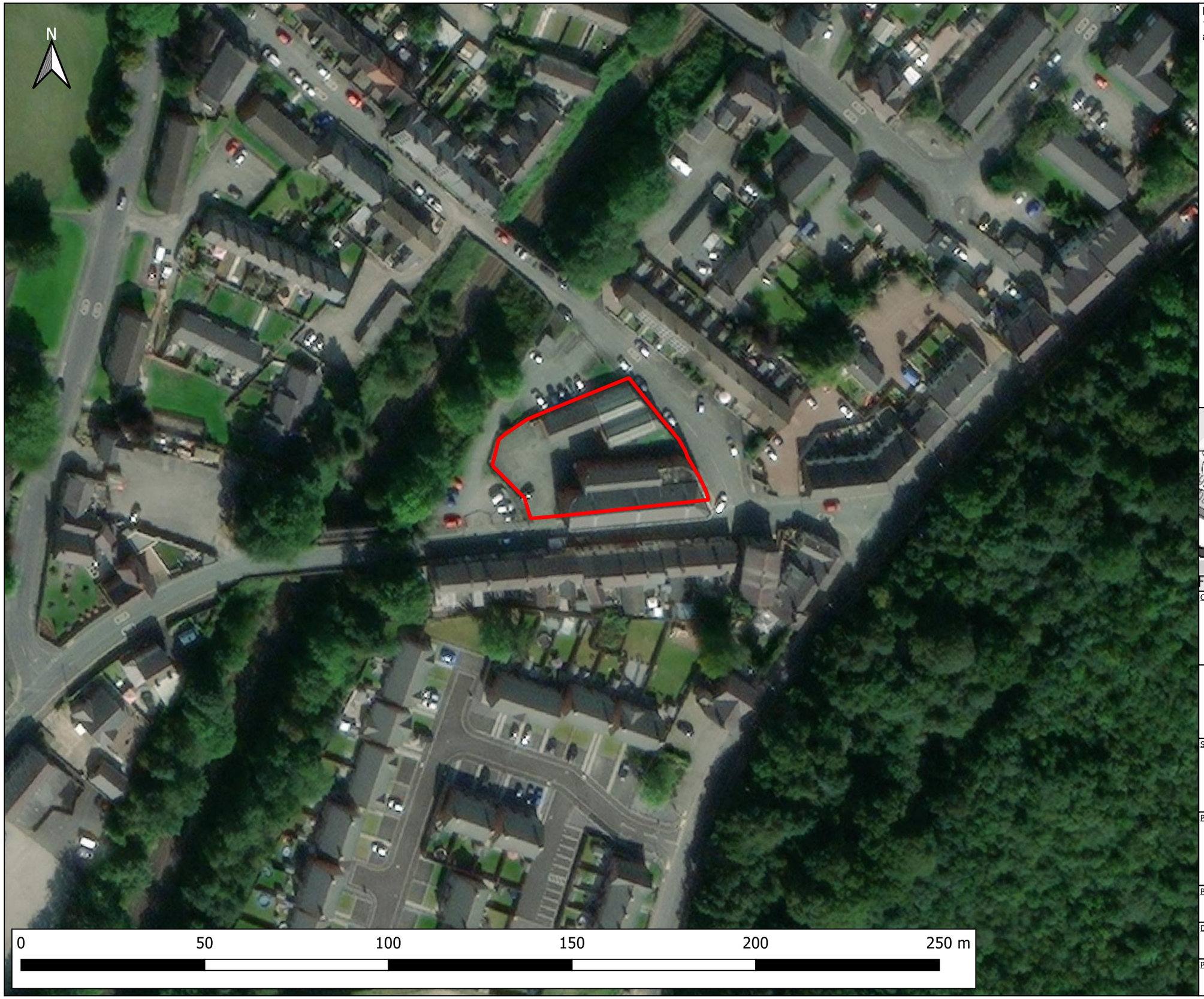
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Location Plan

