RURAL BUILDING COST
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COMPUTATION TABLES - SECTION 7 PAGE

BASIC FARM BUILDINGS

SECTION 1

October 2001

GENERAL PURPOSE BARNS

COMPONENT	CLASS 1 LOW QUALITY	CLASS 2 AVERAGE QUALITY	CLASS 3 GOOD QUALITY
Foundation	Perimeter concrete and column footings	Perimeter concrete and column footings	Perimeter concrete and column footings
Floor	Dirt	Dirt	Dirt
Wall Structure	Light wood boxed frame or wood posts and beams, 10' eave height	Average 2"x 4", 24" on center, 10' eave height	Concrete block or good 2"x 4", 16" on center or 2"x 6", 24" on center, 10' eave height
Exterior Wall Cover	Light wood siding board and batten or light aluminum siding	Average wood or aluminum siding	Good wood siding painted or standard gauge corrugated iron or aluminum siding
Roof Construction	Medium pitch, 2"x 4" rafters 24" to 36" on center, composition decking	Medium pitch, wood joists, wood or composition decking	Medium pitch, wood joists, wood or composition decking
Roof Cover	Composition shingle, asphalt roll paper or light wood shingles	Good wood shingles, light aluminum or corrugated iron	Standard gauge aluminum or corrugated iron or good wood shingles
Electrical	Minimal per class	Minimal per class	Minimal per class
Plumbing	Minimal per class	Minimal per class	Minimal per class

Normal stalls are included commensurate to the quality class.

GENERAL PURPOSE BARNS **SQUARE FOOT COSTS**

	SQUARE FOOT AREA										
CLASS	**1,000**	**2,000**	**3,000**	**4,000**	**5,000**	**6,000**	**7,000**	**8,000**	**9,000**	**10,000**	**11,000**
1	$ 10.34	$ 8.64	$ 7.94	$ 7.59	$ 7.37	$ 7.23	$ 7.12	$ 6.93	$ 6.80	$ 6.66	$ 6.50
2	$ 14.88	$ 12.32	$ 11.20	$ 10.66	$ 10.34	$ 10.14	$ 9.99	$ 9.71	$ 9.48	$ 9.24	$ 9.04
3	$ 18.62	$ 16.51	$ 15.39	$ 14.80	$ 14.49	$ 14.26	$ 14.11	$ 13.82	$ 13.59	$ 13.35	$ 13.17

ADD	Concrete or wood floors, or concrete flatwork per square foot of covered area:		$ 1.88
	Lofts per square foot of floor area -	Low Quality:	$ 2.21
		Average Quality:	$ 2.90
		Good Quality:	$ 3.79

NOTE: The costs given above reflect the use of unskilled farm labor. For professional labor supervised by a contractor or job foreman, costs should be increased up to 25 percent based on the quality level of the finished product.

HAY STORAGE BARNS

COMPONENT	CLASS 1 LOW QUALITY	CLASS 2 AVERAGE QUALITY	CLASS 3 GOOD QUALITY
Foundation	Redwood or cedar mudsills	Concrete or masonry piers	Continuous concrete
Floor	Dirt	Dirt	Dirt
Wall Structure	Light wood boxed frame or wood posts and beams, 10' eave height	Average 2"x 4", 24" on center, 10' eave height	Good 2"x 4", 16" on center or 2"x 6", 24" on center, 10' eave height
Exterior Wall Cover	Light wood siding, board and batten or light aluminum siding	Average wood or aluminum siding	Good wood siding painted, standard gauge corrugated iron or aluminum siding
Roof Construction	Medium to high pitch 2"x 4" rafters 24" to 36" on center, or light wood trusses	Medium to high pitch, average wood trusses	Medium to high pitch, good wood trusses
Roof Cover	Composition shingle, asphalt roll paper or light wood shingles	Good wood shingles, light aluminum or corrugated iron	Standard gauge aluminum, corrugated iron or good wood shingles
Electrical	Minimal per class	Minimal per class	Minimal per class
Plumbing	Minimal per class	Minimal per class	Minimal per class

HAY STORAGE BARNS — **SQUARE FOOT COSTS**

	SQUARE FOOT AREA										
CLASS	**1,000**	**2,000**	**3,000**	**4,000**	**5,000**	**6,000**	**7,000**	**8,000**	**9,000**	**10,000**	**11,000**
1	$ 9.60	$ 7.88	$ 7.19	$ 6.83	$ 6.65	$ 6.47	$ 6.38	$ 6.18	$ 6.05	$ 5.91	$ 5.82
2	$ 13.48	$ 10.80	$ 9.55	$ 9.04	$ 8.69	$ 8.27	$ 8.17	$ 7.83	$ 7.56	$ 7.26	$ 7.11
3	$ 18.48	$ 14.93	$ 13.43	$ 12.53	$ 12.20	$ 11.80	$ 11.56	$ 11.13	$ 10.82	$ 10.40	$ 10.14

ADD	Concrete or wood floors, or concrete flatwork per square foot of covered area:		$ 1.88
	Lofts per square foot of floor area -	Low Quality:	$ 2.21
		Average Quality:	$ 2.90
		Good Quality:	$ 3.79

NOTE: The costs given above reflect the use of unskilled farm labor. For professional labor supervised by a contractor or job foreman, costs should be increased up to 25 percent based on the quality level of the finished product.

FEED BARNS

COMPONENT	CLASS 1 LOW QUALITY	CLASS 2 AVERAGE QUALITY	CLASS 3 GOOD QUALITY
Foundation	Redwood or cedar mudsills	Concrete or masonry piers	Continuous concrete
Floor	Dirt	Dirt	Dirt
Wall Structure	Light wood frame, 10' eave height	Average wood frame, 10' eave height	Good wood frame, 10' eave height
Exterior Wall Cover	Closed sides and open ends	Partially open sides, standard corrugated iron or average wood siding on ends	Partially open sides, good quality siding
Roof Construction	Medium to low pitch 2"x 4" rafters 24" to 36" on center, or light wood trusses	Medium to low pitch, average wood trusses	Medium to low pitch, good wood trusses
Roof Cover	Light metal or composition shingle	Standard gauge corrugated metal	Wood shingles
Electrical	Minimal per class	Minimal per class	Minimal per class
Plumbing	Minimal per class	Minimal per class	Minimal per class

Normal feed stalls are included commensurate to the quality class.

FEED BARNS											**SQUARE FOOT COSTS**
	SQUARE FOOT AREA										
CLASS	**1,000**	**2,000**	**3,000**	**4,000**	**5,000**	**6,000**	**7,000**	**8,000**	**9,000**	**10,000**	**11,000**
1	$ 6.48	$ 6.01	$ 5.75	$ 5.58	$ 5.51	$ 5.48	$ 5.44	$ 5.41	$ 5.38	$ 5.34	$ 5.34
2	$ 7.88	$ 7.43	$ 7.14	$ 6.90	$ 6.75	$ 6.69	$ 6.64	$ 6.60	$ 6.56	$ 6.52	$ 6.51
3	$ 10.49	$ 10.07	$ 9.72	$ 9.45	$ 9.20	$ 9.06	$ 8.98	$ 8.94	$ 8.91	$ 8.82	$ 8.78

ADD	Concrete or wood floors, or concrete flatwork per square foot of covered area:		$ 1.88
	Lofts per square foot of floor area -	Low Quality:	$ 2.21
		Average Quality:	$ 2.90
		Good Quality:	$ 3.79

NOTE: The costs given above reflect the use of unskilled farm labor. For professional labor supervised by a contractor or job foreman, costs should be increased up to 25 percent based on the quality level of the finished product.

POLE BARNS - AVERAGE QUALITY

Structure	Poles 15’ to 20’ on center
Floor	Dirt - use square foot additive for concrete
Roof	Average wood trusses or average steel trusses, low pitch, corrugated iron or aluminum cover, gable end enclosed, 2’ overhang on 2 sides
Walls	18’ wall height, average wood frame or average prefabricated steel frame with corrugated iron covering where called for

All costs listed are based on average quality materials. Use percent additive for good quality materials; heavy steel frame and trusses, wide span, heavy gauge roof cover. Use percent deduction for low quality materials; light wood poles and frame with light wood or steel trusses and light gauge roof cover.

POLE BARNS — **SQUARE FOOT AREA COST TABLES**

TYPE "A" (ALL SIDES OPEN)

END WIDTH	SIDE LENGTH 34'	51'	68'	85'	102'	119'	136'	153'	170'	187'
20'	$ 5.30	$ 5.13	$ 4.98	$ 4.84	$ 4.84	$ 4.66	$ 4.66	$ 4.66	$ 4.66	$ 4.66
25'	$ 4.98	$ 4.84	$ 4.66	$ 4.53	$ 4.37	$ 4.37	$ 4.37	$ 4.37	$ 4.37	$ 4.37
30'	$ 4.74	$ 4.65	$ 4.53	$ 4.35	$ 4.22	$ 4.22	$ 4.22	$ 4.22	$ 4.22	$ 4.22
35'	$ 4.66	$ 4.50	$ 4.36	$ 4.21	$ 4.06	$ 4.06	$ 4.06	$ 4.06	$ 4.06	$ 4.06
40'	$ 4.63	$ 4.51	$ 4.33	$ 4.20	$ 4.05	$ 4.05	$ 4.05	$ 4.05	$ 4.05	$ 4.05
45'	$ 4.61	$ 4.42	$ 4.29	$ 3.85	$ 3.84	$ 3.84	$ 3.84	$ 3.84	$ 3.84	$ 3.84
50'	$ 4.60	$ 4.45	$ 4.26	$ 3.82	$ 3.76	$ 3.22	$ 3.22	$ 3.22	$ 3.22	$ 3.22
60'	$ 4.59	$ 4.43	$ 4.19	$ 3.65	$ 3.64	$ 3.15	$ 3.15	$ 3.15	$ 3.15	$ 3.15
70'	$ 4.50	$ 4.35	$ 4.02	$ 3.52	$ 3.45	$ 3.08	$ 3.08	$ 3.08	$ 3.08	$ 3.08
80'	$ 4.50	$ 4.35	$ 3.85	$ 3.45	$ 3.32	$ 3.01	$ 3.01	$ 3.01	$ 3.01	$ 3.01

