



Ty Mawr Pontardawe Drainage Strategy

For Pobl Group

Date: 12 May 2022

Doc ref: TMP-HYD-XX-XX-RP-C-0001

DOCUMENT CONTROL SHEET

Issued by	Hydrock Consultants Limited Castlebridge 5 5-19 Cowbridge Road East Cardiff CF11 9AB United Kingdom	T +44 (0)2920 023 665 E cardiff@hydrock.com www.hydrock.com
Client	Pobl Group	
Project name	Ty Mawr Pontardawe	
Title	Drainage Strategy	
Doc ref	TMP-HYD-XX-XX-RP-C-0001	
Project no.	C-19531	
Status	FOR INFORMATION	
Date	12/05/2022	

Document Production Record		
Issue Number	P01	Name
Prepared by	Jessica Li - Engineer	
Checked by	Chris Stone - Principal Engineer	
Approved by	Chris Stone - Principal Engineer	

Document Revision Record			
Issue Number	Status	Date	Revision Details
P01	For Information	12/05/2022	First Issue

Hydrock Consultants Limited has prepared this report in accordance with the instructions of the above named client for their sole and specific use. Any third parties who may use the information contained herein do so at their own risk.

CONTENTS

INTRODUCTION	1
EXISTING SITE	2
1. SITE LOCATION	2
2. SITE DESCRIPTION	2
3. EXISTING DRAINAGE ARRANGEMENTS	3
4. EXISTING CONTRIBUTING AREAS AND RUN-OFF RATES.....	4
PROPOSED DEVELOPMENT	5
5. DEVELOPMENT PROPOSALS.....	5
6. FOUL DRAINAGE	5
7. SURFACE WATER.....	5
7.1 S1 – Surface Water Runoff Destination.....	6
7.2 S2 – Surface Water Runoff Hydraulic Control	7
7.3 S3 – Water Quality	9
7.4 S4 – Amenity	10
7.5 S5 – Biodiversity	10
7.6 S6 – Design of Drainage for Construction and Maintenance and Structural Integrity	11
CONCLUSION	12
8. FOUL DRAINAGE	12
9. SURFACE WATER DRAINAGE.....	12

Tables

Table 1: Greenfield Run-off Rates by Return Period	4
Table 2: Peak Discharge Rate for 30min Rainfall Event	4
Table 3: Discharge Summary for 30min Rainfall Event	7
Table 4: Development Storage Summary.....	8

Figures

Figure 1 - Site Location Plan	2
Figure 2 - Extract of DCWW Record Plan	3

Appendices

Appendix A	Site Plans
Appendix B	Runoff Calculations
Appendix C	Storage Calculations
Appendix D	DCWW Pre-app Response

Introduction

Hydrock have been commissioned by Pobl Group to provide a drainage strategy report and preliminary design for the proposed Ty Mawr Pontardawe development at 10 Ty Mawr, Pontardawe, Swansea.

It is our understanding that the client is seeking to redevelop the current brownfield site and that this report is required to support the planning application and SAB pre-application submissions.

The objectives of the report are to;

- Review the existing drainage arrangements on site for both surface and foul water;
- Assess the feasibility of Sustainable Drainage Systems (SuDS) features within the development to control and discharge surface water runoff to comply with the requirements of the Welsh Government statutory "Sustainable Drainage Systems Standards for Wales" (SDSSW) document 2018;
- Assess the options for the disposal of foul water from the development; and
- Provide a preliminary design for surface water (SuDS) systems including indicative sizing of storage/attenuation features and conceptual plan suitable for inclusion in a pre-application submission to the local authority's SuDS Approval Body (SAB).

The following tasks will be undertaken to complete this report;

- Undertake a desktop investigation of the site's existing foul and surface water drainage arrangements;
- Outline anticipated solutions for foul sewage disposal and surface water disposal. This will include preliminary calculations, in order that the conceptual designs may be agreed with the relevant authorities. In preparing the surface water drainage strategy, we will consider inundation of the floodplain and assess flood levels in the location of attenuation features;
- Determine the area of impermeable surfaces that will be added by the proposed development and estimate the equivalent greenfield and brownfield run-off rates for this area;
- Assess the feasibility of using infiltration as a disposal method, based on soakaway test results or any other available information on ground and site conditions;
- Provide general information on the maintenance and adoption of SuDS via the SAB's approval process; and
- Give consideration to drainage exceedance. In particular, use topographic information to identify overland flow paths and areas susceptible to surface water ponding.

A number of sources have been used to compile this drainage strategy. Whilst Hydrock believe them to be trustworthy we are unable to guarantee the accuracy of the information that has been provided by others.

This report is based on information available at the time of preparation. Consequently, there is potential for further information to become available. These changes may lead to future alteration to the conclusions drawn in this report for which Hydrock cannot be held responsible.

Existing Site

1. SITE LOCATION

Figure 1 indicates the site location within the red circle, which is located on 10 Ty Mawr, Pontardawe, Swansea, SA8 4EG (Approximate Grid Reference X-272271, Y-203647). © [OpenStreetMap](#) contributors.

