



Micro
Drainage

Designed by RJH
Checked by

Source Control 2018.1

Time (mins)	Area
From: To:	(ha)
0 4	0.000

Hydrock Consultants Ltd		Page 4
.	Bristol Airport 12 mppa	
.	Cogloop 2 Car Park- A11	
.	Q30	
Date 01/08/2018	Designed by RJH	
File Cog A11.SRCX	Checked by	
XP Solutions	Source Control 2018.1	

Model Details

Storage is Online Cover Level (m) 181.500

Complex Structure

Infiltration Trench

Infiltration Coefficient Base (m/hr)	0.12048	Trench Width (m)	1.8
Infiltration Coefficient Side (m/hr)	0.12048	Trench Length (m)	117.0
Safety Factor	2.0	Slope (1:X)	200.0
Porosity	0.30	Cap Volume Depth (m)	0.000
Invert Level (m)	180.000	Cap Infiltration Depth (m)	0.000

Porous Car Park

Infiltration Coefficient Base (m/hr)	0.12048	Width (m)	15.1
Membrane Percolation (mm/hr)	1000	Length (m)	117.0
Max Percolation (l/s)	490.8	Slope (1:X)	100.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	181.050	Membrane Depth (m)	0

Hydrock Consultants Ltd		Page 1
.	Bristol Airport 12 mppa	
.	Cogloop 2 Car Park- A12	
.	Q30	
Date 01/08/2018	Designed by RJH	
File Cog A12.SRCX	Checked by	
XP Solutions	Source Control 2018.1	

Summary of Results for 30 year Return Period

Half Drain Time : 69 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	180.099	0.599	4.7	19.3	0 K
30 min Summer	180.230	0.730	5.3	27.6	0 K
60 min Summer	180.336	0.836	5.7	34.3	0 K
120 min Summer	180.394	0.894	5.9	38.0	0 K
180 min Summer	180.405	0.905	6.0	38.7	0 K
240 min Summer	180.397	0.897	5.9	38.2	0 K
360 min Summer	180.361	0.861	5.8	35.9	0 K
480 min Summer	180.316	0.816	5.6	33.1	0 K
600 min Summer	180.270	0.770	5.4	30.2	0 K
720 min Summer	180.227	0.727	5.3	27.4	0 K
960 min Summer	180.153	0.653	5.0	22.8	0 K
1440 min Summer	180.056	0.556	4.4	16.7	0 K
2160 min Summer	179.967	0.467	3.6	11.8	0 K
2880 min Summer	179.905	0.405	3.0	8.9	0 K
4320 min Summer	179.823	0.323	2.3	5.6	0 K
5760 min Summer	179.770	0.270	1.9	3.9	0 K
7200 min Summer	179.732	0.232	1.6	2.9	0 K
8640 min Summer	179.704	0.204	1.4	2.2	0 K
10080 min Summer	179.682	0.182	1.2	1.8	0 K
15 min Winter	180.158	0.658	5.0	23.1	0 K
30 min Winter	180.308	0.808	5.6	32.6	0 K
60 min Winter	180.430	0.930	6.1	40.3	0 K
120 min Winter	180.484	0.984	6.3	43.7	0 K
180 min Winter	180.482	0.982	6.3	43.6	0 K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Summer	74.059	0.0	26
30 min Summer	48.833	0.0	38
60 min Summer	30.811	0.0	62
120 min Summer	18.860	0.0	96
180 min Summer	13.992	0.0	128
240 min Summer	11.265	0.0	162
360 min Summer	8.299	0.0	230
480 min Summer	6.674	0.0	296
600 min Summer	5.632	0.0	360
720 min Summer	4.901	0.0	422
960 min Summer	3.933	0.0	542
1440 min Summer	2.881	0.0	778
2160 min Summer	2.107	0.0	1136
2880 min Summer	1.687	0.0	1500
4320 min Summer	1.231	0.0	2212
5760 min Summer	0.984	0.0	2944
7200 min Summer	0.827	0.0	3672
8640 min Summer	0.717	0.0	4400
10080 min Summer	0.636	0.0	5136
15 min Winter	74.059	0.0	27
30 min Winter	48.833	0.0	38
60 min Winter	30.811	0.0	62
120 min Winter	18.860	0.0	100
180 min Winter	13.992	0.0	138

Hydrock Consultants Ltd		Page 2
.	Bristol Airport 12 mppa	
.	Cogloop 2 Car Park- A12	
.	Q30	
Date 01/08/2018	Designed by RJH	
File Cog A12.SRCX	Checked by	
XP Solutions	Source Control 2018.1	

Summary of Results for 30 year Return Period

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
240 min Winter	180.457	0.957	6.2	42.0	0 K
360 min Winter	180.390	0.890	5.9	37.7	0 K
480 min Winter	180.318	0.818	5.6	33.2	0 K
600 min Winter	180.251	0.751	5.3	28.9	0 K
720 min Winter	180.190	0.690	5.1	25.1	0 K
960 min Winter	180.095	0.595	4.7	19.1	0 K
1440 min Winter	179.991	0.491	3.8	13.0	0 K
2160 min Winter	179.892	0.392	2.9	8.3	0 K
2880 min Winter	179.827	0.327	2.3	5.8	0 K
4320 min Winter	179.749	0.249	1.7	3.3	0 K
5760 min Winter	179.702	0.202	1.4	2.2	0 K
7200 min Winter	179.671	0.171	1.1	1.6	0 K
8640 min Winter	179.648	0.148	1.0	1.2	0 K
10080 min Winter	179.632	0.132	0.9	0.9	0 K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
240 min Winter	11.265	0.0	176
360 min Winter	8.299	0.0	246
480 min Winter	6.674	0.0	314
600 min Winter	5.632	0.0	378
720 min Winter	4.901	0.0	440
960 min Winter	3.933	0.0	556
1440 min Winter	2.881	0.0	794
2160 min Winter	2.107	0.0	1152
2880 min Winter	1.687	0.0	1504
4320 min Winter	1.231	0.0	2212
5760 min Winter	0.984	0.0	2936
7200 min Winter	0.827	0.0	3672
8640 min Winter	0.717	0.0	4408
10080 min Winter	0.636	0.0	5104

.	Bristol Airport 12 mppa
.	Cogloop 2 Car Park- A12
.	Q30

Date 01/08/2018	Designed by RJH
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XP Solutions	Source Control 2018.1
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Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	30	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	20.000	Shortest Storm (mins)	15
Ratio R	0.370	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+0

Time Area Diagram

Total Area (ha) 0.249

Time (mins)	Area	Time (mins)	Area	Time (mins)	Area	Time (mins)	Area
From: To:	(ha)	From: To:	(ha)	From: To:	(ha)	From: To:	(ha)
0 4	0.062	4 8	0.062	8 12	0.062	12 16	0.063

Time Area Diagram

Total Area (ha) 0.000

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

0 4 0.000

Hydrock Consultants Ltd		Page 4
.	Bristol Airport 12 mppa	
.	Cogloop 2 Car Park- A12	
.	Q30	
Date 01/08/2018	Designed by RJH	
File Cog A12.SRCX	Checked by	
XP Solutions	Source Control 2018.1	

Model Details

Storage is Online Cover Level (m) 181.000

Complex Structure

Infiltration Trench

Infiltration Coefficient Base (m/hr)	0.12048	Trench Width (m)	1.8
Infiltration Coefficient Side (m/hr)	0.12048	Trench Length (m)	117.0
Safety Factor	2.0	Slope (1:X)	200.0
Porosity	0.30	Cap Volume Depth (m)	0.000
Invert Level (m)	179.500	Cap Infiltration Depth (m)	0.000

Porous Car Park

Infiltration Coefficient Base (m/hr)	0.12048	Width (m)	20.0
Membrane Percolation (mm/hr)	1000	Length (m)	117.0
Max Percolation (l/s)	650.0	Slope (1:X)	100.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	180.550	Membrane Depth (m)	0

Hydrock Consultants Ltd		Page 1
.	Bristol Airport 12 mppa	
.	Cogloop 2 Car Park- A13	
.	Q30	
Date 01/08/2018	Designed by RJH	
File Cog A13.SRCX	Checked by	
XP Solutions	Source Control 2018.1	

Summary of Results for 30 year Return Period

Half Drain Time : 69 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	180.099	0.599	4.7	19.3	0 K
30 min Summer	180.230	0.730	5.3	27.6	0 K
60 min Summer	180.336	0.836	5.7	34.3	0 K
120 min Summer	180.394	0.894	5.9	38.0	0 K
180 min Summer	180.405	0.905	6.0	38.7	0 K
240 min Summer	180.397	0.897	5.9	38.2	0 K
360 min Summer	180.361	0.861	5.8	35.9	0 K
480 min Summer	180.316	0.816	5.6	33.1	0 K
600 min Summer	180.270	0.770	5.4	30.2	0 K
720 min Summer	180.227	0.727	5.3	27.4	0 K
960 min Summer	180.153	0.653	5.0	22.8	0 K
1440 min Summer	180.056	0.556	4.4	16.7	0 K
2160 min Summer	179.967	0.467	3.6	11.8	0 K
2880 min Summer	179.905	0.405	3.0	8.9	0 K
4320 min Summer	179.823	0.323	2.3	5.6	0 K
5760 min Summer	179.770	0.270	1.9	3.9	0 K
7200 min Summer	179.732	0.232	1.6	2.9	0 K
8640 min Summer	179.704	0.204	1.4	2.2	0 K
10080 min Summer	179.682	0.182	1.2	1.8	0 K
15 min Winter	180.158	0.658	5.0	23.1	0 K
30 min Winter	180.308	0.808	5.6	32.6	0 K
60 min Winter	180.430	0.930	6.1	40.3	0 K
120 min Winter	180.484	0.984	6.3	43.7	0 K
180 min Winter	180.482	0.982	6.3	43.6	0 K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Summer	74.059	0.0	26
30 min Summer	48.833	0.0	38
60 min Summer	30.811	0.0	62
120 min Summer	18.860	0.0	96
180 min Summer	13.992	0.0	128
240 min Summer	11.265	0.0	162
360 min Summer	8.299	0.0	230
480 min Summer	6.674	0.0	296
600 min Summer	5.632	0.0	360
720 min Summer	4.901	0.0	422
960 min Summer	3.933	0.0	542
1440 min Summer	2.881	0.0	778
2160 min Summer	2.107	0.0	1136
2880 min Summer	1.687	0.0	1500
4320 min Summer	1.231	0.0	2212
5760 min Summer	0.984	0.0	2944
7200 min Summer	0.827	0.0	3672
8640 min Summer	0.717	0.0	4400
10080 min Summer	0.636	0.0	5136
15 min Winter	74.059	0.0	27
30 min Winter	48.833	0.0	38
60 min Winter	30.811	0.0	62
120 min Winter	18.860	0.0	100
180 min Winter	13.992	0.0	138

Hydrock Consultants Ltd		Page 2
.	Bristol Airport 12 mppa	
.	Cogloop 2 Car Park- A13	
.	Q30	
Date 01/08/2018	Designed by RJH	
File Cog A13.SRCX	Checked by	
XP Solutions	Source Control 2018.1	

Summary of Results for 30 year Return Period

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
240 min Winter	180.457	0.957	6.2	42.0	0 K
360 min Winter	180.390	0.890	5.9	37.7	0 K
480 min Winter	180.318	0.818	5.6	33.2	0 K
600 min Winter	180.251	0.751	5.3	28.9	0 K
720 min Winter	180.190	0.690	5.1	25.1	0 K
960 min Winter	180.095	0.595	4.7	19.1	0 K
1440 min Winter	179.991	0.491	3.8	13.0	0 K
2160 min Winter	179.892	0.392	2.9	8.3	0 K
2880 min Winter	179.827	0.327	2.3	5.8	0 K
4320 min Winter	179.749	0.249	1.7	3.3	0 K
5760 min Winter	179.702	0.202	1.4	2.2	0 K
7200 min Winter	179.671	0.171	1.1	1.6	0 K
8640 min Winter	179.648	0.148	1.0	1.2	0 K
10080 min Winter	179.632	0.132	0.9	0.9	0 K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
240 min Winter	11.265	0.0	176
360 min Winter	8.299	0.0	246
480 min Winter	6.674	0.0	314
600 min Winter	5.632	0.0	378
720 min Winter	4.901	0.0	440
960 min Winter	3.933	0.0	556
1440 min Winter	2.881	0.0	794
2160 min Winter	2.107	0.0	1152
2880 min Winter	1.687	0.0	1504
4320 min Winter	1.231	0.0	2212
5760 min Winter	0.984	0.0	2936
7200 min Winter	0.827	0.0	3672
8640 min Winter	0.717	0.0	4408
10080 min Winter	0.636	0.0	5104

Hydrock Consultants Ltd		Page 3
.	Bristol Airport 12 mppa	
.	Cogloop 2 Car Park- A13	
.	Q30	
Date 01/08/2018	Designed by RJH	
File Cog A13.SRCX	Checked by	
XP Solutions	Source Control 2018.1	

Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	30	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	20.000	Shortest Storm (mins)	15
Ratio R	0.370	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+0

Time Area Diagram

Total Area (ha) 0.249

Time (mins) From:	To:	Area (ha)	Time (mins) From:	To:	Area (ha)	Time (mins) From:	To:	Area (ha)	Time (mins) From:	To:	Area (ha)
0	4	0.062	4	8	0.062	8	12	0.062	12	16	0.063

Time Area Diagram

Total Area (ha) 0.000

Time (mins) From:	To:	Area (ha)
0	4	0.000

Hydrock Consultants Ltd		Page 4
.	Bristol Airport 12 mppa	
.	Cogloop 2 Car Park- A13	
.	Q30	
Date 01/08/2018	Designed by RJH	
File Cog A13.SRCX	Checked by	
XP Solutions	Source Control 2018.1	

Model Details

Storage is Online Cover Level (m) 181.000

Complex Structure

Infiltration Trench

Infiltration Coefficient Base (m/hr)	0.12048	Trench Width (m)	1.8
Infiltration Coefficient Side (m/hr)	0.12048	Trench Length (m)	117.0
Safety Factor	2.0	Slope (1:X)	200.0
Porosity	0.30	Cap Volume Depth (m)	0.000
Invert Level (m)	179.500	Cap Infiltration Depth (m)	0.000

Porous Car Park

Infiltration Coefficient Base (m/hr)	0.12048	Width (m)	20.0
Membrane Percolation (mm/hr)	1000	Length (m)	117.0
Max Percolation (l/s)	650.0	Slope (1:X)	100.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	180.550	Membrane Depth (m)	0

Hydrock Consultants Ltd		Page 1
.	Bristol Airport 12 mppa	
.	Cogloop 2 Car Park- A14	
.	Q30	
Date 01/08/2018	Designed by RJH	
File Cog A14.SRCX	Checked by	
XP Solutions	Source Control 2018.1	

Summary of Results for 30 year Return Period

Half Drain Time : 73 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	177.646	0.646	4.9	22.3	0 K
30 min Summer	177.773	0.773	5.4	30.4	0 K
60 min Summer	177.871	0.871	5.8	36.6	0 K
120 min Summer	177.918	0.918	6.0	39.5	0 K
180 min Summer	177.920	0.920	6.0	39.6	0 K
240 min Summer	177.904	0.904	6.0	38.6	0 K
360 min Summer	177.858	0.858	5.8	35.7	0 K
480 min Summer	177.807	0.807	5.6	32.5	0 K
600 min Summer	177.759	0.759	5.4	29.5	0 K
720 min Summer	177.715	0.715	5.2	26.7	0 K
960 min Summer	177.642	0.642	4.9	22.1	0 K
1440 min Summer	177.549	0.549	4.3	16.3	0 K
2160 min Summer	177.462	0.462	3.5	11.5	0 K
2880 min Summer	177.400	0.400	3.0	8.7	0 K
4320 min Summer	177.320	0.320	2.3	5.5	0 K
5760 min Summer	177.268	0.268	1.9	3.9	0 K
7200 min Summer	177.231	0.231	1.6	2.9	0 K
8640 min Summer	177.203	0.203	1.4	2.2	0 K
10080 min Summer	177.182	0.182	1.2	1.8	0 K
15 min Winter	177.704	0.704	5.2	26.0	0 K
30 min Winter	177.849	0.849	5.7	35.2	0 K
60 min Winter	177.962	0.962	6.2	42.3	0 K
120 min Winter	178.005	1.005	6.4	45.0	0 K
180 min Winter	177.993	0.993	6.3	44.3	0 K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Summer	74.059	0.0	26
30 min Summer	48.833	0.0	38
60 min Summer	30.811	0.0	60
120 min Summer	18.860	0.0	94
180 min Summer	13.992	0.0	128
240 min Summer	11.265	0.0	162
360 min Summer	8.299	0.0	230
480 min Summer	6.674	0.0	294
600 min Summer	5.632	0.0	358
720 min Summer	4.901	0.0	420
960 min Summer	3.933	0.0	542
1440 min Summer	2.881	0.0	778
2160 min Summer	2.107	0.0	1136
2880 min Summer	1.687	0.0	1500
4320 min Summer	1.231	0.0	2212
5760 min Summer	0.984	0.0	2944
7200 min Summer	0.827	0.0	3672
8640 min Summer	0.717	0.0	4400
10080 min Summer	0.636	0.0	5136
15 min Winter	74.059	0.0	27
30 min Winter	48.833	0.0	38
60 min Winter	30.811	0.0	62
120 min Winter	18.860	0.0	100
180 min Winter	13.992	0.0	138

Hydrock Consultants Ltd		Page 2
.	Bristol Airport 12 mppa	
.	Cogloop 2 Car Park- A14	
.	Q30	
Date 01/08/2018	Designed by RJH	
File Cog A14.SRCX	Checked by	
XP Solutions	Source Control 2018.1	

Summary of Results for 30 year Return Period

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
240 min Winter	177.961	0.961	6.2	42.3	0 K
360 min Winter	177.885	0.885	5.9	37.4	0 K
480 min Winter	177.808	0.808	5.6	32.6	0 K
600 min Winter	177.739	0.739	5.3	28.2	0 K
720 min Winter	177.678	0.678	5.1	24.4	0 K
960 min Winter	177.587	0.587	4.7	18.6	0 K
1440 min Winter	177.485	0.485	3.7	12.7	0 K
2160 min Winter	177.387	0.387	2.8	8.1	0 K
2880 min Winter	177.324	0.324	2.3	5.7	0 K
4320 min Winter	177.247	0.247	1.7	3.3	0 K
5760 min Winter	177.202	0.202	1.4	2.2	0 K
7200 min Winter	177.171	0.171	1.1	1.6	0 K
8640 min Winter	177.149	0.149	1.0	1.2	0 K
10080 min Winter	177.133	0.133	0.9	0.9	0 K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
240 min Winter	11.265	0.0	174
360 min Winter	8.299	0.0	246
480 min Winter	6.674	0.0	312
600 min Winter	5.632	0.0	378
720 min Winter	4.901	0.0	440
960 min Winter	3.933	0.0	554
1440 min Winter	2.881	0.0	794
2160 min Winter	2.107	0.0	1152
2880 min Winter	1.687	0.0	1504
4320 min Winter	1.231	0.0	2212
5760 min Winter	0.984	0.0	2936
7200 min Winter	0.827	0.0	3656
8640 min Winter	0.717	0.0	4344
10080 min Winter	0.636	0.0	5136



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0 4 0.000

Hydrock Consultants Ltd		Page 4
.	Bristol Airport 12 mppa	
.	Cogloop 2 Car Park- A14	
.	Q30	
Date 01/08/2018	Designed by RJH	
File Cog A14.SRCX	Checked by	
XP Solutions	Source Control 2018.1	

Model Details

Storage is Online Cover Level (m) 178.500

Complex Structure

Infiltration Trench

Infiltration Coefficient Base (m/hr)	0.12048	Trench Width (m)	1.8
Infiltration Coefficient Side (m/hr)	0.12048	Trench Length (m)	117.0
Safety Factor	2.0	Slope (1:X)	200.0
Porosity	0.30	Cap Volume Depth (m)	0.000
Invert Level (m)	177.000	Cap Infiltration Depth (m)	0.000

Porous Car Park

Infiltration Coefficient Base (m/hr)	0.12048	Width (m)	12.5
Membrane Percolation (mm/hr)	1000	Length (m)	117.0
Max Percolation (l/s)	406.3	Slope (1:X)	100.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	178.050	Membrane Depth (m)	0

Hydrock Consultants Ltd		Page 1
.	Bristol Airport 12 mppa	
.	Cogloop 2 Car Park- A15	
.	Q30	
Date 01/08/2018	Designed by RJH	
File Cog A15.SRCX	Checked by	
XP Solutions	Source Control 2018.1	

Summary of Results for 30 year Return Period

Half Drain Time : 69 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	180.099	0.599	4.7	19.3	0 K
30 min Summer	180.230	0.730	5.3	27.6	0 K
60 min Summer	180.336	0.836	5.7	34.3	0 K
120 min Summer	180.394	0.894	5.9	38.0	0 K
180 min Summer	180.405	0.905	6.0	38.7	0 K
240 min Summer	180.397	0.897	5.9	38.2	0 K
360 min Summer	180.361	0.861	5.8	35.9	0 K
480 min Summer	180.316	0.816	5.6	33.1	0 K
600 min Summer	180.270	0.770	5.4	30.2	0 K
720 min Summer	180.227	0.727	5.3	27.4	0 K
960 min Summer	180.153	0.653	5.0	22.8	0 K
1440 min Summer	180.056	0.556	4.4	16.7	0 K
2160 min Summer	179.967	0.467	3.6	11.8	0 K
2880 min Summer	179.905	0.405	3.0	8.9	0 K
4320 min Summer	179.823	0.323	2.3	5.6	0 K
5760 min Summer	179.770	0.270	1.9	3.9	0 K
7200 min Summer	179.732	0.232	1.6	2.9	0 K
8640 min Summer	179.704	0.204	1.4	2.2	0 K
10080 min Summer	179.682	0.182	1.2	1.8	0 K
15 min Winter	180.158	0.658	5.0	23.1	0 K
30 min Winter	180.308	0.808	5.6	32.6	0 K
60 min Winter	180.430	0.930	6.1	40.3	0 K
120 min Winter	180.484	0.984	6.3	43.7	0 K
180 min Winter	180.482	0.982	6.3	43.6	0 K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Summer	74.059	0.0	26
30 min Summer	48.833	0.0	38
60 min Summer	30.811	0.0	62
120 min Summer	18.860	0.0	96
180 min Summer	13.992	0.0	128
240 min Summer	11.265	0.0	162
360 min Summer	8.299	0.0	230
480 min Summer	6.674	0.0	296
600 min Summer	5.632	0.0	360
720 min Summer	4.901	0.0	422
960 min Summer	3.933	0.0	542
1440 min Summer	2.881	0.0	778
2160 min Summer	2.107	0.0	1136
2880 min Summer	1.687	0.0	1500
4320 min Summer	1.231	0.0	2212
5760 min Summer	0.984	0.0	2944
7200 min Summer	0.827	0.0	3672
8640 min Summer	0.717	0.0	4400
10080 min Summer	0.636	0.0	5136
15 min Winter	74.059	0.0	27
30 min Winter	48.833	0.0	38
60 min Winter	30.811	0.0	62
120 min Winter	18.860	0.0	100
180 min Winter	13.992	0.0	138