TYPE "B" (ENDS AND ONE SIDE CLOSED - ONE SIDE OPEN)

END WIDTH	SIDE LENGTH 34'	51'	68'	85'	102'	119'	136'	153'	170'	187'
20'	$ 7.68	$ 7.00	$ 6.65	$ 6.47	$ 6.33	$ 6.20	$ 6.13	$ 6.12	$ 6.10	$ 6.02
25'	$ 7.10	$ 6.47	$ 6.10	$ 5.90	$ 5.81	$ 5.58	$ 5.53	$ 5.45	$ 5.41	$ 5.38
30'	$ 6.77	$ 6.12	$ 5.81	$ 5.56	$ 5.46	$ 5.36	$ 5.29	$ 5.19	$ 5.16	$ 5.13
35'	$ 6.54	$ 5.84	$ 5.53	$ 5.30	$ 5.19	$ 5.15	$ 5.00	$ 4.99	$ 4.98	$ 4.96
40'	$ 6.39	$ 5.68	$ 5.37	$ 5.16	$ 5.12	$ 4.98	$ 4.84	$ 4.83	$ 4.80	$ 4.76
45'	$ 6.31	$ 5.55	$ 5.18	$ 4.99	$ 4.86	$ 4.76	$ 4.66	$ 4.65	$ 4.63	$ 4.61
50'	$ 6.23	$ 5.41	$ 5.20	$ 4.81	$ 4.76	$ 4.65	$ 4.55	$ 4.53	$ 4.48	$ 4.46
60'	$ 6.10	$ 5.37	$ 4.96	$ 4.67	$ 4.63	$ 4.53	$ 4.45	$ 4.40	$ 4.34	$ 4.32
70'	$ 6.01	$ 5.25	$ 4.81	$ 4.65	$ 4.55	$ 4.46	$ 4.34	$ 4.32	$ 4.28	$ 4.27
80'	$ 5.84	$ 5.17	$ 4.65	$ 4.58	$ 4.46	$ 4.32	$ 4.26	$ 4.24	$ 4.22	$ 4.19

ADD Concrete or wood floors, or concrete flatwork per square foot of covered area: $ 1.88

PERCENT ADDITIVES
Good Quality (add): 28%
Low Quality (deduct): -31%

NOTE: The costs given above reflect the use of unskilled farm labor. For professional labor supervised by a contractor or job foreman, costs should be increased up to 25 percent based on the quality level of the finished product.

POLE BARNS										SQUARE FOOT AREA COST TABLES
TYPE "C" (ALL SIDES CLOSED)										
END WIDTH	SIDE LENGTH									
	34'	51'	68'	85'	102'	119'	136'	153'	170'	187'
20'	$ 8.71	$ 8.10	$ 7.75	$ 7.55	$ 7.48	$ 7.36	$ 7.30	$ 7.28	$ 7.27	$ 7.21
25'	$ 7.84	$ 7.27	$ 6.92	$ 6.74	$ 6.61	$ 6.52	$ 6.48	$ 6.38	$ 6.21	$ 6.13
30'	$ 7.36	$ 6.58	$ 6.28	$ 6.05	$ 5.97	$ 5.82	$ 5.76	$ 5.71	$ 5.70	$ 5.66
35'	$ 6.95	$ 6.23	$ 6.05	$ 5.79	$ 5.74	$ 5.57	$ 5.53	$ 5.51	$ 5.42	$ 5.41
40'	$ 6.74	$ 6.08	$ 5.77	$ 5.58	$ 5.53	$ 5.40	$ 5.36	$ 5.25	$ 5.20	$ 5.18
45'	$ 6.52	$ 5.84	$ 5.53	$ 5.40	$ 5.20	$ 5.15	$ 5.07	$ 5.02	$ 5.00	$ 4.99
50'	$ 6.33	$ 5.70	$ 5.31	$ 5.25	$ 5.19	$ 5.00	$ 4.99	$ 4.98	$ 4.92	$ 4.89
60'	$ 6.10	$ 5.51	$ 5.13	$ 4.89	$ 4.85	$ 4.69	$ 4.66	$ 4.60	$ 4.56	$ 4.53
70'	$ 5.97	$ 5.76	$ 5.02	$ 4.83	$ 4.68	$ 4.59	$ 4.50	$ 4.49	$ 4.45	$ 4.43
80'	$ 5.75	$ 5.16	$ 4.83	$ 4.63	$ 4.50	$ 4.37	$ 4.35	$ 4.30	$ 4.27	$ 4.21

ADD Concrete or wood floors, or concrete flatwork per square foot of covered area: $ 1.88

PERCENT ADDITIVES
Good Quality (add): 28%
Low Quality (deduct): -31%

NOTE: The costs given above reflect the use of unskilled farm labor. For professional labor supervised by a contractor or job foreman, costs should be increased up to 25 percent based on the quality level of the finished product.

SIDE SHEDS - AVERAGE QUALITY

Structure	1 row of poles 15’ to 20’ on center, 1 side ties into adjoining building
Floor	Dirt - Use square foot additive for concrete
Roof	Light wood trusses, low pitch, corrugated iron or aluminum cover, ends enclosed, 2’ overhang on 1 side
Walls	14’ to 16’ wall height, light wood frame with corrugated iron covering

SIDE SHEDS	SQUARE FOOT COSTS
WITH OPEN SIDES:	$ 3.27 TO $ 3.49
WITH ENCLOSED SIDES:	$ 4.28 TO $ 5.61
ADD Concrete or wood floors, or concrete flatwork per square foot of covered area:	$ 1.88

NOTE: The costs given above reflect the use of unskilled farm labor. For professional labor supervised by a contractor or job foreman, costs should be increased up to 25 percent based on the quality level of the finished product.

SHOPS

COMPONENT	CLASS 1 LOW QUALITY	CLASS 2 AVERAGE QUALITY	CLASS 3 GOOD QUALITY
Foundation	Light concrete	Standard concrete	Standard concrete
Floor	Concrete	Concrete	Concrete
Wall Structure	Light wood frame, 15' eave height	Average wood frame, 15' eave height	Good wood frame 15' eave height
Exterior Wall Cover	Light metal or low cost boards	Standard gauge corrugated metal or average wood siding	Good wood siding painted or C-block
Roof Construction	Low to medium pitch, 2"x 4" rafters 24" to 36" on center or light wood trusses	Low to medium pitch, average wood trusses	Low to medium pitch, good wood trusses
Roof Cover	Light metal	Standard gauge metal	Wood shingles
Electrical	2 outlets per 1,000 square foot	4 outlets per 1,000 square foot	4 outlets per 1,000 square foot
Plumbing	1 cold water outlet	2 cold water outlets	1 rough fixture plus 2 cold water outlets
Doors	1 light sliding or swinging door per 2,000 square foot	1 average sliding or swinging door per 2,000 square foot	1 drive through door per 1,000 square foot plus 1 walk-through door
Windows	None	None or few low cost	5 percent of wall area
Shape	Square or rectangular length between 1 and 2 times width	Square or rectangular length between 1 or 2 times width	Square or rectangular length between 1 and 2 times width

SHOPS										**SQUARE FOOT COSTS**
	SQUARE FOOT AREA									
CLASS	**500**	**1,000**	**1,500**	**2,000**	**2,500**	**3,000**	**4,000**	**5,000**	**6,000**	**8,000**
1	$ 10.99	$ 10.27	$ 9.62	$ 9.22	$ 8.91	$ 8.69	$ 8.36	$ 8.10	$ 7.94	$ 7.74
2	$ 15.79	$ 13.98	$ 12.29	$ 11.92	$ 11.19	$ 10.83	$ 10.37	$ 10.06	$ 9.75	$ 9.46
3	$ 19.87	$ 17.86	$ 16.09	$ 15.13	$ 14.48	$ 13.94	$ 13.21	$ 12.86	$ 12.41	$ 11.98

ADD	For interior finish -	Class 1:	$ 1.08	per square foot of floor area
		Class 2:	$ 1.33	per square foot of floor area
		Class 3:	$ 1.64	per square foot of floor area

NOTE: The costs given above reflect the use of unskilled farm labor. For professional labor supervised by a contractor or job foreman, costs should be increased up to 25 percent based on the quality level of the finished product.