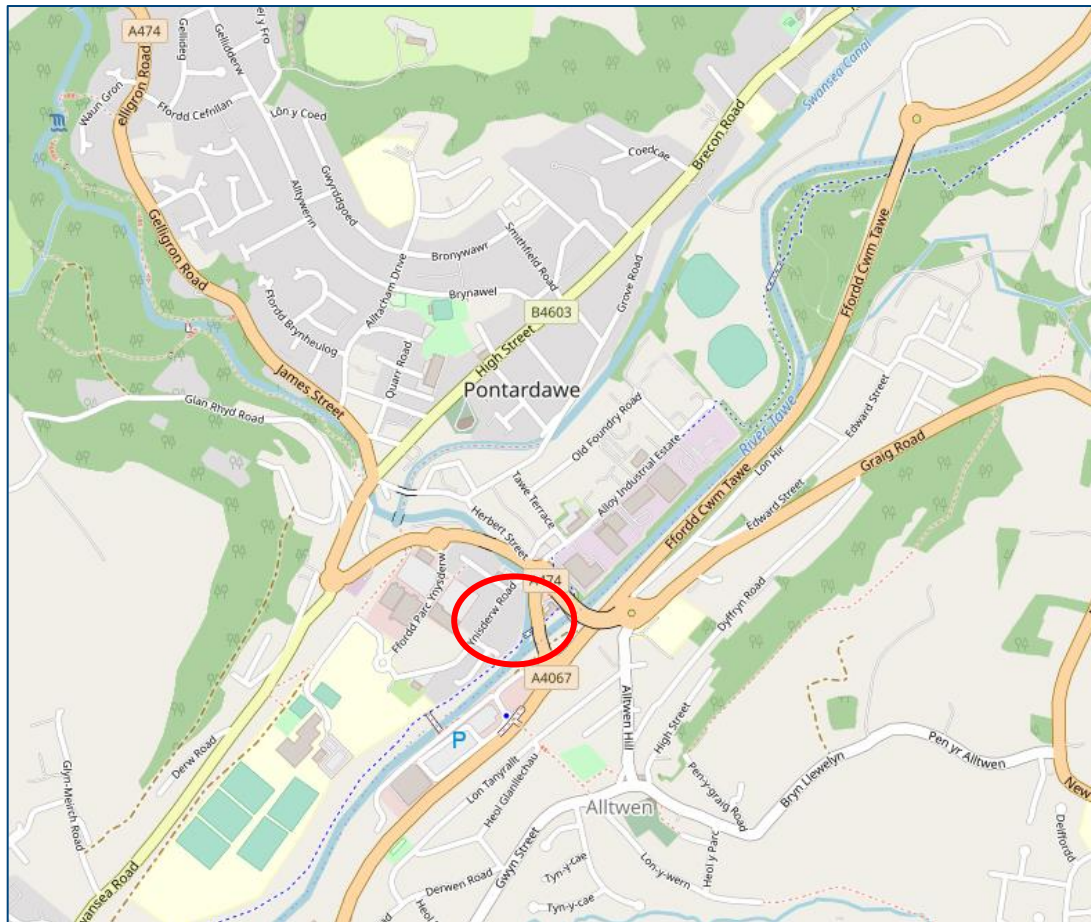


Figure 1 - Site Location Plan

2. SITE DESCRIPTION

The site is approximately 0.16 hectares in area with the site comprising of an existing building and associated car park. The site is generally flat with a slight fall from south to north at a gradient of 1in63.

The site is bordered by existing dwellings on the north, east and south the existing public highway on the western border and an existing commercial plot to the west of the site. The site has allowance for direct vehicle access via Ynisderw Road which runs along the western boundary.

A copy of the existing site plan can be found in Appendix A of this report.

3. EXISTING DRAINAGE ARRANGEMENTS

From available mapping information it has been established that the nearest main watercourse is the river Tawe which is approximately 66m south east of the site. There are also public sewers located just outside the site boundary within the public highway, and a network of private foul and surface water sewers within the site boundary which serve the existing building.

It is assumed that the existing site's surface water discharges into the combined sewer located in Ynisderw Road, CCTV survey of the existing on site drainage network will be required to confirm this.

The nearest foul sewer is a public sewer located within Ynisderw Road which runs parallel to a combined sewer 750mm in diameter flowing northeast to southwest along the western boundary of the site, which is already utilised as a discharge point for the private drainage system serving the site. Figure 2 contains an extract of the Welsh Water asset plan for the area with the site boundary shown in green.

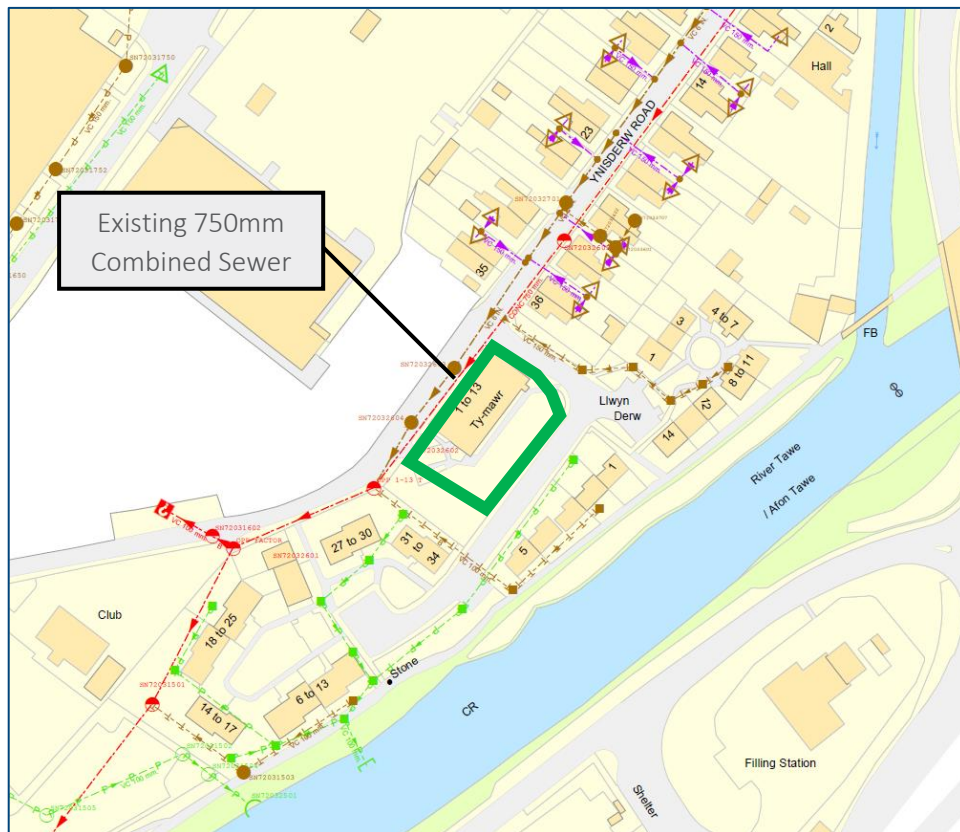


Figure 2 - Extract of DCWW Record Plan

4. EXISTING CONTRIBUTING AREAS AND RUN-OFF RATES

The total site area is circa 0.16 ha, the global greenfield run-off rates have been calculated using the ICP SuDS method and table 1 summarises the runoff rates for each return period (1, 30 & 100). Calculations detailing the derivation of the values in these tables are available in Appendix B.

Table 1: Greenfield Run-off Rates by Return Period

Return Period	Greenfield Run-off Rate (l/s)
1 YRP	1.9
30 YRP	3.4
100 YRP	3.8

As the site is comprised of existing hardstanding and the existing small retail building, we have calculated the existing peak discharge rate from the site for each return period (1, 30 & 100) using a 30min rainfall event based on FSR rainfall data. Table 2 summarises the runoff rates and calculations detailing the derivation of the values are available in Appendix B.

Table 2: Peak Discharge Rate for 30min Rainfall Event

Return Period	Peak Discharge Rate (l/s)
1 YRP	3.9
30 YRP	9.6
100 YRP	12.5

Proposed Development

5. DEVELOPMENT PROPOSALS

For assessment purposes the development is a proposed residential development with associated car parking area. The proposed development will utilise the existing access off Ynisderw Road located to the west of the site.

6. FOUL DRAINAGE

The proposed new development will look to utilise the existing building and bring it back into use as well as constructing a proposed new extension to the southwestern elevation, an existing connection has been identified to the public combined sewer network from the site. The new development will seek to utilise the existing discharge point that currently serves the site via gravity subject to confirmation from DCWW on the available capacity within the public sewer.