PLOT STATUS:	DATE:
FINAL	14-10-2025

DRAWN:	CHECKED:	APPROVED:	PLOT SCALE AT A3:
AM	AW	NJ	1:1000

PLOT NAME:	REVISION:
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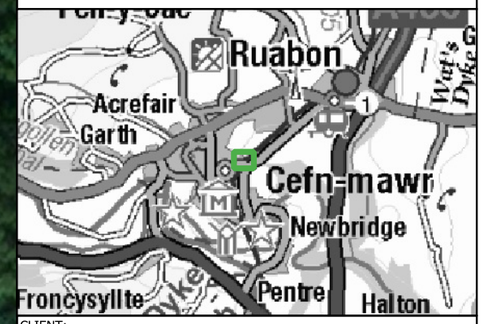
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Notes:
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LEGEND

Site Boundary



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Wheatsheaf Workshops, Rhosymedre

PLOT TITLE:

Aerial Plan

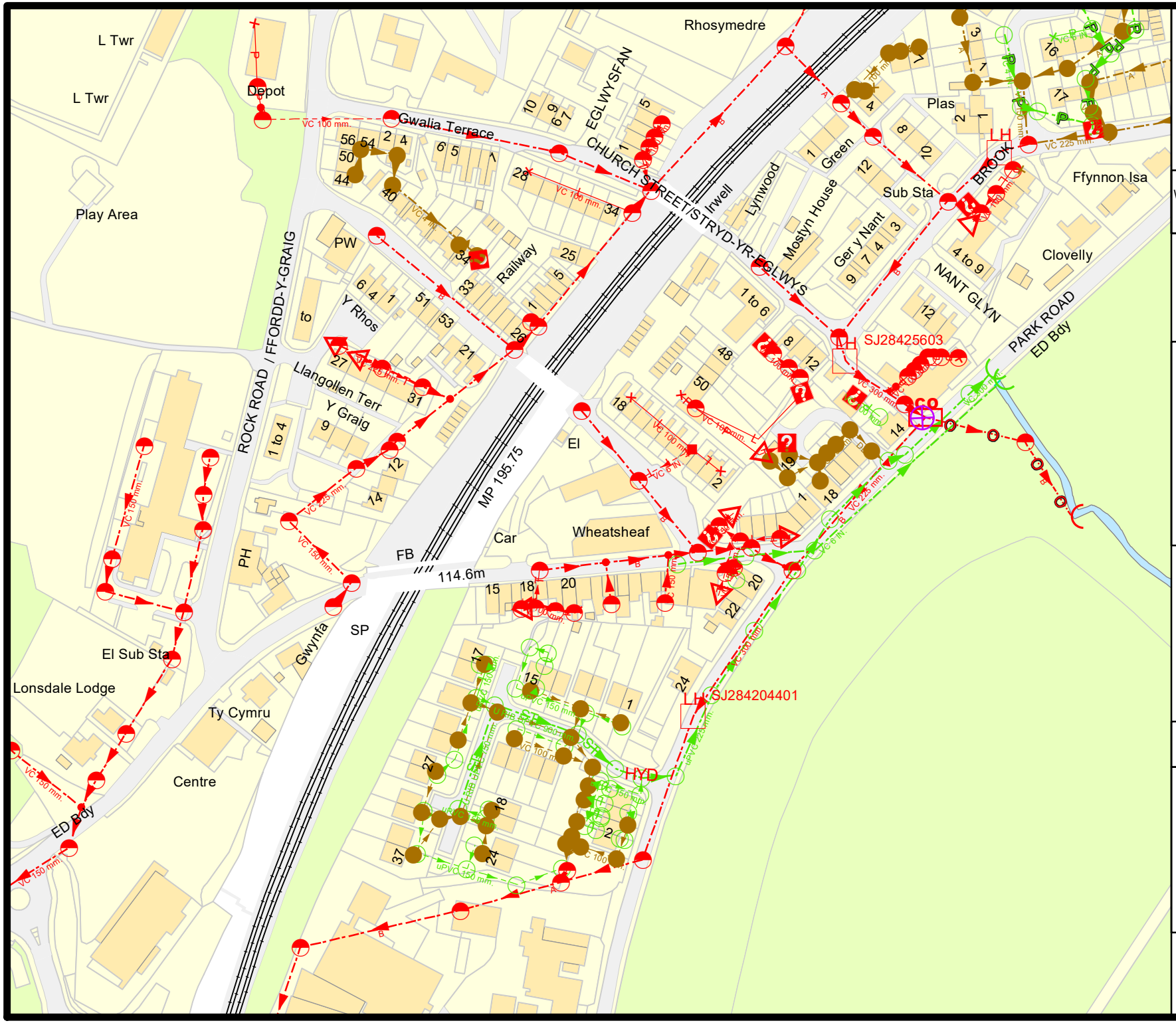
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PLOT NAME:	REVISION:
17176_Aerial_Plan	-

