

DRAINAGE DESIGN - TECHNICAL NOTE

154-XOS-XX-XX-RP-C-5000 Rev P2

VILLAGE BAKERY

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18 May 2022

DOCUMENT ISSUE RECORD

Document Number		154-XOS-XX-XX-RP-C-5000			
Status	Revision	Date of Issue	Author	Checked	Approved
Planning	P1	09.03.2022	U.Malik	M.Walsh	E. Parry
Planning	P2	18.05.2022	U.Malik	M.Walsh	E. Parry

Report Limitation

All comments and proposals contained in this report are based on information available to XOsquare Limited during recent investigations.

This report has been prepared for the sole use of Village Bakery. No other third parties may rely upon or reproduce the contents of this report without the written permission of XOsquare Limited.

1 INTRODUCTION & SITE LOCATION

This drainage technical note has been produced by XOsquare Limited on behalf of Village Bakery in respect of a planning application for the new speculative build **B2/B8 Warehouse**. The proposed development will not form part of the existing bakery production facility, the building will be let to the market as a 26,692 sq ft Warehouse with associated Offices.

The development consists of a lightweight steel portal frame building with associated external works including car park and service yard. The site is located at Wrexham Industrial estate, the national Grid reference for the site is SJ375497 and the nearest postcode to the site is LL13 9UH. Extent of Phase 1 is shown below:



Figure 1-Site Location Plan

A copy of the proposed site plan is included in **Appendix A**.

This Drainage Technical Note sets out the principles of the drainage design for the proposed development and summarizes the reasoning behind the chosen design. This includes justification of specific flow rates, volumes of attenuation and the level of treatment provided for site run-off.

A site summary and summary of the local agencies is found below in Table 1.1

Site Name	Village Bakery, Wrexham Industrial Estate
Location	Wrexham Industrial Estate, LL13 9UH
Application Site Area phase 1	Circa 1.78 Acres
Development	Commercial
Environment Agency Office	WCBC
Lead Local Flood Authority	WCBC
Local Planning Authority	WCBC
Water Supplier	Dee Valley Water

Table 1-Development Summary

2 DRAINAGE SUMMARY

The site is brownfield (as an existing working drainage network is in place) from a land-use perspective and for the purposes of estimating surface water run-off and setting discharge rates. Table 2.1 summarizes the findings of this document.

Outfall Location	The surface water outfall is to connect into the public sewer on Coed Aben Road south of the site. The Foul Water is to connect into the private road east of the site which discharges into the foul public sewer on Coed Aben Road.
Existing Site Peak Run-off Rate	The existing surface water discharge rate is limited to 7l/s through an existing cellular attenuation system.
Infiltration Rate	None
Proposed Site Peak Run-off Rate	The discharge rate will be set to 7l/s as per previous planning application ABE P /2013/0856. This value will be lower than the calculated 60% betterment of Qbar through the Modified rational method therefore the existing consent will be used.
Proposed Storage Volume	342 m ³
Flow Control Type	Hydrobrake Optimum
SuDS Features	Catchpits Sump outfall units/gullies Attenuation Tank Oil separators Flow Controls

Table 2.1 - Drainage Summary

2.1 Existing Site

The site is an irregularly shaped plot of land, of approximately 0.72 hectares, that was formerly a bakery.

The site is located 5km East of Wrexham; The A525 provides a link into Wrexham and can be accessed via Clywedog Road South. Redwither Brook runs from East to West through the industrial estate.

The former bakery building has been demolished following a fire and the site now is free of any buildings. The site is flat with areas of stockpiled material from demolition rubble and infrastructure to slab level.

An existing working drainage network on the site has been established therefore classified as brownfield.

Ground levels apart from the spoil are consistent along the site. The existing carpark remains untouched following the demolition of the building.

The site is drained by separate drainage systems; both surface water and foul drainage connect to the public sewers on Coed Aben Road.

The existing topographical survey is included in **Appendix B**.

2.2 Proposed Development

The application relates to the construction of a B2/B8 speculative warehouse unit, the unit will be located on the site that had been demolished following a fire in 2019, the current site is vacant. Internal floor area totals to approximately 30,139 Sqm, suitable for B2, B8 Use classes with ancillary E(g)(i) Office space. Dedicated car parking allocations and footpaths are linked to an upgraded site access road to afford appropriate and inclusive access.

Scheme proposals include localised soft landscape treatment and planting that complement the existing surroundings and boundary treatments.

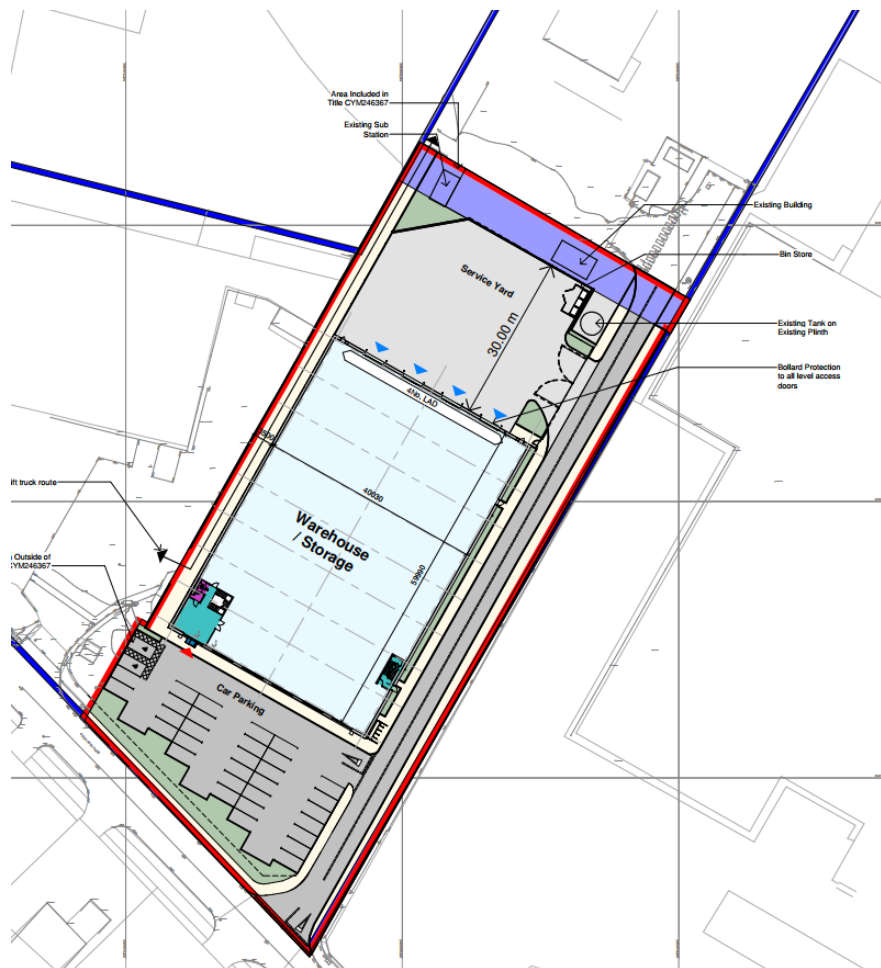


Figure 2 - Overall site layout

3 Surface Water Management

The site is brownfield from a surface water run-off perspective. An existing drainage network is currently in place which discharges to the separate public sewer systems in Coed Aben Road.

Surface water discharge rates remains at the existing 7l/s which is attenuated on site through a cellular tank.

3.1 Methods of Surface Water Managements

There are four methods that have been reviewed for the management and discharge of surface water which are detailed below; these may be applied individually or collectively to form a complete strategy. They should be applied in the order of priority as listed;

- Infiltration via soakaways
- Watercourse
- Surface Water Sewer
- Combined Water Sewer

Based on investigations undertaken to date, the ground conditions show stiff clays therefore infiltration will not be viable. It is therefore proposed to mimic the existing drainage arrangement on the site to dispose the surface water run off to the public sewers.

