



2023 NATIONAL BUILDING COST MANUAL

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Edited by Ben Moselle

47th Edition



National
Building Cost
Estimator



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Contents of This Manual

Explanation of the Cost Tables	4
Area Modification Factors	7
Construction Cost Index.....	9

Residential Structures Section..... 10

Single Family Residences	10
Manufactured Housing.....	16
Multi-Family Residences	19
Motels.....	23
Additional Costs for Residences.....	27
Multi-Family and Motel Garages.....	31
Cabins and Recreational Dwellings	32
Conventional Recreational Dwellings.....	33
"A-Frame" Cabins	38
Additional Costs for Recreational Dwellings	42
Life in Years and Depreciation for Residences.....	43

Public Buildings Section 44

Elementary Schools	44
Secondary Schools	53
Government Buildings.....	56
Public Libraries.....	62
Fire Stations	68

Commercial Structures Section 74

Urban Stores, Masonry or Concrete	76
Urban Stores, Wood or Wood and Steel.....	82
Suburban Stores, Masonry or Concrete	89
Suburban Stores, Wood or Wood and Steel.....	94
Supermarkets, Masonry or Concrete	103
Supermarkets, Wood or Wood and Steel.....	105
Small Food Stores, Masonry or Concrete.....	107
Small Food Stores, Wood Frame.....	109
Discount Houses, Masonry or Concrete.....	111
Discount Houses, Wood or Wood and Steel.....	113
Banks and Savings Offices, Masonry or Concrete	115
Banks and Savings Office, Wood Frame.....	120
Department Stores, Reinforced Concrete.....	126
Department Stores, Masonry or Concrete	129
Department Stores, Wood Frame	132
General Office Buildings, Masonry or Concrete	135
General Office Buildings, Wood Frame	143
Medical-Dental Buildings, Masonry or Concrete	151
Medical-Dental Buildings, Wood Frame	159
Convalescent Hospitals, Masonry or Concrete	167
Convalescent Hospitals, Wood Frame	169
Funeral Homes.....	171
Ecclesiastic Buildings	173
Self Service Restaurants	175
Coffee Shop Restaurants.....	178
Conventional Restaurants.....	181
"A-Frame" Restaurants	183

Theaters, Masonry or Concrete.....	185
Mobile Home Parks.....	195
Service Stations, Wood, Masonry or Steel.....	198
Service Stations, Porcelain Finished Steel.....	200
Service Stations, Ranch or Rustic	202
Additional Costs for Service Stations.....	204
Service Garages, Masonry or Concrete.....	208
Service Garages, Wood Frame.....	213
Auto Service Centers, Masonry or Concrete.....	218

Industrial Structures Section..... 222

Warehouses	224
Light Industrial Buildings.....	225
Factory Buildings.....	226
Internal Offices	227
External Offices	227
Steel Buildings.....	228
Alternate Costs for Steel Buildings.....	230
Commercial and Industrial Building Lives.....	235
Additional Commercial and Industrial Costs.....	236
Material Handling System	242
Display Fronts	242
Satellite Receiver Systems	245
Signs	246
Yard Improvements.....	247

Agricultural Structures Section..... 249

General Purpose Barns	250
Hay Storage Barns	251
Feed Barns.....	252
Shop Buildings	253
Machinery and Equipment Sheds.....	254
Small Sheds	255
Pole Barns	256
Low Cost Dairy Barns.....	257
Stanchion Dairy Barns.....	258
Walk-Through Dairy Barns	259
Modern Herringbone Barns	260
Miscellaneous Dairy Costs.....	261
Poultry Houses, Conventional	262
Poultry Houses, Modern Type.....	263
Poultry Houses, High Rise Type	264
Poultry Houses, Deep Pit Type	265
Poultry House Equipment	266
Green Houses	267
Migrant Worker Housing	268
Miscellaneous Agricultural Structures.....	269
Typical Lives for Agricultural Buildings	269

Military Construction Section..... 270

Facility Costs	271
Index.....	273

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-2023.

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

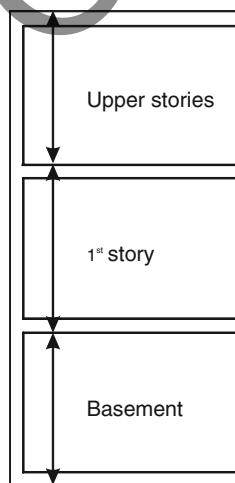
The basic building cost tables reflect the fact that larger buildings generally cost less per square foot than smaller buildings. The cost tables are based on square foot areas which include the following:

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 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. For a valuation tool that considers condition of specific parts of residential buildings, see Craftsman's National Appraisal Estimator at <https://craftsman-book.com/national-appraisal-estimator-online-software>.

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 -2%			Salinas 939 3%			Atlanta 303 20%			Muncie 473 -9%			Camden 48 -9%		
Anniston 362	-7%		San Bernardino 923-924	3%		Augusta 308-309	0%		South Bend 466	-4%		Outler 46	-10%	
Auburn 368	-4%		San Diego 919-921	7%		Buford 305	-1%		Terre Haute 478	-6%		Dexter 49	-6%	
Bellamy 369	-3%		San Francisco 941	33%		Calhoun 307	-1%					Northern Area 47	-8%	
Birmingham 350-352	4%		San Jose 950-951	22%		Columbus 318-319	-3%					Portland 41	3%	
Dothan 363	-3%		San Mateo 943-944	26%		Dublin/Fort Valley 310	-8%		Iowa Average -3%					
Evergreen 364	-4%		Santa Barbara 931	3%		Hinesville 313	3%		Burlington 526	-4%				
Gadsden 359	-7%		Santa Rosa 954	8%		Kings Bay 315	-10%		Carroll 514	-6%		Maryland Average 3%		
Huntsville 358	7%		Stockton 952	8%		Macon 312	2%		Cedar Falls 506	-2%		Annapolis 214	9%	
Jasper 355	-10%		Sunnyvale 940	26%		Marietta 300-302	7%		Cedar Rapids 522-524	2%		Baltimore 210-212	6%	
Mobile 365-366	-2%		Van Nuys 913-916	8%		Savannah 314	-2%		Cherokee 510	-1%		Bethesda 208-209	13%	
Montgomery 360-361	-1%		Whittier 906	9%		Statesboro 304	5%		Council Bluffs 515	-4%		Church Hill 216	-3%	
Scottsboro 357	2%					Valdosta 316	-3%		Creston 508	-4%		Cumberland 215	-9%	
Selma 367	-4%		Colorado Average 2%						Davenport 527-528	0%		Elkton 219	4%	
Sheffield 356	-1%		Aurora 800-801	10%		Hawaii Average 18%			Decorah 521	-6%		Frederick 217	5%	
Tuscaloosa 354	-4%		Boulder 803-804	7%		Aliamau 968	21%		Des Moines 500-503	3%		Laurel 206-207	8%	
			Colorado Springs 808-809	2%		Ewa 967	18%		Dubuque 520	-2%		Salisbury 218	-6%	
			Denver 802	12%		Halawa Heights 967	18%		Fort Dodge 505	-2%				
Alaska Average 14%			Durango 813	-5%		Hilo 967	18%		Mason City 504	-3%		Massachusetts Average 12%		
Anchorage 995	18%		Fort Morgan 807	-1%		Honolulu 968	21%		Ottumwa 525	-10%		Ayer 015-016	7%	
Fairbanks 997	20%		Glenwood Springs 816	4%		Kailua 968	21%		Sheldon 512	-1%		Bedford 17	20%	
Juneau 998	13%		Grand Junction 814-815	-4%		Luualaei 967	18%		Shenandoah 516	-12%		Boston 021-022	27%	
Ketchikan 999	5%		Greeley 806	7%		Mililani Town 967	18%		Sioux City 511	0%		Brockton 023-024	20%	
King Salmon 996	15%		Longmont 805	4%		Pearl City 967	18%		Spencer 513	-3%		Cape Cod 26	6%	
			Pagosa Springs 811	-5%		Wahiawa 967	18%		Waterloo 507	-4%		Chicopee 10	5%	
			Pueblo 810	-3%		Waianae 967	18%		Kansas Average -7%			Dedham 19	15%	
			Salida 812	-3%		Wailuku (Maui) 967	18%		Colby 677	-5%		Fitchburg 14	14%	
Arizona Average -4%			Connecticut Average 8%			Idaho Average -8%			Concordia 669	-15%		Hingham 20	20%	
Chambers 865	-13%		Bridgeport 66	8%		Boise 837	0%		Dodge City 678	-7%		Lawrence 18	18%	
Douglas 855	-9%		Bristol 60	11%		Coeur d'Alene 838	-6%		Emporia 668	-11%		Nantucket 25	12%	
Flagstaff 860	-8%		Fairfield 64	10%		Idaho Falls 834	-9%		Fort Scott 667	-5%		New Bedford 27	9%	
Kingman 864	-4%		Hartford 61	9%		Lewiston 835	-13%		Hays 676	-11%		Northfield 13	4%	
Mesa 852	6%		New Haven 65	7%		Meridian 836	-6%		Hutchinson 675	-8%		Pittsfield 12	-1%	
Phoenix 850	6%		Norwich 63	4%		Pocatello 832	-10%		Independence 673	-2%		Springfield 11	3%	
Prescott 863	-5%		Stamford 068-069	14%		Sun Valley 833	-8%		Kansas City 660-662	4%				
Show Low 859	-8%		Waterbury 67	7%					Liberal 679	-11%		Michigan Average 1%		
Tucson 856-857	-4%		West Hartford 62	3%		Illinois Average 4%			Salina 674	-8%		Battle Creek 490-491	-1%	
Yuma 853	5%					Arlington Heights 600	12%		Topeka 664-666	-5%		Detroit 481-482	8%	
			Delaware Average 3%			Aurora 605	14%		Wichita 670-672	-5%		Flint 484-485	-1%	
Arkansas Average -7%			Dover 199	0%		Belleville 622	4%		Kentucky Average -6%			Grand Rapids 493-495	5%	
Batesville 725	-9%		Newark 197	6%		Bloomington 617	0%		Ashland 411-412	-5%		Grayling 497	-5%	
Camden 717	-8%		Wilmington 198	5%		Carbondale 629	-8%		Bowling Green 421	-4%		Jackson 492	-2%	
Fayetteville 727	-4%					Carol Stream 601	13%		Campton 413-414	-13%		Lansing 488-489	1%	
Fort Smith 729	-7%		District of Columbia Average 11%			Centralia 628	-6%		Covington 410	4%		Marquette 498-499	-2%	
Harrison 726	-13%		Washington 200-205	11%		Champaign 618	-2%		Elizabethtown 427	-7%		Pontiac 483	9%	
Hope 718	-9%					Chicago 606-608	13%		Frankfort 406	-8%		Royal Oak 480	8%	
Hot Springs 719	-13%		Florida Average -3%			Decatur 623	-4%		Hazard 417-418	-13%		Saginaw 486-487	-1%	
Jonesboro 724	-3%		Altamonte Springs 327	-2%		Galesburg 614	-4%		Hopkinsville 422	-5%		Traverse City 496	-2%	
Little Rock 720-722	-2%		Bradenton 342	-5%		Granite City 620	1%		Lexington 403-405	2%		Minnesota Average 2%		
Pine Bluff 716	-13%		Brooksville 346	-5%		Green River 612	0%		Louisville 400-402	0%		Bemidji 566	2%	
Russellville 728	1%		Daytona Beach 321	-9%		Joliet 604	12%		London 407-409	-12%		Brainerd 564	0%	
West Memphis 723	-7%		Fort Lauderdale 333	3%		Kankakee 609	0%		Owensboro 423	-8%		Duluth 556-558	0%	
			Fort Myers 339	-5%		Lawrenceville 624	-2%		Paducah 420	-7%		Fergus Falls 565	-6%	
California Average 9%			Fort Pierce 349	-7%		Oak Park 603	15%		Pikeville 415-416	-11%		Magnolia 561	-7%	
Alhambra 917-918	9%		Gainesville 326	-7%		Peoria 615-616	8%		Somerset 425-426	-10%		Mankato 560	1%	
Bakersfield 932-933	-1%		Jacksonville 322	-1%		Peru 613	3%		White Plains 424	-3%		Minneapolis 553-555	13%	
El Centro 922	0%		Lakeland 338	-7%		Quincy 602	13%		Louisiana Average 1%			Rochester 559	0%	
Eureka 955	-2%		Melbourne 329	-6%		Rockford 610-611	4%		Alexandria 713-714	-8%		St Cloud 563	10%	
Fresno 936-938	-1%		Miami 330-332	3%		Springfield 625-627	-1%		Baton Rouge 707-708	13%		St Paul 550-551	10%	
Herlong 961	1%		Naples 341	-2%		Urbana 619	-3%		Houma 703	7%		Thief River Falls 567	-3%	
Inglewood 902-905	9%		Ocala 344	-10%		Indiana Average -4%			Lafayette 705	4%		Willmar 562	-1%	
Irvine 926-927	15%		Orlando 328	0%		Aurora 470	-7%		Lake Charles 706	8%		Mississippi Average -1%		
Lompoc 934	7%		Panama City 324	-8%		Bloomington 474	-4%		Mandeville 704	6%		Clarksdale 386	0%	
Long Beach 907-908	11%		Pensacola 325	-7%		Columbus 472	-2%		Minden 710	-8%		Columbus 397	-2%	
Los Angeles 900-901	8%		Saint Augustine 320	-2%		Elkhart 465	-3%		Monroe 712	-9%		Greenville 387	-4%	
Marysville 959	1%		Saint Cloud 347	-2%		Evansville 476-477	-2%		New Orleans 700-701	6%		Greenwood 389	-2%	
Modesto 953	2%		St Petersburg 337	-2%		Fort Wayne 467-468	-2%		Shreveport 711	-7%		Gulfport 395	1%	
Mojave 935	5%		Tallahassee 323	-3%		Gary 463-464	5%		Maine Average -5%			Jackson 390-392	3%	
Novato 949	15%		Tampa 335-336	0%		Indianapolis 460-462	5%		Auburn 42	-5%		Laurel 394	1%	
Oakland 945-947	20%		West Palm Beach 334	3%		Jasper 475	-7%		Augusta 43	-5%		McComb 396	-4%	
Orange 928	14%		Georgia Average 0%			Jeffersonville 471	-5%		Bangor 44	-2%		Meridian 393	-1%	
Oxnard 930	4%		Albany 317	-6%		Kokomo 469	-8%		Bath 45	-5%		Tupelo 388	-2%	
Pasadena 910-912	9%		Athens 306	0%		Lafayette 479	-2%		Brunswick 039-040	1%				
Rancho Cordova 956-957	11%													
Redding 960	2%													
Richmond 948	22%													
Riverside 925	4%													
Sacramento 958	11%													