MACHINERY AND EQUIPMENT SHEDS

COMPONENT	CLASS 1 LOW QUALITY	CLASS 2 AVERAGE QUALITY	CLASS 3 GOOD QUALITY
Foundation	Light perimeter concrete	Concrete perimeter	Concrete perimeter
Floor	Dirt	Dirt or concrete*	Dirt or concrete*
Wall Structure	Light wood boxed frame or post and beam, 10' eave height	Post and beam construction, 10' eave height	Average 2"x 4", 24" on center, 10' eave height
Exterior Wall Cover	Light wood or metal siding on a wood frame	Average wood or metal siding on wood frame	Good wood or metal siding on wood frame
Roof Construction	Shed type, or low pitch open wood system for metals	Low pitch, open wood system for metals or wood shingles	Medium pitch, open wood system for metals or wood shingles
Roof Cover	Corrugated metal	Corrugated metal or wood shingle	Standard gauge metal or good wood shingles
Electrical	None	2 outlets per 1,000 square foot	4 outlets per 1,000 square feet
Plumbing	None	None	None
Shape	Usually elongated, width between 15 and 30 feet, any length	Usually elongated, width between 15 and 30 feet, any length	Usually elongated, width between 15 and 30 feet, any length

MACHINERY AND EQUIPMENT SHEDS — **SQUARE FOOT COSTS**

TYPE I (ALL SIDES CLOSED)

	SQUARE FOOT AREA										
CLASS	**500**	**1,000**	**1,500**	**2,000**	**2,500**	**3,000**	**3,500**	**4,000**	**4,500**	**5,000**	**6,000**
1	$ 7.64	$ 6.15	$ 5.66	$ 5.41	$ 5.31	$ 4.92	$ 4.90	$ 4.79	$ 4.74	$ 4.69	$ 4.64
2	$ 10.33	$ 8.47	$ 7.93	$ 7.63	$ 7.47	$ 6.98	$ 6.93	$ 6.82	$ 6.75	$ 6.72	$ 6.65
3	$ 14.11	$ 11.93	$ 11.26	$ 10.91	$ 10.75	$ 10.15	$ 10.04	$ 9.95	$ 9.86	$ 9.83	$ 9.71

TYPE II (ONE SIDE OPEN)

	SQUARE FOOT AREA										
CLASS	**500**	**1,000**	**1,500**	**2,000**	**2,500**	**3,000**	**3,500**	**4,000**	**4,500**	**5,000**	**6,000**
1	$ 6.28	$ 5.03	$ 4.62	$ 4.38	$ 4.24	$ 4.00	$ 3.96	$ 3.88	$ 3.82	$ 3.81	$ 3.76
2	$ 8.53	$ 7.06	$ 6.51	$ 6.23	$ 6.08	$ 5.82	$ 5.72	$ 5.65	$ 5.56	$ 5.54	$ 5.47
3	$ 12.14	$ 10.13	$ 9.45	$ 9.36	$ 9.16	$ 8.81	$ 8.70	$ 8.61	$ 8.46	$ 8.41	$ 8.33

ADD Concrete or wood floors, or concrete flatwork per square foot of covered area: $ 1.88

NOTE: The costs given above reflect the use of unskilled farm labor. For professional labor supervised by a contractor or job foreman, costs should be increased up to 25 percent based on the quality level of the finished product.

SMALL SHEDS AND PUMP HOUSES

COMPONENT	CLASS 1 LOW QUALITY	CLASS 2 AVERAGE QUALITY	CLASS 3 GOOD QUALITY
Foundation	Redwood or cedar mudsills	Concrete or masonry piers	Continuous concrete
Floor	Dirt	Dirt*	Dirt*
Wall Structure	Light wood boxed frame or wood posts and beams 8' eave height	Average 2"x 4" on center, 8' eave height	Good 2"x 6", 24" on center, or 2"x 4", 16" on center, 8' eave height
Exterior Wall Cover	Light wood siding, board and batten or light aluminum siding	Average wood or aluminum siding	Good wood siding painted, standard gauge corrugated or aluminum siding
Roof Construction	Low to medium pitch, shed type, light wood framing	Low to medium pitch, gable or shed type, average wood framing	Low to medium pitch, gable or shed type, good wood framing
Roof Cover	Composition shingle asphalt roll paper, light wood shingles or sod	Good shingles light aluminum corrugated iron	Standard gauge, aluminum corrugated iron or good wood shakes
Electrical	None	Minimal	Minimal
Plumbing	None	None	None

SMALL SHEDS AND PUMP HOUSES — **SQUARE FOOT COSTS**

TYPE I (ALL SIDES CLOSED)

	SQUARE FOOT AREA											
CLASS	**30**	**50**	**60**	**80**	**100**	**120**	**150**	**200**	**250**	**300**	**400**	**500**
1	$ 11.75	$ 9.77	$ 9.49	$ 8.51	$ 7.93	$ 7.56	$ 7.16	$ 6.54	$ 6.29	$ 6.03	$ 5.64	$ 5.42
2	$ 14.42	$ 12.87	$ 12.03	$ 11.03	$ 10.42	$ 10.03	$ 9.59	$ 8.98	$ 8.69	$ 8.40	$ 8.01	$ 7.78
3	$ 21.58	$ 17.59	$ 16.95	$ 15.37	$ 13.90	$ 13.15	$ 12.37	$ 11.44	$ 10.62	$ 10.09	$ 9.33	$ 8.85

TYPE II (ONE SIDE OPEN)

	SQUARE FOOT AREA											
CLASS	**30**	**50**	**60**	**80**	**100**	**120**	**150**	**200**	**250**	**300**	**400**	**500**
1	$ 9.78	$ 7.97	$ 7.37	$ 6.90	$ 6.60	$ 6.25	$ 5.87	$ 5.60	$ 5.42	$ 5.18	$ 4.94	$ 4.73
2	$ 13.01	$ 11.12	$ 10.71	$ 9.47	$ 8.69	$ 7.98	$ 7.72	$ 7.27	$ 7.17	$ 6.61	$ 6.27	$ 5.96
3	$ 16.67	$ 15.02	$ 13.79	$ 12.26	$ 11.33	$ 10.50	$ 10.17	$ 9.68	$ 9.20	$ 8.72	$ 8.32	$ 7.96

ADD Concrete or wood floors, or concrete flatwork per square foot of covered area: $ 1.88
Insulation: 10%

NOTE: Type II with 2 sides open, reduce cost by an additional 12 percent.
Type II with 3 sides open, reduce cost by an additional 25 percent.
Type II with 4 sides open, reduce cost by an additional 30 percent.

The costs given above reflect the use of unskilled farm labor. For professional labor supervised by a contractor or job foreman, costs should be increased up to 25 percent based on the quality level of the finished product.

GENERAL PURPOSE BUILDING

COMPONENT	CLASS 1 LOW QUALITY	CLASS 2 AVERAGE QUALITY	CLASS 3 GOOD QUALITY
Foundation	Wood girder on masonry piers; or holes and backfill for pole frame	Holes and backfill for pole frame; or light perimeter foundation	Continuous concrete poured with floor
Floor	Dirt	Concrete	Concrete
Frame and Exterior Walls	Eave height 8'. Pole or box frame with metal exterior or low grade sidings	Eave height 8'. Pole or box frame with metal exterior or average grade sidings	Eave height 8'. Conventional wood stud frame with good wood or metal sidings
Interior Walls	Normally unfinished see options	Normally unfinished see options	Normally unfinished see options
Roof Structure	Low pitch wood system for metal or low cost composition roof	Low to medium pitch wood system for average cost metal or composition roof	Medium pitch wood system with composition or wood sheathing
Roof Cover	Aluminum or steel corrugated or crimped, low quality	Aluminum or steel corrugated or crimped, average quality	Composition shingle, good quality or average quality metal or wood shingles
Electrical	None	Minimal	Minimal
Plumbing	None	None	None

GENERAL PURPOSE BUILDINGS									**SQUARE FOOT COSTS**
	SQUARE FOOT AREA								
CLASS	**500**	**1,000**	**1,500**	**2,000**	**2,500**	**3,000**	**3,500**	**4,000**	**4,500**
1	$ 5.13	$ 4.38	$ 4.18	$ 3.96	$ 3.86	$ 3.72	$ 3.63	$ 3.58	$ 3.54
2	$ 8.67	$ 7.63	$ 7.32	$ 6.99	$ 6.86	$ 6.66	$ 6.52	$ 6.45	$ 6.38
3	$ 11.22	$ 9.95	$ 9.59	$ 9.47	$ 9.05	$ 8.80	$ 8.63	$ 8.54	$ 8.49

ADD	For interior finish -	Class 1:	$ 0.76	per square foot of floor area
		Class 2:	$ 0.82	per square foot of floor area
		Class 3:	$ 0.89	per square foot of floor area

Height adjustment:

Add 2 percent for each foot of average story height over 8' base height. Subtract 2 percent for each foot of average story height under 8' base height.

NOTE: The costs given above reflect the use of unskilled farm labor. For professional labor supervised by a contractor or job foreman, costs should be increased up to 25 percent based on the quality of level of the finished product.

ROOT CELLARS

COMPONENT	CLASS 1 LOW QUALITY	CLASS 2 AVERAGE QUALITY	CLASS 3 GOOD QUALITY
Foundation	Cedar or redwood mudsills or rubble	Concrete or masonry footings	Continuous concrete
Floor	Dirt	Dirt	Concrete
Wall Structure	Post and beams with wood siding	Post and beams with wood siding	Concrete block or poured concrete
Roof Construction	Flat or low to medium pitch gable, poles or light wood	Flat or low to medium pitch gable, lodge pole or heavier wood	Flat reinforced poured concrete
Roof Cover	Sod	Sod, or if above ground corrugated metal with inside insulation	Sod, or if above ground corrugated metal with inside insulation
Electrical	Minimal	Minimal	Minimal
Plumbing	None	None	None

ROOT CELLARS										**SQUARE FOOT COSTS**
	SQUARE FOOT AREA									
CLASS	**100**	**200**	**300**	**400**	**500**	**600**	**1,000**	**1,500**	**2,000**	**2,500**
1	$ 8.67	$ 7.89	$ 7.51	$ 7.32	$ 7.19	$ 7.09	$ 6.99	$ 6.89	$ 6.82	$ 6.80
2	$ 12.04	$ 10.53	$ 10.08	$ 9.70	$ 9.50	$ 9.43	$ 8.99	$ 8.76	$ 8.62	$ 8.51
3	$ 26.42	$ 21.54	$ 18.50	$ 16.84	$ 15.89	$ 15.41	$ 13.67	$ 12.62	$ 11.90	$ 11.40

NOTE: Above costs are for sod roof covering.

ADD For corrugated metals, light composition or wood shingles;

Class 1: $ 1.34 per square foot of floor area
Class 2: $ 1.61 per square foot of floor area
Class 3: $ 1.93 per square foot of floor area

NOTE: The costs given above reflect the use of unskilled farm labor. For professional labor supervised by a contractor or job foreman, costs should be increased up to 25 percent based on the quality level of the finished product.

