Surface Water
Drainage Assessment

Proposed Housing development,
Meadow Road,
Mirehouse, Cumbria

Home Group

The drainage statement has been prepared to accompany a planning application for the proposed housing scheme at Meadow Road, Mirehouse, Cumbria.

This drainage statement sets out the principles for the proposed surface water drainage disposal.

Surface Water Drainage

The proposed surface water drainage scheme should seek to meet the requirements of National Planning Policy Framework (NPPF) and the current Building Regulations Part H and follow the selection hierarchy. Consideration should be given firstly to infiltration techniques (to ground), to watercourse and then to sewer. Guidance contained within NPPG (Reference ID:7) also requires the use of Sustainable Urban Drainage Systems (SUDS) wherever possible to mimic as far as practicable the natural run-off regime, improve water quality and attenuate peak flows.

A ground investigation has been undertaken on the main development site and this encountered made ground predominately comprised of black/dark grey sany clayey gravel at depths of 1.0m up to 2.0m bgl. Glacial Till is underlying this made ground as a very sandy gravely clay at depths of 2.0m to 3.0m bgl, and as such are not suitable for the use of infiltration techniques to be used on the site.

The nearest watercourse to the site is the 'Pow Beck' which is situated approximately 125m east of the development boundary. The tidal reach of the watercourse is approximately 2.1km North West of the site.

Within the site there are 3no. existing surface water sewers shown crossing the development, these were picked up on the topographical survey and using record information. United Utilities show two of these sewers being adopted. One of which is shown to be a 450mm diameter sewer entering the site from the south and exiting the site in front of Uldale Road, along with a 300mm diameter sewer serving the old garage.
Another sewer has been picked up from the topographical survey and is shown to be a 300mm diameter sewer serving the most north building previously located on site and running through the centre of the development.

It is therefore proposed to connect into the existing surface water sewer which previously served the site. This sewer ultimately discharges to the 'Pow Beck' watercourse located east/northeast to the development. To connect directly into the 'Pow Beck' has been discounted due to the extent of the proposed outfall required.

The EA flood map indicates that the site is location within flood zone 1. Flood zone 1 has a probability of 1 in 1000 in any one year (0.1%). Therefore, the risk of flooding from this source is expected to be low. The flood maps can be viewed in **Appendix B.**

Due to the size of the proposed development and to achieve the minimum acceptable orifice size of 75mm it is proposed to restrict surface water flows from this development to a maximum of 2.7 l/s. Attenuation from this area will be provided within the sub base of the porous car parking bays and through attenuation crates.

