

Paul Waite Associates		Page 2
Summit House Riparian Way Keighley BD20 7BW	23269-PWA-00-XX-CA-C-3001 P01 SURFACE WATER CALCULATIONS SPRINGWOOD	
Date 19/06/2024 File 23269-PWA-00-XX-CA-C-30...	Designed by IB Checked by LS	
Innovyze	Source Control 2020.1.3	

Summary of Results for 30 year Return Period (+40%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max E Outflow (l/s)	Max Volume (m³)	Status
1440 min Winter	43.700	0.000	0.0	0.4	0.4	0.0	O K
2160 min Winter	43.700	0.000	0.0	0.3	0.3	0.0	O K
2880 min Winter	43.700	0.000	0.0	0.3	0.3	0.0	O K
4320 min Winter	43.700	0.000	0.0	0.2	0.2	0.0	O K
5760 min Winter	43.700	0.000	0.0	0.2	0.2	0.0	O K
7200 min Winter	43.700	0.000	0.0	0.1	0.1	0.0	O K
8640 min Winter	43.700	0.000	0.0	0.1	0.1	0.0	O K
10080 min Winter	43.700	0.000	0.0	0.1	0.1	0.0	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
1440 min Winter	4.684	0.0	14.6	0
2160 min Winter	3.486	0.0	16.3	0
2880 min Winter	2.824	0.0	17.6	0
4320 min Winter	2.098	0.0	19.5	0
5760 min Winter	1.701	0.0	20.9	0
7200 min Winter	1.445	0.0	22.1	0
8640 min Winter	1.266	0.0	23.1	0
10080 min Winter	1.131	0.0	24.0	0

Paul Waite Associates		Page 3
Summit House	23269-PWA-00-XX-CA-C-3001 P01	
Riparian Way	SURFACE WATER CALCULATIONS	
Keighley BD20 7BW	SPRINGWOOD	
Date 19/06/2024	Designed by IB	
File 23269-PWA-00-XX-CA-C-30...	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 %	+40

Time Area Diagram

Total Area (ha) 0.016

Time	(mins)	Area
From:	To:	(ha)

0	4	0.016
---	---	-------

Paul Waite Associates		Page 4
Summit House Riparian Way Keighley BD20 7BW	23269-PWA-00-XX-CA-C-3001 P01 SURFACE WATER CALCULATIONS SPRINGWOOD	
Date 19/06/2024 File 23269-PWA-00-XX-CA-C-30...	Designed by IB Checked by LS	
Innovyze	Source Control 2020.1.3	

Model Details

Storage is Online Cover Level (m) 44.300

Porous Car Park Structure

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	5.0
Membrane Percolation (mm/hr)	1000	Length (m)	12.0
Max Percolation (l/s)	16.7	Slope (1:X)	30.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	43.700	Membrane Depth (m)	100

Crown Vortex Valve® Outflow Control

Design Head (m)	0.580	Vortex Valve® Type	R1 SW Only	Invert Level (m)	43.525
Design Flow (l/s)	2.0	Diameter (mm)	67		

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	0.9	0.800	2.4	2.000	3.8	4.000	5.3	7.000	7.0
0.200	1.2	1.000	2.7	2.200	3.9	4.500	5.6	7.500	7.3
0.300	1.5	1.200	2.9	2.400	4.1	5.000	5.9	8.000	7.5
0.400	1.7	1.400	3.1	2.600	4.3	5.500	6.2	8.500	7.7
0.500	1.9	1.600	3.4	3.000	4.6	6.000	6.5	9.000	8.0
0.600	2.1	1.800	3.6	3.500	5.0	6.500	6.8	9.500	8.2