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 2023 construction cost.

Year	Masonry Buildings	Concrete Buildings	Steel Buildings	Wood-Frame Buildings	Agricultural Buildings	Year of Construction
1956	16.21	16.89	18.36	14.25	13.40	1956
1957	15.74	16.26	17.63	14.16	13.07	1957
1958	15.30	15.64	16.78	14.11	15.59	1958
1959	14.82	15.15	16.38	13.51	12.50	1959
1960	14.48	14.87	16.12	13.31	12.25	1960
1961	14.18	14.81	15.85	13.07	12.21	1961
1962	13.86	14.38	15.46	12.91	12.03	1962
1963	13.66	14.00	15.28	12.67	10.91	1963
1964	13.26	13.84	15.07	12.23	11.46	1964
1965	12.84	13.47	14.55	11.97	11.16	1965
1966	12.26	13.09	13.99	11.45	10.84	1966
1967	11.97	12.46	13.08	10.89	10.40	1967
1968	11.48	11.78	12.49	10.30	9.95	1968
1969	10.84	11.25	12.07	9.91	9.39	1969
1970	10.41	10.76	11.46	9.43	8.92	1970
1971	9.76	9.85	10.64	8.12	8.31	1971
1972	9.07	9.12	9.94	8.14	7.73	1972
1973	8.29	8.64	8.83	7.51	7.26	1973
1974	7.38	7.92	8.30	7.02	6.73	1974
1975	6.70	7.00	7.45	6.60	6.00	1975
1976	6.28	6.67	7.07	6.36	5.69	1976
1977	5.85	6.26	6.72	5.91	5.35	1977
1978	5.45	5.85	6.19	5.42	4.84	1978
1979	5.00	5.21	5.54	4.97	4.58	1979
1980	4.54	4.73	4.94	4.46	4.14	1980
1981	4.26	4.46	4.53	4.26	3.88	1981
1982	4.14	4.26	4.39	4.11	3.74	1982
1983	3.94	4.14	4.30	3.93	3.53	1983
1984	3.68	3.88	4.10	3.63	3.43	1984
1985	3.58	3.68	3.99	3.52	3.37	1985
1986	3.49	3.66	3.92	3.47	3.29	1986
1987	3.48	3.58	3.88	3.40	3.27	1987
1988	3.41	3.44	3.81	3.37	3.21	1988
1989	3.33	3.39	3.62	3.30	3.11	1989
1990	3.14	3.25	3.43	3.07	2.97	1990
1991	3.39	3.20	3.27	2.90	2.81	1991
1992	3.03	3.17	3.22	2.89	2.79	1992
1993	2.95	3.14	3.11	2.85	2.74	1993
1994	2.88	2.93	3.00	2.74	2.54	1994
1995	2.74	2.67	2.78	2.57	2.41	1995
1996	2.64	2.62	2.70	2.52	2.36	1996
1997	2.55	2.55	2.59	2.46	2.31	1997
1998	2.43	2.43	2.49	2.35	2.27	1998
1999	2.35	2.35	2.43	2.33	2.24	1999
2000	2.28	2.28	2.33	2.26	2.16	2000
2001	2.21	2.21	2.29	2.17	2.11	2001
2002	2.15	2.15	2.23	2.15	2.06	2002
2003	2.12	2.12	2.18	2.12	2.03	2003
2004	2.03	2.03	2.12	2.07	1.97	2004
2005	1.88	1.88	1.90	1.86	1.93	2005
2006	1.78	1.78	1.75	1.66	1.72	2006
2007	1.72	1.72	1.67	1.54	1.60	2007
2008	1.61	1.61	1.59	1.47	1.51	2008
2009	1.60	1.60	1.53	1.47	1.51	2009
2010	1.56	1.56	1.44	1.46	1.50	2010
2011	1.58	1.58	1.49	1.49	1.55	2011
2012	1.56	1.56	1.33	1.43	1.51	2012
2013	1.49	1.49	1.41	1.36	1.41	2013
2014	1.48	1.48	1.40	1.34	1.40	2014
2015	1.46	1.46	1.39	1.33	1.39	2015
2016	1.45	1.45	1.53	1.34	1.36	2016
2017	1.40	1.40	1.55	1.35	1.36	2017
2018	1.33	1.33	1.34	1.23	1.27	2018
2019	1.25	1.25	1.40	1.18	1.21	2019
2020	1.23	1.23	1.34	1.20	1.20	2020
2021	1.20	1.20	1.41	1.19	1.20	2021
2022	1.14	1.14	1.24	1.10	1.12	2022
2023	1.00	1.00	1.00	1.00	1.00	2023

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.

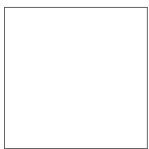
Class 1 and 2 (*Luxury* and *Semi-Luxury*) residences have more than ten corners and are best evaluated by counting the "building masses." A building mass is a group of contiguous rooms on one or more levels with access at varying angles from a common point or

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.

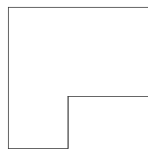
Residences on larger lots often include a separate housekeeping unit, either remote from the main structure (as illustrated below at the right) or joined to the main structure by a hallway (no common wall). Evaluate any separate housekeeping unit as a separate residence. The quality class of separate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

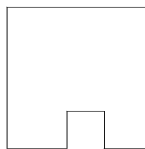
These figures can be applied to nearly all single-family residences built using conventional methods and readily available materials, including the relatively small number of highly decorative, starkly original or exceptionally well-appointed residences.



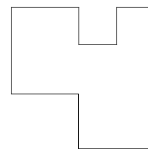
4 corners



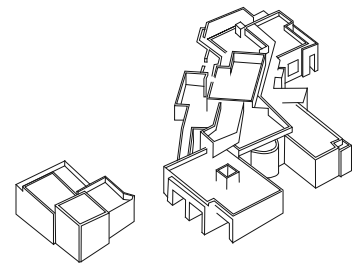
6 corners



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.

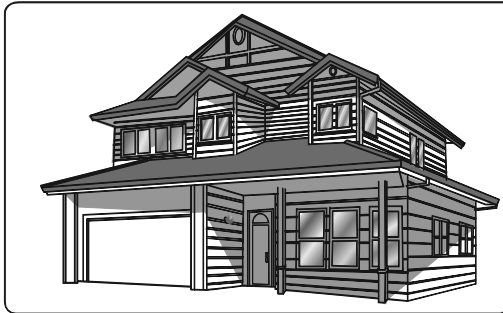
Note: Use the percent of total cost to help identify the correct quality classification.

