



McDonalds Pontardawe Drainage Strategy

For McDonalds LTD

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DOCUMENT CONTROL SHEET

Issued by	Hydrock Consultants Limited 3rd Floor 13 Wharton Street Cardiff CF10 1GS United Kingdom	T +44 (0)2920 023 665 E cardiff@hydrock.com www.hydrock.com
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Prepared by	Jessica Li - Engineer	
Checked by	Mark Lewis - Associate	
Approved by	Richard Baker - Technical Director	

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Introduction

Hydrock have been commissioned by McDonalds Ltd to provide a drainage strategy report and preliminary design for the proposed McDonalds development at Tesco, 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 at Tesco, Pontardawe, Swansea, SA8 3AZ (Approximate Grid Reference X-272293, Y-203501). ©[OpenStreetMap](#) contributors.

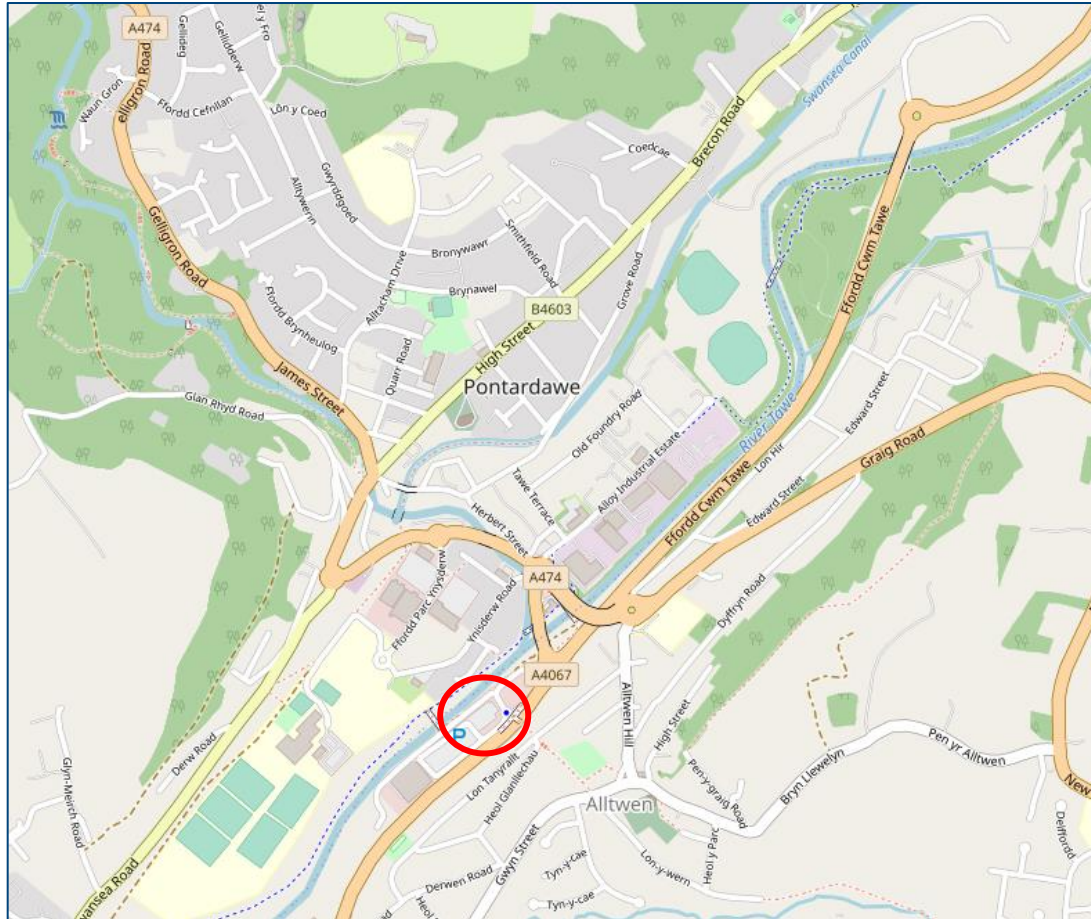


Figure 1 - Site Location Plan

2. SITE DESCRIPTION

The site is approximately 0.35 hectares in area with the site comprising of an existing car park. The site falls from south west to north east at a gradient of approximately 1 in 60.

The site is bordered by an existing car park on the south west, private highway on the north, east and south of the site. The site has allowance for direct vehicle access via the existing access to Tesco Pontardawe which runs along the south western boundary.