No existing water courses are in the vicinity of the site.

The existing drainage from the former bakery building connects to separate surface water and foul public sewers.

The existing road drainage along the site connects into the existing attenuation tank within the carpark.

Service yard and car park are drained by aco channels to the middle of the yard.

All surface water is attenuated on site and restricted using a hydro brake manhole and connects to the public sewer on Coed Aben Road.

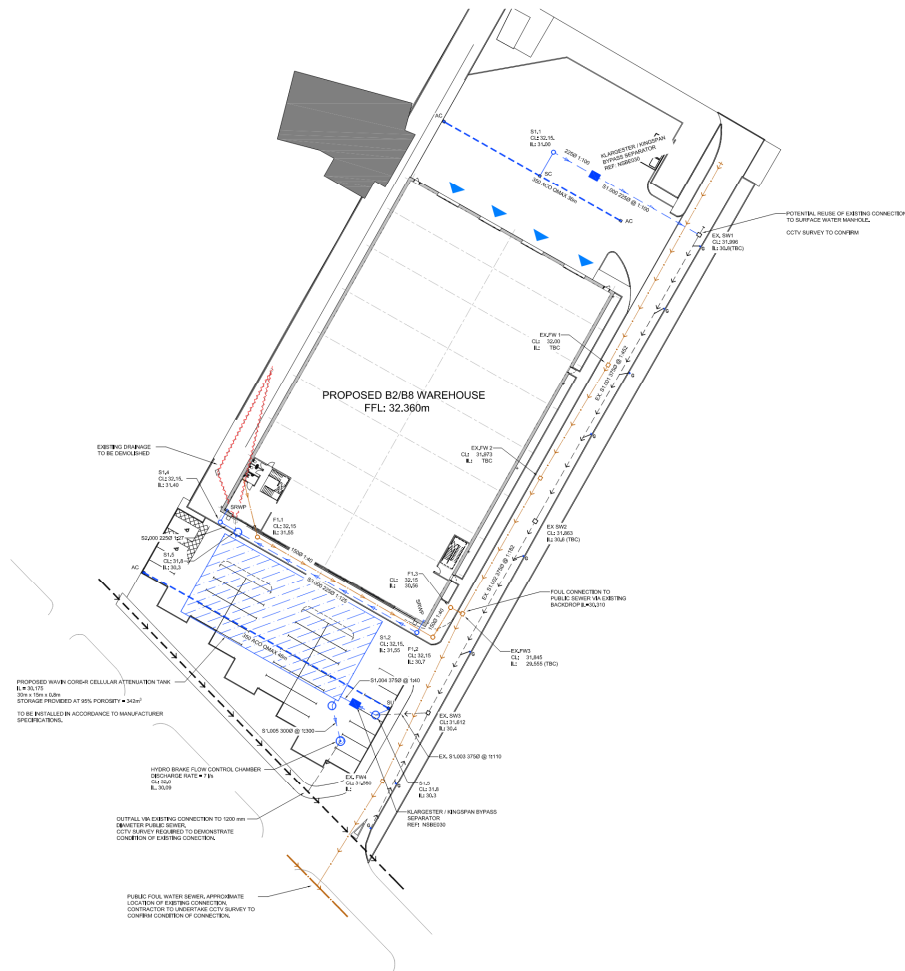


Figure 3 – Site drainage layout

3.2 Attenuation Requirements

The proposed restricted discharge rates outlined above and development runoff generated by proposed impermeable roof and hard standing areas results in a storage requirement during periods of intense rainfall.

The primary form of attenuation proposed for the site is through the use of an attenuation cellular crates.

An Infodrainage model has been generated for the entire site to ensure that below ground pipework and volumes of attenuation are sized accurately. The table below summarizes the main attenuation volumes and restricted discharge rates.

Attenuation Location	Maximum Volume (m³)	Discharge Rate (l/s)
Bakery Carpark	342	7

Table 2 - Attenuation Requirements

Microdrainage calculations can be found in **Appendix D**

3.3 CLIMATE CHANGE

The issue of climate change is discussed in the NPPF Technical guidance with impacts likely on sea levels, peak rainfall intensities, peak river flows, wind speeds and wave heights. The current DEFRA and EA recommended allowances for possible future climate change are summarized on in Table 2 on Gov.uk website (<https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances>) and are summarized below.

Applies across all of England	Total potential change anticipated for the '2020s' (2015 to 2039)	Total potential change anticipated for the '2050s' (2040 to 2069)	Total potential change anticipated for the '2080s' (2070 to 2115)
Upper end	10%	20%	40%
Central	5%	10%	20%

Table 3 - Climate Change

Planning Practice Guidance current advice on Climate Change for peak rainfall intensity allowance in small and urban catchments for a development with a lifespan of greater than 50 years '2080s' (2070 to 2115) is Central 20% and Upper End 40%

Climate change allowances has been agreed with the LLFA as part of the formal reserved matters application and within NYCC suds design Guidance.

The attenuation volumes above and current drainage strategy includes an allowance **of 40%**.

3.4 Sustainable Drainage Systems

As discussed earlier in this document, infiltration-based drainage is considered unsuitable due to the nature of the ground conditions.

It is therefore proposed that non-infiltration-based SuDS solutions alongside traditional drainage measures will be employed across the site, these include:

- Filter Drains/ Strips.
- High-Capacity Drainage Channels & Road Gully's.
- Silt traps & Catchpits.
- Oil Separators.

3.5 Residual Risk and Designing for Exceedance

In the event that the capacity of the attenuation is exceeded, flood water will be retained on site within the service yards, dock levelers and car parks up to the 100 year event + 40% allowance for climate change.

Beyond this storm event exceedance will be safely directed away from buildings and allowed to leave the site where it will follow natural flow paths.

3.6 Maintenance

Requirements for ongoing maintenance of the drainage network will form part of the Operation and Maintenance manual for the site and will be undertaken by the building management. Any specialist or proprietary products that are specified at detailed design will have a manufacturer specific maintenance regime which will be included within the document.

All drainage features should be located in open areas which are accessible. All surface water arrangements outlined above are subject to detailed design.

3.7 Water Quality

The development is located within the catchment of the River Dee and Bala Lake Special Area of Conservation (SAC) and is therefore subject to Phosphorus water quality standards. The public sewer on Coed Aben Road conveys to Five Fords Waste Water Treatment Works which has capacity to treat waste water and holds a phosphate permit.

Response received from Natural Resources Wales (NRW), contained in Appendix E, discusses the requirement for on-site waste water treatment in line with requirements for phosphorus levels for all river SACs across Wales. As the proposed development is for a B2/B8 Warehouse with Offices which has domestic equivalent foul discharge, arising from toilets and domestic appliances (Office kitchens, dishwashers etc), the foul sewage can be conveyed to the Five Fords WTW for treatment. Refer to correspondence with Welsh Water in Appendix F

4 Management and Maintenance Plan

Based on Chapter 32 on the CIRIA report C753 The SuDS Manual and manufacturer recommendations a maintenance strategy has been outlined. The responsibility for maintenance will lie with the Facilities management.