Hydrock Consultants Ltd		Page 2
.	Bristol Airport 12 mppa	
.	Cogloop 2 Car Park- A15	
.	Q30	
Date 01/08/2018	Designed by RJH	
File Cog A15.SRCX	Checked by	
XP Solutions	Source Control 2018.1	

Summary of Results for 30 year Return Period

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
240 min Winter	180.457	0.957	6.2	42.0	0 K
360 min Winter	180.390	0.890	5.9	37.7	0 K
480 min Winter	180.318	0.818	5.6	33.2	0 K
600 min Winter	180.251	0.751	5.3	28.9	0 K
720 min Winter	180.190	0.690	5.1	25.1	0 K
960 min Winter	180.095	0.595	4.7	19.1	0 K
1440 min Winter	179.991	0.491	3.8	13.0	0 K
2160 min Winter	179.892	0.392	2.9	8.3	0 K
2880 min Winter	179.827	0.327	2.3	5.8	0 K
4320 min Winter	179.749	0.249	1.7	3.3	0 K
5760 min Winter	179.702	0.202	1.4	2.2	0 K
7200 min Winter	179.671	0.171	1.1	1.6	0 K
8640 min Winter	179.648	0.148	1.0	1.2	0 K
10080 min Winter	179.632	0.132	0.9	0.9	0 K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
240 min Winter	11.265	0.0	176
360 min Winter	8.299	0.0	246
480 min Winter	6.674	0.0	314
600 min Winter	5.632	0.0	378
720 min Winter	4.901	0.0	440
960 min Winter	3.933	0.0	556
1440 min Winter	2.881	0.0	794
2160 min Winter	2.107	0.0	1152
2880 min Winter	1.687	0.0	1504
4320 min Winter	1.231	0.0	2212
5760 min Winter	0.984	0.0	2936
7200 min Winter	0.827	0.0	3672
8640 min Winter	0.717	0.0	4408
10080 min Winter	0.636	0.0	5104



Micro
Drainage

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Hydrock Consultants Ltd		Page 4
.	Bristol Airport 12 mppa	
.	Cogloop 2 Car Park- A15	
.	Q30	
Date 01/08/2018	Designed by RJH	
File Cog A15.SRCX	Checked by	
XP Solutions	Source Control 2018.1	

Model Details

Storage is Online Cover Level (m) 181.000

Complex Structure

Infiltration Trench

Infiltration Coefficient Base (m/hr)	0.12048	Trench Width (m)	1.8
Infiltration Coefficient Side (m/hr)	0.12048	Trench Length (m)	117.0
Safety Factor	2.0	Slope (1:X)	200.0
Porosity	0.30	Cap Volume Depth (m)	0.000
Invert Level (m)	179.500	Cap Infiltration Depth (m)	0.000

Porous Car Park

Infiltration Coefficient Base (m/hr)	0.12048	Width (m)	20.0
Membrane Percolation (mm/hr)	1000	Length (m)	117.0
Max Percolation (l/s)	650.0	Slope (1:X)	100.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	180.550	Membrane Depth (m)	0

Hydrock Consultants Ltd		Page 1
.	Bristol Airport 12 mppa	
.	Cogloop 2 Car Park- A16	
.	Q30	
Date 01/08/2018	Designed by RJH	
File Cog A16.SRCX	Checked by	
XP Solutions	Source Control 2018.1	

Summary of Results for 30 year Return Period

Half Drain Time : 69 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	180.099	0.599	4.7	19.3	0 K
30 min Summer	180.230	0.730	5.3	27.6	0 K
60 min Summer	180.336	0.836	5.7	34.3	0 K
120 min Summer	180.394	0.894	5.9	38.0	0 K
180 min Summer	180.405	0.905	6.0	38.7	0 K
240 min Summer	180.397	0.897	5.9	38.2	0 K
360 min Summer	180.361	0.861	5.8	35.9	0 K
480 min Summer	180.316	0.816	5.6	33.1	0 K
600 min Summer	180.270	0.770	5.4	30.2	0 K
720 min Summer	180.227	0.727	5.3	27.4	0 K
960 min Summer	180.153	0.653	5.0	22.8	0 K
1440 min Summer	180.056	0.556	4.4	16.7	0 K
2160 min Summer	179.967	0.467	3.6	11.8	0 K
2880 min Summer	179.905	0.405	3.0	8.9	0 K
4320 min Summer	179.823	0.323	2.3	5.6	0 K
5760 min Summer	179.770	0.270	1.9	3.9	0 K
7200 min Summer	179.732	0.232	1.6	2.9	0 K
8640 min Summer	179.704	0.204	1.4	2.2	0 K
10080 min Summer	179.682	0.182	1.2	1.8	0 K
15 min Winter	180.158	0.658	5.0	23.1	0 K
30 min Winter	180.308	0.808	5.6	32.6	0 K
60 min Winter	180.430	0.930	6.1	40.3	0 K
120 min Winter	180.484	0.984	6.3	43.7	0 K
180 min Winter	180.482	0.982	6.3	43.6	0 K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Summer	74.059	0.0	26
30 min Summer	48.833	0.0	38
60 min Summer	30.811	0.0	62
120 min Summer	18.860	0.0	96
180 min Summer	13.992	0.0	128
240 min Summer	11.265	0.0	162
360 min Summer	8.299	0.0	230
480 min Summer	6.674	0.0	296
600 min Summer	5.632	0.0	360
720 min Summer	4.901	0.0	422
960 min Summer	3.933	0.0	542
1440 min Summer	2.881	0.0	778
2160 min Summer	2.107	0.0	1136
2880 min Summer	1.687	0.0	1500
4320 min Summer	1.231	0.0	2212
5760 min Summer	0.984	0.0	2944
7200 min Summer	0.827	0.0	3672
8640 min Summer	0.717	0.0	4400
10080 min Summer	0.636	0.0	5136
15 min Winter	74.059	0.0	27
30 min Winter	48.833	0.0	38
60 min Winter	30.811	0.0	62
120 min Winter	18.860	0.0	100
180 min Winter	13.992	0.0	138

Hydrock Consultants Ltd		Page 2
.	Bristol Airport 12 mppa	
.	Cogloop 2 Car Park- A16	
.	Q30	
Date 01/08/2018	Designed by RJH	
File Cog A16.SRCX	Checked by	
XP Solutions	Source Control 2018.1	

Summary of Results for 30 year Return Period

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
240 min Winter	180.457	0.957	6.2	42.0	0 K
360 min Winter	180.390	0.890	5.9	37.7	0 K
480 min Winter	180.318	0.818	5.6	33.2	0 K
600 min Winter	180.251	0.751	5.3	28.9	0 K
720 min Winter	180.190	0.690	5.1	25.1	0 K
960 min Winter	180.095	0.595	4.7	19.1	0 K
1440 min Winter	179.991	0.491	3.8	13.0	0 K
2160 min Winter	179.892	0.392	2.9	8.3	0 K
2880 min Winter	179.827	0.327	2.3	5.8	0 K
4320 min Winter	179.749	0.249	1.7	3.3	0 K
5760 min Winter	179.702	0.202	1.4	2.2	0 K
7200 min Winter	179.671	0.171	1.1	1.6	0 K
8640 min Winter	179.648	0.148	1.0	1.2	0 K
10080 min Winter	179.632	0.132	0.9	0.9	0 K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
240 min Winter	11.265	0.0	176
360 min Winter	8.299	0.0	246
480 min Winter	6.674	0.0	314
600 min Winter	5.632	0.0	378
720 min Winter	4.901	0.0	440
960 min Winter	3.933	0.0	556
1440 min Winter	2.881	0.0	794
2160 min Winter	2.107	0.0	1152
2880 min Winter	1.687	0.0	1504
4320 min Winter	1.231	0.0	2212
5760 min Winter	0.984	0.0	2936
7200 min Winter	0.827	0.0	3672
8640 min Winter	0.717	0.0	4408
10080 min Winter	0.636	0.0	5104

.	Bristol Airport 12 mppa
.	Cogloop 2 Car Park- A16
.	Q30



Micro
Drainage

Date	01/08/2018
File	Cog A16.SRCX

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Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	30	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	20.000	Shortest Storm (mins)	15
Ratio R	0.370	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+0

Time Area Diagram

Total Area (ha) 0.249

Time (mins) From: To:	Area (ha)	Time (mins) From: To:	Area (ha)	Time (mins) From: To:	Area (ha)	Time (mins) From: To:	Area (ha)
0 4	0.062	4 8	0.062	8 12	0.062	12 16	0.063

Time Area Diagram

Total Area (ha) 0.000

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

0 4 0.000

Hydrock Consultants Ltd		Page 4
.	Bristol Airport 12 mppa	
.	Cogloop 2 Car Park- A16	
.	Q30	
Date 01/08/2018	Designed by RJH	
File Cog A16.SRCX	Checked by	
XP Solutions	Source Control 2018.1	

Model Details

Storage is Online Cover Level (m) 181.000

Complex Structure

Infiltration Trench

Infiltration Coefficient Base (m/hr)	0.12048	Trench Width (m)	1.8
Infiltration Coefficient Side (m/hr)	0.12048	Trench Length (m)	117.0
Safety Factor	2.0	Slope (1:X)	200.0
Porosity	0.30	Cap Volume Depth (m)	0.000
Invert Level (m)	179.500	Cap Infiltration Depth (m)	0.000

Porous Car Park

Infiltration Coefficient Base (m/hr)	0.12048	Width (m)	20.0
Membrane Percolation (mm/hr)	1000	Length (m)	117.0
Max Percolation (l/s)	650.0	Slope (1:X)	100.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	180.550	Membrane Depth (m)	0

Hydrock Consultants Ltd		Page 1
.	Bristol Airport 12 mppa	
.	Cogloop 2 Car Park- A17	
.	Q30	
Date 11/09/2018 15:57	Designed by RJH	
File Cog A17.SRCX	Checked by	
XP Solutions	Source Control 2018.1	

Summary of Results for 30 year Return Period

Half Drain Time : 45 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	172.881	0.381	2.8	7.8	0 K
30 min Summer	172.958	0.458	3.0	11.0	0 K
60 min Summer	173.015	0.515	3.2	13.4	0 K
120 min Summer	173.043	0.543	3.2	14.5	0 K
180 min Summer	173.039	0.539	3.2	14.4	0 K
240 min Summer	173.024	0.524	3.2	13.7	0 K
360 min Summer	172.986	0.486	3.1	12.2	0 K
480 min Summer	172.947	0.447	3.0	10.6	0 K
600 min Summer	172.913	0.413	2.9	9.2	0 K
720 min Summer	172.886	0.386	2.8	8.0	0 K
960 min Summer	172.848	0.348	2.5	6.5	0 K
1440 min Summer	172.791	0.291	2.0	4.6	0 K
2160 min Summer	172.736	0.236	1.6	3.0	0 K
2880 min Summer	172.700	0.200	1.3	2.2	0 K
4320 min Summer	172.653	0.153	1.0	1.3	0 K
5760 min Summer	172.625	0.125	0.8	0.8	0 K
7200 min Summer	172.605	0.105	0.7	0.6	0 K
8640 min Summer	172.592	0.092	0.6	0.5	0 K
10080 min Summer	172.581	0.081	0.5	0.4	0 K
15 min Winter	172.917	0.417	2.9	9.3	0 K
30 min Winter	173.007	0.507	3.1	13.0	0 K
60 min Winter	173.072	0.572	3.3	15.7	0 K
120 min Winter	173.090	0.590	3.3	16.5	0 K
180 min Winter	173.073	0.573	3.3	15.8	0 K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Summer	74.059	0.0	26
30 min Summer	48.833	0.0	36
60 min Summer	30.811	0.0	56
120 min Summer	18.860	0.0	90
180 min Summer	13.992	0.0	124
240 min Summer	11.265	0.0	158
360 min Summer	8.299	0.0	222
480 min Summer	6.674	0.0	284
600 min Summer	5.632	0.0	344
720 min Summer	4.901	0.0	404
960 min Summer	3.933	0.0	524
1440 min Summer	2.881	0.0	764
2160 min Summer	2.107	0.0	1124
2880 min Summer	1.687	0.0	1476
4320 min Summer	1.231	0.0	2208
5760 min Summer	0.984	0.0	2936
7200 min Summer	0.827	0.0	3672
8640 min Summer	0.717	0.0	4392
10080 min Summer	0.636	0.0	5136
15 min Winter	74.059	0.0	26
30 min Winter	48.833	0.0	37
60 min Winter	30.811	0.0	60
120 min Winter	18.860	0.0	96
180 min Winter	13.992	0.0	134

Hydrock Consultants Ltd		Page 2
.	Bristol Airport 12 mppa	
.	Cogloop 2 Car Park- A17	
.	Q30	
Date 11/09/2018 15:57	Designed by RJH	
File Cog A17.SRCX	Checked by	
XP Solutions	Source Control 2018.1	

Summary of Results for 30 year Return Period

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
240 min Winter	173.044	0.544	3.2	14.6	0 K
360 min Winter	172.982	0.482	3.1	12.0	0 K
480 min Winter	172.926	0.426	2.9	9.7	0 K
600 min Winter	172.883	0.383	2.8	7.9	0 K
720 min Winter	172.854	0.354	2.6	6.8	0 K
960 min Winter	172.807	0.307	2.2	5.1	0 K
1440 min Winter	172.743	0.243	1.7	3.2	0 K
2160 min Winter	172.687	0.187	1.3	1.9	0 K
2880 min Winter	172.653	0.153	1.0	1.3	0 K
4320 min Winter	172.613	0.113	0.7	0.7	0 K
5760 min Winter	172.591	0.091	0.6	0.4	0 K
7200 min Winter	172.576	0.076	0.5	0.3	0 K
8640 min Winter	172.566	0.066	0.4	0.2	0 K
10080 min Winter	172.558	0.058	0.4	0.2	0 K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
240 min Winter	11.265	0.0	168
360 min Winter	8.299	0.0	236
480 min Winter	6.674	0.0	298
600 min Winter	5.632	0.0	354
720 min Winter	4.901	0.0	414
960 min Winter	3.933	0.0	534
1440 min Winter	2.881	0.0	772
2160 min Winter	2.107	0.0	1128
2880 min Winter	1.687	0.0	1480
4320 min Winter	1.231	0.0	2204
5760 min Winter	0.984	0.0	2928
7200 min Winter	0.827	0.0	3616
8640 min Winter	0.717	0.0	4312
10080 min Winter	0.636	0.0	5136

.	Bristol Airport 12 mppa
.	Cogloop 2 Car Park- A17
.	Q30

Date 11/09/2018 15:57

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File Cog A17.SRCX

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Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	30	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	20.000	Shortest Storm (mins)	15
Ratio R	0.370	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+0

Time Area Diagram

Total Area (ha) 0.105

Time (mins) From: To:	Area (ha)	Time (mins) From: To:	Area (ha)	Time (mins) From: To:	Area (ha)	Time (mins) From: To:	Area (ha)
0 4	0.026	4 8	0.026	8 12	0.026	12 16	0.027

Time Area Diagram

Total Area (ha) 0.000

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

0 4 0.000

Hydrock Consultants Ltd		Page 4
.	Bristol Airport 12 mppa	
.	Cogloop 2 Car Park- A17	
.	Q30	
Date 11/09/2018 15:57	Designed by RJH	
File Cog A17.SRCX	Checked by	
XP Solutions	Source Control 2018.1	

Model Details

Storage is Online Cover Level (m) 174.000

Complex Structure

Infiltration Trench

Infiltration Coefficient Base (m/hr)	0.12048	Trench Width (m)	1.8
Infiltration Coefficient Side (m/hr)	0.12048	Trench Length (m)	76.5
Safety Factor	2.0	Slope (1:X)	200.0
Porosity	0.30	Cap Volume Depth (m)	0.000
Invert Level (m)	172.500	Cap Infiltration Depth (m)	0.000

Porous Car Park

Infiltration Coefficient Base (m/hr)	0.12048	Width (m)	12.5
Membrane Percolation (mm/hr)	1000	Length (m)	76.5
Max Percolation (l/s)	265.6	Slope (1:X)	100.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	173.550	Membrane Depth (m)	0

Hydrock Consultants Ltd		Page 1
.	Bristol Airport 12 mppa	
.	Cogloop 2 Car Park- A17	
.	Q100 +30%	
Date 12/11/2018	Designed by RJH	
File Cog A17.SRCX	Checked by	
Innovyze	Source Control 2018.1	

Summary of Results for 100 year Return Period (+30%)

Half Drain Time : 80 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	173.097	0.597	3.4	16.7	0 K
30 min Summer	173.247	0.747	3.8	23.0	0 K
60 min Summer	173.363	0.863	4.1	27.8	0 K
120 min Summer	173.413	0.913	4.2	29.8	0 K
180 min Summer	173.408	0.908	4.2	29.6	0 K
240 min Summer	173.384	0.884	4.1	28.6	0 K
360 min Summer	173.326	0.826	4.0	26.2	0 K
480 min Summer	173.265	0.765	3.8	23.7	0 K
600 min Summer	173.208	0.708	3.7	21.4	0 K
720 min Summer	173.157	0.657	3.5	19.2	0 K
960 min Summer	173.070	0.570	3.3	15.6	0 K
1440 min Summer	172.945	0.445	3.0	10.5	0 K
2160 min Summer	172.852	0.352	2.5	6.7	0 K
2880 min Summer	172.801	0.301	2.1	4.9	0 K
4320 min Summer	172.735	0.235	1.6	3.0	0 K
5760 min Summer	172.693	0.193	1.3	2.0	0 K
7200 min Summer	172.664	0.164	1.1	1.5	0 K
8640 min Summer	172.643	0.143	0.9	1.1	0 K
10080 min Summer	172.627	0.127	0.8	0.9	0 K
15 min Winter	173.163	0.663	3.5	19.5	0 K
30 min Winter	173.333	0.833	4.0	26.5	0 K
60 min Winter	173.466	0.966	4.3	32.0	0 K
120 min Winter	173.514	1.014	4.5	34.0	0 K
180 min Winter	173.497	0.997	4.4	33.3	0 K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Summer	124.836	0.0	27
30 min Summer	83.061	0.0	38
60 min Summer	52.662	0.0	62
120 min Summer	32.210	0.0	96
180 min Summer	23.799	0.0	130
240 min Summer	19.065	0.0	164
360 min Summer	13.962	0.0	232
480 min Summer	11.178	0.0	298
600 min Summer	9.399	0.0	362
720 min Summer	8.153	0.0	426
960 min Summer	6.510	0.0	548
1440 min Summer	4.731	0.0	784
2160 min Summer	3.432	0.0	1132
2880 min Summer	2.730	0.0	1484
4320 min Summer	1.973	0.0	2208
5760 min Summer	1.566	0.0	2936
7200 min Summer	1.308	0.0	3672
8640 min Summer	1.129	0.0	4400
10080 min Summer	0.998	0.0	5128
15 min Winter	124.836	0.0	27
30 min Winter	83.061	0.0	38
60 min Winter	52.662	0.0	62
120 min Winter	32.210	0.0	102
180 min Winter	23.799	0.0	138

Hydrock Consultants Ltd		Page 2
.	Bristol Airport 12 mppa	
.	Cogloop 2 Car Park- A17	
.	Q100 +30%	
Date 12/11/2018	Designed by RJH	
File Cog A17.SRCX	Checked by	
Innovyze	Source Control 2018.1	

Summary of Results for 100 year Return Period (+30%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
240 min Winter	173.456	0.956	4.3	31.6	0 K
360 min Winter	173.365	0.865	4.1	27.8	0 K
480 min Winter	173.275	0.775	3.8	24.1	0 K
600 min Winter	173.194	0.694	3.6	20.8	0 K
720 min Winter	173.123	0.623	3.4	17.8	0 K
960 min Winter	173.006	0.506	3.1	13.0	0 K
1440 min Winter	172.870	0.370	2.7	7.4	0 K
2160 min Winter	172.789	0.289	2.0	4.5	0 K
2880 min Winter	172.738	0.238	1.6	3.1	0 K
4320 min Winter	172.678	0.178	1.2	1.7	0 K
5760 min Winter	172.643	0.143	0.9	1.1	0 K
7200 min Winter	172.620	0.120	0.8	0.8	0 K
8640 min Winter	172.604	0.104	0.7	0.6	0 K
10080 min Winter	172.592	0.092	0.6	0.5	0 K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
240 min Winter	19.065	0.0	176
360 min Winter	13.962	0.0	248
480 min Winter	11.178	0.0	316
600 min Winter	9.399	0.0	382
720 min Winter	8.153	0.0	446
960 min Winter	6.510	0.0	568
1440 min Winter	4.731	0.0	786
2160 min Winter	3.432	0.0	1140
2880 min Winter	2.730	0.0	1500
4320 min Winter	1.973	0.0	2208
5760 min Winter	1.566	0.0	2936
7200 min Winter	1.308	0.0	3672
8640 min Winter	1.129	0.0	4360
10080 min Winter	0.998	0.0	5056

Hydrock Consultants Ltd		Page 3
.	Bristol Airport 12 mppa	
.	Cogloop 2 Car Park- A17	
.	Q100 +30%	
Date 12/11/2018	Designed by RJH	
File Cog A17.SRCX	Checked by	
Innovyze	Source Control 2018.1	

Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	100	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	20.000	Shortest Storm (mins)	15
Ratio R	0.370	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+30

Time Area Diagram

Total Area (ha) 0.105

Time (mins) From:	To:	Area (ha)	Time (mins) From:	To:	Area (ha)	Time (mins) From:	To:	Area (ha)	Time (mins) From:	To:	Area (ha)
0	4	0.026	4	8	0.026	8	12	0.026	12	16	0.027