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

4. EXISTING CONTRIBUTING AREAS AND RUN-OFF RATES

The total site area is circa 0.35ha, 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	2.4
30 YRP	4.7
100 YRP	5.8

As the site is comprised of mostly existing hardstanding (0.30ha), the existing peak discharge rate from the site has been calculated 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	16.69
30 YRP	41.01
100 YRP	53.52

Proposed Development

5. DEVELOPMENT PROPOSALS

For assessment purposes the development is a proposed McDonalds development with associated car parking area. The proposed development will utilise the existing Tesco access from the local highway located along the southern boundary of the site.

6. FOUL DRAINAGE

The proposed new development will be located with the existing Tesco's car park. A proposed connection has been identified to the existing private foul sewer network within the site. The new development will seek to utilise the existing private foul sewer that currently serves the site via gravity subject to confirmation from the asset owner on the available capacity within the private sewer.

It is proposed to utilise the existing private pipework within the site where possible however a section of existing private foul sewer will require diverting to move it from beneath the proposed building footprint. It is 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 the asset owner 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 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, 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. The development is considered to have potential demand for grey water in the WC's however the proposed building is to comprise of a prefabricated modular building and based on this storing rain water runoff for reuse would not be feasible or economical.

7.1.2 *Infiltration Methods*

Based on the Cranfield University Soils mapping the subsoils in the area of the site are noted as slowly permeable seasonally wet acid loamy and clayey 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 the river Tawe located to the north of the site, forming a new discharge point to the river would be deemed unfeasible and unlikely to be supported by the local authority and NRW, however as detailed we are proposing to utilise the existing on-site surface water system which currently outfalls to the river which will remove the need to construct a new structure on the river bank.

7.1.4 *Discharge to Surface Water Sewer*

Based on the information received to date there is an existing private surface water sewer which crosses the centre of the site which currently serves the existing Tesco car park and petrol station and main building further downstream. It is assumed that this system currently discharges to the river Tawe. It is proposed to construct a new manhole on the existing sewer to accept the discharge from site subject to the necessary discharge consents, as the existing pipework currently serves the site area and

we are providing betterment over the existing flows there should be capacity within the network to accept the proposed site.

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 bio retention areas 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 existing private surface water sewer within the site boundary, at a proposed rate of 11.7l/s for all rainfall events which will provide 30% betterment for the 1 year event with that number increasing to 86% 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	16.69	11.7	30%
30 year event	44.676	11.7	74%
100 year event	58.297	11.7	80%
100+40% event	81.616	11.7	86%

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 existing private surface water sewer, 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.

Given the proposed site usage bio retention areas 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 0.3ha as shown by the master plan and maximum discharge rate assumed at 11.7l/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 at detailed design stage to confirm the acceptability of the proposed runoff rates and the use of a complex control.

Appendix B 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)
Permeable Paving Systems	435.2	-	65.3
Bio Retention Areas	293.4	-	70.4

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 bio retention areas, 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 bio retention areas 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 bio retention 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 bio retention areas.

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 bio retention areas 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 bio retention areas 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 existing private foul sewer system located within the boundary of the site. If possible, the existing pipework will be reused to minimise the works to be carried out on the existing private foul 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 private 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 the asset owner 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 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 existing on-site private surface water sewer which discharges to the river Tawe further downstream. 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 11.7l/s where the existing private gravity surface water sewer network is proposed to be utilised as the discharge point. 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 providing betterment of up to 85.6% over the existing runoff rates.

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 private gravity surface water sewer network at a restricted discharge rate which flows northeast to southwest, 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 bio retention areas 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.