COLD STORAGE WALK-IN BOXES

COLD STORAGE WALK-IN BOXES							**SQUARE FOOT COSTS**
	SQUARE FOOT AREA						
	50'	**100'**	**150'**	**200'**	**300'**	**400'**	**500'**
COOL BOX	$ 8,925	$ 12,600	$ 15,698	$ 18,165	$ 22,129	$ 25,856	$ 28,928
FREEZE BOX	$ 10,185	$ 14,201	$ 17,535	$ 23,074	$ 27,038	$ 31,380	$ 34,513
	Wall Deduction: $ 57 per lineal foot of wall						

NOTE: Above costs are for prefabricated metal clad units, including refrigeration equipment. Deduct 10 percent for wood exterior and interior. Add 6 percent for each foot of height over 7.5 foot base height. Where walls of building form exterior wall of box, use above wall deduction. For homemade boxes using farm labor for construction, deduct 30 percent.

POTATO STORAGE

TYPE I

Low quality, partly below grade. Minimal quality materials and unskilled farm labor are utilized. Designed for relatively short storage period, referred to as a "potato cellar."

COMPONENT	LOW QUALITY
Foundation	None
Floor	Dirt
Frame	Wood post and beams
Walls	Minimal walls and supports used in this type of potato storage usually earthen side walls
Roof Frame	Open wood system for the use of corrugated metals, or, wood rafters, joists, and sheathing
Roof Cover	Corrugated metals or composition, roll type
Interior Components	None
Insulation	Minimal, usually vapor barrier, wire netting with straw on nailing strips or equivalent
Electrical	Minimal, service entrance and two light fixtures

POTATO STORAGE						
LOW QUALITY						SQUARE FOOT COSTS
SIZE	4,000	5,000	7,000	10,000	15,000	20,000
COST	$ 6.02	$ 5.83	$ 5.53	$ 5.33	$ 4.92	$ 4.53

POTATO STORAGE WAREHOUSE

(COST PER SQUARE FOOT OF FLOOR AREA)

TYPE II

Quonset building - low quality prefabricated galvanized steel building with doors in end walls only, erected on concrete footings without floors, lights or plumbing.

POTATO STORAGE WAREHOUSE						SQUARE FOOT COSTS					
LENGTH	WIDTHS					LENGTH	WIDTHS				
FEET	30'	40'	60'	70'		FEET	30'	40'	60'	70'	
30'	$ 8.13	$ -	$ -	$ -		96'	$ 6.10	$ 5.57	$ 5.29	$ 5.09	
36'	$ 7.77	$ -	$ -	$ -		108'	$ 5.93	$ 5.40	$ 5.12	$ 4.96	
48'	$ 7.24	$ 6.63	$ -	$ -		120'	$ 5.76	$ 5.26	$ 4.98	$ 4.82	
60'	$ 6.85	$ 6.26	$ 5.96	$ -		160'	$ 5.37	$ 4.90	$ 4.62	$ 4.48	
72'	$ 6.54	$ 5.99	$ 5.68	$ 5.48		200'	$ -	$ 4.62	$ 4.37	$ 4.26	
84'	$ 6.32	$ 5.76	$ 5.46	$ 5.29		240'	$ -	$ 4.43	$ 4.18	$ 4.06	

OPTIONS:

Electrical

Minimal Service, add per square foot of floor area: $ 0.09

Plumbing

Minimal Service, add per square foot of floor area: $ 0.06

Insulation

If 2" thick foamglass is sprayed on walls and ceiling (or equivalent), add per square foot of insulated area: $ 1.87

Interior Construction

If potato storage area has bins and interior partitions, add per square foot of floor area: $ 0.79

Concrete (or concrete flatwork)

Add per square foot of concreted area: $ 1.88

NOTE: The costs given above reflect the use of unskilled farm labor. For professional labor supervised by a contractor or job foreman, costs should be increased up to 25 percent based on the quality level of the finished product.

POTATO STORAGE WAREHOUSE

TYPE III

Average and good quality materials may be used. Usually skilled labor with proper supervision is employed and construction is at grade level. The potato storage period can be quite long depending on the amount of temperature and humidity control equipment included. Base wall height commonly 14 feet. More common size 50 feet by 100 feet, 5,000 square foot building, may have other uses. No humidity control equipment included, see options.

COMPONENT	AVERAGE QUALITY	GOOD QUALITY
Foundation	Continuous concrete	Continuous concrete
Floor	Dirt	Dirt
Frame	Heavy timber post and beam. Basic height 14 feet.	Steel frame. Basic height 14 feet.
Exterior Wall	Wood siding painted, 1 or 2 large end doors, one walk-in door.	Aluminum or steel, corrugated metal cover, unpainted. 2 large end doors. 1 or 2 walk-in doors.
Interior Construction	See options	See options
Ceiling	Open	Open
Plumbing	Entry service, 2 hose bibs	Entry service, 2 hose bibs
Electrical	Entry service, 3 outlets	Entry service, 3 outlets
Insulation	2 inch thick cellulose sprayed walls and ceiling or equivalent	2 inch thick cellulose sprayed walls and ceiling or equivalent
Roof Frame	Wood rafters, joists, sheathing	Open steel and frame for corrugated metals
Roof Cover	Asphalt or wood shingle	Galvanized metal

POTATO STORAGE WAREHOUSE TYPE III	SQUARE FOOT COSTS							
	SQUARE FOOT AREA							
	5,000	**7,000**	**10,000**	**15,000**	**20,000**	**25,000**	**30,000**	**40,000**
AVERAGE	$ 14.06	$ 13.40	$ 12.74	$ 11.74	$ 10.94	$ 10.56	$ 10.18	$ 9.70
GOOD	$ 18.51	$ 17.51	$ 16.24	$ 14.66	$ 13.55	$ 12.85	$ 12.33	$ 11.77

OPTIONS:

Interior Construction

If potato storage area has bins and interior partitions,

add for average quality per square foot:	$ 2.84
add for good quality per square foot:	$ 5.52

Exterior Construction

Painted metal exterior walls, add per square foot:	$ 0.42
Concrete or concrete flatwork per square foot of concreted area:	$ 1.88

NOTE: Above costs for potato storage warehouse are based on skilled labor and include contractor fees. Construction done by ranch or farm labor, without contractor supervision, deduct 15 percent to 30 percent depending on the quality of the finished building. See the following page for other additional features.

POTATO STORAGE WAREHOUSE
OPTIONS

TEMPERATURE AND HUMIDITY CONTROL

Air humidity control only, includes fan room, louver system, humidifiers, perforated air pipe and control panel, add the following:

TEMPERATURE AND HUMIDITY CONTROL								SQUARE FOOT COSTS
SIZE	**5,000**	**7,000**	**10,000**	**15,000**	**20,000**	**25,000**	**30,000**	**40,000**
COST	$ 2.15	$ 2.11	$ 2.04	$ 1.94	$ 1.84	$ 1.78	$ 1.76	$ 1.72

AIR CONDITIONING

Includes complete refrigeration unit and controls as well as the air and humidity system listed above.

AIR CONDITIONING								SQUARE FOOT COSTS
SIZE	**5,000**	**7,000**	**10,000**	**15,000**	**20,000**	**25,000**	**30,000**	**40,000**
COST	$ 4.68	$ 4.56	$ 4.38	$ 4.19	$ 3.94	$ 3.84	$ 3.76	$ 3.70

QUONSET BUILDINGS

Costs per square foot of floor area are for Average Quality prefabricated galvanized steel buildings with doors in end walls only and minimum additional features, erected on concrete footings, without floors, lights, or heat. Low quality building costs should be adjusted downward to 30 percent while good quality buildings should be adjusted upwards to 25 percent based on the quality of the finished building and extra additives found. Base height is 20 feet at the center of the arch. Add or deduct 5 percent for each foot of deviation from base.

QUONSET BUILDINGS										
LENGTH	WIDTHS					LENGTH	WIDTHS			
FEET	30'	40'	60'	70'		FEET	30'	40'	60'	70'
30'	$ 11.61	$ -	$ -	$ -		96'	$ 8.71	$ 7.95	$ 7.56	$ 7.28
36'	$ 11.10	$ -	$ -	$ -		108'	$ 8.47	$ 7.72	$ 7.32	$ 7.08
48'	$ 10.34	$ 9.46	$ -	$ -		120'	$ 8.23	$ 7.52	$ 7.12	$ 6.88
60'	$ 9.78	$ 8.95	$ 8.51	$ -		160'	$ 7.68	$ 7.00	$ 6.60	$ 6.40
72'	$ 9.35	$ 8.55	$ 8.11	$ 7.83		200'	$ -	$ 6.60	$ 6.24	$ 6.08
84'	$ 9.03	$ 8.23	$ 7.79	$ 7.56		240'	$ -	$ 6.32	$ 5.97	$ 5.81

PRE ENGINEERED STEEL BUILDINGS

Costs per square foot of floor area are for Average Quality prefabricated galvanized steel buildings, with minimum doors, windows and additional features, erected on concrete footings, without floors, lights, or heat. Multipliers are given below for other types of skin coverings. Low quality buildings costs should be adjusted downwards 25 percent while Good Quality buildings should be adjusted upwards 25 percent based on the quality of the finished building and extra additives found.

PRE ENGINEERED STEEL BUILDINGS								
	EAVE	LENGTH TO WIDTH RATIO						
WIDTH	HEIGHT	1.0	1.5	2.0	3.0	4.0	5.0	
20'	10'	$ 10.09	$ 9.55	$ 9.18	$ 8.69	$ 8.34	$ 8.09	
30'	12'	$ 8.66	$ 8.26	$ 8.06	$ 7.61	$ 7.38	$ 7.20	
40'	14'	$ 8.79	$ 8.23	$ 7.88	$ 7.39	$ 7.05	$ 6.81	
50'	14'	$ 7.79	$ 7.50	$ 7.30	$ 7.03	$ 6.84	$ 6.70	
60'	14'	$ 7.10	$ 6.87	$ 6.71	$ 6.51	$ 6.36	$ 6.25	
80'	16'	$ 7.26	$ 7.01	$ 6.83	$ 6.60	$ 6.37	$ 6.31	
100'	16'	$ 7.10	$ 6.81	$ 6.60	$ 6.33	$ 6.16	$ 6.00	
140'	16'	$ 6.31	$ 6.12	$ 5.95	$ 5.77	$ 5.62	$ 5.53	
160'	18'	$ 6.24	$ 6.06	$ 5.93	$ 5.74	$ 5.61	$ 5.52	
200'	18'	$ 5.87	$ 5.71	$ 5.61	$ 5.47	$ 5.36	$ 5.29	

See following pages for other additional features.

