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FARM BUILDINGS

This section contains cost data for agricultural buildings and other structures and equipment most commonly found on farms. Each page contains written specifications showing the structural components used to calculate the base building cost, shown in tables as dollars for the entire structure or as costs per square foot.

Adjustment tables are provided so allowances can be made when a structure's components vary from those specified. Some pages also provide costs of equipment that might be associated with the structure described on that page. For wall height adjustments on buildings with high pitched roofs, use the height to the eaves, plus one-half the distance from the eaves to the ridge for the effective wall height with which to enter the story height multiplier table.

Costs are averages of final costs including architects' fees, contractors' overhead and profit, and cost of interim financing. They do not represent any building illustrated, except as the building is included in the averages.

The costs provided include professional construction labor. Agricultural structures may be built by small crews of nonunion labor doing all the masonry, carpentry, steel and roofing work. Electrical work, plumbing and painting are usually contracted separately.

Farm or ranch built buildings must be graded according to the quality of workmanship and sometimes the value of the labor is very low, bringing the end costs below those listed. For buildings constructed by the owner, often using some second hand material, 15%–30% may be deducted to reflect proper wage rates and lack of job supervision relative to the quality of the work. When the farm is an estate or showplace, up to 25% can be added for such items as thermopane windows, residential type roofing, tiled floors or walls and extraordinary craftsmanship.

When applicable, each occupancy has costs for the various classes of construction—C,D,D_{POLE},D_{HOOP ARCH} and S. Pole construction is very common on farms; it is contained in Class D. These classes of construction are the same as those used in the commercial and industrial cost schedules, and are not to be confused with the class designations in the residential cost schedules.

CLASS DEFINITIONS: Farm Buildings

The Class of Construction is the basic subdivision in the *Michigan Assessor's Manual*, dividing all buildings into four basic cost groups by type of framing (supporting columns and beams), walls, floors and roof structures.

Class C buildings have masonry or concrete exterior walls, and wood or steel roof and floor structures, except for concrete slab on grade.

Class D buildings generally have wood frame, floor and roof structure. They may have a concrete floor on grade and other substitute materials, but are considered combustible construction. They may have dirt floors.

Class D_{POLE} buildings have wood pole or post frames with metal walls and roof. They may have a concrete floor on grade or a dirt floor. This class includes all the pre-engineered pole- or post-frame buildings.

Class D_{HOOP ARCH} (another subset of Class D) buildings are characterized by combustible, prefabricated, wood-post and tubular-steel, semicircular (hoop - quonset shape), framed roofs that curve to a short wooden pony wall or to the ground. The roof and walls are generally covered with canvas or a woven vinyl

tarps. Ground floors are typically dirt or can be a concrete slab.

Class S buildings have frames, roofs, and walls of incombustible metal. They may have concrete floors on grade or dirt floors. This class includes all the pre-engineered metal buildings. The Class S slant-wall has a light open-steel skeleton modified A slant frame and wall shape.

In each class, there will be variations, combinations, and subclasses, but for the purposes of pricing the major elements of the building should be considered in selecting costs from the tables. Thus, if a building which is otherwise in Class S has girts and purlins or nailers that are wood, the costs for the Class S building may still be representative, or a Class C building may have concrete plank floors instead of wood. Interpolations may be made if the appraiser feels the building overlaps two classes sufficiently to affect the result.

Further details and sketches of the various construction types will be found in the commercial/industrial chapters. The following table summarizes the indicators of construction class.

CLASS OF CONSTRUCTION INDICATORS

CLASS	FRAME	FLOOR	ROOF	WALLS
C	Masonry or concrete load-bearing walls with or without pilasters. Masonry or concrete walls with steel, wood or concrete frame.	Dirt floors or wood or concrete plank on steel floor joists or concrete slab on grade.	Wood or steel joists with wood or steel deck. Concrete plank.	Brick, concrete block or tile masonry, tilt-up, formed concrete, curtain walls.
D	Wood or steel studs in bearing wall, wood frame, primarily combustible construction.	Dirt floors or wood or steel floor joists or concrete slab on grade.	Wood or steel joists with wood or steel deck.	Almost any material except masonry or concrete. Generally combustible construction.
DPOLE	Wood posts or poles and trussed rafters.	Dirt floors or wood joists and deck or concrete slab on grade.	Metal skin on wood purlins or nailers.	Metal skin on wood girts or nailers.
DHOOP ARCH	Wood posts and tubular steel.	Dirt floors or concrete slab on grade.	Canvas or woven vinyl tarp on wooden pony wall or to the ground.	Canvas or woven vinyl tarp.
S	Metal bents, columns, girders, purlins and girts without fireproofing, incombustible construction.	Dirt floors or wood or steel deck on steel floor joists or concrete slab on grade.	Steel or wood deck on steel joists.	Metal skin or sandwich panels. Generally incombustible.

CAUTIONARY COMMENTS: State Tax Commission

- 1) Slurry tanks and similar holding structures may be eligible for exemption as part of a pollution control system provided the apparatus is certified by the State Tax Commission.
- 2) The State Tax Commission has ruled that silo unloaders are agricultural personal property and therefore exempt.
- 3) The built-in refrigeration systems found in on-farm fruit storage buildings are generally considered to be part of the real estate and should be priced from either the adjustments table or the commercial and industrial schedules.
- 4) Pumps which are an integral part of farm water wells are considered to be part of the real estate.
- 5) Moveable irrigation equipment including pumps which are not an integral part of a well are agricultural personal property and therefore exempt.

On the following page is the Agricultural Card with examples of costing on the back.

FARM BUILDINGS AND IMPROVEMENTS (See attached sheets for residences) 2014 ASSESSMENT YEAR

Building Type	BANK BARN	FEEDER BARN	IMPLEMENT BUILDING	BUNK FEEDER	SILLO	SILLO	GRAIN BIN
Building Class	D	D POLE	D POLE				
Building Quality	AVERAGE	LOW COST	AVERAGE	AVERAGE	1983	1985	1983
Year Built	OLD	1983	1989	1985			
Year Remodeled							
Dimensions	10' H x 40' L x 10' W	42' H x 60' L x 12' W	20' H x 54' L x 14' H	5' H x 60' L	16' DIA. x 50' L	20' DIA. x 55' H	18' DIA. x 15' H
Construction	WOOD FRAME	POLE FRAME	POLE FRAME	CONCRETE	CONCRETE STAVE	GLASS LINED STEEL	CORR. GALV. STEEL
Foundation	CONCRETE	POLE COLUMN	POLE COLUMN	CONCRETE	CONCRETE	CONCRETE	CONCRETE
Exterior	VERTICAL ROUGH LUMBER	GALV. STEEL SIDES	COLORED STEEL	CONCRETE & CONCRETE BLOCK			
Roof Type	GABLE	GABLE	GABLE	NONE	DOME	DOME	CONICAL
Roof Cover	COMPOSITION SHINGLE	GALV. STEEL	COLORED STEEL		METAL	METAL	METAL
Basement Floor	CONCRETE	DIRT	DIRT		CONCRETE	CONCRETE	CONCRETE
Upper Floor	WOOD PLANK						
Unit Cost	\$17.50	\$5.57	\$13.14	\$60.5 L.F. ①	\$22,800	\$81,500	\$8,760
Adjustments	ELECTRICAL (BASE)	NO ELECTRICAL (BASE)	GRADED DIRT FLOOR	(\$50 + 71) / 2	LADDER (BASE)	LADDER (BASE)	CONCRETE FLOOR
Adjustments	WATER (BASE)	NO WATER (BASE)	(LONG. BASE - 3.45) (DIRT GRADED + 0.22)		CHUTE (BASE)	UNILASER (PETS. PROOFING)	
Adjusted Unit Cost	\$17.50	\$5.57	\$9.98	\$60.50	\$22,800	\$81,500	\$9,650
x Height Multiplier	x 1.077 (14' EFF. H)	x 1.038	x 1.077	x	x	x	x
x Perimeter Multiplier	x 1.0 (200 PER. - 2400 PER. - 2400 PER.)	x .991 (2400 PER. - 2400 PER.)	x 1.027 (2000 PER. - 2000 PER.)	x	x	x	x
Total Unit Cost	\$19.04	\$5.73	\$10.96	\$60.50	\$22,800	\$81,500	\$9,650
x Square Feet	x 4800 #	x 2620 #	x 1944 #	x 60 L.F.	x	x	x
= Base Cost	\$91,392	\$14,410	\$21,306	\$3,630	\$22,800	\$81,500	\$9,660
x County Multiplier	x .96	x .96	x .96	x .96	x .96	x .96	x .96
= Cost New	\$87,730	\$13,822	\$20,464	\$3,485	\$21,888	\$78,240	\$9,264
Depreciation x % Good	x .30, FINE .35 ②	x .50 ③	x .56 ④	x .52 ④	x .35 ⑤	x .38 ⑥	x .35 ⑤
= Depreciated Cost	\$9,212	\$6,931	\$11,464	\$1,812	\$7,664	\$29,731	\$3,242
x E.C.F.	x .80 ⑤	x .80	x .80	x .80	x .80	x .80	x .80
= True Cash Value	\$7,370	\$5,545	\$9,163	\$1,450	\$6,129	\$23,785	\$2,594
Person Interviewed							Farm Buildings \$ 56,035
Examined By	Date	Date	Date	Date	Date	Date	Residence No. 1 \$
Priced By	Date	Date	Date	Date	Date	Date	Residence No. 2 \$
Checked By	Date	Date	Date	Date	Date	Date	Other \$
							Total to Front of Card \$ 56,035

Remarks: 1. INTERPOLATED NUMBERS FROM TABLES.
 2. OBSERVED CONDITION, EST. FUNC. DEPRECIATION I.E. DETERMINE
 3. FROM SEPARATE MTC. ANALYSIS. REFER TO DETERMINATION OF
 ECONOMIC CONDITION FACTORS.
 4. REFER TO FARM BLDG. DEPRECIATION TABLE, BUREAU COLUMN
 5. REFER TO FARM BLDG. DEPRECIATION TABLE, SMO COLUMN,
 WHERE AGE = 1/4 YEAR - DATE OF CONSTRUCTION

BARNS



EXCELLENT CLASS D



EXCELLENT / GOOD CLASS C



GOOD CLASS D



GOOD / AVERAGE CLASS D



GOOD / AVERAGE CLASSES C AND D



AVERAGE CLASS D

BARNS



AVERAGE CLASS D



**LOW-COST / AVERAGE CLASS D
Barn with Gable Roof**



**LOW-COST / AVERAGE CLASS D
Bank Barn with Gable Roof**



**LOW-COST CLASS D
Bank Barn with Gable Roof**



AVERAGE CLASS S FREESTALL



LOW-COST CLASS D POLE FREESTALL BARN



AVERAGE CLASS D HAY OR LIVESTOCK SHELTER



LOW-COST CLASS S SHELTER

BARNs

OCCUPANCY DESCRIPTION: Multipurpose barn buildings that may include livestock stalls, hay/grain storage. Common “flat roofed” types are gable and shed roofs, which allow for loft areas. Higher quality barns include lighting, water service and concrete floor systems. Lower quality barns may have dirt floors.

Barn loft costs include the floor structure and supports only; height adjustments must usually be made.

Confinement barns are large enclosed structures providing for the housing of cattle. The low quality structures have dirt floors and natural ventilated sidewalls. The average quality structures are environmental barns with feed areas and include some concrete alleyways.

INCLUDED IN COSTS: Architects’ fees and contractors’ overhead and profit.

NOT INCLUDED IN COSTS: Barn loft floors, heating systems and feed and cleaning equipment are not included.

BARNs – GENERAL PURPOSE

CLASS	TYPE	COST/ SQ. FT.	EXTERIOR WALLS	INTERIOR FINISH	LIGHTING & PLUMBING
C	Good	\$36.83	Block or structural tile, some windows, good gable roof and trim	Concrete floor, stalls and feed room	Adequate lights and outlets, water service and drains
	Average	28.06	Brick, concrete block, structural clay tile, few windows, “flat roofed”	Unfinished, some slab or wood floor, stalls	Few electrical outlets and hose bibs
	Low cost	21.42	Concrete block, light shed or gable roof, asphalt shingles	Unfinished, dirt floor, few cheap stalls	None
D	Good	31.86	Lap siding, windows, good frame and gable roof structure	Some wainscot, plank or concrete floors, stalls, feed room	Adequate lights and outlets, water service, drains
	Average	23.01	Wood frame, board and batten or low-cost siding, few windows	Some floor, few partitions and stalls, feed room	Few electrical outlets and hose bibs
	Low cost	16.65	Light wood frame and shed or gable roof structure, board siding	Unfinished, dirt floor, few cheap stalls	None
DPOLE	Good	27.06	Pole frame, metal siding, insulated, good gable roof and trim	Concrete or plank floors, stalls, feed room, interior sheathing	Adequate lights and outlets, water service and drains
	Average	19.27	Pole frame, metal siding, few windows or shutters, “flat roofed”	Some floor, few partitions and stalls, feed room	Few electrical outlets and hose bibs
	Low cost	13.75	Pole frame, metal siding, light roof	Unfin., dirt floor, few cheap stalls	None
S	Good	31.21	Steel panels on steel frame, insulated, good gable roof and trim	Plank or concrete floors, stalls, feed room, interior sheathing	Adequate lights and outlets, water service and drains
	Average	22.61	Steel siding and frame, few windows or shutters, “flat roofed”	Some floor, few partitions and stalls, feed room	Few electrical outlets and hose bibs
	Low cost	16.41	Steel siding and frame, light roof	Unfin. dirt floor, few cheap stalls	None

Stalls cost \$.69 to \$4.16 with stall equipment (feed and water not automated) at \$.34 to \$1.72 per square foot of equipped area. Add for barn cleaner at \$4.69 to \$6.60 per square foot of area served.

HAYLOFTS

CDS	Good	\$12.87	Not included	Heavy timber, good T&G or plank	Not included
	Average	8.29	Not included	Adequate support, plank floor	Not included
	Low cost	5.35	Not included	Minimum support, light floor	Not included

For wall height adjustment on buildings with high-pitched roofs, use the height to the eaves plus one-half the distance from the eaves to the ridge for the effective wall height with which to enter the story height multiplier table. For an example, see page 229.

CONFINEMENT BARNs

D	Average	\$20.60	Wood siding and frame, fully insulated and ventilated	Some paved alleyways, wainscot, dirt stalls, or pens	Adequate lighting and water service
	Low cost	10.24	Boards and plywood, on box frame, some insulation, curtains or vents	Unfinished, dirt floor	Minimum lighting and water service
DPOLE	Average	18.05	Pole frame, metal siding, fully insulated, ventilated	Some paved alleyways, wainscot, dirt stalls, or pens	Adequate lighting and water service
	Low cost	8.70	Pole frame, metal siding, some insulation, side curtains or vents	Unfinished, dirt floor	Minimum lighting and water service
DHOOP ARCH	Low cost	6.35	Wood post, knee wall, pipe hoop frame, fabric cover, end curtains	Some wainscot, dirt floor, claf pens	Minimum water service, feed, not automated
S	Average	20.85	Steel panels and frame, fully insulated, ventilated	Some paved alleyways, wainscot, dirt stalls, or pens	Adequate lighting and water service
	Low cost	10.92	Steel siding and frame, some insulation, side curtains or vents	Unfinished, dirt floor	Minimum lighting and water service

For slotted floors, add the following per square foot of pit area:

Shallow pit, scraper alley: \$7.01 to \$13.90 Deep pit, tractor access: \$16.60 to \$23.55

BARNs

REFINEMENTS: This page provides major adjustments to the base costs on the previous page. Follow Steps 1 through 5 to attain final costs, adjusted for lump sums, heating and cooling, story height, floor area/perimeter ratio and locality.

1 ADJUSTMENTS

Stalls, each, free: \$89 – \$175; tie: \$130 – \$230; box: \$1,620 – \$2,725; calf pen, steel: \$345 - \$395; wire: \$33 – \$66
 Feed racks, per linear foot: \$17.60 – \$23.95; steel feeders, each: paddock, \$120 – \$155; bale, \$560 – \$630; bunk, \$495 – \$560
 Mechanical feeder, per linear foot, trough auger: \$98 - \$135; chain feeder: \$89 – \$170; overhead: \$135 – \$180
 Water troughs, per linear foot, steel: \$23.35 – \$35.75; concrete: \$34.50 – \$51.00; drinking bowls, each: \$120 – \$125
 Automatic waterers, each: \$175 – \$270
 Barn cleaner, elevator and drive: \$7,500 – \$11,800 plus \$45 per linear foot of gutter

2 HEATING AND COOLING

These costs are averages of total installed cost of the entire heating or cooling installation including its prorated share of contractors' overhead and profit and architects' fees.

Electric cable or baseboard	\$4.31
Electric wall heaters (inc. FWA)	1.84
Forced air, ducted	4.85
heaters or furnace, vented	1.36
Hot water, baseboard/convactor	8.63
radiant floor or ceiling	8.87
Space heaters, with fan	2.37
radiant	2.79
Steam	7.68
Wall or floor furnace	9.58
Package heating and cooling	2.19
Ventilation, blower and ducts	1.36
fans only .....	.57

3 HEIGHT REFINEMENTS

STORY HEIGHT MULTIPLIERS

Multiply base cost by following multiplier for any variation in average story height.

Average Wall Height	Square Foot Multiplier
8	.963
9	.981
10	1.000 (base)
11	1.019
12	1.038
13	1.058
14	1.077
16	1.115
18	1.154
20	1.192
22	1.231
24	1.269
28	1.346
32	1.423
36	1.500

4

Average Floor Area, Sq. Ft./Story	AVERAGE PERIMETER														Average Floor Area, Sq. Ft./Story
	75	125	150	200	250	300	350	400	500	600	700	800	900	1000	
1,000	.980	1.110	1.178	1.311	1.444	1.577	1.711	1.844	----	----	----	----	----	----	1,000
2,000	.878	.945	.977	1.044	1.110	1.178	1.245	1.311	----	----	----	----	----	----	2,000
3,000	.843	.889	.911	.955	1.000	1.044	1.088	1.133	----	----	----	----	----	----	3,000
4,000	----	.860	.878	.911	.945	.977	1.010	1.044	1.110	1.178	----	----	----	----	4,000
5,000	----	.844	.857	.884	.911	.938	.960	.991	1.044	1.097	1.150	----	----	----	5,000
6,000	----	----	.843	.865	.888	.911	.934	.955	1.000	1.044	1.088	1.133	----	----	6,000
7,000	----	----	.835	.854	.873	.892	.911	.931	.967	1.006	1.044	1.080	----	----	7,000
8,000	----	----	----	.844	.860	.877	.894	.911	.945	.977	1.010	1.044	1.076	----	8,000
9,000	----	----	----	.836	.852	.867	.881	.896	.926	.955	.985	1.014	1.044	----	9,000
10,000	----	----	----	----	.844	.858	.871	.884	.911	.938	.960	.991	1.018	1.044	10,000
12,000	----	----	----	----	.833	.843	.855	.867	.888	.911	.934	.955	.977	1.000	12,000
14,000	----	----	----	----	.825	.835	.844	.854	.873	.892	.911	.931	.949	.967	14,000
16,000	----	----	----	----	----	.827	.836	.844	.861	.877	.894	.911	.928	.945	16,000
20,000	----	----	----	----	----	.818	.824	.831	.844	.858	.871	.884	.898	.911	20,000

5 USE COUNTY MULTIPLIERS IN MULTIPLIER SECTION.

BARNs

OCCUPANCY DESCRIPTION: Bank barns are two story multipurpose buildings that may include livestock stalls, hay/grain storage. Common flat roof types are gable and shed, which allow for additional loft areas. Higher quality barns include lighting, water service, and plank or concrete floor systems. Lower quality barns may have dirt floors on the lower level.

Barn loft costs include the floor structure and supports only; height adjustments must usually be made.

INCLUDED IN COSTS: Architects' fees and contractors' overhead and profit.

NOT INCLUDED IN COSTS: Barn loft floors, heating systems and feed and cleaning equipment are not included.

BARNs – BANK (TWO-STORY) – GENERAL PURPOSE

CLASS	TYPE	COST/ SQ. FT.	EXTERIOR WALLS	INTERIOR FINISH	LIGHTING & PLUMBING
C	Good	\$26.56	Block or structural tile, some windows, good gable roof and trim	Concrete, good plank floors, stalls and feed room	Adequate lights and outlets, water service and drains
	Average	20.34	Brick, concrete block, structural clay tile, few windows, "flat roofed"	Some slab, wood floor, some partitions and stalls, feed room	Minimum electrical and water outlets
	Low cost	15.60	Concrete block, structural clay tile, light shed or gable roof	Unfinished, dirt floor, upper-level wood floor, few stalls	None
D	Good	23.70	Lap siding, windows, good frame and gable roof structure	Some wainscot, good plank and concrete floors, stalls, feed room	Adequate lights and outlets, water service, drains
	Average	17.50	Wood frame, board and batten or low-cost siding, few windows	Some slab, wood floor, some partitions and stalls, feed room	Minimum electrical and water outlets
	Low cost	12.95	Light wood frame and shed or gable roof structure, board siding	Unfinished, dirt floor, upper-level wood floor, few stalls	None
DPOLE	Good	20.93	Pole frame, metal siding, insulated, good gable roof and trim	Concrete and plank floors, stalls, feed room, interior sheathing	Adequate lights and outlets, water service and drains
	Average	15.41	Pole frame, metal siding, few windows or shutters, "flat roofed"	Some slab, wood floor, some partitions and stalls, feed room	Minimum electrical and water outlets
	Low cost	11.36	Pole frame, metal siding, light roof	Unfin., dirt, wood floors, few stalls	None

Stalls cost \$.69 to \$4.16 with stall equipment (feed and water not automated) at \$.34 to \$1.72 per square foot of equipped area. Add for barn cleaner at \$4.69 to \$6.60 per square foot of area service.

HAYLOFTS

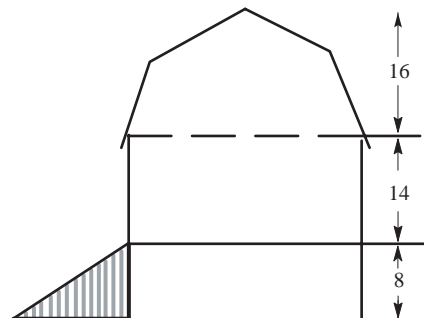
CDS	Good	\$12.87	Not included	Heavy timber, good T&G or plank	Not included
	Average	8.29	Not included	Adequate support, plank floor	Not included
	Low cost	5.35	Not included	Minimum support, light floor	Not included

For wall height adjustment on buildings with high-pitched roofs, use the height from the floor to the eaves plus one-half the distance from the eaves to the ridge for the effective wall height with which to enter the story height multiplier table.

EXAMPLE:

Apply costs to total floor (both floors).

Apply loft costs to additional loft floor area.



$$8' + 14' + (1/2 \times 16') = 30' \div 2 \text{ stories} = 15' \text{ EFFECTIVE WALL HEIGHT}$$

BARNs

REFINEMENTS: This page provides major adjustments to the base costs on the previous page. Follow Steps 1 through 5 to attain final costs, adjusted for lump sums, heating and cooling, story height, floor area/perimeter ratio and locality.

1 ADJUSTMENTS

Stalls, each, free: \$89 – \$175; tie: \$130 – \$230; box: \$1,620 – \$2,725; calf pen, steel: \$345 - \$395; wire: \$33 – \$66

Feed racks, per linear foot: \$17.60 – \$23.95; steel feeders, each: paddock, \$120 – \$155; bale, \$560 – \$630; bunk, \$495 – \$560

Mechanical feeder, per linear foot, trough auger: \$98 - \$135; chain feeder: \$89 – \$170; overhead: \$135 – \$180

Water troughs, per linear foot, steel: \$23.35 – \$35.75; concrete: \$34.50 – \$51.00; drinking bowls, each: \$120 – \$125

Automatic waterers, each: \$175 – \$270

Barn cleaner, elevator and drive: \$7,500 – \$11,800 plus \$45 per linear foot of gutter

Loft access ramps, each: \$858 – \$1,420

2 HEATING AND COOLING

These costs are averages of total installed cost of the entire heating or cooling installation including its prorated share of contractors' overhead and profit and architects' fees.

Electric cable or baseboard	\$4.31
Electric wall heaters (inc. FWA)	1.84
Forced air, ducted	4.85
heaters or furnace, vented	1.36
Hot water, baseboard/convactor	8.63
radiant floor or ceiling	8.87
Space heaters, with fan	2.37
radiant	2.79
Steam	7.68
Wall or floor furnace	9.58
Package heating and cooling	2.19
Ventilation, blower and ducts	1.36
fans only .....	.57

3 HEIGHT REFINEMENTS

STORY HEIGHT MULTIPLIERS
Multiply base cost by following multiplier for any variation in average story height.

Average Wall Height	Square Foot Multiplier
8	.963
9	.981
10	1.000 (base)
11	1.019
12	1.038
13	1.058
14	1.077
16	1.115
18	1.154
20	1.192
22	1.231
24	1.269
28	1.346
32	1.423
36	1.500

4

Average Floor Area, Sq. Ft./Story	AVERAGE PERIMETER														Average Floor Area, Sq. Ft./Story
	75	125	150	200	250	300	350	400	500	600	700	800	900	1000	
1,000	.980	1.110	1.178	1.311	1.444	1.577	1.711	1.844	----	----	----	----	----	----	1,000
2,000	.878	.945	.977	1.044	1.110	1.178	1.245	1.311	----	----	----	----	----	----	2,000
3,000	.843	.889	.911	.955	1.000	1.044	1.088	1.133	----	----	----	----	----	----	3,000
4,000	----	.860	.878	.911	.945	.977	1.010	1.044	1.110	1.178	----	----	----	----	4,000
5,000	----	.844	.857	.884	.911	.938	.960	.991	1.044	1.097	1.150	----	----	----	5,000
6,000	----	----	.843	.865	.888	.911	.934	.955	1.000	1.044	1.088	1.133	----	----	6,000
7,000	----	----	.835	.854	.873	.892	.911	.931	.967	1.006	1.044	1.080	----	----	7,000
8,000	----	----	----	.844	.860	.877	.894	.911	.945	.977	1.010	1.044	1.076	----	8,000
9,000	----	----	----	.836	.852	.867	.881	.896	.926	.955	.985	1.014	1.044	----	9,000
10,000	----	----	----	----	.844	.858	.871	.884	.911	.938	.960	.991	1.018	1.044	10,000
12,000	----	----	----	----	.833	.843	.855	.867	.888	.911	.934	.955	.977	1.000	12,000
14,000	----	----	----	----	.825	.835	.844	.854	.873	.892	.911	.931	.949	.967	14,000
16,000	----	----	----	----	----	.827	.836	.844	.861	.877	.894	.911	.928	.945	16,000
20,000	----	----	----	----	----	.818	.824	.831	.844	.858	.871	.884	.898	.911	20,000

5 USE COUNTY MULTIPLIERS IN MULTIPLIER SECTION.

BARNs

OCCUPANCY DESCRIPTION: Special purpose dairy barn buildings that may include livestock stalls, hay/grain storage. Common roof types are gambrel and gothic, which allow for loft areas. Higher quality barns include lighting, plumbing, interior partitions, and milk processing and storage. Lower quality barns are older milking barns only.

Barn loft costs include the floor structure and supports only; height adjustments must usually be made.

INCLUDED IN COSTS: Architects' fees and contractors' overhead and profit.

NOT INCLUDED IN COSTS: Barn loft floors, heating systems and feed, milking and cleaning equipment are not included.

BARNs – SPECIAL PURPOSE

CLASS	TYPE	COST/ SQ. FT.	EXTERIOR WALLS	INTERIOR FINISH	LIGHTING & PLUMBING
C	Excellent	\$64.71	Decorative block, tile, arches, cupolas, gambrel roof, dormers	Plaster wainscot in cooler and washroom, good concrete floor	Good lighting and plumbing, hot water, milk piping
	Good	49.11	Brick or block, good fenestration, good gambrel roof and trim	Painted, concrete floor, good stalls and dairy facilities, storage	Good wiring, water and power outlets, restroom
	Average	37.34	Block or structural tile, some windows, arch or gambrel roof	Concrete floor, stalls and feed room, good milking	Lighting and power wiring, water service and drains
	Low cost	28.44	Brick, concrete block, structural clay tile, good gable or light gambrel	Unfinished, some slab or wood floor, few stalls, feed room, milk barn only	Adequate electrical and water outlets
D	Excellent	60.64	Best sidings or veneer, good gambrel roof, arches, cupolas, dormers	Plaster wainscot in cooler and washroom, good concrete floor	Good lighting and plumbing, hot water, milk piping
	Good	44.83	Good siding or brick veneer, heavy frame and roof structure	T&G wainscot, concrete floor, good stalls and dairy facilities, storage	Good wiring, water and power outlets, restroom
	Average	33.20	Lap siding, windows, heavy frame and roof structure, gambrel roof	Some wainscot, plank or concrete floors, stalls, feed room, good milking	Lighting and power wiring, water service and drains
	Low cost	24.63	Wood frame, board and batten or siding, few windows, gable roof	Some floor, few partitions and stalls, feed room, milking barn only	Adequate electrical and water outlets
DPOLE	Average	28.42	Pole frame, metal siding, insulated, good arch or gambrel-style roof	Concrete or plank floors, stalls, feed room, interior sheathing	Lighting and power wiring, water service and drains
	Low cost	20.80	Pole frame, metal siding, few windows or shutters, good gable roof	Some floor, few partitions and stalls, feed room, milking barn only	Adequate electrical and water outlets

HAYLOFTS

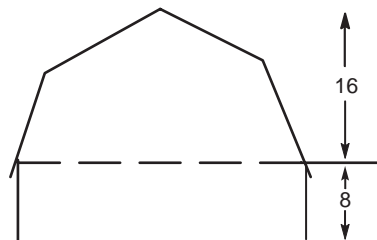
CDS	Good	\$12.87	Not included	Heavy timber, good T&G or plank	Not included
	Average	8.29	Not included	Adequate support, plank floor	Not included
	Low cost	5.35	Not included	Minimum support, light floor	Not included

For wall height adjustment on buildings with high-pitched roofs, use the height to the eaves plus one-half the distance from the eaves to the ridge for the effective wall height with which to enter the story height multiplier table.

