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CONSULTING CIVIL & STRUCTURAL ENGINEERS

**ALDI DEVELOPMENT
POOL ROAD
NEWTOWN**

SAB PRE-APPLICATION REPORT

Date: September 2019

9045-SWF-XX-XX-RP-D-0201

S2: Suitable for Information

Version: P1

By: Phil Sarbutts



REVISION HISTORY

VERSION	DATE	SUITABILITY	REVISIONS
P1	12/10/19	S2: Suitable for Information	Issued For Information

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1. Development Details

The proposed scheme looks to re-develop an existing car showroom and associated garage facilities to become a new Aldi store.

The current development originally had a garage forecourt associated with the scheme but the tanks and pumps were decommissioned in the 2014. The existing site plan is shown below as an extract from the architectural drawings.

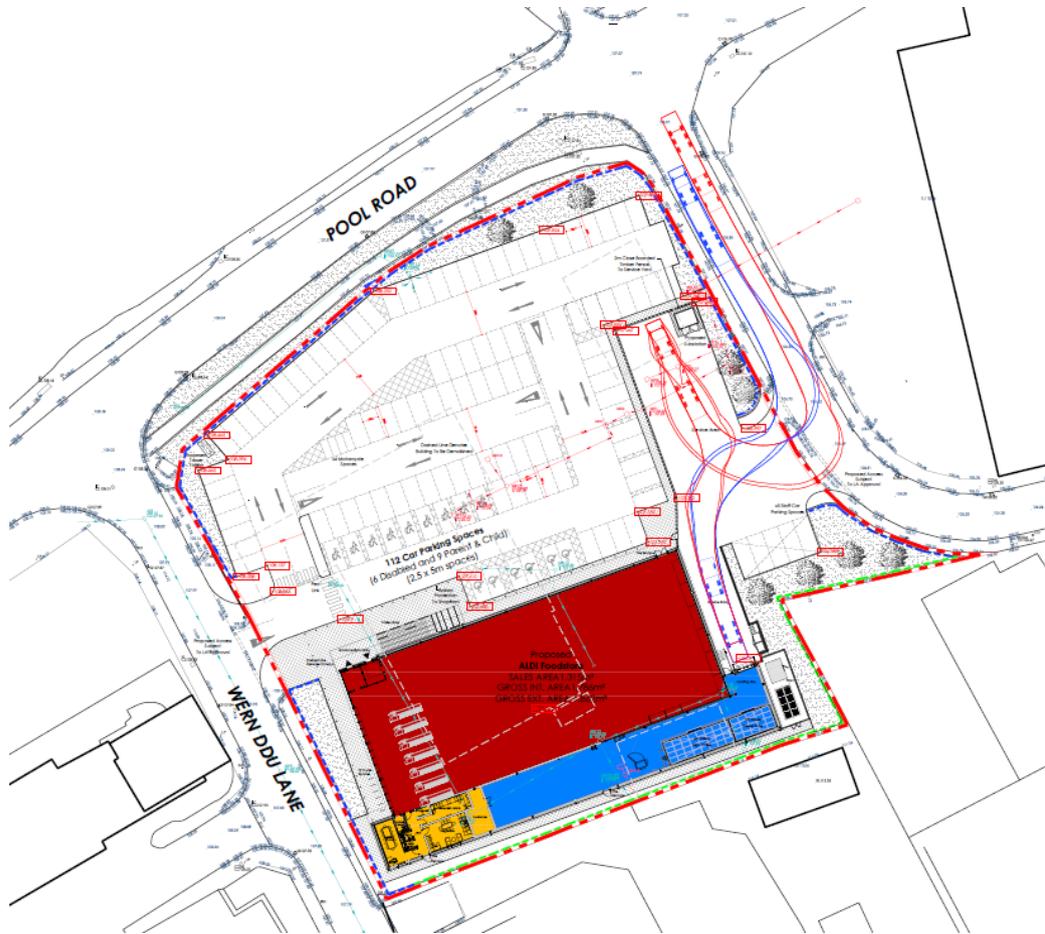


The proposed plan for the site is shown overleaf and this report covers the proposals for the foul and surface water for the development in accordance with the SAB guidance documents.

Currently it is believed that the site discharges to the sewer network with the site served by a combined water system with various outfalls located during a drainage CCTV survey. The original forecourt area drains to the surface water network via a manhole on Pool Road although the survey work notes the offsite pipe network is full of silt.

Drainage from much of the showroom and the van centre close to the industrial estate road discharge via a connection which goes across the site and through private land to the adopted sewer network.

The final outfall appears to be a manhole at the rear of the site serving the surface water in this area. The outfall from this manhole has yet to be proven with too much silt within the system at the time of survey. However, this is thought to discharge to the pipes under Wern Ddu Lane.



