

DMH Tyres Development, Miners Road, Llay Industrial Estate, Wrexham

Drainage Statement for Pre-Planning

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1. INTRODUCTION

Datrys have been commissioned by DMH Tyres to prepare an outline drainage statement in support of a pre-planning application for the construction of an industrial unit on Miners Road in Llay Industrial Estate, Wrexham at grid reference SJ 327 563. The proposed unit will be used as a mechanic garage and consist of 4 vehicle bays, a mezzanine area for training and an office. The existing site is currently disused with two buildings lying vacant. The levels around the site are relatively flat though beyond the rear boundary the ground is built up considerably.

This document will set out the possible solutions to address the surface water runoff associated with the development whilst also offering solution for the foul drainage.

2. SURFACE WATER DRAINAGE HIERARCHY

Sustainable Drainage Philosophy

The surface water design has been undertaken in accordance with the SuDS drainage hierarchy given in the SuDS Manual published by CIRIA and accepted and adopted by the Lead Local Flood Authority (LLFA).

The drainage hierarchy is:

SuDS Priority Level	Design approach
Level 1	Surface water runoff is collected for re-use
Level 2	Surface water runoff is infiltrated to ground
Level 3	Surface water runoff is discharged to a surface water body
Level 4	Surface water runoff is discharged to a surface water sewer, highway drain, or another drainage system
Level 5	Surface water runoff is discharged to a combined sewer

Table 1 - SuDS drainage hierarchy

Priority Level 1 is the preferred (highest priority) and that 4 and 5 should only be used in exceptional circumstances.

Application of SuDS hierarchy to proposals

The following considerations are relevant to the application of the above to the proposed development.

Priority Level 1 – Re-use

The opportunity for re-using water within this site is limited. It is feasible that the attenuation proposed for the development can be a ‘smart’ attenuation tank, which will act as both an attenuation tank and rainwater harvester and may provide greywater for the couple of toilets on site. Regardless of re-use being incorporated into the design, a formal method for disposal must be provided to address excess volumes beyond that of which the above options provide, whilst the antecedent conditions are also unknown therefore may provide no storage capacity during a storm event.

Priority Level 2 – Infiltration to ground

The results of porosity testing are in the process of being analysed and the initial view is that infiltration is not feasible. If the infiltration rate is deemed to be favourable, then the use of soakaways will be used and there will be no need for an offsite solution to be considered.

Priority Level 3 – Discharge to surface water body

There seems to be a minor ditch southwest of the site boundary approximately 200m away, through several third-party boundaries. The depth and level at the ditch are unknown. It is deemed that due to the distance of the ditch, a connection is not feasible.

Priority Level 4 – Surface water or highway sewer

Welsh Water asset maps (**Appendix A**) indicate the presence of a surface water sewer within the site boundary. The Welsh Water asset maps show a chamber located just outside the site boundary however, investigations on site have proven this to be incorrect and the surface water chamber is actually within the site boundary. The surface water sewer is over 5m deep and therefore a connection to this sewer is feasible.

Priority Level 5 – Disposal to combined sewer.

There are no combined sewers within the vicinity and therefore this option is not possible.

3. DESIGN CRITERIA

From the above, the most feasible option entails the discharge of the surface water flow into soakaways if possible. If this is not possible, the attenuated surface water flow will enter into a surface water sewer. The system is to be designed to the following criteria:

Design element	Criterion
Rate of discharge	TBA with SAB/DCWW though assumed to be peak discharge, associated with threshold event, of 4.0l/s
Climate change effects	+ 20%
Urban Creep	0%
No uncontrolled surface flooding or off-site run-off	Up to 1 in 100 Year Return Period + 30% Climate Change

Table 2 - Storm water design criteria

The calculation of the storm water run-off is derived from the Wallingford Modified Rational method and in compliance with BS EN 752-4 *Drain and sewer systems outside buildings*.

Assuming infiltration will not be feasible, the rate of discharge has been determined from existing greenfield runoff calculations with no allowance for climate change as per standard practice. The difference between the design storm flow and the outflow will be stored temporarily in underground storage (i.e., attenuation tank with possibility of also utilising the reservoir layer of permeable paving). To avoid uncontrolled surface flooding, the attenuation will be designed to accommodate the full 1 in 100-year event plus climate change effects. Initial estimates indicate a storage requirement of approximately 40m³, which is intended to be afforded within an underground attenuation tank.