EXAMPLE:

Apply costs to total floor (both floors).

Apply loft costs to additional loft floor area.



$$8' + 1/2 \times 16' = 16' \text{ EFFECTIVE WALL HEIGHT}$$

BARNs

REFINEMENTS: This page provides major adjustments to the base costs on the previous page. Follow Steps 1 through 5 to attain final costs, adjusted for lump sums, heating and cooling, story height, floor area/perimeter ratio and locality.

1

ADJUSTMENTS

Stalls, each, free: \$89 – \$175; tie: \$130 – \$230; box: \$1,620 – \$2,725; calf pen, steel: \$345 – \$395; wire: \$33 – \$66
 Feed racks, per linear foot: \$17.60 – \$23.95; steel feeders, each: paddock, \$120 – \$155; bale, \$560 – \$630; bunk, \$495 – \$560
 Mechanical feeder, per linear foot, trough auger: \$98 – \$135; chain feeder: \$89 – \$170; overhead: \$135 – \$180
 Water troughs, per linear foot, steel: \$23.35 – \$35.75; concrete: \$34.50 – \$51.00; drinking bowls, each: \$120 – \$125
 Barn cleaner, elevator and drive: \$7,500 – \$11,800 plus \$45 per linear foot of gutter
 Milking equipment: \$5,950 – \$16,700 base, plus \$2,070 – \$2,625 per stall, add for power gates, \$1,080 – \$1,290;
 for feed system, add \$770 – \$990, plus \$770 for auger, per stall;
 for computerized automation, add \$1,740 – \$3,500 plus \$44 – \$60 for each I.D. tag
 Bulk milk tanks, including refrigeration. For automatic wash system, add \$2,625 to \$3,500

Capacity, gal.	Cost	Capacity, gal.	Cost	Capacity, gal.	Cost
500	\$14,300	1,500	\$30,900	4,000	\$ 62,200
750	19,000	2,000	34,700	5,000	77,700
1,000	23,400	3,000	46,700	8,000	125,000

2

HEATING AND COOLING

These costs are averages of total installed cost of the entire heating or cooling installation including its prorated share of contractors' overhead and profit and architects' fees.

Electric cable or baseboard	\$4.31
Electric wall heaters (inc. FWA)	1.84
Forced air, ducted	4.85
heaters or furnace, vented	1.36
Hot water, baseboard/convactor	8.63
radiant floor or ceiling	8.87
Space heaters, with fan	2.37
radiant	2.79
Steam	7.68
Wall or floor furnace	9.58
Package heating and cooling	2.19
Ventilation, blower and ducts	1.36
fans only	.57

3

HEIGHT REFINEMENTS

STORY HEIGHT MULTIPLIERS

Multiply base cost by following multiplier for any variation in average story height.

Average Wall Height	Square Foot Multiplier
8	.963
9	.981
10	1.000 (base)
11	1.019
12	1.038
13	1.058
14	1.077
16	1.115
18	1.154
20	1.192
22	1.231
24	1.269
28	1.346
32	1.423
36	1.500

4

Average Floor Area, Sq. Ft./Story	AVERAGE PERIMETER														Average Floor Area, Sq. Ft./Story
	75	125	150	200	250	300	350	400	500	600	700	800	900	1000	
1,000	.980	1.110	1.178	1.311	1.444	1.577	1.711	1.844	----	----	----	----	----	----	1,000
2,000	.878	.945	.977	1.044	1.110	1.178	1.245	1.311	----	----	----	----	----	----	2,000
3,000	.843	.889	.911	.955	1.000	1.044	1.088	1.133	----	----	----	----	----	----	3,000
4,000	----	.860	.878	.911	.945	.977	1.010	1.044	1.110	1.178	----	----	----	----	4,000
5,000	----	.844	.857	.884	.911	.938	.960	.991	1.044	1.097	1.150	----	----	----	5,000
6,000	----	----	.843	.865	.888	.911	.934	.955	1.000	1.044	1.088	1.133	----	----	6,000
7,000	----	----	.835	.854	.873	.892	.911	.931	.967	1.006	1.044	1.080	----	----	7,000
8,000	----	----	----	.844	.860	.877	.894	.911	.945	.977	1.010	1.044	1.076	----	8,000
9,000	----	----	----	.836	.852	.867	.881	.896	.926	.955	.985	1.014	1.044	----	9,000
10,000	----	----	----	----	.844	.858	.871	.884	.911	.938	.960	.991	1.018	1.044	10,000
12,000	----	----	----	----	.833	.843	.855	.867	.888	.911	.934	.955	.977	1.000	12,000
14,000	----	----	----	----	.825	.835	.844	.854	.873	.892	.911	.931	.949	.967	14,000
16,000	----	----	----	----	----	.827	.836	.844	.861	.877	.894	.911	.928	.945	16,000
20,000	----	----	----	----	----	.818	.824	.831	.844	.858	.871	.884	.898	.911	20,000

5

USE COUNTY MULTIPLIERS IN MULTIPLIER SECTION.

BARNs

OCCUPANCY DESCRIPTION: Bank barns are two story special purpose dairy barn buildings that may include livestock stalls, hay/grain storage. Common roof types are gambrel and gothic, which allow for additional loft areas. Higher quality barns include lighting, plumbing, interior partitions, and milk processing and storage. Lower quality barns are older milking barns only.

Barn loft costs include the floor structure and supports only; height adjustments must usually be made.

INCLUDED IN COSTS: Architects' fees and contractors' overhead and profit.

NOT INCLUDED IN COSTS: Barn loft floors, heating systems and feed, milking and cleaning equipment are not included.

BARNs – BANK (TWO-STORY) – SPECIAL PURPOSE

CLASS	TYPE	COST/ SQ. FT.	EXTERIOR WALLS	INTERIOR FINISH	LIGHTING & PLUMBING
C	Excellent	\$44.47	Decorative block, tile, arches, cupolas, gambrel roof, dormers	Plaster wainscot in cooler and washroom, good concrete and plank floors	Good lighting and plumbing, hot water, milk piping
	Good	33.71	Brick or block, good fenestration, good gambrel roof and trim	Painted concrete and plank floors, good stalls, dairy facilities, storage	Good wiring, water and power outlets, restroom
	Average	25.60	Block or structural tile, some windows, arch or gambrel roof	Concrete and wood floors, good stalls, feed room and milking	Lighting and power wiring, water service and drains
	Low cost	19.48	Brick, concrete block, structural clay tile, gable or light gambrel roof	Unfinished, some slab, wood upper floor, stalls, feed room, milking only	Adequate electrical and water outlets
D	Excellent	41.94	Best sidings or veneer, good gambrel roof, arches, cupolas, dormers	Plaster wainscot in cooler and washroom, good concrete and plank floors	Good lighting and plumbing, hot water, milk piping
	Good	31.17	Good siding or brick veneer, heavy frame and roof structure	T&G wainscot, concrete and plank floors, good stalls, dairy facilities	Good wiring, water and power outlets, restroom
	Average	23.21	Lap siding, windows, heavy frame and roof structure, gambrel roof	Some wainscot, plank and concrete floors, good stalls, feed room	Lighting and power wiring, water service and drains
	Low cost	17.32	Wood frame, board and batten or siding, few windows, gable roof	Some slab, wood upper floor, partitions, stalls, feed room, milking only	Adequate electrical and water outlets
DPOLE	Average	20.52	Pole frame, metal siding, insulated, good arch or gambrel roof	Concrete and plank floors, good stalls, feed room, interior sheathing	Lighting and power wiring, water service and drains
	Low cost	15.20	Pole frame, metal siding, few windows or shutters, good gable roof	Some slab, wood upper floor, partitions, stalls, feed room, milking only	Adequate electrical and water outlets

HAYLOFTS

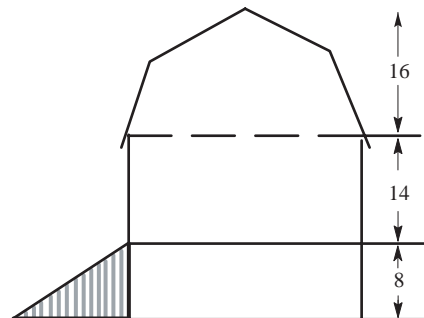
CDS	Good	\$12.87	Not included	Heavy timber, good T&G or plank	Not included
	Average	8.29	Not included	Adequate support, plank floor	Not included
	Low cost	5.35	Not included	Minimum support, light floor	Not included

For wall height adjustment on buildings with high-pitched roofs, use the height from the floor to the eaves plus one-half the distance from the eaves to the ridge for the effective wall height with which to enter the story height multiplier table.

EXAMPLE:

Apply costs to total floor (both floors).

Apply loft costs to additional loft floor area.



$$8' + 14' + (1/2 \times 16') = 30' \div 2 \text{ stories} = 15' \text{ EFFECTIVE WALL HEIGHT}$$

BARNs

REFINEMENTS: This page provides major adjustments to the base costs on the previous page. Follow Steps 1 through 5 to attain final costs, adjusted for lump sums, heating and cooling, story height, floor area/perimeter ratio and locality.

1 ADJUSTMENTS

Stalls, each, free: \$89 – \$175; tie: \$130 – \$230; box: \$1,620 – \$2,725; calf pen, steel: \$345 – \$395; wire: \$33 – \$66
 Feed racks, per linear foot: \$17.60 – \$23.95; steel feeders, each: paddock, \$120 – \$155; bale, \$560 – \$630; bunk, \$495 – \$560
 Mechanical feeder, per linear foot, trough auger: \$98 – \$135; chain feeder: \$89 – \$170; overhead: \$135 – \$180
 Water troughs, per linear foot, steel: \$23.35 – \$35.75; concrete: \$34.50 – \$51.00; drinking bowls, each: \$120 – \$125
 Barn cleaner, elevator and drive: \$7,500 – \$11,800 plus \$45 per linear foot of gutter
 Loft Access ramps, each: \$1,000 – \$1,660
 Milking equipment: \$5,950 – \$16,700 base, plus \$2,070 – \$2,625 per stall, add for power gates, \$1,080 – \$1,290;
 for feed system, add \$770 – \$990, plus \$770 for auger, per stall;
 for computerized automation, add \$1,740 – \$3,500 plus \$44 – \$60 for each I.D. tag
 Bulk milk tanks, including refrigeration. For automatic wash system, add \$2,625 to \$3,500

Capacity, gal.	Cost	Capacity, gal.	Cost	Capacity, gal.	Cost
500	\$14,300	1,500	\$30,900	4,000	\$ 62,200
750	19,000	2,000	34,700	5,000	77,700
1,000	23,400	3,000	46,700	8,000	125,000

2 HEATING AND COOLING

These costs are averages of total installed cost of the entire heating or cooling installation including its prorated share of contractors' overhead and profit and architects' fees.

Electric cable or baseboard	\$4.31
Electric wall heaters (inc. FWA)	1.84
Forced air, ducted	4.85
heaters or furnace, vented	1.36
Hot water, baseboard/convactor	8.63
radiant floor or ceiling	8.87
Space heaters, with fan	2.37
radiant	2.79
Steam	7.68
Wall or floor furnace	9.58
Package heating and cooling	2.19
Ventilation, blower and ducts	1.36
fans only .....	.57

3 HEIGHT REFINEMENTS

STORY HEIGHT MULTIPLIERS
 Multiply base cost by following multiplier for any variation in average story height.

Average Wall Height	Square Foot Multiplier
8	.963
9	.981
10	1.000 (base)
11	1.019
12	1.038
13	1.058
14	1.077
16	1.115
18	1.154
20	1.192
22	1.231
24	1.269
28	1.346
32	1.423
36	1.500

4 AVERAGE PERIMETER

Average Floor Area, Sq. Ft./Story	AVERAGE PERIMETER														Average Floor Area, Sq. Ft./Story
	75	125	150	200	250	300	350	400	500	600	700	800	900	1000	
1,000	.980	1.110	1.178	1.311	1.444	1.577	1.711	1.844	----	----	----	----	----	----	1,000
2,000	.878	.945	.977	1.044	1.110	1.178	1.245	1.311	----	----	----	----	----	----	2,000
3,000	.843	.889	.911	.955	1.000	1.044	1.088	1.133	----	----	----	----	----	----	3,000
4,000	----	.860	.878	.911	.945	.977	1.010	1.044	1.110	1.178	----	----	----	----	4,000
5,000	----	.844	.857	.884	.911	.938	.960	.991	1.044	1.097	1.150	----	----	----	5,000
6,000	----	----	.843	.865	.888	.911	.934	.955	1.000	1.044	1.088	1.133	----	----	6,000
7,000	----	----	.835	.854	.873	.892	.911	.931	.967	1.006	1.044	1.080	----	----	7,000
8,000	----	----	----	.844	.860	.877	.894	.911	.945	.977	1.010	1.044	1.076	----	8,000
9,000	----	----	----	.836	.852	.867	.881	.896	.926	.955	.985	1.014	1.044	----	9,000
10,000	----	----	----	----	.844	.858	.871	.884	.911	.938	.960	.991	1.018	1.044	10,000
12,000	----	----	----	----	.833	.843	.855	.867	.888	.911	.934	.955	.977	1.000	12,000
14,000	----	----	----	----	.825	.835	.844	.854	.873	.892	.911	.931	.949	.967	14,000
16,000	----	----	----	----	----	.827	.836	.844	.861	.877	.894	.911	.928	.945	16,000
20,000	----	----	----	----	----	.818	.824	.831	.844	.858	.871	.884	.898	.911	20,000

5 USE COUNTY MULTIPLIERS IN MULTIPLIER SECTION.

BARNs

OCCUPANCY DESCRIPTION: Freestall barns are typically large, open structures providing free access to stalls and feed areas and include concrete alleyways and curbs in better qualities.

Commodity barns are designed with an open front and only three exterior walls with bay or partition walls. Floors are concrete. No electrical or plumbing is included.

Commodity and sun shelters are open (unwalled) structures for livestock shade or for the storage of hay or other farm commodities. The floor is dirt, and there is no electrical or water. Adjust shelters for height only.

INCLUDED IN COSTS: Architects' fees and contractors' overhead and profit.

NOT INCLUDED IN COSTS: Barn loft floors, heating systems and feed and cleaning equipment.

FREE-STALL BARNs

CLASS	TYPE	COST/ SQ. FT.	EXTERIOR WALLS	INTERIOR FINISH	LIGHTING & PLUMBING
D	Excellent	\$29.55	Good siding, heavy frame, ventilated walls and roof	All concrete alleys and floor, contoured, good metal freestalls	Good wiring, lights, water service, drains
	Good	21.59	Good panels, gable roof, insulated or sheathed	Half concrete and dirt, good curbs and stalls, wainscot	Good lighting and stall plumbing
	Average	15.77	Siding on wood frame, some wall curtains	Concrete alleys, curbs, dirt, metal freestalls	Adequate lights, outlets, water service
	Low cost	11.52	Wood frame, board siding	Some paved alleyways, dirt stalls	Minimum electrical and water
DPOLE	Excellent	25.62	Good siding, heavy frame, ventilated walls and roof	All concrete alleys and floor, contoured, good metal freestalls	Good wiring, lights, water service, drains
	Good	18.70	Good panels, gable roof, insulated or sheathed	Half concrete and dirt, good curbs and stalls, wainscot	Good lighting and stall plumbing
	Average	13.65	Metal siding on pole frame, some wall curtains	Concrete alleys, curbs, dirt, metal freestalls	Adequate lights, outlets, water service
	Low cost	9.96	Metal pole on frame	Some paved alleyways, dirt stalls, metal freestalls	Minimum electrical and water
	Cheap	7.09	Metal roof on poles, no walls	Paved alleys, dirt stalls	Minimum electrical and water
DHOOP ARCH	Average	12.12	Greenhouse pipe frame, wire panels, wall curtains, shaded roof	Concrete alleys, curbs, dirt, metal freestalls	Minimum electrical, adequate water
	Low cost	9.28	Wood post, knee wall, pipe hoop frame, fabric cover, side/end curtains	Concrete alleys, curbs, dirt, metal freestalls	Minimum electrical, adequate water
	Cheap	8.13	Wood post, pipe hoop, fabric cover, open side walls and ends	Minimum facility, some paved alleyways, dirt stalls, freestalls	Minimum electrical and water
S	Excellent	29.52	Good siding, heavy frame, ventilated walls and roof	All concrete alleys and floor, contoured, good metal freestalls	Good wiring, lights, water service, drains
	Good	22.05	Good panels, gable roof, insulated or sheathed	Half concrete and dirt, good curbs and stalls, wainscot	Good lighting and stall plumbing
	Average	16.46	Steel siding and frame, some wall curtains	Concrete alleys, curbs, dirt, metal freestalls	Adequate lights, outlets, water service
	Low cost	12.30	Steel siding and frame	Some paved alleyways, dirt stalls	Minimum electrical and water
	Cheap	8.00	Steel roof, frame, no walls	Paved alleys, dirt stalls	Minimum electrical and water

For slotted floors, add the following per square foot of pit area:

Shallow pit, scraper alley: \$7.01 to \$13.90. Deep pit, tractor access: \$16.60 to \$23.55.

COMMODITY BARNs (STORAGE SHEDs)

C	Average	\$16.94	Open one side, cheap block, shed roof	Unfinished, no doors, slab floor, masonry bay separation walls	None
D	Average	11.79	Open one side, plywood or siding on post frame	Unfinished, no doors, slab floor, concrete & upper frame bay walls	None
DPOLE	Average	10.60	Open one side, metal on pole frame	Unfinished, no doors, slab floor, concrete & upper frame bay walls	None
S	Average	12.89	Open one side, steel frame and siding	Unfinished, no doors, slab floor, concrete & upper frame bay walls	None

COMMODITY SHELTERS (HAY SHEDs)

D	Good	\$4.47 – \$6.24	No walls, composition or steel gable roof on wood rafters and posts, dirt floor
	Average	3.48 – 4.86	No walls, steel shed or flat roof on wood posts and girders, dirt floor
S	Good	6.18 – 8.63	No walls, steel gable roof and truss on steel column, wide span, dirt floor
	Average	4.39 – 6.14	No walls, steel shed or flat roof and girders on good steel posts, dirt floor

For concrete slab, add silage floor from adjustments table.

FARM (SUN) SHELTERS

D	Good	\$2.71 – \$3.79	No walls, light steel flat roof on light wood posts, dirt floor, sun shelters
	Average	2.37 – 3.30	No walls, light steel flat roof on low-cost pipe, dirt floor, sun shelters
S	Good	3.13 – 4.37	No walls, light steel flat roof on light wood posts, dirt floor, sun shelters
	Average	2.67 – 3.73	No walls, light steel flat roof on low-cost pipe, dirt floor, sun shelters

BARNs

REFINEMENTS: This page provides major adjustments to the base costs on the previous page. Follow Steps 1 through 5 to attain final costs, adjusted for lump sums, heating and cooling, story height, floor area/perimeter ratio and locality.

1 ADJUSTMENTS

Stalls, each, free: \$89 – \$175; tie: \$130 – \$230; box: \$1,620 – \$2,725; calf pen, steel: \$345 – \$395; wire: \$33 – \$66

Barn cleaner, each; flush tank, tip-type waterer, 70-gallon: \$715 – \$855; 105-gallon: \$940 – \$1,100

floor-type flooding flush system, excluding water source, cost per flush valve: \$2,420 – \$3,225

Fencing: 4" pipe, cable rails: \$11.85 – \$12.95 per linear foot;

4" pipe, 2" pipe rails: \$14.85 – \$16.25 per linear foot;

8' gate, each: \$135 – \$195 (add \$49.50 – \$66.00 for each addition 4')

Paved transfer lanes, 12' wide: \$22.15 – \$26.00 per linear foot

add for 8" curbing, double-sided: \$39.00 – \$44.75 per linear foot

Feeding fence, tubular steel, \$7.93 – \$17.00, add \$15.85 – \$18.70 for locking or sloped guard rail, per linear foot

Feeding troughs, one sided (fence): wood: \$14.30 – \$21.75; steel: \$28.00 – \$35.50; concrete: \$36.75 – \$43.00 per linear foot

Silage concrete slabs, cost: \$24.43 – \$29.28 per square foot

2 HEATING AND COOLING

These costs are averages of total installed cost of the entire heating or cooling installation including its prorated share of contractors' overhead and profit and architects' fees.

Electric cable or baseboard	\$4.31
Electric wall heaters (inc. FWA)	1.84
Forced air, ducted	4.85
heaters or furnace, vented	1.36
Hot water, baseboard/convactor	8.63
radiant floor or ceiling	8.87
Space heaters, with fan	2.37
radiant	2.79
Steam	7.68
Wall or floor furnace	9.58
Package heating and cooling	2.19
Ventilation, blower and ducts	1.36
fans only .....	.57

3 HEIGHT REFINEMENTS

STORY HEIGHT MULTIPLIERS

Multiply base cost by following multiplier for any variation in average story height.

Average Wall Height	Square Foot Multiplier
8	.963
9	.981
10	1.000 (base)
11	1.019
12	1.038
13	1.058
14	1.077
16	1.115
18	1.154
20	1.192
22	1.231
24	1.269
28	1.346
32	1.423
36	1.500

4

Average Floor Area, Sq. Ft./Story	AVERAGE PERIMETER														Average Floor Area, Sq. Ft./Story		
	75	125	150	200	250	300	350	400	500	600	700	800	900	1000			
1,000	.980	1.110	1.178	1.311	1.444	1.577	1.711	1.844	----	----	----	----	----	----	1,000		
2,000	.878	.945	.977	1.044	1.110	1.178	1.245	1.311	----	----	----	----	----	----	2,000		
3,000	.843	.889	.911	.955	1.000	1.044	1.088	1.133	----	----	----	----	----	----	3,000		
4,000	----	.860	.878	.911	.945	.977	1.010	1.044	1.110	1.178	----	----	----	----	4,000		
5,000	----	----	.844	.857	.884	.911	.938	.960	.991	1.044	1.097	1.150	----	----	5,000		
6,000	----	----	----	.843	.865	.888	.911	.934	.955	1.000	1.044	1.088	1.133	----	6,000		
7,000	----	----	----	----	.835	.854	.873	.892	.911	.931	.967	1.006	1.044	1.080	7,000		
8,000	----	----	----	----	----	.844	.860	.877	.894	.911	.945	.977	1.010	1.044	1.076	8,000	
9,000	----	----	----	----	----	.836	.852	.867	.881	.896	.926	.955	.985	1.014	1.044	9,000	
10,000	----	----	----	----	----	----	.844	.858	.871	.884	.911	.938	.960	.991	1.018	1.044	10,000
12,000	----	----	----	----	----	----	.833	.843	.855	.867	.888	.911	.934	.955	.977	1.000	12,000
14,000	----	----	----	----	----	----	.825	.835	.844	.854	.873	.892	.911	.931	.949	.967	14,000
16,000	----	----	----	----	----	----	----	.827	.836	.844	.861	.877	.894	.911	.928	.945	16,000
20,000	----	----	----	----	----	----	----	.818	.824	.831	.844	.858	.871	.884	.898	.911	20,000

5 USE COUNTY MULTIPLIERS IN MULTIPLIER SECTION.

MILKHOUSES AND MILKHOUSE SHEDS



GOOD CLASS D MILKING PARLOR



**AVERAGE CLASS C
Milkhouse Attached to Barn**

OCCUPANCY DESCRIPTION: Parlors/rooms used for milking operations, milk cooling and storage.

Milk houses are used for cooling and storing milk on the farm. Parlors are attached to barns. Milk house structures are four-walled independent units. Lean-to additions are typically three-walled structures with shed roofs.*

INCLUDED IN COSTS: Architects' fees and contractors' overhead and profit.

NOT INCLUDED IN COSTS: Heat, milk parlor stall or storage equipment.

MILKING PARLORS (DAIRIES)

CLASS	TYPE	COST/ SQ. FT.	EXTERIOR WALLS	INTERIOR FINISH	LIGHTING & PLUMBING
C	Excellent	\$72.09	Brick or stucco on block, insulated heavy roof structure	Ceramic and epoxy finishes, contoured concrete floor, plaster ceiling	High-level lighting, hot water, cow wash, restrooms and showers
	Good	54.25	Brick, concrete block, insulated roof	Plaster walls in cooler/storage room, contoured concrete floor with drains	Good lighting and plumbing, pipe stanchions, milk piping
	Average	40.95	Brick, concrete block or clay tile, light wood trusses	Plaster wainscot in cooler and washroom, good concrete floor	Adequate lighting and plumbing, pipe stanchions
	Low cost	30.96	Clay tile, concrete block, half walls, wood shutters and rafters	Painted walls, concrete milking floor, milking parlor only, no storage	Minimum electrical and plumbing service, wood stanchions
D	Excellent	66.01	Best sidings or veneer, good roof structure, fully insulated	Ceramic and epoxy finishes, contoured concrete floors, plaster ceiling	High-level lighting, hot water, cow wash, restrooms and showers
	Good	47.52	Good stucco or siding, some trim, wood or steel frame	Plaster walls, cooler and storage, contoured concrete floor	Good lighting and plumbing, pipe stanchions, milk piping
	Average	34.30	Stucco or siding, wood frame and rafters, windows or shutters	Plaster wainscot, cooler and washroom, good concrete floor	Adequate lighting and plumbing, pipe stanchions
	Low cost	24.81	Wood siding or plywood on light wood frame, shutters	Some wainscot, concrete floor, milking barn only, no storage	Minimum electrical and plumbing services, wood stanchions
DPOLE	Excellent	58.81	Best metal siding on pole frame, fully insulated, sheathed	Ceramic and epoxy finishes, contoured concrete floors, plaster ceiling	High-level lighting, hot water, cow wash, restrooms and showers
	Good	42.60	Pole frame, good metal siding and sheathing, insulated	Plaster or gypsum board, cooler and storage, contoured concrete floor	Good lighting and plumbing, pipe stanchions, milk piping
	Average	30.95	Pole frame, metal siding, windows or good shutters	Gypsum board or plaster, wainscot in cooler and washroom	Adequate lighting and plumbing, pipe stanchions
	Low cost	22.52	Pole frame, metal siding, some wainscot, shutters	Little interior finish, concrete milking floor, milking barn only	Minimum electrical and plumbing services, wood stanchions
S	Excellent	67.49	Good steel siding and sheathing, fully insulated	Ceramic and epoxy finishes, contoured floors, plaster ceiling	High-level lighting, hot water, cow wash, restrooms and showers
	Good	49.39	Good steel siding, full sheathing, insulated	Plaster or gypsum board, cooler and storage, contoured concrete floor	Good lighting and plumbing, pipe stanchions, milk piping
	Average	36.25	Steel siding, windows or good shutters	Gypsum board or plaster, wainscot in cooler and washroom	Adequate lighting and plumbing, pipe stanchions
	Low cost	26.65	Steel siding, light frame, some wainscot, shutters	Little interior finish, concrete milking floor, milking barn only	Minimum electrical and plumbing wood stanchions

MILKHOUSES

C	Good	\$59.76	Decorative block	Plaster, ceramic and epoxy	Good electrical, restroom & shower
	Average	43.96	Concrete block or clay tile	Plaster wainscot, concrete floor	Adequate electrical and plumbing
D	Good	51.87	Good stucco or siding	Plaster, ceramic and epoxy	Good electrical, restroom & shower
	Average	37.97	Siding or metal on studs	Finished wainscot, concrete floor	Adequate electrical and plumbing

MILKHOUSE SHEDS

C	Good	\$51.38	Decorative block, shed lean-to	Plaster, ceramic and epoxy	Good electrical, restroom & shower
	Average	37.80	Concrete block or clay tile, shed lean-to	Plaster wainscot, concrete floor	Adequate electrical and plumbing
D	Good	44.48	Good stucco or siding, shed lean-to	Plaster, ceramic and epoxy	Good electrical, restroom & shower
	Average	32.56	Siding or metal on studs, shed lean-to	Finished wainscot, concrete floor	Adequate electrical and plumbing

*Costs for lean-to additions, per sq. ft. of ground area, are 80% to 90% of costs for similar four-wall structures.

NOTE: If these structures are totally within a barn, use 45% of the costs above.

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MILKING PARLORS (DAIRIES), MILK HOUSES AND MILKHOUSE SHEDS

REFINEMENTS: This page provides major adjustments to the base costs on the previous page. Follow Steps 1 through 5 to attain final costs, adjusted for lump sums, heating and cooling, story height, floor area/perimeter ratio and locality.

1 ADJUSTMENTS

Concrete tanker loading pad: \$2.65 - \$2.97 per square foot
 Fencing: 4" pipe, cable rails: \$11.85 - \$12.95 per linear foot; stock corrals, 4" pipe, 2" pipe rails: \$14.85 - \$16.25 per linear foot; galvanized rub panels, add \$1.76 - \$2.19 ; 8' gate, each: \$135 - \$195 (add \$49.50 - \$66.00 for each additional 4')
 Holding pen/wash area, block wall, slab floor, pipe dividers, cost per square foot: \$7.71 - \$10.75 ;
 add for roof: \$4.29 - \$6.88; power crowd gate: \$6.94 - \$13.80; cow wash, \$2.86 - \$4.41
 Milking equipment: \$5,950 - \$16,700 base, plus \$2,070 - \$2,625 per stall, add for power gates, \$1,080 - \$1,290;
 for fully automated systems, add, doubles, \$5,950 - \$16,700; rotary, \$13,200 - \$20,900 per stall;
 for feed system, add \$770 - \$990, plus \$770 for auger, per stall;
 for computerized automation, add \$1,740 - \$3,500 plus \$44 - \$60 for each I.D. tag
 Bulk milk tanks, including refrigeration. For automatic wash systems, add \$2,625 to \$3,500.

