



**SWF CONSULTING**  
CONSULTING CIVIL & STRUCTURAL ENGINEERS

---

PROPOSED ALDI  
WESTGATE  
SKELMERSDALE

---

DRAINAGE DESIGN  
PHILOSOPHY

---

DATE: NOVEMBER 2021

---

8841-REP-001

---

VERSION: 02

---

By: P Sarbutts

---



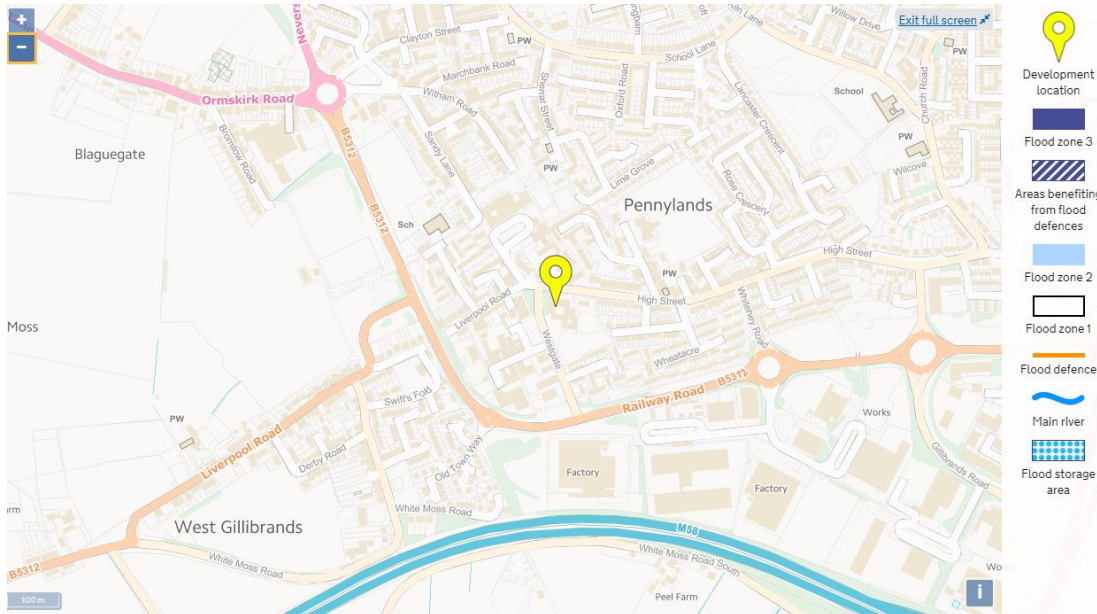
**REVISION HISTORY**

VERSION	STATUS	REVISIONS
01	PRELIMINARY	FIRST ISSUE
02	PRELIMINARY	Site plan Updated, Future Maintenance Section Updated

**DOCUMENT ISSUE RECORD**

VERSION	ISSUE DATE	ISSUED TO	COPIES
01	26/02/2018	O'NEIL & PARTNERS THE HARRIS PARTNERSHIP WALKER WOOD	1 pdf
02	05/11/2021	AVISON YOUNG	1 pdf





This means the site has a low probability of flooding having a less than 1 in 1000 annual probability of river or sea flooding.

### 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 current EA advice is dated 19 February 2016. This states that, with an estimated design life of the development not exceeding 50 years, any necessary on-site designs for drainage, soakaways or other sustainable disposal methods for limiting surface water disposal flows will incorporate rainfall intensities that have been increased by 20-40%, depending upon the sensitivity of the location, to take account of the effects of climate change up until the year 2115.

**Table 2 peak rainfall intensity allowance in small and urban catchments (use 1961 to 1990 baseline)**

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

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. Proposed Drainage Scheme

The scheme lies within West Lancashire Borough Council control and will therefore be subject to their SFRA document, together with the requirements of Lancashire County Council as the Lead Local Flood Authority.



The land is not believed to be within a critical drainage area and therefore the proposals will seek to limit the discharge rate to 30% of the existing flows in line with the Council policy.

A 15 minute storm duration will be used to generate the rainfall profiles for the site based on the entire area being hard landscaped. It is not known what the current drainage regime is for the site and therefore it is presumed that the storms are currently un-attenuated for the site.

Rainfall intensities have been calculated using MicroDrainage software and the results can be found in appendix A.

