



**Highways Permeable Paved Soakaway – 1 in 100
Year + 40% Climate Change + FEH Rainfall Date
Willow Walk, Spalding
Burmor Construction Limited
12th May 2020**

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Unit 6 Neepsend Triangle Business 1 Burton Road Sheffield S3 8BW	Willow Walk, Spalding Highway Soakaway - 1 in 100 Year + 40% CC + FEH Data	
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Summary of Results for 100 year Return Period (+40%)

Half Drain Time : 97 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	3.244	0.444	3.9	26.6	O K
30 min Summer	3.304	0.504	4.4	34.3	O K
60 min Summer	3.343	0.543	4.8	39.8	O K
120 min Summer	3.381	0.581	5.1	45.5	O K
180 min Summer	3.394	0.594	5.2	47.7	O K
240 min Summer	3.396	0.596	5.3	47.9	O K
360 min Summer	3.382	0.582	5.1	45.8	O K
480 min Summer	3.360	0.560	4.9	42.4	O K
600 min Summer	3.337	0.537	4.7	38.9	O K
720 min Summer	3.313	0.513	4.5	35.6	O K
960 min Summer	3.271	0.471	4.2	29.9	O K
1440 min Summer	3.201	0.401	3.5	21.7	O K
2160 min Summer	3.125	0.325	2.9	14.3	O K
2880 min Summer	3.072	0.272	2.4	10.0	O K
4320 min Summer	3.004	0.204	1.8	5.6	O K
5760 min Summer	2.963	0.163	1.4	3.6	O K
7200 min Summer	2.936	0.136	1.2	2.5	O K
8640 min Summer	2.916	0.116	1.0	1.8	O K
10080 min Summer	2.902	0.102	0.9	1.4	O K
15 min Winter	3.274	0.474	4.2	30.3	O K
30 min Winter	3.338	0.538	4.7	39.1	O K
60 min Winter	3.381	0.581	5.1	45.6	O K
120 min Winter	3.420	0.620	5.5	51.8	O K
180 min Winter	3.431	0.631	5.6	53.8	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Summer	168.636	0.0	21
30 min Summer	110.194	0.0	34
60 min Summer	68.798	0.0	60
120 min Summer	44.611	0.0	94
180 min Summer	34.210	0.0	128
240 min Summer	28.041	0.0	164
360 min Summer	20.756	0.0	232
480 min Summer	16.529	0.0	298
600 min Summer	13.757	0.0	364
720 min Summer	11.795	0.0	430
960 min Summer	9.192	0.0	556
1440 min Summer	6.403	0.0	798
2160 min Summer	4.415	0.0	1156
2880 min Summer	3.385	0.0	1508
4320 min Summer	2.327	0.0	2212
5760 min Summer	1.787	0.0	2944
7200 min Summer	1.460	0.0	3672
8640 min Summer	1.241	0.0	4400
10080 min Summer	1.084	0.0	5136
15 min Winter	168.636	0.0	21
30 min Winter	110.194	0.0	34
60 min Winter	68.798	0.0	60
120 min Winter	44.611	0.0	100
180 min Winter	34.210	0.0	138

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Summary of Results for 100 year Return Period (+40%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m ³)	Status
240 min Winter	3.429	0.629	5.5	53.4	O K
360 min Winter	3.407	0.607	5.4	49.7	O K
480 min Winter	3.375	0.575	5.1	44.7	O K
600 min Winter	3.343	0.543	4.8	39.8	O K
720 min Winter	3.312	0.512	4.5	35.4	O K
960 min Winter	3.256	0.456	4.0	28.1	O K
1440 min Winter	3.168	0.368	3.2	18.3	O K
2160 min Winter	3.080	0.280	2.5	10.6	O K
2880 min Winter	3.023	0.223	2.0	6.7	O K
4320 min Winter	2.957	0.157	1.4	3.3	O K
5760 min Winter	2.921	0.121	1.1	2.0	O K
7200 min Winter	2.899	0.099	0.9	1.3	O K
8640 min Winter	2.884	0.084	0.7	0.9	O K
10080 min Winter	2.873	0.073	0.6	0.7	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m ³)	Time-Peak (mins)
240 min Winter	28.041	0.0	176
360 min Winter	20.756	0.0	250
480 min Winter	16.529	0.0	320
600 min Winter	13.757	0.0	388
720 min Winter	11.795	0.0	454
960 min Winter	9.192	0.0	582
1440 min Winter	6.403	0.0	826
2160 min Winter	4.415	0.0	1176
2880 min Winter	3.385	0.0	1532
4320 min Winter	2.327	0.0	2236
5760 min Winter	1.787	0.0	2936
7200 min Winter	1.460	0.0	3672
8640 min Winter	1.241	0.0	4408
10080 min Winter	1.084	0.0	5136

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Rainfall Details

Rainfall Model	FEH	Winter Storms	Yes
Return Period (years)	100	Cv (Summer)	0.750
FEH Rainfall Version	2013	Cv (Winter)	0.840
Site Location	GB 525212 323076	Shortest Storm (mins)	15
Data Type	Point	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+40

Time Area Diagram

Total Area (ha) 0.104

Time (mins)	Area	Time (mins)	Area
From:	To: (ha)	From:	To: (ha)
0	5 0.068	5	10 0.036

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Model Details

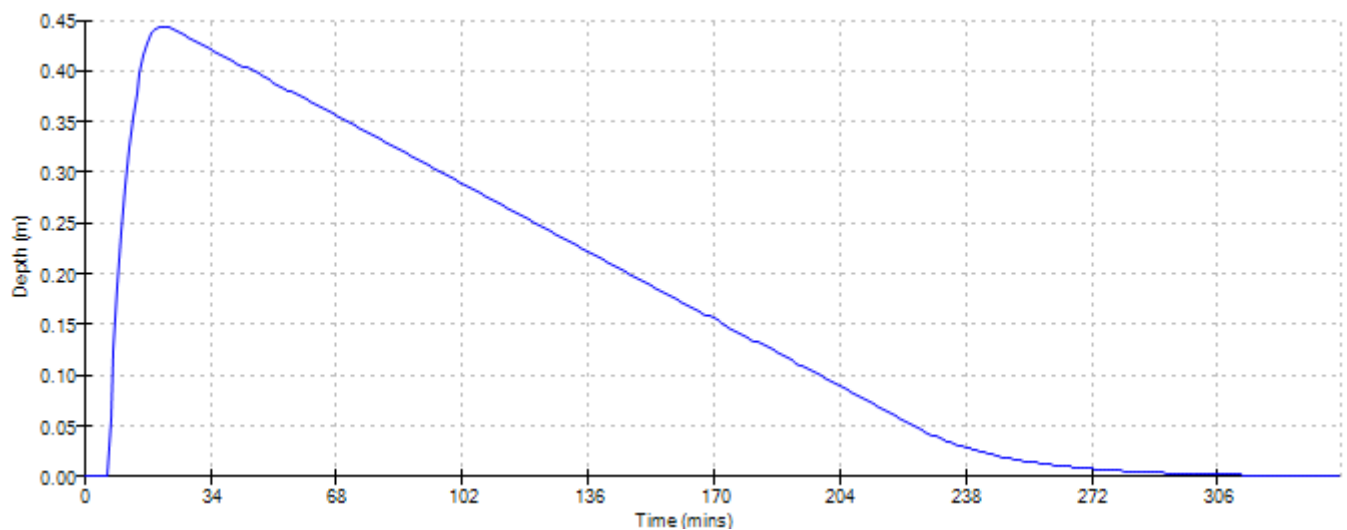
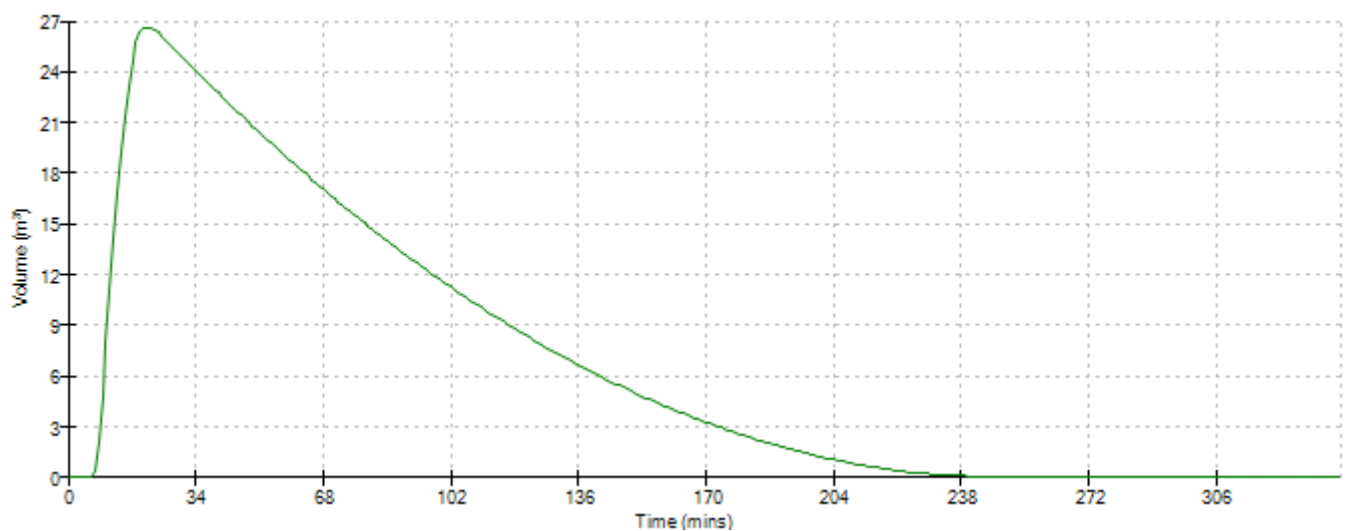
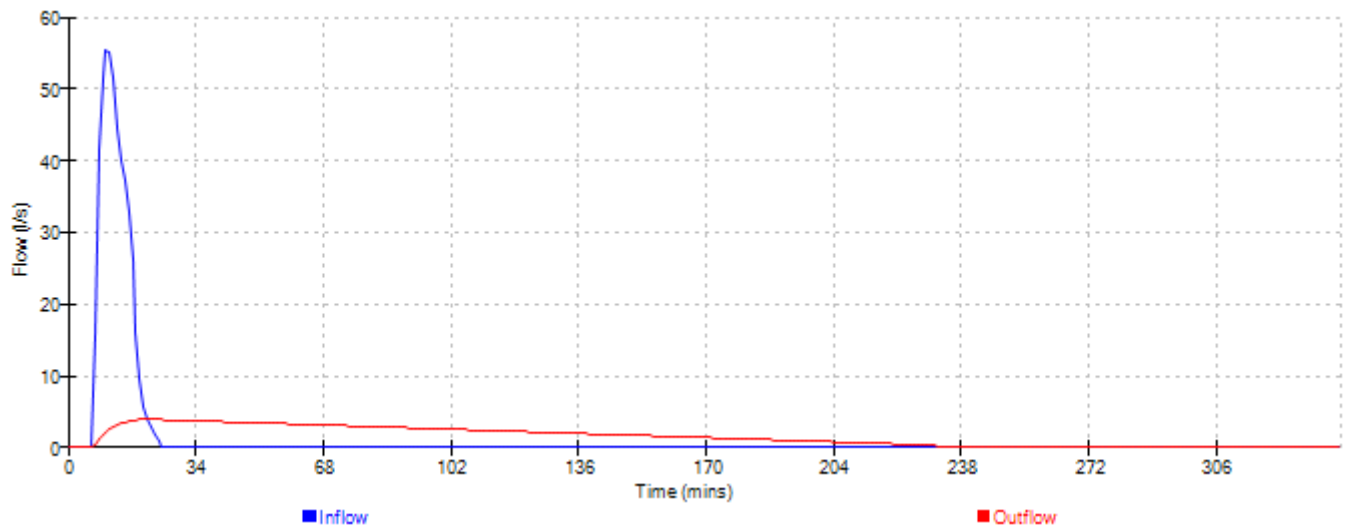
Storage is Online Cover Level (m) 4.800

Porous Car Park Structure

Infiltration Coefficient Base (m/hr)	0.07056	Width (m)	6.0
Membrane Percolation (mm/hr)	1000	Length (m)	110.0
Max Percolation (l/s)	183.3	Slope (1:X)	150.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	2.800	Membrane Depth (m)	0

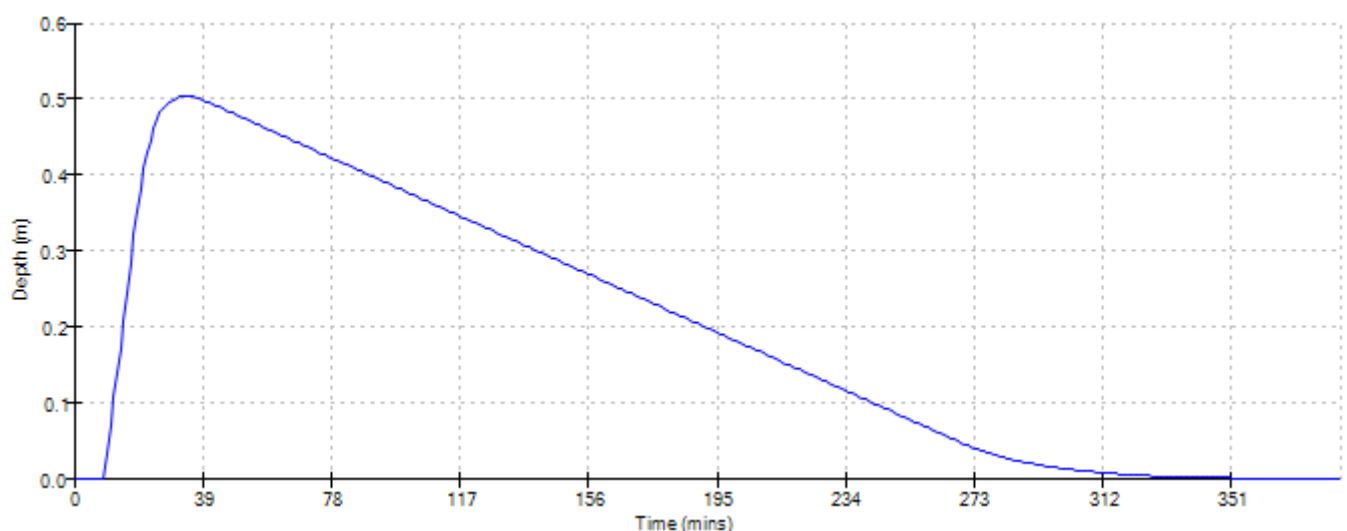
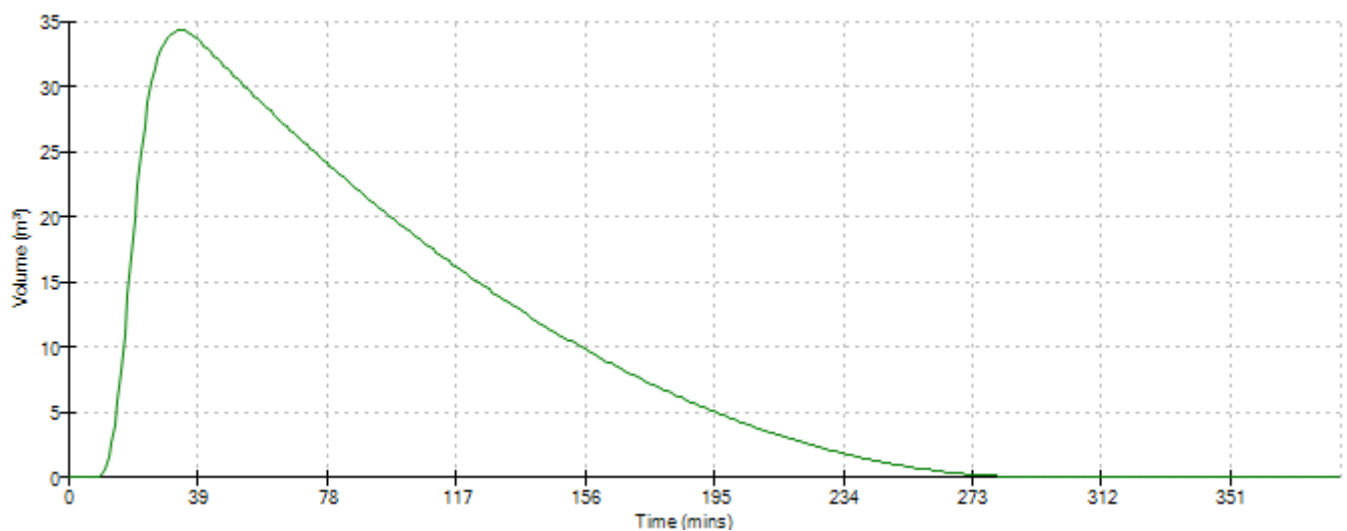
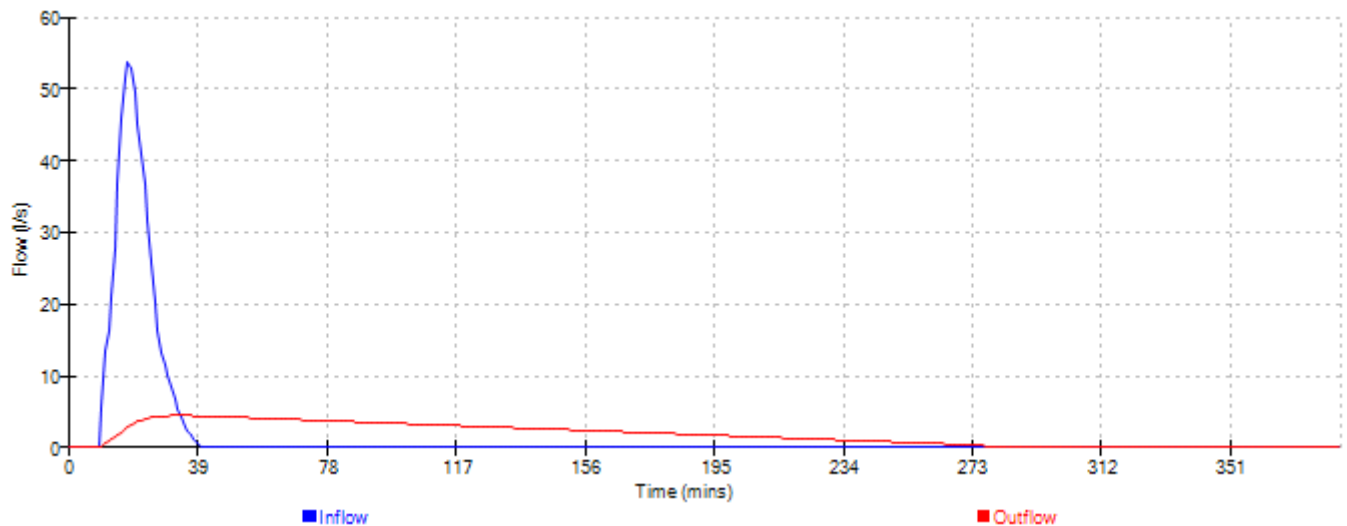
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Event: 15 min Summer



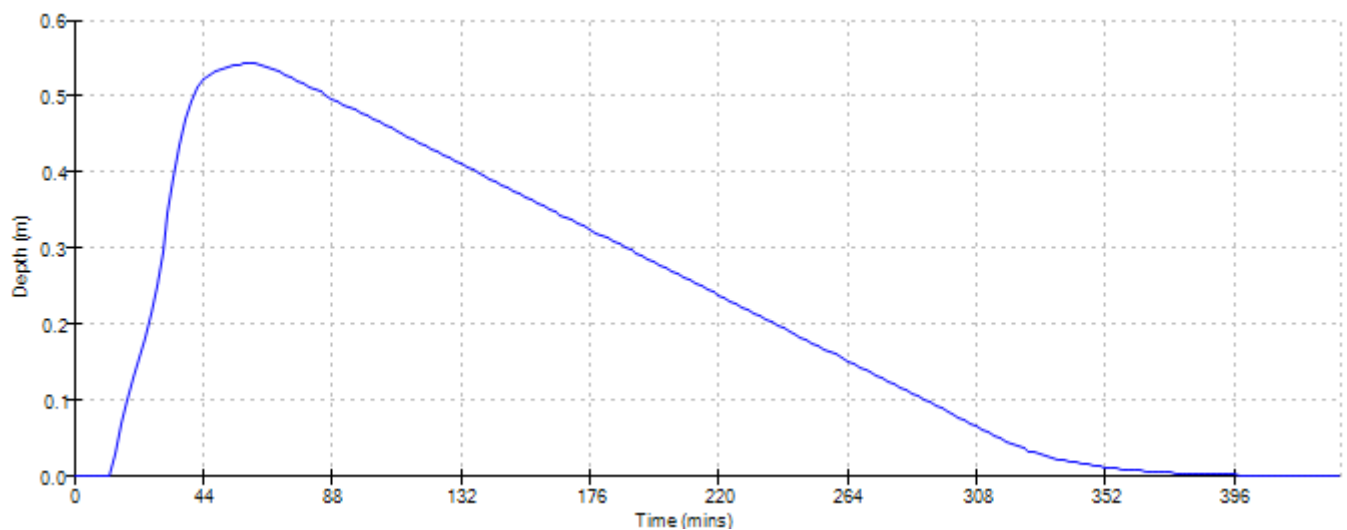
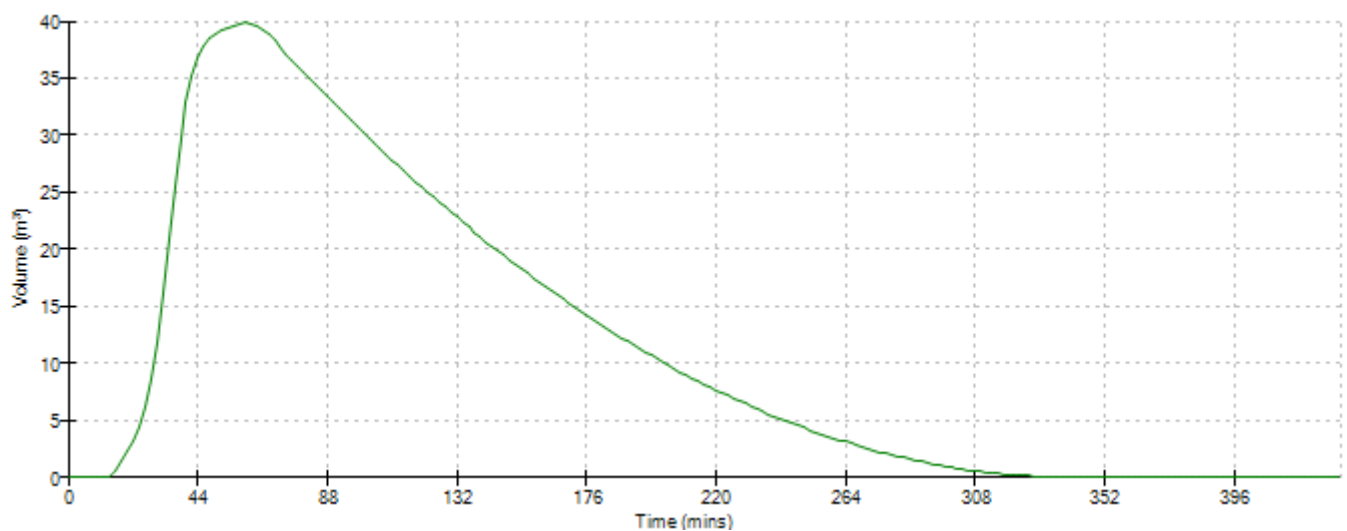
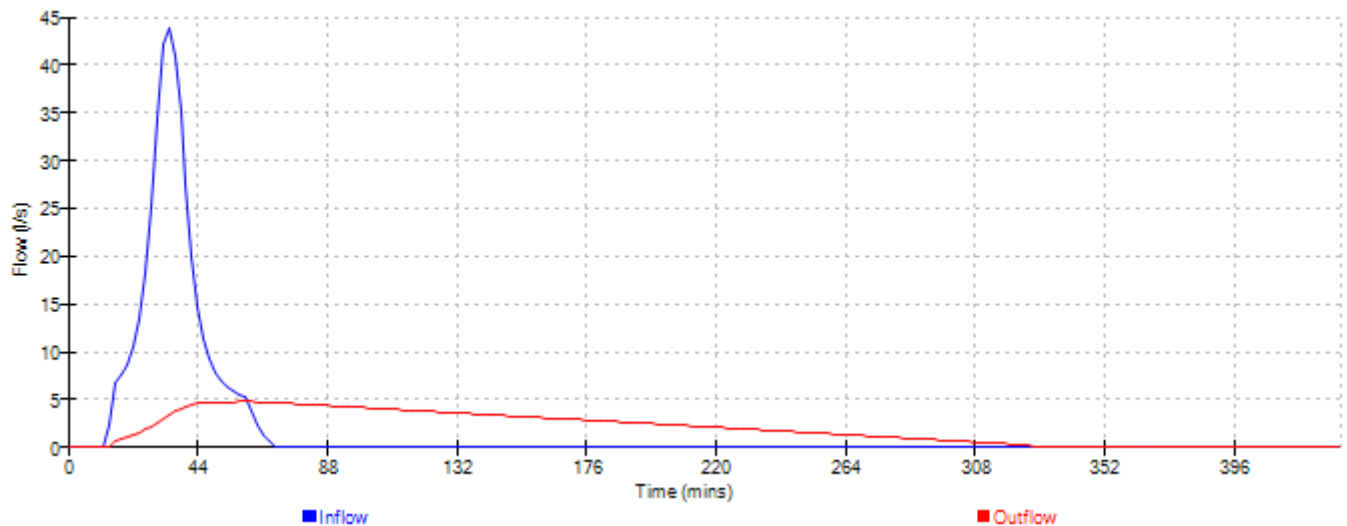
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Event: 30 min Summer



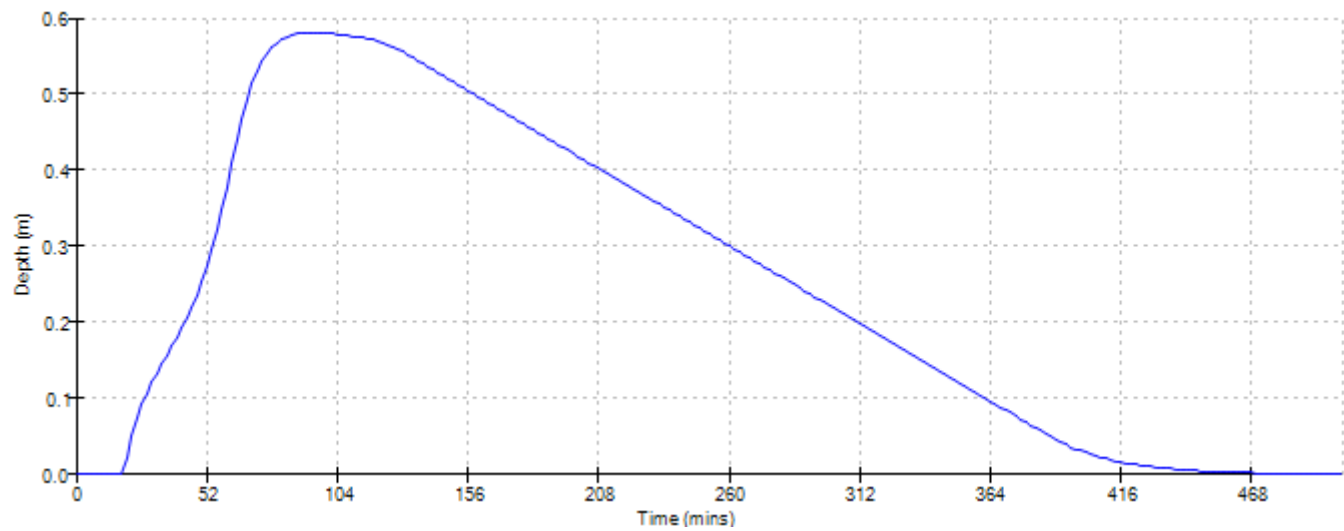
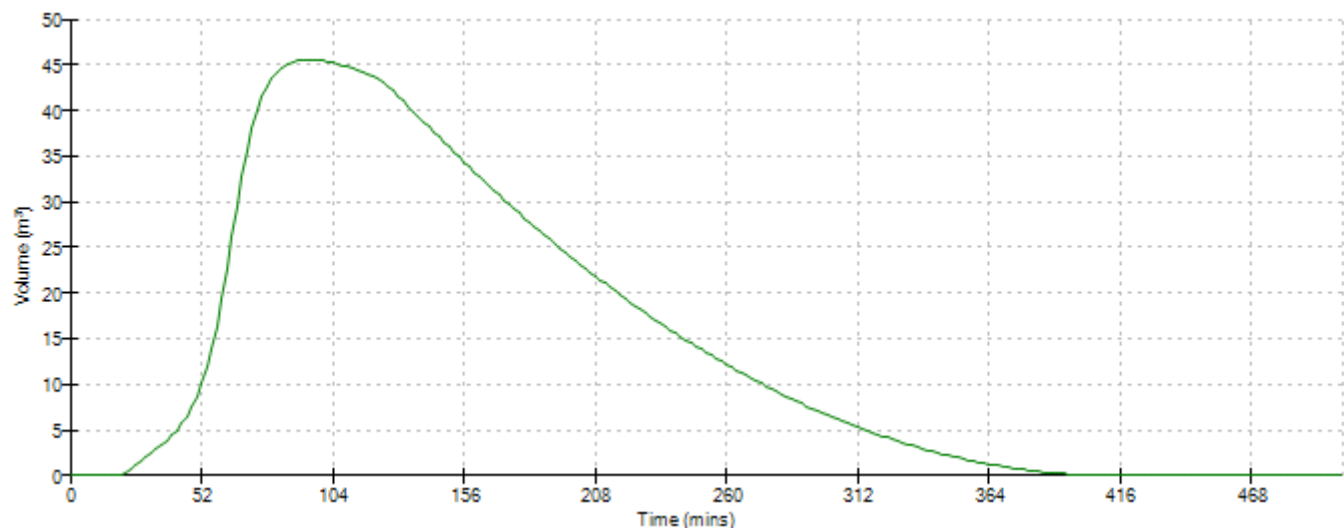
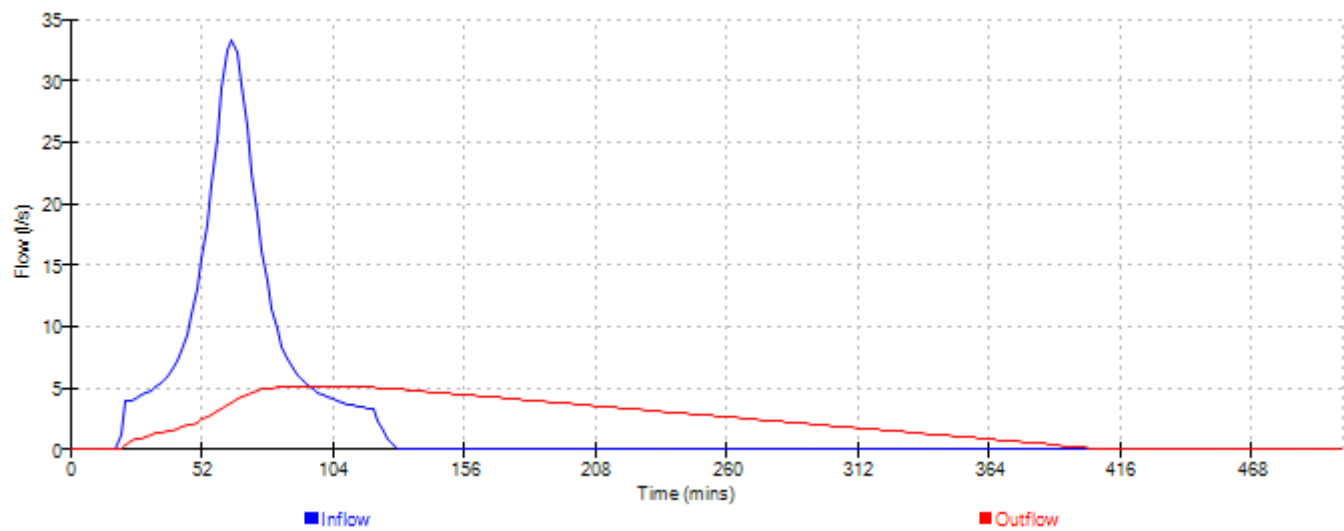
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Event: 60 min Summer



