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Summit House Riparian Way Keighley BD20 7BW	22228-PWA-00-XX-CA-C-3002 P01 SURFACE WATER CALCULATIONS GENESIS BUSINESS PARK	
Date 11/08/2023 File 22228-PWA-00-XX-CA-C-30...	Designed by IB Checked by LS	
Innovyze Source Control 2020.1.3		

Rainfall Details

Rainfall Model	FSR	Ratio R	0.300	Cv (Winter)	0.840
Return Period (years)	30	Summer Storms	Yes	Shortest Storm (mins)	15
Region	England and Wales	Winter Storms	Yes	Longest Storm (mins)	10080
M5-60 (mm)	20.000	Cv (Summer)	0.750	Climate Change %	+30

Time Area Diagram

Total Area (ha) 0.364

Time (mins)	Area (ha)
From: 0	To: 4 0.364

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Model Details

Storage is Online Cover Level (m) 10.000

Cellular Storage Structure

Invert Level (m) 7.600 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m ²)	Inf. Area (m ²)	Depth (m)	Area (m ²)	Inf. Area (m ²)	Depth (m)	Area (m ²)	Inf. Area (m ²)
0.000	180.0	0.0	1.199	180.0	0.0	1.200	0.0	0.0

Hydro-Brake® Optimum Outflow Control

Unit Reference MD-SHE-0100-5000-1400-5000 Sump Available Yes
Design Head (m) 1.400 Diameter (mm) 100
Design Flow (l/s) 5.0 Invert Level (m) 7.600
Flush-Flo™ Calculated Minimum Outlet Pipe Diameter (mm) 150
Objective Minimise upstream storage Suggested Manhole Diameter (mm) 1200
Application Surface

Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.400	5.0	Kick-Flo®	0.855	4.0
Flush-Flo™	0.416	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)	Depth (m)	Flow (l/s)
0.100	3.3	0.800	4.3	2.000	5.9	4.000	8.2	7.000	10.7
0.200	4.6	1.000	4.3	2.200	6.2	4.500	8.6	7.500	11.0
0.300	4.9	1.200	4.7	2.400	6.4	5.000	9.1	8.000	11.4
0.400	5.0	1.400	5.0	2.600	6.7	5.500	9.5	8.500	11.7
0.500	5.0	1.600	5.3	3.000	7.1	6.000	9.9	9.000	12.0
0.600	4.9	1.800	5.6	3.500	7.7	6.500	10.3	9.500	12.3