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Appendix B DCWW Sewer Plan



Dŵr Cymru
Welsh Water

Wheatsheaf Workshop, Rhosymedre, Wrexham, LL14 3YP

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
- 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.

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Map Ref:	328428,342576
Map scale:	1:2000
Printed by:	Ffion Evans
Printed on:	17 Oct 2025

Appendix C NRW Nutrient Budget Calculator Results

Stage 1 - additional nutrient loading from wastewater

This sheet contains 2 tables. The tables are separated by a heading, which describes the following table.

The first table labelled 'Wastewater load input data' requires user inputs. Cells A8, A9, A13, A17 to A20, A22 to A23 are automatically generated and will state 'Not applicable' unless the required user inputs have been entered. You will need to fill in cells B6, B7, B10 to B12 and B14 to B23, unless the description states 'Not applicable'. Cells B8, B9, B13 are automatically generated and will state 'Not applicable' unless the user inputs have been entered. If the user does not enter a postcode in cell B7, cells A9 and B9 will state 'Not applicable', however this data can be selected in Cell B6 in Stage 2. Cells B24 and B25 are automatically generated and will state '0.00' unless the user inputs have been entered.

The second table labelled 'Final calculation of nutrient load from wastewater' does not require any user inputs. Cells B28 to B31 are automatically generated and will state '0.00' unless the user inputs have been entered in the second table labelled 'Wastewater load calculation table'.

How to fill in the table 'Wastewater load calculation table':
Cell B6: Select the Special Area of Conservation (SAC) from the dropdown list.
Cell B7: Enter the postcode, or the nearest postcode, for the proposed development site. This input is optional.
Cell B10: Select the project type or development type from the dropdown list.
Cell B11: Enter the number of additional units being created.
Cell B12: Enter the Local Planning Authority the development is within, if a valid postcode has not been entered into cell B7.
Cell B14: Select 'Yes' if the default occupancy rate is being used for the development if the project type is residential from the dropdown list. Select 'No' if the default occupancy rate does not apply to the residential development.
Cell B15: Enter the average occupancy rate of the development if the default occupancy rate is not automatically generated in cell B13.
Cell B16: Enter the water usage per resident or customer/user in litres per person per day. This value should be kept at 120 for residents unless other efficiency measures are used.
Cell B17: Enter the percentage of customers/users coming from outside the catchment if the project type is not residential. The default value is set to 100%.
Cell B18: Enter the number of employees per unit if the project type is not residential.
Cell B19: Enter the water usage per resident or customer/user in litres per person per day. The default value is 120.
Cell B20: Enter the percentage of employees coming from outside the catchment if the project type is not residential. The default value is set to 100%.
Cell B21: Select the connecting wastewater treatment works (WwTW) from the dropdown list.
Cell B22: Enter the certified value of total phosphorus (TP) if you select 'Package Treatment Plant user defined' or 'Septic Tank user defined' in cell B21. Otherwise the default values for these sewarage systems will be used in the calculation of the nutrient load associated with wastewater.
Cell B23: Enter the certified value of total nitrogen (TN) if you select 'Package Treatment Plant user defined' or 'Septic Tank user defined' in cell B21. Otherwise the default values for these sewerage systems will be used in the calculation of the nutrient load associated with wastewater.