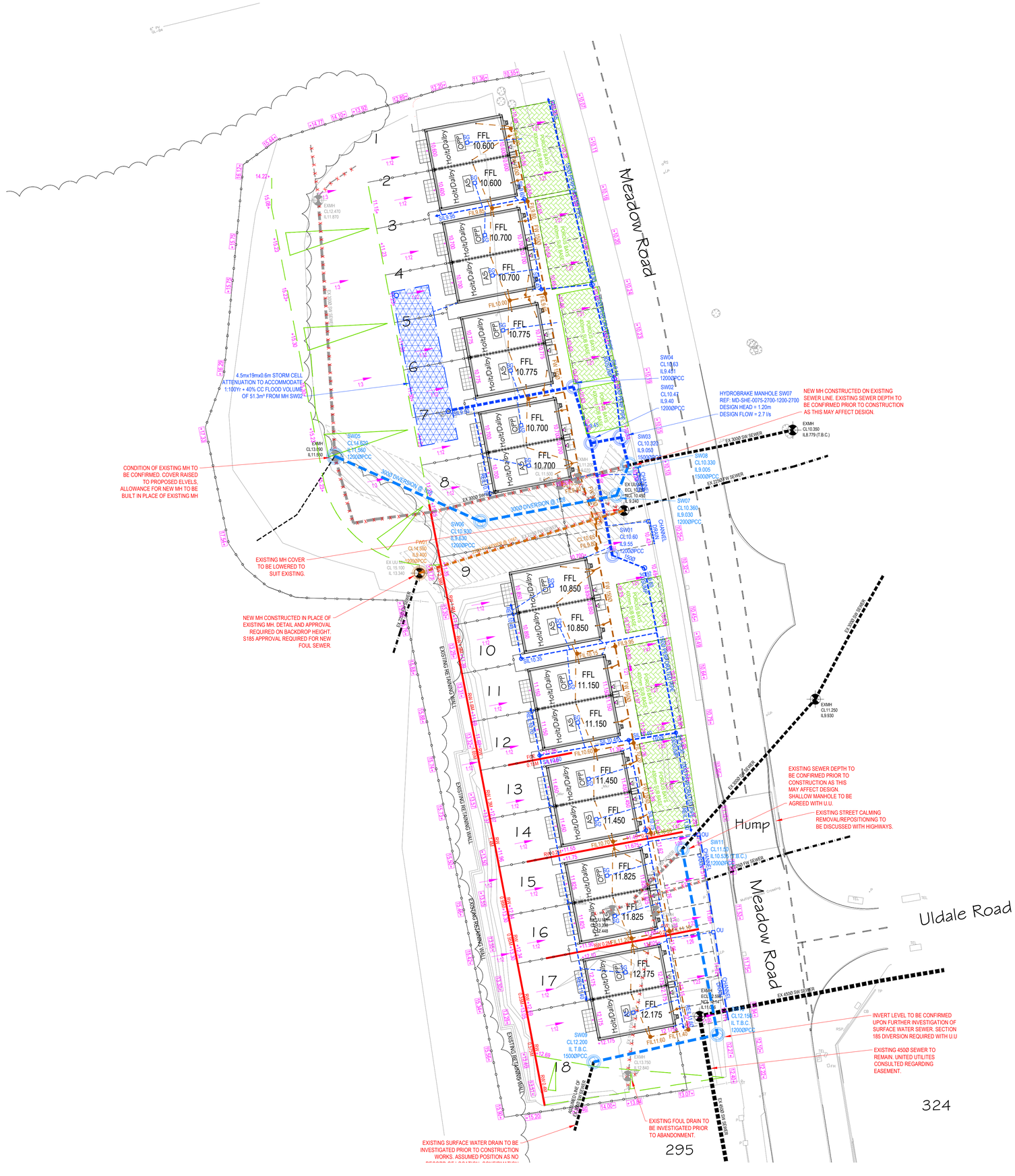
Calculations have been undertaken for all storm events upto the 1 in 100 year+40% event. Flooding will be contained within the system up to the 1 in 100 year+40% storm event.

Microdrainage calculations allow for 10% urban creep within the site.

Porous paving is proposed to provide treatment of surface water flows from this area of the car park in line with current Ciria guidance.

A copy of the calculations and proposed drainage layout plan are attached in **Appendix A.**

Appendix A



HEALTH & SAFETY

1. CONTRACTOR SHOULD BE AWARE OF GENERAL CONSTRUCTION RISKS TO PREVENT SLIPS, TRIPS AND FALLS AND TAKE NECESSARY PRECAUTIONS WITHOUT SPECIAL INSTRUCTION.

ROADS & DRAINAGE

2. CONTRACTOR TO PROVIDE TRENCH SUPPORTS AS APPROPRIATE AND ENSURE THAT PLANT REMAINS A SAFE DISTANCE FROM TRENCHES PRIOR TO INSTALLING DRAINAGE
3. THE TIME THAT EXCAVATIONS ARE OPEN ON SITE SHOULD BE KEPT TO A MINIMUM AND ALL TRENCHES SHOULD BE SURROUNDED BY A BARRIER.
4. CONNECTIONS TO EXISTING SEWERS TO BE MADE BY NWL APPROVED CONTRACTOR ONLY.
5. CONTRACTOR TO MAKE OPERATIVES AWARE OF ASSOCIATED DANGERS TO HEALTH SUCH AS LEPTOSPIROSIS (WEILS DISEASE) AND RECOMMENDED PRECAUTIONS. ADEQUATE WELFARE FACILITIES AND PROTECTIVE CLOTHING TO BE PROVIDED AS REQUIRED.
6. UNFINISHED MANHOLES MUST BE COVERED WITH LOAD BEARING MATERIALS AND SURROUNDED WITH BARRIER.