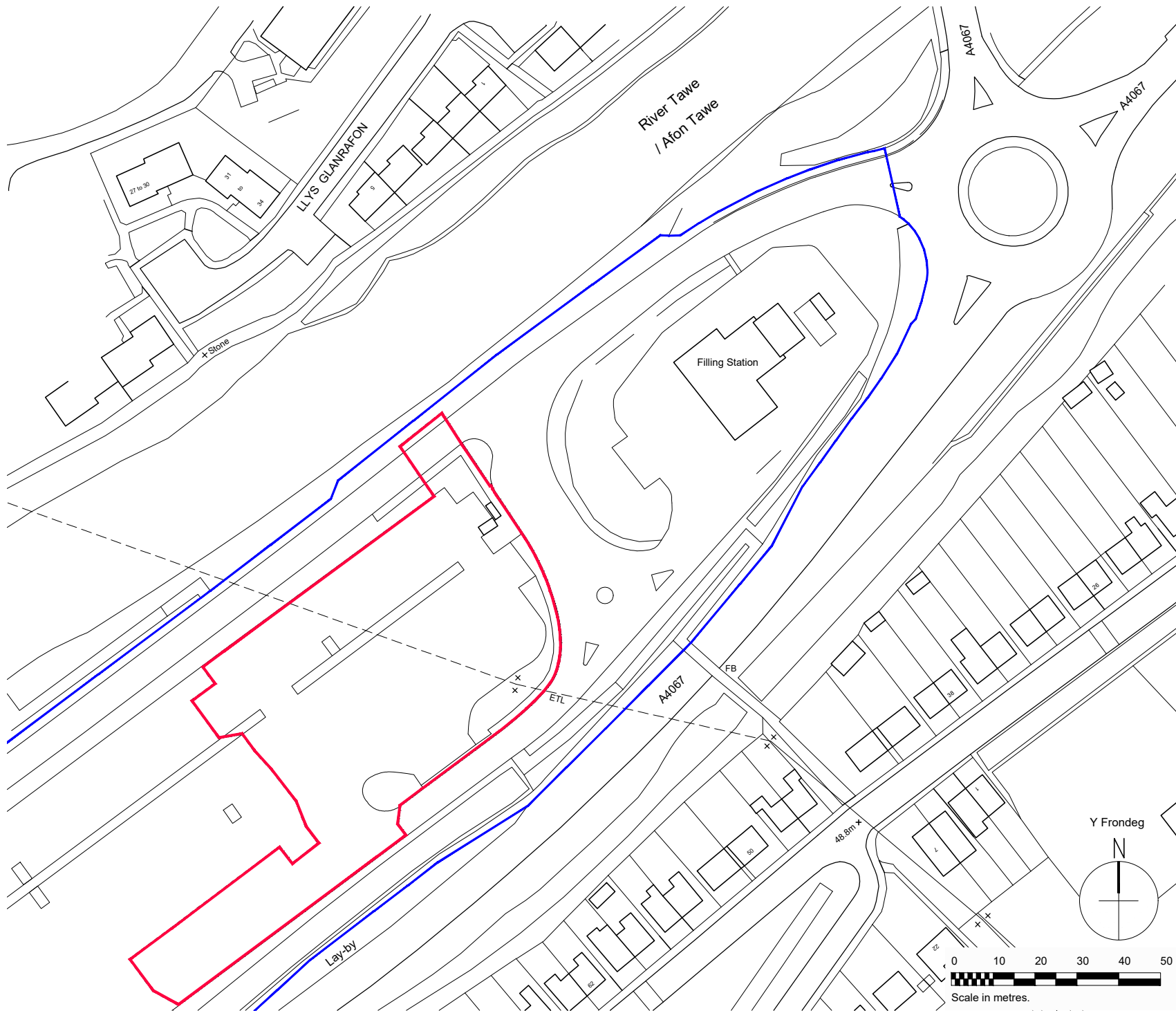
The development is considered to have potential demand for grey water in the WC's however the proposed building is to comprise of a prefabricated modular building and based on this storing rain water runoff for reuse would not be feasible or economical.

Amenity and biodiversity benefits to the site will be provided in the form of bio retention areas 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



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Scurr Architects
88 Southdown Road
Haverfordwest
SA6 2PR
T: 01462 703090
email: scurm@scurr.co.uk
www.scurr.co.uk
architects ■ designers ■ project managers



Application Boundary:

Other Land under Applicant Control:

REV.	DATE	DESCRIPTION	BY	CHECKED
A	04.04.22	Application boundary revised.	DM	JK

GENERAL NOTES:
All works are to be undertaken in accordance with the Building Regulations and the latest British Standards.
All proprietary materials and products are to be used strictly in accordance with the manufacturer's recommendations.
All dimensions to be checked on site prior to construction.
All risks assessed to comply with the designer's responsibility under the Construction (Design Management) Regulations 2015.