NOTE: The costs given above reflect the use of unskilled farm labor. For professional labor supervised by a contractor or job foreman, costs should be increased up to 25 percent based on the quality level of the finished product.

PRE ENGINEERED STEEL BUILDINGS
ADDITIONAL FEATURES

HEIGHT - add or deduct 2 percent for each foot of deviation from base.
ALUMINUM - multiply base costs by 1.05.
ENAMELED STEEL - multiply base costs by 1.05.
SLANT WALL BUILDINGS - deduct 5 percent to 15 percent.

Costs are based on square foot of floor area, unless otherwise noted.

ADDITIONAL FEATURE(S) COSTS	LOW	AVERAGE	GOOD
FLOOR,			
Asphalt:	$ 0.92	$ 1.17	$ 1.49
Concrete:	$ 1.54	$ 1.88	$ 2.27
LIGHTING:	$ 0.10	$ 0.29	$ 0.58
INSULATION (per square foot of insulated area),			
Wall:	$ 0.30	$ 0.37	$ 0.46
Roof:	$ 0.41	$ 0.62	$ 0.95
PLUMBING:	$ 0.09	$ 0.27	$ 0.54
HEATING (suspended space heaters):	$ 0.47	$ 0.65	$ 0.88

Add or subtract 3 percent for each foot of deviation from 10' base height.

NOTE: The costs given above reflect the use of the unskilled farm labor. For professional labor supervised by a contractor or job foreman, costs should be increased up to 25 percent based on the quality level of the finished product.

PREFABRICATED METAL HORSE STABLES

COMPONENT	CLASS 1 LOW QUALITY	CLASS 2 AVERAGE QUALITY	CLASS 3 GOOD QUALITY
Foundation	Light perimeter concrete foundation	Average perimeter concrete foundation	Good perimeter concrete foundation
Floor	Dirt	Dirt	Dirt
Wall Structure	Prefabricated light metal frame	Prefabricated average weight metal frame	Prefabricated heavy duty metal frame
Exterior Wall Cover	Metal cover light weight	Metal cover average weight	Metal cover heavy duty
Roof Construction	Light open steel system for metal	Average open steel system for metal	Heavy duty open steel system for metal
Roof Cover	Low pitch light metal cover	Low pitch average metal cover	Low pitch heavy duty metal cover

PREFABRICATED METAL HORSE STABLES SQUARE FOOT COSTS			
	ONE STABLE	TWO STABLES	FOUR STABLES
CLASS	144 SF	288 SF	576 SF
1	$ 8.28	$ 7.59	$ 6.96
2	$ 11.01	$ 10.12	$ 9.29
3	$ 14.69	$ 13.54	$ 12.49
	ADD PER SQUARE FOOT OF PATIO ROOF OR OVERHANG:		
	LOW	AVERAGE	GOOD
	$ 1.91	$ 2.67	$ 3.77
ADD	Concrete or concrete flatwork per square foot of concreted area:		$ 1.88

NOTE: The costs given above reflect the use of unskilled farm labor. For professional labor supervised by a contractor or job foreman, costs should be increased up to 25 percent based on the quality level of the finished product.

DAIRY BARNS

SECTION 2

DAIRY BARNS

MILKING PARLORS

SITE PREPARATION	Basically level terrain, no excavation, minimum fill.
FOUNDATION	Reinforced concrete for one story height. Foundation and footings formed and poured monolithically with floor slab.
FLOORS	Concrete well formed gutters, elevated slab.
CEILING	Open unfinished, paint only, bottom of roof.
INTERIOR	Type found in dairies and milking parlors, smooth plaster or epoxy paints. Minimum cow stanchions and stalls conforming to the quality of the building. No equipment nor machinery is included.
PLUMBING	Basic plumbing required for building, usual floor drains and hose bibs. Does not include milk piping, pumps or storage.
HEATING - COOLING	Minimum, space heaters and evaporative coolers.
ELECTRICAL LIGHTING	Basic electrical service required for dairies. Does not include machinery or equipment.
EXTERIOR WALLS	8" concrete block, bearing walls or reinforced concrete 36 inch high with 2" x 6" stud framing – 16" on center above.
ROOF STRUCTURE AND COVER	Wood joists, wood or composition deck. Asphalt shingles to 290 pounds.
COST RANGE RATING	Based on cost per square foot of floor area.

DAIRY BARNS		**MILKING PARLORS**	
SQUARE FOOT COST			
LOW QUALITY	**AVERAGE QUALITY**	**GOOD QUALITY**	**VERY GOOD QUALITY**
$ 18.10	$ 22.79	$ 29.08	$ 37.56

NOTE: The costs given above reflect the use of unskilled farm labor. For professional labor supervised by a contractor or job foreman, costs should be increased up to 25 percent based on the quality level of the finished product.

MILKING PARLORS
ADDITIONAL FEATURES

COST RANGE RATING Based on cost per square foot of floor area unless otherwise noted.*

DAIRY BARNS	MILKING PARLORS			
ADDITIONAL FEATURES	**LOW QUALITY**	**AVERAGE QUALITY**	**GOOD QUALITY**	**VERY GOOD QUALITY**
CEILING				
(Gypsum board - taped and painted):	$ 0.93	$ 1.03	$ 1.15	$ 1.27
INSULATION,				
Walls:	$ 0.29	$ 0.36	$ 0.45	$ 0.56
Roof:	$ 0.40	$ 0.60	$ 0.92	$ 1.39
WALL ORNAMENTATION				
(*apply only to ornamented area):				
CERAMIC TILE				
(*cost based on square foot of area covered):	$ 6.10	$ 7.41	$ 8.73	$ 10.04
ROOF COVER				
(Wood shingle):	$ 1.11	$ 1.38	$ 1.71	$ 2.13
AUTOMATIC GATES				
(*based on cost per stall):	$ 741.91	$ 770.63	$ 803.11	$ 863.06
AUTOMATIC FEED EQUIPMENT				
(*based on cost per stall):	$ 199.84	$ 246.05	$ 291.02	$ 335.98

FEED STORAGE BINS (see pages 2 & 3, section 6)

NOTE: The costs given above reflect the use of unskilled farm labor. For professional labor supervised by a contractor or job foreman, costs should be increased up to 25 percent based on the quality level of the finished product.

MILK STORAGE, WASH, AND EQUIPMENT ROOMS

SITE PREPARATION	Basically level terrain, no excavation, minimum fill.
FOUNDATION	Reinforced concrete for one story height. Foundation and footings formed and poured monolithically with floor slab.
FLOORS	Concrete at grade level, may include some gutters and drains.
CEILING	Gypsum board, taped and painted.
INTERIOR	Type found in dairies and milking parlors, smooth plaster or epoxy paints. No equipment or machinery is included.
PLUMBING	Basic plumbing required for building, wash basins, water closet, lavatory. Does not include milk piping, pumps or storage.
HEATING - COOLING	Minimum, space heaters and evaporative coolers.
ELECTRICAL LIGHTING	Basic electrical lighting service required for building.
EXTERIOR WALLS	8" concrete block, bearing walls for good and very good quality, plywood, boards, or wood siding on wood frame, interior sheathing finished for low and average quality.
ROOF STRUCTURE AND COVER	Wood joists and sheathing, asphalt shingle cover.
COST RANGE RATING	Based on cost per square foot of floor area.

DAIRY BARNS	MILK STORAGE, WASH, AND EQUIPMENT ROOMS		
LOW QUALITY	**AVERAGE QUALITY**	**GOOD QUALITY**	**VERY GOOD QUALITY**
$ 11.58	$ 16.01	$ 23.41	$ 30.46

NOTE: The costs given above reflect the use of unskilled farm labor. For professional labor supervised by a contractor or job foreman, costs should be increased up to 25 percent based on the quality level of the finished product.

MILKING STORAGE, WASH AND EQUIPMENT ROOMS
ADDITIONAL FEATURES

COST RANGE RATING Based on cost per square foot of floor area.

DAIRY BARNS	MILK STORAGE, WASH, AND EQUIPMENT ROOMS			
~~**ADDITIONAL FEATURES**~~	**LOW QUALITY**	**AVERAGE QUALITY**	**GOOD QUALITY**	**VERY GOOD QUALITY**
INSULATION,				
Walls:	$ 0.29	$ 0.36	$ 0.45	$ 0.56
Roof:	$ 0.40	$ 0.60	$ 0.92	$ 1.39
WALL ORNAMENTATION (*apply only to ornamented area): **CERAMIC TILE** (*cost based on square foot of area covered):	$ 6.10	$ 7.41	$ 8.73	$ 10.04
ROOF COVER (Wood shingle):	$ 1.11	$ 1.38	$ 1.71	$ 2.13

NOTE: The costs given above reflect the use of unskilled farm labor. For professional labor supervised by a contractor or job foreman, costs should be increased up to 25 percent based on the quality level of the finished product.

WASH PEN AND HOLDING AREA

FLOOR OR RAMP Sloping concrete slab rough finish 6” thick.

WALLS Concrete block 8” - height 5’.

FENCING Welded iron pipe, post 10’ on center set in concrete, pipe top rail with 3 cable strands, or, no pipe top rail with 5 cable strands, or, iron rods. Cable size 5/8” or ¾”.

