Table 1: EPA Stormwater Calculator (SWC) Default Variables for LID Control Sizing

Note: Green text indicates limits (or defaults) of SWC.

		LID Control Variable Defaults							Default Sizing - Simple							Default Sizing - Typical							Default Sizing - Complex						
Variables	Default	Imperv Disconnect (DC)	Rain Harvesting (RH)	Rain Gardens (RG)	Green Roofs (GR)	Street Planters (SP)	Infiltration Basins (IB)	Permeable Pavement (PP)	DC	RH	RG	GR	SP	IB	PP	DC	RH	RG	GR	SP	IB	PP	DC	RH	RG	GR	SP	IB	PP
Footprint Ratio (% Capt Ratio)	varies	100		2		6	5	100																					
Cistern Size (gals)	100		100							45							100							5500					
Emptying Rate (gals/day)	50		50																										
Number per 1,000 sq ft	2		2							1							4							100					
Ponding Height (in)	varies			4		6					12		24					6		6					4		6		
Soil Media Thickness (in)	varies			12	4	18					6	3	12					12	6	18					36	12	24		
Soil Media Conductivity (in/hr)	10			10	10	10																							
Gravel Bed Thickness (in)	varies					12		18					6		12					12		18					36		36
Basin Depth (in)	6						6							12							6							24	
Pavement Thickness (in)	6							6							4							6							9

*Because vegetated swales are not included in calculator, default variables not included

Table 2: Cost Curve Selection Variables Based on User Input

	User's	Categorization Strike Assignments			Categorization Strike Tally			Range Adjust. Coeff.		
Adjustment Variables	Values	Simple	Typical	Complex	Simple	Typical	Complex	Simple	Typ	Complex
Is New Development	1	1	0	0	1	0	0			
Is Redevelopment	0	0	1	1	0	0	0			
Has Pretreatment			1	1						
Site Suitability - Poor	0	0	0	1	0	0	0			
Site Suitability - Moderate	1	0	1	0	0	1	0			
Site Suitability - Excellent	0	1	0	0	0	0	0			
Topography - Flat (2%)	0	1	0	0	0	0	0			
Topography - Moderately Flat (5%)	1	1	1	0	1	1	0			
Topography - Moderately Steep (10%)	0	0	1	1	0	0	0			
Topography - Steep (15%)	0	0	0	1	0	0	0			
Soil Type - A	0	1	0	0	0	0	0			
Soil Type - B	0	0	1	0	0	0	0			
Soil Type - C	1	0	0	1	0	0	1			
Soil Type - D	0	0	0	1	0	0	0			
Count or Total	**4**	**5**	**6**	**7**	**2**	**2**	**1**			
***Note:** Compare project categorization strikes to determine if project is low, typical or high*					0	1	0			

Table 3: Resulting Cost Curve Trendline Regression Equations - Capital Costs

	Default Sizing Equations - Capital Costs							
Trendline Equations	DC	RH	RG	GR	SP	IB	PP	VS
Simple Design Scenario Equation	y = 1.9321x + 1041.3	y = 0.577x + 1812.9	y = 0.9204x + 2021	y = 1.5215x + 2631.6	y = 1.6359x + 2254.4	y = 0.8339x + 2896.1	y = 3.5355x + 1672.5	y = 0.4329x + 1061.2
Typical Design Scenario Equation	y = 4.6869x + 2864.7	y = 1.0891x + 3957	y = 3.29x + 6873.8	y = 5.0205x + 12056	y = 6.5348x + 8371.9	y = 2.3002x + 8457	y = 6.2951x + 2775	y = 0.7534x + 1612.5
Complex Design Scenario Equation	y = 6.7608x + 4748.3	y = 1.728x + 4743	y = 6.7319x + 13229	y = 10.06x + 29592	y = 14.179x + 19955	y = 5.2059x + 17643	y = 9.4437x + 4725	y = 1.1278x + 2137.5
Simple Design Scenario R2	$R^2 = 1$	$R^2 = 1$	$R^2 = 1$	$R^2 = 1$	$R^2 = 1$	$R^2 = 1$	$R^2 = 1$	$R^2 = 1$
Typical Design Scenario R2	$R^2 = 1$	$R^2 = 1$	$R^2 = 1$	$R^2 = 1$	$R^2 = 1$	$R^2 = 1$	$R^2 = 1$	$R^2 = 1$
Complex Design Scenario R2	$R^2 = 1$	$R^2 = 1$	$R^2 = 1$	$R^2 = 1$	$R^2 = 1$	$R^2 = 1$	$R^2 = 1$	$R^2 = 1$

Table 3: Resulting Cost Curve Trendline Regression Equations - Maintenance Cost

	Default Sizing Equations - Maintenance Costs							
Trendline Equations	DC	RH	RG	GR	SP	IB	PP	VS
Simple Design Scenario Equation	y = 0.05x + 1E-13	y = 0.1003x + 0.0002	y = 0.0675x	y = 0.0281x + 6E-14	y = 0.045x	y = 0.0487x + 2E-13	y = 0.0563x	y = 0.0626x
Typical Design Scenario Equation	NA	NA	NA	NA	NA	NA	NA	NA
Complex Design Scenario Equation	y = 0.0751x	y = 0.2407x + 0.0006	y = 1.632x	y = 0.2821x + 1E-12	y = 1.0697x + 4E-12	y = 1.7689x + 8E-12	y = 0.3075x + 1E-12	y = 0.1215x - 5E-13
Simple Design Scenario R2	$R^2 = 1$	$R^2 = 1$	$R^2 = 1$	$R^2 = 1$	$R^2 = 1$	$R^2 = 1$	$R^2 = 1$	$R^2 = 1$
Typical Design Scenario R2	NA	NA	NA	NA	NA	NA	NA	NA
Complex Design Scenario R2	$R^2 = 1$	$R^2 = 1$	$R^2 = 1$	$R^2 = 1$	$R^2 = 1$	$R^2 = 1$	$R^2 = 1$	$R^2 = 1$

Table 4: Regionalization

Adjustment Variables	User's Values
LID Implementation City	Los Angeles
Computed Regional Cost Multiplier	0.99070725

Table 3b: Resulting Costs Ranges for Default Size

	Current Cost (size = 380000 sf or gals)							
Scenario	DC	RH	RG	GR	SP	IB	PP	VS
Default Simple	$ 81,537	$ 146,123	$ 103,596	$ 207,989	$ 214,420	$ 313,734	$ 894,613	$ 114,641
Default Tyical Typical I	$ 1,388,914	$ 296,042	$ 599,960	$ 953,620	$ 1,033,349	$ 325,847	$ 1,795,732	$ 216,514
Default Compl High De	$ 2,178,860	$ 539,595	$ 1,914,212	$ 2,886,050	$ 3,949,835	$ 1,439,214	$ 2,994,130	$ 359,313
Range Interval	$ 789,947	$ 243,554	$ 1,314,252	$ 1,932,430	$ 2,916,486	$ 1,113,367	$ 1,198,398	$ 142,798
Reported Low Low Des	**$ 1,388,914**	**$ 296,042**	**$ 599,960**	**$ 953,620**	**$ 1,033,349**	**$ 325,847**	**$ 1,795,732**	**$ 216,514**
Reported High	**$ 1,783,887**	**$ 417,819**	**$ 1,257,086**	**$ 1,919,835**	**$ 2,491,592**	**$ 882,531**	**$ 2,394,931**	**$ 287,913**

*Note: Default sizing quantities based on 100 SF of LID footprint area

Variable	Value	Units
Current BMP Size	380,000	SF
Default BMP Size	1000	SF
Default Size Multiplier	380	SF
Macro capitcal cost row #	52	-
Macro fill area start row #	58	-

Legend	
Calculated Cell	Gray
Macro enters data here	Green
Value on which cost is based	1
Macro reads calculated value from here	Light Green
Among formulas but manually entered	Manual
Among manual entries but contains formula	Formula

Assumptions

1. 6" mulch over LID footprint assumed for RG, GR, SP, and IB
2. DC assumes roof spout disconnect (1 per 500sf) for Simple, typical same as Simple + 4-6" decompaction, Complex same as Simple + 6-8" decompaction + impervious su
3. RG and GR have 4" gravel - Simple, 6" typical, 8" Complex

Cost Item	Units	Unit Cost	Default Qty	Default Size Multiplier	Default Cost ($)	Applicability Multiplier								Quantity Multiplier - Simple								Quantity Multiplier - Typical								Quantity - Complex								Capital Cost - Simple								Capital Cost - Typical								Capital Cost Complex							
						DC	RH	RG	GR	SP	IB	PP	VS	DC	RH	RG	GR	SP	IB	PP	VS	DC	RH	RG	GR	SP	IB	PP	VS	DC	RH	RG	GR	SP	IB	PP	VS	DC	RH	RG	GR	SP	IB	PP	VS	DC	RH	RG	GR	SP	IB	PP	VS	DC	RH	RG	GR	SP	IB	PP	VS
Mobilization	EA	$ 1,500.00	1	1	$ 1,500	1	1	1	1	1	1	1	1	0.1		0.1	1	1	1	1	0.5	1.0	2.0	1.0	1.0	1.0	1.0	1.0	0.75	2.0	2.0	2.0	4.0	4.0	2.0	2.0	1	$ 150		$ 150	$ 1,500	$ 1,500	$ 1,500	$ 1,500	$ 750	$ 1,500	$ 3,000	$ 1,500	$ 1,500	$ 1,500	$ 1,500	$ 1,500	$ 1,125	$ 3,000	$ 3,000	$ 3,000	$ 6,000	$ 6,000	$ 3,000	$ 3,000	$ 1,500
Demolition	%	5	1	0	$ -	1	1	1		1	1	1	1	1								2.0				0.3	0.3	0.5		3.0		0.5		2.0	0.5	1.0																									
Clearing & Grubbing	SF	$ 0.18	1000	380	$ 69,667		1	1		1	1	1	1								0.75		0.1	0.1		0.3	0.3	0.5	1	1.0	1.0	1.0			1.0	1.0	1.5								$ 52,250		$ 6,967	$ 6,967		$ 17,417	$ 17,417	$ 34,833	$ 69,667		$ 69,667	$ 69,667			$ 69,667	$ 69,667	$ 104,500
Dewatering	DAY	$ 162.50	1	1	$ 163			1																								0.5		2.0																						$ 81					
Embankment	CF	$ 0.37	225	380	$ 31,649		1				1								0.5								1.0								1.5								$ 15,824								$ 31,649								$ 47,473		
Excavation (0 - 1000)	CF	$ 0.07	500	380	$ 13,300		1	1			1	1	1			1.0			0.7	0.9	1.0							1.0			1.0									$ 13,300			$ 8,867	$ 11,822	$ 13,300							$ 13,300	$ 13,300		$ 13,300						
Excavation (1000 - 10,000)	CF	$ 0.06	500	380	$ 11,189			1			1	1												1.0			0.3	1.3	1.0																			$ 11,189			$ 3,730	$ 14,919	$ 11,189								
Excavation (10,000+)	CF	$ 0.23	500	380	$ 42,856			1			1	1																				2.0			1.3	2.5	1.0																			$ 85,711			$ 57,141	$ 107,139	$ 42,856
Haul/Dispose of Ex Material	CF	$ 0.37	500	380	$ 70,581			1			1	1	1								0.5			1.0			0.2	1.3	1.0		1.0	2.0			0.7	2.5	1.5								$ 35,291			$ 70,581			$ 11,764	$ 94,109	$ 70,581			$ 141,163			$ 47,054	$ 176,454	$ 105,872
Finish Grading	SF	$ 0.03	1000	380	$ 9,711							1	1								1.0							1.0	1.5		1.0					1.0	2.0								$ 9,711							$ 9,711	$ 14,567							$ 9,711	$ 19,422
Soil Media / Planting Media	CF	$ 2.10	333	380	$ 266,328			1	1	1	1		1			0.1	0.3	0.3			0.5			1.0	2.0	1.5			1.0		1.0	3.0	4.0	3.0			1.5			$ 13,316	$ 66,582	$ 79,899						$ 266,328	$ 532,657	$ 399,493						$ 798,985	$ 1,065,314	$ 798,985			
Pea Gravel	CF	$ 1.39	333	380	$ 175,926					1								0.3								0.5							1.5	2.0								$ 52,778								$ 87,963								$ 351,852			
Gravel fill 3/4"	CF	$ 1.22	167	380	$ 77,267			1	1		1					0.0	0.7		2.0					1.0	1.0		1.0					2.0			4.0						$ 51,511		$ 154,533					$ 77,267	$ 77,267		$ 77,267					$ 154,533			$ 309,067		
Base Course Gravel	CF	$ 0.39	500	380	$ 74,452							1								0.7								1.0								2.0								$ 49,635								$ 74,452								$ 148,904	
Pavement	SF	$ 3.18	1000	380	$ 1,208,400							1								0.7								1.0								1.5								$ 805,600								$ 1,208,400								$ 1,812,600	
Mulch	SF	$ 0.30	167	380	$ 18,906			1	1	1	1					1.0		1.0						1.0		1.0						1.5		1.5						$ 18,906		$ 18,906						$ 18,906		$ 18,906						$ 28,359		$ 28,359			
Vegetation - Low	SF	$ 0.25	100	380	$ 9,500			1	1	1	1		1			1.0	2.0	1.0			1.0																			$ 9,500	$ 19,000	$ 9,500																			
Vegetation - Typical	SF	$ 1.20	100	380	$ 45,600			1	1	1	1		1											1.0	3.0	1.5	0.5		1.0								1.0											$ 45,600	$ 136,800	$ 68,400	$ 22,800										
Vegetation - High	SF	$ 2.33	100	380	$ 88,540			1	1	1	1						1.0	1.0														2.0	5.0	2.0	1.5																					$ 177,080	$ 442,700	$ 177,080	$ 132,810		
Slotted PVC Underdrain Pipe	LF	$ 11.90	10	380	$ 45,220			1	1	1	1	1				1.0	1.0	1.0	0.0	0.0				1.0	1.0	1.0	0.0	1.0				1.5		1.5		1.5				$ 45,220	$ 45,220	$ 45,220						$ 45,220	$ 45,220	$ 45,220		$ 45,220				$ 67,830		$ 67,830		$ 67,830	
Hydroseed	SF	$ 0.65	1000	380	$ 247,000						1								0.5																1.0								$ 123,500																$ 247,000		
Soil de-compaction 4-6"	SF	$ 0.40	1000	380	$ 152,000	1																1.0																																							
Soil de-compaction 6-8"	SF	$ 0.60	1000	380	$ 228,000	1																								1.0																															
Impervious area removal	SF	$ 1.62	1000	380	$ 615,600	1								0.1								2.0								3.0								$ 61,560								$ 1,231,200								$ 1,846,800							
Roof downspout disconnection	EA	$ 9.77	2.00	380	$ 7,425	1								2.0								4.0								6.0								$ 14,850								$ 29,701								$ 44,551							
Cistern inlet structure	EA	$ 20.00	1	1	20		1								1.0								4.0								8.0								$ 20								$ 80								$ 160						
Cistern outlet structure	EA	$ 20.00	1	1	20		1								1.0								4.0								8.0								$ 20								$ 80								$ 160						
Cistern overflow structure	EA	$ 20.00	1	1	20		1								1.0								4.0								8.0								$ 20								$ 80								$ 160						
Inflow Structure(s)	EA	$ 1,240.00	1	1	1,240			1		1	1					0.1		0.1	0.1					0.5		0.2	0.5					1.0		0.3	2.0					$ 62		$ 124	$ 124					$ 620		$ 248	$ 620					$ 1,240		$ 372	$ 2,480		
Outflow Structure(s)	EA	$ 1,240.00	1	1	1,240	1		1	1	1	1					0.1	0.1	0.1	0.1			0.2		0.5	0.5	0.2	0.5			0.3		1.5	2.0	1.0	2.0					$ 62	$ 124	$ 124	$ 124			$ 248		$ 620	$ 620	$ 248	$ 620			$ 310		$ 1,860	$ 2,480	$ 1,240	$ 2,480		
Overflow Structures(s)	EA	$ 1,240.00	1	1	1,240			1		1	1					0.1	0.1	0.1	0.1					0.5	0.5	0.2	0.5					1.5	2.0	1.0	2.0					$ 62	$ 124	$ 124	$ 124					$ 620	$ 620	$ 248	$ 620					$ 1,860	$ 2,480	$ 1,240	$ 2,480		
Cistern / Storage Tank (s) - Low	GALS	$ 0.37	1000	380	$ 141,807		1								1.0																								$ 141,807																						
Cistern / Storage Tank (s) - Typical	GALS	$ 0.68	1000	380	$ 258,922		1			1													1.0			1.0																					$ 258,922			$ 258,922											
Cistern / Storage Tank (s) - High	GALS	$ 0.91	1000	380	$ 345,230		1			1																					1.0			3.0																					$ 345,230			$ 1,035,689			
Perimeter fence	LF	$ 4.80	126	380	$ 230,720						1																0.5							1.0	1.0																$ 115,360								$ 230,720		
Engineering	%	10	1	1	$ 448,974	1	1	1	1	1	1	1	1	0.5			1.0								1.0	0.5	0.5	1.0	1.0		1.0	1.0	6.0	3.0	1.0	1.0	1.0	$ 3,828			$ 18,406								$ 79,468	$ 44,928	$ 14,167	$ 149,644	$ 18,043		$ 43,168	$ 153,137	$ 911,384	$ 740,594	$ 115,137	$ 239,530	$ 28,745
Contingency - low	%	3	1	1	$ 134,692	1	1	1	1	1	1	1	1	0.5	1.0	1.0	1.0	1.0	1.0	1.0	1.0																	$ 1,148.41	$ 4,256	$ 3,017	$ 5,522	$ 6,245	$ 9,138	$ 26,057	$ 3,339																
Contingency - typical	%	10	1	1	$ 448,974	1	1	1	1	1	1	1	1									1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0																	$ 126,265	$ 26,913	$ 54,542	$ 79,468	$ 89,856	$ 28,335	$ 149,644	$ 18,043								
Contingency - high	%	15	1	1	$ 673,461	1	1	1	1	1	1	1	1																	1.0	1.0	1.0	2.0	2.0	1.0	1.0	1.0																	$ 284,199	$ 64,751	$ 229,705	$ 455,692	$ 740,594	$ 172,706	$ 359,296	$ 43,118
Total					$ 6,197,338	11	15	22	14	19	24	15	12	4	5	5	8	7	6	4		11	16	11	11	10	8	12		17	34	24	27	29	23	17		$ 81,537	$ 146,123	$ 103,596	$ 207,989	$ 214,420	$ 313,734	$ 894,613	$ 114,641	$ 1,388,914	$ 296,042	$ 599,960	$ 953,620	$ 1,033,349	$ 325,847	$ 1,795,732	$ 216,514	$ 2,178,860	$ 539,595	$ 1,914,212	$ 2,886,050	$ 3,949,835	$ 1,439,214	$ 2,994,130	$ 359,313