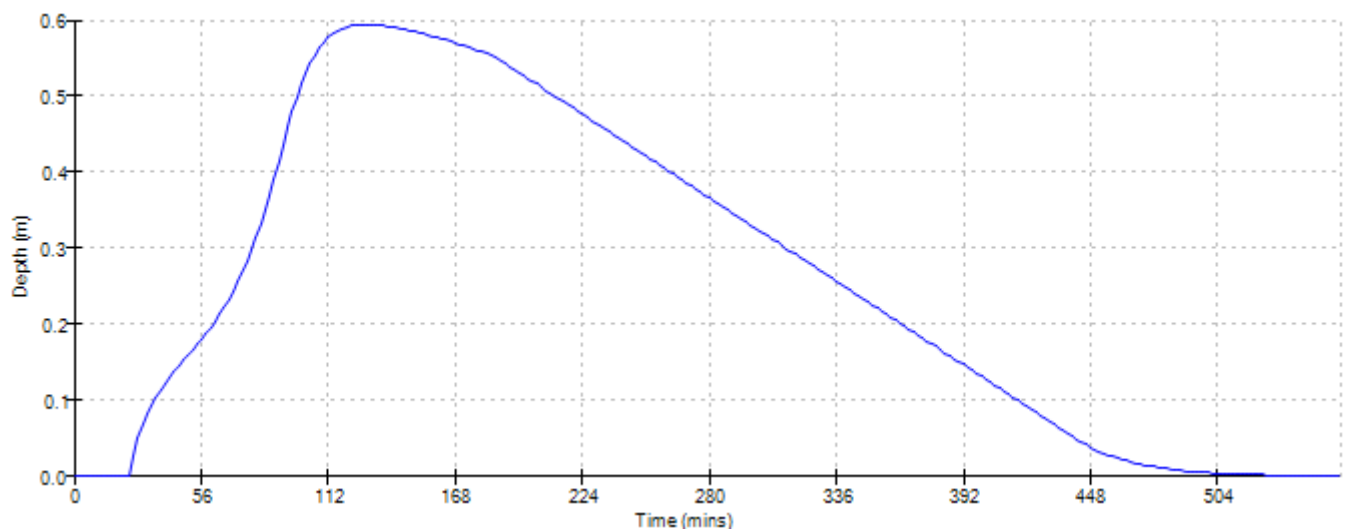
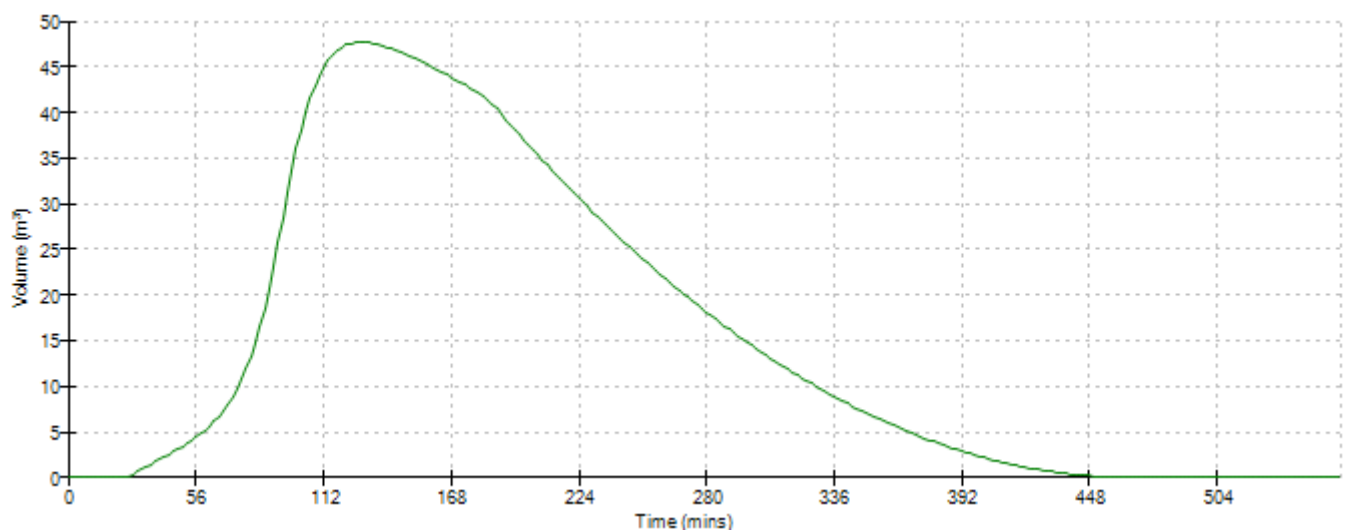
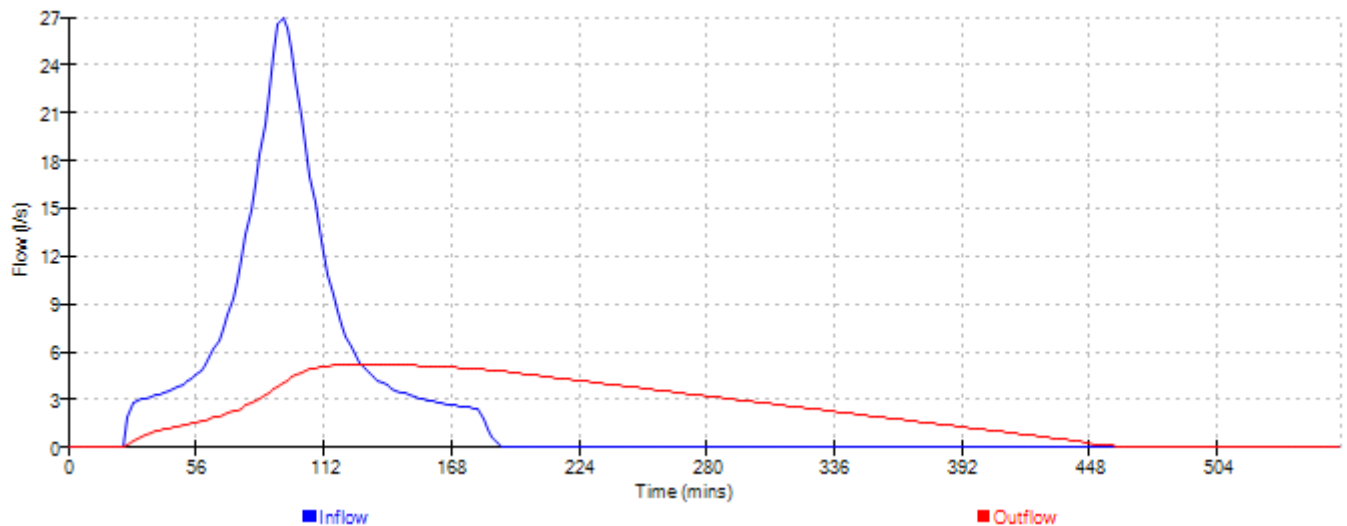
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Event: 120 min Summer

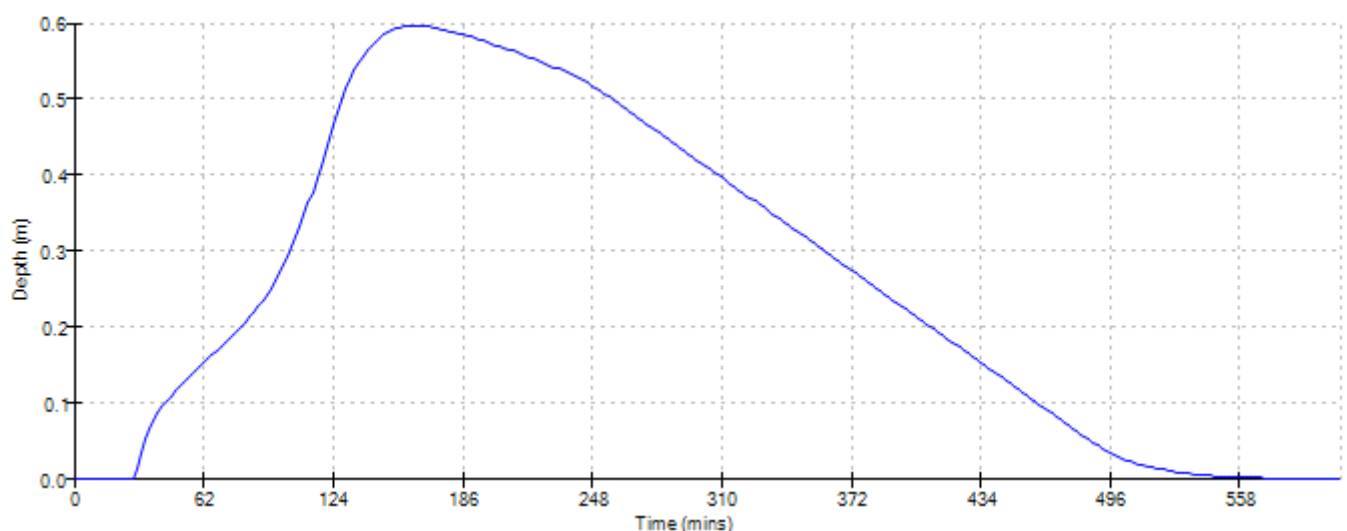
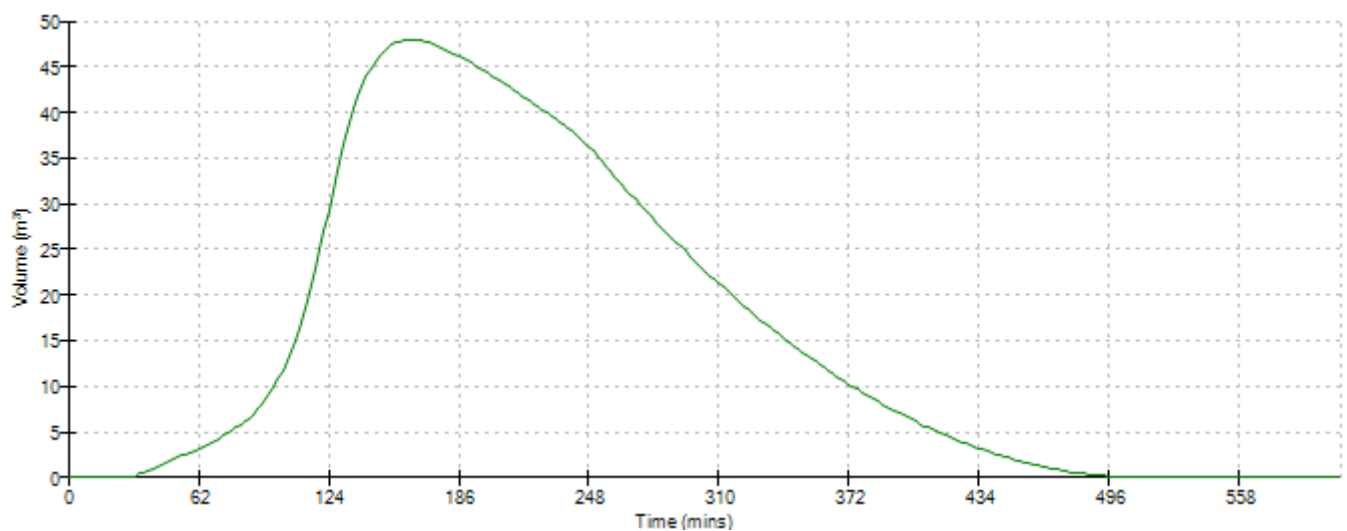
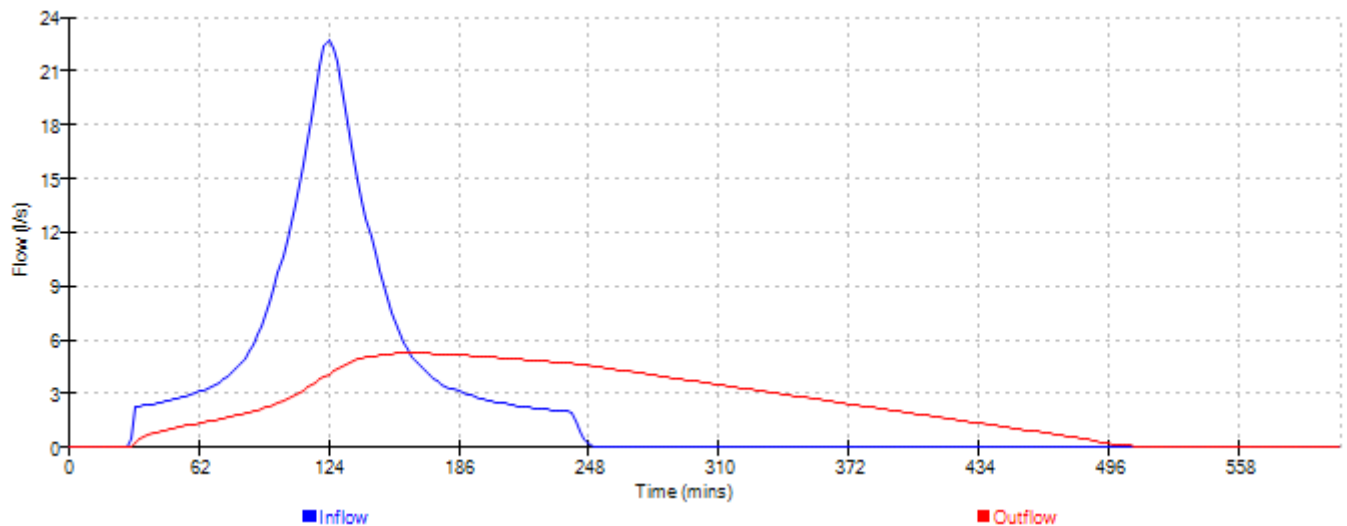


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Event: 180 min Summer

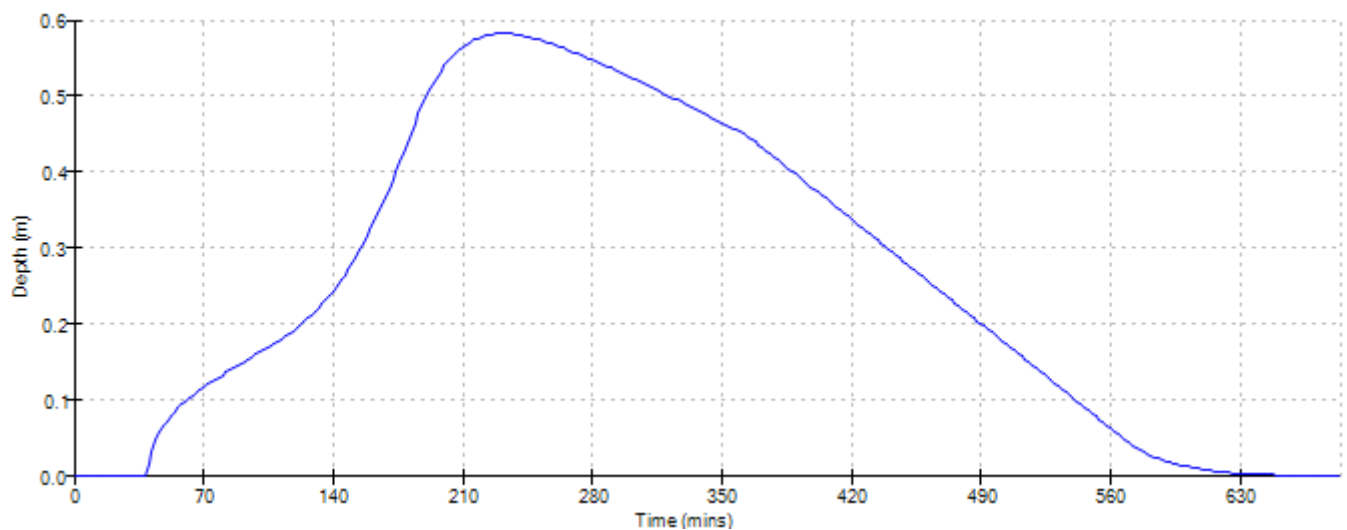
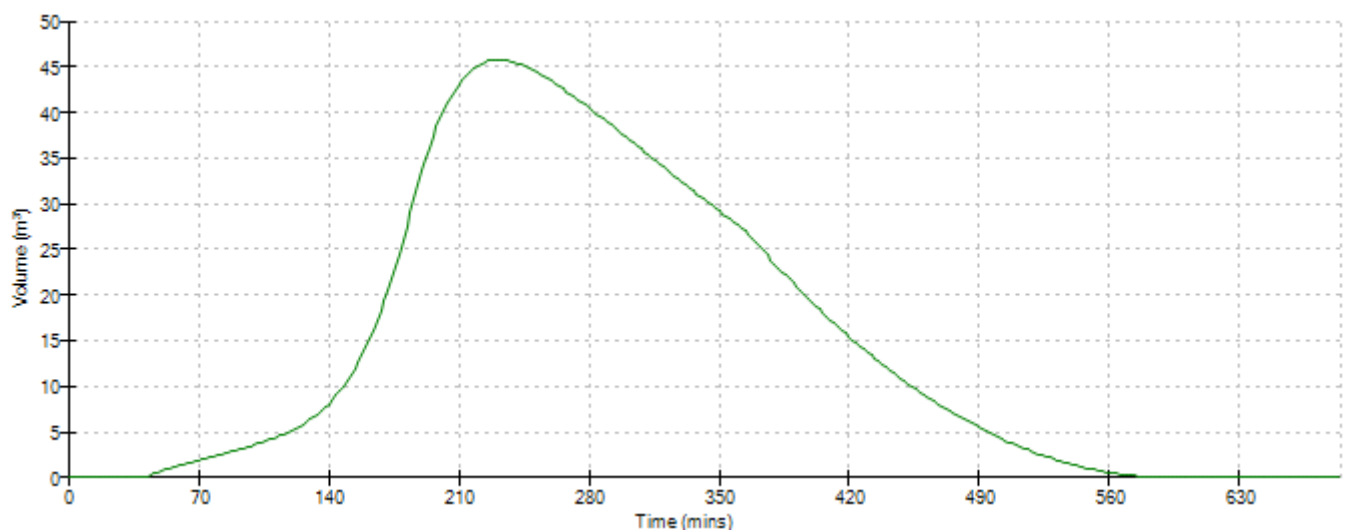
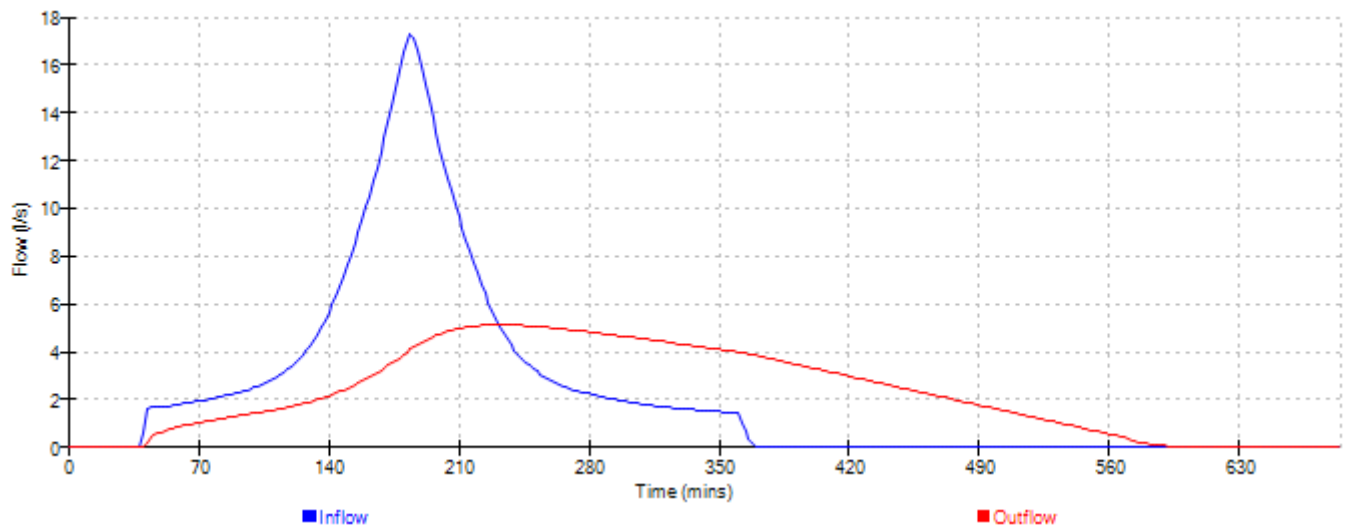


Event: 240 min Summer



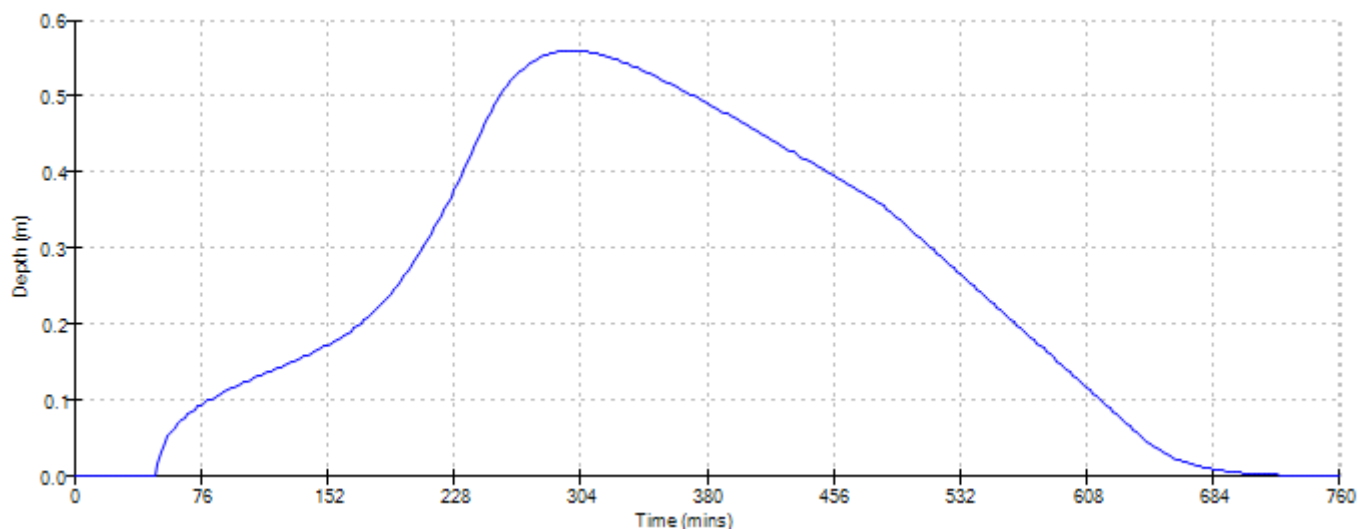
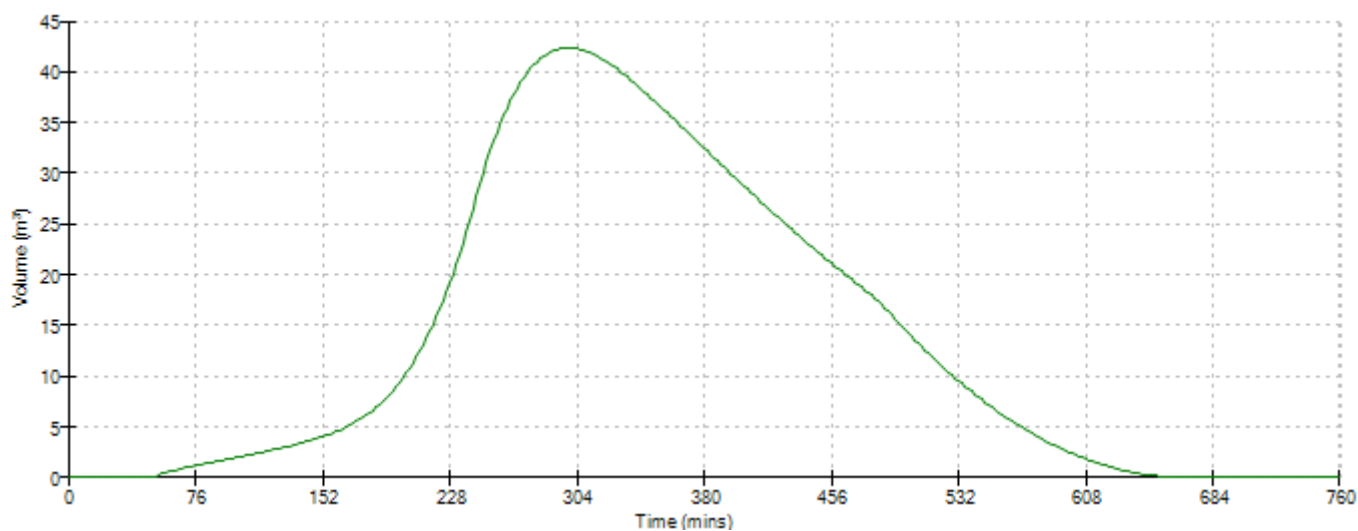
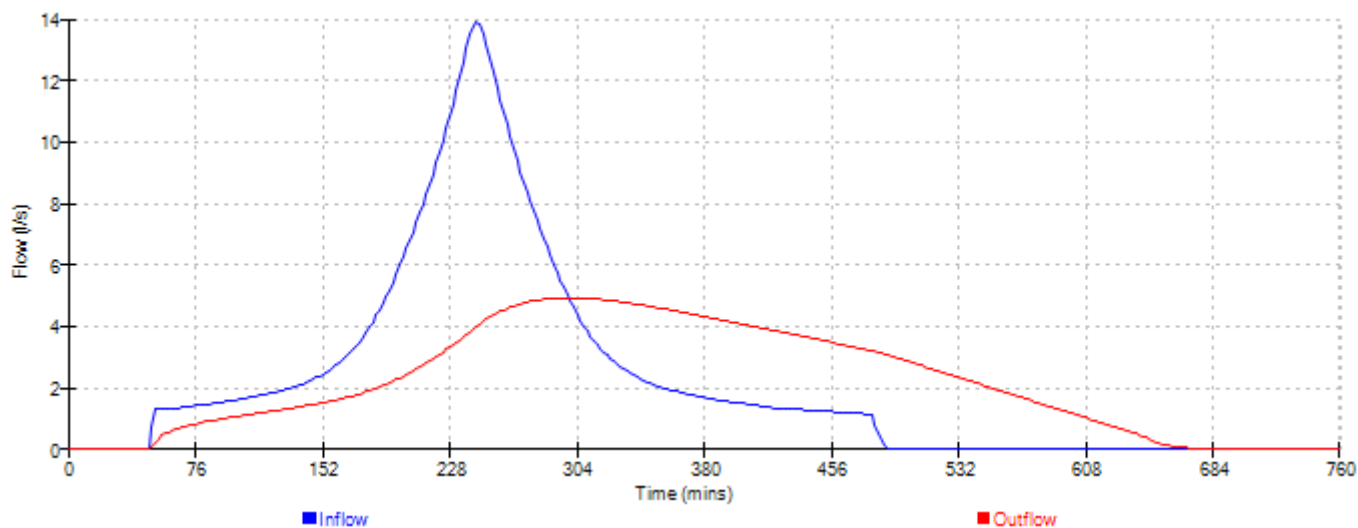
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Event: 360 min Summer

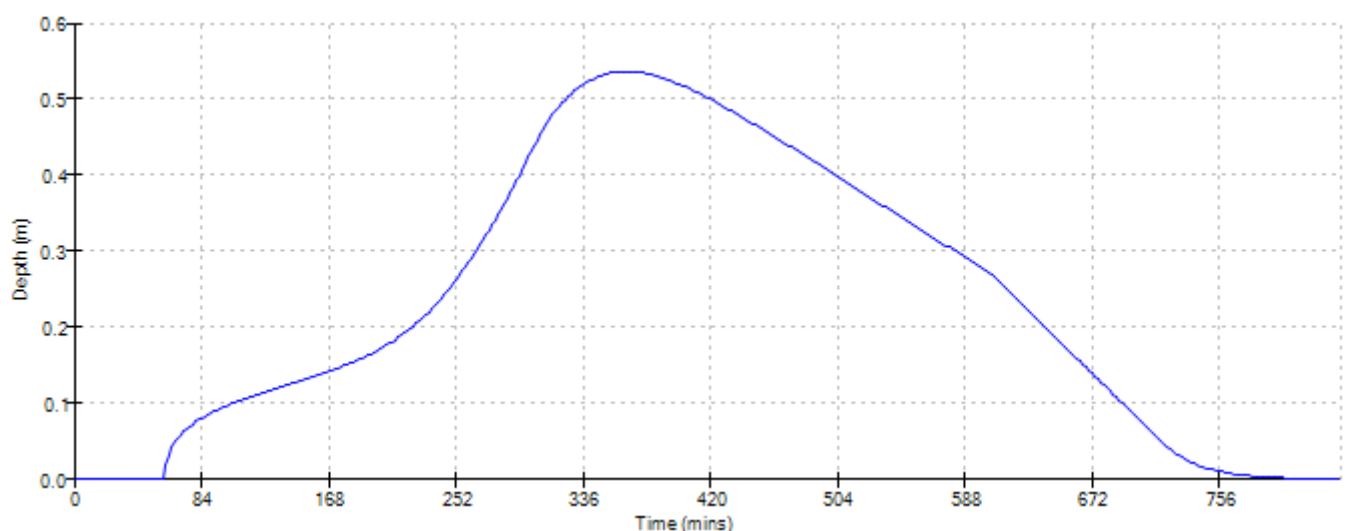
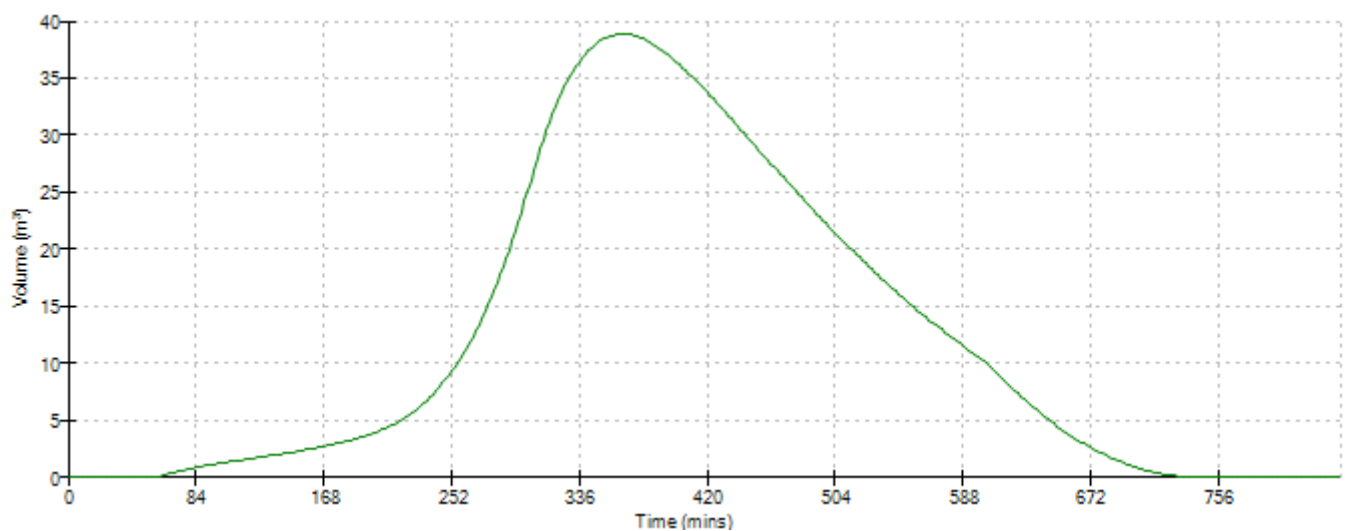
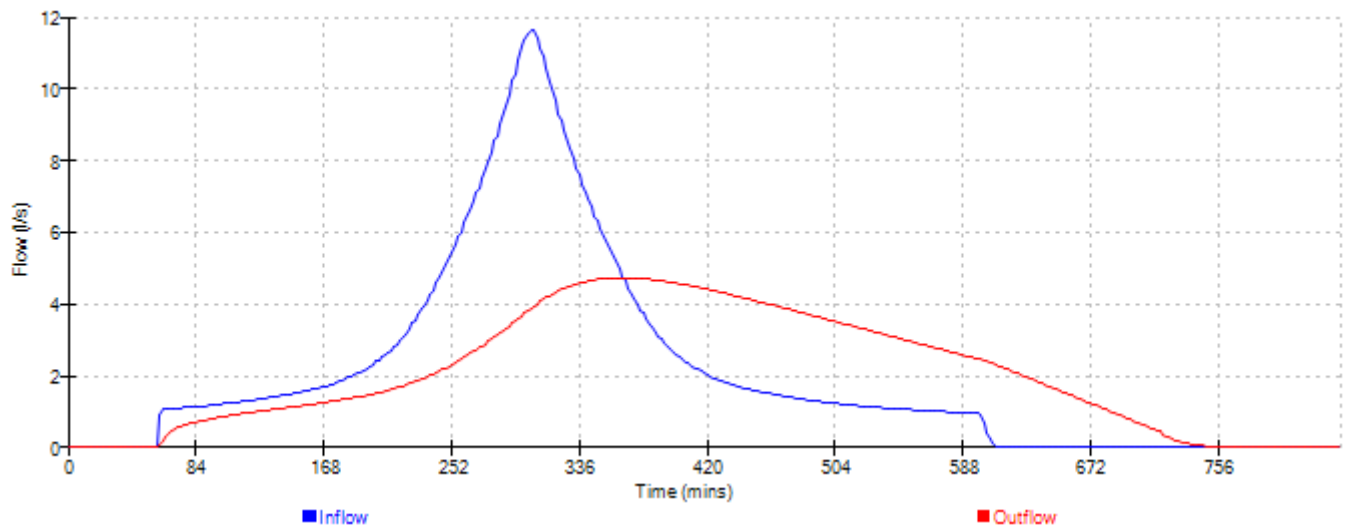