2. Flood Zone Classification

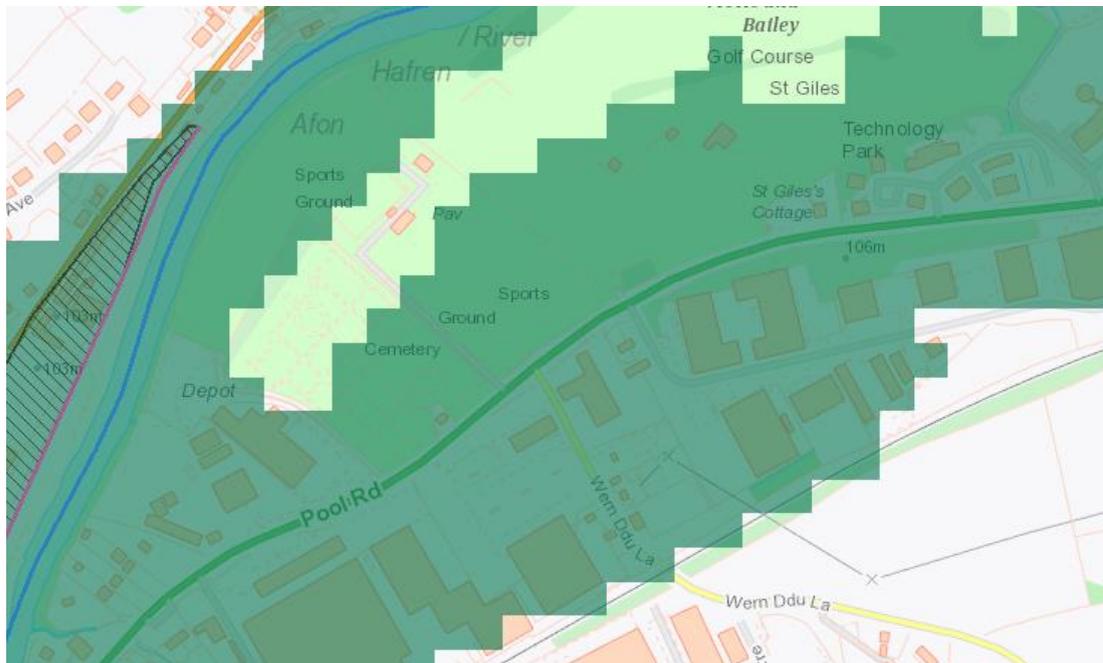
The Natural Resources Wales maps have been consulted as part of this report although more discussion is expected to be found in the Flood Consequences Assessment for this site. Reviewing the online maps show the proposed site is within Flood Zone A and therefore has little or no risk of fluvial or tidal/ coastal flooding.





Looking at Groundsure and Landmark desk study information also reveals:

- has a very low risk of flooding from groundwater
- has a very low risk of surface water flooding
- is not affected by canals
- lies within the zone of influence from reservoir flooding.



The consequences of the flood zone classification should be discussed within the FCA document and it is suggested that this report is read alongside that report but, for ease of reference the flood zone map is reproduced above from the Natural Resources Wales development advice maps together with the reservoir flooding map.

3. Climate Change Allowance

The current guidance indicates that the change in the UK climate could result in significant changes to storm profiles and intensities and therefore an allowance should be made for this within the designs.

The latest industry guidance suggests that a 25% increase for climate change should be allowed for the 100 year storm event and this will be applied to the site.

In addition, the requirements of the Building Regulations will be met in that no surface flooding will be accepted for the 1 in 30 year storm event and no surface water shall escape the site boundary for the 100 year event.

4. Discussion on SuDS measures

Under the Welsh Government requirements the development will be subject to a separate SAB application to Powys County Council to agree the proposed drainage scheme. However, it is intended to follow the hierarchical approach to drainage design looking to utilise the discharge to ground if possible.

Ground conditions for the site show gravelly sands that contain silts and clay elements so are not entirely conducive to infiltration drainage. This, together with the hydrocarbon contamination that has been found across some of the site and at various depth, will make it difficult to recommend infiltration drainage. There is a high risk of liberating the hydrocarbons within the soils and therefore risks contaminating the groundwater. Further



information on the ground investigation can be found in the Brownfield Solutions report DI/C4242/8664 dated August 2019.

Therefore the use of soakaway drainage is not recommended.

The next solution would be to take the surface water to the nearest watercourse, the river Severn. This is via third party land, after crossing a public highway, and is therefore determined to be cost prohibitive to the development. Discharge to watercourse will therefore be discounted.

It is therefore suggested that some form of attenuation tank may be required on the site to deal with storms given the difficulty in providing any other forms of SuDs techniques on a small retail site of this nature.

4.1 Standard S1 - Surface Water runoff destination

The priority for any scheme should be for collecting and re-using surface water by way of grey water harvesting, typically for use in toilets where non-potable water can be used. However, given the limited demand for grey water within an Aldi store it is not anticipated that rainwater harvesting will be financially viable for the scheme and therefore rainwater harvesting will not be considered for this development and Level 1 of the standard will be discounted.

Level 2 of this section of the standard requires the discharge of the surface water to be taken to the ground unless one of 5 exception criteria can be demonstrated. The lack of permeability has not been tested on the site but the initial information from the intrusive ground investigation suggests the levels of silts and clayey material within the ground will make the use of soakaway systems unlikely.

The investigation also has revealed hydrocarbon contamination at varying depths across the site with hydrocarbon sheens observed as deep as 2.6m below the surface. This is due to the site having once been a petrol filling station and although the tanks have been decommissioned within the past 5 years (2014) there is still an unacceptable risk of liberating the hydrocarbons by using infiltration techniques.

Extracts of the ground investigation report are reproduced at the rear of this report, within Appendix A, to support this decision.

Level 3 requires the consideration of discharging to a surface water body. For this site this would be the River Severn which lies approximately 300m north of the site. This would require access over third party land which is either home of Newtown Cricket Club or St Giles Golf Club.

Given the distance involved, access issues and the difficulty in providing protection to any pipework across third party land, the option to discharge to a surface water body is deemed inappropriate.

As a result of the foregoing issues it is therefore expected that the surface water will be discharged via the current outlets from the site to the surface water sewer. This would appear to be via existing connections within the verge area fronting on to Pool Road as indicated on the photographs of the drainage drawings contained within Appendix C. These photographs also show the location of the decommissioned petrol tanks.

This information appears to be confirmed by the drainage CCTV survey which has been undertaken by Layer Surveys, a copy of their survey plan being appended to this report within Appendix D.

4.2 Standard S2 - Surface Water hydraulic control

The site will need the discharge rate to be controlled to give a 30% reduction on the existing 1YR storm event to avoid overloading the existing drainage network off site. All



storm events will be limited to this rate to ensure the pressure on the offsite network is reduced following the redevelopment.