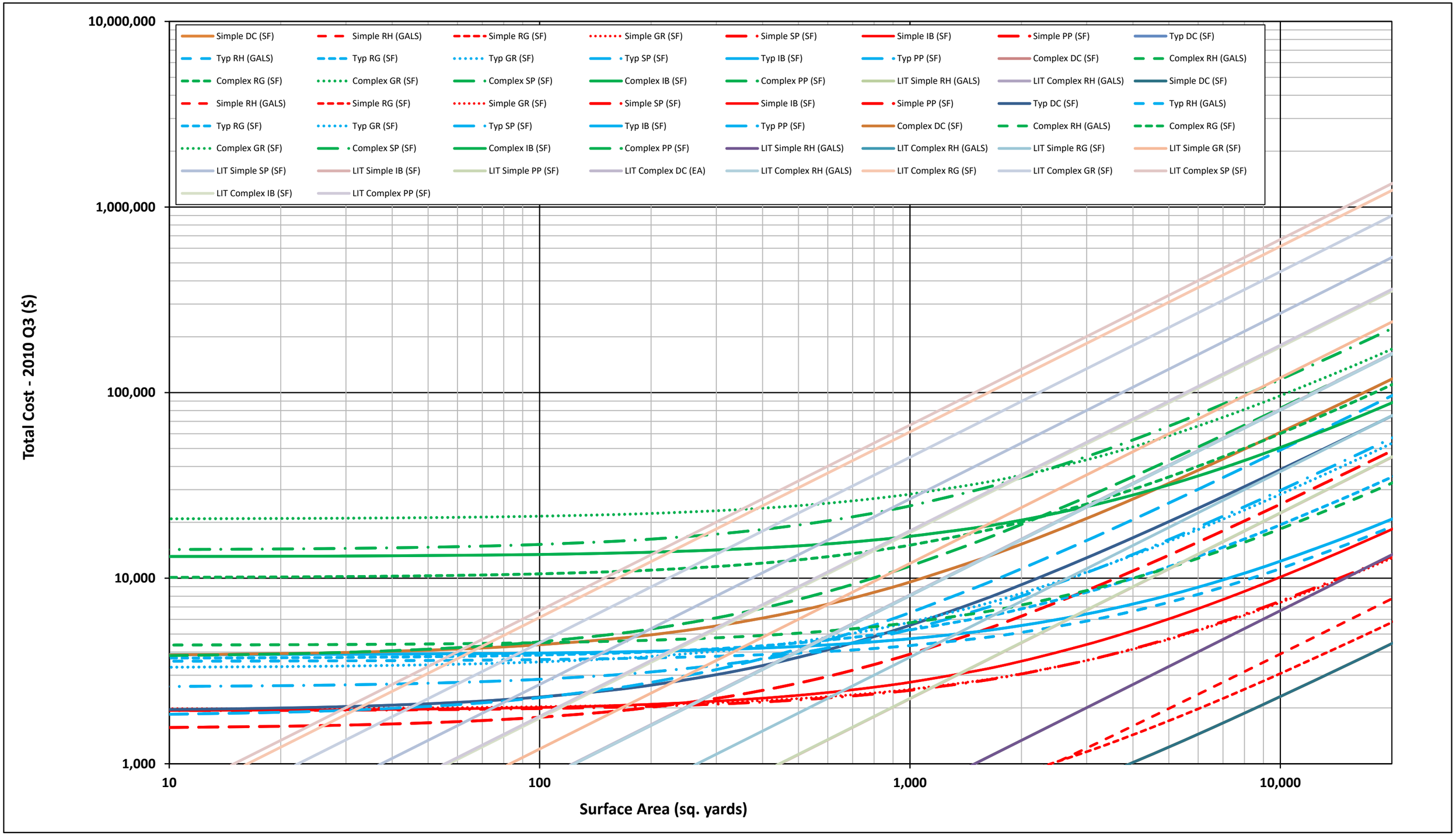
Index	Surface Area (SF)	BMP Size							
		DC (SF)	RH (GALS)	RG (SF)	GR (SF)	SP (SF)	IB (SF)	PP (SF)	VS (SF)
0	0.4	0	0.5	0.4	0.4	0.4	0.4	0.4	0
1	1	1	1	1	1	1	1	1	0
2	2	2	2	2	2	2	2	2	0
3	3	3	3	3	3	3	3	3	0
4	4	4	4	4	4	4	4	4	0
5	5	5	5	5	5	5	5	5	0
6	6	6	6	6	6	6	6	6	0
7	7	7	7	7	7	7	7	7	0
8	8	8	8	8	8	8	8	8	0
9	9	9	9	9	9	9	9	9	0
10	10	10	10	10	10	10	10	10	0
11	20	20	20	20	20	20	20	20	0
12	30	30	30	30	30	30	30	30	0
13	40	40	40	40	40	40	40	40	0
14	50	50	50	50	50	50	50	50	0
15	60	60	60	60	60	60	60	60	0
16	70	70	70	70	70	70	70	70	0
17	80	80	80	80	80	80	80	80	0
18	90	90	90	90	90	90	90	90	0
19	100	100	100	100	100	100	100	100	0
20	150	150	150	150	150	150	150	150	0
21	200	200	200	200	200	200	200	200	0
22	300	300	300	300	300	300	300	300	0
23	400	400	400	400	400	400	400	400	0
24	500	500	500	500	500	500	500	500	0
25	600	600	600	600	600	600	600	600	0
26	700	700	700	700	700	700	700	700	0
27	800	800	800	800	800	800	800	800	0
28	900	900	900	900	900	900	900	900	0
29	1000	1000	1000	1000	1000	1000	1000	1000	0
30	1500	1500	1500	1500	1500	1500	1500	1500	0
31	2000	2000	2000	2000	2000	2000	2000	2000	0
32	3000	3000	3000	3000	3000	3000	3000	3000	0
33	4000	4000	4000	4000	4000	4000	4000	4000	0
34	5000	5000	5000	5000	5000	5000	5000	5000	0
35	6000	6000	6000	6000	6000	6000	6000	6000	0
36	7000	7000	7000	7000	7000	7000	7000	7000	0
37	8000	8000	8000	8000	8000	8000	8000	8000	0
38	9000	9000	9000	9000	9000	9000	9000	9000	0
39	10000	10000	10000	10000	10000	10000	10000	10000	0
40	15000	15000	15000	15000	15000	15000	15000	15000	0
41	20000	20000	20000	20000	20000	20000	20000	20000	0
42	30000	30000	30000	30000	30000	30000	30000	30000	0
43	40000	40000	40000	40000	40000	40000	40000	40000	0
44	50000	50000	50000	50000	50000	50000	50000	50000	0
45	60000	60000	60000	60000	60000	60000	60000	60000	0
46	70000	70000	70000	70000	70000	70000	70000	70000	0
47	80000	80000	80000	80000	80000	80000	80000	80000	0
48	90000	90000	90000	90000	90000	90000	90000	90000	0
49	100000	1E+05	1E+05	100000	100000	100000	100000	100000	0
50	110000	1E+05	1E+05	110000	110000	110000	110000	110000	0
51	120000	1E+05	1E+05	120000	120000	120000	120000	120000	0
52	130000	1E+05	1E+05	130000	130000	130000	130000	130000	0
53	140000	1E+05	1E+05	140000	140000	140000	140000	140000	0
54	150000	2E+05	2E+05	150000	150000	150000	150000	150000	0
55	160000	2E+05	2E+05	160000	160000	160000	160000	160000	0
56	170000	2E+05	2E+05	170000	170000	170000	170000	170000	0
57	180000	2E+05	2E+05	180000	180000	180000	180000	180000	0
58	190000	2E+05	2E+05	190000	190000	190000	190000	190000	0
59	200000	2E+05	2E+05	200000	200000	200000	200000	200000	0
60	210000	2E+05	2E+05	210000	210000	210000	210000	210000	0
61	220000	2E+05	2E+05	220000	220000	220000	220000	220000	0
62	230000	2E+05	2E+05	230000	230000	230000	230000	230000	0
63	240000	2E+05	2E+05	240000	240000	240000	240000	240000	0
64	250000	3E+05	3E+05	250000	250000	250000	250000	250000	0
65	260000	3E+05	3E+05	260000	260000	260000	260000	260000	0
66	270000	3E+05	3E+05	270000	270000	270000	270000	270000	0
67	280000	3E+05	3E+05	280000	280000	280000	280000	280000	0
68	290000	3E+05	3E+05	290000	290000	290000	290000	290000	0
69	300000	3E+05	3E+05	300000	300000	300000	300000	300000	0
70	310000	3E+05	3E+05	310000	310000	310000	310000	310000	0
71	320000	3E+05	3E+05	320000	320000	320000	320000	320000	0
72	330000	3E+05	3E+05	330000	330000	330000	330000	330000	0
73	340000	3E+05	3E+05	340000	340000	340000	340000	340000	0
74	350000	4E+05	4E+05	350000	350000	350000	350000	350000	0
75	360000	4E+05	4E+05	360000	360000	360000	360000	360000	0
76	370000	4E+05	4E+05	370000	370000	370000	370000	370000	0
77	380000	4E+05	4E+05	380000	380000	380000	380000	380000	0

Capital Cost - Simple								Capital Cost - Typical								Capital Cost _ Complex							
Simple DC (SF)	Simple RH (GALS)	Simple RG (SF)	Simple GR (SF)	Simple SP (SF)	Simple IB (SF)	Simple PP (SF)	Simple VS (SF)	Typ DC (SF)	Typ RH (GALS)	Typ RG (SF)	Typ GR (SF)	Typ SP (SF)	Typ IB (SF)	Typ PP (SF)	Typ VS (SF)	Complex DC (SF)	Complex RH (GALS)	Complex RG (SF)	Complex GR (SF)	Complex SP (SF)	Complex IB (SF)	Complex PP (SF)	Complex VS (SF)

Capital Cost - Literature Simple								Capital Cost - Literature Complex							
LIT Simple DC (SF)	LIT Simple RH (GALS)	LIT Simple RG (SF)	LIT Simple GR (SF)	LIT Simple SP (SF)	LIT Simple IB (SF)	LIT Simple PP (SF)	LIT Simple VS (SF)	LIT Complex DC (EA)	LIT Complex RH (GALS)	LIT Complex RG (SF)	LIT Complex GR (SF)	LIT Complex SP (SF)	LIT Complex IB (SF)	LIT Complex PP (SF)	LIT Complex VS (SF)

Maintenance Cost - Literature Simple								Maintenance Cost - Literature Complex							
Maint. Simple DC (SF)	Maint. Simple RH (GALS)	Maint. Simple RG (SF)	Maint. Simple GR (SF)	Maint. Simple SP (SF)	Maint. Simple IB (SF)	Maint. Simple PP (SF)	Maint. Simple VS (SF)	Maint. Complex DC (SF)	Maint. Complex RH (GALS)	Maint. Complex RG (SF)	Maint. Complex GR (SF)	Maint. Complex SP (SF)	Maint. Complex IB (SF)	Maint. Complex PP (SF)	Maint. Complex VS (SF)

Capital Cost - LH-TL								Capital Cost - TH-HL								Capital Cost-HT							
Simple(upper range) DC (SF)	Simple(upper range) RH (GALS)	Simple(upper range) RG (SF)	Simple(upper range) GR (SF)	Simple(upper range) SP (SF)	Simple(upper range) IB (SF)	Simple(upper range) PP (SF)	Simple(upper range) VS (SF)	Typ(upper range) DC (SF)	Typ(upper range) RH (GALS)	Typ(upper range) RG (SF)	Typ(upper range) GR (SF)	Typ(upper range) SP (SF)	Typ(upper range) IB (SF)	Typ(upper range) PP (SF)	Typ(upper range) VS (SF)	Complex(upper range) DC	Complex(upper range) RH	Complex(upper range) RG	Complex(upper range) GR	Complex(upper range) SP	Complex(upper range) IB	Complex(upper range) PP	Complex(upper range) VS


Simple DC (SF)
Simple RH (GALS)
Simple RG (SF)
Simple GR (SF)
Simple SP (SF)
Simple IB (SF)
Simple PP (SF)
Typ DC (SF)
Typ RH (GALS)
Typ RG (SF)
Typ GR (SF)
Typ SP (SF)
Typ IB (SF)
Typ PP (SF)
Complex DC (SF)
Complex RH (GALS)
Complex RG (SF)
Complex GR (SF)
Complex SP (SF)
Complex IB (SF)
Complex PP (SF)
LIT Simple RH (GALS)
LIT Complex RH (GALS)
Simple DC (SF)
Simple RH (GALS)
Simple RG (SF)
Simple GR (SF)
Simple SP (SF)
Simple IB (SF)
Simple PP (SF)
Typ DC (SF)
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Complex DC (SF)
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Complex RG (SF)
Complex GR (SF)
Complex SP (SF)
Complex IB (SF)
Complex PP (SF)
LIT Simple RH (GALS)
LIT Complex RH (GALS)
LIT Simple RG (SF)
LIT Simple GR (SF)
LIT Simple SP (SF)
LIT Simple IB (SF)
LIT Simple PP (SF)
LIT Complex DC (EA)
LIT Complex RH (GALS)
LIT Complex RG (SF)
LIT Complex GR (SF)
LIT Complex SP (SF)
LIT Complex IB (SF)
LIT Complex PP (SF)
10,000,000
1,000,000
100,000
10,000
1,000
Total Cost - 2010 Q3 ($)
10
100
1,000
10,000
Surface Area (sq. yards)

Cost Item	Cost Item	Cost Item	Source / Reference	Comments (RS Means Description)	RS Means Ref #
Mobilization	EA	$ 1,500.00	RS Means 2010 Quarter 3?	Common Earth - 80 H.P; 50' Haul	-
Demolition	%	$ 5.00	Engineer's estimate		-
Clearing & Grubbing	SF	$ 0.18	RS Means 2014 Quarter 4	Clearing & grubbing, heavy stumps, to 24" diameter, grub stumps and remove	311110100350
Dewatering	DAY	$ 162.50	RS Means 2014 Quarter 4	Dewatering, pumping 8 hours, attended 2 hrs per day, 4" discharge pump, used for 8 hours, includes 20 LF of suction hose and 100 LF of discharge hose	312319200650
Embankment	CF	$ 0.37	RS Means 2014 Quarter 4		-
Excavation (0 - 1000)	CF	$ 0.07	RS Means 2014 Quarter 4	Common Earth - 105 H.P.; 50' Haul	312316463000
Excavation (1000 - 10,000)	CF	$ 0.06	RS Means 2014 Quarter 4	Common Earth - 200 H.P.; 50' Haul	312316464000
Excavation (10,000+)	CF	$ 0.23	RS Means 2014 Quarter 4	Common Earth - 300 H.P.; 300' Haul	-
Haul/Dispose of Ex Material	CF	$ 0.37	RS Means 2014 Quarter 4	Cycle 10 miles, 20 MPH, 12 CY truck	-
Finish Grading	SF	$ 0.03	RS Means 2014 Quarter 4	Fine grading, slopes, steep, finish grading	-
Soil Media / Planting Media	CF	$ 2.10	RS Means 2014 Quarter 4	planting beds prep, mix planting soil, skid steer loader, includes loam, manure, peat	-
Pea Gravel	CF	$ 1.39	RS Means 2014 Quarter 4	updated using cost indexes	-
Gravel	CF	$ 1.22	RS Means 2014 Quarter 4	Aggregate, crushed bank gravel, loaded at the pit, prices per CY, includes material only	-
Gravel fill 3/4"	CF	$ 1.22	RS Means 2014 Quarter 4	Geotextile subsurface drainage filtration, drainage material, gravel fill in trench, 3/4"	334626100300
Base Course Gravel	CF	$ 0.39	RS Means 2014 Quarter 4	Base course drainage layers, aggregate base course for roadways and large paved areas, bank run gravel, spread and compacted, 12" deep	321123230400
Pavement	SF	$ 3.18	CNT Stormwater Toolbox	adjusted using RS Means cost index from 2007 to 2014	-
Mulch	CF	$ 0.30	RS Means 2014 Quarter 4	Hydroseed incl. seed and fertilizers (updated using cost indexes)	-
Vegetation - Low	SF	$ 0.25			
Vegetation - Typical	SF	$ 1.20			
Vegetation - High	SF	$ 2.33			
Slotted PVC Underdrain Pipe	LF	$ 11.90	RS Means 2014 Quarter 4	Public water supply wells, wells domestic water, well screen assembly, slotted PVC, 1-1/2" diameter	-
Hydroseed	SF	$ 0.65	RS Means 2014 Quarter 4	Seeding, mechanical seeding hydro or air seeding for large areas, includes lime, fertilizer and seed	-
Soil de-compaction 4-6"	SF	$ 0.40	Engineer's estimate	[Placeholder only Scott S to update]	
Soil de-compaction 6-8"	SF	$ 0.60	Engineer's estimate	[Placeholder only Scott S to update]	
Impervious area removal	SF	$ 1.62	RS Means 2014 Quarter 4	Cold milling asphalt pavement 3" to 6" deep removal from concrete base, rip, load and sweep, excludes haul [Placeholder only Scott S to update]	320116715330
Roof downspout discconection	EA	$ 9.77	RS Means 2014 Quarter 4	Roof downspout elbows vinly, 45 or 75 degress, 21/2" dia [Placeholder only Scott S to update]	077123201300
Cistern inlet structure	EA	$ 20.00	Engineer's estimate	[Placeholder only Scott S to update]	-
Cistern outlet structure	EA	$ 20.00	Engineer's estimate	[Placeholder only Scott S to update]	-
Cistern overflow structure	EA	$ 20.00	Engineer's estimate	[Placeholder only Scott S to update]	-
Inflow Structure(s)	EA	$ 1,240.00	RS Means 2014 Quarter 4	Utility area drain, catch basins or manholes curb inlet frame, grate, and curb box, excluding footing & excavatior	334413131582
Outflow Structure(s)	EA	$ 1,240.00	RS Means 2014 Quarter 4	Utility area drain, catch basins or manholes curb inlet frame, grate, and curb box, excluding footing & excavatior	334413131582
Overflow Structures(s)	EA	$ 1,240.00	RS Means 2014 Quarter 4	Utility area drain, catch basins or manholes curb inlet frame, grate, and curb box, excluding footing & excavatior	334413131582
Cistern / Storage Tank (s) - Low	GALS	$ 0.37	Online	not in RS Means, use http://tankulator.ata.org.au/tank-materials-price-comparision.php [Accessed Feb 2015] use 20,000L price	-
Cistern / Storage Tank (s) - Typical	GALS	$ 0.68	Online	not in RS Means, use http://tankulator.ata.org.au/tank-materials-price-comparision.php [Accessed Feb 2015] use 10,000L price	-
Cistern / Storage Tank (s) - High	GALS	$ 0.91	Online	not in RS Means, use http://tankulator.ata.org.au/tank-materials-price-comparision.php [Accessed Feb 2015] use 5,000L price	-
Perimeter fence	LF	$ 4.80	RS Means 2014 Quarter 4	Temporary fencing, plastic safety fence, 4' high, heavy duty	-
Engineering	%	$ 10.00	Engineer's estimate	-	-
Contingency - low	%	$ 2.00	Engineer's estimate	-	-
Contingency - typical	%	$ 10.00	Engineer's estimate	-	-
Contingency - high	%	$ 15.00	Engineer's estimate	-	-

Capital Costs - Literature

Variable	Impervious Area Disconnection (ID)	Rain Harvesting (RH)	Rain Gardens (RG)	Green Roofs (GR)	Street Planters (SP)	Infiltration Basin (IB)	Permeable Pavement (PP)	Vegetated Swale (VS)
Literature Low ($/ft2) or ($/gal for RH)	$ 2.40	$ 0.50	$ 3	$ 9.60	$ 20	$ 1.30	$ 2	$ 0.25
Literature Low Year	2006	2005	2006	2006	2005	1999	2009	2006
Literature High ($/ft2) or ($/gal for RH)	$ 6.50	$ 8.00	$ 40	$ 32	$ 50	$ 11	$ 16	$ 2.45
Literature High Year	2006	2013	2003	2001	2005	2000	2009	2006
2014 Low	**$ 3.00**	**$ 0.67**	**$ 3.75**	**$ 12.01**	**$ 26.74**	**$ 2.24**	**$ 2.25**	**$ 0.31**
2014 High	**$ 8.13**	**$ 8.06**	**$ 61.42**	**$ 44.86**	**$ 66.85**	**$ 17.60**	**$ 18.01**	**$ 3.07**
References	DSWC, 2006	Hunt and Szpir, 2006; TWDB, 2005, USEPA, 2013	Brown and Schueler, 1997; DSWC, 2006; Iowa Stormwater Partnership, 2008; Lake Superior Streams, 2014; LID Center, 2014	DSWC, 2006; GSA, 2011; Peck and Kuhn, 2001; VA DEQ, 2011, CNT, 2009	BES, 2005; WERF, 2009	A, 1999; MPCA, 20	MPCA, 2011; SCSMC, 2008; WERF, 2009	DSWC, 2006; PA DEP, 2006; SEWRPC, 1991