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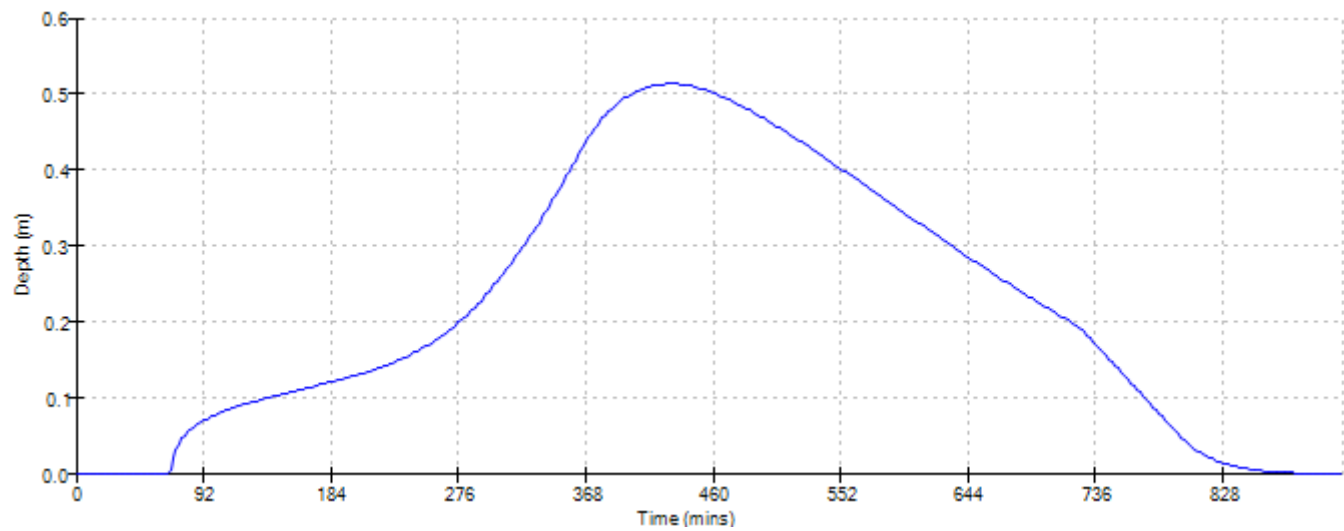
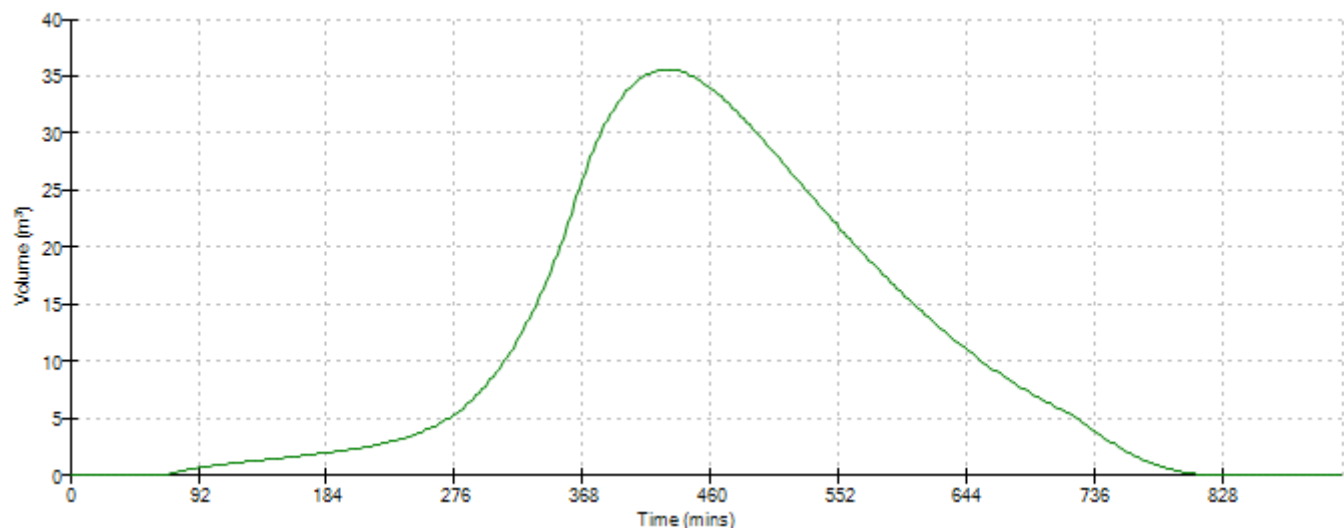
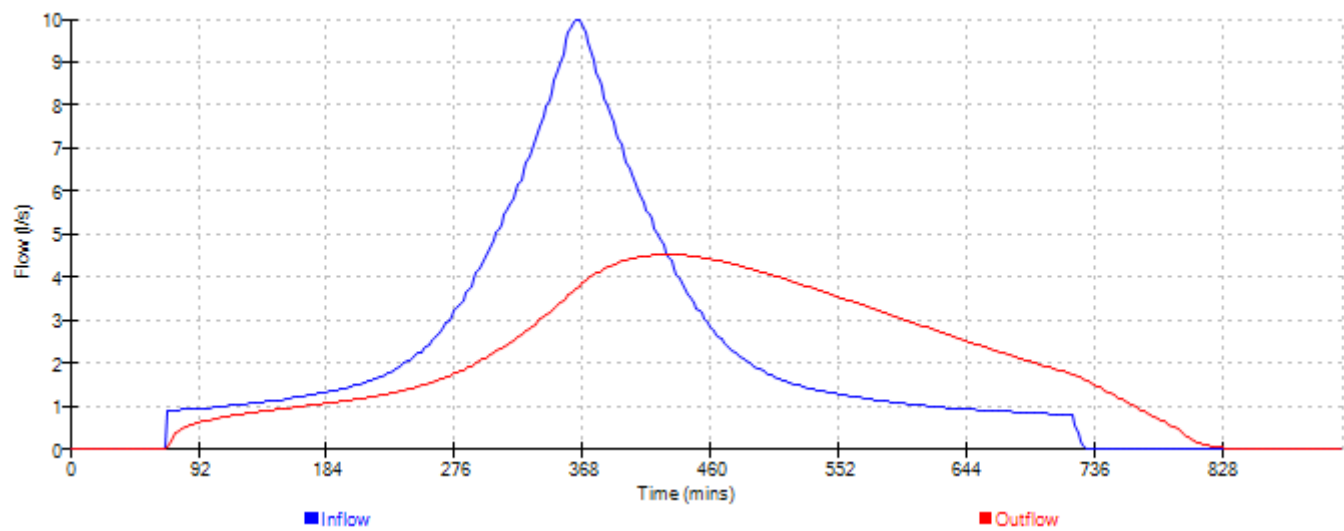
Event: 480 min Summer



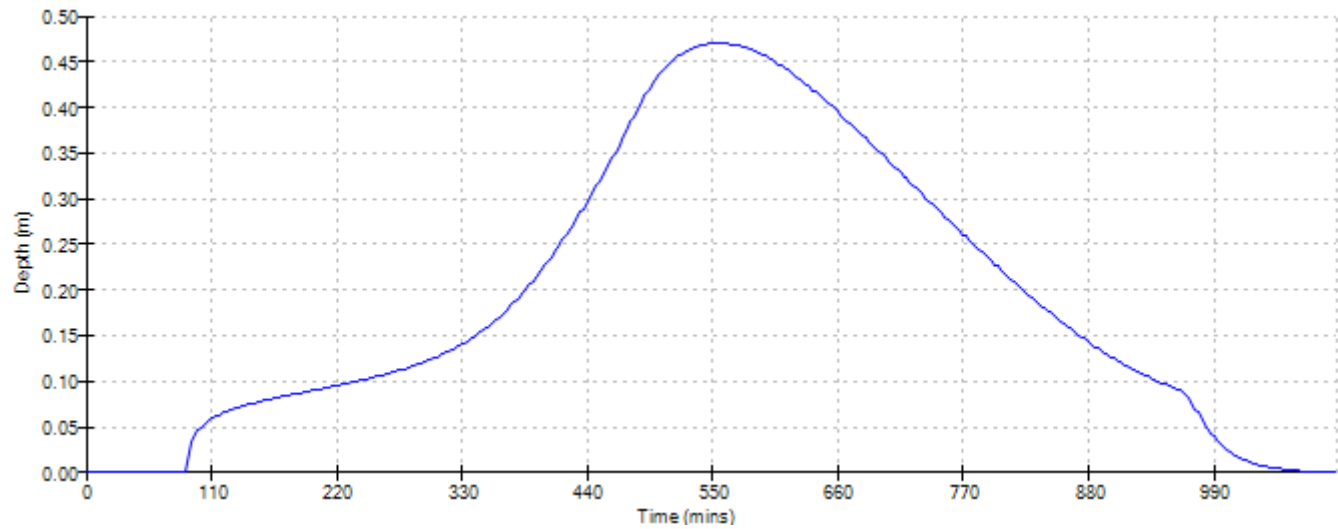
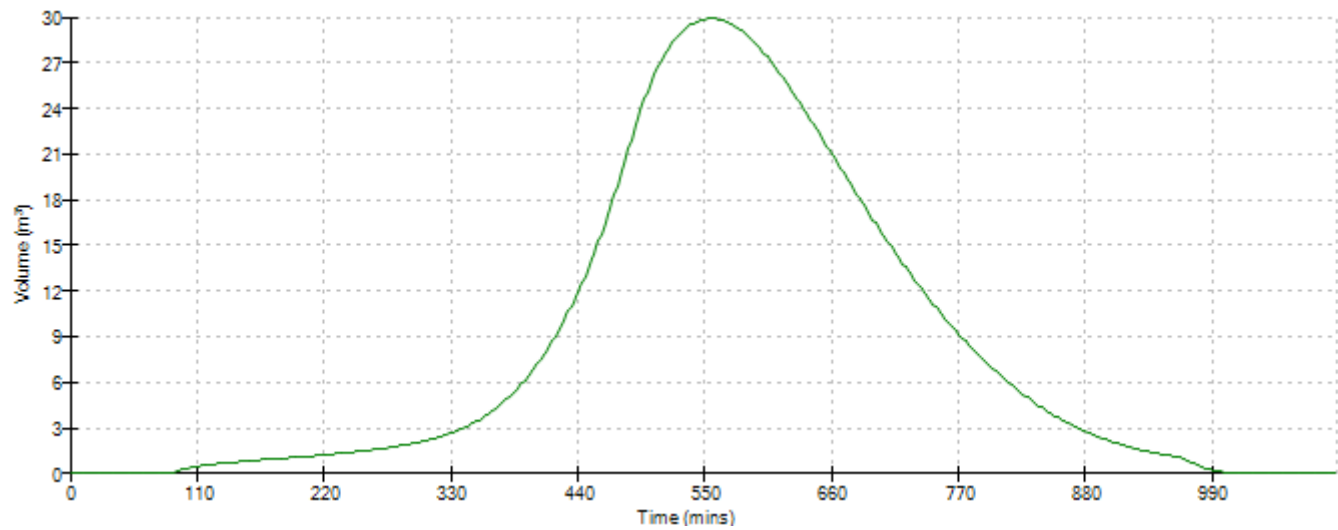
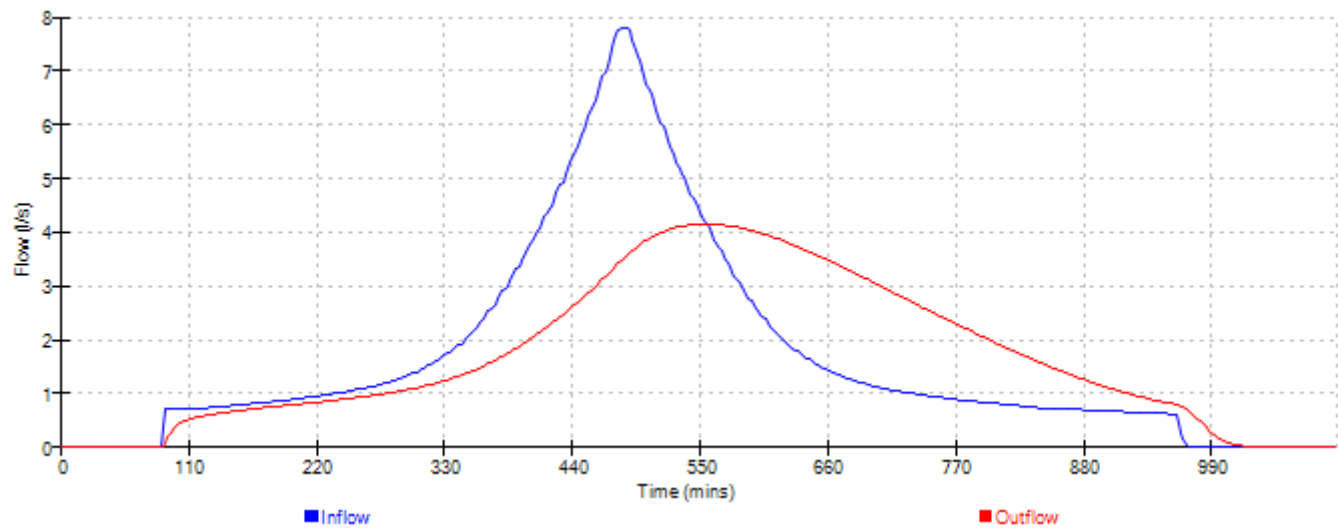
Event: 600 min Summer



Event: 720 min Summer

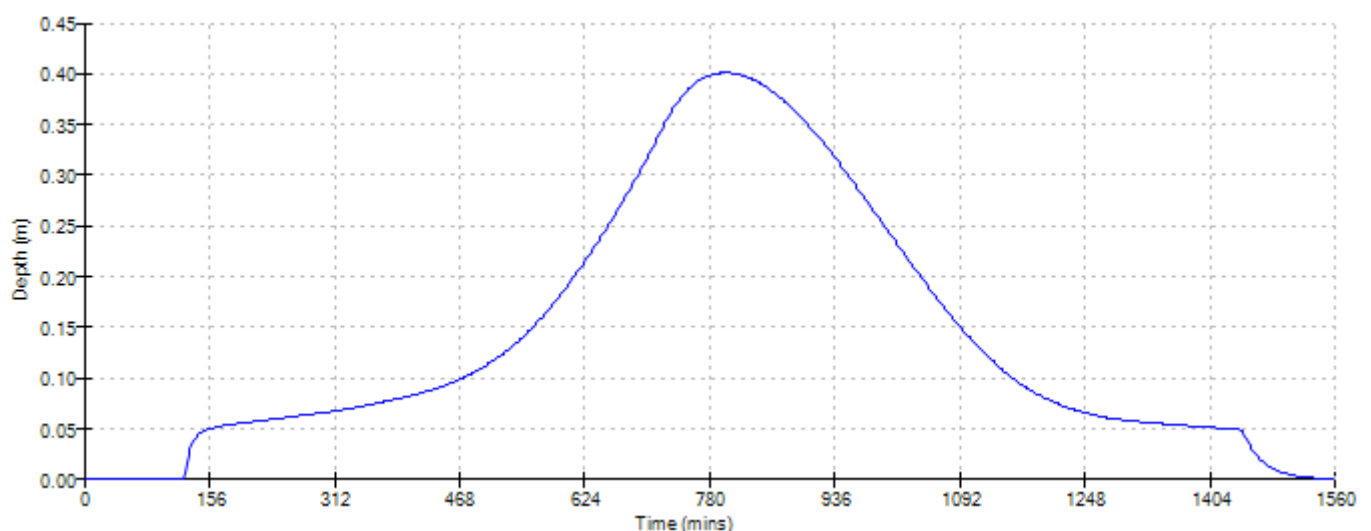
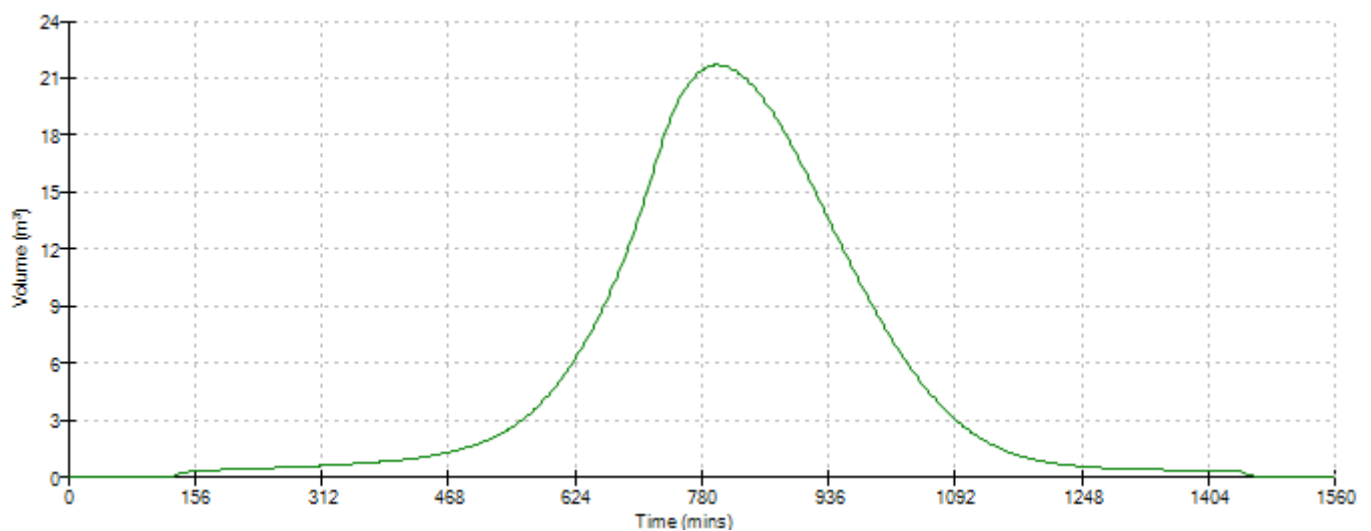
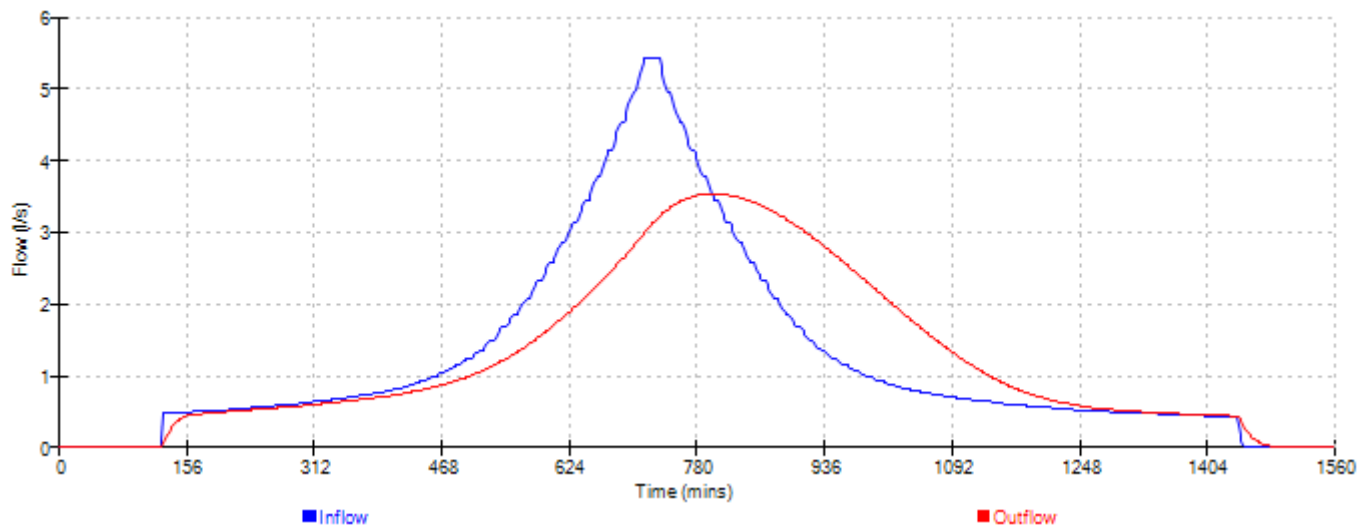


Event: 960 min Summer



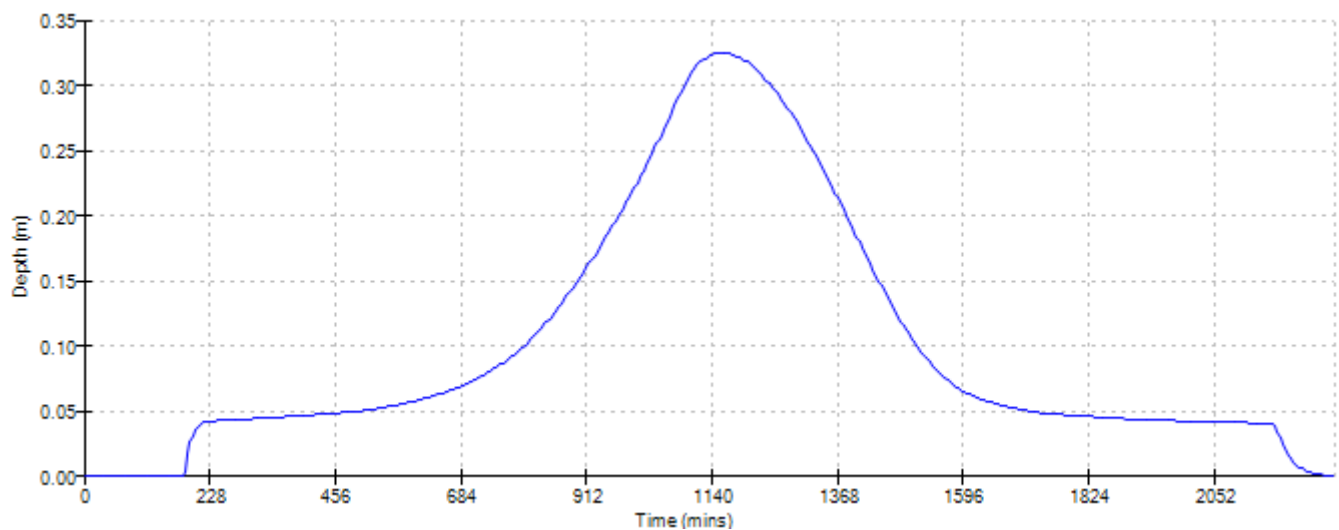
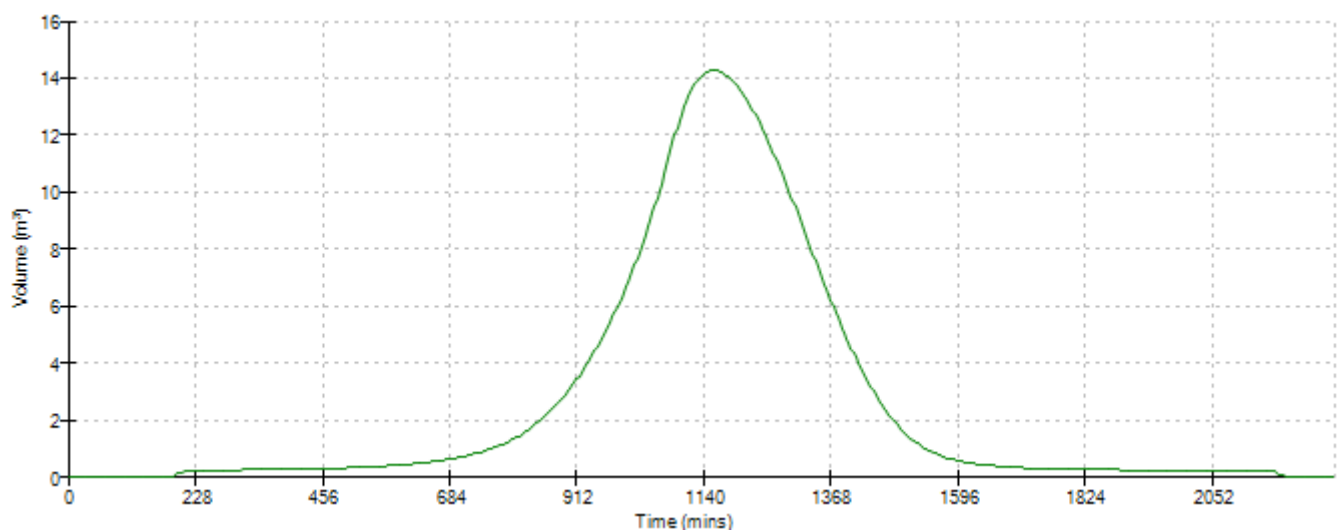
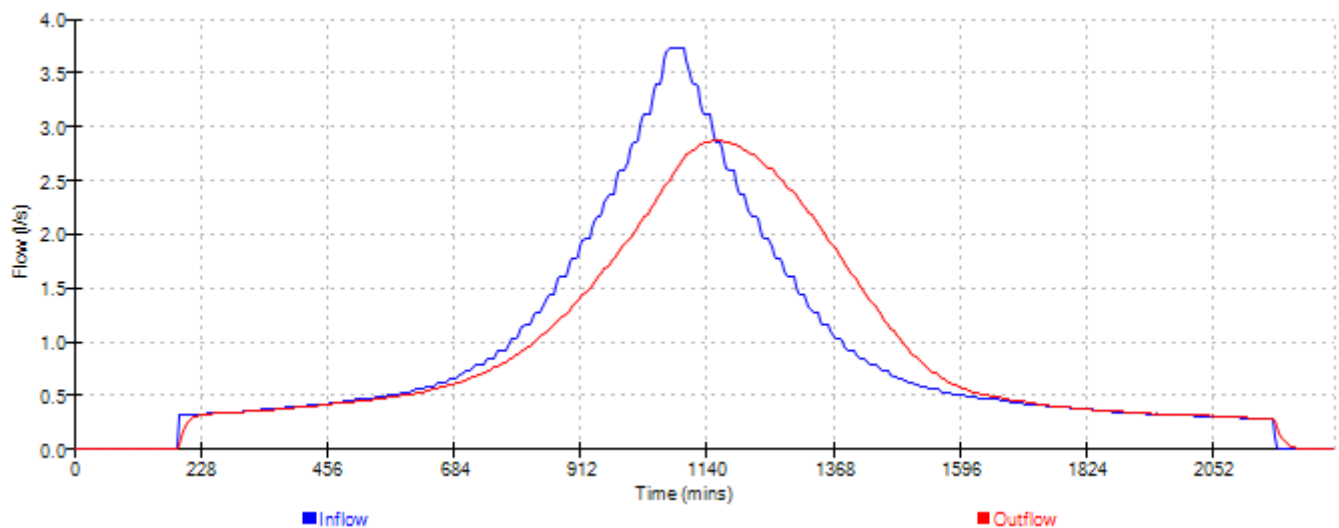
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Event: 1440 min Summer