Single Family Residences

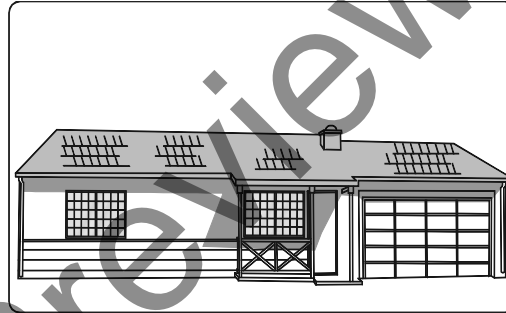
4 Corners (Classes 3, 4, 5 and 6) or One Building Mass (Classes 1 and 2 Only)

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	640.07	613.31	591.16	572.04	557.15	543.89	532.11	521.51	513.62	505.85	498.75	492.75	481.55
1, & 2	556.60	533.31	514.07	497.45	484.52	472.87	462.71	453.49	446.60	439.90	433.62	428.40	418.70
2, Semi-Luxury	389.00	372.74	359.27	347.64	338.62	330.56	323.42	316.99	312.15	307.29	303.12	299.50	292.56
2 & 3	285.53	273.63	263.72	255.24	248.61	242.62	237.38	232.67	229.09	225.63	222.42	219.87	214.82
3, Best Std.	249.17	238.82	230.14	222.74	216.84	211.72	207.18	203.06	199.93	196.91	194.17	191.80	187.45
3 & 4	213.10	204.05	196.74	190.46	185.38	181.00	177.13	173.55	170.95	168.20	166.02	163.97	160.31
4, Good Std.	183.59	175.78	169.53	164.08	159.81	156.01	152.57	149.53	147.19	145.01	143.00	141.14	138.10
4 & 5	165.38	158.42	152.76	147.80	143.91	140.42	137.36	134.77	132.65	130.61	128.83	127.27	124.28
5 Avg. Std.	148.83	142.68	137.52	133.11	129.70	126.54	123.78	121.23	119.40	117.59	115.95	114.59	111.95
5 & 6	129.23	123.83	119.38	115.54	112.49	109.80	107.40	105.19	103.66	102.04	100.81	99.44	97.19
6, Min. Std.	117.48	112.53	108.49	105.01	102.26	99.79	97.66	95.70	94.24	92.75	91.56	90.37	88.29

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	473.14	465.20	458.82	453.10	449.06	445.30	441.21	438.26	432.08	428.15	424.74	421.79	417.55
1, & 2	411.54	404.54	398.96	393.99	390.46	387.22	383.66	381.07	375.76	372.32	369.35	366.77	363.09
2, Semi-Luxury	287.72	282.73	278.88	275.38	272.87	270.56	268.09	266.32	262.58	260.20	258.10	256.34	253.78
2 & 3	211.10	207.56	204.72	202.18	200.27	198.55	196.86	195.49	192.77	191.04	189.48	188.17	186.29
3, Best Std.	184.23	181.09	178.57	176.42	174.84	173.36	171.75	170.55	168.18	168.20	166.87	165.69	164.05
3 & 4	157.53	154.86	152.75	150.88	149.45	148.14	146.94	145.91	143.86	142.57	141.41	140.43	139.02
4, Good Std.	135.73	133.38	131.62	129.91	128.83	127.66	126.58	125.59	123.91	122.79	121.77	120.93	119.72
4 & 5	122.21	120.24	118.39	117.05	115.94	115.04	113.87	113.20	111.64	110.62	109.79	108.99	107.91
5 Avg. Std.	110.06	108.24	106.76	105.31	104.46	103.55	102.60	101.90	100.51	99.06	98.81	98.15	97.19
5 & 6	95.55	93.96	92.63	91.45	90.71	89.80	89.00	88.36	87.26	86.36	85.80	85.14	84.36
6, Min. Std.	86.74	85.36	84.22	83.22	82.44	81.68	80.96	80.36	79.29	78.49	77.96	77.38	76.66

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.

Single Family Residences

10 Corners (Classes 3, 4, 5 and 6) or Four Building Masses (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 2 & 3



Single Family Residence, Class 1

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	679.56	651.15	627.61	609.09	591.56	577.85	566.54	556.95	547.62	539.90	533.13	526.94	515.89
1, & 2	590.96	566.34	545.79	529.67	514.40	502.53	492.61	484.33	476.18	470.06	463.67	458.24	448.63
2, Semi-Luxury	409.43	393.21	379.99	368.36	359.51	351.20	344.32	338.48	332.81	328.12	324.01	320.19	313.49
2 & 3	300.58	288.68	278.93	270.47	263.87	257.76	252.68	248.40	244.30	240.76	237.83	235.02	230.15
3, Best Std.	262.28	251.86	243.40	235.96	230.24	225.01	220.53	216.79	213.22	210.18	207.56	205.15	200.81
3 & 4	224.28	215.20	208.14	201.75	196.91	192.29	188.58	185.33	182.21	179.68	177.42	175.41	171.75
4, Good Std.	193.26	185.55	179.43	173.85	169.54	165.71	162.42	159.77	157.00	154.86	152.89	151.06	147.95
4 & 5	174.07	167.11	161.57	156.61	152.80	149.30	146.34	143.88	141.48	139.53	137.66	136.05	133.31
5 Avg. Std.	156.78	150.39	145.55	141.05	137.60	134.52	131.83	129.57	127.43	125.54	124.16	122.59	120.06
5 & 6	135.98	130.57	126.21	122.41	119.40	116.67	114.44	112.44	110.53	108.96	107.64	106.26	104.23
6, Min. Std.	123.69	118.68	114.84	111.30	108.54	106.05	103.95	102.24	100.44	99.01	97.85	96.66	94.68

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	507.57	505.34	493.45	487.51	483.26	479.28	475.37	472.27	466.21	462.02	458.31	455.09	450.50
1, & 2	441.41	434.72	429.14	423.90	420.36	416.76	413.44	410.64	405.52	400.71	397.55	394.80	390.90
2, Semi-Luxury	308.44	303.83	299.87	296.34	293.74	291.26	288.91	287.09	283.36	280.83	278.53	276.59	273.81
2 & 3	226.41	222.97	220.10	217.48	215.55	213.84	212.03	210.67	208.04	199.87	198.30	196.89	194.95
3, Best Std.	197.59	194.66	192.12	189.75	188.11	186.51	185.05	183.85	181.56	179.92	178.47	177.23	175.45
3 & 4	168.85	166.40	164.24	162.29	160.85	159.45	158.26	157.18	155.09	153.71	152.49	151.40	149.89
4, Good Std.	145.55	143.39	141.64	139.73	138.53	137.38	136.33	135.61	133.70	132.51	130.99	129.65	128.36
4 & 5	131.17	129.12	127.47	125.91	124.81	123.78	122.81	122.07	120.37	119.30	118.35	117.54	116.34
5 Avg. Std.	117.96	116.28	114.82	113.41	112.35	111.53	110.59	109.97	108.40	107.40	106.55	105.79	104.76
5 & 6	102.45	100.93	99.57	98.36	97.45	96.76	95.97	95.36	94.12	93.30	92.51	91.87	90.98
6, Min. Std.	93.17	91.71	90.56	89.44	88.67	87.96	87.26	86.68	85.57	84.79	84.10	83.51	82.72

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 mirrored 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.					

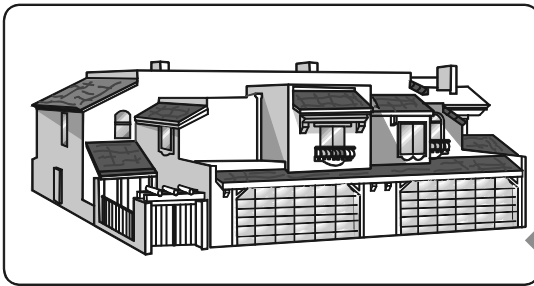
Note: Use the percent of total cost to help identify the correct quality classification. Exceptional class multi-family residences have architectural details and features uncommon in conventional apartment buildings. Many exceptional class multi-family structures are designed for sale or conversion to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

Multi-Family Residences – Apartments

2 or 3 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 2



Multi-Family, Class 4

Average Unit Area in Square Feet

Quality Class	400	450	500	550	600	650	700	750	800	900	1,000
Exceptional	281.81	269.45	262.73	256.75	252.18	248.03	244.91	241.34	239.24	235.12	231.27
1, Best	247.51	236.57	230.71	225.47	221.35	217.86	215.08	211.93	210.12	206.37	203.16
1, & 2	217.05	207.49	202.29	197.65	194.19	191.06	188.58	185.98	184.25	180.90	178.07
2, Good	189.92	181.63	177.03	173.07	169.94	167.12	165.07	162.71	161.23	158.34	155.87
2 & 3	173.68	166.02	161.98	158.19	155.39	152.99	150.93	148.88	147.47	144.94	142.57
3, Hi Average	158.95	151.85	148.12	144.87	142.22	139.95	138.02	136.26	134.91	132.48	130.43
3 & 4	146.74	140.26	136.83	133.63	131.25	129.27	127.57	125.74	124.63	122.38	120.45
4, Lo Average	135.58	129.54	126.31	123.41	121.23	119.29	117.67	116.08	115.08	113.04	111.17
4 & 5	125.19	119.61	116.64	114.00	111.88	110.11	108.76	107.19	106.27	104.28	102.60
5 Minimum	115.52	110.53	107.71	105.25	103.45	101.73	100.34	99.11	98.14	96.23	94.81

Average Unit Area 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	228.55	226.08	224.09	222.41	220.98	219.67	218.55	217.56	216.63	215.92	215.25
1, Best	200.60	198.73	196.76	195.37	194.04	192.91	191.94	191.24	190.30	189.62	189.10
1, & 2	175.98	174.18	172.59	171.25	170.29	169.20	168.30	167.64	166.90	166.44	165.88
2, Good	153.93	152.45	151.08	149.94	149.00	148.05	147.35	146.65	146.05	145.50	145.12
2 & 3	140.95	139.32	138.29	137.11	136.27	135.43	134.77	134.28	133.61	133.20	132.76
3, Hi Average	128.89	127.57	126.43	125.39	124.64	123.90	123.24	122.87	122.16	121.80	121.45
3 & 4	119.04	117.69	116.68	115.77	115.13	114.36	113.94	113.28	112.81	112.52	112.13
4, Lo Average	109.92	108.76	107.73	106.93	106.29	105.65	105.07	104.61	104.18	103.85	103.54
4 & 5	101.47	100.44	99.61	98.71	98.18	97.54	97.01	96.69	96.18	95.90	95.62
5 Minimum	93.62	92.75	91.89	91.23	90.60	90.02	89.62	89.16	88.88	88.48	88.29

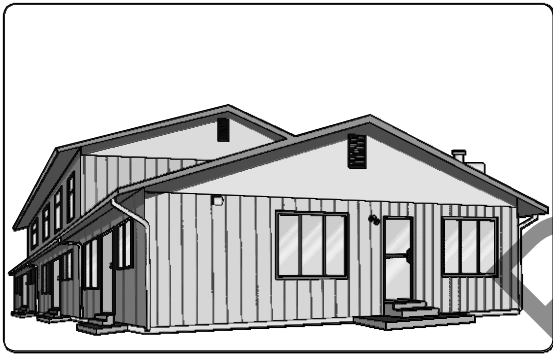
Note: Work outside metropolitan areas may cost 2 to 6% less. Add 2% to the costs for second floor areas and 4% for third floor areas. Add 9% when the exterior walls are masonry.

