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No. 8 Oak Green Stanley Green Business Park Earl Rd, Cheadle Hulme, SK8	8948 DOB BROOK CLOSE FILSWORTH	
Date Feb 20 File SW Net 1 030220.MDX	Designed by RH Checked by KPT	
Innovyze Network 2014.1.1		

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	Add Flow / Climate Change (%)	0
M5-60 (mm)	18.000	Minimum Backdrop Height (m)	0.200
Ratio R	0.360	Maximum Backdrop Height (m)	1.500
Maximum Rainfall (mm/hr)	50	Min Design Depth for Optimisation (m)	1.200
Maximum Time of Concentration (mins)	30	Min Vel for Auto Design only (m/s)	1.00
Foul Sewage (l/s/ha)	0.000	Min Slope for Optimisation (1:X)	500
Volumetric Runoff Coeff.	0.750		

Designed with Level Soffits

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)	Auto Design
S1.000	27.191	0.068	399.9	0.059	5.00	0.0	0.600	o	900	
S2.000	18.468	0.046	401.5	0.045	5.00	0.0	0.600	o	900	
S1.001	22.959	0.057	402.8	0.047	0.00	0.0	0.600	o	900	
S1.002	4.326	0.026	166.4	0.071	0.00	0.0	0.600	o	225	

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	50.00	5.29	86.700	0.059	0.0	0.0	0.0	1.56	992.9	8.0
S2.000	50.00	5.20	86.678	0.045	0.0	0.0	0.0	1.56	990.9	6.1
S1.001	50.00	5.54	86.632	0.151	0.0	0.0	0.0	1.55	989.2	20.4
S1.002	50.00	5.61	86.575	0.222	0.0	0.0	0.0	1.01	40.2	30.1

Free Flowing Outfall Details for Storm

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,I (mm)	W (mm)
S1.002	S	88.470	86.549	0.000	1500	0

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<u>Simulation Criteria for Storm</u> 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 Coefficient 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 Storage Structures 0 Number of Online Controls 1 Number of Time/Area Diagrams 0 Number of Offline Controls 0 Number of Real Time Controls 0 <u>Synthetic Rainfall Details</u> 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) 18.000 Storm Duration (mins) 30 Ratio R 0.360		
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Online Controls for Storm

Hydro-Brake Optimum® Manhole: S4, DS/PN: S1.002, Volume (m³): 22.8

Unit Reference MD-SHE-0099-5000-1400-5000
Design Head (m) 1.400
Design Flow (l/s) 5.0
Flush-Flo™ Calculated
Objective Minimise upstream storage
Diameter (mm) 99
Invert Level (m) 86.575
Minimum Outlet Pipe Diameter (mm) 150
Suggested Manhole Diameter (mm) 1200

Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.400	5.0	Kick-Flo®	0.852	4.0
Flush-Flo™	0.413	5.0	Mean Flow over Head Range	-	4.4

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)
0.100	3.3	1.200	4.6	3.000	7.1	7.000	10.6
0.200	4.6	1.400	5.0	3.500	7.7	7.500	11.0
0.300	4.9	1.600	5.3	4.000	8.2	8.000	11.3
0.400	5.0	1.800	5.6	4.500	8.6	8.500	11.7
0.500	4.9	2.000	5.9	5.000	9.1	9.000	12.0
0.600	4.8	2.200	6.2	5.500	9.5	9.500	12.3
0.800	4.3	2.400	6.4	6.000	9.9		
1.000	4.3	2.600	6.7	6.500	10.3		