Capacity, gal.	Cost	Capacity, gal.	Cost	Capacity, gal.	Cost
500	\$14,300	1,500	\$30,900	4,000	\$ 62,200
750	19,000	2,000	34,700	5,000	77,700
1,000	23,400	3,000	46,700	8,000	125,000

2 HEATING AND COOLING

These costs are averages of total installed cost of the entire heating or cooling installation including its prorated share of contractors' overhead and profit and architects' fees.

Electric cable or baseboard	\$4.31
Electric wall heaters (inc. FWA)	1.84
Forced air, ducted	4.85
heaters or furnace, vented	1.36
Hot water, baseboard/convactor	8.63
radiant floor or ceiling	8.87
Space heaters, with fan	2.37
radiant	2.79
Steam	7.68
Wall or floor furnace	9.58
Package heating and cooling	2.19
Ventilation, blower and ducts	1.36
fans only	.57

3 HEIGHT REFINEMENTS

STORY HEIGHT MULTIPLIERS

Multiply base cost by following multiplier for any variation in average story height.

Average Wall Height	Square Foot Multiplier
8	.963
9	.981
10	1.000 (base)
11	1.019
12	1.038
13	1.058
14	1.077
16	1.115
18	1.154
20	1.192
22	1.231
24	1.269
28	1.346
32	1.423
36	1.500

4

Average Floor Area, Sq. Ft./Story	AVERAGE PERIMETER														Average Floor Area, Sq. Ft./Story
	50	75	100	125	150	200	250	300	350	400	500	600	700	800	
200	1.444	1.794	2.110	2.460	2.776	2.909	----	----	----	----	----	----	----	----	200
300	1.222	1.444	1.667	1.911	2.110	2.510	----	----	----	----	----	----	----	----	300
500	1.044	1.178	1.311	1.444	1.577	1.844	2.110	2.377	2.643	2.909	----	----	----	----	500
750	.955	1.044	1.133	1.222	1.311	1.489	1.667	1.844	2.023	2.201	----	----	----	----	750
1,000	.911	.980	1.044	1.110	1.178	1.311	1.444	1.577	1.711	1.844	----	----	----	----	1,000
1,500	.866	.911	.955	1.000	1.044	1.133	1.222	1.311	1.400	1.489	----	----	----	----	1,500
2,000	----	.878	.911	.945	.977	1.044	1.110	1.178	1.245	1.311	----	----	----	----	2,000
2,500	----	.858	.884	.911	.938	.991	1.044	1.097	1.150	1.204	----	----	----	----	2,500
3,000	----	.843	.865	.889	.911	.955	1.000	1.044	1.088	1.133	----	----	----	----	3,000
3,500	----	----	.854	.872	.892	.931	.967	1.006	1.044	1.080	1.157	----	----	----	3,500
4,000	----	----	----	.860	.878	.911	.945	.977	1.010	1.044	1.110	1.178	----	----	4,000
5,000	----	----	----	.844	.857	.884	.911	.938	.960	.991	1.044	1.097	1.150	----	5,000
8,000	----	----	----	----	----	.844	.860	.877	.894	.911	.945	.977	1.010	1.044	8,000
10,000	----	----	----	----	----	----	.844	.858	.871	.884	.911	.938	.960	.991	10,000
12,000	----	----	----	----	----	----	.833	.843	.855	.867	.888	.911	.934	.955	12,000
14,000	----	----	----	----	----	----	.825	.835	.844	.854	.873	.892	.911	.931	14,000

5 USE COUNTY MULTIPLIERS IN MULTIPLIER SECTION.

SHEEP BARNS AND SHEDS

OCCUPANCY DESCRIPTION: Sheep barns and sheds are structures designed for the raising of sheep. Typically there is minimal electrical and plumbing. The shed structures have dirt floors and half-walls, or shed fronts. The full barn structure has a slab floor, insulated and vented walls and some interior partitions.

INCLUDED IN COSTS: Architects' fees and contractors' overhead and profit.

NOT INCLUDED IN COSTS: Heating or feeding systems.

SHEEP BARNS

CLASS	TYPE	COST/ SQ. FT.	EXTERIOR WALLS	INTERIOR FINISH	LIGHTING & PLUMBING
D	Good	\$28.59	Wood frame and siding, insulated, lambing barn	Insulated ceiling, interior sheathing, slab floor, division of space	Adequate electrical and water service
	Average	22.36	Wood frame and siding, insulated and vented walls	Insulated ceiling, interior sheathing, slab floor, some division of space	Adequate electrical and water service
DPOLE	Good	24.31	Pole frame, metal siding, insulated, lambing barn	Insulated ceiling, interior sheathing, slab floor, division of space	Adequate electrical and water service
	Average	19.17	Pole frame, metal siding, insulated and vented walls	Insulated ceiling, interior sheathing, slab floor, some division of space	Adequate electrical and water service
S	Good	28.03	Steel frame and siding, insulated, lambing barn	Insulated ceiling, interior sheathing, slab floor, division of space	Adequate electrical and water service
	Average	22.70	Steel frame and siding, insulated and vented walls	Insulated ceiling, interior sheathing, slab floor, some division of space	Adequate electrical and water service

SHEEP SHEDS

D	Good	\$15.44	Wood frame and siding, open front, rear vents	Ceiling insulation, some slab floor, subdivided	Adequate electrical, water, feed, not automated
	Average	12.34	Vertical boards or plywood, open front, back ventilation	Some wainscot, dirt floor, some division of space	Minimum water service, feed, not automated
	Low cost	9.86	Plywood, open front, vents	Minimum facility, dirt floor	Hose bibs
	Cheap	8.85	Plywood or siding on box frame, half-walls	Unfinished, dirt floor	Feed and water, not automated
DPOLE	Good	13.72	Pole frame, metal siding, open front, rear vents	Ceiling insulation, some slab floor, subdivided	Adequate electrical, water, feed, not automated
	Average	10.78	Pole frame, metal siding, open front, back ventilation	Some wainscot, dirt floor, some division of space	Minimum water service, feed, not automated
	Low cost	8.46	Metal, open front, vents	Minimum facility, dirt floor	Hose bibs
	Cheap	7.40	Metal siding on pole frame, half-walls	Unfinished, dirt floor	Feed and water, not automated
DHOOP ARCH	Good	9.01	Wood post, knee wall, pipe hoop, fabric cover, curtain side and end doors	Some slab floor, subdivided	Minimum water service, feed, not automated
	Average	7.14	Wood post, knee wall, pipe hoop frame, fabric cover, end curtains	Some wainscot, dirt floor, some division of space	Minimum water service, feed, not automated
	Low cost	5.66	Wood, pipe hoop, fabric cover	Minimum facility, dirt floor	Hose bibs
S	Good	16.08	Steel siding and frame, open front, rear vents	Ceiling insulation, some slab floor, subdivided	Adequate electrical, water, feed, not automated
	Average	12.95	Steel panels and frame, open front, back ventilation	Some wainscot, dirt floor, some division of space	Minimum water service, feed, not automated
	Low cost	10.42	Steel, open front, vents	Minimum facility, dirt floor	Hose bibs
	Cheap	9.50	Steel frame, metal siding, half-walls	Unfinished, dirt floor	Feed and water, not automated
SSLANT WALL	Average	12.05	Steel panels and slant frame, open front, back ventilation	Some wainscot, dirt floor, some division of space	Minimum water service, feed, not automated
	Low cost	9.61	Light steel, open front, vents	Minimum facility, dirt floor	Hose bibs

NOTES: Use total length of walled sides, including vent doors and gates, as perimeter in the Floor Area/Perimeter table.

For slotted floors, add the following per square foot of pit area:

Shallow pit, scraper alley: \$7.01 to \$13.90; Deep pit, tractor access: \$16.60 to \$23.55.

SHEEP BARNS AND SHEDS

REFINEMENTS: This page provides major adjustments to the base costs on the previous page. Follow Steps 1 through 5 to attain final costs, adjusted for lump sums, heating and cooling, story height, floor area/perimeter ratio and locality.

1 ADJUSTMENTS

Confinement pens, solid rod, 27" - 46" high, \$7.38 - \$16.30 per linear foot;
 add for galvanized panels, 42" high, \$2.70 - \$2.76 per linear foot
 Sheep pens, 4" x 4" posts, four split rails, \$7.04 - \$7.26 ; four 2" x 6" rails, \$10.05 - \$10.60 per linear foot
 Lambing pens, 4' x 6' w/18" safety zone, \$300 - \$390 each
 Pen grain feeder, \$60 - \$120 each; Yard, round grain feeder, \$205 - \$445 each, hay feeder, \$675 - \$700 each
 8" fenceline feeder, \$450 - \$460, add \$325 - \$335 for each additional 8'
 Electric pen water, \$89 - \$170 each; Automatic drinker kit with float, \$120 - \$125
 Watering tank, galvanized, 44 gallons, \$83 - \$89 each; 70 gallons, \$120 - \$125 each
 Concrete exercise apron, \$2.14 - \$2.53 per square foot

2 HEATING AND COOLING

These costs are averages of total installed cost of the entire heating or cooling installation including its prorated share of contractors' overhead and profit and architects' fees.

Electric cable or baseboard	\$4.31
Electric wall heaters (inc. FWA)	1.84
Forced air, ducted	4.85
heaters or furnace, vented	1.36
Hot water, baseboard/convactor	8.63
radiant floor or ceiling	8.87
Space heaters, with fan	2.37
radiant	2.79
Steam	7.68
Wall or floor furnace	9.58
Package heating and cooling	2.19
Ventilation, blower and ducts	1.36
fans only .....	.57

3 HEIGHT REFINEMENTS

STORY HEIGHT MULTIPLIERS

Multiply base cost by following multiplier for any variation in average story height.

Average Wall Height	Square Foot Multiplier
7	.943
8	.963
9	.981
10	1.000 (base)
11	1.019
12	1.038
13	1.058
14	1.077
16	1.115
18	1.154
20	1.192
22	1.231
24	1.269
28	1.346
32	1.423

4

Average Floor Area, Sq. Ft./Story	AVERAGE PERIMETER																Average Floor Area, Sq. Ft./Story
	50	75	100	125	150	200	250	300	350	400	500	600	700	800			
500	1.044	1.178	1.311	1.444	1.577	1.844	2.110	2.377	2.643	2.909	----	----	----	----	500		
750	.955	1.044	1.133	1.222	1.311	1.489	1.667	1.844	2.023	2.201	----	----	----	----	750		
1,000	.911	.980	1.044	1.110	1.178	1.311	1.444	1.577	1.711	1.844	----	----	----	----	1,000		
1,500	.866	.911	.955	1.000	1.044	1.133	1.222	1.311	1.400	1.489	----	----	----	----	1,500		
2,000	----	.878	.911	.945	.977	1.044	1.110	1.178	1.245	1.311	----	----	----	----	2,000		
2,500	----	.858	.884	.911	.938	.991	1.044	1.097	1.150	1.204	----	----	----	----	2,500		
3,000	----	.843	.865	.889	.911	.955	1.000	1.044	1.088	1.133	----	----	----	----	3,000		
3,500	----	----	.854	.872	.892	.931	.967	1.006	1.044	1.080	1.157	----	----	----	3,500		
4,000	----	----	----	.860	.878	.911	.945	.977	1.010	1.044	1.110	1.178	----	----	4,000		
5,000	----	----	----	.844	.857	.884	.911	.938	.960	.991	1.044	1.097	1.150	----	5,000		
6,000	----	----	----	----	.843	.865	.888	.911	.934	.955	1.000	1.044	1.088	1.133	6,000		
7,000	----	----	----	----	.835	.854	.873	.892	.911	.931	.967	1.006	1.044	1.080	7,000		
8,000	----	----	----	----	----	.844	.860	.877	.894	.911	.945	.977	1.010	1.044	8,000		
10,000	----	----	----	----	----	----	.844	.858	.871	.884	.911	.938	.960	.991	10,000		

Use the total length of walled sides as the perimeter.

5 USE COUNTY MULTIPLIERS IN MULTIPLIER SECTION.

BARNs AND SHEDS

OCCUPANCY DESCRIPTION: Utility sheds are designed with an open front and only three exterior walls and may be of either wood frame or steel construction. The interior is usually unfinished, with no doors or partitioning and a dirt floor. No electrical or water service is included in the costs. They can be modified to be used for commodity or equipment storage only (no repair shop). Livestock loafing sheds include rub boards.

Feeder barns are designed for livestock shelter and feeding. They are open-front sheds with wood or metal siding attached to wood posts or steel frames. The low quality has an endwall door, while the good quality has doors at both ends and rear vents. Feeders and water are not automated.

INCLUDED IN COSTS: Architects' fees and contractors' overhead and profit.

NOT INCLUDED IN COSTS: Heating systems.

FARM UTILITY STORAGE SHEDS

CLASS	TYPE	COST/ SQ. FT.	EXTERIOR WALLS	INTERIOR FINISH	LIGHTING & PLUMBING
C	Low cost	\$11.76	Open one side, cheap block, shed roof	Unfinished, no doors, dirt floor	None
	Good	8.10	Open one side, boards/hvy. timber	Unfinished, no doors, dirt floor	None
	Average	7.26	Open one side, plywood/box frame	Unfinished, no doors, dirt floor	None
D	Low cost	6.50	Open one side, plywood/post frame	Unfinished, no doors, dirt floor	None
	Low cost	5.29	Open one side, metal on pole frame	Unfinished, no doors, dirt floor	None
DPOLE	Low cost	5.29	Open one side, metal on pole frame	Unfinished, no doors, dirt floor	None
S	Low cost	7.32	Open one side, steel frame/siding	Unfinished, no doors, dirt floor	None
SSLANT WALL	Low cost	6.71	Open front, metal on light slant frame	Unfinished, no doors, dirt floor	None

For commodity (hay) storage, add silage floor from adjustments table.

LOAFING SHEDS

D	Good	\$7.60	Open one side, plywood or boards on timber frame	Unfinished, no doors or vents, dirt floor, rub boards	None
	Average	7.11	Open one side, light plywood on box frame	Unfinished, no doors or vents, dirt floor, rub boards	None
	Low cost	6.65	Open one side, light plywood on post frame	Unfinished, no doors or vents, dirt floor, rub boards	None
DPOLE	Low cost	5.44	Open one side, metal on pole frame	Unfinished, no doors or vents, dirt floor, rub boards	None
S	Low cost	7.44	Open one side, steel frame and siding	Unfinished, no doors or vents, dirt floor, rub boards	None

Add for scraper alley, feed driveway paving, etc., from adjustments table.

FEEDER BARNs (CATTLE SHEDs)

D	Good	\$8.72	Open one side, box frame and siding, good doors, rear vents	Unfinished, dirt floor, rub boards	Feeders, water troughs, not automated
	Average	7.69	Open one side, boards or siding on wood frame, end doors	Unfinished, dirt floor, rub boards	Feeders, water troughs, not automated
	Low cost	6.77	Open one side, boards or siding, post/box frame, one end door	Unfinished, dirt floor	Feeders, not automated
DPOLE	Good	7.22	Open one side, metal on pole frame, good doors, rear vents	Unfinished, dirt floor, rub boards	Feeders, water troughs, not automated
	Average	6.34	Open one side, metal siding on pole frame, end doors	Unfinished, dirt floor, rub boards	Feeders, water troughs, not automated
	Low cost	5.57	Open one side, metal on pole frame, one end door	Unfinished, dirt floor	Feeders, not automated
DHOOP ARCH	Average	6.12	Wood post, knee wall, pipe hoop frame, fabric cover, end curtains	Unfinished, dirt floor, rub boards	Feeders, water troughs, not automated
	Low cost	5.38	Wood post, pipe hoop, partial fabric cover, open ends	Unfinished, dirt floor	Feeders, not automated
S	Good	9.59	Open one side, metal on steel frame, good doors, rear vents	Unfinished, dirt floor, rub boards	Feeders, water troughs, not automated
	Average	8.54	Open one side, metal siding on steel frame, end doors	Unfinished, dirt floor, rub boards	Feeders, water troughs, not automated
	Low cost	7.60	Open one side, metal on steel frame, one end door	Unfinished, dirt floor	Feeders, not automated

Add for scraper alley, feed driveway paving, etc., from adjustments table.

BARNS AND SHEDS

REFINEMENTS: This page provides major adjustments to the base costs on the previous page. Follow Steps 1 through 5 to attain final costs, adjusted for lump sums, heating and cooling, story height, floor area/perimeter ratio and locality.

1	ADJUSTMENTS FOR DEVIATIONS FROM BASE COSTS	ADD OR DEDUCT PER SQUARE FOOT		
		GOOD	AVG.	LOW
	Dirt Floor	\$.24	\$.29	\$.41
	Gravel .....	.53	.62	.85
	Asphalt	1.99	2.52	4.03
	Concrete Flatwork	2.87	3.45	4.97
	Alleys with Curbs	5.09	5.62	6.86
	Silage Floor or Driveways, Reinforced	3.27	3.97	5.84
	Plank Floor	1.18	1.51	2.47
	Feeders, Water Troughs			
	Not Automated .....	.21	.26	.42
	Electric Service .....	.18	.31	.89
	Water Service .....	.14	.20	.40

2	HEATING AND COOLING	
	These costs are averages of total installed cost of the entire heating or cooling installation including its prorated share of contractors' overhead and profit and architects' fees.	
	Electric cable or baseboard	\$4.31
	Electric wall heaters (inc. FWA)	1.84
	Forced air, ducted	4.85
	heaters or furnace, vented	1.36
	Hot water, baseboard/convactor	8.63
	radiant floor or ceiling	8.87
	Space heaters, with fan	2.37
	radiant	2.79
	Steam	7.68
	Wall or floor furnace	9.58
	Package heating and cooling	2.19
	Ventilation, blower and ducts	1.36
	fans only .....	.57

3	HEIGHT REFINEMENTS	
	STORY HEIGHT MULTIPLIERS	
	Multiply base cost by following multiplier for any variation in average story height.	
	Average Wall Height	Square Foot Multiplier
	7	.943
	8	.963
	9	.981
	10	1.000 (base)
	11	1.019
	12	1.038
	13	1.058
	14	1.077
	16	1.115
	18	1.154
	20	1.192
	22	1.231
	24	1.269
	28	1.346
	32	1.423

4	Average Floor Area, Sq. Ft./Story	AVERAGE PERIMETER														Average Floor Area, Sq. Ft./Story
		50	75	100	125	150	200	250	300	350	400	500	600	700	800	
	500	1.044	1.178	1.311	1.444	1.577	1.844	2.110	2.377	2.643	2.909	----	----	----	----	500
	750	.955	1.044	1.133	1.222	1.311	1.489	1.667	1.844	2.023	2.201	----	----	----	----	750
	1,000	.911	.980	1.044	1.110	1.178	1.311	1.444	1.577	1.711	1.844	----	----	----	----	1,000
	1,500	.866	.911	.955	1.000	1.044	1.133	1.222	1.311	1.400	1.489	----	----	----	----	1,500
	2,000	----	.878	.911	.945	.977	1.044	1.110	1.178	1.245	1.311	----	----	----	----	2,000
	2,500	----	.858	.884	.911	.938	.991	1.044	1.097	1.150	1.204	----	----	----	----	2,500
	3,000	----	.843	.865	.889	.911	.955	1.000	1.044	1.088	1.133	----	----	----	----	3,000
	3,500	----	----	.854	.872	.892	.931	.967	1.006	1.044	1.080	1.157	----	----	----	3,500
	4,000	----	----	----	.860	.878	.911	.945	.977	1.010	1.044	1.110	1.178	----	----	4,000
	5,000	----	----	----	.844	.857	.884	.911	.938	.960	.991	1.044	1.097	1.150	----	5,000
	6,000	----	----	----	----	.843	.865	.888	.911	.934	.955	1.000	1.044	1.088	1.133	6,000
	7,000	----	----	----	----	.835	.854	.873	.892	.911	.931	.967	1.006	1.044	1.080	7,000
	8,000	----	----	----	----	----	.844	.860	.877	.894	.911	.945	.977	1.010	1.044	8,000
	10,000	----	----	----	----	----	----	.844	.858	.871	.884	.911	.938	.960	.991	10,000

Use the total length of walled sides as the perimeter.

5 USE COUNTY MULTIPLIERS IN MULTIPLIER SECTION.

BARN AND SHEDS



GOOD CLASS DPOLE FEEDER BARN



AVERAGE DPOLE FEEDER BARN



AVERAGE DPOLE FEEDER BARN



AVERAGE DPOLE FEEDER BARN



LOW CLASS DPOLE CATTLE SHED



AVERAGE CLASS DPOLE CATTLE SHED



LOW CLASS DPOLE STORAGE SHED



LOW CLASS DPOLE LOADING SHED

HOG BARN AND STABLES



GOOD CLASS D HOG HOUSE



GOOD CLASS D POLE FARROWING BARN



AVERAGE / GOOD CLASS S HOG HOUSE



AVERAGE CLASS S FARROWING BARN



GOOD CLASS D STABLE



GOOD CLASS D STABLE



AVERAGE CLASS D STABLE



LOW-COST CLASS D STABLE

HOG HOUSES AND BARNs

OCCUPANCY DESCRIPTION: These barns provide for the breeding and nursery cycles of a swine production operation. Walls are insulated using plywood, wood or metal siding as the exterior cover. Some electrical and water to the pens is usually provided. Most have some type of flushing system. Higher quality (average to good) buildings are suitable for environmental control confinement housing.

INCLUDED IN COSTS: Architects' fees and contractors' overhead and profit.

NOT INCLUDED IN COSTS: Pens, crates, incubators, other special equipment or heat.

HOG HOUSE – NURSERY

CLASS	TYPE	COST/ SQ. FT.	EXTERIOR WALLS	INTERIOR FINISH	LIGHTING & PLUMBING
C	Good	\$48.37	Brick or block, good ventilation and fenestration	Insulated, slab floor, subdivided, office, nursery	Good lighting and plumbing, lab
	Average	43.31	Brick or block, insulated, ventilated	Insulated ceiling, slab floor, subdivided, small office, nursery	Adequate lighting and water service
D	Good	44.07	Wood siding or stucco, good ventilation and fenestration	Insulated, slab floor, subdivided, office, nursery	Good lighting and plumbing, lab
	Average	38.49	Wood siding or stucco, insulated, ventilated	Insulated ceiling, slab floor, subdivided, small office, nursery	Adequate lighting, water service
DPOLE	Good	39.89	Pole frame, metal siding, fully insulated, ventilated	Insulated, interior sheathing, slab floor, subdivided, office, nursery	Good lighting and plumbing, lab
	Average	35.05	Pole frame, metal siding, insulated, ventilated	Insulated ceiling, interior sheathing, slab floor, subdivided, small office	Adequate lighting and water service, nursery
S	Good	45.61	Steel panels and frame, fully insulated, ventilated	Insulated, interior sheathing, slab floor, subdivided, office, nursery	Good lighting and plumbing, lab
	Average	39.94	Steel panels and frame, insulated, ventilated	Insulated ceiling, interior sheathing, slab floor, subdivided, small office	Adequate lighting and water service, nursery

HOG BARN – BREEDING/GESTATION

C	Good	\$38.48	Brick or block, good ventilation and fenestration	Insulated, slab floor, subdivided	Good lighting and water service
	Average	30.61	Block or structural tile, adequate fenestration, ventilated	Insulated ceiling, slab, somedivision of space	Adequate lighting, water service
	Low cost	26.65	Block or structural tile, side curtains or vents	Unfinished, slab floor, somedivision of space	Minimum lighting and water service
D	Good	33.40	Wood siding or stucco, good ventilation and fenestration	Insulated, slab floor, subdivided	Good lighting and water service
	Average	25.33	Stucco or wood siding, insulated, ventilated	Insulated ceiling, plywood interior, slab floor, some subdivision	Adequate lighting, water service
	Low cost	21.69	Boards or plywood, on box frame, some insulation, curtains or vents	Some wainscot, slab floor, some division of space	Minimum lighting and water service
	Cheap	16.71	Low-cost boards, natural ventilation	Slab floor, some subdivision	Minimum services
DPOLE	Good	30.60	Pole frame, metal siding, fully insulated, ventilated	Insulated ceiling, interior sheathing, slab floor, subdivided	Good lighting and water service
	Average	23.47	Pole frame, metal siding, insulated, ventilated	Insulated ceiling, plywood interior, slab floor, some subdivision	Adequate lighting, water service
	Low cost	20.23	Pole frame, metal siding, some insulation, side curtains or vents	Some wainscot, slab floor, some division of space	Minimum lighting and water service
	Cheap	15.76	Metal on pole, natural ventilation	Slab floor, some subdivision	Minimum services
S	Good	34.76	Steel panels and frame, fully insulated, ventilated	Insulated ceiling, interior sheathing, slab floor, subdivided	Good lighting and water service
	Average	26.45	Steel siding and frame, insulated, ventilated	Insulated ceiling, plywood interior, slab, some division of space	Adequate lighting and water service
	Low cost	22.57	Steel siding and frame, some insulation, side curtains or vents	Some wainscot, slab floor, some division of space	Minimum lighting and water service
	Cheap	17.55	Metal on steel, natural ventilation	Slab floor, some subdivision	Minimum services

For slotted floors, add the following per square foot of pit area:

Flush pit: \$8.97 to \$15.25 Shallow pit: \$12.00 to \$19.80 Deep pit: \$19.20 to \$28.50

HOG HOUSES AND BARNs

REFINEMENTS: This page provides major adjustments to the base costs on the previous page. Follow Steps 1 through 5 to attain final costs, adjusted for lump sums, heating and cooling, story height, floor area/perimeter ratio and locality.

1 ADJUSTMENTS

Confinement pens, solid rod, 27" - 46" high, \$7.38 - \$16.30 per linear foot; add for galvanized panels, 42" high, \$2.70 - \$2.76 per linear foot
 PVC, 20" - 38" high, \$5.50 - \$11.45 per linear foot
 Gestation stall, \$100 - \$110 each
 Nursery feeder 1 bu. - 4.5 bushels, round, \$335 - \$530 each; rectangular, one sided, \$190 - \$475 each
 rectangular, two sided, 3.5 bushels. - 9.35 bushels, \$300 - \$615 each
 Nipple watering system, \$78 - \$155 per pen
 Electric pen water, \$89 - \$170 each; Automatic drinker kit with float, \$120 - \$125 each
 High pressure wash system, 2 GPM - 4 GPM, hot water, \$2,525 - \$4,050 plus \$3.86 per linear foot
 High pressure wash system, 2 GPM - 4 GPM, cold water, \$1,000 - \$1,490 plus \$3.86 per linear foot
 Heating pads, nursery, 2' X 3' - 3' X 6', \$105 - \$400 each plus \$435 - \$565 for controller

2 HEATING AND COOLING

These costs are averages of total installed cost of the entire heating or cooling installation including its prorated share of contractors' overhead and profit and architects' fees.

Electric cable or baseboard	\$4.31
Electric wall heaters (inc. FWA)	1.84
Forced air, ducted	4.85
heaters or furnace, vented	1.36
Hot water, baseboard/convactor	8.63
radiant floor or ceiling	8.87
Space heaters, with fan	2.37
radiant	2.79
Steam	7.68
Package heating and cooling	9.58
Wall or floor furnace	2.19
Vent. (blowers/ducts)	1.36
fans only	.57

3 HEIGHT REFINEMENTS

STORY HEIGHT MULTIPLIERS

Multiply base cost by following multiplier for any variation in average story height.

Average Wall Height	Square Foot Multiplier
7	.943
8	.963
9	.981
10	1.000 (base)
11	1.019
12	1.038
13	1.058
14	1.077
16	1.115
18	1.154
20	1.192
22	1.231
24	1.269
28	1.346
32	1.423

4

AVERAGE PERIMETER

Average Floor Area, Sq. Ft./Story	AVERAGE PERIMETER														Average Floor Area, Sq. Ft./Story
	50	75	100	125	150	200	250	300	350	400	500	600	700	800	
500	1.044	1.178	1.311	1.444	1.577	1.844	2.110	2.377	2.643	2.909	----	----	----	----	500
750	.955	1.044	1.133	1.222	1.311	1.489	1.667	1.844	2.023	2.201	----	----	----	----	750
1,000	.911	.980	1.044	1.110	1.178	1.311	1.444	1.577	1.711	1.844	----	----	----	----	1,000
1,500	.866	.911	.955	1.000	1.044	1.133	1.222	1.311	1.400	1.489	----	----	----	----	1,500
2,000	----	.878	.911	.945	.977	1.044	1.110	1.178	1.245	1.311	----	----	----	----	2,000
2,500	----	.858	.884	.911	.938	.991	1.044	1.097	1.150	1.204	----	----	----	----	2,500
3,000	----	.843	.865	.889	.911	.955	1.000	1.044	1.088	1.133	----	----	----	----	3,000
3,500	----	----	.854	.872	.892	.931	.967	1.006	1.044	1.080	1.157	----	----	----	3,500
4,000	----	----	----	.860	.878	.911	.945	.977	1.010	1.044	1.110	1.178	----	----	4,000
5,000	----	----	----	.844	.857	.884	.911	.938	.960	.991	1.044	1.097	1.150	----	5,000
6,000	----	----	----	----	.843	.865	.888	.911	.934	.955	1.000	1.044	1.088	1.133	6,000
8,000	----	----	----	----	----	.844	.860	.877	.894	.911	.945	.977	1.010	1.044	8,000
10,000	----	----	----	----	----	----	.844	.858	.871	.884	.911	.938	.960	.991	10,000
14,000	----	----	----	----	----	----	.825	.835	.844	.854	.873	.892	.911	.931	14,000

Use the total length of walled sides as the perimeter.