System	Maintenance Type	Action	Frequency
General Drainage Systems: -Surface water drainage -Surface water Manhole -Gully -Channel train outlet -Sprinkler tank drain down position -Rain water pipe connection	Routine Maintenance	Remove debris from catchment surface – any debris entering system may cause risks to performance.	Monthly or as required by inspection.
		Inspect sediment and silt accumulation rates.	Six monthly.
		Clearing of catchpits.	Annually or as required by inspection.
		Clearing of drainage channels, gullies and their outlets.	Annually or as required by inspection.
	Remedial Actions	Repair pipework and manholes.	As required from inspection.
	Monitoring	CCTV survey of drainage system in full.	As required by inspection

Table 4 - Maintenance Frequency: General Drainage System

System	Maintenance Type	Action	Frequency
Storage Tanks *Manufacturers O&M manual maintenance requirements are to take precedent to this document	Routine maintenance	Inspect and identify any areas that are not operating correctly. If required, take remedial action	Monthly
		Remove debris from the catchment surface (where it may cause risks to performance)	Monthly
		For systems where rainfall infiltrates into the tank from above, check surface of filter for blockage by sediment, algae or other matter; remove and replace surface infiltration medium as necessary	Annually
		Remove sediment from pre-treatment structures and/or internal forebays	As required.
	Monitoring	Inspect/check all inlets, outlets, vents and overflows to ensure that they are in good condition and operating as designed	Annually
		Survey inside of tank for sediment build-up and remove if necessary	Every 5 years.
	Remedial Actions	Repair/rehabilitate inlets, outlet, overflows and vents	As required

Table 5 - Maintenance frequency: Storage Tanks

System	Maintenance Type	Action	Frequency
Full Retention Separator. *Manufacturers O&M manual maintenance requirements are to take precedent to this document	Routine maintenance	Removal of Litter and Debris and inspect for sediment, silt, oil and grease levels.	Six monthly or as required by inspection.
		Change Filter Media.	As recommended by Manufacturer.
		Remove sediment, silt, oil and grease.	As required based on inspection or following significant spill.
	Remedial Actions	Replacement of parts and/or units.	As required by inspection.
	Monitoring	Inspect for evidence of poor operation.	Six monthly.
		Inspect filter media and establish appropriate replacement frequencies based on usage and observations.	Six monthly.
		Inspect sediment and silt accumulation rates and establish appropriate replacement frequencies based on usage and observations.	Monthly during initial use until a robust replacement regime can be established.

Table 6 - Maintenance frequency: separators

5 Foul Water Management

It is proposed to install a new foul drainage system to serve the proposed development.

The foul water system will be designed and constructed in accordance with the current Building Regulations, BS EN:752 'Drainage and Sewer Systems Outside Buildings', the Local Authority Building Control specifications and requirements, Sewerage Sector Guidance (Appendix C) and the Civil Engineering Specification for the Water Industry.

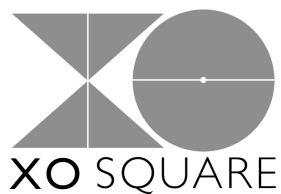
A foul water connection connects into the existing run in the road along the site which then connects into the public sewer on Coed Aben Road and conveys to Five Fords Waste Water Treatment Works.

The final connection will be subject to S104 application with Welsh water.

The proposed foul network is presented on the drainage general arrangement drawings located in **Appendix C**.

6 Summary

1. This statement and supporting appendices demonstrate that the drainage design for the development will satisfy the discharge requirements of Wrexham County Borough Council as LLFA.
2. Infiltration is considered unsuitable for the site due to the existing ground conditions.
3. On site attenuation is proposed in the form of a cellular system.
4. The site will connect foul sewerage to the public foul drainage network via an existing manhole to the east of the site.
5. The site will connect surface water to the public surface water network on Coed Aben Road.



Drainage Technical Note

VILLAGE BAKERY – WAREHOUSE B2/B8

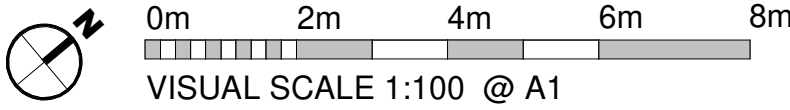
project	XOS-110
Sheet	App. A

APPENDIX A – Site Masterplan

By Department Legend

- Circulation
- Warehouse
- WC

Area Schedule (GIA)			
Level	Name	Area	
		Metric	Imperial
Level 0			
GF	GIA	2,479.80 m²	26,692 ft²
1		2,479.80 m²	26,692 ft²
Level 1			
FF	GIA	381.60 m²	4,108 ft²
1		381.60 m²	4,108 ft²



Hazard Identification

ref	hazard	date

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All dimensions are to be checked on site by the contractor prior to proceeding with any work. This drawing shall not be scaled to ascertain any dimensions, work to figured dimensions only.

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PROJECT NOTES

- Proposals or information contained on this drawing to be used for "TENDERING" purposes and **NOT** for procurement or associated construction works.
- Design information indicated on this drawing is to be used solely for **COORDINATION** purposes.
- Development proposals are to be read in conjunction with all referenced drawings and documents.
- Soft Landscaping shown is indicative, refer to Landscape Architect design for full details.
- Any proposed levels are indicative and subject to change to suit Engineered and/or determined by site conditions.

REFERENCE DRAWINGS

- AV-XX-DR-A-0101 - Site Location Plan
AV-XX-DR-A-0202 - Site Constraints Plan
AV-XX-DR-A-0501 - Site Plan as Proposed
AV-XX-DR-A-0502 - Proposed Site Surfaces & Boundary Treatments
AV-XX-DR-A-0503 - Proposed Bike Store & Cycle Store
- Refer to 20 Series For Building GA Plans
Refer to 21 Series For Building GA Elevations
Refer to 22 Series For Building GA Sections

Gross Internal Area (GIA) Requirements

1. Development proposals comprise of the following GIA accommodation. Check measurements will be recorded as listed below and as depicted on the floor plans.

Warehouse Area: dimensions taken to inside face of sheeting rails.

Office Area: dimensions taken to internal finished faces of perimeter wall linings.

2. For contractual requirements on Building Areas and schedule of minimum GIA's refer to the 'Employers Requirements' document.

3. GIA dimensions on this drawing are target values only. **Employer's Requirements** to achieve minimum GIA accommodation shall **take precedence**.

4. The contractor's designers are to provide 'Measurement Plans' for Employer approval. These shall confirm how GIA requirements will be achieved.

5. ALL dimensions indicated are subject to change during detailed design of structural steel frame and Building Envelope systems. Full coordination required with all relevant subcontractors / specialists.

P4	Coordinated design review	AM	27.04.22	SS
P3	Drawing Update	AM	19.04.22	SS
P2	Coordinated V4 Tender Issue	AR	14.03.22	SS
P1	Planning Issue (Full App)	BE	18.02.22	DC

Rev	Revision Details	Drawn	Date	Checked
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C4

Projects

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Widertop Business Park,
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Project Management • Architecture • Building Surveying • Cost Consultancy