Multi-Family Residences – Apartments

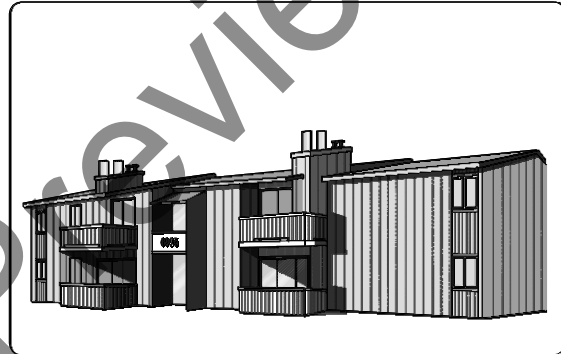
4 to 9 Units

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 3 & 4



Multi-Family, Class 3

Average Unit Area in Square Feet

Quality Class	400	450	500	550	600	650	700	750	800	900	1,000
Exceptional	265.29	253.57	247.11	241.89	237.26	233.53	230.76	227.54	225.43	221.09	217.56
1, Best	233.17	222.79	217.08	212.47	208.57	205.18	202.66	199.88	198.06	194.35	191.24
1, & 2	204.35	195.35	190.29	186.37	182.78	179.92	177.78	175.21	173.68	170.43	167.64
2, Good	178.85	170.98	166.62	163.00	160.01	157.46	155.52	153.26	151.85	149.07	146.65
2 & 3	163.64	156.35	152.45	149.14	146.34	144.00	142.30	140.24	139.04	136.31	134.28
3, Hi Average	149.68	143.15	139.37	136.37	133.71	131.71	130.19	128.18	127.22	124.65	122.87
3 & 4	138.29	132.11	128.62	125.89	123.64	121.70	120.12	118.35	117.47	115.22	113.28
4, Lo Average	127.62	121.91	118.98	116.31	114.14	112.29	110.84	109.41	108.46	106.36	104.61
4 & 5	117.82	112.63	109.85	107.39	105.34	103.70	102.52	101.02	100.10	98.21	96.69
5 Minimum	108.81	103.96	101.28	99.19	97.31	95.77	94.68	93.31	92.36	90.64	89.16

Average Unit Area 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	215.40	213.09	211.17	209.46	208.15	206.74	205.72	204.89	203.86	203.17	202.66
1, Best	189.13	187.22	185.47	183.99	182.91	181.64	180.75	179.95	179.04	178.50	178.07
1, & 2	165.90	164.10	162.71	161.35	160.28	159.25	158.52	157.81	157.04	156.57	156.10
2, Good	145.19	143.67	142.39	141.16	140.26	139.40	138.75	138.07	137.45	136.96	136.60
2 & 3	132.83	131.40	130.19	129.08	128.44	127.62	126.91	126.36	125.66	125.24	124.95
3, Hi Average	121.55	120.12	119.07	118.25	117.47	116.64	116.08	115.52	114.98	114.67	114.27
3 & 4	112.23	110.84	109.95	109.04	108.39	107.71	107.19	106.74	106.27	105.75	105.58
4, Lo Average	103.56	102.52	101.54	100.75	100.10	99.46	99.11	98.60	98.14	97.70	97.45
4 & 5	95.64	94.68	93.80	92.97	92.36	91.86	91.35	91.00	90.51	90.21	89.95
5 Minimum	88.32	87.45	86.60	85.83	85.35	84.85	84.40	84.08	83.64	83.23	83.13

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.				

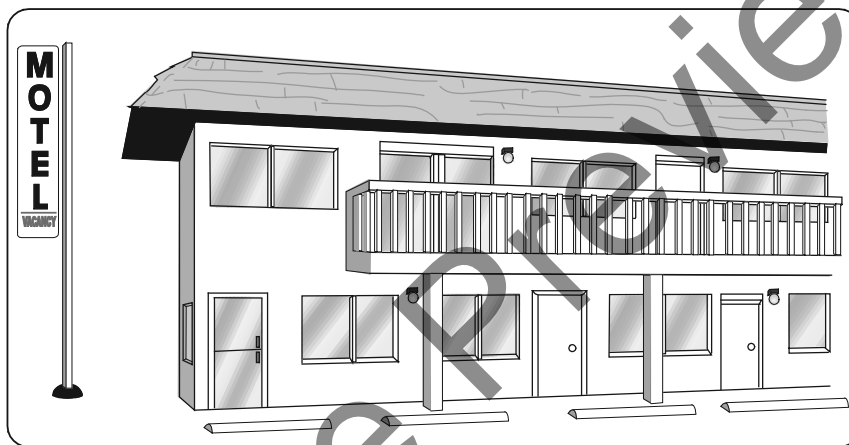
Note: Use the percent of total cost to help identify the correct quality classification.

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	224.74	216.68	210.38	205.03	200.63	196.28	191.04	186.41	181.23	176.28	172.22
1 & 2	206.45	199.03	193.25	188.37	184.35	180.26	175.38	171.18	166.43	161.99	158.15
2, Good	191.57	184.77	179.32	174.84	171.07	167.37	162.83	158.96	154.48	150.28	146.82
2 & 3	176.03	169.81	164.77	160.63	157.21	153.77	149.56	146.02	141.95	138.16	134.98
3, Average	163.37	157.54	152.95	149.07	145.85	142.64	138.83	135.43	131.70	128.15	125.23
3 & 4	149.95	144.60	140.37	136.81	133.90	130.94	127.37	124.39	120.85	117.64	114.87
4, Low	137.07	132.12	128.22	125.07	122.33	119.71	116.44	113.68	110.45	107.46	104.96

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.

Motels

Over 24 Units

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 2 & 3

Average Unit Area in Square Feet

Quality Class	200	225	250	275	300	330	375	425	500	600	720
1, Best	210.58	203.06	197.04	192.15	187.96	183.87	178.92	174.68	169.84	165.22	161.45
1 & 2	193.55	186.59	181.03	176.56	172.73	168.93	164.36	160.48	156.01	151.79	148.30
2, Good	179.64	173.32	168.12	163.92	160.45	156.89	152.74	148.97	144.92	140.95	137.74
2 & 3	165.01	159.07	154.39	150.57	147.25	144.06	140.20	136.75	133.02	129.47	126.50
3, Average	153.04	147.55	143.25	139.65	136.61	133.68	130.07	126.97	123.43	120.07	117.35
3 & 4	140.47	135.41	131.38	128.06	125.37	122.69	119.28	116.45	113.26	110.20	107.65
4, Low	128.43	123.80	120.09	117.08	114.57	112.11	109.06	106.45	103.53	100.79	98.39

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

Covered Porches

Estimate covered porches by applying a fraction of the main building square foot cost.

Porch Description	Suggested Fraction
Ground level floor (usually concrete) without banister, with no ceiling and shed-type roof.	1/4 to 1/3
High (house floor level) floor (concrete or wood) with light banister, no ceiling and shed-type roof.	1/3 to 1/2
Same as above with a finished ceiling and roof like the residence (most typical).	1/2
Same as above but partially enclosed with screen or glass.	1/2 to 2/3
Enclosed lean-to (sleeping porch, etc.) with lighter foundation, wall structure, interior finish or roof than that of house to which it is attached.	1/2 to 3/4
Roofed, enclosed, recessed porch, under the same roof as the main building and with the same type and quality foundation (includes shape costs).	3/4
Roofed, enclosed, recessed porch with the same type roof and foundation as the main building (includes shape costs).	4/4
Good arbor or pergola with floor.	1/4 to 1/3

Uncovered Concrete Decks, cost per square foot, 4" thick concrete

	On Grade	1' High	2' High	3' High	4' High
Less than 100 square feet	\$11.15	\$15.59	\$25.08	\$35.25	\$51.25
100 to 200 square feet	10.26	14.07	20.34	28.61	38.10
200 to 400 square feet	8.62	11.15	17.45	25.35	32.81
Over 400 square feet	8.37	10.26	15.32	20.35	26.44

Uncovered Wood Decks, cost per square foot, 2" thick deck with typical steps and railing

1' to 4' above ground.	\$25.30 to \$27.15
Over 4' to 6' above ground	29.75 to 38.40
Over 6' to 9' above ground	31.00 to 40.10
Over 9' to 12' above ground	32.26 to 42.62
Over 12' above ground	33.80 to 44.20

Porch Roofs, cost per square foot based on wood shingle cover

Type	Cost per Square Foot	Alternate Roof Covers	Cost Difference per S.F.
Unceiled shed roof	\$9.70 to \$11.50	Corrugated aluminum	Deduct \$.84 to \$1.05
Ceiled shed roof	16.33 to 18.41	Roll asphalt	Deduct .83 to .92
Unceiled gable roof	10.89 to 14.15	Fiberglass shingles	Deduct 1.03 to 1.14
Ceiled gable roof	18.40 to 20.49	Wood shakes	Add 1.13 to 1.75
(See the figures at the right for other roof cover)		Clay or concrete tile	Add 6.53 to 7.96
		Slate	Add 7.24 to 10.01

Residential Basements, cost per square foot, including stairs

Size	Unfinished Basements	Finished Basements
Less than 400 square feet	\$30 to \$49	\$45 to \$68
400 - 1,000 square feet	23 to 33	37 to 45
Over 1,000 square feet	20 to 23	34 to 40

These basement costs assume normal soil conditions, 7' headroom, no plumbing, partitions or windows. Unfinished basements have reinforced concrete floors and concrete or concrete block walls, a floor drain, stairway with a landing and handrail, open ceilings and one switched fluorescent fixture. Finished residential basements have a tile ceiling, resilient flooring, wood panel walls and lighting similar to Class 5 residences. Residential basements are common in climates where footing depths must be 4' or more to prevent frost heaving. These figures assume the residence is in an area where minimum footing depth is 4 feet. Where climate doesn't influence footing depth, unfinished basement costs will be 20% to 50% higher.