Time Area Diagram

Total Area (ha) 0.000

Time (mins) From:	To:	Area (ha)
0	4	0.000

Hydrock Consultants Ltd		Page 4
.	Bristol Airport 12 mppa	
.	Cogloop 2 Car Park- A17	
.	Q100 +30%	
Date 12/11/2018	Designed by RJH	
File Cog A17.SRCX	Checked by	
Innovyze	Source Control 2018.1	

Model Details

Storage is Online Cover Level (m) 174.000

Complex Structure

Infiltration Trench

Infiltration Coefficient Base (m/hr)	0.12048	Trench Width (m)	1.8
Infiltration Coefficient Side (m/hr)	0.12048	Trench Length (m)	76.5
Safety Factor	2.0	Slope (1:X)	200.0
Porosity	0.30	Cap Volume Depth (m)	0.000
Invert Level (m)	172.500	Cap Infiltration Depth (m)	0.000

Porous Car Park

Infiltration Coefficient Base (m/hr)	0.12048	Width (m)	12.5
Membrane Percolation (mm/hr)	1000	Length (m)	76.5
Max Percolation (l/s)	265.6	Slope (1:X)	100.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	173.550	Membrane Depth (m)	0

Hydrock Consultants Ltd		Page 1
.	Bristol Airport 12 mppa	
.	Cogloop 2 Car Park- A18	
.	Q30	
Date 11/09/2018 15:59	Designed by RJH	
File Cog A18.SRCX	Checked by	
XP Solutions	Source Control 2018.1	

Summary of Results for 30 year Return Period

Half Drain Time : 62 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	172.388	0.588	4.4	18.5	0 K
30 min Summer	172.480	0.680	4.7	23.8	0 K
60 min Summer	172.539	0.739	4.9	27.2	0 K
120 min Summer	172.555	0.755	5.0	28.0	0 K
180 min Summer	172.540	0.740	4.9	27.2	0 K
240 min Summer	172.515	0.715	4.8	25.8	0 K
360 min Summer	172.465	0.665	4.6	22.9	0 K
480 min Summer	172.420	0.620	4.5	20.3	0 K
600 min Summer	172.380	0.580	4.3	18.0	0 K
720 min Summer	172.347	0.547	4.2	16.1	0 K
960 min Summer	172.298	0.498	3.8	13.4	0 K
1440 min Summer	172.227	0.427	3.2	9.9	0 K
2160 min Summer	172.155	0.355	2.6	6.8	0 K
2880 min Summer	172.105	0.305	2.2	5.0	0 K
4320 min Summer	172.041	0.241	1.7	3.1	0 K
5760 min Summer	172.000	0.200	1.3	2.2	0 K
7200 min Summer	171.972	0.172	1.1	1.6	0 K
8640 min Summer	171.951	0.151	1.0	1.2	0 K
10080 min Summer	171.935	0.135	0.9	1.0	0 K
15 min Winter	172.433	0.633	4.5	21.1	0 K
30 min Winter	172.538	0.738	4.9	27.1	0 K
60 min Winter	172.609	0.809	5.2	31.1	0 K
120 min Winter	172.617	0.817	5.2	31.6	0 K
180 min Winter	172.589	0.789	5.1	30.0	0 K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Summer	74.059	0.0	26
30 min Summer	48.833	0.0	36
60 min Summer	30.811	0.0	58
120 min Summer	18.860	0.0	92
180 min Summer	13.992	0.0	126
240 min Summer	11.265	0.0	158
360 min Summer	8.299	0.0	226
480 min Summer	6.674	0.0	288
600 min Summer	5.632	0.0	350
720 min Summer	4.901	0.0	410
960 min Summer	3.933	0.0	530
1440 min Summer	2.881	0.0	772
2160 min Summer	2.107	0.0	1132
2880 min Summer	1.687	0.0	1484
4320 min Summer	1.231	0.0	2208
5760 min Summer	0.984	0.0	2936
7200 min Summer	0.827	0.0	3672
8640 min Summer	0.717	0.0	4400
10080 min Summer	0.636	0.0	5120
15 min Winter	74.059	0.0	26
30 min Winter	48.833	0.0	37
60 min Winter	30.811	0.0	60
120 min Winter	18.860	0.0	98
180 min Winter	13.992	0.0	134

Hydrock Consultants Ltd		Page 2
.	Bristol Airport 12 mppa	
.	Cogloop 2 Car Park- A18	
.	Q30	
Date 11/09/2018 15:59	Designed by RJH	
File Cog A18.SRCX	Checked by	
XP Solutions	Source Control 2018.1	

Summary of Results for 30 year Return Period

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
240 min Winter	172.551	0.751	4.9	27.8	0 K
360 min Winter	172.474	0.674	4.7	23.4	0 K
480 min Winter	172.407	0.607	4.4	19.6	0 K
600 min Winter	172.353	0.553	4.2	16.5	0 K
720 min Winter	172.314	0.514	4.0	14.2	0 K
960 min Winter	172.254	0.454	3.4	11.1	0 K
1440 min Winter	172.170	0.370	2.7	7.4	0 K
2160 min Winter	172.092	0.292	2.1	4.6	0 K
2880 min Winter	172.043	0.243	1.7	3.2	0 K
4320 min Winter	171.984	0.184	1.2	1.8	0 K
5760 min Winter	171.950	0.150	1.0	1.2	0 K
7200 min Winter	171.927	0.127	0.8	0.9	0 K
8640 min Winter	171.911	0.111	0.7	0.7	0 K
10080 min Winter	171.899	0.099	0.6	0.5	0 K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
240 min Winter	11.265	0.0	170
360 min Winter	8.299	0.0	240
480 min Winter	6.674	0.0	304
600 min Winter	5.632	0.0	364
720 min Winter	4.901	0.0	424
960 min Winter	3.933	0.0	546
1440 min Winter	2.881	0.0	784
2160 min Winter	2.107	0.0	1140
2880 min Winter	1.687	0.0	1500
4320 min Winter	1.231	0.0	2208
5760 min Winter	0.984	0.0	2936
7200 min Winter	0.827	0.0	3672
8640 min Winter	0.717	0.0	4400
10080 min Winter	0.636	0.0	5064

Hydrock Consultants Ltd		Page 3
.	Bristol Airport 12 mppa	
.	Cogloop 2 Car Park- A18	
.	Q30	
Date 11/09/2018 15:59	Designed by RJH	
File Cog A18.SRCX	Checked by	
XP Solutions	Source Control 2018.1	

Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	30	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	20.000	Shortest Storm (mins)	15
Ratio R	0.370	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+0

Time Area Diagram

Total Area (ha) 0.171

Time (mins) From:	To:	Area (ha)	Time (mins) From:	To:	Area (ha)	Time (mins) From:	To:	Area (ha)	Time (mins) From:	To:	Area (ha)
0	4	0.043	4	8	0.043	8	12	0.043	12	16	0.042

Time Area Diagram

Total Area (ha) 0.000

Time (mins) From:	To:	Area (ha)
0	4	0.000

Hydrock Consultants Ltd		Page 4
.	Bristol Airport 12 mppa	
.	Cogloop 2 Car Park- A18	
.	Q30	
Date 11/09/2018 15:59	Designed by RJH	
File Cog A18.SRCX	Checked by	
XP Solutions	Source Control 2018.1	

Model Details

Storage is Online Cover Level (m) 173.300

Complex Structure

Infiltration Trench

Infiltration Coefficient Base (m/hr)	0.12048	Trench Width (m)	1.8
Infiltration Coefficient Side (m/hr)	0.12048	Trench Length (m)	106.0
Safety Factor	2.0	Slope (1:X)	200.0
Porosity	0.30	Cap Volume Depth (m)	0.000
Invert Level (m)	171.800	Cap Infiltration Depth (m)	0.000

Porous Car Park

Infiltration Coefficient Base (m/hr)	0.12048	Width (m)	10.0
Membrane Percolation (mm/hr)	1000	Length (m)	24.9
Max Percolation (l/s)	69.2	Slope (1:X)	100.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	172.850	Membrane Depth (m)	0

Hydrock Consultants Ltd		Page 1
.	Bristol Airport 12 mppa	
.	Cogloop 2 Car Park- A19	
.	Q30	
Date 11/09/2018 16:15	Designed by RJH	
File Cog A19.SRCX	Checked by	
XP Solutions	Source Control 2018.1	

Summary of Results for 30 year Return Period

Half Drain Time : 73 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	177.825	0.625	2.8	15.5	0 K
30 min Summer	177.953	0.753	3.1	19.7	0 K
60 min Summer	178.038	0.838	3.3	22.5	0 K
120 min Summer	178.057	0.857	3.3	23.2	0 K
180 min Summer	178.038	0.838	3.3	22.5	0 K
240 min Summer	178.008	0.808	3.2	21.5	0 K
360 min Summer	177.946	0.746	3.1	19.5	0 K
480 min Summer	177.887	0.687	3.0	17.6	0 K
600 min Summer	177.834	0.634	2.8	15.8	0 K
720 min Summer	177.786	0.586	2.7	14.2	0 K
960 min Summer	177.704	0.504	2.6	11.6	0 K
1440 min Summer	177.585	0.385	2.3	7.7	0 K
2160 min Summer	177.493	0.293	2.1	4.6	0 K
2880 min Summer	177.450	0.250	1.7	3.4	0 K
4320 min Summer	177.396	0.196	1.3	2.1	0 K
5760 min Summer	177.362	0.162	1.1	1.4	0 K
7200 min Summer	177.339	0.139	0.9	1.0	0 K
8640 min Summer	177.321	0.121	0.8	0.8	0 K
10080 min Summer	177.309	0.109	0.7	0.6	0 K
15 min Winter	177.888	0.688	3.0	17.6	0 K
30 min Winter	178.035	0.835	3.3	22.4	0 K
60 min Winter	178.137	0.937	3.5	25.8	0 K
120 min Winter	178.156	0.956	3.5	26.4	0 K
180 min Winter	178.124	0.924	3.4	25.4	0 K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Summer	74.059	0.0	26
30 min Summer	48.833	0.0	37
60 min Summer	30.811	0.0	60
120 min Summer	18.860	0.0	94
180 min Summer	13.992	0.0	128
240 min Summer	11.265	0.0	164
360 min Summer	8.299	0.0	230
480 min Summer	6.674	0.0	296
600 min Summer	5.632	0.0	362
720 min Summer	4.901	0.0	424
960 min Summer	3.933	0.0	548
1440 min Summer	2.881	0.0	784
2160 min Summer	2.107	0.0	1128
2880 min Summer	1.687	0.0	1480
4320 min Summer	1.231	0.0	2208
5760 min Summer	0.984	0.0	2936
7200 min Summer	0.827	0.0	3672
8640 min Summer	0.717	0.0	4400
10080 min Summer	0.636	0.0	5120
15 min Winter	74.059	0.0	27
30 min Winter	48.833	0.0	38
60 min Winter	30.811	0.0	62
120 min Winter	18.860	0.0	100
180 min Winter	13.992	0.0	138

Hydrock Consultants Ltd		Page 2
.	Bristol Airport 12 mppa	
.	Cogloop 2 Car Park- A19	
.	Q30	
Date 11/09/2018 16:15	Designed by RJH	
File Cog A19.SRCX	Checked by	
XP Solutions	Source Control 2018.1	

Summary of Results for 30 year Return Period

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
240 min Winter	178.077	0.877	3.4	23.8	0 K
360 min Winter	177.983	0.783	3.2	20.7	0 K
480 min Winter	177.896	0.696	3.0	17.8	0 K
600 min Winter	177.819	0.619	2.8	15.3	0 K
720 min Winter	177.751	0.551	2.7	13.1	0 K
960 min Winter	177.640	0.440	2.4	9.5	0 K
1440 min Winter	177.504	0.304	2.1	5.0	0 K
2160 min Winter	177.437	0.237	1.6	3.0	0 K
2880 min Winter	177.396	0.196	1.3	2.1	0 K
4320 min Winter	177.348	0.148	1.0	1.2	0 K
5760 min Winter	177.321	0.121	0.8	0.8	0 K
7200 min Winter	177.302	0.102	0.7	0.6	0 K
8640 min Winter	177.289	0.089	0.6	0.4	0 K
10080 min Winter	177.280	0.080	0.5	0.3	0 K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
240 min Winter	11.265	0.0	176
360 min Winter	8.299	0.0	248
480 min Winter	6.674	0.0	316
600 min Winter	5.632	0.0	382
720 min Winter	4.901	0.0	446
960 min Winter	3.933	0.0	570
1440 min Winter	2.881	0.0	778
2160 min Winter	2.107	0.0	1132
2880 min Winter	1.687	0.0	1484
4320 min Winter	1.231	0.0	2208
5760 min Winter	0.984	0.0	2936
7200 min Winter	0.827	0.0	3656
8640 min Winter	0.717	0.0	4400
10080 min Winter	0.636	0.0	5096

Hydrock Consultants Ltd		Page 3
.	Bristol Airport 12 mppa	
.	Cogloop 2 Car Park- A19	
.	Q30	
Date 11/09/2018 16:15	Designed by RJH	
File Cog A19.SRCX	Checked by	
XP Solutions	Source Control 2018.1	

Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	30	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	20.000	Shortest Storm (mins)	15
Ratio R	0.370	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+0

Time Area Diagram

Total Area (ha) 0.134

Time (mins) From:	To:	Area (ha)	Time (mins) From:	To:	Area (ha)	Time (mins) From:	To:	Area (ha)	Time (mins) From:	To:	Area (ha)
0	4	0.033	4	8	0.033	8	12	0.034	12	16	0.034

Time Area Diagram

Total Area (ha) 0.000

Time (mins) From:	To:	Area (ha)
0	4	0.000

Hydrock Consultants Ltd		Page 4
.	Bristol Airport 12 mppa	
.	Cogloop 2 Car Park- A19	
.	Q30	
Date 11/09/2018 16:15	Designed by RJH	
File Cog A19.SRCX	Checked by	
XP Solutions	Source Control 2018.1	

Model Details

Storage is Online Cover Level (m) 179.200

Infiltration Trench Structure

Infiltration Coefficient Base (m/hr)	0.12048	Trench Width (m)	1.8
Infiltration Coefficient Side (m/hr)	0.12048	Trench Length (m)	60.8
Safety Factor	2.0	Slope (1:X)	200.0
Porosity	0.30	Cap Volume Depth (m)	0.000
Invert Level (m)	177.200	Cap Infiltration Depth (m)	0.000

Hydrock Consultants Ltd		Page 1
.	Bristol Airport 12 mppa	
.	Cogloop 2 Car Park- A20	
.	Q30	
Date 10/09/2018 16:36	Designed by RJH	
File Cog A20.SRCX	Checked by	
XP Solutions	Source Control 2018.1	

Summary of Results for 30 year Return Period

Half Drain Time : 46 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	173.276	0.376	1.9	6.7	0 K
30 min Summer	173.342	0.442	2.0	8.5	0 K
60 min Summer	173.376	0.476	2.1	9.4	0 K
120 min Summer	173.372	0.472	2.1	9.3	0 K
180 min Summer	173.349	0.449	2.0	8.7	0 K
240 min Summer	173.323	0.423	2.0	8.0	0 K
360 min Summer	173.276	0.376	1.9	6.7	0 K
480 min Summer	173.235	0.335	1.9	5.7	0 K
600 min Summer	173.202	0.302	1.8	4.8	0 K
720 min Summer	173.174	0.274	1.7	4.0	0 K
960 min Summer	173.138	0.238	1.6	3.1	0 K
1440 min Summer	173.095	0.195	1.3	2.1	0 K
2160 min Summer	173.056	0.156	1.0	1.3	0 K
2880 min Summer	173.030	0.130	0.8	0.9	0 K
4320 min Summer	172.999	0.099	0.6	0.5	0 K
5760 min Summer	172.980	0.080	0.5	0.3	0 K
7200 min Summer	172.968	0.068	0.4	0.2	0 K
8640 min Summer	172.959	0.059	0.4	0.2	0 K
10080 min Summer	172.953	0.053	0.3	0.1	0 K
15 min Winter	173.311	0.411	2.0	7.7	0 K
30 min Winter	173.387	0.487	2.1	9.7	0 K
60 min Winter	173.428	0.528	2.2	10.8	0 K
120 min Winter	173.416	0.516	2.2	10.5	0 K
180 min Winter	173.380	0.480	2.1	9.5	0 K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Summer	74.059	0.0	25
30 min Summer	48.833	0.0	35
60 min Summer	30.811	0.0	56
120 min Summer	18.860	0.0	90
180 min Summer	13.992	0.0	122
240 min Summer	11.265	0.0	156
360 min Summer	8.299	0.0	222
480 min Summer	6.674	0.0	284
600 min Summer	5.632	0.0	344
720 min Summer	4.901	0.0	402
960 min Summer	3.933	0.0	516
1440 min Summer	2.881	0.0	754
2160 min Summer	2.107	0.0	1112
2880 min Summer	1.687	0.0	1472
4320 min Summer	1.231	0.0	2204
5760 min Summer	0.984	0.0	2936
7200 min Summer	0.827	0.0	3608
8640 min Summer	0.717	0.0	4336
10080 min Summer	0.636	0.0	5032
15 min Winter	74.059	0.0	26
30 min Winter	48.833	0.0	36
60 min Winter	30.811	0.0	58
120 min Winter	18.860	0.0	96
180 min Winter	13.992	0.0	132

Hydrock Consultants Ltd		Page 2
.	Bristol Airport 12 mppa	
.	Cogloop 2 Car Park- A20	
.	Q30	
Date 10/09/2018 16:36	Designed by RJH	
File Cog A20.SRCX	Checked by	
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Summary of Results for 30 year Return Period

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
240 min Winter	173.340	0.440	2.0	8.4	0 K
360 min Winter	173.268	0.368	1.9	6.5	0 K
480 min Winter	173.210	0.310	1.8	5.0	0 K
600 min Winter	173.165	0.265	1.7	3.8	0 K
720 min Winter	173.138	0.238	1.6	3.1	0 K
960 min Winter	173.103	0.203	1.4	2.2	0 K
1440 min Winter	173.058	0.158	1.0	1.4	0 K
2160 min Winter	173.020	0.120	0.8	0.8	0 K
2880 min Winter	172.998	0.098	0.6	0.5	0 K
4320 min Winter	172.973	0.073	0.5	0.3	0 K
5760 min Winter	172.959	0.059	0.4	0.2	0 K
7200 min Winter	172.950	0.050	0.3	0.1	0 K
8640 min Winter	172.947	0.047	0.3	0.1	0 K
10080 min Winter	172.944	0.044	0.2	0.1	0 K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
240 min Winter	11.265	0.0	168
360 min Winter	8.299	0.0	234
480 min Winter	6.674	0.0	296
600 min Winter	5.632	0.0	352
720 min Winter	4.901	0.0	406
960 min Winter	3.933	0.0	524
1440 min Winter	2.881	0.0	760
2160 min Winter	2.107	0.0	1112
2880 min Winter	1.687	0.0	1476
4320 min Winter	1.231	0.0	2200
5760 min Winter	0.984	0.0	2920
7200 min Winter	0.827	0.0	3624
8640 min Winter	0.717	0.0	4392
10080 min Winter	0.636	0.0	5120

Hydrock Consultants Ltd		Page 3
.	Bristol Airport 12 mppa	
.	Cogloop 2 Car Park- A20	
.	Q30	
Date 10/09/2018 16:36	Designed by RJH	
File Cog A20.SRCX	Checked by	
XP Solutions	Source Control 2018.1	

Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	30	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	20.000	Shortest Storm (mins)	15
Ratio R	0.370	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+0

Time Area Diagram

Total Area (ha) 0.063

Time (mins) From:	To:	Area (ha)	Time (mins) From:	To:	Area (ha)	Time (mins) From:	To:	Area (ha)	Time (mins) From:	To:	Area (ha)
0	4	0.016	4	8	0.016	8	12	0.016	12	16	0.015

Time Area Diagram

Total Area (ha) 0.000

Time (mins) From:	To:	Area (ha)
0	4	0.000

Hydrock Consultants Ltd		Page 4
.	Bristol Airport 12 mppa	
.	Cogloop 2 Car Park- A20	
.	Q30	
Date 10/09/2018 16:36	Designed by RJH	
File Cog A20.SRCX	Checked by	
XP Solutions	Source Control 2018.1	

Model Details

Storage is Online Cover Level (m) 175.400

Infiltration Trench Structure

Infiltration Coefficient Base (m/hr)	0.12048	Trench Width (m)	1.8
Infiltration Coefficient Side (m/hr)	0.12048	Trench Length (m)	49.4
Safety Factor	2.0	Slope (1:X)	200.0
Porosity	0.30	Cap Volume Depth (m)	0.000
Invert Level (m)	172.900	Cap Infiltration Depth (m)	0.000

Hydrock Consultants Ltd		Page 1
.	Bristol Airport 12 mppa	
.	Cogloop 2 Car Park- A21	
.	Q30	
Date 11/09/2018 16:23	Designed by RJH	
File Cog A21.SRCX	Checked by	
XP Solutions	Source Control 2018.1	