Client
Village Bakery

Project
Village Bakery
Wrexham Industrial Estate - V4

Drawing Title
GA Plan as Proposed

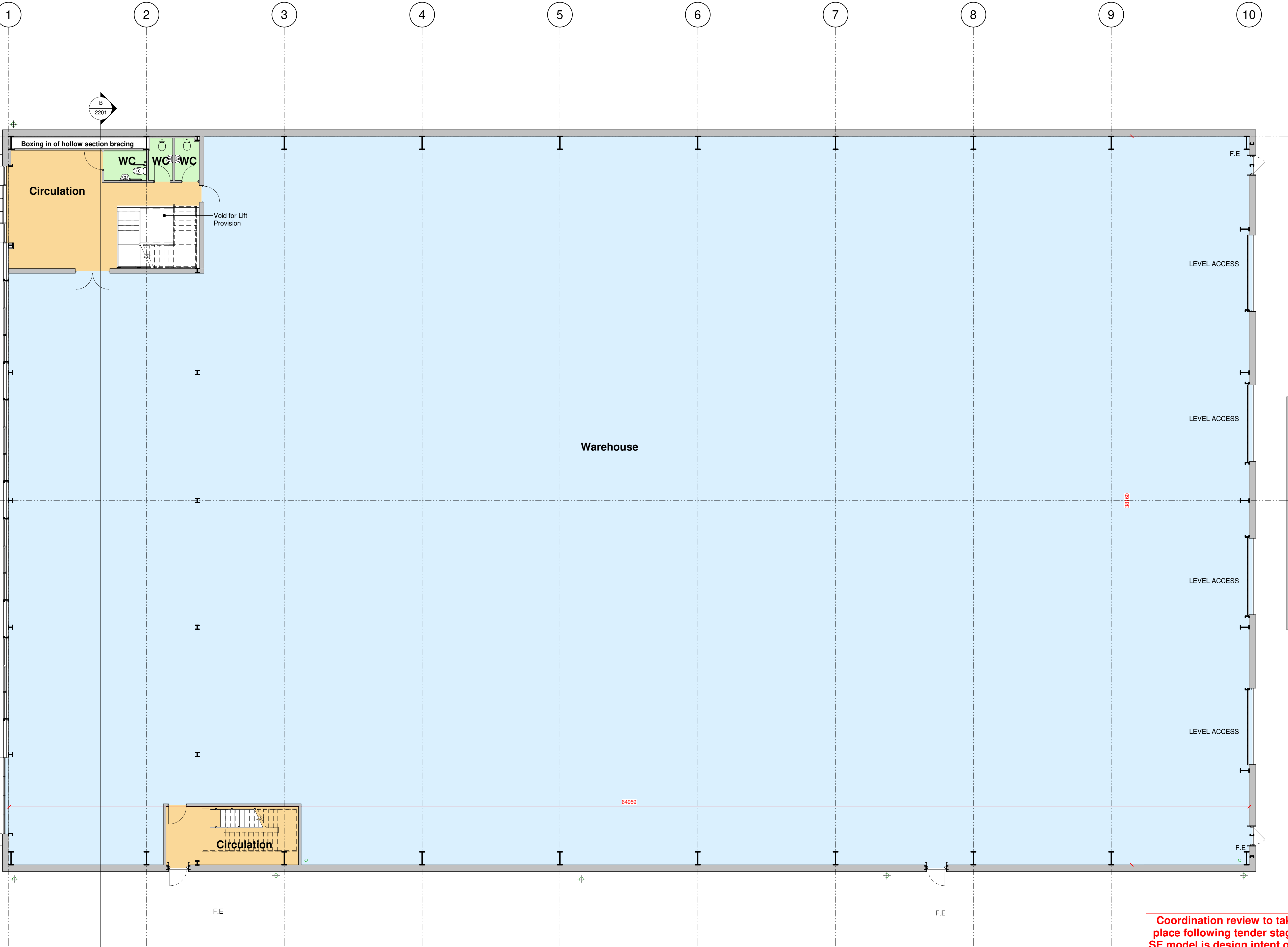
Status Purpose of Issue
S2 SUITABLE FOR INFORMATION

Drawn by BE Created 19.08.21

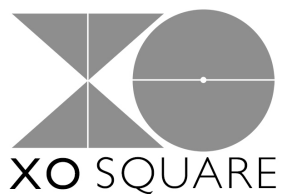
C4 Job no. 21077 Scale 1 : 100 @ A1

Dwg no.	Rev
21077-C4P-V4-00-DR-A-2001	P4

Coordination review to take place following tender stage. SE model is design intent only and requires full review by steel fabricator.



20-00_GA Plan as Proposed - Level 00
1:100



Drainage Technical Note

VILLAGE BAKERY – WAREHOUSE B2/B8

project	XOS-110
Sheet	App. B

APPENDIX B – Topographic Survey



Topographical Survey Legend

[illegible]

BENCH MARK INFORMATION

All levels relate to O.S. (Newlyn) Datum. Establishing using network RTK. Survey plotted on a plane grid, orientated to National Grid.

NOTES

ONLY MANHOLES AND SERVICES VISIBLE AT
TIME OF SURVEY SHOWN

DRAINAGE INFORMATION MUST BE CHECKED AND
VERIFIED WITH LOCAL AUTHORITY RECORDS

PRIOR TO WORK COMMENCING

Levels defining edge of carriageway are observed at channel (bottom of kerb). Unless otherwise stated.

TREE SPREADS ARE SYMBOLIC ONLY AND ARE REPRESENTATIVE OF THE THE AVERAGE SPREAD

THE DRIP LINE LAYER DENOTES THE TREES EXTR

SURVEY STATIONS

STN1	337595.764	349741.620	31
STN1A	337548.699	349755.360	31
STN2	337621.086	349786.281	32
STN3	337651.742	349840.010	32
RS1	337564.176	349760.148	31

REVISIONS

REV.	DESCRIPTION	SURVEYED	DRAWN	DATE
A	STATIONS SURVEYED WHERE POSSIBLE PLEASE NOTE MOSTLY BURIED ON SITE	NO	PSH	01.06.20

JLP Surveying

JLP Surveying Consultants Ltd,
Suite 45 Rodney House,
King Street,
Wigan
WN1 1BT
Tel - 01942 243313
Fax - 01942 492230
Mobile - 07710 428498
EMAIL:- peterhouston@jlp.co.uk