PIPES & CABLES

7. SERVICE RECORDS TO BE REFERRED TO PRIOR TO WORK COMMENCING. CONTRACTOR TO PROCEED WITH CAUTION AND SERVICES TO BE LOCATED BY HAND DIG AND PROTECTED ACCORDINGLY.

EXCAVATION/FILL

8. CONTRACTOR TO ENSURE RELEVANT MEASURES ARE TAKEN TO KEEP PLANT AND PEOPLE A SAFE DISTANCE FROM STEEP SLOPES DURING THE WORKS.
9. CONTRACTOR TO ENSURE THAT PROCEDURES ARE IN PLACE TO KEEP PEOPLE A SAFE DISTANCE FROM WORKING PLANT WHERE NECESSARY.
10. CONTRACTOR TO REFER TO GROUND INVESTIGATION REPORT FOR CONTAMINATION TESTS AND TO PROVIDE ADEQUATE WELFARE FACILITIES AND PROTECTIVE CLOTHING AS REQUIRED.

A1 - Do Not Scale

Only PDF / DWF Issues of this drawing are controlled.
All other formats (eg. DWG AutoCAD FILES) are UN-controlled and are used at your own risk.

Contractors should refer to the residual risks contained in the CDM Pre Construction Information before carrying out any site operations and should not issue parts of this drawing without including the CDM notes and references.
This information will include details of the SIGNIFICANT risks which 3E have considered beyond that which a competent contractor should be aware.

Legend

Adoptable Drainage

- Proposed Adoptable Foul sewer and manhole
- Proposed Adoptable Storm sewer and manhole

All adoptable drainage to be installed in accordance with the relevant edition of Sewers For Adoption and any regional water authority variations

- Proposed private Foul sewer and manhole
- Proposed private Storm sewer and manhole
- Proposed slab floor gully (SG)
- Porous Paving (Sub-base Depth Varies)
- Existing public Foul sewer and manhole — EX 225Ø FW SEWER
- Existing public Surface Water sewer and manhole — EX 300Ø SW SEWER

Retaining walls, steps & external works

- Retaining wall (retained height shown). (edge protection required over 600mm ht) — RW 0.6M
- Tanking to specialist details
- Double damp proof course — DOUBLE DPC
- Steps to paths - 300mm Going 150mm Rise (Handrails required to heights over 600mm) — 6 STEPS
- Proposed Finished Floor Level — FFL 141.000
- Proposed spot height — +141.00
- Proposed Garden / Drive Gradient — 1:12
- Proposed Engineered Batter / Embankment. (1:3 Grad Max unless notes otherwise) — 1:2 Batter

THIS PLAN CURRENTLY SHOWS SEWER EASEMENTS AND ESTIMATED WATER MAIN EASEMENTS ONLY - SUBJECT TO SURVEY AND APPROVALS

SUBJECT TO THE APPROVAL OF ALL RELEVANT AUTHORITIES

Date	Revisions	Drawn	Rev.
26/06/20	Preliminary Issue	OC	P1

Purpose of Issue: PRELIMINARY
Drawing Status: -

Wakefield Office
4 Calder Close
Calder Park
Wakefield
WF4 3BA
tel 01924 240420
wakefield@3econsult.com

Newcastle Office
2 Esh Plaza
Sir Bobby Robson Way
Great Park
Newcastle upon Tyne
NE13 9BA
tel 0191 230 2993
newcastle@3econsult.com

consulting engineers
www.3econsult.com

Client: HOME GROUP

Project: MEADOW ROAD
MIREHOUSE
CUMBRIA

Title: PROPOSED DRAINAGE LAYOUT

Scale	Author	Checked	Date
1:250	OC		JUNE 2020

Job Number	Originator	Zone	Level	Type	Role	Drawing No.	Rev
P19-177-3E-ZZ-XX-DR-C-1000-P1							

STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for Storm

Pipe Sizes STANDARD Manhole Sizes STANDARD

FSR Rainfall Model - England and Wales

Return Period (years)	2	PIMP (%)	100
M5-60 (mm)	16.000	Add Flow / Climate Change (%)	0
Ratio R	0.269	Minimum Backdrop Height (m)	0.200
Maximum Rainfall (mm/hr)	50	Maximum Backdrop Height (m)	1.500
Maximum Time of Concentration (mins)	30	Min Design Depth for Optimisation (m)	1.200
Foul Sewage (l/s/ha)	0.000	Min Vel for Auto Design only (m/s)	1.00
Volumetric Runoff Coeff.	0.750	Min Slope for Optimisation (1:X)	500