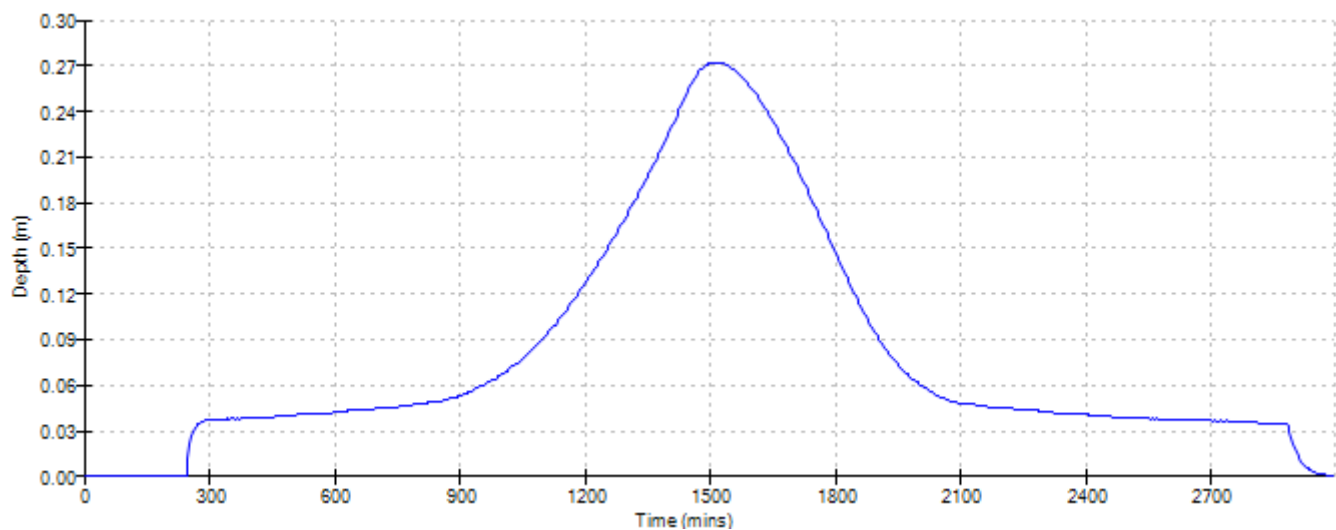
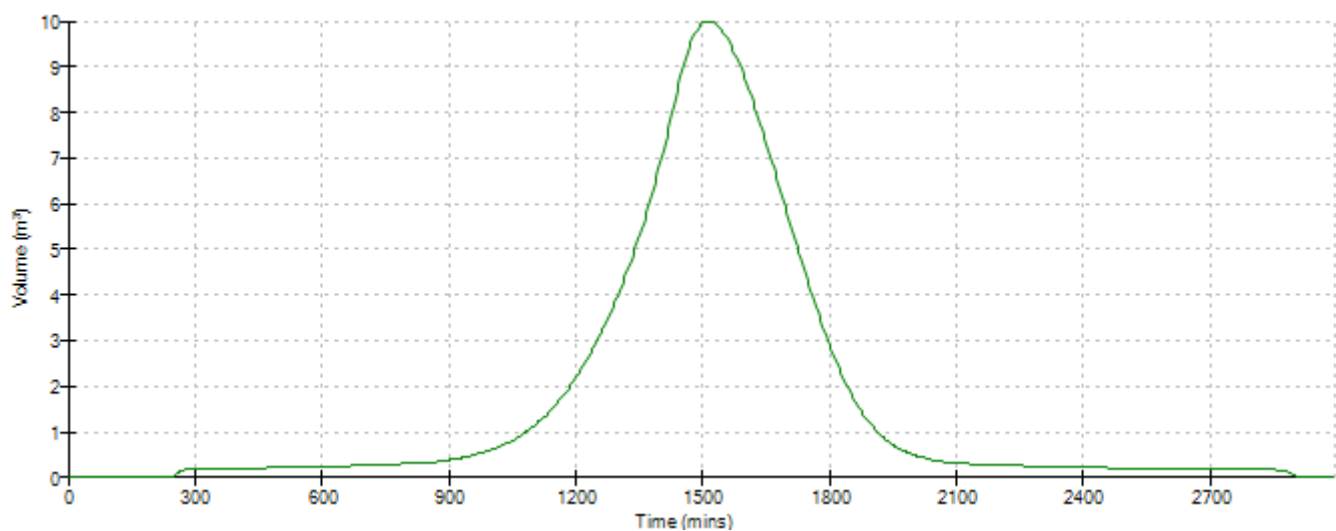
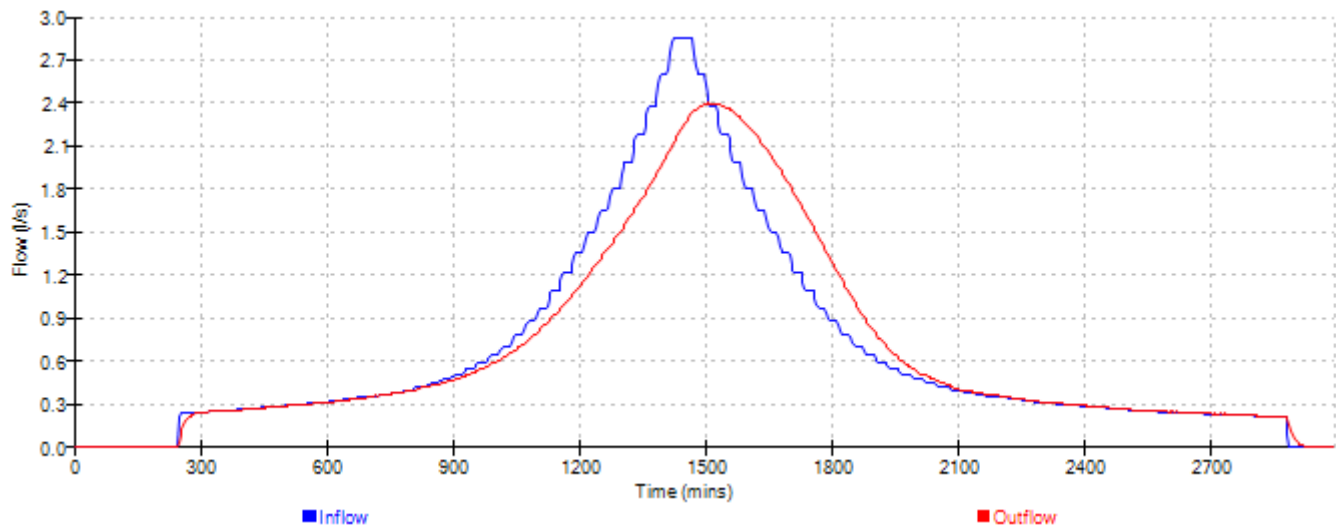
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Event: 2160 min Summer



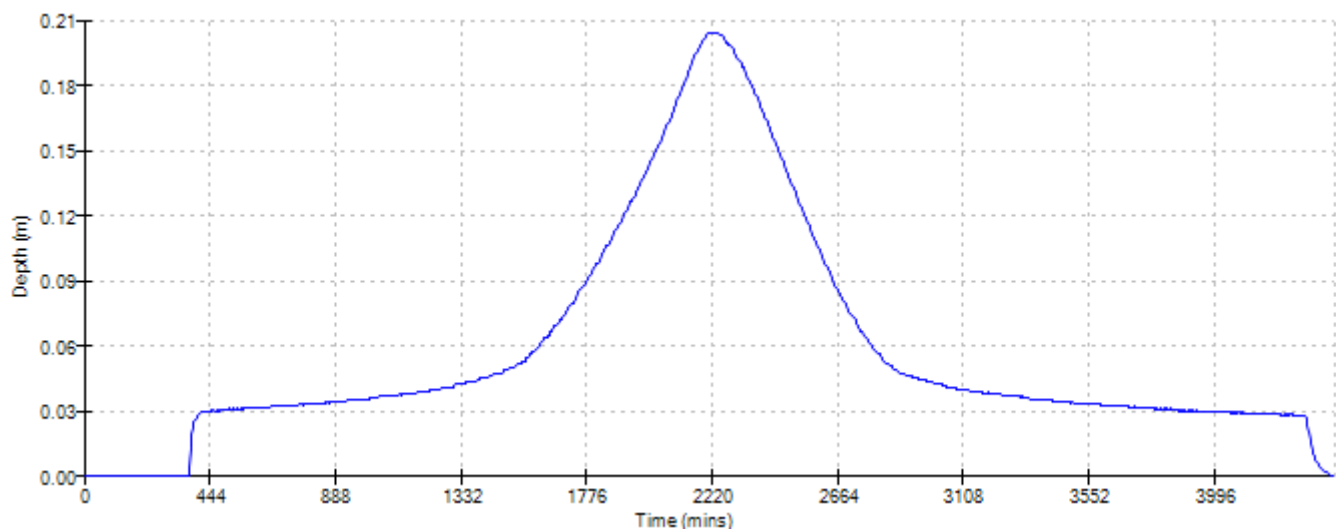
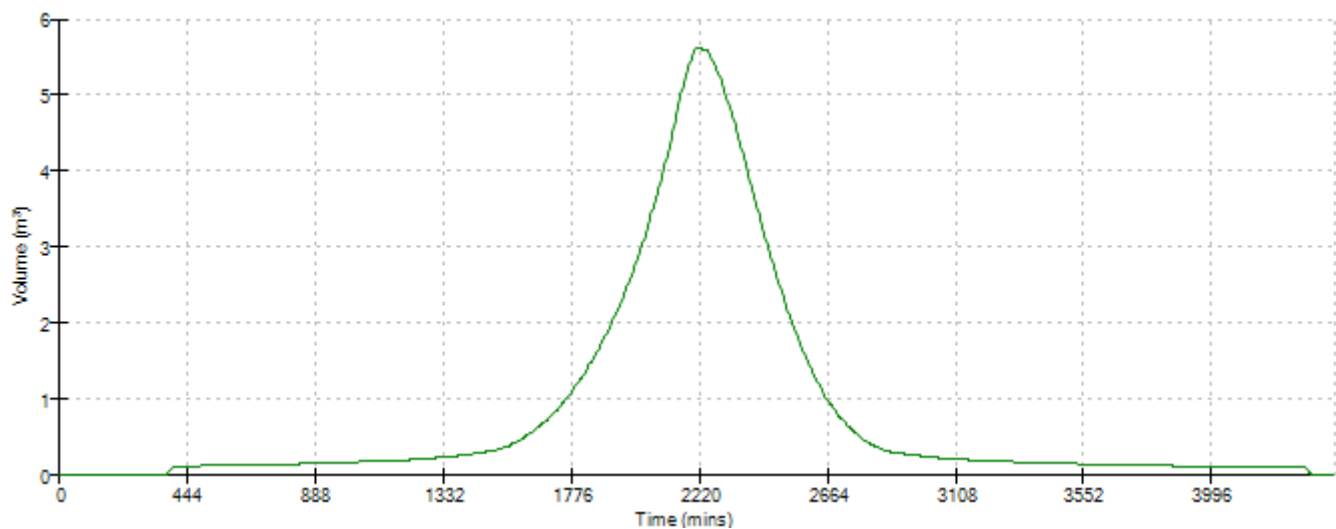
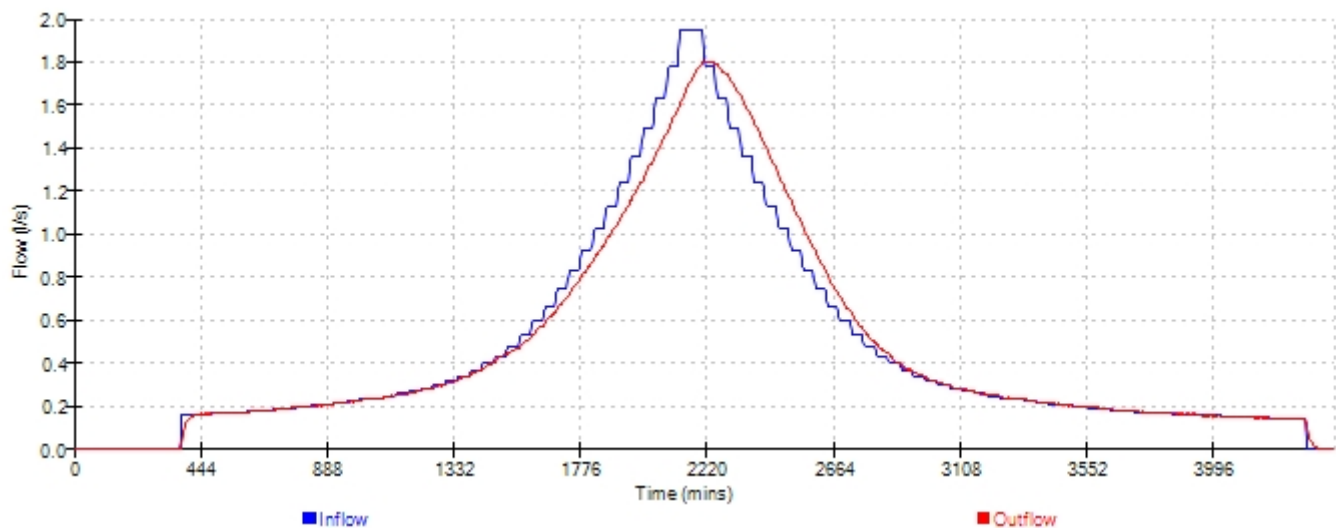
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Event: 2880 min Summer



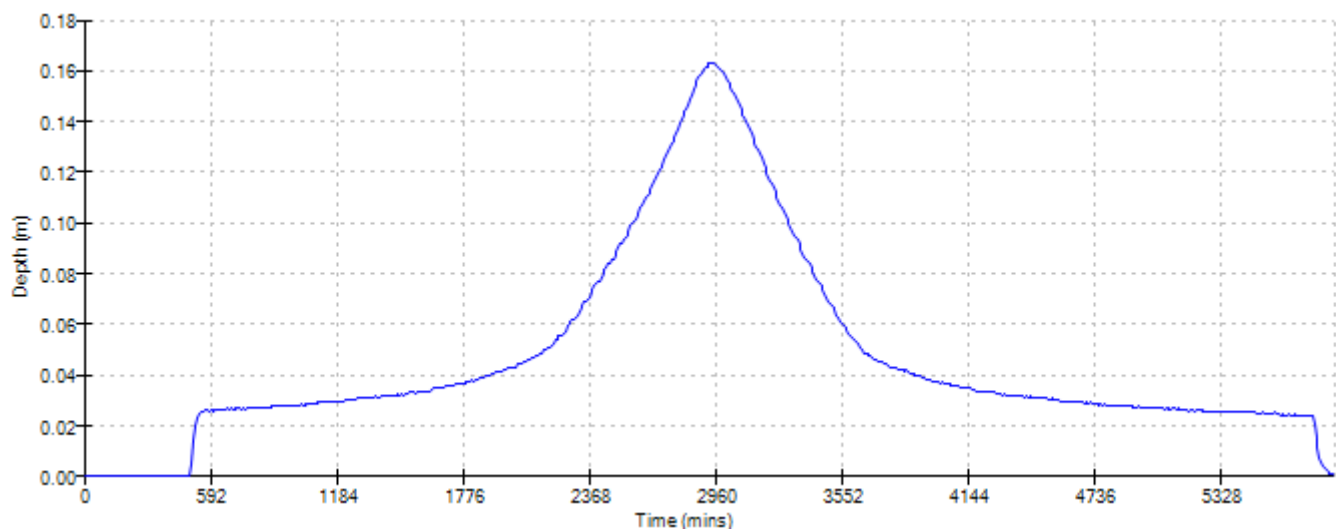
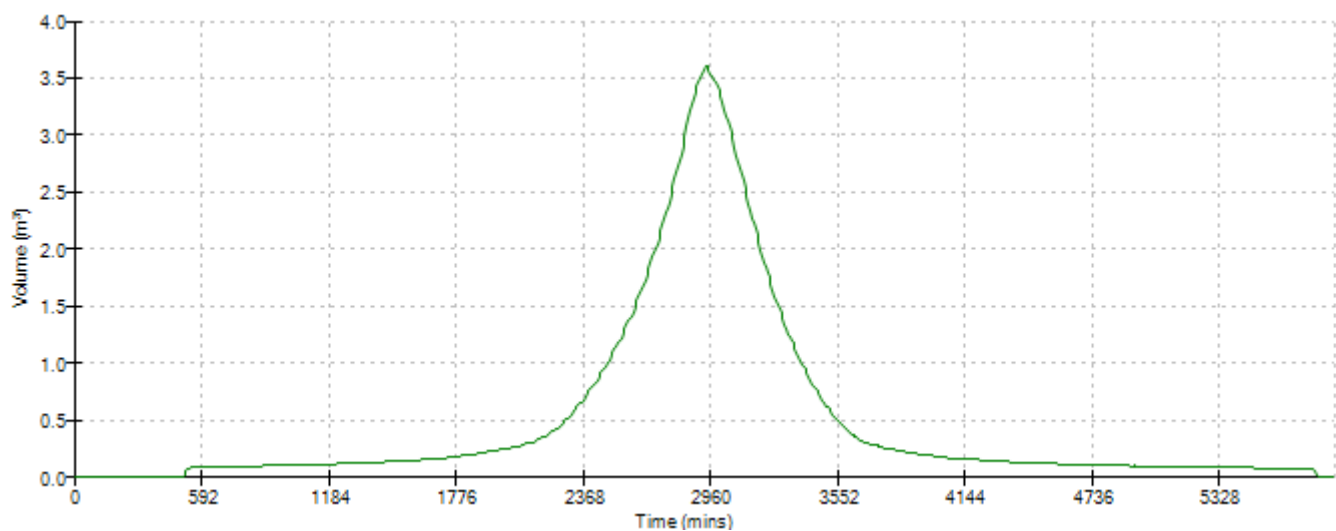
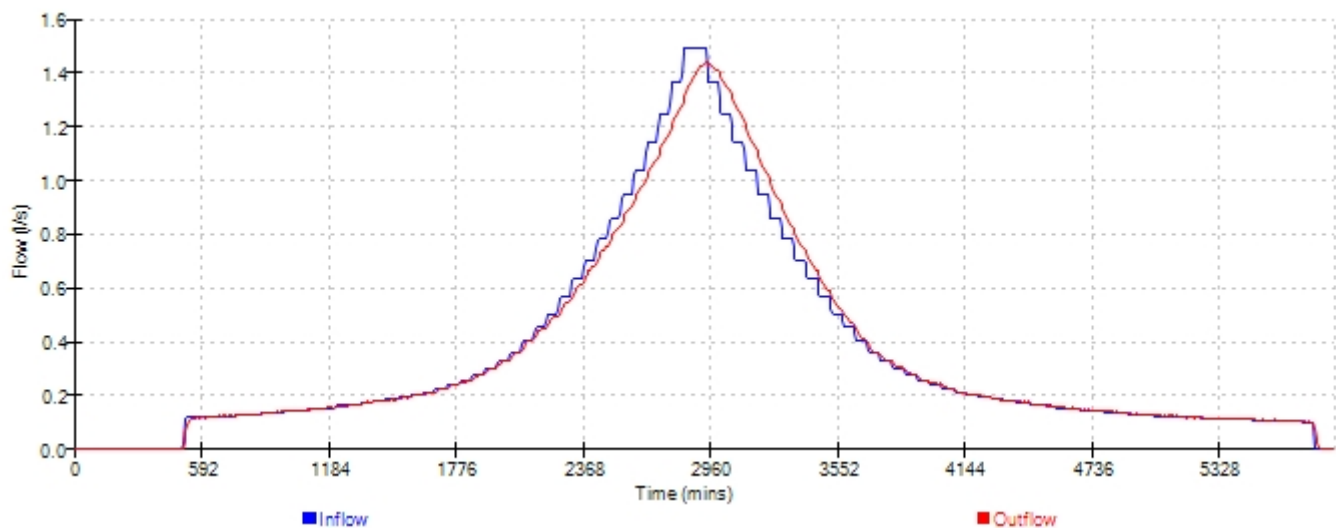
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Event: 4320 min Summer



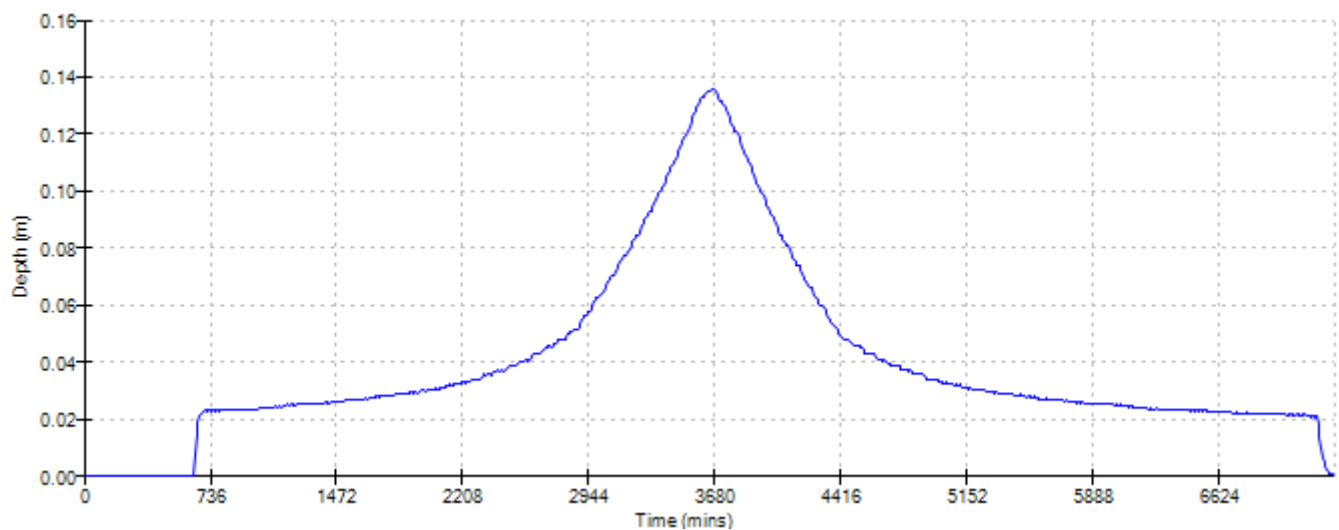
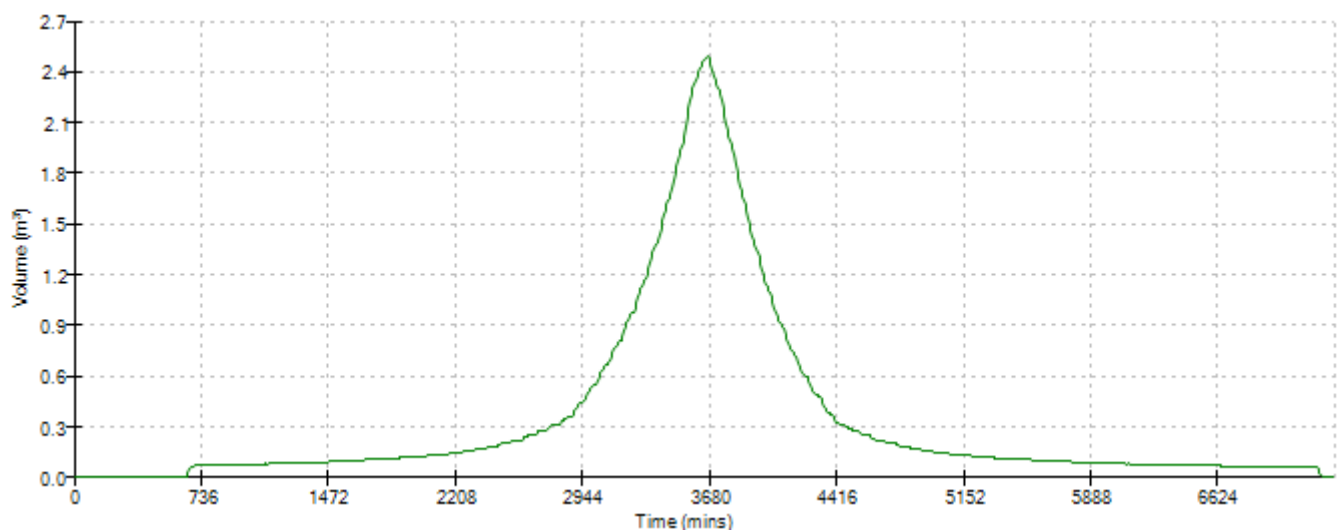
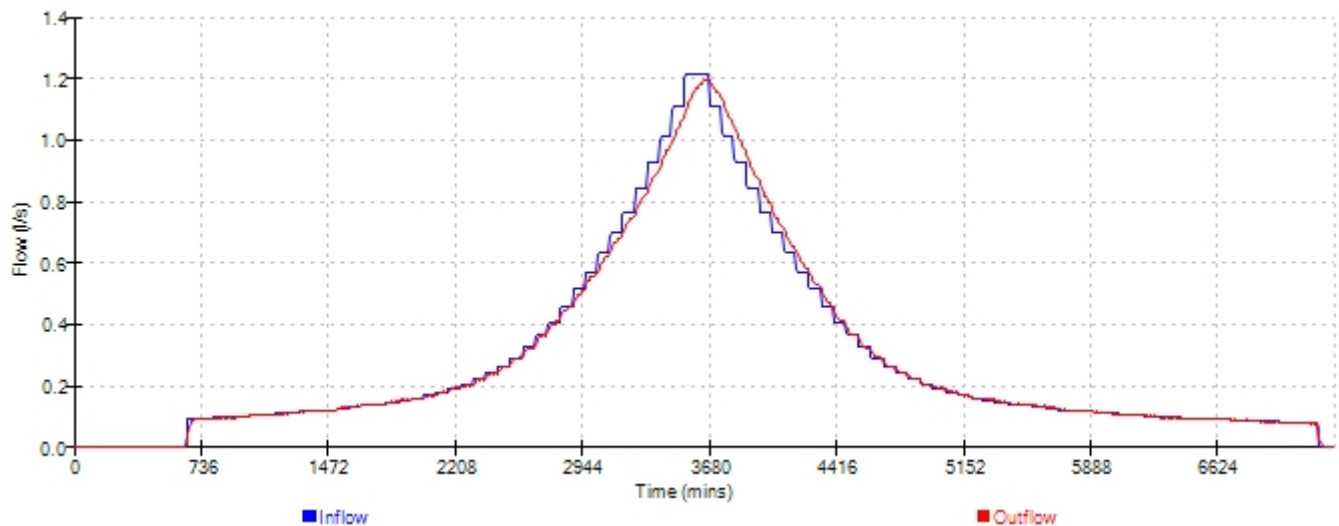
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Event: 5760 min Summer



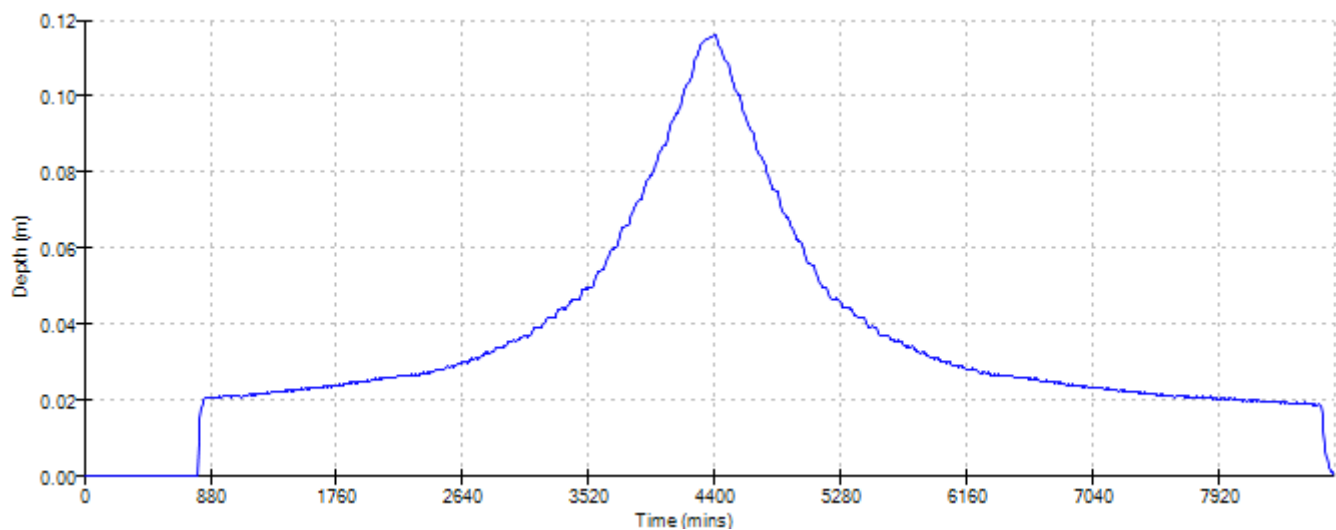
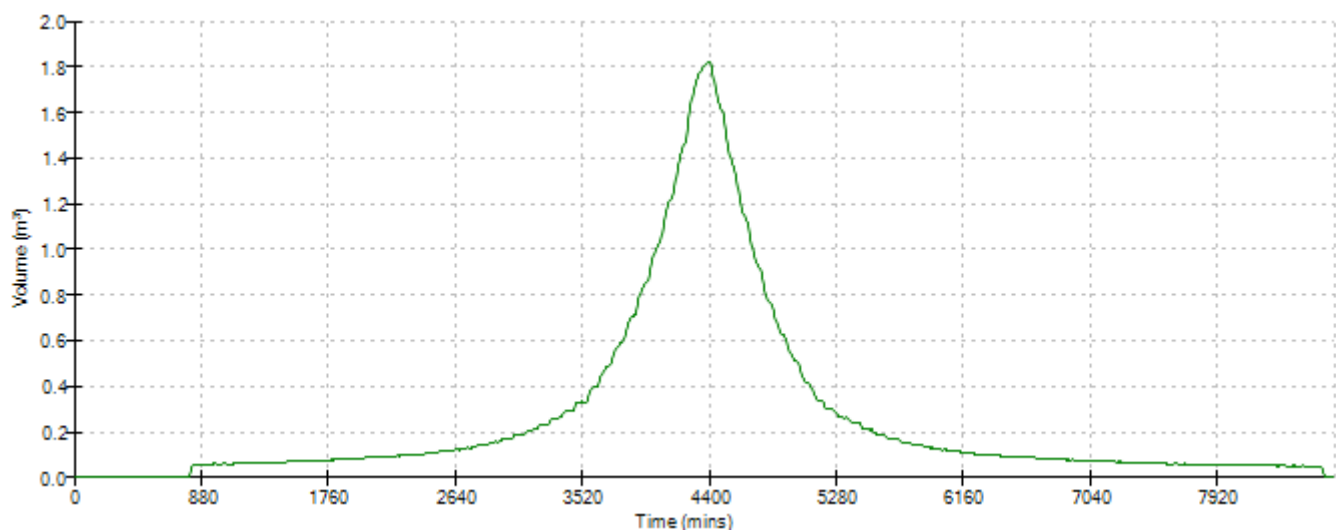
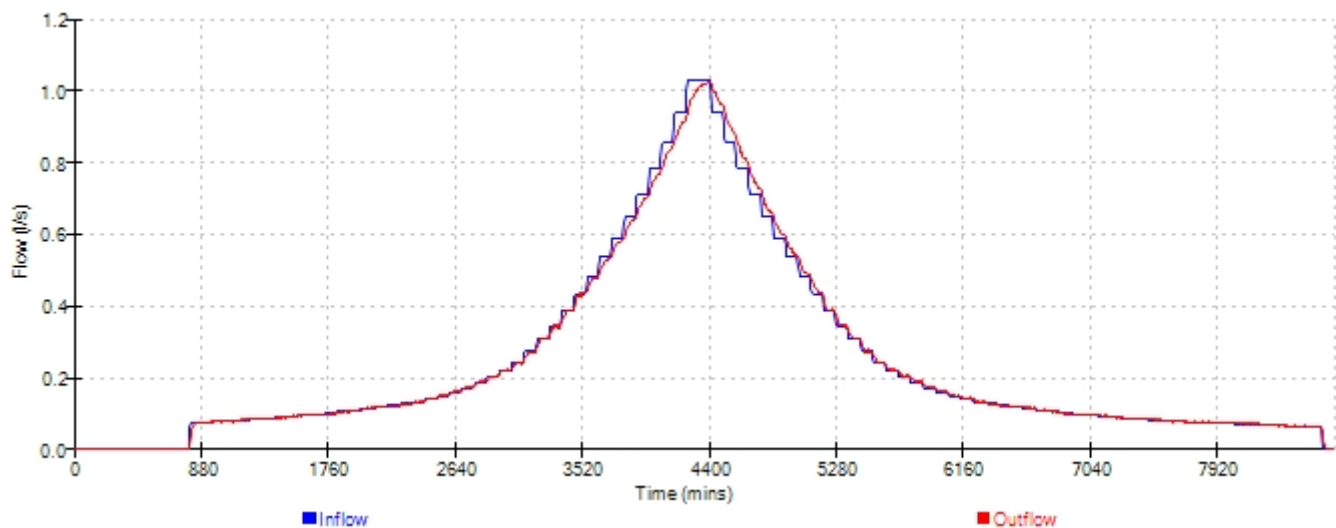
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	Highway Soakaway - 1 in 100 Year + 40% CC + FEH Data	
Date 11/05/2020	Designed by S. Griffiths	
File PERMEABLE BLOCK PAVED	Checked by S. Griffiths	
XP Solutions	Source Control 2017.1.2	