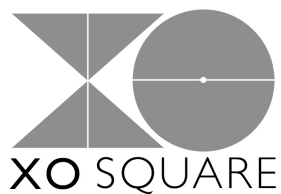
PROJECT
WREXHAM INDUSTRIAL ESTATE

DRAWING TITLE

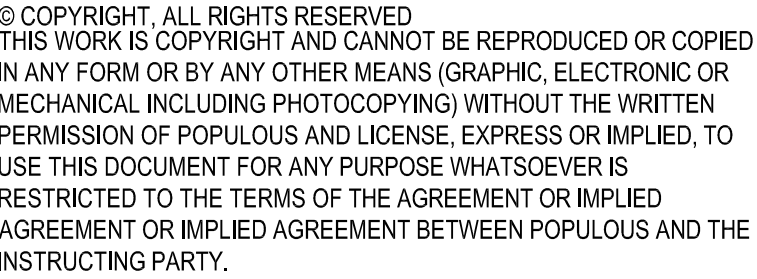
Topographical Land Survey

SCALE	SHEET SIZE	No. of SHEETS	DATE	REVISION
1:200	A0	1	19.05.2021	A

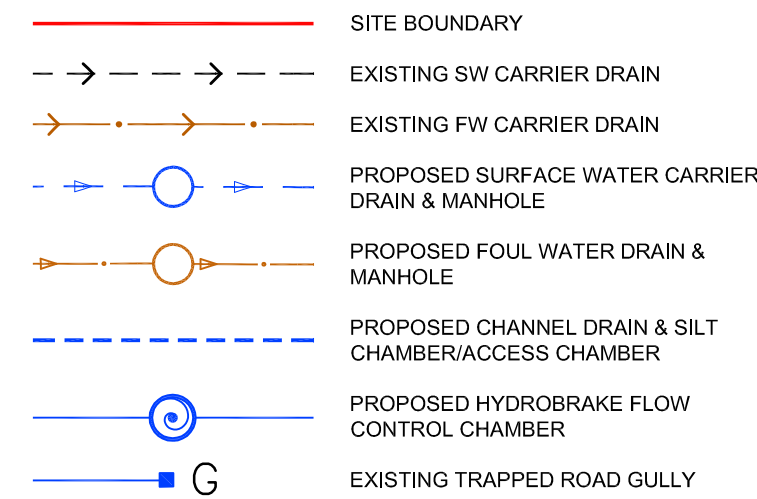
S21-468



APPENDIX C – Drainage General Arrangements



LEGEND



GENERAL NOTES

1. DO NOT SCALE.
 2. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL OTHER RELEVANT DRAWINGS.
 3. SHOULD THERE BE ANY DISCREPANCY BETWEEN DETAILS INDICATED ON THIS DRAWING AND THOSE INDICATED ON OTHER DRAWINGS THE ENGINEER SHOULD BE INFORMED PRIOR TO CONSTRUCTION ON SITE.
 4. UNTIL TECHNICAL APPROVAL HAS BEEN OBTAINED FROM THE RELEVANT AUTHORITIES IT SHOULD BE UNDERSTOOD THAT ALL DRAWINGS ISSUED ARE PRELIMINARY AND NOT FOR CONSTRUCTION. SHOULD THE CONTRACTOR START SITE WORK PRIOR TO APPROVAL BEING GIVEN, IT IS ENTIRELY AT HIS OWN RISK.
 5. ALL DIMENSIONS SHOWN ARE IN MILLIMETRES UNLESS NOTED OTHERWISE.
 6. ALL SURVEY INFORMATION IS PROVIDED BY THE SURVEYING COMPANY AND XSQUARE LIMITED CANNOT ACCEPT ANY LIABILITY FOR ANY DISCREPANCIES THEREIN. ALL SURVEY INFORMATION TO BE VERIFIED ON SITE BY CONTRACTOR. SHOULD DISCREPANCIES BE IDENTIFIED, XSQUARE LIMITED TO BE NOTIFIED IMMEDIATELY.
 7. POSITION AND NUMBER OF PROPOSED SPHONIC RWP'S IS INDICATIVE ONLY AND SUBJECT TO DETAILED DESIGN BY OTHERS
 8. POSITION AND NUMBER OF ALL FOUL WATER POP-UPS IS TO BE CONFIRMED BY THE ARCHITECT/ MEP ENGINEER.
 9. ALL MANHOLE/ INSPECTION CHAMBERS IN SERVICE VEDS TO BE FITTED WITH E600 SCORPION SERIES CAST IRON COVERS BY EJ GROUP OR EQUIVALENT APPROVED. 150mm FRAME DEPTH. 600x600mm CLEAR OPENING.
 10. ALL MANHOLE/ INSPECTION CHAMBERS ON OTHER TRAFFICKED AREAS TO BE FITTED WITH D400 SCORPION SERIES CAST IRON ACCESS COVERS BY EJ GROUP OR EQUIVALENT APPROVED. 100mm FRAME DEPTH. 600x600 CLEAR OPENING.
 11. ACO OMAX CHANNEL TO BE FITTED WITH Q-FLOW DUCTILE IRON EDGE RAIL (32801). ACCESS & SILT CHAMBER TO BE FITTED WITH 6000 DUCTILE IRON SOLD COVER & FRAME (44317).
- SURFACE WATER DRAINAGE DESIGN HAS BEEN DEVELOPED ON THE BASIS OF THE EXISTING DESIGN OF:
- $Q_{max} = 7 \text{ l/s}$
12. ATTENUATION VOLUMES INCLUDE A CLIMATE CHANGE ALLOWANCE OF 40% IN ACCORDANCE WITH WREXHAM COUNTY COUNCIL SUDS GUIDANCE.
 13. NO ALLOWANCE HAS BEEN INCLUDED FOR URBAN CREEP BASED ON THE TYPE OF DEVELOPMENT. TO BE AGREED WITH THE LPA.
 14. REFER TO DRAINAGE STRATEGY BY ADS Structural Refr 6595-ADS-XXX-XX-RP-S500.

T3	08.03.22	JKF	FOUL MANHOLE F1.2 UPDATED TO OMIT WATER TREATMENT PLANT.
T2	08.03.22	MW	TENDER ISSUE
T1	21.02.22	MW	FIRST TENDER ISSUE
Rev	Date	By	Description

REVISIONS



Client

VILLAGE BAKERY

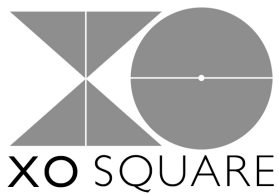
Project Name

VILLAGE BAKERY

Drawing Title

PROPOSED DRAINAGE LAYOUT

Drawing Status				Project No			
TENDER				XOS-110			
Drawn	Approved		Scale		First Issue		Size
MW	EP		1:300		20.02.2022		A1
JOB No.	COMPANY	ZONE	LEVEL	TYPE	ROLE	DRAWING No.	REVISION
154	XOS	XX	XX	DR	C	5570	T3



APPENDIX D – Microdrainage Calculations

Project:	Date: 07/03/2022			
	Designed by:	Checked by:	Approved By:	
Report Title: Rainfall Analysis Criteria	User			
Company Address:				

Runoff Type	Dynamic
Output Interval (mins)	1
Time Step	Default
Urban Creep	Apply Global Value
Urban Creep Global Value (%)	0
Junction Flood Risk Margin (mm)	0
Perform No Discharge Analysis	☐

Rainfall

FSR 1 in 100 + 40% CC Type: FSR

Region	England and Wales
M5-60 (mm)	18.0
Ratio R	0.324
Summer	☒
Winter	☒

Return Period

Return Period (years)	Increase Rainfall (%)
100.0	40

Storm Durations

Duration (mins)	Run Time (mins)
15	30
30	60
60	120
120	240
240	480
360	720
480	960
960	1920
1440	2880

Project:	Date: 07/03/2022			
	Designed by:	Checked by:	Approved By:	
Report Title: Rainfall Analysis Criteria	User			
			Company Address:	

FSR 1 in 1	Type: FSR
------------	-----------

Region	England and Wales
M5-60 (mm)	18.0
Ratio R	0.321
Summer	☒
Winter	☒

Return Period

Return Period (years)	Increase Rainfall (%)
1.0	0

Storm Durations

Duration (mins)	Run Time (mins)
15	30
30	60
60	120
120	240
240	480
360	720
480	960
960	1920
1440	2880

FSR 1 in 30	Type: FSR
-------------	-----------

Region	England and Wales
M5-60 (mm)	18.0
Ratio R	0.324
Summer	☒
Winter	☒

Return Period

Return Period (years)	Increase Rainfall (%)
30.0	0

Storm Durations

Duration (mins)	Run Time (mins)
15	30
30	60
60	120
120	240
240	480
360	720
480	960
960	1920
1440	2880

Project:	Date: 07/03/2022		
	Designed by:	Checked by:	Approved By:
	User		
Report Details: Type: Junctions Summary Storm Phase: Phase		Company Address:	



FSR 1 in 100 + 40% CC: 100 years: Increase Rainfall (%): +40: Critical Storm Per Item

Junction	Storm Event	Cover Level (m)	Invert Level (m)	Max. Level (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Status
S1.1	FSR 1 in 100 + 40% CC: 100 years: +40 %: 15 mins: Winter	32.06 3	31.00 0	31.842	0.842	80.8	0.238	0.000	78.0	37.281	Surcharged
EX. SW1	FSR 1 in 100 + 40% CC: 100 years: +40 %: 480 mins: Winter	31.99 6	30.72 1	31.660	0.939	23.5	1.062	0.000	24.8	185.469	Surcharged
EX. SW3	FSR 1 in 100 + 40% CC: 100 years: +40 %: 480 mins: Winter	31.61 2	30.40 0	31.660	1.260	53.4	49.365	47.994	24.6	280.053	Flood
Ex. Interceptor	FSR 1 in 100 + 40% CC: 100 years: +40 %: 960 mins: Winter	31.80 0	30.30 0	31.696	1.396	86.3	1.579	0.000	48.8	472.012	Surcharged
S1.4	FSR 1 in 100 + 40% CC: 100 years: +40 %: 480 mins: Winter	32.19 2	31.40 0	31.690	0.290	10.8	0.082	0.000	14.5	133.247	Surcharged
S1.3	FSR 1 in 100 + 40% CC: 100 years: +40 %: 960 mins: Winter	32.20 2	31.27 5	31.684	0.409	26.6	0.462	0.000	21.7	316.103	Surcharged
S1.2	FSR 1 in 100 + 40% CC: 100 years: +40 %: 15 mins: Winter	32.15 6	31.55 0	32.051	0.501	65.0	0.142	0.000	63.4	30.025	Surcharged
HB1	FSR 1 in 100 + 40% CC: 100 years: +40 %: 960 mins: Winter	32.00 0	30.08 5	31.709	1.624	24.5	1.836	0.000	6.5	507.341	OK
EX. SW2	FSR 1 in 100 + 40% CC: 100 years: +40 %: 480 mins: Winter	31.86 3	30.60 0	31.660	1.060	92.3	1.199	0.000	20.8	240.970	Surcharged