Summary of Results for 30 year Return Period

Half Drain Time : 57 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	173.239	0.939	1.5	11.6	0 K
30 min Summer	173.415	1.115	2.8	14.6	0 K
60 min Summer	173.455	1.155	3.5	16.1	0 K
120 min Summer	173.468	1.168	3.7	16.7	0 K
180 min Summer	173.463	1.163	3.6	16.5	0 K
240 min Summer	173.453	1.153	3.4	16.0	0 K
360 min Summer	173.431	1.131	3.0	15.1	0 K
480 min Summer	173.411	1.111	2.7	14.5	0 K
600 min Summer	173.396	1.096	2.3	14.0	0 K
720 min Summer	173.380	1.080	1.9	13.6	0 K
960 min Summer	173.284	0.984	1.6	12.2	0 K
1440 min Summer	173.079	0.779	1.4	9.5	0 K
2160 min Summer	172.859	0.559	1.2	6.6	0 K
2880 min Summer	172.704	0.404	1.0	4.5	0 K
4320 min Summer	172.510	0.210	0.9	2.0	0 K
5760 min Summer	172.422	0.122	0.8	0.8	0 K
7200 min Summer	172.404	0.104	0.7	0.6	0 K
8640 min Summer	172.390	0.090	0.6	0.4	0 K
10080 min Summer	172.381	0.081	0.5	0.4	0 K
15 min Winter	173.356	1.056	1.6	13.2	0 K
30 min Winter	173.457	1.157	3.5	16.2	0 K
60 min Winter	173.492	1.192	4.1	18.0	0 K
120 min Winter	173.498	1.198	4.2	18.3	0 K
180 min Winter	173.487	1.187	4.0	17.7	0 K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Summer	74.059	0.0	24
30 min Summer	48.833	0.0	34
60 min Summer	30.811	0.0	52
120 min Summer	18.860	0.0	84
180 min Summer	13.992	0.0	118
240 min Summer	11.265	0.0	152
360 min Summer	8.299	0.0	218
480 min Summer	6.674	0.0	286
600 min Summer	5.632	0.0	352
720 min Summer	4.901	0.0	426
960 min Summer	3.933	0.0	566
1440 min Summer	2.881	0.0	816
2160 min Summer	2.107	0.0	1188
2880 min Summer	1.687	0.0	1540
4320 min Summer	1.231	0.0	2252
5760 min Summer	0.984	0.0	2936
7200 min Summer	0.827	0.0	3656
8640 min Summer	0.717	0.0	4400
10080 min Summer	0.636	0.0	5080
15 min Winter	74.059	0.0	24
30 min Winter	48.833	0.0	34
60 min Winter	30.811	0.0	54
120 min Winter	18.860	0.0	90
180 min Winter	13.992	0.0	124

Hydrock Consultants Ltd		Page 2
.	Bristol Airport 12 mppa	
.	Cogloop 2 Car Park- A21	
.	Q30	
Date 11/09/2018 16:23	Designed by RJH	
File Cog A21.SRCX	Checked by	
XP Solutions	Source Control 2018.1	

Summary of Results for 30 year Return Period

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
240 min Winter	173.472	1.172	3.8	16.9	0 K
360 min Winter	173.443	1.143	3.2	15.6	0 K
480 min Winter	173.418	1.118	2.8	14.7	0 K
600 min Winter	173.399	1.099	2.4	14.1	0 K
720 min Winter	173.382	1.082	2.0	13.7	0 K
960 min Winter	173.255	0.955	1.5	11.8	0 K
1440 min Winter	172.986	0.686	1.3	8.3	0 K
2160 min Winter	172.717	0.417	1.1	4.7	0 K
2880 min Winter	172.543	0.243	0.9	2.4	0 K
4320 min Winter	172.411	0.111	0.7	0.7	0 K
5760 min Winter	172.390	0.090	0.6	0.4	0 K
7200 min Winter	172.376	0.076	0.5	0.3	0 K
8640 min Winter	172.366	0.066	0.4	0.2	0 K
10080 min Winter	172.359	0.059	0.4	0.2	0 K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
240 min Winter	11.265	0.0	160
360 min Winter	8.299	0.0	226
480 min Winter	6.674	0.0	294
600 min Winter	5.632	0.0	362
720 min Winter	4.901	0.0	442
960 min Winter	3.933	0.0	596
1440 min Winter	2.881	0.0	854
2160 min Winter	2.107	0.0	1220
2880 min Winter	1.687	0.0	1584
4320 min Winter	1.231	0.0	2208
5760 min Winter	0.984	0.0	2888
7200 min Winter	0.827	0.0	3640
8640 min Winter	0.717	0.0	4344
10080 min Winter	0.636	0.0	5120

Hydrock Consultants Ltd		Page 3
.	Bristol Airport 12 mppa	
.	Cogloop 2 Car Park- A21	
.	Q30	
Date 11/09/2018 16:23	Designed by RJH	
File Cog A21.SRCX	Checked by	
XP Solutions	Source Control 2018.1	

Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	30	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	20.000	Shortest Storm (mins)	15
Ratio R	0.370	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+0

Time Area Diagram

Total Area (ha) 0.099

Time (mins)	Area	Time (mins)	Area	Time (mins)	Area
From: To: (ha)		From: To: (ha)		From: To: (ha)	
0 4	0.033	4 8	0.033	8 12	0.033

Time Area Diagram

Total Area (ha) 0.000

Time (mins)	Area
From: To: (ha)	
0 4	0.000

Hydrock Consultants Ltd		Page 4
.	Bristol Airport 12 mppa	
.	Cogloop 2 Car Park- A21	
.	Q30	
Date 11/09/2018 16:23	Designed by RJH	
File Cog A21.SRCX	Checked by	
XP Solutions	Source Control 2018.1	

Model Details

Storage is Online Cover Level (m) 174.300

Complex Structure

Infiltration Trench

Infiltration Coefficient Base (m/hr)	0.12048	Trench Width (m)	1.8
Infiltration Coefficient Side (m/hr)	0.12048	Trench Length (m)	24.5
Safety Factor	2.0	Slope (1:X)	200.0
Porosity	0.30	Cap Volume Depth (m)	0.000
Invert Level (m)	172.300	Cap Infiltration Depth (m)	0.000

Porous Car Park

Infiltration Coefficient Base (m/hr)	0.12048	Width (m)	10.0
Membrane Percolation (mm/hr)	1000	Length (m)	15.6
Max Percolation (l/s)	43.3	Slope (1:X)	100.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	173.350	Membrane Depth (m)	0

Hydrock Consultants Ltd		Page 1
.	Bristol Airport 12 mppa	
.	Cogloop 2 Car Park- A21	
.	Q100 +30%	
Date 12/11/2018	Designed by RJH	
File Cog A21.SRCX	Checked by	
Innovyze	Source Control 2018.1	

Summary of Results for 100 year Return Period (+30%)

Half Drain Time : 73 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	173.519	1.219	4.4	19.6	0 K
30 min Summer	173.608	1.308	4.4	24.9	0 K
60 min Summer	173.671	1.371	4.5	28.7	0 K
120 min Summer	173.699	1.399	4.5	30.4	0 K
180 min Summer	173.692	1.392	4.5	30.0	0 K
240 min Summer	173.672	1.372	4.5	28.8	0 K
360 min Summer	173.628	1.328	4.5	26.1	0 K
480 min Summer	173.585	1.285	4.4	23.5	0 K
600 min Summer	173.548	1.248	4.4	21.3	0 K
720 min Summer	173.519	1.219	4.4	19.6	0 K
960 min Summer	173.485	1.185	4.0	17.6	0 K
1440 min Summer	173.439	1.139	3.2	15.5	0 K
2160 min Summer	173.395	1.095	2.3	14.0	0 K
2880 min Summer	173.307	1.007	1.6	12.5	0 K
4320 min Summer	172.966	0.666	1.3	8.0	0 K
5760 min Summer	172.746	0.446	1.1	5.1	0 K
7200 min Summer	172.595	0.295	0.9	3.1	0 K
8640 min Summer	172.492	0.192	0.9	1.7	0 K
10080 min Summer	172.427	0.127	0.8	0.9	0 K
15 min Winter	173.561	1.261	4.4	22.1	0 K
30 min Winter	173.665	1.365	4.5	28.3	0 K
60 min Winter	173.742	1.442	4.6	33.0	0 K
120 min Winter	173.765	1.465	4.6	34.3	0 K
180 min Winter	173.746	1.446	4.6	33.2	0 K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Summer	124.836	0.0	22
30 min Summer	83.061	0.0	34
60 min Summer	52.662	0.0	58
120 min Summer	32.210	0.0	90
180 min Summer	23.799	0.0	124
240 min Summer	19.065	0.0	158
360 min Summer	13.962	0.0	224
480 min Summer	11.178	0.0	286
600 min Summer	9.399	0.0	346
720 min Summer	8.153	0.0	402
960 min Summer	6.510	0.0	520
1440 min Summer	4.731	0.0	764
2160 min Summer	3.432	0.0	1140
2880 min Summer	2.730	0.0	1564
4320 min Summer	1.973	0.0	2296
5760 min Summer	1.566	0.0	3008
7200 min Summer	1.308	0.0	3744
8640 min Summer	1.129	0.0	4416
10080 min Summer	0.998	0.0	5136
15 min Winter	124.836	0.0	23
30 min Winter	83.061	0.0	35
60 min Winter	52.662	0.0	60
120 min Winter	32.210	0.0	98
180 min Winter	23.799	0.0	134

Hydrock Consultants Ltd		Page 2
.	Bristol Airport 12 mppa	
.	Cogloop 2 Car Park- A21	
.	Q100 +30%	
Date 12/11/2018	Designed by RJH	
File Cog A21.SRCX	Checked by	
Innovyze	Source Control 2018.1	

Summary of Results for 100 year Return Period (+30%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
240 min Winter	173.712	1.412	4.5	31.1	0 K
360 min Winter	173.640	1.340	4.5	26.9	0 K
480 min Winter	173.575	1.275	4.4	22.9	0 K
600 min Winter	173.524	1.224	4.4	19.9	0 K
720 min Winter	173.495	1.195	4.2	18.2	0 K
960 min Winter	173.458	1.158	3.5	16.2	0 K
1440 min Winter	173.409	1.109	2.7	14.4	0 K
2160 min Winter	173.368	1.068	1.7	13.4	0 K
2880 min Winter	173.097	0.797	1.4	9.7	0 K
4320 min Winter	172.732	0.432	1.1	4.9	0 K
5760 min Winter	172.516	0.216	0.9	2.0	0 K
7200 min Winter	172.418	0.118	0.8	0.7	0 K
8640 min Winter	172.402	0.102	0.7	0.6	0 K
10080 min Winter	172.391	0.091	0.6	0.4	0 K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
240 min Winter	19.065	0.0	170
360 min Winter	13.962	0.0	238
480 min Winter	11.178	0.0	300
600 min Winter	9.399	0.0	354
720 min Winter	8.153	0.0	408
960 min Winter	6.510	0.0	528
1440 min Winter	4.731	0.0	766
2160 min Winter	3.432	0.0	1216
2880 min Winter	2.730	0.0	1620
4320 min Winter	1.973	0.0	2340
5760 min Winter	1.566	0.0	3056
7200 min Winter	1.308	0.0	3632
8640 min Winter	1.129	0.0	4400
10080 min Winter	0.998	0.0	5088

Hydrock Consultants Ltd		Page 3
.	Bristol Airport 12 mppa	
.	Cogloop 2 Car Park- A21	
.	Q100 +30%	
Date 12/11/2018	Designed by RJH	
File Cog A21.SRCX	Checked by	
Innovyze	Source Control 2018.1	

Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	100	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	20.000	Shortest Storm (mins)	15
Ratio R	0.370	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+30

Time Area Diagram

Total Area (ha) 0.099

Time (mins)	Area	Time (mins)	Area	Time (mins)	Area
From: To: (ha)		From: To: (ha)		From: To: (ha)	
0 4	0.033	4 8	0.033	8 12	0.033

Time Area Diagram

Total Area (ha) 0.000

Time (mins)	Area
From: To: (ha)	
0 4	0.000

Hydrock Consultants Ltd		Page 4
.	Bristol Airport 12 mppa	
.	Cogloop 2 Car Park- A21	
.	Q100 +30%	
Date 12/11/2018	Designed by RJH	
File Cog A21.SRCX	Checked by	
Innovyze	Source Control 2018.1	

Model Details

Storage is Online Cover Level (m) 174.300

Complex Structure

Infiltration Trench

Infiltration Coefficient Base (m/hr)	0.12048	Trench Width (m)	1.8
Infiltration Coefficient Side (m/hr)	0.12048	Trench Length (m)	24.5
Safety Factor	2.0	Slope (1:X)	200.0
Porosity	0.30	Cap Volume Depth (m)	0.000
Invert Level (m)	172.300	Cap Infiltration Depth (m)	0.000

Porous Car Park

Infiltration Coefficient Base (m/hr)	0.12048	Width (m)	10.0
Membrane Percolation (mm/hr)	1000	Length (m)	15.6
Max Percolation (l/s)	43.3	Slope (1:X)	100.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	173.350	Membrane Depth (m)	0

Hydrock Consultants Ltd		Page 1
.	Bristol Airport 12 mppa	
.	Cogloop 2 Car Park- A22	
.	Q30	
Date 01/08/2018	Designed by RJH	
File Cog A22.SRCX	Checked by	
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Summary of Results for 30 year Return Period

Half Drain Time : 66 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	177.886	0.886	2.0	10.6	0 K
30 min Summer	177.995	0.995	2.4	13.4	0 K
60 min Summer	178.060	1.060	2.6	15.2	0 K
120 min Summer	178.080	1.080	2.6	15.8	0 K
180 min Summer	178.070	1.070	2.6	15.5	0 K
240 min Summer	178.050	1.050	2.5	14.9	0 K
360 min Summer	178.006	1.006	2.4	13.7	0 K
480 min Summer	177.963	0.963	2.3	12.5	0 K
600 min Summer	177.923	0.923	2.1	11.5	0 K
720 min Summer	177.887	0.887	2.0	10.6	0 K
960 min Summer	177.824	0.824	1.8	9.2	0 K
1440 min Summer	177.725	0.725	1.6	7.1	0 K
2160 min Summer	177.620	0.620	1.3	5.2	0 K
2880 min Summer	177.545	0.545	1.1	4.0	0 K
4320 min Summer	177.443	0.443	0.8	2.7	0 K
5760 min Summer	177.377	0.377	0.7	1.9	0 K
7200 min Summer	177.330	0.330	0.6	1.5	0 K
8640 min Summer	177.293	0.293	0.5	1.2	0 K
10080 min Summer	177.265	0.265	0.5	0.9	0 K
15 min Winter	177.941	0.941	2.2	11.9	0 K
30 min Winter	178.057	1.057	2.6	15.1	0 K
60 min Winter	178.129	1.129	2.8	17.2	0 K
120 min Winter	178.142	1.142	2.8	17.6	0 K
180 min Winter	178.122	1.122	2.8	17.0	0 K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Summer	74.059	0.0	26
30 min Summer	48.833	0.0	37
60 min Summer	30.811	0.0	58
120 min Summer	18.860	0.0	92
180 min Summer	13.992	0.0	126
240 min Summer	11.265	0.0	158
360 min Summer	8.299	0.0	226
480 min Summer	6.674	0.0	290
600 min Summer	5.632	0.0	354
720 min Summer	4.901	0.0	418
960 min Summer	3.933	0.0	542
1440 min Summer	2.881	0.0	786
2160 min Summer	2.107	0.0	1148
2880 min Summer	1.687	0.0	1504
4320 min Summer	1.231	0.0	2216
5760 min Summer	0.984	0.0	2944
7200 min Summer	0.827	0.0	3672
8640 min Summer	0.717	0.0	4408
10080 min Summer	0.636	0.0	5136
15 min Winter	74.059	0.0	26
30 min Winter	48.833	0.0	37
60 min Winter	30.811	0.0	60
120 min Winter	18.860	0.0	96
180 min Winter	13.992	0.0	134

Hydrock Consultants Ltd		Page 2
.	Bristol Airport 12 mppa	
.	Cogloop 2 Car Park- A22	
.	Q30	
Date 01/08/2018	Designed by RJH	
File Cog A22.SRCX	Checked by	
XP Solutions	Source Control 2018.1	

Summary of Results for 30 year Return Period

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
240 min Winter	178.090	1.090	2.7	16.0	0 K
360 min Winter	178.025	1.025	2.5	14.2	0 K
480 min Winter	177.963	0.963	2.3	12.5	0 K
600 min Winter	177.909	0.909	2.1	11.1	0 K
720 min Winter	177.860	0.860	1.9	10.0	0 K
960 min Winter	177.777	0.777	1.7	8.2	0 K
1440 min Winter	177.655	0.655	1.4	5.8	0 K
2160 min Winter	177.533	0.533	1.1	3.8	0 K
2880 min Winter	177.453	0.453	0.9	2.8	0 K
4320 min Winter	177.352	0.352	0.6	1.7	0 K
5760 min Winter	177.292	0.292	0.5	1.2	0 K
7200 min Winter	177.251	0.251	0.4	0.9	0 K
8640 min Winter	177.221	0.221	0.4	0.7	0 K
10080 min Winter	177.198	0.198	0.3	0.5	0 K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
240 min Winter	11.265	0.0	170
360 min Winter	8.299	0.0	240
480 min Winter	6.674	0.0	306
600 min Winter	5.632	0.0	372
720 min Winter	4.901	0.0	436
960 min Winter	3.933	0.0	560
1440 min Winter	2.881	0.0	806
2160 min Winter	2.107	0.0	1164
2880 min Winter	1.687	0.0	1516
4320 min Winter	1.231	0.0	2244
5760 min Winter	0.984	0.0	2944
7200 min Winter	0.827	0.0	3672
8640 min Winter	0.717	0.0	4408
10080 min Winter	0.636	0.0	5136



Designed by RJH
Checked by

Source Control 2018.1

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	30	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	20.000	Shortest Storm (mins)	15
Ratio R	0.370	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+0

Total Area (ha) 0.090

Time (mins)	Area	Time (mins)	Area	Time (mins)	Area	Time (mins)	Area
From: To:	(ha)	From: To:	(ha)	From: To:	(ha)	From: To:	(ha)
0 4	0.023	4 8	0.023	8 12	0.022	12 16	0.022

Total Area (ha) 0.000

Time (mins)	Area
From: To:	(ha)
0 4	0.000

Hydrock Consultants Ltd		Page 4
.	Bristol Airport 12 mppa	
.	Cogloop 2 Car Park- A22	
.	Q30	
Date 01/08/2018	Designed by RJH	
File Cog A22.SRCX	Checked by	
XP Solutions	Source Control 2018.1	

Model Details

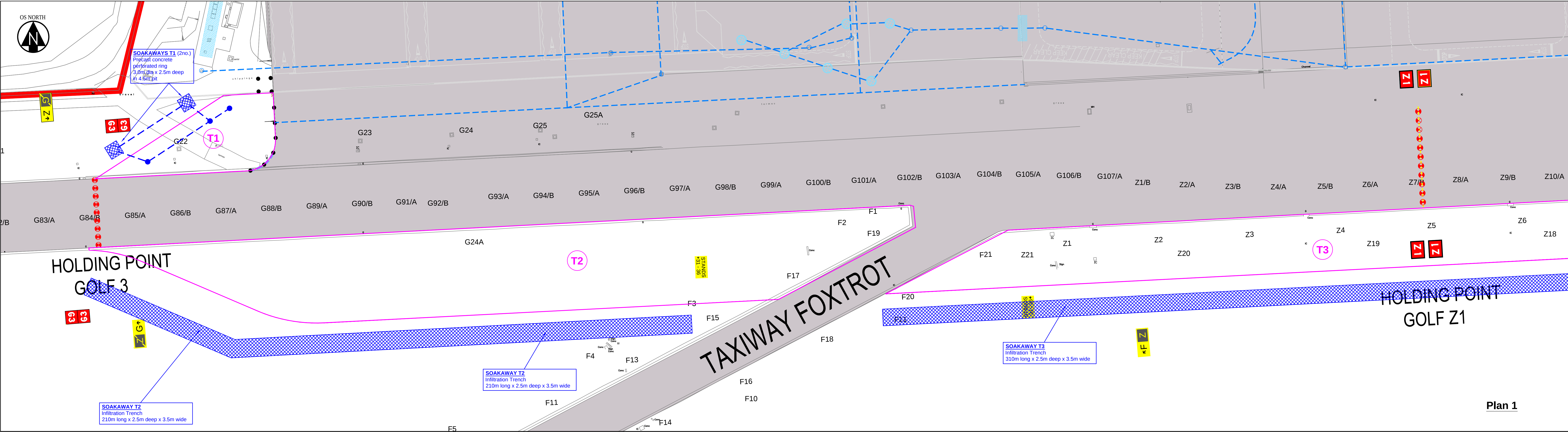
Storage is Online Cover Level (m) 178.500

Infiltration Trench Structure

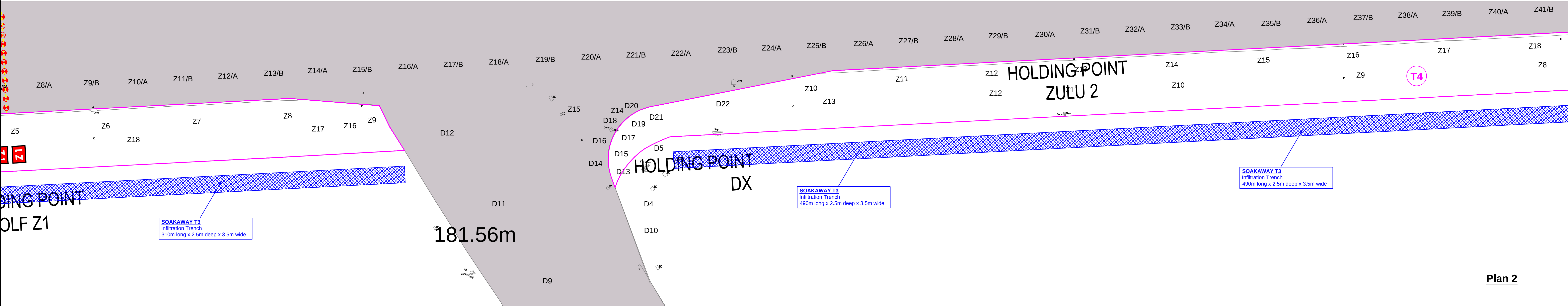
Infiltration Coefficient Base (m/hr)	0.12048	Trench Width (m)	1.8
Infiltration Coefficient Side (m/hr)	0.12048	Trench Length (m)	91.9
Safety Factor	2.0	Slope (1:X)	50.0
Porosity	0.30	Cap Volume Depth (m)	0.000
Invert Level (m)	177.000	Cap Infiltration Depth (m)	0.000