Event: 7200 min Summer

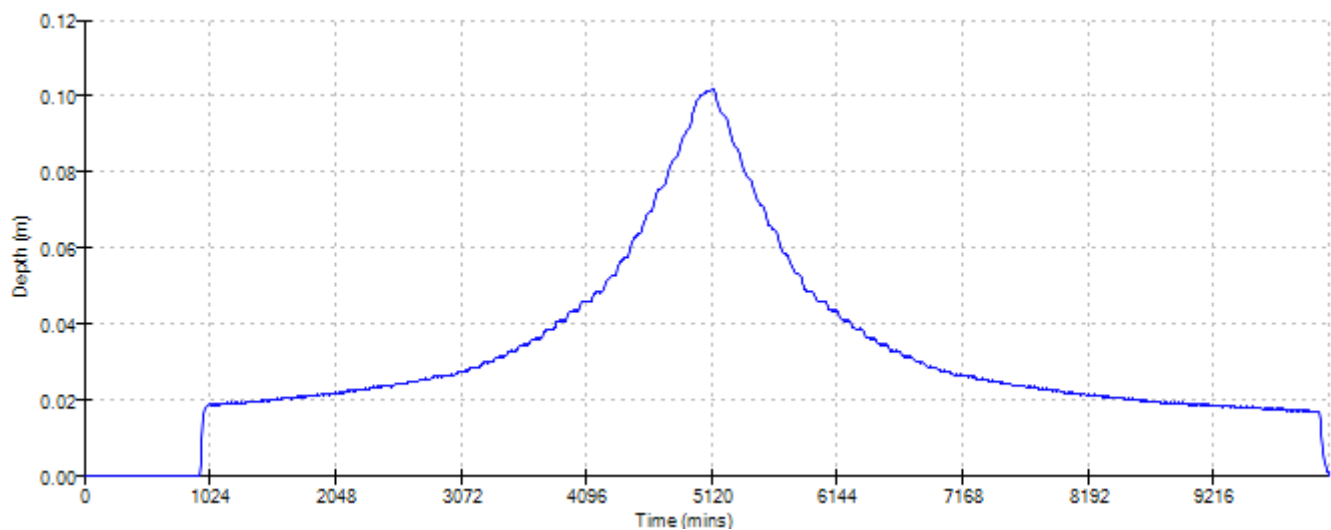
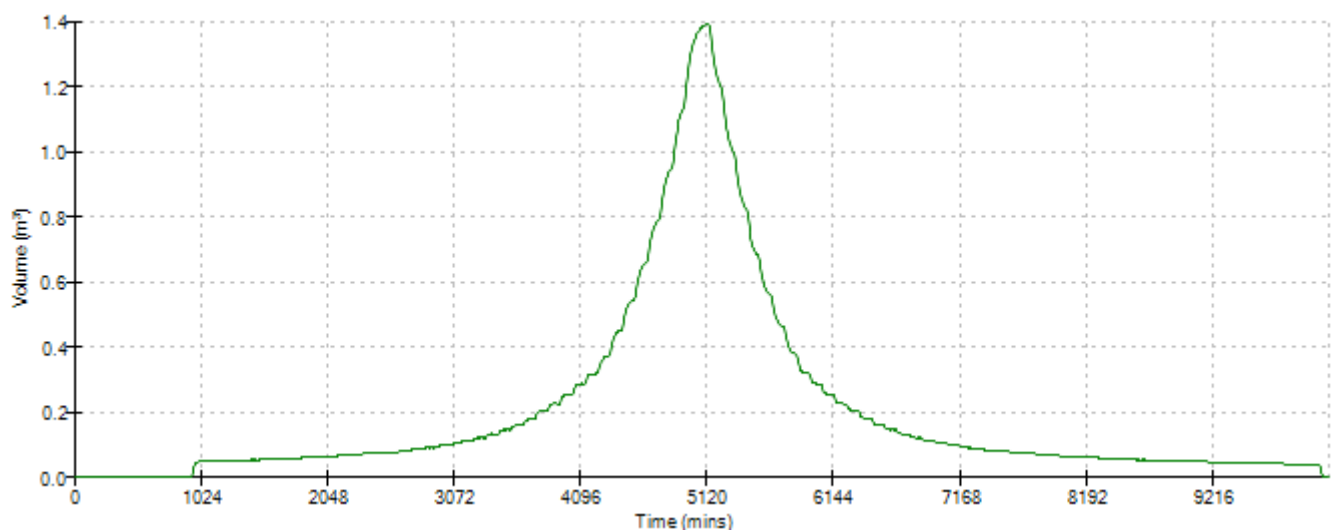
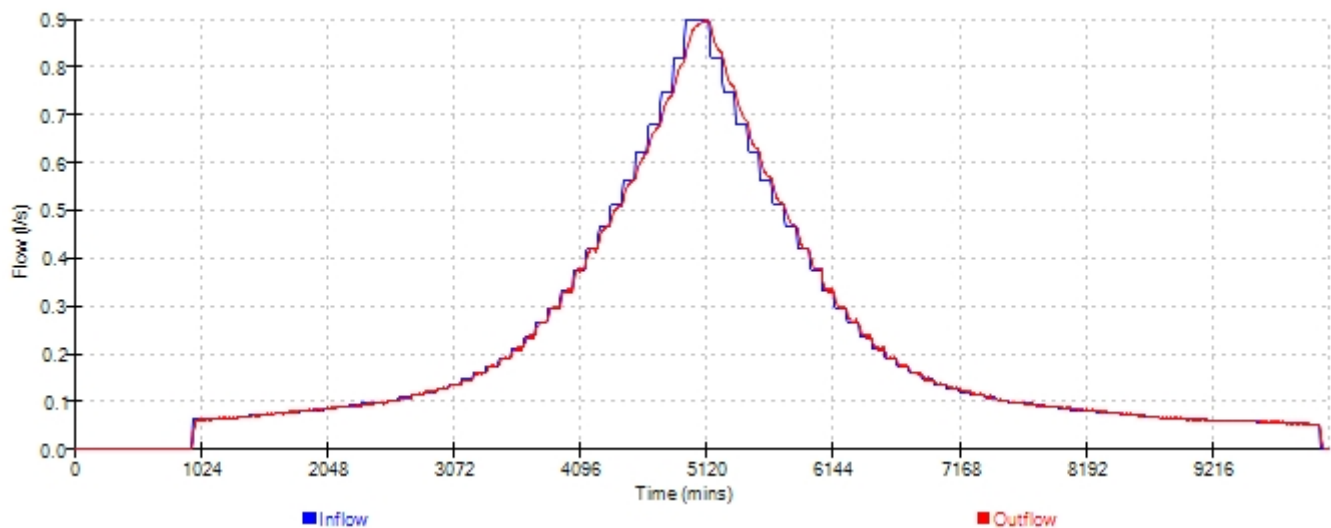


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Date 11/05/2020	Designed by S. Griffiths	
File PERMEABLE BLOCK PAVED	Checked by S. Griffiths	
XP Solutions	Source Control 2017.1.2	

Event: 8640 min Summer

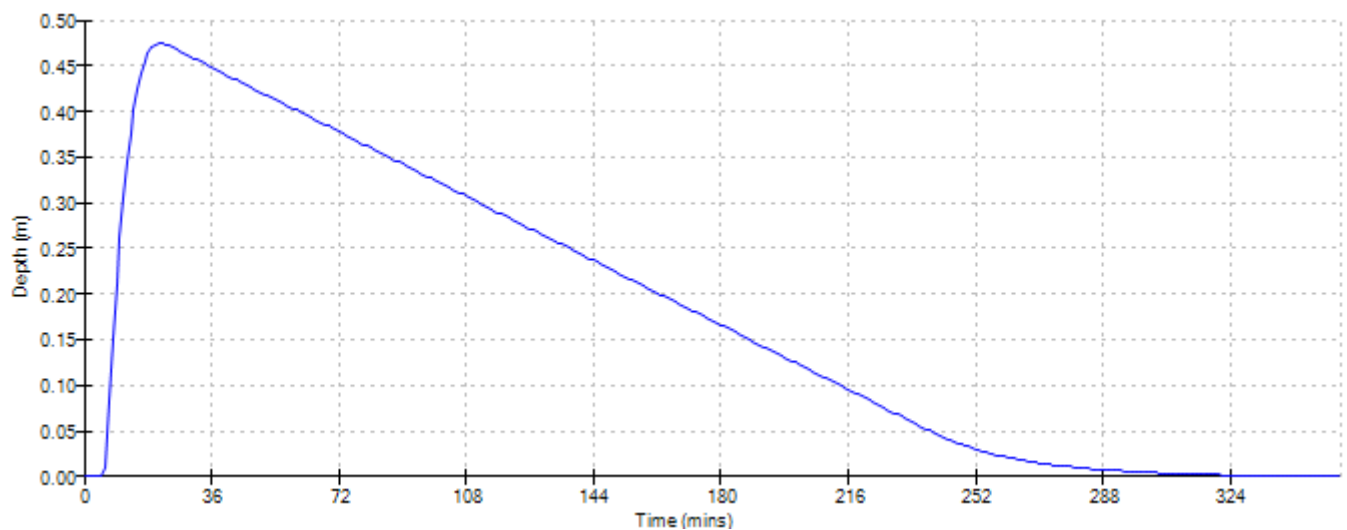
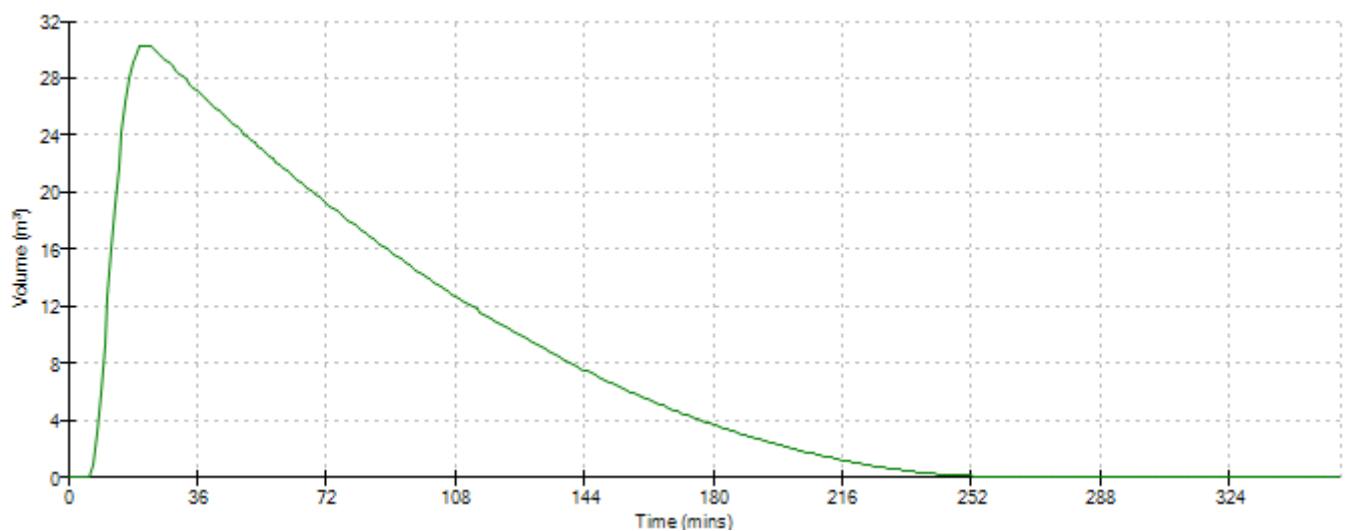
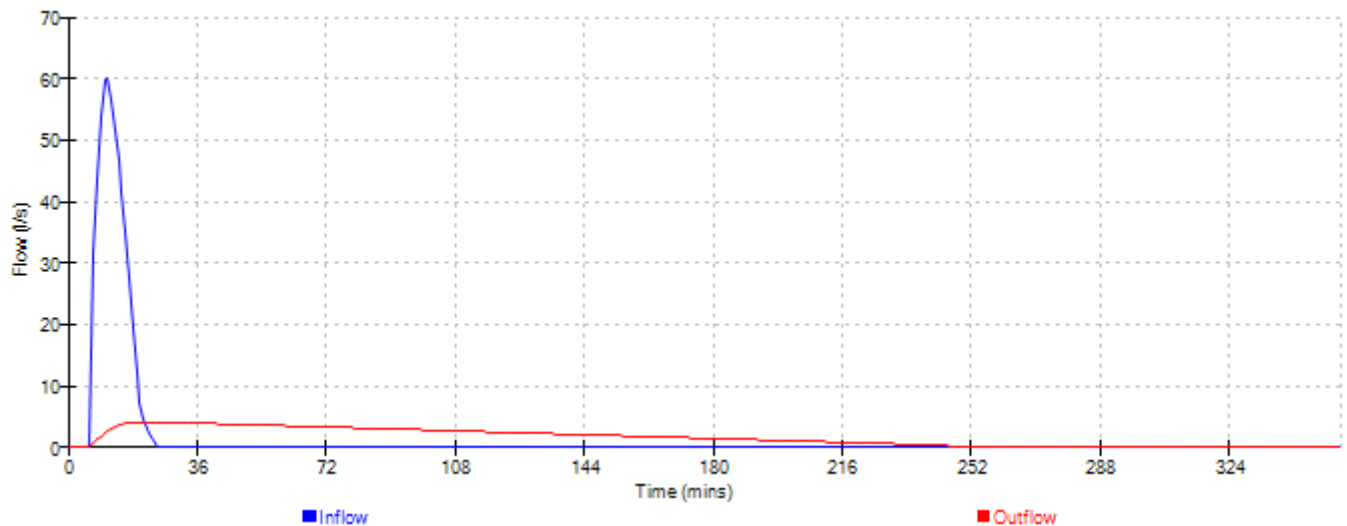


Event: 10080 min Summer

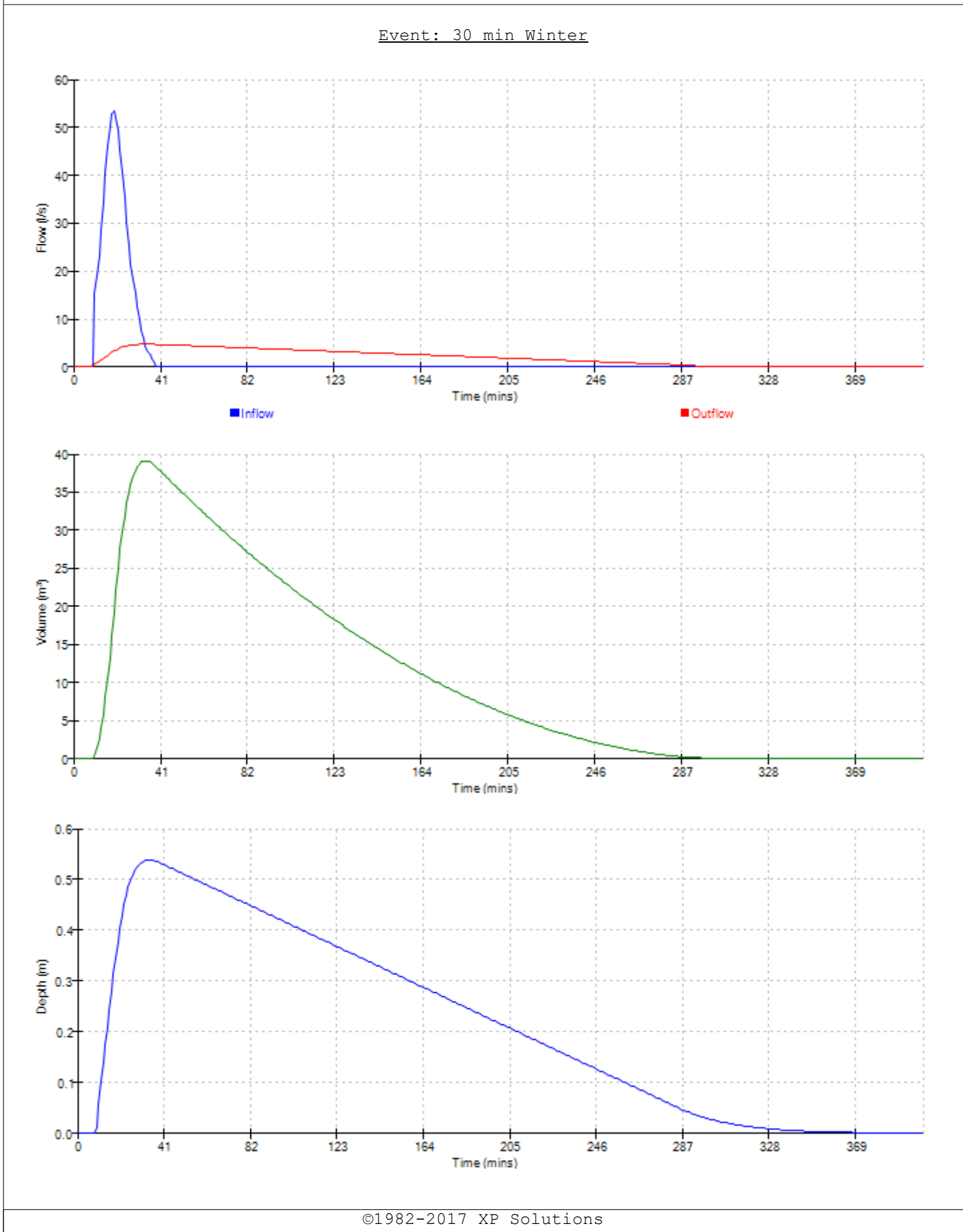


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File PERMEABLE BLOCK PAVED	Checked by S. Griffiths	
XP Solutions	Source Control 2017.1.2	

Event: 15 min Winter

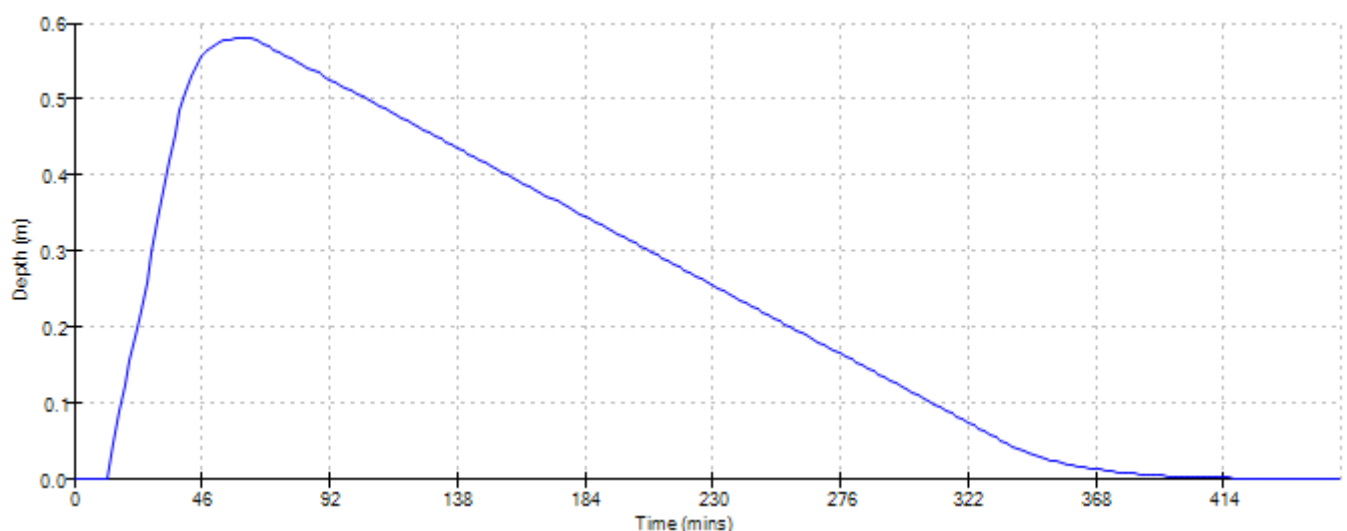
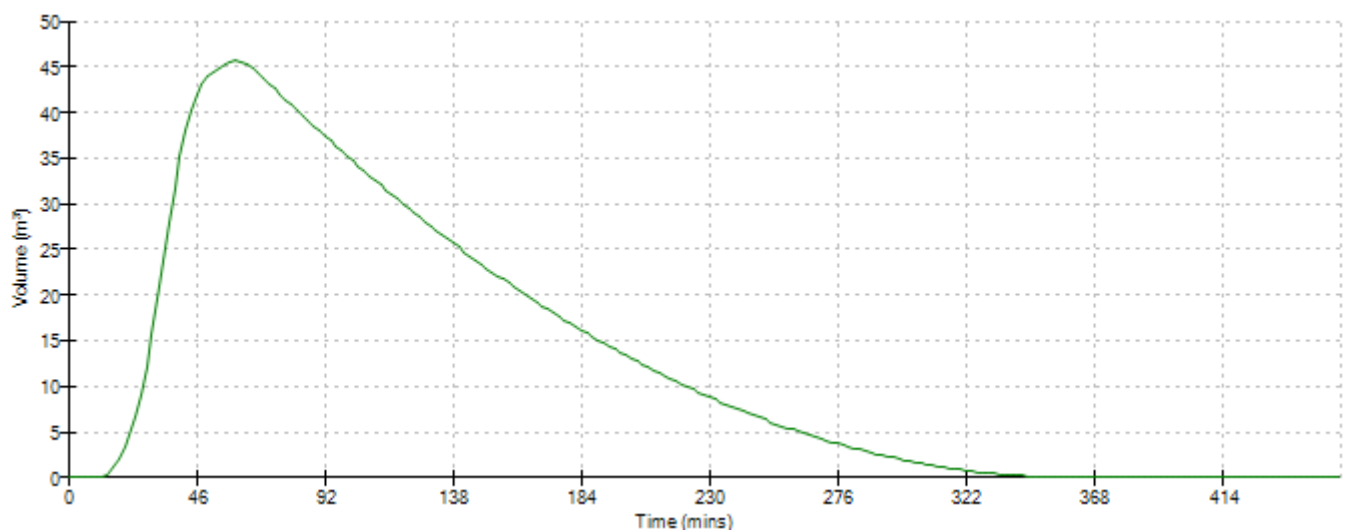
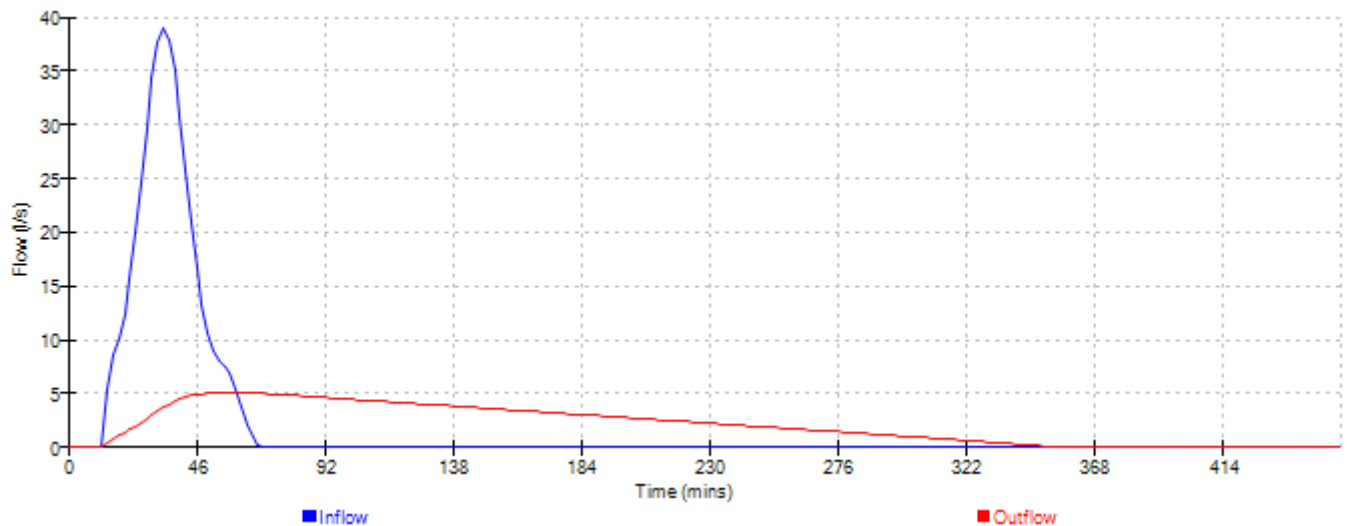


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File PERMEABLE BLOCK PAVED	Checked by S. Griffiths	
XP Solutions	Source Control 2017.1.2	



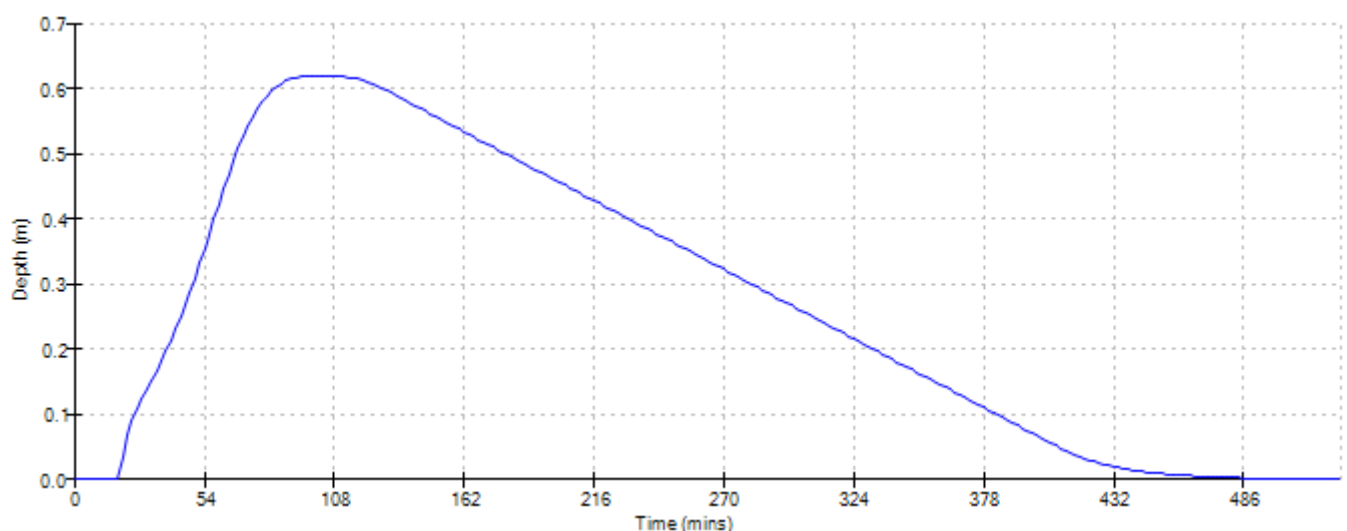
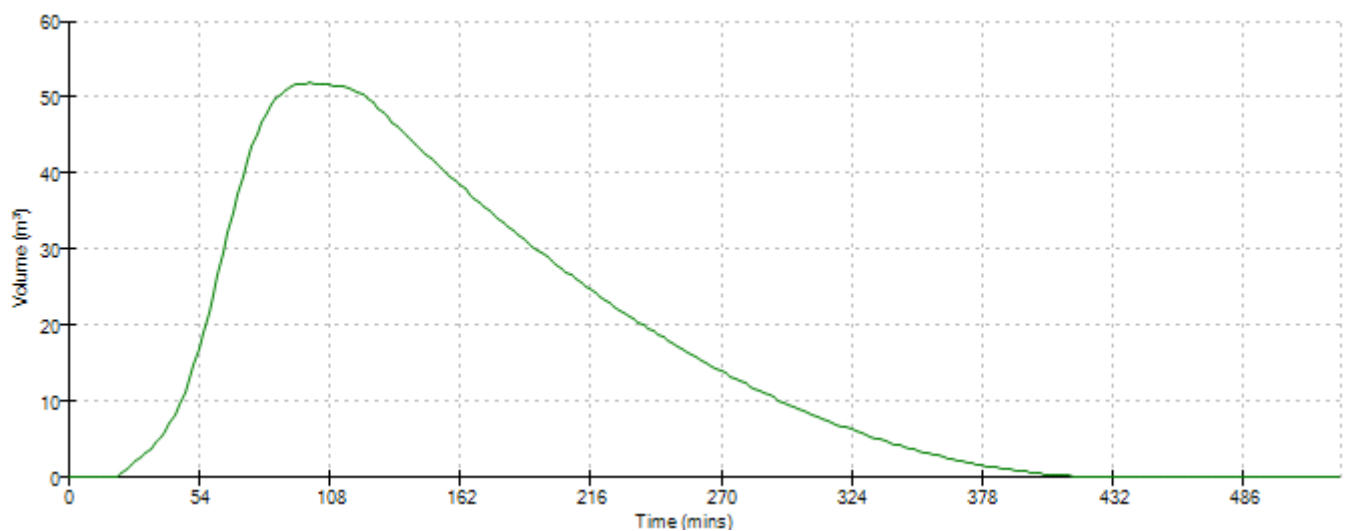
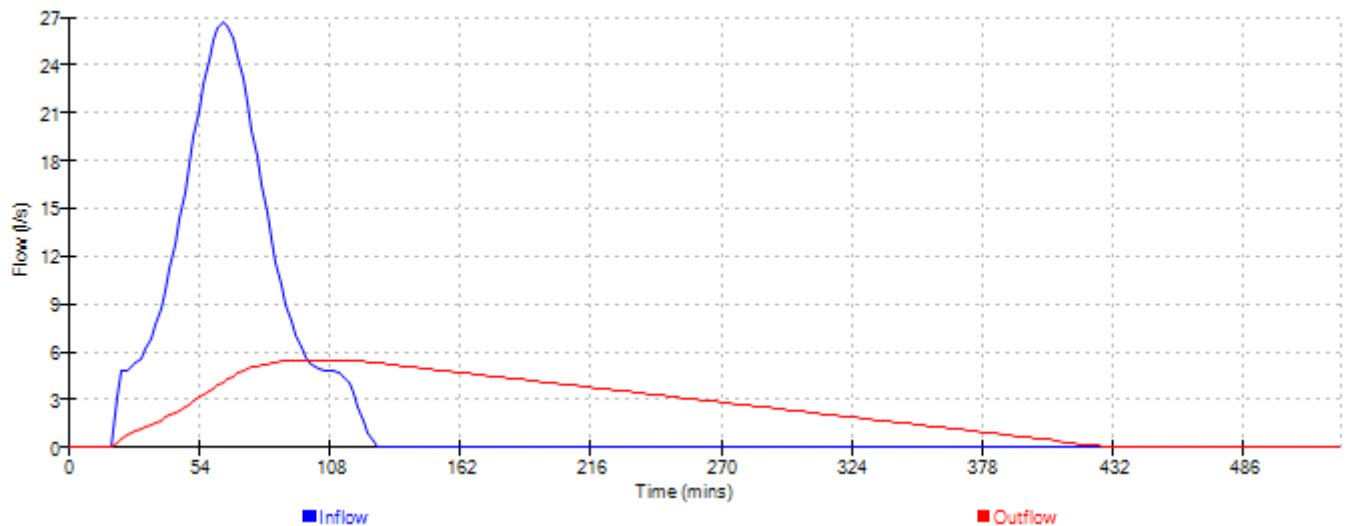
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Date 11/05/2020	Designed by S. Griffiths	
File PERMEABLE BLOCK PAVED	Checked by S. Griffiths	
XP Solutions	Source Control 2017.1.2	

