

2. M&R Cost Profiles

Apartments, 1-3 Story

Washington, D.C.

Apartments, 1-3 Story

Gross Square Feet:	22,500
Height in Ft:	30
Exterior:	Clay Brick
Floor coverings:	Carpet, Ceramic Tile, Vinyl Tile
HVAC:	Chilled Water, Oil Boiler, Baseboard Rad.
Capacity:	N/A
Occupancy:	100
Replacement Cost:	\$4,606,183

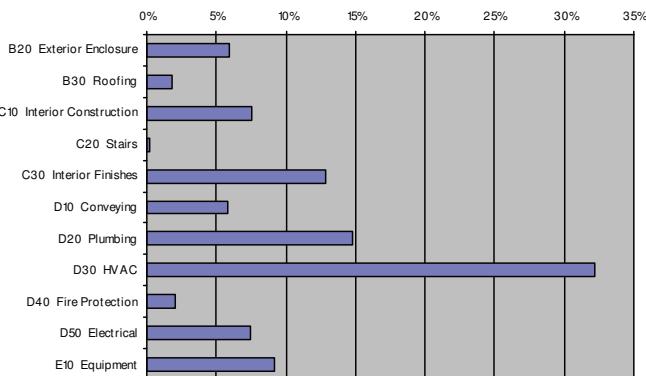
Components (Continued on Page 152)

Uniform / Component	Quantity	Units
B20 Exterior Enclosure		
Clay Brick, Exterior, 1st Floor	3520	Sq Ft
Clay Brick, Exterior, 2nd Floor	3520	Sq Ft
Clay Brick, Exterior, 3rd+ Floor	3520	Sq Ft
Aluminum Operable Window, 24 sf, 1st Floor	32	Each
Aluminum Operable Window, 24 sf, 2nd Floor	32	Each
Aluminum Operable Window, 24 sf, 3rd+ Floor	32	Each
Steel w/ Safety Glass, Painted, Exterior Door	4	Each
B30 Roofing		
Built-up Roof	7500	Sq Ft
C10 Interior Construction		
Wood, Hollow Core, Painted, Interior Door	239	Each
Wood, Solid Core, Painted, Interior Door	42	Each
C20 Stairs		
Metal, Painted, Interior Railing	300	Ln Ft
Metal, Painted, Interior Stairs	600	Sq Ft
C30 Interior Finishes		
Concrete Block, Painted, Interior Wall Finish	9600	Sq Ft
Sheetrock, Stippled, Interior Wall Finish	31500	Sq Ft
Wallpaper, Interior Wall Finish	11250	Sq Ft
Carpet, Nylon 20 oz., High Traffic	13500	Sq Ft
Ceramic Tile Flooring	2250	Sq Ft
Vinyl Tile Flooring	6750	Sq Ft
Sheetrock, Unstippled Ceiling	22500	Sq Ft
D10 Conveying		
Elevator, Hydraulic, 2,500 lbs, 3-5 Floor, 200 fpm	1	Each
D20 Plumbing		
Bathtub & Shower Enclosure, Fiberglass	42	Each
Flush Tank Water Closet, One Piece	60	Each
Lavatory, Vitreous China	60	Each
Service Sink, Iron, Enamel	2	Each
Sink, Stainless Steel	42	Each
Circulator Pump, 1 HP, Cold Water	1	Each
Circulator Pump, 1 HP, Hot Water	1	Each
Pipe & Fittings, 3/4" Copper, Cold Water	6.14	K Ln Ft
Pipe & Fittings, 3/4" Copper, Hot Water	3.06	K Ln Ft
Pipe & Fittings, 2" Copper, Cold Water	5.33	K Ln Ft
Pipe & Fittings, 4" Steel	0.92	K Ln Ft
Pipe Insulation, Fiberglass, Cold Water	6.6	K Ln Ft
Pipe Insulation, Fiberglass, Hot Water	3.32	K Ln Ft
Water Heater, Electric, 52 Gal.	24	Each
Backflow Preventer, 4"	1	Each
Pipe & Fittings, 6" Cast Iron	1.96	K Ln Ft
Pipe & Fittings, 10" Cast Iron	0.2	K Ln Ft
Pipe & Fittings, 4" PVC	0.15	K Ln Ft
Roof Drain, 4-6"	5	Each
D30 HVAC		
Chemical Feed System	1	Each
Circulation Pump, 5 HP, Hot Water	2	Each
Expansion Tank, 60 Gal.	2	Each
Gas Boiler, 1,000 Mbh	1	Each
Chiller, Reciprocal Air-Cooled Hermetic, 60 Ton	1	Each
Circulation Pump, 5 HP, Chiller & Condenser Water	2	Each
Condenser, Air-Cooled, 60 Ton	1	Each
Duct Insulation, Fiberglass Blanket	8400	Sq Ft
Ductwork	12550	Lbs
Exhaust Fan, Ceiling, 200-500 Cfm	65	Each
Fan Coil, Two-Pipe, 400 Cfm	100	Each
Thermostat	43	Each
D40 Fire Protection		
Fire Alarm Control Panel	1	Each
Fire Sprinkler Head	175	Each
Fire Sprinkler System	1	Each
Fire Extinguisher	10	Each
D50 Electrical		
Circuit Breaker, 600 V, 70-100 Amp., 3 Ph.	44	Each
Main Switchgear, <1,200 Amp.	1	Each
Power Panel Board, 208 Y/120 V, 200 Amp.	2	Each
Safety Switch, Fused, 400 Amp., 3 Ph.	6	Each
Exit Lighting Fixture, w/ Battery	6	Each
Grounded Fault Circuit Interruptor, 15 Amp.	100	Each
Incandescent Lighting Fixture, Basic, 200 w	135	Each
Receptacle, 120 V, 15 Amp.	225	Each
TV Cable Outlet	42	Each
Wiring Device, Switch	168	Each
Annunciation Panel	1	Each