Designed with Level Soffits

Network Design Table for Storm

- Indicates pipe length does not match coordinates

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
S1.000	11.950	0.350	34.1	0.010	5.00	0.0	0.600	o	100	Pipe/Conduit	
S2.000	24.252	0.850	28.5	0.020	5.00	0.0	0.600	o	100	Pipe/Conduit	
S2.001	11.135	0.300	37.1	0.014	0.00	0.0	0.600	o	100	Pipe/Conduit	
S3.000	30.081	0.800	37.6	0.028	5.00	0.0	0.600	o	100	Pipe/Conduit	
S3.001	10.946	0.150	73.0	0.000	0.00	0.0	0.600	o	100	Pipe/Conduit	
S2.002	5.789	0.100	57.9	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
S1.001	20.310	0.500	40.6	0.035	0.00	0.0	0.600	o	150	Pipe/Conduit	
S1.002	4.183	0.100	41.8	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
S1.003	14.336	0.050	286.7	0.016	0.00	0.0	0.600	o	375	Pipe/Conduit	
S4.000	14.943	0.049	305.0	0.000	5.00	0.0	0.600	o	300	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
S1.000	45.32	5.15	10.700	0.010	0.0	0.0	0.0	1.32	10.4	1.2
S2.000	44.91	5.28	11.600	0.020	0.0	0.0	0.0	1.45	11.4	2.4
S2.001	44.45	5.42	10.750	0.034	0.0	0.0	0.0	1.27	10.0	4.1
S3.000	44.54	5.40	11.400	0.028	0.0	0.0	0.0	1.26	9.9	3.4
S3.001	43.92	5.60	10.600	0.028	0.0	0.0	0.0	0.90	7.1	3.4
S2.002	43.70	5.67	10.400	0.062	0.0	0.0	0.0	1.32	23.4	7.3
S1.001	43.08	5.89	10.300	0.107	0.0	0.0	0.0	1.58	28.0	12.5
S1.002	42.95	5.93	9.800	0.107	0.0	0.0	0.0	1.56	27.6	12.5
S1.003	42.32	6.16	9.475	0.123	0.0	0.0	0.0	1.06	117.6	14.1
S4.000	44.91	5.28	9.500	0.000	0.0	0.0	0.0	0.90	63.3	0.0

Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
S4.001	7.129#	0.026	274.2	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
S1.004	3.732	0.375	10.0	0.018	0.00	0.0	0.600	o	375	Pipe/Conduit	
S5.000	23.019	0.250	92.1	0.024	5.00	0.0	0.600	o	150	Pipe/Conduit	
S6.000	11.111	0.150	74.1	0.012	5.00	0.0	0.600	o	100	Pipe/Conduit	
S6.001	5.651	0.100	56.5	0.010	0.00	0.0	0.600	o	100	Pipe/Conduit	
S5.001	11.719	0.150	78.1	0.010	0.00	0.0	0.600	o	150	Pipe/Conduit	
S5.002	9.605	0.100	96.1	0.005	0.00	0.0	0.600	o	150	Pipe/Conduit	
S1.005	3.993	0.045	88.7	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
S4.001	44.51	5.40	9.451	0.000	0.0	0.0	0.0	0.94	66.8	0.0
S1.004	42.30	6.17	9.425	0.141	0.0	0.0	0.0	5.77	637.5	16.2
S5.000	44.63	5.37	9.550	0.024	0.0	0.0	0.0	1.05	18.5	2.9
S6.000	45.14	5.21	9.600	0.012	0.0	0.0	0.0	0.90	7.0	1.5
S6.001	44.85	5.30	9.450	0.022	0.0	0.0	0.0	1.03	8.1	2.7
S5.001	44.10	5.54	9.300	0.056	0.0	0.0	0.0	1.14	20.1	6.7
S5.002	43.64	5.69	9.150	0.061	0.0	0.0	0.0	1.03	18.1	7.2
S1.005	42.20	6.20	9.050	0.202	0.0	0.0	0.0	1.92	212.5	23.1