Event: 60 min Winter



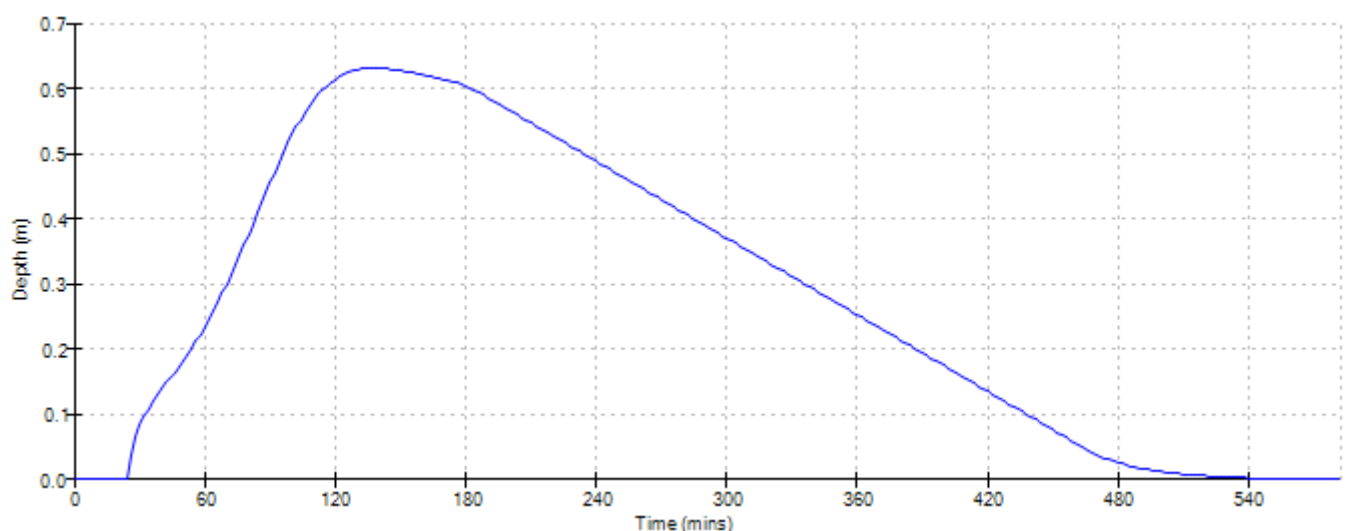
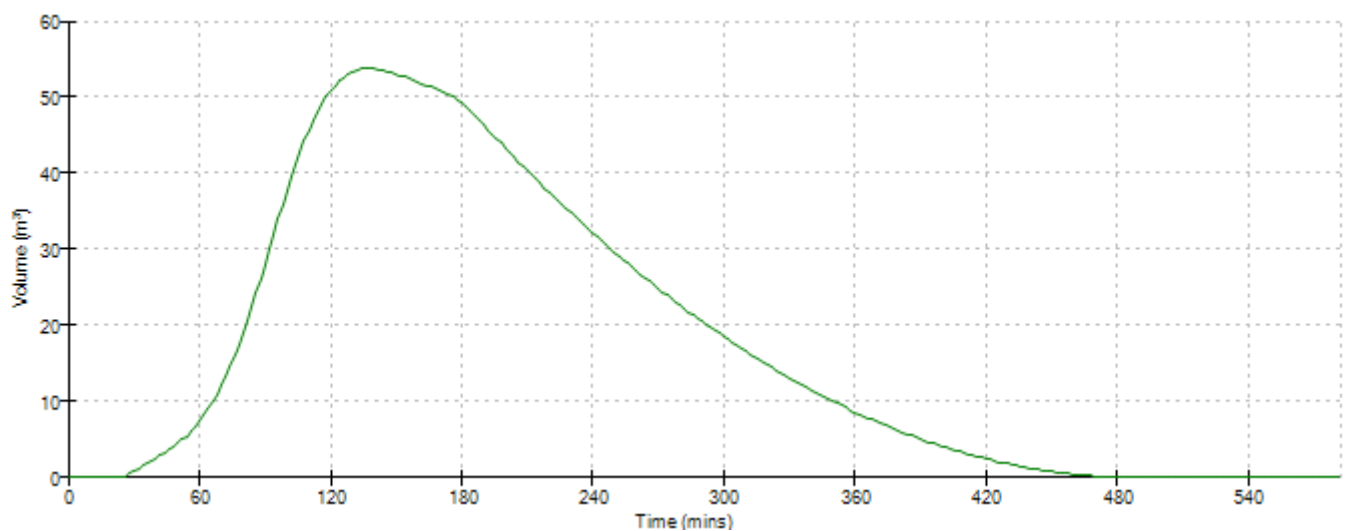
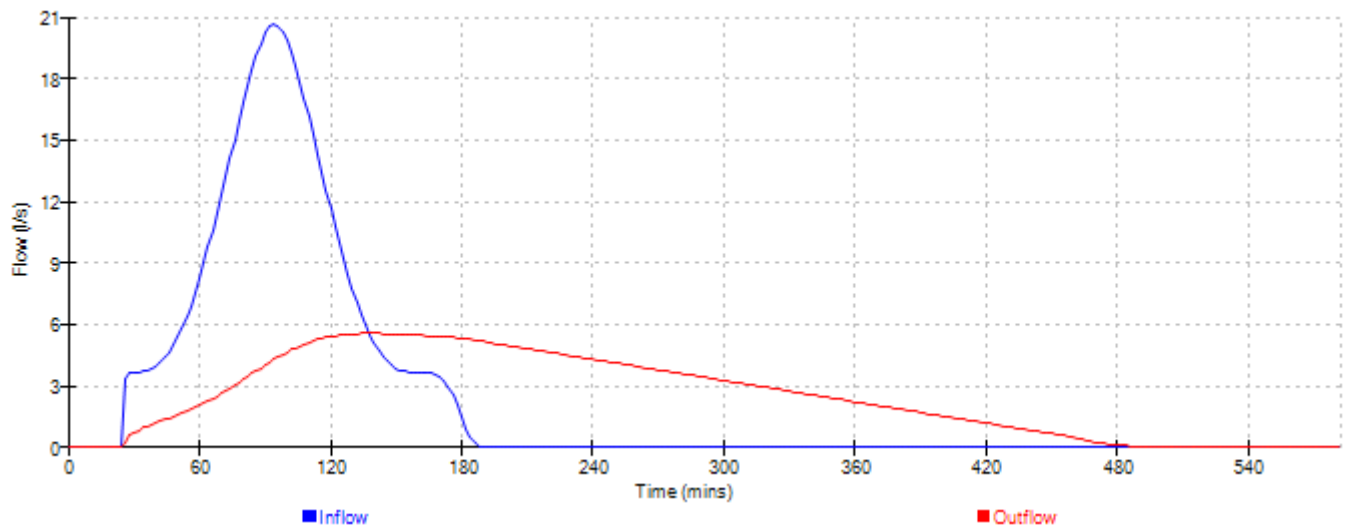
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File PERMEABLE BLOCK PAVED	Checked by S. Griffiths	
XP Solutions	Source Control 2017.1.2	

Event: 120 min Winter

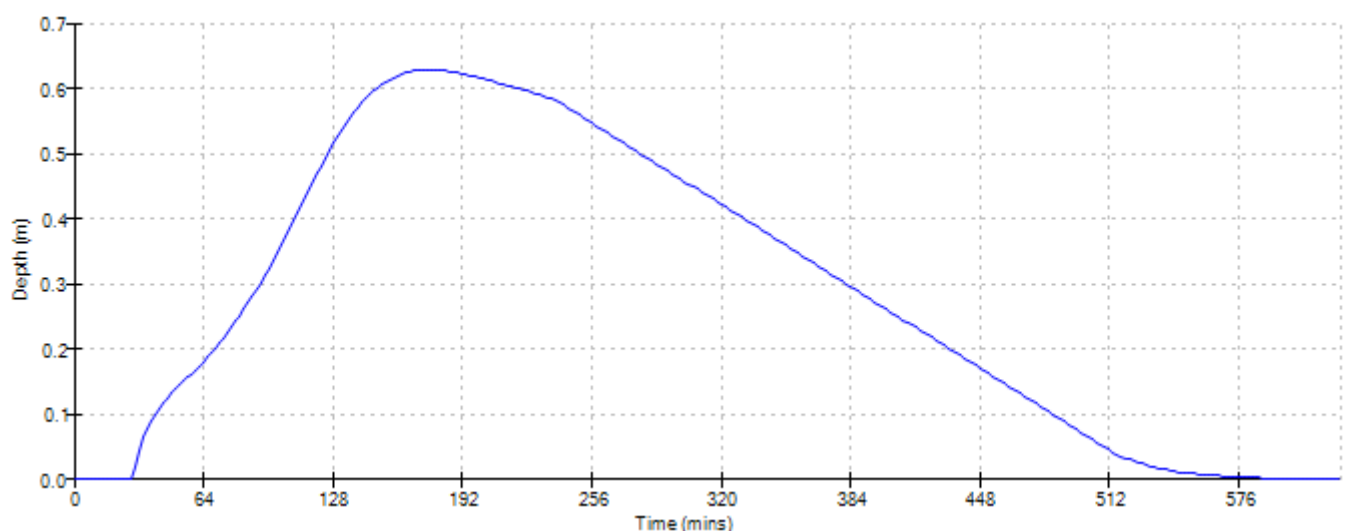
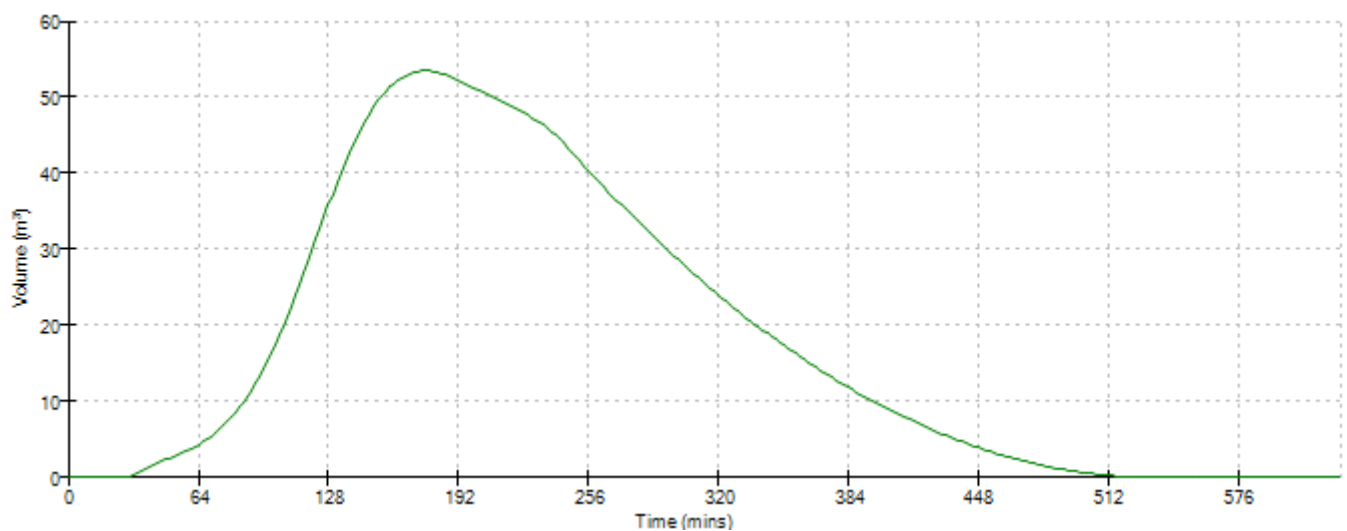
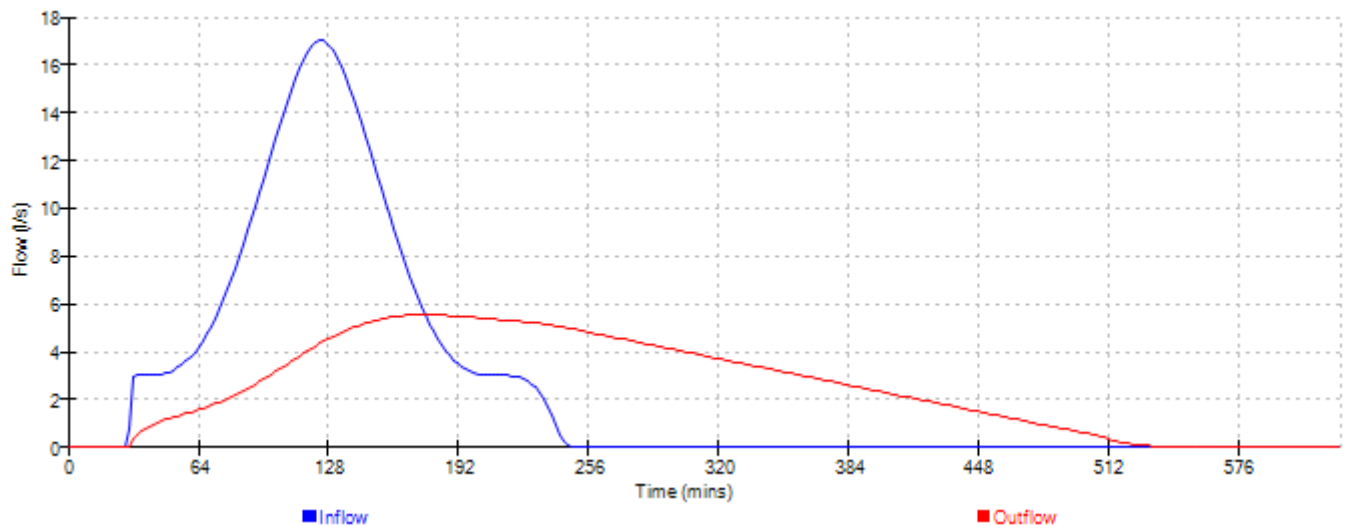


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File PERMEABLE BLOCK PAVED	Checked by S. Griffiths	
XP Solutions	Source Control 2017.1.2	

Event: 180 min Winter

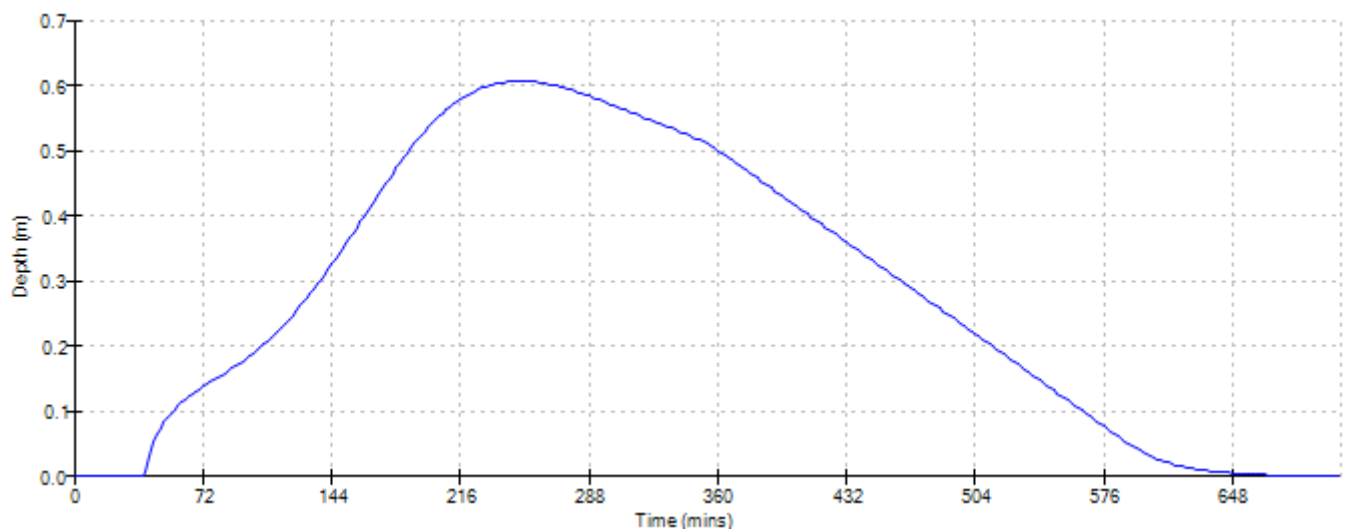
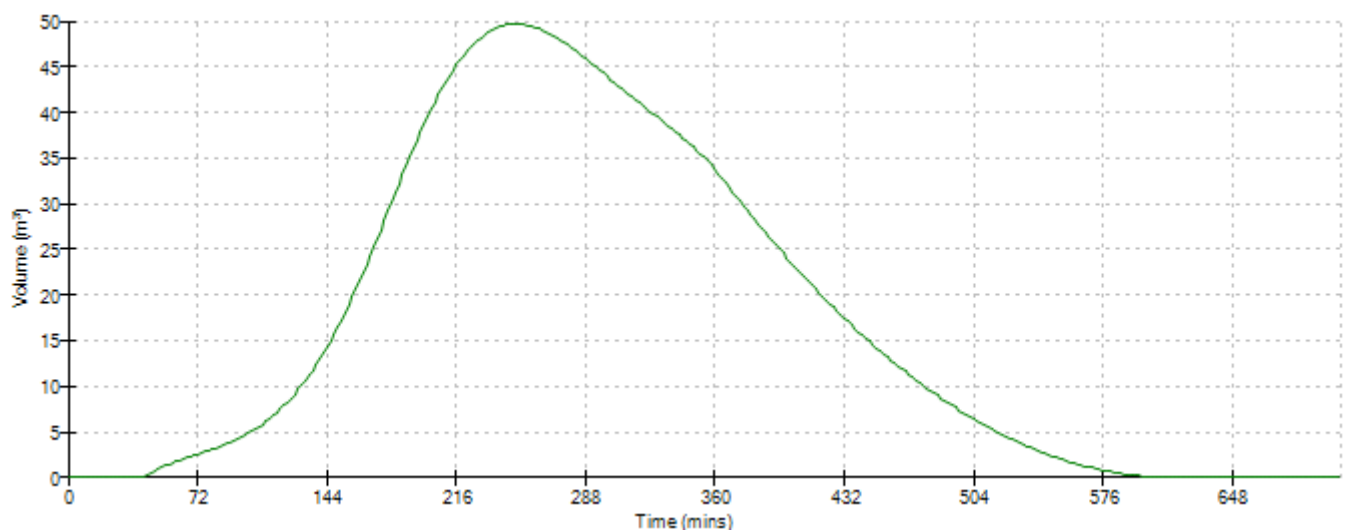
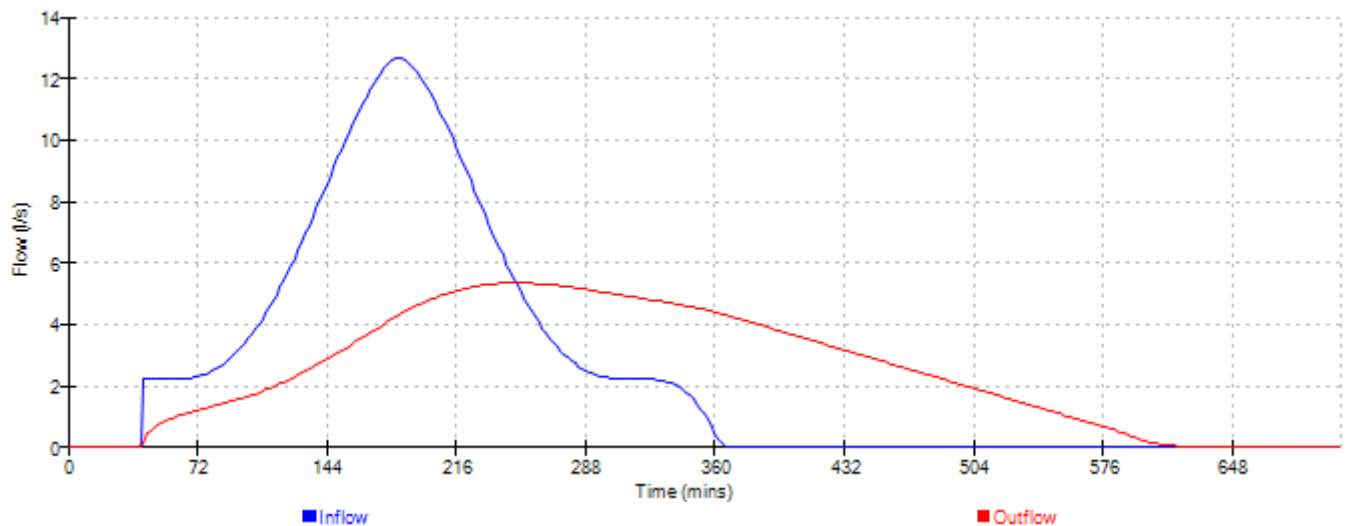


Event: 240 min Winter

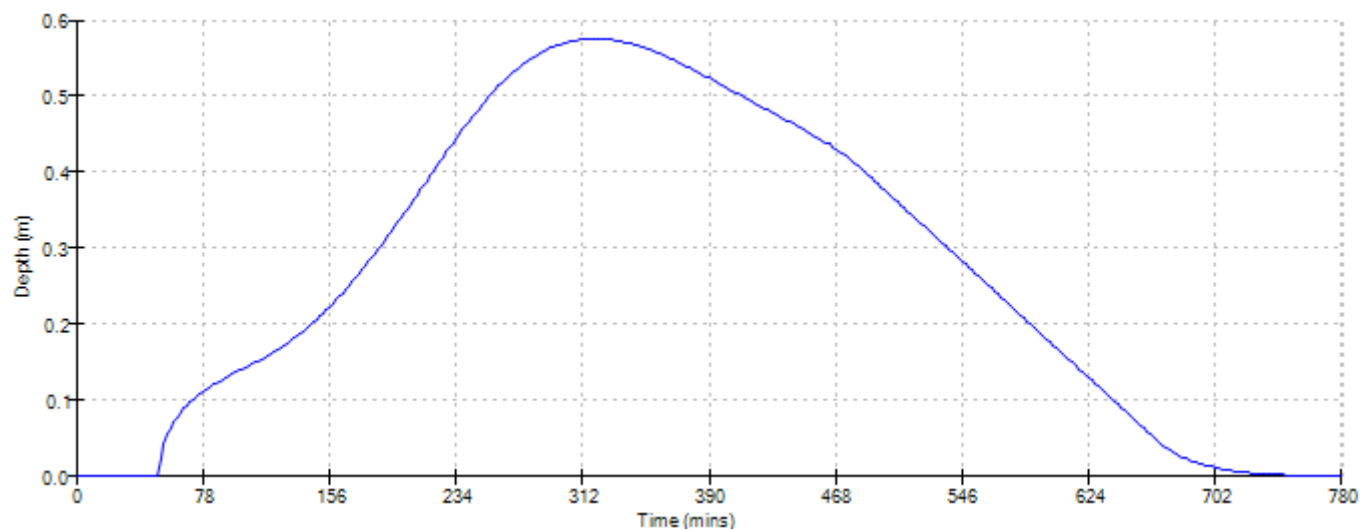
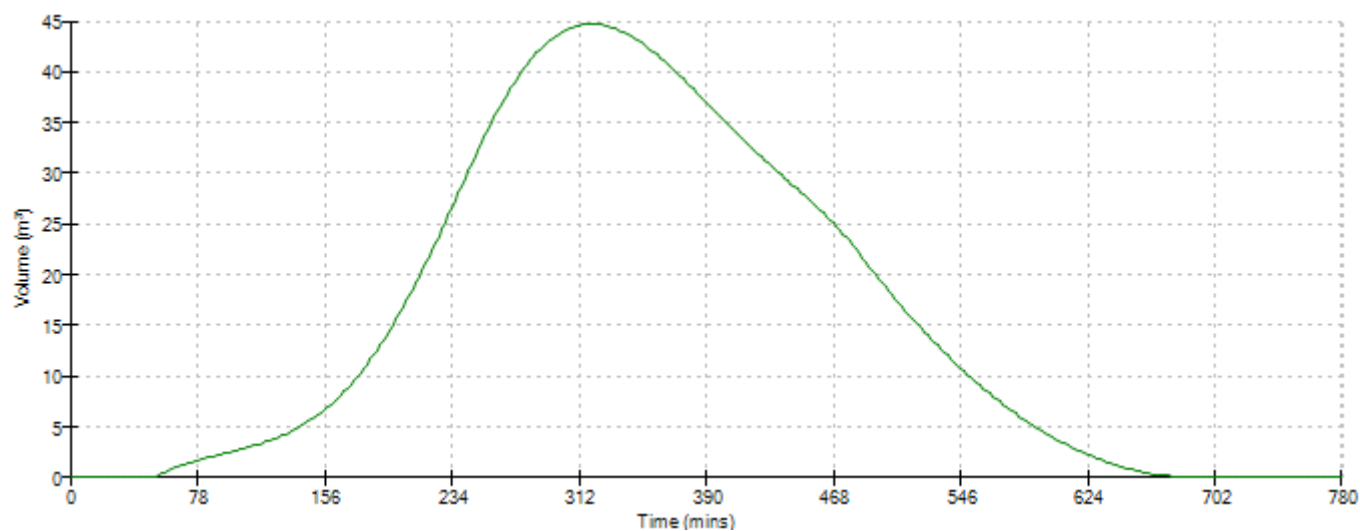
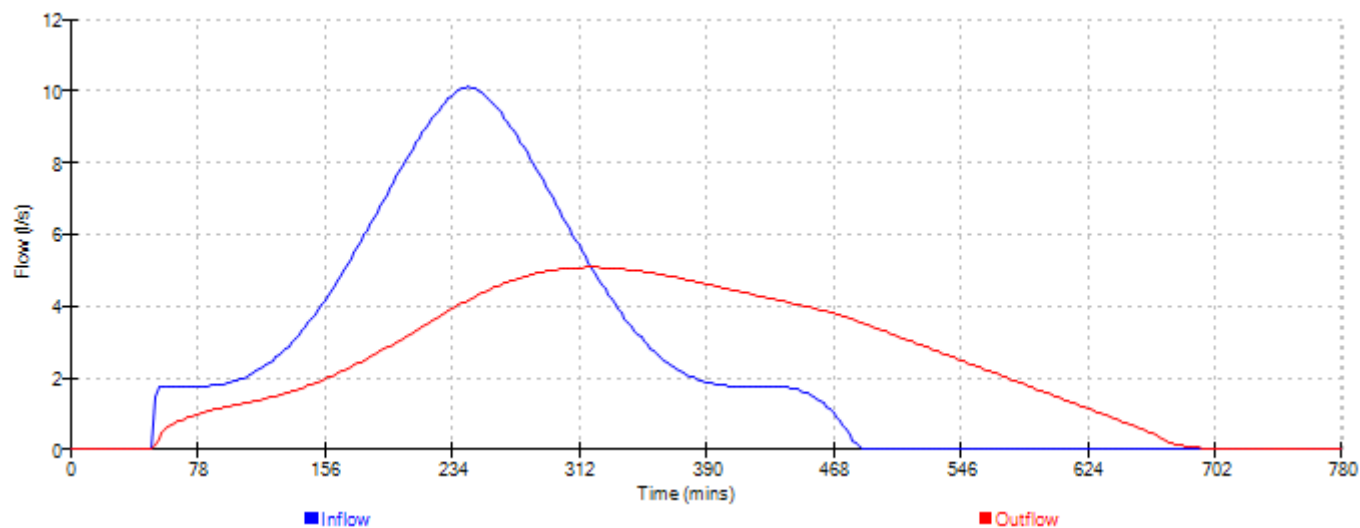


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File PERMEABLE BLOCK PAVED	Checked by S. Griffiths	
XP Solutions	Source Control 2017.1.2	

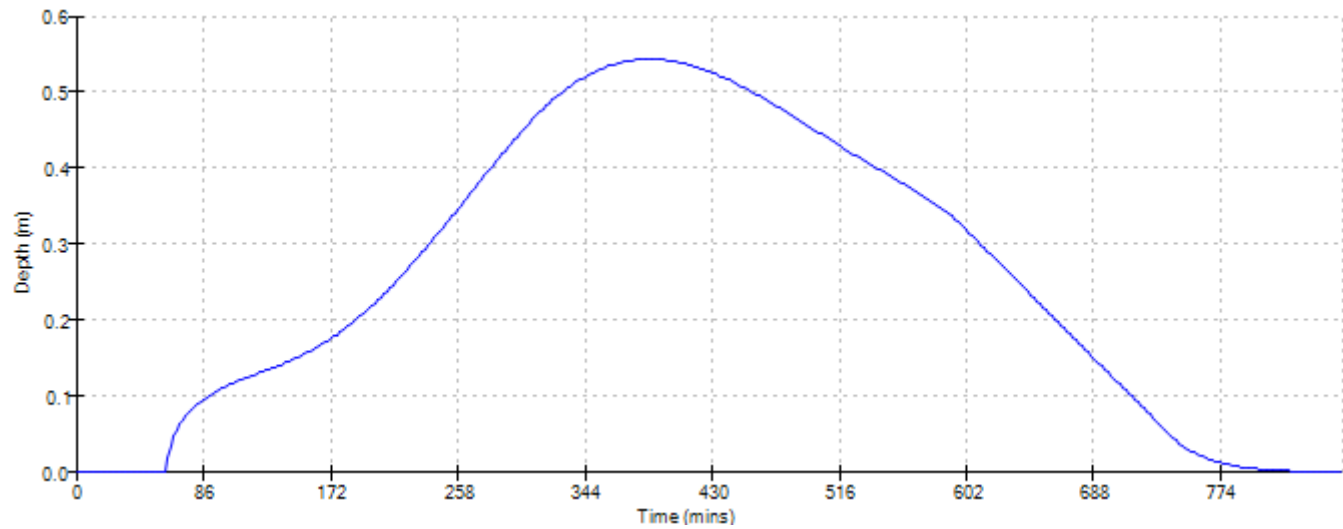
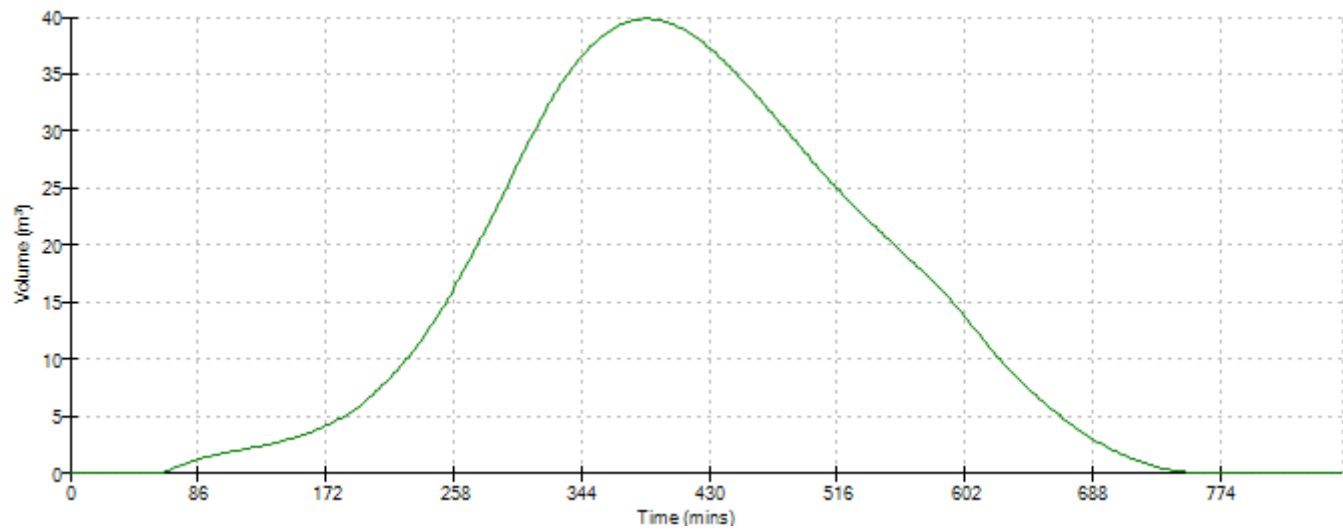
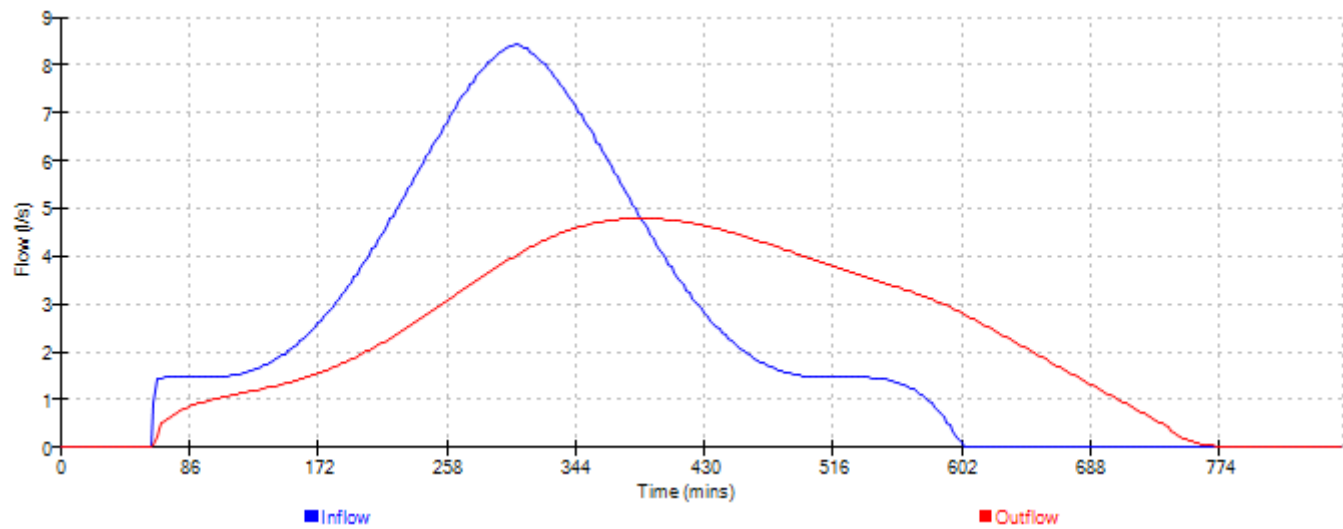
Event: 360 min Winter