GATES Metal gates (2 usually) 12 linear feet each, 5 rail.

SPRINKLER Hooded rainbird type or equivalent including piping and pump.

COST RANGE RATING Based on cost per square foot of floor area.

LOW QUALITY	AVERAGE QUALITY	GOOD QUALITY	VERY GOOD QUALITY
$ 5.63	$ 5.96	$ 6.41	$ 6.89

ROOF COVERING Wood or pipe post and beam, steel trusses, light metal roof cover;

LOW QUALITY	AVERAGE QUALITY	GOOD QUALITY	VERY GOOD QUALITY
$ 3.14	$ 4.00	$ 5.14	$ 6.56

METAL RAIL FENCE

WELDED IRON RAIL: Iron pipe post 2-1/2" to 4" in diameter - 7' to 10' on center in concrete:

$ 10.94 per lineal foot.

CABLE FENCE

Iron pipe post 2-1/2" to 4" in diameter - 7' to 10' on center in concrete - iron pipe top rail;

3-Cable: $ 7.77 per lineal foot.

4-Cable: $ 8.47 per lineal foot.

METAL GATES

54" to 64" high - welded iron rails or pipe with bracing:

$ 14.11 per lineal foot of gate width.

NOTE: The costs given above reflect the use of unskilled farm labor. For professional labor supervised by a contractor or job foreman, costs should be increased up to 25 percent based on the quality level of the finished product.

DAIRY EQUIPMENT

STAINLESS STEEL REFRIGERATED HOLDING TANKS	
SIZE	**COST**
500 GALLONS	$ 10,069
1,000 GALLONS	$ 14,387
1,250 GALLONS	$ 16,518
1,500 GALLONS	$ 17,948
2,000 GALLONS	$ 21,890
2,500 GALLONS	$ 26,600
3,000 GALLONS	$ 31,311
4,000 GALLONS	$ 38,844
5,000 GALLONS	$ 46,037

VACUUM PUMP SYSTEMS	
ICLUDES 3 PHASE ELECTRIC MOTORS 8 THROUGH 20 STALL SYSTEM	
USE PER COW STALL:	$ 337

REFRIGERATION COMPRESSORS	
SIZE	**COST**
3 HORSE POWER	$ 2,878
4 HORSE POWER	$ 4,027
5 HORSE POWER	$ 4,604
7.5 HORSE POWER	$ 5,754
10 HORSE POWER	$ 7,553
15 HORSE POWER	$ 12,229

HEAD STANCHIONS		
TYPE	**COST**	
STEEL STANCHIONS	$ 13.40	PER LINEAL FOOT
STEEL LOCKABLE STANCHIONS	$ 18.20	PER LINEAL FOOT
STEEL SELF LOCKING STANCHIONS	$ 50.16	EACH STANCHION

NOTE: See following page for listing of additional equipment.

DAIRY EQUIPMENT

PLATE COOLERS					
NUMBER OF STALLS	**6**	**8**	**12**	**20**	**24**
COST	$ 1,923	$ 2,446	$ 3,670	$ 6,115	$ 7,338

HERRINGBONE STALLS			
	SIZE	**NUMBER OF STALLS**	**COST**
	DOUBLE 3	6	$ 2,431
	DOUBLE 4	8	$ 2,818
	DOUBLE 6	12	$ 3,602
	DOUBLE 10	20	$ 9,958
	DOUBLE 12	24	$ 11,521
NOTE: Larger or other sizes, use a combination of above. Above costs include manual operated gates.			

MILK TRANSFER LINES		
TYPE	**SIZE**	**COST PER LINEAL FOOT**
STAINLESS STEEL	18 GAUGE - 1.5"	$ 4.78
STAINLESS STEEL	18 GAUGE - 2"	$ 6.07
STAINLESS STEEL	16 GAUGE - 2"	$ 7.91
STAINLESS STEEL	16 GAUGE - 2.5"	$ 10.98
STAINLESS STEEL	16 GAUGE - 3"	$ 13.26
GLASS PIPE	1.5"	$ 36.97
GLASS PIPE	2"	$ 45.80
NOTE: Flushing systems require twice the amount of pipe.		

MILKER UNITS (IN PLACE COST)				
Electric pulsator or hydropulsator;				
Manual on and off - price range per unit:	$ 323	to	$ 518	EACH UNIT
To automate unit for automatic off, add:	$ 541	to	$ 1,619	

BUNK HOUSES

SECTION 3

BUNKHOUSES

COMPONENT	CLASS 1 LOW QUALITY	CLASS 2 AVERAGE QUALITY	CLASS 3 GOOD QUALITY	CLASS 4 VERY GOOD QUALITY
Foundation	Thickened slab around perimeter	Thickened slab around perimeter	Thickened slab around perimeter	Spread footing around perimeter and thickened slab at partitions
Floor	4" concrete slab	4" concrete slab	4" concrete slab	4" concrete slab
Walls	Box construction 2"x4" at 48" on center	Box construction 4"x4" at 48" on center	2"x4" studs at 24" on center, 2"x4" stud partitions at 24" on center	Masonry exterior walls wood frame interior partitions and ceiling
Exterior Cover	Cheap grade redwood or Douglas fir vertical or horizontal	Average grade of redwood, Douglas fir, B and B or horizontal board	Average or better grade of redwood B and B or horizontal siding or stucco finish	Natural blocks
Interior Finish	None	Gypsum board or plywood partitions painted	Gypsum board or plywood partitions painted	Sheet rock finished
Roof Framing	Rafters and tie at plate line	Very simple truss	Rafters, collar beams and ceiling joists or good trusses	Rafters, collar beams and ceiling joists or good trusses
Roofing	Composition or used metal sheeting	Composition or metal sheeting	Aluminum or corrugated iron or light wood shingles	Good grade composition shingles or wood shingles
Doors	Two or three cheap doors	Three or four average doors	One average door each room	One good door each room
Windows	Few and small	One window each room	One steel or aluminum window in each room	One steel sash or aluminum window in each room
Electrical	Minimum outlets	Minimum outlets	Average or better outlets	Average or better outlets adequate amount

BUNKHOUSES

SQUARE FOOT COST TABLE									
CLASS	**400**	**600**	**800**	**1,000**	**1,200**	**1,500**	**2,000**	**2,500**	**3,000**
1	$ 10.45	$ 9.87	$ 9.58	$ 9.27	$ 9.15	$ 8.87	$ 8.67	$ 8.50	$ 8.42
2	$ 13.94	$ 13.20	$ 12.86	$ 12.45	$ 12.30	$ 11.95	$ 11.68	$ 11.47	$ 11.38
3	$ 18.83	$ 17.89	$ 17.44	$ 16.93	$ 16.74	$ 16.29	$ 15.95	$ 15.69	$ 15.55
4	$ 33.82	$ 31.35	$ 30.20	$ 28.75	$ 28.30	$ 27.06	$ 26.18	$ 25.43	$ 25.10

1. Hook up costs for utilities are included.

2. Costs do not include any interior plumbing. Add for
   Class 1: $ 269 per fixture
   Class 2: $ 414 per fixture
   Class 3: $ 637 per fixture
   Class 4: $ 978 per fixture

3. Costs do not include domestic well or septic system when required.
   See section 4 of Rural Manual for these additional costs.

4. Asphalt tile or linoleum floor covering add: $ 2.28 per square foot

5. Installed carpet, add: $ 2.36 per square foot

6. Cooling systems not included. Do not add for window units.
   Add for evaporative coolers, roof or wall units only: $ 0.84 per square foot

7. Heating systems not included - furnace, floor or wall type, add: $ 0.73 per square foot

8. Costs do not include insulation, add: $ 0.62 per square foot of roof
   $ 0.37 per square foot of wall

NOTE: The costs given above reflect the use of unskilled farm labor. For professional labor supervised by a contractor or job foreman, costs should be increased up to 25 percent based on the quality level of the finished product.

UTILITIES

SECTION 4

UTILITIES

SECTION 4

DOMESTIC WATER SYSTEMS - SEPTIC SYSTEMS - MOBILE HOME HOOKUPS

NOTE: The costs offered in this manual for this section are general or average costs. Specific areas may vary substantially indicating that these costs need modification. It may be necessary for each assessor to substitute cost data more applicable for his area.

In the case of a residence or a bunkhouse, hookup costs are already included with the building's cost figure and it is not necessary to add hookup costs. Mobile home hookup costs are listed on Page 2 of this section.

PUMPS

DOMESTIC WATER SYSTEMS

Includes submersible pump, piping at well, pressure tank and pad, does not include drilling well.

DOMESTIC WATER SYSTEMS							
MOTOR	**1/2 HP**	**3/4 HP**	**1 HP**	**1 1/2 HP**	**2 HP**	**3 HP**	**5 HP**
TANK	**82 GAL**	**82 GAL**	**120 GAL**	**220 GAL**	**220 GAL**	**315 GAL**	**525 GAL**
COST	$ 1,688	$ 1,700	$ 1,816	$ 2,076	$ 2,329	$ 2,389	$ 2,452

Drilling and casing costs per foot of depth - (includes gravel and concrete packing)

4"-6" WELL: $ 23 per foot

8"-10" WELL: $ 34 per foot

EXAMPLE $ 1,816 = 1 HORSEPOWER MOTOR AND PUMP
$ 2,300 = 6" WELL AT 100' DEPTH.

$ 4,116 TOTAL COST

Jet pump - complete shallow well package installed, does not include drilling well.