5 USE COUNTY MULTIPLIERS IN MULTIPLIER SECTION.

HOG HOUSES AND BARNs

OCCUPANCY DESCRIPTION: These barns provide for farrowing and finishing cycles of swine production. Walls are insulated using plywood, wood or metal siding as the exterior cover. Some electrical and water to the pens is usually provided. Most have some type of flushing system. Higher quality (average to good) buildings are suitable for environmental control confinement housing.

INCLUDED IN COSTS: Architects' fees and contractors' overhead and profit.

NOT INCLUDED IN COSTS: Pens, crates, incubators, other special equipment or heat.

HOG BARNs – FARROWING

CLASS	TYPE	COST/ SQ. FT.	EXTERIOR WALLS	INTERIOR FINISH	LIGHTING & PLUMBING
C	Good	\$43.15	Brick or block, good ventilation and fenestration	Insulated, slab floor, subdivided	Good lighting and water service
	Average	35.11	Brick or block, adequate fenestration, ventilated	Insulated ceiling, slab floor, subdivided	Adequate lighting and water service
	Low cost	28.52	Block, side curtains or vents	Some insulation, slab, subdivided	Minimum services
D	Good	38.37	Wood siding or stucco, good ventilation and fenestration	Insulated, slab floor, subdivided	Good lighting and water service
	Average	29.91	Wood siding or stucco, adequate fenestration, ventilated	Insulated, slab floor, subdivided	Adequate lighting, water service
	Low cost	23.28	Wood, side curtains or vents	Some insulation, slab, subdivided	Minimum services
DPOLE	Good	34.93	Pole frame, metal siding, fully insulated and ventilated	Insulated ceiling, interior sheathing, slab floor, subdivided	Good lighting and water service
	Average	27.51	Pole frame, metal siding, insulated, ventilated	Insulated ceiling, interior sheathing, slab floor, subdivided	Adequate lighting and water service
	Low cost	21.65	Metal, side curtains or vents	Some insulation, slab, subdivided	Minimum services
	Cheap	19.22	Metal on pole, natural ventilation	Slab floor, subdivided	Minimum services
S	Good	39.80	Steel panels and frame, fully insulated and ventilated	Insulated ceiling, interior sheathing, slab floor, subdivided	Good lighting and water service
	Average	31.13	Steel panels and frame, insulated, ventilated	Insulated ceiling, interior sheathing, slab floor, subdivided	Adequate lighting and water service
	Low cost	24.34	Steel, side curtains or vents	Some insulation, slab, subdivided	Minimum services
	Cheap	21.52	Metal on steel, natural ventilation	Slab floor, subdivided	Minimum services

HOG BARNs – FINISHING

C	Average	\$27.28	Block or structural tile, adequate fenestration, fully ventilated	Insulated ceiling, slab, somedivision of space	Adequate lighting, water service
	Low cost	24.27	Block or structural tile, little fenestration, ventilated, side curtains or vents	Unfinished, partial floor, somedivision of space	Adequate lighting and water service
	Cheap	15.56	Cheap block, natural ventilation	Unfinished, dirt floor, no curtains	Minimum services
D	Average	22.27	Stucco or wood siding, insulated, fully ventilated	Insulated ceiling, plywood interior, slab floor, some subdivision	Adequate lighting, water service
	Low cost	19.15	Boards or plywood on box frame, some insulation, side curtains/vents	Some wainscot, some slab floor, some division of space	Adequate lighting and water service
	Cheap	11.79	Low-cost boards, natural ventilation	Unfinished, dirt floor, no curtains	Minimum services
DPOLE	Average	20.54	Pole frame, metal siding, insulated, fully ventilated	Insulated ceiling, plywood interior, slab floor, some subdivision	Adequate lighting, water service
	Low cost	17.95	Pole frame, metal siding, some insulation, side curtains or vents	Some wainscot, partial floor, some division of space	Adequate lighting and water service
	Cheap	10.54	Metal on pole, natural ventilation	Unfinished, dirt floor, no curtains	Minimum services
S	Average	23.06	Steel siding and frame, insulated, fully ventilated	Insulated ceiling, plywood interior, slab, some division of space	Adequate lighting and water service
	Low cost	20.10	Steel siding and frame, some insulation, side curtains or vents	Some wainscot, slab floor, some division of space	Adequate lighting and water service
	Cheap	12.55	Metal on steel, natural ventilation	Unfinished, dirt floor, no curtains	Minimum services

For slotted floors, add the following per square foot of pit area:

Flush pit: \$8.97 to \$15.25 Shallow pit: \$12.00 to \$19.80 Deep pit: \$19.20 to \$28.50

HOG HOUSES AND BARNs

REFINEMENTS: This page provides major adjustments to the base costs on the previous page. Follow Steps 1 through 5 to attain final costs, adjusted for lump sums, heating and cooling, story height, floor area/perimeter ratio and locality.

1	<p>ADJUSTMENTS</p> <p>Confinement pens, solid rod, 27" - 46" high, \$7.38 - \$16.30 per linear foot; add for galvanized panels, 42" high, \$2.70 - \$2.76 per linear foot PVC, 20" - 38" high, \$5.50 - \$11.45 per linear foot Farrowing crate, finger, \$280 - \$435; riser, \$175 - \$315; complete package, \$815 - \$920 each Partitions, 42" high, frame, \$9.60 plus \$7.21 for poly laminated finish; masonry, \$23.40 per linear foot Growing/finishing feeders, 4.5 bushels - 15.0 bushels, round, \$605 - \$820 each; rectangular, one sided, \$375 - \$975 each rectangular, two sided, 4.5 bushels - 20.5 bushels, \$520 - \$1,690 each Electric pen water, \$89 - \$170 each; Automatic drinker kit with float, \$120 - \$125 each automatic waterer, \$175 - \$270; water fountain, \$300 - \$470 each, water fountain with heater, \$565 - \$860 High pressure wash system, 2 GPM - 4 GPM, hot water, \$2,525 - \$4,050 plus \$3.86 per linear foot High pressure wash system, 2 GPM - 4 GPM, cold water, \$1,000 - \$1,490 plus \$3.86 per linear foot Heating pads, nursery, 2' X 3' - 3' X 6', \$105 - \$400 each plus \$435 - \$565 for controller</p>
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2	<p>HEATING AND COOLING</p> <p>These costs are averages of total installed cost of the entire heating or cooling installation including its prorated share of contractors' overhead and profit and architects' fees.</p> <table style="width: 100%; border-collapse: collapse;"> <tr><td>Electric cable or baseboard</td><td style="text-align: right;">\$4.31</td></tr> <tr><td>Electric wall heaters (inc. FWA)</td><td style="text-align: right;">1.84</td></tr> <tr><td>Forced air, ducted</td><td style="text-align: right;">4.85</td></tr> <tr><td> heaters or furnace, vented</td><td style="text-align: right;">1.36</td></tr> <tr><td>Hot water, baseboard/convactor</td><td style="text-align: right;">8.63</td></tr> <tr><td> radiant floor or ceiling</td><td style="text-align: right;">8.87</td></tr> <tr><td>Space heaters, with fan</td><td style="text-align: right;">2.37</td></tr> <tr><td> radiant</td><td style="text-align: right;">2.79</td></tr> <tr><td>Steam</td><td style="text-align: right;">7.68</td></tr> <tr><td>Package heating and cooling</td><td style="text-align: right;">9.58</td></tr> <tr><td>Wall or floor furnace</td><td style="text-align: right;">2.19</td></tr> <tr><td>Vent. (blowers/ducts)</td><td style="text-align: right;">1.36</td></tr> <tr><td> fans only</td><td style="text-align: right;">.57</td></tr> </table>	Electric cable or baseboard	\$4.31	Electric wall heaters (inc. FWA)	1.84	Forced air, ducted	4.85	heaters or furnace, vented	1.36	Hot water, baseboard/convactor	8.63	radiant floor or ceiling	8.87	Space heaters, with fan	2.37	radiant	2.79	Steam	7.68	Package heating and cooling	9.58	Wall or floor furnace	2.19	Vent. (blowers/ducts)	1.36	fans only57
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4	<table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th rowspan="2" style="text-align: left;">Average Floor Area, Sq. Ft./Story</th> <th colspan="14">AVERAGE PERIMETER</th> <th rowspan="2" style="text-align: right;">Average Floor Area, Sq. 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5 USE COUNTY MULTIPLIERS IN MULTIPLIER SECTION.

HOG SHEDS

OCCUPANCY DESCRIPTION: These open and modified open-front sheds provide for raising and fattening swine. Walls are insulated using sidings as the exterior cover, with backwall vent doors and front hinged vent doors on the modified sheds. Some electrical and water to the pens is usually provided.

INCLUDED IN COSTS: Architects' fees and contractors' overhead and profit.

NOT INCLUDED IN COSTS: Heating and any special equipment.

MODIFIED HOG SHEDS

CLASS	TYPE	COST/ SQ. FT.	EXTERIOR WALLS	INTERIOR FINISH	LIGHTING & PLUMBING
C	Average	\$26.87	Block or concrete, insulated vent doors	Insulated ceiling, slab, subdivided	Adequate electrical, water, feed, not automated
	Low cost	23.89	Block or concrete, insulated, vent doors	Insulated ceiling, natural vent., slab floor, some division of space	Minimum lighting and water service
D	Average	21.72	Wood siding or stucco, insulated vent doors	Insulated ceiling, interior sheathing, slab floor, subdivided	Adequate electrical, water, feed, not automated
	Low cost	18.87	Wood siding and frame, insulated, vent doors	Insulated ceiling, natural vent., slab floor, some division of space	Minimum lighting and water service
DPOLE	Average	19.85	Pole frame, metal siding, insulated vent doors	Insulated ceiling, interior sheathing, slab floor, subdivided	Adequate electrical, water, feed, not automated
	Low cost	17.71	Pole frame, metal siding, insulated, vent doors	Insulated ceiling, natural vent., slab floor, some division of space	Minimum lighting and water service
S	Average	22.67	Steel siding and frame, insulated vent doors	Insulated ceiling, plywood interior, slab floor, subdivided	Adequate electrical, water, feed, not automated
	Low cost	19.82	Steel panels and frame, insulated, vent doors	Insulated ceiling, natural vent., slab floor, some division of space	Minimum lighting and water service

HOG SHEDS

D	Average	\$17.26	Stucco or wood siding, open front, upper doors	Some ceiling insulation, slab floor, subdivided	Adequate electrical, water, feed, not automated
	Low cost	14.83	Vertical boards or plywood, open front, back vents	Some wainscot, slab floor, some division of space	Water service
	Cheap	10.97	Plywood, open front, vents	Minimum facility, some flooring	Hose bibs
DPOLE	Average	15.53	Pole frame, metal siding, open front, upper doors	Some ceiling insulation, slab floor, subdivided	Adequate electrical, water, feed, not automated
	Low cost	13.37	Pole frame, metal siding, open front, back vents	Some wainscot, slab floor, some division of space	Water service
	Cheap	9.72	Metal, open front, vents	Minimum facility, some flooring	Hose bibs
DHOOP ARCH	Average	10.30	Wood post, knee wall, pipe hoop, fabric cover, end walls, curtains	Concrete slab floor, subdivided	Adequate electrical, water, feed, not automated
	Low cost	8.36	Wood post, knee wall, pipe hoop frame, fabric cover, end gates	Some wainscot, partial floor, some division of space	Minimum water service, feed, not automated
	Cheap	7.53	Wood, pipe hoop, fabric cover	Minimum facility, some flooring	Hose bibs
S	Average	17.93	Steel siding and frame, open front, upper doors	Some ceiling insulation, slab floor, subdivided	Adequate electrical, water, feed, not automated
	Low cost	15.39	Steel panels and frame, open front, back vents	Some wainscot, slab floor, some division of space	Water service
	Cheap	11.49	Steel, open front, vents	Minimum facility, some flooring	Hose bibs
S SLANT WALL	Low cost	14.37	Steel panels and slant frame, open front, back vents	Some wainscot, slab floor, some division of space	Water service
	Cheap	10.74	Light steel, open front, vents	Minimum facility, some flooring	Hose bibs

For slotted floors add the following per square foot of pit area:

Flush pit: \$8.97 to \$15.25 Shallow pit: \$12.00 to \$19.80 Deep pit: \$19.20 to \$28.50

LIVESTOCK SHELTERS



LOW-COST CLASS D LIVESTOCK SHELTER

Individual shelters, hutches or small coops, for the segregation of breeding or young stock (with open front, stucco or wood siding, and composition roof), cost \$1,090 to \$1,950. Add \$480 for concrete floor, \$690 for front wall and fenestration. Add for water and electrical.

HOG SHEDS

REFINEMENTS: This page provides major adjustments to the base costs on the previous page. Follow Steps 1 through 5 to attain final costs, adjusted for lump sums, heating and cooling, story height, floor area/perimeter ratio and locality.

1 ADJUSTMENTS

Confinement pens, solid rod, 27" - 46" high, \$7.38 - \$16.30 per linear foot;
 add for galvanized panels, 42" high, \$2.70 - \$2.76 per linear foot
 PVC, 20" - 38" high, \$5.50 - \$11.45 per linear foot
 Partitions, 42" high, frame, \$9.60 plus \$7.21 for poly laminated finish; masonry, \$23.40 per linear foot
 Growing/finishing feeders, 4.5 bushels - 15.0 bushels, round, \$605 - \$820 each; rectangular, one sided, \$375 - \$975 each
 rectangular, two sided, 4.5 bushels - 20.5 bushels, \$520 - \$1,690 each
 Bulk feeders, 25 bu. - 85 bushels, round, \$1,490 - \$1,830; rectangular, two sided, \$910 - \$2,180
 Mechanical feeder, per linear foot: trough auger: \$98 - \$135; chain feeder: \$89 - \$170; overhead: \$135 - \$180
 Electric pen water, \$89 - \$170 each; Automatic drinker kit with float, \$120 - \$125 each
 automatic waterer, \$175 - \$270; water fountain, \$300 - \$470 each, water fountain with heater, \$565 - \$860
 Watering tanks, 300 gal. - 1,100 gal., \$210 - \$500; Water troughs, steel, \$23.35 - \$35.75; Concrete, \$34.50 - \$51.00 per linear foot
 Concrete exercise apron, \$2.14 - \$2.53 per square foot

2 HEATING AND COOLING

These costs are averages of total installed cost of the entire heating or cooling installation including its prorated share of contractors' overhead and profit and architects' fees.

Electric cable or baseboard	\$4.31
Electric wall heaters (inc. FWA)	1.84
Forced air, ducted	4.85
heaters or furnace, vented	1.36
Hot water, radiant floor or ceiling	8.63
Solar heat, active air	8.87
radiant floor or ceiling	3.13
Space heaters, with fan	2.37
radiant	2.79
Steam	7.68
Wall or floor furnace	9.58
Package heating and cooling	2.19
Vent. (blowers/ducts)	1.36
fans only (light duty, finishing) .....	.57

3 HEIGHT REFINEMENTS

STORY HEIGHT MULTIPLIERS

Multiply base cost by following multiplier for any variation in average story height.

Average Wall Height	Square Foot Multiplier
7	.943
8	.963
9	.981
10	1.000 (base)
11	1.019
12	1.038
13	1.058
14	1.077
16	1.115
18	1.154
20	1.192
22	1.231
24	1.269
28	1.346
32	1.423

4

Average Floor Area, Sq. Ft./Story	AVERAGE PERIMETER														Average Floor Area, Sq. Ft./Story
	50	75	100	125	150	200	250	300	350	400	500	600	700	800	
500	1.044	1.178	1.311	1.444	1.577	1.844	2.110	2.377	2.643	2.909	----	----	----	----	500
750	.955	1.044	1.133	1.222	1.311	1.489	1.667	1.844	2.023	2.201	----	----	----	----	750
1,000	.911	.980	1.044	1.110	1.178	1.311	1.444	1.577	1.711	1.844	----	----	----	----	1,000
1,500	.866	.911	.955	1.000	1.044	1.133	1.222	1.311	1.400	1.489	----	----	----	----	1,500
2,000	----	.878	.911	.945	.977	1.044	1.110	1.178	1.245	1.311	----	----	----	----	2,000
2,500	----	.858	.884	.911	.938	.991	1.044	1.097	1.150	1.204	----	----	----	----	2,500
3,000	----	.843	.865	.889	.911	.955	1.000	1.044	1.088	1.133	----	----	----	----	3,000
3,500	----	----	.854	.872	.892	.931	.967	1.006	1.044	1.080	1.157	----	----	----	3,500
4,000	----	----	----	.860	.878	.911	.945	.977	1.010	1.044	1.110	1.178	----	----	4,000
5,000	----	----	----	.844	.857	.884	.911	.938	.960	.991	1.044	1.097	1.150	----	5,000
6,000	----	----	----	----	.843	.865	.888	.911	.934	.955	1.000	1.044	1.088	1.133	6,000
8,000	----	----	----	----	----	.844	.860	.877	.894	.911	.945	.977	1.010	1.044	8,000
10,000	----	----	----	----	----	----	.844	.858	.871	.884	.911	.938	.960	.991	10,000
14,000	----	----	----	----	----	----	.825	.835	.844	.854	.873	.892	.911	.931	14,000

Use the total length of walled (including vent door) sides as the perimeter.

5 USE COUNTY MULTIPLIERS IN MULTIPLIER SECTION.

STABLES AND CORRALS

OCCUPANCY DESCRIPTION: These are usually designed for the care and housing of horses. The better qualities are highly decorative and include stone, brick, brick veneer or wood as the exterior finish. Interiors have finished stalls, with restrooms, lounge and quality finishes throughout. Good lighting and water service are also included.

The lower qualities use block or low-cost wood finishes on the walls and low-cost roof systems. Floors may be finished only in feed and tack rooms, with the remaining floor being dirt. Stalls are not finished, and there is no lighting or plumbing. The best estate types are the custom luxury thoroughbred breeding facilities, where cost is not an issue.

Stable barn loft costs include the floor structure and supports only; height adjustments must usually be made.

INCLUDED IN COSTS: Architects' fees and contractors' overhead and profit. The size of the stables and the needs of the owners influence the facilities included in the stable. Commonly the following areas can be found: stalls or boxes, feed, tack, manure bunkers and lavatory accommodations. The better qualities may also include a sick box, washing and cleaning room, a sitting room/lounge for grooms and office facilities.

NOT INCLUDED IN COSTS: Heating and special equipment.

STABLES

CLASS	TYPE	COST/ SQ. FT.	EXTERIOR WALLS	INTERIOR FINISH	LIGHTING & PLUMBING
C	Good	\$47.17	Good brick or block, some windows and ornamentation	Fin. stalls, good floors, concrete in feed/tack rm., gd. qual. thruout	Good lighting and water outlets, restroom
	Average	33.45	Block, very plain, doors on stalls	Plywood wainscot in stalls, floors in feed and tack rooms	Adequate lighting and water outlets
	Low cost	23.77	Concrete block, open stalls	Rough stalls, dirt	None
D	Good	40.37	Brick veneer, best siding, some windows, ornamentation	T&G stalls, finished tack and feed rooms, floors	Good lighting and water outlets, restroom
	Average	26.08	Stucco or wood siding, little trim, good roofing	Wainscot in stalls, concrete floors in tack and feed rooms	Adequate lighting and water outlets
	Low cost	16.88	Boards on post and beam	Unfinished, dirt floors, open stalls	None
DPOLE	Good	36.62	Pole frame, good metal panels, finished inside, some trim	Finished stalls, good floors, good quality throughout	Good lighting and water outlets, restroom
	Average	23.67	Pole frame, metal siding, no trim, doors on stalls	Wood wainscot in stalls, floors in feed and tack rooms	Adequate lighting and water outlets
	Low cost	15.33	Metal on poles, open stalls	Rough stalls, dirt floor	None
	Cheap	12.11	Metal or plywood on low-cost pole, shed or low gable	Rough stalls, dirt floor, no tackroom, minimum hobby stable	None
DHOOP ARCH	Average	8.69	Wood post, knee wall, pipe hoop frame, fabric cover, curtains	Rough stalls, dirt floor	Minimum electrical, adequate water
	Low cost	5.88	Wood post, pipe hoop, fabric cover, open side walls and ends	Unfinished, dirt floors, open pipe stalls	None
S	Good	41.58	Good steel panels, finished inside, some trim	Finished stalls, good floors, good quality throughout	Good lighting and water outlets, restroom
	Average	27.05	Steel siding, no trim, doors on stalls	Plywood wainscot in stalls, floors in feed and tack rooms	Adequate lighting and water outlets
	Low cost	17.63	Galvanized steel, open stalls	Rough stalls, dirt floor	None

HIGH-VALUE (ESTATE) STABLES

C	Excellent	\$198.86	Face brick, cut stone, custom arches, cupolas, heavy roof, dormers	Custom stalls, imported woods, best broodmare or yearling barns	Extensive fixtures and custom hardware throughout
	Good	138.52	Face brick, stone trim, slate or tile gambrel roof, some custom sash	Fine custom stalls, finishes, besttraining or stallion barns	High-quality fixtures, fine hardware, horse baths
	Average	96.57	Good brick, stone trim, skylights, shakes or metal on good structure	Good finished stalls, good thoroughbred barn, some extras	Some special custom fixtures, electrical and plumbing
	Low cost	67.39	Decorative block, small estate type, insulated, some distinctive trim	Finished stalls, lounge and restrooms, quality finishes	High-level electrical service, showers and dressing room
D	Excellent	193.43	Face brick or stone ven., heavy roof, custom dormers, arches, cupolas	Custom stalls, imported woods, best broodmare or yearling barns	Extensive fixtures and custom hardware throughout
	Good	133.07	Face brick veneer, stone trim, slate or tile on gambrel, some custom sash	Fine custom stalls, finishes, besttraining or stallion barns	High-quality fixtures, fine hardware, horse baths
	Average	91.62	Fine sidings, good veneer, skylights, good shakes or metal	Good finished stalls, good thoroughbred barn, some extras	Some special custom fixtures, electrical and plumbing
	Low cost	63.14	Good sidings or masonry veneer, insulated, small estate type, good trim	Finished stalls, lounge and restrooms, good finishes	High-level electrical service, showers and dressing room
DPOLE	Low cost	57.15	Small estate type, insulated, some distinctive trim, complex roof	Finished stalls, lounge and restrooms, good finishes	High-level electrical service, showers and dressing room
S	Low cost	64.91	Insulated, small estate type, some distinctive trim, complex roof	Finished stalls, lounge and restrooms, good finishes	High-level electrical service, showers and dressing room

STABLE HAYLOFTS

CDS	Good	\$12.87	Not included	Heavy timber, good T&G or plank	Not included
	Average	8.29	Not included	Adequate support, plank floor	Not included
	Low cost	5.35	Not included	Minimum support, light floor	Not included

STABLES AND CORRALS

REFINEMENTS: This page provides major adjustments to the base costs on the previous page. Follow Steps 1 through 5 to attain final costs, adjusted for lump sums, heating and cooling, story height, floor area/perimeter ratio and locality.

1	ADJUSTMENTS	Cost per Lin. Ft. Except as Indicated
	Horse corrals, vinyl, 5" x 5" posts, three 2" x 6" rails	\$ 14.85 – \$ 18.20
	Horse corrals, 6" x 6" posts, concreted, five 2" x 6" rails, nailed, painted	\$ 15.70 \$ 16.55
	Horse corrals, polymer grid, 5' - 2" x 6" top rail	12.40 – 13.25
	8' gate, each (vinyl, add 100% - 150%)	155.00 – 250.00
	Electrified fence strands, each strand (plus \$265 per charger)	.47 – .59
	Horse walkers, two horses, \$2,825 - \$3,375 each; four horses, each	3,375.00 – 4,175.00
	For six-horse walker each	4,550.00 – 6,850.00
	Portable pipe corrals (plus \$51 - \$73 for 4' gate, for larger gates, see below)	100.00 – 235.00
	Stock corrals, 6" x 6" posts, four split rails, unfinished	8.91 – 9.36
	Stock corrals, 6" x 6" posts, four 2" x 6" rails, nailed, unfinished	12.05 – 12.65
	Finished, painted paddocks, add	1.98 – 2.80
	Stock corrals, 4" pipe, cable rails	11.40 – 12.50
	Stock corrals, 4" pipe, 2" pipe rails (galvanized rub panels, add \$1.76 - \$2.19)	14.50 – 15.90
	8' gate, each (add \$51 - \$73 for each additional 4')	155.00 – 250.00
	Feed racks: \$17.60 - \$23.95; steel feeders, each: bale, \$180 - \$395; bunk, \$180 - \$235; bunk w/hayrack, \$390 - \$405; paddock, \$120 - \$155	
	Water troughs: steel, \$23.35 - \$35.75; concrete, \$34.50 - \$51.00; drinking bowls, each, \$120 - \$125	
	Watering tanks, galvanized, each: 175 gallons, \$155 - \$160; 300 gallons, \$210 - \$235; 500 gallons, \$280 - \$285	
	Automatic waterer, each: \$175 - \$270; feed lots, \$565 - \$1,000	

2	HEATING AND COOLING
	These costs are averages of total installed cost of the entire heating or cooling installation including its prorated share of contractors' overhead and profit and architects' fees.
	Electric cable or baseboard \$4.31
	Electric wall heaters (inc. FWA) 1.84
	Forced air, ducted 4.85
	heaters or furnace, vented 1.36
	Hot water, baseboard/convactor 8.63
	radiant floor or ceiling 8.87
	Space heaters, with fan 2.37
	radiant 2.79
	Steam 7.68
	Wall or floor furnace 9.58
	Package heating and cooling 2.19
	Ventilation, blower and ducts 1.36
	fans only57

3	HEIGHT REFINEMENTS
	STORY HEIGHT MULTIPLIERS
	Multiply base cost by following multiplier for any variation in average story height.
	Average Wall Height Square Foot Multiplier
	7943
	8963
	9981
	10 1.000 (base)
	11 1.019
	12 1.038
	13 1.058
	14 1.077
	16 1.115
	18 1.154
	20 1.192
	22 1.231
	24 1.269
	28 1.346
	32 1.423

4	Average Floor Area, Sq. Ft./Story	AVERAGE PERIMETER														Average Floor Area, Sq. Ft./Story
		75	125	150	200	250	300	350	400	500	600	700	800	900	1000	
	500	1.178	1.444	1.577	1.844	2.110	2.377	2.643	2.909	----	----	----	----	----	----	500
	750	1.044	1.222	1.311	1.489	1.667	1.844	2.023	2.201	----	----	----	----	----	----	750
	1,000	.980	1.110	1.178	1.311	1.444	1.577	1.711	1.844	----	----	----	----	----	----	1,000
	1,500	.911	1.000	1.044	1.133	1.222	1.311	1.400	1.489	----	----	----	----	----	----	1,500
	2,000	.878	.945	.977	1.044	1.110	1.178	1.245	1.311	----	----	----	----	----	----	2,000
	2,500	.858	.911	.938	.991	1.044	1.097	1.150	1.204	----	----	----	----	----	----	2,500
	3,000	.843	.889	.911	.955	1.000	1.044	1.088	1.133	----	----	----	----	----	----	3,000
	4,000	----	.860	.878	.911	.945	.977	1.010	1.044	1.110	1.178	----	----	----	----	4,000
	6,000	----	----	.843	.865	.888	.911	.934	.955	1.000	1.044	1.088	1.133	----	----	6,000
	8,000	----	----	----	.844	.860	.877	.894	.911	.945	.977	1.010	1.044	1.076	----	8,000
	10,000	----	----	----	----	.844	.858	.871	.884	.911	.938	.960	.991	1.018	1.044	10,000
	14,000	----	----	----	----	.825	.835	.844	.854	.873	.892	.911	.931	.949	.967	14,000
	18,000	----	----	----	----	----	.822	.828	.836	.852	.867	.881	.896	.911	.926	18,000
	20,000	----	----	----	----	----	.818	.824	.831	.844	.858	.871	.884	.898	.911	20,000

5 USE COUNTY MULTIPLIERS IN MULTIPLIER SECTION.

ARENAS



GOODS CLASS S RIDING AREA

OCCUPANCY DESCRIPTION: These buildings include a large, simple clear-span riding or exercise area with some stabling facilities, which may be in a lean-to extension. A good show, exhibit or auction/sale facility includes spectator viewing and lounge commensurate with the quality level.



LOW CLASS DPOLE EXERCISE AREA

INCLUDED IN COSTS: Architects' fees and contractors' overhead and profit.

NOT INCLUDED IN COSTS: Heating, seating, lockers or food preparation or training equipment.