PROPOSED DEVELOPMENT AT	STORE No 1 -
Tesco, Gwyn's Drift, Pontardawe	NB 8823
SWANSEA SA8 3AZ	

ON BEHALF OF : -
McDonald's Restaurants Ltd

DRAWING TITLE : -
Site Location Plan

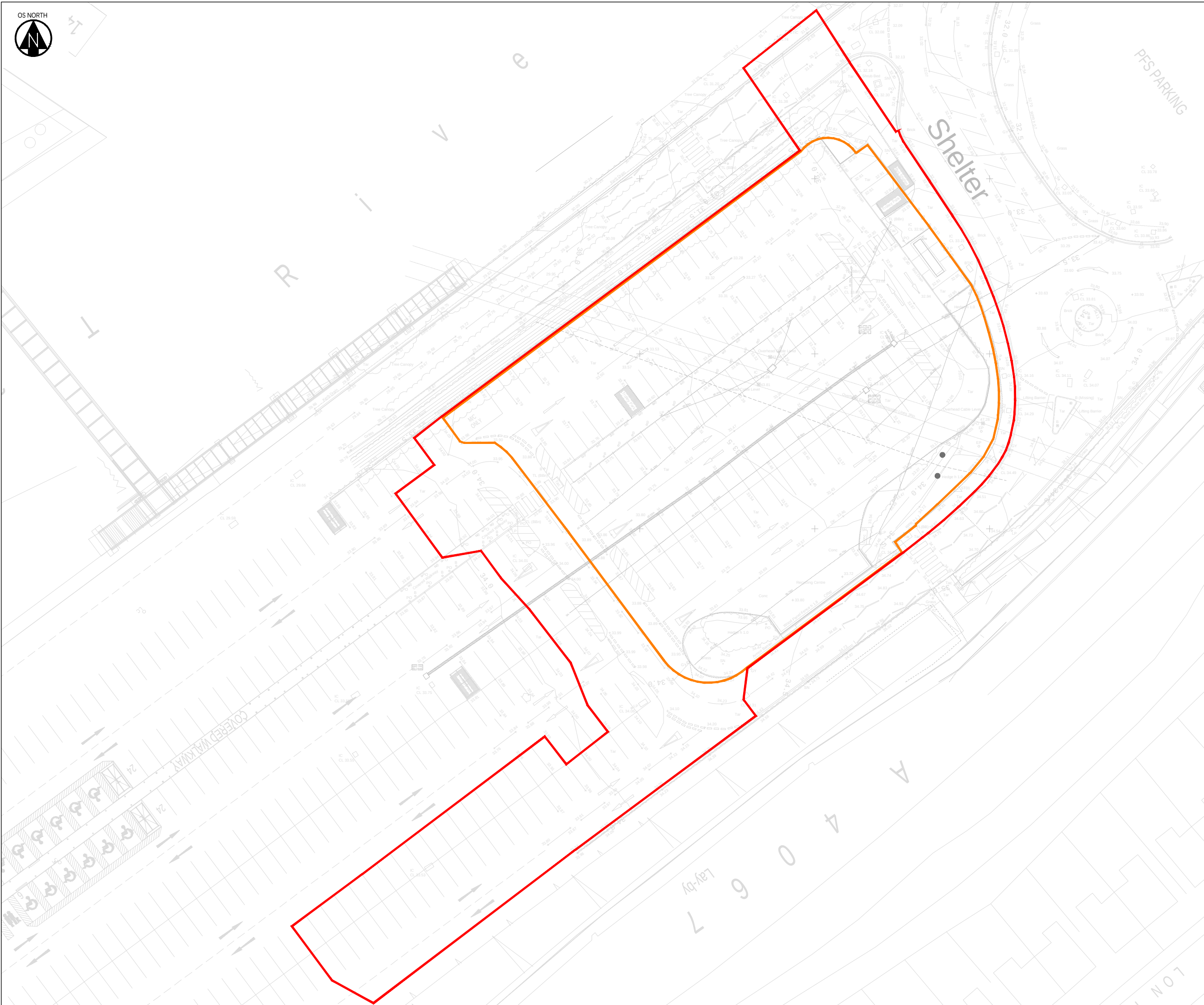
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SCALE & SIZE 1:1250@A4	DATE APR 2022	



Scurr Architects
88 Southdown Road
Haverfordwest
SA6 2PR
T: 01462 703090
email: scurm@scurr.co.uk
www.scurr.co.uk
architects ■ designers ■ project managers



