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2022 NATIONAL BUILDING COST MANUAL

46th Edition

Edited by
Ben Moselle

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Explanation of the Cost Tables

This manual shows construction or replacement costs for a wide variety of residential, commercial, industrial, public, agricultural and military buildings. For your convenience and to minimize the chance of an error, all the cost and reference information you need for each building type is brought together on two or three pages. After reading pages 4 to 6, you should be able to turn directly to any building type and create an error-free estimate or appraisal of the construction or replacement cost.

The costs are per square foot of floor area for the basic building and additional costs for optional or extra components that differ from building to building. Building shape, floor area, design elements, materials used, and overall quality influence the basic structure cost. These and other cost variables are isolated for the building types. Components included in the basic square foot cost are listed with each building type. Instructions for using the basic building costs are included above the cost tables. These instructions include a list of components that may have to be added to the basic cost to find the total cost for your structure.

The figures in this manual are intended to reflect the amount that would be paid by the first user of a building completed in mid 2022.

Costs in the tables include all construction costs: labor, material, equipment, plans, building permit, supervision, overhead and profit. Cost tables do not include land value, site development costs, government mandated fees (other than the building permit) or the cost of modifying unusual soil conditions or grades. Construction expense may represent as much as 60% or as little as 40% of the cost to the first building owner. Site preparation, utility lines, government fees and mandates, finance cost and marketing are not part of the construction cost and may be as much as 20% of the cost to the first building owner.

Building Quality

Structures vary widely in quality and the quality of construction is the most significant variable in the finished cost. For estimating purposes the structure should be placed in one or more quality classes. These classes are numbered from 1 which is the highest quality generally encountered. Each section of this manual has a page describing typical specifications which define the quality class.

Each number class has been assigned a word description (such as best, good, average or low) for convenience and to help avoid possible errors.

The quality specifications do not reflect some design features and construction details that can make a building both more desirable and more costly. When substantially more than basic design elements are present, and when these elements add significantly to the cost, it is appropriate to classify the quality of the building as higher than would be warranted by the materials used in construction.

Many structures do not fall into a single class and have features of two quality classes. The tables have "half classes" which apply to structures which have some features of one class and some features of a higher or lower class. Classify a building into a "half class" when the quality elements are fairly evenly divided between two classes. Generally, quality elements do not vary widely in a single building. For example, it would be unusual to find a top quality single family residence with minimum quality roof cover. The most weight should be given to quality elements that have the greatest cost. For example, the type of wall and roof framing or the quality of interior finish are more significant than the roof cover or bathroom wall finish. Careful evaluation may determine that certain structures fall into two distinct classes. In this case, the cost of each part of the building should be evaluated separately.

Building Shapes

Shape classification considers any cost differences that arise from variations in building outline. Shape classification considerations vary somewhat with different building types. Where the building shape often varies widely between buildings and shape has a significant effect on the building cost, basic building costs are given for several shapes. Use the table that most closely matches the shape of the building you are evaluating. If the shape falls near the division between two basic building cost tables, it is appropriate to average the square foot cost from those two tables.

Explanation of the Cost Tables

Area of Buildings

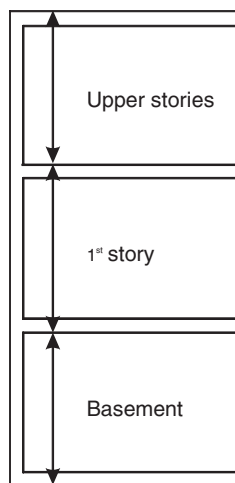
The basic building cost tables reflect the fact that larger buildings generally cost less per square foot than smaller buildings. The cost tables are based on square foot areas which include the following:

1. All floor area within and including the exterior walls of the main building.
2. Inset areas such as vestibules, entrances or porches outside of the exterior wall but under the main roof.
3. Any enclosed additions, annexes or lean-tos with a square foot cost greater than three-fourths of the square foot cost of the main building.

Select the basic building cost listed below the area which falls closest to the actual area of your building. If the area of your building falls nearly midway between two listed building areas, it is appropriate to average the square foot costs for the listed areas.

Wall Heights

Building costs are based on the wall heights given in the instructions for each building cost table. Wall height for the various floors of a building are computed as follows: The basement is measured from the bottom of floor slab to the bottom of the first floor slab or joist. The main or first floor extends from the bottom of the first floor slab or joist to the top of the roof slab or ceiling joist. Upper floors are measured from the top of the floor slab or floor joist to the top of the roof slab or ceiling joist. These measurements may be illustrated as follows:



Square foot costs of most building design types must be adjusted if the actual wall height differs from the listed wall height. Wall height adjustment tables are included for buildings requiring this adjustment. Wall height adjustment tables list square foot costs for a foot of difference in perimeter wall height of buildings of various areas. The amount applicable to the actual building area is added or deducted for each foot of difference from the basic wall height.

Buildings such as residences, medical-dental buildings, funeral homes and convalescent hospitals usually have a standard 8-foot ceiling height except in chapels or day room areas. If a significant cost difference exists due to a wall height variation, this factor should be considered in establishing the quality class.

Other Adjustments

A common wall exists when two buildings share one wall. Common wall adjustments are made by deducting the in-place cost of the exterior wall finish plus one-half of the in-place cost of the structural portion of the common wall area.

If an owner has no ownership in a wall, the in-place cost of the exterior wall finish plus the in-place cost of the structural portion of the wall should be deducted from the total building costs. Suggested common wall and no wall ownership costs are included for many of the building types.

Some square foot costs include the cost of expensive veneer finishes on the entire perimeter wall. When these buildings butt against other buildings, adjustments should be made for the lack of this finish. Where applicable, linear foot cost deductions are provided.

The square foot costs in this manual are based on composite costs of total buildings including usual work room or storage areas. They are intended to be applied on a 100% basis to the total building area even though certain areas may or may not have interior finish. Only in rare instances will it be necessary to modify the square foot cost of a portion of a building.

Multiple story buildings usually share a common roof structure and cover, a common foundation and common floor or ceiling structures. The costs of these components are included in the various floor levels as follows:

Explanation of the Cost Tables

The first or main floor includes the cost of a floor structure built at ground level, foundation costs for a one-story building, a complete ceiling and roof structure, and a roof cover. The basement includes the basement floor structure and the difference between the cost of the first floor structure built at ground level and its cost built over a basement. The second floor includes the difference between the cost of a foundation for a one-story building and the cost of a foundation for a two-story building and the cost of the second story floor structure.

Location Adjustments

The figures in this manual are intended as national averages for metropolitan areas of the United States. Use the information on page 7 to adapt the basic building costs to any area listed. Frequently building costs outside metropolitan areas are 2% to 6% lower if skilled, productive, lower cost labor is available in the area. The factors on page 7 can be applied to nearly all the square foot costs and some of the "additional" costs in this book.

Temporary working conditions in any community can affect construction and replacement costs. Construction which must be done under deadline pressure or in adverse weather conditions or after a major fire, flood, or hurricane or in a thin labor market can temporarily inflate costs 25% to 50%. Conditions such as these are usually temporary and affect only a limited area. But the higher costs are real and must be considered, no matter how limited the area and how transient the condition.

Depreciation

Depreciation is the loss in value of a structure from all causes and is caused primarily by three forms of obsolescence: (1) physical (2) functional, and (3) economic.

Physical obsolescence is the deterioration of building components such as paint, carpets or roofing. Much of this deterioration is totally curable. The physical life tables on pages 43, 235 and 269 assume normal physical obsolescence. Good judgment is required to evaluate how deferred maintenance or rehabilitation will reduce or extend the anticipated physical life of a building.

Functional obsolescence is due to some deficiency or flaw in the building. For example, too few bathrooms for the number of bedrooms or an

exceptionally high ceiling can reduce the life expectancy of a residence. Some functional obsolescence can be cured. The physical life tables do not consider functional obsolescence.

Economic obsolescence is caused by conditions that occur off site and are beyond control of the owner. Examples of economic obsolescence include a store in an area of declining economic activity or obsolescence caused by governmental regulation (such as a change in zoning). Because this kind of obsolescence is particularly difficult to measure, it is not considered in the physical life tables.

"Effective age" considers all forms of depreciation. It may be less than chronological age, if recently remodeled or improved, or more than the actual age, if deterioration is particularly bad. Though effective age is not considered in the physical life tables, it may yield a better picture of a structure's life than the actual physical age. Once the effective age is determined, considering physical, functional and economic deterioration, use the percent good tables on pages 43, 235 or 269 to determine the present value of a depreciated building. Present value is the result of multiplying the replacement cost (found by using the cost tables) by the appropriate percent good.

Limitations

This manual will be a useful reference for anyone who has to develop budget estimates or replacement costs for buildings. Anyone familiar with construction estimating understands that even very competent estimators with complete working drawings, full specifications and precise labor and material costs can disagree on the cost of a building. Frequently exhaustive estimates for even relatively simple structures can vary 10% or more. The range of competitive bids on some building projects is as much as 20%. Estimating costs is not an exact science and there's room for legitimate disagreement on what the "right" cost is. This manual can not help you do in a few minutes what skilled estimators may not be able to do in many hours. This manual will help you determine a reasonable replacement or construction cost for most buildings. It is not intended as a substitute for judgment or as a replacement for sound professional practice, but should prove a valuable aid to developing an informed opinion of value.

Area Modification Factors

Construction costs are higher in some cities than in other cities. Add or deduct the percentage shown on this page or page 8 to adapt the costs in this book to your job site. Adjust your estimated total project cost by the percentage shown for the appropriate city in this table to find your total estimated cost. Where 0% is shown it means no modification is required. Factors for Canada adjust to Canadian dollars.

These percentages were compiled by comparing the construction cost of buildings in nearly 600 communities throughout North America. Because these percentages are based on completed projects, they consider all

construction cost variables, including labor, equipment and material cost, labor productivity, climate, job conditions and markup.

Modification factors are listed alphabetically by state and city, followed by the first three digits of the postal zip code.

These percentages are composites of many costs and will not necessarily be accurate when estimating the cost of any particular part of a building. But when used to modify costs for an entire structure, they should improve the accuracy of your estimates.