Appendix J – Taxiway Extensions

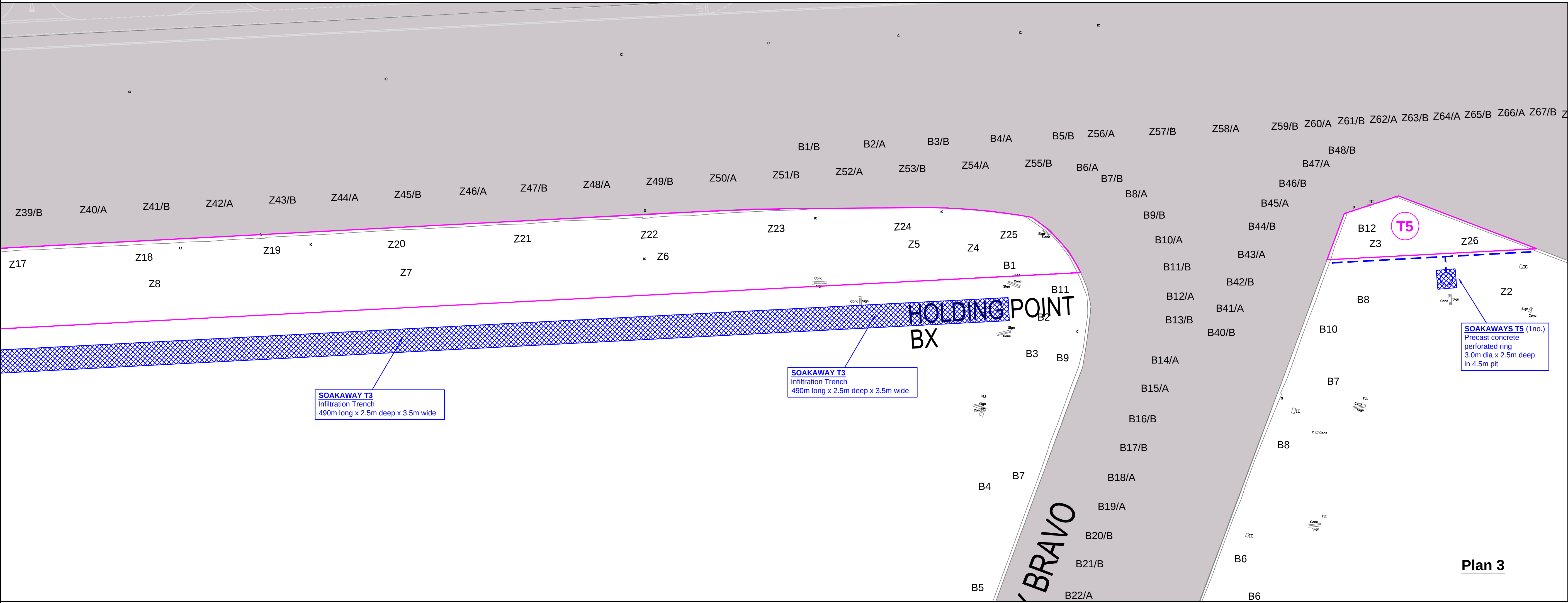
Reference	Title
BAE-HYD-XX-XX-DR-D-2016-P02	Taxiway Extensions - Proposed Surface Water Drainage
Taxiway T1.SRCX	Manhole Soakaways – Q30
Taxiway T1.SRCX	Manhole Soakaways – Q100 +30%
Taxiway T2 V2.SRCX	Trench Soakaways – Q30
Taxiway T2 V2.SRCX	Trench Soakaways – Q100 +30%
Taxiway T3 V2.SRCX	Trench Soakaways – Q30
Taxiway T3 v2.SRCX	Trench Soakaways – Q100 +30%
Taxiway T4 V2.SRCX	Trench Soakaways – Q30
Taxiway T4 V2.SRCX	Trench Soakaways – Q100 +30%
Taxiway T5.SRCX	Manhole Soakaways – Q30
Taxiway T5.SRCX	Manhole Soakaways – Q100 +30%



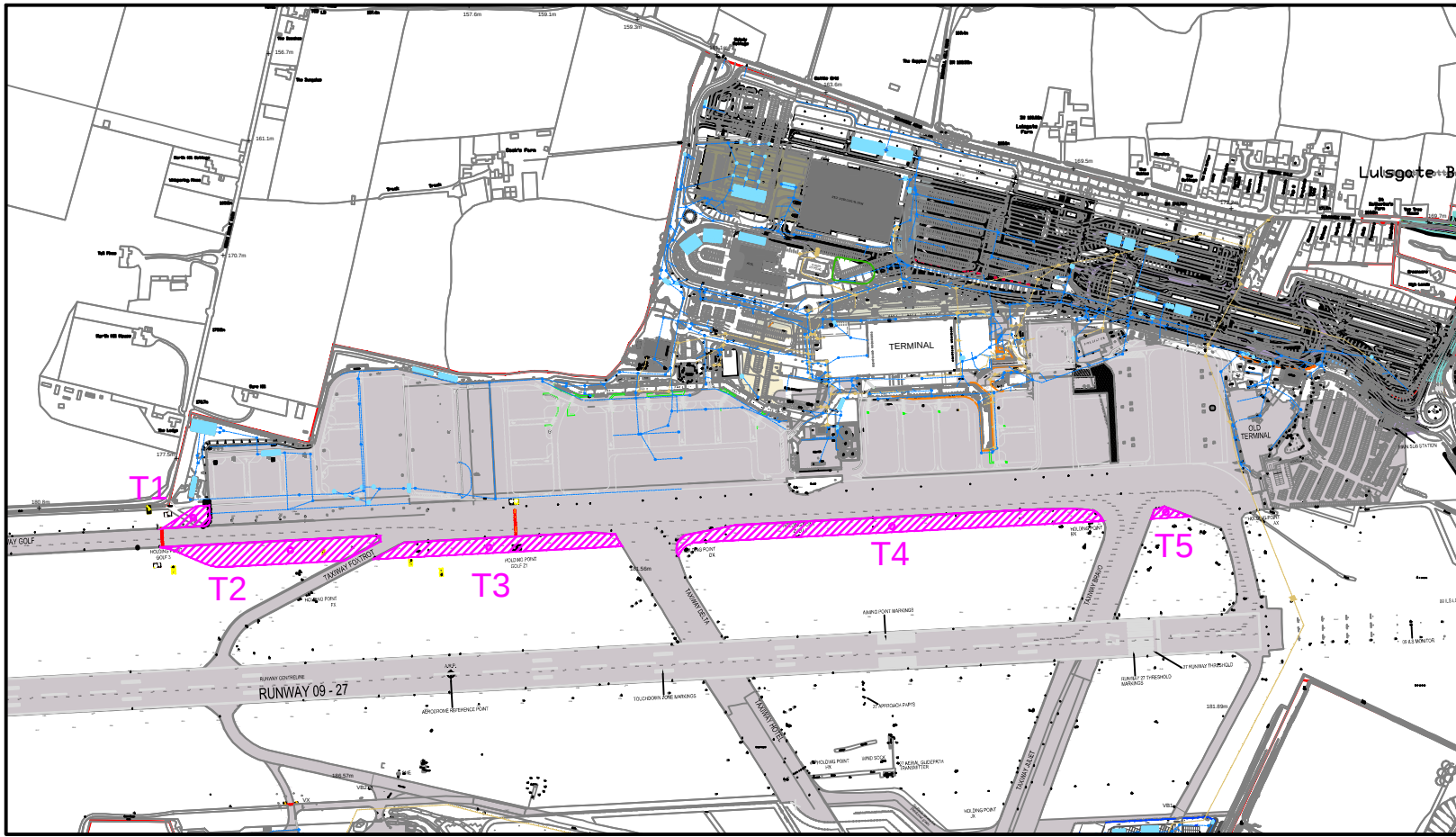
Plan 1



Plan 2



Plan 3



Key Plan

KEY

Existing surface water drain

Existing soakaway

Proposed surface water drain

Proposed infiltration trench

Proposed precast concrete perforated ring soakaway placed in stone filled pit

Revisions

Rev	Date	Description	By	Ctd	App
P02	05/12/18	Master plan updated.			
P01	01/10/18	First issue.			

Hydrock

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CLIENT

BRISTOL AIRPORT

PROJECT

BRISTOL AIRPORT 12mppa
EXPANSION SCHEME

TITLE

TAXIWAY EXTENSIONS
PROPOSED SURFACE WATER DRAINAGE

HYDROCK PROJECT NO.
C-09194-C

SCALE @ A0
1:500

STATUS DESCRIPTION
FOR APPROVAL

STATUS
S2

DRAWING NO. (PROJECT CODE-ORIGINATOR ZONE-LEVEL-TYPE-ROLE-NUMBER)
BAE-HYD-XX-XX-DR-D-2016

REVISION
P02

Hydrock Consultants Ltd		Page 1
.	Bristol Airport 12 mppa	
.	Taxiway Extension T1	
.	Q30	
Date 01/09/2018	Designed by RJH	
File Taxiway T1.SRCX	Checked by	
Innovyze	Source Control 2018.1	

Summary of Results for 30 year Return Period

Half Drain Time : 245 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	179.544	0.544	0.8	12.0	0 K
30 min Summer	179.709	0.709	0.8	15.6	0 K
60 min Summer	179.860	0.860	0.9	19.0	0 K
120 min Summer	179.970	0.970	0.9	21.4	0 K
180 min Summer	179.995	0.995	1.0	21.9	0 K
240 min Summer	179.992	0.992	1.0	21.9	0 K
360 min Summer	179.974	0.974	0.9	21.5	0 K
480 min Summer	179.947	0.947	0.9	20.9	0 K
600 min Summer	179.917	0.917	0.9	20.2	0 K
720 min Summer	179.888	0.888	0.9	19.6	0 K
960 min Summer	179.831	0.831	0.9	18.3	0 K
1440 min Summer	179.725	0.725	0.8	16.0	0 K
2160 min Summer	179.586	0.586	0.8	12.9	0 K
2880 min Summer	179.472	0.472	0.7	10.4	0 K
4320 min Summer	179.298	0.298	0.6	6.6	0 K
5760 min Summer	179.179	0.179	0.6	4.0	0 K
7200 min Summer	179.101	0.101	0.6	2.2	0 K
8640 min Summer	179.057	0.057	0.5	1.3	0 K
10080 min Summer	179.046	0.046	0.5	1.0	0 K
15 min Winter	179.613	0.613	0.8	13.5	0 K
30 min Winter	179.800	0.800	0.9	17.6	0 K
60 min Winter	179.975	0.975	0.9	21.5	0 K
120 min Winter	180.109	1.109	1.0	24.4	0 K
180 min Winter	180.147	1.147	1.0	25.3	0 K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Summer	74.059	0.0	32
30 min Summer	48.833	0.0	45
60 min Summer	30.811	0.0	72
120 min Summer	18.860	0.0	126
180 min Summer	13.992	0.0	180
240 min Summer	11.265	0.0	208
360 min Summer	8.299	0.0	272
480 min Summer	6.674	0.0	340
600 min Summer	5.632	0.0	410
720 min Summer	4.901	0.0	478
960 min Summer	3.933	0.0	616
1440 min Summer	2.881	0.0	884
2160 min Summer	2.107	0.0	1276
2880 min Summer	1.687	0.0	1652
4320 min Summer	1.231	0.0	2384
5760 min Summer	0.984	0.0	3072
7200 min Summer	0.827	0.0	3752
8640 min Summer	0.717	0.0	4416
10080 min Summer	0.636	0.0	5096
15 min Winter	74.059	0.0	32
30 min Winter	48.833	0.0	45
60 min Winter	30.811	0.0	72
120 min Winter	18.860	0.0	126
180 min Winter	13.992	0.0	180

Hydrock Consultants Ltd		Page 2
.	Bristol Airport 12 mppa	
.	Taxiway Extension T1	
.	Q30	
Date 01/09/2018	Designed by RJH	
File Taxiway T1.SRCX	Checked by	
Innovyze	Source Control 2018.1	

Summary of Results for 30 year Return Period

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
240 min Winter	180.145	1.145	1.0	25.2	0 K
360 min Winter	180.122	1.122	1.0	24.7	0 K
480 min Winter	180.086	1.086	1.0	23.9	0 K
600 min Winter	180.042	1.042	1.0	23.0	0 K
720 min Winter	179.998	0.998	1.0	22.0	0 K
960 min Winter	179.911	0.911	0.9	20.1	0 K
1440 min Winter	179.752	0.752	0.8	16.6	0 K
2160 min Winter	179.555	0.555	0.8	12.2	0 K
2880 min Winter	179.400	0.400	0.7	8.8	0 K
4320 min Winter	179.180	0.180	0.6	4.0	0 K
5760 min Winter	179.057	0.057	0.5	1.3	0 K
7200 min Winter	179.043	0.043	0.5	1.0	0 K
8640 min Winter	179.038	0.038	0.4	0.8	0 K
10080 min Winter	179.034	0.034	0.4	0.7	0 K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
240 min Winter	11.265	0.0	230
360 min Winter	8.299	0.0	288
480 min Winter	6.674	0.0	364
600 min Winter	5.632	0.0	442
720 min Winter	4.901	0.0	516
960 min Winter	3.933	0.0	664
1440 min Winter	2.881	0.0	946
2160 min Winter	2.107	0.0	1348
2880 min Winter	1.687	0.0	1732
4320 min Winter	1.231	0.0	2436
5760 min Winter	0.984	0.0	3008
7200 min Winter	0.827	0.0	3672
8640 min Winter	0.717	0.0	4400
10080 min Winter	0.636	0.0	5144

Hydrock Consultants Ltd		Page 3
.	Bristol Airport 12 mppa	
.	Taxiway Extension T1	
.	Q30	
Date 01/09/2018	Designed by RJH	
File Taxiway T1.SRCX	Checked by	
Innovyze	Source Control 2018.1	

Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	30	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	20.000	Shortest Storm (mins)	15
Ratio R	0.370	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+0

Time Area Diagram

Total Area (ha) 0.094

Time (mins)	Area	Time (mins)	Area	Time (mins)	Area	Time (mins)	Area	Time (mins)	Area					
From:	To:	From:	To:	From:	To:	From:	To:	From:	To:					
0	4	0.019	4	8	0.019	8	12	0.019	12	16	0.019	16	20	0.018

Time Area Diagram

Total Area (ha) 0.000

Time (mins)	Area
From:	To:
0	4
0.000	

Hydrock Consultants Ltd		Page 4
.	Bristol Airport 12 mppa	
.	Taxiway Extension T1	
.	Q30	
Date 01/09/2018	Designed by RJH	
File Taxiway T1.SRCX	Checked by	
Innovyze	Source Control 2018.1	

Model Details

Storage is Online Cover Level (m) 181.500

Lined Soakaway Structure

Infiltration Coefficient Base (m/hr)	0.09000	Ring Diameter (m)	3.00
Infiltration Coefficient Side (m/hr)	0.09000	Pit Multiplier	1.5
Safety Factor	2.0	Number Required	2
Porosity	0.30	Cap Volume Depth (m)	0.000
Invert Level (m)	179.000	Cap Infiltration Depth (m)	0.000

Hydrock Consultants Ltd		Page 1
.	Bristol Airport 12 mppa	
.	Taxiway Extension T1	
.	Q100 +30%	
Date 12/11/2018	Designed by RJH	
File Taxiway T1.SRCX	Checked by	
Innovyze	Source Control 2018.1	

Summary of Results for 100 year Return Period (+30%)

Half Drain Time : 330 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	179.940	0.940	0.9	20.7	0 K
30 min Summer	180.237	1.237	1.1	27.3	0 K
60 min Summer	180.522	1.522	1.2	33.6	0 K
120 min Summer	180.751	1.751	1.3	38.6	0 K
180 min Summer	180.825	1.825	1.3	40.2	0 K
240 min Summer	180.833	1.833	1.3	40.4	0 K
360 min Summer	180.823	1.823	1.3	40.2	0 K
480 min Summer	180.796	1.796	1.3	39.6	0 K
600 min Summer	180.759	1.759	1.3	38.8	0 K
720 min Summer	180.716	1.716	1.3	37.8	0 K
960 min Summer	180.627	1.627	1.2	35.9	0 K
1440 min Summer	180.469	1.469	1.2	32.4	0 K
2160 min Summer	180.269	1.269	1.1	28.0	0 K
2880 min Summer	180.099	1.099	1.0	24.2	0 K
4320 min Summer	179.831	0.831	0.9	18.3	0 K
5760 min Summer	179.631	0.631	0.8	13.9	0 K
7200 min Summer	179.475	0.475	0.7	10.5	0 K
8640 min Summer	179.353	0.353	0.7	7.8	0 K
10080 min Summer	179.258	0.258	0.6	5.7	0 K
15 min Winter	180.057	1.057	1.0	23.3	0 K
30 min Winter	180.392	1.392	1.1	30.7	0 K
60 min Winter	180.718	1.718	1.3	37.9	0 K
120 min Winter	180.988	1.988	1.4	43.8	0 K
180 min Winter	181.084	2.084	1.4	45.9	0 K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Summer	124.836	0.0	33
30 min Summer	83.061	0.0	46
60 min Summer	52.662	0.0	74
120 min Summer	32.210	0.0	128
180 min Summer	23.799	0.0	184
240 min Summer	19.065	0.0	232
360 min Summer	13.962	0.0	290
480 min Summer	11.178	0.0	356
600 min Summer	9.399	0.0	424
720 min Summer	8.153	0.0	494
960 min Summer	6.510	0.0	632
1440 min Summer	4.731	0.0	908
2160 min Summer	3.432	0.0	1308
2880 min Summer	2.730	0.0	1700
4320 min Summer	1.973	0.0	2460
5760 min Summer	1.566	0.0	3184
7200 min Summer	1.308	0.0	3904
8640 min Summer	1.129	0.0	4608
10080 min Summer	0.998	0.0	5352
15 min Winter	124.836	0.0	33
30 min Winter	83.061	0.0	46
60 min Winter	52.662	0.0	72
120 min Winter	32.210	0.0	128
180 min Winter	23.799	0.0	182

Hydrock Consultants Ltd		Page 2
.	Bristol Airport 12 mppa	
.	Taxiway Extension T1	
.	Q100 +30%	
Date 12/11/2018	Designed by RJH	
File Taxiway T1.SRCX	Checked by	
Innovyze	Source Control 2018.1	

Summary of Results for 100 year Return Period (+30%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
240 min Winter	181.105	2.105	1.5	46.4	0 K
360 min Winter	181.087	2.087	1.4	46.0	0 K
480 min Winter	181.055	2.055	1.4	45.3	0 K
600 min Winter	181.006	2.006	1.4	44.2	0 K
720 min Winter	180.948	1.948	1.4	43.0	0 K
960 min Winter	180.823	1.823	1.3	40.2	0 K
1440 min Winter	180.589	1.589	1.2	35.0	0 K
2160 min Winter	180.303	1.303	1.1	28.7	0 K
2880 min Winter	180.071	1.071	1.0	23.6	0 K
4320 min Winter	179.721	0.721	0.8	15.9	0 K
5760 min Winter	179.474	0.474	0.7	10.5	0 K
7200 min Winter	179.293	0.293	0.6	6.5	0 K
8640 min Winter	179.160	0.160	0.6	3.5	0 K
10080 min Winter	179.069	0.069	0.5	1.5	0 K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
240 min Winter	19.065	0.0	236
360 min Winter	13.962	0.0	302
480 min Winter	11.178	0.0	376
600 min Winter	9.399	0.0	452
720 min Winter	8.153	0.0	530
960 min Winter	6.510	0.0	680
1440 min Winter	4.731	0.0	970
2160 min Winter	3.432	0.0	1388
2880 min Winter	2.730	0.0	1792
4320 min Winter	1.973	0.0	2560
5760 min Winter	1.566	0.0	3296
7200 min Winter	1.308	0.0	4040
8640 min Winter	1.129	0.0	4680
10080 min Winter	0.998	0.0	5264

Hydrock Consultants Ltd		Page 3
.	Bristol Airport 12 mppa	
.	Taxiway Extension T1	
.	Q100 +30%	
Date 12/11/2018	Designed by RJH	
File Taxiway T1.SRCX	Checked by	
Innovyze	Source Control 2018.1	

Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	100	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	20.000	Shortest Storm (mins)	15
Ratio R	0.370	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+30

Time Area Diagram

Total Area (ha) 0.094

Time (mins) From:	Time (mins) To:	Area (ha)	Time (mins) From:	Time (mins) To:	Area (ha)	Time (mins) From:	Time (mins) To:	Area (ha)	Time (mins) From:	Time (mins) To:	Area (ha)	Time (mins) From:	Time (mins) To:	Area (ha)
0	4	0.019	4	8	0.019	8	12	0.019	12	16	0.019	16	20	0.018

Time Area Diagram

Total Area (ha) 0.000

Time (mins) From:	Time (mins) To:	Area (ha)
0	4	0.000

Hydrock Consultants Ltd		Page 4
.	Bristol Airport 12 mppa	
.	Taxiway Extension T1	
.	Q100 +30%	
Date 12/11/2018	Designed by RJH	
File Taxiway T1.SRCX	Checked by	
Innovyze	Source Control 2018.1	

Model Details

Storage is Online Cover Level (m) 181.500

Lined Soakaway Structure

Infiltration Coefficient Base (m/hr)	0.09000	Ring Diameter (m)	3.00
Infiltration Coefficient Side (m/hr)	0.09000	Pit Multiplier	1.5
Safety Factor	2.0	Number Required	2
Porosity	0.30	Cap Volume Depth (m)	0.000
Invert Level (m)	179.000	Cap Infiltration Depth (m)	0.000

Hydrock Consultants Ltd		Page 1
.	Bristol Airport 12 mppa	
.	Taxiway Extension T2	
.	Q30	
Date 01/09/2018	Designed by RJH	
File Taxiway T2 v2.SRCX	Checked by	
Innovyze	Source Control 2018.1	