	YR 2	YR 30	YR100
Rainfall intensity I (mm/hr)	37.269	70.599	91.386
Peak Discharge Q (l/s)	96.3	182.4	236.1
Peak Discharge Q (l/s)	129.2 (based on 50mm/hr)		

The peak discharge is calculated using the formula  $Q = AI$  based on the site area being 1.24Ha but only around 75% of the site positively drained. That means a drained area of 0.93Ha.

The final line in the table above presumes that the drainage was designed on a flat rainfall intensity of 50mm/hr without the consideration of all storms. This was common practice and is therefore likely to be the design criteria for the existing network.

Therefore, applying the 30% reduction in discharge rates the allowable discharge is to be taken as

	YR 2	YR 30	YR100
Allowable Discharge Q (l/s)	67.4	127.7	165.3
Allowable Discharge q (l/s)	67.4	90.4	

With the restriction of the existing network, effectively limiting the current discharge rate, it is proposed to adopt the figures in the final line in the table above. This will give betterment of at least 30% for the 2 year storm event and 50% or more for the 30 year event or above.

Given the need to limit the discharge rate from the site it will be necessary to introduce some attenuation measures. It is expected that this will be in the form of an ESS Versavoid storage tank which will be sized using MicroDrainage software. Initial sizing can be found in appendix C for the 30% reduction proposal or in appendix D for the greenfield run off.

	YR 2	YR 30	YR100+CC
Attenuation size V (m <sup>3</sup> )	16 to 65	62 to 152	153 to 292

The attenuation is based on the hard landscaped area being 80% of the site area, 0.992Ha.

To control the flow it is anticipated that an orifice plate may be used or a vortex control device such as a Hydrobrake. Should existing levels dictate, it may be necessary to use pumps to control the flow in place of the vortex control. Should pumping be required then this will be undertaken on a duty/ assist basis to ensure discharge rates are controlled.

Any alarm systems, either for the oil separator or the pump station, will be wired back to the dealership offices to ensure any issues with either apparatus is dealt with quickly.

It is anticipated that the discharge from the site can be taken presumed adopted sewers under High Street or Westgate, via an existing connection from the site.



## **5. Proposed Foul Water Drainage Scheme**

It is anticipated that a network of foul drainage serves the retail terrace and therefore we would expect to be able to discharge the foul drainage from the proposed development into that network.

The foul drainage is then presumed to discharge into the adopted sewer network, presumably under High Street or Westgate.

## **6. Future maintenance**

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

It is recommended that 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 car park areas should be swept of debris, particularly around the autumn months to reduce the ingress of leaf litter.

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

The pump set, within the proprietary pumping chamber to the loading dock, will be alarmed back to the store managers office together with the alarms associated with the oil separator. When these alarms sound, information will be available in the operation and maintenance manuals to instruct on how to proceed. This will generally be contacting a drainage specialist to diagnose the issues to correct the fault.

The pumps should be serviced on an annual basis ensuring that they continue to operate effectively. At the same time, an inspection of the oil separator should be undertaken to ensure the filters are operating satisfactorily.

The Hydrobrake flow control is to be 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.

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.

The attenuation will 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 or downstream end. It should be noted that silt traps within the ACO channels and the upstream separator shall reduce the likelihood of silts entering the attenuation tank.

As with any drainage system it is 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.

## **7. 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 Matt Kelly is the Property Manager for the Bolton region and can be contacted at:

Aldi Regional Distribution Centre



**SWF CONSULTING**  
CONSULTING CIVIL & STRUCTURAL ENGINEERS

Drainage Design Statement

Logistics North, Bridgewater Avenue  
Bolton  
BL5 1EE  
Tel: 0161 655 1098

The maintenance contractor contact is Sally Gorton of Calder Construction:

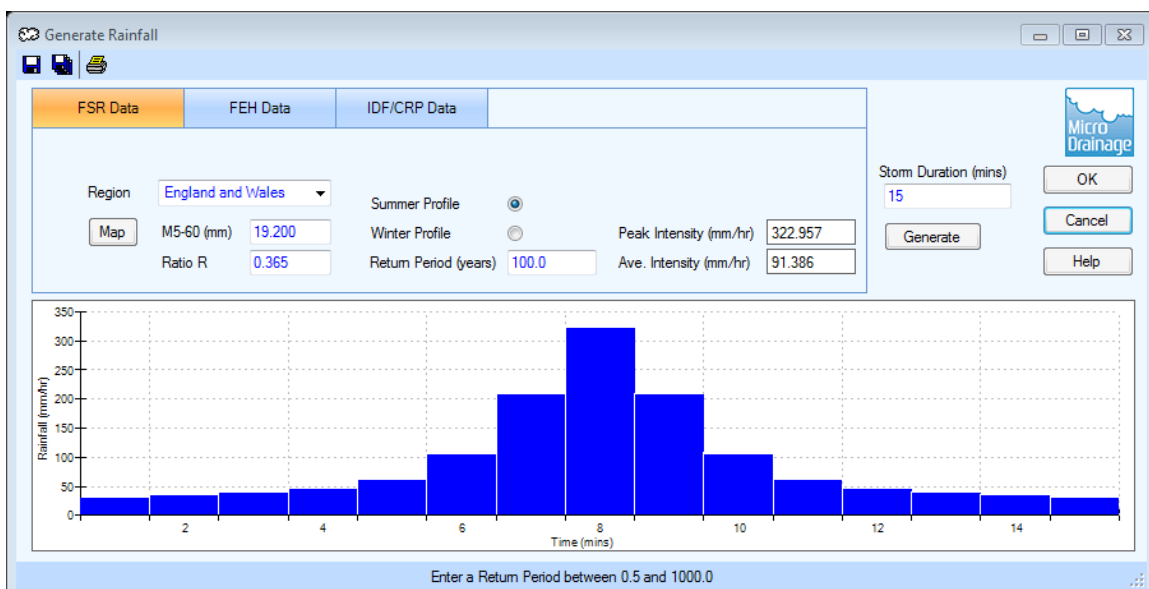
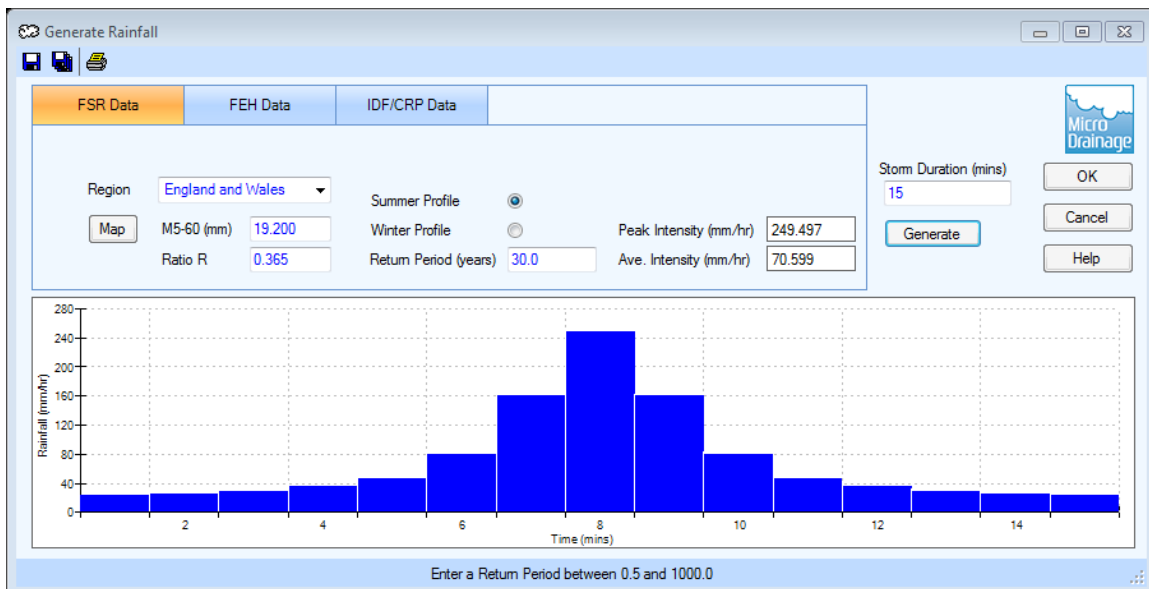
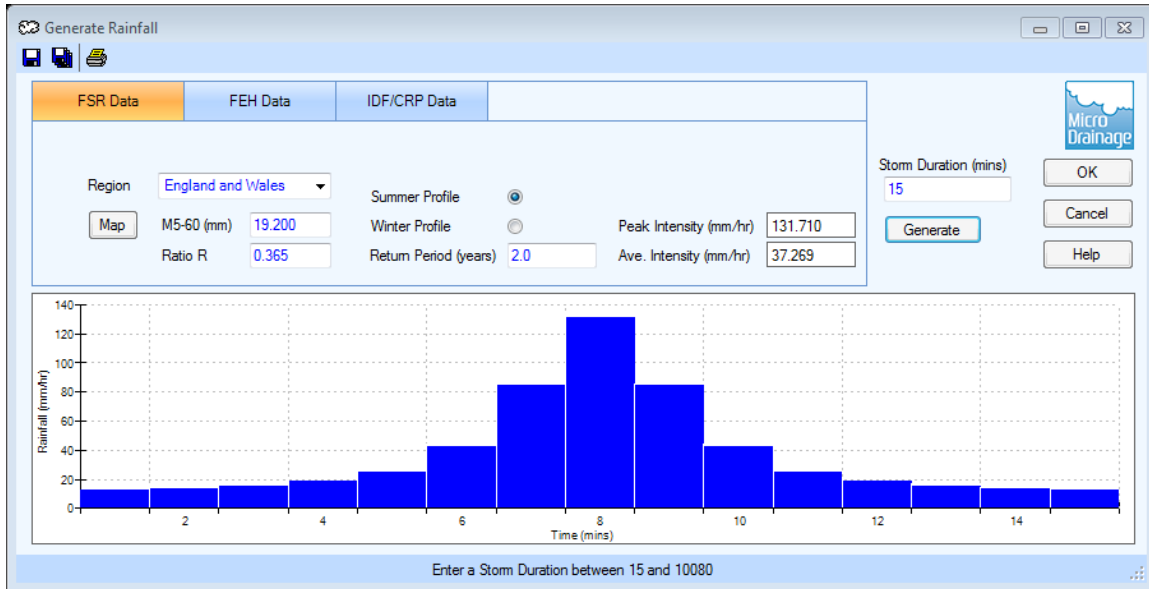
Unit 15, Brearley Lane  
Halifax  
West Yorkshire  
HX2 6HU  
Tel: 01422 886870