Alabama Average -4%			Salinas 939 1%			Atlanta 303 12%			Muncie 473 -8%			Camden 48 -10%		
Anniston 362	-8%		San Bernardino 923-924	2%		Augusta 308-309	-2%		South Bend 466	-2%		Cutler 46	-7%	
Auburn 368	-4%		San Diego 919-921	8%		Buford 305	-2%		Terre Haute 478	-3%		Dexter 49	-4%	
Bellamy 369	5%		San Francisco 941	27%		Calhoun 307	-9%					Northern Area 47	-8%	
Birmingham 350-352	2%		San Jose 950-951	17%		Columbus 318-319	-3%					Portland 41	2%	
Dothan 363	-7%		San Mateo 943-944	21%		Dublin/Fort Valley 310	-8%		Iowa Average -3%					
Evergreen 364	-10%		Santa Barbara 931	7%		Hinesville 313	-6%		Burlington 526	1%				
Gadsden 359	-9%		Santa Rosa 954	16%		Kings Bay 315	-10%		Carroll 514	-11%		Maryland Average 2%		
Huntsville 358	-1%		Stockton 952	4%		Macon 312	-4%		Cedar Falls 506	-4%		Annapolis 214	8%	
Jasper 355	-8%		Sunnyvale 940	20%		Marietta 300-302	4%		Cedar Rapids 522-524	2%		Baltimore 210-212	7%	
Mobile 365-366	-2%		Van Nuys 913-916	8%		Savannah 314	-4%		Cherokee 510	1%		Bethesda 208-209	13%	
Montgomery 360-361	-2%		Whittier 906	8%		Statesboro 304	-11%		Council Bluffs 515	-1%		Church Hill 216	-4%	
Scottsboro 357	-4%					Valdosta 316	-1%		Creston 508	1%		Cumberland 215	-8%	
Selma 367	-5%		Colorado Average 1%						Davenport 527-528	1%		Elkton 219	-5%	
Sheffield 356	0%		Aurora 800-801	7%		Hawaii Average 20%			Decorah 521	-8%		Frederick 217	7%	
Tuscaloosa 354	-4%		Boulder 803-804	4%		Aliamau 968	22%		Des Moines 500-503	5%		Laurel 206-207	8%	
			Colorado Springs 808-809	0%		Ewa 967	20%		Dubuque 520	-4%		Salisbury 218	-6%	
			Denver 802	8%		Halawa Heights 967	20%		Fort Dodge 505	-3%				
Alaska Average 23%			Durango 813	-1%		Hilo 967	20%		Mason City 504	-3%		Massachusetts Average 12%		
Anchorage 995	26%		Fort Morgan 807	-2%		Honolulu 968	22%		Ottumwa 525	-6%		Ayer 015-016	6%	
Fairbanks 997	27%		Glenwood Springs 816	4%		Kailua 968	22%		Sheldon 512	-7%		Bedford 17	15%	
Juneau 998	19%		Grand Junction 814-815	0%		Lualualei 967	20%		Shenandoah 516	-14%		Boston 021-022	37%	
Ketchikan 999	18%		Greeley 806	5%		Mililani Town 967	20%		Sioux City 511	5%		Brockton 023-024	20%	
King Salmon 996	23%		Longmont 805	2%		Pearl City 967	20%		Spencer 513	-7%		Cape Cod 26	4%	
			Pagosa Springs 811	-4%		Wahiawa 967	20%		Waterloo 507	-3%		Chicopee 10	7%	
			Pueblo 810	0%		Walanae 967	20%		Kansas Average 0%			Dedham 19	18%	
			Salida 812	-6%		Wailuku (Maui) 967	20%		Colby 677	-8%		Fitchburg 14	11%	
Arizona Average -4%			Connecticut Average 8%			Idaho Average -9%			Concordia 669	-12%		Hingham 20	19%	
Chambers 865	-8%		Bridgeport 66	6%		Boise 837	-5%		Dodge City 678	-4%		Lawrence 18	14%	
Douglas 855	-8%		Bristol 60	12%		Coeur d'Alene 838	-10%		Emporia 668	8%		Nantucket 25	9%	
Flagstaff 860	-7%		Fairfield 64	9%		Idaho Falls 834	-9%		Fort Scott 667	-6%		New Bedford 27	6%	
Kingman 864	-5%		Hartford 61	11%		Lewisston 835	-11%		Hays 676	-13%		Northfield 13	2%	
Mesa 852	3%		New Haven 65	7%		Meridian 836	-9%		Hutchinson 675	-6%		Pittsfield 12	1%	
Phoenix 850	3%		Norwich 63	3%		Pocatello 832	-10%		Independence 673	29%		Springfield 11	8%	
Prescott 863	-6%		Stamford 068-069	12%		Sun Valley 833	-8%		Kansas City 660-662	5%				
Show Low 859	-7%		Waterbury 67	6%					Liberal 679	14%		Michigan Average 1%		
Tucson 856-857	-5%		West Hartford 62	5%					Salina 674	-7%		Battle Creek 490-491	-1%	
Yuma 853	2%								Topeka 664-666	-1%		Detroit 481-482	7%	
									Wichita 670-672	-4%		Flint 484-485	-4%	
Arkansas Average -7%			Delaware Average 2%			Illinois Average 4%			Kentucky Average -4%			Grand Rapids 493-495	1%	
Batesville 725	-9%		Dover 199	-4%		Arlington Heights 600	14%		Ashland 411-412	-4%		Grayling 497	-7%	
Camden 717	-2%		Newark 197	6%		Aurora 605	14%		Bowling Green 421	-5%		Jackson 492	-1%	
Fayetteville 727	-4%		Wilmington 198	4%		Belleville 622	0%		Campton 413-414-11	-11%		Lansing 488-489	0%	
Fort Smith 729	-7%					Bloomington 617	-1%		Covington 410	2%		Marquette 498-499	3%	
Harrison 726	-12%		District of Columbia Average 12%			Carbondale 629	-4%		Elizabethtown 427	-10%		Pontiac 483	12%	
Hope 718	-8%		Washington 200-205	12%		Carol Stream 601	14%		Frankfort 406	7%		Royal Oak 480	7%	
Hot Springs 719	-13%					Centralia 628	-3%		Hazard 417-418-10	-10%		Saginaw 486-487	-5%	
Jonesboro 724	-9%		Florida Average -5%			Chicago 606-608	15%		Hopkinsville 422	-5%		Traverse City 496	-2%	
Little Rock 720-722	-3%		Altamonte Springs 327	-3%		Decatur 623	-7%		Lexington 403-405	1%				
Pine Bluff 716	-11%		Bradenton 342	-6%		Galesburg 614	-4%		London 407-409	-7%		Minnesota Average -1%		
Russellville 728	-4%		Brooksville 346	-7%		Granite City 620	3%		Louisville 400-402	2%		Bemidji 566	-6%	
West Memphis 723	-2%		Daytona Beach 321	-9%		Green River 612	5%		Owensboro 423	-4%		Brainerd 564	-3%	
			Fort Lauderdale 333	2%		Joliet 604	13%		Paducah 420	0%		Duluth 556-558	2%	
California Average 9%			Fort Myers 339	-6%		Kankakee 609	-3%		Pikeville 415-416	-8%		Fergus Falls 565	-10%	
Alhambra 917-918	8%		Fort Pierce 349	-10%		Lawrenceville 624	-6%		Somerset 425-426-11	-11%		Magnolia 561	-8%	
Bakersfield 932-933	2%		Gainesville 326	-9%		Oak Park 603	18%		White Plains 424	-4%		Mankato 560	-4%	
El Centro 922	0%		Jacksonville 322	-2%		Peoria 615-616	6%		Louisiana Average 2%			Minneapolis 553-555	13%	
Eureka 955	7%		Lakeland 338	-8%		Peru 613	2%		Alexandria 713-714	4%		Rochester 559	-1%	
Fresno 936-938	-2%		Melbourne 329	-8%		Quincy 602	16%		Baton Rouge 707-708	10%		St Cloud 563	2%	
Herlong 961	9%		Miami 330-332	1%		Rockford 610-611	3%		Houma 703	4%		St Paul 550-551	12%	
Inglewood 902-905	9%		Naples 341	-2%		Springfield 625-627	0%		Lafayette 705	8%		Thief River Falls 567	-2%	
Irvine 926-927	13%		Ocala 344	-12%		Urbana 619	-4%		Lake Charles 706	13%		Willmar 562	-6%	
Lompoc 934	3%		Orlando 328	1%		Indiana Average -3%			Mandeville 704	-3%				
Long Beach 907-908	9%		Panama City 324	-11%		Aurora 470	-5%		Minden 710	-5%		Mississippi Average -6%		
Los Angeles 900-901	8%		Pensacola 325	-8%		Bloomington 474	-2%		Monroe 712	-8%		Clarksdale 386	-9%	
Marysville 959	9%		Saint Augustine 320	-2%		Columbus 472	-4%		New Orleans 700-701	2%		Columbus 397	0%	
Modesto 953	1%		Saint Cloud 347	-2%		Elkhart 465	-4%		Shreveport 711	-4%		Greenville 387	-14%	
Mojave 935	5%		St Petersburg 337	-6%		Evansville 476-477	4%					Greenwood 389	-10%	
Novato 949	18%		Tallahassee 323	-6%		Fort Wayne 467-468	-1%		Maine Average -5%			Gulfport 395	-6%	
Oakland 945-947	24%		Tampa 335-336	-1%		Gary 463-464	8%		Auburn 42	-4%		Jackson 390-392	-3%	
Orange 928	12%		West Palm Beach 334	-2%		Indianapolis 460-462	4%		Augusta 43	-5%		Laurel 394	-7%	
Oxnard 930	2%					Jasper 475	-8%		Bangor 44	-6%		McComb 396	-11%	
Pasadena 910-912	9%		Georgia Average -4%			Jeffersonville 471	-5%		Bath 45	-6%		Meridian 393	3%	
Rancho Cordova 956-957	4%		Albany 317	-6%		Kokomo 469	-8%		Brunswick 039-040	-1%		Tupelo 388	-7%	
Redding 960	-3%		Athens 306	-5%		Lafayette 479	-5%							
Richmond 948	17%													
Riverside 925	4%													
Sacramento 958	3%													

Building Cost Historical Index

Use this table to find the approximate current dollar building cost when the actual cost is known for any year since 1955. Multiply the figure listed below for the building type and year of construction by the known cost. The result is the estimated 2022 construction cost.

Year	Masonry Buildings	Concrete Buildings	Steel Buildings	Wood-Frame Buildings	Agricultural Buildings	Year of Construction
1955	14.99	15.50	16.09	13.52	12.48	1955
1956	14.22	14.82	14.81	12.95	11.96	1956
1957	13.81	14.26	14.22	12.87	11.67	1957
1958	13.42	13.72	13.53	12.83	13.92	1958
1959	13.00	13.29	13.21	12.28	11.16	1959
1960	12.70	13.04	13.00	12.10	10.94	1960
1961	12.44	12.99	12.78	11.88	10.90	1961
1962	12.16	12.61	12.47	11.74	10.74	1962
1963	11.98	12.28	12.32	11.52	9.74	1963
1964	11.63	12.14	12.15	11.12	10.23	1964
1965	11.26	11.82	11.73	10.88	9.96	1965
1966	10.75	11.48	11.28	10.41	9.68	1966
1967	10.50	10.93	10.55	9.90	9.29	1967
1968	10.07	10.33	10.07	9.36	8.88	1968
1969	9.51	9.87	9.73	9.01	8.38	1969
1970	9.13	9.44	9.24	8.57	7.96	1970
1971	8.56	8.64	8.58	7.38	7.42	1971
1972	7.96	8.00	8.02	7.40	6.90	1972
1973	7.27	7.58	7.12	6.83	6.48	1973
1974	6.47	6.95	6.69	6.38	6.01	1974
1975	5.88	6.14	6.01	6.00	5.36	1975
1976	5.51	5.85	5.70	5.78	5.08	1976
1977	5.13	5.49	5.42	5.37	4.78	1977
1978	4.78	5.13	4.99	4.93	4.32	1978
1979	4.39	4.57	4.47	4.52	4.09	1979
1980	3.98	4.15	3.98	4.05	3.70	1980
1981	3.74	3.91	3.65	3.87	3.46	1981
1982	3.63	3.74	3.54	3.74	3.34	1982
1983	3.46	3.63	3.47	3.57	3.15	1983
1984	3.23	3.40	3.31	3.30	3.06	1984
1985	3.14	3.23	3.22	3.20	3.01	1985
1986	3.06	3.21	3.16	3.15	2.94	1986
1987	3.05	3.14	3.13	3.09	2.92	1987
1988	2.99	3.02	3.07	3.06	2.87	1988
1989	2.92	2.97	2.92	3.00	2.78	1989
1990	2.75	2.85	2.77	2.79	2.65	1990
1991	2.97	2.81	2.64	2.64	2.51	1991
1992	2.66	2.78	2.60	2.63	2.49	1992
1993	2.59	2.75	2.51	2.59	2.45	1993
1994	2.53	2.57	2.42	2.49	2.27	1994
1995	2.40	2.34	2.24	2.34	2.15	1995
1996	2.32	2.30	2.18	2.29	2.11	1996
1997	2.24	2.24	2.09	2.24	2.06	1997
1998	2.13	2.13	2.01	2.14	2.03	1998
1999	2.06	2.06	1.96	2.12	2.00	1999
2000	2.00	2.00	1.88	2.05	1.93	2000
2001	1.94	1.94	1.85	1.97	1.88	2001
2002	1.89	1.89	1.80	1.95	1.84	2002
2003	1.86	1.86	1.76	1.93	1.81	2003
2004	1.78	1.78	1.71	1.88	1.76	2004
2005	1.65	1.65	1.53	1.69	1.72	2005
2006	1.56	1.56	1.41	1.51	1.54	2006
2007	1.51	1.51	1.35	1.40	1.43	2007
2008	1.41	1.41	1.28	1.34	1.35	2008
2009	1.40	1.40	1.23	1.34	1.35	2009
2010	1.37	1.37	1.16	1.33	1.34	2010
2011	1.39	1.39	1.20	1.35	1.38	2011
2012	1.37	1.37	1.07	1.30	1.35	2012
2013	1.31	1.31	1.14	1.24	1.26	2013
2014	1.30	1.30	1.13	1.22	1.25	2014
2015	1.28	1.28	1.12	1.21	1.24	2015
2016	1.27	1.27	1.23	1.22	1.21	2016
2017	1.23	1.23	1.25	1.23	1.21	2017
2018	1.17	1.17	1.08	1.12	1.13	2018
2019	1.10	1.10	1.13	1.07	1.08	2019
2020	1.08	1.08	1.08	1.09	1.07	2020
2021	1.05	1.05	1.14	1.08	1.07	2021
2022	1.00	1.00	1.00	1.00	1.00	2022

Residential Structures Section

The figures in this section include all costs associated with normal construction:

Foundations as required for normal soil conditions. Excavation for foundations, piers, and other foundation components given a fairly level construction site. Floor, wall, and roof structures. Interior floor, wall, and ceiling finishes. Exterior wall finish and roof cover. Interior partitions as described in the quality class. Finish carpentry, doors, windows, trim, etc. Electric wiring and fixtures. Rough and finish plumbing as described in applicable building specifications. Built-in appliances as described in applicable building specifications. All labor

and materials including supervision. All design and engineering fees, if necessary. Permits and fees. Utility hook-ups. Contractors' contingency, overhead and profit.

The square foot costs do not include heating and cooling equipment or the items listed in the section "Additional Costs for Residential Structures" which appear on pages 27 to 31. The costs of the following should be figured separately and added to the basic structure cost: porches, basements, balconies, exterior stairways, built-in equipment beyond that listed in the quality classifications, garages and carports.

Single Family Residences

Single family residences vary widely in quality and the quality of construction is the most significant factor influencing cost. Residences are listed in six quality classes. Class 1 is the most expensive commonly encountered and Class 6 is the minimum required under most building codes. Nearly all homes built from stock plans or offered to the public by residential tract developers will fall into Class 3, 4, 5, or 6. For convenience, these classes are labeled *Best Standard*, *Good Standard*, *Average Standard* or *Minimum Standard*. Class 1 residences are labeled *Luxury*. Class 2 residences are labeled *Semi-Luxury*. Class 1 and 2 residences are designed by professional architects, usually to meet preferences of the first owner.

The shape of the outside perimeter also has a significant influence on cost. The more complex the shape, the more expensive the structure per square foot of floor. The shape classification of multiple story or split-level homes should be based on the outline formed by the outer-most exterior walls, including the garage area, regardless of the story level. Most residences that fall into Classes 3, 4, 5 or 6 have 4, 6, 8 or 10 corners, as illustrated below. Small insets that do not require a change in the roof line can be ignored when evaluating the outside perimeter.

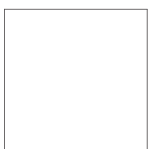
Class 1 and 2 (*Luxury* and *Semi-Luxury*) residences have more than ten corners and are best evaluated by counting the "building masses." A building mass is a group of contiguous rooms on one or more levels with access at varying angles from a common point or

hallway. The illustration at the right below represents a residence with two building masses. Most Class 1 and Class 2 residences have from one to four building masses, ignoring any attached garage. For convenience, cost tables for Class 1 and 2 single family residences with one, two, three or four building masses have been appended to cost tables for Class 3, 4, 5 and 6 residences with 4, 6, 8 and 10 building corners.

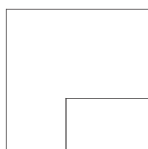
Residences on larger lots often include a separate housekeeping unit, either remote from the main structure (as illustrated below at the right) or joined to the main structure by a hallway (no common wall). Evaluate any separate housekeeping unit as a separate residence. The quality class of separate housekeeping units will usually be the same as the main residence if designed and built at the same time as the main residence.

Residences which have features of two or more quality classes can be placed between two of the six labeled classes. The tables have five half-classes (1 & 2, 2 & 3, etc.) which can be applied to residences with some characteristics of two or more quality classes. If a portion of a residence differs significantly in quality from other portions, evaluate the square footage of each portion separately.

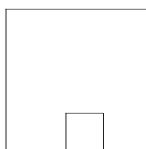
These figures can be applied to nearly all single-family residences built using conventional methods and readily available materials, including the relatively small number of highly decorative, starkly original or exceptionally well-appointed residences.