DOMESTIC WATER SYSTEMS					
JET PUMP	**1/2 HP**	**3/4 HP**	**1 HP**	**1 1/2 HP**	**2 HP**
TANK	**42 GAL**	**82 GAL**	**82 GAL**	**120 GAL**	**220 GAL**
COST	$ 778	$ 847	$ 913	$ 1,040	$ 1,165

EXAMPLE $ 847 = 3/4 HORSEPOWER MOTOR AND PUMP
$ 1,380 = 6" WELL AT 60' DEPTH

$ 2,227 TOTAL COST

PRESSURE TANK SIZES

42 gallons	16 inch diameter	x	48 height	50 inch circumference
82 gallons	20 inch diameter	x	60 height	63 inch circumference
120 gallons	24 inch diameter	x	60 height	75 inch circumference
220 gallons	30 inch diameter	x	72 height	94 inch circumference
315 gallons	36 inch diameter	x	72 height	113 inch circumference
525 gallons	36 inch diameter	x	120 height	113 inch circumference

SEPTIC TANK COSTS

Average septic tank costs were secured from excavating and construction companies across the state. The costs are broken down by the most common sizes. The costs listed below do include leach field costs, they do not include hookup costs as they are not necessary for residences or bunkhouses. For mobile home hookups use hookup costs listed below.

SEPTIC TANK COSTS			
AREA	**1,000 Gallons**	**1,250 Gallons**	**1,500 Gallons**
CARSON CITY	$ 2,068	$ 2,277	$ 2,496
RENO	$ 2,388	$ 2,563	$ 2,991
ELKO	$ 2,137	$ 2,426	$ 2,710
PAHRUMP	$ 1,566	$ 1,714	$ 2,137
LAS VEGAS	$ 1,460	$ 1,746	$ 2,105

MOBILE HOME HOOKUP COSTS	
Water	$ 286
Electric	$ 842
Sewer	$ 356
Gas	$ 215

Water hookup includes trenching, pipe and labor from unit to city main or domestic well system.

Electric hookup includes pole, box, overhead wiring, and conduit for a 100 ampere system.

Sewer hookup includes trenching, pipe and labor to a city sewer main or to a septic system.

Gas hookup includes trenching, pipe and labor from unit to tank and regulator or to main.

NOTE: The above mobile home hookup costs do not include connector, service, or user fees. The above costs include a combined piping cost of 40 lineal feet of water and sewer lines. If longer piping costs are encountered use $8.54 per lineal foot for either water or sewer lines.

CORRAL AND FENCES

SECTION 5

CORRAL FENCING

COSTS ARE PER LINEAR FOOT

TYPE QUALITY	LOW	FAIR	AVERAGE	GOOD
WOOD	$ 4.08	$ 4.91	$ 5.93	$ 7.14
Examples of rails	4-4”	4-6”	5-6”	7-6”
	3-6”	3-8”	4-10”	6-8”
	2-10”	2-12”	3-12”	4-12”
	2 or 3 poles	4 or 5 poles	6 or 7 poles	7 or 8 poles

Base costs are for railroad tie posts eight feet on center with two inch thick rails. Reduce base by one class for lighter wood posts or one inch thick rails. (Reduce low quality by 20 percent.) Adjust base cost plus or minus 7.5 percent for each foot of deviation from base of eight feet on center. Less than eight feet, increase costs, more than eight feet, reduce costs. For solid wood fence of two inch thick rails add 35 percent to good quality. Do not adjust base cost overall more or less than 50 percent.

PIPE AND CABLE FENCES

TYPE QUALITY	LOW	FAIR	AVERAGE
4" PIPE, CABLE RAILS	$ 6.30	$ 6.60	$ 6.89
4" PIPE, 2" PIPE RAILS	$ 8.07	$ 8.36	$ 8.66

TYPE QUALITY	LOW	FAIR	AVERAGE	GOOD
Wire	$ 1.95	$ 2.09	$ 3.06	$ 3.35
Examples: Barbed wire	2 or 3 strands or hog/cattle fence	3 or 4 strands or light grade woven or welded wire	5 or 6 strands or horse fence medium grade welded wire	7 or 8 strands or bull panels heavy welded wire

Base costs are for railroad tie posts eight feet on center. Adjusted cost plus or minus 7.5 percent for each foot of deviation from base. Reduce one class for lighter wood posts, reduce two classes for metal “T” posts. Reduce low quality by 30 percent for light wood posts or 50 percent for metal “T” posts. Do not adjust base cost overall more or less than 50 percent.

FEED TROUGHS

TYPE QUALITY	LOW	FAIR	AVERAGE	GOOD
WOOD WITHOUT FENCE	$ 3.22	$ 4.26	$ 5.46	$ 7.70
WITH FENCE	$ 4.54	$ 5.88	$ 7.19	$ 9.37

For metal troughs, add 200 percent. For concrete troughs, add 250 percent.

CONCRETE

In-place cost of concrete for flatwork is per square foot:	$ 1.88	to	$ 2.27
and cost per square foot of wall area is:			$ 6.95

CHAIN LINK FENCING

Average cost per linear foot, including complete installation on two inch round or "H" posts set in concrete, 8 to 12 feet on centers.

TYPE	HEIGHT				
	4'	6'	8'	10'	12'
2" INCH MESH AVERAGE QUALITY	$ 3.68	$ 5.32	$ 7.00	$ 8.64	$ 10.25
ADD FOR RAILS	$ 0.85	$ 0.85	$ 0.88	$ 0.88	$ 0.88
ADD FOR PRIVACY SLATS	$ 2.49	$ 3.80	$ 5.11	$ 6.54	$ 7.85
ADD FOR 3 STRAND BARBED WIRE	$ 1.06	$ 1.06	$ 1.22	$ 1.22	$ 1.22

Add 5 percent to 15 percent for aluminum or vinyl covered wire.

GATES

Gates may be included in linear footage of fencing, commensurate to quality class, height, etc.

TYPE QUALITY	LOW	FAIR	AVERAGE	GOOD
METAL PIPE OR PORTABLE PANELS	$ 3.67	$ 5.85	$ 7.81	$ 11.33

PLASTIC FENCING

TYPE	COST
POLYMER GRID , 5', 2" * 6" TOP RAIL	$ 6.37
VINYL FENCE, 5" * 5" POSTS, 3 - 2" * 6" RAILS	$ 11.62

For other types of plastic fence, see the Marshall & Swift Commercial Manual, Section 66 Page 5

NOTE: The costs given above reflect the cost of unskilled farm labor. For professional labor supervised by a contractor or job foreman, costs should be increased up to 25 percent based on the quality level of the finished product.

CORRAL LOADING CHUTE

COST PER LINEAR FOOT AND INCLUDES BOTH SIDES

SPACED	LIGHT CHUTE	$	36.76	per linear foot
SPACED	HEAVY CHUTE (INCLUDES PLATFORM	$	42.02	per linear foot
SOLID	LIGHT CHUTE	$	49.02	per linear foot
SOLID	HEAVY CHUTE (INCLUDES PLATFORM	$	61.27	per linear foot

CONCRETE DIPPING VAT

USUALLY COMPOSED OF:

Six inch electric welded fabric, reinforced concrete wade in dipping vat.

Three foot six inches wide by 30 feet long and four feet deep with two inch supply and drain lines included.

Pump and valve not included.

COMPLETE IN PLACE COST 2,947

COMMERCIALLY MANUFACTURED HEAVY DUTY CATTLE GUARDS

CORRALS AND FENCES COMMERCIALLY MANUFACTURED HEAVY DUTY CATTLEGUARDS			
7.5' x 8'	**7.5' x 10'**	**7.5' x 12'**	**7.5' x 15'**
$ 1,575	$ 2,100	$ 2,625	$ 3,255

CATTLE SQUEEZE	
STATIONARY MODEL, LIGHT	$ 934
STATIONARY MODEL, HEAVY	$ 1,759
HEAVY DUTY, HYDRAULIC	$ 5,464
CALF TABLE	$ 833

WINDMILLS AND STEEL TOWERS							
	FAN SIZE		**TOWERS**		**INSTALLATION**		**TOTAL COST**
6'	$ 1,055	**21'**	$ 1,117	$ 1,125		$ 3,297	
6'	$ 1,055	**27'**	$ 1,423	$ 1,050		$ 3,528	
6'	$ 1,055	**33'**	$ 1,764	$ 1,171		$ 3,990	
8'	$ 1,323	**21'**	$ 1,117	$ 983		$ 3,423	
8'	$ 1,323	**27'**	$ 1,423	$ 908		$ 3,654	
8'	$ 1,323	**33'**	$ 1,764	$ 987		$ 4,074	
10'	$ 2,294	**27'**	$ 1,423	$ 1,197		$ 4,914	
10'	$ 2,294	**33'**	$ 1,764	$ 1,234		$ 5,292	
12'	$ 3,622	**27'**	$ 1,423	$ 1,675		$ 6,720	
12'	$ 3,622	**33'**	$ 1,764	$ 1,880		$ 7,266	
14'	$ 5,775	**27'**	$ 1,423	$ 2,336		$ 9,534	
14'	$ 5,775	**33'**	$ 1,764	$ 3,045		$ 10,584	
16'	$ 7,825	**33'**	$ 1,764	$ 3,368		$ 12,957	

CATTLE AND HORSE WATERING TANKS

ROUND BOTTOMLESS STOCK TANKS

25.5 INCH DEEP, GALVANIZED CORRUGATED METAL

$ 34.15 PER FOOT OF DIAMETER - 12 GAUGE METAL - ADD 25 PERCENT FOR 10 GAUGE METAL
ADD: $ 1.88 PER SQUARE FOOT FOR CONCRETE SLAB

COMMERCIALLY MANUFACTURED METAL WATER TROUGHS

(GALVANIZED TANK)

175 GAL	300 GAL	500 GAL
$ 110	$ 168	$ 215

OMMERCIALLY MANUFACTURED AUTOMATIC WATERERS WITH HEATE			
LENGTH	**WIDTH**	**HEIGHT**	**COST**
21"	14"	24"	$ 447
16"	18"	28"	$ 462
16"	26"	28"	$ 548
47"	14"	24"	$ 679
47"	26"	24"	$ 719
74"	14"	24"	$ 787
74"	26"	24"	$ 842
94"	14"	24"	$ 879
120"	14"	24"	$ 1,049