The capacity of the sewer has been confirmed by DCWW for the proposed foul flows generated from the site, and a copy of the pre planning response from DCWW (PPA0005665) is included in Appendix D.

It is proposed to utilise the existing pipework from site to the public sewer which will remove the need for off-site works to form the connection, it is therefore recommended that prior to detailed design a survey of the existing sewer is undertaken to establish the condition is suitable for reuse and this will need to be agreed with DCWW as part of the detailed design stage of the project.

All on site sewerage systems will be designed and constructed to comply with building regulations requirements with any adopted elements in accordance with the latest edition of “Sewers for Adoption” and any of the adopting authority’s (DCWW) specific requirements.

7. SURFACE WATER

The aim of the surface water drainage strategy is to mimic the natural catchment processes as closely as possible and adopt the principles of water management schemes as stated in section 2 of the SDSSW document 2018. The previous sections of this report have established the current drainage arrangements on site and have also determined the current discharge rates for surface water leaving the site.

From 7th January 2019 Schedule 3 of the Flood and Water Management Act has been implemented by the Welsh Government which requires any development of more than 1 unit or where the construction area is greater than 100m² to comply with the SuDS Approving Bodies (SAB’s) design guidance and ministers’ standards which will require all sites to adopt SuDs in their design. The standards are listed below;

- S1 – Surface Water Runoff Destination
- S2 – Surface Water Runoff Hydraulic Control
- S3 – Water Quality
- S4 – Amenity
- S5 – Biodiversity
- S6 – Design of Drainage for Construction, Operation and Maintenance

The Standards listed will need to be met by the design in order to comply with the SDSSW. S1 is a hierarchy standard with standards S2-S6 being fixed.

7.1 S1 – Surface Water Runoff Destination

In determining a suitable methodology for disposal of surface water flows from this development, it is necessary to explore the technical options outlined under Standard S1 of the SDSSW 2018 document published by Welsh Government. This states that disposal should be made through the hierarchical approach which are, in order of preference; surface water runoff collected for use, infiltration methods, discharge to surface water body, discharge to a surface water sewer, highway sewer or another drainage system and finally discharge to a combined sewer. Each of these options are considered below.

7.1.1 *Collected for Use*

The suitability of this option will depend on the proposed water usage of the development, if the development has low grey water demand, as is typical of residential developments the collection of water for reuse would not be economical or feasible, however if the demand for grey water is deemed to be high then rainwater harvesting would be an appropriate solution for parts of the development. The use of rainwater harvesting would need to be used in conjunction with one of the below methods of discharge in order to cater for exceedance flows in extreme rainfall events where the rainfall volume exceeds the volume of surface water storage provided by the rainwater harvesting tanks.

As the development is considered to have low demand for grey water the use of a grey water system would not be suitable due to there being periods of very low demand which may result in legionella issues. Basic forms of rainwater harvesting could be incorporated into the development in the form of rainwater butts that will collect water from rainwater downpipes and store it for irrigation of the soft landscaped areas and planting beds however the demand for this will again be low as the planted landscape areas will be accepting surface water runoff from the impermeable areas as part of the design. Based on this storing rain water runoff for reuse is not feasible on this scheme.

7.1.2 *Infiltration Methods*

Based on the Cranfield University Soils mapping the subsoils in the area of the site are noted as freely draining floodplain soils, at the time of writing this report we are awaiting the results of the site investigation report. Infiltration testing will need to be carried out prior to detail design to establish the feasibility of infiltration as a disposal method for surface water run off generated from the site. As part of the detailed design stage where feasible and where ground conditions allow, the proposed sustainable drainage features could be designed as part or full infiltration drainage features depending on the result of the site investigation testing. The use of soakaways may be unfeasible due to the sites close proximity to the river which may result in the ground water table being high.

7.1.3 *Discharge to Surface Water Body*

Sequentially, the next consideration in the hierarchical approach is discharge to a surface water body. The nearest watercourse is river Tawe located to the east of the site, there is a surface water system that is located within the highway to the south of the site which discharges to the river and it is proposed to utilise this existing discharge point to provide a connection to the river.

7.1.4 Discharge to Surface Water Sewer

Based on the above information the site will look to utilise an existing surface water sewer to establish a discharge to the river.

7.1.5 Discharge to Combined Sewer

Based on the above information there is no need to consider discharging into a combined public sewer system.

7.2 S2 – Surface Water Runoff Hydraulic Control

This standard requires surface water to be managed to prevent as far as possible any discharge from the development for rainfall events of less than 5mm and that the surface water runoff rate and volume for up to a 1 in 100-year return period should be managed to protect people, properties and the receiving water body. Consideration is also required to the risk associated with runoff from events greater than 1 in 100-year return period with mitigating proposals developed for the scheme.

7.2.1 Interception of Runoff

Interception will need to be considered under the statutory standards. Interception aims to mimic greenfield runoff conditions by preventing runoff from the majority of all small rainfall events. This can contribute to reducing pollution load to receiving surface water bodies. Meeting the Interception criterion is not expected during particularly wet periods, when permeable surfaces and subsoils are saturated, so a suggested target is that 80% compliance should be achieved during the summer and 50% in winter. Refer to table G2.1 in the Statutory Standards for Sustainable Drainage Systems 2018 document published by Welsh Government for details of interception mechanisms and their assumed compliance with the standards. It is proposed that this scheme will utilise permeable paving and a swale to provide suitable levels of interception.

7.2.2 Hydraulic Control and Storage

For the purposes of this section of the report infiltration will not be accounted for as a means of disposing surface water runoff generated from the development, therefore the discharge volume for the site will not decrease. The proposed development will be discharging into the adjacent main river, we have proposed to discharge at 2.7l/s for all rainfall events which will provide 33% betterment for the 1 year event with that number increasing to 85% for the 100 year event with 40% allowance for climate change.

Table 3: Discharge Summary for 30min Rainfall Event

Return Period	Pre-Development run-off rate	Post Development runoff rate	Betterment (%)
1 year event	3.9	2.7	30%
30 year event	9.6	2.7	72%
100 year event	12.5	2.7	79%
100+40% event	17.6	2.7	85%

In accordance with statutory guidelines, the development of this site should not increase flood risk elsewhere and as such, all runoff from impermeable areas on site should be contained within the site boundary for up to and including a 1 in 100 year design period storm, plus 40% climate change and urban creep allowance, these allowances will have to be agreed with the SAB prior to detailed design. It is proposed to discharge surface water runoff from the development via the existing gravity surface water sewer network with runoff rates restricted to the proposed peak discharge rates stated in table 3 which then discharges to the river Tawe, this will need to be agreed with the adopting SAB's authority.

Betterment over the existing discharge rates will be provided via a restricted discharge rate and with the introduction of some permeable paving which will decrease the impermeable area draining to the outfall.

Given the proposed site usage rain gardens and permeable paving can be introduced to help reduce the run off rate and provide attenuation storage across the site.