The following design criteria will apply for the surface water runoff of the site:

- Approved Document H, Building Regulations
- Sewers for Adoption, 7th Edition
- Rainfall runoff management for developments (SC030219)
- BRE Digest 365
- Statutory standards for sustainable drainage systems – designing, constructing, operating, and maintaining surface water drainage systems.
- SuDS manual
- Non-Statutory SuDS Technical Standards for Sustainable Drainage: Practical Guidance

4. SUSTAINABLE DRAINAGE

Scheme Approach to Sustainable Drainage

The design for surface water disposal from the site will be considered in line with the CIRIA SuDS manual. This approach seeks to manage the quantity and quality of surface water runoff on or as close to the surface and as close to the source of the runoff as possible as well as providing amenity and biodiversity to the end users and flora and fauna.

In order for the surface water design to be approved by SAB (SuDS Approval Body), the design has to show compliance with Statutory National Standards for Sustainable Drainage Systems. These Standards are:

- S1 – Surface water runoff destination
- S2 – Surface water runoff hydraulic control
- S3 – Water quality
- S4 – Amenity
- S5 – Biodiversity
- S6 – Design of drainage for Construction and Maintenance and Structural Integrity

S1 – Surface water runoff destination

The opportunity for re-using water within this site is limited. It is feasible that the attenuation proposed for the development can be in the form of a 'smart' attenuation tank, which will act as both an attenuation tank and rainwater harvester and may provide greywater for the couple of toilets on site.

Initial findings from the porosity testing have deemed that soakaways are unlikely to work. If soakaways are not feasible, then a connection into the surface water sewer on site will be sought subject to agreement with SAB and Welsh Water.

S2 – Surface water runoff hydraulic control

The proposed site discharge will be restricted to a suitable rate via a flow control device to match the existing site runoff. The peak run off rate is initially estimated as 4.0l/s. The additional surface water will be stored onsite in an underground attenuation tank situated within the parking area. The attenuation will be large enough to store on site all storms up to the threshold event (1 in 100-year event + 20% for climate change effects). Due to the type of development the proposed site is, an allowance for urban creep has not been factored into the attenuation calculations.

Some car parking surface water will be routed through a tree pit to slow the conveyance of flows and maximise the opportunity for evapotranspiration. The permeable paving for car parking spaces closest to the building will also assist with reducing the rate of runoff at source and will consist of a type C arrangement, with the pipework connecting into the proposed surface water network. Due to the depth of the existing Welsh Water sewers (5m+ deep) running through the site, the extent of permeable paving cannot be increased.

There will be no discharge from the proposed site from the first 5mm of any rainfall event.

S3 – Water quality

The site is considered a brownfield site and due to the proposed nature of the development, there may be a risk of groundwater, soil contamination or pollution risk that may arise from petrol or oil spillage from vehicles using the development site. As a result, it is anticipated that an oil separator will be required.

Table 26.2 of the SuDS Manual identifies the site as a medium pollution hazard level with indices varying between 0.6 – 0.7. Table 26.3 suggests permeable paving offers a mitigation index of 0.6 - 0.7, while the SuDS Manual does not provide a mitigation index for the tree pit, it is anticipated it would offer a similar range to the permeable paving.

The sub-base reservoir layer of the permeable paving provides an effective measure to trap suspended solids and hydrocarbons thus improving the water quality before discharging into the onsite pipe network and subsequently offsite.

The drainage of the car parking will form a part of the general site surface water drainage system and will need to be subjected to some form of treatment, likely to be via a type C style permeable paving arrangement or routing the drainage through a tree pit. These are likely to improve the quality of the water before entering the surface water drainage network.

S4 – Amenity

As the proposed site is a unit within an industrial estate, the opportunity for providing amenity is limited. However, the use of permeable paving within the site will promote multi-functionality, whilst the allowance of climate change aids the developments resilience to future change.

S5 - Biodiversity

As the proposed site is a unit within an industrial estate, the opportunity for providing biodiversity is limited. The proposed tree pit will be provided opportunities for wildlife and potentially increase the number of species with planting at the base of the tree also a possibility.