Area Summary for Storm

Pipe Number	PIMP Type	PIMP Name	PIMP (%)	Gross Area (ha)	Imp. Area (ha)	Pipe Total (ha)
1.000	-	-	100	0.010	0.010	0.010
2.000	-	-	100	0.020	0.020	0.020
2.001	-	-	100	0.014	0.014	0.014
3.000	-	-	100	0.028	0.028	0.028
3.001	-	-	100	0.000	0.000	0.000
2.002	-	-	100	0.000	0.000	0.000
1.001	-	-	100	0.035	0.035	0.035
1.002	-	-	100	0.000	0.000	0.000
1.003	-	-	100	0.016	0.016	0.016
4.000	-	-	100	0.000	0.000	0.000
4.001	-	-	100	0.000	0.000	0.000
1.004	-	-	100	0.018	0.018	0.018
5.000	-	-	100	0.024	0.024	0.024
6.000	-	-	100	0.012	0.012	0.012
6.001	-	-	100	0.010	0.010	0.010
5.001	-	-	100	0.010	0.010	0.010
5.002	-	-	100	0.005	0.005	0.005
1.005	-	-	100	0.000	0.000	0.000
				Total	Total	Total
				0.202	0.202	0.202

Network Classifications for Storm

PN	USMH Name	Pipe Dia (mm)	Min Cover Depth (m)	Max Cover Depth (m)	Pipe Type	MH Dia (mm)	MH Width (mm)	MH Ring Depth (m)	MH Type
S1.000	SP02	100	0.530	0.580	Unclassified	450	0	0.530	Unclassified
S2.000	SRE2	100	0.460	0.580	Unclassified	100	0	0.460	Unclassified
S2.001	SP03	100	0.580	0.730	Unclassified	450	0	0.580	Unclassified
S3.000	SP04	100	0.550	0.675	Unclassified	1200	0	0.675	Unclassified
S3.001	SP05	100	0.550	0.730	Unclassified	1200	0	0.550	Unclassified
S2.002	SP06	150	0.580	0.730	Unclassified	600	0	0.730	Unclassified
S1.001	SP07	150	0.580	0.600	Unclassified	600	0	0.580	Unclassified
S1.002	SP08	150	0.600	0.750	Unclassified	600	0	0.600	Unclassified
S1.003	SW01	375	0.670	0.750	Unclassified	600	0	0.750	Unclassified
S4.000	SW ATT	300	0.899	1.000	Unclassified	600	0	1.000	Unclassified
S4.001	SW04	300	0.745	0.899	Unclassified	1200	0	0.899	Unclassified
S1.004	SW02	375	0.670	0.895	Unclassified	600	0	0.670	Unclassified
S5.000	SRE3	150	0.600	1.000	Unclassified	150	0	0.600	Unclassified
S6.000	SP09	100	0.890	1.140	Unclassified	450	0	0.890	Unclassified
S6.001	SP10	100	1.000	1.140	Unclassified	450	0	1.140	Unclassified
S5.001	SP11	150	1.000	1.150	Unclassified	600	0	1.000	Unclassified
S5.002	SP12	150	1.120	1.150	Unclassified	1500	0	1.150	Unclassified
S1.005	SW03	375	0.895	1.195	Unclassified	1500	0	0.895	Unclassified

Free Flowing Outfall Details for Storm

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
S1.005	SW04	10.575	9.005	9.005	300	0

Simulation Criteria for Storm

Volumetric Runoff Coeff	0.750	Additional Flow - % of Total Flow	0.000
Areal Reduction Factor	1.000	MADD Factor * 10m³/ha Storage	2.000
Hot Start (mins)	0	Inlet Coeffiecient	0.800
Hot Start Level (mm)	0	Flow per Person per Day (l/per/day)	0.000
Manhole Headloss Coeff (Global)	0.500	Run Time (mins)	60
Foul Sewage per hectare (l/s)	0.000	Output Interval (mins)	1