Note: *Infiltration basin = $2/ft3 to $21/ft3. Using low and high basin depths from 1-EPA-InputVariables - 12" and 24" respectively, converts to: $2/ft2 to $10.5/ft2*
Note: *Literature values given in square feet, multiplied by 9 to convert to square yards*

Maintenance Costs - Literature

Variable	Impervious Area Disconnection (ID)	Rain Harvesting (RH)	Rain Gardens (RG)	Green Roofs (GR)	Street Planters (SP)	Infiltration Basin (IB)	Permeable Pavement (PP)	Vegetated Swale (VS)
Literature Low ($/ft2) or ($/gal for RH)	$ 0.04	$ 0.075	$ 0.06	$ 0.03	$ 0.04	$ 0.04	$ 0.05	$ 0.05
Literature Low Year	2006	2005	2009	2008	2009	2005	2009	2006
Literature High ($/ft2) or ($/gal for RH)	$ 0.06	$ 0.18	$ 1.45	$ 0.20	$ 0.80	$ 1.32	$ 0.23	$ 0.06
Literature High Year	2006	2005	2009	2001	2005	2005	2005	1991
2014 Low	**$ 0.05**	**$ 0.10**	**$ 0.07**	**$ 0.03**	**$ 0.05**	**$ 0.05**	**$ 0.06**	**$ 0.06**
2014 High	**$ 0.08**	**$ 0.24**	**$ 1.63**	**$ 0.28**	**$ 1.07**	**$ 1.77**	**$ 0.31**	**$ 0.12**
References		LID Center, 2005; SBPAT Tool, 2005	CNT, 2009; Barr, 2011	BES, 2008; Peck and Kuhn, 2001	BES, 2005; WERF, 2009	Weiss, 2005	CNT, 2009; LID Center 2005; MPCA, 2011	PA DEP, 2006; SEWRPC, 1991

Source: ENR CCI - https://enr.construction.com/engineering/pdf/ENR03252013QCR.pdf

Year	RS Means HCI	2014 Q4 Ratio	ENR CCI
2014	202.7	1	9960
2013	201.2	0.992599901	
2012	194.6	0.960039467	9308
2011	191.2	0.94326591	9070
2010	183.5	0.905278737	8799
2009	180.1	0.88850518	8570
2008	180.4	0.8899852	8310
2006	162	0.799210656	7751
2005	151.6	0.747903305	7446
2003	132	0.651208683	
2001	143.7	0.708929452	6334
2000	120.9	0.596447953	
1999	117.6	0.580167736	6059
1997	112.8	0.55648742	5826
1991	96.8	0.477553034	

Historical Cost Indexes

The table below lists both the RSMeans® historical cost index based on Jan. 1, 1993 = 100 as well as the computed value of an index based on Jan. 1, 2014 costs. Since the Jan. 1, 2014 figure is estimated, space is left to write in the actual index figures as they become available through either the quarterly *RSMeans Construction Cost Indexes* or as printed in the *Engineering News-Record*. To compute the actual index based on Jan. 1, 2014 = 100, divide the historical cost index for a particular year by the actual Jan. 1, 2014 construction cost index. Space has been left to advance the index figures as the year progresses.

Year	Historical Cost Index Jan. 1, 1993 = 100		Current Index Based on Jan. 1, 2014 = 100		Year	Historical Cost Index Jan. 1, 1993 = 100	Current Index Based on Jan. 1, 2014 = 100		Year	Historical Cost Index Jan. 1, 1993 = 100	Current Index Based on Jan. 1, 2014 = 100	
	Est.	Actual	Est.	Actual		Actual	Est.	Actual		Actual	Est.	Actual
Oct 2014*					July 1999	117.6	58.0		July 1981	70.0	34.5	
July 2014*					1998	115.1	56.8		1980	62.9	31.0	
April 2014*					1997	112.8	55.6		1979	57.8	28.5	
Jan 2014*	202.7		100.0	100.0	1996	110.2	54.4		1978	53.5	26.4	
July 2013		201.2	99.3		1995	107.6	53.1		1977	49.5	24.4	
2012		194.6	96.0		1994	104.4	51.5		1976	46.9	23.1	
2011		191.2	94.3		1993	101.7	50.2		1975	44.8	22.1	
2010		183.5	90.5		1992	99.4	49.1		1974	41.4	20.4	
2009		180.1	88.9		1991	96.8	47.8		1973	37.7	18.6	
2008		180.4	89.0		1990	94.3	46.5		1972	34.8	17.2	
2007		169.4	83.6		1989	92.1	45.5		1971	32.1	15.8	
2006		162.0	79.9		1988	89.9	44.3		1970	28.7	14.2	
2005		151.6	74.8		1987	87.7	43.3		1969	26.9	13.3	
2004		143.7	70.9		1986	84.2	41.6		1968	24.9	12.3	
2003		132.0	65.1		1985	82.6	40.8		1967	23.5	11.6	
2002		128.7	63.5		1984	82.0	40.4		1966	22.7	11.2	
2001		125.1	61.7		1983	80.2	39.5		1965	21.7	10.7	
2000		120.9	59.6		1982	76.1	37.6		1964	21.2	10.5	

Adjustments to Costs

The "Historical Cost Index" can be used to convert national average building costs at a particular time to the approximate building costs for some other time.

Time Adjustment Using the Historical Cost Indexes:

$$\frac{\text{Index for Year A}}{\text{Index for Year B}} \times \text{Cost in Year B} = \text{Cost in Year A}$$

Example:

Estimate and compare construction costs for different years in the same city.

To estimate the national average construction cost of a building in 1970, knowing that it cost $900,000 in 2014:

INDEX in 1970 = 28.7

INDEX in 2014 = 202.7

$$\frac{\text{INDEX 1970}}{\text{INDEX 2014}} \times \text{Cost 2014} = \text{Cost 1970}$$

$$\frac{28.7}{202.7} \times \$900{,}000 = .142 \times \$900{,}000 = \$128{,}000$$

The construction cost of the building in 1970 is $128,000.

Note: The city cost indexes for Canada can be used to convert U.S. national averages to local costs in Canadian dollars.

*Historical Cost Index updates and other resources are provided on the following website.
http://www.reedconstructiondata.com/rsmeans/chgnotice/456321

User Input Variable	Value
Cost Estimation Year	2015
LID Implementation City	Los Angeles
Computed Regional Cost Multiplier	0.99

MODEL USING NATIONAL & CITY SPECIFIC MODELS TO PREDICT RS MEANS

Coefficients for model

	NATIONAL	Anchorage	Atlanta	Boston	Chicago	Cincinnati	Cleveland	Dallas	Denver	Detroit	Honolulu	Houston	Los Angeles	Miami	Milwaukee	Minneapolis	New York	Philadelphia	Pittsburgh	Portland	San Diego	San Francisco	Seattle	Washington
Intercept	-19.428	-19.428	-19.428	-19.428	-19.428	-19.428	-19.428	-19.428	-19.428	-19.428	-19.428	-19.428	-19.428	-19.428	-19.428	-19.428	-19.428	-19.428	-19.428	-19.428	-19.428	-19.428	-19.428	-19.428
Ready-mix concrete manufacturing	0.113	0.113	0.113	0.113	0.113	0.113	0.113	0.113	0.113	0.113	0.113	0.113	0.113	0.113	0.113	0.113	0.113	0.113	0.113	0.113	0.113	0.113	0.113	0.113
Tractor shovel loaders (skid steer, wheel, crawler, and integral design backhoes)	0.325	0.325	**0.304932**	0.305	**0.396454**	0.396	0.396	**0.264**	0.264	0.264	0.264	0.264	0.264	0.264	0.264	**0.357176**	**0.4395572**	**0.40557176**	0.406	0.406	0.406	0.406	0.406	**0.36493239**
Energy	0.097	0.097	0.097	0.097	0.097	0.097	0.097	0.097	0.097	0.097	0.097	0.097	0.097	0.097	0.097	0.097	0.097	0.097	0.097	0.097	0.097	0.097	0.097	0.097
Fuels and utilities	0.398	0.398	**0.283199**	**0.4592194**	**0.44202**	0.442	0.442	**0.3392**	0.339	0.339	0.339	0.339	0.339	0.339	0.339	**0.421136472**	**0.4831199**	**0.462920184**	0.463	0.463	0.463	0.463	0.463	**0.45178684**

Notes: - BOLD BLUE TEXT represents city-specific model coefficients. Ideally developing city-specific models for all cities is recommended. However most cities follow the National model reasonably well and city-specific models were developed for those that do not to save ti

BLS CPI INDICES

Year	US Average Ready Mix Concrete	US Average Tractor Shovel loaders	Anchorage Energy*	Anchorage Fuels and Utilities	Atlanta Energy	Atlanta Fuels and Utilities	Boston Energy	Boston Fuels and Utilities	Chicago Energy	Chicago Fuels and Utilities	Cincinnati Energy*	Cincinnati Fuels and Utilities	Cleveland Energy	Cleveland Fuels and Utilities
1980			86.50	80.10	87.20	75.00	88.70	82.10	86.00	74.00	81.60	71.80	80.20	71.40
1981			100.30	89.80	98.00	82.80	104.40	98.20	95.90	84.60	91.90	80.40	91.10	81.10
1982			100.00	91.90	99.60	93.90	102.00	99.90	97.10	93.00	98.50	94.40	96.70	92.70
1983			99.40	100.90	99.30	99.40	98.30	97.70	101.30	102.10	101.30	103.20	102.80	103.80
1984			100.50	107.30	101.00	106.70	99.60	102.50	101.60	104.90	100.20	102.40	100.50	103.50
1985			103.40	111.70	101.90	109.60	97.20	99.60	102.90	105.80	100.40	103.00	100.90	104.90
1986	109.50	127.80	96.60	115.10	86.80	111.70	81.10	90.00	90.60	105.10	87.40	100.10	90.10	104.10
1987	109.20	131.20	94.60	120.30	85.90	113.60	80.70	88.90	92.60	104.30	87.40	98.40	91.50	102.60
1988	109.70	135.60	98.20	124.90	85.50	112.50	81.70	89.70	91.00	102.00	86.30	97.20	92.30	103.70
1989	111.50	141.10	105.20	129.70	90.00	115.80	87.40	96.70	98.30	108.20	91.60	99.30	100.00	109.40
1990	114.30	145.10	114.50	131.10	97.10	121.90	97.90	104.90	102.70	108.90	98.50	101.40	108.90	112.00
1991	116.90	148.50	112.20	136.50	95.80	121.60	99.90	109.10	102.70	111.90	99.60	104.20	108.80	113.90
1992	117.40	152.30	112.70	137.60	95.40	125.10	98.10	111.80	100.80	113.60	99.40	106.60	107.00	114.70
1993	121.00	156.70	114.70	144.80	98.90	131.20	98.80	117.20	104.50	119.70	104.50	113.20	108.50	119.10
1994	125.80	159.70	114.40	142.10	99.40	132.20	100.00	119.90	98.30	110.70	109.60	117.50	111.20	121.80
1995	131.30	163.30	114.40	141.00	97.80	127.90	100.20	119.60	101.20	113.10	107.90	115.00	110.40	120.00
1996	135.20	168.10	119.10	141.20	103.90	134.50	104.80	123.00	109.90	120.80	113.90	118.40	118.40	124.20
1997	138.00	169.80	123.50	146.40	104.00	139.10	108.00	126.00	109.60	125.70	114.60	121.90	121.10	129.00
1998	142.30	173.20	118.30	148.40	97.90	142.10	98.30	119.10	101.00	120.10	110.90	126.60	114.60	130.10
1999	145.60	176.40	116.20	144.60	102.10	143.10	99.40	117.40	102.20	117.40	113.90	126.30	116.70	127.80
2000	150.20	178.10	131.00	143.80	122.50	155.60	120.10	131.90	124.50	134.40	128.50	132.20	135.10	139.80
2001	153.40	179.00	143.20	159.80	129.10	174.70	131.00	152.00	127.40	138.00	123.10	133.40	146.10	157.00
2002	153.00	178.20	140.10	162.50	120.30	165.90	116.20	134.30	115.60	124.50	116.10	127.40	130.40	135.20
2003	153.90	181.00	149.90	160.40	133.70	178.00	135.60	155.00	132.00	140.90	131.80	140.80	153.20	155.70
2004	162.10	185.40	164.40	175.10	149.50	187.80	151.00	166.00	144.70	146.70	146.10	148.40	169.80	164.40
2005	181.90	193.70	185.40	189.40	179.60	214.10	181.50	196.10	168.50	162.90	168.90	158.70	201.20	187.70
2006	202.50	201.20	211.20	211.90	192.10	220.60	208.00	227.00	175.10	156.30	193.50	182.20	212.30	193.40
2007	210.30	203.90	232.19	238.72	202.60	227.58	213.21	227.54	198.32	178.56	204.61	189.95	216.59	190.27
2008	216.70	210.90	272.86	241.66	236.62	252.54	250.56	264.07	229.56	203.53	229.78	206.24	249.51	213.28
2009	222.10	218.30	251.55	271.27	190.57	245.28	192.55	217.59	174.26	171.09	191.66	206.86	194.32	186.59
2010	216.60	212.00	260.35	247.74	212.43	257.68	209.80	222.18	195.13	180.52	217.57	222.19	212.55	191.80
2011	215.20	218.70	288.46	256.23	252.65	276.31	246.31	241.19	224.59	182.97	243.37	220.61	239.06	191.27
2012	220.10	236.10	291.49	257.46	252.45	274.12	246.17	236.82	222.92	175.88	239.48	206.07	234.05	183.58
2013	226.90	246.50	283.52	260.92	251.17	281.63	246.58	245.70	220.84	180.01	242.01	216.39	235.62	191.54
2014	236.90	248.50	290.39	277.15	250.31	293.49	250.02	261.21	231.23	208.97	240.13	224.58	235.49	200.68
2015	247.60	249.70	260.62	294.65	208.78	290.56	206.57	249.78	189.31	197.88	202.00	218.63	191.85	194.64

Year	Dallas Energy	Dallas Fuels and Utilities	Denver Energy*	Denver Fuels and Utilities	Detroit Energy	Detroit Fuels and Utilities	Honolulu Energy*	Honolulu Fuels and Utilities	Houston Energy	Houston Fuels and Utilities	Kansas City Energy*	Kansas City Fuels and Utilities	Los Angeles Energy	Los Angeles Fuels and Utilities
1980	83.20	67.90	85.30	73.30	83.80	72.20	78.80	70.20	84.10	68.30	83.90	67.00	88.30	72.60
1981	96.70	82.20	94.70	85.90	94.50	84.00	103.30	97.90	96.70	79.90	93.00	76.10	97.60	78.70
1982	99.00	95.30	100.00	97.60	96.30	92.40	104.50	101.70	100.60	95.50	98.60	92.00	99.40	91.10
1983	99.20	99.60	100.40	100.30	100.70	101.40	96.70	98.10	99.50	101.70	101.20	102.40	99.90	101.40
1984	101.80	105.10	99.60	102.10	103.00	106.30	98.80	100.20	99.90	102.90	100.20	105.60	100.70	107.50
1985	102.30	105.40	100.40	104.30	106.60	111.70	97.10	97.50	100.30	104.90	97.90	102.70	101.80	110.70
1986	85.60	102.70	88.10	106.30	93.10	108.90	82.30	87.60	80.80	96.20	82.80	101.00	89.10	114.00
1987	90.80	100.60	89.10	103.60	93.80	108.80	84.80	88.80	84.00	94.20	89.80		89.30	112.60
1988	92.60	104.70	86.90	103.60	92.60	106.60	84.70	87.30	85.20	96.70	88.50		91.70	115.90
1989	97.20	107.70	91.90	105.60	98.10	111.50	89.20	90.90	91.60	99.90	92.60		98.30	119.50
1990	105.10	109.30	94.30	106.80	103.50	112.40	97.10	98.00	101.10	101.90	100.10		107.90	124.50
1991	108.10	116.20	96.20	111.90	102.50	111.20	100.20	101.30	101.60	104.20	99.80		109.00	133.00
1992	108.30	118.70	96.80	115.30	102.40	116.60	104.60	106.10	101.20	104.30	98.60		116.30	136.90
1993	110.00	122.00	97.60	117.00	100.50	116.80	112.60	117.50	101.00	106.90	100.60		118.80	140.90
1994	111.40	126.30	99.90	121.30	100.40	116.80	113.20	121.30	101.50	107.60	101.00		118.20	143.10
1995	112.50	128.50	98.90	121.00	100.50	116.20	119.00	128.40	96.70	100.00	100.40		118.80	149.30
1996	114.00	128.40	98.50	120.50	107.50	121.20	124.40	133.80	102.00	105.40	108.80		118.20	149.10
1997	113.20	128.60	103.20	126.60	107.60	126.30	126.30	137.10	102.30	106.90	110.60		120.70	154.00
1998	105.60	128.40	96.60	128.60	100.10	124.30	121.00	131.00	96.60	107.80	103.80		108.30	146.10
1999	108.20	127.80	100.00	129.20	104.90	127.80	117.90	133.40	98.60	106.10	106.60		115.40	145.40
2000	128.00	135.80	117.60	138.10	121.00	129.80	137.00	147.40	114.70	111.30	124.20		132.00	155.60
2001	139.60	161.20	128.90	162.40	120.60	134.70	140.00	146.60	124.70	132.50	133.10		143.20	178.20
2002	129.80	149.90	108.50	139.70	119.60	144.10	128.00	142.60	109.90	114.90	121.80		145.50	187.00
2003	148.50	167.20	124.30	162.20	133.20	156.10	147.00	154.10	127.80	133.50	136.00		160.40	186.90
2004	167.50	177.10	141.30	176.00	149.70	169.00	160.60	161.10	144.80	143.00	152.20		174.50	184.70
2005	203.60	204.00	169.60	198.10	177.30	193.50	186.30	179.80	176.60	163.80	174.70		198.80	202.20
2006	230.10	226.50	175.70	193.10	201.30	214.30	211.60	203.30	207.90	196.40	189.20		228.50	231.10
2007	235.21	224.93	179.91	183.25	211.33	210.67	219.19	214.04	208.12	188.69	205.14		238.22	232.93
2008	270.14	245.40	206.49	202.56	235.22	228.47	276.86	283.91	232.56	200.80	233.55		265.48	244.45
2009	212.55	224.04	159.07	184.43	199.28	229.28	213.83	240.28	192.80	200.89	184.32		214.66	234.87
2010	223.06	211.18	177.99	191.26	220.98	235.03	252.69	280.20	206.00	192.34	206.68		241.27	252.91
2011	256.75	213.31	210.63	205.90	254.32	235.36	308.05	335.11	237.95	191.91	239.51		278.97	260.47
2012	257.51	210.74	209.36	195.36	260.99	242.40	325.79	360.25	231.51	177.61	240.19		289.40	264.56
2013	260.80	222.12	214.89	213.61	254.44	244.25	323.52	363.73	219.77	167.89	245.67		290.82	285.41
2014	259.49	231.91	219.37	229.97	245.74	243.48	324.53	375.69	222.20	180.78	243.30		285.07	297.24
2015	211.14	225.33	174.60	223.04	201.82	236.59	245.41	329.29	164.48	156.42	202.91		255.75	294.99

Year	Miami Energy	Miami Fuels and Utilities	Milwaukee Energy*	Milwaukee Fuels and Utilities*	Minneapolis Energy*	Minneapolis Fuels and Utilities*	New York Energy	New York Fuels and Utilities	Philadelphia Energy	Philadelphia Fuels and Utilities	Pittsburgh Energy*	Pittsburgh Fuels and Utilities*
1980	83.50	75.20	80.80	70.80	81.00	69.20	87.50	79.90	87.20	76.70	82.40	71.00
1981	96.90	89.70	93.60	84.40	93.00	82.80	100.80	93.70	100.00	89.70	93.30	79.90
1982	96.00	93.20	98.70	94.50	98.10	93.70	100.20	97.90	100.30	96.90	95.10	89.10
1983	99.00	98.20	100.40	100.50	100.90	101.40	99.70	99.80	97.90	97.30	100.90	101.00
1984	104.90	108.50	100.90	105.00	101.10	104.90	100.00	102.40	101.70	105.80	104.00	109.90
1985	107.90	114.90	100.10	104.60	101.20	105.00	100.20	103.00	103.60	106.80	104.70	111.00
1986	92.60	111.90	86.30	97.70	86.90	100.70	87.60	97.70	90.80	103.30	92.50	110.00
1987	94.30	109.80	86.60	100.30	84.30	95.50	85.70	94.10	90.00	100.80	92.20	108.40
1988	96.60	112.20	86.90	100.50	87.10	98.90	85.80	93.50	90.10	100.90	90.50	108.10
1989	97.60	109.10	90.40	100.10	92.50	98.70	91.40	98.10	97.40	106.40	97.80	115.50
1990	102.70	109.30	93.10	94.40	99.10	102.10	99.30	102.80	107.80	112.90	109.20	123.70
1991	103.60	111.50	92.60	97.80	95.00	103.10	100.20	105.60	109.00	116.80	113.40	131.20
1992	102.20	111.10	95.80	104.20	97.20	107.00	101.00	107.30	108.80	118.60	112.90	131.00
1993	106.00	113.40	98.60	108.60	100.80	113.50	104.10	111.20	105.40	118.20	111.90	132.40
1994	103.90	111.90	98.10	106.30	98.60	112.50	104.70	112.40	106.70	120.50	116.50	136.10
1995	104.90	113.10	95.40	102.50	97.90	113.30	105.20	113.20	109.90	124.00	119.40	137.90
1996	110.30	118.20	98.90	104.40	106.50	119.50	110.40	117.40	113.20	127.80	120.20	139.20
1997	111.90	119.80	99.80	108.00	106.70	120.20	111.20	119.20	116.30	131.90	125.50	145.20
1998	102.20	118.00	96.80	112.60	99.90	119.20	104.40	116.50	109.40	133.20	116.90	143.60
1999	106.10	115.80	99.20	112.40	104.50	123.50	106.30	116.10	109.70	129.00	119.00	142.50
2000	120.80	116.80	119.10	124.90	124.80	135.20	123.30	126.10	125.10	133.40	134.80	149.20
2001	126.60	130.30	122.50	133.70	127.30	143.50	124.10	129.70	132.60	148.50	147.00	171.90
2002	118.80	122.70	117.60	129.30	116.80	130.60	115.80	122.00	123.50	142.60	133.10	155.70
2003	129.30	129.70	136.00	148.00	133.90	147.30	133.20	136.40	136.60	151.30	151.80	174.30
2004	143.40	135.70	150.80	153.60	151.70	156.20	146.70	143.60	151.80	160.40	170.50	183.10
2005	166.20	142.60	177.10	170.80	178.70	175.70	173.30	164.80	172.50	171.40	199.60	203.10
2006	191.90	168.80	193.30	181.20	194.00	179.00	190.60	177.40	198.20	194.00	219.80	216.60
2007	195.12	165.39	202.37	182.95	207.02	181.76	201.10	186.97	206.96	201.67	233.55	227.02
2008	215.94	172.71	229.45	204.14	227.67	198.54	231.49	210.55	232.76	217.85	275.14	256.54
2009	183.18	178.07	184.48	188.51	178.71	173.42	194.21	197.89	194.14	208.18	225.09	236.41
2010	190.11	166.39	205.81	198.96	201.47	180.45	209.89	202.01	208.24	212.01	239.00	233.67
2011	221.74	168.60	237.78	206.48	235.95	187.34	236.14	204.57	237.07	220.33	276.51	244.52
2012	223.68	167.71	237.43	202.70	230.41	181.03	235.36	197.52	237.68	217.40	278.78	245.69
2013	221.45	169.10	235.69	208.60	235.44	197.51	234.23	201.81	231.65	215.84	270.90	240.78
2014	219.95	177.39	239.95	226.23	233.97	208.34	231.03	204.44	227.37	216.04	272.96	248.24
2015	181.47	172.30	195.71	210.22	189.37	198.58	187.03	186.30	187.93	204.55	232.56	245.22

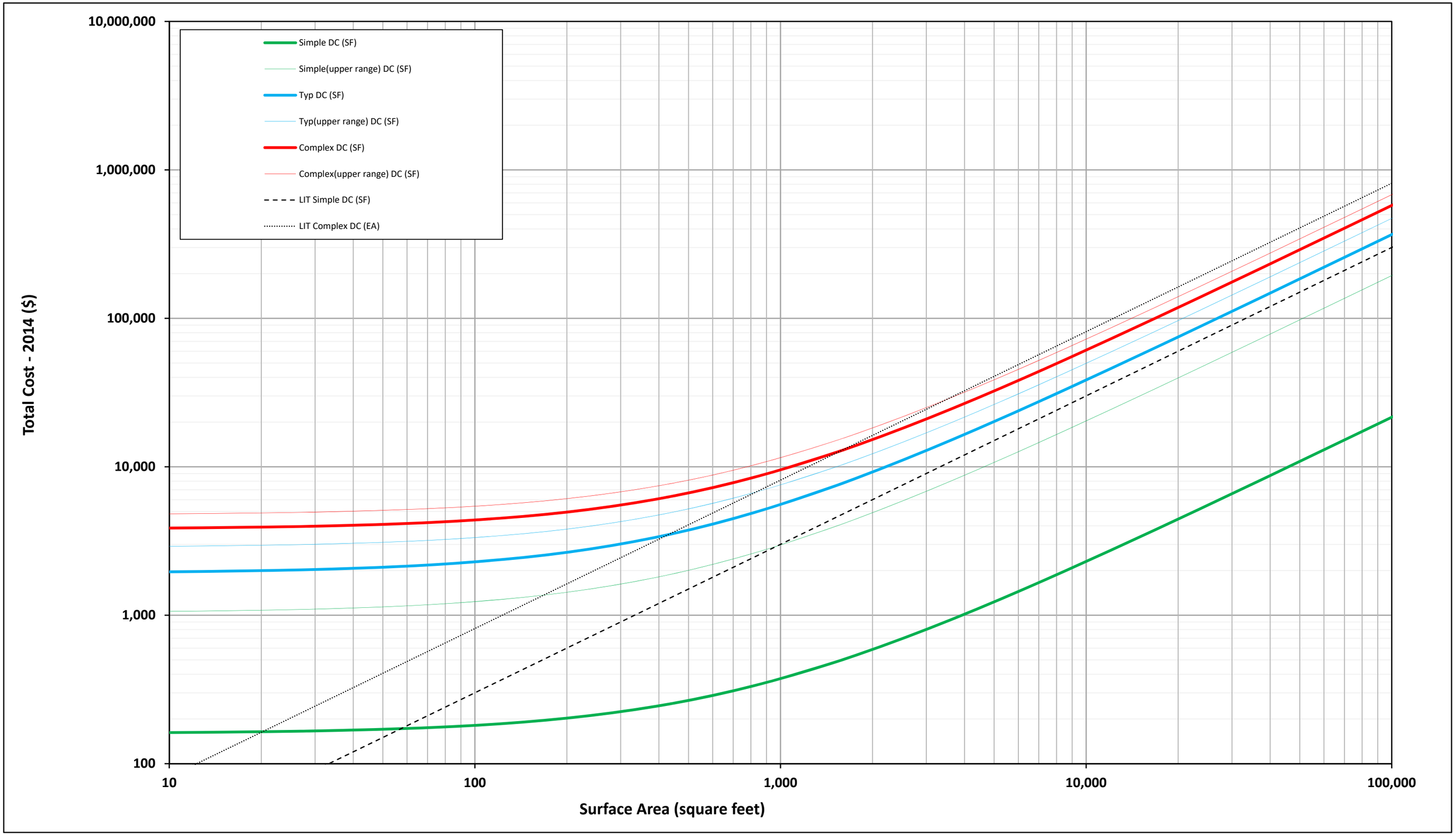
Year	Portland Energy*	Portland Fuels and Utilities*	San Diego Energy*	San Diego Fuels and Utilities*	San Francisco Energy	San Francisco Fuels and Utilities	Seattle Energy	Seattle Fuels and Utilities	St. Louis Energy*	St. Louis Fuels and Utilities	Washington Energy	Washington Fuels and Utilities
1980	92.50	84.30	84.40	69.30	88.80	75.80	86.00	73.40	86.50	74.5		
1981	103.90	94.40	95.90	79.30	98.10	83.00	98.60	84.70	94.60	81.1		
1982	102.00	96.60	98.50	92.60	101.80	98.10	98.50	92.50	98.50	94.7		
1983	97.90	98.50	101.30	103.30	97.10	95.90	98.40	100.30	101.70	102.7		
1984	100.00	104.90	100.10	104.20	101.20	106.00	103.10	107.20	99.80	102.6		
1985	103.20	108.70	100.00	103.30	103.40	111.00	104.40	108.60	102.20	106.6		
1986	86.90	102.50	85.70	101.30	88.40	110.40	87.50	101.80	90.40	106.9		
1987	84.40	101.10	86.80	102.50	88.90	109.40	84.40	94.40	93.00	105.4		
1988	87.00	102.10	86.50	103.30	96.10	116.70	85.30	94.30	94.00	106.0		
1989	91.60	102.70	90.20	100.50	103.80	119.90	89.20	94.90	98.20	111.6		
1990	97.00	103.90	97.70	102.10	114.10	125.10	97.70	95.80	105.50	113.7		
1991	97.20	107.80	94.30	104.80	117.80	134.70	96.50	97.40	104.10	115.2		
1992	100.00	114.30	100.00	106.40	121.60	139.50	99.10	101.90	101.60	116.2		
1993	101.10	118.80	101.90	110.60	123.60	142.00	102.00	106.20	102.30	118.8		
1994	103.90	124.30	103.20	114.70	123.40	142.80	112.40	112.70	103.30	119.8		
1995	106.10	126.60	103.20	118.60	125.60	148.10	116.30	114.60	100.60	116.9		
1996	113.10	130.80	102.90	119.70	122.30	142.80	122.60	118.60	112.10	123.0		
1997	110.70	129.90	106.00	123.20	125.20	149.40	120.90	120.90	111.60	123.9	102.8	
1998	106.00	138.00	95.50	117.70	114.30	140.70	112.00	121.40	103.10		96.4	105.6
1999	114.00	139.50	102.30	120.80	125.40	145.30	121.80	123.60	106.50		100.1	108.1
2000	129.40	146.10	126.50	139.50	144.60	155.00	146.30	131.50	128.50		116.7	112.8
2001	132.20	157.80	131.90	152.40	158.50	184.90	162.40	155.80	136.10		114.3	112
2002	134.10	177.50	123.70	151.20	144.50	180.10	156.40	158.50	121.50		109.0	109
2003	144.50	175.00	141.40	160.70	166.10	193.30	170.60	157.70	134.90		120.7	115.5
2004	160.10	182.30	156.70	162.70	175.50	191.90	190.60	163.30	150.30		133.0	120.8
2005	181.30	192.60	177.70	176.30	203.80	211.60	220.90	174.40	173.20		154.4	132
2006	199.80	202.50	202.00	193.80	231.40	238.90	244.10	185.40	195.90		171.0	142.2
2007	219.09	215.30	210.94	194.88	250.41	248.13	263.22	196.04	204.06		188.448	160.304
2008	240.61	220.18	233.28	204.91	276.55	258.61	289.43	200.43	227.23		222.453	188.906
2009	202.11	227.86	204.92	232.33	229.38	260.79	243.17	206.59	187.62		189.149	186.525
2010	219.73	227.47	221.63	233.04	256.53	276.79	270.65	216.47	205.98		200.639	183.813
2011	257.20	240.77	258.63	241.26	292.03	284.24	312.95	225.70	242.27		226.900	180.417
2012	262.85	245.53	264.26	229.94	301.48	297.61	321.45	232.04	246.16		228.813	177.382
2013	254.23	246.03	267.52	248.40	296.62	317.14	313.88	239.17	247.34		228.204	182.29
2014	257.13	258.43	270.47	271.36	293.27	326.63	311.92	243.13	242.52		223.440	185.874
2015	220.66	261.80	250.86	279.32	261.01	348.72	269.22	250.94	208.32		187.387	184.275

Predicted using model and regional data

Year	NATIONAL	Anchorage	Atlanta	Boston	Chicago	Cincinnati	Cleveland	Dallas	Denver	Detroit	Honolulu	Houston	Los Angeles	Miami	Milwaukee	Minneapolis	New York	Philadelphia	Pittsburgh	Portland	San Diego	San Francisco	Seattle	Washington
1980																								
1981																								
1982																								
1983																								
1984																								
1985																								
1986	84.58	89.77	71.98	81.13	98.87	96.35	98.38	69.84	71.30	72.67	64.40	67.17	74.01	73.63	68.21	89.44	104.83	101.42	104.68	100.67	100.00	104.47	100.40	
1987	85.25	92.72	73.44	81.59	100.02	96.91	99.16	70.49	71.34	73.56	65.91	67.66	74.42	73.95	69.98	88.18	104.37	101.53	105.26	101.12	102.00	105.40	98.02	
1988	87.36	96.39	74.48	83.45	100.65	98.08	101.53	73.27	72.35	73.92	66.61	69.85	76.99	76.20	71.30	91.51	106.08	103.42	106.80	103.68	104.19	111.32	99.90	
1989	91.20	100.97	77.73	89.10	106.48	101.90	107.18	76.39	75.17	77.77	69.92	73.21	80.50	76.91	73.16	94.12	111.47	109.11	113.36	106.84	105.68	115.98	102.99	
1990	95.08	104.05	81.69	95.41	109.12	105.40	111.09	79.07	77.18	79.97	74.47	76.18	84.50	78.84	72.86	97.94	116.58	115.06	120.20	109.85	109.09	121.32	106.17	
1991	98.00	107.38	82.81	98.87	112.09	108.39	113.56	82.90	80.29	80.66	77.08	78.20	88.68	80.87	75.16	99.47	119.80	118.66	125.75	113.35	111.68	127.80	108.47	
1992	100.33	109.16	84.97	101.15	114.22	110.99	115.31	84.82	82.56	83.54	80.19	79.25	91.77	81.65	78.70	102.74	122.43	121.07	127.21	118.23	114.57	131.98	112.40	
1993	103.68	114.06	88.79	105.45	119.43	116.55	119.55	87.68	84.78	84.99	86.40	81.68	94.94	84.37	82.03	107.80	126.96	122.75	129.95	122.61	118.89	135.53	116.87	
1994	105.84	114.48	90.58	108.26	116.58	120.68	122.74	90.61	87.80	86.32	89.08	83.31	96.96	85.00	82.54	108.79	129.46	125.70	133.87	127.19	122.68	137.64	122.64	
1995	108.05	115.83	90.93	109.86	119.98	121.46	123.91	93.03	89.17	87.70	93.63	81.84	100.70	87.07	82.56	110.96	132.10	129.71	137.07	130.55	126.57	142.39	125.98	
1996	112.05	118.37	95.29	113.78	126.56	125.89	128.89	94.85	90.68	91.78	97.69	85.89	102.28	91.04	85.25	116.56	137.18	134.18	140.14	135.56	129.44	142.01	130.83	
1997	114.37	121.74	97.44	116.30	129.69	128.50	132.26	95.61	93.96	94.29	99.76	87.20	104.95	92.50	87.33	117.80	139.19	137.39	144.43	135.92	132.36	146.35	132.74	
1998	114.21	123.63	99.23	113.72	128.22	132.05	133.96	96.19	95.39	94.27	98.56	88.34	102.46	92.34	89.98	118.43	139.21	139.19	144.73	141.08	130.67	143.13	133.98	116.94
1999	116.11	123.33	101.27	114.39	128.79	133.85	134.79	97.46	97.14	97.14	100.30	89.17	104.13	93.19	91.37	122.20	140.98	138.94	146.09	144.22	134.43	148.01	137.61	119.97
2000	122.55	125.51	107.82	124.09	139.65	139.07	143.06	103.06	102.83	100.35	107.86	93.46	110.16	95.92	98.50	130.22	148.73	143.68	151.93	149.98	146.64	155.57	144.85	124.84
2001	128.55	133.72	114.50	135.01	142.24	139.80	152.45	113.39	112.77	102.57	108.48	102.22	119.51	101.66	102.41	134.64	151.30	152.12	164.35	156.39	153.86	171.48	158.38	124.94
2002	124.89	134.19	110.87	125.16	134.77	136.10	140.93	108.36	102.84	105.40	105.71	94.56	122.46	98.07	100.19	127.86	146.38	148.14	155.14	165.32	152.14	167.53	158.68	122.73
2003	131.67	135.32	116.55	137.50	144.82	144.76	153.41	116.87	112.84	111.63	112.29	103.44	124.71	102.30	109.15	137.65	156.36	154.67	166.79	166.41	159.49	176.97	160.92	127.92
2004	138.42	144.94	123.12	146.31	151.29	152.17	161.54	124.16	121.26	119.69	118.07	110.40	127.42	107.79	114.58	145.62	164.00	163.07	175.39	174.01	164.61	179.94	168.16	134.04
2005	152.66	157.61	138.26	167.86	166.28	164.47	180.41	141.21	135.92	135.11	131.33	124.97	140.14	116.77	127.39	161.65	182.71	175.78	193.07	186.44	178.55	197.41	181.84	146.45
2006	165.61	173.84	145.93	189.23	169.31	182.54	189.31	155.72	139.13	148.80	146.06	143.36	157.13	132.46	136.80	169.53	196.10	194.10	206.65	198.19	194.37	218.09	194.55	157.73
2007	170.78	188.32	150.63	191.69	183.35	188.99	190.29	157.28	137.80	150.13	152.04	142.37	160.28	133.21	139.86	173.80	203.81	200.47	214.78	207.96	197.72	226.18	203.31	169.47
2008	184.30	196.42	163.84	214.94	200.91	202.13	207.15	170.17	149.49	161.06	183.89	151.41	169.40	140.28	152.24	186.09	221.94	214.03	236.03	215.86	208.09	237.12	211.44	188.96
2009	179.40	209.18	160.21	190.86	184.77	202.26	193.56	159.93	141.32	160.42	165.56	150.17	163.80	141.50	145.16	174.03	216.09	209.43	225.49	219.31	221.65	237.19	213.43	187.97
2010	179.89	197.98	163.29	192.09	187.84	208.42	194.51	154.29	143.18	162.18	180.57	146.25	170.21	135.92	148.48	176.32	216.20	209.38	222.38	217.65	220.42	244.04	217.48	184.94
2011	187.51	206.10	174.33	206.23	194.27	212.72	199.33	159.88	152.91	167.13	206.16	150.80	178.03	141.33	155.73	184.79	222.76	218.58	233.59	229.99	230.35	253.48	228.40	188.23
2012	193.39	213.11	179.56	210.07	198.42	213.37	202.90	164.23	154.36	175.31	221.55	155.48	185.57	146.37	159.57	188.37	227.48	224.90	241.97	240.35	233.27	268.20	239.77	193.95
2013	199.86	217.87	185.50	218.13	204.94	223.07	211.47	171.93	164.60	178.82	226.03	149.57	196.30	150.14	164.91	200.28	234.79	228.58	243.92	244.74	247.12	281.76	247.33	200.67
2014	205.30	226.78	190.52	227.33	220.67	228.43	217.42	176.79	172.25	179.38	231.84	155.83	201.42	154.47	172.97	206.55	237.76	230.21	249.52	252.71	259.98	287.77	250.92	203.69
2015	201.22	232.48	187.26	219.46	213.40	223.81	212.22	171.41	167.10	174.33	209.98	143.52	199.35	150.55	164.79	199.77	226.49	222.77	245.92	252.44	263.47	296.58	252.10	201.14

Mulitplier

Year	NATIONAL	Anchorage	Atlanta	Boston	Chicago	Cincinnati	Cleveland	Dallas	Denver	Detroit	Honolulu	Houston	Los Angeles	Miami	Milwaukee	Minneapolis	New York	Philadelphia	Pittsburgh	Portland	San Diego	San Francisco	Seattle	Washington
1980																								
1981																								
1982																								
1983																								
1984																								
1985																								
1986	1	1.06	0.85	0.96	1.17	1.14	1.16	0.83	0.84	0.86	0.76	0.79	0.88	0.87	0.81	1.06	1.24	1.20	1.24	1.19	1.18	1.24	1.19	
1987	1	1.09	0.86	0.96	1.17	1.14	1.16	0.83	0.84	0.86	0.77	0.79	0.87	0.87	0.82	1.03	1.22	1.19	1.23	1.19	1.20	1.24	1.15	
1988	1	1.10	0.85	0.96	1.15	1.12	1.16	0.84	0.83	0.85	0.76	0.80	0.88	0.87	0.82	1.05	1.21	1.18	1.22	1.19	1.19	1.27	1.14	
1989	1	1.11	0.85	0.98	1.17	1.12	1.18	0.84	0.82	0.85	0.77	0.80	0.88	0.84	0.80	1.03	1.22	1.20	1.24	1.17	1.16	1.27	1.13	
1990	1	1.09	0.86	1.00	1.15	1.11	1.17	0.83	0.81	0.84	0.78	0.80	0.89	0.83	0.77	1.03	1.23	1.21	1.26	1.16	1.15	1.28	1.12	
1991	1	1.10	0.84	1.01	1.14	1.11	1.16	0.85	0.82	0.82	0.79	0.80	0.90	0.83	0.77	1.02	1.22	1.21	1.28	1.16	1.14	1.30	1.11	
1992	1	1.09	0.85	1.01	1.14	1.11	1.15	0.85	0.82	0.83	0.80	0.79	0.91	0.81	0.78	1.02	1.22	1.21	1.27	1.18	1.14	1.32	1.12	
1993	1	1.10	0.86	1.02	1.15	1.12	1.15	0.85	0.82	0.82	0.83	0.79	0.92	0.81	0.79	1.04	1.22	1.18	1.25	1.18	1.15	1.31	1.13	
1994	1	1.08	0.86	1.02	1.10	1.14	1.16	0.86	0.83	0.82	0.84	0.79	0.92	0.80	0.78	1.03	1.22	1.19	1.26	1.20	1.16	1.30	1.16	
1995	1	1.07	0.84	1.02	1.11	1.12	1.15	0.86	0.83	0.81	0.87	0.76	0.93	0.81	0.76	1.03	1.22	1.20	1.27	1.21	1.17	1.32	1.17	
1996	1	1.06	0.85	1.02	1.13	1.12	1.15	0.85	0.81	0.82	0.87	0.77	0.91	0.81	0.76	1.04	1.22	1.20	1.25	1.21	1.16	1.27	1.17	
1997	1	1.06	0.85	1.02	1.13	1.12	1.16	0.84	0.82	0.82	0.87	0.76	0.92	0.81	0.76	1.03	1.22	1.20	1.26	1.19	1.16	1.28	1.16	
1998	1	1.08	0.87	1.00	1.12	1.16	1.17	0.84	0.84	0.83	0.86	0.77	0.90	0.81	0.79	1.04	1.22	1.22	1.27	1.24	1.14	1.25	1.17	1.02
1999	1	1.06	0.87	0.99	1.11	1.15	1.16	0.84	0.84	0.84	0.86	0.77	0.90	0.80	0.79	1.05	1.21	1.20	1.26	1.24	1.16	1.27	1.19	1.03
2000	1	1.02	0.88	1.01	1.14	1.13	1.17	0.84	0.84	0.82	0.88	0.76	0.90	0.78	0.80	1.06	1.21	1.17	1.24	1.22	1.20	1.27	1.18	1.02
2001	1	1.04	0.89	1.05	1.11	1.09	1.19	0.88	0.88	0.80	0.84	0.80	0.93	0.79	0.80	1.05	1.18	1.18	1.28	1.22	1.20	1.33	1.23	0.97
2002	1	1.07	0.89	1.00	1.08	1.09	1.13	0.87	0.82	0.84	0.85	0.76	0.98	0.79	0.80	1.02	1.17	1.19	1.24	1.32	1.22	1.34	1.27	0.98
2003	1	1.03	0.89	1.04	1.10	1.10	1.17	0.89	0.86	0.85	0.85	0.79	0.95	0.78	0.83	1.05	1.19	1.17	1.27	1.26	1.21	1.34	1.22	0.97
2004	1	1.05	0.89	1.06	1.09	1.10	1.17	0.90	0.88	0.86	0.85	0.80	0.92	0.78	0.83	1.05	1.18	1.18	1.27	1.26	1.19	1.30	1.21	0.97
2005	1	1.03	0.91	1.10	1.09	1.08	1.18	0.92	0.89	0.89	0.86	0.82	0.92	0.76	0.83	1.06	1.20	1.15	1.26	1.22	1.17	1.29	1.19	0.96
2006	1	1.05	0.88	1.14	1.02	1.10	1.14	0.94	0.84	0.90	0.88	0.87	0.95	0.80	0.83	1.02	1.18	1.17	1.25	1.20	1.17	1.32	1.17	0.95
2007	1	1.10	0.88	1.12	1.07	1.11	1.11	0.92	0.81	0.88	0.89	0.83	0.94	0.78	0.82	1.02	1.19	1.17	1.26	1.22	1.16	1.32	1.19	0.99
2008	1	1.07	0.89	1.17	1.09	1.10	1.12	0.92	0.81	0.87	1.00	0.82	0.92	0.76	0.83	1.01	1.20	1.16	1.28	1.17	1.13	1.29	1.15	1.03
2009	1	1.17	0.89	1.06	1.03	1.13	1.08	0.89	0.79	0.89	0.92	0.84	0.91	0.79	0.81	0.97	1.20	1.17	1.26	1.22	1.24	1.32	1.19	1.05
2010	1	1.10	0.91	1.07	1.04	1.16	1.08	0.86	0.80	0.90	1.00	0.81	0.95	0.76	0.83	0.98	1.20	1.16	1.24	1.21	1.23	1.36	1.21	1.03
2011	1	1.10	0.93	1.10	1.04	1.13	1.06	0.85	0.82	0.89	1.10	0.80	0.95	0.75	0.83	0.99	1.19	1.17	1.25	1.23	1.23	1.35	1.22	1.00
2012	1	1.10	0.93	1.09	1.03	1.10	1.05	0.85	0.80	0.91	1.15	0.78	0.96	0.76	0.83	0.97	1.18	1.16	1.25	1.24	1.21	1.39	1.24	1.00
2013	1	1.09	0.93	1.09	1.03	1.12	1.06	0.86	0.82	0.89	1.13	0.75	0.98	0.75	0.83	1.00	1.17	1.14	1.22	1.22	1.24	1.41	1.24	1.00
2014	1	1.10	0.93	1.11	1.07	1.11	1.06	0.86	0.84	0.87	1.13	0.76	0.98	0.75	0.84	1.01	1.16	1.12	1.22	1.23	1.27	1.40	1.22	0.99
2015	1	1.16	0.93	1.09	1.06	1.11	1.05	0.85	0.83	0.87	1.04	0.71	0.99	0.75	0.82	0.99	1.13	1.11	1.22	1.25	1.31	1.47	1.25	1.00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Typ DC (SF)
Typ(upper range) DC (SF)
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LIT Complex DC (EA)
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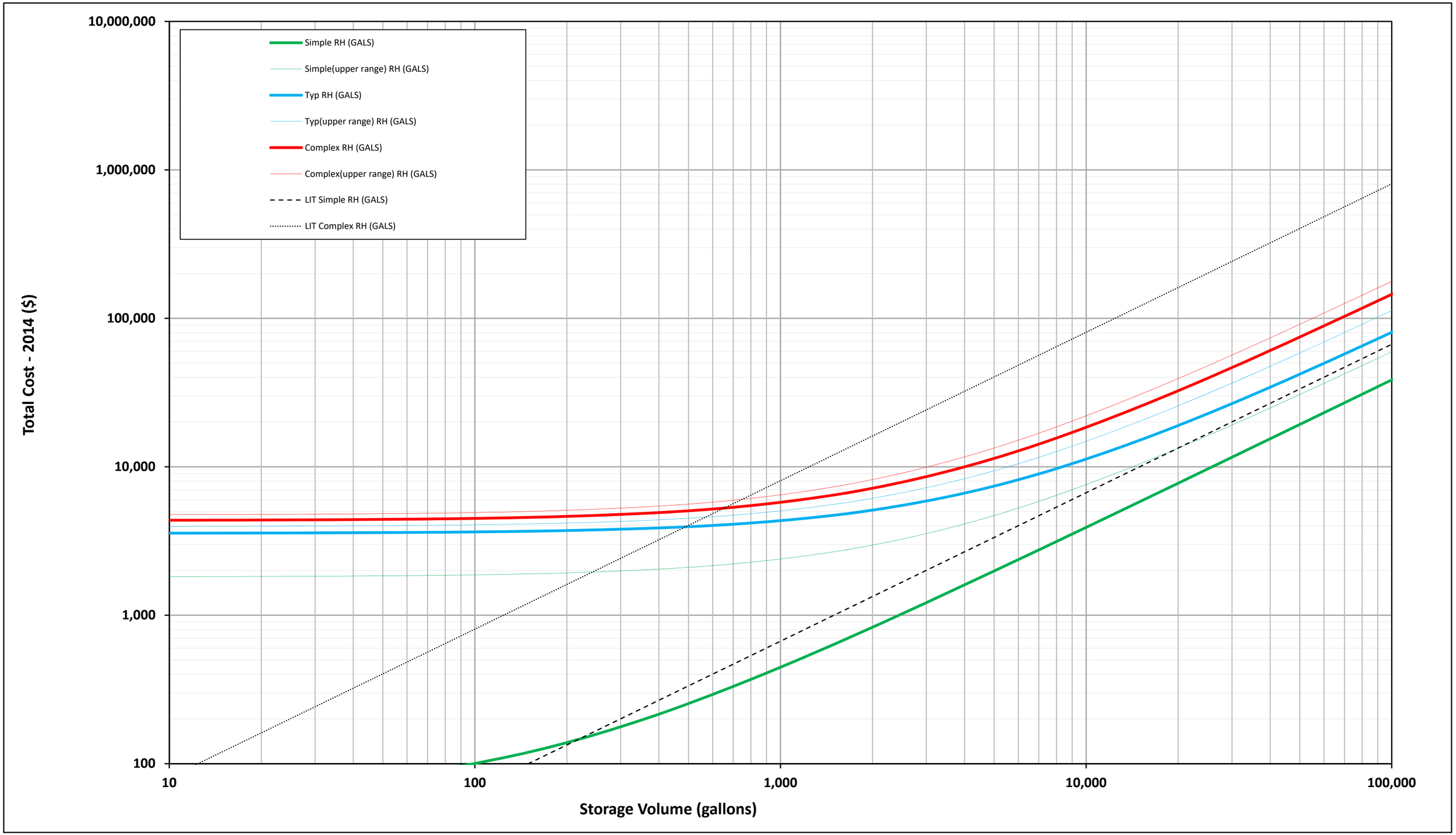
100,000
Surface Area (square feet)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Typ RH (GALS)
Typ(upper range) RH (GALS)
Complex RH (GALS)
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LIT Complex RH (GALS)
Total Cost - 2014 ($)
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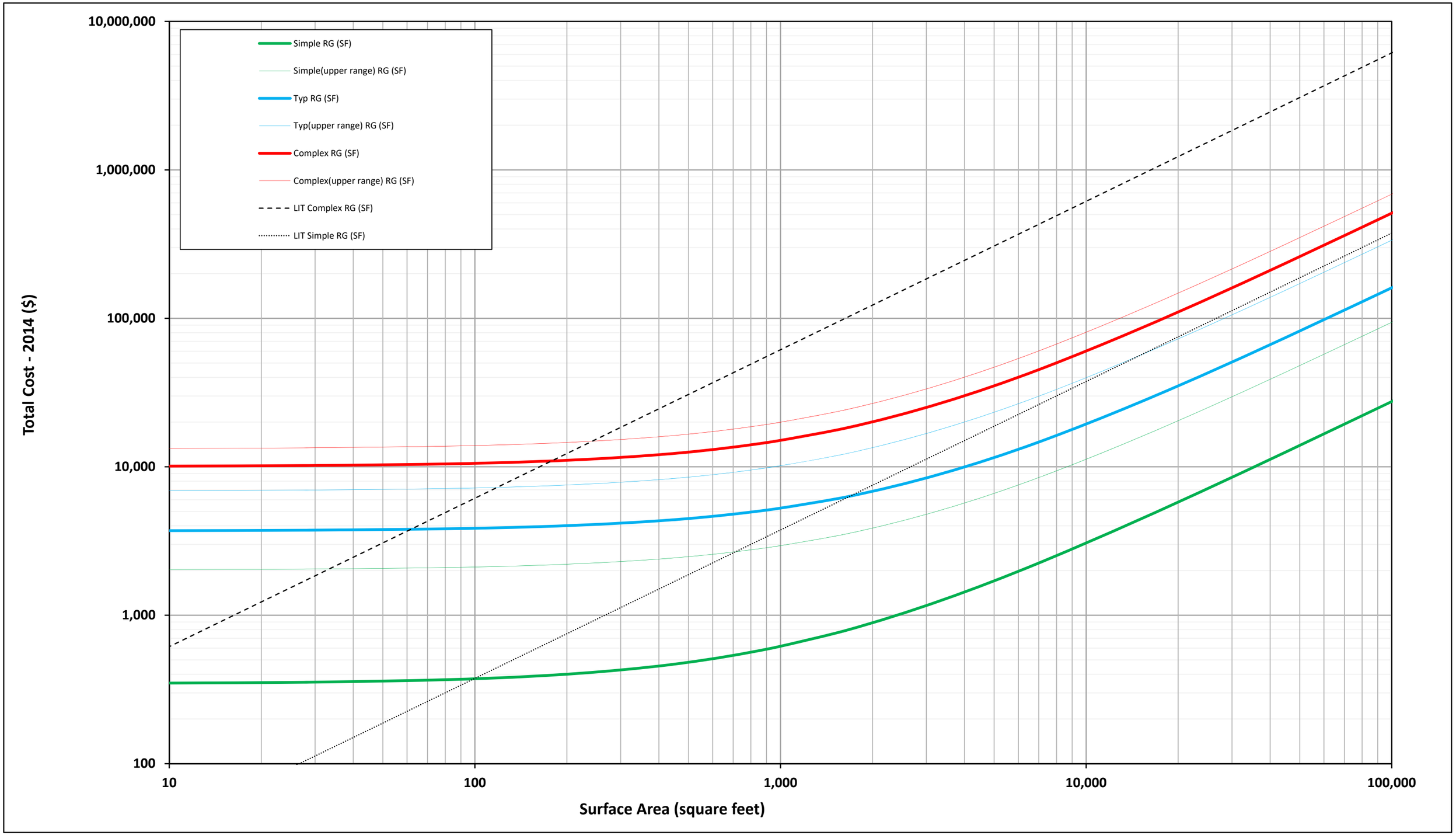
Storage Volume (gallons)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Typ(upper range) RG (SF)
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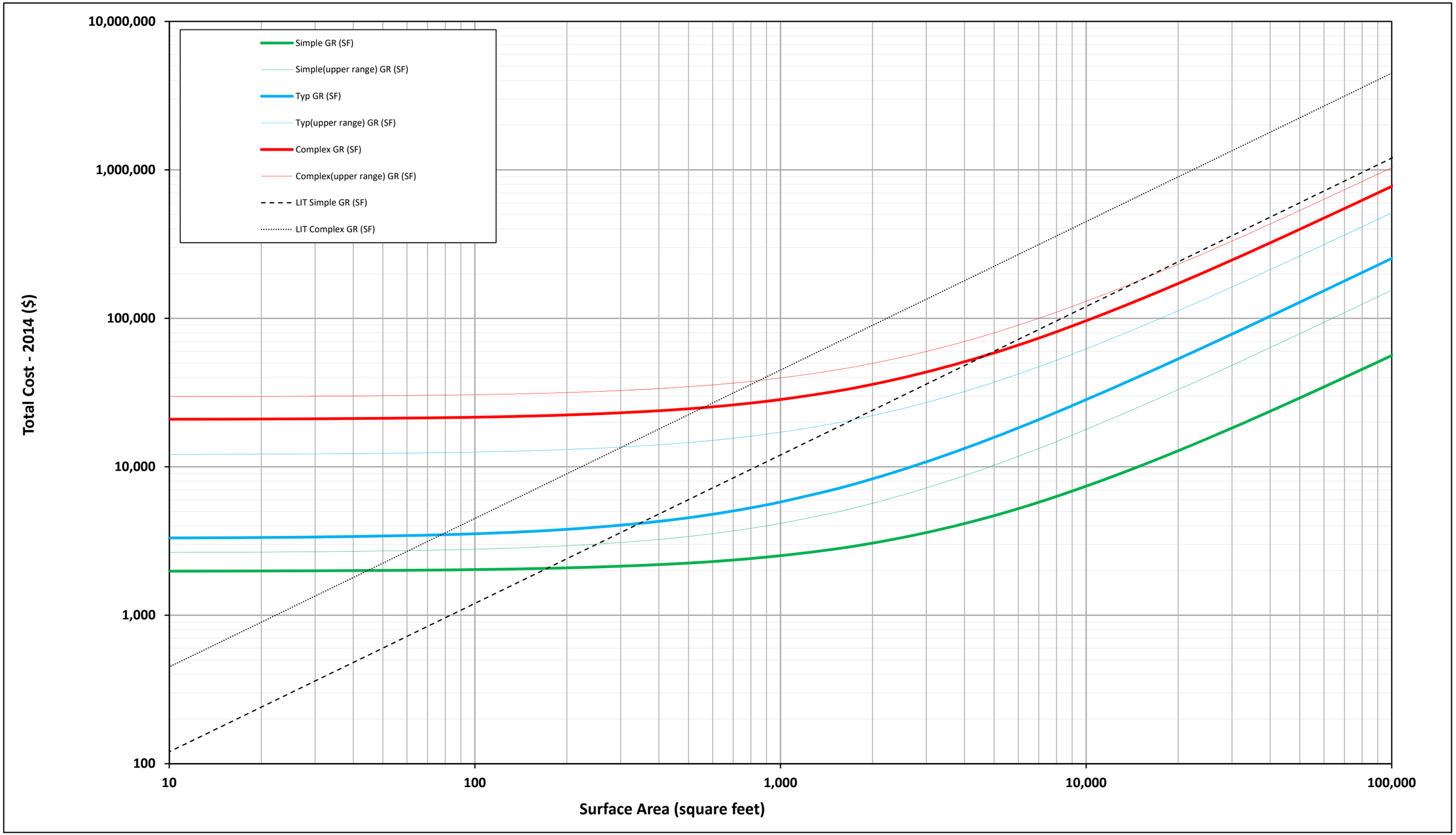
Surface Area (square feet)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LIT Complex GR (SF)
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Total Cost - 2014 ($)
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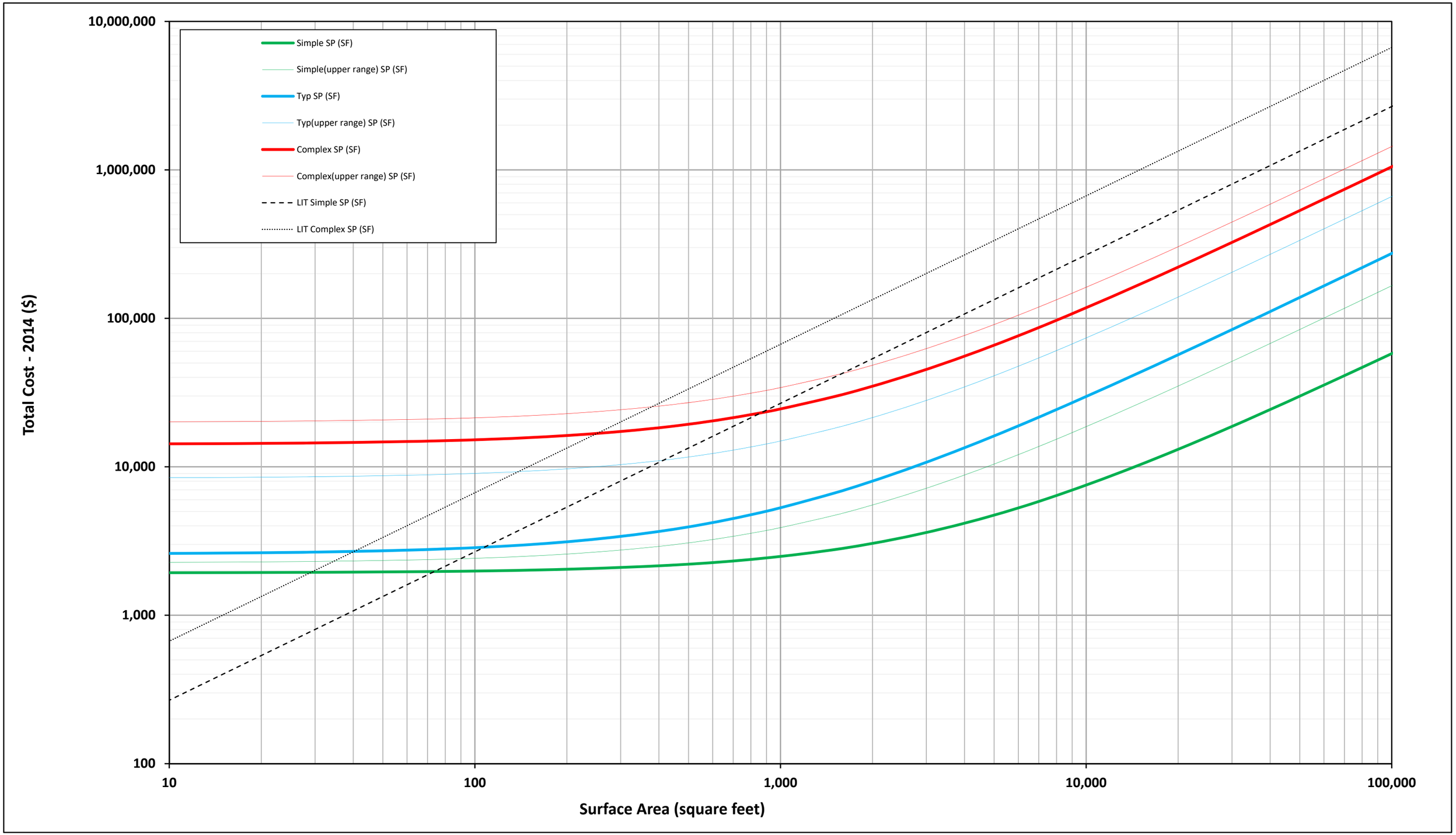
Surface Area (square feet)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Total Cost - 2014 ($)
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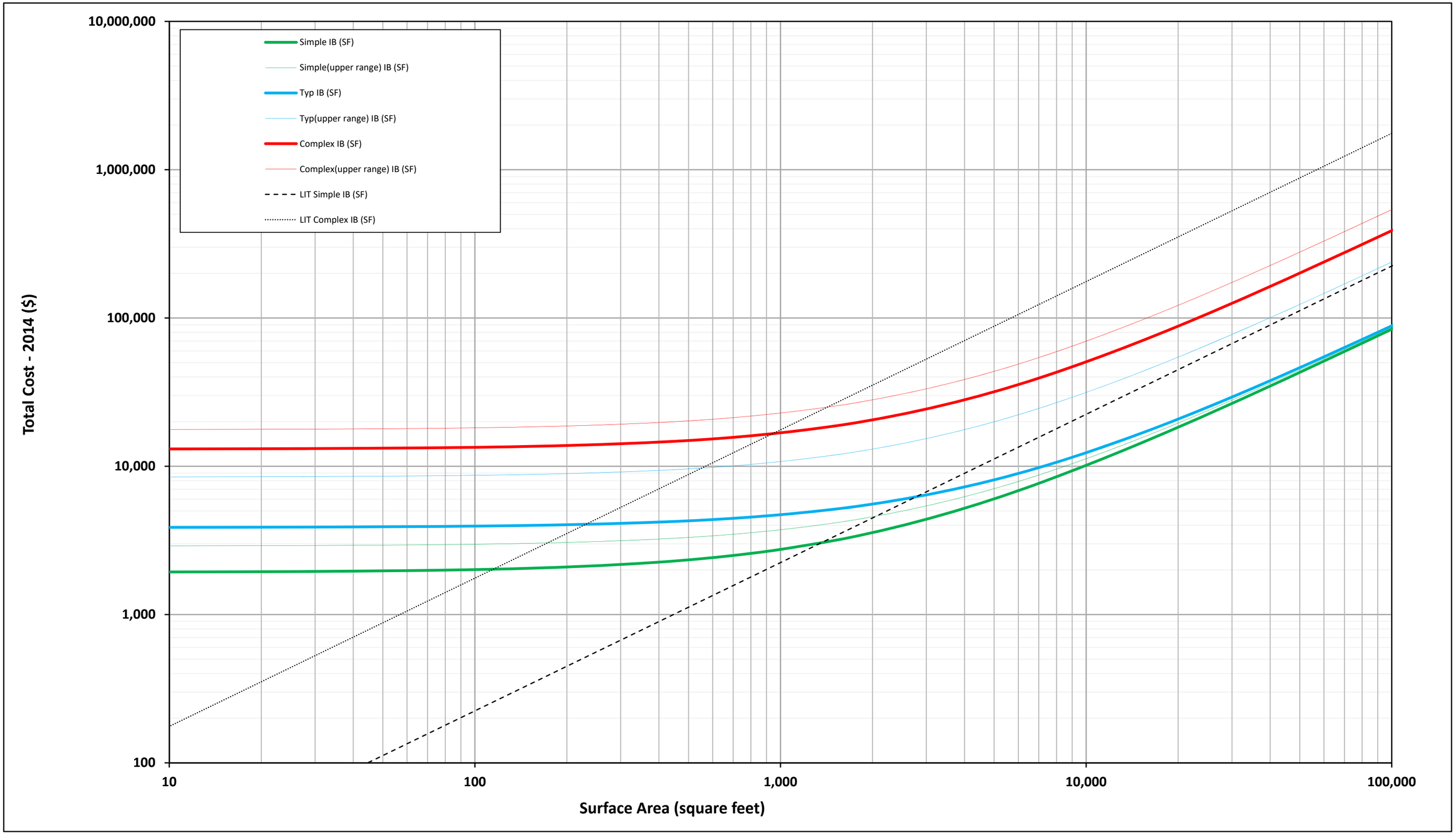
Surface Area (square feet)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LIT Complex IB (SF)
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Total Cost - 2014 ($)
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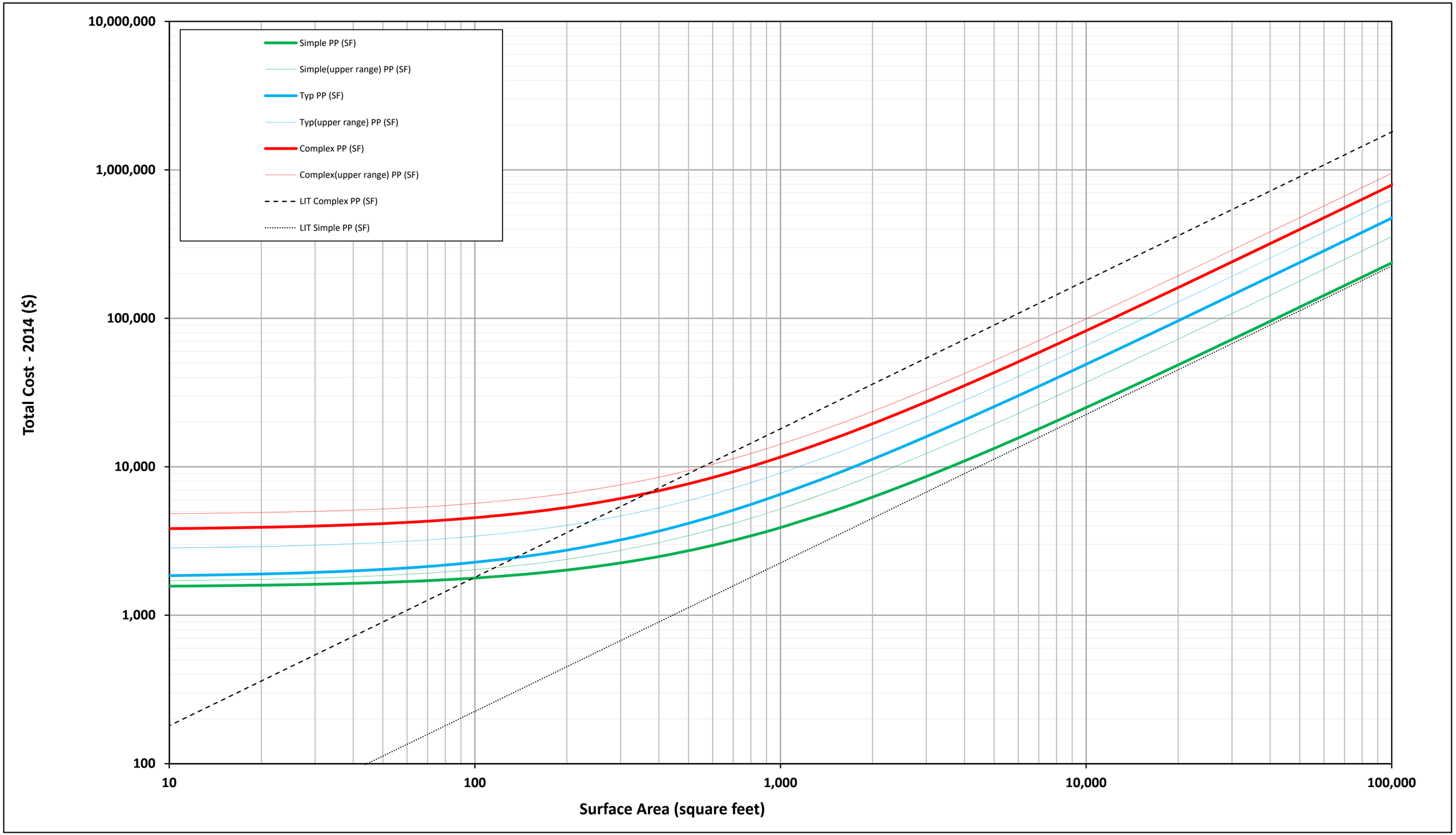
Surface Area (square feet)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Total Cost - 2014 ($)
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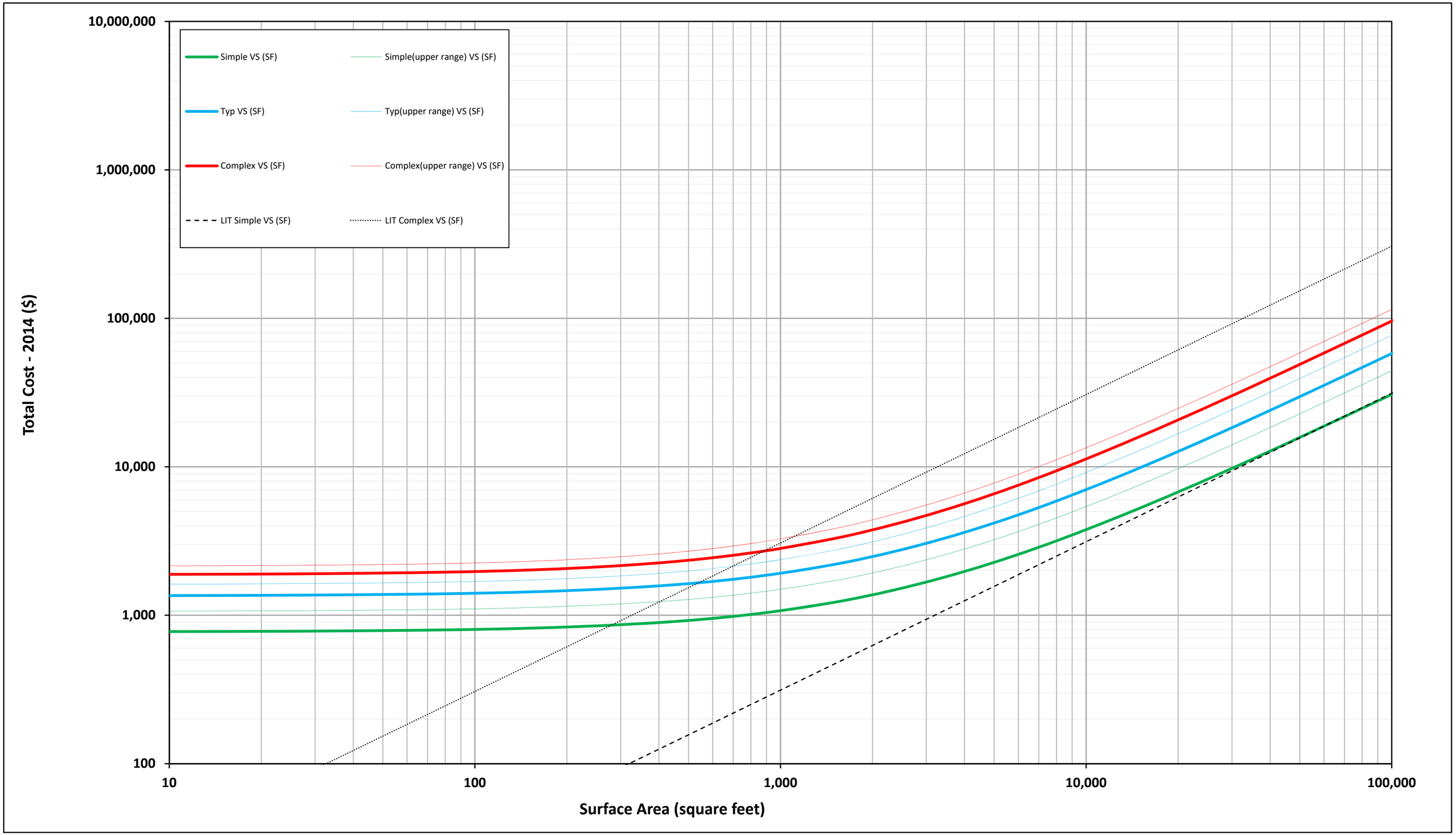
Surface Area (square feet)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LIT Complex VS (SF)
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Total Cost - 2014 ($)
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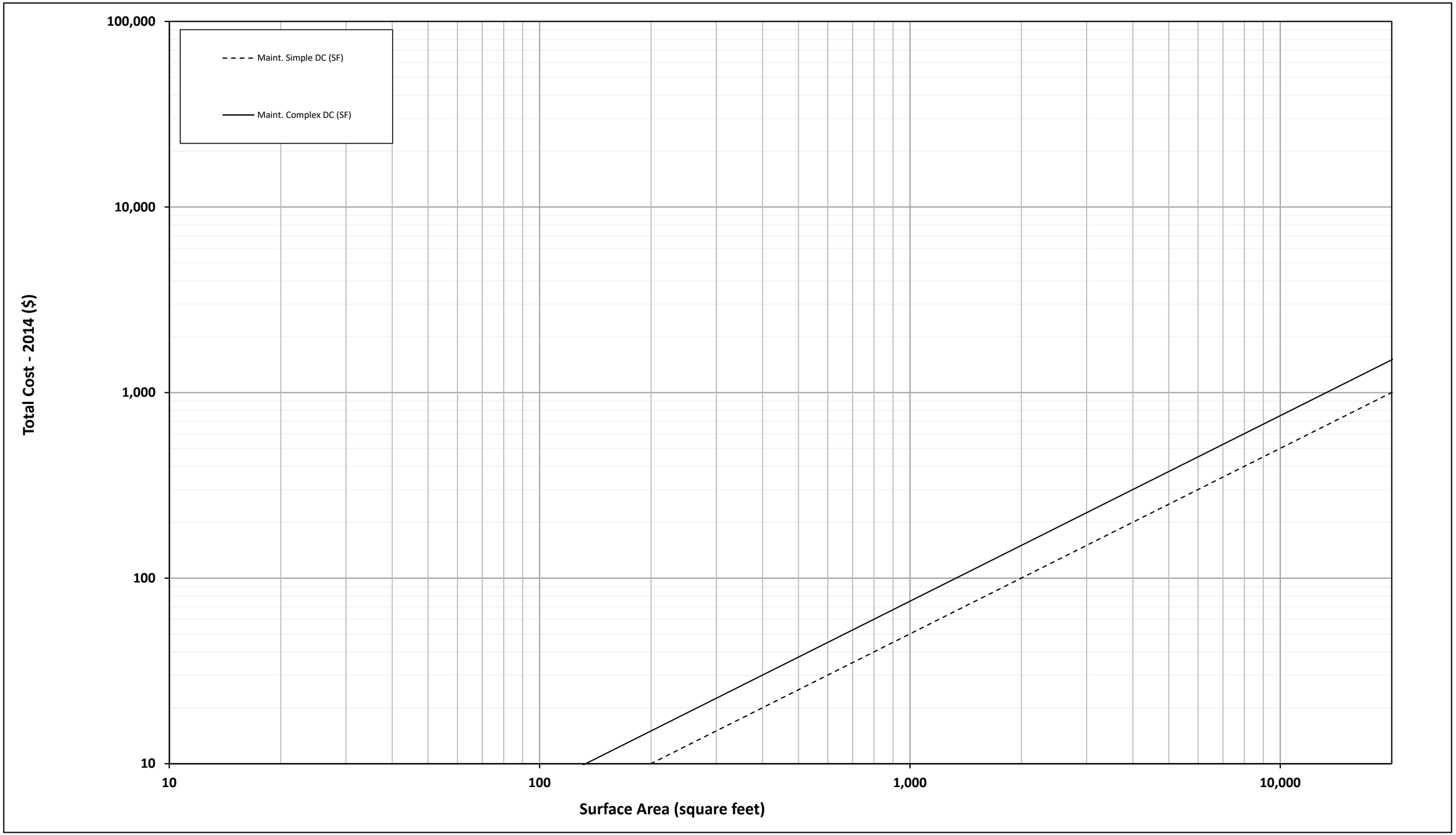
Surface Area (square feet)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Total Cost - 2014 ($)
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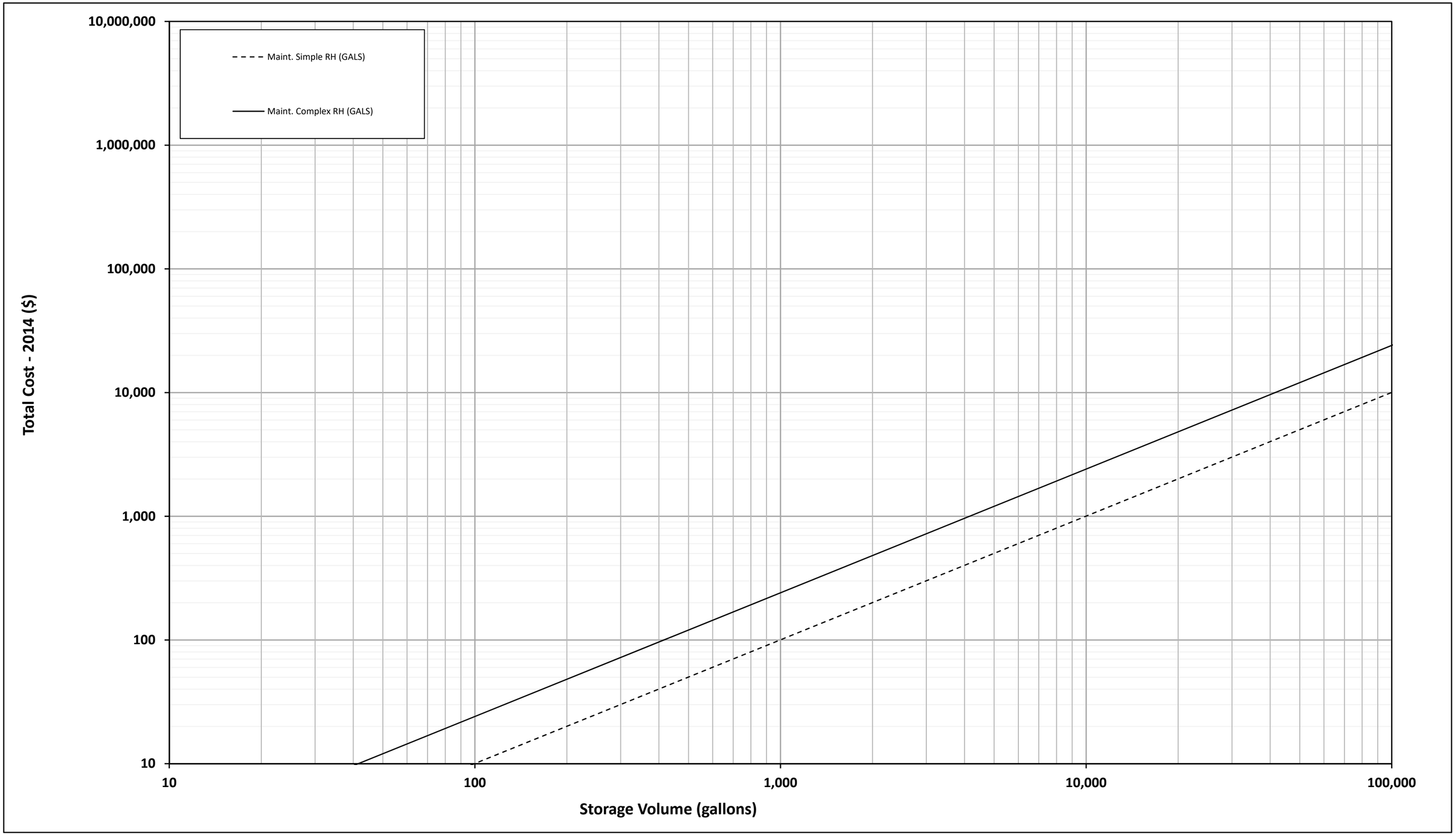
Surface Area (square feet)


Maint. Simple RH (GALS)
Maint. Complex RH (GALS)
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Total Cost - 2014 ($)
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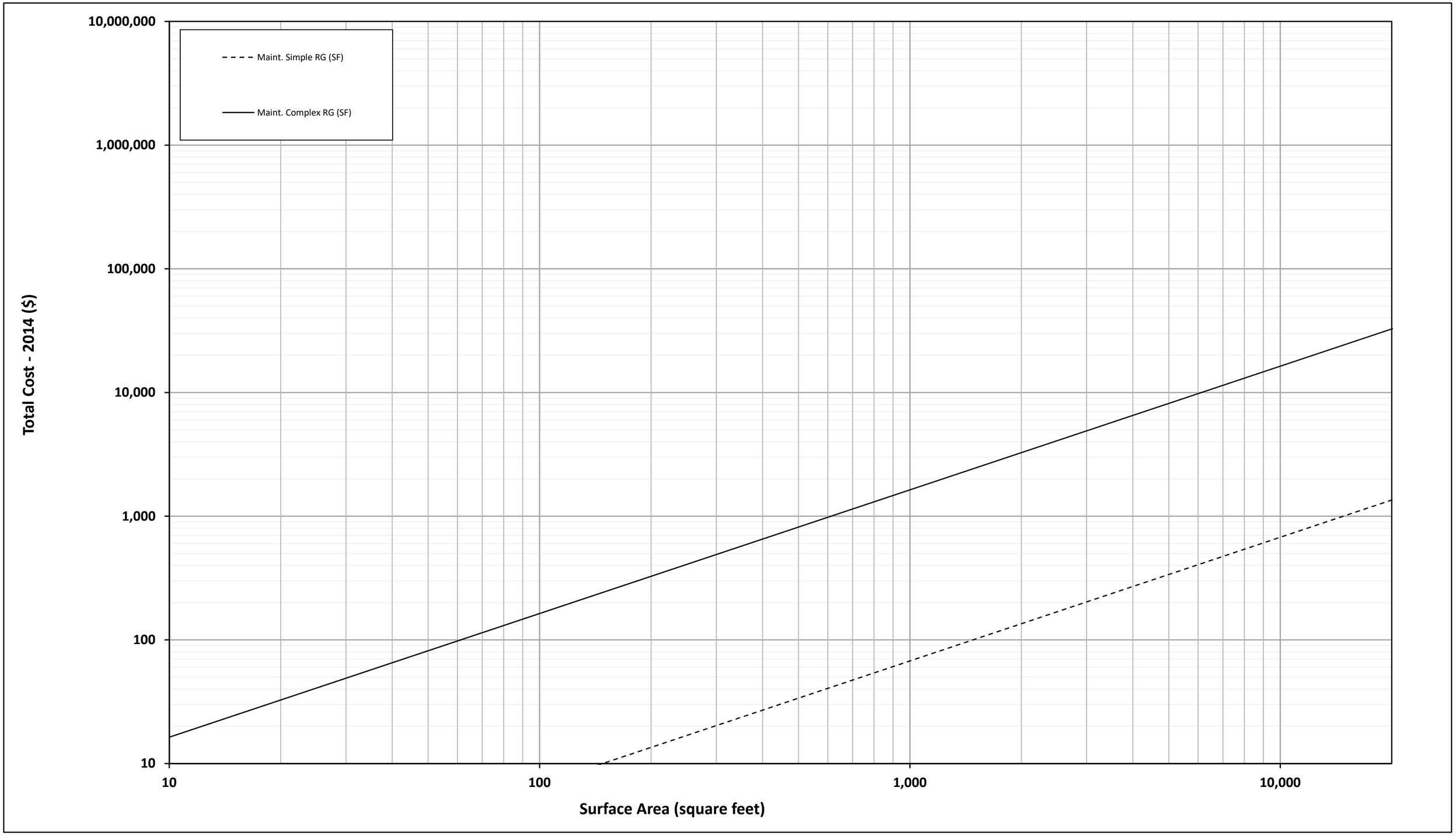
Storage Volume (gallons)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Maint. Complex RG (SF)
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Total Cost - 2014 ($)
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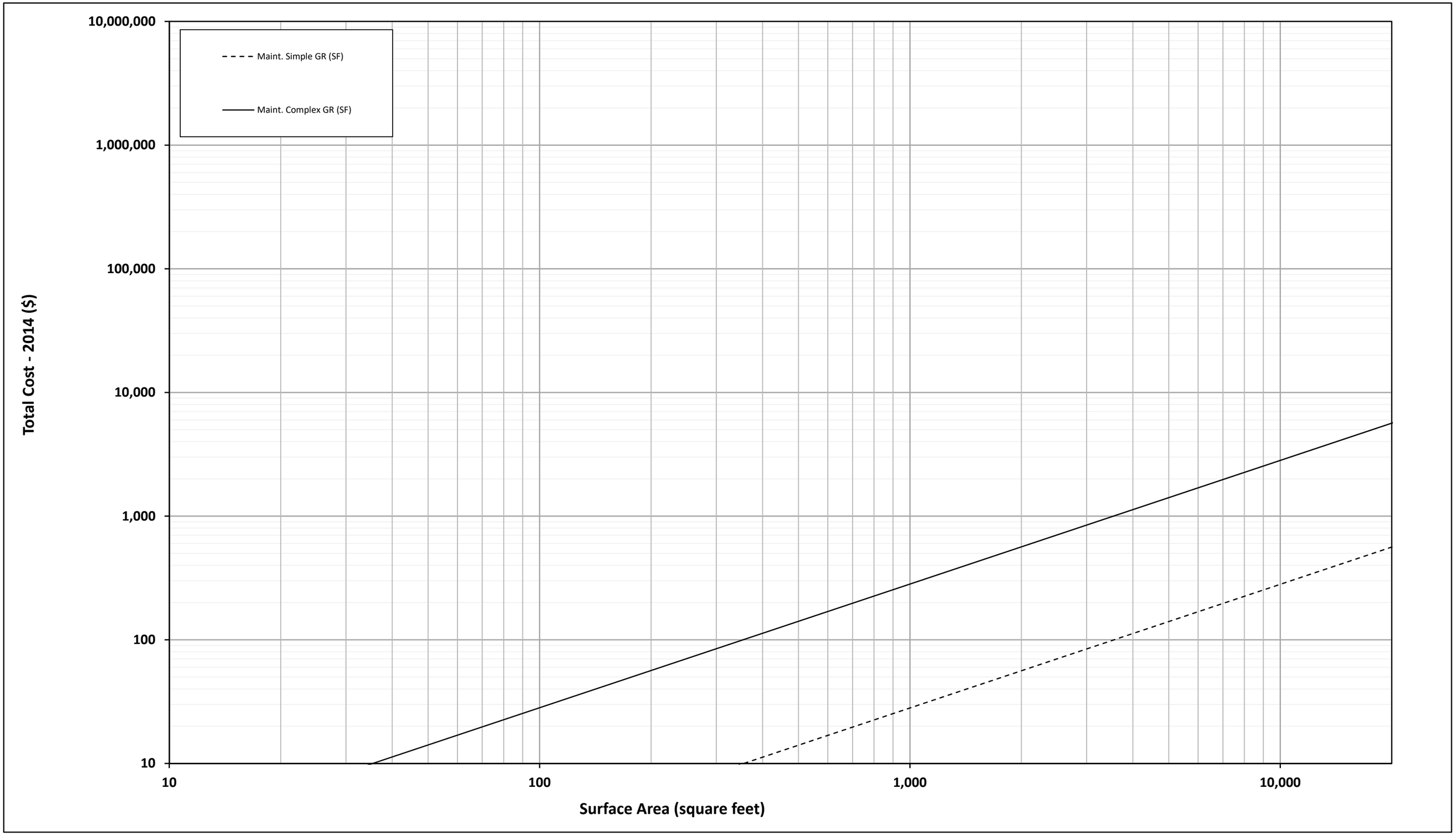
Surface Area (square feet)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Maint. Complex GR (SF)
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Total Cost - 2014 ($)
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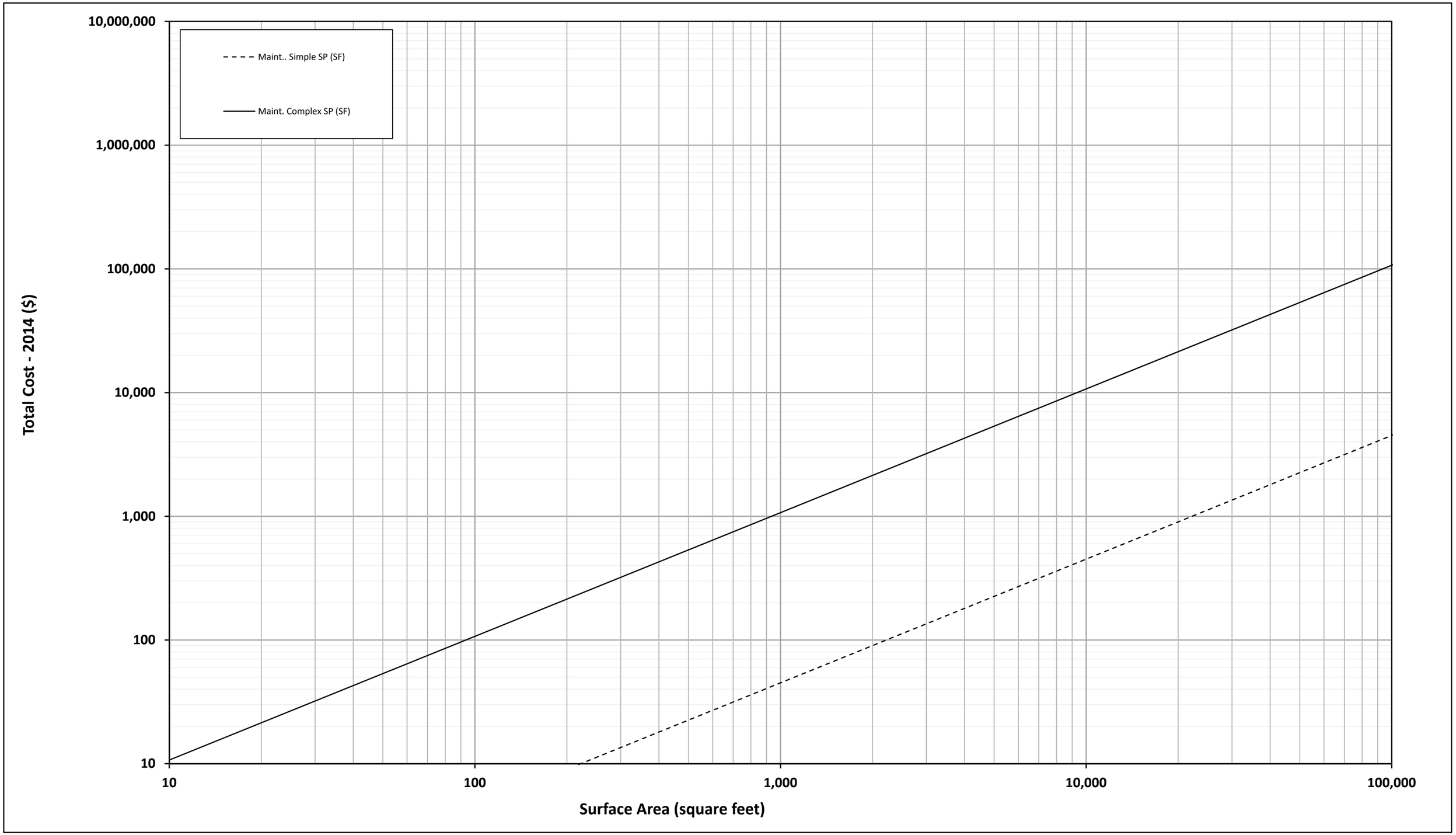
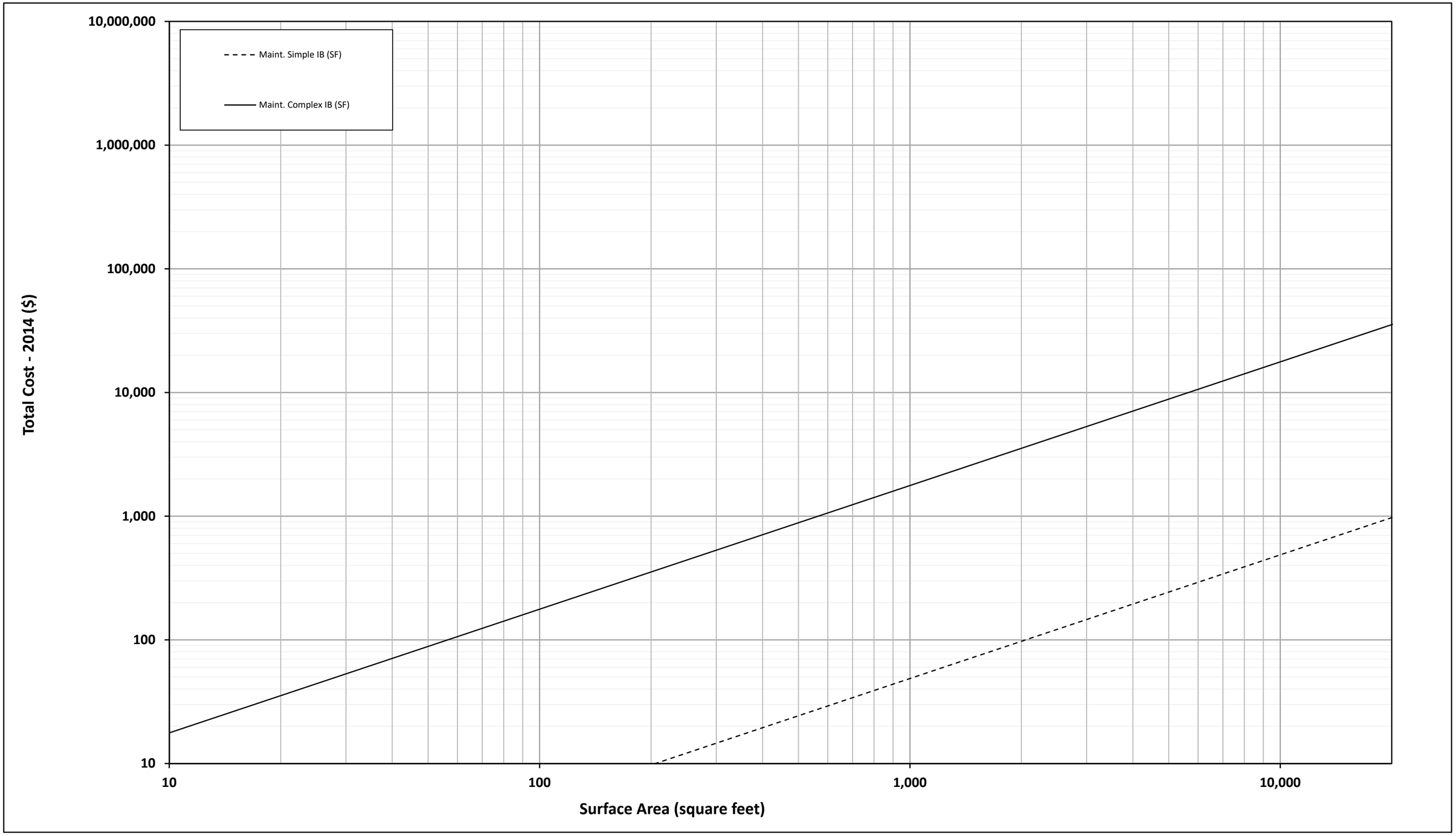
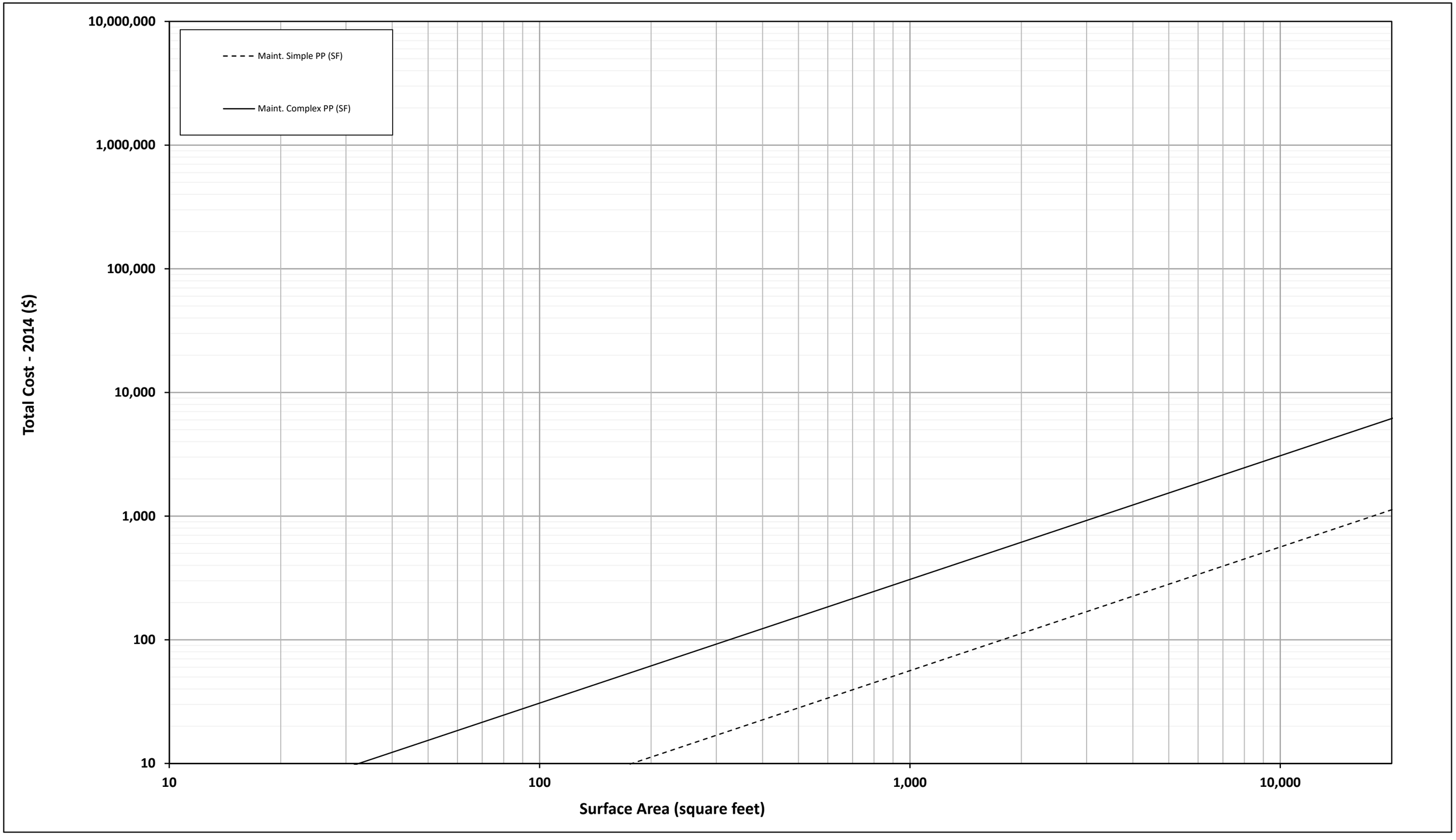
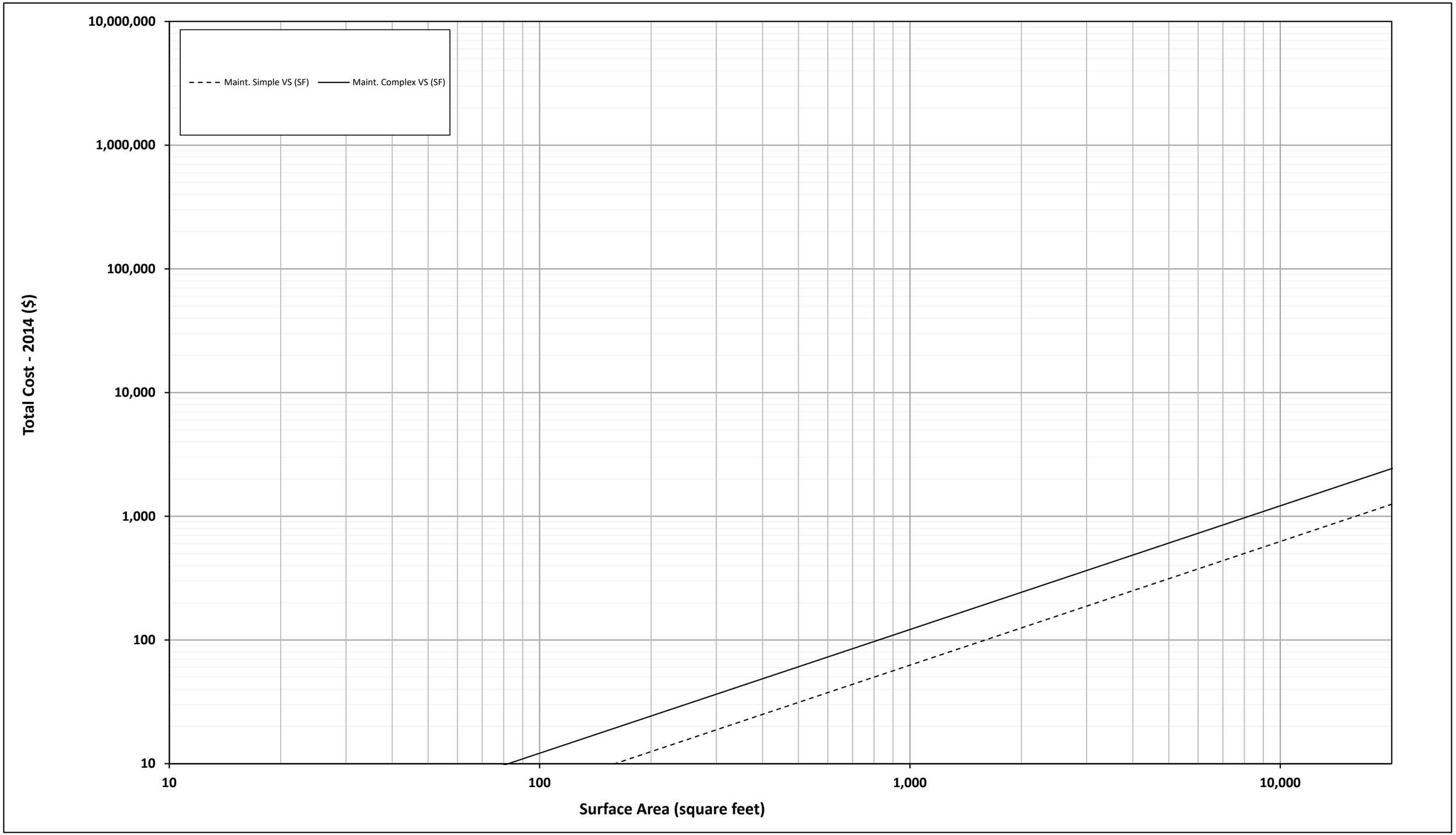
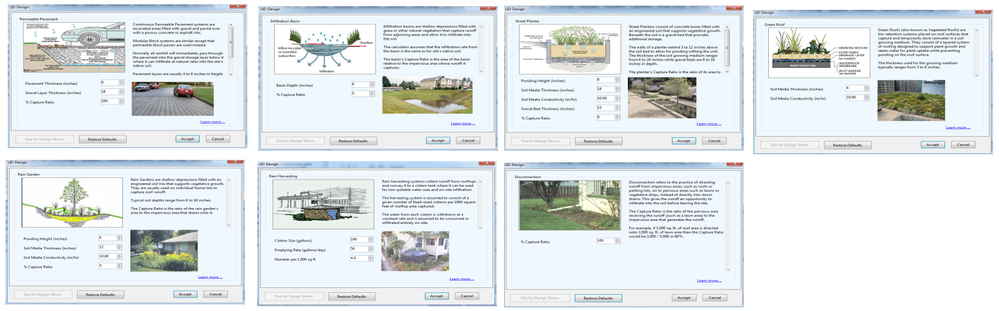
1,000
10,000
Surface Area (square feet)

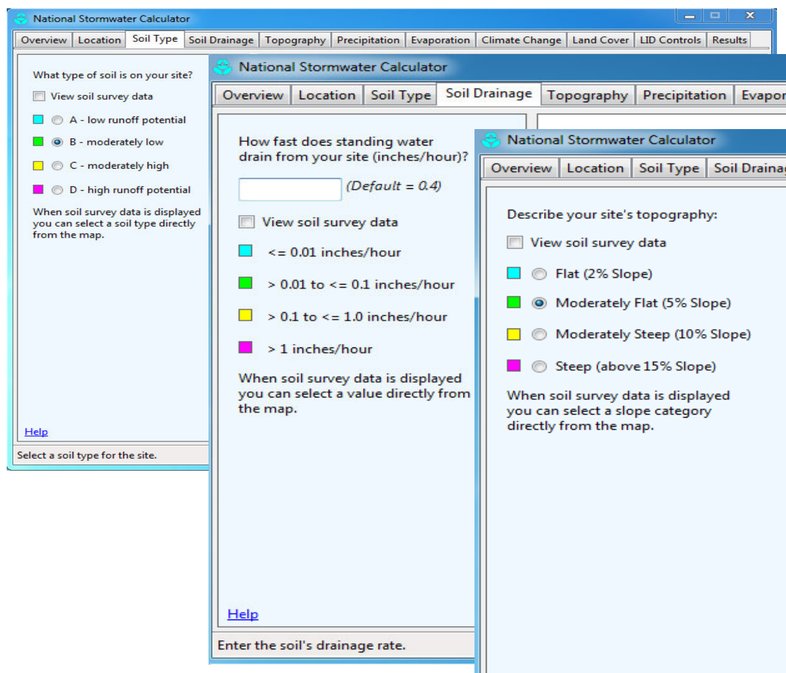

Maint.. Simple SP (SF)
Maint. Complex SP (SF)
10,000,000
1,000,000
100,000
10,000
1,000
100
10
Total Cost - 2014 ($)
10
100
1,000
10,000
100,000
Surface Area (square feet)

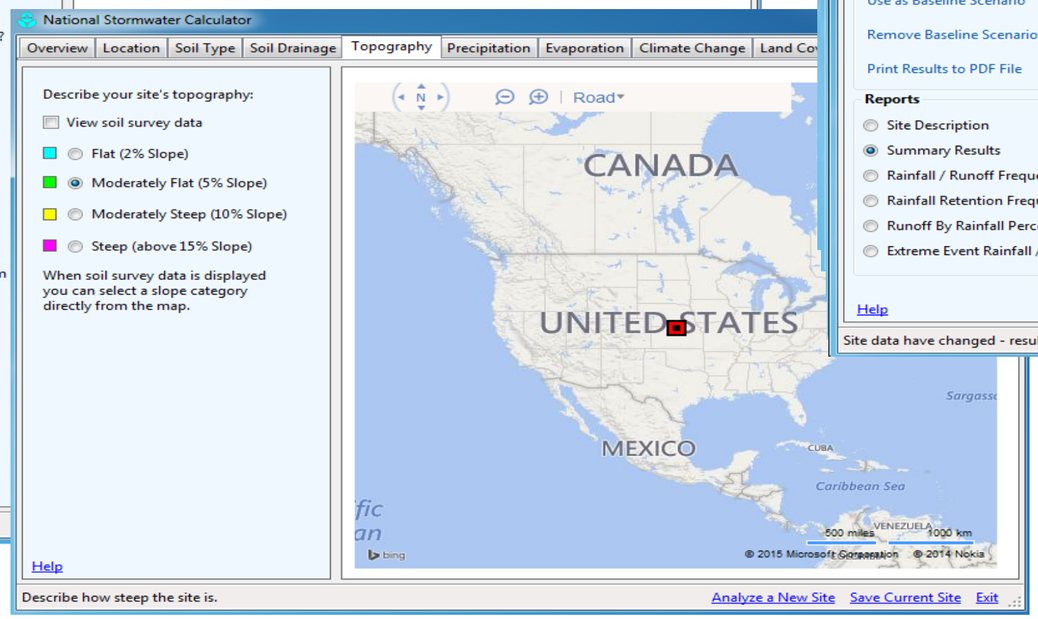

Maint. Simple IB (SF)
Maint. Complex IB (SF)
10,000,000
1,000,000
100,000
10,000
1,000
100
10
Total Cost - 2014 ($)
10
100
1,000
10,000
Surface Area (square feet)

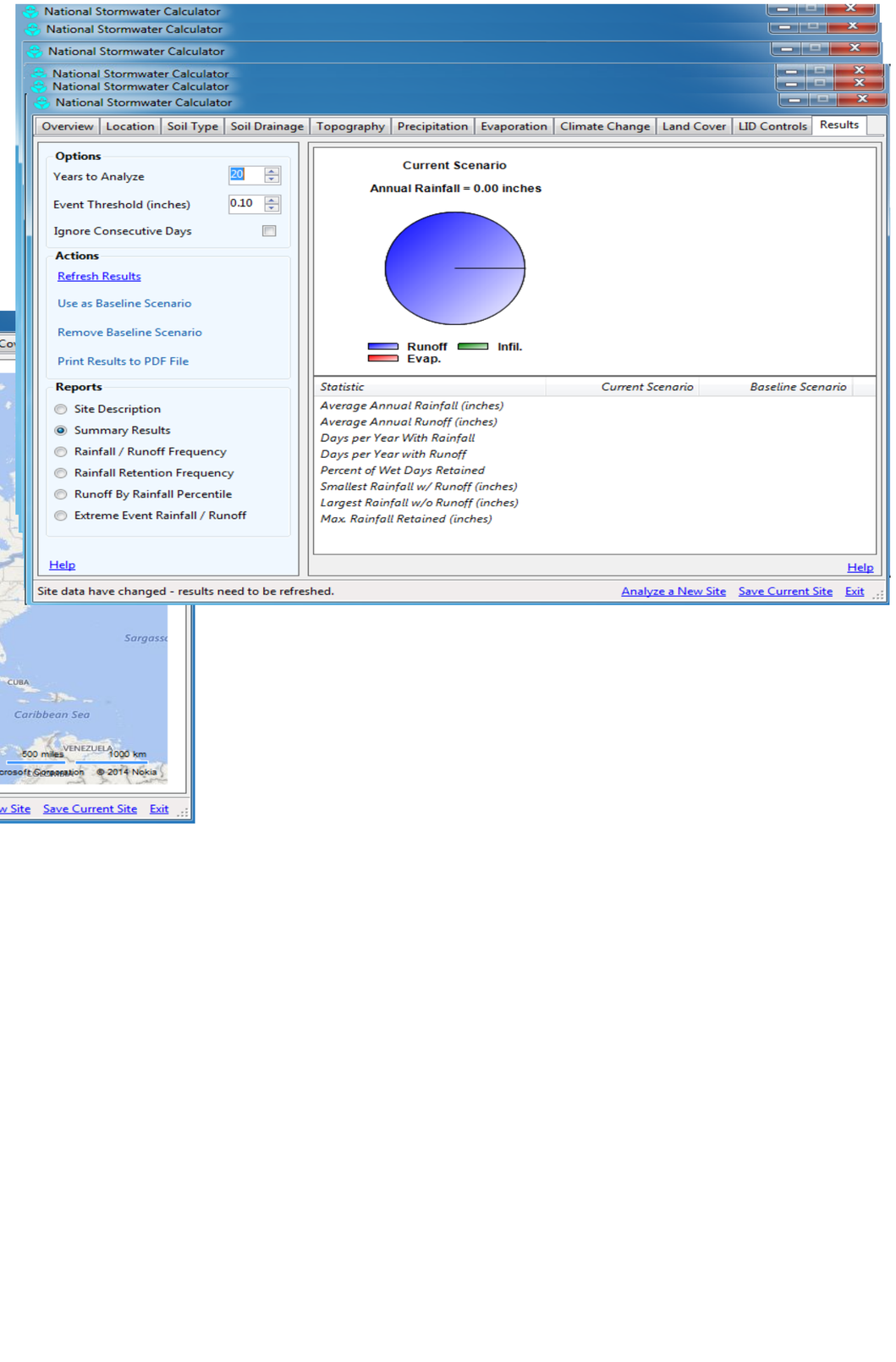

Maint. Simple PP (SF)
Maint. Complex PP (SF)
10,000,000
1,000,000
100,000
10,000
1,000
100
10
Total Cost - 2014 ($)
10
100
1,000
10,000
Surface Area (square feet)


Maint. Simple VS (SF)
Maint. Complex VS (SF)
10,000,000
1,000,000
100,000
10,000
1,000
100
10
Total Cost - 2014 ($)
10
100
1,000
10,000
Surface Area (square feet)




National Stormwater Calculator
Overview
Location
Soil Type
Soil Drainage
Topography
Precipitation
Evaporation
Climate Change
Land Cover
LID Controls
Results
What type of soil is on your site?
View soil survey data
A - low runoff potential
B - moderately low
C - moderately high
D - high runoff potential
When soil survey data is displayed you can select a soil type directly from the map.
Help
Select a soil type for the site.
How fast does standing water drain from your site (inches/hour)?
(Default = 0.4)
View soil survey data
<= 0.01 inches/hour
> 0.01 to <= 0.1 inches/hour
> 0.1 to <= 1.0 inches/hour
> 1 inches/hour
When soil survey data is displayed you can select a value directly from the map.
Help
Enter the soil's drainage rate.

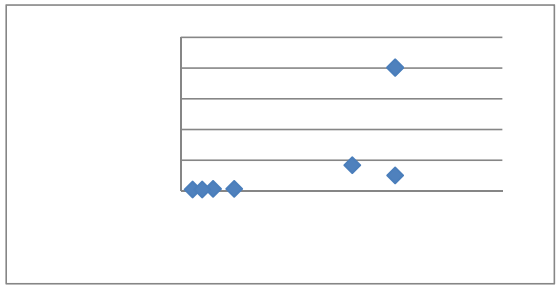

National Stormwater Calculator
Overview
Location
Soil Type
Soil Drainage
Topography
Precipitation
Evaporation
Climate Change
Land Cover
Describe your site's topography:
View soil survey data
Flat (2% Slope)
Moderately Flat (5% Slope)
Moderately Steep (10% Slope)
Steep (above 15% Slope)
When soil survey data is displayed you can select a slope category directly from the map.
Help
Road
CANADA
UNITED STATES
MEXICO
CUBA
Caribbean Sea
VENEZUELA
500 miles
1000 km
© 2015 Microsoft Corporation
© 2014 Nokia
Describe how steep the site is.
Analyze a New Site
Save Current Site
Exit


National Stormwater Calculator
Overview
Location
Soil Type
Soil Drainage
Topography
Precipitation
Evaporation
Climate Change
Land Cover
LID Controls
Results
Options
Years to Analyze
20
Event Threshold (inches)
0.10
Ignore Consecutive Days
Actions
Refresh Results
Use as Baseline Scenario
Remove Baseline Scenario
Print Results to PDF File
Reports
Site Description
Summary Results
Rainfall / Runoff Frequency
Rainfall Retention Frequency
Runoff By Rainfall Percentile
Extreme Event Rainfall / Runoff
Help
Current Scenario
Annual Rainfall = 0.00 inches
Runoff
Infil.
Evap.
Statistic
Current Scenario
Baseline Scenario
Average Annual Rainfall (inches)
Average Annual Runoff (inches)
Days per Year With Rainfall
Days per Year with Runoff
Percent of Wet Days Retained
Smallest Rainfall w/ Runoff (inches)
Largest Rainfall w/o Runoff (inches)
Max. Rainfall Retained (inches)
Help
Site data have changed - results need to be refreshed.
Analyze a New Site
Save Current Site
Exit

Rainwater Harvesting

Id	WQV (gal)	Total Cost ($)	Source	Cost location	Cost Year		2014 $
1	8004	31040	www.wetlandstudies.com	Gainesville, Virgina	2005	$	41,503
2	1504	1500	http://www.portlandonline.com/bps/index.cfm?c=ecbbd&a=bbehfa	Portland	1996	$	2,759
3	10000	178000	Hicks, 2008. A Cost-Benefit Analysis of Rainwater Harvesting at Comme	Maryland	2008	$	200,003
4	10000	179000	Hicks, 2008. A Cost-Benefit Analysis of Rainwater Harvesting at Comme	Maryland	2008	$	201,127
5	10000	22100	WERF Tool References, Miller, 2008	Salt Lake City, UT	2008	$	24,832
6	550	1446.12	DSWC Stormwater BMP Costs	North Carolina	2006	$	1,809
7	1000	1756.12	DSWC Stormwater BMP Costs	North Carolina	2006	$	2,197
8	2500	2411.28	DSWC Stormwater BMP Costs	North Carolina	2006	$	3,017

Rain Garden/Bioretention

ft3	gallons	Total Cost ($)
10	74.81	89.36
100	748.1	872.61
1000	7481	8521.60
10000	74810	83218.73

Green Roofs