This will include a variety of planting of known wildlife value local to the area – providing habitat and food for insects, invertebrates, and birds.

The site is limited in what it can provide from a biodiversity perspective due to the narrowness of the site. A vehicle tracking exercise has been carried out and reducing the current width of the proposed hardstanding to allow a swale for example would result in large vehicles struggling to enter the bays.

S6 - Design of drainage for Construction and Maintenance and Structural Integrity

All SuDS features will be installed by a competent contractor and will be situated in locations and at shallow depths where they can be easily maintained. A maintenance plan will state the maintenance requirements for the SuDS features for them to remain at their optimum capacity.

All materials and components, where possible, will have a minimum design life equivalent to the design life of the development, including an appropriate factor of safety.

5. FOUL WATER DRAINAGE

The following design criteria will apply for the surface water runoff and foul discharge design of the site:

- Approved Document H, Building Regulations
- Sewers for Adoption 7th Edition
- BS EN 12056 Part 2.

There is an existing 225mm diameter foul sewer running from west to east through the site. It is proposed to construct a manhole (5m+ deep) with backdrop on this sewer line and provide a 100mm diameter connection to the foul sewer. This new connection could be made to the sewer subject to agreement of the Section 106. The drainage on site will remain private as it only serves one unit.

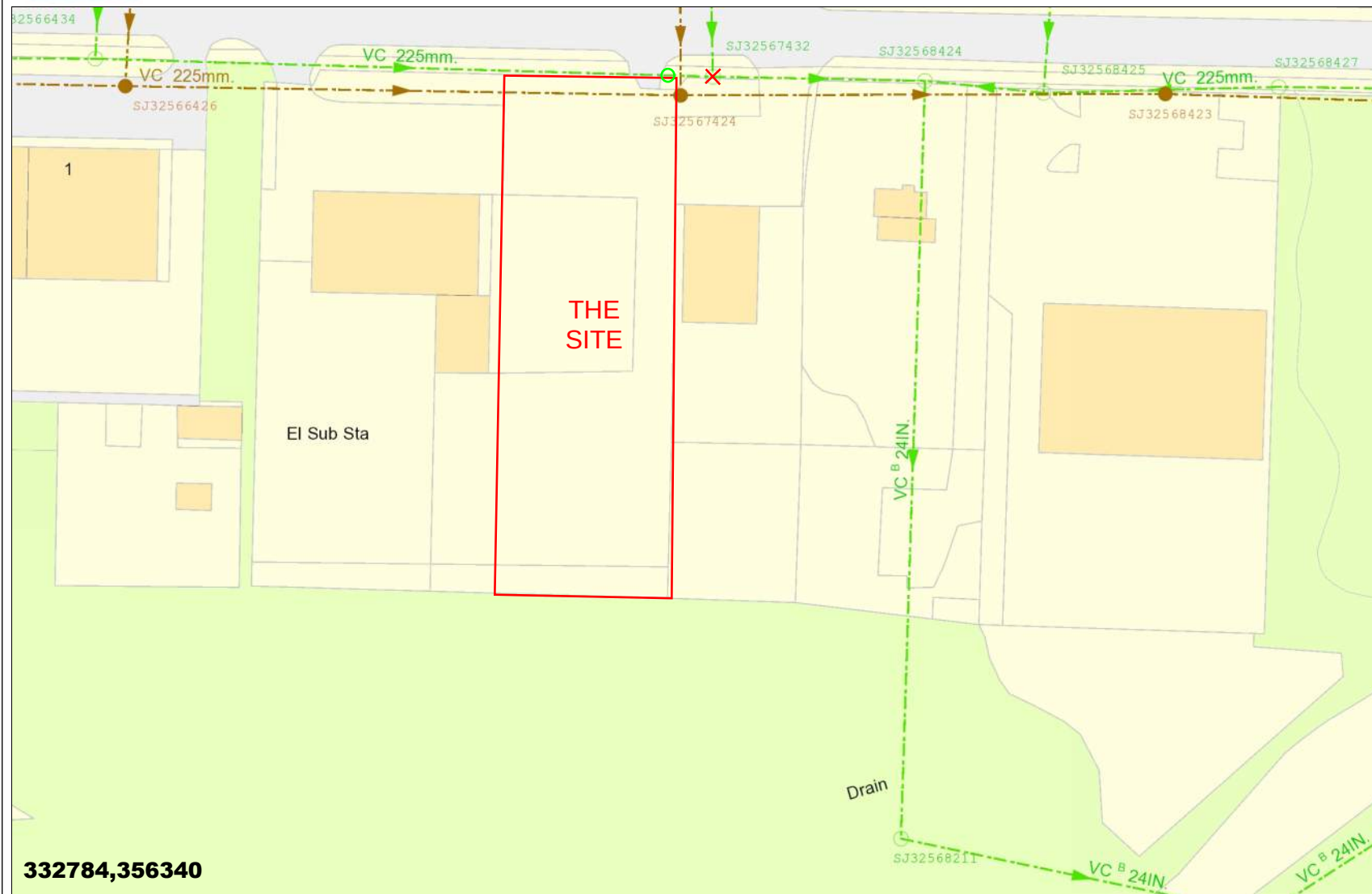
There is also a possibility of utilising an existing connection in the adjacent unit. This is likely to reduce the need for deep drainage within the proposal site however further investigation into this is required to determine whether this is feasible.