Wastewater load input data

Description of required information	Data entry column - user inputs required
Special Area of Conservation (SAC):	River Dee and Bala Lake/ Afon Dyfrdwy a Llyn Tegid
Postcode:	LL14 3YP
Local Planning Authority (LPA):	**Wrexham County Borough Council**
Rainfall:	**906**
Project type:	Commercial
Development proposal (number of additional units):	24
Not applicable	
Not applicable	**Not applicable**
Not applicable	
Number of customers / users per unit:	2
Water usage per customer / user (litres/person/day):	10
Percentage of customers / users from outside catchment:	100
Number of employees (per unit):	5
Water usage per employee (litres/person/day):	50
Percentage of employees from outside catchment:	100
Wastewater treatment works:	Five Fords STW
Not applicable	
Not applicable	
Phosphorus permitted limit (mg TP/l):	**1.00**
Nitrogen permitted limit (mg TN/l):	**27.00**

Final calculation of nutrient load from wastewater

Description of values generated	Values generated
Additional population:	**168.00**
Annual wastewater production (litres):	**2366820.00**
Annual phosphorus load (kg TP/year):	**2.37**
Annual nitrogen load (kg TN/year):	**63.90**

Appendix D Existing & Proposed Development Plans

N

G-01
G-02
G-3
G-04
G-05
G-06
G-07
G-08
G-09
G-10
G-11
G-12
F-01
No access not surveyed
No access not surveyed
No access not surveyed
under stairs
To basement
To basement
Disabled W/C
Lobby
Male
Female
up 90
up 100
up 180
up 150
up 150
up 260
up 350

First floor plan 1:50

As Existing

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Wheatsheaf Workshops, High Street, Rhosymedre, Cefn-Mawr, Wrexham, LL14 3YE	WW/PD/01	17.05.24

Title;	Scale (A1);	Revision;
01-Ground Floor Plan	1:50	

N

F-01

F-02

F-03

F-04

F-05

F-06

F-07

F-08

Lobby

Lobby

Lobby

Store

Corridor

Store

No access not surveyed

F-09

up 150

up 170

Lobby

Store

Corridor

F-10

Kitchen

F-11

F-12

Female

Male

F-13

F-14

First floor plan 1:50

As Existing

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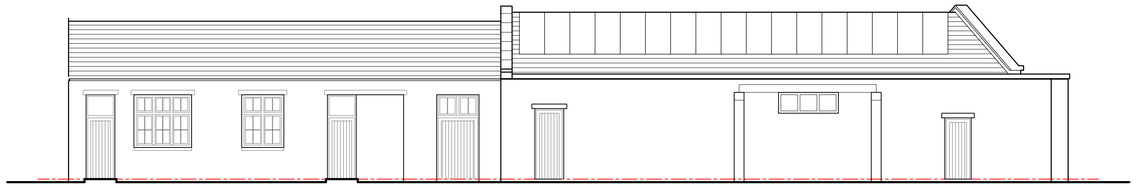
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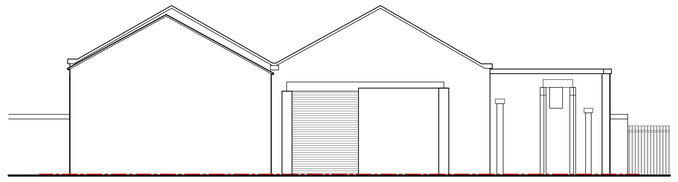
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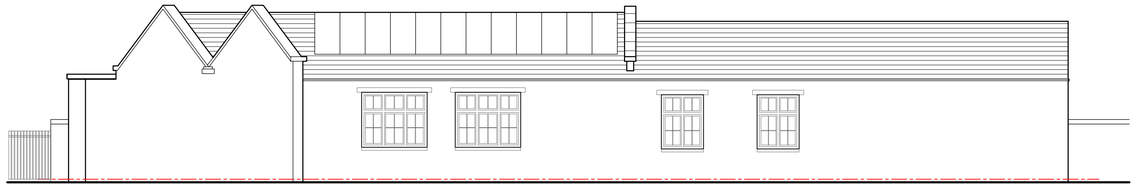
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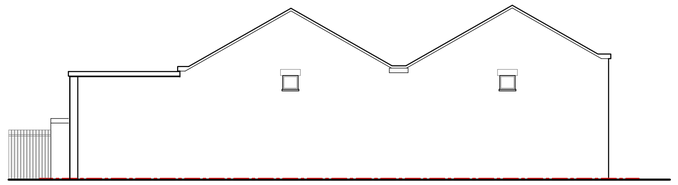
Front elevation 1:100



