SWF CONSULTING
CONSULTING CIVIL & STRUCTURAL ENGINEERS

PROPOSED ALDI WESTGATE SKELMERSDALE

DRAINAGE DESIGN PHILOSOPHY

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REVISION HISTORY

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01	PRELIMINARY	FIRST ISSUE

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

1. Development Details

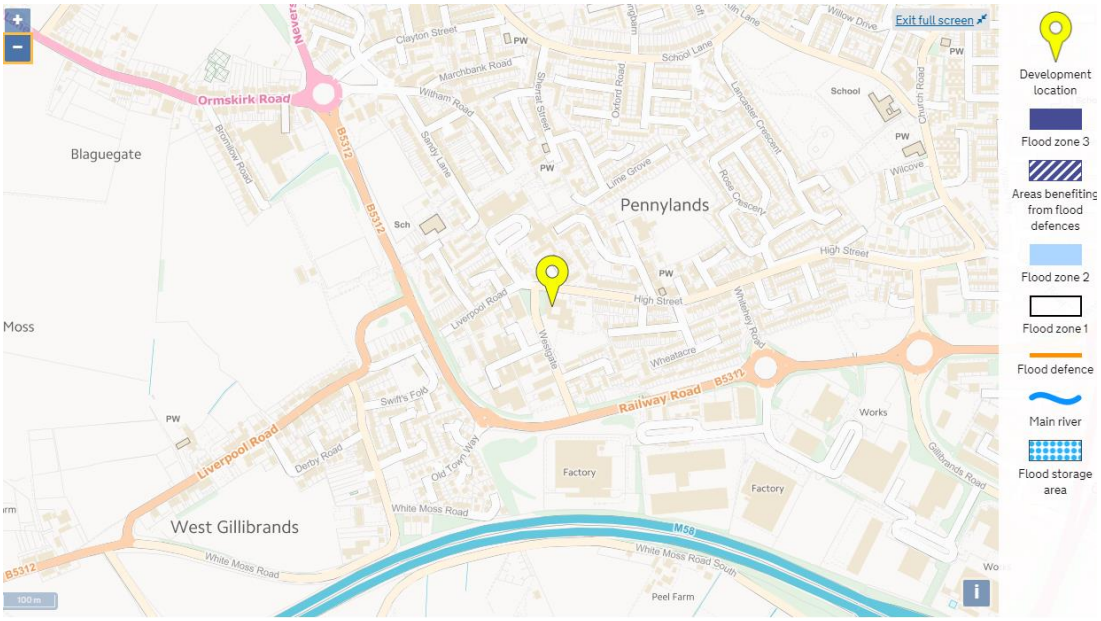
The site is currently occupied by an office block which is earmarked for demolition to facilitate the construction of a new Aldi store and associated car park.

Given the site is already developed it is expected that there is surface water drainage to the site which is presumed to discharge directly into the sewer network, either under High Street or Westgate.

The size of the development will require a flood risk assessment to be produced which will supersede any advice within this document.

2. Flood Zone Classification

The Environment Agency maps have been consulted and the site is shown to be in Flood Zone 1. A copy of the map, taken from the online mapping tool is shown overleaf.



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 note 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 nd 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^3)	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.