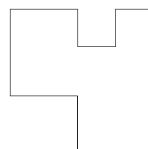
4 corners



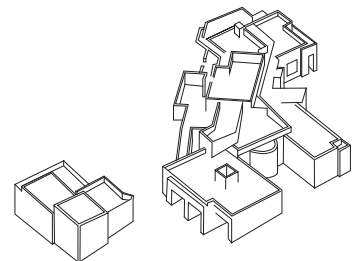
6 corners



8 corners



10 corners



2 building masses and one separate unit

Single Family Residences

Quality Classification

	Class 1 Luxury	Class 2 Semi-Luxury	Class 3 Best Std.	Class 4 Good Std.	Class 5 Average Std.	Class 6 Minimum Std.
Foundation (9% of total cost)	Reinforced concrete.	Reinforced concrete.	Reinforced concrete.	Reinforced concrete or concrete block.	Reinforced concrete or concrete block.	Reinforced concrete.
Floor Structure (12% of total cost)	Engineered wood or steel exceeding code minimums.	Engineered wood or steel or reinforced concrete slab.	Engineered wood or steel or reinforced concrete slab.	Wood frame or slab on grade, changes in shape and elevation.	Standard wood frame or slab on grade with elevation changes.	Slab on grade. No changes in elevation.
Wall Framing and Exterior Finish (14% of total cost)	Wood or steel, very irregular walls, stone veneer, many architectural doors and windows.	Wood or steel, irregular shape, masonry veneer, better grade doors and windows.	Wood or steel, several wall offsets, wood or masonry accents, good grade doors and windows.	Wood or steel, stucco or wood siding, some trim or veneer, average doors and windows.	Wood or steel, stucco or wood siding, few offsets, commodity grade doors and windows.	Wood or steel, stucco or hardboard siding, minimum grade doors and windows.
Roof (10% of total cost)	Complex plan, tile, slate or metal, highly detailed.	Multi-level, slate, tile or flat surface, decorative details.	Multi-pitch, shake, tile or flat surface, large closed soffit.	Wood trusses, tile or good shingles, closed soffit.	Wood frame, shingle or built-up cover, open 24" soffit.	Wood frame, composition shingle cover, open soffit.
Floor Finish (5% of total cost)	Terrazzo, marble, granite, or inlaid hardwood or best carpet throughout.	Marble or granite entry, hardwood, good carpet or sheet vinyl elsewhere.	Simulated marble tile entry, good carpet, hardwood or vinyl elsewhere.	Better sheet vinyl and average carpet, some areas with masonry or tile.	Good sheet vinyl and standard carpet, small area with tile or hardwood.	Composition tile or minimum grade sheet vinyl.
Interior Wall and Ceiling Finish (8% of total cost)	Plaster or gypsum wallboard with artistic finish, many offsets and wall openings, decorative details in nearly all rooms.	Plaster on gypsum or metal lath or 2 layers of 5/8" gypsum wallboard, decorative details, many irregular wall openings.	Gypsum wallboard with putty or texture coat finish, some irregular walls, decorative details in living room, entry and kitchen.	1/2" gypsum wallboard with textured finish, several irregular walls and wall openings, some decorative details.	1/2" gypsum wallboard with textured finish, most walls are rectangular, doors and windows are the only openings.	1/2" gypsum wallboard, smooth or orange peel finish. Nearly all walls are regular, no decorative details.
Interior Detail (5% of total cost)	Exposed beams or decorative ceiling, 12' to 16' ceiling in great room, many sky windows, built-in shelving and alcoves for art.	Great room has 12' to 16' ceiling, most rooms have windows on two sides, formal dining area, several framed openings.	Cathedral ceiling at entry, one or more floor level changes, several wall openings or pass-throughs, formal dining area.	8' or 9' ceiling throughout, walk-in closet in master bedroom, separate dining area, some decorative wood trim.	8' or 9' ceiling throughout, sliding mirrored closet doors, standard grade molding and trim, breakfast bar or nook.	Drop ceiling in kitchen, other rooms have 7'6" to 8' ceiling, minimum grade molding and trim.
Bath Detail (4% of total cost)	Custom large tile showers, separate elevated spa in master bathroom.	Large tile showers, at least one bathtub, glass block or large window by each bath.	Tile or fiberglass shower, at least one built-in bathtub, window in bathroom.	Good plastic tub and shower in at least one bathroom, one small window in each bath.	Average plastic tub and shower in at least one bathroom.	Minimum plastic tub and shower in one bathroom.
Kitchen Detail (8% of total cost)	Over 30 LF of deluxe wall and base cabinets, stone counter top, island work area, breakfast bar.	Over 25 LF of good custom base and wall cabinets, synthetic stone counter top, desk and breakfast bar.	Over 20 LF of good stock wall and base cabinets, tile or acrylic counter top, desk and breakfast bar or nook.	Over 15 LF of stock standard grade wall and base cabinets, low-cost tile or acrylic counter top, breakfast nook.	Over 10 LF of stock standard grade wall and base cabinets, low-cost acrylic or laminated plastic counter top.	Less than 10 LF of low-cost wall and base cabinets, laminated plastic counter top, space for table.
Plumbing (12% of total cost)	4 deluxe fixtures per bathroom, more bathrooms than bedrooms.	4 good fixtures per bathroom, more bathrooms than bedrooms.	3 good fixtures per bathroom, as many bathrooms as bedrooms.	3 standard fixtures per bathroom, less bathrooms than bedrooms.	3 standard fixtures per bathroom, less bathrooms than bedrooms.	3 minimum fixtures per bathroom, 2 bathrooms.
Special Features (3% of total cost)	10 luxury built-in appliances, wet bar, home theater, pantry, wine cellar.	8 good built-in appliances, wet bar, walk-in pantry, central vacuum.	6 good built-in appliances, walk-in pantry, wet bar, central vacuum.	5 standard built-in appliances, sliding glass or French doors, laundry room.	4 standard grade kitchen appliances.	4 minimum grade kitchen appliances.
Electrical System (10% of total cost)	Over 100 recessed or track lights, security system, computer network.	80 to 100 recessed lighting fixtures, security system, computer network.	Ample recessed lighting on dimmers, computer network, multiple TV outlets.	Limited recessed lighting on dimmers, multiple TV outlets.	12 lighting fixtures, switch-operated duplex plug outlets in bedrooms.	10 or less lighting fixtures, switch-operated plug outlets in most rooms.
If Exterior Walls are Masonry	Reinforced split face concrete block or brick with face brick veneer.	Reinforced block or brick with masonry veneer or stucco coat.	Textured or coated concrete block or good quality detailed brick.	Colored or coated concrete block or good quality brick.	Colored concrete block or painted common brick.	Painted concrete block or common-brick.

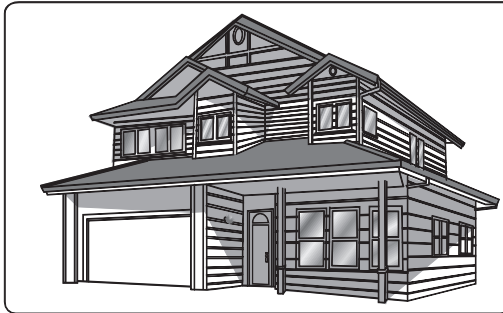
Note: Use the percent of total cost to help identify the correct quality classification.

Single Family Residences

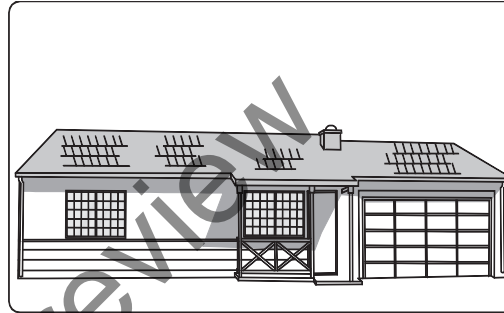
4 Corners (Classes 3, 4, 5 and 6) or One Building Mass (Classes 1 and 2 Only)

Estimating Procedure

1. Establish the structure quality class by applying the information on page 11.
2. Multiply the structure floor area (excluding the garage) by the appropriate square foot cost below.
3. Multiply the total from step 2 by the correct location factor listed on page 7 or 8.
4. Add, when appropriate, the cost of a porch, garage, heating and cooling equipment, basement, fireplace, carport, appliances and plumbing fixtures beyond that listed in the quality classification. See the cost of these items on pages 27 to 31.



Single Family Residence, Class 4



Single Family Residence, Class 6

Square Foot Area

Quality Class	700	800	900	1,000	1,100	1,200	1,300	1,400	1,500	1,600	1,700	1,800	2,000
1, Luxury	576.64	552.53	532.58	515.35	501.94	489.99	479.38	469.83	462.72	455.72	449.32	443.92	433.83
1, & 2	501.44	480.46	463.13	448.15	436.50	426.01	416.86	408.55	402.34	396.31	390.65	385.95	377.21
2, Semi-Luxury	350.45	335.80	323.67	313.19	305.06	297.80	291.37	285.58	281.22	276.84	273.08	269.82	263.57
2 & 3	257.23	246.51	237.59	229.95	223.97	218.58	213.86	209.61	206.39	203.27	200.38	198.08	193.53
3, Best Std.	224.48	215.15	207.33	200.67	195.35	190.74	186.65	182.94	180.12	177.40	174.93	172.79	168.87
3 & 4	191.98	183.83	177.24	171.59	167.01	163.06	159.58	156.35	154.01	151.53	149.57	147.72	144.42
4, Good Std.	165.40	158.36	152.73	147.82	143.97	140.55	137.45	134.71	132.60	130.64	128.83	127.15	124.41
4 & 5	148.99	142.72	137.62	133.15	129.65	126.50	123.75	121.41	119.50	117.67	116.06	114.66	111.96
5 Avg. Std.	134.08	128.54	123.89	119.92	116.85	114.00	111.51	109.22	107.57	105.94	104.46	103.23	100.86
5 & 6	116.42	111.56	107.55	104.09	101.34	98.92	96.76	94.77	93.39	91.93	90.82	89.59	87.56
6, Min. Std.	105.84	101.38	97.74	94.60	92.13	89.90	87.98	86.22	84.90	83.56	82.49	81.41	79.54

Square Foot Area

Quality Class	2,200	2,400	2,600	2,800	3,000	3,200	3,400	3,600	4,000	4,200	4,400	4,600	5,000+
1, Luxury	426.25	419.10	413.35	408.20	404.56	401.17	397.49	394.83	389.26	385.72	382.65	379.99	376.17
1, & 2	370.76	364.45	359.42	354.95	351.77	348.85	345.64	343.31	338.52	335.42	332.75	330.42	327.11
2, Semi-Luxury	259.21	254.71	251.24	248.09	245.83	243.75	241.52	239.93	236.56	234.41	232.52	230.94	228.63
2 & 3	190.18	186.99	184.43	182.14	180.42	178.87	177.35	176.12	173.67	172.11	170.70	169.52	167.83
3, Best Std.	165.97	163.14	160.87	158.94	157.51	156.18	154.73	153.65	151.51	151.53	150.33	149.27	147.79
3 & 4	141.92	139.51	137.61	135.93	134.64	133.46	132.38	131.45	129.60	128.44	127.40	126.51	125.24
4, Good Std.	122.28	120.16	118.58	117.04	116.06	115.01	114.04	113.14	111.63	110.62	109.70	108.95	107.86
4 & 5	110.10	108.32	106.66	105.45	104.45	103.64	102.59	101.98	100.58	99.66	98.91	98.19	97.22
5 Avg. Std.	99.15	97.51	96.18	94.87	94.11	93.29	92.43	91.80	90.55	89.24	89.02	88.42	87.56
5 & 6	86.08	84.65	83.45	82.39	81.72	80.90	80.18	79.60	78.61	77.80	77.30	76.70	76.00
6, Min. Std.	78.14	76.90	75.87	74.97	74.27	73.59	72.94	72.40	71.43	70.71	70.23	69.71	69.06

Note: Tract work and highly repetitive jobs may reduce the cost 8 to 12%. Add 4% to the square foot cost of floors above the second floor level. Work outside metropolitan areas may cost 2 to 6% less. When the exterior walls are masonry, add 9 to 10% for class 2 and 1 structures and 5 to 8% for class 3, 4, 5 and 6 structures. The building area includes all full story (7'6" to 9' high) areas within and including the exterior walls of all floor areas of the building, including small inset areas such as entrances outside the exterior wall but under the main roof. For areas with a ceiling height of less than 80", see the section on half-story areas on page 30.