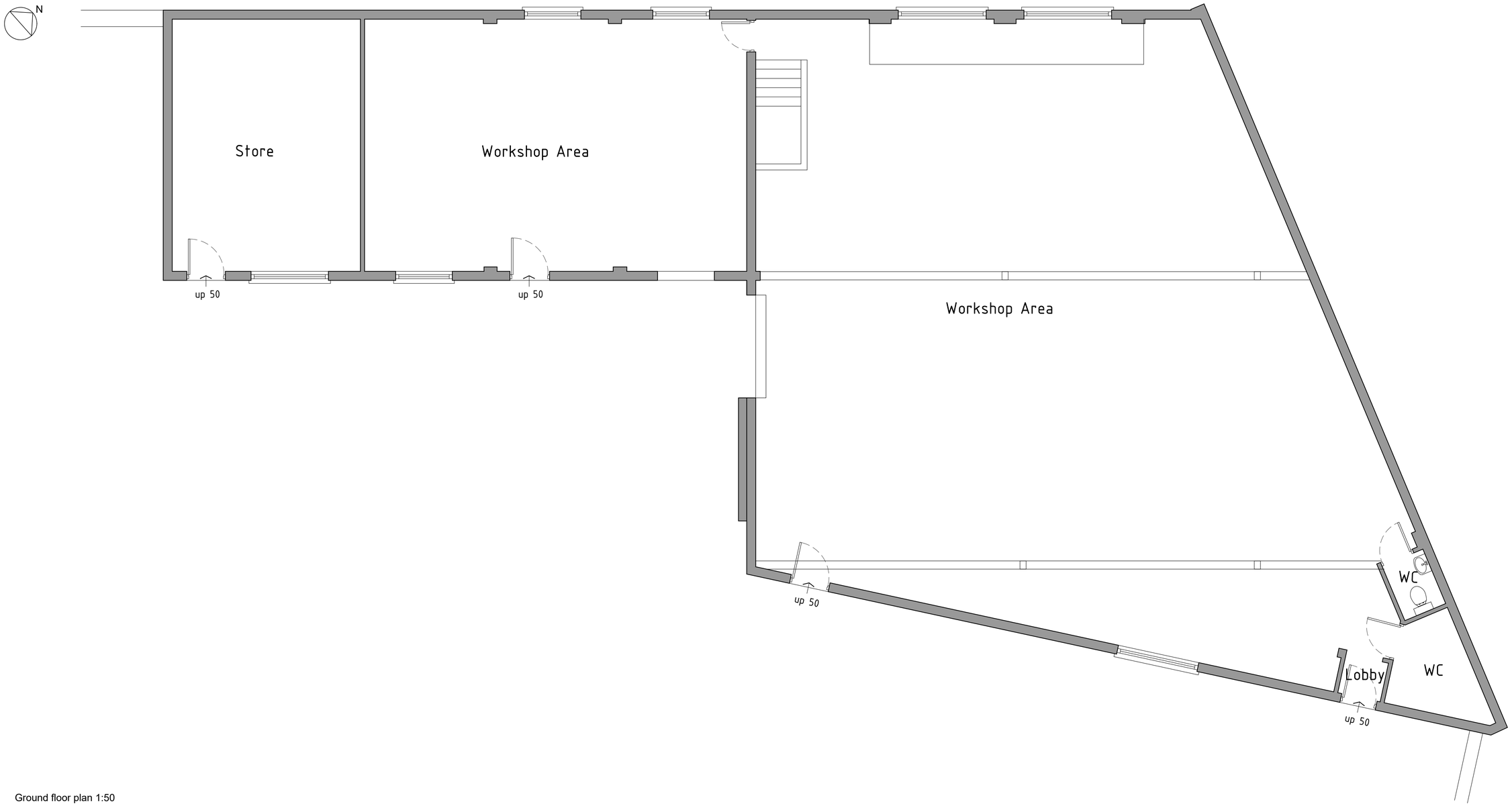
Side-01 elevation 1:100



Rear elevation 1:100



Side-02 elevation 1:100



Ground floor plan 1:50

As Existing

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Title;	**Scale (A1);**
01- Outbuilding As Existing floor plans and Elevations	1:50/100
Dwg No;	**Date;**
WWW/PD/01	01.07.24