ARENAS

CLASS	TYPE	COST/ SQ. FT.	EXTERIOR WALLS	INTERIOR FINISH	LIGHTING & PLUMBING
C	Excellent	\$59.29	Steel frame, good block or concrete panels, good entrance	Finished stalls, lounge, viewing area, quality finishes	High-level electrical service, good restrooms and kitchen
	Good	39.61	Steel or wood frame, block or tilt-up, small entrance	Fin. stalls, good floors in snack bar, feed/tack rm., good qual. throughout	Good lighting and water outlets, restrooms
	Average	26.48	Block or tilt-up, very plain, some interior finish	Unfinished arena area, floors in feed/tack and washrooms	Adequate lighting and water service
	Low cost	17.69	Concrete block, some wainscot	Minimum facility, some flooring	Minimum services
D	Excellent	53.05	Glulam or steel frame, good veneer, siding, good entrance	Finished stalls, lounge, viewing area, quality finishes	High-level electrical service, good restrooms and kitchen
	Good	30.67	Good siding or stucco on wood or steel frame, small entrance	Fin. stalls, good floors in snack bar, feed/tack rm., good qual. throughout	Good lighting and water outlets, restrooms
	Average	17.73	Siding or stucco on wood frame, some interior finish	Unfinished arena area, floors in feed/tack and washrooms	Adequate lighting and water service
	Low cost	10.24	Vertical boards or plywood on box frame, some wainscot	Dirt arena floor, some stalls, few finishes, some flooring	Minimum lighting and water service
DPOLE	Good	26.78	Good metal panels, insulated pole frame, small entrance	Fin. stalls, good floors in snack bar, feed/tack rm., good quality throughout	Good lighting and water outlets, restrooms
	Average	15.41	Good metal on pole frame, some interior finish	Unfinished arena area, floors in feed/tack and washrooms	Adequate lighting and water service
	Low cost	8.86	Pole frame, metal siding, some wainscot	Dirt arena floor, some stalls, few finishes, some flooring	Minimum lighting and water service
	Cheap	8.03	Pole frame, metal siding	Unfinished, dirt floor, exer. only	Minimum electrical only
DHOOP ARCH	Cheap	7.06	Wood post, wide hoop frame, fabric cover, end walls, curtain doors	Unfinished, dirt floor, exercise arena, corral pipe fence	Minimum electrical only
S	Excellent	54.70	Steel frame, good enameled siding, masonry trim, good entrance	Finished stalls, lounge, viewing area, quality finishes	High-level electrical service, good restrooms and kitchen
	Good	32.16	Insulated sandwich panels, steel frame, small entrance	Fin. stalls, good floors in snack bar, feed/tack rm., good qual. throughout	Good lighting and water outlets, restrooms
	Average	18.91	Good metal panels and roof, some interior finish	Unfinished arena area, floors in feed/tack and washrooms	Adequate lighting and water service
	Low cost	11.11	Steel siding, some wainscot	Minimum facility, some flooring	Minimum services
	Cheap	10.10	No walls, steel gable roof and truss on steel columns, wide span	Unfinished open arena, sand floor	Minimum electrical and water service

EQUESTRIAN LEAN-TOS

D	Average	\$16.08	Side extension, board siding, windows and side doors	Stalls, tackroom, some flooring	Adequate lighting and water
	Low cost	9.73	Side extension, board siding	Some stalls and flooring	Minimum services
	Cheap	5.91	Side extension, plywood/box frame	Unfinished, no doors, dirt floor	None
DPOLE	Average	14.59	Side extension, good metal on pole frame, windows and side doors	Stalls, tackroom, some flooring	Adequate lighting and water
	Low cost	8.61	Side extension, metal on pole frame	Some stalls and flooring	Minimum services
	Cheap	5.09	Side extension, metal on pole frame	Unfinished, no doors, dirt floor	None
S	Average	16.98	Steel siding, side doors, windows	Stalls, tackroom, some flooring	Adequate lighting and water
	Low cost	10.43	Side extension, steel frame/siding	Some stalls and flooring	Minimum services
	Cheap	6.42	Side extension, steel frame/siding	Unfinished, no doors, dirt floor	None

ARENAS

REFINEMENTS: This page provides major adjustments to the base costs on the previous page. Follow Steps 1 through 5 to attain final costs, adjusted for lump sums, heating and cooling, story height, floor area/perimeter ratio and locality.

1	ADJUSTMENTS	Cost per Lin. Ft. Except as Indicated
	Stock corrals, 6" x 6" posts, four split rails, unfinished	\$ 8.91 – \$ 9.36
	Stock corrals, 6" x 6" posts, four 2" x 6" rails, nailed, unfinished	12.05 – 12.65
	Stock corrals, 4" pipe, cable rails	11.40 – 12.50
	Stock corrals, 4" pipe, 2" pipe rails (galvanized rub panels, add \$1.76 - \$2.19)	14.50 – 15.90
	8' gate, each (add \$51 - \$73 for each additional 4')	155.00 – 250.00
	Finished, painted paddocks, add	1.98 – 2.80
	Portable pipe corrals (plus \$51 - \$73 for 4' gate, for larger gates, see above)	100.00 – 235.00
	Portable 20' work alley: \$1,640 - \$2,775; curved, \$1,930 - \$3,025; tub, \$2,000 - \$2,290	
	Cattle squeeze, each (portable, \$3,025 - \$3,225 plus \$4,325 for scale)	1,290.00 – 2,400.00
	Head gate each.	385.00 – 1,020.00
	Crossing guard each.	2,170.00 – 4,450.00
	Loading chute, 6" x 6" supports and posts, 2" ramp, 12' - 15' long, each	1,190.00 – 3,425.00
	Bleachers, portable, steel frame, metal, fiberglass or wood benches, erected	
	Cost per seat: up to 800 seats, \$18.15 - \$71.00; over 800 seats, \$17.05 - \$64.00	
	Bleachers, permanent, wood frame and benches	
	Cost per seat: up to 1000 seats, \$23.10 - \$91.00	
	Bleachers, grandstand, open steel frame, metal, fiberglass or wood benches, school or fairground type	
	Cost per seat: up to 1000 seats, \$36 - \$225	

2	HEATING AND COOLING
	These costs are averages of total installed cost of the entire heating or cooling installation including its prorated share of contractors' overhead and profit and architects' fees.
	Electric cable or baseboard \$4.31
	Electric wall heaters (inc. FWA) 1.84
	Forced air, ducted 4.85
	heaters or furnace, vented 1.36
	Hot water, baseboard/convactor 8.63
	radiant floor or ceiling 8.87
	Space heaters, with fan 2.37
	radiant 2.79
	Steam 7.68
	Wall or floor furnace 9.58
	Package heating and cooling 2.19
	Ventilation, blower and ducts 1.36
	fans only57

3	HEIGHT REFINEMENTS	
	STORY HEIGHT MULTIPLIERS	
	Multiply base cost by following multiplier for any variation in average story height.	
	Average Wall Height	Square Foot Multiplier
	8	.963
	9	.981
	10	1.000 (base)
	11	1.019
	12	1.038
	13	1.058
	14	1.077
	16	1.115
	18	1.154
	20	1.192
	22	1.231
	24	1.269
	28	1.346
	32	1.423
	36	1.500

4	Average Floor Area, Sq. Ft./Story	AVERAGE PERIMETER														Average Floor Area, Sq. Ft./Story
		75	125	150	200	250	300	350	400	500	600	700	800	900	1000	
	500	1.178	1.444	1.577	1.844	2.110	2.377	2.643	2.909	----	----	----	----	----	----	500
	750	1.044	1.222	1.311	1.489	1.667	1.844	2.023	2.201	----	----	----	----	----	----	750
	1,000	.980	1.110	1.178	1.311	1.444	1.577	1.711	1.844	----	----	----	----	----	----	1,000
	1,500	.911	1.000	1.044	1.133	1.222	1.311	1.400	1.489	----	----	----	----	----	----	1,500
	2,000	.878	.945	.977	1.044	1.110	1.178	1.245	1.311	----	----	----	----	----	----	2,000
	3,000	.843	.889	.911	.955	1.000	1.044	1.088	1.133	----	----	----	----	----	----	3,000
	4,000	----	.860	.878	.911	.945	.977	1.010	1.044	1.110	1.178	----	----	----	----	4,000
	6,000	----	----	.843	.865	.888	.911	.934	.955	1.000	1.044	1.088	1.133	----	----	6,000
	8,000	----	----	----	.844	.860	.877	.894	.911	.945	.977	1.010	1.044	1.076	----	8,000
	10,000	----	----	----	----	.844	.858	.871	.884	.911	.938	.960	.991	1.018	1.044	10,000
	14,000	----	----	----	----	.825	.835	.844	.854	.873	.892	.911	.931	.949	.967	14,000
	18,000	----	----	----	----	----	.822	.828	.836	.852	.867	.881	.896	.911	.926	18,000
	20,000	----	----	----	----	----	.818	.824	.831	.844	.858	.871	.884	.898	.911	20,000
	25,000	----	----	----	----	----	.810	.815	.820	.831	.841	.852	.863	.873	.884	25,000

Use the total walled sides as the perimeter. Do not use table for structures without walls.

5 USE COUNTY MULTIPLIERS IN MULTIPLIER SECTION.

POULTRY HOUSES

OCCUPANCY DESCRIPTION: These buildings are designed for the care and housing of caged poultry, e.g., commercial laying. The costs are for complete houses. The quality determination should be influenced by wall systems; closed-type, open screening, curtains, etc.; floor systems, e.g., slab, wood or dirt; the amount of interior finish, lighting and plumbing systems.

INCLUDED IN COSTS: Architects' fees and contractors' overhead and profit.

NOT INCLUDED IN COSTS: Racks, cages, feeders, egg gathering or other special equipment or heat.

ONE-STORY – CAGE OPERATION – ENCLOSED HOUSES*

CLASS	TYPE	COST/ SQ. FT.	EXTERIOR WALLS	INTERIOR FINISH	LIGHTING & PLUMBING
C	Good	\$35.13	Brick or block, heavy roof, well insulated, good fenestration	Paint and sealant, good plank or concrete slab with drains	Wiring in conduit, high-level lighting, water service
	Average	25.46	Concrete block, insulated roof, good fenestration and ventilation	Painted, concrete or wood floors, some partitions	Good lighting and outlets, water service
	Low cost	18.46	Concrete block, adequate fenestration, clear-span roof, ventilated	Unfinished, low-cost concrete or wood floors	Adequate electrical service, water service
D	Good	29.62	Brick veneer or best stucco, good fenestration, insulation	Finished interior walls, good plank or concrete floor with drains	Wiring in conduit, high-level lighting, water service
	Average	20.75	Good siding and windows, insulation, good frame, vents and roof	Plywood ceilings, concrete floors, some partitions	Good lighting and outlets, water service
	Low cost	14.56	Wood siding, adequate fenestration, insulated, ventilated	Unfinished, cheap slab or wood	Adequate services
DPOLE	Good	26.80	Pole frame, metal siding, fully insulated-sheathed, good openings	Finished interior walls, good plank or concrete floor with drains	Wiring in conduit, high-level lighting, water service
	Average	18.53	Pole frame, metal sidings, insulated, adequate fenestration	Concrete floors, some partitions	Good lighting and water
	Low cost	12.83	Metal siding on poles, some wainscot and insulation, ventilated	Unfinished, low-cost concrete or wood floors	Adequate electrical service, water service
	Cheap	10.52	Metal on poles, sidewall vents	Unfinished, cheap floor	Minimum service
S	Good	30.28	Best steel panels, insulated interior, sheathing, good fenestration	Finished interior walls, good plank or concrete floor with drains	Wiring in conduit, high-level lighting, water service
	Average	21.19	Steel siding, insulated, sheathing, adequate fenestration	Concrete floors, some partitions	Good lighting and water
	Low cost	14.84	Steel siding and frame, some wainscot and insulation, ventilated	Unfinished, low-cost concrete or wood floors	Adequate electrical service, water service
	Cheap	12.42	Light frame, sidewall vents	Unfinished, cheap floor	Minimum service

ONE-STORY – CAGE OPERATION – SCREENED HOUSES*

DPOLE	Average	\$13.19	Heavy pole frame, curtain sidewalls	Concrete floors, some partitions	Good lighting and water
	Fair	12.10	Metal, insulated, sidewall open screen, full curtains	Unfinished, good floor, insulated ceiling	Adequate lighting and outlets, water service
	Low cost	11.13	Metal, insulated, sidewall open screen, no curtains	Unfinished, pole frame, concrete or wood floor, insulated ceiling	Adequate electrical service, water service
	Cheap	7.31	Metal or lath partial walls or screen on light pole frame	Open ventilation, unfinished, cheap floor, no insulation	Minimum lighting and water
S	Average	15.25	Heavy steel frame, curtain sides	Concrete floors, some partitions	Good lighting and water
	Fair	14.10	Metal, insulated, sidewall open screen, full curtains	Unfinished, good floor, insulated ceiling	Adequate lighting and outlets, water service
	Low cost	13.06	Metal, insulated, sidewall open screen, no curtains	Unfinished, pole frame, concrete or wood floor, insulated ceiling	Adequate electrical service, water service
	Cheap	8.23	Metal partial walls or screen on light steel frame	Open ventilation, unfinished, cheap floor, no insulation	Minimum lighting and water

*Costs are for one-story poultry houses. For two- or three-story buildings, use 75% of the base square foot cost for each additional story. For high-rise houses, where the house is elevated for cleaning purposes, add 20%. For stud-backed walls on Class D_{POLE} structures, add 5%.

EXAMPLE: Low-cost Class D_{POLE}, two-story curtain-screened cage house, 40' x 200' x 16' height.

Base Cost	= \$11.13	1st Floor Cost Factor:	.905 x \$11.13	= \$ 10.08
Height Factor	= .963	2nd Floor Cost Factor:	.75 x \$10.08	= \$ 7.56
Size/Shape Factor	= .940	Total Cage House Cost:	8,000 x \$10.08	= \$ 80,600
Combined Factors	= .905		8,000 x \$7.56	= \$ 60,450
		(10.08 + 7.56)/2 = \$8.82	16,000 x \$8.82	= \$ 141,050

POULTRY CAGE HOUSES

REFINEMENTS: This page provides major adjustments to the base costs on the previous page. Follow Steps 1 through 5 to attain final costs, adjusted for lump sums, heating and cooling, story height, floor area/perimeter ratio and locality.

1	ADJUSTMENTS POULTRY EQUIPMENT SYSTEMS*	A-FRAME COST PER BIRD	BATTERY COST PER BIRD
	(Costs Calculated at .48 Square Feet per Bird)		
	A-frame layer cages with chain feeding system, 5-tier	\$7.00	-----
	Battery layer cages with feeding system (cages with manure removal belts under every tier and direct-drive chain feeding systems), 8-tier	-----	\$13.60
	Auger feeder bin and fill system (bulk feed bin which delivers feed to the feeders through an auger fill system) .....	.31	.25
	Nipple watering system .....	.76	.55
	Egg collection system (transports eggs from layer house to egg packing building) .....	.23	.13
	Manure removal system (belt conveyor system located in the rear of the building transports the manure to a secondary conveyor, which transports the manure outside the building)	-----	.13
	House fan system (fans, shutters, and other miscellaneous equipment) .....	.67	.55
	Evaporative cooling pad system (does not include framing materials or plumbing from water source to the cooling system) .....	.24	.22
	Sidewall curtain and air inlet system .....	.34	.25
	*Equipment costs can vary a plus or minus 25%, and density will vary significantly by type and size of operation, as well as by type of cage and building system, with a range from .37 to .87 square feet per bird.		

2	HEATING AND COOLING	
	These costs are averages of total installed cost of the entire heating or cooling installation including its prorated share of contractors' overhead and profit and architects' fees.	
	Electric cable or baseboard	\$4.31
	Electric wall heaters (inc. FWA)	1.84
	Forced air, ducted	4.85
	heaters or furnace, vented	1.36
	Hot water, baseboard/convactor	8.63
	radiant floor or ceiling	8.87
	Space heaters, with fan	2.37
	radiant	2.79
	Steam	7.68
	Package heating and cooling	9.58
	Wall or floor furnace	2.19
	Package heating and cooling	1.36
	Ventilation, blower and ducts .....	.57

3	HEIGHT REFINEMENTS STORY HEIGHT MULTIPLIERS	
	Multiply base cost by following multiplier for any variation in average story height.	
	Average Wall Height	Square Foot Multiplier
	7	.943
	8	.963
	9	.981
	10	1.000 (base)
	11	1.019
	12	1.038
	13	1.058
	14	1.077
	16	1.115
	18	1.154
	20	1.192
	22	1.231
	24	1.269
	28	1.346
	32	1.423

4	Average Floor Area, Sq. Ft./Story	AVERAGE PERIMETER													Average Floor Area, Sq. Ft./Story	
		75	125	150	200	250	300	350	400	500	600	700	800	900		1000
	500	1.178	1.444	1.577	1.844	2.110	2.377	2.643	2.909	-----	-----	-----	-----	-----	-----	500
	750	1.044	1.222	1.311	1.489	1.667	1.844	2.023	2.201	-----	-----	-----	-----	-----	-----	750
	1,000	.980	1.110	1.178	1.311	1.444	1.577	1.711	1.844	-----	-----	-----	-----	-----	-----	1,000
	1,500	.911	1.000	1.044	1.133	1.222	1.311	1.400	1.489	-----	-----	-----	-----	-----	-----	1,500
	2,000	.878	.945	.977	1.044	1.110	1.178	1.245	1.311	-----	-----	-----	-----	-----	-----	2,000
	2,500	.858	.911	.938	.991	1.044	1.097	1.150	1.204	-----	-----	-----	-----	-----	-----	2,500
	3,000	.843	.889	.911	.955	1.000	1.044	1.088	1.133	-----	-----	-----	-----	-----	-----	3,000
	4,000	-----	.860	.878	.911	.945	.977	1.010	1.044	1.110	1.178	-----	-----	-----	-----	4,000
	6,000	-----	-----	.843	.865	.888	.911	.934	.955	1.000	1.044	1.088	1.133	-----	-----	6,000
	8,000	-----	-----	-----	.844	.860	.877	.894	.911	.945	.977	1.010	1.044	1.076	-----	8,000
	10,000	-----	-----	-----	-----	.844	.858	.871	.884	.911	.938	.960	.991	1.018	1.044	10,000
	14,000	-----	-----	-----	-----	.825	.835	.844	.854	.873	.892	.911	.931	.949	.967	14,000
	18,000	-----	-----	-----	-----	-----	.822	.828	.836	.852	.867	.881	.896	.911	.926	18,000
	20,000	-----	-----	-----	-----	-----	.818	.824	.831	.844	.858	.871	.884	.898	.911	20,000

5 USE COUNTY MULTIPLIERS IN MULTIPLIER SECTION.

POULTRY HOUSES

OCCUPANCY DESCRIPTION: These buildings are designed for the care and housing of poultry at ground level, with predominantly dirt floors. The costs are for complete houses. The quality determination should be influenced by roof systems; the amount and character of screening; floor systems, e.g., slab, wood or dirt; the amount of interior finish, lighting and plumbing systems.

INCLUDED IN COSTS: Architects' fees and contractors' overhead and profit.

NOT INCLUDED IN COSTS: Racks, cages, incubators, other special equipment or heat.

FLOOR OPERATION – BREEDER HOUSES

CLASS	TYPE	COST/ SQ. FT.	EXTERIOR WALLS	INTERIOR FINISH	LIGHTING & PLUMBING
C	Good	\$21.61	Brick or block, good ventilation and fenestration	Insulated ceiling, some slab and division of space	Adequate lighting and water service
	Average	16.72	Minimum block, shutters or vents, light roof structure, insulation	Unfinished, partial floor, some partitions, natural ventilation only	Minimum wiring and lighting, water service
D	Good	17.47	Wood siding or stucco, good ventilation and fenestration	Insulated ceiling, plywood interior, some slab floor and subdivision	Adequate lighting and water service
	Average	13.26	Light wood frame, wood siding, shutters or vents, insulated building	Unfinished, partial floor, some partitions, natural ventilation only	Minimum wiring and lighting, water service
DPOLE	Good	13.80	Pole frame, metal siding, fully insulated, ventilated	Insulated ceiling, plywood interior, some slab floor and subdivision	Adequate lighting and water service
	Average	11.73	Metal siding on pole frame, shutters or vents, insulation	Unfinished, partial floor, some partitions, natural ventilation only	Minimum wiring and lighting, water service
	Fair	10.81	Metal, insulated, sidewall top open screen, side curtains	Unfinished, partial floor, few partitions, insulated ceiling	Minimum wiring and lighting, water service
	Low cost	9.97	Metal, insulated, sidewall top open screen, no curtains	Unfinished, pole frame, partial floor, few partitions, insulated ceiling	Minimum services
	Cheap	6.66	Metal or plywood partial walls or screen on light pole frame	Open ventilation, unfinished, partial floor, no insulation, few partitions	Minimum lighting and hose bib
S	Good	15.77	Steel panels and frame, fully insulated, ventilated	Insulated ceiling, plywood interior, some slab and division of space	Adequate lighting and water service
	Average	13.64	Metal siding on steel frame, shutters or vents, insulation	Unfinished, partial floor, some partitions, natural ventilation only	Minimum wiring and lighting, water service
	Fair	12.71	Metal, insulated, sidewall top open screen, side curtains	Unfinished, partial floor, few partitions, insulated ceiling	Minimum wiring and lighting, water service
	Low cost	11.83	Metal, insulated, sidewall top open screen, no curtains	Unfinished, partial floor, few partitions, insulated ceiling	Minimum services
	Cheap	7.51	Metal partial walls or screen on light steel frame	Open ventilation, unfinished, partial floor, no insulation, few partitions	Minimum lighting and hose bib

FLOOR OPERATION – BROILER HOUSES

DPOLE	Good	\$12.70	Pole frame, metal siding, fully insulated, ventilated	Insulated ceiling, interior sheathing, dirt floor, subdivided	Adequate lighting and water service
	Average	10.60	Pole frame, metal siding insulated, shutters or vents	Insulated ceiling, plywood interior, dirt floor, some subdivision	Adequate lighting and water service
	Fair	9.69	Metal, insulated, sidewall top open screen, curtain sidewalls	Unfinished, dirt floor, insulated ceiling	Minimum wiring and lighting, water service
	Low cost	8.86	Metal, insulated, sidewall top open screen, no curtains	Unfinished, pole frame, dirt floor, insulated ceiling	Minimum services
	Cheap	5.58	Metal or plywood partial walls or screen on light pole frame	Open ventilation, unfinished, dirt floor, no insulation	Minimum lighting and hose bib
S	Good	14.58	Steel panels and frame, fully insulated, ventilated	Insulated ceiling, interior sheathing, dirt floor, subdivided	Adequate lighting and water service
	Average	12.43	Steel siding and frame, insulated, shutters or vents	Insulated ceiling, plywood interior, dirt, some division of space	Adequate lighting and water service
	Fair	11.49	Metal, insulated, sidewall top open screen, curtain sidewalls	Unfinished, dirt floor, insulated ceiling	Minimum wiring and lighting, water service
	Low cost	10.61	Metal, insulated, sidewall top open screen, no curtains	Unfinished, steel frame, dirt floor, insulated ceiling	Minimum services
	Cheap	6.35	Metal partial walls or screen on light steel frame	Open ventilation, unfinished, dirt floor, no insulation	Minimum lighting and hose bib

For stud-backed walls on Class D_{POLE} structures, add 5%.

POULTRY FLOOR HOUSES

REFINEMENTS: This page provides major adjustments to the base costs on the previous page. Follow Steps 1 through 5 to attain final costs, adjusted for lump sums, heating and cooling, story height, floor area/perimeter ratio and locality.

1 ADJUSTMENTS POULTRY EQUIPMENT SYSTEMS*	BREEDER COST PER BIRD (1.90 Square Feet)	BROILER COST PER BIRD (.80 Square Feet)
Female, chain feeder system	\$2.22	----
Male, pan feeder system (with direct drive) .....	.83	\$.69
Nipple watering system .....	.95	.69
Female, bin, scale and fill system (daily feed bin with scale delivers feed to the feeder through an auger fill system) .....	.93	----
Male, bin and fill system (bulk feed bin which delivers feed to the feeders through an auger fill system) .....	.37	----
Nest and egg collection system	4.75	----
Heating system (infrared brooders with wall heaters operating on propane gas)	----	.51
House fan system (fans, shutters and other miscellaneous equipment)	1.74	.83
Evaporative cooling pad system (does not include framing materials or plumbing equipment from water source to the cooling system)	1.17	.52
Sidewall curtain and air inlet system	1.59	.71
Concrete floor costs \$2.14 to \$2.53 per square foot of paved area.		
*Equipment costs can vary a plus or minus 25%, and bird density will vary significantly by type and size of operation, as well as by type of bird, with a range of .59 to 2.0 square feet per bird.		

2 HEATING AND COOLING	
These costs are averages of total installed cost of the entire heating or cooling installation including its prorated share of contractors' overhead and profit and architects' fees.	
Electric cable or baseboard	\$4.31
Electric wall heaters (inc. FWA)	1.84
Forced air, ducted	4.85
heaters or furnace, vented	1.36
Hot water, baseboard/convactor	8.63
radiant floor or ceiling	8.87
Space heaters, with fan	2.37
radiant	2.79
Steam	7.68
Package heating and colling	9.58
Wall or floor furnace	2.19
Package heating and cooling	1.36
Ventilation, blower and ducts .....	.57

3 HEIGHT REFINEMENTS	
STORY HEIGHT MULTIPLIERS	
Multiply base cost by following multiplier for any variation in average story height.	
Average Wall Height	Square Foot Multiplier
7	.943
8	.963
9	.981
10	1.000 (base)
11	1.019
12	1.038
13	1.058
14	1.077
16	1.115
18	1.154
20	1.192
22	1.231
24	1.269
28	1.346
32	1.423

4 Average Floor Area, Sq. Ft./Story	AVERAGE PERIMETER														Average Floor Area, Sq. Ft./Story
	75	125	150	200	250	300	350	400	500	600	700	800	900	1000	
500	1.178	1.444	1.577	1.844	2.110	2.377	2.643	2.909	----	----	----	----	----	----	500
750	1.044	1.222	1.311	1.489	1.667	1.844	2.023	2.201	----	----	----	----	----	----	750
1,000	.980	1.110	1.178	1.311	1.444	1.577	1.711	1.844	----	----	----	----	----	----	1,000
1,500	.911	1.000	1.044	1.133	1.222	1.311	1.400	1.489	----	----	----	----	----	----	1,500
2,000	.878	.945	.977	1.044	1.110	1.178	1.245	1.311	----	----	----	----	----	----	2,000
2,500	.858	.911	.938	.991	1.044	1.097	1.150	1.204	----	----	----	----	----	----	2,500
3,000	.843	.889	.911	.955	1.000	1.044	1.088	1.133	----	----	----	----	----	----	3,000
4,000	----	.860	.878	.911	.945	.977	1.010	1.044	1.110	1.178	----	----	----	----	4,000
6,000	----	----	.843	.865	.888	.911	.934	.955	1.000	1.044	1.088	1.133	----	----	6,000
8,000	----	----	----	.844	.860	.877	.894	.911	.945	.977	1.010	1.044	1.076	----	8,000
10,000	----	----	----	----	.844	.858	.871	.884	.911	.938	.960	.991	1.018	1.044	10,000
14,000	----	----	----	----	.825	.835	.844	.854	.873	.892	.911	.931	.949	.967	14,000
18,000	----	----	----	----	----	.822	.828	.836	.852	.867	.881	.896	.911	.926	18,000
20,000	----	----	----	----	----	.818	.824	.831	.844	.858	.871	.884	.898	.911	20,000

5 USE COUNTY MULTIPLIERS IN MULTIPLIER SECTION.

TURKEY BARNs

OCCUPANCY DESCRIPTION: These buildings are designed for the care and housing of turkeys at ground level, with predominantly dirt floors. The costs are for complete houses. The quality determination should be influenced by roof systems; the amount and character of screening; floor systems, e.g. slab, wood or dirt; the amount of interior finish, lighting and plumbing systems.

INCLUDED IN COSTS: Architects' fees and contractors' overhead and profit.

NOT INCLUDED IN COSTS: Racks, cages, incubators, other special equipment or heat.

CLASS	TYPE	COST/ SQ. FT.	EXTERIOR WALLS	INTERIOR FINISH	LIGHTING & PLUMBING
D	Average	\$12.97	Siding, insulated, sidewall top open screen, curtains and shutters	Unfinished, partial floor, few partitions, insulated ceiling	Adequate wiring and lighting, water service
	Fair	11.83	Siding, insulated, sidewall open screen, side curtains	Unfinished, dirt floor, some concrete, insulated ceiling	Adequate services
	Low cost	10.79	Plywood partial walls, side screen on wood studs, no curtains	Open ventilation, unfinished, dirt floor, no insulation	Minimum lighting and hose bib
DPOLE	Average	11.30	Metal, insulated, sidewall top open screen, curtains and shutters	Unfinished, partial floor, few partitions, insulated ceiling	Adequate wiring and lighting, water service
	Fair	10.26	Metal, insulated, sidewall open screen, side curtains	Unfinished, pole frame, dirt floor, some concrete, insulated ceiling	Adequate services
	Low cost	9.31	Metal partial walls, side screen on light pole frame, no curtains	Open ventilation, unfinished, dirt floor, no insulation	Minimum lighting and hose bib
DHOOP ARCH	Average	6.88	Wood post, knee wall, pipe hoop frame, fabric cover, end curtains	Unfinished, dirt floor, some concrete	Minimum services
	Low cost	5.46	Wood post, light pipe hoop, fabric cover	Open ventilation, unfinished, dirt floor, wire fence pens	Minimum lighting and hose bib
S	Average	13.24	Metal, insulated, sidewall top open screen, curtains and shutters	Unfinished, partial floor, few partitions, insulated ceiling	Adequate wiring and lighting, water service
	Fair	12.14	Metal, insulated, sidewall open screen, side curtains	Unfinished, steel frame, dirt floor, some concrete, insulated ceiling	Adequate services
	Low cost	11.13	Metal partial walls, side screen on light steel frame, no curtains	Open ventilation, unfinished, dirt floor, no insulation	Minimum lighting and hose bib

For stud-backed walls on Class D_{POLE} structures, add 5%.

FEED TANKS: Costs are averages of typical farm hoppers with roof, manhole and ladder, including necessary steel structural supports and concrete footings. Height is overall from ground level to top of tank. Capacity in tons is figured at 50 pounds per bushel. Costs do not include delivery auger.

DIAMETER (feet)	HEIGHT (feet)	CAPACITY (bushels)	CAPACITY (tons)	COST
6	10	120	3.0	\$1,800
6	16	240	6.0	2,575
6	21	360	9.0	2,900
6	25	480	12.0	3,300
6	28	600	15.0	3,600
9	14	300	7.5	3,725
9	17	458	11.5	4,450
9	20	594	14.8	4,825
9	25	866	21.8	5,600
9	28	1,000	25.0	5,950

DIAMETER (feet)	HEIGHT (feet)	CAPACITY (bushels)	CAPACITY (tons)	COST
9	31	1,130	28.3	\$ 6,150
12	20	870	21.8	8,300
12	25	1,345	33.8	9,450
12	31	1,825	45.8	10,800
12	36	2,300	57.5	11,600
12	42	2,780	69.5	12,700
15	33	4,030	100.75	14,900
15	41	5,220	130.5	17,500
18	34	5,980	149.5	21,000

TURKEY BARNs

REFINEMENTS: This page provides major adjustments to the base costs on the previous page. Follow Steps 1 through 5 to attain final costs, adjusted for lump sums, heating and cooling, story height, floor area/perimeter ratio and locality.