Additional Costs for Residential Structures

Appliances. Add these costs only when the appliance is not included in the quality class. Includes installation.

Built-in single wall oven with broiler	\$636 to \$767	Range hood and fan	\$190 to \$450
Built-in double wall oven with microwave	1,150 to 2,170	Franklin or Buck stove	
Drop-in range with single oven, economy	509 to 767	Steel, cast iron front	1,520 to 2,300
Drop-in range with single oven, excellent	1,271 to 2,380	Steel, cast iron front, glass door	2,300 to 3,180
Range top, four elements		All cast iron, glass panel door	3,950 to 5,700
Residential grade, without grill	572 to 1,080	Under counter 5 CF refrigerator	705 to 1,020
Residential grade, with grill	946 to 1,600	Central vacuum, 3 to 5 outlets	2,170 to 4,340
Commercial grade	4,339 to 7,260	Dishwasher	347 to 1,280
Hot water circulator	705 to 763	Garbage disposal	231 to 539
Instant hot water dispenser	578 to 816	Trash compactor	436 to 731

Fireplaces, cost each, including reinforced foundation, flue, cap, gas line and valve.

	1 Story	2 Story
Freestanding wood burning heat circulating prefab metal fireplace with interior flue, base and cap	\$2,045	\$2,500
36" wide zero-clearance enclosed metal firebox, brick face, wood mantel	2,390	2,730
48" wide zero-clearance enclosed metal firebox, raised hearth, brick face and mantel	3,290	3,740
Masonry, 5' base, common brick or block on interior face, wood or brick mantle	5,230	5,890
Masonry, 6' base, used brick or natural stone on interior face, raised hearth	10,400	12,350
Masonry, 8' base, used brick or natural stone on interior face, raised hearth	12,500	18,120

Residential Garages and Carports

Attached and detached garages for single family dwellings usually fall in the same quality class as the main structure. Costs are per SF of floor based on wood or light steel construction. Add 8% if exterior walls are masonry. Attached garages assume a common roof and a 20 foot wall in common with the main structure. Multiply the square foot cost below by the correct location factor on page 7 or 8 to find the square foot cost for any garage. Costs include interior finish and one light fixture per 300 SF of floor. Deduct 10% to 18% if interior walls are unfinished. Where dwelling and exterior garage walls are in vertical alignment with second floor walls, the garage cost per SF will be about 2/3 of the main dwelling cost per SF if finished and 1/2 of the main dwelling cost if unfinished. Carports with wood or steel posts, an asphalt floor, and built-up or metal roof will cost \$15.80 to \$18.30 per SF.

Square Foot Area for Attached Garages for Single Family Dwellings

Quality Class	220	260	280	320	360	400	440	480	540	600	720
1, Luxury	193.78	184.63	180.74	175.07	168.48	164.30	159.38	155.46	151.61	147.83	144.16
1, & 2	168.10	160.32	157.11	151.91	146.72	143.05	138.81	135.36	131.98	128.72	125.50
2, Semi-Luxury	126.36	120.67	118.38	114.52	110.60	107.85	104.64	102.04	99.52	97.03	94.61
2 & 3	102.22	95.75	94.27	93.03	89.82	87.61	84.98	82.91	80.83	78.82	76.87
3, Best Std.	84.97	81.26	79.78	77.24	74.85	72.98	70.82	69.02	67.34	65.65	64.01
3 & 4	71.95	69.03	67.87	65.80	63.41	61.85	60.00	58.51	57.04	55.64	54.26
4, Good Std.	63.70	60.77	59.68	58.08	56.14	54.73	53.10	51.78	50.49	49.24	48.03
4 & 5	60.10	56.88	55.58	53.75	51.84	50.55	49.01	47.81	46.61	45.47	44.33
5 Avg. Std.	56.29	52.84	51.59	49.62	47.50	46.31	44.93	43.82	42.75	41.65	40.64
5 & 6	49.95	47.16	46.11	44.32	42.69	41.60	40.36	39.36	38.41	37.44	36.50
6, Min. Std.	43.76	41.49	40.83	39.48	37.98	37.02	35.94	35.03	34.14	33.33	32.47

Square Foot Area for Detached Garages for Single Family Dwellings

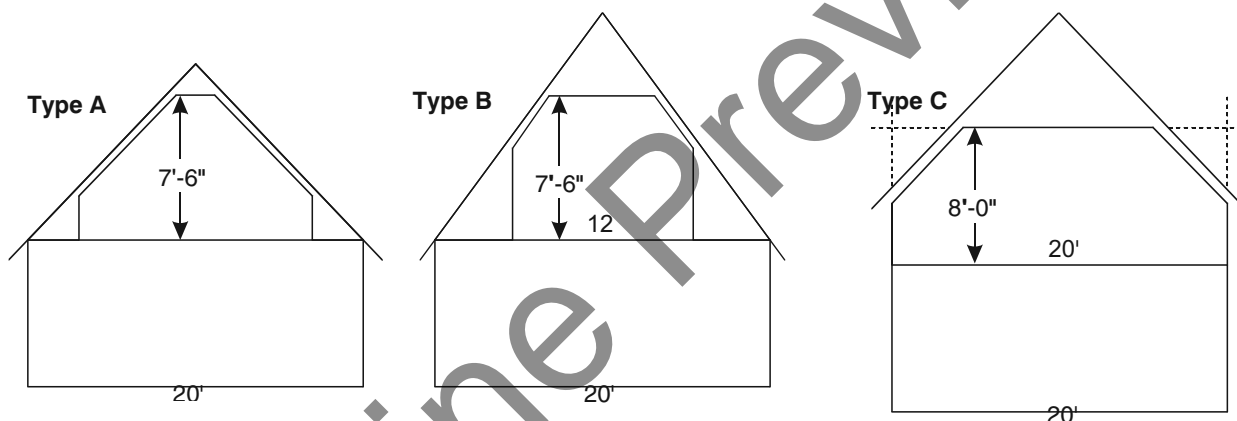
Quality Class	220	260	280	320	360	400	440	480	540	600	720
1, Luxury	220.41	203.70	197.64	187.08	183.38	177.58	169.84	165.63	161.52	157.51	153.59
1, & 2	189.90	176.08	170.45	161.74	158.81	153.76	147.08	143.42	139.85	136.36	132.98
2, Semi-Luxury	141.55	131.61	127.73	121.21	119.13	115.35	110.29	107.58	104.91	102.30	99.74
2 & 3	114.43	106.30	103.06	97.88	96.30	93.21	89.17	86.96	84.77	82.68	80.63
3, Best Std.	94.74	87.98	85.39	81.21	79.89	77.37	73.97	72.15	70.34	68.62	66.91
3 & 4	83.92	78.11	75.77	72.13	71.06	68.75	65.79	64.17	62.55	61.01	59.48
4, Good Std.	74.01	68.93	66.88	63.58	62.63	60.64	58.00	56.54	55.17	53.79	52.45
4 & 5	68.38	63.65	61.79	58.22	57.98	56.14	53.68	52.35	51.05	49.77	48.54
5 Avg. Std.	64.61	59.16	57.04	53.79	52.63	50.96	48.73	47.51	46.34	45.18	44.07
5 & 6	54.37	50.22	48.48	45.99	45.21	43.78	41.86	40.81	39.80	38.83	37.84
6, Min. Std.	47.36	43.75	42.50	40.33	39.78	38.53	36.84	35.94	35.02	34.13	33.33

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	\$9,378	\$7,547	\$6,383	\$5,319	\$4,501
3 fixture bath	13,613	11,605	9,627	8,286	6,634
4 fixture bath	17,321	14,971	13,366	10,951	9,375
4 to 9 units					
2 fixture bath	8,655	7,175	5,997	5,012	4,132
3 fixture bath	12,247	10,638	9,156	7,612	6,125
4 fixture bath	16,949	14,351	11,864	9,886	8,166
10 or more units					
2 fixture bath	7,794	6,634	5,631	4,379	3,612
3 fixture bath	12,002	10,022	8,415	6,632	5,445
4 fixture bath	15,836	13,613	10,887	8,909	6,805

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.	\$50,800	\$83,800
2,500 lbs.	54,100	86,400
3,000 lbs.	56,800	93,800
3,500 lbs.	—	98,800
4,000 lbs.	—	102,700

Add for deluxe car, \$10,500. Add for each additional stop over 2: \$3,940, baked enamel doors \$10,790, stainless steel doors \$11,300.

Electric based on six stops

Capacity	200 F.P.M.	250 F.P.M.	300 F.P.M.
2,000 lbs.	\$127,400	\$134,600	\$139,800
2,500 lbs.	134,800	142,300	151,100
3,000 lbs.	144,500	158,100	163,500
3,500 lbs.	158,200	168,300	176,700
4,000 lbs.	168,100	182,200	190,800

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

\$27.40 plus \$1.13 per foot over 5' high
\$12.20 plus \$0.84 per foot over 5' high
\$3.90 plus \$1.13 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	45.85	41.03	36.65	32.20	30.14	28.91	28.11	26.79

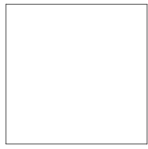
Separate Structure Garages

Area	400	800	1,200	2,000	3,000	5,000	10,000	20,000
Cost	52.59	46.82	42.97	40.78	39.03	37.46	35.86	35.08

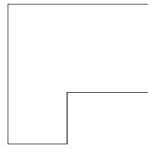
Basement Garages

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.	70.02	64.04	61.28	60.41	58.63	57.94	57.11	56.49
Concrete block exterior walls, reinforced concrete columns. Flat concrete roof slab.	69.60	65.22	60.96	59.29	58.04	57.26	56.43	54.56
Concrete block exterior walls, steel posts and beams, light concrete/metal roof fireproofed with spray plaster.	65.29	59.71	56.85	49.25	47.10	52.83	51.17	50.38
Concrete block exterior walls, wood posts and beams, light concrete/metal roof fireproofed with spray plaster.	58.26	55.34	51.91	48.35	46.82	46.18	45.44	44.61
Add for each security gate	4.25	3.09	2.61	1.94	1.63	1.32	1.14	1.01

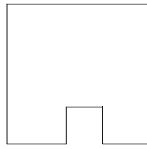
Cabins and Recreational Dwellings



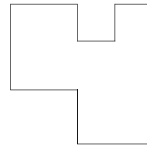
4 corners



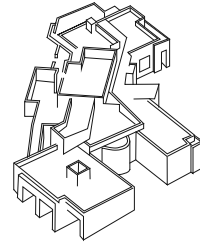
6 corners



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.