Revision;



Front elevation 1:100



Side-01 elevation 1:100



Rear elevation 1:100



Side-02 elevation 1:100

As Existing

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Wheatsheaf Workshops, High Street, Rhosymedre, Cefn-Mawr, Wrexham, LL14 3YE	WW/PD/03	17.05.24

Title;	Scale (A1);	Revision;
03-Elevations	1:100	

N

Legend		
Apartment No.	No. Bedrooms	Size
Apartment-01	2 bedroom	78m2
Apartment-02	2 bedroom	83m2
Apartment-03	2 bedroom	98m2
Apartment-04	1 bedroom	56m2
Apartment-05	2 bedroom	70m2
Apartment-06	2 bedroom	84m2
Apartment-07	2 bedroom	84m2
Apartment-08	1 bedroom	54m2
Apartment-09	1 bedroom	51m2
Apartment-10	2 bedroom	75m2
Apartment-11	1 bedroom	41m2



Ground floor plan 1:50

Proposed

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N

Legend		
Apartment No.	No. Bedrooms	Size
Apartment-01	2 bedroom	78m2
Apartment-02	2 bedroom	83m2
Apartment-03	2 bedroom	98m2
Apartment-04	1 bedroom	56m2
Apartment-05	2 bedroom	70m2
Apartment-06	2 bedroom	84m2
Apartment-07	2 bedroom	84m2
Apartment-08	1 bedroom	54m2
Apartment-09	1 bedroom	51m2
Apartment-10	2 bedroom	75m2
Apartment-11	1 bedroom	41m2



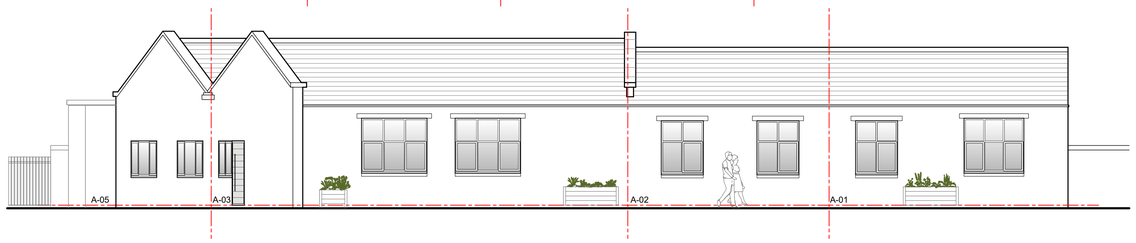
First floor plan 1:50

Proposed

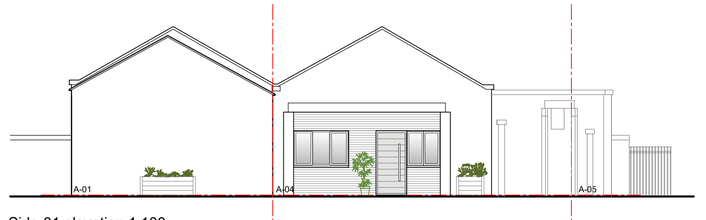
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HDS Architectural Services, The Foundry, 15 Yorke Street, Wrexham LL13 8LW Tel (01978) 345250 www.hdsarchitectural.co.uk	**Title;** 05-First Floor Plan	**Scale (A1);** 1:50	**Revision;**	