The proposed discharge rates and estimated storage volumes are designed in Appendix E at the rear of this report. Given the need to avoid letting water enter the underlying ground it is suggested that a conventional piped drainage system may be the most beneficial design from a contamination risk perspective although the car park area may utilise permeable macadam to improve water quality.

To limit the discharge from the site it is anticipated that a vortex flow control will be used, such as a Hydrobrake, which will control the rate of discharge for all storm events.

Attenuation measures will need to be sized to ensure that all storm events, up to and including the 100YR storm are contained within the site boundary. This is likely to be the provision of underground storage tanks given the difficulties in providing surface attenuation systems or the stone sub-base of the permeable macadam.

As discussed in Section 3 of the report any flooding will be contained within the site for all storm event up to and including the 100 year event and a 25% increase in flows is to be made for climate change.

4.3 Standard S3 - Water Quality

The car park area is expected to be drained via a porous macadam over 4-20mm stone which will act as a storage medium for the attenuation volumes. Given the need to prevent the infiltration of water to the ground, due to potential contamination, a series of perforated pipes will convey the flows to the outfall position.

Due the inherent nature of permeable solutions the water quality will be improved water quality with the proposed mitigation indices of the simple index approach being equal to the recommended values for the land use.

The service yard area will need to be hard landscaped and, as such, will contain a conventional piped drainage system. A proprietary oil separator with high level alarm will be provided with silt traps being provided upstream to limit the risk of sedimentation of the system.

Given the need to limit discharge from the site it is expected that some geo-cellular storage will be provided under the service yard with the use of a vortex flow control limiting the discharge.

The roof will also require use of a pipe drainage system which is likely to be connected to the service yard drainage. The pollution hazard level of the type of roof proposed is very low with suspended solids giving the greatest risk. Silt trap manholes will be provided to this drainage system to slow the flow of water through the piped system to allow the solids to settle rather than enter the offsite drainage network.

4.4 Standard S4 - Amenity

There is no public open space associated with the development with the access road remaining a private road. The use of the site as a retail development, with customer parking and the store forming the majority of the site, preclude the use of swales and detention basins etc.

4.5 Standard S5 - Biodiversity

Given the lack of space to improve the biodiversity of the site. Landscaping is to be provided to the site but this will not form part of the surface water drainage scheme given difficulties in maintaining any swales etc.



4.6 Standard S6 - Design of drainage for Construction, Operation, Maintenance and Structural Integrity

Section 8 of this report covers the maintenance of the proposed system in more detail however it should be noted that the responsibility of the installed drainage systems on this site will remain with Aldi Stores Ltd. There is no intention for the drainage, nor any of the attenuation features, to be offered for adoption.

The drainage will all be designed in accordance with the latest British Standards for drainage together with the advice contained within the Ciria SUDS Manual to ensure that the installed drainage is sufficient for use under unadopted highways, HGV routes and car park areas.

5. Proposed Drainage Scheme

It is proposed to use the existing connections for the discharge of the surface water from the site with the customer car park area being designed as a lined permeable car park that will drain via the existing forecourt connection to the drainage under Pool Road. The existing connection has been proven to be a 150mm pipe as a connection on to a 225mm pipe, noted in the photograph of the drainage drawing in Appendix C.

The service yard will not be suitable for a permeable drainage solution due to the slewing off HGV's in the area. As a result the drainage will be a conventional system passing through an oil separator.

It is anticipated that this drainage will re-use the existing combined connection from the site which currently serves the van centre and main showroom building. It is expected that this will require a restricted flow and therefore requires the use of geo-cellular storage and this is proposed to be an ESS VersaVoid tank.

The rainwater from the roof of the building will need to discharge under gravity conditions given the lack of space at the rear for any other drainage system and this is also proposed to use the existing combined connection from the site. It will therefore be collected and taken to the drainage system under the service yard.

A schematic drawing showing the proposed drainage for the development can be found in Appendix F at the rear of the report.

6. Foul Drainage

The Severn Trent sewer records have been consulted for the area, see Appendix B, and this information shows, together with that from the CCTV survey, that the current site is drained via a combined pipe. It is therefore proposed that the foul water from the re-developed plot will utilise this existing connection.

The scheme will see the provision of 3 toilets within the building, one for customer use and the remaining ones for the staff. Each WC will have an associated wash hand basin with a small, domestic style kitchen providing other points of connection.

Condensate drainage is to be provided to the chill and freezer areas of the store although these typically provide very little flow. Therefore the expected peak discharge from the site is expected to be no more than 2.5l/s.

7. Future Maintenance

Given the drainage installation is a gravity fed system the requirements for maintenance are similar to any typical installation.

It is recommended that any road gullies are cleared of silt build up on an annual basis to prevent the build-up of silts within the below ground drainage network. In addition, the



roads should be swept of debris, particularly around the autumn months to reduce the ingress of leaf litter.

In a similar manner, any ACO channels to the service yard area should be cleared on an annual basis ensuring that the proprietary silt traps are cleaned as necessary.

The permeable macadam product is requires the maintenance to be undertaken by a sweeper fitted with water jetting and vacuuming equipment. It is therefore recommended that the whole car park area is swept twice a year with particular emphasis with one clean in early autumn to prevent the degradation of leaf litter blocking the porous structure.

The storage tanks, within the development, are likely to be specified as ESS Versavoid tanks. These are capable of jet cleaning and vacuuming as with any conventional drainage pipe with access points either directly over the tank or at the upstream end. Immediately upstream of the geo-cellular storage tanks are silt trap manholes and these need to be emptied, at least annually, to prevent any silts entering the storage tanks.