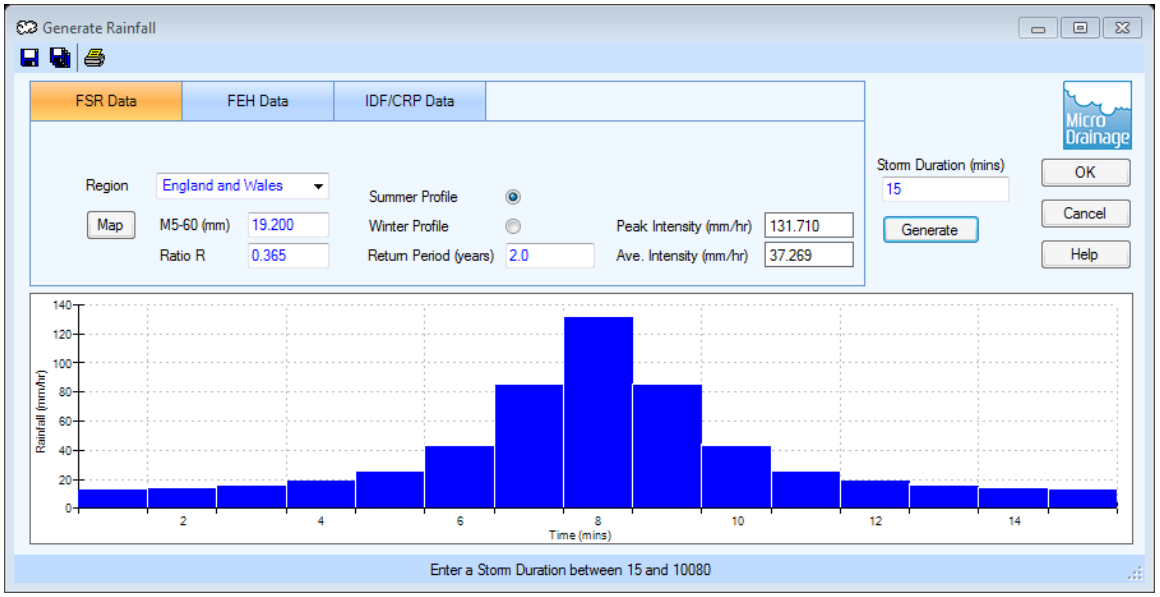
The foul drainage is then presumed to discharge into the adopted sewer network, presumably under High Street or Westgate.