Number of Input Hydrographs 0	Number of Offline Controls 0	Number of Time/Area Diagrams 0
Number of Online Controls 1	Number of Storage Structures 6	Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model	FSR	Profile Type	Summer
Return Period (years)	2	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	16.000	Storm Duration (mins)	30
Ratio R	0.257		

Online Controls for Storm

Hydro-Brake® Optimum Manhole: SW03, DS/PN: S1.005, Volume (m³): 2.7

Unit Reference	MD-SHE-0075-2700-1200-2700
Design Head (m)	1.200
Design Flow (l/s)	2.7
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	75
Invert Level (m)	9.050
Minimum Outlet Pipe Diameter (mm)	100
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.200	2.7	Kick-Flo®	0.670	2.1
Flush-Flo™	0.330	2.6	Mean Flow over Head Range	-	2.3

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	2.1	0.800	2.2	2.000	3.4	4.000	4.7	7.000	6.1
0.200	2.5	1.000	2.5	2.200	3.6	4.500	5.0	7.500	6.3
0.300	2.6	1.200	2.7	2.400	3.7	5.000	5.2	8.000	6.5
0.400	2.5	1.400	2.9	2.600	3.9	5.500	5.5	8.500	6.7
0.500	2.5	1.600	3.1	3.000	4.1	6.000	5.7	9.000	6.9
0.600	2.3	1.800	3.2	3.500	4.4	6.500	5.9	9.500	7.1

Storage Structures for Storm

Porous Car Park Manhole: SP07, DS/PN: S1.001

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	5.4
Membrane Percolation (mm/hr)	1000	Length (m)	11.1
Max Percolation (l/s)	16.7	Slope (1:X)	100.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	10.470	Membrane Depth (mm)	0

Porous Car Park Manhole: SP08, DS/PN: S1.002

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	5.5
Membrane Percolation (mm/hr)	1000	Length (m)	16.8
Max Percolation (l/s)	25.7	Slope (1:X)	100.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	9.980	Membrane Depth (mm)	0

Tank or Pond Manhole: SW ATT, DS/PN: S4.000

Invert Level (m) 9.500

Depth (m)	Area (m²)	Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	85.5	0.600	85.5	0.601	0.0

Porous Car Park Manhole: SP11, DS/PN: S5.001

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	5.4
Membrane Percolation (mm/hr)	1000	Length (m)	21.8
Max Percolation (l/s)	32.7	Slope (1:X)	100.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	9.740	Membrane Depth (mm)	0

Porous Car Park Manhole: SP12, DS/PN: S5.002

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	5.2
Membrane Percolation (mm/hr)	1000	Length (m)	11.0
Max Percolation (l/s)	15.9	Slope (1:X)	100.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	9.890	Membrane Depth (mm)	0

Porous Car Park Manhole: SW03, DS/PN: S1.005

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	5.1
Membrane Percolation (mm/hr)	1000	Length (m)	5.5
Max Percolation (l/s)	7.8	Slope (1:X)	100.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	10.020	Membrane Depth (mm)	0

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

Simulation Criteria

Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	0.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
Hot Start Level (mm)	0	Inlet Coeffiecient	0.800
Manhole Headloss Coeff (Global)	0.500	Flow per Person per Day (l/per/day)	0.000
Foul Sewage per hectare (l/s)	0.000		

Number of Input Hydrographs 0 Number of Offline Controls 0 Number of Time/Area Diagrams 0
Number of Online Controls 1 Number of Storage Structures 6 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model	FSR	M5-60 (mm) 16.000	Cv (Summer) 0.750
Region	England and Wales	Ratio R 0.269	Cv (Winter) 0.840

Margin for Flood Risk Warning (mm)	300.0
Analysis Timestep	2.5 Second Increment (Extended)
DTS Status	ON
DVD Status	ON
Inertia Status	ON

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 240, 360, 480, 960, 1440
Return Period(s) (years)	100
Climate Change (%)	40