Manufactured Housing

Quality Classification

	Class 1 Best Quality	Class 2 Good Quality	Class 3 Average Quality	Class 4 Low Quality	Class 5 Lowest Quality
Design	Indistinguishable from site-built construction, good floor plan and sight lines, superior fit and finish	Comparable to site-built construction, good floor plan, shelves and alcoves, good fit and finish	Clearly manufactured housing but with good design and materials, adequate fit and finish	Mobile home design, utilitarian floor plan, commodity-grade materials	Poor design, often sold unfinished, common only in Sun Belt states
Roof (12% of total cost)	Complex roof line, 30-year architectural shingles, roof pitch at least 4" in 12", good overhang on all sides, R-38 insulation	Decorative roof line, gable accents, 25-year shingles, 4" in 12" pitch, 12" overhang on all sides, R-33 insulation	Gable accents, 25-year shingles, 4" in 12" pitch, 8" to 12" overhang front and back, R-21 insulation	Simple roof line, less than 4" in 12" pitch, small overhang front and back, R-19 insulation	Straight roof line, minimum pitch, little or no overhang, minimum roof cover, R-7 insulation
Exterior Walls (18% of total cost)	Good fiber-cement siding, 9' to 10' high, decorative trim, 6" exterior walls, R-19 insulation, 7/16" plywood sheathing	Painted fiber cement siding, 9' high, some trim, 6" exterior walls, R-15 insulation, 7/16" OSB sheathing	Good foam-backed vinyl siding, 8' to 9' high, 4" exterior walls, R-13 insulation, 7/16" OSB sheathing	Vinyl siding, 8' high, 4" exterior walls, R-11 insulation, 3/8" plywood sheathing	Hardboard or economy siding, 7' high, 4" exterior walls, R-7 insulation
Doors and Windows (9% of total cost)	Two 36" wide insulated steel panel exterior doors, solid core wood panel interior doors, good hardware, large insulated low-E vinyl sash windows, recessed entry	Two 36" wide insulated steel exterior doors, hollow core wood interior doors, good hardware, good insulated low-E vinyl sash windows, recessed entry	36" wide steel front door with deadbolt, hollow core wood interior doors, average hardware, insulated vinyl windows, recessed entry	36" wide steel front door, hollow core wood interior doors, economy hardware, smaller dual glazed vinyl windows, 6' sliding bedroom door	34" or 32" wide aluminum exterior doors, hollow core wood interior doors, economy hardware, aluminum windows with storm sash
Interior (5% of total cost)	Hardwood paneling or 1/2" gypsum board with good workmanship and trim throughout, coffered/vaulted/beamed ceilings, plank-type acoustical tile, mirrored walls, built-in buffet cabinets, custom drapes, skylights, window sills, good drapes with sheers throughout	Pre-finished hardwood paneling and trim or 1/2" gypsum board in all rooms, vaulted/beamed, ceiling in main rooms, good floor to ceiling drapes over sheer underlays in living room and dining room, several wall mirrors, some acoustic treatments	Pre-finished and grooved hardwood, plywood paneling or 1/2" gypsum board, no exposed fasteners, coordinated drapes in all rooms except kitchen and baths, one vaulted ceiling, acoustic tile, pre-finished wood trim	Pre-finished fire rated plywood paneling or 3/8" gypsum board, some exposed fasteners, acoustical tile ceiling, economy drapes in living room, dining room, and bedrooms, vinyl on composition molding.	Stapled 3/8" vinyl-covered wallboard with battens at seams and corners, exposed fasteners or holding strips, unit may have been sold with interior finishing incomplete.
Floors (8% of total cost)	Hardwood or ceramic tile entry, 30-50 oz. carpet, good vinyl in utility and guest bath. Good vinyl or hardwood in kitchen.	26-30 oz. carpet with 1/2" pad in all rooms except guest bath and utility, vinyl in kitchen, utility, and guest bath.	22-26 oz. carpet with 1/2" rebond pad in all rooms except baths and kitchen, vinyl in kitchen and baths	16- 22 oz. carpet with 5 lb. pad in living, dining and bedrooms, economy vinyl sheet or tile in other areas	Glued or stapled foam-backed carpet in living room and bedroom, economy vinyl elsewhere
Heating (7% of total cost)	110,000 BTU upflow air-condition-ready forced air furnace with exterior access door, metal ducting to all rooms, fireplace, dual-zone heating	80,000 to 110,000 BTU upflow or downflow air-condition-ready furnace with exterior access door, metal ducting to all rooms, fireplace	80,000 BTU upflow or downflow forced air condition-ready furnace, ducting to all rooms, simulated fireplace	Forced air furnace, fiberglass attic ducting to all rooms, under-door return vents, ready for air conditioning unit.	Forced air furnace, minimum taped fiberglass duct, registers at the room center, return vents under doors
Kitchen (23% of total cost)	18± LF of 25" wide stone or ceramic counter, 4" splash, luxury cabinets, roller drawers, dropped luminous ceiling, island work space, walk-in pantry, name-brand fixtures, cast iron sink, wet bar	16± LF of tile or Corian counter, 4" splash, quality wood cabinets, dropped luminous ceiling, island work space, walk-in pantry, good quality fixtures, stainless or integrated 8" deep sink	14± LF of Corian counter, 2" splash, average quality wood-face cabinets and hardware, built-in range and oven with hood and fan, pantry cabinet, 7" deep stainless or porcelain sink	12± LF laminate counter, smaller commodity-grade cabinets with wood raised panel doors, no lining, built-in range and oven, hood and fan, add for dishwasher if present	10± LF of 24" wide laminate counter, plastic-faced MDF cabinets, stapled and glued, economy range and oven, minimum grade sink and fixtures, add for dishwasher if present
Baths and Plumbing (14% of total cost)	2 to 2¾ baths, 8 fixtures, master bath with two basins, sunken 60" tub, fiberglass shower with glass door, quality medicine cabinets, 6± feet of mirror over 8± feet of cultured marble or ceramic tile lavatory top, decorative faucets, 40-gal. water heater, separate commode closet	2 baths, vent fans, master bath will have two basins, sunken 60" tub and stall shower, quality medicine cabinets and fixtures, cultured marble vanities, good cabinets, 60" one-piece shower in guest bath, 30- to 40-gallon water heater, separate commode closet	2 baths, vent fans, fiberglass shower with glass or plastic door, fiberglass 60" tub, acrylic round toilets, 6 to 8 LF cultured marble vanity in each bath, twin basin master bath with 4± foot mirror, good cabinets, 30- to 40-gallon water heater	1¾ baths, fiberglass shower with plastic door, fiberglass one-piece 54" tub, acrylic round toilets, 4 to 5 linear foot cultured marble vanity with single basin, average quality cabinets and hardware, 30-gallon water heater	1¾ baths, fiberglass 54" one-piece tub and shower with curtain, acrylic round toilets, small 4' plastic marble vanity, minimum quality cabinets and hardware, 20-gallon electric water heater, plastic supply and drain pipe
Bedrooms (4% of total cost)	9 to 14 linear foot floor-to-ceiling sliding mirrored wardrobe doors, or large walk-in closets, phone and cable TV jacks	9 to 14 linear foot floor-to-ceiling sliding wardrobe doors in master bedroom or walk-in closets, phone and cable TV jacks	10± linear foot wardrobe, floor-to-ceiling mirrored sliding doors in master bedroom, cable TV jacks	8± linear foot wardrobe, pre-finished and grooved plywood doors, mirrored wardrobe door in master bedroom	Five to six linear foot wardrobe, plain plywood sliding doors

Manufactured Housing

Additional Costs

Permanent Foundation, in place of setting on piers

Single Story

Less than 1,000 square feet of floor area	\$8,750 to \$15,450
Over 1,000 square feet to 1,800 square feet of floor area	\$15,450 to \$28,300
Over 1,800 square feet to 2,500 square feet of floor area	\$28,300 to \$46,200

For two-story units, use the footprint of the first floor and select a figure higher in the range of costs. For difficult site conditions, such as a high water table, heavy clay soil, rock, over 3' foundation depth or a sloping site, use a figure in the higher range of costs.

Air Conditioning

Central air for use by existing furnace and ducts	
2 ton, up to 1,100 S.F.	\$3,600
2-1/2 to 3 ton, over 1,100 to 1,600 S.F.	\$4,130
4 to 5 ton, over 1,600 to 2,500 S.F.	\$4,535 to \$5,340
Cost per unit	
Thru-wall small unit 1/2 H.P., 6,000 Btu	\$1,250
Thru-wall large unit 1 H.P., 12,000 Btu	\$1,660
Evaporative cooler, roof mounted	\$1,180 to \$1,870
Wiring for air conditioning	\$227 to \$478

Built-Ins

Dishwasher (included in classes 1, 2 & 3)	\$970 - \$1,290
Garbage disposal (included in all base cost, deduct if missing)	\$200 - \$1,200
Built-in microwave oven	\$540 - \$750
Trash compactor	\$880 - \$1,110
Wet bar (walk-up – if not included in class)	\$770 - \$930
Wet bar (walk behind – if not included in class)	\$2,540 - \$2,770
Separate shower in master bath	\$880 - \$1,110
One-half bath: toilet, sink, and pullman	\$1,740 - \$1,850
Bathroom sink or laundry sink	\$370
Fireplace (permanent – includes flue)	\$3,400 - \$4,600
Fireplace (free standing – includes flue)	\$1,550 - \$2,770
Built-in buffet-hutch (included in classes 1 and 2)	\$1,170 - \$1,475
Whirlpool tub in master bath	\$1,420 - \$1,740

Porches and Decks (no roofs included)

Wood deck at home floor level with handrail, skirting, steps and outdoor carpet, per square foot of porch or deck	\$19.30 to \$27.00
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Skirting, cost per linear foot of skirt

Lightweight aluminum panels	\$6.70
Lap aluminum siding	\$11.95
Painted hardboard panels	\$15.50
Flagstone-type aluminum panels	\$12.00
Concrete composite panels	\$20.05 - \$25.00
Vinyl panels	\$13.33
Brick or stone	\$21.01

Storage Buildings, Garages, per S.F. of floor

Aluminum exterior	\$20.80
Enameled steel exterior	\$16.40
Hardboard panel exterior	\$36.45
Figure the garage cost per SF at 2/3 of the home cost per SF.	

Tie Downs

Cork screw anchor and straps, per each	\$105 - \$155
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Steps and Rails, per flight to 36" high

Fiberglass steps	\$265 - \$415
Handrail	\$60 - \$90

Carport, Porch, or Deck Roof, per S.F. covered

Aluminum supports and roof cover, free standing	\$15.05 - \$20.00
Aluminum supports and roof cover, attached to house	\$9.70 - \$14.05
Wood supports and enameled steel cover, free standing	\$17.65 - \$22.00

Screen Wall Enclosure, per linear foot of 8' wall

Wood frame with screen walls and door	\$69.00
Wood or aluminum frame with screen and glass walls, with door	\$120.00

Roof Snowload Capability

Cost per square foot of roof	
30 pound design load	\$.76 - \$1.21
40 pound design load	\$1.20 - \$2.18
50 pound design load	\$2.18 - \$2.89
60 pound design load	\$2.88 - \$3.85
80 pound design load	\$3.65 - \$5.80
100 pound design load	\$4.81 - \$6.65
175 pound design load	\$6.10 - \$7.35

Multi-Family Residences – Apartments

Quality Classification

	Class 1 Best Quality	Class 2 Good Quality	Class 3 High Average Quality	Class 4 Low Average Quality	Class 5 Minimum Quality
Foundation (9% of total cost)	Conventional crawl space built on a sloping site.	Conventional crawl space built on a sloping site.	Conventional crawl space, footing over 40" deep.	Concrete slab or crawl space with 30" footing.	Concrete slab.
Floor Structure (12% of total cost)	Engineered wood, steel or concrete exceeding code requirements, complex plan, changes in elevation.	Engineered wood or steel built to meet code requirements, changes in shape and elevation.	Standard wood frame with irregular shape and changes in elevation.	Standard wood frame or concrete slab, simple floor plan.	Simple slab on grade with no changes in elevation.
Walls and Exterior Finish (12% of total cost)	Complex wood or light steel frame, stone or masonry veneer, 10' average wall height.	Wood or light steel frame, masonry veneer at entrance, good wood or stucco siding.	Wood or light steel frame, decorative trim at entrance, plywood or stucco siding, simple framing plan.	Wood frame, some ornamental details at entrance, plywood or hardboard siding.	Wood frame, little or no ornamentation, inexpensive stucco or hardboard siding.
Roof & Cover (10% of total cost)	Complex roof plan, good insulation, tile or good shake cover.	Good insulation, good shake, tile or 5-ply built-up roof.	4-ply built-up roof, some portions heavy shake or tile.	4-ply built-up roof, some portions shake or composition shingles.	4-ply built-up roof or minimum grade composition single.
Windows and Doors (5% of total cost)	Many large, good quality vinyl or metal windows, architectural grade doors.	Large, good-quality vinyl or metal windows, commercial grade doors.	Good quality vinyl or metal windows, residential grade doors.	Standard residential-grade doors and windows.	Minimum grade doors and windows.
Interior Finish (8% of total cost)	Gypsum board with heavy texture or plaster, some paneled walls, cathedral ceiling at entry, built-in cases, several wall offsets and level changes.	Textured gypsum board, some paneled walls, decorative or stain grade trim at entrance or living room, several irregular walls and wall openings.	Textured 1/2" gypsum board, several irregular walls or wall openings, few ornamental details, standard grade trim and wall molding.	Textured 1/2" gypsum board, some wall-cover or hardboard paneling, most walls are rectangular, standard grade trim and wall molding.	1/2" gypsum board with smooth finish, no ornamental details, doors and windows are the only wall openings.
Floor Finish (5% of total cost)	Masonry or stone tile entry, good hardwood or deluxe carpet in most rooms, good sheet vinyl in other rooms.	Masonry or tile at entry, hardwood or good carpet in most rooms, sheet vinyl in other rooms.	Hardwood or tile at entry, standard carpet in most rooms, sheet vinyl in kitchen and bath.	Average quality carpet or hardwood in most rooms, sheet vinyl or resilient tile in kitchen.	Minimum carpet or resilient tile throughout.
Interior Features (5% of total cost)	Breakfast bar or nook, formal dining room, one walk-in closet, linen closet utility room or pantry.	Formal dining room ample closet space linen closet and utility closet, extra shelving.	Separate dining area, good closet space, linen closet and small utility closet.	Dining area is in the kitchen, small closet in each bedroom, linen closet.	Dining area is part of kitchen, minimum closet space, minimum shelving.
Bath Detail (4% of total cost)	Good tile shower, 8' simulated marble top.	Tile shower, 6' vanity cabinet and top.	Better vanity cabinet and good wall cabinet.	Good vanity cabinet, good medicine cabinet.	Vanity and one small medicine cabinet.
Kitchen (8% of total cost)	16 LF of better hardwood wall and base cabinets, synthetic stone top, 6 very good built-in appliances.	12 LF of good hardwood wall and base cabinets, tile or acrylic top, 5 good built-in appliances.	8 LF of standard hardwood wall and base cabinets, acrylic top, 4 standard grade built-in appliances.	6 LF of low-cost wall and base cabinets, laminate counter top, 4 standard grade appliances.	5 LF of low-cost wall & base cabinets, laminate counter top, low cost appliances.
Electrical (10% of total cost)	Ample recessed lighting, task lighting in kitchen and bath, security & computer, networks, good chandelier.	Recessed lighting in most rooms, good task lighting in kitchen & bath, security & computer networks.	Recessed lighting in kitchen and living room, switched receptacles in bedrooms, wired for cable TV.	Low-cost recessed lighting in kitchen and living room, switched receptacles in other rooms, cable TV.	Fluorescent ceiling fixture in kitchen, switched receptacles in other rooms.
Plumbing (12% of total cost)	Four excellent fixtures per bathroom, copper supply and drain lines.	Three good fixtures per bathroom, copper supply and drain lines.	Three standard fixtures per bathroom, copper supply and plastic drain lines.	Three low cost fixtures per bathroom, plastic supply and drain lines.	Three minimum-grade fixtures per bathroom, plastic supply & drains.
Plumbing costs assume 1 bathroom per unit. See page 30 for the costs of additional bathrooms.					
For Masonry Walls	Good textured block, tile or decorative brick.	Colored or detailed block tile or decorative brick.	Colored concrete block, tile or decorative brick.	Colored concrete block or brick.	Concrete block or common brick.
When masonry walls are used in lieu of wood or light steel frame walls, add 9% to the appropriate S.F. cost.					