Event: 480 min Winter

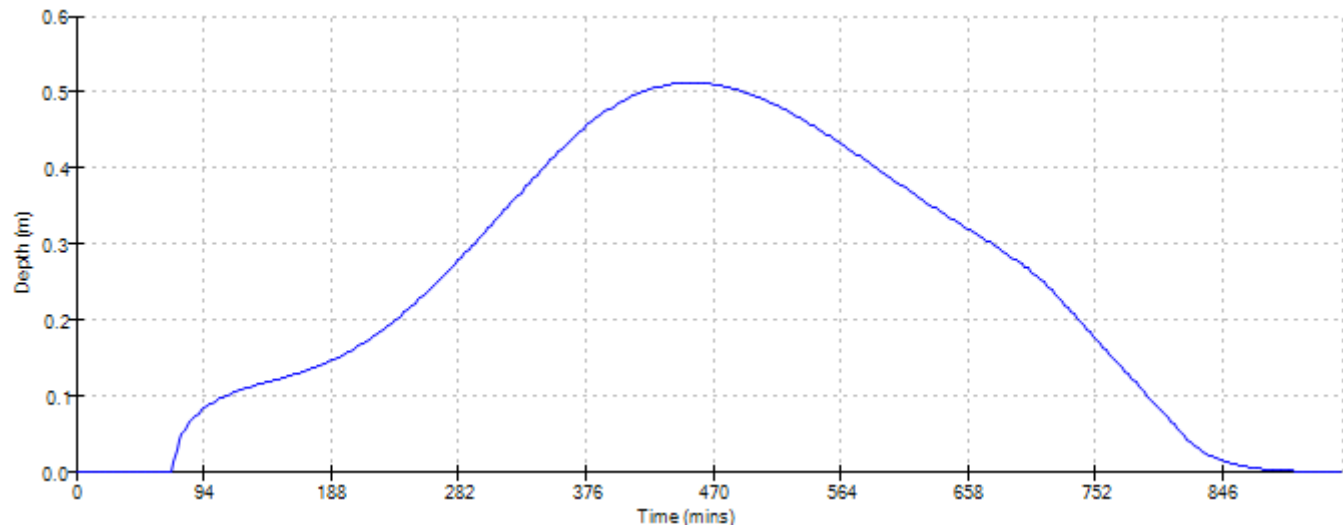
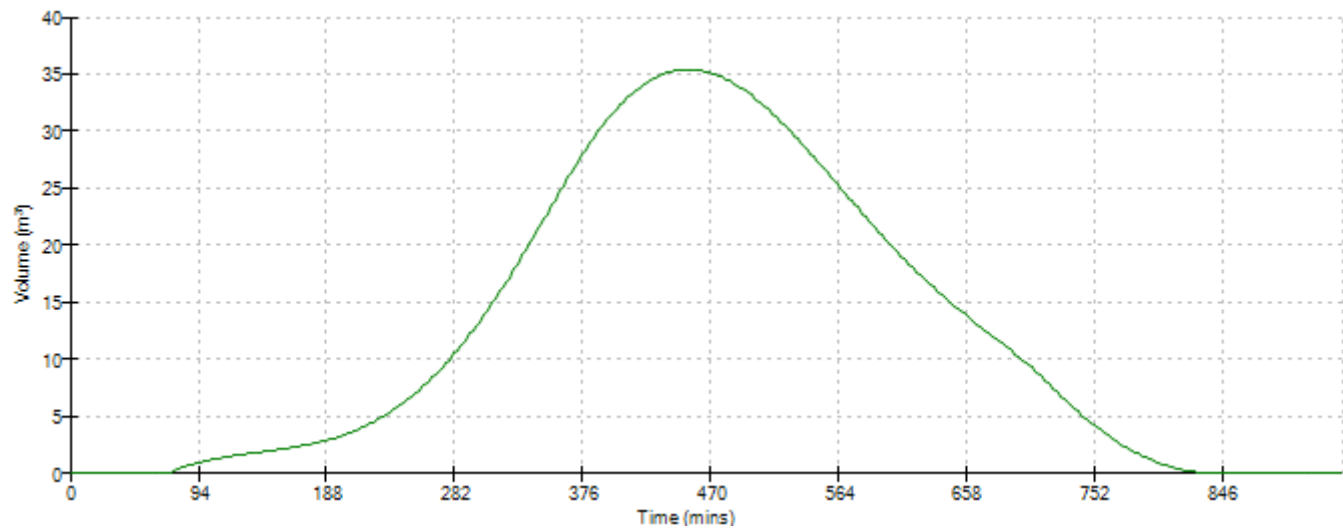
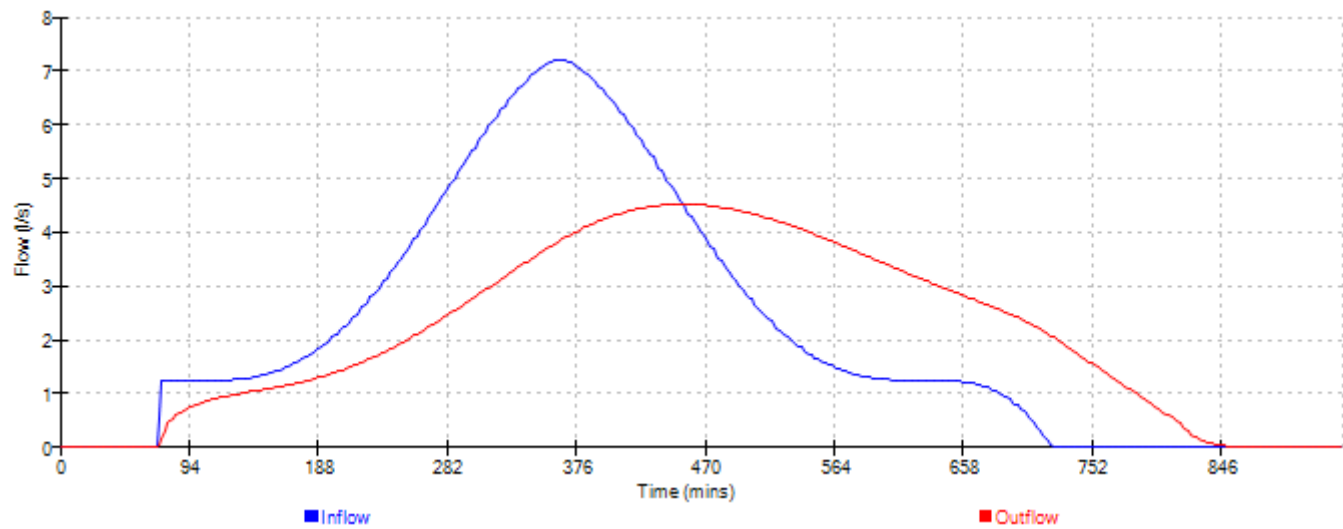


Event: 600 min Winter



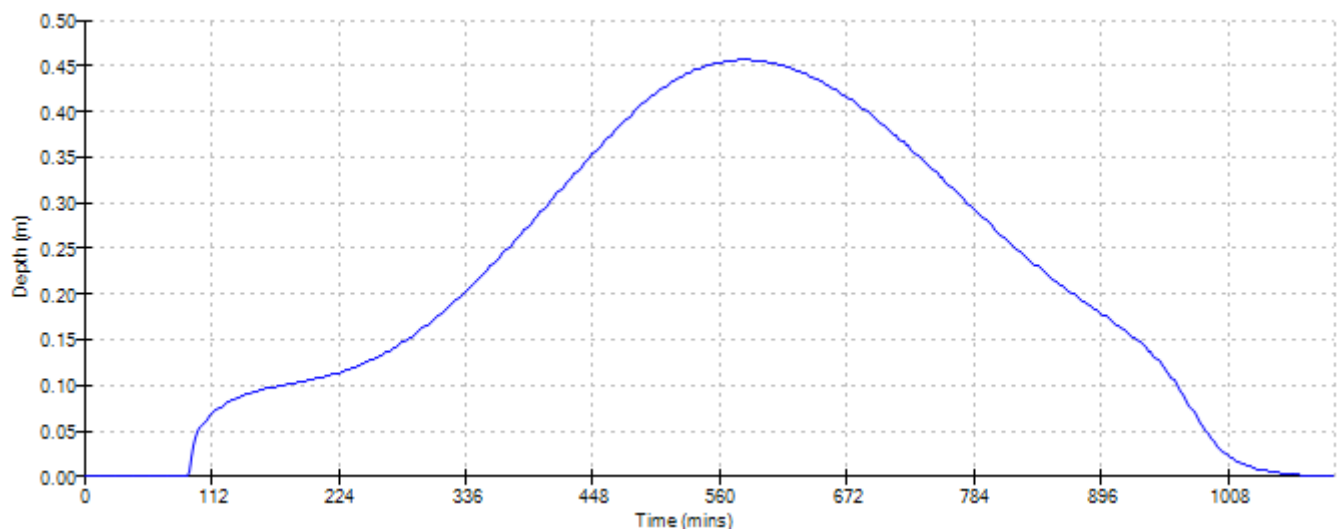
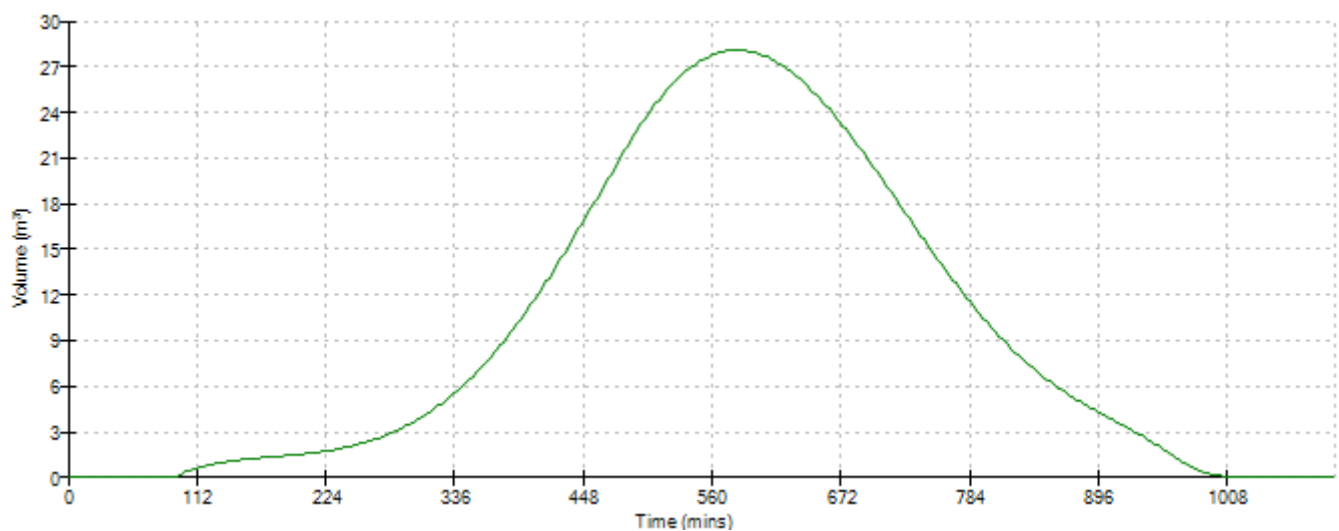
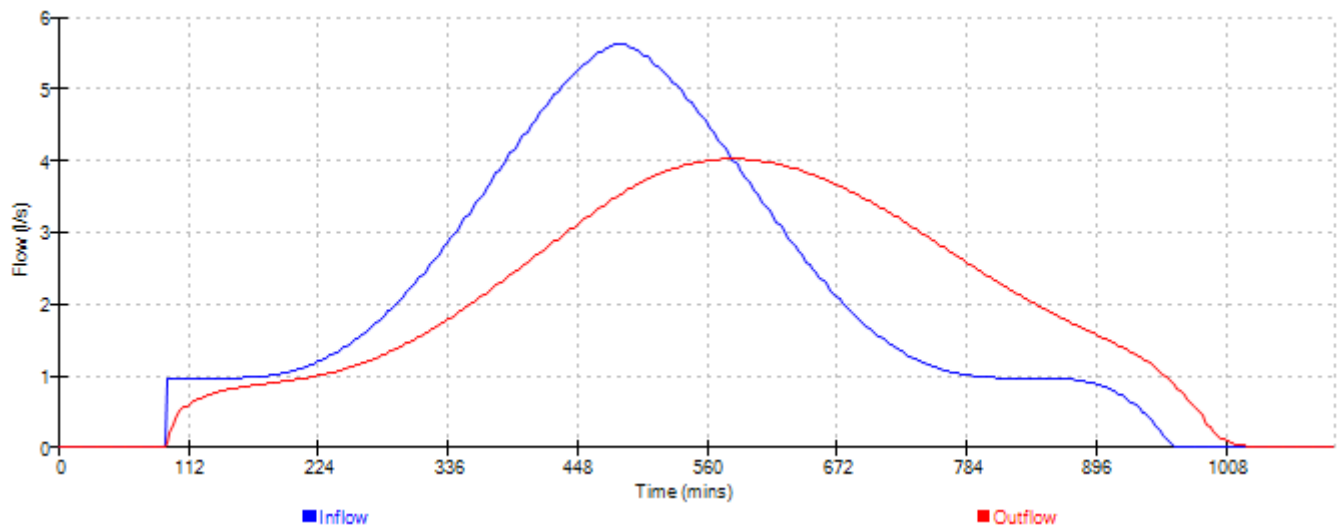
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XP Solutions	Source Control 2017.1.2	

Event: 720 min Winter



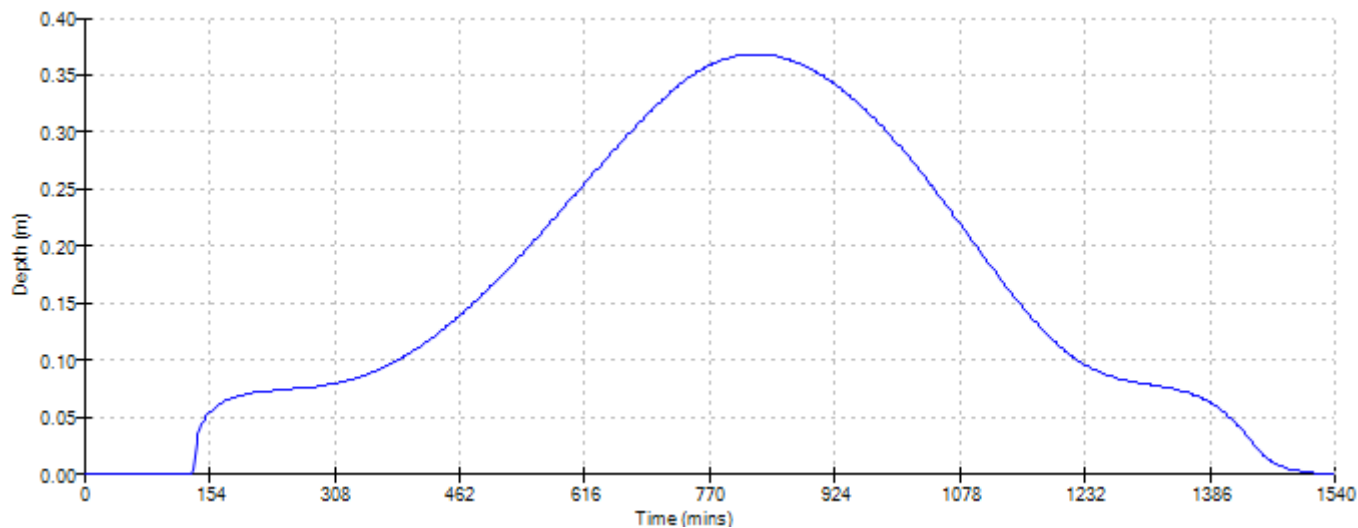
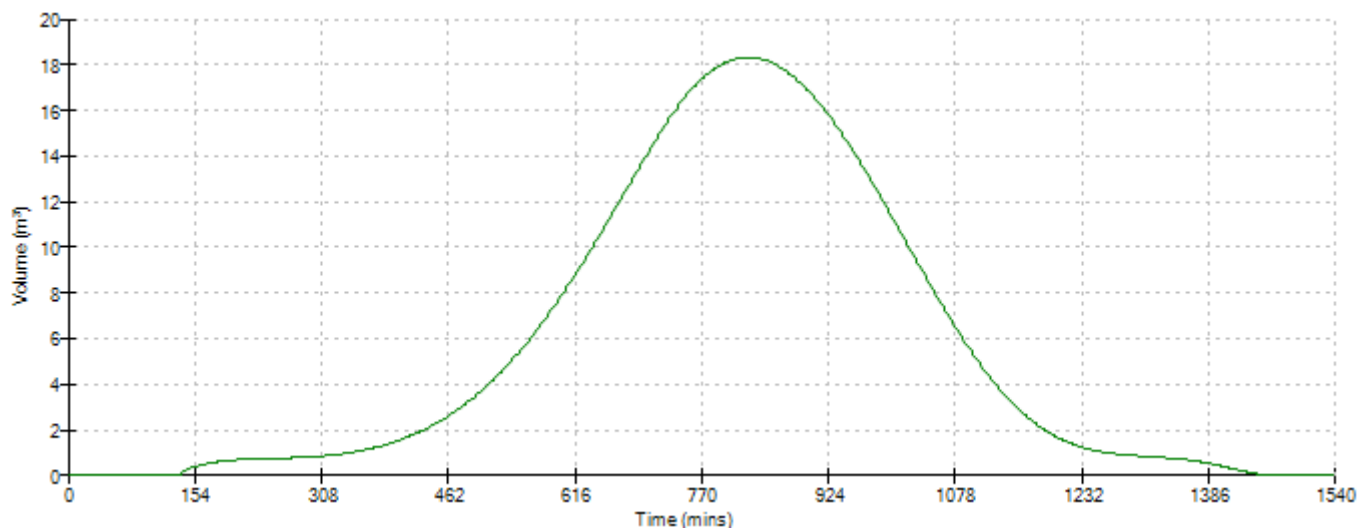
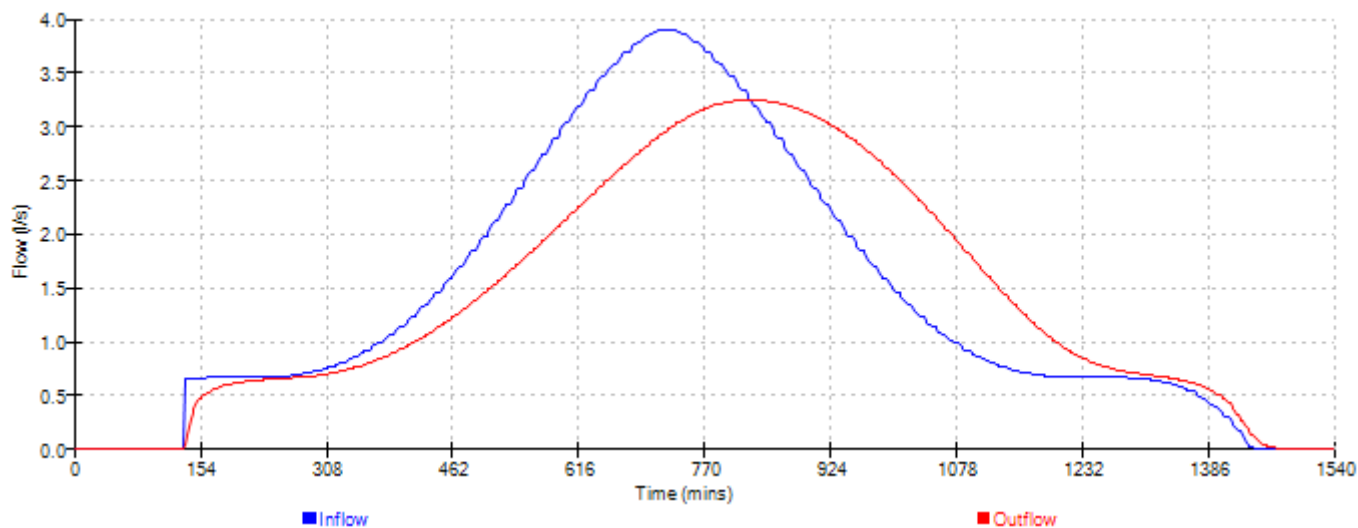
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Date 11/05/2020	Designed by S. Griffiths	
File PERMEABLE BLOCK PAVED	Checked by S. Griffiths	
XP Solutions	Source Control 2017.1.2	

Event: 960 min Winter



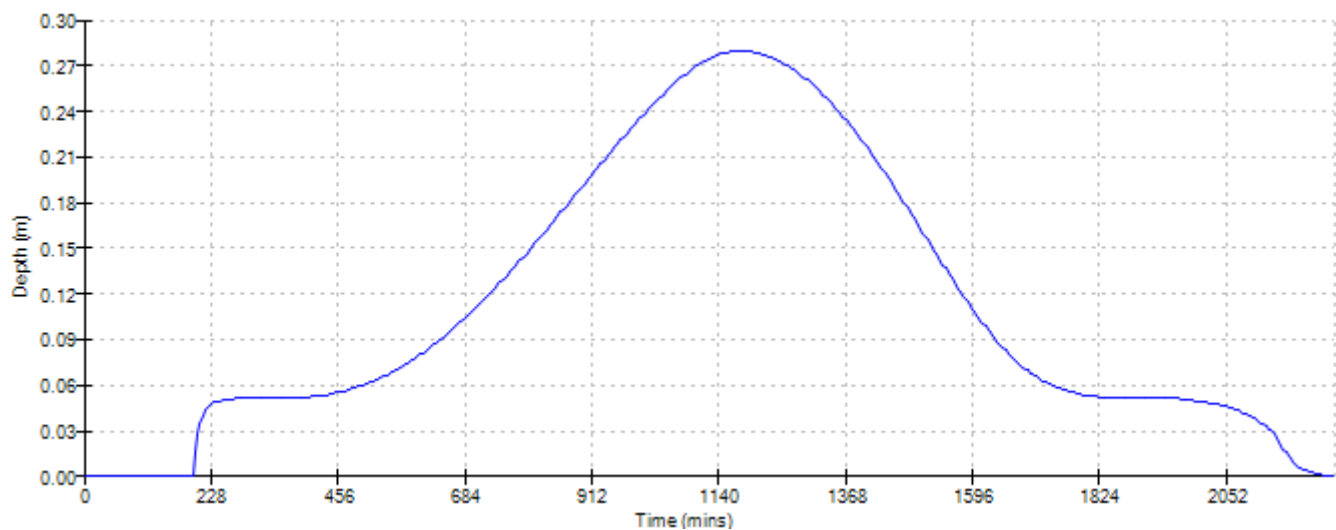
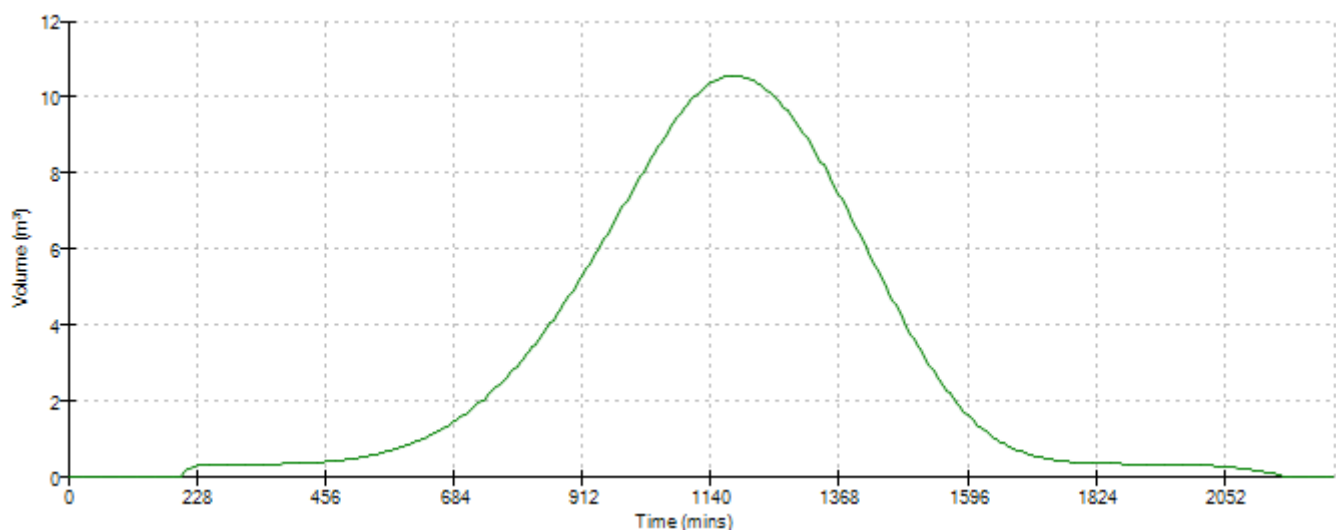
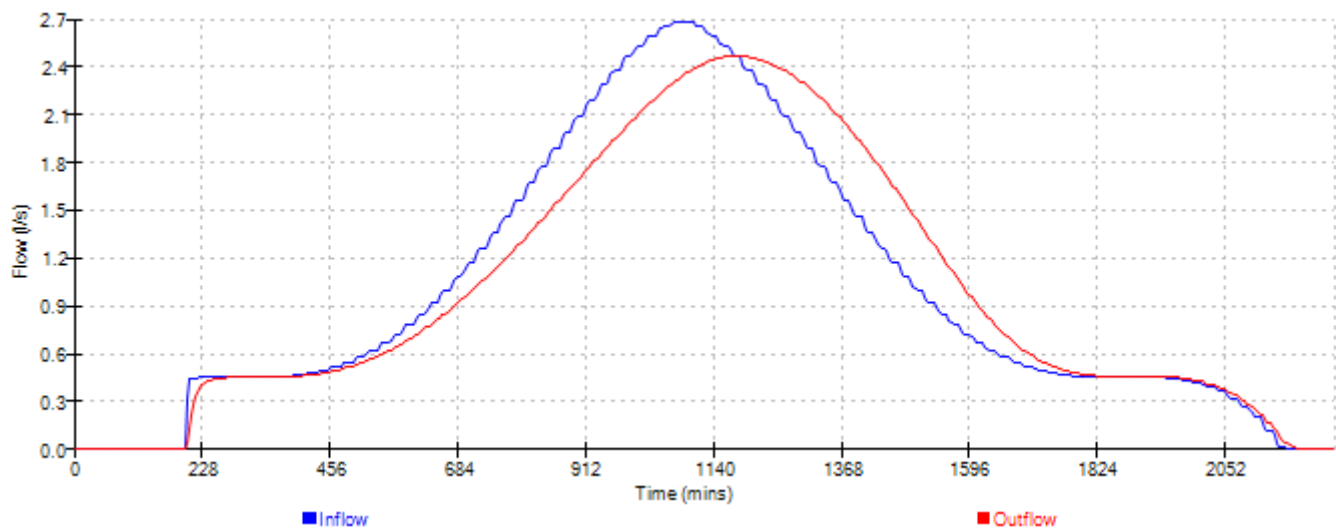
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Date 11/05/2020	Designed by S. Griffiths	
File PERMEABLE BLOCK PAVED	Checked by S. Griffiths	
XP Solutions	Source Control 2017.1.2	