Project:	Date: 07/03/2022		
	Designed by: User	Checked by:	Approved By:
Report Details: Type: Junctions Summary Storm Phase: Phase	Company Address:		



FSR 1 in 1: 1 years: Increase Rainfall (%): +0: Critical Storm Per Item

Junction	Storm Event	Cover Level (m)	Invert Level (m)	Max. Level (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Status
S1.1	FSR 1 in 1: 1 years: +0 %: 15 mins: Winter	32.06 3	31.00 0	31.092	0.092	18.3	0.026	0.000	18.1	8.439	OK
EX. SW1	FSR 1 in 1: 1 years: +0 %: 15 mins: Winter	31.99 6	30.72 1	30.863	0.142	27.1	0.160	0.000	26.5	12.585	OK
EX. SW3	FSR 1 in 1: 1 years: +0 %: 15 mins: Winter	31.61 2	30.40 0	30.517	0.117	34.1	0.132	0.000	33.7	16.323	OK
Ex. Interceptor	FSR 1 in 1: 1 years: +0 %: 15 mins: Winter	31.80 0	30.30 0	30.410	0.110	45.3	0.124	0.000	45.2	22.000	OK
S1.4	FSR 1 in 1: 1 years: +0 %: 15 mins: Winter	32.19 2	31.40 0	31.477	0.077	18.5	0.022	0.000	18.4	8.528	OK
S1.3	FSR 1 in 1: 1 years: +0 %: 15 mins: Winter	32.20 2	31.27 5	31.331	0.056	32.9	0.063	0.000	32.9	15.310	OK
S1.2	FSR 1 in 1: 1 years: +0 %: 15 mins: Winter	32.15 6	31.55 0	31.642	0.092	14.7	0.026	0.000	14.5	6.780	OK
HB1	FSR 1 in 1: 1 years: +0 %: 240 mins: Winter	32.00 0	30.08 5	30.328	0.243	5.6	0.275	0.000	5.5	99.107	OK
EX. SW2	FSR 1 in 1: 1 years: +0 %: 15 mins: Winter	31.86 3	30.60 0	30.727	0.127	34.3	0.144	0.000	34.1	16.376	OK

Project:	Date: 07/03/2022		
	Designed by: User	Checked by:	Approved By:
Report Details: Type: Junctions Summary Storm Phase: Phase	Company Address:		



FSR 1 in 30: 30 years: Increase Rainfall (%): +0: Critical Storm Per Item

Junction	Storm Event	Cover Level (m)	Invert Level (m)	Max. Level (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Status
S1.1	FSR 1 in 30: 30 years: +0 %: 15 mins: Winter	32.06 3	31.00 0	31.171	0.171	44.8	0.049	0.000	44.2	20.670	OK
EX. SW1	FSR 1 in 30: 30 years: +0 %: 15 mins: Winter	31.99 6	30.72 1	30.963	0.242	66.3	0.273	0.000	64.8	30.865	OK
EX. SW3	FSR 1 in 30: 30 years: +0 %: 360 mins: Winter	31.61 2	30.40 0	30.649	0.249	14.2	0.281	0.000	14.3	121.229	OK
Ex. Interceptor	FSR 1 in 30: 30 years: +0 %: 360 mins: Winter	31.80 0	30.30 0	30.648	0.348	19.3	0.394	0.000	19.2	162.392	OK
S1.4	FSR 1 in 30: 30 years: +0 %: 15 mins: Winter	32.19 2	31.40 0	31.532	0.132	45.3	0.037	0.000	45.2	20.914	OK
S1.3	FSR 1 in 30: 30 years: +0 %: 15 mins: Winter	32.20 2	31.27 5	31.368	0.093	80.8	0.106	0.000	80.6	37.548	OK
S1.2	FSR 1 in 30: 30 years: +0 %: 15 mins: Winter	32.15 6	31.55 0	31.708	0.158	36.0	0.045	0.000	35.6	16.631	OK
HB1	FSR 1 in 30: 30 years: +0 %: 360 mins: Winter	32.00 0	30.08 5	30.648	0.563	5.8	0.637	0.000	5.6	145.946	OK
EX. SW2	FSR 1 in 30: 30 years: +0 %: 15 mins: Winter	31.86 3	30.60 0	30.816	0.216	84.3	0.245	0.000	84.7	40.227	OK

Project:	Date: 07/03/2022		
	Designed by: User	Checked by:	Approved By:
Report Details: Type: Stormwater Controls Summary Storm Phase: Phase	Company Address:		



FSR 1 in 100 + 40% CC: 100 years: Increase Rainfall (%): +40: Critical Storm Per Item

Stormwater Control	Storm Event	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Residual Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Percentage Available (%)	Status
Cellular Storage	FSR 1 in 100 + 40% CC: 100 years: +40 %: 360 mins: Winter	31.796	31.796	1.621	1.621	57.4	342.929	0.000	0.000	17.5	255.084	0	OK

Project:	Date: 07/03/2022		
	Designed by: User	Checked by:	Approved By:
Report Details: Type: Stormwater Controls Summary Storm Phase: Phase		Company Address:	




FSR 1 in 1: 1 years: Increase Rainfall (%): +0: Critical Storm Per Item

Stormwater Control	Storm Event	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Residual Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Percentage Available (%)	Status
Cellular Storage	FSR 1 in 1: 1 years: +0 %: 240 mins: Winter	30.330	30.330	0.155	0.155	19.2	66.324	0.000	0.000	5.6	99.249	81	OK

Project:	Date: 07/03/2022		
	Designed by: User	Checked by:	Approved By:
Report Details: Type: Stormwater Controls Summary Storm Phase: Phase	Company Address:		

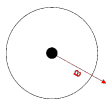
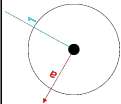
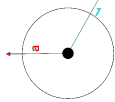
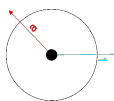
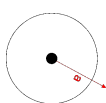


FSR 1 in 30: 30 years: Increase Rainfall (%): +0: Critical Storm Per Item

Stormwater Control	Storm Event	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Residual Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Percentage Available (%)	Status
Cellular Storage	FSR 1 in 30: 30 years: +0 %: 360 mins: Winter	30.648	30.648	0.473	0.473	32.5	202.413	0.000	0.000	5.8	147.674	41	OK

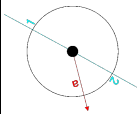
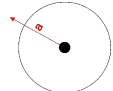
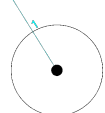
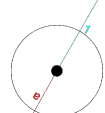
Project:	Date: 07/03/2022		
	Designed by: User	Checked by:	Approved By:
Report Details: Manhole Schedule Phase: Phase		Company Address:	