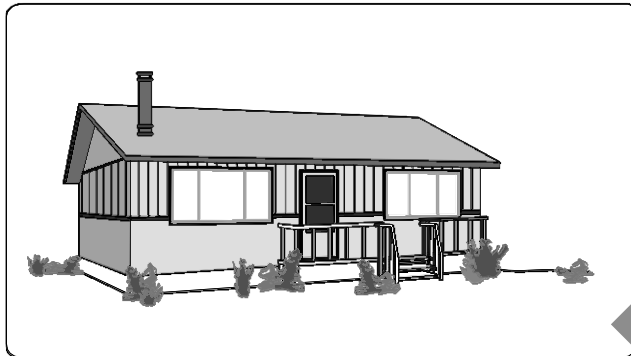
Note: Use the percent of total cost to help identify the correct quality classification.

Conventional Recreational Dwellings

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 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 5



Conventional Recreational Dwelling, Class 3

Square Foot Area

Quality Class	400	500	600	700	800	900	1,000	1,100	1,200	1,300	1,400
1, Luxury	—	—	—	—	502.16	480.36	462.15	447.64	435.23	424.49	414.77
1, & 2	—	—	—	465.31	441.35	422.26	406.20	393.65	382.44	373.33	364.70
2, Semi-Luxury	—	—	436.65	408.40	387.27	370.57	356.48	345.65	335.70	327.64	319.96
2 & 3	—	410.05	378.97	354.39	335.91	321.56	309.18	300.12	291.10	284.13	277.70
3, Best Std.	342.52	307.23	283.97	265.56	251.80	240.90	231.68	224.81	218.23	212.93	208.09
3 & 4	313.03	280.81	259.40	242.59	230.11	220.19	211.90	205.44	199.53	194.65	190.19
4, Good Std.	286.07	256.57	237.20	221.67	210.38	201.21	193.47	187.76	182.24	178.00	173.84
4 & 5	264.00	236.67	218.78	204.66	194.04	185.71	178.51	173.25	168.02	164.10	160.43
5 Avg. Std.	243.45	218.33	201.93	188.70	179.01	171.24	164.69	159.72	155.18	151.47	147.90
5 & 6	224.59	201.51	186.17	174.09	165.08	157.98	151.96	147.31	143.20	139.56	136.47
6, Min. Std.	207.09	185.83	171.84	160.54	152.27	145.83	140.17	136.03	131.91	128.89	125.92

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	408.65	400.37	394.52	388.80	378.71	369.65	363.48	356.68	352.57	346.74	343.40
1, & 2	357.48	352.08	346.76	341.80	333.00	324.76	319.61	313.49	310.06	304.96	301.80
2, Semi-Luxury	315.01	309.12	304.34	300.02	292.37	284.89	280.57	275.19	272.07	267.68	264.88
2 & 3	273.09	268.21	264.07	260.24	253.54	247.22	243.33	238.77	236.07	232.17	229.77
3, Best Std.	204.80	200.89	197.84	195.06	190.07	185.30	182.50	178.81	176.88	174.04	172.09
3 & 4	187.00	183.63	180.85	178.25	173.55	169.29	166.63	163.57	161.64	158.96	157.40
4, Good Std.	170.93	167.88	165.18	162.94	158.67	154.59	152.31	149.49	147.86	145.31	143.80
4 & 5	157.66	154.76	152.61	150.18	146.26	142.68	140.59	137.82	136.39	134.03	—
5 Avg. Std.	145.49	142.85	140.61	138.66	134.95	131.73	129.75	127.17	125.79	—	—
5 & 6	134.23	131.78	129.76	127.99	124.63	121.51	119.64	117.25	—	—	—
6, Min. Std.	123.89	121.56	119.71	117.96	114.89	112.08	110.26	—	—	—	—

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

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	—	—	—	—	526.73	501.82	483.52	469.81	456.49	446.58	436.24
1, & 2	—	—	—	484.88	462.93	441.35	424.99	413.04	401.31	392.64	383.53
2, Semi-Luxury	—	—	454.20	425.47	406.20	387.40	373.08	362.45	352.39	344.44	336.61
2 & 3	—	426.08	394.01	369.14	352.41	336.13	323.70	314.30	305.78	298.85	292.02
3, Best Std.	354.15	319.25	295.32	276.52	264.09	251.91	242.59	235.54	229.17	224.03	218.83
3 & 4	323.81	291.95	269.84	252.90	241.45	230.20	221.80	215.34	209.38	204.66	200.04
4, Good Std.	295.86	266.76	246.72	231.02	220.65	210.43	202.64	196.74	191.35	186.95	182.82
4 & 5	273.00	246.01	227.58	213.09	203.53	194.11	186.90	181.58	176.67	172.53	168.79
5 Avg. Std.	251.85	226.96	209.89	196.66	187.73	179.03	172.45	167.53	162.94	159.11	155.52
5 & 6	232.28	209.38	193.57	181.36	173.25	165.18	159.01	154.55	150.18	146.75	143.61
6, Min. Std.	214.23	193.16	178.58	167.32	159.72	152.31	146.74	142.62	138.66	135.49	132.51

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	429.65	421.42	415.15	410.99	399.68	391.11	384.46	378.37	373.96	367.78	364.32
1, & 2	377.62	370.57	365.09	361.28	351.35	343.51	338.04	332.58	331.14	323.28	320.35
2, Semi-Luxury	331.52	325.36	320.59	316.95	308.52	301.38	296.70	291.71	288.32	283.76	281.17
2 & 3	287.46	282.18	278.08	274.94	267.61	261.31	257.45	253.12	250.09	246.19	243.96
3, Best Std.	215.43	211.39	208.36	206.04	200.63	195.83	192.95	189.70	187.50	184.58	182.78
3 & 4	197.00	193.27	190.30	188.31	183.51	179.03	176.31	173.44	171.28	168.78	167.14
4, Good Std.	180.00	176.67	174.08	172.09	167.65	163.64	161.13	158.51	156.61	153.99	152.74
4 & 5	165.93	162.94	160.51	159.01	154.58	151.03	148.71	146.19	144.48	142.17	—
5 Avg. Std.	153.10	150.21	148.09	146.44	142.64	139.25	137.26	134.84	133.26	—	—
5 & 6	141.19	138.69	136.77	134.95	131.59	128.38	126.54	124.36	—	—	—
6, Min. Std.	130.24	127.99	126.01	124.63	121.50	118.56	116.74	—	—	—	—

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.

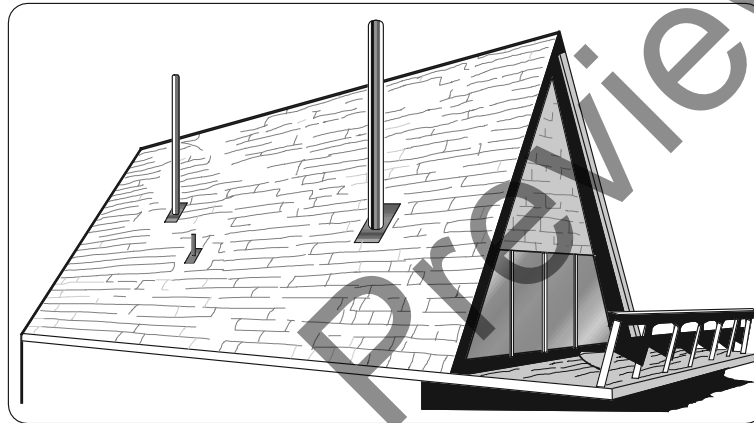
Note: Use the percent of total cost to help identify the correct quality classification.

"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	280.03	252.67	233.66	219.71	208.79	200.16	193.03	187.07	182.03	177.58	173.78
1 & 2	257.31	232.17	214.71	201.83	191.90	183.75	177.37	171.88	167.20	163.21	159.67
2, Good	236.07	212.99	197.10	185.19	176.12	168.74	162.80	157.69	153.50	149.78	146.53
2 & 3	222.87	201.10	186.00	174.85	166.21	159.32	153.60	148.94	144.87	141.37	138.31
3, Average	211.13	190.52	176.21	165.61	157.40	150.88	145.49	141.01	137.26	133.91	131.04
3 & 4	191.62	172.93	159.85	150.32	142.90	136.99	132.13	128.02	124.55	121.52	118.98
4, Low	171.88	155.13	143.49	134.91	128.25	122.88	118.54	114.90	111.69	109.05	106.68

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	167.60	164.89	162.45	160.20	156.33	153.09	150.39	148.00	145.93	144.04	142.47
1 & 2	154.66	152.18	149.83	147.81	144.28	141.26	138.78	136.57	134.71	133.00	131.52
2, Good	142.70	140.33	138.25	136.34	133.11	130.38	128.03	126.02	124.20	122.67	121.35
2 & 3	135.46	133.22	131.25	129.48	126.33	123.78	121.52	119.62	117.93	116.48	115.14
3, Average	128.67	126.57	124.64	123.04	120.06	117.57	115.43	113.63	112.08	110.64	109.41
3 & 4	118.39	116.46	114.67	113.19	110.46	108.18	106.25	104.56	103.11	101.83	100.65
4, Low	105.93	103.83	102.76	101.31	100.01	97.98	96.19	94.64	93.36	92.17	91.15

"A-Frame" Cabins

8 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 2

Square Foot Area

Quality Class	400	500	600	700	800	900	1,000	1,100	1,200	1,300	1,400
1, Best	289.20	261.52	242.46	228.36	217.52	208.77	201.68	195.67	190.61	186.28	182.37
1 & 2	265.17	239.90	222.40	209.45	199.43	191.45	184.96	179.48	174.79	170.80	167.28
2, Good	243.15	219.89	203.91	191.99	182.88	175.56	169.52	164.51	160.30	156.61	153.31
2 & 3	229.47	207.55	192.42	181.20	172.59	165.63	160.01	155.26	151.26	147.77	144.74
3, Average	217.04	196.34	181.93	171.37	163.25	156.72	151.33	146.95	143.05	139.73	136.95
3 & 4	197.19	178.44	165.35	155.69	148.30	142.36	137.53	133.49	130.00	127.06	124.40
4, Low	176.80	159.87	148.20	139.59	132.97	127.62	123.30	119.62	116.52	113.84	111.53