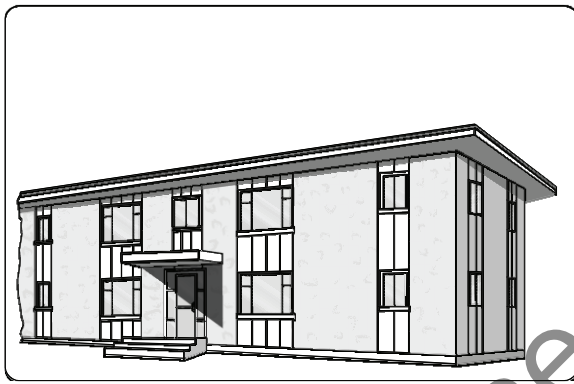
Note: Use the percent of total cost to help identify the correct quality classification. Exceptional class multi-family residences have architectural details and features uncommon in conventional apartment buildings. Many exceptional class multi-family structures are designed for sale or conversion to condominium ownership.

Multi-Family Residences – Apartments

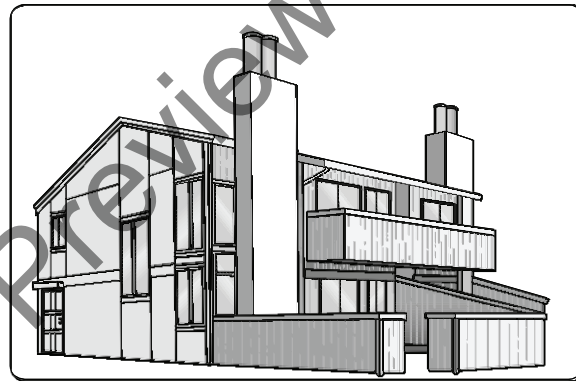
10 or More Units

Estimating Procedure

1. Establish the structure quality class by applying the information on page 19.
2. Multiply the average unit area by the appropriate square foot cost below. The average unit area is found by dividing the building area on all floors by the number of units in the building. The building area should include office and utility rooms, interior hallways and interior stairways.
3. Multiply the total from step 2 by the correct location factor listed on page 7 or 8.
4. Add, when appropriate, the cost of balconies, porches, garages, heating and cooling equipment, basements, fireplaces, carports, appliances and plumbing fixtures beyond that listed in the quality classification. See the cost of these items on pages 27 to 31.
5. Costs assume one bathroom per unit. Add the cost of additional bathrooms from page 30.



Multi-Family, Class 4



Multi-Family, Class 3 & 4

Average Unit in Square Feet

Quality Class	400	450	500	550	600	650	700	750	800	900	1,000
Exceptional	225.96	214.82	210.39	206.01	201.88	198.73	196.00	193.58	191.61	188.27	185.53
1, Best	198.39	188.75	184.85	180.92	177.26	174.63	172.29	170.07	168.27	165.47	162.95
1, & 2	173.96	165.54	162.09	158.67	155.49	153.17	151.03	149.04	147.66	144.94	142.94
2, Good	152.26	144.82	141.86	138.79	136.11	134.04	132.12	130.52	129.20	126.92	125.02
2 & 3	139.26	132.49	129.73	127.09	124.59	122.63	120.97	119.39	118.23	116.12	114.36
3, Hi Average	127.40	121.12	118.66	116.21	113.90	112.10	110.69	109.22	108.09	106.14	104.63
3 & 4	117.68	112.00	109.64	107.27	105.12	103.47	102.05	100.79	99.79	98.09	96.66
4, Lo Average	108.59	103.38	101.16	99.05	97.05	95.71	94.24	93.20	92.30	90.50	89.31
4 & 5	100.36	95.52	93.42	91.48	89.74	88.29	87.11	85.92	85.09	83.58	82.37
5 Minimum	92.62	88.13	86.28	84.50	82.78	81.52	80.32	79.41	78.54	77.19	76.05

Average Unit in Square Feet

Quality Class	1,100	1,200	1,300	1,400	1,500	1,600	1,700	1,800	1,900	2,000	2,200
Exceptional	183.19	181.38	179.59	178.25	176.84	175.90	175.20	174.31	173.56	172.79	172.43
1, Best	160.91	159.30	157.84	156.47	155.31	154.47	153.91	153.11	152.56	151.78	151.41
1, & 2	141.09	139.67	138.38	137.34	136.22	135.56	134.96	134.31	133.69	133.19	132.71
2, Good	123.50	122.29	121.12	120.10	119.10	118.61	118.03	117.51	116.90	116.46	116.21
2 & 3	113.05	111.88	110.82	109.93	108.90	108.44	108.05	107.47	107.03	106.56	106.28
3, Hi Average	103.38	102.37	101.37	100.52	99.69	99.20	98.85	98.32	97.92	97.49	97.14
3 & 4	95.52	94.47	93.65	92.84	92.01	91.65	91.16	90.85	90.40	90.01	89.81
4, Lo Average	88.13	87.25	86.40	85.70	85.07	84.63	84.19	83.80	83.55	83.10	82.95
4 & 5	81.40	80.68	79.84	79.19	78.52	78.05	77.77	77.47	77.08	76.79	76.53
5 Minimum	75.15	74.37	73.72	73.14	72.49	72.10	71.85	71.49	71.20	70.87	70.72

Note: Work outside metropolitan areas may cost 2 to 6% less. Add 2% to the costs for second floor areas and 4% for third floor areas. Add 9% when the exterior walls are masonry.

Motels

Quality Classification

	Class 1 Best Quality	Class 2 Good Quality	Class 3 Average Quality	Class 4 Low Quality
Foundation (4%) Foundation costs will vary greatly with substrate, type, and location.	Concrete slab	Concrete slab	Concrete slab	Concrete slab
Framing* (20% of total Cost)	Wood frame.	Wood frame.	Wood frame.	Wood frame.
Windows (2% of total Cost)	Large, good quality.	Average number and quality.	Average number and quality.	Small, few, low cost.
Roofing (8% of total Cost)	Heavy, shake, tile or slate.	Medium shake or good built-up with large rock, inexpensive tile.	Wood or good composition shingle, light shake, or good built-up with rock.	Inexpensive shingles or built-up with rock.
Overhang (2% of total Cost)	36" open or 24" closed.	30" open or small closed.	16" open.	12" to 16" open.
Exterior Walls (10% of total Cost)	Good wood or stucco, masonry veneer on front.	Good wood siding or stucco with some veneer.	Hardboard, wood shingle, plywood or stucco.	Low cost stucco, hardboard or plywood.
Flooring (5% of total Cost)	Good carpet, good sheet vinyl.	Good carpet, sheet vinyl or inlaid resilient.	Average carpet, average resilient tile in bath.	Minimum tile or low cost carpet.
Interior Finish (23% of total cost including finish carpentry, wiring, lighting, etc.)	Gypsum board with heavy texture or plaster with putty coat. Some good sheet wall cover or paneling.	Gypsum board, taped, textured and painted or plaster. Some wall-paper.	Gypsum board taped and textured or colored interior stucco.	Minimum gypsum board.
Baths (15% of total Cost)	Vinyl or foil wall cover, ceramic tile over tub with glass shower door, ample mirrors.	Ceramic tile over tub with glass shower door.	Plastic coated hardboard with low cost glass shower door.	Plastic coated hardboard with one small mirror.
Plumbing** (9% of total Cost)	Copper tube, good quality fixtures.	Galvanized pipe, good fixtures.	Average cost fixtures.	Plastic pipe, low cost fixtures.
Special Features (2% of total Cost)	8' sliding glass door, 8' to 10' tile pullman in bath.	8' sliding glass door, good tile or plastic top pullman in bath.	Small tile or plastic pullman in bath.	None.
*For Masonry Walls	8" textured face reinforced masonry.	8" colored or detailed reinforced masonry.	8" colored block or common brick, reinforced.	8" painted concrete block.
Note: When masonry walls are used in lieu of wood frame walls add 8% to the appropriate cost				
**Add the Following Amounts per Kitchen Unit				
Kitchens	Good sink, 8' to 10' of good cabinets and drainboard - \$3,920	Average sink and 6' to 8' average cabinet and drainboard - \$3,640	Low cost sink, and 5' of cabinets and drainboard - \$2,610	Minimum sink, cabinets and drainboard - \$2,210
Add the cost of built-in kitchen fixtures from the table of costs for built-in appliances on page 29.				

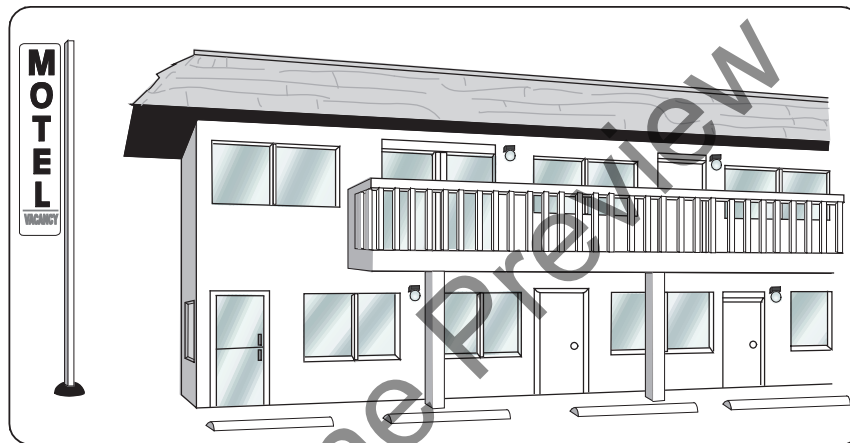
Note: Use the percent of total cost to help identify the correct quality classification.

Motels

9 Units or Less

Estimating Procedure

1. Establish the structure quality class by applying the information on page 23.
2. Multiply the average unit area by the appropriate cost below. The average unit area is found by dividing the total building area on all floors (including office and manager's area, utility rooms, interior hallways and stairway area) by the number of units in the building.
3. Multiply the total from step 2 by the correct location factor listed on page 7 or 8.
4. Add, when appropriate, the cost of heating and cooling equipment, porches, balconies, exterior stairs, garages, kitchens, built-in kitchen appliances and fireplaces. See pages 23 and 27 to 31.



Motel, Class 3 & 4

Average Unit Area in Square Feet

Quality Class	200	225	250	275	300	330	375	425	500	600	720
1, Best	202.47	195.21	189.53	184.71	180.75	176.83	172.11	167.94	163.27	158.81	155.15
1 & 2	185.99	179.31	174.10	169.70	166.08	162.40	158.00	154.22	149.94	145.94	142.48
2, Good	172.59	166.46	161.55	157.51	154.12	150.78	146.69	143.21	139.17	135.39	132.27
2 & 3	158.59	152.98	148.44	144.71	141.63	138.53	134.74	131.55	127.88	124.47	121.60
3, Average	147.18	141.93	137.79	134.30	131.40	128.50	125.07	122.01	118.65	115.45	112.82
3 & 4	135.09	130.27	126.46	123.25	120.63	117.96	114.75	112.06	108.87	105.98	103.49
4, Low	123.49	119.03	115.51	112.68	110.21	107.85	104.90	102.41	99.50	96.81	94.56

Note: Add 2% for work above the first floor. Work outside metropolitan areas may cost 2 to 6% less. Add 8% when the exterior walls are masonry. Deduct 2% for area built on a concrete slab.

Additional Costs for Residential Structures

Balconies, Standard Wood Frame, cost per square foot, including foundations

Supported by 4" x 4" posts, 2" wood floor, open on underside, open 2" x 4" railing.	\$23.30 to \$25.10
Supported by 4" x 4" posts, 2" wood floor, sealed on underside, solid stucco or wood siding on railing.	27.60 to 29.70
Supported by steel columns, lightweight concrete floor, sealed on underside, solid stucco or open grillwork railing	41.90 to 46.20

Heating and Cooling Equipment

Prices include wiring and minimum duct work.

Use the higher figures for smaller residences and in more extreme climates where greater heating and cooling density is required. Cost per square foot of heated or cooled area.

Type	Perimeter Outlets	Overhead Outlets
Central Ducted Air Systems, Single Family		
Forced air heating	\$5.65 to \$6.29	\$4.43 to \$5.08
Forced air heating and cooling	6.40 to 7.62	5.99 to 6.45
Gravity heat	4.10 to 5.52	—
Central Ducted Air Systems, Multi-Family		
Forced air heating	4.99 to 5.39	4.69 to 5.38
Forced air heating and cooling	6.78 to 7.46	5.93 to 6.38
Motel Units		
Forced air heating	5.75 to 6.20	5.60 to 6.11
Forced air heating and cooling	6.90 to 7.46	6.68 to 6.91
Circulating hot and cold water system	13.20 to 15.98	13.40 to 15.98

Floor and Wall Furnaces, cost each

Single floor unit	\$1,040 to \$1,215
Dual floor unit	1,805 to 1,970
Single wall unit	695 to 820
Dual wall unit	1,275 to 1,505
Thermostat control, add	115 to 138

Electric Baseboard Units, cost each

500 watts, 3'	\$196 to \$232
1,000 watts, 4'	301 to 346
1,500 watts, 6'	332 to 379
2,000 watts, 8'	416 to 484
2,500 watts, 10'	494 to 551
3,000 watts, 12'	600 to 665

Outside Stairways, cost per square foot of horizontal step area

Standard wood frame, wood steps with open risers, open on underside, open 2" x 4" railing, unpainted.	\$18.28 to \$20.11
Standard wood frame, solid wood risers, sealed on underside, solid stucco or wood siding on railing.	22.01 to 26.00
Precast concrete steps with open risers, steel frame, pipe rail with ornamental grillwork.	47.98 to 53.50

Ductless mini-split heating and cooling unit. Includes pad-mounted compressor-condenser, 8' of insulated copper refrigerant lines, PVC condensate drain, control wiring, PVC wall chase, clamps, brackets, interior wall-mounted evaporator and wireless control.

