



2017 NATIONAL BUILDING COST MANUAL

41st Edition

Edited by
Ben Moselle



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Contents of This Manual

Explanation of the Cost Tables 4	Theaters, Masonry or Concrete..... 185
Area Modification Factors 7	Mobile Home Parks..... 195
Construction Cost Index 9	Service Stations, Wood, Masonry or Steel..... 198
 	Service Stations, Porcelain Finished Steel..... 200
Residential Structures Section10	Service Stations, Ranch or Rustic..... 202
Single Family Residences..... 10	Additional Costs for Service Stations..... 204
Manufactured Housing..... 16	Service Garages, Masonry or Concrete..... 208
Multi-Family Residences..... 19	Service Garages, Wood Frame..... 213
Motels..... 23	Auto Service Centers, Masonry or Concrete..... 218
Additional Costs for Residences..... 27	
Multi-Family and Motel Garages..... 31	Industrial Structures Section 222
Cabins and Recreational Dwellings..... 32	Warehouses..... 224
Conventional Recreational Dwellings..... 33	Light Industrial Buildings..... 225
“A-Frame” Cabins..... 38	Factory Buildings..... 226
Additional Costs for Recreational Dwellings..... 42	Internal Offices..... 227
Life in Years and Depreciation for Residences..... 43	External Offices..... 227
 	Steel Buildings..... 228
Public Buildings Section 44	Alternate Costs for Steel Buildings..... 230
Elementary Schools..... 44	Commercial and Industrial Building Lives..... 235
Secondary Schools..... 53	Additional Commercial and Industrial Costs..... 236
Government Buildings..... 56	Material Handling System..... 242
Public Libraries..... 62	Display Fronts..... 242
Fire Stations..... 68	Satellite Receiver Systems..... 245
 	Signs..... 246
Commercial Structures Section 74	Yard Improvements..... 247
Urban Stores, Masonry or Concrete..... 76	
Urban Stores, Wood or Wood and Steel..... 82	Agricultural Structures Section 249
Suburban Stores, Masonry or Concrete..... 89	General Purpose Barns..... 250
Suburban Stores, Wood or Wood and Steel..... 94	Hay Storage Barns..... 251
Supermarkets, Masonry or Concrete..... 103	Feed Barns..... 252
Supermarkets, Wood or Wood and Steel..... 105	Shop Buildings..... 253
Small Food Stores, Masonry or Concrete..... 107	Machinery and Equipment Sheds..... 254
Small Food Stores, Wood Frame..... 109	Small Sheds..... 255
Discount Houses, Masonry or Concrete..... 111	Pole Barns..... 256
Discount Houses, Wood or Wood and Steel..... 113	Low Cost Dairy Barns..... 257
Banks and Savings Offices, Masonry or Concrete..... 115	Stanchion Dairy Barns..... 258
Banks and Savings Office, Wood Frame..... 120	Walk-Through Dairy Barns..... 259
Department Stores, Reinforced Concrete..... 126	Modern Herringbone Barns..... 260
Department Stores, Masonry or Concrete..... 129	Miscellaneous Dairy Costs..... 261
Department Stores, Wood Frame..... 132	Poultry Houses, Conventional..... 262
General Office Buildings, Masonry or Concrete..... 135	Poultry Houses, Modern Type..... 263
General Office Buildings, Wood Frame..... 143	Poultry Houses, High Rise Type..... 264
Medical-Dental Buildings, Masonry or Concrete..... 151	Poultry Houses, Deep Pit Type..... 265
Medical-Dental Buildings, Wood Frame..... 159	Poultry House Equipment..... 266
Convalescent Hospitals, Masonry or Concrete..... 167	Green Houses..... 267
Convalescent Hospitals, Wood Frame..... 169	Migrant Worker Housing..... 268
Funeral Homes..... 171	Miscellaneous Agricultural Structures..... 269
Ecclesiastic Buildings..... 173	Typical Lives for Agricultural Buildings..... 269
Self Service Restaurants..... 175	
Coffee Shop Restaurants..... 178	Military Construction Section 270
Conventional Restaurants..... 181	Facility Costs 271
“A-Frame” Restaurants..... 183	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 2017.

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

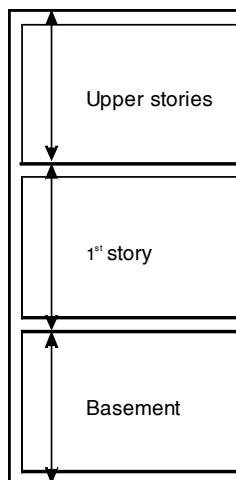
The basic building cost tables reflect the fact that larger buildings generally cost less per square foot than smaller buildings. The cost tables are based on square foot areas which include the following:

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 mid-way 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 the first floor slab or joist to the bottom of the first floor slab or joist. The main or first floor extends from the bottom of the first floor slab or joist to the top of the roof slab or ceiling joist. Upper floors are measured from the top of the floor slab or floor joist to the top of the roof slab or ceiling joist. These measurements may be illustrated as follows:



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

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

Other Adjustments

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

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

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

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

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

Explanation of the Cost Tables

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

Location Adjustments

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

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

Depreciation

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

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

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

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

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

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

Limitations

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

Area Modification Factors

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

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

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

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

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

Alabama Average -4%	Salinas 939 1%	Atlanta 303 12%	Muncie 473 -8%	Camden 48 -10%
Anniston 362 -8%	San Bernardino 923-924 2%	Augusta 308-309 -2%	South Bend 466 -2%	Cutler 46 -7%
Auburn 368 -4%	San Diego 919-921 8%	Buford 305 -2%	Terre Haute 478 -3%	Dexter 49 -4%
Bellamy 369 5%	San Francisco 941 27%	Calhoun 307 -9%		Northern Area 47 -8%
Birmingham 350-352 2%	San Jose 950-951 17%	Columbus 318-319 -3%		Portland 41 2%
Dothan 363 -7%	San Mateo 943-944 21%	Dublin/Fort Valley 310 -8%	Iowa Average -3%	
Evergreen 364 -10%	Santa Barbara 931 7%	Hinesville 313 -6%	Burlington 526 1%	Maryland Average 2%
Gadsden 359 -9%	Santa Rosa 954 5%	Kings Bay 315 -10%	Carroll 514 -11%	Annapolis 214 8%
Huntsville 358 -1%	Stockton 952 4%	Macon 312 -4%	Cedar Falls 506 -4%	Baltimore 210-212 7%
Jasper 355 -8%	Sunnyvale 940 20%	Marietta 300-302 4%	Cherokee 510 1%	Bethesda 208-209 13%
Mobile 365-366 -2%	Van Nuys 913-916 8%	Savannah 314 -4%	Council Bluffs 515 -1%	Church Hill 216 -4%
Montgomery 360-361 -2%	Whittier 906 8%	Statesboro 304 -11%	Creston 508 -1%	Cumberland 215 -8%
Scottsboro 357 -4%		Valdosta 316 -1%	Davenport 527-528 1%	Elkton 219 -5%
Selma 367 -5%	Colorado Average 1%		Decorah 521 -8%	Frederick 217 7%
Sheffield 356 0%	Aurora 800-801 7%	Hawaii Average 20%	Des Moines 500-503 5%	Laurel 206-207 8%
Tuscaloosa 354 -4%	Boulder 803-804 4%	Aliamanu 968 22%	Dubuque 520 -4%	Salisbury 218 -6%
	Colorado Springs 808-809 0%	Ewa 967 20%	Fort Dodge 505 -3%	
Alaska Average 23%	Denver 802 8%	Halawa Heights 967 20%	Mason City 504 -3%	Massachusetts Average 12%
Anchorage 995 27%	Durango 813 -1%	Hilo 967 20%	Ottumwa 525 -6%	Ayer 015-016 6%
Fairbanks 997 27%	Fort Morgan 807 -2%	Honolulu 968 22%	Sheldon 512 -7%	Bedford 17 15%
Juneau 998 19%	Glenwood Springs 816 4%	Kailua 968 22%	Shenandoah 516 -14%	Boston 021-022 37%
Ketchikan 999 18%	Grand Junction 814-815 0%	Luulualei 967 20%	Sioux City 511 5%	Brockton 023-024 20%
King Salmon 996 23%	Greeley 806 5%	Mililani Town 967 20%	Spencer 513 -7%	Cape Cod 26 4%
	Longmont 805 2%	Wahiawa 967 20%	Waterloo 507 -3%	Chicopee 10 7%
Arizona Average -4%	Pagosa Springs 811 -4%	Waianae 967 20%		Dedham 19 18%
Chambers 865 -8%	Pueblo 810 0%	Wailuku (Maui) 967 20%	Kansas Average -3%	Fitchburg 14 11%
Douglas 855 -8%	Salida 812 -6%		Colby 677 -9%	Hingham 20 19%
Flagstaff 860 -7%		Idaho Average -9%	Concordia 669 -12%	Lawrence 18 14%
Kingman 864 -5%	Connecticut Average 8%	Boise 837 -5%	Dodge City 678 -4%	Nantucket 25 9%
Mesa 852 3%	Bridgeport 66 6%	Coeur d'Alene 838 -10%	Emporia 668 3%	New Bedford 27 7%
Phoenix 850 3%	Bristol 60 12%	Idaho Falls 834 -9%	Fort Scott 667 -6%	Northfield 13 2%
Prescott 863 -6%	Fairfield 64 9%	Lewiston 835 -11%	Hays 676 -13%	Pittsfield 12 1%
Show Low 859 -8%	Hartford 61 11%	Meridian 836 -9%	Hutchinson 675 -6%	Springfield 11 8%
Tucson 856-857 -5%	New Haven 65 7%	Pocatello 832 -10%	Independence 673 9%	
Yuma 853 2%	Norwich 63 3%	Sun Valley 833 -8%	Kansas City 660-662 5%	
	Stamford 068-069 12%		Liberal 679 2%	Michigan Average 1%
Arkansas Average -7%	Waterbury 67 6%	Illinois Average 4%	Salina 674 -7%	Battle Creek 490-491 -1%
Batesville 725 -9%	West Hartford 62 5%	Arlington Heights 600 14%	Topeka 664-666 -1%	Detroit 481-482 7%
Camden 717 -2%		Aurora 605 14%	Wichita 670-672 -4%	Flint 484-485 -4%
Fayetteville 727 -4%	Delaware Average 2%	Belleville 622 0%		Grand Rapids 493-495 1%
Fort Smith 729 -7%	Dover 199 -4%	Bloomington 617 -1%	Kentucky Average -4%	Grayling 497 -7%
Harrison 726 -12%	Newark 197 6%	Carbondale 629 -4%	Ashland 411-412 -4%	Jackson 492 -1%
Hope 718 -8%	Wilmington 198 4%	Carol Stream 601 14%	Bowling Green 421 -5%	Lansing 488-489 0%
Hot Springs 719 -13%		Centralia 628 -3%	Campton 413-414 -11%	Marquette 498-499 3%
Jonesboro 724 -9%	District of Columbia Average 12%	Champaign 618 -2%	Covington 410 2%	Pontiac 483 12%
Little Rock 720-722 -3%	Washington 200-205 12%	Chicago 606-608 15%	Elizabethtown 427 -10%	Royal Oak 480 7%
Pine Bluff 716 -11%		Decatur 623 -7%	Frankfort 406 7%	Saginaw 486-487 -5%
Russellville 728 -4%	Florida Average -5%	Galesburg 614 -4%	Hazard 417-418 -9%	Traverse City 496 -2%
West Memphis 723 -2%	Altamonte Springs 327 -3%	Granite City 620 3%	Hopkinsville 422 -5%	
	Bradenton 342 -6%	Green River 612 5%	Lexington 403-405 1%	Minnesota Average -1%
California Average 7%	Brooksville 346 -7%	Joliet 604 13%	London 407-409 -7%	Bemidji 566 -6%
Alhambra 917-918 8%	Daytona Beach 321 -9%	Kankakee 609 -3%	Louisville 400-402 2%	Brainerd 564 -3%
Bakersfield 932-933 2%	Fort Lauderdale 333 2%	Lawrenceville 624 -6%	Owensboro 423 -4%	Duluth 556-558 2%
El Centro 922 0%	Fort Myers 339 -6%	Oak Park 603 18%	Paducah 420 0%	Fergus Falls 565 -10%
Eureka 955 -5%	Fort Pierce 349 -10%	Peoria 615-616 6%	Pikeville 415-416 -8%	Magnolia 561 -8%
Fresno 936-938 -2%	Gainesville 326 -9%	Peru 613 2%	Somersset 425-426 -11%	Mankato 560 -4%
Herlong 961 -3%	Jacksonville 322 -2%	Quincy 602 16%	White Plains 424 -4%	Minneapolis 553-555 13%
Inglewood 902-905 9%	Lakeland 338 -8%	Rockford 610-611 3%		Rochester 559 -1%
Irvine 926-927 13%	Melbourne 329 -8%	Springfield 625-627 0%	Louisiana Average 0%	St Cloud 563 2%
Lompoc 934 3%	Miami 330-332 1%	Urbana 619 -4%	Alexandria 713-714 -3%	St Paul 550-551 12%
Long Beach 907-908 9%	Naples 341 -2%		Baton Rouge 707-708 10%	Thief River Falls 567 -2%
Los Angeles 900-901 8%	Ocala 344 -12%	Indiana Average -2%	Houma 703 4%	Willmar 562 -6%
Marysville 959 -3%	Orlando 328 1%	Aurora 470 -5%	Lafayette 705 1%	
Modesto 953 1%	Panama City 324 -11%	Bloomington 474 -2%	Lake Charles 706 6%	Mississippi Average -6%
Mojave 935 5%	Pensacola 325 -8%	Columbus 472 -4%	Mandeville 704 2%	Clarksdale 386 -9%
Novato 949 11%	Saint Augustine 320 -2%	Elkhart 465 -4%	Minden 710 -5%	Columbus 397 0%
Oakland 945-947 17%	Saint Cloud 347 -2%	Evansville 476-477 4%	Monroe 712 -8%	Greenville 387 -14%
Orange 928 12%	St Petersburg 337 -6%	Fort Wayne 467-468 -1%	New Orleans 700-701 2%	Greenwood 389 -10%
Oxnard 930 2%	Tallahassee 323 -6%	Gary 463-464 11%	Shreveport 711 -4%	Gulfport 395 -6%
Pasadena 910-912 9%	Tampa 335-336 -1%	Indianapolis 460-462 4%		Jackson 390-392 -3%
Rancho Cordova 956-957 4%	West Palm Beach 334 -2%	Jasper 475 -7%	Maine Average -5%	Laurel 394 -7%
Redding 960 -3%		Jeffersonville 471 -5%	Auburn 42 -4%	McComb 396 -11%
Richmond 948 17%	Georgia Average -4%	Kokomo 469 -8%	Augusta 43 -5%	Meridian 393 3%
Riverside 925 4%	Albany 317 -6%	Lafayette 479 -5%	Bangor 44 -6%	Tupelo 388 -7%
Sacramento 958 3%	Athens 306 -5%		Bath 45 -6%	
			Brunswick 039-040 -1%	

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 1950. Multiply the figure listed below for the building type and year of construction by the known cost. The result is the estimated 2017 construction cost.