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	176.65	173.83	171.26	169.04	165.09	161.79	158.96	156.62	154.49	152.69	151.12
1 & 2	159.73	157.13	154.82	152.75	149.21	146.25	143.72	141.58	139.65	138.05	136.49
2, Good	150.09	147.60	145.45	143.59	140.20	137.41	135.05	133.00	131.20	129.67	128.29
2 & 3	142.10	139.73	137.74	135.92	132.76	130.07	127.93	125.94	124.20	122.81	121.47
3, Average	135.36	133.13	131.17	129.43	126.42	123.95	121.84	120.01	118.39	116.92	115.67
3 & 4	124.16	122.13	120.29	118.75	115.97	113.68	111.75	110.06	108.61	107.30	106.14
4, Low	110.64	109.05	107.61	105.07	103.01	101.20	99.66	98.32	97.14	96.18	94.68

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
10	11	53	16	58	20	64	30	77	20	26	60	31	67	36	73	41	77
11	10	50	15	56	19	60	29	74	22	24	58	29	63	34	70	39	74
12	9	48	14	54	19	59	28	72	24	23	56	28	60	32	67	37	71
13	8	46	13	53	18	57	27	70	26	22	54	26	58	31	64	35	68
14	7	44	12	51	17	56	27	67	28	20	52	24	56	29	61	34	65
15	7	42	11	49	16	54	26	65	30	18	50	23	54	27	58	32	63
16	6	40	11	48	15	53	25	62	32	17	48	21	53	26	56	30	61
17	5	38	10	46	14	52	24	60	34	15	47	20	51	24	55	29	60
18	5	36	9	44	13	50	23	59	36	14	45	18	49	23	53	27	58
19	4	33	8	43	13	49	22	58	38	12	43	17	47	21	51	26	56
20	4	31	7	41	12	47	21	58	40	11	41	16	45	20	50	24	55
21	3	29	7	39	11	46	21	55	42	10	39	14	44	19	48	23	53
22	3	27	6	37	11	44	20	54	44	9	37	13	42	17	46	21	51
23	3	25	6	35	10	43	19	53	46	8	35	12	40	16	45	20	50
24	3	23	5	34	9	42	18	52	48	7	33	11	38	15	43	19	48
25	2	21	5	32	9	40	17	51	50	6	31	10	37	14	41	18	46
26	2	19	4	30	8	39	17	50	52	5	29	9	35	12	40	16	45
27	2	16	4	29	7	37	16	49	54	5	28	8	33	11	38	15	43
28	2	14	4	27	7	36	15	48	56	4	26	7	31	10	36	14	41
29	2	12	3	25	6	34	14	47	58	4	24	6	30	9	35	13	40
30	1	10	3	24	6	33	14	46	60	3	22	5	28	8	33	12	38
31	—	—	3	22	5	31	13	45	62	3	20	4	26	7	31	11	36
32	—	—	3	20	5	30	12	44	64	3	17	4	24	6	30	10	35
33	—	—	2	18	5	29	12	43	66	2	16	3	22	5	28	9	33
34	—	—	2	17	4	27	11	42	68	2	14	3	21	5	27	8	32
35	—	—	2	15	4	26	11	41	70	2	12	3	19	4	25	7	30
36	—	—	2	13	4	24	10	40	72	1	10	2	17	4	23	6	28
38	—	—	1	10	3	21	9	38	74	—	—	2	15	4	21	5	26
40	—	—	—	—	2	19	7	35	76	—	—	2	14	3	19	5	24
42	—	—	—	—	2	16	6	33	80	—	—	1	10	2	17	4	22
46	—	—	—	—	1	10	5	29	82	—	—	—	—	2	15	3	18
50	—	—	—	—	—	—	4	25	84	—	—	—	—	1	13	2	16
55	—	—	—	—	—	—	3	20	96	—	—	—	—	—	11	1	10
60	—	—	—	—	—	—	2	14	98	—	—	—	—	—	10	—	—
64	—	—	—	—	—	—	1	10	100	—	—	—	—	—	—	—	1

Index

A

Adjustment factors, live load 229
Adjustments, wall heights 5
Adjustments for area 7
Administrative office (military) 272
A-frame 32
A-frame cabins 38-41
 4 corners 39
 6 corners 40
 8 corners 41
A-frame restaurants 183-184
Age factors 9
Agricultural structures 249-269
Air and water service 205
Air compressors 206
Air conditioning 18, 28, 266
Aircraft avionics shop (military) 272
Aircraft machine shop (military) 272
Aircraft operations (military) 272
Ambulatory clinic (military) 272
Appliances 29
Applied instruction building
 (military) 272
Area modification factors 6, 7-8
Area of buildings 4
Auto service centers 218-221
Automatic teller 125
Average Life 43

B

Balconies 28
Banks and savings offices 115-125
Barns 250-252, 256-260
 dairy 257-260
 feed 252
 general purpose 250
 hay storage 251
 herringbone 260
 low cost 257
 pole 256
 stanchion 258
 walk-through 259
Barracks, dormitory (military) 272
Baseboard units 28
Basement garages 31
Basements 237
Basements, residential 27
Bathrooms, multi-family
 residential 30
Block, concrete 42
Bowling alley (on military base) 272
Boxes, walk-in 242
Brick 42
Buffet hut 18
Building classes 4
Building quality 4
Building shapes 4
Built-ins 18
Bulkheads 242, 244, 245
Bumpers 247

C

Cabins 32, 38-42
Cages, poultry 262, 263, 264,
 265, 266
Canopies 204, 232, 237
Canopy lights 237
Carports 18, 29, 42
Cash boxes 205
Catch basin 248
Ceilings 245

Central air 18, 28
Chain link fence 248
Chapel center (on military base) 272
Child development center
 (on military base) 272
Churches 172-173
City hall 56, 59
Classes, quality 11, 16, 19, 23,
 33, 38, 44, 47, 50, 53, 56, 59, 76, 82,
 89, 94, 103, 105, 107, 109, 111, 113,
 115, 120, 126, 129, 132, 135, 143, 151,
 159, 167, 169, 171, 173, 175, 178,
 181, 183, 185, 191, 195-196, 198,
 200, 202, 208, 213, 218, 223, 227,
 244, 250-255, 257-260, 262-265, 267,
 268
Classrooms, temporary 55
Coffee shop restaurants 178-180
Commercial structures 74-248
Commissary (military) 272
Compressors, refrigeration 261
Concrete block 42
Concrete decks, uncovered 27
Concrete paving 247
Concrete walls 42
Contents 3
Convalescent hospitals 167-169
Conventional recreational dwellings
 4 corners 34
 6 corners 35
 8 corners 36
 10 corners 37
Conventional restaurants 181-182
Coolers 28
Coolers, evaporative 266
Cooling 18
Cooling pads 266
Corral, holding 261
Cost tables, explanation 4
Counters 125
Covered porches 27
Curbing 206
Curbs 247
Current dollar costs 9

D

Dairy barns 257-260
Dampers 234
Deck roofs 18
Decks 42
 concrete 27
Decks and porches 18, 27, 42
Dental clinic (on military base) 272
Department stores 126-134
Depreciation 6, 43
Dining facility (on military base) 272
Discount houses 111-114
Dishwasher 18
Dispensers 204
Display fronts 242-245
Display platforms 245
Display signs 246
Dock levelers 237
Docks 237
Domes, skylights 240
Door hoods 233
Doors 238
 exterior 238
 fire 238
 hollow metal 232
 interior 238
 roll-up 238
 sidewall, sliding 232

walk-thru 232
warehouse 238
Downspouts 233
Drainage 248
Draperies 238
Dumbwaiters 238

E

Ecclesiastic buildings 173-174
Economic obsolescence 6
Education center (on
 military base) 272
Effective age 6
Electric heating 239
Elementary school (military
 dependents) 272
Elementary schools 44-49
Elevators 30, 238
Entrances 136-141, 144-149,
 152-157, 160-165, 245
Equipment room 258, 259
Equipment shed 254, 260
Escalators 238
Evaporative cooler 18
Explanation of tables 4
External access 125
External offices 227
Extinguishers, fire 239

F

Factory buildings 226
Family housing (on military
 base) 272
Family service center (military) 272
Fans 266
Feed barns 252
Feed tanks, bulk 269
Feeders, automatic 266
Fence
 cable 261
 chain link 248
 metal rail 261
 wood 248
Fencing 206
Fill 239
Finishes, wall 245
Fire and rescue station
 (on military base) 272
Fire escapes 239
Fire extinguishers 239
Fire sprinklers 239
Fire stations 68
 on military base 272
Fireplaces 18, 29, 42, 239
Fixtures 125
Flatwork 42, 261
Floor furnaces 28
Foggers 266
Foundations, permanent, for
 manufactured housing 18
Framed openings 233
Functional obsolescence 6
Funeral homes 171-172
Furnaces 28

G

Garages 29, 31, 42
 basement 31
 ground level 31
 separate structure 31
Garbage disposal 18

Gasoline storage tanks 205
Gates 247-261
General office buildings 135-150
General purpose barns 250
Glass 245
Government offices 56-61
Greenhouses 267
Gutters 233

H

Half classes 4
Half-baths 18
Half-story costs 30, 42
Hangars (military) 272
Hay shelters 261
Hay storage barns 251
Heat and smoke vents 241
Heaters
 baseboard 239
 electric 28, 239
 suspended 239
Heating 42, 266
Heating and cooling 28, 239
Herringbone barns 260
High school (military
 dependents) 272
Historical index 9
Holding corral 261
Holding tanks 261
Hospitals, convalescent 167-170
How to use this book 4-6

I

Index, historical 9
Industrial buildings 223
 light 225
Industrial structures 222-248
Installation maintenance shop
 (military) 272
Instructions 4
Insulation 233
Intercom 237
Internal offices 227
Island lighters 205
Island office 204

J

Jr. high/middle school (military
 dependents) 272

K

Kitchen equipment 240

L

Laundry sinks 18
Libraries, public 62
Library (on military base) 272
Lifts 237
Light industrial buildings 225
Lighting 245, 248
Limitations 6
Livestock scales 269
Loading ramps 237
Loafing sheds 261
Local modifiers 7-8
Location adjustments 6
Lube room equipment 205

Index

M

Machinery and equipment sheds... 254
Main Exchange (military)..... 272
Manholes..... 248
Manufactured housing..... 16-18
 additional costs..... 18
Material handling..... 242
Medical clinic (on military base) ... 272
Medical facility (on military base)..... 272
Medical-dental buildings..... 151-159
Mezzanines..... 125, 240
Microwave..... 18
Migrant worker housing..... 268
Military construction costs..... 270
Milk house..... 257
Milk line..... 261
Milking barn..... 258-260
Mobile home parks..... 195-197
Mobile homes..... 16-18
Mortuaries..... 171-172
Motels..... 23-26
Multi-family residences..... 20-22
Multi-unit buildings..... 92-93

N

Night deposit vault..... 125
Normal Percent Good..... 235

O

Obsolescence
 economic..... 6
 functional..... 6
 physical..... 6
Offices, external and internal..... 227
Offices, government..... 56-61
Openings, framed..... 233
Operations building (military)..... 272
Overhangs..... 233
Overhead heaters..... 239

P

PA systems..... 237
Parachute and dinghy shop (military)..... 272
Partitions..... 240
 interior..... 234
Paving..... 206
 asphaltic..... 247
 concrete..... 247
Percent Good..... 43
Percent Good table..... 235
Physical fitness training center (military)..... 272
Physical lives..... 43, 235, 269
Physical obsolescence..... 6
Platforms..... 245
Plumbing..... 42
Pneumatic tube systems..... 240
Pole barns..... 256
Porch roofs..... 18, 27
Porches, covered..... 27
Porches and decks..... 18, 42
Post mounting..... 207, 246
Posts..... 42
Poultry houses..... 262-266
 controlled environment..... 263
 conventional..... 262

 deep pit..... 265
 equipment costs..... 266
 high rise..... 264
Prefabricated classrooms..... 55
Present Value..... 43
Pressure tanks..... 269
Public address systems..... 237
Public buildings
 elementary schools..... 44-47
 libraries..... 62
 secondary schools..... 50-55
Pullmans..... 18
Pumps..... 204

Q

Quality classes, explanation..... 4
Quality classifications
 A-frame cabins..... 38
 A-frame restaurants..... 183
 auto service centers..... 218
 banks and savings offices..... 115, 120
 coffee shop restaurants..... 178
 convalescent hospitals..... 167, 169
 conventional recreational dwellings..... 33
 conventional restaurants..... 181
 department stores..... 126, 129, 132
 discount houses..... 111, 113
 display fronts..... 244
 ecclesiastic buildings..... 173
 feed barns..... 252
 funeral homes..... 171
 general office buildings..... 135, 143
 general purpose barns..... 250
 government offices..... 56, 59
 greenhouses..... 267
 hay storage barns..... 251
 industrial buildings..... 223
 internal offices..... 227
 machinery and equipment sheds..... 254
 manufactured housing..... 16
 medical-dental buildings..... 151, 159
 migrant worker housing..... 268
 mobile home parks..... 195
 modern herringbone barns..... 260
 motels..... 23
 multi-family..... 19
 poultry houses..... 262
 schools, elementary..... 44-45, 47
 schools, secondary..... 50-53
 self service restaurants..... 175
 service garages..... 208, 213
 service stations..... 198, 200, 202
 shop buildings..... 253
 single family..... 11
 small food stores..... 107, 109
 small sheds..... 255
 suburban stores..... 89, 94
 supermarkets..... 103, 105
 theaters..... 185, 191
 urban stores..... 76, 82
Quality specifications..... 4

R

Rails and steps..... 18
Ramp..... 261
Receiver systems, satellite..... 245
Record storage..... 125
Recreation center (military)..... 272
Recreational dwellings..... 32-42
Regional medical center (military)..... 272

Remaining Life..... 43
Reserve Center (military)..... 272
Residences
 multi-family..... 19-22
 single family..... 10-15
Residential structures section..... 10-43
Restaurants
 A-frame..... 183-184
 coffee shop..... 178-180
 conventional..... 181-182
 self service..... 175-177
Room coolers..... 28
Rotators..... 206, 247

S

Safe deposit boxes..... 125
Satellite communications center (military)..... 272
Satellite receiver..... 245
Scales
 livestock..... 269
 truck..... 269
Schools, elementary..... 44-47
Schools, secondary..... 50-55
Screen walls..... 18
Seating..... 240
Secondary schools..... 50-55
Security systems..... 237
Self service restaurants..... 175-178
Septic tanks..... 269
Service club (military)..... 272
Service garages..... 208-213
Service station signs..... 206
Service stations..... 198-207
 additional costs..... 204-207
Sheds..... 254-255
Shop buildings..... 253
Shopping centers..... 88
Showers..... 18
Sidewall doors..... 232
Signs, lighted..... 246
Single family residences..... 10-15
 4 corners..... 12
 6 corners..... 13
 8 corners..... 14
 10 corners..... 15
Sinks..... 18
Site improvement..... 206
Skirting..... 18
Skylights..... 234, 240, 241
Sliding windows..... 234
Small food stores..... 107-110
Small sheds..... 255
Snowload capability..... 18
Sound systems..... 237
Sprinklers..... 261
 fire..... 239
 roof..... 266
Stairways..... 28
Stanchion barns..... 258
Stanchions, steel..... 261
Station hospital (military)..... 272
Steel buildings..... 228-234
Steel stanchions..... 261
Steps and rails..... 18
Storage buildings..... 18, 204
Storage facility (military)..... 272
Storage tanks, gasoline..... 205
Stores
 suburban..... 88-102
 urban..... 75-87
Stripping..... 247

Suburban stores..... 88-102
Suite entrances
 exterior..... 136-138, 144-146,
 152-154, 160-162
 interior..... 139-141, 147-149,
 155-157, 163-165
Sump pumps..... 261
Supermarkets..... 103-106

T

Table of Contents..... 3
Tanks, pressure..... 269
Temporary classrooms..... 55
Temporary lodging facility (military)..... 272
Theaters..... 185-191
Tie downs..... 18
Toilets..... 18
Trailer parks..... 195-197
Trash compactor..... 18
Truck scales..... 269
Turbines..... 204

U

Unaccompanied officers quarters (military)..... 272
Urban stores..... 75-87

V

Vault doors..... 125
Vehicle hoist..... 206
Vehicle maint. shop (military)..... 272
Ventilators..... 234, 241
Vents..... 234, 241

W

Walk-in boxes..... 242
Walk-through barns..... 259
Walk-thru doors..... 232
Wall finishes..... 245
Wall furnaces..... 28
Wall heaters..... 28
Wall heights..... 5
Walls, bulkhead..... 245
Warehouses..... 224
Wash area..... 261
Water systems..... 269
Water tanks..... 261
Wet bar..... 18
Whirlpool..... 18
Window frames..... 245
Windows
 aluminum industrial..... 234
 aluminum sliding..... 234
 steel sliding..... 234
Wood decks, uncovered..... 27
Wood fence..... 248
Wood posts..... 42

X-Y-Z

Yard improvements..... 247-248
Yard lights..... 205
Youth center (military dependents)..... 272

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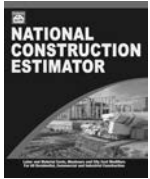
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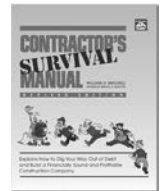
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National Repair & Remodeling Estimator

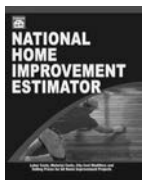


The complete pricing guide for dwelling reconstruction costs. Reliable, specific data you can apply on every repair and remodeling job. Up-to-date material costs and labor figures based on thousands of jobs across the country. Provides recommended crew sizes; average production rates; exact material, 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.

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National Home Improvement Estimator

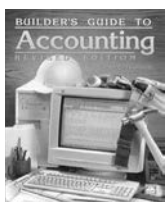


Current labor and material prices for home improvement projects. Provides manhours for each job, recommended crew size, and the labor cost for removal and installation work. Material prices are current, with location adjustment factors and free monthly updates on the Web. Gives step-by-step instructions for the work, with helpful diagrams, and home improvement shortcuts and tips from experts.

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328 pages, 8½ x 11, \$55.00

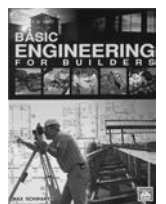
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This book is for you if you've ever been stumped by an engineering problem on the job, yet wanted to avoid the expense of hiring a qualified engineer. Here you'll find engineering principles explained in non-technical language and practical methods 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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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, \$62.95

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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**

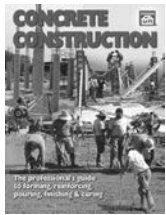
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Home Building Mistakes & Fixes

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



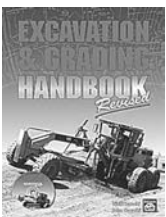
Just when you think you know all there is about concrete, many new innovations create faster, more efficient ways to do the work. This comprehensive concrete manual has both the tried-and-tested methods and materials, and more recent innovations. It covers everything you need to know about concrete, along with Styrofoam forming systems, fiber reinforcing

adjuncts, and some architectural innovations, like architectural foam elements, that can help you offer more in the jobs you bid on. Every chapter provides detailed, step-by-step instructions for each task, with hundreds of photographs and drawings that show exactly how the work is done. To keep your jobs organized, there are checklists for each stage of the concrete work, from planning, to finishing and protecting your pours. Whether you're doing residential or commercial work, this manual has the instructions, illustrations, charts, estimating data, rules of thumb and examples every contractor can apply on their concrete jobs.

288 pages, 8½ x 11, \$28.75

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

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Builders Guide to Swimming Pool Construction

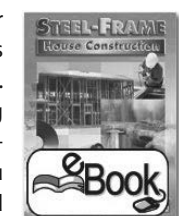
Break into the lucrative swimming pool construction business with this practical how-to guide. Here you'll learn how to get the permits and do the surveying, planning and layout for a typical pool, including how to read a soils report. You'll read about the excavation, backfill, soil compaction, sand and gravel bedding and drainage requirements, and mechanical systems such as pumps, heaters, filters, skimmers, and solar systems. Covers underground piping, including drain, supply, and gas; and electrical work, including grounding and supply to breaker, pump, underwater lighting, and heater. Shows wood and pre-fabricated metal forms for walls, steps, spas, equipment base and diving board base, and how to install bar and mesh steel reinforcement. Covers cast-in-place and sprayed concrete and modern pool finishes. Includes scheduling, and a section on estimating labor, material and equipment costs.

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

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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 hundreds of photos and illustrations. **320 pages.**

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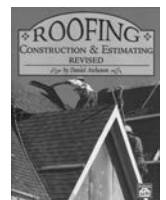
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