9,500 BTU (3/4 ton, 110 volt)	\$1,050
18,000 BTU (1-1/2 ton, 230 volt)	1,320
24,000 BTU (2 ton, 230 volt)	1,650
42,000 BTU (3-1/2 ton, 230 volt, 5-zone)	5,300

Window Type or Thru-the-Wall

Refrigerated Room Coolers, cost each

1/3 ton	\$150 to \$185
1/2	535 to 665
3/4	270 to 325
1	330 to 390
1-1/2	470 to 560
2	800 to 960

Ton = 12,000 Btu

Electric Wall Heaters, cost each

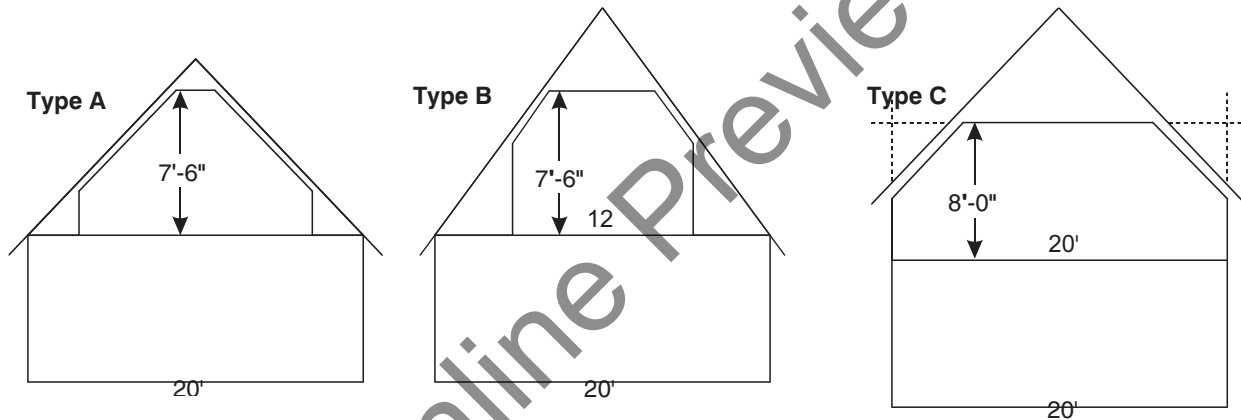
500 watts	\$140 to \$169
1,000	142 to 172
2,000	164 to 197
3,000	185 to 222
Add for circulating fan	79 to 115
Add for thermostat	52 to 115

Additional Costs for Residential Structures

Costs for Multi-Family Residential Bathrooms beyond 1 per unit

	Class 1 Best Quality	Class 2 Good Quality	Class 3 High Average	Class 4 Low Average	Class 5 Minimum Quality
2 or 3 units					
2 fixture bath	\$8,525	\$6,861	\$5,803	\$4,835	\$4,092
3 fixture bath	12,375	10,550	8,752	7,533	6,031
4 fixture bath	15,746	13,610	12,151	9,955	8,523
4 to 9 units					
2 fixture bath	7,868	6,523	5,452	4,556	3,756
3 fixture bath	11,134	9,671	8,324	6,920	5,568
4 fixture bath	15,408	13,046	10,785	8,987	7,424
10 or more units					
2 fixture bath	7,085	6,031	5,119	3,981	3,284
3 fixture bath	10,911	9,111	7,650	6,029	4,950
4 fixture bath	14,396	12,375	9,897	8,099	6,186

Half Story Areas



Use a fraction of the basic square foot cost for figuring the reduced headroom floor area.
Type "C" includes typical dormers.

Type	Same Finish As Main Area	Lesser Quality Finish
A	1/3	1/4
B	1/2	1/3
C	2/3	1/2

Elevators, per shaft cost for car and machinery

Hydraulic based on two stops

Capacity	100 F.P.M.	200 F.P.M.
2,000 lbs.	\$46,200	\$76,200
2,500 lbs.	49,200	78,500
3,000 lbs.	51,600	85,300
3,500 lbs.	—	89,800
4,000 lbs.	—	93,400

Add for deluxe car, \$9,500. Add for each additional stop over 2: \$3,640, baked enamel doors \$9,790, stainless steel doors \$10,300.

Electric based on six stops

Capacity	200 F.P.M.	250 F.P.M.	300 F.P.M.
2,000 lbs.	\$115,800	\$122,400	\$127,100
2,500 lbs.	122,500	129,400	137,400
3,000 lbs.	131,400	143,800	148,700
3,500 lbs.	143,900	153,000	160,700
4,000 lbs.	152,800	165,700	173,500

Add \$8,990 for a deluxe car. Add \$9,800 for each additional stop over 6.

Homes Raised on Piles or Columns

Concrete columns on driven piles
Concrete columns on grade beams
Braced timber piles or poured concrete columns

Add per SF of floor

\$24.70 plus \$1.03 per foot over 5' high
\$11.30 plus \$0.77 per foot over 5' high
\$3.60 plus \$1.03 per foot over 5' high

Multi-Family and Motel Garages Cost Per Square Foot

Garages built at ground level under a multi-family or motel unit. The costs below include the following components:

1. A reinforced concrete floor in all areas.
2. Exterior walls, on one long side and two short sides, made up of a wood frame and good quality stucco, wood siding or masonry veneer.
3. A finished ceiling in all areas.
4. The difference between the cost of a standard wood frame floor structure at second floor level and one at ground level.
5. An inexpensive light fixture for each 600 square feet.

Where no exterior walls enclose the two short sides, use $\frac{2}{3}$ of the square foot cost.

Garages built as separate structures for multi-family or motel units. The costs below include the following components:

1. Foundations.
2. A reinforced concrete floor in all areas.
3. Exterior walls on one long side and two short sides, made up of a wood frame and good quality stucco, wood siding or masonry veneer.
4. Steel support columns supporting the roof.

5. A wood frame roof structure with composition tar and gravel, wood shingle or light shake cover. No interior ceiling finish.
6. An inexpensive light fixture for each 600 square feet.

Use the location modifiers on page 7 or 8 to adjust garage costs to any area.

Basement Garages

Costs listed below are per square foot of floor, including the horizontal area of stairs and the approach ramp. These costs assume a single-level garage is built on one level, approximately 5 feet below grade, directly below 2 to 4 story multi-family structure with perimeter walls in vertical alignment. These costs include:

1. Excavation to 5' below ground line.
2. Full wall enclosure.
3. Typical storage facilities.
4. Minimum lighting.
5. Concrete floors.

Use the location modifiers on page 7 or 8 to adjust garage costs to the site.

Ground Level Garages

Area	400	800	1,200	2,000	3,000	5,000	10,000	20,000
Cost	41.68	37.30	33.32	29.27	27.40	26.28	25.55	24.35

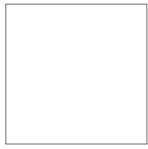
Separate Structure Garages

Area	400	800	1,200	2,000	3,000	5,000	10,000	20,000
Cost	47.81	42.56	39.06	37.07	35.48	34.05	32.60	31.89

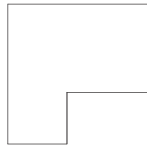
Basement Garages

Type	5,000	7,500	10,000	15,000	20,000	30,000	40,000	60,000
Reinforced concrete exterior walls and columns.								
Flat concrete roof slab.	63.65	58.22	55.71	54.92	53.30	52.67	51.92	51.35
Concrete block exterior walls, reinforced concrete columns. Flat concrete roof slab.	63.27	59.29	55.42	53.90	52.76	52.05	51.30	49.60
Concrete block exterior walls, steel posts and beams, light concrete/metal roof fireproofed with spray plaster.	59.35	54.28	51.68	44.77	42.82	48.03	46.52	45.80
Concrete block exterior walls, wood posts and beams, light concrete/metal roof fireproofed with spray plaster.	52.96	50.31	47.19	43.95	42.56	41.98	41.31	40.55
Add for each security gate	3.86	2.81	2.37	1.76	1.48	1.20	1.04	0.92

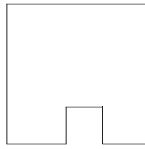
Cabins and Recreational Dwellings



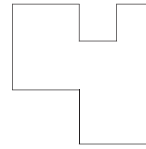
4 corners



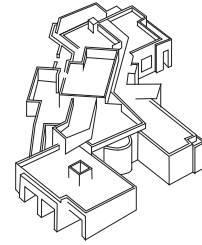
6 corners



8 corners



10 corners



2 building masses

Example of Dwelling Shapes

Cabins and recreational dwellings are designed for single family occupancy, usually on an intermittent basis. These structures are characterized by a more rustic interior and exterior finish and often have construction details which would not meet building requirements in metropolitan areas. Classify these structures into either "conventional type" or "A-frame" construction. Conventional dwellings have an exterior wall which is approximately 8 feet high on all sides. A-frame cabins have a sloping roof which reduces the horizontal area 8 feet above the first floor to between 50% and 75% of the first floor area.

Conventional recreational dwellings vary widely in quality and the quality of construction is the most significant factor influencing cost. Conventional recreational dwellings are listed in six quality classes. Class 1 is the most expensive commonly encountered and Class 6 is the minimum commonly encountered. Nearly all conventional recreational dwellings built from stock plans will fall into Class 3, 4, 5, or 6. For convenience, these classes are labeled *Best Standard*, *Good Standard*, *Average Standard* or *Minimum Standard*. Class 1 residences are labeled *Luxury*. Class 2 residences are labeled *Semi-Luxury*. Class 1 and 2 residences are designed by professional architects, usually to meet preferences of the first owner.

The shape of the outside perimeter also has a significant influence on cost: The more complex the shape, the more expensive the structure per square foot of floor. The shape classification of multiple story or split-level conventional recreational dwellings should be based on the outline formed by the outermost exterior walls, including the garage area, regardless of the story level. Most conventional recreational dwellings fall into Classes 3, 4, 5 or 6 and have 4, 6, 8 or 10 corners, as illustrated above. Small insets that do not require a change in the roof line can be ignored when evaluating the outside perimeter.

Class 1 and 2 (*Luxury and Semi-Luxury*) conventional recreational dwellings have more than ten corners and are best evaluated by counting the "building masses." A building mass is a group of contiguous rooms on one or more levels with access at varying angles from a common point or hallway. The illustration at the right above represents a conventional recreational dwelling with two building masses. Most Class 1 and Class 2 conventional recreational dwellings have from one to four building masses, ignoring any attached garage. For convenience, cost tables for Class 1 and 2 conventional recreational dwellings with one, two, three or four building masses have been appended to cost tables for Class 3, 4, 5 and 6 conventional recreational dwellings with 4, 6, 8 and 10 building corners.

Conventional recreational dwellings which have features of two or more quality classes can be placed between two of the six labeled classes. The tables have five half-classes (1 & 2, 2 & 3, etc.) which can be applied to conventional recreational dwellings with some characteristics of two or more quality classes. If a portion of a conventional recreational dwelling differs significantly in quality from other portions, evaluate the square footage of each portion separately.

Cabins and recreational dwellings are often built under difficult working conditions and in remote sites. Individual judgments may be necessary in evaluating the cost impact of the dwelling location. The costs assume construction by skilled professional craftsmen. Where non-professional labor or second quality materials are used, use the next lower quality classification that might otherwise apply. If the structure is assembled from prefabricated components, use costs for the next lower half class.