The proposed site drainage will be designed and checked to ensure the existing outfall has the capacity to accept the flows and upstream storage provided to ensure there is no flooding off site for all rainfall events up to and including a 1 in 100 year event plus 40% climate change, this detailed design check will be carried out during the next stage of design.

For the purposes of this report storage has been estimated using the source control suite within WinDes and below provides a summary of the features used and storage values.

For the purposes of this calculation the overall attenuated impermeable area for the development has been taken as 0.09ha as shown by the master plan and maximum discharge rate assumed at 2.7l/s for all rainfall events up to and including the 100 year return period with 40% allowance for climate change and urban creep, the storage volume could be reduced by the use of alternative complex controls to satisfy clause G2.30 of the standards, liaison will need to be undertaken with the SAB and DCWW at detailed design stage to confirm the acceptability of the proposed runoff rates and the use of a complex control.

Appendix C contains the WinDes calculations for the development and Appendix A contains the proposed layout plans with table 4 providing a summary of the preliminary storage volumes across the site in the different SuDS features.

Table 4: Development Storage Summary

SuDS Feature	Approx. Area (sqm)	Attenuated Discharge Rate (l/s)	Indicative Storage Provided (m ³)
Paving Systems	324	-	48.6
Rain Gardens	96	-	23

7.2.3 Exceedance Flows and Flood Pathways

"It is inevitable that as a result of extreme rainfall the capacities of sewers, covered watercourses and other drainage systems will be exceeded on occasion. Periods of exceedance occur when the rate of surface runoff exceeds the drainage system inlet capacity, when the pipe system becomes overloaded, or when the outfall becomes restricted due to flood levels in the receiving water. Underground conveyance cannot economically or sustainably be built large enough for the most extreme events and, as a result,

there will be occasions when surface water runoff will exceed the design capacity of drains. When drainage exceedance capacity is exceeded the excess water (exceedance flow) is conveyed above ground, and will travel along streets and paths, between and through buildings and across open space. Indiscriminate flooding of property can occur when this flow of water is not controlled.” (CIRIA C753).

Flood-flow pathways would be designed to convey the overland flows from rainfall events above a 1in100 year return period to suitable areas of open space, such as landscaped areas, car parking areas and other hard surfaced areas in order to protect properties against flooding. Consideration should also be given to exceedance pathways from storage areas in the event of extreme rainfall or failure with allowance made to convey flows away from properties both on and off the site. These should be considered as part of the detailed drainage and levels design of the development.

7.2.4 Flood Risks to People

“People are at risk of suffering death or serious injury when flooding occurs. People are unable to stand in deep or fast flowing floodwater. Once they are unable to stand, there is a high risk of death or serious injury. Adults are unable to stand in still floodwater with a depth of about 1.5m or greater, although this is obviously affected by the height of a person. The depth of flowing floodwater where people are unable to stand is much less. For example, some people will be at risk when the water depth is only 0.5m, if the velocity is 1m/s (about 2 mph). If the velocity increases to 2m/s (about 4 mph) some people will be unable to stand in a depth of water of only 0.3m. Most people will be unable to stand when the velocity is 2m/s and the depth is 0.6m.” (Defra/ Environment Agency, FD2321/TR2)

During the detailed design, a hydraulic model will be built to assist the design of the proposed surface water drainage networks. When an extreme storm event is simulated within the model, potential flooding locations will become evident and the flood flow pathways can be designed/defined based on the proposed layout and levels of the hard areas and landscaping. The depth and velocity of the overland flood water can be determined and then compared with Figure 2.1 (Combinations of flood depth and velocity that cause danger to people) in the Defra / EA Flood Risks to People publication. The velocity and depth as described above would then give a category of flood hazard and the corresponding risk to people. If the risk is deemed to be too high, then the design would require reassessment.

7.3 S3 – Water Quality

This standard requires treatment of surface water runoff to prevent negative impacts on the receiving water quality and/or protect downstream drainage systems including sewers. The only exception to this standard is where drainage connects directly to a combined sewer, where the quality requirements are limited to preventing the discharge of oil and sediments to the sewer system.

Whilst the development is connecting to the combined sewer as best practice the aim of the surface water management strategy with regards to water quality is to follow the guiding principles of the SDSSW and use simple, natural processes that promote biodiversity and long-term sustainability. As such, it employs a SuDS management train approach, providing drainage components in series.

The management trains to be used on the project would have been assessed using the Simple Index Assessment (SIA) tool available publicly (<http://www.ukSuDS.com/drainage-calculation-tools/water-quality-assessment-for-SuDS-developments>) which is built around the principles for simple assessment outlined in CIRIA C753 to assess the levels of treatment provided by the proposals.

The possible impact of accidental spills will need to be addressed with the most vulnerable areas to a spill or other pollution incident being any car park areas and access roads, therefore the highway areas and parking will be drained into the permeable paving system or adjacent swale, which will provide a level of treatment for pollution.

Planting within the SuDS features should form part of the water quality strategy. SuDS components like swales provide water quality improvements by reducing sediment and contaminants from runoff either through settlement or biological breakdown of pollutants as part of their interceptor function, so only robust and tolerant species of planting should be specified. Once these species establish this will decrease the flow rate of water travelling through and filter pollutants and contaminants before entering the downstream network.

7.4 S4 – Amenity

This standard requires that the design of the surface water management system should maximise amenity benefits.

The primary amenity focus of the SuDS scheme should be to improve the health and well-being of the users. The scheme will need to be based on natural forms that mimic natural landscapes found within the region and the vegetated rain garden planting areas are designed with locally contextual species that will encourage natural colonisation. Other key amenity benefits should include improving air quality around the development, increasing carbon sequestration and improving water quality through removal of pollutants via the paving system and rain gardens.

7.5 S5 – Biodiversity

This standard requires that the surface water management system should maximise biodiversity benefits.

The SuDS scheme biodiversity strategy should revolve around the creation of significant and varied habitat to increase the overall biodiversity of the site and ecological value. The inclusion of plant species that will enhance the general eco system and simultaneously act as a water filtration system to clean pollutants and contaminants should be used where possible.

The plant species selected should be both locally contextual and appropriate for the varied habitat zones including primary characteristics that shall ensure:

- Good soil binding and filtration species
- Minimised erosion
- Improved filtration via dense root and stem species
- Tolerance to seasonal variations including droughts and inundations
- Good suspended solids retention
- Pollutant tolerant
- Emergent and pioneering species for natural ecological colonisation
- The creation of diverse, self-sustaining and resilient ecosystems for high species biodiversity
- Support for local and regional habitat strategies

In general, the proposed rain garden will be the focal habitat for the site and will enhance the site over the current site layout by adding areas of water and damp soils. Exposed areas of rain garden will attract certain species and shaded areas under adjacent buildings and trees will further enhance the varied ecosystem potential.