1	ADJUSTMENTS TURKEY FINISHING QIPMENT SYSTEMS	COST PER SQUARE FOOT	COST PER BIRD
	(Costs Calculated at 3 Square Feet per Bird)		
	Pan feeder systems with direct drives	\$.65	\$1.95
	Auger feeder bin and fill system (bulk feed bin which delivers feed to the feeders through an auger fill system) .....	.36	1.08
	Nipple watering system .....	.69	2.08
	Heating system (jet brooders with wall heaters operating on propane gas) .....	.41	1.22
	House fan system (fans, shutters and other miscellaneous equipment) .....	.92	2.76
	Evaporative cooling pad system (does not include framing materials or plumbing equipment from water source to cooling system) .....	.58	1.74
	Sidewall curtain and air inlet system .....	.84	2.52

2	HEATING AND COOLING	
	These costs are averages of total installed cost of the entire heating or cooling installation including its prorated share of contractors' overhead and profit and architects' fees.	
	Electric cable or baseboard	\$4.31
	Electric wall heaters (inc. FWA)	1.84
	Forced air, ducted	4.85
	heaters or furnace, vented	1.36
	Hot water, baseboard/convactor	8.63
	radiant floor or ceiling	8.87
	Space heaters, with fan	2.37
	radiant	2.79
	Steam	7.68
	Package heating and cooling	9.58
	Wall or floor furnace	2.19
	Vent. (blowers/ducts)	1.36
	fans only .....	.57

3	HEIGHT REFINEMENTS STORY HEIGHT MULTIPLIERS	
	Multiply base cost by following multiplier for any variation in average story height.	
	Average Wall Height	Square Foot Multiplier
	7	.943
	8	.963
	9	.981
	10	1.000 (base)
	11	1.019
	12	1.038
	13	1.058
	14	1.077
	16	1.115
	18	1.154
	20	1.192
	22	1.231
	24	1.269
	28	1.346
	32	1.423

4	Average Floor Area, Sq. Ft./Story	AVERAGE PERIMETER													Average Floor Area, Sq. Ft./Story	
		75	125	150	200	250	300	350	400	500	600	700	800	900	1000	
	500	1.178	1.444	1.577	1.844	2.110	2.377	2.643	2.909	----	----	----	----	----	----	500
	750	1.044	1.222	1.311	1.489	1.667	1.844	2.023	2.201	----	----	----	----	----	----	750
	1,000	.980	1.110	1.178	1.311	1.444	1.577	1.711	1.844	----	----	----	----	----	----	1,000
	1,500	.911	1.000	1.044	1.133	1.222	1.311	1.400	1.489	----	----	----	----	----	----	1,500
	2,000	.878	.945	.977	1.044	1.110	1.178	1.245	1.311	----	----	----	----	----	----	2,000
	2,500	.858	.911	.938	.991	1.044	1.097	1.150	1.204	----	----	----	----	----	----	2,500
	3,000	.843	.889	.911	.955	1.000	1.044	1.088	1.133	----	----	----	----	----	----	3,000
	4,000	----	.860	.878	.911	.945	.977	1.010	1.044	1.110	1.178	----	----	----	----	4,000
	6,000	----	----	.843	.865	.888	.911	.934	.955	1.000	1.044	1.088	1.133	----	----	6,000
	8,000	----	----	----	.844	.860	.877	.894	.911	.945	.977	1.010	1.044	1.076	----	8,000
	10,000	----	----	----	----	.844	.858	.871	.884	.911	.938	.960	.991	1.018	1.044	10,000
	14,000	----	----	----	----	.825	.835	.844	.854	.873	.892	.911	.931	.949	.967	14,000
	18,000	----	----	----	----	----	.822	.828	.836	.852	.867	.881	.896	.911	.926	18,000
	20,000	----	----	----	----	----	.818	.824	.831	.844	.858	.871	.884	.898	.911	20,000

5 USE COUNTY MULTIPLIERS IN MULTIPLIER SECTION.

FARM IMPLEMENT (EQUIPMENT SHOP) BUILDINGS



GOOD CLASS D



AVERAGE CLASS D



GOOD CLASS D ARCH RIB



AVERAGE DPOLE



LOW-COST / AVERAGE DPOLE



GOOD CLASS S SLANT WALL



GOOD CLASS S QUONSET



AVERAGE CLASS S



AVERAGE CLASS D IMPLEMENT SHED



LOW CLASS DPOLE IMPLEMENT SHED

STORAGE BUILDINGS



AVERAGE CLASS D UTILITY
Arch Rib



LOW CLASS S UTILITY
Slant Wall



LOW CLASS D POLE UTILITY BUILDING



LOW CLASS S QUONSET UTILITY



GOOD CLASS S UTILITY
Grain Storage



GOOD CLASS S GREENHOUSE
Straight Wall



CLASS D TOOL SHED



CLASS D BULK FERTILIZER STORAGE

FARM IMPLEMENT BUILDINGS

OCCUPANCY DESCRIPTION: Implement buildings are for storage and maintenance of farm equipment. These structures have lighter gauge materials or less interior finish than their commercial counterparts. They have better electrical circuits and built in shop features not found in utility buildings or storage sheds. Walls are usually either block or some type of metal or wood over the frame. Roof systems are

either steel or wood, and the floors are light concrete or asphalt. For arch-rib, use center arch height in entering the story height table.

INCLUDED IN COSTS: Architects' fees and contractors' overhead and profit.

NOT INCLUDED IN COSTS: Heating systems are not included.

FARM IMPLEMENT (EQUIPMENT SHOP) BUILDINGS

CLASS	TYPE	COST/ SQ. FT.	EXTERIOR WALLS	INTERIOR FINISH	LIGHTING & PLUMBING
C	Good	\$27.87	Reinforced block, steel or wood truss, good roof cover	Unfinished, concrete floor, tool cabinets, shop area	Good lighting and outlets, water service
	Average	21.80	Block, steel or wood roof structure, good fenestration	Unfinished, concrete or asphalt floor, some cabinets	Adequate water, electrical service and outlets
D	Good	21.76	Wood frame and truss, wood siding or stucco	Unfinished, concrete floor, tool cabinets, shop area	Good lighting and outlets, water service
	Average	15.38	Open wood frame, exposed board siding, shingles, windows	Unfinished, concrete or asphalt floor, some cabinets	Adequate water, electrical service and outlets
DPOLE	Good	19.05	Pole frame, best metal siding, sheathing	Unfinished, concrete floor, tool cabinets, shop area	Good lighting and outlets, water service
	Average	13.14	Pole frame, metal siding, good doors, windows	Unfinished, concrete or asphalt floor, some cabinets	Adequate water, electrical service and outlets
	Low cost	9.09	Pole frame, metal siding	Unfinished, light floor, few extras	Minimum services
S	Good	22.24	Steel frame and truss, steel or aluminum siding	Unfinished, concrete floor, tool cabinets, shop area	Good lighting and outlets, water service
	Average	15.83	Steel frame and siding, good doors, windows	Unfinished, concrete or asphalt floor, some cabinets	Adequate water, electrical service and outlets
	Low cost	11.30	Light steel frame, siding	Unfinished, light floor, few extras	Minimum services
S SLANT WALL	Good	20.89	Light steel slant frame and truss, steel siding	Unfinished, concrete floor, tool cabinets, shop area	Good lighting and outlets, water service
	Average	14.81	Light steel slant frame and siding, good doors, windows	Unfinished, concrete or asphalt floor, some cabinets	Adequate water, electrical service and outlets
	Low cost	10.53	Light steel slant frame and siding	Unfinished, light floor, few extras	Minimum services

ARCH-RIB (QUONSET) FARM IMPLEMENT BUILDINGS

D	Good	\$25.52	Good laminated arch, siding, shingles, pedestrian and overhead doors	Unfinished, concrete floor, tool cabinets, shop area	Good lighting and outlets, water service
	Average	19.37	Arched frame, shingles and siding, windows, overhead door	Unfinished, concrete or asphalt floor, some cabinets	Adequate water, electrical service and outlets
	Low cost	14.74	Light arch-rib, frame, comp. shingles, end-wall sliding-door entry	Unfinished, light floor, few extras	Minimum services
DPOLE	Good	23.72	Good laminated arch, metal siding, pedestrian and overhead doors	Unfinished, concrete floor, tool cabinets, shop area	Good lighting and outlets, water service
	Average	17.79	Pre-engineered arched frame, metal siding, windows, overhead door	Unfinished, concrete or asphalt floor, some cabinets	Adequate water, electrical service and outlets
	Low cost	13.38	Light arch-rib frame, metal siding, end-wall sliding-door entry	Unfinished, light floor, few extras	Minimum services
DHOOP ARCH	Average	12.04	Wood post, knee wall, pipe hoop frame, fabric cover, end curtains	Unfinished, concrete or asphalt floor, some cabinets	Adequate water, electrical service and outlets
	Low cost	9.16	Wood post, pipe hoop, fabric cover	Unfinished light floor, few extras	Minimum services
S	Good	25.37	Good self-framing quonset panels, pedestrian and overhead doors	Unfinished, concrete or asphalt floor, some cabinets	Good lighting and outlets, water service
	Average	19.16	Pre-engineered quonset, metal siding, windows, overhead door	Unfinished, concrete or asphalt floor, some cabinets	Adequate water, electrical service and outlets
	Low cost	14.51	Light self-framing quonset panels, end-wall sliding-door entry	Unfinished, light floor, few extras	Minimum services
	Cheap	11.79	Light self-framing quonset panels, open ends	Unfinished, light floor	Minimum services

FARM IMPLEMENT (EQUIPMENT) SHELTERS

D	Good	\$10.42 - \$14.55	No walls, composition or steel gable roof on wood rafters and posts, concrete floor, security lighting		
	Average	7.40 - 10.34	No walls, steel shed or flat roof on wood posts and girders, light slab floor, minimum electrical		
	Low cost	5.24 - 7.32	No walls, light steel flat roof on light wood posts, asphalt floor, no electrical		
S	Very Good	13.62 - 19.02	No walls, large bulk commodity canopy structure, heavy frame and floor, good electrical		
	Good	11.48 - 16.02	No walls, steel gable roof and truss on steel column, wide span, concrete floor, security lighting		
	Average	8.14 - 11.36	No walls, heavy fabric or steel shed or flat roof and girders on good steel posts, light slab floor, minimum electrical		
	Low cost	5.77 - 8.06	No walls, light steel, fiberglass or shade netting, flat roof on low-cost pipe, asphalt floor, no electrical		

FARM IMPLEMENT BUILDINGS

REFINEMENTS: This page provides major adjustments to the base costs on the previous page. Follow Steps 1 through 5 to attain final costs, adjusted for lump sums, heating and cooling, story height, floor area/perimeter ratio and locality.

1 ADJUSTMENTS FOR DEVIATIONS FROM BASE COSTS	ADD OR DEDUCT PER SQUARE FOOT		
	GOOD	AVERAGE	LOW
Dirt Floor	\$.24	\$.29	\$.41
Gravel .....	.53	.62	.85
Asphalt	1.99	2.52	4.03
Concrete Floor, plain	2.87	3.45	4.97
Reinforced	3.27	3.97	5.84
Plank Floor	1.18	1.51	2.47
Electric Service .....	.18	.31	.89
Water Service .....	.14	.20	.40

2 HEATING AND COOLING	
These costs are averages of total installed cost of the entire heating or cooling installation including its prorated share of contractors' overhead and profit and architects' fees.	
Electric cable or baseboard	\$4.31
Electric wall heaters (inc. FWA)	1.84
Forced air, ducted	4.85
heaters or furnace, vented	1.36
Hot water, baseboard/convactor	8.63
radiant floor or ceiling	8.87
Space heaters, with fan	2.37
radiant	2.79
Steam	7.68
Wall or floor furnace	9.58
Package heating and cooling	2.19
Ventilation, blower and ducts	1.36
fans only .....	.57

3 HEIGHT REFINEMENTS	
STORY HEIGHT MULTIPLIERS	
Multiply base cost by following multiplier for any variation in average story height.	
Average Wall Height	Square Foot Multiplier
7	.943
8	.963
9	.981
10	1.000 (base)
11	1.019
12	1.038
13	1.058
14	1.077
16	1.115
18	1.154
20	1.192
22	1.231
24	1.269
28	1.346
32	1.423

4 Average Floor Area, Sq. Ft./Story	AVERAGE PERIMETER														Average Floor Area, Sq. Ft./Story
	75	125	150	200	250	300	350	400	500	600	700	800	900	1000	
500	1.178	1.444	1.577	1.844	2.110	2.377	2.643	2.909	----	----	----	----	----	----	500
750	1.044	1.222	1.311	1.489	1.667	1.844	2.023	2.201	----	----	----	----	----	----	750
1,000	.980	1.110	1.178	1.311	1.444	1.577	1.711	1.844	----	----	----	----	----	----	1,000
2,000	.878	.945	.977	1.044	1.110	1.178	1.245	1.311	----	----	----	----	----	----	2,000
3,000	.843	.889	.911	.955	1.000	1.044	1.088	1.133	----	----	----	----	----	----	3,000
4,000	----	.860	.878	.911	.945	.977	1.010	1.044	1.110	1.178	----	----	----	----	4,000
6,000	----	----	.843	.865	.888	.911	.934	.955	1.000	1.044	1.088	1.133	----	----	6,000
8,000	----	----	----	.844	.860	.877	.894	.911	.945	.977	1.010	1.044	1.076	----	8,000
10,000	----	----	----	----	.844	.858	.871	.884	.911	.938	.960	.991	1.018	1.044	10,000
12,000	----	----	----	----	.833	.843	.855	.867	.888	.911	.934	.955	.977	1.000	12,000
14,000	----	----	----	----	.825	.835	.844	.854	.873	.892	.911	.931	.949	.967	14,000
16,000	----	----	----	----	----	.827	.836	.844	.861	.877	.894	.911	.928	.945	16,000
18,000	----	----	----	----	----	.822	.828	.836	.852	.867	.881	.896	.911	.926	18,000
20,000	----	----	----	----	----	.818	.824	.831	.844	.858	.871	.884	.898	.911	20,000

Use the total length of walled sides as the perimeter. Do not use table for sheds without walls.

5 USE COUNTY MULTIPLIERS IN MULTIPLIER SECTION.

SHEDS AND UTILITY BUILDINGS

OCCUPANCY DESCRIPTION: Equipment shed buildings are for storage and maintenance of farm equipment. These structures are typically designed with an open front and only three exterior walls, of either wood frame or steel construction. Floors are either light concrete, asphalt, gravel or dirt. Electrical and water service are commensurate with the quality.

are light arch-rib wood with metal (Class D_{POLE}), wood siding or shingles (Class D) or self-framing metal quonset panels (Class S). The floors are light concrete, asphalt or dirt at the lower qualities. Use the center arch height in entering the story height table.

Quonset shape farm utility buildings have many uses, such as general material, commodity or equipment storage. Interior modifications can make them accommodate any one of several uses. Frames

INCLUDED IN COSTS: Architects' fees and general contractors' overhead and profit.

NOT INCLUDED IN COSTS: No heat or special equipment.

FARM IMPLEMENT/EQUIPMENT SHEDS

CLASS	TYPE	COST/ SQ. FT.	EXTERIOR WALLS	INTERIOR FINISH	LIGHTING & PLUMBING
C	Average	\$17.79	Open one side, block light roof, some end-wall fenestration	Unfinished, light concrete or asphalt floor, some cabinets	Adequate water, electrical service and outlets
	Low cost	12.91	Open front, cheap block, shed roof	Unfinished, gravel floor, few extras	Minimum services
D	Average	13.25	Open one side, wood frame, siding, some end-wall fenestration	Unfinished, light concrete or asphalt floor, some cabinets	Adequate water, electrical service and outlets
	Low cost	7.62	Open front, box frame, siding	Unfinished, gravel floor, few extras	Minimum services
DPOLE	Average	10.99	Open one side, metal on pole frame, some end-wall windows	Unfinished, light concrete or asphalt floor, some cabinets	Adequate water, electrical service and outlets
	Low cost	6.30	Open front, metal on pole frame	Unfinished, gravel floor, few extras	Minimum services
S	Average	13.66	Open one side, metal on steel frame, some end-wall windows	Unfinished, light concrete or asphalt floor, some cabinets	Adequate water, electrical service and outlets
	Low cost	8.41	Open front, metal on steel frame	Unfinished, gravel floor, few extras	Minimum services
SSLANT WALL	Average	12.68	Open one side, metal on steel slant frame, some light panels	Unfinished, light concrete or asphalt floor, some cabinets	Adequate water, electrical service and outlets
	Low cost	7.72	Open front, metal on light slant frame	Unfinished, gravel floor, few extras	Minimum services

ARCH-RIB (QUONSET) FARM UTILITY BUILDINGS

D	Good	\$24.63	Good laminated arch, siding, shingles, pedestrian and overhead doors	Unfinished, good concrete slab	Adequate wiring, lighting and water service
	Average	14.46	Arched frame, shingles and siding, end wall sliding-door entry	Unfinished, cheap asphalt or slab floor	Adequate wiring and outlets, water service
	Low cost	8.50	Arch-rib frame, siding, composition shingles, open ends	Unfinished, dirt floor	Minimum electric service
DPOLE	Good	22.77	Good laminated arch, metal siding, pedestrian and overhead doors	Unfinished, good concrete slab	Adequate wiring, lighting and water service
	Average	13.21	Pre-engineered arched frame, metal siding, end-wall sliding door entry	Unfinished, cheap asphalt or slab floor	Adequate wiring and outlets, water service
	Low cost	7.68	Light arch-rib frame, metal siding, open ends	Unfinished, dirt floor	Minimum electric service
DHOOP ARCH	Average	9.54	Wood post, knee wall, pipe hoop frame, fabric cover, end curtains	Unfinished, cheap asphalt or slab floor	Adequate wiring, lighting and water service
	Low cost	5.97	Wood, pipe hoop, fabric cover	Unfinished, dirt floor	Minimum electric service
S	Good	24.38	Good self-framing quonset panels, pedestrian and overhead doors	Unfinished, good concrete slab	Adequate wiring, lighting and water service
	Average	14.25	Pre-engineered quonset, metal siding, end-wall sliding-door entry	Unfinished, cheap asphalt or slab floor	Adequate wiring and outlets, water service
	Low cost	8.34	Light self-framing quonset panels, open ends	Unfinished, dirt floor	Minimum electric service

SHEDS AND UTILITY BUILDINGS

REFINEMENTS: This page provides major adjustments to the base costs on the previous page. Follow Steps 1 through 5 to attain final costs, adjusted for lump sums, heating and cooling, story height, floor area/perimeter ratio and locality.

1

ADJUSTMENTS FOR DEVIATIONS FROM BASE COSTS	ADD OR DEDUCT PER SQUARE FOOT		
	GOOD	AVERAGE	LOW
Dirt Floor	\$.24	\$.29	\$.41
Gravel .....	.53	.62	.85
Asphalt	1.99	2.52	4.03
Concrete Floor, plain	2.87	3.45	4.97
Reinforced	3.27	3.97	5.84
Plank Floor	1.18	1.51	2.47
Electric Service .....	.18	.31	.89
Utility buildings .....	.17	.25	.54
Water Service .....	.14	.20	.40

2

HEATING AND COOLING	
These costs are averages of total installed cost of the entire heating or cooling installation including its prorated share of contractors' overhead and profit and architects' fees.	
Electric cable or baseboard	\$4.31
Electric wall heaters (inc. FWA)	1.84
Forced air, ducted	4.85
heaters or furnace, vented	1.36
Hot water, baseboard/convactor	8.63
radiant floor or ceiling	8.87
Space heaters, with fan	2.37
radiant	2.79
Steam	7.68
Wall or floor furnace	9.58
Package heating and cooling	2.19
Ventilation, blower and ducts	1.36
fans only .....	.57

3

HEIGHT REFINEMENTS	
STORY HEIGHT MULTIPLIERS	
Multiply base cost by following multiplier for any variation in average story height.	
Average Wall Height	Square Foot Multiplier
7	.943
8	.963
9	.981
10	1.000 (base)
11	1.019
12	1.038
13	1.058
14	1.077
16	1.115
18	1.154
20	1.192
22	1.231
24	1.269
28	1.346
32	1.423

4

Average Floor Area, Sq. Ft./Story	AVERAGE PERIMETER														Average Floor Area, Sq. Ft./Story
	75	125	150	200	250	300	350	400	500	600	700	800	900	1000	
500	1.178	1.444	1.577	1.844	2.110	2.377	2.643	2.909	----	----	----	----	----	----	500
750	1.044	1.222	1.311	1.489	1.667	1.844	2.023	2.201	----	----	----	----	----	----	750
1,000	.980	1.110	1.178	1.311	1.444	1.577	1.711	1.844	----	----	----	----	----	----	1,000
2,000	.878	.945	.977	1.044	1.110	1.178	1.245	1.311	----	----	----	----	----	----	2,000
3,000	.843	.889	.911	.955	1.000	1.044	1.088	1.133	----	----	----	----	----	----	3,000
4,000	----	.860	.878	.911	.945	.977	1.010	1.044	1.110	1.178	----	----	----	----	4,000
6,000	----	----	.843	.865	.888	.911	.934	.955	1.000	1.044	1.088	1.133	----	----	6,000
8,000	----	----	----	.844	.860	.877	.894	.911	.945	.977	1.010	1.044	1.076	----	8,000
10,000	----	----	----	----	.844	.858	.871	.884	.911	.938	.960	.991	1.018	1.044	10,000
12,000	----	----	----	----	.833	.843	.855	.867	.888	.911	.934	.955	.977	1.000	12,000
14,000	----	----	----	----	.825	.835	.844	.854	.873	.892	.911	.931	.949	.967	14,000
16,000	----	----	----	----	----	.827	.836	.844	.861	.877	.894	.911	.928	.945	16,000
18,000	----	----	----	----	----	.822	.828	.836	.852	.867	.881	.896	.911	.926	18,000
20,000	----	----	----	----	----	.818	.824	.831	.844	.858	.871	.884	.898	.911	20,000

Use the total length of walled sides as the perimeter. Do not use table for sheds without walls.

5

USE COUNTY MULTIPLIERS IN MULTIPLIER SECTION.

FARM UTILITY BUILDINGS

OCCUPANCY DESCRIPTION: Utility buildings have many uses, such as general material, commodity or equipment storage. Interior modifications can make them accommodate any of several uses. Floors are light concrete, asphalt or dirt at the lower qualities.

Lean-tos are side extensions used in conjunction with utility buildings. The lowest cost, cheap lean-tos are totally unfinished, with dirt floors, while the low-cost quality includes some openings.

Tool sheds are small multipurpose auxiliary type structures which may be used for the storage of small hand tools, feed supplies or wood, or as pump houses, etc. Better qualities have a slab, while the lower qualities have dirt floors with no electrical or plumbing.

INCLUDED IN COSTS: Architects' fees and contractors' overhead and profit.

NOT INCLUDED IN COSTS: Heating systems.

FARM UTILITY BUILDINGS

CLASS	TYPE	COST/ SQ. FT.	EXTERIOR WALLS	INTERIOR FINISH	LIGHTING & PLUMBING
C	Good	\$26.86	Brick, concrete block, clay tile, wood rafters, windows	Unfinished walls, slab or plank floor	Adequate wiring and outlets, water service
	Average	19.36	Block, cheap brick, light roof	Cheap slab or asphalt	Minimum electric service
D	Average	13.12	Wood frame, siding or stucco, windows	Unfinished walls, cheap asphalt or slab floor	Adequate wiring and outlets, water service
	Low cost	8.43	Wood frame, board siding on exposed studs, sliding door	Unfinished, dirt floor	Minimum electric service
DPOLE	Average	10.33	Pole frame, metal siding, windows, walkdoor	Unfinished walls, cheap asphalt or slab floor	Adequate wiring and outlets, water service
	Low cost	6.05	Light pole frame, metal siding, sliding door entry only	Unfinished, dirt floor	Minimum electric service
S	Average	13.11	Steel frame and truss, metal siding, windows, walkdoor	Unfinished walls, cheap asphalt or slab floor	Adequate wiring and outlets, water service
	Low cost	8.19	Light steel frame, metal siding, sliding-door entry only	Unfinished, dirt floor	Minimum electric service
S SLANT WALL	Average	12.13	Light steel slant frame and metal siding, windows, walkdoor	Unfinished walls, cheap asphalt or slab floor	Adequate wiring and outlets, water service
	Low cost	7.53	Light steel slant frame and siding, sliding-door entry only	Unfinished, dirt floor	Minimum electric service

UTILITY LEAN-TOS

D	Good	\$11.88	Side extension, wood frame, siding or stucco, windows, walkdoor	Unfinished, good concrete slab	Adequate wiring and outlets, water service
	Average	8.35	Side extension, board siding on exposed studs, sliding door	Unfinished, cheap asphalt or slab floor	Minimum electric service
	Low cost	5.88	Side extension, plywood/box frame	Unfinished, no doors, dirt floor	None
DPOLE	Good	10.16	Side extension, pole frame, metal siding, windows, walkdoor	Unfinished, good concrete slab	Adequate wiring and outlets, water service
	Average	7.17	Side extension, light frame, metal siding, sliding-door entry only	Unfinished, cheap asphalt or slab floor	Minimum electric service
	Low cost	5.07	Side extension, metal on pole frame	Unfinished, no doors, dirt floor	None
S	Good	11.89	Side extension, steel frame, metal siding, windows, walkdoor	Unfinished, good concrete slab	Adequate wiring and outlets, water service
	Average	8.72	Side extension, light frame, metal siding, sliding-door entry only	Unfinished, cheap asphalt or slab floor	Minimum electric service
	Low cost	6.41	Side extension, steel frame/siding	Unfinished, no doors, dirt floor	None

TOOLSHED BUILDINGS

C	Good	\$24.71	Cheap block, windows, hip or gable roof	Unfinished, good slab	One or two lights and outlets, no plumbing
D	Good	20.11	Good siding and windows, hip or gable roof	Some wainscot, good concrete slab	One or two lights and outlets, no plumbing
	Average	12.37	Board or metal on exposed studs, windows, gable roof	Unfinished interior, light slab or board floor	None
	Low cost	7.63	Low-cost board siding or box frame, few openings	Unfinished interior, dirt floor	None

FARM UTILITY BUILDINGS

REFINEMENTS: This page provides major adjustments to the base costs on the previous page. Follow Steps 1 through 5 to attain final costs, adjusted for lump sums, heating and cooling, story height, floor area/perimeter ratio and locality.

1

ADJUSTMENTS FOR DEVIATIONS FROM BASE COSTS	ADD OR DEDUCT PER SQUARE FOOT		
	GOOD	AVERAGE	LOW
Dirt Floor	\$.24	\$.29	\$.41
Gravel .....	.53	.62	.85
Asphalt	1.99	2.52	4.03
Concrete Floor, plain	2.87	3.45	4.97
Reinforced	3.27	3.97	5.84
Plank Floor	1.18	1.51	2.47
Electric Service .....	.18	.31	.89
Utility buildings .....	.17	.25	.54
Water Service .....	.14	.20	.40

2

HEATING AND COOLING	
These costs are averages of total installed cost of the entire heating or cooling installation including its prorated share of contractors' overhead and profit and architects' fees.	
Electric cable or baseboard	\$4.31
Electric wall heaters (inc. FWA)	1.84
Forced air, ducted	4.85
heaters or furnace, vented	1.36
Hot water, baseboard/convactor	8.63
radiant floor or ceiling	8.87
Space heaters, with fan	2.37
radiant	2.79
Steam	7.68
Wall or floor furnace	9.58
Package heating and cooling	2.19
Ventilation, blower and ducts	1.36
fans only .....	.57

3

HEIGHT REFINEMENTS	
STORY HEIGHT MULTIPLIERS	
Multiply base cost by following multiplier for any variation in average story height.	
Average Wall Height	Square Foot Multiplier
7	.943
8	.963
9	.981
10	1.000 (base)
11	1.019
12	1.038
13	1.058
14	1.077
16	1.115
18	1.154
20	1.192
22	1.231
24	1.269
28	1.346
32	1.423

4

Average Floor Area, Sq. Ft./Story	AVERAGE PERIMETER														Average Floor Area, Sq. Ft./Story
	50	75	150	200	250	300	350	400	500	600	700	800	900	1000	
500	1.044	1.178	1.577	1.844	2.110	2.377	2.643	2.909	----	----	----	----	----	----	500
750	.955	1.044	1.311	1.489	1.667	1.844	2.023	2.201	----	----	----	----	----	----	750
1,000	.911	.980	1.178	1.311	1.444	1.577	1.711	1.844	----	----	----	----	----	----	1,000
1,500	.866	.911	1.044	1.133	1.222	1.311	1.400	1.489	----	----	----	----	----	----	1,500
2,000	----	.878	.977	1.044	1.110	1.178	1.245	1.311	----	----	----	----	----	----	2,000
2,500	----	.858	.938	.991	1.044	1.097	1.150	1.204	----	----	----	----	----	----	2,500
3,000	----	.843	.911	.955	1.000	1.044	1.088	1.133	----	----	----	----	----	----	3,000
4,000	----	----	.878	.911	.945	.977	1.010	1.044	1.110	1.178	----	----	----	----	4,000
5,000	----	----	.857	.884	.911	.938	.960	.991	1.044	1.097	1.150	----	----	----	5,000
6,000	----	----	.843	.865	.888	.911	.934	.955	1.000	1.044	1.088	1.133	----	----	6,000
7,000	----	----	.835	.854	.873	.892	.911	.931	.967	1.006	1.044	1.080	----	----	7,000
8,000	----	----	----	.844	.860	.877	.894	.911	.945	.977	1.010	1.044	1.076	----	8,000
9,000	----	----	----	.836	.852	.867	.881	.896	.926	.955	.985	1.014	1.044	----	9,000
10,000	----	----	----	----	.844	.858	.871	.884	.911	.938	.960	.991	1.018	1.044	10,000

Use the total length of walled sides as the perimeter.