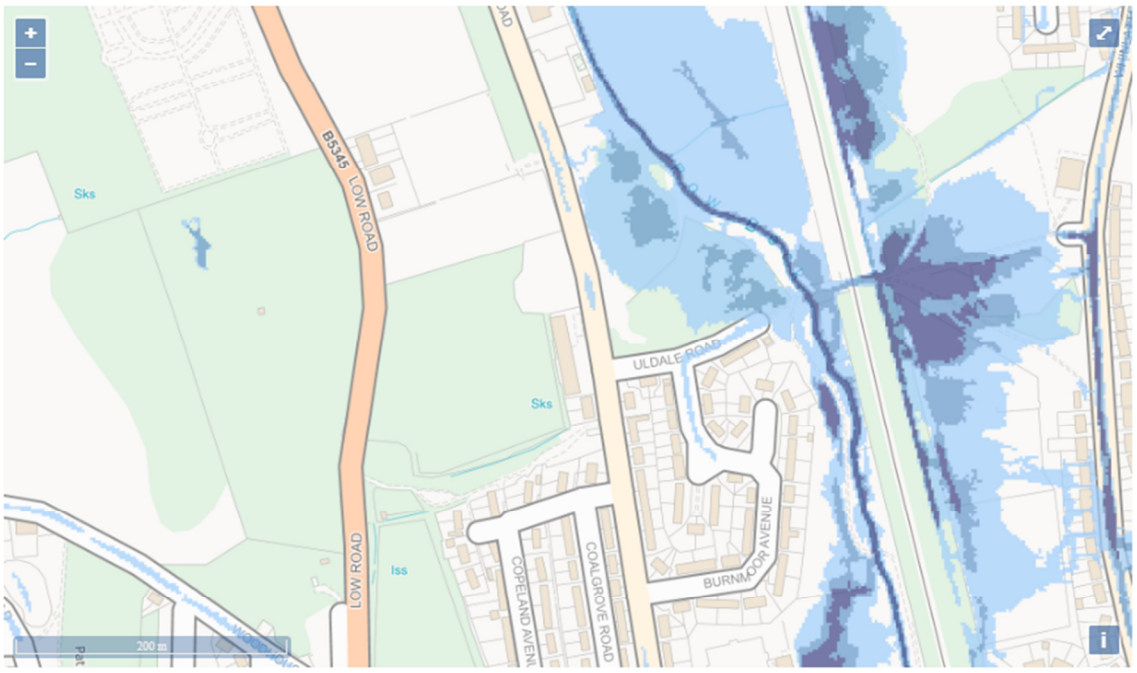
PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)
S1.000	SP02	15 Winter	100	+40%					10.746	-0.054
S2.000	SRE2	15 Winter	100	+40%	100/15 Winter				11.712	0.012
S2.001	SP03	15 Winter	100	+40%	100/15 Summer				11.298	0.448
S3.000	SP04	15 Winter	100	+40%	100/15 Summer				11.688	0.188
S3.001	SP05	15 Winter	100	+40%	100/15 Summer				11.012	0.312
S2.002	SP06	15 Winter	100	+40%	100/15 Summer				10.756	0.206
S1.001	SP07	15 Winter	100	+40%	100/15 Summer				10.653	0.203
S1.002	SP08	360 Winter	100	+40%	100/15 Summer				10.267	0.317
S1.003	SW01	360 Winter	100	+40%	100/15 Summer				10.265	0.415
S4.000	SW ATT	360 Winter	100	+40%	100/15 Winter				10.264	0.464
S4.001	SW04	360 Winter	100	+40%	100/15 Summer				10.264	0.513
S1.004	SW02	360 Winter	100	+40%	100/15 Summer				10.264	0.464
S5.000	SRE3	360 Winter	100	+40%	100/15 Summer				10.271	0.571
S6.000	SP09	360 Winter	100	+40%	100/15 Summer				10.272	0.572
S6.001	SP10	360 Winter	100	+40%	100/15 Summer				10.271	0.721
S5.001	SP11	360 Winter	100	+40%	100/15 Summer				10.269	0.819
S5.002	SP12	360 Winter	100	+40%	100/15 Summer				10.267	0.967
S1.005	SW03	360 Winter	100	+40%	100/15 Summer				10.264	0.839