As with any drainage system is it recommended that jet clearing of the system is undertaken on a 5 yearly basis. This should check for defects in the pipework and allow for the removal of any debris

The oil separator should be maintained in accordance with BS EN 858-2 which gives advice on the frequency and type of inspection to be carried out. At the very least this should be every six months or in accordance with the manufacturers' specification. The inspection shall determine the depth of oil in the system and the depth of sediment/ sludge present together with details of any repairs. Aldi Stores will be encouraged to enter into a maintenance contract with the supplier for regular inspections.

The separator will also have an alarm warning of a high oil level and this will be wired back to the managers office who will have details on what to do in the event of it being triggered. This is most likely to be calling the maintenance contractor to undertake some emergency cleaning.

The Hydrobrake flow control is fitted with a by-pass handle to allow downstream cleaning of the pipe network which should be undertaken on the same annual basis as the silt traps to the ACO channels to prevent issues with flooding due to blockage. A simple visual inspection of the chamber is recommended to be undertaken every 6 months.

8. Responsible Person

Each Aldi region has designated Property Managers who are based with the distribution centre that serves their store. The drainage maintenance falls under their remit with works sub-contracted as necessary to complete the requirement.

At the time of writing the report Liz Bagnall is the Property Manager for the Neston West region and can be contacted at:

Aldi Distribution Centre
Chester High Road
Neston
CH64 3TS 0151 353 2271

The maintenance contractor is David Ratcliff of Calder Construction. Their details are as follows:

Unit 15, Brearley La
Halifax
West Yorkshire
HX2 6HU 01422 886870

APPENDIX A

Extracts of the Geo-Environmental Investigation (undertaken by Brownfield Solutions)

4.0 GROUND CONDITIONS

4.1 Made Ground

Made ground was encountered in all the exploratory holes down to between 0.20m bgl and 0.40m bgl. Tarmacadam was encountered across site to between 0.05m and 0.10m bgl. Underlying the tarmacadam was a subbase generally comprising sand and gravel of limestone and siltstone, with a low to medium cobble content of limestone. These strata were encountered down to between 0.10m and 0.40m.

Within WS04 the subbase was underlain by a brown orange slightly gravelly clayey sand down to 0.30m bgl.

Within WS05 a firm brown grey slightly gravelly sandy clay was encountered beneath the subbase to 0.30m bgl.

In WS07 a dark grey slightly clayey sand and gravel was encountered beneath the subbase to 0.20m bgl.

4.2 Natural Superficial Strata

The superficial deposits comprised a brown gravelly to very gravelly sand that had varying contents of silt and clay. The gravel predominantly comprised siltstone with minor limestone. Cobbles of limestone were occasionally encountered within this stratum. The stratum was generally present to the base of the boreholes between 1.70m and 3.80m bgl. Within WS07 this became a sandy gravel from 1.90m bgl.

Within WS01 a firm friable brown slightly gravelly sandy silty clay was encountered between 0.40m and 0.60m bgl, a brown orange gravelly silty clay was encountered between 0.70m and 1.20m bgl.

Within WS05 a stiff very gravelly clay was encountered at 1.60m to the base of the borehole at 1.65m bgl.

Within WS04 and WS09 a grey slightly gravelly sand was encountered between 1.90m and 2.70m, and between 2.10m and 2.60m bgl respectively.

4.3 Solid Geology

Bedrock is believed to have been encountered within WS01, WS04, WS08 and WS09. The bedrock was weathered and was recovered as siltstone gravel, a summary is presented below. These depths are generally consistent with the depths of the Nantglyn Flags encountered within boreholes in the general area.

Location	Depth Encountered (m bgl)	Description
WS01	1.80	Grey slightly clayey gravel
WS04	2.70	Dark brown slightly gravelly sand
WS08	3.80	Dark brown slightly clayey gravelly sand
WS09	2.60	Grey clayey gravel

4.4 Groundwater

Groundwater was encountered in three exploratory holes during the drilling. The depths and locations are shown in the table below:

Location	Depth during site works (m)	Depth during monitoring period (range) (m)
WS01	2.00	No Groundwater
WS02	NGW	No Groundwater



Location	Depth during site works (m)	Depth during monitoring period (range) (m)
WS04	NGW	No Groundwater
WS05	NGW	No Groundwater
WS06	NGW	No Groundwater
WS07	0.10 – 0.20 perched	NA
WS09	2.10 – 2.60 perched	NA

4.5 Observations

Contamination

During the works undertaken by BSL observations for both visual and olfactory evidence of contamination were made.

A petrol odour was observed in WS09 between 1.30m and 2.60m bgl, a slight hydrocarbon sheen was observed between 2.10m and 2.60m bgl.

Anecdotal evidence from an employee confirmed the presence of services pits on site, as suspected as a potential source in the Desk Study, these were noted to have been backfilled and partially built over. The services pits were unable to be investigated during the site works as the area was inaccessible due to the site being active.

Poor housekeeping practices were observed during the site works and further localised hydrocarbon contamination should be expected.

An interceptor and an open drain filled with contaminated silt were identified in areas not accessible during the site walkover for the Phase I investigation. The location of these is noted on the Exploratory Hole location Plan Drawing No. C4242/03.

Excavations

Excavation by hand and using the window sampling rig was difficult.

No collapsing of hand pits or boreholes was observed.

Where the CBR is found to be less than 2%, the sub-grade is unlikely to be suitable for both the trafficking of site plant and as a permanent highway foundation without improvement of the soils.

To achieve the required design CBR value, improvement works should be carried out in accordance with DMRB IAN 73/06 Rev 1 Chapter 5 and may include proof rolling, excavation and re-engineering / replacement of weaker soils, the inclusion of a geogrid or use of stabilisation techniques such as the addition of hydraulic binders (e.g. cement/lime).

Care should be taken to ensure the stratum at formation level is protected against inclement weather, as this is likely to lead to surface deterioration and a decrease in soils strengths.

6.9 Soakaways

The use of soakaways may not be feasible due to the variability of fines content within the soils underlying the site, however this would need to be confirmed by in-situ testing in accordance with BRE Digest 365 'Soakaway Design' 2016.

Consideration should also be given to the location of the proposed soakaways as additional infiltration in the areas which are impacted by hydrocarbons would have a detrimental on the underlying aquifer.

If drainage of the highway to soakaways is to be considered it is suggested that this is discussed with the Local Authority at the earliest opportunity, to confirm the adequacy of proposed testing and to allow their inspection of any test results.

APPENDIX B

Sewer Record



Hafren Dyfrdwy Limited, Pencoedde Wrexham Road, Rhosyllen, Wrexham, LL14 4EH

Date of Issue: 13 June 2019

SEWER RECORD Greenhouse Ltd,
SY16 3AH

Greenhouse Ford Newtown Car Showroom Pool Road, NEWTOWN,

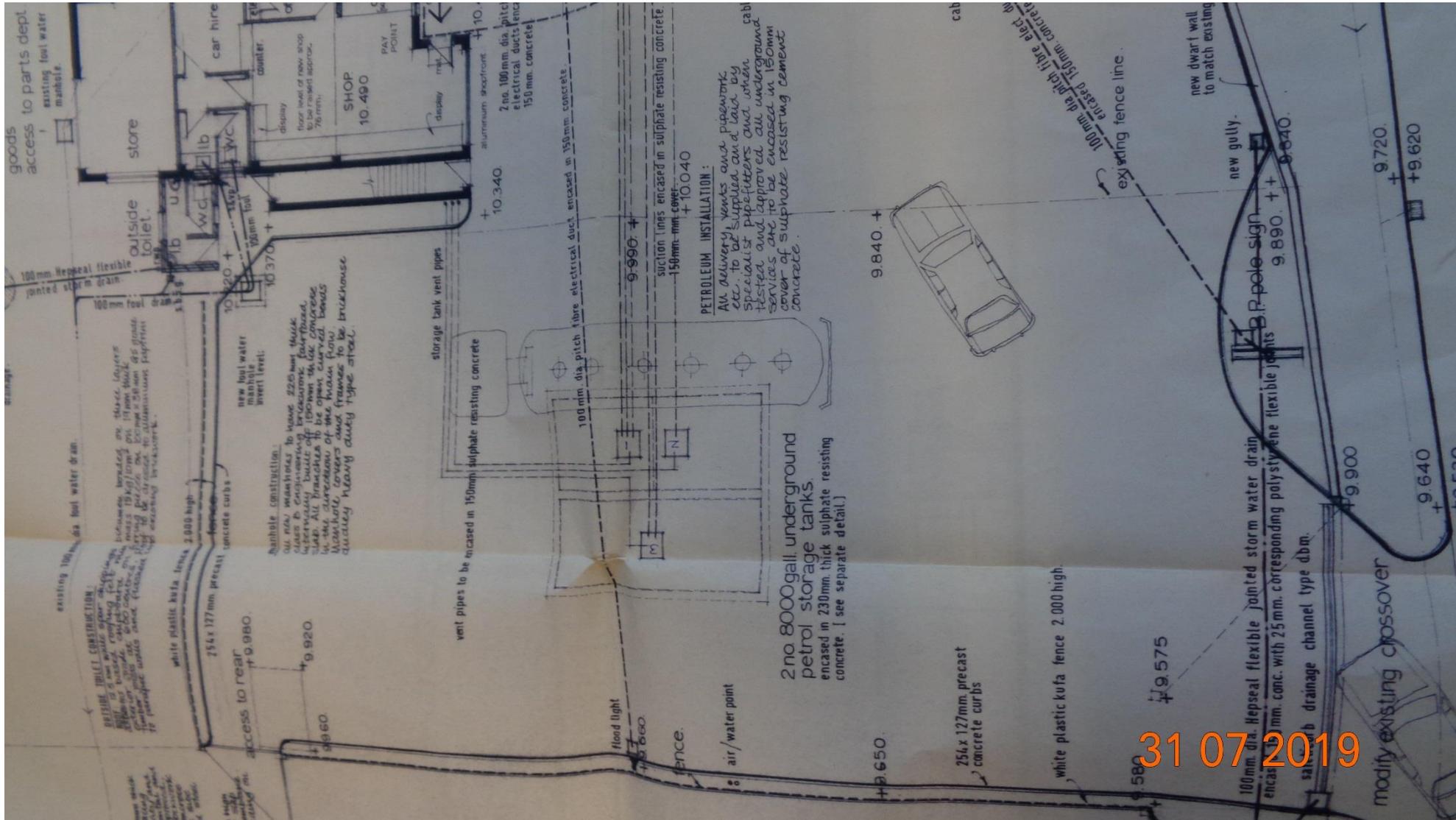


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APPENDIX C

Existing Drainage Plans

(Received from vendor)