Year	Masonry Buildings	Concrete Buildings	Steel Buildings	Wood-Frame Buildings	Agricultural Buildings	Year of Construction
1950	14.59	15.41	16.05	12.90	11.94	1950
1951	13.64	14.56	14.57	12.07	11.09	1951
1952	13.15	14.19	14.25	11.85	10.99	1952
1953	12.98	13.72	13.61	11.56	10.75	1953
1954	12.73	13.23	13.61	11.56	10.75	1954
1955	12.21	12.63	12.89	10.95	10.28	1955
1956	11.58	12.07	11.87	10.49	9.85	1956
1957	11.25	11.61	11.39	10.42	9.61	1957
1958	10.93	11.18	10.84	10.39	11.47	1958
1959	10.59	10.82	10.59	9.95	9.19	1959
1960	10.34	10.62	10.41	9.80	9.01	1960
1961	10.13	10.58	10.24	9.62	8.98	1961
1962	9.91	10.27	9.99	9.51	8.84	1962
1963	9.76	10.00	9.88	9.32	8.02	1963
1964	9.47	9.89	9.74	9.00	8.43	1964
1965	9.17	9.63	9.40	8.81	8.20	1965
1966	8.75	9.35	9.04	8.43	7.97	1966
1967	8.55	8.90	8.46	8.02	7.65	1967
1968	8.20	8.41	8.07	7.58	7.31	1968
1969	7.74	8.04	7.80	7.30	6.90	1969
1970	7.43	7.69	7.41	6.94	6.56	1970
1971	6.97	7.04	6.88	5.97	6.11	1971
1972	6.48	6.52	6.43	5.99	5.68	1972
1973	5.92	6.17	5.71	5.53	5.34	1973
1974	5.27	5.66	5.36	5.17	4.95	1974
1975	4.79	5.00	4.82	4.86	4.41	1975
1976	4.49	4.77	4.57	4.68	4.18	1976
1977	4.18	4.47	4.34	4.35	3.93	1977
1978	3.89	4.18	4.00	3.99	3.56	1978
1979	3.57	3.72	3.58	3.66	3.37	1979
1980	3.24	3.38	3.19	3.28	3.05	1980
1981	3.05	3.19	2.93	3.13	2.85	1981
1982	2.95	3.05	2.83	3.03	2.75	1982
1983	2.82	2.95	2.78	2.89	2.59	1983
1984	2.63	2.77	2.65	2.67	2.52	1984
1985	2.56	2.63	2.58	2.59	2.48	1985
1986	2.50	2.61	2.53	2.55	2.42	1986
1987	2.48	2.56	2.51	2.50	2.40	1987
1988	2.43	2.46	2.46	2.48	2.36	1988
1989	2.38	2.42	2.34	2.43	2.29	1989
1990	2.24	2.32	2.22	2.26	2.19	1990
1991	2.42	2.29	2.11	2.14	2.07	1991
1992	2.16	2.26	2.08	2.13	2.05	1992
1993	2.11	2.24	2.01	2.10	2.02	1993
1994	2.06	2.09	1.94	2.02	1.87	1994
1995	1.95	1.91	1.79	1.90	1.77	1995
1996	1.89	1.88	1.75	1.86	1.74	1996
1997	1.82	1.82	1.67	1.82	1.70	1997
1998	1.74	1.74	1.61	1.74	1.68	1998
1999	1.67	1.67	1.57	1.72	1.64	1999
2000	1.63	1.63	1.51	1.66	1.59	2000
2001	1.58	1.58	1.48	1.60	1.55	2001
2002	1.54	1.54	1.44	1.58	1.52	2002
2003	1.51	1.51	1.41	1.57	1.49	2003
2004	1.45	1.45	1.37	1.53	1.45	2004
2005	1.34	1.34	1.23	1.37	1.42	2005
2006	1.27	1.27	1.13	1.22	1.27	2006
2007	1.23	1.23	1.08	1.13	1.18	2007
2008	1.15	1.15	1.02	1.08	1.11	2008
2009	1.14	1.14	0.99	1.08	1.11	2009
2010	1.12	1.12	0.93	1.07	1.10	2010
2011	1.13	1.13	0.96	1.09	1.13	2011
2012	1.12	1.12	0.86	1.05	1.11	2012
2013	1.07	1.07	0.91	1.00	1.04	2013
2014	1.06	1.06	0.91	0.99	1.03	2014
2015	1.05	1.05	0.90	0.98	1.02	2015
2016	1.04	1.04	0.99	0.99	1.00	2016
2017	1.00	1.00	1.00	1.00	1.00	2017

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.

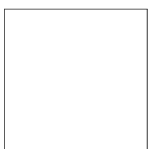
Class 1 and 2 (*Luxury* and *Semi-Luxury*) residences have more than ten corners and are best evaluated by counting the "building masses." A building mass is a group of contiguous rooms on one or more levels with access at varying angles from a common point or

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.

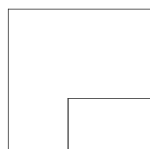
Residences on larger lots often include a separate housekeeping unit, either remote from the main structure (as illustrated below at the right) or joined to the main structure by a hallway (no common wall). Evaluate any separate housekeeping unit as a separate residence. The quality class of separate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

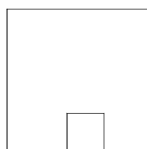
These figures can be applied to nearly all single-family residences built using conventional methods and readily available materials, including the relatively small number of highly decorative, starkly original or exceptionally well-appointed residences.



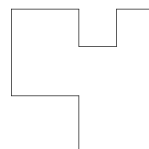
4 corners



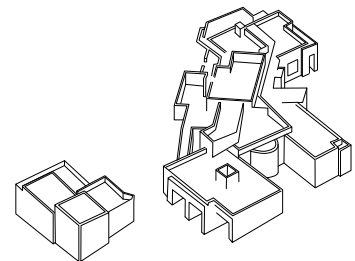
6 corners



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.

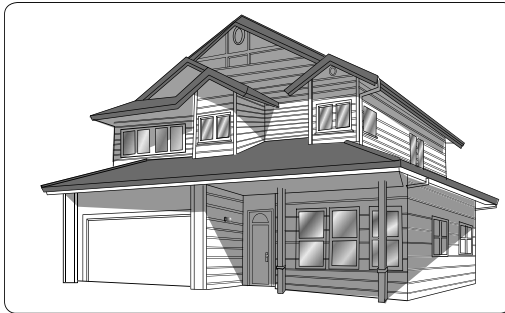
Note: Use the percent of total cost to help identify the correct quality classification.

Single Family Residences

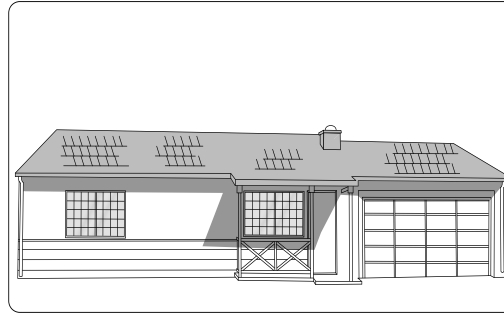
4 Corners (Classes 3, 4, 5 and 6) or One Building Mass (Classes 1 and 2 Only)

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	479.27	459.21	442.64	428.32	417.18	407.23	398.42	390.49	384.57	378.75	373.45	368.95	360.55
1, & 2	416.76	399.31	384.90	372.46	362.78	354.06	346.47	339.55	334.41	329.37	324.68	320.77	313.50
2, Semi-Luxury	291.27	279.09	269.01	260.30	253.54	247.50	242.16	237.35	233.72	230.08	226.95	224.25	219.07
2 & 3	213.80	204.89	197.47	191.12	186.14	181.68	177.74	174.21	171.53	168.94	166.54	164.62	160.84
3, Best Std.	186.56	178.81	172.30	166.79	162.36	158.52	155.11	152.05	149.70	147.45	145.38	143.61	140.34
3 & 4	159.55	152.79	147.30	142.62	138.82	135.52	132.63	129.94	128.00	125.94	124.30	122.77	120.03
4, Good Std.	137.48	131.61	126.93	122.85	119.66	116.81	114.24	111.95	110.21	108.57	107.07	105.67	103.39
4 & 5	123.82	118.61	114.39	110.67	107.76	105.14	102.86	100.90	99.31	97.79	96.46	95.30	93.07
5 Avg. Std.	111.44	106.83	102.96	99.67	97.10	94.75	92.69	90.78	89.40	88.05	86.82	85.80	83.83
5 & 6	96.76	92.71	89.38	86.51	84.23	82.21	80.42	78.77	77.62	76.40	75.48	74.46	72.77
6, Min. Std.	87.97	84.27	81.23	78.62	76.57	74.72	73.12	71.65	70.55	69.45	68.56	67.67	66.11

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	354.27	348.33	343.54	339.26	336.24	333.42	330.36	328.14	323.52	320.59	318.03	315.82	312.65
1, & 2	308.14	302.90	298.72	295.01	292.36	289.93	287.28	285.33	281.34	278.77	276.55	274.62	271.88
2, Semi-Luxury	215.44	211.69	208.80	206.19	204.31	202.58	200.74	199.42	196.62	194.83	193.26	191.93	190.01
2 & 3	158.06	155.41	153.28	151.38	149.96	148.66	147.39	146.37	144.34	143.04	141.88	140.89	139.49
3, Best Std.	137.94	135.59	133.70	132.10	130.91	129.80	128.60	127.71	125.93	125.94	124.93	124.06	122.83
3 & 4	117.94	115.95	114.38	112.98	111.90	110.91	110.01	109.25	107.71	106.75	105.88	105.15	104.09
4, Good Std.	101.62	99.87	98.56	97.28	96.46	95.59	94.77	94.04	92.77	91.94	91.17	90.55	89.65
4 & 5	91.50	90.02	88.65	87.64	86.81	86.14	85.26	84.76	83.60	82.84	82.20	81.61	80.80
5 Avg. Std.	82.41	81.06	79.94	78.85	78.22	77.53	76.82	76.30	75.26	74.17	73.99	73.49	72.77
5 & 6	71.54	70.35	69.36	68.48	67.92	67.25	66.64	66.16	65.33	64.66	64.24	63.74	63.16
6, Min. Std.	64.94	63.91	63.06	62.31	61.72	61.16	60.63	60.18	59.37	58.76	58.38	57.94	57.39

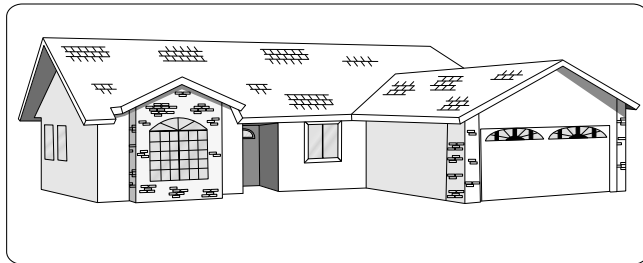
Note: Tract work and highly repetitive jobs may reduce the cost 8 to 12%. Add 4% to the square foot cost of floors above the second floor level. Work outside metropolitan areas may cost 2 to 6% less. When the exterior walls are masonry, add 9 to 10% for class 2 and 1 structures and 5 to 8% for class 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

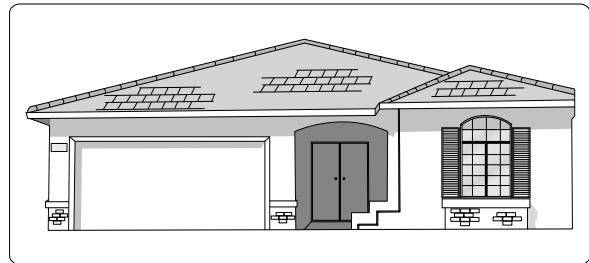
6 Corners (Classes 3, 4, 5, and 6) or Two Building Masses (Classes 1 and 2 Only)

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 5



Single Family Residence, Class 5

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	488.47	468.02	451.15	436.56	425.22	415.35	407.23	399.19	392.86	387.09	381.79	377.07	369.04
1, & 2	424.75	406.99	392.31	379.61	369.73	361.10	354.06	347.15	341.62	336.59	332.04	327.90	320.89
2, Semi-Luxury	296.93	284.50	273.99	265.72	258.39	252.40	247.50	242.61	238.73	235.21	232.07	229.12	224.31
2 & 3	217.93	208.84	201.11	195.07	189.65	185.23	181.68	178.08	175.22	172.66	170.33	168.14	164.64
3, Best Std.	190.18	182.21	175.51	170.16	165.53	161.67	158.52	155.41	152.97	150.66	148.63	146.82	143.67
3 & 4	162.59	155.85	149.98	145.53	141.57	138.17	135.60	132.85	130.83	128.78	127.11	125.46	122.79
4, Good Std.	140.11	134.27	129.24	125.35	121.94	119.08	116.81	114.48	112.59	110.99	109.57	108.14	105.76
4 & 5	126.26	120.97	116.35	112.91	109.80	107.22	105.14	103.07	101.53	99.95	98.66	97.38	95.35
5 Avg. Std.	113.66	108.95	104.82	101.71	98.93	96.55	94.75	92.96	91.47	90.06	88.83	87.71	85.80
5 & 6	98.65	94.48	91.02	88.29	85.80	83.76	82.21	80.60	79.31	78.14	77.10	76.05	74.51
6, Min. Std.	89.72	85.97	82.74	80.23	78.03	76.21	74.72	73.27	72.05	70.98	70.04	69.16	67.71

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	363.08	357.50	352.53	348.33	344.93	341.60	338.80	336.24	332.71	329.71	327.07	326.06	322.80
1, & 2	315.73	310.93	306.61	302.90	299.98	297.00	294.63	292.36	289.37	286.75	285.77	283.76	280.92
2, Semi-Luxury	220.75	217.23	214.22	211.69	209.59	207.57	205.89	204.31	202.22	200.38	198.77	197.40	195.41
2 & 3	161.98	159.47	157.29	155.41	153.86	152.36	151.14	149.96	148.40	147.28	145.46	144.35	143.34
3, Best Std.	141.32	139.16	137.18	135.59	134.32	132.96	131.89	130.91	129.52	128.36	127.32	126.44	125.17
3 & 4	120.83	118.98	117.29	115.95	114.78	113.65	112.71	111.90	110.67	109.66	108.80	108.05	106.96
4, Good Std.	104.10	102.45	101.04	99.87	98.90	97.90	97.18	96.46	95.42	94.58	93.84	93.15	92.23
4 & 5	93.80	92.28	91.02	90.02	89.03	88.21	87.50	86.81	85.94	85.18	84.49	83.90	83.05
5 Avg. Std.	84.42	83.13	82.05	81.06	80.20	79.44	78.78	78.22	77.40	76.71	76.07	75.56	74.79
5 & 6	73.27	72.05	71.09	70.35	69.60	68.99	68.41	67.92	67.12	66.51	65.98	65.54	64.87
6, Min. Std.	66.61	65.60	64.69	63.91	63.30	62.68	62.17	61.72	61.05	60.49	60.02	59.60	59.00

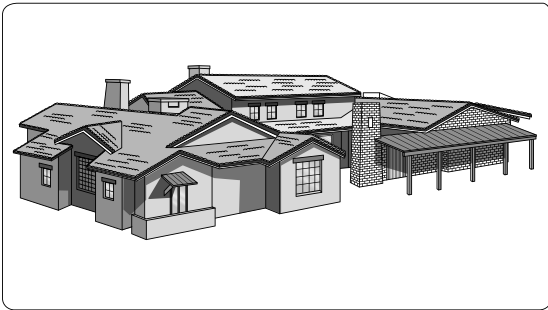
Note: Tract work and highly repetitive jobs may reduce the cost 8 to 12%. Add 4% to the square foot cost of floors above the second floor level. Work outside metropolitan areas may cost 2 to 6% less. When the exterior walls are masonry, add 9 to 10% for class 2 and 1 structures and 5 to 8% for class 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

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 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 1



Single Family Residence, Class 2 & 3

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	498.41	477.86	460.16	445.67	433.84	424.07	415.35	407.51	400.51	395.17	390.02	385.54	377.51
1, & 2	433.37	415.60	400.12	387.58	377.22	368.76	361.10	354.40	348.30	343.62	339.14	335.24	328.32
2, Semi-Luxury	301.78	289.49	279.22	270.66	263.64	257.70	252.37	247.65	243.41	240.15	237.06	234.26	229.43
2 & 3	221.54	212.49	204.92	198.65	193.53	189.17	185.23	181.79	178.68	176.30	173.96	171.99	168.43
3, Best Std.	193.31	185.43	178.88	173.39	168.87	165.09	161.67	158.60	155.92	153.85	151.82	150.14	146.99
3 & 4	165.25	158.51	152.84	148.16	144.35	141.18	138.17	135.66	133.26	131.54	129.80	128.33	125.65
4, Good Std.	142.39	136.55	131.72	127.75	124.30	121.61	119.08	116.90	114.83	113.38	111.81	110.55	108.24
4 & 5	128.29	123.05	118.62	115.07	111.95	109.49	107.22	105.33	103.44	102.07	100.72	99.56	97.47
5 Avg. Std.	115.53	110.80	106.86	103.63	100.85	98.66	96.55	94.84	93.08	91.95	90.69	89.74	87.79
5 & 6	100.25	96.16	92.72	89.90	87.54	85.65	83.76	82.30	80.85	79.78	78.72	77.80	76.21
6, Min. Std.	91.12	87.43	84.29	81.73	79.54	77.80	76.21	74.85	73.48	72.52	71.59	69.03	67.74

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	371.16	370.37	360.55	356.81	353.48	350.52	347.00	345.03	340.72	337.67	334.94	332.61	329.29
1, & 2	322.75	315.73	313.50	310.26	307.37	304.82	301.72	300.08	296.37	293.69	291.33	289.28	286.40
2, Semi-Luxury	225.53	220.75	219.07	216.83	214.91	213.03	210.83	209.63	207.10	205.27	203.61	202.22	200.15
2 & 3	165.55	161.98	160.84	159.18	157.69	156.38	154.78	153.92	152.05	150.68	149.49	148.44	146.96
3, Best Std.	144.44	141.32	140.34	138.89	137.59	136.45	135.09	134.33	133.80	132.63	131.59	130.68	129.36
3 & 4	123.38	120.83	120.03	118.72	117.65	116.69	115.54	114.83	113.45	112.42	111.54	110.75	109.63
4, Good Std.	106.42	104.10	103.39	102.34	101.38	100.61	99.56	98.91	97.75	96.84	96.09	95.39	94.46
4 & 5	95.88	93.80	93.07	92.15	91.38	90.56	89.56	89.12	88.05	86.75	86.04	85.44	84.58
5 Avg. Std.	86.32	84.42	83.83	83.01	82.20	81.54	80.73	80.30	79.28	78.59	77.94	77.40	76.64
5 & 6	74.96	73.27	72.77	72.01	71.40	70.76	70.03	69.63	68.84	68.23	67.68	67.20	66.53
6, Min. Std.	66.62	65.23	64.78	64.17	63.58	63.05	62.47	62.06	61.38	60.83	60.35	60.95	59.33

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.

