Flow Capacity Comparison Between CSP and Streamliner

Existing CSP Sizes		Estimated Flow Capacity - CSP	Suggested Streamliner				Estimated Flow Capacity -	Difference In
			Inside Diameter		Outside Diameter			
Inches	mm	m^3/s	Inches	mm	Inches	mm	Streamliner m^3/s	Flow Capacity
11.8	300	0.05	10	250	11.3	288	0.08	48%
14.8	375	0.09	12	300	13.6	345	0.13	32%
14.8	375	0.09	10	250	11.3	288	0.08	-19%
17.7	450	0.15	15	375	16.9	430	0.23	48%
17.7	450	0.15	12	300	13.6	345	0.13	-19%
17.7	450	0.15	10	250	11.3	288	0.08	-50%
20.7	525	0.23	18	450	20.4	520	0.37	59%
20.7	525	0.23	15	375	16.9	430	0.23	-2%
20.7	525	0.23	12	300	13.6	345	0.13	-46%
23.6	600	0.33	19.5	490	22.3	565	0.47	40%
23.6	600	0.33	18	450	20.4	520	0.37	11%
23.6	600	0.33	15	375	16.9	430	0.23	-31%
26.6	675	0.46	21	525	23.8	605	0.56	23%
26.6	675	0.46	19.5	490	22.3	565	0.47	2%
26.6	675	0.46	18	450	20.4	520	0.37	-19%
29.5	750	0.60	24	600	27.2	690	0.80	32%
29.5	750	0.60	21	525	23.8	605	0.56	-7%
29.5	750	0.60	19.5	490	22.3	565	0.47	-23%
31.5	800	0.72	27	685	31	775	1.14	59%
31.5	800	0.72	24	600	27.2	690	0.80	11%
31.5	800	0.72	21	525	23.8	605	0.56	-22%
35.4	900	0.98	30	750	34	865	1.45	48%
35.4	900	0.98	27	685	31	775	1.14	16%
35.4	900	0.98	24	600	27.2	690	0.80	-19%
39.4	1000	1.30	33	840	37	940	1.96	51%
39.4	1000	1.30	30	750	34	865	1.45	11%
39.4	1000	1.30	27	685	31	775	1.14	-12%
39.4	1000	1.30	24	600	27.2	690	0.80	-39%
41.3	1050	1.48	33	840	37	940	1.96	32%
41.3	1050	1.48	30	750	34	865	1.45	-2%
41.3	1050	1.48	27	685	31	775	1.14	-23%
41.3	1050	1.48	24	600	27.2	690	0.80	-46%
47.2	1200	2.11	36	910	40.2	1022	2.42	15%
47.2	1200	2.11	33	840	37	940	1.96	-7%
47.2	1200	2.11	30	750	34	865	1.45	-31%
47.2	1200	2.11	27	685	31	775	1.14	-46%

Flow Capacity Comparison Between CSP and Streamliner

Existing CSP Sizes		Estimated Flow Capacity - CSP	Suggested Streamliner				Estimated Flow Capacity -	Difference In
			Inside Diameter		Outside Diameter			
Inches	mm	m^3/s	Inches	mm	Inches	mm	Streamliner m^3/s	Flow Capacity
50.2	1275	2.48	40	1020	45	1144	3.29	32%
50.2	1275	2.48	36	910	40.2	1022	2.42	-2%
50.2	1275	2.48	33	840	37	940	1.96	-21%
50.2	1275	2.48	30	750	34	865	1.45	-42%
53.1	1350	2.89	42	1070	47.6	1210	3.73	29%
53.1	1350	2.89	40	1020	45	1144	3.29	14%
53.1	1350	2.89	36	910	40.2	1022	2.42	-16%
53.1	1350	2.89	33	840	37	940	1.96	-32%
59.1	1500	3.83	48	1220	53.9	1370	5.30	38%
59.1	1500	3.83	42	1070	47.6	1210	3.73	-3%
59.1	1500	3.83	40	1020	45	1144	3.29	-14%
59.1	1500	3.83	36	910	40.2	1022	2.42	-37%
65.0	1650	4.94	48	1220	53.9	1370	5.30	7%
65.0	1650	4.94	42	1070	47.6	1210	3.73	-24%
65.0	1650	4.94	40	1020	45	1144	3.29	-33%
65.0	1650	4.94	36	910	40.2	1022	2.42	-51%
70.9	1800	6.23	54	1370	60.6	1538	7.22	16%
70.9	1800	6.23	48	1220	53.9	1370	5.30	-15%
70.9	1800	6.23	42	1070	47.6	1210	3.73	-40%
70.9	1800	6.23	40	1020	45	1144	3.29	-47%
76.8	1950	7.71	60	1520	67.3	1710	9.52	24%
76.8	1950	7.71	54	1370	60.6	1538	7.22	-6%
76.8	1950	7.71	48	1220	53.9	1370	5.30	-31%
76.8	1950	7.71	42	1070	47.6	1210	3.73	-52%
82.7	2100	9.39	66	1680	74	1880	12.43	32%
82.7	2100	9.39	60	1520	67.3	1710	9.52	1%
82.7	2100	9.39	54	1370	60.6	1538	7.22	-23%
82.7	2100	9.39	48	1220	53.9	1370	5.30	-44%
88.6	2250	11.29	72	1830	80.3	2040	15.62	38%
88.6	2250	11.29	66	1680	74	1880	12.43	10%
88.6	2250	11.29	60	1520	67.3	1710	9.52	-16%
88.6	2250	11.29	54	1370	60.6	1538	7.22	-36%
94.5	2400	13.41	72	1830	80.3	2040	15.62	16%
94.5	2400	13.41	66	1680	74	1880	12.43	-7%
94.5	2400	13.41	60	1520	67.3	1710	9.52	-29%
94.5	2400	13.41	54	1370	60.6	1538	7.22	-46%
100.4	2550	15.76	72	1830	80.3	2040	15.62	-1%
100.4	2550	15.76	66	1680	74	1880	12.43	-21%
100.4	2550	15.76	60	1520	67.3	1710	9.52	-40%

Flow Capacity Comparison Between CSP and Streamliner

Existing CSP Sizes		Estimated Flow Capacity - CSP	Suggested Streamliner				Estimated Flow Capacity -	Difference In
			Inside Diameter		Outside Diameter			
Inches	mm	m^3/s	Inches	mm	Inches	mm	Streamliner m^3/s	Flow Capacity
106.3	2700	18.36	72	1830	80.3	2040	15.62	-15%
106.3	2700	18.36	66	1680	74	1880	12.43	-32%
112.2	2850	21.20	72	1830	80.3	2040	15.62	-26%
118.1	3000	24.31	72	1830	80.3	2040	15.62	-36%

NOTES:

Assume CSP culvert has profile of $2^2/_3$ x $^1/_2$"

All calculations are based on full pipe flow conditions.

Assumed that slope of pipe run is .1m/m

Manning's 'n' for Corrugated Steel Pipe is assumed to be 0.024; for Streamliner, 0.010.

IDEAL PIPE