

National Academies of Science, Engineering, and Medicine
Facilities Staffing Requirements for VHA
Marketplace Tools for Modeling
January 29, 2019

Asset-specific, Data-driven
Approaches for Facilities Staffing

Stephen Plotner, Principal Cost Engineer Emeritus, RSMeans by Gordian



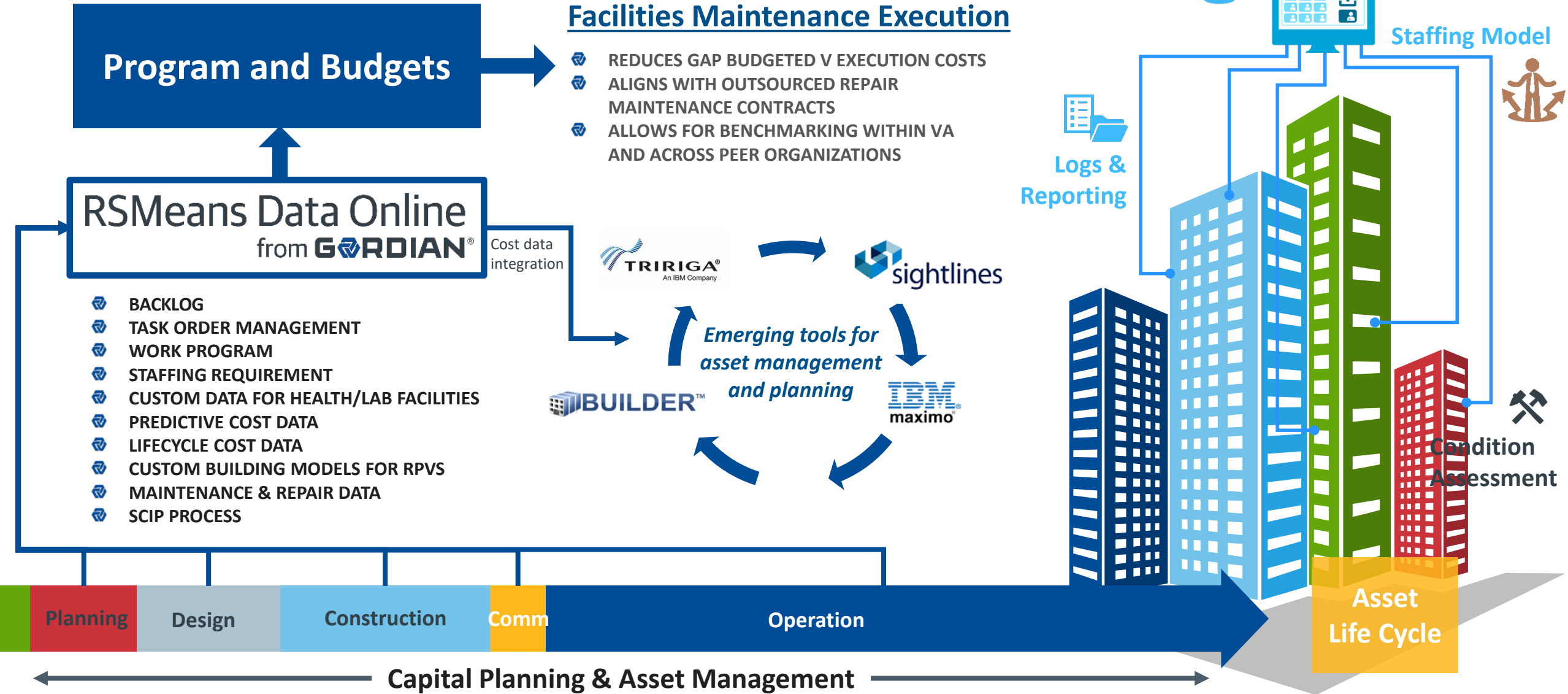


Asset-Driven Cost Data for Facilities Staffing Modeling

- Benchmark staff efficiency against industry norms, other facilities, or outsourcing options
- In a outsourced FM model, can serve as a contractual unit price basis or independent pricing validation.
- Forecast building life cycle costs over multiple years based on annual preventative maintenance and cyclical repair and replacement maintenance

Cost data tailored to VA environment and assets may be required

Granular, data-driven approach aligns with maturing VA approach to asset management



RSMeans data

RSMeans data has progressed from handwritten cost books to the most comprehensive construction cost database in North America. More than 22,000 hours are invested in cost research each year. Our Cost Engineers apply their skill and expertise to validate each line item and work closely with Data Scientists to develop the formulas and algorithms to ensure accuracy, completeness and usability.

Actively monitored data points fueling our database:

55,000+
Material
Pricing



35
Trade
Wage Rates



638
Equipment
Rental Rates



Productivity



970+
Location
Factors

How the Database is Built

Construction costs are comprised of material, labor and/or equipment prices and can be referenced at the unit, assembly or square foot level of detail. Unit costs also contain productivity data.



Material



Labor

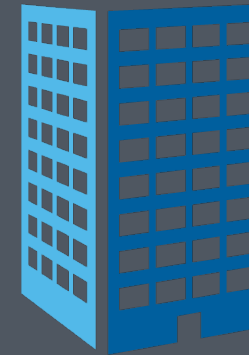
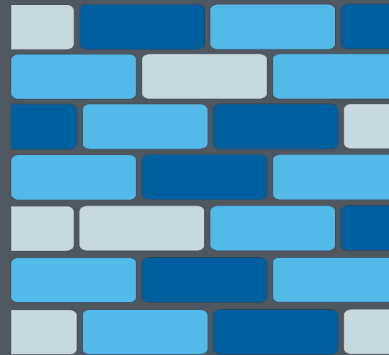
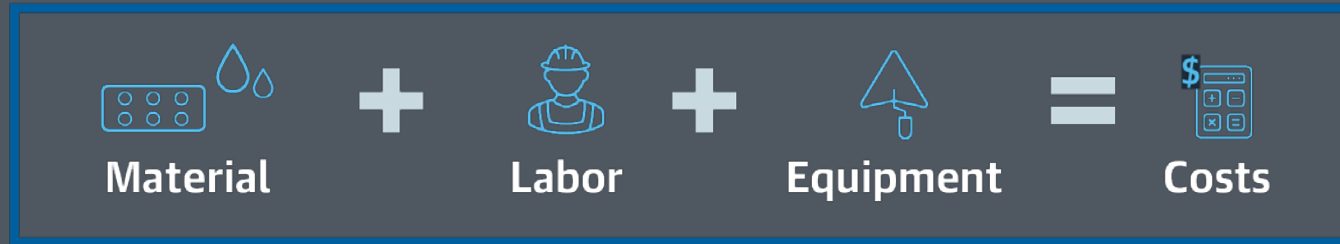


Equipment



Costs

How the Database is Built



Unit

Ex: Brick

Assembly

Ex: Brick Wall

SqFt Model

Ex: Brick Building

Ongoing Investments After Initial Construction

**Preventative
maintenance**

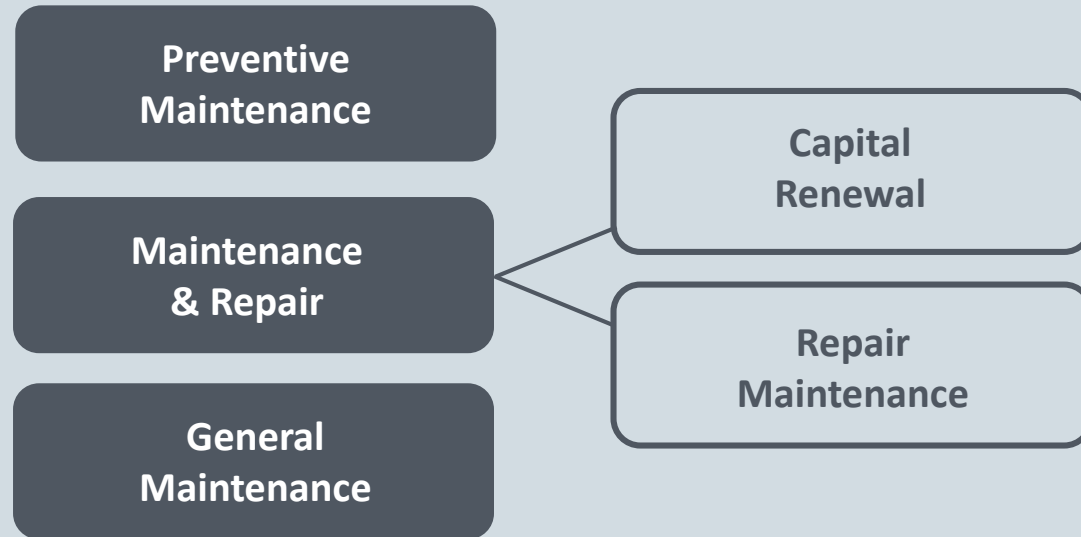
**Repair
maintenance**

**Capital
renewal**

Any of these can be deferred

Cost Data for Asset Management

Facilities Maintenance and Repair



Repair/Replacement Maintenance

D30 HVAC		D3023	Heat Generating Systems								
D3023 186		Boiler, Gas/Oil									
	System Description	Freq. (Years)	Crew	Unit	Labor Hours	2017 Bare Costs				Total In-House	Total w/O&P
						Material	Labor	Equipment	Total		
2010	Repair boiler, gas/oil, 20,000 MBH	7	Q-5	Ea.							
	Remove/replace burner blower				.600		37.50		37.50	46.50	58
	Remove burner blower bearing				1.000		62.50		62.50	78	97
	Replace burner blower bearing				2.000	65	125		190	227	275
	Remove burner blower motor				.976		55		55	68.50	85.50
	Replace burner blower motor				1.951	271	110		381	435	510
	Remove burner fireye				.195		12.15		12.15	15.15	18.95
	Replace burner fireye				.300	248	18.70		266.70	296	340
	Remove burner ignition transformer				.333		21		21	26	32.50
	Replace burner ignition transformer				.667	75.50	41.50		117	135	159
	Remove burner ignition electrode				.267		16.60		16.60	20.50	26
	Replace burner ignition electrode				.444	14.20	27.50		41.70	50	61
	Remove burner oil pump				.500		31		31	39	48.50
	Replace burner oil pump				2.602	168	146		314	365	435
	Remove burner nozzle				.167		10.40		10.40	12.95	16.20
	Replace burner nozzle				.571	9.10	35.50		44.60	54.50	67
	Remove burner gas regulator				1.300		73		73	91	114
	Replace burner gas regulator				2.600	2,300	146		2,446	2,700	3,100
	Remove burner auto gas valve				5.195		300		300	375	465
	Replace burner auto gas valve				8.000	6,075	460		6,535	7,250	8,325
	Remove burner solenoid valve				2.600		156		156	195	243
	Replace burner solenoid valve				10.399	4,000	625		4,625	5,175	5,975
	Repair controls				.600		37.50		37.50	46.50	58
Total					43.266	13,225.80	2,547.85		15,773.65	17,701.60	20,509.65
2050	Replace boiler, gas/oil, 20,000 MBH	30	Q-7	Ea.							
	Remove boiler				1527.360		90,280		90,280	113,000	141,500
	Replace boiler, gas/oil, 20,000 MBH				3156.840	273,800	187,220		461,020	535,000	634,000
Total					4684.200	273,800	277,500		551,300	648,000	775,500
D3023 198		Blowoff System									
	System Description	Freq. (Years)	Crew	Unit	Labor Hours	2017 Bare Costs				Total In-House	Total w/O&P
						Material	Labor	Equipment	Total		
1010	Repair boiler blowoff system	10	1 STPI	Ea.							
	Repair leak				1.000		62.50		62.50	78	97
	Total				1.000		62.50		62.50	78	97

- Cyclical upgrades: repair or replacement, including removal, refinishing, etc.
- UNIFORMAT II
- Includes approximate frequency
- Labor-hours include consideration for work in existing, occupied facility
- Custom FMR data can be developed to meet the requirements of unique infrastructure and environments

Preventative Maintenance

D20 PLUMBING			D2025 190		Water Heater, Solar				
PM Components				Labor-hrs.	W	M	Q	S	A
PM System D2025 190 1950									
Solar, closed loop hot water heating system, up to 6 panels									
1	Check with operating or area personnel for deficiencies.			.035				✓	✓
2	Inspect interior piping and connections for leaks and damaged insulation; tighten connections and repair damaged insulation as necessary.			.125				✓	✓
3	Check zone and circulating pump motors for excessive overheating; lubricate motor bearings.			.077				✓	✓
4	Check pressure and air relief valves for proper operation.			.030				✓	✓
5	Check control panel and differential thermostat for proper operation.			.094				✓	✓
6	Clean sight glasses, controls, pumps, and flow indicators on tanks.			.127				✓	✓
7	Check system pressure on closed loop for loss of fluid.			.046				✓	✓
8	Check fluid level on drain-back systems; add fluid as necessary.			.029				✓	✓
9	Test glycol strength in closed systems, as applicable; if required, drain system and replace with new fluid mixture.			.222				✓	✓
10	Check heat exchanger for exterior leaks.			.077				✓	✓
11	Clean strainers and traps.			.181					✓
12	Check storage and expansion tanks; for leaks and deteriorated insulation.			.077					✓
13	Inspect all collector piping for leaks and damaged insulation; tighten connections and repair as required.			.133				✓	✓
14	Inspect collector glazing for cracks and seals for tightness; tighten or replace seals as necessary.			.124				✓	✓
15	Wash/clean glazing on collector panels.			.585					✓
16	Inspect ferrule around pipe flashing where solar piping runs through roof; repair as necessary.			.086				✓	✓
17	Check collector mounting brackets and bolts; tighten as required.			.094				✓	✓
18	Clean area.			.066				✓	✓
19	Fill out maintenance checklist and report deficiencies.			.022				✓	✓
Total labor-hours/period								1.165	2.230
Total labor-hours/year								1.165	2.230
Description		Labor-hrs.	Cost Each				Total In-House	Total w/O&P	
			2015 Bare Costs						
			Material	Labor	Equip.	Total			
1900	Wtr. hting. sys., solar clsd. lp., up to 6 panels, annually	2.230	245	133		378	435	515	
1950	Annualized	3.395	246	203		449	525	625	

- Work task checklists
- UNIFORMAT II
- Productivity based on: experienced technicians with proper tools and materials
- Labor-hours include consideration for work in existing, occupied facility
- Frequency (weekly, monthly, quarterly, semi-annually, or annually) based on non-critical/normal usage
- Annual and annualized rollups

General Maintenance – Landscape Maintenance

019304.40 Lawn Renovation													
★	⚡	Line Number	🌿	✎	Description	Unit	Crew	Daily Output	Labor Hours	Bare Material	Bare Labor	Bare Equipment	Total O&P
☆	⚡	019304400010			LAWN RENOVATION								
☆	⚡	019304400020			Lawn renovations, aerating, 18" walk behind cultivator	M.S.F.	CLAM	95.00	0.084		2.48		3.86
☆	⚡	019304400030			48" tractor drawn cultivator	M.S.F.	A18	750.00	0.011		0.31	0.49	1.03
☆	⚡	019304400040			72" tractor drawn cultivator	M.S.F.	A18	1100.00	0.007		0.21	0.33	0.70
☆	⚡	019304400050			Fertilizing, dry granular, 4#/M.S.F., drop spreader	M.S.F.	CLAM	24.00	0.333	2.00	9.80		17.75
☆	⚡	019304400060			Rotary spreader	M.S.F.	CLAM	140.00	0.057	2.00	1.68		5.10
☆	⚡	019304400070			Tractor drawn 8' spreader	M.S.F.	A18	500.00	0.016	2.00	0.47	0.73	4.04
☆	⚡	019304400080			Tractor drawn 12' spreader	M.S.F.	A18	800.00	0.010	2.00	0.29	0.46	3.46
☆	⚡	019304400090			Overseeding, utility mix, 7#/M.S.F., drop spreader	M.S.F.	CLAM	10.00	0.800	9.50	23.50		48.50
☆	⚡	019304400100			Tractor drawn spreader	M.S.F.	A18	52.00	0.154	9.50	4.52	7.05	26.50
☆	⚡	019304400110			Watering, 1" of water, applied by hand	M.S.F.	CLAM	21.00	0.381		11.20		17.45
☆	⚡	019304400120			Soaker hoses	M.S.F.	CLAM	82.00	0.098		2.87		4.47

- Unit Costs for Tasks: per Occurrence per Unit of Measure
- MasterFormat2016

General Maintenance – Custodial Maintenance

019306.25 Ceiling Care													
★	⚡	Line Number	🌿	✎	Description	Unit	Crew	Daily Output	Labor Hours	Bare Material	Bare Labor	Bare Equipment	Total O&P
☆	⚡	019306250010			CEILING CARE								
☆	⚡	019306250020			Washing hard ceiling from ladder, hand	M.S.F.	CLAM	2.05	3.902	4.77	115.00		185.00
☆	⚡	019306250030			Machine	M.S.F.	CLAM	2.52	3.175	4.77	93.50		151.00
☆	⚡	019306250035			Acoustic tile cleaning, chemical spray, including mask								
☆	⚡	019306250040			Unobstructed floor	S.F.	CLAM	5400.00	0.006	0.07	0.17		0.36
☆	⚡	019306250045			Obstructed floor	S.F.	CLAM	4000.00	0.008	0.07	0.24		0.46
☆	⚡	019306250048			Chemical spray cleaning and coating, including mask								
☆	⚡	019306250050			Unobstructed floor	S.F.	CLAM	4800.00	0.007	0.13	0.20		0.47
☆	⚡	019306250055			Obstructed floor	S.F.	CLAM	3400.00	0.009	0.13	0.28		0.59

- Unit Costs for Tasks: per Occurrence per Unit of Measure
- MasterFormat2016

Location Factors By UniFormat II Division

Division

Location

Location Factors

DIV. NO.	BUILDING SYSTEMS	ALABAMA											
		BIRMINGHAM			HUNTSVILLE			MOBILE			MONTGOMERY		
		MAT.	INST.	TOTAL	MAT.	INST.	TOTAL	MAT.	INST.	TOTAL	MAT.	INST.	TOTAL
A	Substructure	104.4	81.3	90.3	96.3	76.8	84.4	100.1	69.6	81.5	101.8	63.7	78.5
B10	Shell: Superstructure	103.9	86.4	97.0	104.2	82.1	95.5	103.9	78.1	93.8	103.4	74.5	92.0
B20	Exterior Closure	98.8	77.1	88.4	99.1	68.2	84.3	101.1	56.9	80.0	99.7	52.9	77.3
B30	Roofing	99.6	82.1	93.0	96.6	77.6	89.4	97.6	71.7	87.8	97.8	67.7	86.4
C	Interior Construction	99.6	75.2	89.4	100.2	71.2	88.0	97.4	54.6	79.4	98.1	47.3	76.8
D10	Services: Conveying	100.0	90.1	97.3	100.0	87.1	96.5	100.0	87.1	96.5	100.0	84.5	95.7
D20 - 40	Mechanical	100.0	70.4	88.1	100.0	61.6	84.5	99.9	60.7	84.1	100.0	34.2	73.4
D50	Electrical	99.0	61.6	79.3	95.3	64.9	79.3	95.7	59.1	76.3	96.3	60.9	77.6
E	Equipment & Furnishings	100.0	75.1	98.7	100.0	71.6	98.5	100.0	52.6	97.6	100.0	42.7	97.1
G	Site Work	97.2	93.6	94.7	89.1	92.5	91.5	95.8	87.8	90.3	95.9	87.8	90.4
A-G	WEIGHTED AVERAGE	100.6	76.7	90.2	99.8	72.1	87.8	99.9	65.4	84.9	99.9	57.1	81.2

DIV. NO.	BUILDING SYSTEMS	ALASKA									ARIZONA					
		ANCHORAGE			FAIRBANKS			JUNEAU			FLAGSTAFF			MESA/TENPE		
		MAT.	INST.	TOTAL	MAT.	INST.	TOTAL	MAT.	INST.	TOTAL	MAT.	INST.	TOTAL	MAT.	INST.	TOTAL
A	Substructure	134.0	119.9	125.4	131.6	120.1	124.6	132.2	119.9	124.7	93.4	77.4	83.7	97.7	78.5	85.9
B10	Shell: Superstructure	117.7	109.9	114.7	121.0	110.0	116.7	119.5	109.9	115.7	96.5	73.6	87.5	94.7	74.9	86.9
B20	Exterior Closure	160.5	123.0	142.6	147.6	123.0	135.9	155.2	123.0	139.8	117.4	64.1	91.9	107.2	64.2	86.6
B30	Roofing	160.0	117.2	143.8	167.3	118.5	148.8	168.8	117.2	149.2	96.2	69.2	85.9	101.3	65.7	87.8
C	Interior Construction	133.4	120.9	128.1	130.4	121.3	126.6	131.7	120.9	127.2	102.8	60.4	85.0	98.6	65.4	84.7
D10	Services: Conveying	100.0	112.0	103.3	100.0	112.0	103.3	100.0	112.0	103.3	100.0	85.8	96.1	100.0	86.0	96.1
D20 - 40	Mechanical	100.3	105.0	102.2	100.2	108.0	103.4	100.3	105.0	102.2	100.2	79.0	91.6	100.0	79.0	91.5
D50	Electrical	117.7	117.8	117.7	130.0	117.8	123.5	119.9	117.8	118.8	103.4	61.3	81.1	94.2	61.3	76.8
E	Equipment & Furnishings	100.0	119.0	101.0	100.0	119.0	101.0	100.0	119.0	101.0	100.0	64.1	98.2	100.0	69.0	98.4
G	Site Work	127.9	130.1	129.4	120.7	130.1	127.2	138.4	130.1	132.7	86.5	96.1	93.1	89.5	95.8	93.8
A-G	WEIGHTED AVERAGE	121.1	115.6	118.7	121.0	116.4	119.0	121.3	115.6	118.8	101.3	71.8	88.4	98.6	72.8	87.4

Cost Models with RSMeans data



- RSMeans Data Online with your model, plans, designs, unique costs (additives) and specifications
 - New construction
 - Renovation/FMR
 - Lifecycle costing

RSMMeans Data Online – Square Foot Estimator

Creating quick conceptual estimates is easy with RSMMeans Online's powerful Square Foot Estimator

With more than 100 commercial and residential models available, you can develop cost estimates and reports in minutes for virtually any location in the U.S. and Canada

Square Foot Estimator

\$ Calculate Building Cost

👁 Quick View

💾 Save Estimate

📄 Customize/View Report

🔄 Clear All

🖨


📄

📈 Life Cycle Cost

⚡ Create Alert

Model: Apartment, 1-3 Story with Brick Veneer / Reinforced Concrete

Default Building Image



\$3,348,141.78

Building Cost

GREENVILLE, SC

Location

3

Stories (Ea.)

No

Basement

\$148.81

Cost per S.F.

22,500

Floor Area

10.00

Story Height

\$0.00

Additive Cost

Estimate Header Information

Building Category:
Commercial New Construction

Labor Type
Open Shop

Release
Year 2017 Quarter 2

Location
GREENVILLE (296)

* Estimate Name

Client Name

Folder
Personal Folder::Current Estimates

Estimate Address

State/Province

City

Zip/Postal Code

Notes

300 characters max

Forecast Data

RSMeans Data Online – Life Cycle Cost Estimator (Cost Detail)

Life Cycle Cost Estimator

Cost Details

Sustainment Model

Source

RSMeans Online

Model

Apartment, 1-3 Story with Brick Veneer / Reinforced Concrete

* Year Built

2017

Gross Square Feet

22,500

* Start Year

2017

* Time Period

10

Assembly Information

Customized	Quantity	Unit	Line Number	Description	Replacement Cost	Frequency (in years)	Year of Last Major Repair	M&R Task	M&R Task Cost	PM Task	Annual Cost
A10 Foundations											
	400.0000	L.F.	A10101051560	Foundation wall, CIP, 4' wall height, direct chute, .1...	\$24,921.40						
	400.0000	L.F.	A10101103100	Strip footing, concrete, reinforced, load 14.8 KLF, s...	\$14,831.00						
	24.0000	Ea.	A10102107700	Spread footings, 3000 PSI concrete, load 200K, soi...	\$15,814.44						
	7500.0000	S.F.	A10301202240	Slab on grade, 4" thick, non industrial, reinforced	\$33,159.22						
	502.5000	S.F.		Minor repairs to concrete floor unfinished		15		A10331100010	\$25,853.62		
	75.0000	C.S...		Replace unfinished concrete floor		75		A10331100020	\$50,154.00		
				Total A10	\$88,726.06				\$76,007.62		
A20 Basement Construction											
	7500.0000	S.F.	A20101104560	Excavate and fill, 10,000 SF, 4' deep, sand, gravel, ...	\$1,649.25						
				Total A20	\$1,649.25						
B10 Superstructure											
	632.0000	V.L.F.	B10102049913	Cast-in-place concrete column, 12", square, tied, ...	\$32,889.56						
	15000.0000	S.F.	B10102205100	Cast-in-place concrete beam and slab, 7.5" slab, t...	\$215,679.75						
	720.0000	V.L.F.	B10107203750	Fireproofing, gypsum board, fire rated, 3 layer, 1.5...	\$23,509.19						
	7500.0000	S.F.	B10207257000	Roof, concrete, beam and slab, 25'x25' bay, 40 PSF...	\$95,349.38						
				Total B10	\$367,427.88						

4

Editable columns

M&R costs

Repair costs

Preventive costs

RSMeans Data Online – Life Cycle Cost Estimator (Summary Table)

Life Cycle Cost Estimator

Summary Table

Sustainment Model

Source: RSMeans Online

Model: Library (Green) with Precast Concrete

Source: 2

Year Built: 2016

Gross Square Feet: 25,000

Story Height: 14

Start Year: 2016

Time Period: 10

Replacement Value: \$ 4,126,855.94

Labor Inflation: 3.500 %

Replacement Inflation: 5.000 %

Preventive Sustainment Factor: 1.000

M&R Sustainment Factor: 1.000

Replacement Sustainment Factor: 1.000

Calculate

Summary Information

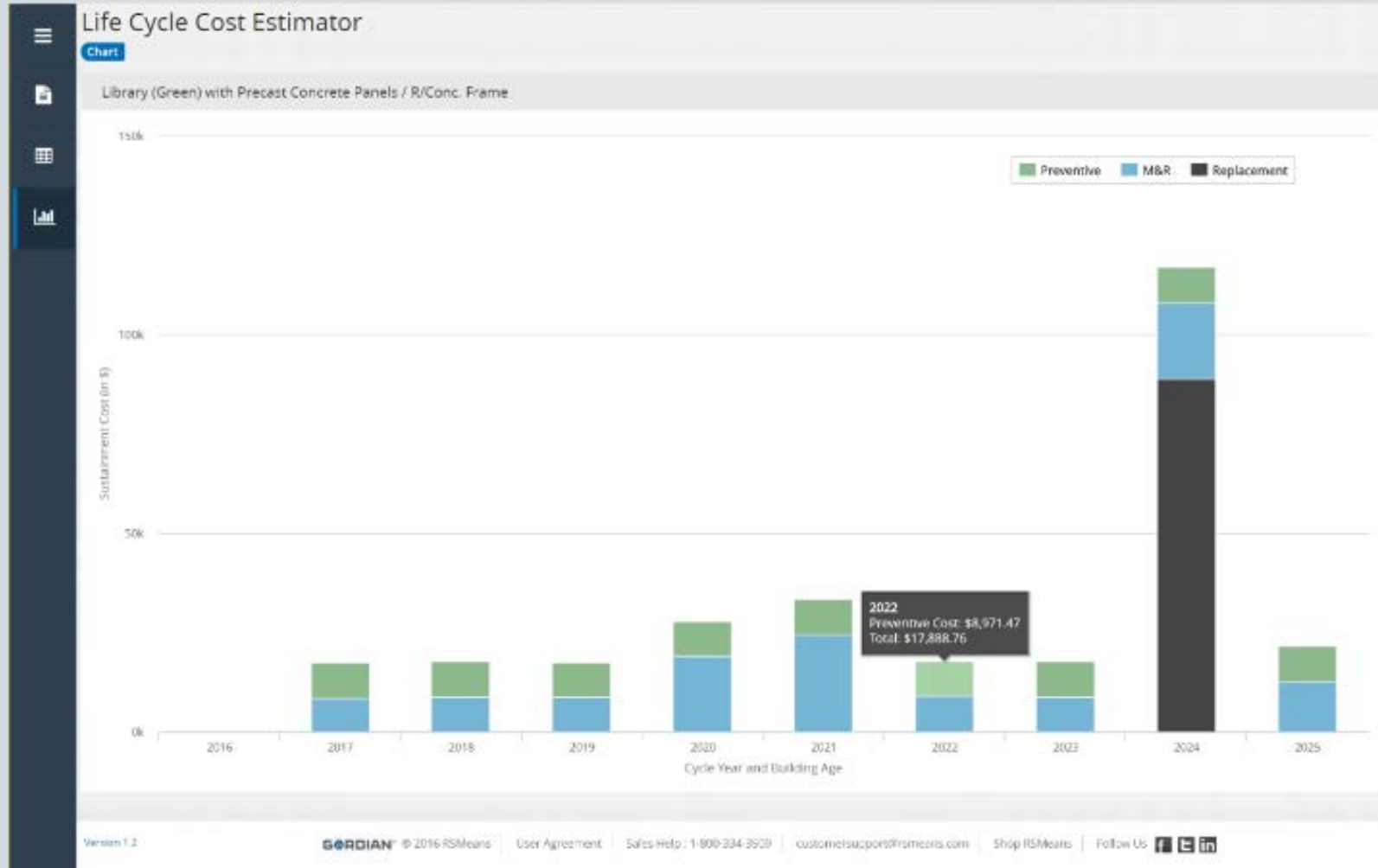
Year	Preventive Cost (Current Year)	M&R Cost (Current Year)	Replacement Cost (Current Year)	Sustainment Cost (Current Year)	Sustainment Ratio (Current Year)	Preventive Cost (Indexed Year)	M&R Cost (Indexed Year)	Replacement Cost (Indexed Year)	Sustainment Cost (Indexed Year)	Sustainment Ratio (Indexed Year)
2016										
2017	\$8,971.47	\$8,575.70		\$17,547.17	0.425%	\$9,285.47	\$8,875.85		\$18,161.32	0.419%
2018	\$8,971.47	\$8,853.54		\$17,825.01	0.432%	\$9,610.46	\$9,484.13		\$19,094.60	0.420%
2019	\$8,971.47	\$8,639.45		\$17,610.92	0.427%	\$9,246.83	\$9,378.71		\$18,525.54	0.409%
2020	\$8,971.47	\$18,953.54		\$27,925.01	0.677%	\$10,294.97	\$21,749.62		\$32,044.59	0.639%
2021	\$8,971.47	\$24,459.88		\$33,431.35	0.810%	\$10,555.29	\$29,050.66		\$39,705.96	0.754%
2022	\$8,971.47	\$8,917.29		\$17,888.76	0.433%	\$11,028.23	\$10,961.63		\$21,989.85	0.398%
2023	\$8,971.47	\$8,705.75		\$17,677.22	0.428%	\$11,414.22	\$11,076.15		\$22,490.36	0.387%
2024	\$8,971.47	\$19,049.16	\$89,031.25	\$117,051.88	2.836%	\$11,613.71	\$25,084.11	\$131,539.70	\$168,437.52	2.763%
2025	\$8,971.47	\$12,684.45		\$21,655.92	0.525%	\$12,227.19	\$17,287.60		\$29,514.80	0.461%

M&R costs Repair costs Preventive costs

Save Estimate Export

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RSMeans Data Online – Life Cycle Cost Estimator (Chart)

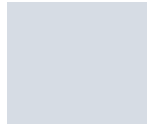


Preventive Maintenance Model (Tasks)

LEGEND (LABOR BURDEN BASED ON AN AVERAGE OF 35 TRADES)



FACILITY MODEL



TASK ID & LABOR-HOURS FOR STAFFING



BARE COSTS (NO MARKUP FOR MATERIAL PROFIT, LABOR BURDEN, OVERHEAD, OR PROFIT)



IN-HOUSE COSTS [MATERIAL + 10%; LABOR + 30.1% LABOR BURDEN (11.8% WORKERS COMP + 18.3% PAYROLL TAXES & PUBLIC LIABILITY INSURANCE); NO HOME OFFICE OVERHEAD OR PROFIT]



SUBCONTRACTOR COST [MATERIAL + 25%; LABOR + 30.1% LABOR BURDEN; 16.0% HOME OFFICE OVERHEAD; 15% PROFIT]

DEFINITION

Annualized Preventive Maintenance:

Based on performing all PM tasks at the recommended periodic frequencies throughout the year.

Preventive Maintenance Model (Tasks)

PREVENTIVE MAINTENANCE MODEL

PROJECT: Preventive Maintenance			CLASSIFICATION: Office Building (60,000 Gross SF 47,280 Net SF)		SHEET NO: 1 of 1						
LOCATION: Philadelphia, PA			ARCHITECT:		ESTIMATE NO: PM 01						
TAKE OFF B'TL			PRICES BY: JK		DATE: 2019						
			EXTENSIONS BY: RK		CHECKED BY: DL						
DESCRIPTION	QUANTITY	UNIT	SOURCE	ANNUALIZED LABOR-HOURS PER UNIT	ANNUALIZED LABOR-HOURS PER YEAR	BARE COST		IN-HOUSE COST		SUBCONTRACT COST	
						UNIT	TOTAL	UNIT	TOTAL	UNIT	TOTAL
Door, overhead, electric, roll up, to 24' high x 25' wide, annualized	2	Ea.	FM+R B2035 410 1950	4.070	8.140	\$308.00	\$616.00	\$382.84	\$765.68	\$465.00	\$930.00
Hydraulic lift, loading dock, annualized	2	Ea.	FM+R E1035 310 1950	1.632	3.264	\$145.50	\$291.00	\$177.00	\$354.00	\$213.00	\$426.00
Extinguishing system, wet pipe, annualized	2	Ea.	FM+R D4015 150 1950	11.342	22.684	\$823.00	\$1,646.00	\$1,008.16	\$2,016.32	\$1,250.00	\$2,500.00
Backflow prevention device, over 4", annualized	2	Ea.	FM+R D4015 100 2950	0.493	0.986	\$44.40	\$88.80	\$53.70	\$107.40	\$65.00	\$130.00
Unit heater, gas radiant, annualized	4	Ea.	FM+R D3055 110 1950	1.009	4.036	\$55.74	\$222.96	\$71.77	\$287.08	\$88.50	\$354.00
Package unit, air cooled, 25 thru 50 ton, annualized	12	Ea.	FM+R D3055 210 2950	3.249	38.988	\$370.00	\$4,440.00	\$437.05	\$5,244.60	\$525.00	\$6,300.00
Water heater, gas, to 120 gal., annualized	6	Ea.	FM+R D2025 260 1950	1.721	10.326	\$234.00	\$1,404.00	\$274.55	\$1,647.30	\$325.00	\$1,950.00
Urinals, annualized	12	Ea.	FM+R D2015 100 1950	0.228	2.736	\$17.85	\$214.20	\$22.03	\$264.36	\$26.50	\$318.00
Toilet (vacuum breaker type), annualized	30	Ea.	FM+R D2015 100 2950	0.177	5.310	\$18.25	\$547.50	\$21.96	\$658.80	\$26.00	\$780.00
Lavatories, annualized	36	Ea.	FM+R D2015 100 4950	0.348	12.528	\$30.60	\$1,101.60	\$37.05	\$1,333.80	\$45.00	\$1,620.00
Light, emergency, dry cell, annualized	90	Ea.	FM+R D5095 250 2950	0.356	32.040	\$53.15	\$4,783.50	\$61.88	\$5,569.20	\$73.00	\$6,570.00
ANNUALIZED SUBTOTALS				LABOR-HOURS 141.038		\$15,355.56		\$18,248.54		\$21,878.00	
CITY COST ADJUSTMENT				FM+R Weighted Average		x 1.150		x 1.150		x 1.150	
TOTAL ANNUALIZED PM COSTS ADJUSTED FOR CITY						\$17,659.00		\$20,986.00		\$25,160.00	

Building
Square Footage

Serial Number

Cost Estimate

Labor Hours

Environmental Services Model (Custodial Tasks)

LEGEND (LABOR BURDEN BASED ON A COMMON MAINTENANCE LABORER)



FACILITY MODEL



TASK ID & LABOR-HOURS FOR STAFFING



BARE COSTS (NO MARKUP FOR MATERIAL PROFIT, LABOR BURDEN, OVERHEAD, OR PROFIT)



IN-HOUSE COSTS [MATERIAL + 10%; LABOR + 31.3% LABOR BURDEN (13.0% WORKERS COMP + 18.3% PAYROLL TAXES & PUBLIC LIABILITY INSURANCE); NO HOME OFFICE OVERHEAD OR PROFIT]



SUBCONTRACTOR COST [MATERIAL + 25%; LABOR + 31.3% LABOR BURDEN; 16.0% HOME OFFICE OVERHEAD; 15% PROFIT]

Environmental Services Model (Custodial Tasks)

ENVIRONMENTAL SERVICES MODEL (OFFICE BUILDING)

										SHEET NO:		1 of 3	
PROJECT:	Custodial Care		CLASSIFICATION: Office Building (60,000 Gross SF 47,280 Net SF)							ESTIMATE NO:		GM 02	
LOCATION:	Philadelphia, PA		ARCHITECT:							DATE:		2018	
TAKE OFF BY:	TL		PRICES BY: JK			EXTENSIONS BY: RK				CHECKED BY:		DL	
DESCRIPTION	QUANTITY	UNIT	FREQUENCY PER YEAR	TOTAL UNITS PER YEAR	SOURCE	LABOR HOURS PER UNIT	LABOR HOURS PER YEAR	BARE COST		IN-HOUSE COST		SUBCONTRACT COST	
								UNIT	TOTAL	UNIT	TOTAL	UNIT	TOTAL
DAILY WORK													
Vacuuming, entry mats & elevator carpet	0.2	M.S.F.	260	52	FM+R 01 93 06.40 0750	1.000	52.000	\$29.50	\$1,534.00	\$36.50	\$1,898.00	\$46.00	\$2,392.00
General cleaning, water fountain	6	Ea.	260	1,560	FM+R 01 93 06.40 0490	0.017	26.520	\$0.52	\$811.20	\$0.64	\$998.40	\$0.80	\$1,248.00
General cleaning, empty to larger portable container, wastebaskets	100	Ea.	260	26,000	FM+R 01 93 06.40 0290	0.008	208.000	\$0.24	\$6,240.00	\$0.31	\$8,060.00	\$0.38	\$9,880.00
Restrooms, fixture cleaning, toilets	36	Ea.	260	9,360	FM+R 01 93 06.40 0110	0.044	411.840	\$1.40	\$13,104.00	\$1.73	\$16,192.80	\$2.15	\$20,124.00
Restrooms, fixture cleaning, urinals	12	Ea.	260	3,120	FM+R 01 93 06.40 0120	0.042	131.040	\$1.31	\$4,087.20	\$1.62	\$5,054.40	\$2.01	\$6,271.20
Restrooms, fixture cleaning, sinks	24	Ea.	260	6,240	FM+R 01 93 06.40 0130	0.039	243.360	\$1.15	\$7,176.00	\$1.43	\$8,923.20	\$1.79	\$11,169.60
Restrooms, accessories cleaning, soap dispenser	24	Ea.	260	6,240	FM+R 01 93 06.40 0170	0.006	37.440	\$0.19	\$1,185.60	\$0.24	\$1,497.60	\$0.30	\$1,872.00
Restrooms, accessories cleaning, sanitary napkin dispenser	6	Ea.	260	1,560	FM+R 01 93 06.40 0180	0.013	20.280	\$0.38	\$592.80	\$0.47	\$733.20	\$0.58	\$904.80
Restrooms, accessories cleaning, paper towel dispenser	12	Ea.	260	3,120	FM+R 01 93 06.40 0190	0.005	15.600	\$0.17	\$530.40	\$0.21	\$655.20	\$0.26	\$811.20
Restrooms, accessories cleaning, toilet tissue dispenser	36	Ea.	260	9,360	FM+R 01 93 06.40 0200	0.005	46.800	\$0.17	\$1,591.20	\$0.21	\$1,965.60	\$0.26	\$2,433.60
Hard floor care, restroom ceramic tile, damp mop with bucket & wringer, 24 oz. mop head, unobstructed	2.4	M.S.F.	260	624	FM+R 01 93 06.45 0060	0.229	142.896	\$11.90	\$7,425.60	\$14.10	\$8,798.40	\$16.95	\$10,576.80
Restroom accessory, refilling/restocking, toilet tissue dispenser	36	Ea.	260	9,360	FM+R 01 93 06.40 0250	0.006	56.160	\$1.55	\$14,508.00	\$1.73	\$16,192.80	\$1.99	\$18,626.40

(Continued)

ABBREVIATIONS

Ea. Each Item
 Flight Flight of stairs between floors
 S.F. Square Feet
 M.S.F. Thousand Square Feet

Environmental Services Model (Custodial Tasks)

ENVIRONMENTAL SERVICES MODEL (OFFICE BUILDING)

PROJECT: Custodial Care										SHEET NO: 1 of 3					
CLASSIFICATION: Office Building (60,000 Gross SF 47,280 Net SF)										ESTIMATE NO: GM 02					
LOCATION: Philadelphia, PA										DATE: 2018					
TAKE OFF BY: TL										PRICES BY: JK		EXTENSIONS BY: RK		CHECKED BY: DL	
WEEKLY WORK															
General cleaning, glass entry doors	8	Ea.	52	416	FM+R 01 93 06.40 0390	0.048	19.968	\$1.61	\$669.76	\$1.98	\$823.68	\$2.44	\$1,015.04		
Restroom accessory, refilling/restocking paper towel dispenser, rolled	12	Ea.	52	624	FM+R 01 93 06.40 0240	0.024	14.976	\$5.20	\$3,244.80	\$5.80	\$3,619.20	\$6.70	\$4,180.80		
Restrooms, accessories refilling/restocking, soap dispenser (1 bag)	24	Ea.	52	1,248	FM+R 01 93 06.40 0210	0.013	16.224	\$9.57	\$11,943.36	\$10.60	\$13,228.80	\$12.05	\$15,038.40		
Restrooms, toilet partition cleaning	36	Ea.	52	1,872	FM+R 01 93 06.40 0270	0.083	155.376	\$2.81	\$5,260.32	\$3.45	\$6,458.40	\$4.27	\$7,993.44		
General cleaning, restroom wastebaskets	24	Ea.	52	1,248	FM+R 01 93 06.40 0500	0.031	38.688	\$0.93	\$1,160.64	\$1.16	\$1,447.68	\$1.45	\$1,809.60		
Vacuum carpet, offices, 16" upright, all areas	45.0	M.S.F.	52	2,340	FM+R 01 93 06.80 0100	0.320	748.800	\$9.40	\$21,996.00	\$11.75	\$27,495.00	\$14.65	\$34,281.00		
Vacuum carpet, corridors, 16" upright, traffic areas	6.2	M.S.F.	52	322	FM+R 01 93 06.80 0090	0.152	48.944	\$4.48	\$1,442.56	\$5.60	\$1,803.20	\$7.00	\$2,254.00		
Sweep stairs & landings, damp wipe handrails	12	Flight	52	624	FM+R 01 93 06.40 0020	0.100	62.400	\$3.04	\$1,896.96	\$3.78	\$2,358.72	\$4.71	\$2,939.04		
Hard floor care, common areas, dust mop, 24" mop, obstructed	4.7	M.S.F.	52	244	FM+R 01 93 06.45 0150	0.235	57.340	\$6.90	\$1,683.60	\$8.60	\$2,098.40	\$10.80	\$2,635.20		
Clean carpeted elevators	2	Ea.	52	104	FM+R 01 93 06.40 0080	0.167	17.368	\$5.97	\$620.88	\$7.30	\$759.20	\$9.00	\$936.00		

(Continued)

ABBREVIATIONS	
Ea.	Each Item
Flight	Flight of stairs between floors
S.F.	Square Feet
M.S.F.	Thousand Square Feet

Environmental Services Model (Custodial Tasks)

ENVIRONMENTAL SERVICES MODEL (OFFICE BUILDING)

PROJECT: Custodial Care										CLASSIFICATION: Office Building (60,000 Gross SF 47,280 Net SF)				SHEET NO: 1 of 3			
LOCATION: Philadelphia, PA										ARCHITECT:				ESTIMATE NO: GM 02			
TAKE OFF BY: TL										PRICES BY: JK				EXTENSIONS BY: RK		DATE: 2018	
CHECKED BY:										DL							
MONTHLY WORK																	
Restrooms, ceramic tile wall cleaning	4,800	S.F.	12	57,600	FM+R 01 93 06.40 0280	0.003	172.800	\$0.13	\$7,488.00	\$0.15	\$8,640.00	\$0.19	\$10,944.00				
Restroom, accessory, refilling/restocking, sanitary napkin/tampon dispenser	6	Ea.	12	72	FM+R 01 93 06.40 0220	0.021	1.512	\$22.11	\$1,591.92	\$24.50	\$1,764.00	\$28.00	\$2,016.00				
Restroom accessory refilling/restocking, sanitary seat covers	36	Ea.	12	432	FM+R 01 93 06.40 0260	0.008	3.456	\$5.54	\$2,393.28	\$6.15	\$2,656.80	\$7.00	\$3,024.00				
Hard floor care, common areas, damp mop with bucket & wringer, 24 oz. mop head, unobstrcted	4.7	M.S.F.	12	56.00	FM+R 01 93 06.45 0060	0.229	12.824	\$11.90	\$666.40	\$14.10	\$789.60	\$16.95	\$949.20				
QUARTERLY WORK																	
Hard floor care, common areas, spray buffing, 350 RPM, 24" diameter machine	4.7	M.S.F.	4	19	FM+R 01 93 06.45 0910	0.274	5.206	\$9.13	\$173.47	\$11.20	\$212.80	\$13.90	\$264.10				
Damp mop stairs & landings, damp wipe handrails	12	Flight	4	48	FM+R 01 93 06.40 0040	0.178	8.544	\$5.53	\$265.44	\$6.85	\$328.80	\$8.50	\$408.00				
Carpet cleaning, entry mats & elevators, portable extractor	0.2	M.S.F.	4	1	FM+R 01 93 06.20 0230	0.186	0.186	\$15.80	\$15.80	\$18.20	\$18.20	\$21.50	\$21.50				
Damp wipe, venetian blinds	336	Ea.	4	1,344	FM+R 01 93 06.95 0070	0.050	67.200	\$1.57	\$2,110.08	\$1.94	\$2,607.36	\$2.42	\$3,252.48				
Wash windows, interior, trigger sprayer & wipe cloth, over 12 S.F.	10.08	M.S.F.	4	40	FM+R 01 93 06.95 0030	0.627	25.080	\$23.37	\$934.80	\$28.50	\$1,140.00	\$34.50	\$1,380.00				
Vacuuming, overhead air vents	400	Ea.	4	1,600	FM+R 01 93 06.40 0760	0.017	27.200	\$0.49	\$784.00	\$0.61	\$976.00	\$0.76	\$1,216.00				

(Continued)

ABBREVIATIONS

- Ea. Each Item
- Flight Flight of stairs between floors
- S.F. Square Feet
- M.S.F. Thousand Square Feet

Environmental Services Model (Custodial Tasks)

ENVIRONMENTAL SERVICES MODEL (OFFICE BUILDING)

PROJECT: Custodial Care		CLASSIFICATION: Office Building (60,000 Gross SF 47,280 Net SF)		SHEET NO: 1 of 3											
LOCATION: Philadelphia, PA		ARCHITECT:		ESTIMATE NO: GM 02											
TAKE OFF BY: TL		PRICES BY: JK		DATE: 2018											
				CHECKED BY: DL											
				EXTENSIONS BY: RK											
DESCRIPTION	QUANTITY	UNIT	FREQUENCY PER YEAR	TOTAL UNITS PER YEAR	SOURCE	LABOR HOURS PER UNIT	LABOR HOURS PER YEAR	BARE COST		IN-HOUSE COST		SUBCONTRACT COST			
								UNIT	TOTAL	UNIT	TOTAL	UNIT	TOTAL		
SEMIANNUAL WORK															
Hard floor care, common areas, scrubbing, 350 RPM, 24" diameter machine	4.7	M.S.F.	2	9	FM+R 01 93 06.45 1060	0.217	1.953	\$11.55	\$103.95	\$13.65	\$122.85	\$16.40	\$147.60		
Hard floor care, common areas, finish application, mop	4.7	M.S.F.	2	9	FM+R 01 93 06.45 1160	0.571	5.139	\$32.85	\$295.65	\$38.50	\$346.50	\$46.00	\$414.00		
ANNUAL WORK															
Hard floor care, common areas, stripping, 350 RPM, 20" diameter machine	4.7	M.S.F.	1	5	FM+R 01 93 06.45 1130	0.762	3.810	\$26.29	\$131.45	\$32.00	\$160.00	\$39.50	\$197.50		
Hard floor care, common areas, wet pick up, 20" opening attachment	4.7	M.S.F.	1	5	FM+R 01 93 06.45 1150	0.332	1.660	\$9.75	\$48.75	\$12.15	\$60.75	\$15.20	\$76.00		
Hard floor care, common areas, finish application, mop	4.7	M.S.F.	1	5	FM+R 01 93 06.45 1160	0.571	2.855	\$32.85	\$164.25	\$38.50	\$192.50	\$46.00	\$230.00		
Carpet cleaning, corridors & offices, portable extractor	51.2	M.S.F.	1	51	FM+R 01 93 06.20 0230	0.186	9.486	\$15.80	\$805.80	\$18.20	\$928.20	\$21.50	\$1,096.50		
General cleaning, overhead air vents	400	Ea.	1	400	FM+R 01 93 06.40 0430	0.046	18.400	\$1.36	\$544.00	\$1.70	\$680.00	\$2.12	\$848.00		
ANNUAL SUBTOTALS								LABOR HOURS 2030.334		\$127,211.92		\$152,686.24		\$185,877.00	
CITY COST ADJUSTMENT								FM+R Weighted Average		x	1.150	x	1.150	x	1.150
TOTAL ANNUAL CLEANING COST ADJUSTED FOR CITY										\$146,305.00		\$175,589.00		\$213,759.00	
ANNUAL COST PER GROSS SQUARE FOOT								FTEs PER 8-HOUR SHIFT 1.53		\$2.44		\$2.93		\$3.56	
ANNUAL COST PER NET RENTABLE SQUARE FOOT										\$3.09		\$3.71		\$4.52	

Building
Square Footage

Serial Number

Cost Estimate

Labor Hours

Questions

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Thank You

Contacts:

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