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	—	—	—	—	394.39	375.73	362.03	351.77	341.80	334.38	326.63
1, & 2	—	—	—	363.06	346.61	330.46	318.22	309.28	300.48	293.99	287.17
2, Semi-Luxury	—	—	340.09	318.58	304.14	290.08	279.35	271.39	263.85	257.90	252.04
2 & 3	—	319.04	295.02	276.40	263.87	251.69	242.37	235.33	228.95	223.76	218.65
3, Best Std.	265.17	239.05	221.11	207.06	197.74	188.62	181.65	176.36	171.59	167.74	163.86
3 & 4	242.46	218.60	202.04	189.36	180.79	172.37	166.08	161.23	156.78	153.24	149.78
4, Good Std.	221.53	199.73	184.73	172.97	165.22	157.56	151.72	147.30	143.28	139.97	136.89
4 & 5	204.41	184.21	170.40	159.54	152.39	145.34	139.93	135.96	132.29	129.19	126.39
5 Avg. Std.	188.57	169.93	157.15	147.25	140.56	134.05	129.12	125.45	122.00	119.13	116.45
5 & 6	173.91	156.78	144.93	135.79	129.71	123.68	119.05	115.72	112.46	109.89	107.52
6, Min. Std.	160.41	144.63	133.71	125.28	119.58	114.05	109.88	106.79	103.82	101.45	99.22

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	321.70	315.53	310.86	307.72	299.26	292.85	287.86	283.30	279.99	275.38	272.80
1, & 2	282.74	277.47	273.37	270.51	263.07	257.22	253.11	249.03	247.94	242.06	239.85
2, Semi-Luxury	248.23	243.62	240.05	237.31	231.00	225.66	222.15	218.42	215.89	212.47	210.54
2 & 3	215.24	211.28	208.21	205.86	200.38	195.66	192.77	189.52	187.26	184.32	182.67
3, Best Std.	161.30	158.27	156.02	154.27	150.23	146.63	144.47	142.05	140.39	138.21	136.86
3 & 4	147.50	144.71	142.49	141.00	137.39	134.05	132.00	129.87	128.26	126.38	125.15
4, Good Std.	134.77	132.29	130.33	128.86	125.53	122.52	120.65	118.68	117.26	115.30	114.37
4 & 5	124.25	122.00	120.17	119.05	115.74	113.08	111.34	109.45	108.17	106.46	—
5 Avg. Std.	114.64	112.48	110.88	109.66	106.80	104.27	102.78	100.97	99.78	—	—
5 & 6	105.72	103.84	102.40	101.05	98.53	96.12	94.75	93.12	—	—	—
6, Min. Std.	97.51	95.84	94.34	93.31	90.96	88.77	87.42	—	—	—	—

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

Conventional Recreational Dwellings

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 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 2 & 3



Conventional Recreational Dwelling, Class 1

Square Foot Area

Quality Class	400	500	600	700	800	900	1,000	1,100	1,200	1,300	1,400
1, Luxury	—	—	—	—	401.19	384.27	370.70	360.03	350.71	342.78	335.17
1, & 2	—	—	—	370.50	352.58	337.91	325.85	316.50	308.23	301.83	294.64
2, Semi-Luxury	—	—	346.61	325.21	309.35	296.60	285.96	277.78	270.44	264.26	258.59
2 & 3	—	324.70	300.80	282.16	268.35	257.30	247.99	240.93	234.50	229.14	224.34
3, Best Std.	269.87	243.39	225.39	211.45	201.15	192.80	185.82	180.61	175.77	171.70	168.03
3 & 4	246.64	222.53	206.04	193.27	183.77	176.22	169.93	164.97	160.65	157.11	153.57
4, Good Std.	225.31	203.28	188.28	176.67	167.97	161.02	155.36	150.89	146.84	143.48	140.43
4 & 5	207.95	187.59	173.71	162.93	154.96	148.66	143.19	139.14	135.42	132.38	129.52
5 Avg. Std.	191.90	172.97	160.23	150.29	143.01	137.02	132.10	128.44	124.94	122.06	119.48
5 & 6	176.99	159.54	147.78	138.63	131.90	126.48	121.96	118.38	115.27	112.69	110.18
6, Min. Std.	163.30	147.25	136.38	127.91	121.66	116.69	112.41	109.33	106.42	103.88	101.73

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	330.53	324.48	319.35	315.04	307.99	300.45	296.47	290.96	287.92	281.75	280.20
1, & 2	290.64	285.24	280.79	277.03	270.77	264.02	260.66	255.94	253.27	247.77	246.55
2, Semi-Luxury	254.89	250.35	246.47	243.25	237.56	231.69	228.67	224.67	222.22	217.47	216.52
2 & 3	221.06	217.08	213.80	211.13	206.01	201.03	198.38	195.10	192.87	188.67	187.92
3, Best Std.	165.75	162.76	160.23	158.22	154.38	150.75	148.66	146.13	144.63	141.31	140.74
3 & 4	151.44	148.78	146.33	144.68	141.18	137.80	135.83	133.47	132.10	129.25	128.68
4, Good Std.	138.36	135.96	133.79	132.14	128.96	125.81	124.18	122.02	120.75	118.06	117.64
4 & 5	127.69	125.45	123.45	121.96	119.03	116.09	114.48	112.69	111.36	108.93	—
5 Avg. Std.	117.75	115.72	113.86	112.41	109.81	107.11	105.66	103.84	102.80	—	—
5 & 6	108.67	106.79	105.03	103.81	101.25	98.76	97.50	95.89	—	—	—
6, Min. Std.	100.24	98.50	96.84	95.74	93.37	91.03	89.91	—	—	—	—

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 hardwood 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 hardwood 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.

Public Libraries – Wood or Steel Frame

Upper Floor and Basement

Estimating Procedure

1. Establish the quality class for the second floor and the basement. The quality class will usually be the same as the first floor of the building. Square foot costs for unfinished basements will be nearly the same regardless of the structure quality class.
2. Calculate the area of any second floor or basement.
3. Find in the tables below the square foot cost for the appropriate quality class and the nearest area.
4. Use figures in the Wall Height Adjustment row to adjust the square foot cost for wall heights more or less than 10 feet.
5. Multiply the adjusted square foot cost by the area.
6. Multiply that total by the location factor on page 7.
7. Add costs from the section Additional Costs for Commercial, Industrial and Public Buildings beginning on page 236.
8. Add totals from this page to the cost for the first floor to find the total building cost.

Second Floor – Square Foot Area

Quality Class	4,000	6,000	8,000	10,000	12,000	16,000	20,000	24,000	28,000	32,000	40,000
1, Best	252.63	241.45	232.56	225.35	219.24	214.01	209.49	202.03	195.89	190.94	183.13
1 & 2	226.54	216.55	208.62	202.09	196.57	191.89	187.88	181.09	175.70	171.29	164.18
2, Good	203.87	194.95	187.82	181.95	176.97	172.77	169.10	163.08	158.18	154.11	147.88
2 & 3	182.39	174.37	167.90	162.63	158.29	154.52	151.24	145.79	141.48	137.86	132.22
3, Average	163.54	156.33	150.62	145.97	141.91	138.60	135.66	130.78	126.88	123.64	118.59
3 & 4	142.73	136.45	131.45	127.37	123.89	120.98	118.41	114.13	110.68	107.97	103.49
4, Low	121.79	116.39	112.13	108.69	105.72	103.19	100.99	97.37	94.43	92.07	88.28
Wall height Adjustment*	1.38	1.06	.96	.90	.86	.83	.78	.75	.74	.74	.74

***Wall Height Adjustment:** Add or subtract the amount listed in this table to or from the square foot of floor cost for each foot of second and higher floor wall height more or less than 10 feet.

Finished Basements – Square Foot Area

Quality Class	4,000	6,000	8,000	10,000	12,000	16,000	20,000	24,000	28,000	32,000	40,000
1, Best	177.50	169.64	163.40	158.33	154.05	150.38	147.19	141.94	137.63	134.16	128.66
2, Good	143.26	136.97	131.95	127.84	124.33	121.39	118.81	114.58	111.13	108.28	103.90
3, Average	114.91	109.85	105.84	102.55	99.71	97.38	95.31	91.88	89.14	86.87	83.33
4, Low	85.56	81.78	78.78	76.37	74.28	72.50	70.96	68.40	66.35	64.69	62.03

Unfinished Basements

Area	4,000	6,000	8,000	10,000	12,000	16,000	20,000	24,000	28,000	32,000	40,000
Cost	44.39	42.42	40.84	39.61	38.53	37.60	36.80	35.48	34.41	33.56	32.18

Wall Height Adjustment: Add or subtract the amount listed in this table to or from the square foot of floor cost for each foot of basement wall height more or less than 10 feet.

Area	4,000	6,000	8,000	10,000	12,000	16,000	20,000	24,000	28,000	32,000	40,000
Finished	.94	.72	.65	.62	.59	.57	.53	.52	.51	.51	.51
Unfinished	.85	.65	.59	.56	.54	.52	.49	.48	.47	.47	.47

Fire Stations – Masonry or Concrete

Quality Classification

	Class 1 Best Quality	Class 2 Good Quality	Class 3 Average Quality	Class 4 Low Quality
Foundation (6% of total cost)	Reinforced concrete, depth to 12'.	Reinforced concrete, depth 8' to 10'.	Reinforced concrete, depth 6 to 8'.	Reinforced concrete, depth 6' or less.
Floor Structure (5% of total cost)	Concrete on steel beams and deck.	Lightweight concrete on steel beams.	6" thickened edge concrete slab on 6" rock base.	4" reinforced slab on rock base.
Exterior Walls (15% of total cost)	Decorative brick with store-front glazing. Metal trim. Decorative public entrance.	Insulated glass with textured-block, good brick or stone veneer. Public entrance.	Colored concrete block with some brick or wood trim. Plain entrance.	Tilt-up concrete, brick or concrete block. Few decorative details.
Roof Structure & Cover (18% of total cost)	Glu-lams or steel trusses on steel intermediate columns. Panelized roof system with elastomeric or metal roof cover. Patio or roof deck. Engineered for earthquake or high wind zones.	Glu-lams or steel beams on steel intermediate columns. Panelized roof system with 5-ply, built-up or elastomeric roof cover. Good insulation.	Wood or metal trusses on intermediate columns. Panelized roof system with built-up or good composition roofing. Adequate insulation.	Beams or trusses on steel supports. OSB sheathing. Built-up or low cost membrane roofing. Foil insulation. Not designed for high wind or seismic zones.
Floor Finish (5% of total cost)	Stone or good terrazzo in public rooms. Carpeted leisure-time rooms. Tile in restrooms.	Terrazzo or hardwood in public rooms. Carpet in offices. Vinyl in restrooms.	Good sheet vinyl in meeting rooms. Carpet in offices. Composition tile in restrooms.	Low cost sheet vinyl in public rooms. Floor tile elsewhere.
Windows & Doors (6% of total cost)	Low-E glass in metal sash. Metal-frame laminated glass entrance doors. Metal interior doors. Institutional grade hardware. LEED certified.	Colored low-E glass. Decorative metal exterior doors. Solid core 8' high wood interior doors. Commercial grade hardware.	Insulated store front or glazed curtain wall. Metal exterior doors. Wood interior doors. Standard grade hardware.	Few standard grade metal windows. Low cost metal exterior doors. Low grade hardware.
Interior Wall Finish (13% of total cost)	Decorative plaster in public rooms. Plaster- or vinyl-covered wallboard in leisure time areas. Decorative metal or hardwood veneer wainscot and trim.	Plaster or good paneling in public rooms. Vinyl-covered wallboard in hallways. Textured or vinyl-covered wallboard with good trim elsewhere.	Textured and painted interior stucco or gypsum wallboard. Wood trim in public meeting rooms.	Painted gypsum wallboard.
Ceiling Finish (2% of total cost)	Suspended decorative textured plaster in administrative rooms. Acoustic ceiling tile elsewhere.	Suspended acoustical tile with concealed grid in meeting rooms. Ceiling tile elsewhere.	Suspended acoustical tile with exposed grid. Wallboard in vehicle bays.	Painted gypsum wallboard with trowel texture.
Specialties (13% of total cost)	Wired security, PA and surveillance systems. Video and network connections. Good day room and dispatch areas.	Surveillance and security system. Network connections throughout. Recreation facilities and good vehicle maintenance area.	Data network and AV connections throughout. Some cabinets and shelves. Plain day room and storage.	Minimum alarm system. Few cabinets and shelves. Few built-ins.
Plumbing (7% of total cost)	Top grade commercial fixtures. Copper supply, vent & drain pipe. Metal or synthetic stone toilet partitions.	Good commercial grade fixtures. Copper supply & drain pipe. Metal toilet partitions.	Standard grade fixtures. PEX or PVC supply, vent and drain pipe. Composition toilet partitions.	Minimum fixtures. Plastic supply, vent & drain pipe. Plastic-faced toilet partitions.
Lighting and Power (10% of total cost)	Decorative indirect fixtures in public rooms. Many recessed task lights on separate controls. Recessed fluorescent fixtures in offices and hallways.	Indirect lighting fixtures in public rooms. Track lighting or recessed fluorescent fixtures with some task lighting in offices and hallways.	Continuous 4 tube fluorescent strips with decorative diffusers, 8' O.C. Some recessed ceiling fixtures.	Continuous exposed 2 tube fluorescent strip, fixtures 8' O.C.

Notes: Use the percent of total cost to help identify the correct quality classification. Includes vehicle and equipment bays, equipment storage and maintenance area, living accommodations, leisure time, administration and training facilities.

Square foot costs include the following components: Foundations as required for normal soil conditions. Floor, wall and roof structures. Interior ceiling, wall and floor finishes (including carpet). Exterior wall finish and roof cover. Interior partitions. Basic lighting and electrical systems. Rough and finish plumbing. Specialties as listed. Design and engineering fees. Typical utility hook-up. Contractor's mark-up.

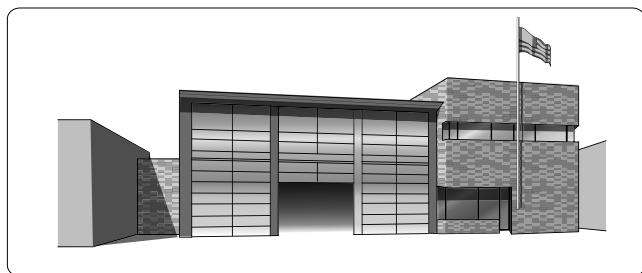
Add the cost of: Canopies and canopy lighting. Installed PA and security systems beyond what appears in the quality classification above. Docks and ramps. Elevators. Draperies. Fire extinguishers and fire sprinklers. Heating and cooling systems. Exterior signs. Walks, paving and curbing. Yard improvements. See the section "Additional Costs for Commercial, Industrial and Public Structures" beginning on page 236.

Fire Stations – Masonry or Concrete

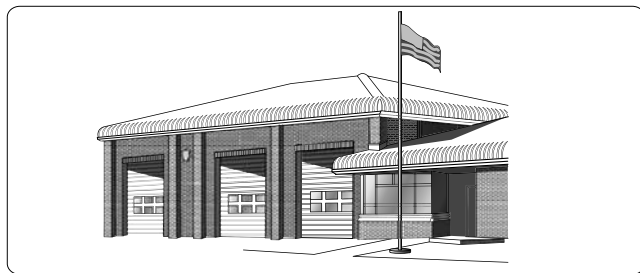
First Floor

Estimating Procedure

1. Use the tables in this section to estimate the cost of staffed fire stations including vehicle and equipment bays, equipment storage and maintenance areas, living accommodations, leisure time, administration and training facilities. Use the cost tables for Service Garages for volunteer fire stations with fire-fighting equipment bays but without living accommodations or administration facilities.
2. Establish the structure quality class by applying the information on page 68.
3. Calculate the area of the first floor. This should include all area within the building exterior walls and all inset areas outside the main walls but under the main building roof.
4. Find in the table below the square foot cost for the appropriate quality class and the nearest building area.
5. Use figures in the Wall Height Adjustment row to adjust that square foot cost for wall heights more or less than 14 feet in vehicle bays and 8 feet in other areas.
6. Multiply the adjusted square foot cost by the area of the first floor.
7. Multiply that total by the location factor on page 7.
8. Add costs from the section Additional Costs for Commercial, Industrial and Public Buildings beginning on page 236.
9. Using figures on the next page, add the cost of any second or higher floors or a basement.



Fire Station, Class 2



Fire Station, Class 3

First Floor – Square Foot Area

Quality Class	4,000	6,000	8,000	10,000	12,000	16,000	20,000	24,000	28,000	32,000	40,000
1, Best	252.08	240.92	232.07	224.87	218.78	213.54	209.05	201.58	195.48	190.53	182.74
1 & 2	226.05	216.08	208.17	201.67	196.15	191.46	187.48	180.71	175.33	170.94	163.85
2, Good	203.45	194.53	187.42	181.58	176.58	172.39	168.74	162.74	157.84	153.79	147.56
2 & 3	181.99	174.00	167.56	162.27	157.95	154.16	150.89	145.49	141.18	137.58	131.95
3, Average	163.20	156.02	150.32	145.65	141.60	138.31	135.38	130.49	126.59	123.37	118.34
3 & 4	142.43	136.15	131.18	127.11	123.62	120.72	118.16	113.89	110.44	107.71	103.29
4, Low	121.52	116.15	111.88	108.45	105.51	102.95	100.77	97.17	94.22	91.88	88.08
Wall Height Adjustment*	1.38	1.06	.96	.91	.87	.84	.78	.76	.75	.75	.75

***Wall Height Adjustment:** Add or subtract the amount listed in this row to or from the square foot of floor cost for each foot of wall height more or less than 14 feet in equipment bays and 8 feet in other areas.