Conventional Recreational Dwellings

Quality Classification

	Class 1 Luxury	Class 2 Semi-Luxury	Class 3 Best Std.	Class 4 Good Std.	Class 5 Average Std.	Class 6 Minimum Std.
Foundation (8% of total cost)	Reinforced concrete on a sloping site.	Reinforced concrete.	Reinforced concrete.	Reinforced concrete or concrete block.	Reinforced concrete or concrete block.	Wood piers, light concrete or block
Floor Structure (11% of total cost)	Engineered wood or steel, complex plan, elevation changes.	Engineered wood or steel trusses, good floor insulation.	Engineered wood or steel trusses, T&G sub-floor, good floor insulation.	Good wood frame with OSB sub-floor, some floor insulation.	Standard wood frame with OSB sub-floor, some floor insulation.	2" floor joists 16" on center with OSB sub-floor.
Wall Framing and Exterior Finish (14% of total cost)	Wood or steel, irregular walls, wood siding, stone, veneer, top-grade doors and windows.	Wood or steel, irregular walls, wood siding, stone veneer, better doors and windows.	Wood or steel, several wall offsets, plywood or lap siding, good grade doors and windows.	Wood or steel, shingle or plywood siding, some trim or veneer, average doors and windows.	Wood or steel, wood panel siding few or no offsets, commodity grade doors and windows.	Wood or steel, panel hardboard siding, minimum grade doors and windows.
Roof (13% of total cost)	Complex, heavy tile or metal cover, highly detailed.	Multi-pitch, shake, metal or good tile surface.	Dual-pitch, wood single or tile surface, gable over entrances.	Wood trusses, wood or good fiberglass shingle surface.	Simple wood frame, fiberglass shingle surface.	Wood frame, fiberglass shingle or roll roofing cover.
Floor Finish (5% of total cost)	Stone or masonry tile entry, inlaid hardwood or best carpet throughout.	Masonry entry, good hardwood or carpet in most rooms, good sheet vinyl elsewhere.	Hardwood or tile entry, carpet in most rooms sheet vinyl in kitchen and bathrooms.	Good sheet vinyl or average carpet in most areas, some hardwood or tile.	Sheet vinyl or tile on most areas, carpet in living room.	Composition tile or minimum grade sheet vinyl.
Interior Wall and Ceiling Finish (8% of total cost)	Top-grade paneling or wallboard with artistic finish, many offsets and wall openings, decorative details in most rooms.	Good wood paneling or textured wallboard with decorative details in most rooms, many wall openings, several racks and shelves.	Good hardwood veneer paneling or gypsum wallboard, some irregular walls, decorative details in living room, entry and kitchen.	1/2" gypsum wallboard with smooth finish, plywood paneling at entry and living room, some decorative details.	1/2" gypsum wallboard with smooth finish, most walls are rectangular, doors and windows are the only openings.	Taped 1/2" gypsum wallboard, smooth or orange peel finish. Nearly all walls are regular, few decorative details.
Interior Features (5% of total cost)	Exposed beams or decorative details, 10' to 14' ceiling in great room, many sky widows, built-in shelving.	Great room has exposed beams, most rooms have windows on two sides, several framed openings.	Cathedral ceiling at entry or in master bedroom, floor level changes, several wall openings or pass-throughs.	Cathedral ceiling in master bedroom, sliding glass door, decorative wood molding and trim.	Rustic exposed ceiling beams, sliding closet doors, standard grade wood molding and trim.	Minimum grade molding and trim.
Bath Detail (4% of total cost)	At least 1 large tile shower, good tile counter in master bath.	Tile in 1 bathroom, glass block or good window in each bath, good vanity cabinet.	Tile or fiberglass shower, at least one built-in bathtub, good window in each bath.	Good plastic tub and shower in at least one bathroom, one small window in each bath.	Average plastic tub and shower in at least one bathroom, small vanity cabinet.	Minimum plastic tub and shower in one bathroom, minimum vanity.
Kitchen Detail (8% of total cost)	Over 20 LF of good custom wall & base cabinets, synthetic stone counter top, island work area.	15 to 18 LF of good custom base and wall cabinets, acrylic or tile counter top, desk with book shelf above.	12 to 15 LF of good stock wall and base cabinets, tile or acrylic counter top, desk and shelf or breakfast nook.	10 to 12 LF of stock standard grade wall and base cabinets, low-cost tile or laminated plastic counter top.	8 to 10 LF of stock standard grade wall and base cabinets, laminated plastic or resin coated hardboard top.	Less than 8 LF of low-cost wall and base cabinets, resin-coated hardboard counter top.
Plumbing (11% of total cost)	12 good fixtures, 2 water heaters, laundry room, copper piping.	10 good fixtures large water heater, laundry area, copper piping.	9 average grade fixtures, copper supply and plastic drain piping.	8 standard grade, fixtures, plastic supply and plastic drain lines.	7 low-cost fixtures, plastic supply and plastic drain lines.	6 or less minimum grade fixtures, plastic supply and drain lines.
Special Features (4% of total cost)	10 deluxe built-in appliances, good weather-protection throughout.	7 good built-in appliances, good wall and ceiling insulation.	6 good built-in appliances, good wall and ceiling, insulation.	5 average built-in appliances, adequate wall and ceiling insulation.	4 standard grade kitchen appliances, adequate ceiling insulation.	3 minimum grade built-in kitchen appliances, limited insulation.
Electrical System (9% of total cost)	Ample area and track lighting in most rooms, task light in bathrooms.	Good area and track lighting, simple light fixture in each bathroom.	Good light fixtures in kitchen and baths, limited fixtures in other rooms.	Good light fixture in most rooms, switch-operated outlet in bedrooms.	Simple light fixture in most rooms, switch-operated plugs in bedrooms.	5 or less lighting fixtures, switch-operated plug outlet in most rooms.

Note: Use the percent of total cost to help identify the correct quality classification.

Conventional Recreational Dwellings

8 Corners (Classes 3, 4, 5, and 6) or Three Building Masses (Classes 1 and 2 only)

Estimating Procedure

1. Establish the structure quality class by applying the information on page 33.
2. Multiply the structure floor area by the appropriate cost listed below.
3. Multiply the total from step 2 by the correct location factor listed on page 7 or 8.
4. Add, when appropriate, the cost of a deck or porch, paving, fireplace, garage or carport, heating, extra plumbing fixtures, supporting walls, half story areas, construction on hillside lots, and construction in remote areas.
See page 42.



Conventional Recreational Dwelling, Class 3



Conventional Recreational Dwelling, Class 1 & 2

Square Foot Area

Quality Class	400	500	600	700	800	900	1,000	1,100	1,200	1,300	1,400
1, Luxury	—	—	—	—	474.53	452.09	435.60	423.25	411.25	402.32	393.01
1, & 2	—	—	—	436.83	417.05	397.61	382.87	372.11	361.54	353.73	345.52
2, Semi-Luxury	—	—	409.19	383.31	365.95	349.01	336.11	326.53	317.47	310.31	303.25
2 & 3	—	383.86	354.96	332.56	317.49	302.82	291.62	283.15	275.48	269.23	263.08
3, Best Std.	319.05	287.61	266.05	249.12	237.92	226.95	218.55	212.20	206.46	201.83	197.14
3 & 4	291.72	263.02	243.10	227.84	217.52	207.39	199.82	194.00	188.63	184.38	180.22
4, Good Std.	266.54	240.32	222.27	208.13	198.78	189.58	182.56	177.24	172.39	168.42	164.70
4 & 5	245.95	221.63	205.03	191.97	183.36	174.87	168.38	163.59	159.16	155.43	152.06
5 Avg. Std.	226.89	204.47	189.09	177.17	169.13	161.29	155.36	150.93	146.79	143.34	140.11
5 & 6	209.26	188.63	174.39	163.39	156.08	148.81	143.25	139.23	135.30	132.21	129.38
6, Min. Std.	193.00	174.02	160.88	150.74	143.89	137.22	132.20	128.49	124.92	122.06	119.38

Square Foot Area

Quality Class	1,500	1,600	1,700	1,800	2,000	2,200	2,400	2,600	2,800	3,000	3,200
1, Luxury	387.07	379.66	374.01	370.26	360.07	352.35	346.36	340.87	336.90	331.33	328.22
1, & 2	340.20	333.85	328.91	325.48	316.53	309.47	304.54	299.62	298.32	291.24	288.60
2, Semi-Luxury	298.67	293.12	288.82	285.54	277.95	271.51	267.30	262.80	259.75	255.64	253.31
2 & 3	258.97	254.22	250.52	247.69	241.09	235.41	231.94	228.04	225.31	221.79	219.78
3, Best Std.	194.08	190.44	187.71	185.62	180.75	176.42	173.83	170.90	168.92	166.29	164.67
3 & 4	177.48	174.12	171.44	169.65	165.32	161.29	158.84	156.25	154.31	152.05	150.58
4, Good Std.	162.16	159.16	156.83	155.04	151.04	147.42	145.16	142.80	141.09	138.73	137.60
4 & 5	149.49	146.79	144.60	143.25	139.26	136.06	133.97	131.70	130.16	128.08	—
5 Avg. Std.	137.93	135.32	133.41	131.93	128.50	125.45	123.66	121.48	120.05	—	—
5 & 6	127.20	124.95	123.22	121.58	118.55	115.66	114.00	112.04	—	—	—
6, Min. Std.	117.33	115.31	113.52	112.28	109.46	106.81	105.17	—	—	—	—

Note: Add 4% to the square foot cost for floors above the second floor level.

“A-Frame” Cabins

Quality Classification

	Class 1 Best Quality	Class 2 Good Quality	Class 3 Average Quality	Class 4 Low Quality
Framing (10% of total cost)	Wood frame.	Wood frame.	Wood frame.	Wood frame.
Floor Framing (5% of total cost)	4" x 8" girders 48" o.c. with 2" T&G subfloor, or 2" x 6" to 2" x 8" joists 16" o.c. with 1" subfloor.	4" x 8" girders 48" o.c. with 1-1/4" plywood or 2" T&G subfloor, or 2" x 6" to 2" x 8" joists 16" o.c. with 1" subfloor.	4" x 6" girders 48" o.c. with 1-1/4" plywood or 2" T&G subfloor, or 2" x 6" joists 16" o.c. with 1" subfloor.	4" x 6" girders 48" o.c. with 1-1/4" plywood or 2" T&G subfloor, or 2" x 6" joists 16" o.c. with 1" subfloor.
Roof Framing (8% of total cost)	4" x 8" at 48" o.c. with 2" or 3" T&G sheathing.	4" x 8" at 48" o.c. with 2" or 3" T&G sheathing.	4" x 8" at 48" o.c. with 2" T&G sheathing.	4" x 8" at 48" o.c. with 1-1/4" plywood or 2" T&G sheathing.
Gable End Finish (5% of total cost)	Good plywood, lap board or board and batt.	Average to good plywood, or boards.	Average plywood, board or wood shingle.	Low cost plywood, shingle or composition siding.
Windows (2% of total cost)	Good quality large insulated wood or metal windows.	Average quality insulated wood or metal windows.	Average quality wood or metal windows.	Small glass area of low cost windows.
Roofing (10% of total cost)	Heavy wood shakes.	Medium wood or aluminum shakes.	Wood or composition shingles.	Low cost composition shingles.
Flooring (5% of total cost)	Good carpet or hardwood with sheet vinyl in kitchen and baths.	Average to good quality carpet with good tile or sheet vinyl in kitchen and baths.	Average quality carpet with resilient tile in kitchen and baths.	Composition tile.
Interior Finish (25% of total cost including finish carpentry, wiring, lighting, fireplace, etc.)	Good quality hard-wood veneer paneling.	Good textured gypsum wallboard, good plywood or knotty pine paneling.	Textured gypsum wallboard or plywood paneling.	Low cost paneling or wallboard.
Bathrooms (5% of total cost)	Two 3-fixture baths and one 2-fixture bath, good fixtures.	Two 3-fixture baths, good fixtures.	Two 3-fixture baths, average fixtures.	One 3-fixture bath.
Kitchen (5% of total cost)	15' to 18' good quality hardwood veneer base cabinet with matching wall cabinets. 15' to 18' of good quality plastic or ceramic tile drain board.	12' to 16' of hard-wood veneer base cabinet with matching wall cabinets. 12' to 16' of plastic or ceramic tile drainboard.	8' to 12' of average quality veneer or painted base cabinets with matching wall cabinets. 8' to 12' of plastic drainboard.	6' to 8' of minimum base cabinets with matching wall cabinets. 6' to 8' of minimum plastic drainboard.
Plumbing (15% of total cost)	Nine good quality fixtures and one larger or two 30 gallon water heaters. Copper supply piping.	Seven good quality fixtures and one water heater.	Seven average quality fixtures and one water heater.	Four low cost fixtures and one water heater. Plastic supply pipe.
Special Features (5% of total cost)	Built-in oven, range, dishwasher, disposer, range hood with good insulation, good lighting fixtures, insulated sliding glass door and ornate entry door.	Built-in range, oven and range hood, some insulation, 8' sliding glass door, average electric fixtures.	Drop-in range and hood, some insulation, low cost electric fixtures.	Minimum electric fixtures.

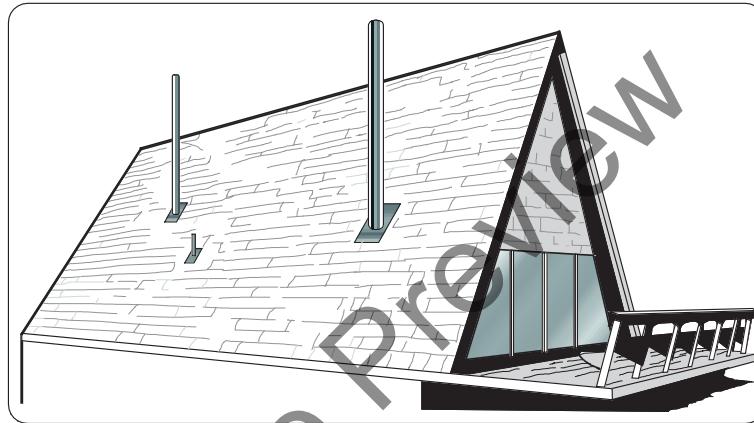
Note: Use the percent of total cost to help identify the correct quality classification.

"A-Frame" Cabins

4 Corners

Estimating Procedure

1. Establish the structure quality class by applying the information on page 38.
2. Multiply the structure floor area by the appropriate cost listed below.
3. Multiply the total from step 2 by the correct location factor listed on page 7 or 8.
4. Add, when appropriate, the cost of a deck or porch, paving, fireplace, garage or carport, heating, extra plumbing fixtures, supporting walls, half story areas, construction on hillside lots, and construction in remote areas.
See page 42.



"A-Frame" Cabin, Class 3 & 4

Square Foot Area

Quality Class	400	500	600	700	800	900	1,000	1,100	1,200	1,300	1,400
1, Best	252.28	227.63	210.50	197.94	188.10	180.32	173.90	168.53	163.99	159.98	156.56
1 & 2	231.81	209.16	193.43	181.83	172.88	165.54	159.79	154.85	150.63	147.04	143.85
2, Good	212.68	191.88	177.57	166.84	158.67	152.02	146.67	142.06	138.29	134.94	132.01
2 & 3	200.78	181.17	167.57	157.52	149.74	143.53	138.38	134.18	130.51	127.36	124.60
3, Average	190.21	171.64	158.75	149.20	141.80	135.93	131.07	127.04	123.66	120.64	118.05
3 & 4	172.63	155.79	144.01	135.42	128.74	123.41	119.04	115.33	112.21	109.48	107.19
4, Low	154.85	139.76	129.27	121.54	115.54	110.70	106.79	103.51	100.62	98.24	96.11

Square Foot Area

Quality Class	1,500	1,600	1,700	1,800	2,000	2,200	2,400	2,600	2,800	3,000	3,200
1, Best	150.99	148.55	146.35	144.32	140.84	137.92	135.49	133.33	131.47	129.77	128.35
1 & 2	139.33	137.10	134.98	133.16	129.98	127.26	125.03	123.04	121.36	119.82	118.49
2, Good	128.56	126.42	124.55	122.83	119.92	117.46	115.34	113.53	111.89	110.51	109.32
2 & 3	122.04	120.02	118.24	116.65	113.81	111.51	109.48	107.77	106.24	104.94	103.73
3, Average	115.92	114.03	112.29	110.85	108.16	105.92	103.99	102.37	100.97	99.68	98.57
3 & 4	106.66	104.92	103.31	101.97	99.51	97.46	95.72	94.20	92.89	91.74	90.68
4, Low	95.43	93.54	92.58	91.27	90.10	88.27	86.66	85.26	84.11	83.04	82.12

Cabins and Recreational Dwellings

Additional Costs

Half-Story Costs

For conventional recreational dwellings, use the suggested fractions found on page 30 in the section "Additional Costs for Residential Structures." For "A-Frame" cabins, use one of the following costs: A simple platform with low cost floor cover, minimum partitions, and minimum lighting costs \$69 to \$101 per square foot. Average quality half story area with average quality carpet, average number of partitions finished with gypsum wallboard or plywood veneer and average lighting costs \$101 to \$112 per square foot. A good quality half story area with good carpet, decorative rustic partitions, ceiling beams and good lighting costs \$133 to \$155 per square foot.