Event: 1440 min Winter



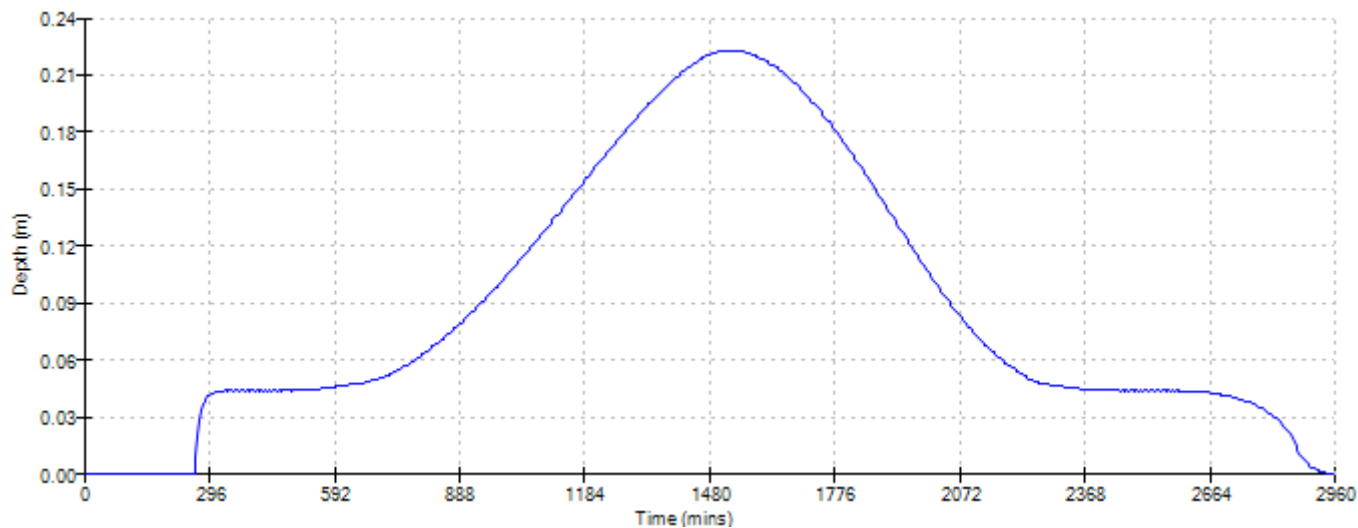
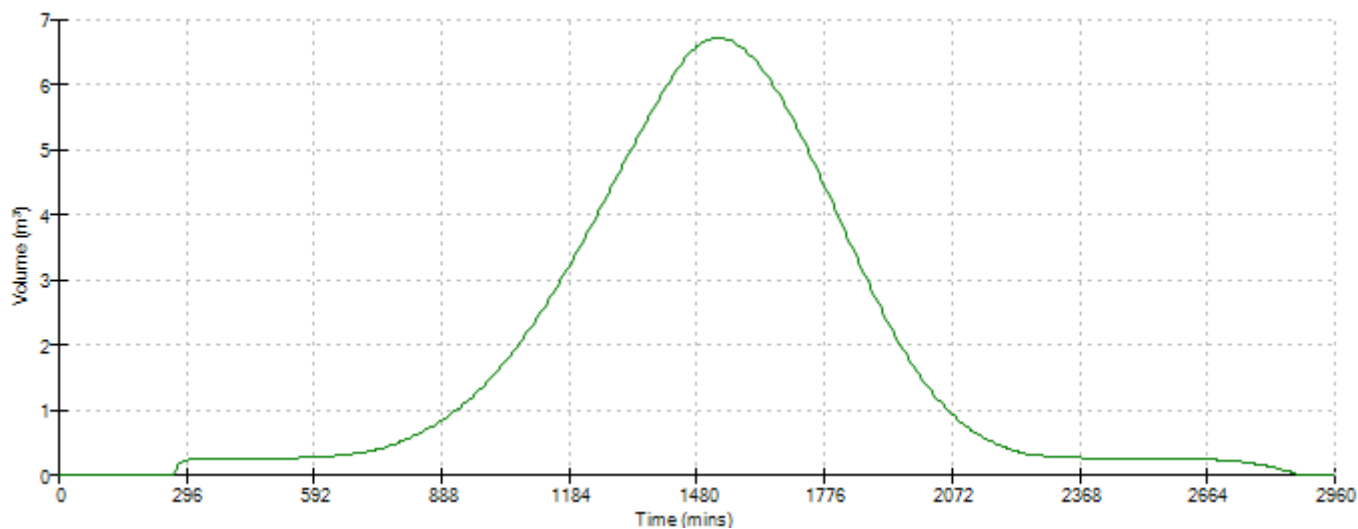
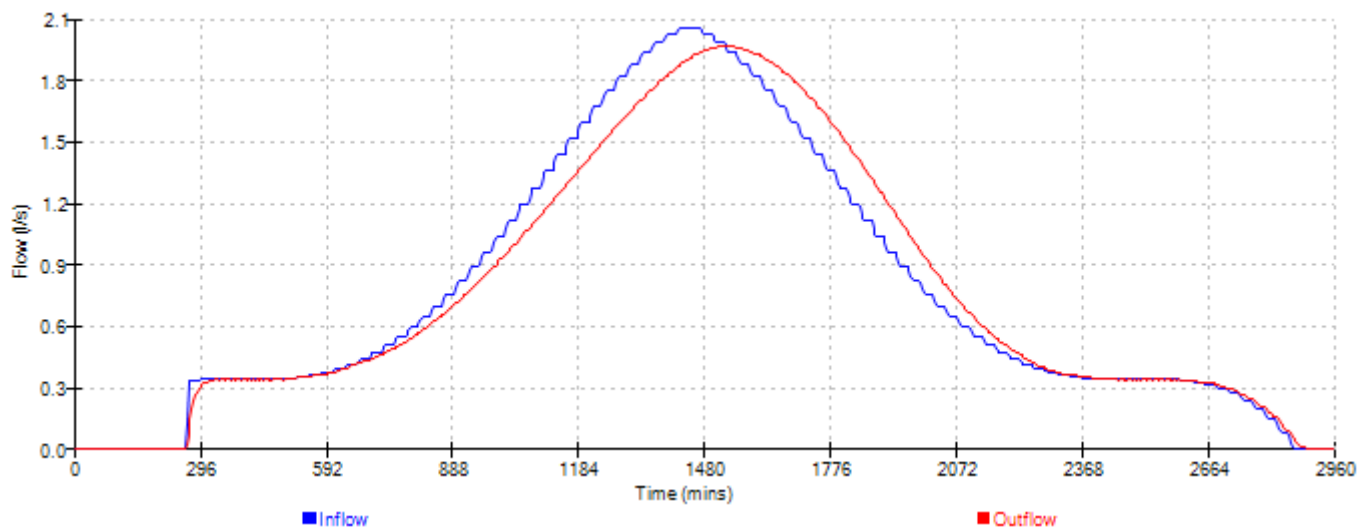
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Date 11/05/2020	Designed by S. Griffiths	
File PERMEABLE BLOCK PAVED	Checked by S. Griffiths	
XP Solutions	Source Control 2017.1.2	

Event: 2160 min Winter



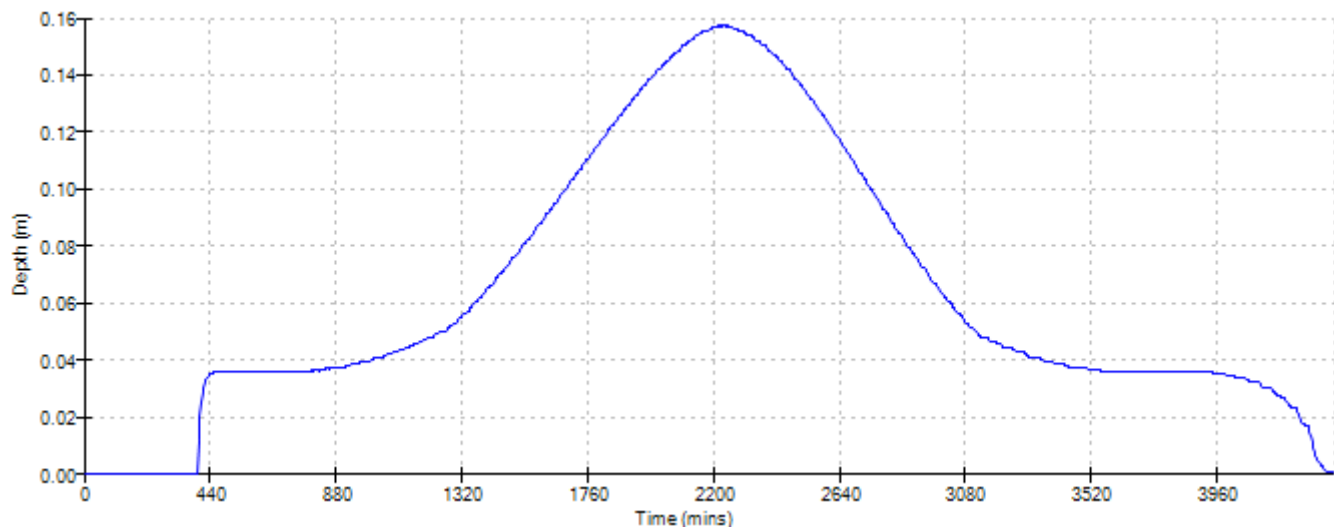
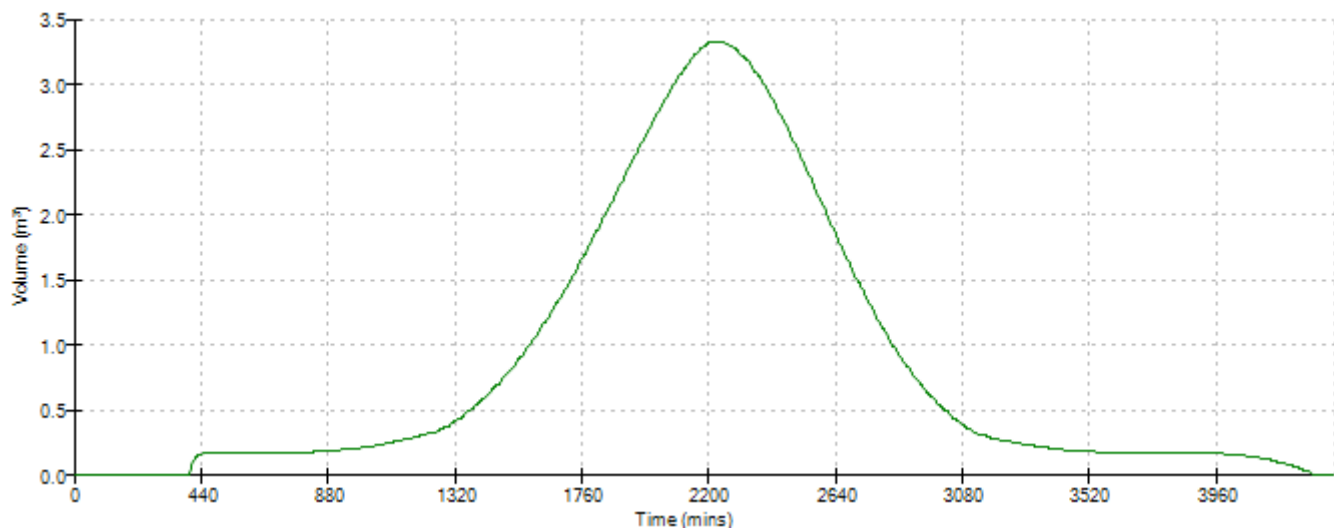
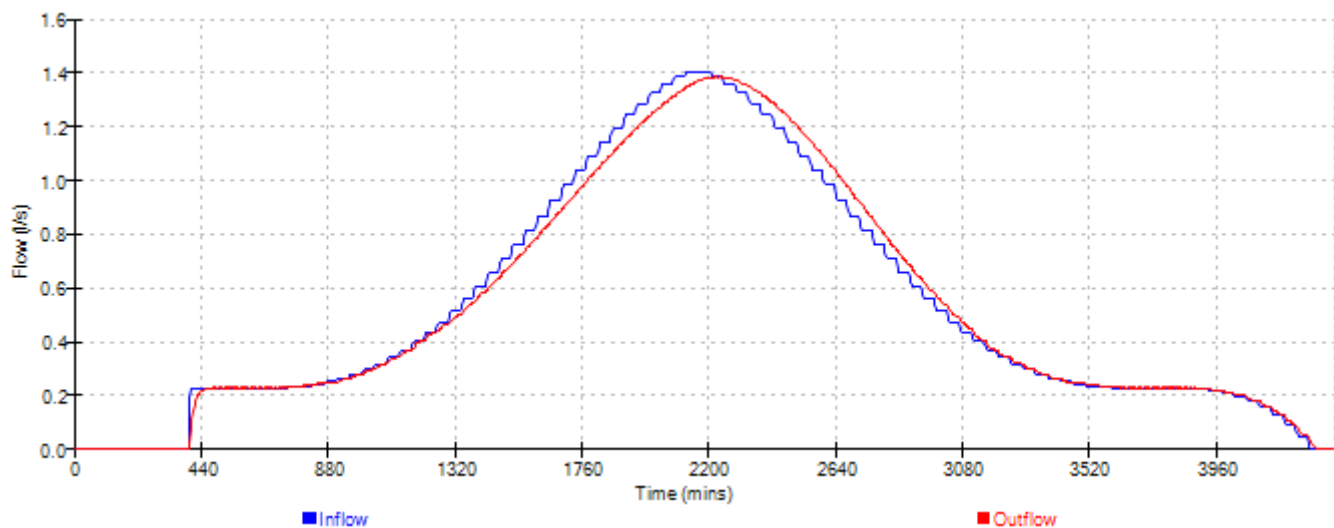
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File PERMEABLE BLOCK PAVED	Checked by S. Griffiths	
XP Solutions	Source Control 2017.1.2	

Event: 2880 min Winter

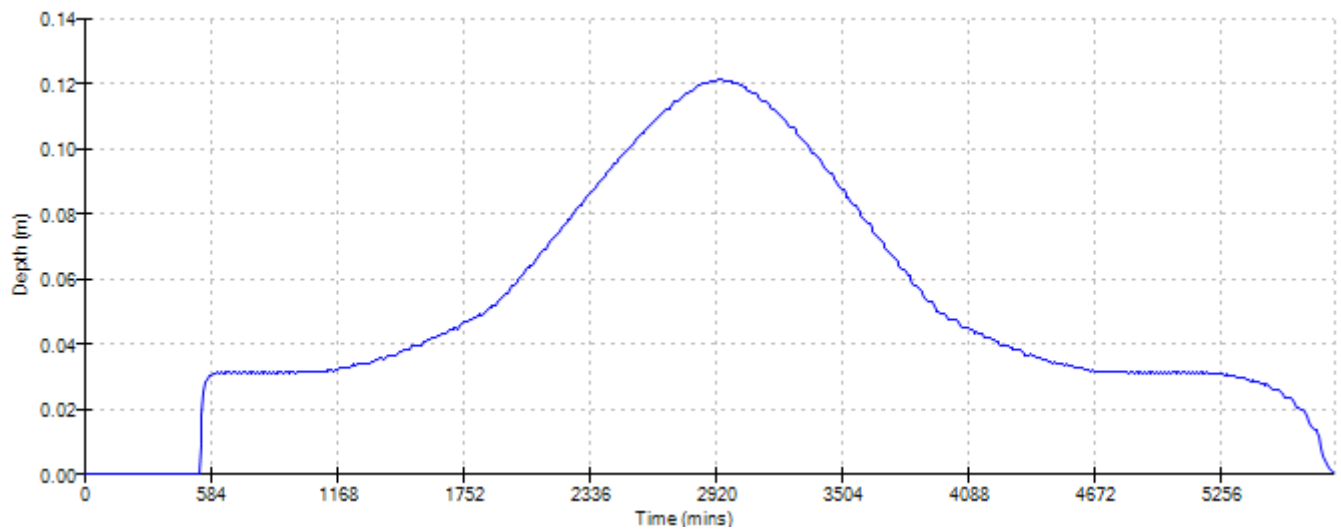
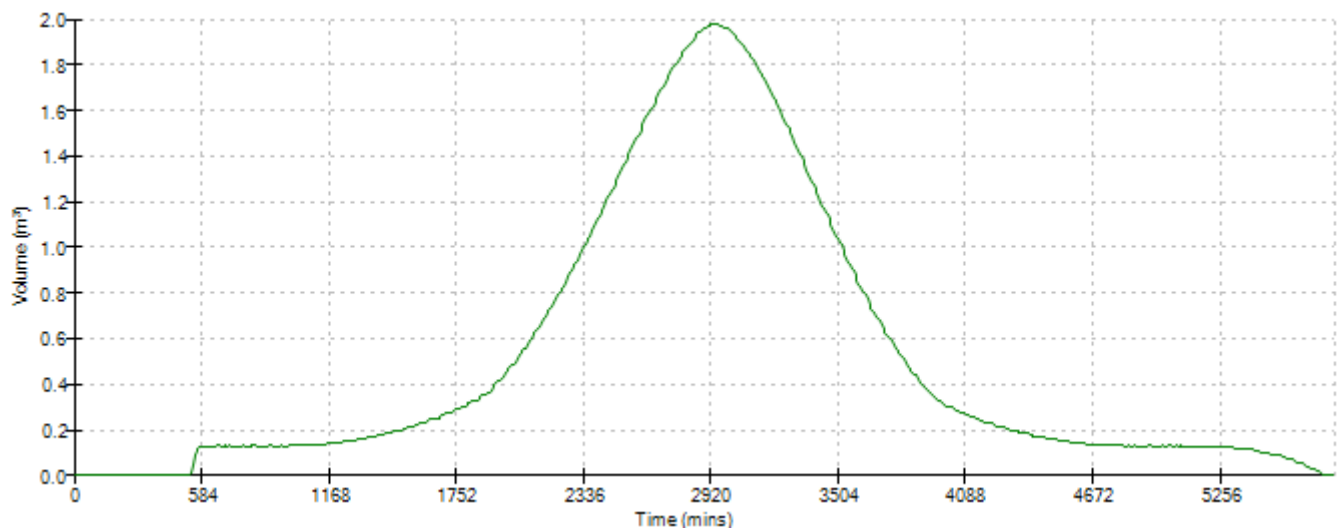
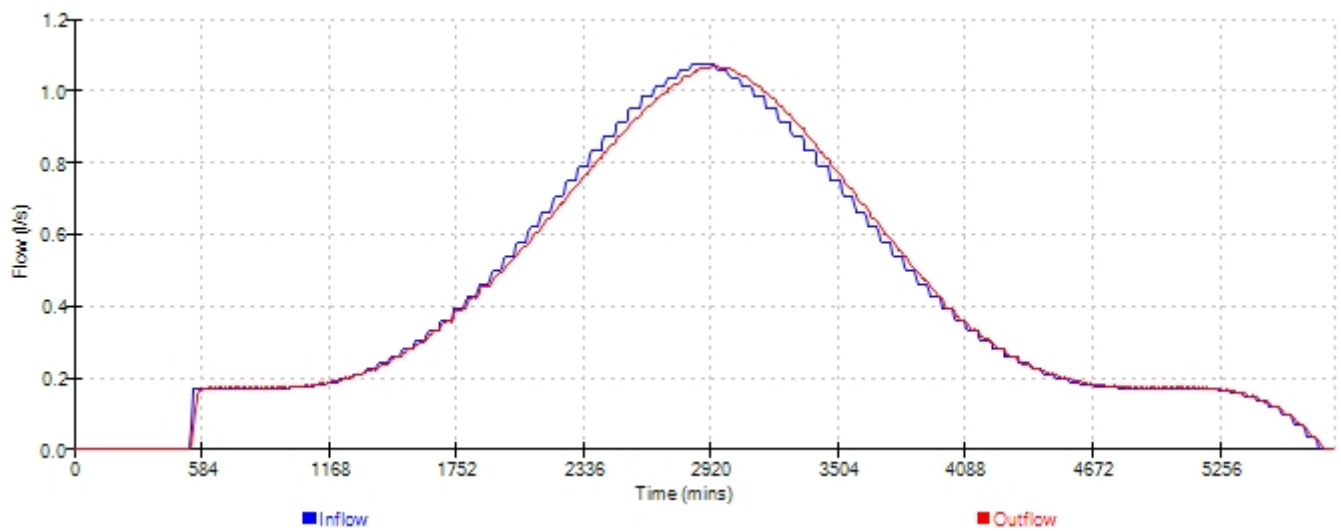


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File PERMEABLE BLOCK PAVED	Checked by S. Griffiths	
XP Solutions	Source Control 2017.1.2	

Event: 4320 min Winter

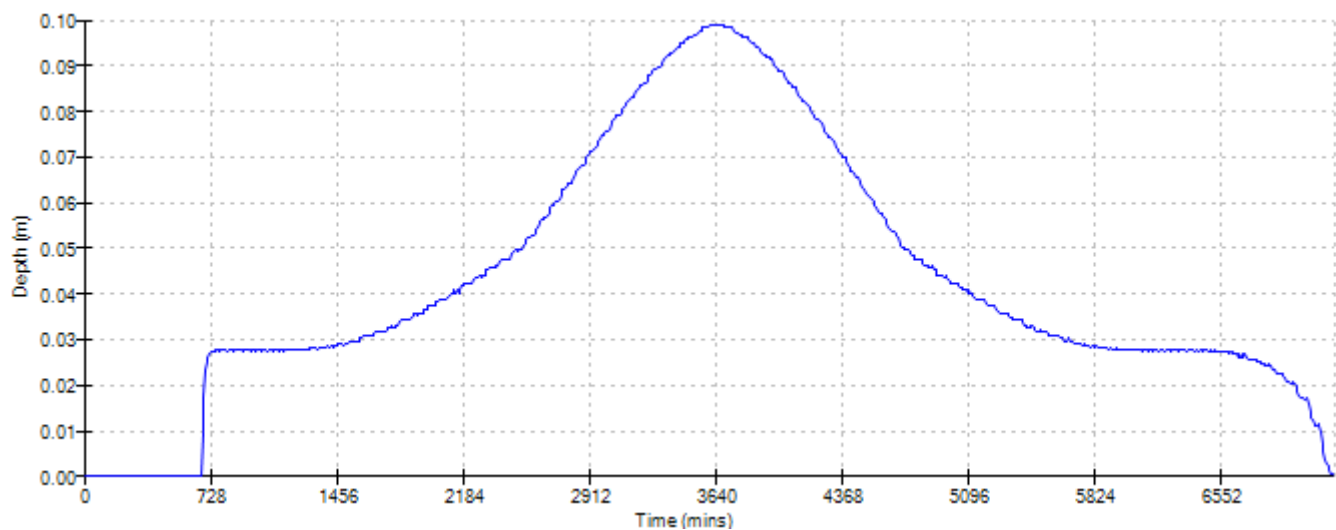
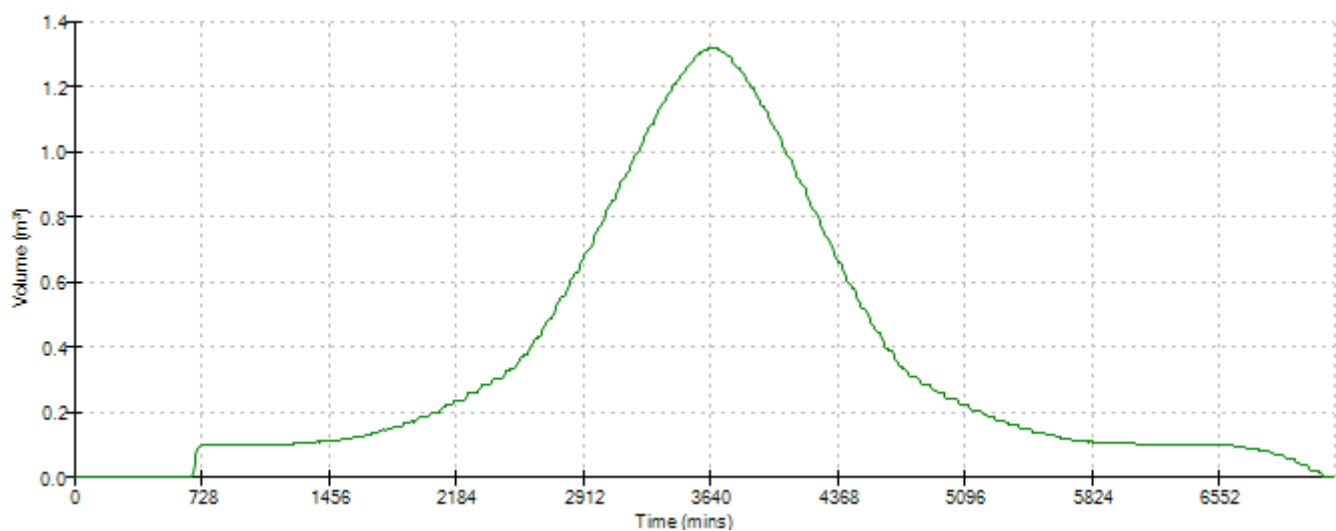
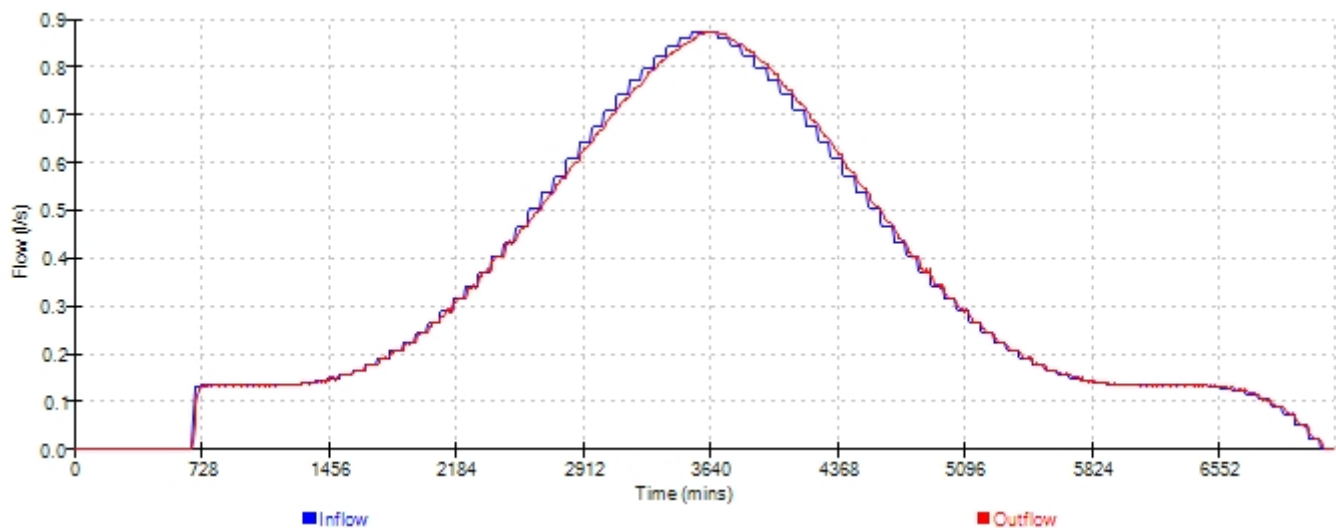


Event: 5760 min Winter



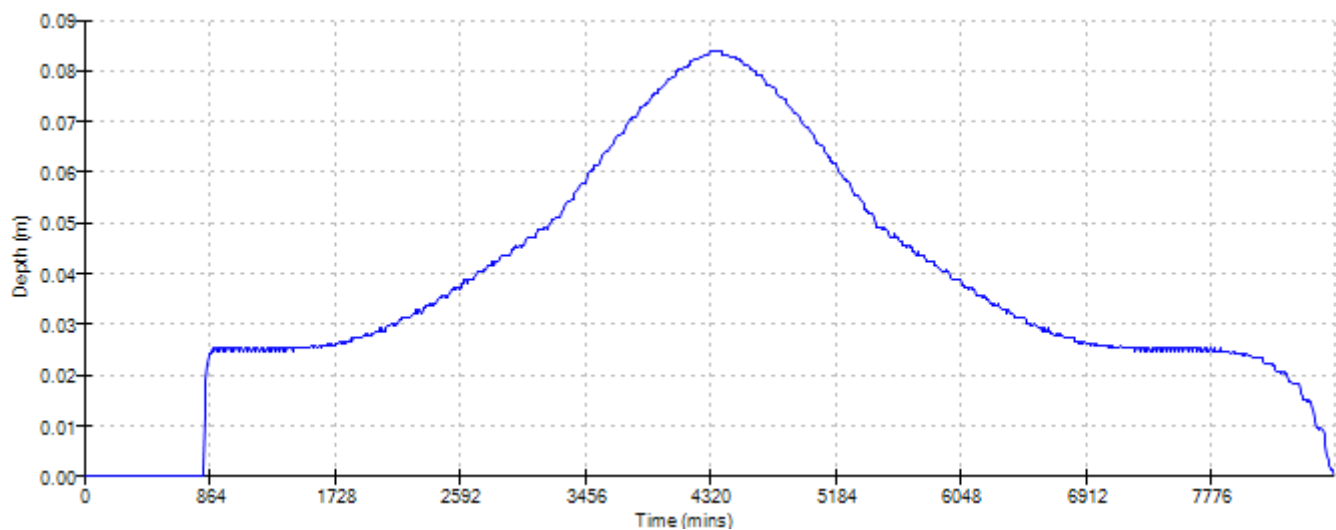
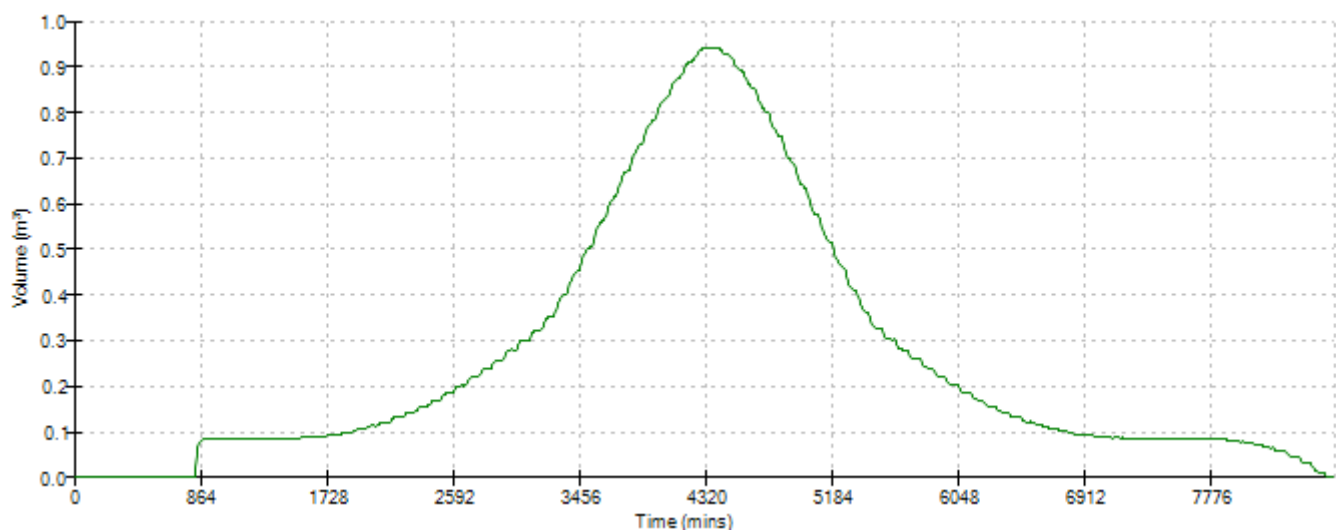
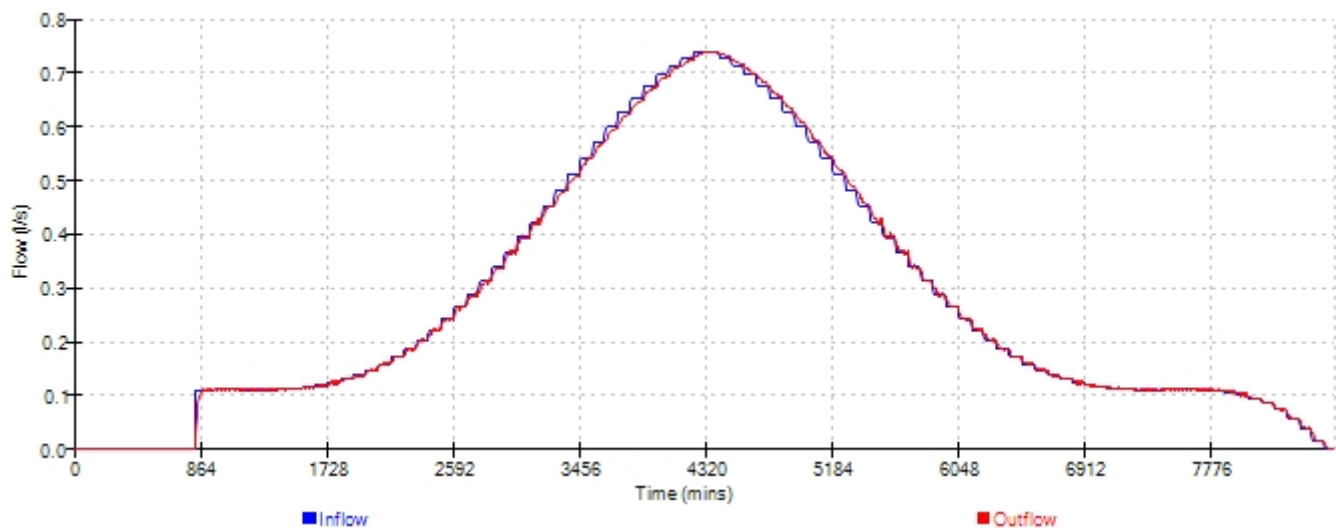
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Date 11/05/2020 File PERMEABLE BLOCK PAVED	Designed by S. Griffiths Checked by S. Griffiths	
XP Solutions	Source Control 2017.1.2	

Event: 7200 min Winter



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XP Solutions	Source Control 2017.1.2	

Event: 8640 min Winter



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File PERMEABLE BLOCK PAVED	Checked by S. Griffiths	
XP Solutions	Source Control 2017.1.2	

Event: 10080 min Winter