7.6 S6 – Design of Drainage for Construction and Maintenance and Structural Integrity

The surface water drainage system should be designed with the overriding ethos of simplicity in construction, use and maintenance. This then allows a very simple translation from the principles described within standard S6, namely that all elements of the surface water drainage system should be designed so that they can be constructed, as well as maintained and operated “...easily, safely, cost-effectively, in a timely manner, and with the aim of minimising the use of scarce resources and embedded carbon (energy).” (SDSSW).

The proposed system will be private and therefore the client will be responsible for the maintenance of the surface water drainage elements of the system to ensure it continues to comply with SuDS standards.

Information with regards to the construction methodology and requirements of the proposed system will be developed as part of the detailed design stage of the project, likewise the maintenance requirements and regime of the proposed system will be developed into the full maintenance strategy for the site during the next phase of design development. This will be developed in conjunction with the client’s maintenance team, as it is not considered appropriate for these details to be developed by the design team in isolation from the end users. This will then need to be confirmed and submitted for approval to the SAB prior to construction commencing on site.

Conclusion

8. FOUL DRAINAGE

The most sustainable method for the disposal of foul water discharge from the proposed development site is via the existing mains sewer network.

The new development will seek to discharge foul flows from the site to the public combined sewer system located along the western boundary of the site just outside the proposed development site. If possible, the existing connection pipework will be reused to avoid the need for works to be carried out on the public sewer network. The depth of the existing sewer will allow the whole site to discharge via gravity with no requirement for pumping.

The proposed development will involve adding flows to the existing on-site pipework that is proposed to be reused to accommodate the new development, it is therefore recommended that prior to detailed design a survey of the existing sewer is undertaken to establish the condition of the pipework and its suitability for reuse. The proposed site plan in Appendix A shows the indicative layout for the foul sewer network across the site. Any works to the existing public sewer system will need to be agreed with DCWW prior to construction.

All on site sewerage systems will be designed and constructed to comply with building regulations requirements with any adopted elements in accordance with the latest edition of “Sewers for Adoption” and any of the adopting authority’s (DCWW) specific requirements.

9. SURFACE WATER DRAINAGE

The aim of the surface water drainage strategy is to mimic the natural catchment processes as closely as possible and the proposed system will need to be designed in accordance with the statutory (SDSSW) document 2018 and any local authority’s SAB requirements and CIRIA’s C753 SuDS Manual as well as meeting the requirements of Building Regulations, Document H.

In determining a suitable methodology for disposal of surface water flows from this development, it is necessary to explore the technical options outlined under Standard S1 in the statutory (SDSSW) document 2018 published by the Welsh Government. Based on the hierarchy it is proposed to discharge surface water runoff from the development to the river Tawe. To attempt to reduce the load on the existing surface water sewer network infiltration will be introduced where possible to the proposed on-site system, this will need to be confirmed by infiltration testing which at the time of writing this report has not been carried out.

Surface water runoff is to be attenuated from site to 2.7l/s where the existing gravity surface water sewer network is proposed to be utilised as the discharge point which flows to the Tawe, this runoff rate will be maintained for all rainfall events up to and including a 100YRP with 40% allowance for climate change and urban creep.

In accordance with statutory guidelines, the development of this site should not increase flood risk elsewhere and as such, all runoff from impermeable areas on site should be contained within the site boundary for up to and including a 1 in 100 year design period storm, plus 40% climate change and urban creep allowance, these allowances will have to be agreed with the SAB prior to detailed design. It is proposed to discharge surface water runoff from the development to the existing gravity surface water sewer network at a restricted discharge rate which discharges to the river Tawe located to the south east of the site, this will need to be agreed with the adopting SAB’s authority.

Betterment over the existing discharge rates will be provided via a restricted discharge rate and with the introduction of some SuDs features and permeable paving, given the proposed site usage rain gardens and permeable paving can be introduced across the site.

The proposed site drainage will be designed and checked to ensure the existing outfall has the capacity to accept the flows and upstream storage provided if necessary to ensure there is no flooding off site for all rainfall events up to and including a 1 in 100 year event plus 40% climate change, this detailed design check will be carried out during the next stage of design.

As the scheme is a residential development it has been considered that the use of a grey water system would not be suitable due to there being periods of very low demand which may result in legionella issues however other basic forms of rainwater harvesting could be incorporated into the development in the form of rainwater butts that will collect water from rainwater downpipes and store it for irrigation of the soft landscaped areas and planting beds.

Amenity and biodiversity benefits to the site will be provided in the form of rain gardens which will be incorporated throughout the site and also form part of the attenuation storage for the site, this will maximise the available green infrastructure within the development site which will improve air quality and water quality of the site.

All on site surface water drainage systems will be designed and constructed to comply with the (SDSSW) and building regulations requirements. The detailed design of the scheme will incorporate the philosophies outline in this report regarding standards S1-S6 listed in section 7 of this report.

Refer to drawings in Appendix A for further details of the proposed layout and features to be used across the site.