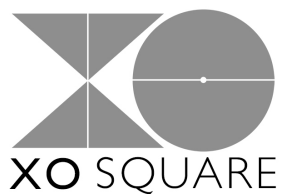


Name	Cover Level (m) Invert Level (m)	Manhole Schematic	Manhole Size (m)	Connection Details				Type
Coordinates (m)	Depth (m)			Incoming Connections	Connection Type	Connection Invert (m)	Connection Size (mm)	Junction Type
				Outgoing Connections				Cover
S1.1	32.063 31.000		Diameter / Length: 0.600					Manhole - Access not Required
E:337614.191 N:349835.920	1.063			{a} S1.000	Pipe	31.000	Diam/Width:225	Not Applicable
EX. SW1	31.996 30.721		Diameter / Length: 1.200	{1} S1.000	Pipe	30.721	Diam/Width:225	Manhole - Access not Required
E:337638.528 N:349822.362	1.275			{a} S1.001	Pipe	30.721	Diam/Width:375	Not Applicable
EX. SW3	31.612 30.400		Diameter / Length: 1.200	{1} S1.002	Pipe	30.400	Diam/Width:375	Manhole - Access not Required
E:337593.550 N:349743.038	1.212			{a} S1.003	Pipe	30.400	Diam/Width:375	Not Applicable
Interceptor	31.800 30.300		Diameter / Length: 1.200	{1} S1.003	Pipe	30.300	Diam/Width:375	Manhole - Access Required
E:337582.564 N:349742.912	1.500			{a} S1.004	Pipe	30.300	Diam/Width:375	Not Applicable
S1.4	32.192 31.400		Diameter / Length: 0.600					Manhole - Access not Required
E:337558.794 N:349774.631	0.792			{a} S2.000	Pipe	31.400	Diam/Width:225	Not Applicable

Project:	Date: 07/03/2022		
	Designed by: User	Checked by:	Approved By:
Report Details: Manhole Schedule Phase: Phase	Company Address:		



Name	Cover Level (m) Invert Level (m)	Manhole Schematic	Manhole Size (m)	Connection Details				Type
Coordinates (m)	Depth (m)			Incoming Connections	Connection Type	Connection Invert (m)	Connection Size (mm)	Junction Type
				Outgoing Connections				Cover
S1.3	32.202 31.275		Diameter / Length: 1.200	{1} S2.000	Pipe	31.275	Diam/Width:225	Manhole - Access Required
E:337561.836 N:349772.970	0.927			{2} S3.000	Pipe	31.275	Diam/Width:225	
				{a} S2.001	Pipe	31.275	Diam/Width:225	Not Applicable
S1.2	32.156 31.550		Diameter / Length: 0.600					Manhole - Access not Required
E:337591.654 N:349756.231	0.606			{a} S3.000	Pipe	31.550	Diam/Width:225	Not Applicable
HB1	32.000 30.085		Diameter / Length: 1.200	{1} S1.005	Pipe	30.085	Diam/Width:300	Manhole - Access Required
E:337578.982 N:349738.368	1.915							Not Applicable
EX. SW2	31.863 30.600		Diameter / Length: 1.200	{1} S1.001	Pipe	30.600	Diam/Width:375	Manhole - Access not Required
E:337611.312 N:349774.819	1.263			{a} S1.002	Pipe	30.600	Diam/Width:375	Not Applicable



Drainage Technical Note

VILLAGE BAKERY – WAREHOUSE B2/B8

project	XOS-110
Sheet	App. E

APPENDIX E – Correspondence from Natural Resources Wales (NRW)

Maes Y Ffynnon,
Penrhosgarnedd,
Bangor,
Gwynedd
LL572DW

Wrexham County Borough Council,
The Guildhall,
Wrexham,
LL11 1AY

ebost/email:
northplanning@cyfoethnaturiolcymru.gov.uk

30/03/2022

Annwyl Syr/Madam / Dear Sir/Madam,

BWRIAD / PROPOSAL: ERECTION OF INDUSTRIAL UNIT (CLASS B2)

LLEOLIAD / LOCATION: VILLAGE BAKERY LTD, COED ABEN ROAD, WREXHAM INDUSTRIAL ESTATE, WREXHAM, LL13 9UH

Thank you for re-consulting Cyfoeth Naturiol Cymru / Natural Resources Wales about the above, which we received on 10/03/2021.

We have concerns with the application as submitted because inadequate information has been provided in support of the proposal. To overcome these concerns, you should seek further information from the applicant regarding foul drainage. If this information is not provided, we would object to this planning application. Further details are provided below.

Foul Drainage

As stated in our previous response letter dated 06/01/2022 (our ref: CAS-177976-H5F5), we note the application site is within the catchment of the River Dee and Bala Lake Special Area of Conservation (SAC). As you are aware, on the 21st January 2021, we published an evidence package outlining phosphorus levels for all river SACs across Wales. As part of this package, we issued a [Planning Position Statement](#), in which we advised that any proposed development that might increase the amount of phosphate (or phosphorus) within a river SAC catchment could lead to damaging effects to the SAC. Therefore, such proposals should be screened through a Habitats Regulations Assessment (HRA), to determine whether they are likely to have a significant effect on the SAC. We have also issued [Planning Advice](#) (May 2021) which gives specific advice in respect of foul drainage arrangements for new developments.

This application for the erection of an industrial unit proposes connection of foul water to the mains sewer. As such, we refer you to our [Planning Advice](#), in particular the bullet point list given in the section titled 'What does this mean for development proposals involving connection to public wastewater treatment works', which specifies the information that

should be provided to support applications which propose connections to public wastewater treatment works.

With regards to the third bullet point, we note from the information in the letter from Dŵr Cymru, dated 14/03/2023 that Five Fords Wastewater Treatment Works does have capacity to treat additional waste water and holds a phosphate permit.

We note that the Drainage Technical Note (154-XOS-XX-XX-RP-C-5000, March 2022) proposed to treat phosphates that are discharged from this site prior to connecting to the foul mains, via a *Kingspan* foul water treatment plant. The development is within a sewered area and as such, should connect directly to the mains.

Whilst various suggested mitigation options might be appropriate in principle, the applicant will need to provide your Authority with details of the mitigation option that is intended for delivery, evidence that the option can be delivered and finally the analysis showing that it will achieve neutrality with regards phosphorus loading in the SAC (or evidence that any residual phosphorus discharge will not result in adverse effect on site integrity).

Your Authority will need to take the above into account in your determination of whether the development is likely to have a significant effect on the SAC. Should you determine that an Appropriate Assessment is required, the Applicant will then need to submit whatever evidence they deem appropriate (seeking advice from consultants as necessary) to demonstrate no adverse effect on site integrity. You should then consult us on your Appropriate Assessment under Regulation 63 of the Conservation of Habitats and Species Regulations 2017 (as amended).

With regards to pre-treatment (chemical dosing) via a package treatment plant before connection to mains, there are a number of matters to consider.

- What is the proposed chemical? What is the risk to the environment, for example, how will the chemical react in the receiving watercourse?
- Dosing the system in the correct way based on the number of people.
- Having an appropriate management system over the lifetime of the development.
- Measures to ensure there are no spills.
- Can neutrality be achieved with regards to phosphorus loading in the Special Area of Conservation (SAC) and guaranteed over the lifetime of development? If neutrality is not possible, analysis will be required to demonstrate what effect the phosphorus discharge would have on the SAC.

Advice would also need to be sought from Dŵr Cymru Welsh Water on whether they are satisfied with such a proposal. Their advice should also be sought on what impact the chemical dosing would have on their final effluent discharge / permit compliance etc.

European Protected Species (EPS)

We note that the protected species report submitted in support of the above application (Indigo Surveys, November 2021. Ref 21819) states that the application site offered negligible value habitat

for any EPS. We therefore have no comments to make on the application as submitted and advise that you liaise with your Authority's internal ecologist.

Other Matters

Our comments above only relate specifically to matters included on our checklist, *Development Planning Advisory Service: Consultation Topics* (September 2018), which is published on our [website](#). We have not considered potential effects on other matters and do not rule out the potential for the proposed development to affect other interests.