Decks and Porches, per square foot

2" wood deck with steps and railing (300 S.F. base)	
1' to 4' above ground	\$25.57 to \$30.01
Over 4' to 6' above ground	29.70 to 38.50
Over 6' to 9' above ground	31.10 to 40.77
Over 9' to 12' above ground	32.24 to 42.69
Over 12' above ground	33.98 to 44.15

Fireplaces, 2-story, including foundation

Metal hood with concrete slab	\$2,734 to \$3,386
Prefabricated, zero clearance	3,920 to 5,884
Simple concrete block	4,790 to 7,973
Concrete block with stone facing	6,320 to 9,610
Simple natural stone	10,905 to 15,820

Extra Plumbing, cost each

Lavatory	\$1,680 to \$2,465
Water closet or bidet	2,050 to 2,516
Tub and shower	2,160 to 2,880
Stall shower	1,612 to 2,350
Laundry or utility sink	1,175 to 1,390

Supporting Wall Costs

Cabins and recreational dwellings built on sloping lots cost more than if they are built on level lots. The cost of supporting walls of a building that do not enclose any living area should be estimated by using the figures below. These costs include everything above a normal foundation (12" to 18" above ground) up to the bottom of the next floor structure where square foot costs can be applied. In addition to the cost of supporting walls, add the cost of any extra structural members and the higher cost of building on a slope. A good rule of thumb for this is to add \$960 for each foot of vertical distance between the highest and the lowest points of intersection of foundation and ground level.

Wood posts, per foot of height

4" x 4"	\$2.39 to \$3.80
4" x 6"	3.80 to 6.50
6" x 6"	4.90 to 9.25
8" x 8"	11.07 to 17.20
10" x 10"	20.49 to 29.36
12" x 12"	30.80 to 42.85

Brick, per square foot of wall

8" common brick	\$39.54 to \$48.44
12" common brick	60.74 to 75.58
8" common brick, 1 side face brick	50.24 to 61.90
12" common brick, 1 side face brick	78.55 to 97.84

Heating, cost each

Wall furnace, 35,000 Btu	\$1,370
Wall furnace, 65,000 Btu	1,680
Baseboard hot water, per SF*	5.36
Central heating, perimeter ducts, per S.F.*	7.50

*Cost is per SF of floor area heated.

Garages, Carports and Basements

For garage, carport and basement costs for conventional recreational dwellings, see pages 27 and 29.

Flatwork, per square foot

Asphalt paving	\$5.28 to \$7.93
4" concrete	5.42 to 8.16
6" concrete	5.76 to 8.40

Reinforced concrete walls, per C.F.

Formed one side only	\$22.50 to \$26.12
Formed both sides	28.80 to 32.53

Reinforced concrete block, per square foot of wall

8" natural	\$10.63 to \$12.83
8" colored	14.63 to 17.19
8" detailed blocks, natural	12.10 to 15.86
8" detailed blocks, colored	16.49 to 18.63
8" sandblasted	12.83 to 15.04
8" splitface, natural	10.95 to 12.90
8" splitface, colored	16.19 to 19.40
8" slump block, natural	11.76 to 14.62
8" slump block, colored	16.30 to 18.89
12" natural	20.75 to 23.20

Life in Years and Depreciation for Residences

Quality Class	1	2	3	4	5	6
Single family residences	70	70	70	60	60	55
Manufactured housing	55	50	45	40	30	
Multi-family residences	60	60	55	55	50	
Motels	60	55	55	50		
Conventional recreational dwellings	70	60	60	55	55	50
A-frame cabins	60	55	55	50		

This table shows typical physical lives in years in the absence of unusual physical, functional or economic obsolescence. Raise half classes to the next higher whole class.

To Find the Present Value of an Existing Residence

Present value is the replacement cost less depreciation (inverse of the “% Good” column below). Multiply the appropriate figure in the “% good” column by the current replacement cost developed using this manual to find the present value. For newer residences, the chronological age (“Age” column) is usually the best indicator of percent good. The present value of older residences may be influenced more by physical, functional or economic obsolescence than by age. When physical, functional or economic conditions limit or extend the remaining useful life of a residence, estimate that life in years and use the “Rem. Life” column (rather than the “Age” column) to find the percent good.

20 Years		25 Years		30 Years		40 Years		45 Years		50 Years		55 Years		60 Years		70 Years	
Rem.	%	Rem.	%	Rem.	%	Rem.	%	Rem.	%	Rem.	%	Rem.	%	Rem.	%	Rem.	%
Age	Life	Age	Life	Age	Life	Age	Life	Age	Life	Age	Life	Age	Life	Age	Life	Age	Life
0	20	100	25	100	30	100	40	100	0	45	100	50	100	55	100	60	100
1	19	94	24	95	29	96	39	98	2	43	97	48	97	53	98	58	98
2	18	88	23	90	28	93	38	96	4	41	93	46	94	51	96	56	96
3	17	81	22	86	27	89	37	94	6	39	89	44	91	49	94	54	95
4	16	75	21	81	26	86	36	92	8	37	85	42	88	47	91	52	92
5	15	69	20	77	25	82	35	90	10	35	81	39	85	45	88	50	90
6	14	63	19	72	24	79	34	87	12	33	77	38	82	43	85	48	87
7	13	59	18	68	23	75	33	84	14	32	73	36	78	41	82	46	85
8	12	57	17	63	22	71	32	82	16	30	69	35	74	40	79	45	83
9	11	55	16	60	21	67	31	80	18	28	65	33	70	38	76	43	80
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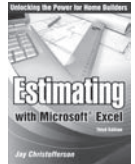
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336 pages, 8½ x 11, \$38.00

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A practical guide to simplified construction surveying. How to divide land, use a transit and tape to find a known point, draw an accurate survey map from your field notes, use topographic surveys, and the right way to level and set grade. You'll learn how to make a survey for any residential or commercial lot, driveway, road, or bridge — including how to figure cuts and fills and calculate excavation quantities. Use this guide to make your own surveys, or just read and verify the accuracy of surveys made by others.

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National Repair & Remodeling Estimator



The complete pricing guide for dwelling reconstruction costs. Reliable, specific data you can apply on every repair and remodeling job. Up-to-date material costs and labor figures based on thousands of jobs across the country. Provides recommended crew sizes; average production rates; exact material, equipment, and labor costs; a total unit cost and a total price including overhead and profit. Separate listings for high- and low-volume builders, so prices shown are specific for any size business. Estimating tips specific to repair and remodeling work to make your bids complete, realistic, and profitable. Includes a free download of an electronic version of the book with *National Estimator*, a stand-alone *Windows*™ estimating program. Additional information and *National Estimator ShowMe* tutorial video is available on our website under the "Support" dropdown tab.

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National Home Improvement Estimator

Current labor and material prices for home improvement projects. Provides manhours for each job, recommended crew size, and the labor cost for removal and installation work. Material prices are current, with location adjustment factors and free monthly updates on the Web. Gives step-by-step instructions for the work, with helpful diagrams, and home improvement shortcuts and tips from experts. Includes a free download of an electronic version of the book, and *National Estimator*, a stand-alone *Windows*™ estimating program. Additional information and *National Estimator ShowMe* tutorial video is available on our website under the "Support" dropdown tab.

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Standard Estimating Practice, 10th Edition

Estimating isn't always an easy job. Sometimes snap decisions can produce negative long-term effects. This book was designed by the American Society of Professional Estimators as a set of standards to guide professional estimators. It's intended to help every estimator develop estimates that are uniform and verifiable. Every step that should be included in the estimate is listed, as well as aspects in the plans to consider when you're estimating a job, and what you should look for that may not be included. The result should help you produce more consistently accurate estimates.

852 pages, 8½ x 11, \$99.95



Builder's Guide to Accounting Revised

Step-by-step, easy-to-follow guidelines for setting up and maintaining records for your building business. This practical guide to all accounting methods shows how to meet state and federal accounting requirements, explains the new depreciation rules, and describes how the Tax Reform Act can affect the way you keep records. Full of charts, diagrams, simple directions and examples to help you keep track of where your money is going. Recommended reading for many state contractor's exams. Each chapter ends with a set of test questions, and a CD-ROM included FREE has all the questions in interactive self-test software. Use the Study Mode to make studying for the exam much easier, and Exam Mode to practice your skills.

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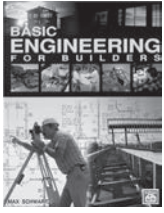
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328 pages, 8½ x 11, \$42.50

eBook (PDF) also available; \$21.25 at www.craftsman-book.com

Basic Engineering for Builders



This book is for you if you've ever been stumped by an engineering problem on the job, yet wanted to avoid the expense of hiring a qualified engineer. Here you'll find engineering principles explained in non-technical language and practical methods for applying them on the job. With the help of this book you'll be able to understand engineering functions in the plans

and how to meet the requirements, how to get permits issued without the help of an engineer, and anticipate requirements for concrete, steel, wood and masonry. See why you sometimes have to hire an engineer and what you can undertake yourself: surveying, concrete, lumber loads and stresses, steel, masonry, plumbing, and HVAC systems. This book is designed to help you, the builder, save money by understanding engineering principles that you can incorporate into the jobs you bid. **400 pages, 8½ x 11, \$39.50**
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National Renovation & Insurance Repair Estimator



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488 pages, 8½ x 11, \$99.50. Revised annually
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Easy Scheduling

Easy Scheduling presents you with a complete set of "real world" scheduling tools that are specifically tailored to meet the needs of small- to medium-sized construction businesses. Step by step, it shows you how to use *Microsoft Project* to build a schedule that will synchronize everyone's efforts into an organized system that becomes the foundation of all planning and communication for all your jobs. You'll see how to establish realistic project goals, set checkpoints, activities, relationships and time estimates for each task, as well as establish priorities. You'll learn how to create a project flowchart to keep everyone focused and on track, and see how to use CSI (Construction Specification Institute) coding to organize and sort tasks, methods, and materials across multiple projects. If you want an easy way to schedule your jobs, *Microsoft Project* and *Easy Scheduling* is the answer for you. (Does not include *Microsoft Project*.) Published by BNI.

316 pages, 8½ x 11, \$59.95

Moving to Commercial Construction

In commercial work, a single job can keep you and your crews busy for a year or more. The profit percentages are higher, but so is the risk involved. This book takes you step-by-step through the process of setting up a successful commercial business: finding work, estimating and bidding, value engineering, getting through the submittal and shop drawing process, keeping a stable work force, controlling costs, and promoting your business. Explains the design/build and partnering business concepts and their advantage over the competitive bid process. Includes sample letters, contracts, checklists and forms that you can use in your business, plus a CD-ROM with blank copies in several word-processing formats for both Mac™ and PC computers. **256 pages, 8½ x 11, \$42.00**

eBook (PDF) also available; \$21.00, at www.craftsman-book.com

Home Building Mistakes & Fixes

This is an encyclopedia of practical fixes for real-world home building and repair problems. There's never an end to "surprises" when you're in the business of building and fixing homes, yet there's little published on how to deal with construction that went wrong - where out-of-square or non-standard or jerry-rigged turns what should be a simple job into a nightmare. This manual describes jaw-dropping building mistakes that actually occurred, from disastrous misunderstandings over property lines, through basement floors leveled with an out-of-level instrument, to a house collapse when a siding crew removed the old siding. You'll learn the pitfalls the painless way, and real-world working solutions for the problems every contractor finds in a home building or repair jobsite. Includes dozens of those "surprises" and the author's step-by-step, clearly illustrated tips, tricks and work-arounds for dealing with them. **384 pages, 8½ x 11, \$52.50**

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Concrete Construction

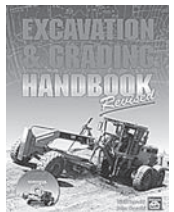
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Excavation & Grading Handbook Revised

The foreman's, superintendent's and operator's guide to highway, subdivision and pipeline jobs: how to read plans and survey stake markings, set grade, excavate, compact, pave and lay pipe on nearly any job. Includes hundreds of informative, on-the-job photos and diagrams that even experienced pros will find invaluable. This new edition has been completely revised to be current with state-of-the-art equipment usage and the most efficient excavating and grading techniques. You'll learn how to read topo maps, use a laser level, set crows feet, cut drainage channels, lay or remove asphaltic concrete, and use GPS and sonar for absolute precision. For those in training, each chapter has a set of self-test questions, and a Study Center CD-ROM included has all 250 questions in a simple interactive format to make learning easy and fun. **512 pages, 8½ x 11, \$59.00**
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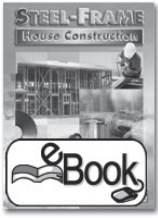


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In this single, 4-page laminated card, you get all the math essentials you need in contracting. The formulas and rules of thumb for calculating dimensions, surface areas, volume, etc.

4 pages, 8½ x 11, \$7.95

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Framing with steel has obvious advantages over wood, yet building with steel requires new skills that can present challenges to the wood builder. This book explains the secrets of steel framing techniques for building homes, whether pre-engineered or built stick by stick. It shows you the techniques, the tools, the materials, and how you can make it happen. Includes

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How to design plumbing systems in residential, commercial, and industrial buildings. Covers designing systems that meet code requirements for homes, commercial buildings, private sewage disposal systems, and even mobile home parks. Includes relevant code sections and many illustrations to guide you through what the code requires in designing drainage, waste, and vent systems.

192 pages, 8½ x 11, \$39.95

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Public Works Inspectors' Manual, 7th Edition

A complete operational and technical guidebook for all professionals involved in public works construction. The most complete and authoritative reference of its kind ever written. 75 charts, tables and drawings. Written by a former public works inspector.

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352 pages, 4 x 6, \$21.95

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240 pages, 8½ x 11, \$49.95. Published by Builder's Book, Inc.

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