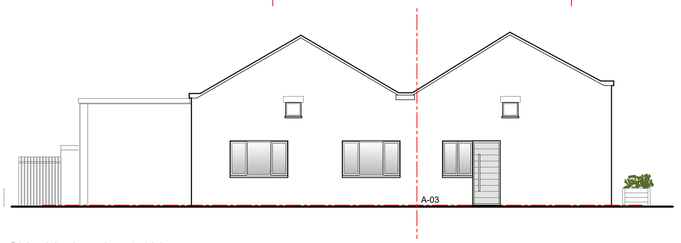
Front elevation 1:100



Rear elevation 1:100



Side-01 elevation 1:100



Side-02 elevation 1:100



Ground floor plan 1:50

Legend

Apartment No.	No. Bedrooms	Size
Apartment-01	1 bedroom	42m2
Apartment-02	1 bedroom	40m2
Apartment-03	1 bedroom	63m2
Apartment-04	1 bedroom	62m2
Apartment-05	1 bedroom	65m2

Proposed

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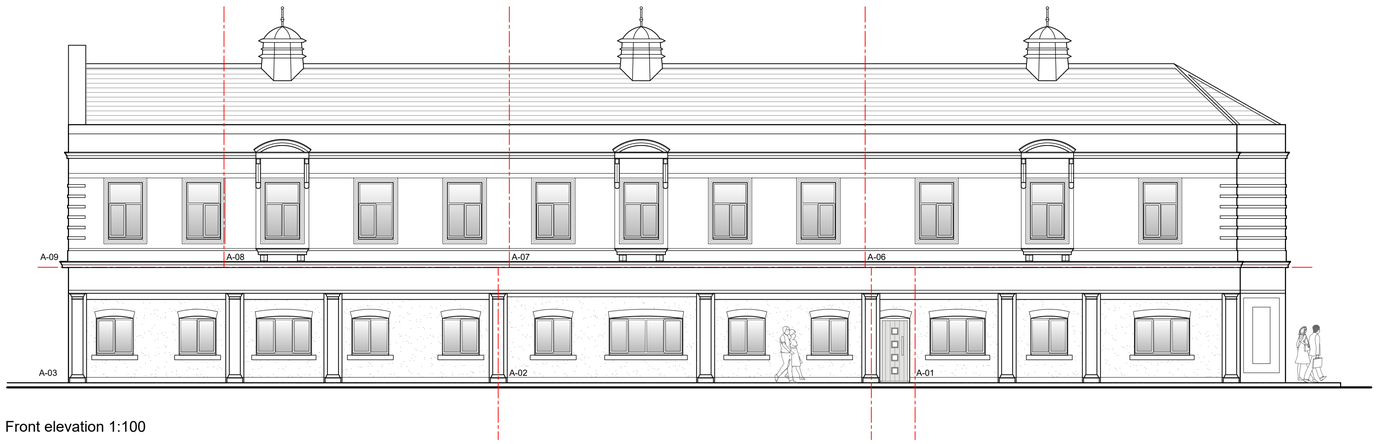
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02- Outbuilding Proposed floor plans and Elevations

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1:50/100

Dwg No;
WW/PD/02a

Date;
29.01.25

Revision;



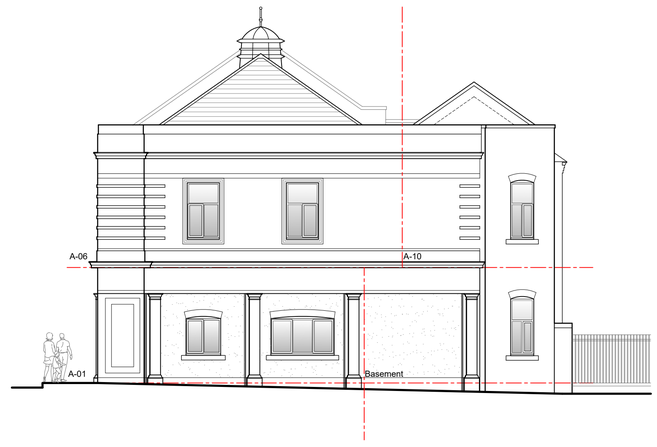
Front elevation 1:100



Side-01 elevation 1:100



Rear elevation 1:100



Side-02 elevation 1:100

Proposed

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Dwg No; WW/PD/06a

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Title; 06-Proposed Elevations

Scale (A1); 1:100

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