

Knapp Hicks

making it happen

Knapp Hicks & Partners Ltd

File: BRAYDELLS PLOT 5.pfd

Network: Storm Network

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Design Settings

Rainfall Methodology

FEH-22

Return Period (years)

2

Additional Flow (%)

0

CV

1.000

Time of Entry (mins)

5.00

Maximum Time of Concentration (mins)

30.00

Maximum Rainfall (mm/hr)

50.0

Minimum Velocity (m/s)

1.00

Connection Type

Level Soffits

Minimum Backdrop Height (m)

0.200

Preferred Cover Depth (m)

1.200

Include Intermediate Ground

✓

Enforce best practice design rules

✓

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)
RE 1		5.00	37.000		533879.834	122017.075	0.500
SW PPIC 1	0.006	5.00	37.130	450	533890.255	122012.074	0.780
SW PPCP 1	0.009	5.00	37.000	450	533886.079	122001.131	0.796
SW PPIC 19	0.017	5.00	36.750	450	533869.871	121994.921	0.823
HW 3			36.700		533870.149	121993.025	1.100

Links

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)
1	RE 1	SW PPIC 1	11.559	0.600	36.500	36.356	0.144	80.3	100	5.22	50.0
2	SW PPIC 1	SW PPCP 1	11.713	0.600	36.350	36.204	0.146	80.2	100	5.45	50.0
3	SW PPCP 1	SW PPIC 19	22.144	0.600	36.204	35.927	0.277	79.9	100	5.88	50.0
4	SW PPIC 19	HW 3	6.595	0.600	35.927	35.600	0.327	20.2	100	5.94	50.0

Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)	Pro Depth (mm)	Pro Velocity (m/s)
1	0.859	6.7	0.0	0.400	0.674	0.000	0.0	0	0.000
2	0.860	6.8	1.1	0.680	0.696	0.006	0.0	27	0.627
3	0.861	6.8	2.7	0.696	0.723	0.015	0.0	44	0.815
4	1.727	13.6	5.8	0.723	1.000	0.032	0.0	46	1.660

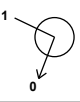
Pipeline Schedule

Link	Length (m)	Slope (1:X)	Dia (mm)	Link Type	US CL (m)	US IL (m)	US Depth (m)	DS CL (m)	DS IL (m)	DS Depth (m)
1	11.559	80.3	100	Circular	37.000	36.500	0.400	37.130	36.356	0.674
2	11.713	80.2	100	Circular	37.130	36.350	0.680	37.000	36.204	0.696
3	22.144	79.9	100	Circular	37.000	36.204	0.696	36.750	35.927	0.723
4	6.595	20.2	100	Circular	36.750	35.927	0.723	36.700	35.600	1.000

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
1	RE 1		Junction		SW PPIC 1	450	Manhole	Adoptable
2	SW PPIC 1	450	Manhole	Adoptable	SW PPCP 1	450	Manhole	Adoptable
3	SW PPCP 1	450	Manhole	Adoptable	SW PPIC 19	450	Manhole	Adoptable
4	SW PPIC 19	450	Manhole	Adoptable	HW 3		Junction	

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Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
RE 1	533879.834	122017.075	37.000	0.500			0 1	36.500	100
SW PPIC 1	533890.255	122012.074	37.130	0.780	450		1 1	36.356	100
SW PPCP 1	533886.079	122001.131	37.000	0.796	450		0 2	36.350	100
							1 2	36.204	100
							0 3	36.204	100
SW PPIC 19	533869.871	121994.921	36.750	0.823	450		1 3	35.927	100
							0 4	35.927	100
HW 3	533870.149	121993.025	36.700	1.100			1 4	35.600	100

Simulation Settings

Rainfall Methodology	FEH-22	Skip Steady State	x	2 year (l/s)	0.2
Rainfall Events	Singular	Drain Down Time (mins)	1440	30 year (l/s)	0.3
Summer CV	1.000	Additional Storage (m³/ha)	20.0	100 year (l/s)	0.4
Winter CV	1.000	Starting Level (m)		Check Discharge Volume	✓
Analysis Speed	Normal	Check Discharge Rate(s)	✓	100 year 360 minute (m³)	13

Storm Durations

15 | 30 | 60 | 120 | 180 | 240 | 360 | 480 | 600 | 720 | 960 | 1440

Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
2	0	0	0
30	0	0	0
30	45	0	0
100	20	0	0
100	45	0	0

Pre-development Discharge Rate

Site Makeup	Greenfield	Growth Factor 30 year	1.95
Greenfield Method	FEH	Growth Factor 100 year	2.48
Positively Drained Area (ha)	0.033	Betterment (%)	0
SAAR (mm)	822	QMed	0.2
Host	1	QBar	0.2
BFIHost	0.482	Q 1 year (l/s)	
Region	1	Q 30 year (l/s)	
QBar/QMed conversion factor	1.111	Q 100 year (l/s)	
Growth Factor 1 year	0.85		

Pre-development Discharge Volume

Site Makeup	Greenfield	Return Period (years)	100
Greenfield Method	FSR/FEH	Climate Change (%)	0
Positively Drained Area (ha)	0.033	Storm Duration (mins)	360
Soil Index	5	Betterment (%)	0
SPR	0.53	PR	0.573
CWI	123.259	Runoff Volume (m ³)	13

Node SW PPIC 19 Online Orifice Control

Flap Valve	x	Design Depth (m)	0.850	Discharge Coefficient	0.600
Replaces Downstream Link	x	Design Flow (l/s)	1.7		
Invert Level (m)	35.927	Diameter (m)	0.029		

Node SW PPIC 19 Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	35.960	Slope (1:X)	500.0
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)	118	Depth (m)	0.530
Safety Factor	2.0	Width (m)	10.000	Inf Depth (m)	
Porosity	0.30	Length (m)	16.500		

Results for 2 year Critical Storm Duration. Lowest mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	RE 1	1	36.500	0.000	0.0	0.0000	0.0000	OK
15 minute summer	SW PPIC 1	10	36.377	0.027	1.1	0.0084	0.0000	OK
15 minute summer	SW PPCP 1	11	36.247	0.043	2.7	0.0167	0.0000	OK
180 minute summer	SW PPIC 19	124	36.042	0.115	2.3	3.3307	0.0000	SURCHARGED
180 minute summer	HW 3	124	35.614	0.014	0.6	0.0000	0.0000	OK

Link Event (Outflow)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	RE 1	1	SW PPIC 1	0.0	0.000	0.000	0.0069	
15 minute summer	SW PPIC 1	2	SW PPCP 1	1.1	0.435	0.158	0.0290	
15 minute summer	SW PPCP 1	3	SW PPIC 19	2.7	0.593	0.393	0.1071	
180 minute summer	SW PPIC 19	4	HW 3	0.6	0.843	0.041	0.0044	7.0

Results for 30 year Critical Storm Duration. Lowest mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	RE 1	1	36.500	0.000	0.0	0.0000	0.0000	OK
15 minute summer	SW PPIC 1	10	36.395	0.045	2.8	0.0140	0.0000	OK
15 minute summer	SW PPCP 1	12	36.314	0.110	7.0	0.0422	0.0000	SURCHARGED
120 minute winter	SW PPIC 19	102	36.159	0.232	4.7	9.1446	0.0000	SURCHARGED
120 minute winter	HW 3	102	35.617	0.017	0.8	0.0000	0.0000	OK

Link Event (Outflow)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	RE 1	1	SW PPIC 1	0.0	0.000	0.000	0.0161	
15 minute summer	SW PPIC 1	2	SW PPCP 1	2.8	0.522	0.411	0.0653	
15 minute summer	SW PPCP 1	3	SW PPIC 19	6.8	0.893	1.008	0.1733	
120 minute winter	SW PPIC 19	4	HW 3	0.8	0.942	0.060	0.0057	13.4

Results for 30 year +45% CC Critical Storm Duration. Lowest mass balance: 99.42%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	RE 1	12	36.556	0.056	0.9	0.0000	0.0000	OK
15 minute summer	SW PPIC 1	12	36.556	0.206	4.1	0.0643	0.0000	SURCHARGED
15 minute summer	SW PPCP 1	12	36.520	0.316	9.1	0.1216	0.0000	SURCHARGED
180 minute winter	SW PPIC 19	160	36.261	0.334	4.9	14.2649	0.0000	SURCHARGED
180 minute winter	HW 3	160	35.618	0.018	1.0	0.0000	0.0000	OK

Link Event (Outflow)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	RE 1	1	SW PPIC 1	-0.9	-0.163	-0.138	0.0715	
15 minute winter	SW PPIC 1	2	SW PPCP 1	3.4	0.526	0.510	0.0916	
15 minute summer	SW PPCP 1	3	SW PPIC 19	7.9	1.007	1.164	0.1733	
180 minute winter	SW PPIC 19	4	HW 3	1.0	0.996	0.073	0.0065	21.7

Results for 100 year +20% CC Critical Storm Duration. Lowest mass balance: 99.39%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	RE 1	12	36.574	0.074	1.0	0.0000	0.0000	OK
15 minute summer	SW PPIC 1	12	36.573	0.223	4.2	0.0699	0.0000	SURCHARGED
15 minute summer	SW PPCP 1	12	36.539	0.335	9.1	0.1288	0.0000	SURCHARGED
120 minute winter	SW PPIC 19	116	36.273	0.346	7.0	14.8526	0.0000	SURCHARGED
120 minute winter	HW 3	116	35.619	0.018	1.0	0.0000	0.0000	OK

Link Event (Outflow)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	RE 1	1	SW PPIC 1	-1.0	-0.149	-0.142	0.0813	
15 minute summer	SW PPIC 1	2	SW PPCP 1	3.5	0.530	0.522	0.0916	
15 minute summer	SW PPCP 1	3	SW PPIC 19	8.0	1.019	1.178	0.1733	
120 minute winter	SW PPIC 19	4	HW 3	1.0	1.002	0.074	0.0066	20.1

Results for 100 year +45% CC Critical Storm Duration. Lowest mass balance: 99.29%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	RE 1	12	36.709	0.209	2.0	0.0000	0.0000	FLOOD RISK
15 minute summer	SW PPIC 1	12	36.708	0.358	5.1	0.1120	0.0000	SURCHARGED
15 minute summer	SW PPCP 1	12	36.670	0.466	9.8	0.1794	0.0000	SURCHARGED
120 minute winter	SW PPIC 19	116	36.345	0.418	8.4	18.4633	0.0000	SURCHARGED
120 minute winter	HW 3	116	35.619	0.019	1.1	0.0000	0.0000	OK

Link Event (Outflow)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	RE 1	1	SW PPIC 1	-2.0	-0.275	-0.295	0.0904	
15 minute summer	SW PPIC 1	2	SW PPCP 1	4.1	0.530	0.607	0.0916	
15 minute summer	SW PPCP 1	3	SW PPIC 19	8.9	1.134	1.311	0.1733	
120 minute winter	SW PPIC 19	4	HW 3	1.1	1.031	0.082	0.0071	24.3