31 07 2019

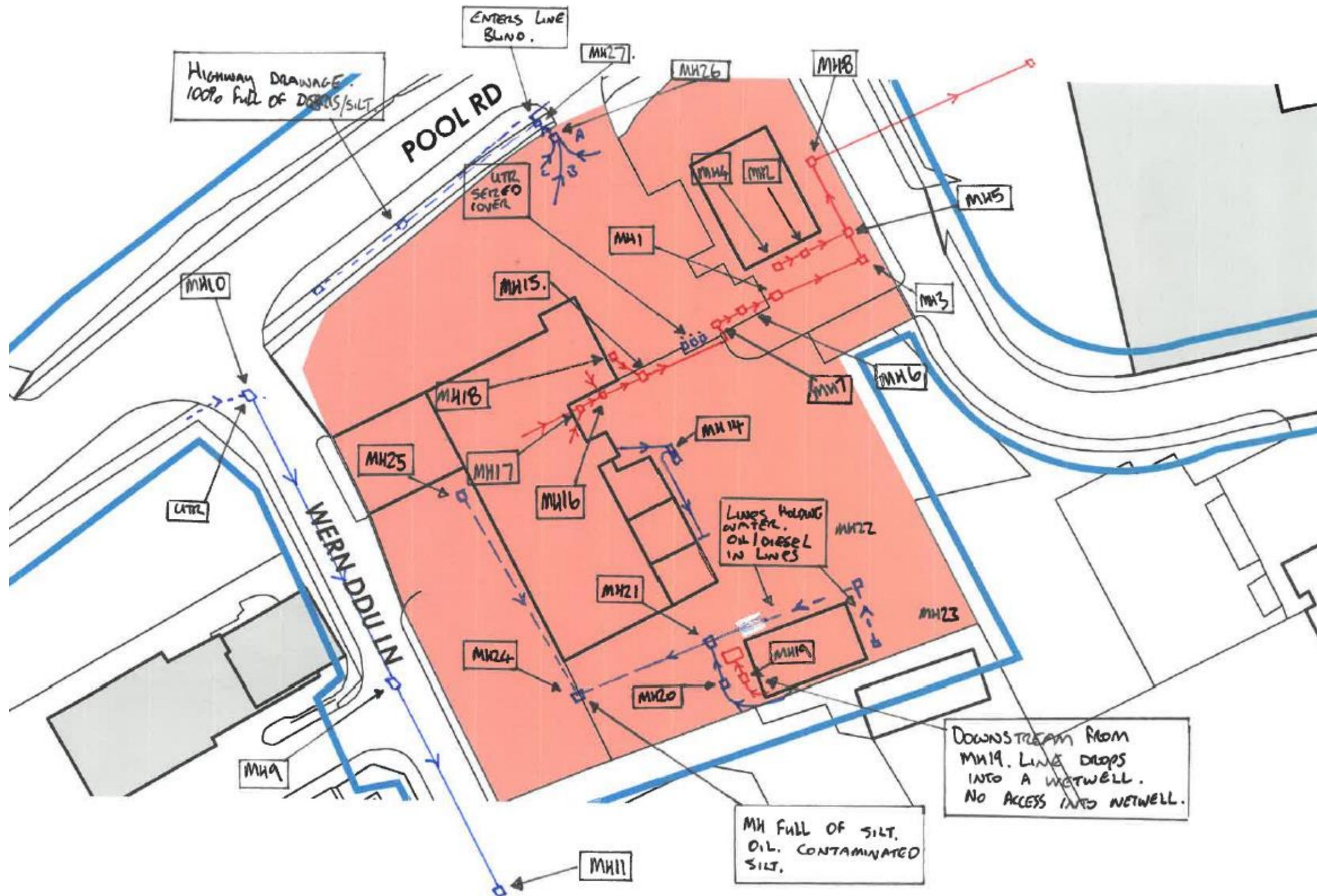


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Drainage Design Statement

APPENDIX D

Drainage CCTV Plan





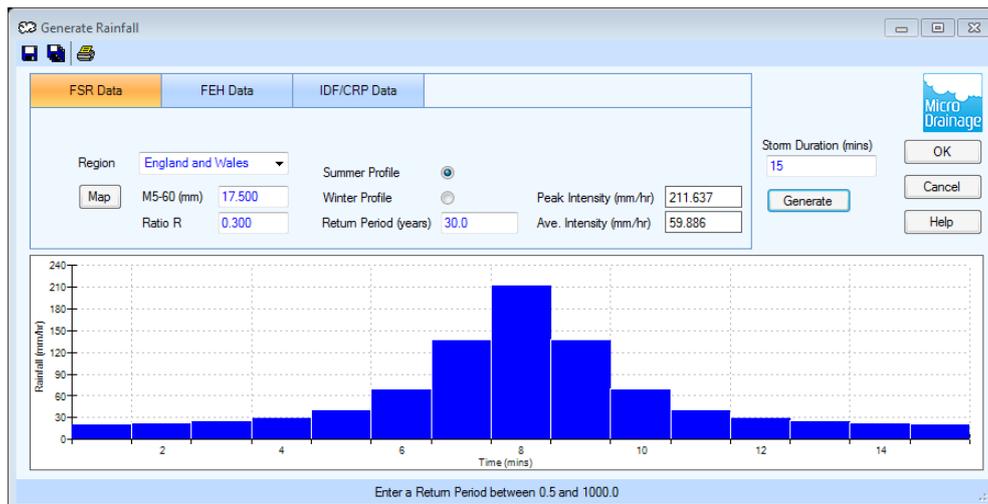
APPENDIX E

Rainfall Profiles & Storage Requirements

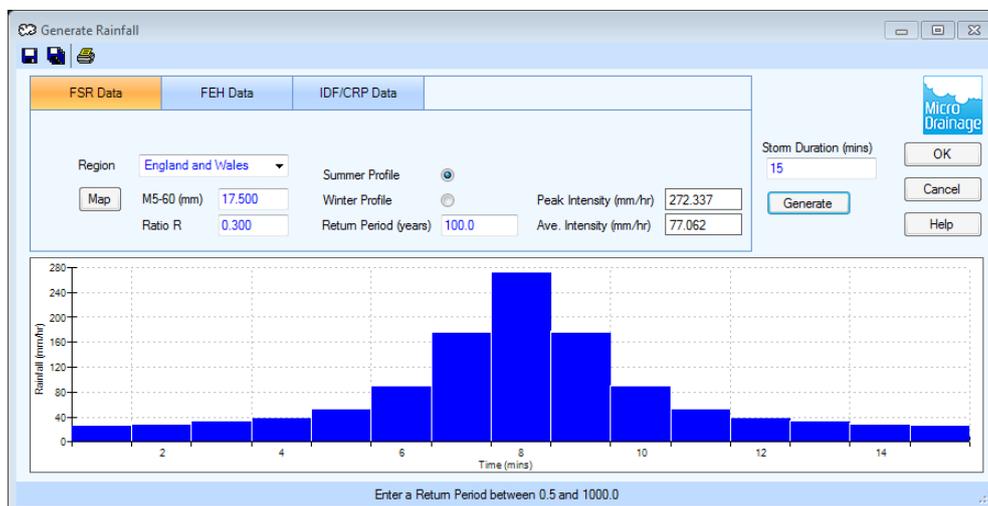
1 YR Rainfall (15 minute storm duration)



30 YR Rainfall (15 minute storm duration)



100 YR Rainfall (15 minute storm duration)



Existing Discharge Rate:

Given the site has an existing impermeable area of 0.683 Ha (total site area of 0.759Ha) and around 50% of the drainage discharges to the combined network the pass forward flow to be replicated is given by:

$$Q = A_i = (0.683\text{Ha} \times 24.535\text{mm/hr}) / 0.36 = 46.5\text{l/s}$$

Proposed Discharge Rate

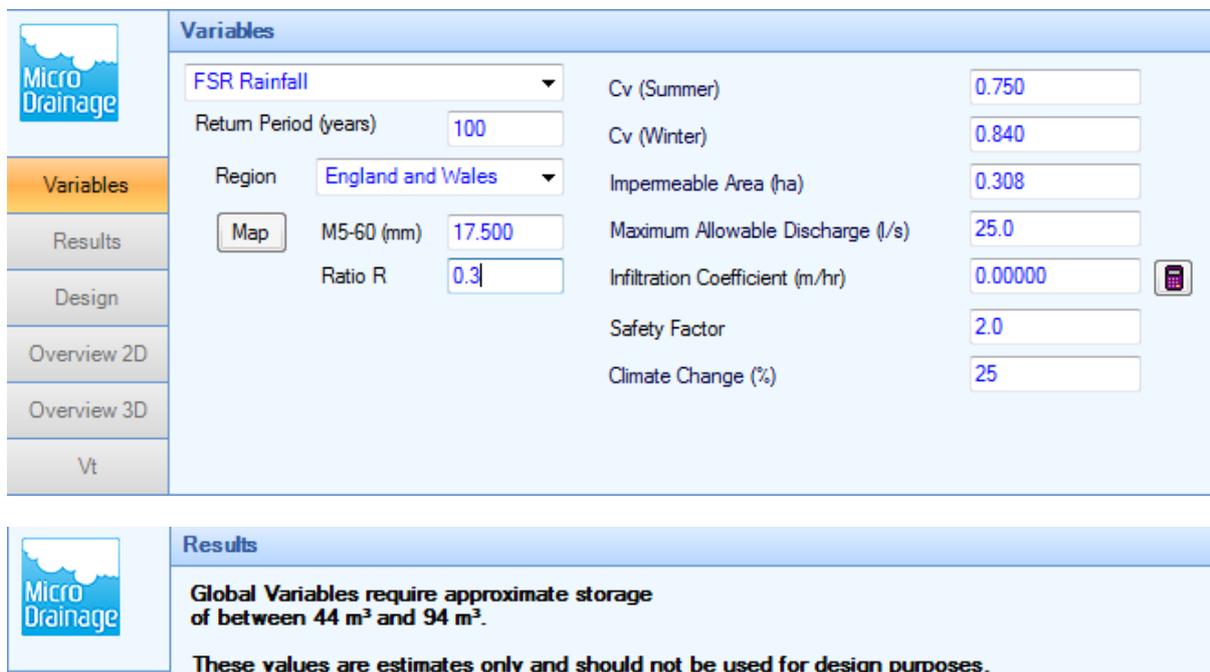
The scheme will look to limit discharge to 70% of this flow, therefore

$$\text{Allowable discharge for all storms} = 46.5 \times 0.7 = 32.6\text{l/s}$$

Given the permeable car park will naturally limit the discharge to 5l/s it is suggested that the discharge via the combined system is taken as 25l/s leaving sufficient capacity for the anticipated foul flows.

Attenuation Requirements

100YR Storm (roof and service yard areas only)



The image shows a screenshot of the Micro Drainage software interface. It is divided into two main sections: 'Variables' and 'Results'.

Variables Section:

- FSR Rainfall:** A dropdown menu.
- Return Period (years):** Input field with value 100.
- Region:** Dropdown menu with 'England and Wales' selected.
- Map:** A button to view a map.
- M5-60 (mm):** Input field with value 17.500.
- Ratio R:** Input field with value 0.3.
- Cv (Summer):** Input field with value 0.750.
- Cv (Winter):** Input field with value 0.840.
- Impemeable Area (ha):** Input field with value 0.308.
- Maximum Allowable Discharge (l/s):** Input field with value 25.0.
- Infiltration Coefficient (m/hr):** Input field with value 0.00000.
- Safety Factor:** Input field with value 2.0.
- Climate Change (%):** Input field with value 25.

Results Section:

Global Variables require approximate storage of between 44 m³ and 94 m³.

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



100YR Storm (permeable car park area)

Variables

Rainfall and Runoff

FSR Rainfall ▼

Return Period (years)

Region ▼
England and Wales

M5-60 (mm)

Ratio R

Infiltration Structure

Porous Car Park ▼

Infiltration Coefficient Base (m/hr)

Safety Factor

Porosity

Cv (Summer)

Cv (Winter)

Impemeable Area (ha)

Climate Change (%)

With Outflow

Maximum Discharge (l/s)

Results

Results are presented in paired rows. These represent maximum and minimum storage requirements for each size of structure.