Summary of Results for 30 year Return Period

Half Drain Time : 181 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	183.204	1.204	12.8	149.7	0 K
30 min Summer	183.408	1.408	13.9	194.7	0 K
60 min Summer	183.595	1.595	14.9	235.8	0 K
120 min Summer	183.720	1.720	15.6	263.5	0 K
180 min Summer	183.743	1.743	15.7	268.6	0 K
240 min Summer	183.743	1.743	15.7	268.5	0 K
360 min Summer	183.722	1.722	15.6	263.9	0 K
480 min Summer	183.685	1.685	15.4	255.7	0 K
600 min Summer	183.641	1.641	15.1	246.1	0 K
720 min Summer	183.596	1.596	14.9	236.2	0 K
960 min Summer	183.508	1.508	14.4	216.8	0 K
1440 min Summer	183.352	1.352	13.6	182.3	0 K
2160 min Summer	183.171	1.171	12.6	142.4	0 K
2880 min Summer	183.046	1.046	11.9	114.8	0 K
4320 min Summer	182.892	0.892	9.8	83.5	0 K
5760 min Summer	182.781	0.781	8.4	64.1	0 K
7200 min Summer	182.697	0.697	7.3	51.0	0 K
8640 min Summer	182.632	0.632	6.6	41.9	0 K
10080 min Summer	182.580	0.580	5.9	35.3	0 K
15 min Winter	183.290	1.290	13.3	168.8	0 K
30 min Winter	183.522	1.522	14.5	219.9	0 K
60 min Winter	183.737	1.737	15.7	267.1	0 K
120 min Winter	183.888	1.888	16.5	300.5	0 K
180 min Winter	183.916	1.916	16.6	306.8	0 K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Summer	74.059	0.0	35
30 min Summer	48.833	0.0	47
60 min Summer	30.811	0.0	72
120 min Summer	18.860	0.0	122
180 min Summer	13.992	0.0	158
240 min Summer	11.265	0.0	190
360 min Summer	8.299	0.0	258
480 min Summer	6.674	0.0	326
600 min Summer	5.632	0.0	396
720 min Summer	4.901	0.0	462
960 min Summer	3.933	0.0	596
1440 min Summer	2.881	0.0	854
2160 min Summer	2.107	0.0	1220
2880 min Summer	1.687	0.0	1572
4320 min Summer	1.231	0.0	2296
5760 min Summer	0.984	0.0	3008
7200 min Summer	0.827	0.0	3744
8640 min Summer	0.717	0.0	4424
10080 min Summer	0.636	0.0	5152
15 min Winter	74.059	0.0	35
30 min Winter	48.833	0.0	47
60 min Winter	30.811	0.0	72
120 min Winter	18.860	0.0	124
180 min Winter	13.992	0.0	172

Hydrock Consultants Ltd		Page 2
.	Bristol Airport 12 mppa	
.	Taxiway Extension T2	
.	Q30	
Date 01/09/2018	Designed by RJH	
File Taxiway T2 v2.SRCX	Checked by	
Innovyze	Source Control 2018.1	

Summary of Results for 30 year Return Period

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
240 min Winter	183.910	1.910	16.6	305.3	0 K
360 min Winter	183.873	1.873	16.4	297.2	0 K
480 min Winter	183.813	1.813	16.1	284.1	0 K
600 min Winter	183.746	1.746	15.7	269.3	0 K
720 min Winter	183.678	1.678	15.3	254.2	0 K
960 min Winter	183.545	1.545	14.6	225.0	0 K
1440 min Winter	183.320	1.320	13.4	175.2	0 K
2160 min Winter	183.079	1.079	12.1	122.1	0 K
2880 min Winter	182.946	0.946	10.6	94.0	0 K
4320 min Winter	182.767	0.767	8.2	61.7	0 K
5760 min Winter	182.648	0.648	6.7	44.0	0 K
7200 min Winter	182.563	0.563	5.7	33.3	0 K
8640 min Winter	182.500	0.500	5.0	26.2	0 K
10080 min Winter	182.451	0.451	4.5	21.4	0 K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
240 min Winter	11.265	0.0	202
360 min Winter	8.299	0.0	276
480 min Winter	6.674	0.0	352
600 min Winter	5.632	0.0	426
720 min Winter	4.901	0.0	498
960 min Winter	3.933	0.0	638
1440 min Winter	2.881	0.0	900
2160 min Winter	2.107	0.0	1256
2880 min Winter	1.687	0.0	1616
4320 min Winter	1.231	0.0	2336
5760 min Winter	0.984	0.0	3056
7200 min Winter	0.827	0.0	3752
8640 min Winter	0.717	0.0	4488
10080 min Winter	0.636	0.0	5152

Hydrock Consultants Ltd		Page 3
.	Bristol Airport 12 mppa	
.	Taxiway Extension T2	
.	Q30	
Date 01/09/2018	Designed by RJH	
File Taxiway T2 v2.SRCX	Checked by	
Innovyze	Source Control 2018.1	

Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	30	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	20.000	Shortest Storm (mins)	15
Ratio R	0.370	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+0

Time Area Diagram

Total Area (ha) 1.203

Time (mins)	Area	Time (mins)	Area	Time (mins)	Area
From:	To:	From:	To:	From:	To:
0	4 0.201	8	12 0.201	16	20 0.200
4	8 0.201	12	16 0.200	20	24 0.200

Time Area Diagram

Total Area (ha) 0.000

Time (mins)	Area
From:	To:
0	4 0.000

Hydrock Consultants Ltd		Page 4
.	Bristol Airport 12 mppa	
.	Taxiway Extension T2	
.	Q30	
Date 01/09/2018	Designed by RJH	
File Taxiway T2 v2.SRCX	Checked by	
Innovyze	Source Control 2018.1	

Model Details

Storage is Online Cover Level (m) 184.500

Infiltration Trench Structure

Infiltration Coefficient Base (m/hr)	0.09000	Trench Width (m)	3.5
Infiltration Coefficient Side (m/hr)	0.09000	Trench Length (m)	210.0
Safety Factor	2.0	Slope (1:X)	200.0
Porosity	0.30	Cap Volume Depth (m)	0.000
Invert Level (m)	182.000	Cap Infiltration Depth (m)	0.000

Hydrock Consultants Ltd		Page 1
.	Bristol Airport 12 mppa	
.	Taxiway Extension T2	
.	Q100 +30%	
Date 12/11/2018	Designed by RJH	
File Taxiway T2 v2.SRCX	Checked by	
Innovyze	Source Control 2018.1	

Summary of Results for 100 year Return Period (+30%)

Half Drain Time : 272 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m ³)	Status
15 min Summer	183.701	1.701	15.5	259.4	0 K
30 min Summer	184.074	2.074	17.5	341.6	0 K
60 min Summer	184.427	2.427	19.3	419.3	Flood Risk
120 min Summer	184.536	2.536	19.7	478.9	FL00D
180 min Summer	184.549	2.549	19.7	495.5	FL00D
240 min Summer	184.550	2.550	19.7	495.7	FL00D
360 min Summer	184.546	2.546	19.7	490.9	FL00D
480 min Summer	184.537	2.537	19.7	480.6	FL00D
600 min Summer	184.526	2.526	19.7	467.3	FL00D
720 min Summer	184.514	2.514	19.7	452.9	FL00D
960 min Summer	184.449	2.449	19.5	424.3	Flood Risk
1440 min Summer	184.213	2.213	18.2	372.2	Flood Risk
2160 min Summer	183.919	1.919	16.6	307.4	0 K
2880 min Summer	183.686	1.686	15.4	256.0	0 K
4320 min Summer	183.346	1.346	13.6	181.0	0 K
5760 min Summer	183.124	1.124	12.4	132.1	0 K
7200 min Summer	182.997	0.997	11.2	104.3	0 K
8640 min Summer	182.906	0.906	10.0	86.2	0 K
10080 min Summer	182.834	0.834	9.1	73.0	0 K
15 min Winter	183.850	1.850	16.3	292.1	0 K
30 min Winter	184.271	2.271	18.5	384.9	Flood Risk
60 min Winter	184.532	2.532	19.7	474.1	FL00D
120 min Winter	184.592	2.592	19.7	546.7	FL00D
180 min Winter	184.612	2.612	19.7	570.4	FL00D

Storm Event	Rain (mm/hr)	Flooded Volume (m ³)	Time-Peak (mins)
15 min Summer	124.836	0.0	36
30 min Summer	83.061	0.0	49
60 min Summer	52.662	0.0	74
120 min Summer	32.210	35.6	128
180 min Summer	23.799	49.4	182
240 min Summer	19.065	49.5	214
360 min Summer	13.962	45.5	276
480 min Summer	11.178	37.0	344
600 min Summer	9.399	26.1	412
720 min Summer	8.153	14.3	480
960 min Summer	6.510	0.0	616
1440 min Summer	4.731	0.0	882
2160 min Summer	3.432	0.0	1272
2880 min Summer	2.730	0.0	1644
4320 min Summer	1.973	0.0	2360
5760 min Summer	1.566	0.0	3064
7200 min Summer	1.308	0.0	3752
8640 min Summer	1.129	0.0	4496
10080 min Summer	0.998	0.0	5160
15 min Winter	124.836	0.0	36
30 min Winter	83.061	0.0	49
60 min Winter	52.662	31.7	74
120 min Winter	32.210	91.8	128
180 min Winter	23.799	111.6	182

Hydrock Consultants Ltd		Page 2
.	Bristol Airport 12 mppa	
.	Taxiway Extension T2	
.	Q100 +30%	
Date 12/11/2018	Designed by RJH	
File Taxiway T2 v2.SRCX	Checked by	
Innovyze	Source Control 2018.1	

Summary of Results for 100 year Return Period (+30%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
240 min Winter	184.614	2.614	19.7	572.9	FLOOD
360 min Winter	184.605	2.605	19.7	562.8	FLOOD
480 min Winter	184.593	2.593	19.7	547.7	FLOOD
600 min Winter	184.576	2.576	19.7	527.7	FLOOD
720 min Winter	184.558	2.558	19.7	505.6	FLOOD
960 min Winter	184.520	2.520	19.7	460.2	FLOOD
1440 min Winter	184.265	2.265	18.5	383.7	Flood Risk
2160 min Winter	183.857	1.857	16.3	293.8	0 K
2880 min Winter	183.548	1.548	14.6	225.5	0 K
4320 min Winter	183.132	1.132	12.4	133.9	0 K
5760 min Winter	182.946	0.946	10.6	94.0	0 K
7200 min Winter	182.827	0.827	9.0	71.8	0 K
8640 min Winter	182.738	0.738	7.8	57.1	0 K
10080 min Winter	182.667	0.667	7.0	46.7	0 K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
240 min Winter	19.065	113.6	236
360 min Winter	13.962	105.3	298
480 min Winter	11.178	92.6	372
600 min Winter	9.399	76.0	448
720 min Winter	8.153	57.7	522
960 min Winter	6.510	20.3	664
1440 min Winter	4.731	0.0	940
2160 min Winter	3.432	0.0	1340
2880 min Winter	2.730	0.0	1716
4320 min Winter	1.973	0.0	2400
5760 min Winter	1.566	0.0	3072
7200 min Winter	1.308	0.0	3768
8640 min Winter	1.129	0.0	4504
10080 min Winter	0.998	0.0	5240

Hydrock Consultants Ltd		Page 3
.	Bristol Airport 12 mppa	
.	Taxiway Extension T2	
.	Q100 +30%	
Date 12/11/2018	Designed by RJH	
File Taxiway T2 v2.SRCX	Checked by	
Innovyze	Source Control 2018.1	

Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	100	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	20.000	Shortest Storm (mins)	15
Ratio R	0.370	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+30

Time Area Diagram

Total Area (ha) 1.203

Time (mins)	Area	Time (mins)	Area	Time (mins)	Area
From: To: (ha)		From: To: (ha)		From: To: (ha)	
0 4 0.201		8 12 0.201		16 20 0.200	
4 8 0.201		12 16 0.200		20 24 0.200	

Time Area Diagram

Total Area (ha) 0.000

Time (mins)	Area
From: To: (ha)	
0 4 0.000	

Hydrock Consultants Ltd		Page 4
.	Bristol Airport 12 mppa	
.	Taxiway Extension T2	
.	Q100 +30%	
Date 12/11/2018	Designed by RJH	
File Taxiway T2 v2.SRCX	Checked by	
Innovyze	Source Control 2018.1	

Model Details

Storage is Online Cover Level (m) 184.500

Infiltration Trench Structure

Infiltration Coefficient Base (m/hr)	0.09000	Trench Width (m)	3.5
Infiltration Coefficient Side (m/hr)	0.09000	Trench Length (m)	210.0
Safety Factor	2.0	Slope (1:X)	200.0
Porosity	0.30	Cap Volume Depth (m)	0.000
Invert Level (m)	182.000	Cap Infiltration Depth (m)	0.000

Hydrock Consultants Ltd		Page 1
.	Bristol Airport 12 mppa	
.	Taxiway Extension T3	
.	Q30	
Date 01/09/2018	Designed by RJH	
File Taxiway T3 v2.SRCX	Checked by	
Innovyze	Source Control 2018.1	

Summary of Results for 30 year Return Period

Half Drain Time : 174 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	181.403	1.403	17.3	206.8	0 K
30 min Summer	181.597	1.597	20.0	267.6	0 K
60 min Summer	181.768	1.768	21.3	323.4	0 K
120 min Summer	181.884	1.884	22.3	361.0	0 K
180 min Summer	181.908	1.908	22.4	368.8	0 K
240 min Summer	181.910	1.910	22.5	369.6	0 K
360 min Summer	181.894	1.894	22.3	364.4	0 K
480 min Summer	181.862	1.862	22.1	354.0	0 K
600 min Summer	181.824	1.824	21.8	341.5	0 K
720 min Summer	181.784	1.784	21.5	328.3	0 K
960 min Summer	181.704	1.704	20.8	302.4	0 K
1440 min Summer	181.567	1.567	19.8	257.7	0 K
2160 min Summer	181.418	1.418	17.5	211.2	0 K
2880 min Summer	181.300	1.300	15.7	177.6	0 K
4320 min Summer	181.122	1.122	13.0	132.2	0 K
5760 min Summer	180.991	0.991	11.2	103.2	0 K
7200 min Summer	180.892	0.892	9.8	83.6	0 K
8640 min Summer	180.812	0.812	8.8	69.2	0 K
10080 min Summer	180.748	0.748	8.0	58.8	0 K
15 min Winter	181.488	1.488	18.6	232.6	0 K
30 min Winter	181.702	1.702	20.8	301.7	0 K
60 min Winter	181.900	1.900	22.4	366.0	0 K
120 min Winter	182.039	2.039	23.5	411.5	0 K
180 min Winter	182.065	2.065	23.7	420.0	0 K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Summer	74.059	0.0	35
30 min Summer	48.833	0.0	47
60 min Summer	30.811	0.0	72
120 min Summer	18.860	0.0	122
180 min Summer	13.992	0.0	156
240 min Summer	11.265	0.0	188
360 min Summer	8.299	0.0	256
480 min Summer	6.674	0.0	324
600 min Summer	5.632	0.0	392
720 min Summer	4.901	0.0	460
960 min Summer	3.933	0.0	592
1440 min Summer	2.881	0.0	846
2160 min Summer	2.107	0.0	1220
2880 min Summer	1.687	0.0	1588
4320 min Summer	1.231	0.0	2308
5760 min Summer	0.984	0.0	3016
7200 min Summer	0.827	0.0	3752
8640 min Summer	0.717	0.0	4488
10080 min Summer	0.636	0.0	5160
15 min Winter	74.059	0.0	35
30 min Winter	48.833	0.0	47
60 min Winter	30.811	0.0	72
120 min Winter	18.860	0.0	122
180 min Winter	13.992	0.0	168

Hydrock Consultants Ltd		Page 2
.	Bristol Airport 12 mppa	
.	Taxiway Extension T3	
.	Q30	
Date 01/09/2018	Designed by RJH	
File Taxiway T3 v2.SRCX	Checked by	
Innovyze	Source Control 2018.1	

Summary of Results for 30 year Return Period

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
240 min Winter	182.062	2.062	23.7	419.0	0 K
360 min Winter	182.030	2.030	23.4	408.5	0 K
480 min Winter	181.977	1.977	23.0	391.1	0 K
600 min Winter	181.916	1.916	22.5	371.3	0 K
720 min Winter	181.853	1.853	22.0	351.0	0 K
960 min Winter	181.734	1.734	21.1	312.2	0 K
1440 min Winter	181.541	1.541	19.5	249.5	0 K
2160 min Winter	181.345	1.345	16.4	190.1	0 K
2880 min Winter	181.196	1.196	14.1	150.2	0 K
4320 min Winter	180.983	0.983	11.1	101.5	0 K
5760 min Winter	180.839	0.839	9.1	73.9	0 K
7200 min Winter	180.734	0.734	7.8	56.6	0 K
8640 min Winter	180.656	0.656	6.8	45.1	0 K
10080 min Winter	180.594	0.594	6.1	37.0	0 K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
240 min Winter	11.265	0.0	200
360 min Winter	8.299	0.0	274
480 min Winter	6.674	0.0	350
600 min Winter	5.632	0.0	422
720 min Winter	4.901	0.0	494
960 min Winter	3.933	0.0	630
1440 min Winter	2.881	0.0	886
2160 min Winter	2.107	0.0	1264
2880 min Winter	1.687	0.0	1632
4320 min Winter	1.231	0.0	2352
5760 min Winter	0.984	0.0	3064
7200 min Winter	0.827	0.0	3760
8640 min Winter	0.717	0.0	4496
10080 min Winter	0.636	0.0	5168

Hydrock Consultants Ltd		Page 3
.	Bristol Airport 12 mppa	
.	Taxiway Extension T3	
.	Q30	
Date 01/09/2018	Designed by RJH	
File Taxiway T3 v2.SRCX	Checked by	
Innovyze	Source Control 2018.1	

Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	30	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	20.000	Shortest Storm (mins)	15
Ratio R	0.370	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+0

Time Area Diagram

Total Area (ha) 1.647

Time (mins)	Area	Time (mins)	Area	Time (mins)	Area
From: To: (ha)		From: To: (ha)		From: To: (ha)	
0 4 0.275		8 12 0.275		16 20 0.274	
4 8 0.275		12 16 0.274		20 24 0.274	

Time Area Diagram

Total Area (ha) 0.000

Time (mins)	Area
From: To: (ha)	
0 4 0.000	

Hydrock Consultants Ltd		Page 4
.	Bristol Airport 12 mppa	
.	Taxiway Extension T3	
.	Q30	
Date 01/09/2018	Designed by RJH	
File Taxiway T3 v2.SRCX	Checked by	
Innovyze	Source Control 2018.1	

Model Details

Storage is Online Cover Level (m) 182.500

Infiltration Trench Structure

Infiltration Coefficient Base (m/hr)	0.09000	Trench Width (m)	3.5
Infiltration Coefficient Side (m/hr)	0.09000	Trench Length (m)	310.0
Safety Factor	2.0	Slope (1:X)	200.0
Porosity	0.30	Cap Volume Depth (m)	0.000
Invert Level (m)	180.000	Cap Infiltration Depth (m)	0.000

Hydrock Consultants Ltd		Page 1
.	Bristol Airport 12 mppa	
.	Taxiway Extension T3	
.	Q100 +30%	
Date 12/11/2018	Designed by RJH	
File Taxiway T3 v2.SRCX	Checked by	
Innovyze	Source Control 2018.1	

Summary of Results for 100 year Return Period (+30%)

Half Drain Time : 264 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	181.867	1.867	22.1	355.5	0 K
30 min Summer	182.211	2.211	24.8	467.5	Flood Risk
60 min Summer	182.509	2.509	27.1	573.8	FL00D
120 min Summer	182.572	2.572	27.1	656.9	FL00D
180 min Summer	182.591	2.591	27.1	680.6	FL00D
240 min Summer	182.591	2.591	27.1	681.6	FL00D
360 min Summer	182.587	2.587	27.1	676.3	FL00D
480 min Summer	182.577	2.577	27.1	663.0	FL00D
600 min Summer	182.563	2.563	27.1	645.2	FL00D
720 min Summer	182.548	2.548	27.1	625.3	FL00D
960 min Summer	182.517	2.517	27.1	584.2	FL00D
1440 min Summer	182.345	2.345	25.9	511.1	Flood Risk
2160 min Summer	182.071	2.071	23.7	421.9	0 K
2880 min Summer	181.858	1.858	22.1	352.5	0 K
4320 min Summer	181.564	1.564	19.7	256.7	0 K
5760 min Summer	181.392	1.392	17.1	203.4	0 K
7200 min Summer	181.259	1.259	15.0	166.3	0 K
8640 min Summer	181.153	1.153	13.5	139.5	0 K
10080 min Summer	181.064	1.064	12.2	118.9	0 K
15 min Winter	182.004	2.004	23.2	400.1	0 K
30 min Winter	182.393	2.393	26.2	526.7	Flood Risk
60 min Winter	182.567	2.567	27.1	649.4	FL00D
120 min Winter	182.644	2.644	27.1	749.5	FL00D
180 min Winter	182.669	2.669	27.1	782.6	FL00D

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Summer	124.836	0.0	36
30 min Summer	83.061	0.0	48
60 min Summer	52.662	9.3	74
120 min Summer	32.210	72.5	128
180 min Summer	23.799	90.5	182
240 min Summer	19.065	91.3	214
360 min Summer	13.962	87.2	276
480 min Summer	11.178	77.0	344
600 min Summer	9.399	63.5	412
720 min Summer	8.153	48.4	480
960 min Summer	6.510	17.1	614
1440 min Summer	4.731	0.0	878
2160 min Summer	3.432	0.0	1260
2880 min Summer	2.730	0.0	1628
4320 min Summer	1.973	0.0	2340
5760 min Summer	1.566	0.0	3064
7200 min Summer	1.308	0.0	3760
8640 min Summer	1.129	0.0	4504
10080 min Summer	0.998	0.0	5240
15 min Winter	124.836	0.0	36
30 min Winter	83.061	0.0	49
60 min Winter	52.662	66.7	74
120 min Winter	32.210	143.4	128
180 min Winter	23.799	169.0	182

Hydrock Consultants Ltd		Page 2
.	Bristol Airport 12 mppa	
.	Taxiway Extension T3	
.	Q100 +30%	
Date 12/11/2018	Designed by RJH	
File Taxiway T3 v2.SRCX	Checked by	
Innovyze	Source Control 2018.1	

Summary of Results for 100 year Return Period (+30%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
240 min Winter	182.672	2.672	27.1	786.3	FLOOD
360 min Winter	182.662	2.662	27.1	773.4	FLOOD
480 min Winter	182.646	2.646	27.1	753.0	FLOOD
600 min Winter	182.625	2.625	27.1	725.8	FLOOD
720 min Winter	182.602	2.602	27.1	695.2	FLOOD
960 min Winter	182.553	2.553	27.1	631.7	FLOOD
1440 min Winter	182.378	2.378	26.1	521.7	Flood Risk
2160 min Winter	181.999	1.999	23.2	398.3	0 K
2880 min Winter	181.720	1.720	21.0	307.6	0 K
4320 min Winter	181.404	1.404	17.3	206.9	0 K
5760 min Winter	181.208	1.208	14.3	153.3	0 K
7200 min Winter	181.064	1.064	12.2	119.0	0 K
8640 min Winter	180.954	0.954	10.7	95.6	0 K
10080 min Winter	180.867	0.867	9.5	79.0	0 K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
240 min Winter	19.065	172.0	236
360 min Winter	13.962	162.0	296
480 min Winter	11.178	146.1	372
600 min Winter	9.399	125.2	448
720 min Winter	8.153	101.7	522
960 min Winter	6.510	53.2	664
1440 min Winter	4.731	0.0	932
2160 min Winter	3.432	0.0	1324
2880 min Winter	2.730	0.0	1688
4320 min Winter	1.973	0.0	2388
5760 min Winter	1.566	0.0	3112
7200 min Winter	1.308	0.0	3824
8640 min Winter	1.129	0.0	4512
10080 min Winter	0.998	0.0	5248

Hydrock Consultants Ltd		Page 3
.	Bristol Airport 12 mppa	
.	Taxiway Extension T3	
.	Q100 +30%	
Date 12/11/2018	Designed by RJH	
File Taxiway T3 v2.SRCX	Checked by	
Innovyze	Source Control 2018.1	

Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	100	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	20.000	Shortest Storm (mins)	15
Ratio R	0.370	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+30

Time Area Diagram

Total Area (ha) 1.647

Time (mins)	Area	Time (mins)	Area	Time (mins)	Area
From:	To:	From:	To:	From:	To:
	(ha)		(ha)		(ha)
0	4 0.275	8	12 0.275	16	20 0.274
4	8 0.275	12	16 0.274	20	24 0.274

Time Area Diagram

Total Area (ha) 0.000

Time (mins)	Area
From:	To:
	(ha)
0	4 0.000

Hydrock Consultants Ltd		Page 4
.	Bristol Airport 12 mppa	
.	Taxiway Extension T3	
.	Q100 +30%	
Date 12/11/2018	Designed by RJH	
File Taxiway T3 v2.SRCX	Checked by	
Innovyze	Source Control 2018.1	

Model Details

Storage is Online Cover Level (m) 182.500

Infiltration Trench Structure

Infiltration Coefficient Base (m/hr)	0.09000	Trench Width (m)	3.5
Infiltration Coefficient Side (m/hr)	0.09000	Trench Length (m)	310.0
Safety Factor	2.0	Slope (1:X)	200.0
Porosity	0.30	Cap Volume Depth (m)	0.000
Invert Level (m)	180.000	Cap Infiltration Depth (m)	0.000

Hydrock Consultants Ltd		Page 1
.	Bristol Airport 12 mppa	
.	Taxiway Extension T4	
.	Q30	
Date 01/09/2018	Designed by RJH	
File Taxiway T4 V2.SRCX	Checked by	
Innovyze	Source Control 2018.1	

Summary of Results for 30 year Return Period

Half Drain Time : 176 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	181.522	1.522	19.2	243.1	0 K
30 min Summer	181.731	1.731	22.7	314.6	0 K
60 min Summer	181.900	1.900	25.7	379.2	0 K
120 min Summer	182.003	2.003	27.6	421.3	0 K
180 min Summer	182.025	2.025	28.1	430.6	0 K
240 min Summer	182.029	2.029	28.1	432.1	0 K
360 min Summer	182.017	2.017	27.9	427.0	0 K
480 min Summer	181.991	1.991	27.4	416.0	0 K
600 min Summer	181.958	1.958	26.8	402.7	0 K
720 min Summer	181.924	1.924	26.2	388.7	0 K
960 min Summer	181.855	1.855	24.9	361.3	0 K
1440 min Summer	181.728	1.728	22.7	313.5	0 K
2160 min Summer	181.572	1.572	20.0	259.3	0 K
2880 min Summer	181.446	1.446	17.9	219.6	0 K
4320 min Summer	181.255	1.255	15.0	165.2	0 K
5760 min Summer	181.113	1.113	12.9	130.1	0 K
7200 min Summer	181.006	1.006	11.4	106.2	0 K
8640 min Summer	180.918	0.918	10.2	88.5	0 K
10080 min Summer	180.847	0.847	9.2	75.3	0 K
15 min Winter	181.613	1.613	20.7	273.3	0 K
30 min Winter	181.836	1.836	24.6	354.1	0 K
60 min Winter	182.019	2.019	27.9	427.9	0 K
120 min Winter	182.134	2.134	30.1	478.1	0 K
180 min Winter	182.154	2.154	30.5	487.0	0 K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Summer	74.059	0.0	35
30 min Summer	48.833	0.0	47
60 min Summer	30.811	0.0	70
120 min Summer	18.860	0.0	120
180 min Summer	13.992	0.0	152
240 min Summer	11.265	0.0	184
360 min Summer	8.299	0.0	252
480 min Summer	6.674	0.0	322
600 min Summer	5.632	0.0	390
720 min Summer	4.901	0.0	456
960 min Summer	3.933	0.0	590
1440 min Summer	2.881	0.0	850
2160 min Summer	2.107	0.0	1224
2880 min Summer	1.687	0.0	1592
4320 min Summer	1.231	0.0	2312
5760 min Summer	0.984	0.0	3048
7200 min Summer	0.827	0.0	3760
8640 min Summer	0.717	0.0	4496
10080 min Summer	0.636	0.0	5160
15 min Winter	74.059	0.0	35
30 min Winter	48.833	0.0	47
60 min Winter	30.811	0.0	72
120 min Winter	18.860	0.0	120
180 min Winter	13.992	0.0	160

Hydrock Consultants Ltd		Page 2
.	Bristol Airport 12 mppa	
.	Taxiway Extension T4	
.	Q30	
Date 01/09/2018	Designed by RJH	
File Taxiway T4 V2.SRCX	Checked by	
Innovyze	Source Control 2018.1	

Summary of Results for 30 year Return Period

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
240 min Winter	182.152	2.152	30.5	486.5	0 K
360 min Winter	182.126	2.126	30.0	474.7	0 K
480 min Winter	182.083	2.083	29.2	455.6	0 K
600 min Winter	182.034	2.034	28.2	434.3	0 K
720 min Winter	181.983	1.983	27.3	412.9	0 K
960 min Winter	181.884	1.884	25.4	372.7	0 K
1440 min Winter	181.708	1.708	22.3	306.5	0 K
2160 min Winter	181.500	1.500	18.8	236.3	0 K
2880 min Winter	181.340	1.340	16.3	188.5	0 K
4320 min Winter	181.109	1.109	12.8	129.1	0 K
5760 min Winter	180.951	0.951	10.6	94.9	0 K
7200 min Winter	180.835	0.835	9.1	73.2	0 K
8640 min Winter	180.748	0.748	8.0	58.7	0 K
10080 min Winter	180.679	0.679	7.1	48.3	0 K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
240 min Winter	11.265	0.0	194
360 min Winter	8.299	0.0	270
480 min Winter	6.674	0.0	344
600 min Winter	5.632	0.0	418
720 min Winter	4.901	0.0	488
960 min Winter	3.933	0.0	626
1440 min Winter	2.881	0.0	892
2160 min Winter	2.107	0.0	1272
2880 min Winter	1.687	0.0	1644
4320 min Winter	1.231	0.0	2376
5760 min Winter	0.984	0.0	3072
7200 min Winter	0.827	0.0	3816
8640 min Winter	0.717	0.0	4504
10080 min Winter	0.636	0.0	5240

Hydrock Consultants Ltd		Page 3
.	Bristol Airport 12 mppa	
.	Taxiway Extension T4	
.	Q30	
Date 01/09/2018	Designed by RJH	
File Taxiway T4 V2.SRCX	Checked by	
Innovyze	Source Control 2018.1	

Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	30	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	20.000	Shortest Storm (mins)	15
Ratio R	0.370	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+0

Time Area Diagram

Total Area (ha) 1.926

Time (mins)	Area	Time (mins)	Area	Time (mins)	Area
From: To: (ha)		From: To: (ha)		From: To: (ha)	
0 4 0.321		8 12 0.321		16 20 0.321	
4 8 0.321		12 16 0.321		20 24 0.321	

Time Area Diagram

Total Area (ha) 0.000

Time (mins)	Area
From: To: (ha)	
0 4 0.000	

Hydrock Consultants Ltd		Page 4
.	Bristol Airport 12 mppa	
.	Taxiway Extension T4	
.	Q30	
Date 01/09/2018	Designed by RJH	
File Taxiway T4 V2.SRCX	Checked by	
Innovyze	Source Control 2018.1	

Model Details

Storage is Online Cover Level (m) 182.500

Infiltration Trench Structure

Infiltration Coefficient Base (m/hr)	0.09000	Trench Width (m)	3.5
Infiltration Coefficient Side (m/hr)	0.09000	Trench Length (m)	490.0
Safety Factor	2.0	Slope (1:X)	200.0
Porosity	0.30	Cap Volume Depth (m)	0.000
Invert Level (m)	180.000	Cap Infiltration Depth (m)	0.000

Hydrock Consultants Ltd		Page 1
.	Bristol Airport 12 mppa	
.	Taxiway Extension T4	
.	Q100 +30%	
Date 12/11/2018	Designed by RJH	
File Taxiway T4 V2.SRCX	Checked by	
Innovyze	Source Control 2018.1	

Summary of Results for 100 year Return Period (+30%)

Half Drain Time : 238 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	181.991	1.991	27.4	416.0	0 K
30 min Summer	182.277	2.277	33.0	544.5	Flood Risk
60 min Summer	182.505	2.505	37.2	663.8	FL00D
120 min Summer	182.565	2.565	37.2	753.3	FL00D
180 min Summer	182.579	2.579	37.2	774.7	FL00D
240 min Summer	182.580	2.580	37.2	776.4	FL00D
360 min Summer	182.576	2.576	37.2	770.0	FL00D
480 min Summer	182.564	2.564	37.2	752.9	FL00D
600 min Summer	182.550	2.550	37.2	730.8	FL00D
720 min Summer	182.533	2.533	37.2	706.4	FL00D
960 min Summer	182.501	2.501	37.2	657.8	FL00D
1440 min Summer	182.344	2.344	34.3	576.9	Flood Risk
2160 min Summer	182.146	2.146	30.4	483.4	0 K
2880 min Summer	181.985	1.985	27.3	413.7	0 K
4320 min Summer	181.738	1.738	22.8	317.3	0 K
5760 min Summer	181.554	1.554	19.7	253.7	0 K
7200 min Summer	181.409	1.409	17.4	208.5	0 K
8640 min Summer	181.295	1.295	15.6	176.0	0 K
10080 min Summer	181.199	1.199	14.1	150.9	0 K
15 min Winter	182.110	2.110	29.7	467.5	0 K
30 min Winter	182.415	2.415	35.8	612.3	Flood Risk
60 min Winter	182.563	2.563	37.2	751.2	FL00D
120 min Winter	182.636	2.636	37.2	860.3	FL00D
180 min Winter	182.657	2.657	37.2	891.1	FL00D

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Summer	124.836	0.0	36
30 min Summer	83.061	0.0	48
60 min Summer	52.662	5.1	72
120 min Summer	32.210	64.5	124
180 min Summer	23.799	78.8	170
240 min Summer	19.065	80.1	200
360 min Summer	13.962	75.6	264
480 min Summer	11.178	64.3	332
600 min Summer	9.399	49.4	400
720 min Summer	8.153	33.4	468
960 min Summer	6.510	1.1	598
1440 min Summer	4.731	0.0	860
2160 min Summer	3.432	0.0	1240
2880 min Summer	2.730	0.0	1612
4320 min Summer	1.973	0.0	2344
5760 min Summer	1.566	0.0	3064
7200 min Summer	1.308	0.0	3768
8640 min Summer	1.129	0.0	4504
10080 min Summer	0.998	0.0	5248
15 min Winter	124.836	0.0	36
30 min Winter	83.061	0.0	48
60 min Winter	52.662	63.1	74
120 min Winter	32.210	136.1	126
180 min Winter	23.799	157.0	180

Hydrock Consultants Ltd		Page 2
.	Bristol Airport 12 mppa	
.	Taxiway Extension T4	
.	Q100 +30%	
Date 12/11/2018	Designed by RJH	
File Taxiway T4 V2.SRCX	Checked by	
Innovyze	Source Control 2018.1	

Summary of Results for 100 year Return Period (+30%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
240 min Winter	182.655	2.655	37.2	888.7	FLOOD
360 min Winter	182.645	2.645	37.2	873.9	FLOOD
480 min Winter	182.626	2.626	37.2	845.3	FLOOD
600 min Winter	182.602	2.602	37.2	809.3	FLOOD
720 min Winter	182.576	2.576	37.2	770.6	FLOOD
960 min Winter	182.525	2.525	37.2	694.2	FLOOD
1440 min Winter	182.345	2.345	34.4	577.4	Flood Risk
2160 min Winter	182.082	2.082	29.1	455.0	0 K
2880 min Winter	181.875	1.875	25.3	369.2	0 K
4320 min Winter	181.572	1.572	20.0	259.6	0 K
5760 min Winter	181.360	1.360	16.6	194.2	0 K
7200 min Winter	181.202	1.202	14.2	151.8	0 K
8640 min Winter	181.080	1.080	12.4	122.6	0 K
10080 min Winter	180.985	0.985	11.1	101.8	0 K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
240 min Winter	19.065	155.4	226
360 min Winter	13.962	145.4	286
480 min Winter	11.178	126.0	362
600 min Winter	9.399	102.1	436
720 min Winter	8.153	76.0	506
960 min Winter	6.510	25.3	644
1440 min Winter	4.731	0.0	908
2160 min Winter	3.432	0.0	1296
2880 min Winter	2.730	0.0	1672
4320 min Winter	1.973	0.0	2396
5760 min Winter	1.566	0.0	3120
7200 min Winter	1.308	0.0	3832
8640 min Winter	1.129	0.0	4576
10080 min Winter	0.998	0.0	5256

Hydrock Consultants Ltd		Page 3
.	Bristol Airport 12 mppa	
.	Taxiway Extension T4	
.	Q100 +30%	
Date 12/11/2018	Designed by RJH	
File Taxiway T4 V2.SRCX	Checked by	
Innovyze	Source Control 2018.1	

Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	100	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	20.000	Shortest Storm (mins)	15
Ratio R	0.370	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+30

Time Area Diagram

Total Area (ha) 1.926

Time (mins)	Area	Time (mins)	Area	Time (mins)	Area
From: To: (ha)		From: To: (ha)		From: To: (ha)	
0 4 0.321		8 12 0.321		16 20 0.321	
4 8 0.321		12 16 0.321		20 24 0.321	

Time Area Diagram

Total Area (ha) 0.000

Time (mins)	Area
From: To: (ha)	
0 4 0.000	

Hydrock Consultants Ltd		Page 4
.	Bristol Airport 12 mppa	
.	Taxiway Extension T4	
.	Q100 +30%	
Date 12/11/2018	Designed by RJH	
File Taxiway T4 V2.SRCX	Checked by	
Innovyze	Source Control 2018.1	

Model Details

Storage is Online Cover Level (m) 182.500

Infiltration Trench Structure

Infiltration Coefficient Base (m/hr)	0.09000	Trench Width (m)	3.5
Infiltration Coefficient Side (m/hr)	0.09000	Trench Length (m)	490.0
Safety Factor	2.0	Slope (1:X)	200.0
Porosity	0.30	Cap Volume Depth (m)	0.000
Invert Level (m)	180.000	Cap Infiltration Depth (m)	0.000

Hydrock Consultants Ltd		Page 1
.	Bristol Airport 12 mppa	
.	Taxiway Extension T5	
.	Q30	
Date 01/09/2018	Designed by RJH	
File Taxiway T5.SRCX	Checked by	
Innovyze	Source Control 2018.1	

Summary of Results for 30 year Return Period

Half Drain Time : 229 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	181.483	0.483	0.4	5.3	0 K
30 min Summer	181.629	0.629	0.4	6.9	0 K
60 min Summer	181.761	0.761	0.4	8.4	0 K
120 min Summer	181.853	0.853	0.4	9.4	0 K
180 min Summer	181.870	0.870	0.4	9.6	0 K
240 min Summer	181.866	0.866	0.4	9.5	0 K
360 min Summer	181.846	0.846	0.4	9.3	0 K
480 min Summer	181.819	0.819	0.4	9.0	0 K
600 min Summer	181.791	0.791	0.4	8.7	0 K
720 min Summer	181.763	0.763	0.4	8.4	0 K
960 min Summer	181.708	0.708	0.4	7.8	0 K
1440 min Summer	181.608	0.608	0.4	6.7	0 K
2160 min Summer	181.478	0.478	0.4	5.3	0 K
2880 min Summer	181.372	0.372	0.3	4.1	0 K
4320 min Summer	181.217	0.217	0.3	2.4	0 K
5760 min Summer	181.118	0.118	0.3	1.3	0 K
7200 min Summer	181.062	0.062	0.3	0.7	0 K
8640 min Summer	181.047	0.047	0.2	0.5	0 K
10080 min Summer	181.041	0.041	0.2	0.5	0 K
15 min Winter	181.545	0.545	0.4	6.0	0 K
30 min Winter	181.710	0.710	0.4	7.8	0 K
60 min Winter	181.863	0.863	0.4	9.5	0 K
120 min Winter	181.977	0.977	0.5	10.8	0 K
180 min Winter	182.005	1.005	0.5	11.1	0 K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Summer	74.059	0.0	32
30 min Summer	48.833	0.0	45
60 min Summer	30.811	0.0	72
120 min Summer	18.860	0.0	124
180 min Summer	13.992	0.0	174
240 min Summer	11.265	0.0	204
360 min Summer	8.299	0.0	268
480 min Summer	6.674	0.0	338
600 min Summer	5.632	0.0	406
720 min Summer	4.901	0.0	476
960 min Summer	3.933	0.0	612
1440 min Summer	2.881	0.0	880
2160 min Summer	2.107	0.0	1264
2880 min Summer	1.687	0.0	1636
4320 min Summer	1.231	0.0	2348
5760 min Summer	0.984	0.0	3056
7200 min Summer	0.827	0.0	3688
8640 min Summer	0.717	0.0	4408
10080 min Summer	0.636	0.0	5136
15 min Winter	74.059	0.0	32
30 min Winter	48.833	0.0	45
60 min Winter	30.811	0.0	72
120 min Winter	18.860	0.0	124
180 min Winter	13.992	0.0	178

Hydrock Consultants Ltd		Page 2
.	Bristol Airport 12 mppa	
.	Taxiway Extension T5	
.	Q30	
Date 01/09/2018	Designed by RJH	
File Taxiway T5.SRCX	Checked by	
Innovyze	Source Control 2018.1	

Summary of Results for 30 year Return Period

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
240 min Winter	181.999	0.999	0.5	11.0	0 K
360 min Winter	181.974	0.974	0.5	10.7	0 K
480 min Winter	181.937	0.937	0.5	10.3	0 K
600 min Winter	181.895	0.895	0.5	9.9	0 K
720 min Winter	181.852	0.852	0.4	9.4	0 K
960 min Winter	181.770	0.770	0.4	8.5	0 K
1440 min Winter	181.620	0.620	0.4	6.8	0 K
2160 min Winter	181.436	0.436	0.4	4.8	0 K
2880 min Winter	181.294	0.294	0.3	3.2	0 K
4320 min Winter	181.104	0.104	0.3	1.1	0 K
5760 min Winter	181.046	0.046	0.2	0.5	0 K
7200 min Winter	181.039	0.039	0.2	0.4	0 K
8640 min Winter	181.034	0.034	0.2	0.4	0 K
10080 min Winter	181.030	0.030	0.2	0.3	0 K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
240 min Winter	11.265	0.0	226
360 min Winter	8.299	0.0	286
480 min Winter	6.674	0.0	362
600 min Winter	5.632	0.0	438
720 min Winter	4.901	0.0	514
960 min Winter	3.933	0.0	660
1440 min Winter	2.881	0.0	938
2160 min Winter	2.107	0.0	1332
2880 min Winter	1.687	0.0	1708
4320 min Winter	1.231	0.0	2384
5760 min Winter	0.984	0.0	2928
7200 min Winter	0.827	0.0	3576
8640 min Winter	0.717	0.0	4408
10080 min Winter	0.636	0.0	5144

Hydrock Consultants Ltd		Page 3
.	Bristol Airport 12 mppa	
.	Taxiway Extension T5	
.	Q30	
Date 01/09/2018	Designed by RJH	
File Taxiway T5.SRCX	Checked by	
Innovyze	Source Control 2018.1	

Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	30	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	20.000	Shortest Storm (mins)	15
Ratio R	0.370	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+0

Time Area Diagram

Total Area (ha) 0.042

Time (mins) From: To: (ha)	Time (mins) From: To: (ha)	Time (mins) From: To: (ha)	Time (mins) From: To: (ha)	Time (mins) From: To: (ha)
0 4 0.008	4 8 0.008	8 12 0.008	12 16 0.009	16 20 0.009

Time Area Diagram

Total Area (ha) 0.000

Time (mins) From: To: (ha)
0 4 0.000

Time Area Diagram

Total Area (ha) 0.000

Time (mins) From: To: (ha)
0 4 0.000

Hydrock Consultants Ltd		Page 4
.	Bristol Airport 12 mppa	
.	Taxiway Extension T5	
.	Q30	
Date 01/09/2018	Designed by RJH	
File Taxiway T5.SRCX	Checked by	
Innovyze	Source Control 2018.1	

Model Details

Storage is Online Cover Level (m) 182.800

Lined Soakaway Structure

Infiltration Coefficient Base (m/hr)	0.09000	Ring Diameter (m)	3.00
Infiltration Coefficient Side (m/hr)	0.09000	Pit Multiplier	1.5
Safety Factor	2.0	Number Required	1
Porosity	0.30	Cap Volume Depth (m)	0.000
Invert Level (m)	181.000	Cap Infiltration Depth (m)	0.000

Hydrock Consultants Ltd		Page 1
.	Bristol Airport 12 mppa	
.	Taxiway Extension T5	
.	Q100 +30%	
Date 12/11/2018	Designed by RJH	
File Taxiway T5.SRCX	Checked by	
Innovyze	Source Control 2018.1	

Summary of Results for 100 year Return Period (+30%)

Half Drain Time : 320 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	181.836	0.836	0.4	9.2	0 K
30 min Summer	182.100	1.100	0.5	12.1	0 K
60 min Summer	182.352	1.352	0.6	14.9	0 K
120 min Summer	182.550	1.550	0.6	17.1	Flood Risk
180 min Summer	182.610	1.610	0.6	17.7	Flood Risk
240 min Summer	182.612	1.612	0.6	17.8	Flood Risk
360 min Summer	182.598	1.598	0.6	17.6	Flood Risk
480 min Summer	182.568	1.568	0.6	17.3	Flood Risk
600 min Summer	182.530	1.530	0.6	16.9	Flood Risk
720 min Summer	182.488	1.488	0.6	16.4	0 K
960 min Summer	182.407	1.407	0.6	15.5	0 K
1440 min Summer	182.262	1.262	0.5	13.9	0 K
2160 min Summer	182.076	1.076	0.5	11.9	0 K
2880 min Summer	181.919	0.919	0.5	10.1	0 K
4320 min Summer	181.674	0.674	0.4	7.4	0 K
5760 min Summer	181.491	0.491	0.4	5.4	0 K
7200 min Summer	181.353	0.353	0.3	3.9	0 K
8640 min Summer	181.246	0.246	0.3	2.7	0 K
10080 min Summer	181.165	0.165	0.3	1.8	0 K
15 min Winter	181.941	0.941	0.5	10.4	0 K
30 min Winter	182.239	1.239	0.5	13.7	0 K
60 min Winter	182.527	1.527	0.6	16.8	Flood Risk
120 min Winter	182.762	1.762	0.6	19.4	Flood Risk
180 min Winter	182.800	1.800	0.7	20.3	FLOOD

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Summer	124.836	0.0	33
30 min Summer	83.061	0.0	46
60 min Summer	52.662	0.0	74
120 min Summer	32.210	0.0	128
180 min Summer	23.799	0.0	182
240 min Summer	19.065	0.0	226
360 min Summer	13.962	0.0	288
480 min Summer	11.178	0.0	352
600 min Summer	9.399	0.0	422
720 min Summer	8.153	0.0	492
960 min Summer	6.510	0.0	630
1440 min Summer	4.731	0.0	902
2160 min Summer	3.432	0.0	1300
2880 min Summer	2.730	0.0	1688
4320 min Summer	1.973	0.0	2432
5760 min Summer	1.566	0.0	3176
7200 min Summer	1.308	0.0	3896
8640 min Summer	1.129	0.0	4592
10080 min Summer	0.998	0.0	5264
15 min Winter	124.836	0.0	33
30 min Winter	83.061	0.0	46
60 min Winter	52.662	0.0	74
120 min Winter	32.210	0.0	128
180 min Winter	23.799	0.5	182

Hydrock Consultants Ltd		Page 2
.	Bristol Airport 12 mppa	
.	Taxiway Extension T5	
.	Q100 +30%	
Date 12/11/2018	Designed by RJH	
File Taxiway T5.SRCX	Checked by	
Innovyze	Source Control 2018.1	

Summary of Results for 100 year Return Period (+30%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
240 min Winter	182.801	1.801	0.7	20.5	FLOOD
360 min Winter	182.800	1.800	0.7	20.2	FLOOD
480 min Winter	182.797	1.797	0.7	19.8	Flood Risk
600 min Winter	182.748	1.748	0.6	19.3	Flood Risk
720 min Winter	182.691	1.691	0.6	18.6	Flood Risk
960 min Winter	182.571	1.571	0.6	17.3	Flood Risk
1440 min Winter	182.357	1.357	0.6	15.0	0 K
2160 min Winter	182.092	1.092	0.5	12.0	0 K
2880 min Winter	181.878	0.878	0.5	9.7	0 K
4320 min Winter	181.559	0.559	0.4	6.2	0 K
5760 min Winter	181.337	0.337	0.3	3.7	0 K
7200 min Winter	181.179	0.179	0.3	2.0	0 K
8640 min Winter	181.073	0.073	0.3	0.8	0 K
10080 min Winter	181.047	0.047	0.2	0.5	0 K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
240 min Winter	19.065	0.6	236
360 min Winter	13.962	0.4	300
480 min Winter	11.178	0.0	374
600 min Winter	9.399	0.0	452
720 min Winter	8.153	0.0	528
960 min Winter	6.510	0.0	678
1440 min Winter	4.731	0.0	968
2160 min Winter	3.432	0.0	1380
2880 min Winter	2.730	0.0	1776
4320 min Winter	1.973	0.0	2552
5760 min Winter	1.566	0.0	3288
7200 min Winter	1.308	0.0	3968
8640 min Winter	1.129	0.0	4584
10080 min Winter	0.998	0.0	5136

Hydrock Consultants Ltd		Page 3
.	Bristol Airport 12 mppa	
.	Taxiway Extension T5	
.	Q100 +30%	
Date 12/11/2018	Designed by RJH	
File Taxiway T5.SRCX	Checked by	
Innovyze	Source Control 2018.1	

Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	100	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	20.000	Shortest Storm (mins)	15
Ratio R	0.370	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+30

Time Area Diagram

Total Area (ha) 0.042

Time (mins) From: To:	Area (ha)	Time (mins) From: To:	Area (ha)	Time (mins) From: To:	Area (ha)	Time (mins) From: To:	Area (ha)	Time (mins) From: To:	Area (ha)
0 4	0.008	4 8	0.008	8 12	0.008	12 16	0.009	16 20	0.009

Time Area Diagram

Total Area (ha) 0.000

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

0 4	0.000
-----	-------

Time Area Diagram

Total Area (ha) 0.000

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

0 4	0.000
-----	-------

Hydrock Consultants Ltd		Page 4
.	Bristol Airport 12 mppa	
.	Taxiway Extension T5	
.	Q100 +30%	
Date 12/11/2018	Designed by RJH	
File Taxiway T5.SRCX	Checked by	
Innovyze	Source Control 2018.1	

Model Details

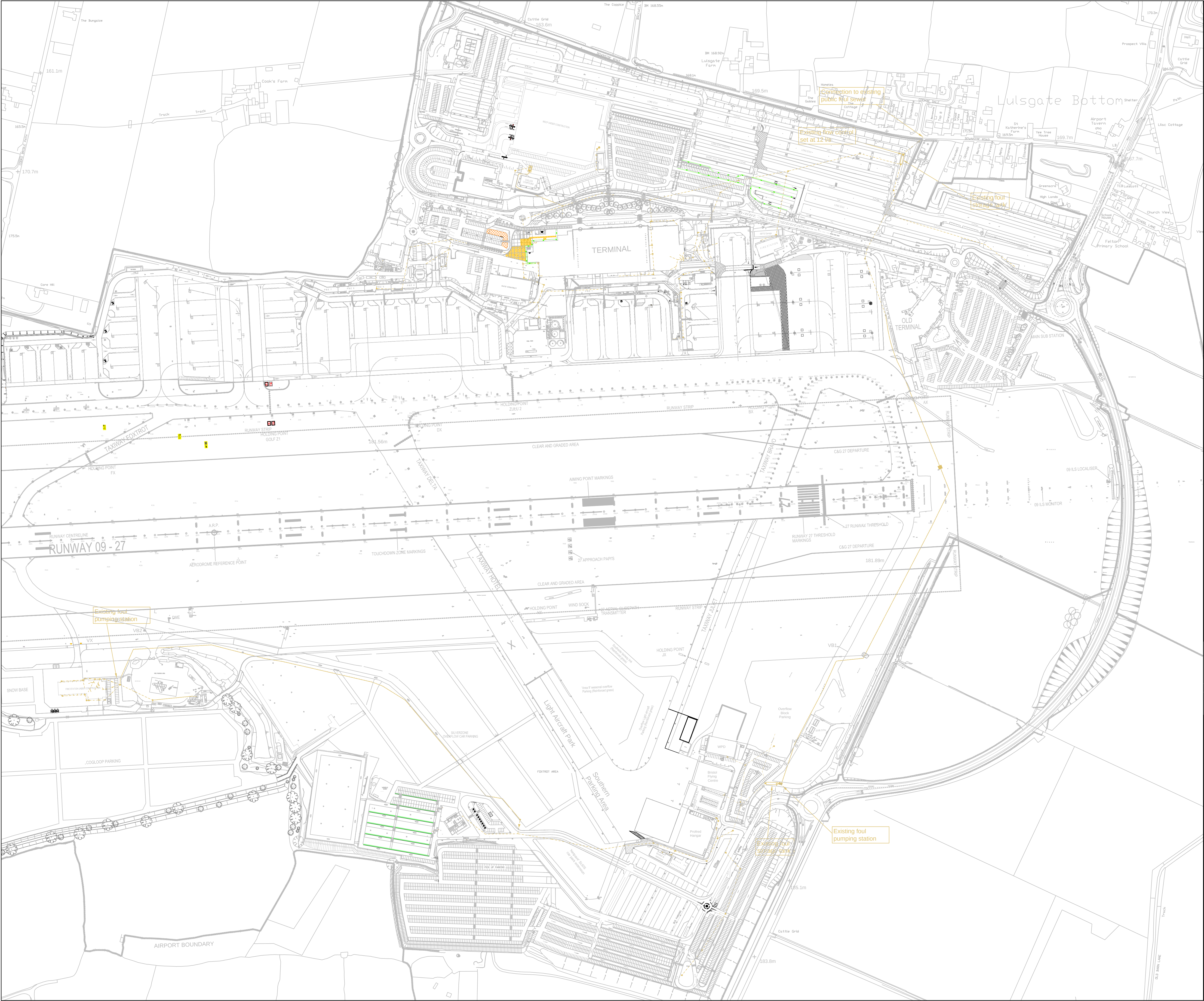
Storage is Online Cover Level (m) 182.800

Lined Soakaway Structure

Infiltration Coefficient Base (m/hr)	0.09000	Ring Diameter (m)	3.00
Infiltration Coefficient Side (m/hr)	0.09000	Pit Multiplier	1.5
Safety Factor	2.0	Number Required	1
Porosity	0.30	Cap Volume Depth (m)	0.000
Invert Level (m)	181.000	Cap Infiltration Depth (m)	0.000

Appendix K – Foul Drainage

Reference	Title
BAE-HYD-XX-XX-DR-D-2013-P02	Existing Foul Water Drainage
BAE-HYD-XX-XX-DR-D-2014-P03	Proposed Foul Water Drainage



NOTES

Existing foul drain

Existing foul rising main

REVISIONS

Rev	Date	Description	By	Ckd	App
P02	16/11/18	Additional existing drainage.	RJH		
P01	24/09/18	First Issue.	RJH		



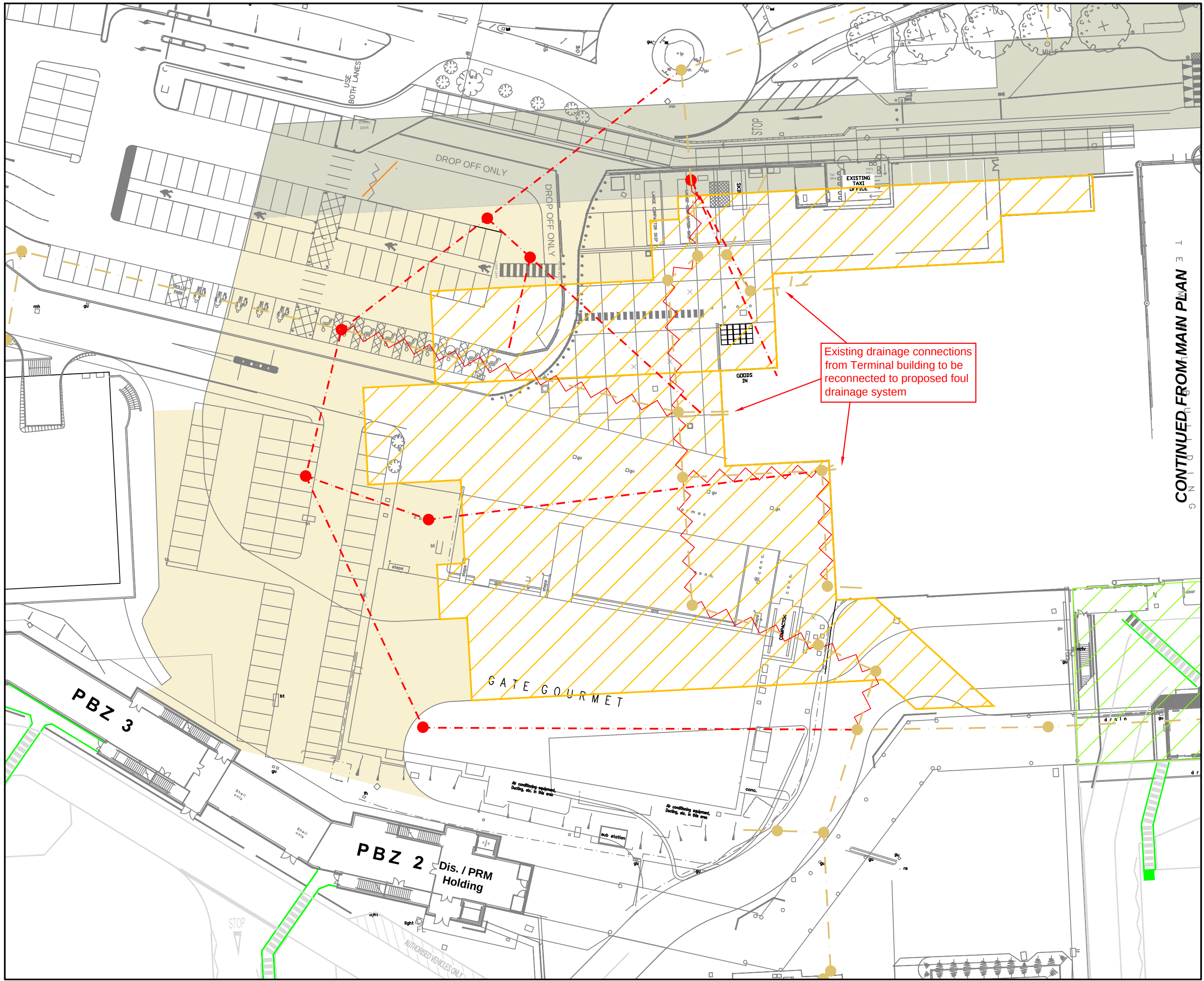
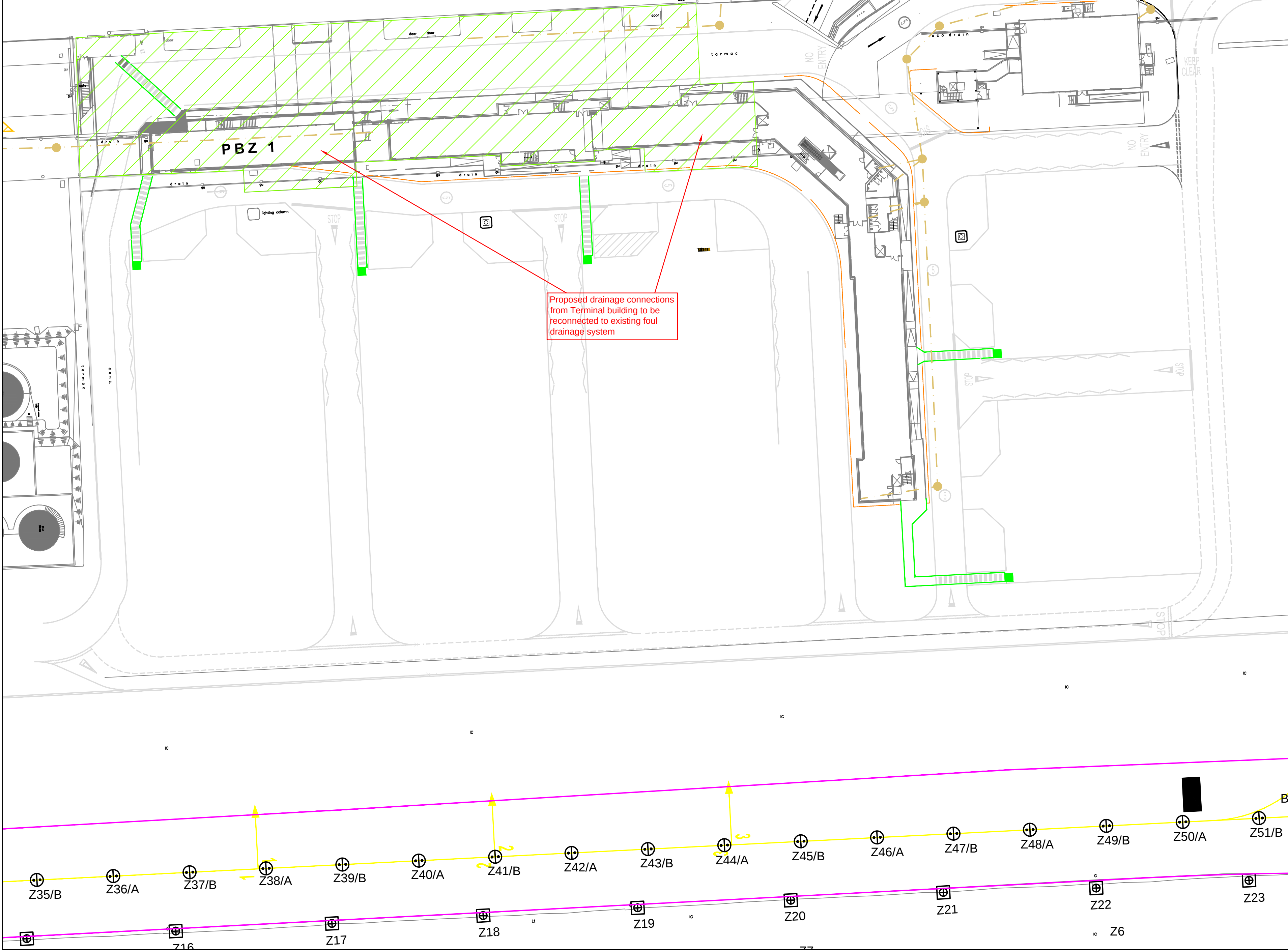
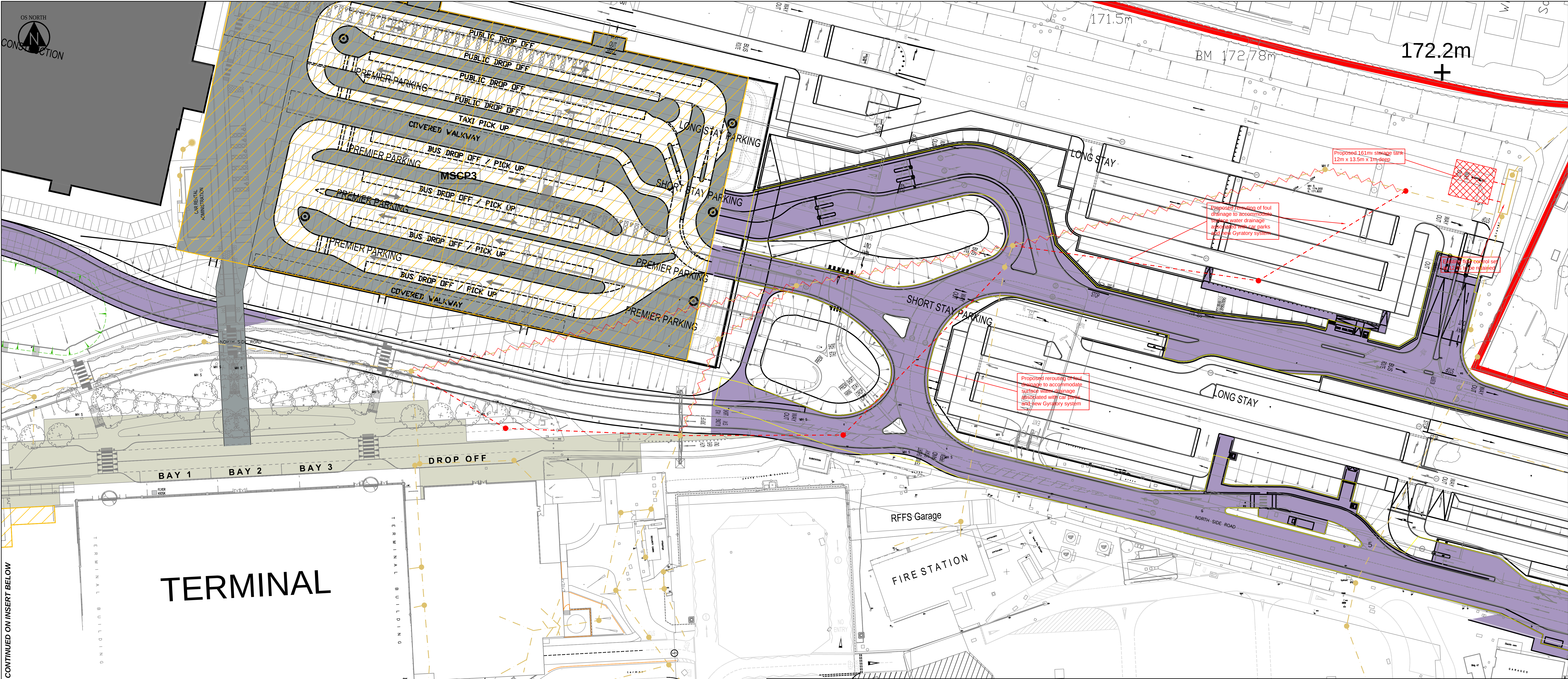
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CLIENT
BRISTOL AIRPORT

PROJECT
BRISTOL AIRPORT
12mpps EXPANSION SCHEME

TITLE
EXISTING FOUL DRAINAGE

HYDROCK PROJECT NO. C-09194-C	SCALE @ A1 1 : 2,500
STATUS DESCRIPTION INFORMATION	STATUS S2
DRAWING NO. (PROJECT CODE-ORIGINATOR-ZONE-LEVEL-TYPE-ROLE-NUMBER) BAE-HYD-XX-XX-DR-D-2013	REVISION P02



- KEY
- Existing surface water drain
 - Proposed surface water drain
 - Existing foul water drain to be abandoned
 - Proposed Western Terminal Extension
 - Proposed South Terminal Extension

REVISIONS

P03	05/12/18	Master plan updated.	RJH	
P02	15/11/18	Drainage updated.	RJH	
P01	24/09/18	First issue.	RJH	

Rev	Date	Description	By	Ckd	App

CLIENT
BRISTOL AIRPORT

PROJECT
BRISTOL AIRPORT 12m ppa
EXPANSION SCHEME

TITLE
PROPOSED FOUL WATER DRAINAGE

HYDROCK PROJECT NO. C-09194-C	SCALE @ AD 1:500	STATUS FOR APPROVAL	STATUS S2
DRAWING NO. (PROJECT CODE ORIGINATOR ZONE LEVEL TYPE ROLE NUMBER) BAE-HYD-XX-XX-DR-D-2014		REVISION P03	