APPENDICES

APPENDIX A – WELSH WATER UTILITY MAPS



Scale: 1: 1000



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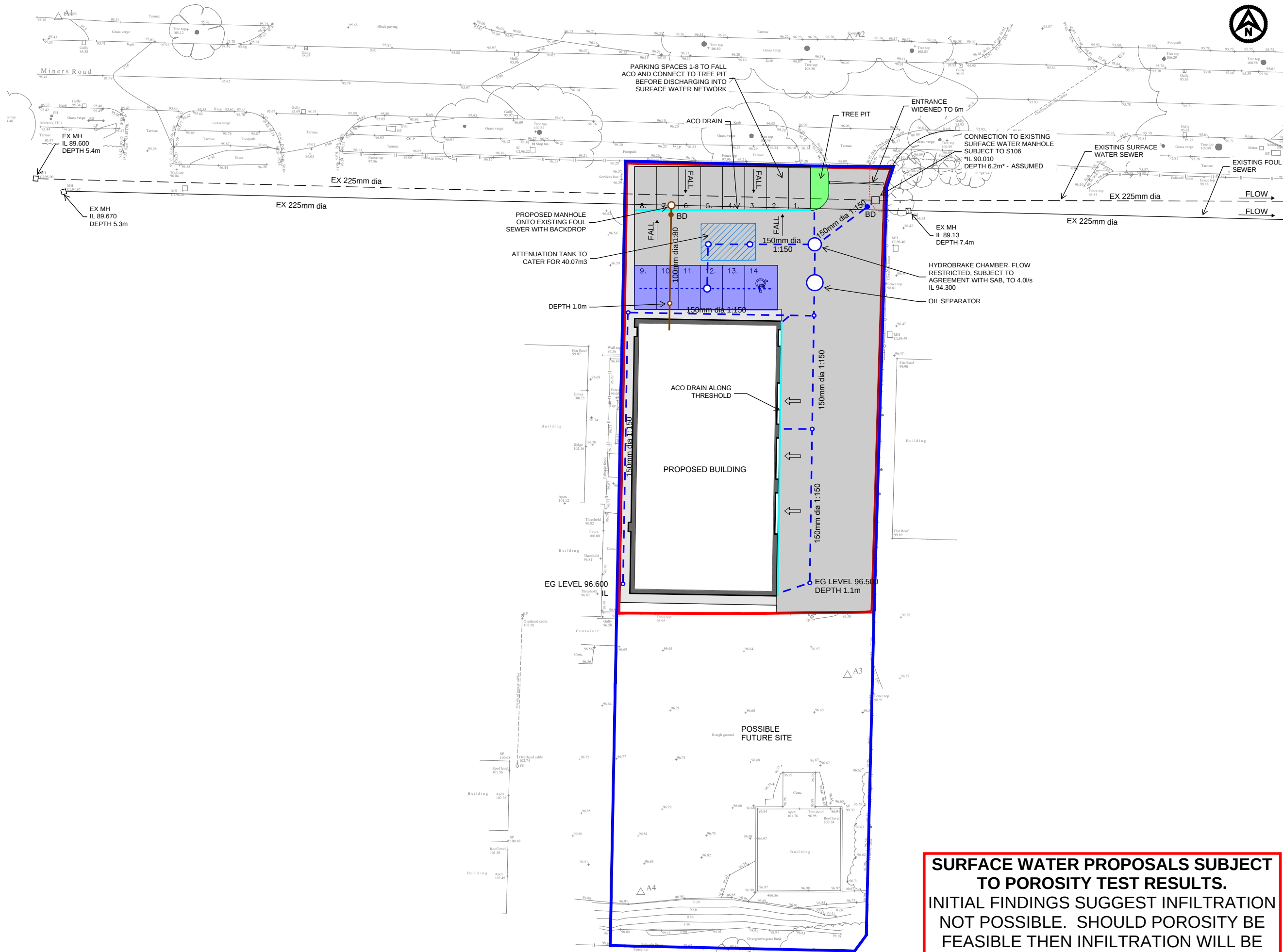
Dŵr Cymru Cyfyngedig ('the Company') gives this information as to the position of its underground apparatus by way of general guidance only and on the strict understanding that it is based on the best information available and no warranty as to its correctness is relied upon in the event of excavations or other works made in the vicinity of the company's apparatus and any onus of locating the apparatus before carrying out any excavations rests entirely on you. The information which is supplied hereby the company, is done so in accordance with statutory requirements of sections 198 and 199 of the water industry Act 1991 based upon the best information available and in particular, but without prejudice to the generality of the foregoing, it should be noted that the records that are available to the Company may not disclose the existence of a drain sewer or disposal main laid before 1 September 1989, or if they do, the particulars thereof including their position underground may not be accurate. It must be understood that the furnishing of this information is entirely without prejudice to the provision of the New Roads and Street Works Act 1991 and the company's right to be compensated for any damage to its apparatus.