Appendix A Site Plans



- GENERAL NOTES:
1. DRAWING TO BE READ IN CONJUNCTION WITH ALL OTHER RELEVANT PROJECT DRAWINGS
 2. USE OF THIS DRAWING DOES NOT ABSOLVE THE CLIENT FROM HIS RESPONSIBILITIES UNDER THE HEALTH AND SAFETY. THE CONSTRUCTION DESIGN AND MANAGEMENT REGULATIONS 2015. THE PRINCIPAL DESIGNER IS REQUIRED TO CONTACT HYDROCK CONSULTANTS PRIOR TO PERMITTING THIS DRAWING TO BE USED IN CONNECTION WITH ANY CONSTRUCTION WORKS
 3. THE DRAWING SHALL BE READ IN CONJUNCTION WITH THE HEALTH AND SAFETY INFORMATION PROVIDED AND/OR WITHIN THE PRE-CONSTRUCTION INFORMATION.
 4. BEFORE COMMENCEMENT OF ANY WORKS ASSOCIATED WITH THE DRAWING REFER TO ALL RELEVANT HEALTH AND SAFETY INFORMATION FOR THE WORKS INCLUDING RESIDUAL RISK INFORMATION.
 5. THE CONTRACTOR SHOULD COMPLY WITH HS(G) 47 "AVOIDING DANGER FROM UNDERGROUND SERVICES" WHEN PLANNING, LOCATING AND EXCAVATING AROUND EXISTING SERVICES. IT IS KNOWN THAT EXISTING UTILITY COMPANY UNDERGROUND SERVICES AND APPARATUS ARE PRESENT WITHIN THE PROPOSED WORKS AREA AND IT IS THE CONTRACTORS RESPONSIBILITY TO LOCATE EXISTING SERVICES ON SITE ACCURATELY.
 6. INFORMATION REGARDING THE LOCATION AND DEPTH OF EXISTING SERVICES CANNOT BE GUARANTEED BY THE STATUTORY UNDERTAKER.
 7. THE CONTRACTOR SHALL CONDUCT THE WORKS WITH DUE REGARD FOR THE ECOLOGICAL AND ENVIRONMENTAL REQUIREMENTS OF THE SCHEME.
 8. THE DRAWING SHALL BE USED FOR THE INTENDED PURPOSE ONLY AND HYDROCK DOES NOT WARRANT THE ACCURACY OF THIS INFORMATION.
 9. THIS DRAWING HAS BEEN BASED ON INFORMATION PROVIDED BY OTHER PARTIES AND HYDROCK DO NOT WARRANT THE ACCURACY OF THIS INFORMATION. DIMENSIONS SHALL NOT BE SCALED FROM THE DRAWING AND THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL DIMENSIONS AND LEVEL'S ON SITE FOR THE ACTUAL SETTING OUT OF THE WORKS. DIMENSIONS MARKED 'DIMENSIONS TO BE SITE CHECKED' ARE SUBJECT TO CONFIRMATION BY THE CONTRACTOR BEFORE THE WORKS COMMENCE.
 10. HYDROCK IS NOT RESPONSIBLE FOR CHECKING DIMENSIONS ON SITE.
 11. HYDROCK IS NOT RESPONSIBLE FOR SETTING OUT GRID LINES, BUILDING LINE ETC
 12. HYDROCK IS NOT RESPONSIBLE FOR DIMENSIONS USED IN THE ORDERING AND MANUFACTURING OF EQUIPMENT AND THIS SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.
 13. ALL FIGURED LEVELS ARE IN METRES AND RELATED TO EXISTING SURVEY GRID & DATUM UNLESS NOTED OTHERWISE
 14. ALL FIGURED DIMENSIONS ARE IN METRES UNLESS NOTED OTHERWISE.
 15. TEMPORARY WORKS DESIGN ASSOCIATED WITH THE CONSTRUCTION OF THE WORKS SHALL BE RESPONSIBILITY OF THE CONTRACTOR.
 16. THE CONTRACTOR SHALL MAINTAIN FREE AND OPEN ACCESS TO PUBLIC HIGHWAY AND ADJACENT LANDS AT ALL TIMES DURING THE COURSE OF THE WORKS UNLESS OTHERWISE AGREED IN WRITING WITH THE INTERESTED PARTIES.
 17. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE DESIGN OF ALL TRAFFIC MANAGEMENT PROPOSALS & PHASING. SUCH DETAILS SHALL BE SUBMITTED TO THE LOCAL HIGHWAY AUTHORITY FOR APPROVAL PRIOR TO THE START OF THE WORKS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL ASSOCIATED COSTS AND ORDERS.
 18. CONFLICTING INFORMATION SHOWN ON THE ENGINEER'S DRAWINGS OR DISCREPANCIES BETWEEN THE INFORMATION GIVEN BY THE ENGINEER AND THAT PROVIDED BY OTHERS MUST BE REFERRED TO THE ENGINEER BEFORE THE WORKS COMMENCE.

REVISIONS

P01	12/05/22	First Issue	JSL	CS	CS
Rev	Date	Description	By	Ckd	App



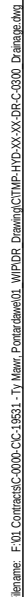
FIRST FLOOR, CASTLEBRIDGE 5
CASTLEBRIDGE
5-19 COWBRIDGE ROAD EAST
CARDIFF
CF11 9AB
t: +44 (0) 2920 023665
e: cardiff@hydrock.com

CLIENT
POBL GROUP

PROJECT
TY MAWR, PONTARDAWE

TITLE
EXISTING SITE LAYOUT

HYDROCK PROJECT NO. C-19531		SCALE @ A1 1:150	
STATUS DESCRIPTION FOR INFORMATION			STATUS S2
DRAWING NO. (PROJECT-ORIGINATOR-ZONE-LEVEL-TYPE-ROLE-NUMBER) TMP-HYD-XX-XX-DR-C-0020			REVISION P01



Appendix B Runoff Calculations

ICP SUDS Mean Annual Flood

Input

Return Period (years) 100 SAAR (mm) 1400 Urban 0.000
Area (ha) 0.160 Soil 0.400 Region Number Region 9

Results 1/s

QBAR Rural 1.2
QBAR Urban 1.2

Q100 years 2.7

Q1 year 1.1
Q30 years 2.2
Q100 years 2.7

Ty Mawr : Global Runoff Rates

Duration in minutes
30

Existing Q (l/s)

1	30	100	100+cc
year rainfall	year rainfall	year rainfall	year rainfall
mm	mm	mm	mm
18.176	44.676	58.297	81.616
3.92	9.64	12.58	17.62

Hydrock

Cardiff Office
First Floor,
5 Castlebridge,
5-19 Cowbridge Road East,
Cardiff,
CF11 9AB

Calculation & Parameters Used

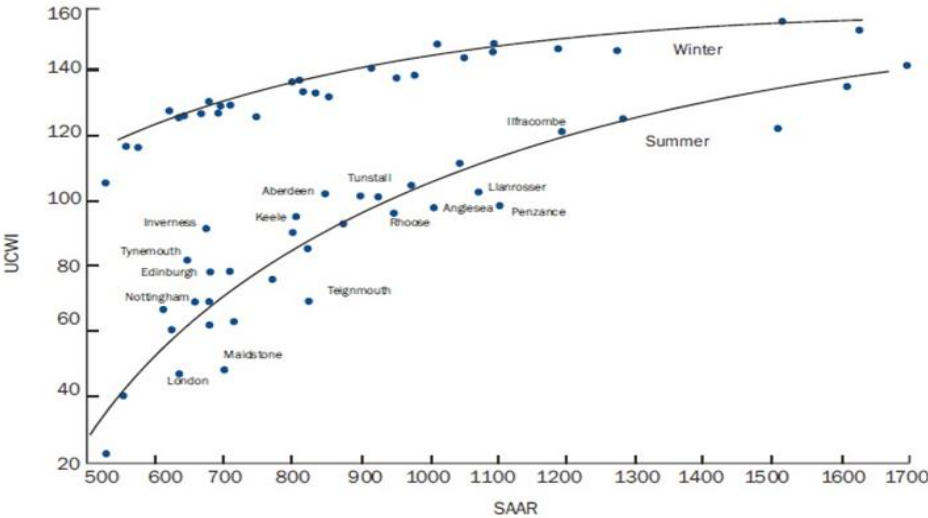
$Q = 3.6C_vIA$
I mm/hr average rainfall intensity during the time of concentration
A 0.160 ha Total Site Area

$C_v = PR/100$
when whole catchment is being considered
Cv (ex) 0.37 Volumetric co-efficient

Cv = taken as 0.85
when impermeable area alone being considered
Cv 0.85 Volumetric co-efficient

$PR = 0.829PIMP + 25.0SOIL + 0.078UCWI - 20.7$
PIMP (existing) 44.00 % % of surface currently draining to the storm sewer