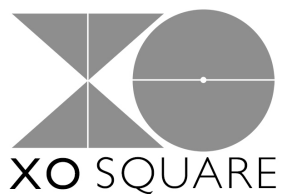
We advise the applicant that, in addition to planning permission, it is their responsibility to ensure they secure all other permits/consents/licences relevant to their development. Please refer to our [website](#) for further details.

If you have any queries on the above, please do not hesitate to contact us.

Yn gywir / Yours faithfully

Garmon Lewis

Cynghorydd - Cynllunio Datblygu / Advisor - Development Planning
Cyfoeth Naturiol Cymru / Natural Resources Wales



APPENDIX F – Email Correspondence Welsh Water

Elton Parry

From: Elton Parry
Sent: 17 May 2022 17:21
To: Jake MacMillan
Cc: David Cunningham; Steven Shaw; Mark Walsh; Umar Malik
Subject: RE: Village Bakery Ltd, Coed Aben Road, LL13 9UH
Attachments: 21077-C4P-V4-00-DR-A-2001_P5_GA Plan as proposed Ground Floor.pdf; 21077-C4P-V4-XX-DR-A-2002_P3_GA Plan as proposed First Floor.pdf; XOS-154_CALC_FOUL DISCHARGE RATES.pdf; P-2021-1189 V2.pdf

Hi Jake

Thank you for returning my call.

To confirm the development is a B2/B8 Speculative development and is likely to be let as a distribution/storage unit, it is not an extension to the Village Bakery production facility.

I have attached the Architectural Plans and our calculation of foul discharge rates. Essentially, we are connecting up domestic facilities for the offices which are toilets, hand basins, kitchen sinks, dishwashers and have provided an allowance of future provision for an additional office floor level at Second Floor and showers. The calculated discharge from appliances is **0.61 l/s**.

As our development site is located within the River Dee and Bala Lake Special Area of Conservation please can you provide comment with regard to any requirement for on site phosphorus treatment. As we understand it, our development will be discharging domestic equivalent foul from the offices which will be treated off site at Five Fords Waste Water Treatment Works, via a direct mains connection.

We also attach the consultee response from Garmon Lewis at Natural Resources Wales, dated 30th March 2022.

Look forward to hearing from you.

Kind Regards

Elton Parry
Director

M: 07951 347 593



XOsquare Limited Consulting Engineers
54 Oak Street, Manchester M4 5JA
www.XOsquare.co.uk

From: Jake MacMillan <Jake.MacMillan@dwrcymru.com>
Sent: 17 May 2022 13:39

To: Elton Parry <elton@xosquare.co.uk>
Subject: Village Bakery Ltd, Coed Aben Road, LL13 9UH

Hi Elton,

Good to talk earlier, please let me know the proposal of the above site and I will have a look into the sewerage network for you.

Best regards,



Jake MacMillan
Development Control Officer | Developer Services
Dŵr Cymru Welsh Water

 T: 0800 917 2652 | E: 45xxx | M: 07557860559

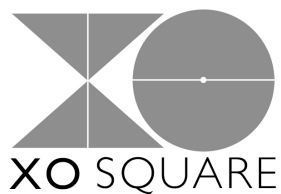
 A: PO Box 3146, Cardiff, CF30 0EH

 W: dwrcymru.com

 E: developer.services@dwrcymru.com

Dwr Cymru Welsh Water is firmly committed to water conservation and promoting water efficiency. Please log on to our website www.dwrcymru.com/waterefficiency to find out how you can become water wise. Mae Dwr Cymru Welsh Water wedi ymrwymo i warchod adnoddau dwr a hyrwyddo defnydd dwr effeithiol. Mae cyngor i' ch helpu i ddefnyddio dwr yn ddoeth yn www.dwrcymru.com/waterefficiency

***** This email and any file attached is confidential. If you are not a named recipient or believe you may have received this email in error please delete from your system and promptly inform the sender. Dwr Cymru Cyf (trading as Welsh Water) is a company registered in England and Wales, number 02366777, registered office Linea, Fortran Road, St Mellons, Cardiff CF3 0LT. Mae’r neges e-bost yma ac unrhyw ffeil sydd ynghlwm wrthi'n gyfrinachol. Os nad chi yw’r derbynnydd a enwir, neu os ydych chi’n credu eich bod wedi derbyn y neges yma ar gam, dylech ei dileu o’ch system ar unwaith a hysbysu’r anfonwr. Cwmni sydd wedi ei gofrestru yng Nghymru yw Dŵr Cymru Cyf (yn masnachu fel Dŵr Cymru), ei rif cofrestredig yw 02366777, ,, ac mae ei swyddfa gofrestredig yn Linea, Heol Fortran, Llaneirwg, Caerdydd, CF3 0LT.



Drainage Technical Note

VILLAGE BAKERY – WAREHOUSE B2/B8

project	XOS-110
Sheet	App. G

APPENDIX G – Foul Discharge Calculation



LOCATION

Village Bakery Ltd, Coed Aben Road, LL13 9UH
B2/B8 Speculative Development

Made by : MW

Date : 01 April 2022

Checked by : UM

Date : 01 April 2022

XOS-154

Foul Discharge Rates

Information

Project No :

Title :

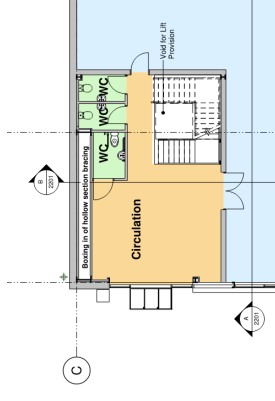
Revision:

Appliances in each unit

Unit 1 B2/B8 Warehouse + Offices

Toilets	9
Kitchen Sinks	2
Drinking fountain	7
Showers	2
Dishwasher	2
Basins	9

Ground floor



First Floor



Future Provision - Second Floor (As First)



APPLIANCE	Discharge Units ^{1/2} (du/l/s)	Number of appliances ^{1/}	Total of du's (l/s)
Toilet Bowl with flushing box	2	9	18
Basin	0.5	9	4.5
Bath	0.8	0	0
Shower Tray	0.6	2	1.2
Kitchen Sink	0.8	2	1.6
Urinal	0.5	0	0
Washing Machine	1.5	0	0
Dishwasher	0.8	2	1.6
Floor Gully	1.5	0	0
Bidet	0.5	0	0
Drinking fountain	0.05	7	0.35
Sprinkling tap	0.3	0	0

(ΣDu) total load (du-l/s) for this location	27.25
---	-------

Total waste flow rate based on equation $(l/s) (Q_{ww}) = K (\sqrt{du's})$	3.65
Any pumped waste discharge $(l/s) (Q_p)$	0.00
Any continuous discharge (e.g. condensate etc) $(l/s) (Q_c)$	0.00
Peak design flow rate for stack/location $(Q_{tot}) (l/s)$	3.65

Average flow (l/s)	0.61
----------------------	------

*average flow rates dependant upon fitting usage and building operation hours

Frequency of use factors (k)	
Intermittent use- e.g. domestic/guesthouse/office	0.50
Frequent use- e.g. Restaurant/Office	0.70
Congested use- e.g. Public use	1.00
Special use- e.g. laboratory	1.20

Enter Frequency of use factor (from above)	0.70
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Designers notes :

- 1) Wastewater discharge units in accordance with BS EN 12056-2:2000 table 2
- 2) The calculations are based on the following Architectural planning drawings:

- a. 21077-C4P-V4-00-DR-A-2001 Rev P5 GA Plan as proposed Ground Floor
- b. 21077-C4P-V4-XX-DR-A-2002 Rev P3 GA Plan as proposed First Floor