Fire Stations – Masonry or Concrete

Upper Floors and Basements

Estimating Procedure

1. Establish the quality class for second and higher floors and the basement. The quality class will usually be the same as the first floor of the building. Square foot costs for unfinished basements will be nearly the same regardless of the structure quality class.
2. Calculate the area of any second or higher floor or a basement.
3. Find in the tables below the square foot cost for the appropriate quality class and the nearest area.
4. Use figures in the Wall Height Adjustment row to adjust the square foot cost for wall heights more or less than 8 feet.
5. Multiply the adjusted square foot cost by the area.
6. Multiply that total by the location factor on page 7.
7. Add costs from the section Additional Costs for Commercial, Industrial and Public Buildings beginning on page 236.
8. Add totals from this page to the cost for the first floor to find the total building cost.

Second and Higher Floors – Square Foot Area

Quality Class	4,000	6,000	8,000	10,000	12,000	16,000	20,000	24,000	28,000	32,000	40,000
1, Best	221.38	211.56	203.80	197.48	192.14	187.53	183.58	177.02	171.67	167.33	160.48
1 & 2	198.52	189.77	182.80	177.07	172.26	168.14	164.63	158.69	153.96	150.12	143.90
2, Good	178.66	170.84	164.58	159.46	155.07	151.40	148.20	142.90	138.61	135.05	129.58
2 & 3	159.81	152.80	147.15	142.50	138.71	135.41	132.54	127.76	123.98	120.82	115.87
3, Average	143.32	137.00	131.98	127.91	124.37	121.46	118.87	114.61	111.17	108.35	103.91
3 & 4	125.08	119.57	115.19	111.61	108.57	106.00	103.76	100.02	96.99	94.59	90.70
4, Low	106.72	102.00	98.26	95.24	92.65	90.43	88.50	85.33	82.74	80.68	77.35
Wall Height Adjustment*	1.20	.93	.85	.81	.77	.73	.68	.67	.66	.66	.66

***Wall Height Adjustment:** Add or subtract the amount listed in this row to or from the square foot of floor cost for each foot of wall height more or less than 8 feet.

Finished Basement – Square Foot Area

Quality Class	4,000	6,000	8,000	10,000	12,000	16,000	20,000	24,000	28,000	32,000	40,000
1, Best	137.32	131.26	126.41	122.51	119.17	116.34	113.89	109.82	106.50	103.80	99.55
2, Good	110.84	105.97	102.09	98.91	96.20	93.92	91.93	88.66	85.98	83.77	80.39
3, Average	88.92	84.97	81.89	79.34	77.14	75.36	73.75	71.08	68.96	67.22	64.46
4, Low	66.19	63.29	60.96	59.09	57.48	56.10	54.89	52.95	51.33	50.04	47.98

Unfinished Basements

Area	4,000	6,000	8,000	10,000	12,000	16,000	20,000	24,000	28,000	32,000	40,000
Cost	45.93	43.89	42.27	40.97	39.86	38.91	38.09	36.70	35.59	34.72	33.29

Wall Height Adjustment: Add or subtract the amount listed in this table to or from the square foot of floor cost for each foot of basement wall height more or less than 8 feet.

Area	4,000	6,000	8,000	10,000	12,000	16,000	20,000	24,000	28,000	32,000	40,000
Finished	.98	.76	.69	.66	.63	.61	.56	.55	.53	.53	.53
Unfinished	.89	.69	.63	.59	.58	.55	.49	.48	.47	.47	.47

Commercial Structures Section

Section Contents

Structure Type	Page
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 Offices, 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	179
"A-Frame" Restaurants	183
Theaters, Masonry or Concrete	185
Theaters, Wood Frame	191
Mobile Home Parks	196
Service Stations, Wood, Masonry or Painted Steel	198
Service Stations, Porcelain Finished Steel	200
Service Stations, Ranch or Rustic	202
Additional Costs for Service Stations	205
Service Garages, Masonry or Concrete	208
Service Garages, Wood Frame	213
Auto Service Centers, Masonry or Concrete	218
Typical Lives for Commercial Buildings	235
Additional Costs for Commercial Buildings	236

Urban Stores

Urban store buildings are designed for retail sales and are usually found in strip or downtown commercial developments. Square foot costs in this section are representative of a building situation where construction activities are restricted to the immediate site. This restriction tends to make the cost slightly higher than suburban type stores where unlimited use of modern machinery and techniques is possible. Do not use these figures for department stores, discount houses or suburban stores. These building types are evaluated in later sections.

Costs are for shell-type buildings without permanent partitions and include all labor, material and equipment costs for the following:

1. Foundations as required for normal soil conditions.
2. Floor, rear wall, side wall and roof structures.
3. A front wall consisting of vertical support columns or pilasters and horizontal beams spanning the area between these members leaving an open space to receive a display front.
4. Interior floor, wall and ceiling finishes.
5. Exterior wall finish on the side and rear walls.
6. Roof cover.
7. Basic lighting and electrical systems.
8. Rough and finish plumbing.
9. Design and engineering fees.
10. Permits and fees.
11. Utility hook-up.
12. Contractor's contingency, overhead and profit.

The in-place costs of the following components should be added to the basic building cost to arrive at the total structure cost. See the section "Additional Costs for Commercial, Industrial and Public Structures" on page 236.

1. Heating and air conditioning systems.
2. Elevators and escalators.
3. Fire sprinklers and fire escapes.
4. All display front components.
5. Finish materials on the front wall.
6. Canopies, ramps and docks.
7. Interior partitions.
8. Exterior signs.
9. Mezzanines and basements.
10. Communication systems.

For valuation purposes, urban stores are divided into two building types: 1) masonry or concrete frame and, 2) wood or wood and steel frame. Masonry or concrete urban stores vary widely in cost. Consequently, 6 quality classifications are established. Wood or wood and steel frame urban stores are divided into 4 quality classes.

Urban Stores – Masonry or Concrete

Quality Classification

	Class 1 Best Quality	Class 2 Good Quality	Class 3 High Average Quality	Class 4 Low Average Quality	Class 5 Low Quality	Class 6 Minimum Quality
Foundation (15% of total cost)	Reinforced concrete.	Reinforced concrete.	Reinforced concrete.	Reinforced concrete.	Reinforced concrete.	Reinforced concrete.
Floor Structure (15% of total cost)	6" reinforced concrete on 6" rock fill or 2" x 12" joists 16" o.c.	4" to 6" reinforced concrete on 6" rock fill or 2" x 10" joists 16" o.c.	4" reinforced concrete on 6" rock fill or 2" x 10" joists 16" o.c.	4" reinforced concrete on 6" rock fill or 2" x 8" joists 16" o.c.	4" reinforced concrete on 6" rock fill or 2" x 6" joists 16" o.c.	4" reinforced concrete on 4" rock fill or 2" x 6" joists 16" o.c.
Wall Structure (15% of total cost)	Reinforced 8" concrete or 12" common brick or block.	Reinforced 8" concrete or 12" common brick or block.	Reinforced 8" concrete or 12" common brick or block.	Reinforced 8" concrete or 12" common brick or block.	Reinforced 8" concrete block or reinforced 6" concrete.	Reinforced 8" concrete block or reinforced 6" concrete or 8" clay tile or 8" brick.
Roof Covering (10% of total cost)	5 ply composition roof on 1" sheathing with insulation.	5 ply composition roof on 1" sheathing with insulation.	5 ply composition roof on 1" sheathing with insulation.	5 ply composition roof on 1" sheathing with insulation.	4 ply composition roof on 1" sheathing.	4 ply composition roof on 1" sheathing.
Floor Finish (5% of total cost)	Combination solid vinyl tile and terrazzo or very good carpet.	Combination solid vinyl tile and terrazzo or very good carpet.	Solid vinyl tile with some terrazzo or good carpet.	Vinyl tile with small areas of terrazzo, carpet or solid vinyl tile.	Resilient tile.	Composition tile.
Interior Wall Finish (5% of total cost)	Plaster on gypsum or metal lath or 2 layers of 5/8" gypsum wallboard with expensive wallpaper or vinyl wall cover.	Plaster on gypsum or metal lath or 2 layers of 5/8" gypsum wallboard with average wallpaper or vinyl wall cover.	Plaster with putty coat finish on gypsum or metal lath, or 5/8" gypsum wallboard taped, textured and painted, some vinyl wall covering.	Plaster with putty coat finish or gypsum or metal lath, or 5/8" gypsum wallboard taped, textured and painted or with wallpaper.	Lath, 2 coats plaster with putty coat finish or 1/2" gypsum wallboard taped, textured and painted.	Interior plaster on masonry. Colored finish.
Ceiling Finish (5% of total cost)	Acoustical plaster or suspended anodized acoustical metal panels.	Acoustical plaster or suspended anodized acoustical metal panels.	Plaster with putty coat finish and some acoustical plaster or suspended acoustical tile with gypsum wallboard backing.	Plaster with putty coat finish or suspended acoustical tile.	Gypsum wallboard taped and textured or lath, 2 coats of plaster and putty coat finish.	Ceiling tile or gypsum wallboard and paint.
Exterior Wall Finish (5% of total cost)	Waterproofed and painted finish with face brick on exposed walls.	Waterproofed and painted finish with face brick on exposed walls.	Waterproofed and painted finish, face brick on exposed walls.	Painted finish, face brick on exposed wall.	Painted finish.	Unfinished.
Lighting (10% of total cost)	Encased modular units and custom designed chandeliers. Many spotlights.	Encased modular units and stock design chandeliers. Many spotlights.	Encased modular units and stock chandeliers. Many spotlights.	Quad open strip fixtures or triple encased louvered strip fixtures. Average number of spotlights.	Triple open strip fixtures or double encased louvered strip fixtures. Some spotlights.	Double open strip fluorescent fixtures.
Plumbing (Per each 5,000 S.F.) (12% of total cost)	6 good fixtures, metal or marble toilet partitions.	6 good fixtures, metal or marble toilet partitions.	6 standard fixtures, metal or marble toilet partitions.	6 standard fixtures, metal toilet partitions.	4 standard commercial fixtures, metal toilet partitions.	4 standard commercial fixtures, wood toilet partitions.
Bath Wall Finish (3% of total cost)	Ceramic tile or marble or custom mosaic tile.	Ceramic tile or marble or custom mosaic tile.	Ceramic tile or marble or plain mosaic tile.	Gypsum wallboard and paint, some ceramic tile or plastic finish wallboard.	Gypsum wallboard and paint.	Gypsum wallboard and paint.

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

Urban Stores – Wood or Wood and Steel Frame

Quality Classification

	Class 1 Best Quality	Class 2 Good Quality	Class 3 Average Quality	Class 4 Low Quality
Foundation (15% of total cost)	Reinforced concrete.	Reinforced concrete.	Reinforced concrete.	Reinforced concrete.
Floor Structure (15% of total cost)	4" reinforced concrete on 6" rock fill or 2" x 10" joists 16" o.c.	4" reinforced concrete on 6" rock fill or 2" x 8" joists 16" o.c.	4" reinforced concrete on 6" rock fill or 2" x 6" joists 16" o.c.	4" reinforced concrete on 4" rock fill or 2" x 6" joists 16" o.c.
Wall Structure (15% of total cost)	2" x 6" studs 16" o.c.	2" x 4" or 2" x 6" studs 16" o.c.	2" x 4" studs 16" o.c. up to 14' high, 2" x 6" studs 16" o.c. over 14' high.	2" x 4" studs 16" o.c. up to 14' high, 2" x 6" studs 16" o.c. over 14' high.
Roof Covering (10% of total cost)	5 ply composition roof on O.S.B. sheathing with insulation.	5 ply composition roof on O.S.B. sheathing with insulation.	4 ply composition roof on O.S.B. sheathing.	4 ply composition roof on O.S.B. sheathing.
Floor Finish (5% of total cost)	Sheet vinyl with some terrazzo or good carpet.	Resilient tile with small areas of terrazzo, carpet or solid vinyl tile.	Composition tile.	Minimum grade tile.
Interior Wall Finish (5% of total cost)	Plaster with putty coat finish on gypsum or metal lath, or 5/8" gypsum wallboard taped, textured and painted or some vinyl wall cover.	Plaster with putty coat finish on gypsum or metal lath, or 5/8" gypsum wallboard taped, textured and painted or with wallpaper.	Lath, 2 coats plaster with putty coat finish or 1/2" gypsum wallboard taped, textured and painted.	1/2" gypsum wallboard taped, textured and painted.
Ceiling Finish (5% of total cost)	Plaster with putty coat finish and some acoustical plaster or suspended acoustical tile with gypsum wallboard backing.	Plaster with putty coat finish or suspended acoustical tile with exposed grid.	Gypsum wallboard taped and textured or lath, 2 coats of plaster and putty coat finish.	Ceiling tile or gypsum wallboard and paint.
Exterior Wall Finish (5% of total cost)	Good wood siding.	Average wood siding.	Stucco or average wood siding.	Stucco or inexpensive wood siding.
Lighting (10% of total cost)	Encased modular units and stock chandeliers. Many spotlights.	Quad open strip fixtures or triple encased louvered strip fixtures. Average number of spotlights.	Triple open strip fixtures or double encased louvered strip fixtures. Some spotlights.	Double open strip fixtures.
Plumbing (12% of total cost) <i>(Per 5,000 S.F.)</i>	6 standard fixtures, metal or marble toilet partitions.	6 standard fixtures, metal toilet partitions.	4 standard commercial fixtures, metal toilet partitions.	4 standard commercial fixtures, wood toilet partitions.
Bath Wall Finish (3% of total cost)	Ceramic tile, marble or plain mosaic tile.	Gypsum wallboard and paint, some ceramic tile or plastic finish wallboard.	Gypsum wallboard and paint.	Gypsum wallboard and paint.

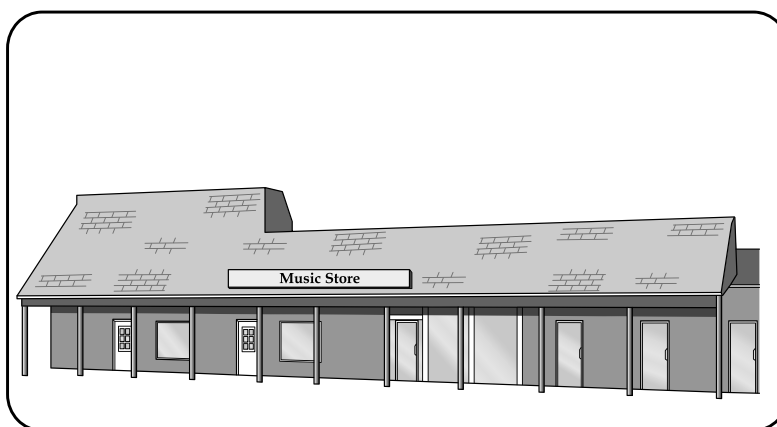
Note: Use the percent of total cost to help identify the correct quality classification

Urban Stores – Wood or Wood and Steel Frame

First Floor, Length Less Than Twice Width

Estimating Procedure

1. Establish the structure quality class by applying the information on page 82.
2. Compute the building ground floor area. This should include everything within the exterior walls and all insets outside the walls but under the main roof.
3. Add to or subtract from the cost below the appropriate amount from the Wall Height Adjustment Table on page 87 if the first floor wall height is more or less than 16 feet for large stores or 12 feet for small stores.
4. Multiply the adjusted square foot cost by the building area.
5. Deduct, if appropriate, for common walls, using the figures on page 87.
6. Multiply the total cost by the location factor on page 7 or 8.
7. Add the cost of heating and cooling equipment, elevators, escalators, fire escapes, fire sprinklers, display fronts, canopies, ramps, docks, interior partitions, mezzanines, basements, and communication systems from pages 236 to 248.
8. Add the cost of second and higher floors from page 86.