# APPENDIX A

## Rainfall Intensity Calculations

(based on 15 minute storm duration)





# APPENDIX B

## Quick Storage Estimation (based on 30% reduction)



**2 YEAR EVENT:**

 <b>Variables</b> Results Design Overview 2D Overview 3D Vt	<b>Variables</b>		
	FSR Rainfall		
	Return Period (years)	2	
	Region	England and Wales	
	Map	M5-60 (mm)	19.200
		Ratio R	0.365
		Cv (Summer)	0.750
	Cv (Winter)	0.840	
	Impermeable Area (ha)	0.992	
	Maximum Allowable Discharge (l/s)	67.4	
	Infiltration Coefficient (m/hr)	0.00000	
	Safety Factor	2.0	
	Climate Change (%)	0	

**Results**

Global Variables require approximate storage of between 16 m<sup>3</sup> and 65 m<sup>3</sup>.  
 These values are estimates only and should not be used for design purposes.

**30 YEAR EVENT:**

 <b>Variables</b> Results Design Overview 2D Overview 3D Vt	<b>Variables</b>		
	FSR Rainfall		
	Return Period (years)	30	
	Region	England and Wales	
	Map	M5-60 (mm)	19.200
		Ratio R	0.365
		Cv (Summer)	0.750
	Cv (Winter)	0.840	
	Impermeable Area (ha)	0.992	
	Maximum Allowable Discharge (l/s)	90.4	
	Infiltration Coefficient (m/hr)	0.00000	
	Safety Factor	2.0	
	Climate Change (%)	0	

**Results**

Global Variables require approximate storage of between 62 m<sup>3</sup> and 152 m<sup>3</sup>.  
 These values are estimates only and should not be used for design purposes.

**100 YEAR EVENT:**

 <b>Variables</b> Results Design Overview 2D Overview 3D Vt	<b>Variables</b>		
	FSR Rainfall		
	Return Period (years)	100	
	Region	England and Wales	
	Map	M5-60 (mm)	19.200
		Ratio R	0.365
		Cv (Summer)	0.750
	Cv (Winter)	0.840	
	Impermeable Area (ha)	0.992	
	Maximum Allowable Discharge (l/s)	90.4	
	Infiltration Coefficient (m/hr)	0.00000	
	Safety Factor	2.0	
	Climate Change (%)	20	

**Results**

Global Variables require approximate storage of between 153 m<sup>3</sup> and 292 m<sup>3</sup>.  
 These values are estimates only and should not be used for design purposes.