50-Year M&R Cost Summary

Task Type	50 Year Total Cost	Annual Cost per GSFT	Annual Cost as % of Replacement
PM & Minor Repair	\$3,045,566	\$2.71	1.32%
Unscheduled Maintenance	\$2,347,056	\$2.09	1.02%
Renewal & Replacement	\$5,539,031	\$4.92	2.41%
Total	\$10,931,653	\$9.72	4.75%

Distribution of M&R Costs



Thirty Most Costly M&R Tasks

M&R Task	Task Cost*	Pct.**
Maintain Fan Coil, Two-Pipe, 400 Cfm	27.36	7.2%
Replace Fan Coil, Two-Pipe, 400 Cfm	25.63	6.7%
Replace Carpet, Nylon 20 oz., High Traffic	21.74	5.7%
Maintain Elevator, Hydraulic, 2,500 lbs, 3-5 Floor, 200 fpm	15.05	3.9%
Refinish Sheetrock, Stippled, Interior Wall Finish	13.66	3.6%
Refinish Sheetrock, Unstippled Ceiling	13.20	3.5%
Replace Wood, Hollow Core, Painted, Interior Door Locks	12.57	3.3%
Replace Cooking Range, Domestic	11.45	3.0%
Replace Refrigerator, Domestic	11.21	2.9%
Renovate Elevator, Hydraulic, 2,500 lbs, 3-5 Floor, 200 fpm	10.11	2.7%
Maintain Fan & Motor, Exhaust Fan, Ceiling 200-500 Cfm	9.48	2.5%
Maintain Cooking Range, Domestic	8.35	2.2%
Maintain Chemical Feed System	8.26	2.2%
Replace Chiller, Reciprocal Air Cooled Hermetic, 60 Ton	6.62	1.7%
Maintain Chiller, Reciprocal Air Cooled Hermetic, 60 Ton	6.01	1.6%
Replace Water Heater, Electric, 52 Gal.	5.71	1.5%
Replace Wood, Hollow Core, Painted, Interior Door	5.37	1.4%
Maintain Circuit Breaker, 600 V, 70-100 Amp., 3 Ph.	4.90	1.3%
Replace Bathtub & Shower Enclosure, Fiberglass	4.74	1.2%
Maintain Refrigerator, Domestic	4.63	1.2%
Replace Pipe & Fittings, 2" Copper, Cold Water (20% of Pipe)	4.58	1.2%
Clean & Reseal Clay Brick, Exterior, 3rd+ Floor	4.31	1.1%
Refinish Concrete Block, Painted, Interior Wall Finish	4.30	1.1%
Replace Fan & Motor, Exhaust Fan, Ceiling 200-500 Cfm	4.27	1.1%
Repair Fan Coil, Two-Pipe, 400 Cfm	4.23	1.1%
Inspect & Test Gas Boiler, 1,000 Mbh	3.95	1.0%
Place New Membrane Over Existing, Built-up Roof	3.66	1.0%
Maintain Thermostat	3.63	1.0%
Replace Thermostat	3.62	0.9%
Repair Circuit Breaker, 600 V, 70-100 Amp., 3 Ph.	3.42	0.9%

*Task cost (\$2009) per GSFT over 50 years.

**Percent of total M&R costs.

Note: For alternative locations use the Local Indexes shown in Chapter 3.