Urban Store, Class 3

Smaller Stores – Square Foot Area

Quality Class	500	600	700	800	900	1,000	1,250	1,500	1,750	2,000	2,500
2, Good	116.64	112.44	109.18	106.52	104.31	102.42	98.76	96.02	93.90	92.19	89.49
2 & 3	109.26	105.35	102.32	99.78	97.74	95.97	92.50	89.89	88.01	86.34	83.80
3, Average	102.61	98.90	96.03	93.66	91.79	90.11	86.84	84.50	82.54	81.05	78.74
3 & 4	94.15	90.76	88.13	86.00	84.20	82.68	79.72	77.51	75.76	74.39	72.26
4, Low	85.99	82.94	80.48	78.58	76.93	75.55	72.83	70.82	69.21	67.95	65.98

Larger Stores – Square Foot Area

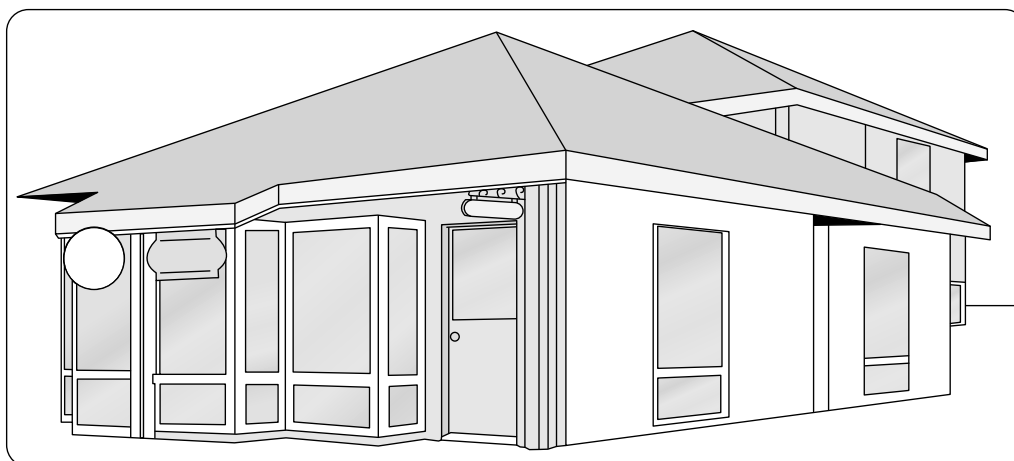
Quality Class	3,000	3,500	4,000	4,500	5,000	6,000	7,500	10,000	15,000	20,000
1, Best	108.84	106.57	104.81	103.36	102.08	100.12	97.90	95.41	92.40	90.67
1 & 2	98.51	96.51	94.89	93.58	92.46	90.68	88.64	86.34	83.67	82.05
2, Good	89.18	87.36	85.87	84.70	83.64	82.03	80.20	78.18	75.75	74.28
2 & 3	83.51	81.80	80.42	79.33	78.37	76.87	75.17	73.21	70.92	69.57
3, Average	78.19	76.59	75.31	74.24	73.35	71.92	70.36	68.54	66.39	65.10
3 & 4	70.77	69.32	68.20	67.24	66.42	65.14	63.68	62.00	60.12	58.99
4, Low	64.81	63.52	62.44	61.60	60.84	59.63	58.34	56.80	55.06	53.98

Urban Stores – Wood or Wood and Steel Frame

First Floor, Length Between 2 and 4 Times Width

Estimating Procedure

1. Establish the structure quality class by applying the information on page 82.
2. Compute the building ground floor area. This should include everything within the exterior walls and all insets outside the walls but under the main roof.
3. Add to or subtract from the cost below the appropriate amount from the Wall Height Adjustment Table on page 87 if the first floor wall height is more or less than 16 feet for large stores or 12 feet for small stores.
4. Multiply the adjusted square foot cost by the building area.
5. Deduct, if appropriate, for common walls, using the figures on page 87.
6. Multiply the total cost by the location factor on page 7 or 8.
7. Add the cost of heating and cooling equipment, elevators, escalators, fire escapes, fire sprinklers, display fronts, canopies, ramps, docks, interior partitions, mezzanines, basements, and communication systems from pages 236 to 248.
8. Add the cost of second and higher floors from page 86.



Urban Store, Class 3

Smaller Stores – Square Foot Area

Quality Class	500	600	700	800	900	1,000	1,250	1,500	1,750	2,000	2,500
2, Good	126.13	121.09	117.18	114.04	111.46	109.23	104.96	101.79	99.36	97.39	94.36
2 & 3	117.50	112.79	109.17	106.27	103.84	101.78	97.76	94.83	92.52	90.72	87.94
3, Average	110.78	106.48	103.00	100.25	97.97	96.07	92.26	89.49	87.36	85.59	82.94
3 & 4	101.78	97.74	94.58	92.05	89.92	88.17	84.73	82.15	80.19	78.58	76.16
4, Low	92.75	89.01	86.16	83.86	81.96	80.33	77.21	74.87	73.07	71.60	69.42

Larger Stores – Square Foot Area

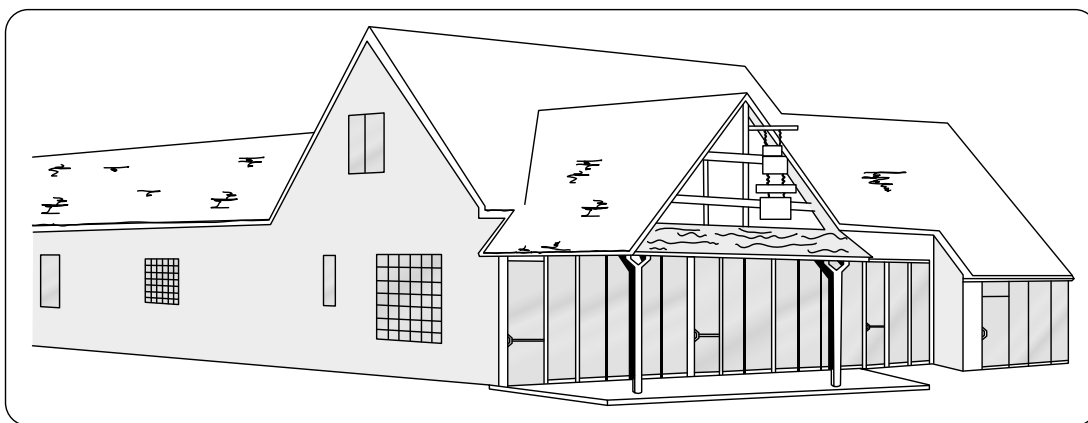
Quality Class	3,000	3,500	4,000	4,500	5,000	6,000	7,500	10,000	15,000	20,000
1, Best	113.21	111.40	109.31	106.91	105.76	103.63	101.21	98.23	94.75	92.67
1 & 2	104.09	101.73	99.80	98.23	96.92	94.79	92.44	89.72	86.54	84.59
2, Good	93.10	90.99	89.32	87.91	86.71	84.77	82.67	80.29	77.37	75.70
2 & 3	86.87	84.94	83.37	82.05	80.91	79.10	77.12	74.90	72.25	70.63
3, Average	81.73	79.89	78.41	77.21	76.11	74.44	72.54	70.46	67.95	66.43
3 & 4	75.01	73.28	71.96	70.84	69.87	68.30	66.57	64.66	62.39	61.01
4, Low	68.66	67.13	65.85	64.82	63.94	62.50	60.94	59.19	57.05	55.82

Urban Stores – Wood or Wood and Steel Frame

First Floor, Length More Than 4 Times Width

Estimating Procedure

1. Establish the structure quality class by applying the information on page 82.
2. Compute the building ground floor area. This should include everything within the exterior walls and all insets outside the walls but under the main roof.
3. Add to or subtract from the cost below the appropriate amount from the Wall Height Adjustment Table on page 87 if the first floor wall height is more or less than 16 feet for large stores or 12 feet for small stores.
4. Multiply the adjusted square foot cost by the building area.
5. Deduct, if appropriate, for common walls, using the figures on page 87.
6. Multiply the total cost by the location factor on page 7 or 8.
7. Add the cost of heating and cooling equipment, elevators, escalators, fire escapes, fire sprinklers, display fronts, canopies, ramps, docks, interior partitions, mezzanines, basements, and communication systems from pages 236 to 248.
8. Add the cost of second and higher floors from page 86.



Urban Store, Class 3

Smaller Stores – Square Foot Area

Quality Class	500	600	700	800	900	1,000	1,250	1,500	1,750	2,000	2,500
2, Good	139.01	132.17	127.02	123.00	119.71	116.96	111.71	108.02	105.15	102.86	99.49
2 & 3	129.87	123.47	118.70	114.90	111.79	109.19	104.40	100.88	98.19	96.15	92.94
3, Average	121.78	115.78	111.27	107.72	104.84	102.48	97.89	94.58	92.08	90.13	87.21
3 & 4	111.39	105.94	101.79	98.56	95.96	93.73	89.61	86.55	84.25	82.40	79.72
4, Low	101.83	96.82	93.09	90.11	87.69	85.66	81.89	79.13	76.97	75.40	72.92

Larger Stores – Square Foot Area

Quality Class	3,000	3,500	4,000	4,500	5,000	6,000	7,500	10,000	15,000	20,000
1, Best	123.03	119.82	117.24	115.12	113.30	110.45	107.29	103.73	99.54	97.11
1 & 2	112.40	109.46	107.13	105.18	103.49	100.93	98.02	94.77	90.95	88.73
2, Good	102.86	100.19	98.02	96.23	94.70	92.35	89.71	86.73	83.27	81.20
2 & 3	91.26	88.90	86.97	85.41	84.03	81.94	79.61	76.94	73.87	72.10
3, Average	86.91	84.67	82.83	81.29	80.05	78.04	75.82	73.28	70.37	68.64
3 & 4	78.31	76.25	74.63	73.24	72.16	70.31	68.30	66.00	63.36	61.83
4, Low	70.89	69.03	67.54	66.31	65.28	63.64	61.83	59.79	57.35	55.95

Urban Stores – Wood or Wood and Steel Frame

Second and Higher Floors

Estimating Procedure

1. Establish the structure quality class. The class for second and higher floors will usually be the same as the first floor.
2. Compute the square foot area of the second floor and each higher floor.
3. Add to or subtract from the square foot cost below the appropriate amount from the Wall Height Adjustment Table on page 87 if the wall height is more or less than 12 feet.
4. Multiply the adjusted square foot cost by the area of each floor.
5. Deduct, if appropriate, for common walls, using the figures on page 87.
6. Add 2% to the cost for each floor above the second floor. For example, the third floor cost would be 102% of the second floor cost and the fourth floor cost would be 104% of the second floor cost.
7. Multiply the total cost by the location factor on page 7 or 8.
8. Add the cost of heating and cooling equipment, escalators, fire escapes, fire sprinklers, and interior partitions from pages 236 to 248.

Length less than twice width – Square Foot Area

Quality Class	2,500	3,000	3,500	4,000	4,500	5,000	6,000	7,500	10,000	15,000	20,000
1, Best	94.59	92.67	91.07	89.82	88.80	87.95	86.52	84.99	83.21	81.12	79.86
1 & 2	85.93	84.08	82.68	81.57	80.65	79.86	78.55	77.13	75.56	73.65	72.51
2, Good	77.95	76.32	75.10	74.02	73.12	72.46	71.25	70.01	68.55	66.80	65.77
2 & 3	72.27	70.79	69.60	68.65	67.86	67.19	66.12	64.90	63.54	61.96	61.02
3, Average	67.37	65.98	64.91	64.03	63.28	62.66	61.65	60.50	59.28	57.76	56.88
3 & 4	63.49	62.13	61.10	60.26	59.61	59.03	58.10	57.01	55.87	54.41	53.53
4, Low	59.45	58.26	57.23	56.47	55.89	55.25	54.40	53.42	52.28	50.99	50.18

Length between 2 and 4 times width – Square Foot Area

Quality Class	2,500	3,000	3,500	4,000	4,500	5,000	6,000	7,500	10,000	15,000	20,000
1, Best	97.38	95.16	93.48	92.07	90.92	89.93	88.37	86.66	84.69	82.39	80.92
1 & 2	88.36	86.34	84.78	83.54	82.52	81.69	80.21	78.66	76.87	74.77	73.51
2, Good	80.17	78.31	76.91	75.82	74.87	74.06	72.77	71.35	69.71	67.85	66.64
2 & 3	74.44	72.75	71.47	70.41	69.52	68.82	67.57	66.28	64.77	62.97	61.89
3, Average	69.38	67.85	66.61	65.66	64.81	64.15	62.99	61.79	60.34	58.68	57.73
3 & 4	65.28	63.83	62.68	61.76	60.95	60.31	59.28	58.14	56.80	55.23	54.33
4, Low	61.20	59.82	58.72	57.86	57.17	56.56	55.52	54.48	53.27	51.76	50.76

Length over 4 times width – Square Foot Area

Quality Class	2,500	3,000	3,500	4,000	4,500	5,000	6,000	7,500	10,000	15,000	20,000
1, Best	101.54	98.91	96.92	95.31	94.00	92.81	90.97	88.95	86.67	83.94	82.37
1 & 2	92.23	89.82	88.05	86.55	85.31	84.29	82.63	80.79	78.71	76.25	74.78
2, Good	83.64	81.53	79.85	78.54	77.44	76.51	74.98	73.28	71.42	69.12	67.89
2 & 3	77.75	75.76	74.23	73.01	71.93	71.05	69.66	68.12	66.39	64.30	63.06
3, Average	72.39	70.56	69.12	68.00	67.05	66.20	64.92	63.46	61.82	59.86	58.71
3 & 4	68.21	66.45	65.10	64.04	63.13	62.40	61.12	59.81	58.26	56.42	55.30
4, Low	63.75	62.11	60.89	59.85	59.04	58.30	57.17	55.91	54.43	52.77	51.72

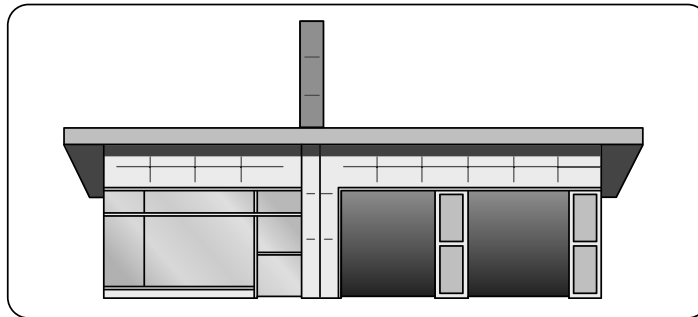
Service Stations – Porcelain Finished Steel

Estimating Procedure

1. Establish the structure quality class by applying the information on page 200.
2. Compute the building floor area.
3. Multiply the square foot cost by the building floor area.
4. Multiply the total cost by the location factor listed on page 7 or 8.
5. Add the cost of appropriate equipment and fixtures from the section “Additional Costs for Service Stations” beginning on page 204.



Good Quality



Average Quality



Low Quality

Square Foot Area

Quality Class	1,000	1,100	1,200	1,300	1,400	1,500	1,600	1,700	1,800	2,000	2,400
Good	171.21	165.27	160.58	156.74	153.65	151.18	149.02	147.25	145.77	143.48	140.52
Average	163.83	158.12	153.58	149.97	147.03	144.57	142.57	140.87	139.46	137.22	134.45
Low	148.82	143.62	139.49	136.24	133.58	131.32	129.50	128.02	126.67	124.66	122.15

Service Stations – Ranch or Rustic Type

Quality Classification

	Best Quality	Good Quality	Average Quality	Low Quality
Foundation & Floor (20% of total cost)	Reinforced concrete.	Reinforced concrete.	Reinforced concrete.	Reinforced concrete.
Walls (12% of total cost)	Steel frame.	Steel frame.	Steel frame, wood frame or masonry.	Steel frame, wood frame or masonry.
Roof Structure (8% of total cost)	Steel frame, hip or gable type.	Steel frame, hip or gable type.	Steel or wood frame, hip or gable type.	Steel or wood frame, hip or gable type.
Exterior Finish (10% of total cost)	Natural stone veneer.	Used brick veneer.	Painted steel and masonry veneer.	Painted steel or wood siding.
Roof Cover (6% of total cost)	Shingle tile or mission tile.	Heavy wood shakes or shingle tile.	Wood shakes or tar and rock.	Composition shingle or tar and gravel.
Glass Area (7% of total cost)	Large area float glass in heavy aluminum frame.	Large area float glass in heavy aluminum frame.	Large area, painted steel frame.	Average area, painted steel frame.
Lube Room Doors (5% of total cost)	Painted steel or aluminum and glass sectional roll up.	Painted steel or aluminum and glass sectional roll up.	Painted steel sectional roll up.	Painted steel sectional roll up.
Floor Finish (5% of total cost)	Concrete floors, ceramic tile in office.	Concrete floors, ceramic tile in office.	Concrete floors.	Concrete floors.
Interior Wall Finish (5% of total cost)	Painted steel panels or gypsum wallboard and paint.	Painted steel panels or gypsum wallboard and paint.	Painted steel panels or gypsum wallboard and paint.	Painted steel panels or gypsum wallboard and paint.
Ceiling Finish (3% of total cost)	Painted steel panels.	Painted steel panels.	Painted steel panels, gypsum wallboard, or "V" rustic and paint.	Painted steel panels, gypsum wallboard or "V" rustic and paint.
Restroom Finish (5% of total cost)	Ceramic tile floors, ceramic tile walls, painted steel ceiling.	Ceramic tile floors, ceramic tile walls, painted steel ceiling.	Ceramic tile floors, 5' ceramic tile wainscot, painted steel ceiling.	Ceramic tile floors, 5' ceramic tile wainscot, painted steel ceiling.
Restroom Fixtures (10% of total cost)	5 good fixtures.	5 good fixtures.	5 good fixtures.	5 good fixtures.
Exterior Appointments (4% of total cost)	3' to 6' overhang on all sides, 3' raised walk on 3 sides, fluorescent soffit lights on all sides.	3' to 6' overhang on all sides, 3' raised walk on 3 sides, fluorescent soffit lights on all sides.	3' to 6' overhang on 3 sides, 6' x 8' sign pylon, 3' raised walk on 3 sides, fluorescent soffit lights on 3 sides.	2' to 3' overhang on 3 sides, 3' raised walk on 3 sides, fluorescent soffit lights on 3 sides.

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

Square foot costs include the cost of the following components: Foundations as required for normal soil conditions. Floor, wall and roof structure. Interior floor, wall and ceiling finishes as described above. Interior partitions. Exterior finish and roof cover. A built-in work bench, tire rack and shelving. Electrical services and fixtures contained within the building. Air and water lines within the building. That portion of rough plumbing serving the building and plumbing fixtures within the building. Roof overhangs and raised walks as described above. Lube room doors. Permits and fees. Contractor's mark-up.