5

USE COUNTY MULTIPLIERS IN MULTIPLIER SECTION.

FARM STORAGE BUILDINGS



CLASS D CORN CRIB
Wood-covered Exterior



CLASS D CORN CRIB
Wire-mesh-covered Exterior

OCCUPANCY DESCRIPTION: Utility building modified for grain storage.

Corn cribs are for the dry storage of corn on the cob; both wire and wood cribs are priced. Corn cribs are modified for height and perimeter just as other structures are.

Fertilizer storage buildings provide for the blending and distribution of dry fertilizers in bulk or bag.

INCLUDED IN COSTS: Architects' fees and contractors' overhead and profit.

NOT INCLUDED IN COSTS: Heating and special storage and handling equipment are not included.

FARM UTILITY/GRAIN STORAGE BUILDINGS

CLASS	TYPE	COST/ SQ. FT.	EXTERIOR WALLS	INTERIOR FINISH	LIGHTING & PLUMBING
D	Very good	\$22.19	Dropsiding on wood frame, sliding doors, asphalt shingles	Good slab, interior wood cribbing, good granary	Adequate wiring and lighting
	Good	20.56	Heavy wood frame, siding or stucco, bulkheads	Finished walls, good slab, grain or feed storage	Adequate wiring and lighting
DPOLE	Very good	19.30	Pole frame, metal siding	Good slab, interior wood cribbing	Adequate wiring and lighting
	Good	17.78	Pole frame and truss metal siding, sheathing and bulkheads	Lined walls, good slab, grain storage	Adequate wiring and lighting
DHOOP ARCH	Good	15.33	Wood post, bulkhead, pipe hoop, fabric cover, end walls, curtain doors	Good concrete slab, grain storage	Adequate wiring and lighting
S	Good	21.17	Steel frame and truss, heavy steel panels, bulkheads	Good concrete slab, grain storage	Adequate wiring and lighting
SSLANT WALL	Good	19.73	Light steel slant frame, heavy steel panels	Good concrete slab, grain storage	Adequate wiring and lighting

For quonset storage, see Page 263.

CORN CRIB BUILDINGS

D	Good	\$17.40	Wood skeleton frame, spaced boards, gable roof	Concrete slab or wood plank, drive-through alley	Minimum lighting
	Average	16.32	Wood skeleton, spaced boards	Concrete slab or wood plank	None
	Loft	5.70	Not included	Plank storage bin, adequate support	Not included
	Good	15.98	Wood skeleton frame, wire mesh, gable roof	Concrete slab or wood plank, drive-through alley	Minimum lighting
	Average	14.91	Wood skeleton, wire mesh	Concrete slab or wood plank	None
	Loft	4.66	Not included	Wire storage bin, adequate support	Not included

BAG FERTILIZER STORAGE

D	Average	\$33.45	Heavy wood frame, composition roof, wood siding and skirting	Concrete or built-up wood dock-height floor, sealed, few partitions	Rigid conduit, sparkproof fixtures, no plumbing
DPOLE	Average	31.06	Metal siding on poles, sheathing, metal skirting	Concrete or built-up wood dock-height floor, sealed, few partitions	Rigid conduit, sparkproof fixtures, no plumbing
S	Average	33.86	Pre-engineered frame, siding and sheathing, steel skirting	Concrete or built-up wood dock-height floor, sealed, few partitions	Rigid conduit, sparkproof fixtures, no plumbing

Loading platforms cost \$16.00 to \$17.60 per square foot; add \$355 for steps.

BULK FERTILIZER STORAGE

C	Average	\$42.86	Wall-bearing block or concrete, wood trusses, driveway	Heavy bins, concrete slab, small finished office, blend area	Rigid conduit, sparkproof fixtures, some plumbing
D	Average	38.84	Heavy wood frame, roof, wood siding, driveway	Heavy bins, concrete slab, small finished office, blend area	Rigid conduit, sparkproof fixtures, some plumbing
DPOLE	Average	35.70	Metal siding on poles, wood sheathing, driveway	Heavy bins, concrete slab, small finished office, blend area	Rigid conduit, sparkproof fixtures, some plumbing
S	Average	40.06	Steel frame, siding and sheathing, driveway	Heavy bins, concrete slab, small finished office, blend area	Rigid conduit, sparkproof fixtures, some plumbing

FARM STORAGE BUILDINGS

REFINEMENTS: This page provides major adjustments to the base costs on the previous page. Follow Steps 1 through 5 to attain final costs, adjusted for lump sums, heating and cooling, story height, floor area/perimeter ratio and locality.

1

ADJUSTMENTS

Pole frame, rough wood floor, wrapped with cheap fencing materials or wire mesh: \$14.91 – \$15.98 per sq. ft. of ground area
 For metal roof, add \$1.57 – \$3.75 per sq. ft. of roof. Corn crib with spaced boards \$16.32 - \$17.40.



EXCLUSIVELY OWNER-BUILT CORN CRIBS

2

HEATING AND COOLING

These costs are averages of total installed cost of the entire heating or cooling installation including its prorated share of contractors' overhead and profit and architects' fees.

Electric cable or baseboard	\$4.31
Electric wall heaters (inc. FWA)	1.84
Forced air, ducted	4.85
heaters or furnace, vented	1.36
Hot water, baseboard/convactor	8.63
radiant floor or ceiling	8.87
Space heaters, with fan	2.37
radiant	2.79
Steam	7.68
Wall or floor furnace	9.58
Package heating and cooling	2.19
Ventilation, blower and ducts	1.36
fans only .....	.57

3

HEIGHT REFINEMENTS

STORY HEIGHT MULTIPLIERS

Multiply base cost by following multiplier for any variation in average story height.

Average Wall Height	Square Foot Multiplier
7	.943
8	.963
9	.981
10	1.000 (base)
11	1.019
12	1.038
13	1.058
14	1.077
16	1.115
18	1.154
20	1.192
22	1.231
24	1.269
28	1.346
32	1.423

4

Average Floor Area, Sq. Ft./Story	AVERAGE PERIMETER														Average Floor Area, Sq. Ft./Story
	50	75	150	200	250	300	350	400	500	600	700	800	900	1000	
500	1.044	1.178	1.577	1.844	2.110	2.377	2.643	2.909	----	----	----	----	----	----	500
750	.955	1.044	1.311	1.489	1.667	1.844	2.023	2.201	----	----	----	----	----	----	750
1,000	.911	.980	1.178	1.311	1.444	1.577	1.711	1.844	----	----	----	----	----	----	1,000
1,500	.866	.911	1.044	1.133	1.222	1.311	1.400	1.489	----	----	----	----	----	----	1,500
2,000	----	.878	.977	1.044	1.110	1.178	1.245	1.311	----	----	----	----	----	----	2,000
2,500	----	.858	.938	.991	1.044	1.097	1.150	1.204	----	----	----	----	----	----	2,500
3,000	----	.843	.911	.955	1.000	1.044	1.088	1.133	----	----	----	----	----	----	3,000
4,000	----	----	.878	.911	.945	.977	1.010	1.044	1.110	1.178	----	----	----	----	4,000
5,000	----	----	.857	.884	.911	.938	.960	.991	1.044	1.097	1.150	----	----	----	5,000
6,000	----	----	.843	.865	.888	.911	.934	.955	1.000	1.044	1.088	1.133	----	----	6,000
7,000	----	----	.835	.854	.873	.892	.911	.931	.967	1.006	1.044	1.080	----	----	7,000
8,000	----	----	----	.844	.860	.877	.894	.911	.945	.977	1.010	1.044	1.076	----	8,000
9,000	----	----	----	.836	.852	.867	.881	.896	.926	.955	.985	1.014	1.044	----	9,000
10,000	----	----	----	.844	.858	.871	.884	.911	.938	.960	.991	1.018	1.044	10,000	

Use the total length of walled sides as the perimeter. Do not use table for sheds without walls.

5

USE COUNTY MULTIPLIERS IN MULTIPLIER SECTION.

GREENHOUSES

OCCUPANCY DESCRIPTION: Enclosures used to regulate the climatic conditions for germinating and growing various plants and vegetables.

INCLUDED IN COSTS: Architects' fees and contractors' overhead and profit.

NOT INCLUDED IN COSTS: Heating or automated watering systems, shade curtains and planting benches.

STRAIGHT-WALL STRUCTURES

CLASS	TYPE	COST/ SQ. FT.	EXTERIOR WALLS	INTERIOR FINISH	LIGHTING & PLUMBING
D	Average	\$9.92	Wood frame, glass or fiberglass covering, some vents	Gravel, some concrete	Adequate electrical and hose bibs
	Fair	6.46	Wood frame, fiberglass walls, double polyethylene roof cover	Gravel floor	Minimum electrical, lighting and water
	Low cost	4.21	Post frame, fiberglass end walls, double polyethylene cover	Dirt floor	Minimum equipment outlet and hose bibs
	Cheap	3.74	Light post frame, wide spacing, polyethylene cover	Dirt floor	No electrical, hose bib only
S	Excellent	32.09	Best frame, translucent sandwich panels and venting	Concrete floor, drains	Good lighting and plumbing
	Very good	26.47	Heavy frame, good sandwich panels, good wall and roof vents	Good concrete walks	Adequate electrical, good fixtures and water service
	Good	21.80	Good metal frame, tempered glass, polycarbonate or acrylic, good vents	Concrete walks	Adequate electrical and water service
	Average	10.15	Metal frame, glass or fiberglass covering, some vents	Gravel, some concrete	Adequate electrical and hose bibs
	Fair	6.91	Metal frame, double polyethylene arch roof, fiberglass walls	Gravel floor	Minimum electrical, lighting and water
	Low cost	4.71	Metal frame, fiberglass end walls, double polyethylene cover	Dirt floor	Minimum equipment outlet and hose bib
	Cheap	4.19	Light pipe arch, wide spacing, polyethylene cover	Dirt floor	No electrical, hose bib only

HOOP (ARCH-RIB/QUONSET) STRUCTURES

D	Low cost	\$3.92	Light built-up wood arch, fiberglass ends, double polyethylene cover	Dirt floor	Minimum equipment outlet and hose bibs
S	Very good	18.54	Good translucent sandwich panels, heavy frame, pitched peak, vents	Good concrete walks	Adequate electrical, good fixtures and water service
	Good	15.30	Good polycarbonate or acrylic cover, roof and wall vents	Concrete walks	Adequate electrical and water service
	Average	7.21	Fiberglass panels on light arch frame, some vents	Gravel, some concrete	Adequate electrical and hose bibs
	Fair	4.94	Pipe or light tubular arch, double poly., fiberglass ends & knee walls	Gravel floor	Minimum electrical, lighting and water
	Low cost	3.39	Trussed pipe arch, double polyethylene cover, fiberglass end walls	Dirt floor	Minimum equipment outlet and hose bibs
	Cheap	3.02	Light pipe arch, wide spacing, polyethylene cover	Dirt floor	No electrical, hose bib only

For modified hoop structures (3' straight side wall), add 5%.

SHADE SHELTERS

D	Average	\$2.28	Light wood posts and girders, shade netting cover	Some gravel	No electrical, hose bibs only
	Low	1.68	No walls, wood posts and cable, flat shade netting roof	Dirt floor	Hose bibs only
S	Average	2.57	Light pipe columns and girders, shade netting cover	Some gravel	No electrical, hose bibs only
	Low	1.92	No walls, steel pipe and cable, flat shade netting roof	Dirt floor	Hose bibs only

LATH SHADE HOUSES

D	Average	\$4.97	Wood skeleton frame, spaced wood lath	Gravel, some concrete walks	Equipment outlets and hose bibs
S	Average	8.83	Metal skeleton frame, spaced aluminum lath	Gravel, some concrete walks	Equipment outlets and hose bibs

GREENHOUSES

REFINEMENTS: This page provides major adjustments to the base costs on the previous page. Follow Steps 1 through 5 to attain final costs, adjusted for lump sums, heating and cooling, story height, floor area/perimeter ratio and locality.

1	ADJUSTMENTS	COST RANGE
	Humidifiers, each	\$ 415.00 – \$2,070.00
	Exhaust fan cooling assembly, per sq. ft. of pad	725.00 – 1,950.00
	Water-drip humidity pad assembly, per sq. ft. of pad	13.20 – 21.05
	Automatic vent and/or environmental controls, per unit	725.00 – 1,870.00
	Automatic chemical injectors (excluding tanks), per unit	2,420.00 – 4,300.00
	Automatic water controls, per unit	275.00 – 690.00
	Traveling boom sprayer, per linear foot of rail	44.25 – 93.00
	Roof shade curtains, per sq. ft. of cover, man. ....	.72 – .89
	Hinged sidewall vents, manual, per linear foot	30.25 – 35.75
	Automatic sidewall curtain assembly, per linear foot	12.35 – 16.25
	Concrete Curb per linear foot	2.69 – 5.95
	Stem Knee Walls. Per linear foot	11.50 – 14.30
	MISCELLANEOUS SQUARE FOOT COSTS	
	Electrical: Low Cost \$.23 ; Average, \$.71; Good, \$1.43; Excellent, \$2.49	
	Floors or walks: Dirt, \$.23 - \$.36; Gravel, \$.51 - \$.74; Asphalt, \$1.94 - \$3.16; Concrete, \$2.86 - \$4.17	
	Water system, plastic: Spray, \$.18 - \$.31; Mist, \$.27 - \$.46; Drip tube, \$.33 - \$.54	
	Planting benches, per square foot of bench: Plastic, \$3.48 - \$5.54; Wood slat, \$5.49 - \$6.27; Solid propagating, \$5.95 - \$10.65	

2	HEATING AND COOLING	
	These costs are averages of total installed cost of the entire heating or cooling installation including its prorated share of contractors' overhead and profit and architects' fees.	
	Hot water or steam	\$4.85
	Gas furnaces	3.25
	Suspended gas heaters	2.79
	add for fan-jet duct distribution .....	.98
	Ventilation, fans only .....	.57

3	HEIGHT REFINEMENTS	
	STORY HEIGHT MULTIPLIERS	
	Multiply base cost by following multiplier for any variation in average story height.	
	Average Wall Height	Square Foot Multiplier
	7	.973
	8	.983
	9	.991
	10	1.000(base)
	11	1.009
	12	1.018
	13	1.027
	14	1.036
	16	1.055
	18	1.074

4	Average Floor Area, Sq. Ft./Story	AVERAGE PERIMETER												Average Floor Area, Sq. Ft./Story		
		90	120	200	300	500	600	800	1000	1200	1400	1600	1800		2000	
	500	1.710	1.750	1.840	----	----	----	----	----	----	----	----	----	----	----	500
	1,000	1.650	1.670	1.720	1.780	----	----	----	----	----	----	----	----	----	----	1,000
	2,000	1.360	1.370	1.410	1.450	----	----	----	----	----	----	----	----	----	----	2,000
	4,000	----	1.170	1.200	1.240	1.320	----	----	----	----	----	----	----	----	----	4,000
	5,000	----	----	1.150	1.160	1.180	1.190	----	----	----	----	----	----	----	----	5,000
	6,000	----	----	----	1.110	1.130	1.140	----	----	----	----	----	----	----	----	6,000
	8,000	----	----	----	1.040	1.060	1.070	1.080	----	----	----	----	----	----	----	8,000
	10,000	----	----	----	.950	.990	1.000	1.020	1.040	----	----	----	----	----	----	10,000
	20,000	----	----	----	----	.830	.840	.860	.880	----	----	----	----	----	----	20,000
	25,000	----	----	----	----	----	.800	.820	.840	.860	----	----	----	----	----	25,000
	50,000	----	----	----	----	----	----	.680	.700	.720	.740	----	----	----	----	50,000
	100,000	----	----	----	----	----	----	----	.580	.590	.600	.610	----	----	----	100,000
	200,000	----	----	----	----	----	----	----	----	.550	.560	.570	.580	.590	----	200,000

5 USE COUNTY MULTIPLIERS IN MULTIPLIER SECTION.

PACKING AND COLD STORAGE BUILDINGS



CLASS S FRUIT PACKING BARN



AVERAGE CLASS C COLD STORAGE

OCCUPANCY DESCRIPTION: Seed processing storage buildings are designed for bulk storage, cleaning and bagging of various grass seeds and for temporary bag storage and distribution. Costs include a heavy concrete floor and storage bins.

Fruit packing barns are for the packing and short term storage of fresh produce.

Cold storage buildings are designed to keep stored horticultural crops at various temperature levels. Some partitions and office areas are included in the better qualities.

INCLUDED IN COSTS: Built-in refrigerator rooms.

NOT INCLUDED IN COSTS: Heat, refrigeration or special fixtures or packing equipment.

SEED PROCESSING STORAGE

CLASS	TYPE	COST/ SQ. FT.	EXTERIOR WALLS	INTERIOR FINISH	LIGHTING & PLUMBING
D	Average	\$30.39	Heavy wood frame, studs and roof, wood siding, sliding	Heavy bins and concrete slab, cleaning area, warehouse	Rigid conduit, dustproof fixtures, water service
DPOLE	Average	26.65	Metal siding on pole frame, stud infill sheathing, sliding doors	Heavy bins and concrete slab, cleaning area, warehouse	Rigid conduit, dustproof fixtures, water service
S	Average	30.11	Steel frame and siding, some sheathing, sliding doors	Heavy bins and concrete slab, cleaning area, warehouse	Rigid conduit, dustproof fixtures, water service
DS	Mezzanine	10.38	Not included	Loft floor, adequate support, heavy plywood or plank flooring	Not included

FRUIT PACKING BARNES

C	Average	\$32.26	Block or tilt-up, light truss, metal or built-up roof	Produce cooler, concrete slab, small finished office	Good lighting, water service
D	Average	28.61	Plywood on studs or box frame, metal or composition roof	Fruit cooler, concrete slab, small finished office	Good lighting, water service
DPOLE	Average	26.32	Metal siding on poles, no wainscot	Fruit cooler, concrete slab, small finished office	Good lighting, water service
S	Average	30.04	Steel siding and frame	Fruit cooler, concrete slab, small finished office	Good lighting, water service

FARM COLD STORAGE BUILDINGS

C	Good	\$47.65	Steel or wood frame or bearing walls, block or tilt-up, insulated	Cooler and chilled rooms, some distribution office and finish	Adequate lighting and plumbing
	Average	33.67	Block, tilt-up, light construction, exposed ceiling insulation	Cooler storage, unfinished, few partitions, small office	Minimum lighting and plumbing
	Low cost	23.83	Block, tilt-up, very plain, light construction, exposed ceiling insulation	Cooler storage, unfinished, concrete slab	Minimum lighting and water service
D	Good	43.21	Good wood frame with stucco or siding, fully insulated	Cooler and chilled rooms, some distribution office and finish	Adequate lighting and plumbing
	Average	29.89	Stucco or siding on wood, exposed ceiling insulation	Cooler storage, unfinished, few partitions, small office	Minimum lighting and plumbing
	Low cost	20.71	Stucco or siding on studs or box frame, exposed insulation	Cooler storage, unfinished, concrete slab	Minimum lighting and water service
DPOLE	Average	27.63	Pole frame, metal siding, lined, exposed ceiling insulation	Cooler storage, unfinished, few partitions, small office	Minimum lighting and plumbing
	Low cost	19.43	Pole frame, metal siding, exposed insulation	Cooler storage, unfinished, concrete slab	Minimum lighting and water service
S	Good	44.61	Rigid steel frame, insulated siding or low-cost sandwich panels	Cooler and chilled rooms, some distribution office and finish	Adequate lighting and plumbing
	Average	31.27	Pre-engineered frame, metal siding, lined, exposed ceiling insulation	Cooler storage, unfinished, few partitions, small office	Minimum lighting and plumbing
	Low cost	21.96	Light frame, metal siding, exposed insulation	Cooler storage, unfinished, concrete slab	Minimum lighting and water service

PACKING AND COLD STORAGE BUILDINGS

REFINEMENTS: This page provides major adjustments to the base costs on the previous page. Follow Steps 1 through 5 to attain final costs, adjusted for lump sums, heating and cooling, story height, floor area/perimeter ratio and locality.

1

ADJUSTMENTS	
Cold storage refrigeration	
Freezer/sharp freezer.....	\$19.85
Chiller/freezer.....	17.10
Cooler/chilled air.....	14.55
Cooled air only.....	12.60
Controlled atmosphere	
Nonenvironmental buildings	
Conditioned/ventilated air	4.31
Cooled air	11.10
For dock-height floors, add the cost per square foot to the base cost of the first floor.	
Elevated on compacted fill: \$3.52 – \$6.95 per square foot. For cut and balance, use proportional cost.	
Elevated on posts and piers with cross bracing, beams and skirting: \$9.64 – \$13.00 per square foot	

2

HEATING AND COOLING	
These costs are averages of total installed cost of the entire heating or cooling installation including its prorated share of contractors' overhead and profit and architects' fees.	
Electric cable or baseboard	\$4.31
Electric wall heaters (inc. FWA)	1.84
Forced air, ducted	4.85
Heaters or furnace, vented	1.36
Hot water, baseboard/convactor	8.63
Radiant floor or ceiling	8.87
Space heaters, with fan	2.37
Radiant	2.79
Steam	7.68
Wall or floor furnace	9.58
Package heating and cooling	2.19
Ventilation, blower and ducts	1.36
Fans only .....	.57

3

HEIGHT REFINEMENTS	
STORY HEIGHT MULTIPLIERS	
Multiply base cost by following multiplier for any variation in average story height.	
Average Wall Height	Square Foot Multiplier
8	.963
9	.981
10	1.000 (base)
11	1.019
12	1.038
13	1.058
14	1.077
16	1.115
18	1.154
20	1.192
22	1.231
24	1.269
28	1.346
32	1.423
36	1.500

4

Average Floor Area, Sq. Ft./Story	AVERAGE PERIMETER														Average Floor Area, Sq. Ft./Story
	100	125	150	200	250	300	350	400	500	600	700	800	900	1000	
1,000	1.044	1.110	1.178	1.311	1.444	1.577	1.711	1.844	----	----	----	----	----	----	1,000
2,000	.911	.945	.977	1.044	1.110	1.178	1.245	1.311	----	----	----	----	----	----	2,000
3,000	.865	.889	.911	.955	1.000	1.044	1.088	1.133	----	----	----	----	----	----	3,000
4,000	----	.860	.878	.911	.945	.977	1.010	1.044	1.110	1.178	----	----	----	----	4,000
5,000	----	.844	.857	.884	.911	.938	.960	.991	1.044	1.097	1.150	----	----	----	5,000
6,000	----	----	.843	.865	.888	.911	.934	.955	1.000	1.044	1.088	1.133	----	----	6,000
7,000	----	----	.835	.854	.873	.892	.911	.931	.967	1.006	1.044	1.080	----	----	7,000
8,000	----	----	----	.844	.860	.877	.894	.911	.945	.977	1.010	1.044	1.076	----	8,000
9,000	----	----	----	.836	.852	.867	.881	.896	.926	.955	.985	1.014	1.044	----	9,000
10,000	----	----	----	----	.844	.858	.871	.884	.911	.938	.960	.991	1.018	1.044	10,000
12,000	----	----	----	----	.833	.843	.855	.867	.888	.911	.934	.955	.977	1.000	12,000
14,000	----	----	----	----	.825	.835	.844	.854	.873	.892	.911	.931	.949	.967	14,000
18,000	----	----	----	----	----	.822	.828	.836	.852	.867	.881	.896	.911	.926	18,000
20,000	----	----	----	----	----	.818	.824	.831	.844	.858	.871	.884	.898	.911	20,000

5 **USE COUNTY MULTIPLIERS IN MULTIPLIER SECTION.**

FRUIT/VEGETABLE STORAGE BUILDINGS



CHEAP CLASS D POTATO STORAGE

OCCUPANCY DESCRIPTION: Potato storage buildings are designed to provide long term storage. The masonry structures are built below grade with heaped earth on three sides, while the wood or steel frame buildings have metal or wood siding with insulated walls and roof.



LOW-COST S ENVIRONMENTAL

Fruit/vegetable buildings are the modern, controlled atmosphere buildings for the long-term storage of apples, potatoes, onions, etc.

INCLUDED IN COSTS: Architects' fees and contractors' overhead and profit. Built-in refrigerator and fan rooms.

NOT INCLUDED IN COSTS: No heat, refrigeration or controlled atmosphere equipment or sensors.

POTATO STORAGE

CLASS	TYPE	COST/ SQ. FT.	EXTERIOR WALLS	INTERIOR FINISH	LIGHTING & PLUMBING
C	Good	\$53.55	Block, below grade, heaped earth 3 sides, heavy insulation and roof	Partitions, bulkheads, plank floors raised over concrete, heating ducts	Adequate electrical, water service
	Average	35.95	Block, below grade, heaped earth three sides, insulation	Partitions, bulkheads, plank floors on concrete, heating ducts	Minimum lighting, no plumbing
	Low cost	24.17	Block or tile, light insulation and roof	Partitions, concrete air channels	Minimum lighting only
	Cheap	13.05	Dirt trench, block end walls only, pole rafters, straw,	Unfinished, dirt floor	Minimum electrical only
D	Good	49.10	Wood T&G on heavy studs, heavily insulated	Heavy partitions and bulkheads, plank floors raised	Adequate lighting outlets, water service
	Average	31.76	Plywood or siding on wood studs, good roof, moderate insulation	Partitions, bulkheads, plank floors on concrete, heating ducts	Minimum lighting, no plumbing
	Low cost	20.56	Plywood, lightly insulated roof	Partitions, concrete air channels	Minimum lighting only
	Cheap	10.27	Dirt trench, wood end walls only, pole rafters, straw, dirt cover	Unfinished, dirt floor	Minimum electrical only
DPOLE	Good	44.15	Pole frame, metal panels and sheathing, heavily insulated	Heavy partitions and bulkheads, plank floors raised	Adequate lighting outlets, water service
	Average	28.52	Pole frame, good metal panels, roof, moderately insulated	Partitions, bulkheads, plank floors on concrete, heating ducts	Minimum lighting, no plumbing
	Low cost	18.45	Pole frame, lightly insul. roof	Partitions, concrete air channels	Minimum lighting only
	Cheap	9.02	Dirt trench, metal end walls only, pole rafters, straw, dirt cover	Unfinished, dirt floor	Minimum electrical only
D	Good	49.69	Metal sandwich panels or steel and sheathing, heavily insulated	Heavy partitions and bulkheads, plank floors raised	Adequate lighting outlets, water service
	Average	32.95	Steel siding, frame, good roof, moderately insulated	Partitions, bulkheads, plank floors on concrete, heating ducts	Minimum lighting, no plumbing
	Low cost	21.88	Galv. steel, lightly insulated roof	Partitions, concrete air channels	Minimum lighting only

VEGETABLE BUILDINGS – ENVIRONMENTAL

SSLANT WALL	Good	\$48.40	Built-up steel sandwich envelope-cavity wall and roof, insulated	Concrete floor and plenum with catwalk, attached fan	Adequate electrical and water service
	Fair	34.52	Built-up steel sandwich envelope-cavity wall and roof, insulated	Elevated concrete floor, plenum, catwalk, attached fan room	Adequate electrical and water service
	Low cost	30.86	Built-up steel sandwich envelope-cavity wall and roof, insulated	Dirt floor, concrete center plenum, catwalk, attached fan room	Adequate electrical and water service

CONTROLLED ATMOSPHERE BUILDINGS

C	Average	\$41.17	Block, tilt-up, light construction, sealed ceiling insulation	Controlled atmosphere storage, sealed rooms, double slab	Adequate electrical and water service
D	Average	37.21	Stucco or siding on wood, sealed ceiling	Controlled atmosphere storage, sealed rooms, double slab	Adequate electrical and water service
DPOLE	Average	34.51	Pole frame, metal siding, lined, sealed ceiling insulation	Controlled atmosphere storage, sealed rooms, double slab	Adequate electrical and water service
S	Average	39.04	Pre-engineered frame, metal siding, lined, sealed ceiling insulation	Controlled atmosphere storage, sealed rooms, double slab	Adequate electrical and water service

FRUIT/VEGETABLE STORAGE BUILDINGS

REFINEMENTS: This page provides major adjustments to the base costs on the previous page. Follow Steps 1 through 5 to attain final costs, adjusted for lump sums, heating and cooling, story height, floor area/perimeter ratio and locality.