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KEY

 PLANNING APPLICATION SITE BOUNDARY

 SAB SITE BOUNDARY

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 works associated with the drawing refer to all relevant health and safety information for the works including residual risk information.
5. This drawing has been based on information provided by other parties and Hydrock do not warrant the accuracy of this information.
6. The drawing indicates the design intent for the works and items/service routes in such detail as to indicate the design. The drawing does not show all components that may be necessary to locate services in a fully coordinated manner.
7. It is known that existing utility company underground services and apparatus is present within the proposed works area and it is the Contractor's responsibility to locate existing services on site accurately.
8. The Contractor should comply with h(s)g 47 "Avoiding Danger from Underground Services" when excavating around existing services.
9. The Contractor is to verify the line, level and diameter of existing sewers before commencing drainage works.
10. The contractor should allow for all necessary investigative work (cat detection, trial holes, etc.) to determine route and depth of all underground services to avoid damage and preserve supplies to existing users
11. The drawing shall be used for the intended purpose only and Hydrock does not warrant the accuracy of this information.
12. 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.
13. Hydrock is not responsible for checking dimensions on site.
14. Hydrock is not responsible for setting out grid lines, building line etc
15. Hydrock is not responsible for dimensions used in the ordering and manufacturing of equipment and this shall be the responsibility of the contractor.
16. All figured levels are in metres and related to existing survey grid & datum unless noted otherwise
17. All figured dimensions are in metres unless noted otherwise.

REVISIONS

P01	07/06/22	First Issue.	JSL	ML	CS
Rev	Date	Description	By	Ckd	App

Hydrock  **THIRD FLOOR, WHARTON PLACE**
13 WHARTON STREET
CARDIFF
CF10 1GS
t: +44 (0) 2920 023665
e: cardiff@hydrock.com

CLIENT
MCDONALDS
RESTAURANTS LTD

PROJECT
MCDONALDS
PONTARDAWE

TITLE
EXISTING SITE PLAN

HYDROCK PROJECT NO C-15297-C	SCALE @ A1 1 : 250
STATUS DESCRIPTION INFORMATION	STATUS S2
DRAWING NO. (PROJECT CODE-ORIGINATOR-ZONE-LEVEL-TYPE-ROLE-NUMBER) PNT-HYD-XX-XX-DR-C-1200	REVISION P01



DRAINAGE KEY

- PLANNING APPLICATION SITE BOUNDARY
- SAB SITE BOUNDARY
- PROPOSED SURFACE WATER MANHOLE AND SEWER
- PROPOSED FOUL WATER MANHOLE AND SEWER
- PROPOSED FOUL WATER INSPECTION CHAMBER AND SEWER
- PROPOSED LINEAR DRAINAGE CHANNEL, ACO MULTIDRAIN OR SIMILAR, WITH ACCESS AND SUMP UNITS
- EXISTING DRAINAGE SEWER, TO BE DIVERTED
- EXISTING SURFACE WATER CULVERT
- PROPOSED PERMEABLE PAVING
- PROPOSED BIORETENTION AREA
- PROPOSED RAIN GARDEN
- INDICATIVE EASEMENT OF EXISTING CULVERT
- PROPOSED SURFACE WATER FLOWPATH DIRECTION
- PROPOSED BUILDING

- General Notes:**
- Drawing to be read in conjunction with all other relevant project drawings
 - 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.
 - The drawing shall be read in conjunction with the health and safety information provided and/or within the pre-construction information.
 - Before commencement of works associated with the drawing refer to all relevant health and safety information for the works including residual risk information.
 - The drawing has been based on information provided by other parties and Hydrock do not warrant the accuracy of this information.
 - The drawing indicates the design intent for the works and items/service routes in such detail as to indicate the design. The drawing does not show all components that may be necessary to locate services in a fully coordinated manner.
 - It is known that existing utility company underground services and apparatus is present within the proposed works area and it is the Contractor's responsibility to locate existing services on site accurately.
 - The Contractor should comply with hsg(g) 47 "Avoiding Danger from Underground Services" when excavating around existing services.
 - The Contractor is to verify the line, level and diameter of existing sewers before commencing drainage works.
 - The contractor should allow for all necessary investigative work (cat detection, trial holes, etc.) to determine route and depth of all underground services to avoid damage and preserve supplies to existing users
 - The drawing shall be used for the intended purpose only and Hydrock does 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.
 - Hydrock is not responsible for checking dimensions on site.
 - Hydrock is not responsible for setting out grid lines, building line etc
 - Hydrock is not responsible for dimensions used in the ordering and manufacturing of equipment and this shall be the responsibility of the contractor.
 - All figured levels are in metres and related to existing survey grid & datum unless noted otherwise
 - All figured dimensions are in metres unless noted otherwise.