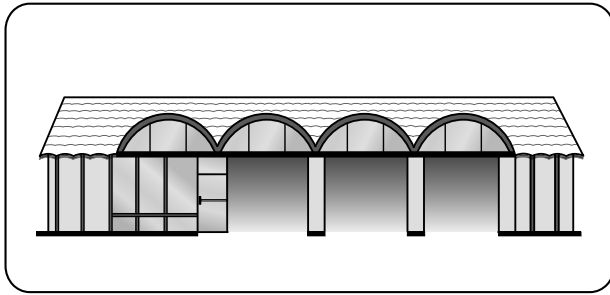
The in-place cost of these extra components should be added to the basic building cost to arrive at the total structure cost. See the section "Additional Costs for Service Stations" beginning on page 204. Canopies. Pumps, dispensers and turbines. Air and water services outside the building. Island lighters. Gasoline storage tanks. Hoists. Compressors. Yard lights. Signs. Paving. Curbs and fences. Miscellaneous equipment and accessories. Island office and storage buildings. Site improvements. Heating and cooling systems

Land improvement costs: Most service stations sites require an expenditure of \$10,000 or more for items such as leveling, excavation, curbs, driveways, relocation of power poles, replacement of sidewalks with reinforced walks and street paving.

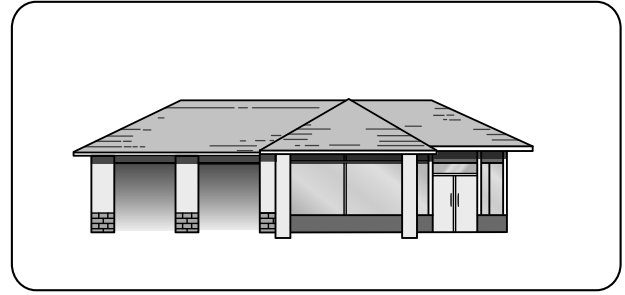
Service Stations – Ranch or Rustic Type

Estimating Procedure

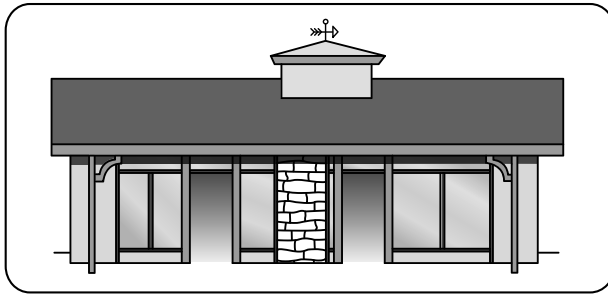
1. Establish the structure quality class by applying the information on page 202.
2. Compute the building floor area.
3. Multiply the square foot cost by the building floor area.
4. Multiply the total cost by the location factor listed on page 7 or 8.
5. Add the cost of appropriate equipment and fixtures from the section “Additional Costs for Service Stations” beginning on page 204.



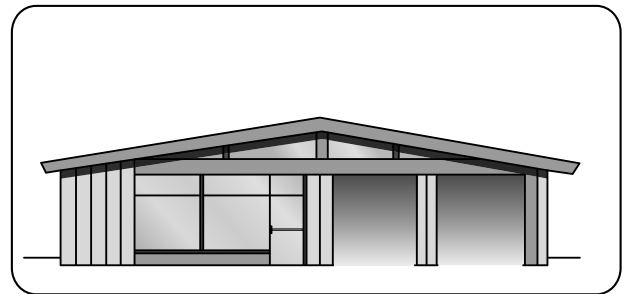
Best Quality



Good Quality



Average Quality



Low Quality

Square Foot Area

Quality Class	1,000	1,100	1,200	1,300	1,400	1,500	1,600	1,700	1,800	2,000	2,400
Best	190.14	183.41	178.07	173.82	170.41	167.53	165.23	163.27	161.64	159.11	156.00
Good	182.42	175.94	170.84	166.77	163.46	160.74	158.48	156.67	155.02	152.68	149.67
Average	175.08	168.83	163.97	160.03	156.84	154.23	152.12	150.29	148.82	146.45	143.62
Low	165.32	159.50	154.88	151.19	148.16	145.75	143.65	142.00	140.54	138.33	135.64

Additional Costs for Service Stations

A portion of the typical plumbing or electrical cost has been added to each item of equipment requiring these services. It will not be necessary except in rare instances to add extra cost for these items.

Canopies, cost per square foot

Type	Less than 500 S.F.	500 to 1,000 S.F.	Over 1,000 S.F.
Painted steel	\$36.30 to \$40.70	\$33.30 to \$40.80	\$28.80 to \$32.00
Porcelain and steel	41.60 to 43.30	36.30 to 40.40	33.14 to 36.12
Ranch style or gable roof type	47.05 to 51.40	37.20 to 44.20	33.72 to 37.84

Deluxe steel with illuminated plastic signs on sides or in gables.
Also includes illuminated plastic island lighters.

Round type, good steel 71.68 to 84.10

Costs include cost of foundation, steel support column or columns, complete canopy, painting or porcelaining, light fixtures, and electrical service. Ranch or gable roof types include the cost of a rock or shake roof cover. Concrete pads under canopies or masonry trim on support columns are not included in these costs.

Island Office and Storage buildings, cost per square foot

Type	Area						
	Under 30	31 - 40	41 - 50	51 - 60	61 - 80	81 - 100	101 - 120
Steel and glass or concrete block	464.50	445.15	395.65	354.37	317.31	296.26	240.41
Wood frame with stucco and glass	385.25	362.51	301.12	282.29	216.86	201.04	189.14

These buildings are usually found at self-service stations. Add \$1,810 per unit for any plumbing fixtures in these buildings. Steel island offices cost about \$1,865

Pumps, Dispensers and Turbines, cost each

Type	Installed Cost	Type	Installed Cost
Single pump	\$6,375	Blendomatic pump	\$10,470
Twin pump	8,650	Blendomatic dispenser	8,590
Single dispenser	4,855	Turbine pump, 1/3 HP	1,808
Twin dispenser	8,120	Turbine pump, 3/4 HP	2,504

Installed cost includes the cost of the pump or dispenser, installation cost, electrical hookup cost, a portion of the piping cost and a portion of the island block cost. Concrete islands 4" to 6" thick cost from \$12.40 to \$15.05 per square foot.

All of the above pump and dispenser costs are for the computing type. Add for electronic remote control totalizer, per hose, \$1,970. Add for vapor control system, per hose/dispenser, \$2,055.

Dispenser cost does not include the cost of the pump. Turbine pump costs must be added. 1/3 HP turbines will serve a single product up to four dispensers. 3/4 HP turbines will serve a single product up to eight dispensers.

Alternate Costs for Steel Buildings

These costs are to be added to the basic building cost

Skylights, Polycarbonate, with curb

	2' x 2'	4' x 4'	4' x 8'
Single dome	\$163	\$432	\$544
Double dome	194	490	632
Triple dome	240	565	914
Double, ventilating	467	802	1,040

Partitions, Interior, 26 gauge steel, cost per square foot of partition with two sides finished

Painted drywall finish	\$3.90
Painted plywood, fire retardant	5.70

Ventilators, round type, includes screen (gravity type), cost each

Diameter	Stationary			Rotary		
	Galvanized	Colored	Aluminum	Galvanized	Colored	Aluminum
12"	\$230	\$249	\$411	\$366	\$411	\$517
16"	321	335	480	458	502	641
20"	386	410	550	559	589	730
24"	417	441	611	624	662	834

Ventilators, ridge type, includes screen and damper

Throat Size	4"	9"	12"	14"
Cost per linear foot, galvanized	\$62	\$91	\$116	\$134
Cost per linear foot, colored	64	101	125	144

Ventilator-Dampers, cost each

Diameter	12"	16"	20"	24"
Damper only	\$85	\$115	\$120	\$139
Dampers with cords and pulleys	169	212	261	301

Continuous Ridge Ventilator, includes screen and damper, cost per 10 foot unit

Size & Type	First 10'		Each Additional 10'	
	Galvanized	Color	Galvanized	Color
9" throat	\$878	\$1,004	\$828	\$931
10" throat	1,004	1,105	893	1,004
12" throat	647	1,448	1,190	1,260

Steel Sliding Windows, includes glass and screens, cost per window

3' x 2'6"	\$436
6' x 2'6"	539
6' x 3'8"	623

Smoke and Heat Vents, automatic control, cost per 10 foot unit

Size & Type	First 10'		Each Additional 10'	
	Galvanized	Color	Galvanized	Color
9" ridge mounted	\$3,233	\$3,417	\$2,672	\$2,744
9" slope mounted	3,335	3,580	2,744	2,876

Aluminum Industrial Windows, includes glass and screens, cost per window

Size and Type	Project Out	Fixed
3' x 2'6"	\$424	\$310
2' x 2'8"	454	340
6' x 2'6"	628	416
6' x 3'8"	761	529

Add for operators:

One or two 10 foot sections	Add \$107.00
Two to seven 10 foot sections	Add \$224.00

Aluminum Sliding Windows, includes glass and screens, cost per window

Width	Height					
	2'	2'6"	3'	3'6"	4'	
2'	\$317	\$346	\$353	\$373	\$394	
3'	346	368	372	394	408	
4'	—	386	408	408	454	
5'	—	409	424	520	538	
6'	—	452	520	560	602	

If window is fixed, deduct \$5.55 per window. For mullions add \$11.00 each.

Additional Costs for Commercial, Industrial, and Public Structures

Section Contents

Additional Structure Costs	237
Basements	237
Communications Systems	237
Public Address Systems	237
Burglar Alarms	237
Canopies	237
Docks	237
Doors	238
Draperies	238
Dumbwaiters	238
Elevators	238
Escalators	238
Fill	239
Fire Escapes	239
Fire Extinguishers	239
Fire Sprinklers	239
Fireplaces	239
Heating and Cooling Systems	239
Kitchen Equipment	240
Mezzanines	240
Partitions	240
Pneumatic Tube Systems	240
Seating	240
Skylights	240
Ventilators	241
Walk-in Boxes	242
Material Handling Systems	242
Display Fronts	242
Display Front Illustrations	243
Display Front Classification and Costs	244
Bulkhead Walls	245
Ceiling	245
Entrances	245
Glass	245
Lighting	245
Platforms	245
Wall Finish	245
Satellite Receiver Systems	245
Signs	246
Post Mounting Costs	246
Rotators	247
Yard Improvements	247
Asphaltic Concrete Paving	247
Concrete Paving	247
Curbs	247
Gates	247
Striping	247
Lighting	248
Chain Link Fences	248
Wood Fences	248
Drainage Items	248

Additional Structure Costs

Basements

Cost includes concrete floor and walls, open ceiling, minimum lighting, no plumbing, and no wall finish. Cost per square foot of floor at 12' wall height.

Area	500	1,000	1,500	2,000	3,000	4,000	5,000	7,500	10,000	15,000	20,000
Cost	57.05	51.10	44.52	40.33	39.29	34.17	33.04	31.92	28.05	26.81	25.21

Add or subtract the amount listed in the table below to or from the square foot of floor cost for each foot of wall height more or less than 12 feet.

Wall Height Adjustment Square Foot Area

Area	500	1,000	1,500	2,000	3,000	4,000	5,000	7,500	10,000	15,000	20,000
Cost	3.82	2.80	2.48	2.02	1.66	1.52	1.42	1.10	.90	.70	.66

Canopies, per S.F. of canopy area

Light frame, flat roof underside, plywood and paint or cheap stucco supported by wood or light steel posts, 4" to 6" wood fascia.	\$20.09 to \$21.62
Average frame, underside of good stucco, flat roof, cantilevered from building or supported by steel posts, 6" to 12" metal fascia.	\$22.43 to \$30.38
Same as above but with sloping shake or tile roof.	\$23.44 to \$32.70
Corrugated metal on steel frame.	\$20.29 to \$30.38

Canopy Lights, per S.F. based on one row of lights for 5' canopy

Recessed spots (1 each 6 linear feet)	\$3.24
Single tube fluorescent	5.95
Double tube fluorescent	8.34

Public Address Systems, speakers attached to building. No conduit included.

Base cost, master control	\$904 to \$1,757
Per indoor speaker	188
Per outdoor speaker	376

Sound Systems, cost per unit

Voice only, per unit	\$101 to \$171
Music (add to above), small units	101 to 131
Music (add to above), large units	131 to 394
Larger installations cost the least per unit.	

Docks for unloading trucks. Cost per S.F. of dock at 4' height

L x W	10'	20'	30'	50'	100'	200'
5'	33.53	29.80	27.17	24.54	22.73	21.11
10'	29.80	25.86	22.62	20.30	18.79	18.18
15'	26.16	21.92	19.39	16.77	15.55	14.44
20'	23.43	18.79	16.26	15.05	14.04	13.23

Cost includes compacted fill, three concrete walls, concrete floor, and rock base.

Intercommunication Systems

Master control, base cost	\$1,896 to \$5,708
Cost per station	145 to 217
Nurses call system, per station	217 to 397

Security Systems

Control panel	\$155 to \$309
Each door or window secured	31 to 69
Heat detectors, each	10 to 51
Smoke detectors, each	20 to 101
Motion detectors, each	20 to 41

Loading Ramps, cost per S.F. of ramp

Size	
Under 300 S.F.	\$9.65
Over 300 S.F.	9.25

Dock Levelers and Lifts, cost each

Dock leveler, manual	\$7,575
Dock leveler, mechanical	3,687
Powered platform dock leveler	
6' x 6' recessed	3,287
6' x 8' recessed	3,717
Electro-hydraulic, pit recessed scissor lift	
5,000 lb. capacity, 6' x 8'	9,849
10,000 lb. capacity, 8' x 10'	17,412
20,000 lb. capacity, 8' x 12'	28,745

Additional Structure Costs

Doors, with hardware

Exterior, commercial, cost per door	
Glass in wood (3' x 7')	\$943 to \$1,474
1/4" plate in aluminum (3' x 7')	1,525 to 2,473
Automatic, tempered glass (3' x 7')	7,253 to 11,023
Residential type (3' x 7')	359 to 660
Interior, commercial and industrial, cost per S.F.	
Hollow core wood	\$15.25 to \$15.97
Solid wood	15.35 to 19.88
Hollow core metal	33.48 to 39.63
Fire, cost per S.F.	
Hollow metal, 1-3/4"	\$52.82 to \$69.99
Metal clad, rolling	43.23 to 70.80
Metal clad, swinging	61.81 to 88.38

Elevators, Freight, Electric, car and equipment, per shaft, car speed in feet per minute, 2 stop

Capacity	50 to 75	100 to 150	200
2,500 lbs	\$63,276	—	—
3,000	66,780	\$76,500	\$88,455
3,500	80,240	80,189	90,040
4,000	74,935	83,430	96,450
5,000	80,140	91,470	103,232
6,000	88,330	100,110	111,300
8,000	100,050	111,440	126,495
10,000	114,902	126,445	144,990

For manual doors, **add** \$5,560 for each stop. For power operated doors, **add** \$8,430 for each additional stop. **Add** \$8,430 per car for self-leveling cars. **Add** for double center opening doors, per stop \$355. **Add** for deluxe cab (raised panel, interior, drop ceiling) \$4,220.

Elevators, Freight,

Hydraulic, 100 F.P.M.

Shaft, car, machinery

2,500 lb. capacity	\$59,940
6,000 lb. capacity	100,800
Cost per stop	
Manual doors	9,500
Automatic doors	21,000

Elevators, Passenger, Electric, car and machinery cost, per shaft*

Capacity	200 F.P.M., 10 Stops	350 F.P.M., 5 Stops	500 F.P.M., 5 Stops
2,000 lbs.	\$103,680	\$110,500	\$237,000
2,500 lbs.	127,300	117,800	244,900
3,000 lbs.	128,620	125,900	247,100
3,500 lbs.	129,330	132,360	248,600
4,000 lbs.	130,130	140,210	251,900
4,000 lbs (Hospital)	131,800	143,900	259,000

*Add for each additional stop: 200 or 350 F.P.M. units, \$7,180; 500 F.P.M. units, \$11,816. Deduct for multi-shaft applications, \$3,393 to \$7,180 per additional shaft. Add for rear-opening door: \$10,200 to base cost, plus \$7,360 per door.

Roll-Up Metal Warehouse Door with chain operator, cost each

10' x 10'	\$2,677
12' x 12'	3,553
14' x 14'	3,900
Fusible link (add to above)	580
Motor controlled (add to above)	293

Draperies, cost per square yard of opening

	54" high	68" high	96" high
Minimum	\$22.90	\$23.00	\$25.80
Good quality	51.60	52.80	61.80
Better quality	62.90	68.80	84.50

Escalators, cost per flight up or down

Total Rise	32" W	40" W	48" W
10' to 13'	\$136,990	\$140,080	\$152,440
14'	141,110	147,290	159,650
15'	146,260	153,470	165,830
16'	150,380	163,770	165,830
17'	156,560	165,830	168,920
18'	159,650	170,980	168,920
19'	164,800	172,010	169,950
20'	170,980	177,160	175,100
21'	176,130	179,220	179,220

Add for glass side enclosure: \$15,219 - \$17,923.