PN	US/MH Name	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
S1.000	SP02	0.000	0.43			4.2	OK	
S2.000	SRE2	0.000	0.73			8.1	SURCHARGED	
S2.001	SP03	0.000	1.37			12.8	FLOOD RISK	
S3.000	SP04	0.000	0.95			9.1	SURCHARGED	
S3.001	SP05	0.000	1.35			9.0	FLOOD RISK	
S2.002	SP06	0.000	1.05			20.5	SURCHARGED	
S1.001	SP07	0.000	1.04		5	27.4	SURCHARGED	
S1.002	SP08	0.000	0.44		81	8.8	FLOOD RISK	
S1.003	SW01	0.000	0.11			10.0	SURCHARGED	

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

PN	US/MH Name	Flooded Volume (m^3)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
S4.000	SW ATT	0.000	0.08			4.1	SURCHARGED	
S4.001	SW04	0.000	0.07			3.4	SURCHARGED	
S1.004	SW02	0.000	0.02			4.5	FLOOD RISK	
S5.000	SRE3	0.000	0.11			1.9	FLOOD RISK	
S6.000	SP09	0.000	0.14			1.0	SURCHARGED	
S6.001	SP10	0.000	0.24			1.7	SURCHARGED	
S5.001	SP11	0.000	0.22		178	3.9	FLOOD RISK	
S5.002	SP12	0.000	0.27		162	4.3	FLOOD RISK	
S1.005	SW03	0.000	0.03		235	2.7	FLOOD RISK	

Appendix B



Extent of flooding from surface water

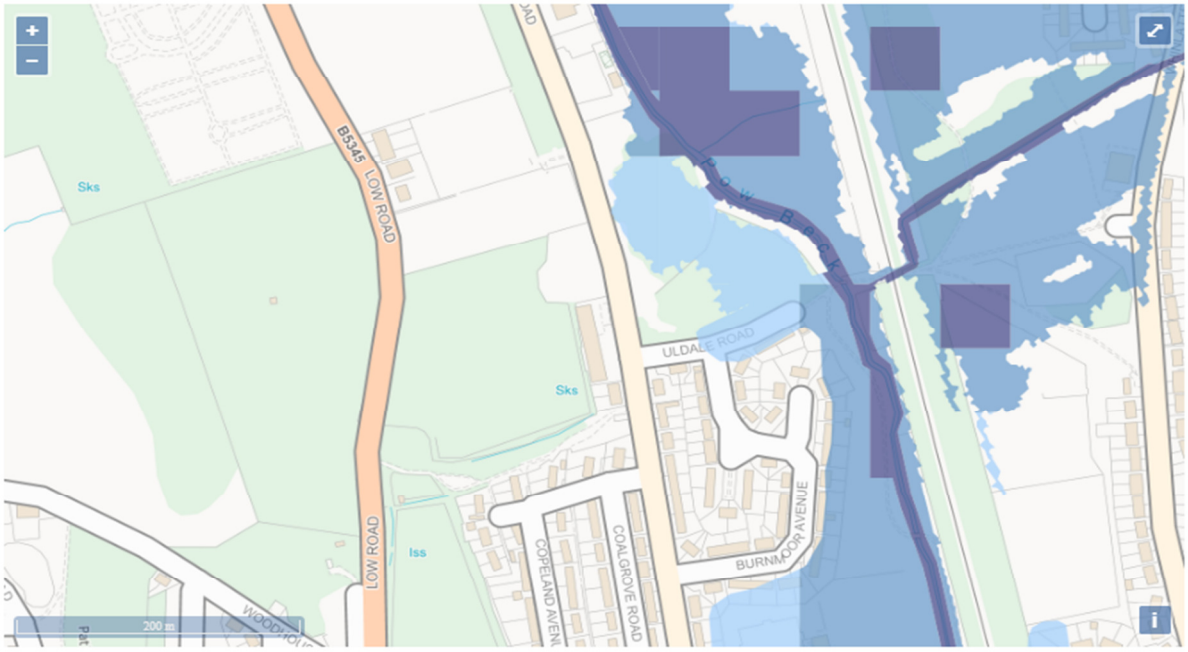
High Medium Low Very low Location you selected

Online EA Flood Maps – Surface Water Flooding

Extent of flooding from reservoirs

Maximum extent of flooding Location you selected

Online EA Flood Maps – Reservoir Flooding



Extent of flooding from rivers or the sea

High Medium Low Very low Location you selected

Online EA Flood Maps – River Flooding