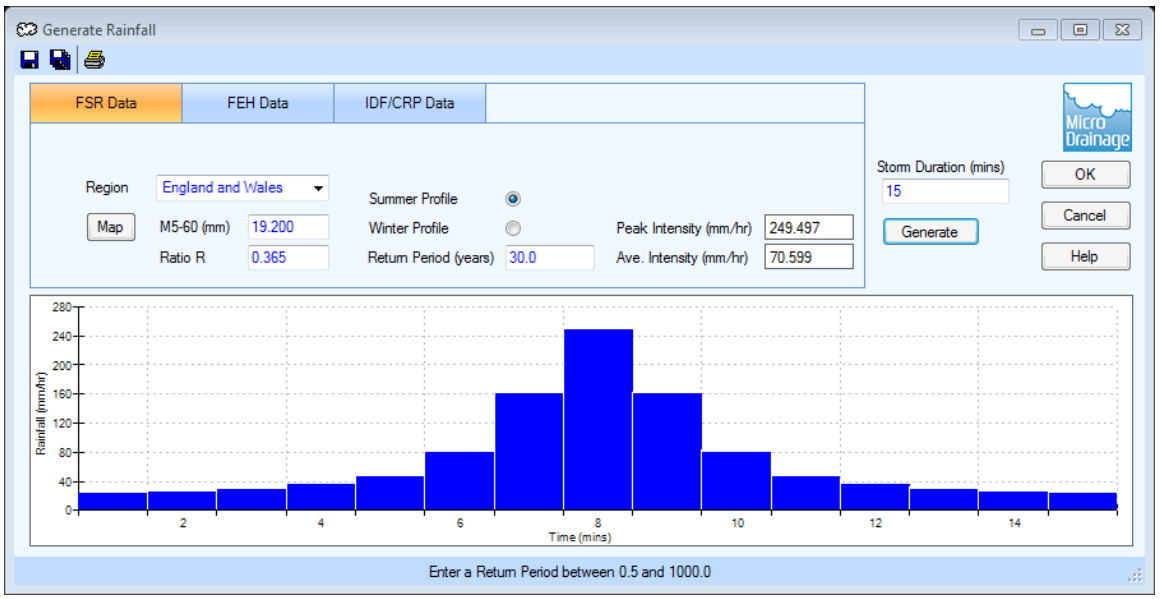
6. Future maintenance

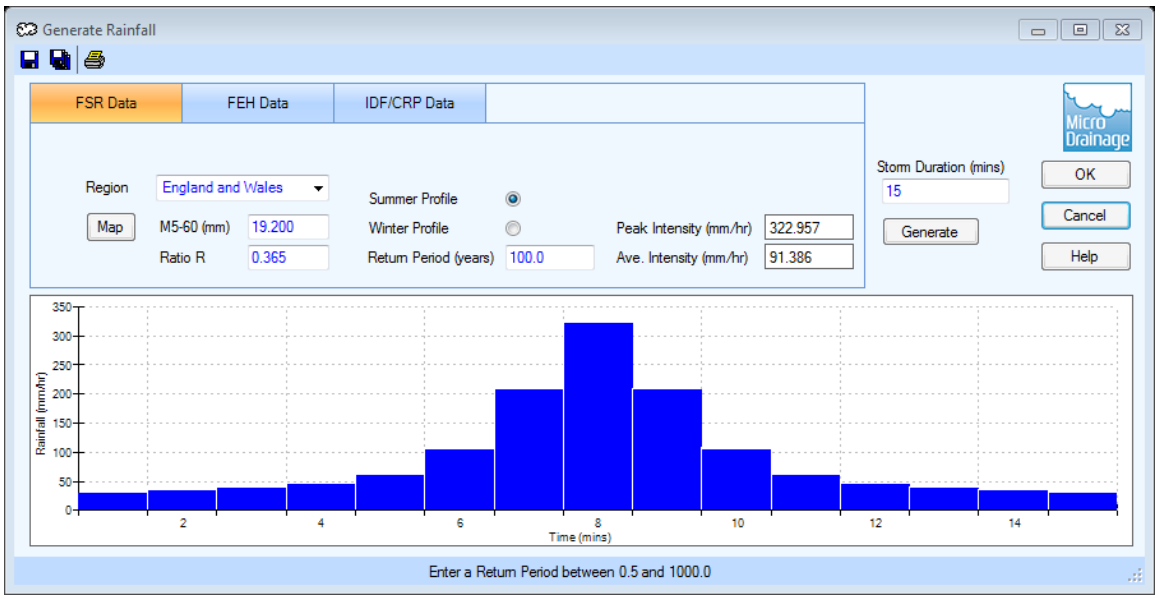
APPENDIX A

Rainfall Intensity Calculations

(based on 15 minute storm duration)


Generate Rainfall
FSR Data
FEH Data
IDF/CRP Data
Region
England and Wales
Map
M5-60 (mm)
19.200
Ratio R
0.365
Summer Profile
Winter Profile
Return Period (years)
2.0
Peak Intensity (mm/hr)
131.710
Ave. Intensity (mm/hr)
37.269
Storm Duration (mins)
15
Generate
OK
Cancel
Help
Micro Drainage
Rainfall (mm/hr)
Time (mins)
Enter a Storm Duration between 15 and 10080


Generate Rainfall
FSR Data
FEH Data
IDF/CRP Data
Region
England and Wales
Map
M5-60 (mm)
19.200
Ratio R
0.365
Summer Profile
Winter Profile
Return Period (years)
30.0
Peak Intensity (mm/hr)
249.497
Ave. Intensity (mm/hr)
70.599
Storm Duration (mins)
15
Generate
OK
Cancel
Help
Micro Drainage
Rainfall (mm/hr)
Time (mins)
Enter a Return Period between 0.5 and 1000.0