Dumbwaiters, includes door, traction type

	1st Two Stops	Add'l. Stops
Hand operated, 25 fpm (no doors)		
25 lb.	\$2,420 to \$4,410	\$1,840
75 lb.	3,260 to 5,460	1,840
Electrical, with machinery above, floor loading		
100 lb., 50 fpm	\$9,100 to \$14,590	\$3,470
300 lb., 50 fpm	9,460 to 14,560	3,470
500 lb., 50 fpm	9,950 to 15,770	3,470
500 lb., 100 fpm	14,560 to 23,500	(5 stop)

Additional Structure Costs

Fill, compacted under raised floor, includes perimeter retaining wall but not slab, per C.F.

Up to 10,000 S.F.	\$1.06 to \$1.70
Over 10,000 to 50,000 S.F.	.90 to 1.32

Fire Extinguishers, cost each

Fire hose and cabinet	\$371 to \$733
Extinguisher cabinets	98 to 216
Extinguishers, chemical	78 to 192
Extinguishers, carbon dioxide	221 to 436

Fire Escapes

Type	Unit	Cost
Second story	Each	\$4,222 to \$5,767
Additional floors	Per story	2,485 to 3,727

Fire Sprinklers, cost per S.F. of area served

Area	Wet Pipe System	
	Normal	Special*
to 2,000	\$4.53	\$5.60
2,001 to 4,000	3.15	4.53
4,001 to 10,000	2.79	3.85
Over 10,000	2.45	3.53

Area	Dry Pipe System	
	Normal	Special*
to 2,000	\$4.90	\$5.94
2,001 to 4,000	3.15	4.27
4,001 to 10,000	3.02	4.20
Over 10,000	2.79	3.84

Costs include normal installation, service lines, permit and valves.

*Special hazard systems are custom engineered to meet code or insurance requirements and are usually so identified by a metal plate attached to the riser.

Overhead Suspended Heaters, per unit

25 MBTU	\$1,091 to \$1,318
50	1,270 to 1,410
75	1,410 to 1,555
100	1,609 to 1,830
150	1,968 to 2,111
200	2,272 to 2,379
250	2,510 to 2,545

Fireplace

	1 Story	2 Story
Freestanding wood burning heat circulating prefab fireplace, with interior flue, base and cap.	\$1,646	—
Zero-clearance, insulated prefab metal fireplace, brick face.	2,353	\$3,101
5' base, common brick, on interior face.	3,131	3,515
6' base, common brick, used brick, face brick or natural stone on interior face with average wood mantle.	4,878	5,232
8' base, common brick, used brick or natural stone on interior face, raised hearth.	6,818	7,656

Electric Heating Units

Baseboard, per linear foot	\$15.75 to \$31.50
Add for thermostat	42.00
Cable in ceiling, per S.F.	2.38 to 3.06
Wall heaters, per K.W.	52.50 to 105.00

Heating and Cooling Systems

Type and Use	Cost per S.F. of Floor Area**		Heating & Cooling	
	Heating Only			
Elementary schools	\$7.01 to \$10.89		\$12.69 to \$19.85	
Secondary schools	7.50 to 11.62		13.64 to 21.15	
Government offices	12.14 to 18.85		22.11 to 34.23	
Libraries	8.30 to 15.14		15.14 to 23.32	
Fire stations	7.35 to 13.33		11.55 to 17.95	
Urban stores	4.62 to 7.15		8.41 to 13.03	
Suburban stores	3.70 to 5.72		6.71 to 10.43	
Small food stores	3.92 to 6.10		7.15 to 11.08	
Supermarkets	4.59 to 7.09		8.37 to 12.94	
Discount houses	3.39 to 5.28		6.17 to 9.61	
Bank and savings	6.19 to 9.60		11.22 to 17.39	
Department stores	4.34 to 6.72		7.90 to 12.26	
Reinforced concrete	5.46 to 8.48		9.97 to 15.43	
General offices				
Forced air	5.41 to 8.40		9.85 to 15.28	
Hot & chilled water	—		11.39 to 17.68	
Medical-Dental				
Forced air	5.88 to 9.14		10.70 to 16.69	
Hot & chilled water	—		12.06 to 18.77	
Convalescent hospitals				
Forced air	5.46 to 8.48		9.97 to 15.42	
Hot & chilled water	—		11.72 to 18.20	
Funeral homes	7.88 to 12.17		14.30 to 22.12	
Ecclesiastic buildings	6.08 to 9.44		11.05 to 17.02	
Restaurants	8.10 to 12.60		14.86 to 22.93	
Theaters	5.42 to 8.43		9.90 to 15.33	
Industrial buildings	2.34 to 5.82		—	
Interior offices	2.66 to 3.73		4.82 to 7.50	

**Use the higher figures where more heating and cooling density is required.

Additional Structure Costs

Kitchen Equipment, cost per linear foot of stainless steel fixture

Work tables	\$837 to \$1,017
Serving fixtures	347 to 1,939

Mezzanines, cost per S.F. of floor

Unfinished (min. lighting and plumbing)	2.60 to 31.10
Store mezzanines	43.10 to 54.70
Office mezzanines (without partitions)	46.60 to 60.50
Office mezzanines (with partitions)	60.50 to 95.00

Costs include floor system, floor finish, stairways, lighting, and partitions where applicable.

Seating, cost per seat space

Theater, economy	\$168
Theater, lodge	308
Pews, bench type	81
Pews, seat type	113

Partitions, cost per S.F. of surface

Gypsum on wood frame, (finished both sides) 2" x 4" wood studs, 24" on center with 1/2" gypsum board, taped, textures and painted.	\$5.82
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Plaster on wood frame (finished both sides) 2" x 4" wood studs, 24" on center with 2 coats plaster over gypsum lath, painted with primer and 1 coat enamel.	\$10.80
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Pneumatic Tube Systems

Twin tube, two station system	
2-1/4" round, 500 to 1,500 feet	\$19,988 to \$36,360
3" round, 500 to 1,500 feet	20,604 to 39,663
4" round, 500 to 1,500 feet	21,432 to 45,743
4" x 7" oval, 500 to 1,500 feet	34,098 to 56,762

Automatic System, twin tube, cost per station	
4" round, 500 to 1,500 feet	\$25,452 to \$33,795
4" x 7" oval, 500 to 1,500 feet	34,098 to 36,885

Skylights, Plastic Rectangular Domes, cost per unit

Size	Single Plastic Panel		Double Plastic Panel	
	Skylight Only	With 4" or 9" Insulated Curb	Skylight Only	With 4" or 9" Insulated Curb
16" x 16"	\$184	\$312	\$223	\$329
16" x 24"	209	353	252	345
16" x 48"	238	407	329	488
24" x 24"	238	378	353	372
24" x 32"	252	407	386	488
24" x 48"	294	461	407	554
28" x 92"	502	744	793	919
32" x 32"	252	407	353	488
32" x 48"	340	473	452	562
32" x 72"	432	670	737	850
39" x 39"	353	473	473	556
39" x 77"	527	744	919	987
40" x 61"	488	670	737	1,001
48" x 48"	378	554	554	683
48" x 64"	527	825	825	987
48" x 72"	611	949	949	1,115
48" x 92"	799	1,022	1,223	1,554
48" x 122"	1,126	1,350	1,544	1,801
58" x 58"	611	839	987	1,136
60" x 72"	765	1,022	1,189	1,361
60" x 92"	974	1,243	1,479	1,265
64" x 64"	778	987	1,072	1,704
77" x 77"	1,115	1,404	1,801	1,973
94" x 94"	1,983	2,315	3,248	3,601

Triple dome skylights cost about 30% more than double dome skylights.

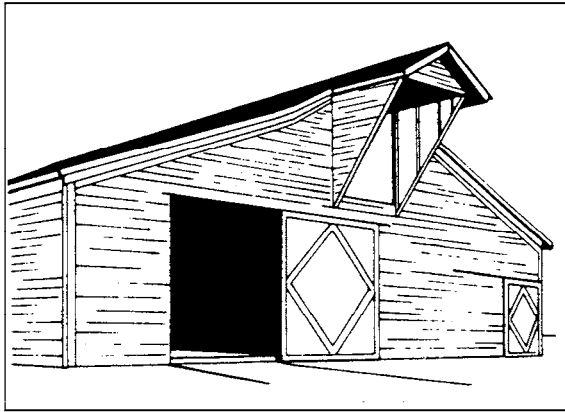
Agricultural Structures Section

Section Contents

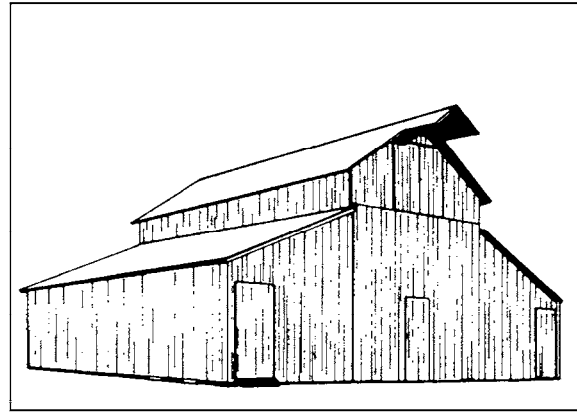
Structure Type	Page
General Purpose Barns	250
Hay Storage Barns	251
Feed Barns	252
Shop Buildings	253
Machinery and Equipment Sheds	254
Small Sheds	255
Pole Barns	256
Low Cost Dairy Barns	257
Stanchion Dairy Barns	258
Walk-Through Dairy Barns	259
Modern Herringbone Barns	260
Miscellaneous Dairy Costs	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
Greenhouses	267
Migrant Worker Housing	268
Miscellaneous Agricultural Structures	269
Typical Lives for Agricultural Buildings	269

General Purpose Barns

Quality Classification



General Purpose Barn, Class 1



General Purpose Barn, Class 3

Component	Class 1 Good Quality	Class 2 Average Quality	Class 3 Low Quality
Foundation (20% of total cost)	Continuous concrete.	Concrete or masonry piers.	Redwood or cedar mudsills.
Floor (5% of total cost)	Concrete.	Dirt, leveled & compacted.	Dirt, leveled & compacted.
Wall Structure (25% of total cost)	Good wood frame, 10' eave height.	Average wood frame, 10' eave height.	Light wood frame, 10' eave height.
Exterior Wall Cover (25% of total cost)	Good wood siding, painted.	Standard gauge corrugated iron, aluminum or average wood siding.	Light aluminum or low cost boards.
Roof Construction (9% of total cost)	Medium to high pitch, good wood trusses.	Medium to high pitch, average wood trusses.	Medium to high pitch, 2" x 4" rafters 24" to 36" o.c. or light wood trusses.
Roof Cover (5% of total cost)	Wood shingles.	Standard gauge corrugated iron or aluminum.	Light aluminum.
Electrical (8% of total cost)	Four outlets per 1,000 S.F.	Two outlets per 1,000 S.F.	None.
Plumbing (3% of total cost)	Two cold water outlets.	One cold water outlet.	None.

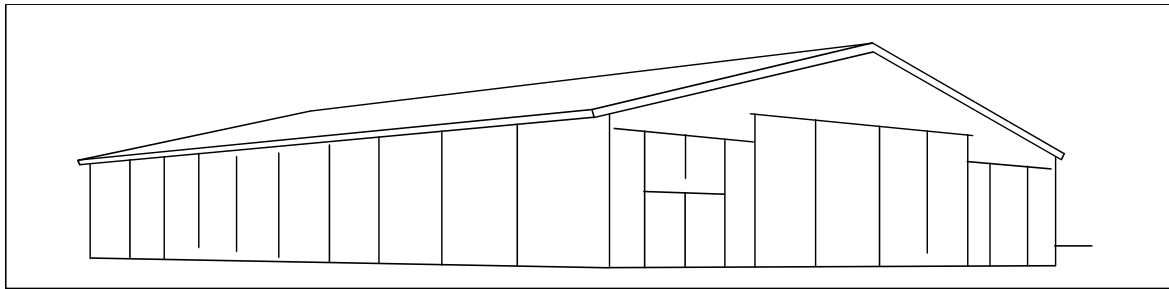
Note: Use the percent of total cost to help identify the correct quality classification.

Square Foot Area

Quality Class	1,000	2,000	3,000	4,000	5,000	6,000	7,000	8,000	9,000	10,000	11,000
1, Good	39.29	36.19	33.51	32.17	30.86	29.49	28.53	27.90	27.35	26.81	26.34
2, Average	29.15	26.30	24.37	23.41	22.49	21.69	21.05	20.67	20.32	19.99	19.66
3, Low	19.00	16.42	15.24	14.60	14.16	13.87	13.59	13.42	13.23	13.13	12.98

Hay Storage Barns

Quality Classification



Hay Storage Barn, Class 2

Length between one and two times width

Component	Class 1 Good Quality	Class 2 Average Quality	Class 3 Low Quality
Foundation (25% of total cost)	Continuous concrete.	Concrete or masonry piers.	Redwood or cedar mudsills.
Floor (5% of total cost)	Concrete.	Dirt, leveled & compacted.	Dirt, leveled & compacted.
Wall Structure (25% of total cost)	Good wood frame, 20' eave height.	Average wood frame, 20' eave height.	Light wood frame, 20' eave height.
Exterior Wall Cover (30% of total cost)	Good wood siding, painted.	Standard gauge corrugated iron or aluminum.	Light aluminum or low cost boards.
Roof Construction (10% of total cost)	Low to medium pitch, good wood trusses.	Low to medium pitch, average wood trusses.	Low to medium pitch, 2" x 4" rafters 24" to 36" o.c. or light wood trusses.
Roof Cover (5% of total cost)	Wood shingles.	Standard gauge corrugated iron or aluminum.	Light aluminum.
Electrical	None.	None.	None.
Plumbing	None.	None.	None.

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

Square Foot Area

Quality Class	1,000	2,000	3,000	4,000	5,000	6,000	7,000	8,000	9,000	10,000	11,000
1, Good	30.51	27.45	25.42	23.83	22.85	22.00	21.45	20.90	20.48	20.06	19.64
2, Average	18.74	16.77	15.54	14.69	14.15	13.65	13.17	12.74	12.45	12.21	12.06
3, Low	16.29	14.63	13.65	12.92	12.32	11.85	11.48	11.21	11.02	10.67	10.44

Pole Barns

These prices are for pole barns with a low pitch corrugated iron or aluminum covered roof supported by light wood trusses and poles 15' to 20' o.c. The gable end is enclosed and the roof overhangs about 2' on two sides. Wall height is 18 feet. Where sides are enclosed, the wall consists of a light wood frame covered with corrugated metal.

All Sides Open – Side Length

End Width	34	51	68	85	102	119	136	153	170	187
20	9.30	8.96	8.78	8.71	8.64	8.55	8.53	8.53	8.52	8.51
25	8.73	8.39	8.24	8.16	8.13	8.05	8.02	8.01	8.00	7.99
30	8.34	8.01	7.91	7.79	7.76	7.70	7.69	7.66	7.66	7.66
35	8.02	7.76	7.63	7.52	7.48	7.42	7.41	7.40	7.37	7.37
40	7.93	7.63	7.48	7.37	7.35	7.32	7.30	7.23	7.23	7.21
45	7.77	7.48	7.35	7.23	7.19	7.16	7.14	7.12	7.10	7.10
50	7.59	7.31	7.14	7.09	7.02	7.01	6.98	6.97	6.97	6.95
60	7.56	7.25	7.10	7.02	6.99	6.97	6.95	6.94	6.91	6.91
70	7.48	7.16	7.06	6.99	6.95	6.91	6.90	6.87	6.86	6.86
80	7.42	7.14	7.01	6.95	6.90	6.87	6.82	6.82	6.79	6.76

Ends and One Side Closed, One Side Open – Side Length

End Width	34	51	68	85	102	119	136	153	170	187
20	16.78	14.78	13.78	13.24	12.92	12.67	12.47	12.29	12.19	12.13
25	15.35	13.54	12.67	12.13	11.76	11.55	11.43	11.28	11.16	11.06
30	14.41	12.69	11.85	11.41	11.04	10.85	10.71	10.58	10.47	10.39
35	13.66	12.08	11.28	10.80	10.51	10.30	10.18	10.10	9.96	9.88
40	13.17	11.64	10.87	10.41	10.18	9.92	9.79	9.69	9.58	9.53
45	12.82	11.32	10.53	10.16	9.81	9.67	9.51	9.42	9.31	9.26
50	12.47	10.94	10.25	9.81	9.54	9.36	9.26	9.13	9.04	9.00
60	12.13	10.64	9.98	9.54	9.31	9.13	9.00	8.87	8.81	8.74
70	11.85	10.41	9.71	9.34	9.13	8.95	8.77	8.70	8.63	8.53
80	11.58	10.12	9.51	9.16	8.86	8.71	8.57	8.51	8.42	8.34

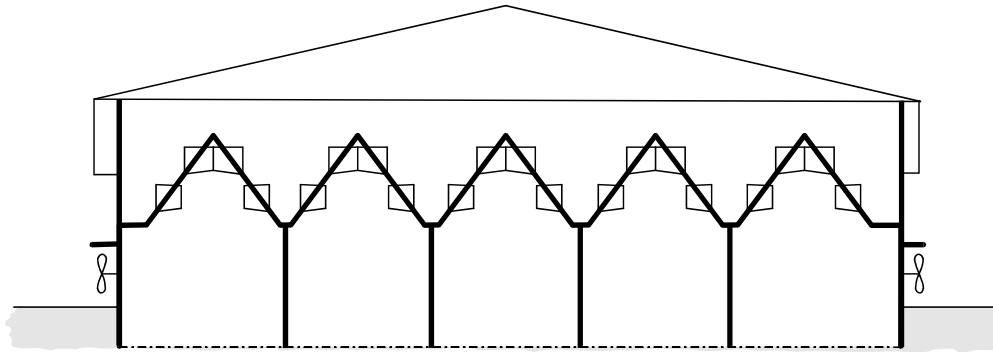
All Sides Closed – Side Length

End Width	34	51	68	85	102	119	136	153	170	187
20	20.11	18.08	17.06	16.44	16.05	15.75	15.57	15.40	15.29	15.17
25	17.97	16.16	15.22	14.70	14.31	14.08	13.87	13.70	13.62	13.54
30	16.45	14.79	13.99	13.46	13.16	12.93	12.77	12.66	12.53	12.45
35	15.49	13.93	13.12	12.68	12.33	12.11	11.95	11.87	11.74	11.67
40	14.70	13.25	12.48	12.05	11.74	11.55	11.41	11.28	11.16	11.07
45	14.12	12.68	11.94	11.54	11.28	11.04	10.90	10.79	10.72	10.61
50	13.55	12.19	11.51	11.06	10.79	10.62	10.50	10.37	10.28	10.22
60	12.95	11.62	10.94	10.59	10.32	10.16	10.03	9.90	9.81	9.74
70	12.56	11.28	10.63	10.28	10.00	9.81	9.69	9.57	9.51	9.46
80	12.11	10.85	10.28	9.90	9.60	9.48	9.36	9.26	9.20	9.14

Side sheds tying into one side of a pole barn are priced as follows. The shed consists of one row of poles 14' to 16' high, spaced 15' to 20' o.c. A light wood truss covered with a low pitch sheet metal roof spans the distance between the poles and the barn side. If the sides are open, the cost will be between \$8.09 and \$10.80 per square foot of area covered. If all sides are enclosed with sheet metal and a light wood frame, the square foot cost will be \$12.94 to \$16.92.