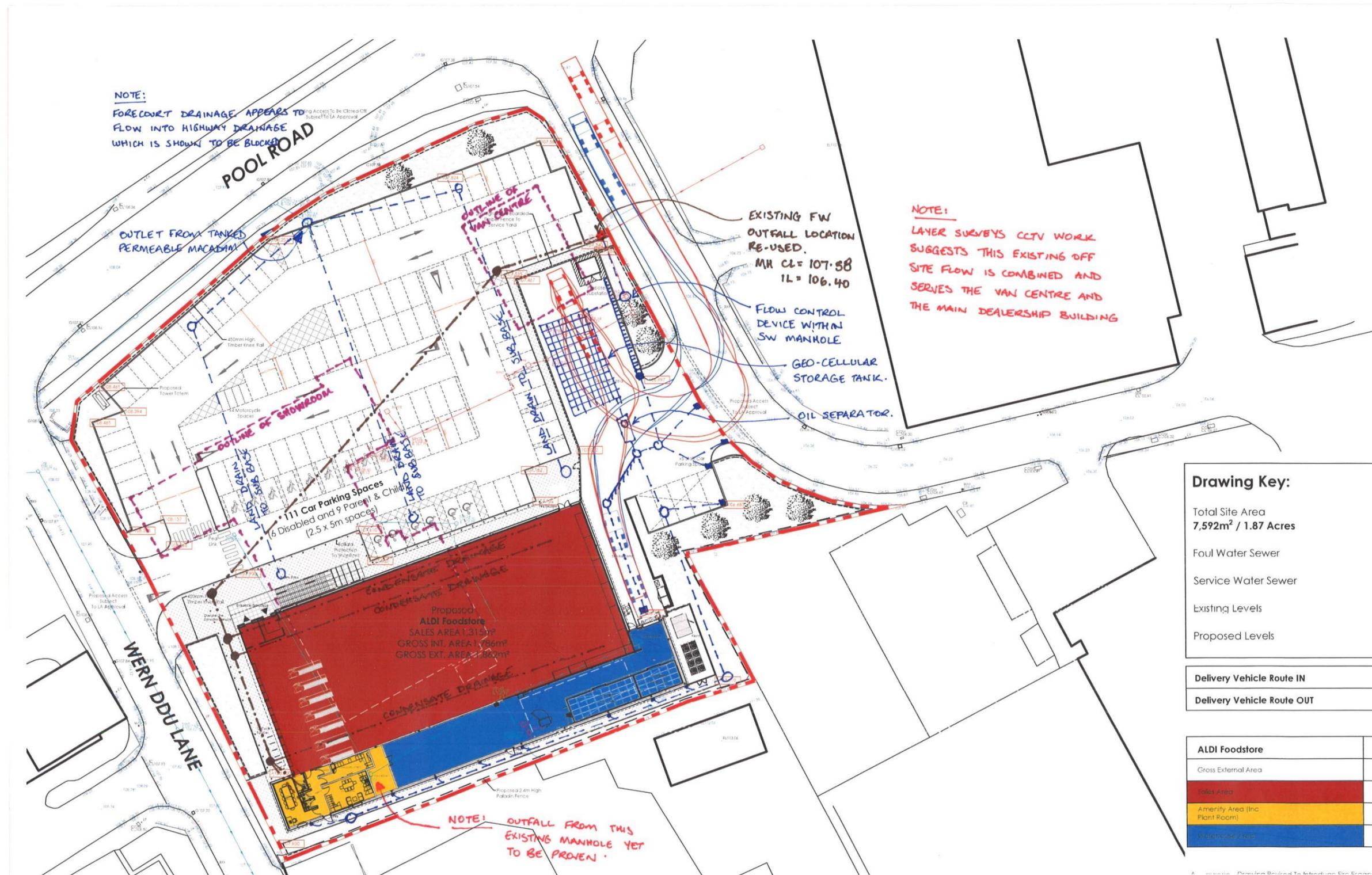
Depth (m)	Net Vol (m ³)	Surface Area (m ²)	Capacity Ratio	Ex/Fill Vol (m ³)	Half Drain (mins)
0.2	235.3	3921.4	1.0	784.3	1307
	150.2	2502.7	1.5	500.5	250
0.3	235.3	2614.3	1.4	784.3	1307
	150.2	1668.5	2.2	500.5	250
0.4	235.3	1960.7	1.9	784.3	1307
	150.2	1251.4	3.0	500.5	250
0.6	235.3	1307.1	2.9	784.3	1307
	150.2	834.2	4.5	500.5	250
1.0	235.3	784.3	4.8	784.3	1307
	150.2	500.5	7.5	500.5	250
1.5	235.3	522.9	7.2	784.3	1307
	150.2	333.7	11.2	500.5	250
2.0	235.3	392.1	9.6	784.3	1307
	150.2	250.3	15.0	500.5	250

Taking a car park sub base depth of 300mm requires an area of permeable paving of 2614m² which is less than the proposed car park surface area.



APPENDIX F

Proposed Drainage Scheme



Drawing Key:

- Total Site Area
7,592m² / 1.87 Acres
- Foul Water Sewer
- Service Water Sewer
- Existing Levels
- Proposed Levels

Delivery Vehicle Route IN

Delivery Vehicle Route OUT

ALDI Foodstore

Gross External Area
Sales Area
Amenity Area (Inc. Plant Room)
Warehouse Area

9045-SWF-XX-XX-DR-S-9002
INITIAL DRAINAGE PROPOSALS
NOT TO SCALE.