REVISIONS				
P03	07/06/22	Amended to suit new layout, and issued for Pre-SAB	JSL	ML CS
P02	21/03/22	Amended to suit new layout	JSL	CS CS
P01	04/11/21	First Issue.	JSL	CS CS

Rev	Date	Description	By	Ckd	App
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Hydrock  THIRD FLOOR, WHARTON PLACE
13 WHARTON STREET
CARDIFF
CF10 1GS
t: +44 (0) 2920 023665
e: cardiff@hydrock.com

CLIENT
MCDONALDS RESTAURANTS LTD

PROJECT
MCDONALDS PONTARDAWE

TITLE
PROPOSED DRAINAGE STRATEGY

HYDROCK PROJECT NO. C-15297-C		SCALE @ A1 1 : 200	
STATUS DESCRIPTION INFORMATION			STATUS S2
DRAWING NO. (PROJECT CODE-ORIGINATOR-ZONE-LEVEL-TYPE-ROLE-NUMBER) PNT-HYD-XX-XX-DR-C-2200			REVISION P03

Appendix B Drainage Calculations

ICP SUDS Mean Annual Flood

Input

Return Period (years) 100 SAAR (mm) 1400 Urban 0.000
Area (ha) 0.350 Soil 0.400 Region Number Region 9

Results 1/s

QBAR Rural 2.7
QBAR Urban 2.7

Q100 years 5.8

Q1 year 2.4
Q30 years 4.7
Q100 years 5.8

McDonalds Pontardawe : 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
16.69	41.01	53.52	74.92



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

Calculation & Parameters Used

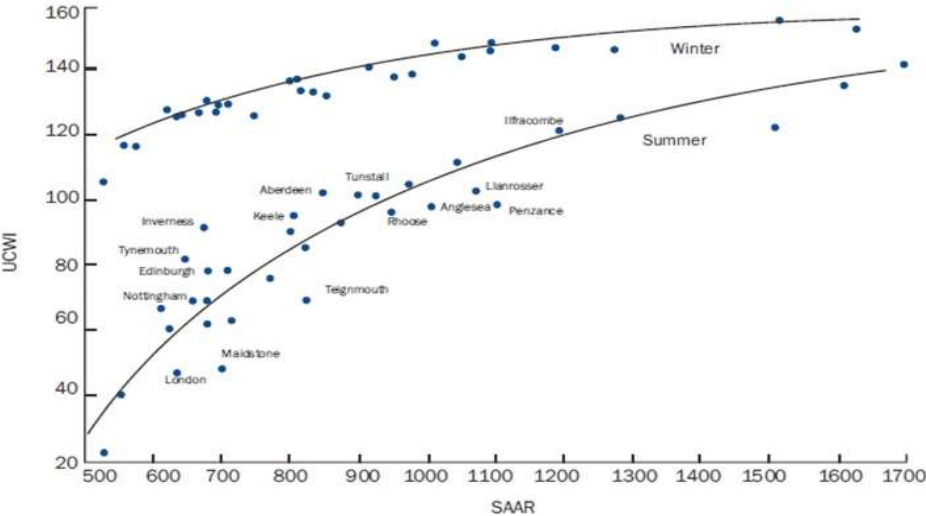
$Q = 3.6C_vIA$
I mm/hr average rainfall intensity during the time of concentration
A 0.300 ha Total Site Area

$C_v = PR/100$
when whole catchment is being considered
Cv (ex) 0.76 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) 91.00 % % of surface currently draining to the storm sewer

PR 76.44
SOIL 0.4 - Soil Type Host Class 6 - SPR value 33.8%
UCWI 150 mm 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



Variables

Results

Design

Overview 2D

Overview 3D

Vt

Variables

FSR Rainfall

Return Period (years)

Region

Map

M5-60 (mm)

Ratio R

Cv (Summer)

Cv (Winter)

Impemeable Area (ha)

Maximum Allowable Discharge (l/s)

Infiltration Coefficient (m/hr)

Safety Factor

Climate Change (%)

100

England and Wales

19.800

0.236

0.750

0.840

0.300

11.7

0.00000

2.0

40

Analyse

OK

Cancel

Help

Enter Climate Change between -100 and 600

Variables

Results

Design

Overview 2D

Overview 3D

Vt

Results

Global Variables require approximate storage of between 108 m³ and 196 m³.

These values are estimates only and should not be used for design purposes.

Analyse

OK

Cancel

Help

Enter Maximum Allowable Discharge between 0.0 and 999999.0