Poultry Houses

Deep Pit Type



Basic Building

Foundation (25% of total cost)	Concrete piers.
Floors (15% of total cost)	Concrete with waterproof membrane.
Wall Frame (15% of total cost)	2" x 4" @24" o.c.
Roof & Cover (15% of total cost)	Wood trusses with 2" x 4" purlins @24" o.c., corrugated iron aluminum cover.
Exterior (15% of total cost)	Two rib aluminum or corrugated iron.
Interior (5% of total cost)	3/4" insulation.
Lighting (5% of total cost)	Fluorescent or good incandescent.
Plumbing (5% of total cost)	Good basic system.
Basic Building Cost Per S.F.	\$34.20 to \$36.03

Equipment

Component	Flat Deck	Stair Step
Cages (33% of total cost)	12" x 20".	12" x 20".
Watering (20% of total cost)	Automatic cup system.	Automatic cup system.
Feeding (25% of total cost)	Automatic system.	Automatic system.
Egg Gathering (15% of total cost)	Automatic system.	Automatic system.
Cooling (7% of total cost)	Negative pressure system.	Negative pressure system.
Heating	None.	None.
Building & Equipment Square Foot Cost	\$40.57 to \$43.98	\$42.36 to \$45.80

Poultry Houses

Equipment Costs

Add these costs to the basic building cost

Component	Serving One Row of Cages	Serving Two Rows of Cages
Automatic feeders	\$2.22 per bird	\$1.27 per bird
Automatic egg gathering	1.71 per bird	.95 per bird
Automatic water cup system	1.66 per bird	.80 per bird
	5.30 per cup	3.40 per cup
"V" water trough	.43 per bird	.31 per bird
16" feed trough	.51 per bird	.33 per bird

Foggers

1/2" galvanized pipe	\$2.40/linear foot
3/4" galvanized pipe	2.52/linear foot
1" galvanized pipe	2.61/linear foot

Roof sprinklers

\$2.71 per linear foot

Evaporative coolers

\$786 each. \$1.99 per S.F. of building

Fans

36"	\$403 each
48"	525 each
50"	585 each

Negative pressure air conditioning system

\$1.61 to \$2.07 per S.F. of building.

Cooling pads in walls

\$.95 per S.F. of surface.

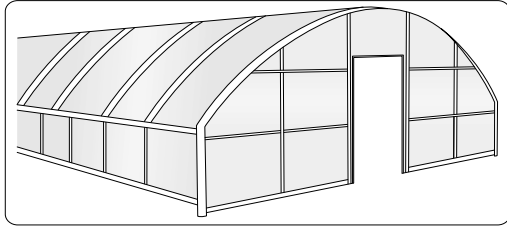
Heating systems

\$2,244 per unit.

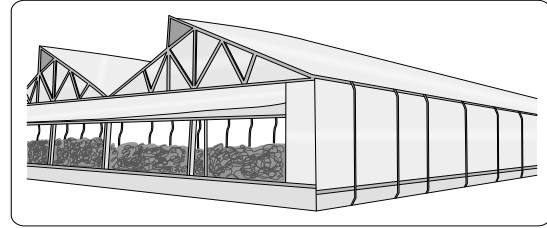
Cages, 12" x 20" or 18"

\$8.26 each. \$2.14 per bird.

Greenhouses



Greenhouse, Class 3



Greenhouse, Class 1

Quality Classification

Component	Class 1 High Quality	Class 2 Average Quality	Class 3 Low Quality
Wall and roof	Heavy steel frame, 8' wall, glass or multi-wall polycarbonate cover.	Galvanized steel frame, 8' wall, double polycarbonate or fiberglass cover.	Light pipe, 4' wall, single light polyethylene cover, fiberglass ends.
Floor	Finished concrete walks, concrete foundation.	Gravel, some plain concrete walks.	Dirt, some gravel.
Interior	Good lighting, running water, roof vents, and exhaust fans.	Average lighting, water, and roof vents.	Light wood frame, 10' eave height.

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

Square Foot Area

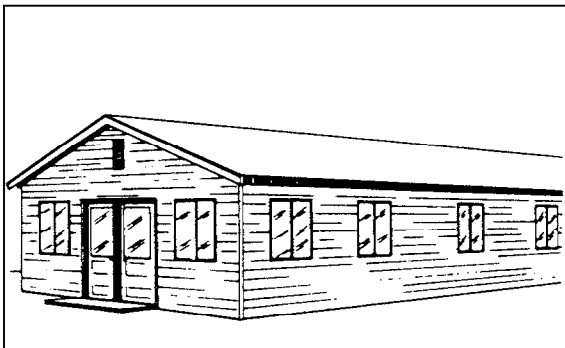
Quality Class	5,000	7,500	10,000	15,000	20,000	25,000	30,000	35,000	40,000	45,000	50,000
High	24.21	23.35	22.57	21.15	19.83	19.12	18.58	18.05	17.53	17.21	17.12
Average	18.19	17.64	17.04	15.52	14.48	14.01	13.69	13.28	13.14	12.88	12.69
Low	4.12	3.89	3.69	3.61	3.57	3.51	3.45	3.20	2.99	2.86	2.75

Migrant Worker Housing

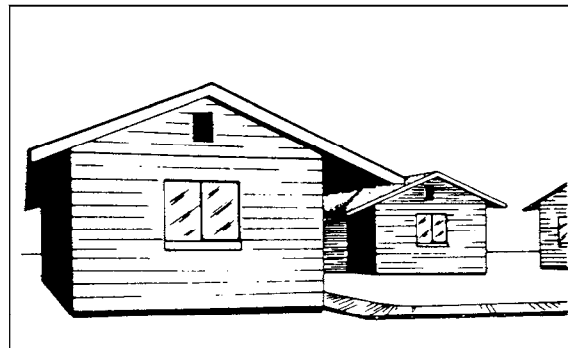
Quality Classification

	Class 1 Best Quality	Class 2 Prefabricated	Class 3 Good Quality	Class 4 Average Quality	Class 5 Low Quality
Slab Foundation (15% of total cost)	Spread footing around perimeter and thickened slab at partitions.	Spread footing around perimeter.	Thickened around perimeter.	Thickened around perimeter.	Thickened around perimeter.
Floor (10% of total cost)	4" concrete slab reinforced.	4" concrete slab reinforced.	4" concrete slab.	4" concrete slab.	4" concrete slab.
Walls (20% of total cost)	Masonry exterior walls, wood frame interior partitions and ceiling.	Metal building, prefabricated.	2" x 4" studs @16" o.c., 2" x 4" stud partitions.	Box construction 4" x 4" at 48" o.c.	Box construction 2" x 4" at 48" o.c.
Exterior Cover (15% of total cost)	Natural blocks.	Prefabricated metal building.	Average grade redwood board and batt or horizontal siding or stucco finish.	Fair grade redwood or fir board and batt or horizontal board.	Poor grade of redwood or fir, vertical or horizontal.
Interior Finish (15% of total cost)	Gypsum wallboard.	None.	Gypsum wallboard.	Plywood partitions.	None.
Roof Framing (10% of total cost)	Rafters, collar beams and ceiling joists.	Prefabricated metal building.	Rafters, collar beams and ceiling joists.	Very simple truss.	Rafters and tie at plate line.
Roofing (5% of total cost)	Composition shingles.	Metal.	Aluminum or wood.	Composition or sheet metal.	Composition or used sheet metal.
Doors (3% of total cost)	1 metal door and metal frame each room.	Metal doors.	1 average door each room.	3 or 4 average doors.	2 or 3 cheap doors.
Windows (2% of total cost)	1 steel sash or aluminum window in each room.	Approximately 20% of floor area.	1 steel or aluminum window in each room.	1 window each room.	Few and small.
Electrical (5% of total cost)	1 good light and plug in each room.	1 light, 1 plug for each 300 S.F.	1 light, 1 plug in each room.	1 pull chain light and plug for each 400 S.F.	1 pull chain light for each 500 S.F.

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



Migrant Worker Housing, Class 1



Migrant Worker Housing, Class 4

Square Foot Area

Quality Class	400	600	800	1,000	1,200	1,500	2,000	2,500	3,000
1, Best	60.86	56.25	53.74	52.20	51.05	49.89	48.66	47.87	47.27
2, Prefabricated	55.81	51.48	49.22	47.76	46.75	45.64	44.54	43.80	43.32
3, Good	52.13	48.17	46.04	44.61	43.67	42.67	41.62	40.90	40.48
4, Average	43.87	40.56	38.74	37.55	36.75	35.92	35.01	34.37	33.98
5, Low	36.09	33.33	31.90	30.62	30.23	29.60	28.89	28.38	28.05

Costs do not include any plumbing. Add \$788 to \$942 per fixture.

Miscellaneous Agricultural Structures

Livestock Scales

Type	Size	Capacity	In-Place
Full-capacity beam	16' x 8'	5 ton	\$12,470
Printing beam	16' x 8'	5 ton	15,600
Full-capacity beam	22' x 8'	10 ton	16,500
Printing beam	22' x 8'	10 ton	19,950

Additional Costs for Livestock Scales

Types and Size	Cost
Each foot arm is removed from scale	\$150/L.F.
Angle iron stock rack for 16' x 8' scale	4,080 ea.
Angle iron stock rack (wood) for 16' x 8'	606 ea.
Angle iron stock rack for 22' x 8' scale	7,110 ea.

Scale pit has 4" concrete walls and slab poured in place. May be poured in or on top of the ground. If on top, compacted ramps and steps to the scale beam are included.

Motor Truck Scales

Five inch reinforced concrete platform. All-steel structure and scale mechanism. Reinforced concrete pit. Motor truck scales are of two general types, the beam type (either manual or type registering) and the full-automated dial type. The construction of both, insofar as the weight-carrying mechanism is concerned is very similar. The method of recording and weight capacity make the cost vary.

Capacity	Platform Size	Total Cost
20 tons	24' x 10'	\$25,850
30 tons	34' x 10'	32,670
40 tons	40' x 10'	35,950
50 tons	45' x 10'	40,950
50 tons	50' x 10'	42,700
50 tons	60' x 10'	48,800
50 tons	70' x 10'	53,100

Above costs are for full-capacity beam scales. Add \$860 for the registering type beam.

Septic Tanks

2 bedroom home with 1,200 gallon tank	\$2,580
3 bedroom home with 1,500 gallon tank	2,720
4 bedroom home with 2,000 gallon tank	3,180

Typical Physical Lives in years for agricultural structures

Building Type	Good	Average	Low
Barns	40	30	20
Dairy barns	25	25	—
Dairy barns, low cost	—	20	20
Storage sheds	40	30	20
Poultry houses, modern	30	25	—
Poultry houses, conventional	—	25	20

To determine the useful life remaining, use the percent good table for residential structures on page 43.

Bulk Feed Tanks

Size and Type	Cost
5 Ton	\$2,360
9 Ton	3,330
10.5 Ton	3,550
13 Ton	3,910
15 Ton	4,600
20 Ton	5,860
25 Ton	6,400
31 Ton	7,380
34 Ton	7,730
40 Ton	8,930
45 Ton	10,240
60 Ton	11,470

Tanks are equipped with a scissor-type opening chute

Domestic Water Systems. Submersible pump, installed at 105' depth. Add the costs below for well (with casing) and pressure tank (if installed.)

	Typical Installation		
	1/2 HP	3/4 HP	1 HP
Total cost	\$2,405	\$2,675	\$3,140
Pressure tank size	82 gal.	82 gal.	120 gal.
Cost per ft. above or below 105' depth	\$2.97	\$3.33	\$3.72
	1-1/2 HP	2 HP	3 HP
	Total cost	\$3,585	\$4,555
Pressure tank size	220 gal.	220 gal.	315 gal.
Cost per ft. above or below 105' depth	\$3.88	\$5.59	\$7.54

6" wells average \$37.47 per foot of depth
8" wells average \$45.25 per foot or depth.

Pressure Tank Sizes and Installed Costs

42 gal. 16" dia. x 48" depth	\$298 to \$ 414
82 gal. 20" dia. x 60" depth	418 to 489
120 gal. 24" dia. x 60" depth	490 to 737
220 gal. 30" dia. x 72" depth	1,210 to 1,365
315 gal. 36" dia. x 72" depth	1,696 to 1,910
525 gal. 36" dia. x 120" depth	2,200 to 2,495

Military Construction Costs

The Office of the Under Secretary of Defense prepared the following square foot guidelines to reflect the cost of military construction for fiscal 2016. The costs are based on construction of permanent facilities built on military bases worldwide. Use the "Construction Cost Indices" at the end of this section to adapt the square foot costs to any other area. The "Size Cost Adjustment Chart" should be used to determine the approximate cost of a structure larger or smaller than the typical size shown.

Included in these costs are all items of equipment which are permanently built-in or attached to the structure, including items with fixed utility connections.

The costs include items such as the following:

- Furniture, cabinets and shelving, built-in.
- Venetian blinds and shades.
- Window screens and screen doors.
- Elevators and escalators.
- Drinking water coolers.
- Telephone, fire alarm and intercom systems.
- Theater seats.
- Pneumatic tube systems.
- Heating, ventilating and air conditioning installations.
- Electrical generators and auxiliary gear.
- Waste disposers such as incinerators.
- Food preparation & serving equipment, built-in.
- Raised flooring.
- Hoods and vents.
- Chapel pews and pulpit.
- Refrigerators, built-in.
- Laboratory furniture, built-in.
- Cranes and hoists, built-in.
- Dishwashers.

The costs listed are the estimated contract award costs, excluding contingencies, supervision, and administration. They include construction to the five-foot line only, but do not include the cost of outside utilities or other site improvements.

Figures listed do not include the cost of piles or other special foundations which are considered as an additional supporting item. The cost of air conditioning is

included to the extent authorized by the Construction Criteria Manual.

The costs of equipment such as furniture and furnishings which are loose, portable, or can be detached from the structure without tools are excluded from the unit costs. The cost of permanently attached equipment related directly to the operating function for which the structure is being provided, such as technical, scientific, production and processing equipment, is normally excluded from these costs. The following items are excluded from the costs on the following page.

- Furniture, loose.
- Furnishings, including rugs, loose.
- Filing cabinets and portable safes.
- Office machines, portable.
- Wall clocks, plug-in
- Food preparation and serving equipment, including appliances, portable.
- Training aids and equipment, including simulators.
- Shop equipment.
- Bowling lanes, including automatic pin spotting equipment, score table and players' seating.
- Automatic data processing equipment.
- Communications equipment.
- Photographic equipment, portable.
- Any operational equipment for which installation, mounting and connections are provided in building design and which are detachable without damage to the building or equipment.

Estimating Procedure

Determine the area relationship of the proposed building by dividing the gross area by the typical size as shown in the Square Foot Cost Table. Locate the quotient on the Area Relationship scale and trace vertically to the Factor Line, then trace horizontally to the Cost Relationship scale. This value is then multiplied by the unit cost in the Square Foot Cost Table and factored by the Construction Cost Index to determine the adjusted unit cost for the building.

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 hutch 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
 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
 Striping 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