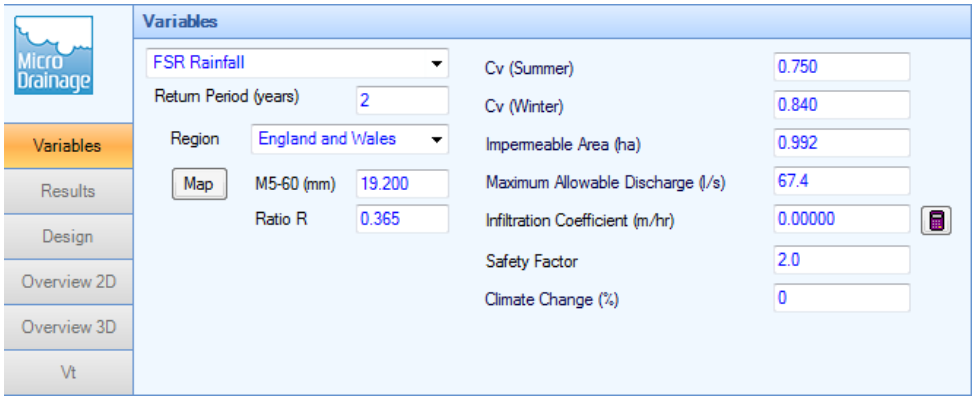

Generate Rainfall
FSR Data
FEH Data
IDF/CRP Data
Region
England and Wales
Map
M5-60 (mm)
19.200
Ratio R
0.365
Summer Profile
Winter Profile
Return Period (years)
100.0
Peak Intensity (mm/hr)
322.957
Ave. Intensity (mm/hr)
91.386
Storm Duration (mins)
15
Generate
OK
Cancel
Help
Micro Drainage
Rainfall (mm/hr)
Time (mins)
Enter a Return Period between 0.5 and 1000.0

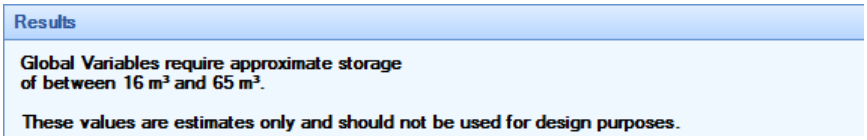
APPENDIX B

Quick Storage Estimation

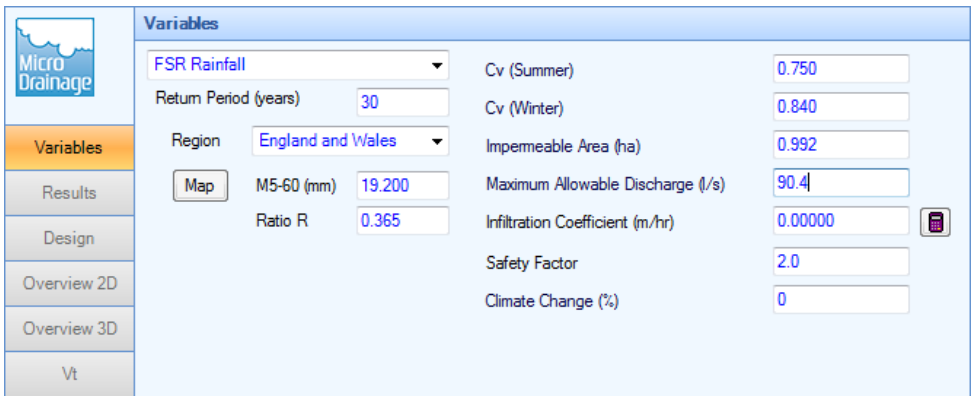
(based on 30% reduction)

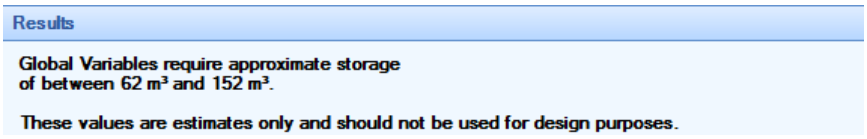
2 YEAR EVENT:





30 YEAR EVENT:





100 YEAR EVENT: