Design Settings

Rainfall Methodology	FEH-22	Minimum Velocity (m/s)	1.00
Return Period (years)	2	Connection Type	Level Soffits
Additional Flow (%)	0	Minimum Backdrop Height (m)	0.200
CV	0.750	Preferred Cover Depth (m)	1.200
Time of Entry (mins)	5.00	Include Intermediate Ground	✓
Maximum Time of Concentration (mins)	30.00	Enforce best practice design rules	✓
Maximum Rainfall (mm/hr)	50.0		

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Width (mm)	Easting (m)	Northing (m)	Depth (m)
SW MH 01.00			8.300	475		510559.780	103772.160	1.070
SW MH 02.00	0.004	5.00	8.445	1200		510590.350	103777.490	0.895
SW MH 03.00	0.047	5.00	8.750	475		510585.820	103807.100	1.075
SW MH 04.00	0.029	5.00	9.000	475		510615.150	103782.700	1.175
SW MH 05.00	0.019	5.00	8.800	475		510608.650	103826.670	0.525
SW MH 06.00	0.067	5.00	8.750	475		510595.500	103808.690	0.625
SW MH 07.00	0.025	5.00	8.800	475		510590.540	103852.780	0.742
SW MH 08.00	0.021	5.00	8.800	475		510604.050	103855.840	0.600
EX SW MH			8.300	900	670	510557.810	103769.670	1.100
ATT TANK			8.300	50		510592.150	103809.440	0.600
DIFFUSER NORTH		5.00	8.450	50		510581.630	103815.570	0.650
DIFFUSER SOUTH		5.00	8.450	50		510584.000	103789.900	0.600

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)
1.000	SW MH 08.00	SW MH 07.00	13.852	0.600	8.200	8.058	0.142	97.6	150	5.23	50.0
1.001	SW MH 07.00	ATT TANK	43.370	0.600	8.058	7.700	0.358	121.1	150	6.02	50.0
2.000	SW MH 06.00	ATT TANK	3.433	0.600	8.125	7.700	0.425	8.1	150	5.02	50.0
4.000	SW MH 05.00	SW MH 04.00	44.448	0.600	8.275	7.825	0.450	98.8	225	5.56	50.0
4.001	SW MH 04.00	SW MH 02.00	25.341	0.600	7.825	7.625	0.200	126.7	225	5.93	50.0
1.004	SW MH 02.00	SW MH 01.00	31.031	0.600	7.550	7.230	0.320	97.0	100	7.29	47.5
1.005	SW MH 01.00	EX SW MH	3.175	0.600	7.230	7.200	0.030	105.8	100	7.37	47.2
1.002	ATT TANK	SW MH 03.00	6.749	0.600	7.700	7.675	0.025	269.9	300	6.14	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)
1.000	1.017	18.0	2.8	0.450	0.592	0.021	0.0
1.001	0.912	16.1	6.2	0.592	0.450	0.046	0.0
2.000	3.567	63.0	9.1	0.475	0.450	0.067	0.0
4.000	1.315	52.3	2.6	0.300	0.950	0.019	0.0
4.001	1.160	46.1	6.5	0.950	0.595	0.048	0.0
1.004	0.781	6.1	27.3	0.795	0.970	0.212	0.0
1.005	0.747	5.9	27.1	0.970	1.000	0.212	0.0
1.002	0.952	67.3	15.3	0.300	0.775	0.113	0.0

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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)
1.003	SW MH 03.00	SW MH 02.00	29.955	0.600	7.675	7.550	0.125	239.6	300	6.63	49.7
3.000	DIFFUSER NORTH	SW MH 03.00	9.450	0.600	7.800	7.750	0.050	189.0	150	5.22	50.0
5.000	DIFFUSER SOUTH	SW MH 02.00	13.940	0.600	7.850	7.680	0.170	82.0	150	5.21	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)
1.003	1.011	71.5	21.5	0.775	0.595	0.160	0.0
3.000	0.727	12.9	0.0	0.500	0.850	0.000	0.0
5.000	1.111	19.6	0.0	0.450	0.615	0.000	0.0

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)
1.000	13.852	97.6	150	Circular	8.800	8.200	0.450	8.800	8.058	0.592
1.001	43.370	121.1	150	Circular	8.800	8.058	0.592	8.300	7.700	0.450
2.000	3.433	8.1	150	Circular	8.750	8.125	0.475	8.300	7.700	0.450
4.000	44.448	98.8	225	Circular	8.800	8.275	0.300	9.000	7.825	0.950
4.001	25.341	126.7	225	Circular	9.000	7.825	0.950	8.445	7.625	0.595
1.004	31.031	97.0	100	Circular	8.445	7.550	0.795	8.300	7.230	0.970
1.005	3.175	105.8	100	Circular	8.300	7.230	0.970	8.300	7.200	1.000
1.002	6.749	269.9	300	Circular	8.300	7.700	0.300	8.750	7.675	0.775
1.003	29.955	239.6	300	Circular	8.750	7.675	0.775	8.445	7.550	0.595
3.000	9.450	189.0	150	Circular	8.450	7.800	0.500	8.750	7.750	0.850
5.000	13.940	82.0	150	Circular	8.450	7.850	0.450	8.445	7.680	0.615

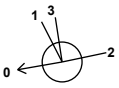
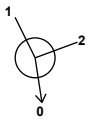
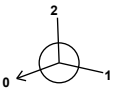
Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Width (mm)	Node Type	MH Type
1.000	SW MH 08.00	475	Manhole	Adoptable	SW MH 07.00	475		Manhole	Adoptable
1.001	SW MH 07.00	475	Manhole	Adoptable	ATT TANK	50		Manhole	Adoptable
2.000	SW MH 06.00	475	Manhole	Adoptable	ATT TANK	50		Manhole	Adoptable
4.000	SW MH 05.00	475	Manhole	Adoptable	SW MH 04.00	475		Manhole	Adoptable
4.001	SW MH 04.00	475	Manhole	Adoptable	SW MH 02.00	1200		Manhole	Adoptable
1.004	SW MH 02.00	1200	Manhole	Adoptable	SW MH 01.00	475		Manhole	Adoptable
1.005	SW MH 01.00	475	Manhole	Adoptable	EX SW MH	900	670	Manhole	Adoptable
1.002	ATT TANK	50	Manhole	Adoptable	SW MH 03.00	475		Manhole	Adoptable
1.003	SW MH 03.00	475	Manhole	Adoptable	SW MH 02.00	1200		Manhole	Adoptable
3.000	DIFFUSER NORTH	50	Manhole	Adoptable	SW MH 03.00	475		Manhole	Adoptable
5.000	DIFFUSER SOUTH	50	Manhole	Adoptable	SW MH 02.00	1200		Manhole	Adoptable

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Width (mm)	Connections		Link	IL (m)	Dia (mm)
SW MH 01.00	510559.780	103772.160	8.300	1.070	475		1		1.004	7.230	100
											
							0		1.005	7.230	100

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Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Width (mm)	Connections	Link	IL (m)	Dia (mm)
SW MH 02.00	510590.350	103777.490	8.445	0.895	1200			1	5.000	7.680	150
								2	4.001	7.625	225
								3	1.003	7.550	300
								0	1.004	7.550	100
SW MH 03.00	510585.820	103807.100	8.750	1.075	475			1	3.000	7.750	150
								2	1.002	7.675	300
								0	1.003	7.675	300
SW MH 04.00	510615.150	103782.700	9.000	1.175	475			1	4.000	7.825	225
								0	4.001	7.825	225
SW MH 05.00	510608.650	103826.670	8.800	0.525	475			0	4.000	8.275	225
SW MH 06.00	510595.500	103808.690	8.750	0.625	475			0	2.000	8.125	150
SW MH 07.00	510590.540	103852.780	8.800	0.742	475			1	1.000	8.058	150
								0	1.001	8.058	150
SW MH 08.00	510604.050	103855.840	8.800	0.600	475			0	1.000	8.200	150
EX SW MH	510557.810	103769.670	8.300	1.100	900	670		1	1.005	7.200	100
ATT TANK	510592.150	103809.440	8.300	0.600	50			1	2.000	7.700	150
								2	1.001	7.700	150
								0	1.002	7.700	300
DIFFUSER NORTH	510581.630	103815.570	8.450	0.650	50			0	3.000	7.800	150
DIFFUSER SOUTH	510584.000	103789.900	8.450	0.600	50			0	5.000	7.850	150

Simulation Settings

Rainfall Methodology	FEH-22	Analysis Speed	Normal	Additional Storage (m³/ha)	20.0
Summer CV	0.750	Skip Steady State	x	Check Discharge Rate(s)	x
Winter CV	0.840	Drain Down Time (mins)	240	Check Discharge Volume	x

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Storm Durations

15	60	180	360	600	960	2160	4320	7200	10080
30	120	240	480	720	1440	2880	5760	8640	

Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
2	0	0	0
30	40	0	0
100	0	0	0
100	45	0	0

Node SW MH 02.00 Online Head/Flow Control

Flap Valve	x	Invert Level (m)	7.550	Design Flow (l/s)	2.0
Replaces Downstream Link	✓	Design Depth (m)	0.800		

Head (m)	Flow (l/s)	Head (m)	Flow (l/s)	Head (m)	Flow (l/s)	Head (m)	Flow (l/s)	Head (m)	Flow (l/s)	Head (m)	Flow (l/s)
0.028	0.321	0.166	1.957	0.303	1.985	0.441	1.836	0.579	1.733	0.717	1.908
0.055	1.019	0.193	1.987	0.331	1.969	0.469	1.768	0.607	1.770	0.745	1.941
0.083	1.578	0.221	2.000	0.359	1.948	0.497	1.676	0.634	1.805	0.772	1.973
0.110	1.818	0.248	2.002	0.386	1.922	0.524	1.657	0.662	1.840	0.800	2.005
0.138	1.904	0.276	1.996	0.414	1.886	0.552	1.696	0.690	1.875		

Node ATT TANK Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	1.5	Invert Level (m)	7.700
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	Time to half empty (mins)	

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	203.5	0.0	0.600	203.5	0.0	0.601	0.0	0.0

Node DIFFUSER NORTH Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	7.800	Slope (1:X)	1000.0
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)		Depth (m)	0.500
Safety Factor	2.0	Width (m)	8.000	Inf Depth (m)	
Porosity	0.32	Length (m)	35.125		

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Results for 2 year Critical Storm Duration. Lowest mass balance: 99.23%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
120 minute winter	SW MH 01.00	92	7.274	0.044	2.0	0.0077	0.0000	OK
180 minute winter	SW MH 02.00	144	7.806	0.256	3.0	0.3125	0.0000	SURCHARGED
180 minute winter	SW MH 03.00	144	7.806	0.131	2.0	0.1381	0.0000	OK
15 minute winter	SW MH 04.00	11	7.883	0.058	7.0	0.0388	0.0000	OK
15 minute winter	SW MH 05.00	10	8.310	0.035	2.8	0.0311	0.0000	OK
15 minute summer	SW MH 06.00	8	8.187	0.062	9.4	0.1436	0.0000	OK
15 minute winter	SW MH 07.00	10	8.138	0.080	6.8	0.0684	0.0000	OK
15 minute winter	SW MH 08.00	10	8.242	0.042	3.1	0.0366	0.0000	OK
120 minute winter	EX SW MH	92	7.240	0.040	2.0	0.0000	0.0000	OK
180 minute winter	ATT TANK	144	7.806	0.106	6.6	20.5509	0.0000	OK
180 minute winter	DIFFUSER NORTH	144	7.806	0.006	0.1	0.0516	0.0000	OK
15 minute summer	DIFFUSER SOUTH	1	7.850	0.000	0.0	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
120 minute winter	SW MH 01.00	1.005	EX SW MH	2.0	0.643	0.341	0.0099	31.0
180 minute winter	SW MH 02.00	Head/Flow	SW MH 01.00	2.0				
180 minute winter	SW MH 03.00	1.003	SW MH 02.00	1.9	0.205	0.027	1.4033	
15 minute winter	SW MH 04.00	4.001	SW MH 02.00	6.8	0.613	0.147	0.5297	
15 minute winter	SW MH 05.00	4.000	SW MH 04.00	2.7	0.465	0.051	0.2641	
15 minute summer	SW MH 06.00	2.000	ATT TANK	9.6	3.038	0.152	0.0125	
15 minute winter	SW MH 07.00	1.001	ATT TANK	6.8	1.314	0.423	0.2448	
15 minute winter	SW MH 08.00	1.000	SW MH 07.00	3.1	0.454	0.170	0.0942	
180 minute winter	ATT TANK	1.002	SW MH 03.00	1.8	0.352	0.027	0.1753	
180 minute winter	DIFFUSER NORTH	3.000	SW MH 03.00	-0.1	-0.028	-0.005	0.0296	
15 minute summer	DIFFUSER SOUTH	5.000	SW MH 02.00	0.0	0.000	0.000	0.1036	

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Results for 30 year +40% CC Critical Storm Duration. Lowest mass balance: 99.23%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	SW MH 01.00	217	7.274	0.044	2.0	0.0077	0.0000	OK
240 minute winter	SW MH 02.00	240	8.085	0.535	5.1	0.6526	0.0000	SURCHARGED
240 minute winter	SW MH 03.00	240	8.085	0.410	8.5	0.4314	0.0000	SURCHARGED
240 minute winter	SW MH 04.00	240	8.085	0.260	5.1	0.1744	0.0000	SURCHARGED
15 minute winter	SW MH 05.00	10	8.342	0.067	10.3	0.0600	0.0000	OK
15 minute summer	SW MH 06.00	9	8.233	0.108	34.7	0.2508	0.0000	OK
15 minute winter	SW MH 07.00	12	8.500	0.442	23.0	0.3761	0.0000	SURCHARGED
15 minute winter	SW MH 08.00	11	8.555	0.355	11.4	0.3109	0.0000	FLOOD RISK
15 minute summer	EX SW MH	217	7.240	0.040	2.0	0.0000	0.0000	OK
240 minute winter	ATT TANK	240	8.085	0.385	14.4	74.4485	0.0000	FLOOD RISK
240 minute winter	DIFFUSER NORTH	240	8.085	0.285	8.3	24.0043	0.0000	SURCHARGED
240 minute winter	DIFFUSER SOUTH	240	8.085	0.235	0.1	0.0005	0.0000	SURCHARGED

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	SW MH 01.00	1.005	EX SW MH	2.0	0.643	0.341	0.0099	30.0
240 minute winter	SW MH 02.00	Head/Flow	SW MH 01.00	2.0				
240 minute winter	SW MH 03.00	1.003	SW MH 02.00	-2.8	0.295	-0.039	2.1094	
240 minute winter	SW MH 04.00	4.001	SW MH 02.00	4.7	0.450	0.101	1.0078	
15 minute winter	SW MH 05.00	4.000	SW MH 04.00	10.1	0.648	0.193	0.7490	
15 minute summer	SW MH 06.00	2.000	ATT TANK	34.9	3.424	0.553	0.0452	
15 minute winter	SW MH 07.00	1.001	ATT TANK	21.8	1.419	1.351	0.7635	
15 minute winter	SW MH 08.00	1.000	SW MH 07.00	10.0	0.570	0.558	0.2439	
240 minute winter	ATT TANK	1.002	SW MH 03.00	-4.3	0.203	-0.064	0.4753	
240 minute winter	DIFFUSER NORTH	3.000	SW MH 03.00	-8.3	-0.511	-0.646	0.1664	
240 minute winter	DIFFUSER SOUTH	5.000	SW MH 02.00	-0.1	-0.012	-0.007	0.2454	

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Results for 100 year Critical Storm Duration. Lowest mass balance: 99.23%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
2880 minute summer	SW MH 01.00	1860	7.274	0.044	2.0	0.0077	0.0000	OK
240 minute winter	SW MH 02.00	236	8.033	0.483	4.7	0.5897	0.0000	SURCHARGED
240 minute winter	SW MH 03.00	236	8.033	0.358	7.7	0.3770	0.0000	SURCHARGED
240 minute winter	SW MH 04.00	240	8.033	0.208	4.6	0.1398	0.0000	OK
15 minute winter	SW MH 05.00	10	8.338	0.063	9.3	0.0568	0.0000	OK
15 minute summer	SW MH 06.00	9	8.226	0.101	31.2	0.2355	0.0000	OK
15 minute winter	SW MH 07.00	11	8.403	0.345	21.0	0.2934	0.0000	SURCHARGED
15 minute winter	SW MH 08.00	11	8.450	0.250	10.3	0.2192	0.0000	SURCHARGED
2880 minute summer	EX SW MH	1860	7.240	0.040	2.0	0.0000	0.0000	OK
240 minute winter	ATT TANK	236	8.033	0.333	13.6	64.4498	0.0000	FLOOD RISK
240 minute winter	DIFFUSER NORTH	236	8.033	0.233	7.5	19.3632	0.0000	SURCHARGED
240 minute winter	DIFFUSER SOUTH	236	8.033	0.183	0.1	0.0004	0.0000	SURCHARGED

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
2880 minute summer	SW MH 01.00	1.005	EX SW MH	2.0	0.643	0.341	0.0099	155.5
240 minute winter	SW MH 02.00	Head/Flow	SW MH 01.00	2.0				
240 minute winter	SW MH 03.00	1.003	SW MH 02.00	-2.2	0.267	-0.031	2.1094	
240 minute winter	SW MH 04.00	4.001	SW MH 02.00	4.3	0.443	0.092	0.9906	
15 minute winter	SW MH 05.00	4.000	SW MH 04.00	9.1	0.642	0.174	0.6348	
15 minute summer	SW MH 06.00	2.000	ATT TANK	31.4	3.430	0.498	0.0413	
15 minute winter	SW MH 07.00	1.001	ATT TANK	19.8	1.418	1.229	0.7635	
15 minute winter	SW MH 08.00	1.000	SW MH 07.00	9.2	0.581	0.512	0.2439	
240 minute winter	ATT TANK	1.002	SW MH 03.00	-4.1	0.245	-0.061	0.4753	
240 minute winter	DIFFUSER NORTH	3.000	SW MH 03.00	-7.5	-0.477	-0.581	0.1664	
240 minute winter	DIFFUSER SOUTH	5.000	SW MH 02.00	-0.1	-0.012	-0.007	0.2454	

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Results for 100 year +45% CC Critical Storm Duration. Lowest mass balance: 99.23%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
2160 minute summer	SW MH 01.00	1020	7.274	0.044	2.0	0.0077	0.0000	OK
480 minute winter	SW MH 02.00	464	8.218	0.668	3.8	0.8153	0.0000	FLOOD RISK
480 minute winter	SW MH 03.00	464	8.218	0.543	5.5	0.5716	0.0000	SURCHARGED
480 minute winter	SW MH 04.00	464	8.218	0.393	3.8	0.2639	0.0000	SURCHARGED
15 minute winter	SW MH 05.00	10	8.352	0.077	13.5	0.0691	0.0000	OK
15 minute winter	SW MH 06.00	10	8.259	0.134	47.5	0.3101	0.0000	OK
15 minute winter	SW MH 07.00	11	8.768	0.710	29.2	0.6040	0.0000	FLOOD RISK
15 minute winter	SW MH 08.00	11	8.800	0.600	14.9	0.5262	0.5333	FLOOD
2160 minute summer	EX SW MH	1020	7.240	0.040	2.0	0.0000	0.0000	OK
480 minute winter	ATT TANK	464	8.218	0.518	10.0	100.2090	0.0000	FLOOD RISK
480 minute winter	DIFFUSER NORTH	464	8.218	0.418	5.0	35.9689	0.0000	FLOOD RISK
480 minute winter	DIFFUSER SOUTH	464	8.218	0.368	0.1	0.0007	0.0000	FLOOD RISK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
2160 minute summer	SW MH 01.00	1.005	EX SW MH	2.0	0.643	0.341	0.0099	219.0
480 minute winter	SW MH 02.00	Head/Flow	SW MH 01.00	2.0				
480 minute winter	SW MH 03.00	1.003	SW MH 02.00	-1.8	0.159	-0.026	2.1094	
480 minute winter	SW MH 04.00	4.001	SW MH 02.00	3.5	0.426	0.075	1.0078	
15 minute winter	SW MH 05.00	4.000	SW MH 04.00	13.2	0.661	0.253	1.1441	
15 minute winter	SW MH 06.00	2.000	ATT TANK	47.3	3.439	0.750	0.0571	
15 minute winter	SW MH 07.00	1.001	ATT TANK	24.3	1.418	1.508	0.7635	
15 minute winter	SW MH 08.00	1.000	SW MH 07.00	11.5	0.653	0.639	0.2439	
480 minute winter	ATT TANK	1.002	SW MH 03.00	-1.8	0.269	-0.027	0.4753	
480 minute winter	DIFFUSER NORTH	3.000	SW MH 03.00	-5.0	-0.351	-0.386	0.1664	
480 minute winter	DIFFUSER SOUTH	5.000	SW MH 02.00	-0.1	-0.006	-0.005	0.2454	

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