PR 37.48
SOIL 0.4 Soil Type Host Class 6 - SPR value 33.8%
UCWI 150 antecedent wetness conditions (degree of wetness at start of storm event)
taken as winter - worst case
Ref Figure 4.6 of SUDS Manual
SAAR 1400 mm



Appendix C Storage Calculations

•
•
•



Date 12/05/2022 12:45

Designed by JessicaLi

File SOURCE CONTROL CALCS.SRCX

Checked by

Innovyze

Source Control 2020.1.3

Summary of Results for 100 year Return Period (+40%)

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
15 min Summer	9.368	0.368	2.7	16.6	O K
30 min Summer	9.520	0.520	2.7	23.4	O K
60 min Summer	9.681	0.681	2.7	30.6	O K
120 min Summer	9.789	0.789	2.7	35.5	Flood Risk
180 min Summer	9.809	0.809	2.7	36.4	Flood Risk
240 min Summer	9.814	0.814	2.7	36.6	Flood Risk
360 min Summer	9.803	0.803	2.7	36.1	Flood Risk
480 min Summer	9.777	0.777	2.7	35.0	Flood Risk
600 min Summer	9.745	0.745	2.7	33.5	Flood Risk
720 min Summer	9.709	0.709	2.7	31.9	Flood Risk
960 min Summer	9.622	0.622	2.7	28.0	O K
1440 min Summer	9.437	0.437	2.7	19.7	O K
2160 min Summer	9.264	0.264	2.7	11.9	O K
2880 min Summer	9.172	0.172	2.6	7.8	O K
4320 min Summer	9.100	0.100	2.2	4.5	O K
5760 min Summer	9.081	0.081	1.8	3.7	O K
7200 min Summer	9.071	0.071	1.6	3.2	O K
8640 min Summer	9.064	0.064	1.4	2.9	O K
10080 min Summer	9.059	0.059	1.3	2.7	O K
15 min Winter	9.418	0.418	2.7	18.8	O K
30 min Winter	9.594	0.594	2.7	26.7	O K
60 min Winter	9.777	0.777	2.7	35.0	Flood Risk
120 min Winter	9.911	0.911	2.7	41.0	Flood Risk
180 min Winter	9.932	0.932	2.7	41.9	Flood Risk
240 min Winter	9.936	0.936	2.7	42.1	Flood Risk
360 min Winter	9.911	0.911	2.7	41.0	Flood Risk
480 min Winter	9.865	0.865	2.7	38.9	Flood Risk

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	113.595	0.0	19.1	23
30 min Summer	81.616	0.0	27.5	37
60 min Summer	56.129	0.0	37.9	64
120 min Summer	36.935	0.0	49.8	118
180 min Summer	28.232	0.0	57.1	150
240 min Summer	23.309	0.0	62.9	182
360 min Summer	17.723	0.0	71.8	252
480 min Summer	14.554	0.0	78.6	322
600 min Summer	12.473	0.0	84.2	392
720 min Summer	10.985	0.0	89.0	462
960 min Summer	8.975	0.0	96.9	600
1440 min Summer	6.726	0.0	108.9	834
2160 min Summer	5.032	0.0	122.3	1172
2880 min Summer	4.102	0.0	132.9	1508
4320 min Summer	3.080	0.0	149.6	2204
5760 min Summer	2.520	0.0	163.3	2936
7200 min Summer	2.162	0.0	175.1	3672
8640 min Summer	1.912	0.0	185.9	4312
10080 min Summer	1.728	0.0	195.9	5136
15 min Winter	113.595	0.0	21.4	24
30 min Winter	81.616	0.0	30.8	37
60 min Winter	56.129	0.0	42.4	64
120 min Winter	36.935	0.0	55.8	118
180 min Winter	28.232	0.0	64.0	166
240 min Winter	23.309	0.0	70.5	192
360 min Winter	17.723	0.0	80.4	272
480 min Winter	14.554	0.0	88.0	348

•
•
•



Date 12/05/2022 12:45

Designed by JessicaLi

File SOURCE CONTROL CALCS.SRCX

Checked by

Innovyze

Source Control 2020.1.3

Summary of Results for 100 year Return Period (+40%)

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
600 min Winter	9.809	0.809	2.7	36.4	Flood Risk
720 min Winter	9.748	0.748	2.7	33.7	Flood Risk
960 min Winter	9.596	0.596	2.7	26.8	O K
1440 min Winter	9.328	0.328	2.7	14.7	O K
2160 min Winter	9.150	0.150	2.5	6.7	O K
2880 min Winter	9.097	0.097	2.2	4.4	O K
4320 min Winter	9.072	0.072	1.6	3.2	O K
5760 min Winter	9.062	0.062	1.3	2.8	O K
7200 min Winter	9.056	0.056	1.2	2.5	O K
8640 min Winter	9.051	0.051	1.0	2.3	O K
10080 min Winter	9.048	0.048	0.9	2.2	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
600 min Winter	12.473	0.0	94.3	424
720 min Winter	10.985	0.0	99.6	500
960 min Winter	8.975	0.0	108.5	644
1440 min Winter	6.726	0.0	122.0	858
2160 min Winter	5.032	0.0	136.9	1172
2880 min Winter	4.102	0.0	148.8	1476
4320 min Winter	3.080	0.0	167.6	2204
5760 min Winter	2.520	0.0	182.9	2912
7200 min Winter	2.162	0.0	196.1	3664
8640 min Winter	1.912	0.0	208.2	4392
10080 min Winter	1.728	0.0	219.4	5016

•
•
•



Date 12/05/2022 12:45

Designed by JessicaLi

File SOURCE CONTROL CALCS.SRCX

Checked by

Innovyze

Source Control 2020.1.3

Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	100	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	19.800	Shortest Storm (mins)	15
Ratio R	0.236	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+40

Time Area Diagram

Total Area (ha) 0.090

Time (mins)	Area	Time (mins)	Area	Time (mins)	Area
From: To: (ha)	From: To: (ha)	From: To: (ha)			
0 4 0.030	4 8 0.030	8 12 0.030			

Appendix D DCWW Pre-app Response

Mr Lewis Morgan
SMS Energy Services
Corpse Walk
Cardiff Gate Business Park
Cardiff
CF23 8XH

Date: 11/05/2021
Our Ref: PPA0005665

Dear Mr Morgan

Grid Ref: 272271 203635
Site Address: Ty Mawr, Pontardawe
Development: 14 Residential apartments

Firstly, we note that the proposal relates to a residential development comprising 14 no. apartments at Ty Mawr, Pontardawe and acknowledge that the site comprises of a potential windfall development with no allocated status in the Local Development Plan (LDP). Accordingly, whilst it does not appear an assessment has been previously undertaken of the public sewerage and watermains systems, we offer the following comments as part of our appraisal of this development.