**EXACT LOCATION OF
ALL APPARATUS TO
BE DETERMINED ON
SITE**

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Whilst every reasonable effort has been taken to correctly record the pipe material of DCWW assets, there is a possibility that in some cases pipe material (other than Asbestos Cement or Pitch Fibre) may be found to be Asbestos Cement (AC) or Pitch Fibre (PF). It is therefore advisable that the possible presence of AC or PF pipes be anticipated and considered as part of any risk assessment prior to excavation

APPENDIX B – PRELIMINARY DRAINAGE SCHEME



- KEY:
- SITE OWNERSHIP BOUNDARY
 - SITE PLANNING BOUNDARY
 - EXISTING FOUL SEWER
 - EXISTING SURFACE WATER SEWER
 - PROPOSED FOUL DRAINAGE
 - PROPOSED SURFACE WATER DRAINAGE
 - PROPOSED PERFORATED PIPE AND INSPECTION CHAMBER
 - PROPOSED BACKDROP
 - PROPOSED POROUS SURFACING WITHIN CAR PARKING
 - PROPOSED SUDS TREE PIT
 - PROPOSED ACO DRAINAGE
 - PROPOSED ATTENUATION TANK
 - PROPOSED IMPERMEABLE SURFACING
 - PROPOSED FOOTWAY

REV	DATE	DESCRIPTION	BY	CHK	APP
REVISIONS					

STATUS

SCHEME

CLIENT

D.M.H. TYRES LTD

Big enough to cope, small enough to care

PROJECT

DMH Tyres Redevelopment
Miners Road, Llay Industrial Estate

TITLE

Preliminary Drainage Scheme

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DRAWN	TD	CHECKED	AC	PASSED	AC
DATE	15.02.21	CLIENT'S REF.			

SCALE AT A1	1:200	AUTOCAD REF.	20258/SK501
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SURFACE WATER PROPOSALS SUBJECT TO POROSITY TEST RESULTS.
INITIAL FINDINGS SUGGEST INFILTRATION NOT POSSIBLE. SHOULD POROSITY BE FEASIBLE THEN INFILTRATION WILL BE THE PURSUED SOLUTION FOR DISPOSAL