1

ADJUSTMENTS	
Controlled atmosphere	
nonenvironmental buildings	
conditioned/ventilated air	\$ 4.31
Cooled air	11.10
environmental buildings	
fruits, conditioned and cooled air	24.40
Vegetables, high to precise humidity	44.25
Warm and cooled air	59.00

2

HEATING AND COOLING	
These costs are averages of total installed cost of the entire heating or cooling installation including its prorated share of contractors' overhead and profit and architects' fees.	
Electric cable or baseboard	\$4.31
Electric wall heaters (inc. FWA)	1.84
Forced air, ducted	4.85
Heaters or furnace, vented	1.36
Hot water, baseboard/convactor	8.63
Radiant floor or ceiling	8.87
Space heaters, with fan	2.37
Radiant	2.79
Steam	7.68
Wall or floor furnace	9.58
Package heating and cooling	2.19
Ventilation, blower and ducts	1.36
fans only .....	.57

3

HEIGHT REFINEMENTS	
STORY HEIGHT MULTIPLIERS	
Multiply base cost by following multiplier for any variation in average story height.	
Average Wall Height	Square Foot Multiplier
7	.943
8	.963
9	.981
10	1.000 (base)
11	1.019
12	1.038
13	1.058
14	1.077
16	1.115
18	1.154
20	1.192
22	1.231
24	1.269
28	1.346
32	1.423
36	1.500

4

Average Floor Area, Sq. Ft./Story	AVERAGE PERIMETER														Average Floor Area, Sq. Ft./Story
	100	125	150	200	250	300	350	400	500	600	700	800	900	1000	
1,000	1.044	1.110	1.178	1.311	1.444	1.577	1.711	1.844	----	----	----	----	----	----	1,000
2,000	.911	.945	.977	1.044	1.110	1.178	1.245	1.311	----	----	----	----	----	----	2,000
3,000	.865	.889	.911	.955	1.000	1.044	1.088	1.133	----	----	----	----	----	----	3,000
4,000	----	.860	.878	.911	.945	.977	1.010	1.044	1.110	1.178	----	----	----	----	4,000
5,000	----	.844	.857	.884	.911	.938	.960	.991	1.044	1.097	1.150	----	----	----	5,000
6,000	----	----	.843	.865	.888	.911	.934	.955	1.000	1.044	1.088	1.133	----	----	6,000
7,000	----	----	.835	.854	.873	.892	.911	.931	.967	1.006	1.044	1.080	----	----	7,000
8,000	----	----	----	.844	.860	.877	.894	.911	.945	.977	1.010	1.044	1.076	----	8,000
9,000	----	----	----	.836	.852	.867	.881	.896	.926	.955	.985	1.014	1.044	----	9,000
10,000	----	----	----	----	.844	.858	.871	.884	.911	.938	.960	.991	1.018	1.044	10,000
12,000	----	----	----	----	.833	.843	.855	.867	.888	.911	.934	.955	.977	1.000	12,000
14,000	----	----	----	----	.825	.835	.844	.854	.873	.892	.911	.931	.949	.967	14,000
18,000	----	----	----	----	----	.822	.828	.836	.852	.867	.881	.896	.911	.926	18,000
20,000	----	----	----	----	----	.818	.824	.831	.844	.858	.871	.884	.898	.911	20,000

5

USE COUNTY MULTIPLIERS IN MULTIPLIER SECTION.

FARM LABOR HOUSING



OCCUPANCY DESCRIPTION: These buildings provide minimum living facilities for families. The construction is usually box frame with plywood or board and batten exterior finish. Concrete or board floors, no partitions and minimum cabinetry are included in the costs. Minimum lighting and electrical outlets and kitchen sink with cold water service will normally be found.

INCLUDED IN COSTS: Architects' fees and contractors' overhead and profit.

NOT INCLUDED IN COSTS: Heat, sprinklers, kitchen equipment or recreational equipment.

TRANSIENT LABOR CABINS

CLASS	TYPE	COST/ SQ. FT.	EXTERIOR WALLS	INTERIOR FINISH	LIGHTING & PLUMBING
D	Average	\$30.86	Box frame, plywood, board and batten or metal siding	Slab or board floor, no partitions, minimum cabinetry	One or two lights and outlets, sink with cold water

LABOR DORMITORIES (BUNK HOUSES)

C	Good	\$49.09	Cheap brick, stucco on block, good fenestration, insulated	Concrete floor, gypsum or plywood partitions, individual rms.	Lighting and outlet in each room, common shower room
	Average	38.26	Block, adequate fenestration	Concrete floor, common rooms	Adequate lighting, plumbing in common restroom
	Low cost	29.91	Low-cost block, minimum fenestration	Unfinished, no partitions	Minimum lighting and water service
D	Good	44.68	Stucco or siding on studs, good fenestration, insulated	Concrete floor, gypsum or plywood partitions, individual rms.	Lighting and outlet in each room, common shower room
	Average	33.06	Plywood or siding on box frame or wide-spaced studs	Concrete floor, common rooms	Adequate lighting, plumbing in common restroom
	Low cost	24.53	Box frame, plywood or board and batten	Light slab, unfinished interior	Minimum droplights, water service
S	Good	46.74	Steel panels and frame, good fenestration, insulated	Concrete floor, gypsum or plywood partitions, individual rms.	Lighting and outlet in each room, common shower room
	Average	35.20	Steel panels and frame, sheathing	Concrete floor, common rooms	Adequate lighting, minimum plumbing
CDS	Utility basement	20.43	Unfinished block or concrete walls, waterproofed, concrete slab	Unfinished storage and utility, open stairs or outside entry	Minimum light fixtures and outlets, floor drain
	Unfinished cellar	7.81	Excavated dirt walls	Unfinished, dirt floor, post and pier flooring supports	None

FARM LABOR HOUSING

REFINEMENTS: this page provides major adjustments to the base costs on the previous page. Follow Steps 1 through 5 to attain final costs, adjusted for lump sums, heating and cooling, story height, floor area/perimeter ratio and locality.

1

<p>KITCHENS: For units having kitchens or built-in kitchen units, add the following:</p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td>Excellent (stove, refrigerator, sink & cabinet unit) . . .</td> <td style="text-align: right;">\$5,250</td> </tr> <tr> <td>Good</td> <td style="text-align: right;">3,825</td> </tr> <tr> <td>Average (cabinets and sink)</td> <td style="text-align: right;">2,850</td> </tr> <tr> <td>Low cost</td> <td style="text-align: right;">2,130</td> </tr> </table>	Excellent (stove, refrigerator, sink & cabinet unit) . . .	\$5,250	Good	3,825	Average (cabinets and sink)	2,850	Low cost	2,130	<p>ADDITIONAL EQUIPMENT</p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td>Water heater</td> <td style="text-align: right;">\$740 - \$1,640</td> </tr> <tr> <td>Exhaust fan</td> <td style="text-align: right;">125 - 315</td> </tr> </table>	Water heater	\$740 - \$1,640	Exhaust fan	125 - 315
Excellent (stove, refrigerator, sink & cabinet unit) . . .	\$5,250												
Good	3,825												
Average (cabinets and sink)	2,850												
Low cost	2,130												
Water heater	\$740 - \$1,640												
Exhaust fan	125 - 315												

2

HEATING AND COOLING

These costs are averages of total installed cost of the entire heating or cooling installation including its prorated share of contractors' overhead and profit and architects' fees.

Electric cable or baseboard	\$4.31
Electric wall heaters (inc. FWA)	1.84
Forced air, ducted	4.85
heaters or furnace, vented	1.36
Hot water, baseboard/convactor	8.63
radiant floor or ceiling	8.87
Space heaters, with fan	2.37
radiant	2.79
Steam	7.68
Wall or floor furnace	9.58
Package heating and cooling	2.19
Ventilation, blower and ducts	1.36
fans only . . . . .	.57

3

HEIGHT REFINEMENTS

STORY HEIGHT MULTIPLIERS
Multiply base cost by following multiplier for any variation in average story height.

Average Wall Height	Square Foot Multiplier
7	.943
8	.963
9	.981
10	1.000 (base)
11	1.019
12	1.038
13	1.058
14	1.077
16	1.115
18	1.154
20	1.192
22	1.231
24	1.269
28	1.346
32	1.423
36	1.500

4

Average Floor Area, Sq. Ft./Story	AVERAGE PERIMETER														Average Floor Area, Sq. Ft./Story
	50	75	100	125	150	200	250	300	350	400	500	600	700	800	
500	1.044	1.178	1.311	1.444	1.577	1.844	2.110	2.377	2.643	2.909	----	----	----	----	500
750	.955	1.044	1.133	1.222	1.311	1.489	1.667	1.844	2.023	2.201	----	----	----	----	750
1,000	.911	.980	1.044	1.110	1.178	1.311	1.444	1.577	1.711	1.844	----	----	----	----	1,000
1,500	.866	.911	.955	1.000	1.044	1.133	1.222	1.311	1.400	1.489	----	----	----	----	1,500
2,000	----	.878	.911	.945	.977	1.044	1.110	1.178	1.245	1.311	----	----	----	----	2,000
2,500	----	.858	.884	.911	.938	.991	1.044	1.097	1.150	1.204	----	----	----	----	2,500
3,000	----	.843	.865	.889	.911	.955	1.000	1.044	1.088	1.133	----	----	----	----	3,000
3,500	----	----	.854	.872	.892	.931	.967	1.006	1.044	1.080	1.157	----	----	----	3,500
4,000	----	----	----	.860	.878	.911	.945	.977	1.010	1.044	1.110	1.178	----	----	4,000
5,000	----	----	----	.844	.857	.884	.911	.938	.960	.991	1.044	1.097	1.150	----	5,000
6,000	----	----	----	----	.843	.865	.888	.911	.934	.955	1.000	1.044	1.088	1.133	6,000
7,000	----	----	----	----	.835	.854	.873	.892	.911	.931	.967	1.006	1.044	1.080	7,000
8,000	----	----	----	----	----	.844	.860	.877	.894	.911	.945	.977	1.010	1.044	8,000
10,000	----	----	----	----	----	----	.844	.858	.871	.884	.911	.938	.960	.991	10,000

5

USE COUNTY MULTIPLIERS IN MULTIPLIER SECTION.

CORN CRIBS



OCCUPANCY DESCRIPTION: Dry storage of corn on the cob.
For frame cribs, see Page 267.

Cylindrical wire mesh corn cribs with concrete base, steel frame and conical steel roof . . . \$2.36 – \$4.05 per bushel of capacity.

BASE STRUCTURE: Cost each

DIAMETER	HEIGHT	CAPACITY Bushels	COST RANGE	DIAMETER	HEIGHT	CAPACITY Bushels	COST RANGE	
8'	8'	134.1	\$ 420 – \$ 615	14'	16'	821	\$2,040 – \$3,200	
	12'	201.1	580 – 875		20'	1,026.3	2,490 – 3,950	
	16'	268.1	745 – 1,130		24'	1,231.5	2,975 – 4,750	
10'	12'	314.2	850 – 1,290	16'	16'	1,072.3	2,575 – 4,150	
	16'	418.9	1,100 – 1,690		20'	1,340.4	3,175 – 5,150	
	20'	523.6	1,350 – 2,090		24'	1,608.5	3,800 – 6,150	
12'	12'	452.4	1,190 – 1,830	28'	28'	1,876.6	4,425 – 7,150	
	16'	603.2	1,530 – 2,380					
	20'	754	1,880 – 2,975					
	24'	904.8	2,210 – 3,525					

Deduct \$2.97 per square foot for lack of slab.
If no roof deduct \$2.86 to \$3.74 per square foot.

HORIZONTAL SILOS



BUNKER SILOS

OCCUPANCY DESCRIPTIONS: A bunker silo is used primarily for corn or grass silage. Treated plank side walls or tilt-up concrete panels with open ends. Usually above ground with concrete floor on grade.



BUNKER SILOS

A trench silo is used primarily for corn or grass silage. Usually below ground with concrete or treated plank floor and side walls.

COST PER LINEAR FOOT OF LENGTH	WIDTH, Feet						
	20	30	40	50	60	80	100
BUNKER SILOS (Above ground)							
Tilt-up concrete panels and precast wall supports, sealed . .	\$345	\$385	\$425	\$455	\$470	\$520	\$550
Poles and braces, tilt-up concrete panels, concrete floor . . .	250	280	305	330	355	385	420
Cantilevered poles, plywood or T&G walls, concrete floor. . .	210	250	275	300	325	365	395
TRENCH SILOS (Below ground)							
Concrete wall panels and floor, sealed	\$330	\$395	\$430	\$510	\$555	\$630	\$705
Plywood or T&G walls, concrete floor	240	305	365	415	460	550	625
Dirt trench, plastic lined, no flooring.	65	93	120	155	175	230	285

Add or deduct 8% for each foot of deviation from the 12' base height. For concrete tilt-up panels on bunker silos 16' and over, add 10% for each foot of deviation from 12' base height. For asphalt floor, deduct \$.84 per square foot. For roof cover, add \$2.59 to \$3.96 per square foot. For end walls, add per linear foot: 8' high, \$76; 10' high, \$110; 16' high, \$150.

FEED LOTS

BUNK FEEDERS



CATTLE FEED BUNK

OCCUPANCY DESCRIPTION: Two sided feeders used in cattle lots, for beef or dairy cattle. Concrete construction with plank sides or post and plank construction.

BASE STRUCTURE	COST/LIN. FT.
Concrete	\$50.00 – \$71.00
Plank	24.75 – 30.25
Steel	40.75 – 50.00
Wood	23.95 – 32.75



CATTLE FENCE BUNK

OCCUPANCY DESCRIPTION: One sided feeder used in cattle lots, for beef or dairy cattle. Concrete or post and plank construction.

BASE STRUCTURE	COST/LIN. FT.
Concrete	\$36.75 – \$43.00
Plank	20.45 – 25.50
Steel	28.00 – 35.50
Wood	14.30 – 21.75

ADJUSTMENTS	COST/LIN. FT.
Roof 10' wide, wood	\$ 43.00 – \$ 53.00
Metal	52.00 – 59.00
10' concrete apron	19.25 – 22.40
Mechanical feeder, automatic control	229.00 – 275.00
Manual control	89.00 – 125.00

For stock fencing, see Page 250.

STOCK WATERER – Cost each	YARD PAVING – Cost per square foot
Used in cattle and hog feed lots	Concrete, plain, 4" thick
Underground piping, wiring, automatic controls	6"
Cattle	mesh reinforced, 4"
Hogs or sheep	6"
Combination cattle and hogs	Asphalt paving, 2" thick
	Crushed rock, 3" thick

SILOS

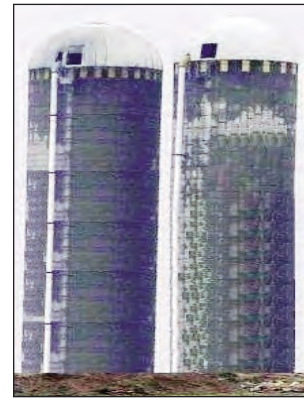
GLASS-LINED STEEL: Complete with ladder, dome roof. Mechanical unloading equipment not included.

SIZE DIAMETER (ft.) x HEIGHT (ft.)	COST	SIZE DIAMETER (ft.) x HEIGHT (ft.)	COST
14 x 23	\$34,900	20 x 68	\$ 92,500
14 x 32	38,900	20 x 77	103,000
14 x 41	46,000	20 x 87	116,000
17 x 31	49,500	25 x 34	102,000
17 x 40	54,000	25 x 42	110,000
17 x 49	60,500	25 x 43	113,000
20 x 28	52,750	25 x 51	126,000
20 x 32	57,250	25 x 60	129,000
20 x 33	60,500	25 x 69	141,000
20 x 38	63,750	25 x 79	157,000
20 x 41	66,250	25 x 88	172,000
20 x 43	67,250	31 x 70	200,000
20 x 50	73,750	31 x 80	219,000
20 x 59	81,500	31 x 89	244,000

SILOS



CONCRETE STAVE



**REINFORCED CONCRETE
CAST-IN-PLACE**

OCCUPANCY DESCRIPTION: Used to store corn or grass silage, haylage, high-moisture grain and other fermented feed.

NOT INCLUDED IN COSTS: Mechanical unloading equipment.

CONCRETE STAVE: Complete with ladder, chute and dome roof.

DIAMETER (Feet)	HEIGHT (Feet)								
	30	35	40	45	50	60	70	80	90
10	\$10,900	\$12,600	\$14,300	\$16,100	\$17,900	----	----	----	----
12	11,400	13,400	15,300	17,200	19,100	\$22,900	----	----	----
14	13,200	15,400	17,600	19,800	21,900	26,200	\$30,600	----	----
16	13,700	15,900	18,100	20,500	22,800	27,200	31,700	\$36,200	----
18	14,800	17,200	19,600	22,100	24,600	29,400	34,300	39,100	\$44,000
20	16,400	19,200	21,900	24,700	27,500	33,000	38,400	43,900	49,200
22	19,200	22,400	25,500	28,700	31,800	38,300	44,500	50,750	57,250
24	----	----	----	----	36,700	44,000	51,250	58,250	65,500
26	----	----	----	----	----	48,700	56,750	64,500	72,500
28	----	----	----	----	----	53,750	62,750	71,500	80,250
30	----	----	----	----	----	59,500	69,500	79,250	89,000

REINFORCED CONCRETE, CAST-IN-PLACE: Complete with ladder, chute and dome roof.

DIAMETER (Feet)	HEIGHT (Feet)								
	30	35	40	45	50	60	70	80	90
10	----	----	----	----	----	----	----	----	----
12	\$16,400	\$19,100	\$21,800	\$24,600	\$27,300	\$32,700	----	----	----
14	19,000	22,100	25,200	28,300	31,400	37,600	\$44,000	----	----
16	19,600	22,900	26,100	29,400	32,600	39,100	45,500	\$ 52,000	----
18	21,200	24,800	28,300	31,800	35,200	42,300	49,200	56,250	\$ 63,000
20	23,700	27,700	31,700	35,600	39,400	47,300	55,000	63,000	70,750
22	27,600	32,200	36,700	41,300	45,800	54,750	63,750	73,250	82,250
24	----	----	----	----	52,750	63,250	73,750	84,000	94,250
26	----	----	----	----	----	67,500	78,500	89,500	100,000
28	----	----	----	----	----	72,000	83,750	95,500	107,000
30	----	----	----	----	----	76,750	89,250	102,000	114,000

ADJUSTMENTS

For no chute, deduct \$17.35 to \$20.95 per vertical linear foot.

For flat roof, deduct \$5.45 per square foot of area.

For no roof, deduct \$10.30 per square foot of area.

STEEL GRAIN BINS

STANDARD BINS: Costs are averages for utility-type storage bins usually found on farms and ranches. Costs of standard bins are for tank with door and manhole, erected on the buyer's slab. Height is to top of shell. Cost of drying bin includes ventilated floor, auger tube, steel columns and beam supports for plenum assembly, fans and heat.



ADJUSTMENTS:

Ladders: \$68.00 plus \$9.71 per linear foot
 For safety cages, add: \$18.90 to \$23.45 per linear foot installed
 Auger and drive: \$405.00 plus \$39.25 to \$47.75 per foot of bin diameter
 For small feed tanks, use \$120.00 to \$100.00 per foot. Add \$4,725 for scale.
 For spreaders, add: \$785.00 to \$1,190.00
 For stirrators, add: \$185 to \$280 per foot of bin diameter

DIAMETER (Feet)	HEIGHT (Feet)	CAPACITY (Bushels)	COST		
			W/OUT DRYING BIN	WITH DRYING BIN	SLAB FLOOR
15	7	1,257	\$ 4,825	\$ 7,050	\$ 650
	11	1,792	6,350	9,300	705
	15	2,329	7,600	11,100	805
18	11	2,647	7,050	10,300	865
	15	3,422	8,750	12,700	900
	18	4,198	9,900	14,400	935
	26	5,748	13,200	----	1,050
21	11	3,693	7,800	11,300	1,190
	18	5,813	9,900	14,400	1,230
	26	7,934	15,700	----	1,440
24	15	6,344	11,600	17,000	1,570
	18	7,739	14,600	21,100	1,640
	26	10,528	19,100	----	1,830
	33	13,318	22,700	----	1,930
27	18	9,955	16,600	24,000	2,110
	26	13,500	21,700	----	2,380
	33	17,046	27,100	----	2,490
30	18	12,473	19,900	29,100	2,360
	26	16,863	25,700	----	2,725
	33	21,252	30,700	----	2,925
36	22	21,648	31,600	----	3,675
	26	24,823	35,500	----	3,875
	33	31,174	40,000	----	4,025
	40	37,524	44,400	----	4,325
42	26	34,382	43,600	----	5,400
	33	43,026	51,500	----	5,650
	40	51,670	60,750	----	6,000
	48	60,314	70,250	----	6,450
48	26	45,684	56,000	----	7,000
	33	56,974	69,000	----	7,400
	40	68,264	81,750	----	7,750
	48	79,554	94,500	----	8,450

FEED TANKS: Costs are averages of typical farm hoppers with roof, manhole and ladder including necessary steel structural supports and concrete footings. Height is overall from ground level to top of tank. Capacity in tons is figured at 50 pound per bushel. Costs do not include delivery auger.

DIAMETER (Feet)	HEIGHT (Feet)	CAPACITY (Bushels)	CAPACITY (Tons)	COST
6	10	120	3.0	\$1,800
6	16	240	6.0	2,575
6	21	360	9.0	2,900
6	25	480	12.0	3,300
6	28	600	15.0	3,600
9	14	300	7.8	3,725
9	17	458	11.3	4,450
9	20	594	14.8	4,825
9	25	866	21.8	5,600
9	28	1,000	25.0	5,950

DIAMETER (Feet)	HEIGHT (Feet)	CAPACITY (Bushels)	CAPACITY (Tons)	COST
9	31	1,130	28.5	\$ 6,150
12	20	870	21.8	8,300
12	25	1,345	33.6	9,450
12	31	1,825	45.6	10,800
12	36	2,300	57.5	11,600
12	42	2,780	69.5	12,700
15	33	4,030	100.75	14,900
15	41	5,220	130.5	17,500
18	34	5,980	149.5	21,000

STEEL TANKS



Notes: For utility bins with less capacity or heavy corrugated, see Page 280. Add \$265 to \$280 per running foot of tunnel and \$155 to \$180 conveyor gallery.

Add \$.11 to \$.19 per bushel for aeration systems.

BUSHEL CAPACITY	HEAVY BOLTED STEEL (per Tank)
	Cost per Bushel
15,000	\$2.93
20,000	2.80
25,000	2.71
30,000	2.61
35,000	2.55
40,000	2.50
50,000	2.41
60,000	2.34
80,000	2.22
100,000	2.16
125,000	2.07
150,000	1.99
175,000	1.96
200,000	1.91
250,000	----
300,000	----
400,000	----

GLASS-LINED TANKS

For silos, see Page 278; for slurry tanks, see Page 282.



MANURE AND WATER MANAGEMENT SYSTEMS

VERTICAL TURBINE PUMPS (base depth = 100 feet)

If the motor horsepower, flow and depth are known, enter the table directly, adding or subtracting 5% of the base cost for each 20 feet of depth variation from the 100-foot base.

If the flow capacity is not known, the underlined figures are the average costs.

If the depth is not known, the other figures will give an approximation of average cost based on flow and motor capacity.

Costs are averages including motor, pump electric panels, starters, switches and complete installation, but do not include the cost of electric service to site or well costs.

CAPACITY (GPM)	MOTOR HORSEPOWER											CAPACITY (GPM)	
	5	10	30	50	75	100	150	200	250	300	400		500
200	<u>\$ 9,700</u>	\$10,800	----	----	----	----	----	----	----	----	----	----	200
400	11,400	<u>11,900</u>	----	----	----	----	----	----	----	----	----	----	400
600	13,100	13,700	\$15,800	----	----	----	----	----	----	----	----	----	600
800	----	15,800	17,900	----	----	----	----	----	----	----	----	----	800
1,000	----	17,900	<u>19,900</u>	\$22,300	----	----	----	----	----	----	----	----	1,000
1,500	----	----	24,800	27,300	----	----	----	----	----	----	----	----	1,500
2,000	----	----	29,300	<u>31,600</u>	\$34,400	----	----	----	----	----	----	----	2,000
2,500	----	----	----	37,000	39,300	\$42,100	----	----	----	----	----	----	2,500
3,000	----	----	----	41,000	<u>43,200</u>	45,900	\$ 51,250	\$ 57,500	\$ 64,250	----	----	----	3,000
4,000	----	----	----	----	52,250	<u>55,000</u>	61,250	67,750	75,250	\$ 83,750	----	----	4,000
5,000	----	----	----	----	60,500	63,250	69,500	76,250	84,000	92,000	\$111,000	----	5,000
6,000	----	----	----	----	----	66,250	<u>77,750</u>	<u>83,750</u>	91,750	99,250	118,000	\$139,000	6,000
8,000	----	----	----	----	----	----	93,750	101,000	<u>109,000</u>	<u>117,000</u>	135,000	155,000	8,000
10,000	----	----	----	----	----	----	112,000	119,000	126,000	136,000	<u>153,000</u>	<u>173,000</u>	10,000
12,000	----	----	----	----	----	----	----	139,000	147,000	155,000	173,000	193,000	12,000

WELL JET SYSTEMS

Well jet system cost includes motor, pump, piping at well, drilling and casing.

Add for storage tanks. For precharged tanks, add 75%.

PUMP (HP.)	SHALLOW		DEEP	
	(to 25' Depth)	COST	(to 100' Depth)	COST
1/3	\$1,740	\$2,050	\$3,700	\$4,700
1/2	1,930	2,230	3,875	4,975
3/4	2,170	2,550	4,075	5,250
1	2,230	2,850	4,300	5,550
1 1/2	2,500	3,150	4,700	5,900

WATER TANKS

SIZE (Gal.)	COST RANGE	SIZE (Gal.)	COST RANGE
12	\$ 83 - \$115	120	\$ 305 - \$ 385
21	120 - 150	220	680 - 800
40	155 - 195	315	855 - 1,110
80	210 - 255	525	1,250 - 1,410

WINDMILLS

Cost includes steel wheel and tower complete, excluding well.

TOWER HEIGHT	WINDMILL SIZE					
	6'	8'	10'	12'	14'	16'
21'	\$5,650	\$5,950	\$7,850	----	----	----
27'	6,100	6,250	8,550	\$11,700	\$16,600	----
33'	6,900	7,050	9,150	12,500	18,300	\$22,500

SLURRY TANKS

Costs are averages for glass-lined slurry storage tanks with ladder, erected on buyers' slabs. For concrete slab, add \$6.35 to \$7.71 per cubic foot of concrete. For pumps, see below.

DIA.	HEIGHT	COST	DIA.	HEIGHT	COST
25'	14'	\$ 40,300	81'	14'	\$108,000
	23'	43,700		19'	131,000
42'	14'	50,500		23'	158,000
	23'	66,750	101'	14'	136,000
62'	14'	72,250		19'	175,000
	23'	105,000		23'	211,000

LIQUID MANURE TANKS

Cost per cubic foot for complete concrete tanks. For plank cover, deduct \$4.41 per square foot of top; for no cover, deduct \$9.08. Rectangular tanks, \$2.86 - \$4.46, round tanks, \$2.48 - \$3.64; open pits, concrete, \$1.59 - \$2.18; large lagoons, clay, \$.19 - \$.36; agitator pumps, \$9,600 - \$26,400 each; add \$7,100 for lagoon flotation systems.

*FLOOR AREA/PERIMETER MULTIPLIERS

Average Floor Area, Sq. Ft./Story	AVERAGE PERIMETER														Average Floor Area, Sq. Ft./Story
	75	100	125	150	200	250	300	400	500	600	700	800	900	1000	
500	1.178	1.311	1.444	1.577	1.844	2.110	2.377	2.909	----	----	----	----	----	----	500
750	1.044	1.133	1.222	1.311	1.489	1.667	1.844	2.201	----	----	----	----	----	----	750
1,000	.980	1.044	1.110	1.178	1.311	1.444	1.577	1.844	----	----	----	----	----	----	1,000
2,000	.878	.911	.945	.977	1.044	1.110	1.178	1.311	----	----	----	----	----	----	2,000
3,000	.843	.865	.889	.911	.955	1.000	1.044	1.133	----	----	----	----	----	----	3,000
4,000	----	----	.860	.878	.911	.945	.977	1.044	1.110	1.178	----	----	----	----	4,000
5,000	----	----	.844	.857	.884	.911	.938	.991	1.044	1.097	1.150	----	----	----	5,000
8,000	----	----	----	----	.844	.860	.877	.911	.945	.977	1.010	1.044	1.076	----	8,000
10,000	----	----	----	----	----	.844	.858	.884	.911	.938	.960	.991	1.018	1.044	10,000
14,000	----	----	----	----	----	.825	.835	.854	.873	.892	.911	.931	.949	.967	14,000
20,000	----	----	----	----	----	----	.818	.831	.844	.858	.871	.884	.898	.911	20,000
25,000	----	----	----	----	----	----	----	.810	.820	.831	.841	.852	.863	.873	25,000

USE FOR AREA/PERIMETERS NOT FOUND WITH INDIVIDUAL BUILDING OCCUPANCIES

FARM BUILDING DEPRECIATION SCHEDULE

(Except residences and residential garages)

		REMAINING CONDITION		Age	REMAINING CONDITION	
Age		Silos	Buildings		Silos	Buildings
				31	33%	49%
				32	32%	48%
1	.....	97%	98%	33	30%	47%
2	.....	95%	96%	34	29%	46%
3	.....	92%	94%	35	27%	45%
4	.....	90%	92%	36	26%	44%
5	.....	87%	90%	37	24%	43%
6	.....	85%	88%	38	23%	42%
7	.....	82%	86%	39	21%	41%
8	.....	80%	84%	40	20%	40%
9	.....	77%	82%	41		39%
10	.....	75%	80%	42		38%
11	.....	72%	78%	43		37%
12	.....	70%	76%	44		35%
13	.....	67%	74%	45		35%
14	.....	65%	72%	46		34%
15	.....	62%	70%	47		33%
16	.....	60%	68%	48		32%
17	.....	57%	66%	49		31%
18	.....	55%	64%	50		30%
19	.....	52%	62%	51		29%
20	.....	50%	60%	52		28%
21	.....	48%	59%	53		27%
22	.....	47%	58%	54		26%
23	.....	45%	57%	55		25%
24	.....	44%	56%	56		24%
25	.....	42%	55%	57		23%
26	.....	41%	54%	58		22%
27	.....	39%	53%	59		21%
28	.....	38%	52%	60		20%
29	.....	36%	51%	Older		20%
30	.....	35%	50%			

Age = Tax Year - date of construction

Example: A 2014 assessment is being figured for a building constructed in 1994. The age is 20 years.

It is recognized that exceptional, as well as poor maintenance, remodeling, replacements, and other factors can cause a deviation from typical experience. Where the use of the concept of effective age is desirable and/or an overall observed condition is employed, it is recommended that the appraiser refer to the narrative building section definitions and their corresponding percent condition ranges found on Page 22 of the Residential Section.