Please note, notwithstanding the following assessment, we would advise there is also a mandatory requirement to undertake pre-application consultation with all 'Specialist Consultees', including Dwr Cymru Welsh Water as the statutory water and sewerage undertaker, in accordance with Schedule 4 of Town & Country Planning (Development Management Procedure) (Wales) (Amendment) Order 2016. As a major development, amounting to more than 10 units, you will be statutorily required to consult Welsh Water and a substantive response will be issued within 28 days from the date of the notice as per the requirements of Article 2E.

Public Sewerage Network

The proposed development site is located in the immediate vicinity of a separate sewerage system, comprising combined, foul and surface water public sewers, which drains to Trebanos Wastewater Treatment Works (WwTW).

The site is within close proximity of a variety of assets including a 750mm combined public sewer, along Ynisderw Road, with the approximate position being marked on the attached Statutory Public Sewer Record. In accordance with the Water Industry Act 1991, Dwr Cymru Welsh Water requires access to its apparatus at all times in order to carry out maintenance and repairs. Having regard to the submitted 'Site Area' and 'Site Layout Plan', it appears the proposed development would be situated close albeit outside the protection zone of the 750mm combined public sewer, measured 4 metres either side of the centreline, and therefore acceptable in principle.

Nonetheless, it is recommended that the developer ascertain the distance and relationship of the sewer to the proposed development and should be referred to in the 'Site Layout Plan', for the purposes of any forthcoming planning application. Further information regarding Asset Protection is provided in the attached Advice & Guidance note.

You are also advised that some public sewers and lateral drains may not be recorded on our maps of public sewers because they were originally privately owned and were transferred into public ownership by nature of the Water Industry (Schemes for Adoption of Private Sewers) Regulations 2011. The presence of such assets may affect the proposal. In order to assist you may contact Dwr Cymru Welsh Water on 0800 085 3968 to establish the location and status of the apparatus in and around your site. Please be mindful that under the Water Industry Act 1991 Dwr Cymru Welsh Water has rights of access to its apparatus at all times.

Surface Water Drainage

As of 7th January 2019, this proposed development is subject to Schedule 3 of the Flood and Water Management Act 2010. The development therefore requires approval of Sustainable Drainage Systems (SuDS) features, in accordance with the 'Statutory standards for sustainable drainage systems – designing, constructing, operating and maintaining surface water drainage systems'. As highlighted in these standards, the developer is required to explore and fully exhaust all surface water drainage options in accordance with a hierarchy which states that discharge to a combined sewer shall only be made as a last resort. Disposal should be made through the hierarchical approach, preferring infiltration and, where infiltration is not possible, disposal to a surface water drainage body in liaison with the Land Drainage Authority and/or Natural Resources Wales.

It is therefore recommended that the developer consult with Neath Port Talbot County Borough Council, as the determining SuDS Approval Body (SAB), in relation to their proposals for SuDS features. Please note, DCWW is a statutory consultee to the SAB application process and will provide comments to any SuDS proposals by response to SAB consultation. Please refer to further detailed advice relating to surface water management included in our attached Advice & Guidance note. In addition, please note that no highway or land drainage run-off will be permitted to discharge directly or indirectly into the public sewerage system.

Foul Water Drainage – Sewerage Network

We have considered the impact of foul flows generated by the proposed development and concluded that flows can be accommodated within the public sewerage system. We advise that the flows should be connected to the foul sewer between manholes SN72032603 and SN72032602 located in Ynisderw Road. Should a planning application be submitted for this development we will seek to control these points of communication via appropriate planning conditions and therefore recommend that any drainage layout or strategy submitted as part of your application takes this into account. However, should you wish for an alternative connection point to be considered please provide further information to us in the form of a drainage strategy, preferably in advance of a planning application being submitted.



Welsh Water is owned by Glas Cymru – a 'not-for-profit' company.
Mae Dŵr Cymru yn eiddo i Glas Cymru – cwmni 'nid-er-elw'.

We welcome correspondence in
Welsh and English

Dŵr Cymru Cyf, a limited company registered in
Wales no 2366777. Registered office: Pentwyn Road,
Nelson, Treharris, Mid Glamorgan CF46 6LY

Rydym yn croesawu gohebiaeth yn y
Gymraeg neu yn Saesneg

Dŵr Cymru Cyf, cwmni cyfyngedig wedi'i gofrestru yng
Nghymru rhif 2366777. Swyddfa gofrestredig: Heol Pentwyn
Nelson, Treharris, Morgannwg Ganol CF46 6LY.

You may need to apply to Dwr Cymru Welsh Water for any connection to the public sewer under Section 106 of the Water Industry Act 1991. However, if the connection to the public sewer network is either via a lateral drain (i.e. a drain which extends beyond the connecting property boundary) or via a new sewer (i.e. serves more than one property), it is now a mandatory requirement to first enter into a Section 104 Adoption Agreement (Water Industry Act 1991). The design of the sewers and lateral drains must also conform to the Welsh Ministers Standards for Foul Sewers and Lateral Drains, and conform with the publication "Sewers for Adoption"- 7th Edition. Further information can be obtained via the Developer Services pages of www.dwrcymru.com.

Foul Water Drainage – Sewage Treatment

No problems are envisaged with the Wastewater Treatment Works for the treatment of domestic discharges from this site.

Potable Water Supply

A water supply can be made available to service this proposed development. Initial indications are that a connection can be made from the 4" diameter UPVC watermain in 272242, 203623 location. The cost of providing new on-site watermains can be calculated upon the receipt of detailed site layout plans which should be sent to the above address.

I trust the above information is helpful and will assist you in forming water and drainage strategies that should accompany any future planning application. I also attach copies of our water and sewer extract plans for the area, and a copy of our Planning Guidance Note which provides further information on our approach to the planning process, making connections to our systems and ensuring any existing public assets or infrastructure located within new development sites are protected.

Please note that our response is based on the information provided in your enquiry and should the information change we reserve the right to make a new representation. Should you have any queries or wish to discuss any aspect of our response please do not hesitate to contact our dedicated team of planning officers, either on 0800 917 2652 or via email at developer.services@dwrcymru.com

Please quote our reference number in all communications and correspondence.

Yours faithfully,



Owain George
Planning Liaison Manager
Developer Services

Please Note that demands upon the water and sewerage systems change continually; consequently the information given above should be regarded as reliable for a maximum period of 12 months from the date of this letter.



Welsh Water is owned by Glas Cymru – a 'not-for-profit' company.
Mae Dŵr Cymru yn eiddo i Glas Cymru – cwmni 'nid-er-elw'.

We welcome correspondence in
Welsh and English

Dŵr Cymru Cyf, a limited company registered in
Wales no 2366777. Registered office: Pentwyn Road,
Nelson, Treharris, Mid Glamorgan CF46 6LY

Rydym yn croesawu gohebiaeth yn y
Gymraeg neu yn Saesneg

Dŵr Cymru Cyf, cwmni cyfyngedig wedi'i gofrestru yng
Nghymru rhif 2366777. Swyddfa gofrestredig: Heol Pentwyn
Nelson, Treharris, Morgannwg Ganol CF46 6LY.