COMMERCIALLY MANUFACTURED METAL WATER TANKS

GALVANIZED WITH BOTTOM 25.5” TO 27” DEEP

$ 44.11 PER FOOT OF DIAMETER - 12 GAUGE METAL - ADD 25 PERCENT FOR 10 GAUGE METAL
ADD: $ 1.88 PER SQUARE FOOT FOR CONCRETE BASE

ALL OTHER WATER TROUGHS

1 cubic foot = 7.5 gallons

VOLUME	ALL OTHER WATER TROUGHS 1 cubic foot = 7.5 gallons	COST PER GALLON
LESS THAN 100 GALLONS		$ 2.25
100 TO 175 GALLONS		$ 1.80
176 TO 300 GALLONS		$ 1.47
301 TO 500 GALLONS		$ 1.04
OVER 500 GALLONS		$ 0.90

COMMERCIALLY MANUFACTURED PROFESSIONAL ROPING AND DOGGING CHUTE	
FIRST SECTION WITH RELEASE GATE	$ 1,147
SECOND SECTION	$ 763
THIRD SECTION	$ 743

COMMERCIALLY MANUFACTURED BUCKING CHUTE	
FIRST SECTION	$ 2,198
ADDITIONAL SECTIONS, EACH	$ 1,506

COMMERCIALLY MANUFACTURED METAL FENCE PANELS

Portable or stationary, no post costs are included. For post costs, see Corral Fencing Costs - Page 1 Section 5.

6' x 62" HEIGHT, 7 RAIL MEDIUM DUTY	$ 74
8'	$ 83
10'	$ 91
12'	$ 109
14'	$ 115
16	$ 120
6' x 62" HEIGHT, 7 RAIL EXTRA HEAVY DUTY	$ 89
8'	$ 100
10'	$ 118
12'	$ 143
14'	$ 150
16	$ 154

For extra heavy duty panels with solid steel sections, increase cost 100%.

COMMERCIALLY MANUFACTURED CROWDING ALLEYS		
24' x 60" HEIGHT INCLUDES FRAMES AND HEADGATE WITH STAND	$	960
24' x 60" HEIGHT (ADD-ON SECTION)	$	385
ALLEY STOPS	$	91
10' CUTOUT GATE INCLUDING FRAME AND 10' PANEL	$	508

CURVED CROWDING ALLEYS		
30' x 74" SWEEP INC 5' GATE & 24' ADJUSTABLE ALLEY, A1 CAGE & 1(	$	5,061
30' x 74" SWEEP INC 5' GATE & 20' ADJUSTABLE ALLEY	$	2,225
30' x 74" SWEEP INC 5' GATE & 20' ADJUSTABLE ALLEY WITH BLOCK	$	2,490
ADJUSTABLE ALLEY BOW	$	137

HEIGHT	COMMERCIALLY MANUFACTURED FEEDER PANEL	
8' x 64"	$	113
10' x 64"	$	133
12' x 64"	$	159
14' x 64"	$	167
16' x 64"	$	175

HEADGATES		
SELF CATCH HEAVY DUTY	$	615
SELF CATCH LIGHT DUTY	$	344

MISCELLANEOUS COSTS

SECTION 6

MISCELLANEOUS COSTS

FARM SILOS

Costs of concrete stave silo, complete. For other construction material, see factors listed below.

MISCELLANEOUS COSTS — FARM SILOS									
DIAMETER	**HEIGHT**								
	30'	**35'**	**40'**	**45'**	**50'**	**60'**	**70'**	**80'**	**90'**
12'	$ 8,272	$ 9,651	$ 11,029	$ 12,408	$ 13,787	$ 16,544	$ -	$ -	$ -
14'	$ 9,513	$ 11,098	$ 12,684	$ 14,269	$ 15,854	$ 19,025	$ 27,297	$ -	$ -
16'	$ 9,863	$ 11,506	$ 13,150	$ 14,794	$ 16,438	$ 19,725	$ 23,013	$ 26,300	$ -
18'	$ 10,658	$ 12,434	$ 14,211	$ 15,987	$ 17,763	$ 21,316	$ 24,869	$ 28,421	$ 31,974
20'	$ 11,931	$ 13,919	$ 15,908	$ 17,896	$ 19,884	$ 23,861	$ 27,838	$ 31,815	$ 35,792
22'	$ 13,840	$ 16,146	$ 18,453	$ 20,759	$ 23,066	$ 27,679	$ 32,292	$ 36,905	$ 41,519
24'	$ -	$ -	$ -	$ -	$ 26,513	$ 31,815	$ 37,118	$ 42,420	$ 47,723
30'	$ -	$ -	$ -	$ -	$ -	$ 43,268	$ 50,480	$ 57,691	$ 64,903

NOTE: For silos of other construction materials, multiply the above appropriate size costs by the following factors:

Brick masonry	1.75	Glass lined steel	2.15
Reinforced concrete	1.60	Steel	1.80
Concrete block	1.20	Wood	1.10

For no chute, deduct $ 12.46 per vertical foot of height.

For flat roof, deduct $ 3.98 per square foot of floor area;
For no roof, deduct $ 7.42 per square foot.

SILO UNLOADER									
FOR SILO UNLOADER, ADD PER FOOT OF DIAMETER OF SILO:									
DIAMETER									
12'	**14'**	**16'**	**18'**	**20'**	**22'**	**24'**	**26'**	**28'**	**30'**
$ 551	$ 492	$ 460	$ 431	$ 416	$ 389	$ 376	$ -	$ -	$ 320

NOTE: Above costs are based on professional construction labor supervised by a contractor or his job foreman. For farm labor with no professional supervision, costs should be reduced up to 25 percent relative to the quality of the finished product.

MISCELLANEOUS COSTS

STEEL GRAIN 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 buyer's slab. Height is to top of shell. Cost of ventilated floor includes floor, auger tube, and steel columns and beam supports for plenum assembly.

NOTE: To calculate capacity in bushels, multiply diameter squared x height x .63.

MISCELLANEOUS COSTS			STEEL GRAIN BINS	
SIZE DIAMETER X HEIGHT	**CAPACITY (BUSHELS)**	**COST W/OUT DRY BIN**	**WITH DRY BIN**	**ADD FOR SLAB FLOOR**
15 X 7	1,257 BU	$ 3,315	$ 4,824	$ 462
15 X 11	1,792 BU	$ 4,371	$ 6,340	$ 504
15 X 15	2,329 BU	$ 5,220	$ 7,595	$ 588
15 X 18	2,864 BU	$ 5,856	$ 8,520	$ 672
18 X 11	2,647 BU	$ 4,829	$ 7,026	$ 620
18 X 15	3,422 BU	$ 6,002	$ 8,733	$ 646
18 X 18	4,198 BU	$ 6,492	$ 9,446	$ 672
21 X 11	3,693 BU	$ 4,928	$ 7,170	$ 851
21 X 15	4,753 BU	$ 6,382	$ 9,285	$ 887
21 X 18	5,813 BU	$ 7,939	$ 11,551	$ 924
24 X 11	4,949 BU	$ 5,275	$ 7,674	$ 1,076
24 X 15	6,344 BU	$ 6,969	$ 10,140	$ 1,129
24 X 18	7,739 BU	$ 8,886	$ 12,930	$ 1,181
27 X 11	6,409 BU	$ 6,362	$ 9,257	$ 1,391
27 X 15	8,182 BU	$ 8,481	$ 12,340	$ 1,460
30 x 15	10,278 BU	$ 9,467	$ 13,775	$ 1,601
30 X 18	12,473 BU	$ 12,094	$ 17,597	$ 1,706
30 X 22	14,668 BU	$ 15,040	$ -	$ 1,785
30 X 26	16,863 BU	$ 18,588	$ -	$ 1,943
36 X 15	10,840 BU	$ 13,443	$ 19,559	$ 2,363
36 X 18	12,920 BU	$ 16,876	$ 24,554	$ 2,494
36 X 22	21,648 BU	$ 20,646	$ -	$ 2,625

LADDERS	$ 51.19	PLUS	$ 7.25	PER LINEAR FOOT
SAFETY CAGES	$ 13.91	TO	$ 17.59	PER FOOT INSTALLED
AUGER AND DRIV	$ 267.75	PLUS	$ 26.25	PER FOOT OF TANK DIAMETER
SPREADERS	$ 525.00	TO	$ 787.50	
STIRRATORS	$ 136.50	TO	$ 210.00	PER FOOT OF TANK DIAMETER

NOTE: Above costs are based on professional construction labor supervised by a contractor or his job foreman. For labor with no professional supervision, costs should be reduced up to 25 percent relative to the quality of the finished product.

MISCELLANEOUS COSTS

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.

MISCELLANEOUS COSTS			FEED TANKS	
DIAMETER (FEET)	**HEIGHT** (FEET)	**CAPACITY** (BUSHELS)	**CAPACITY** (TONS)	**COST**
6'	10'	120	3.0	$ 1,260
6'	16'	240	6.0	$ 1,733
6'	21'	360	9.0	$ 1,995
6'	25'	480	12.0	$ 2,231
6'	28'	600	15.0	$ 2,468
9'	14'	300	7.8	$ 2,546
9'	17'	450	11.3	$ 3,029
9'	20'	590	14.8	$ 3,297
9'	25'	855	21.4	$ 3,827
9'	28'	1,000	25.0	$ 4,016
9'	31'	1,130	28.5	$ 4,200
12'	20'	870	21.8	$ 5,702
12'	25'	1,345	33.6	$ 6,479
12'	31'	1,825	45.6	$ 7,392
12'	36'	2,300	57.5	$ 7,980
12'	42'	2,780	69.5	$ 8,715
7'	11'	157	4.0	$ 1,691
7'	14'	239	6.0	$ 1,838
7'	16'	321	8.0	$ 1,974
ADD:	$ 3.03 PER SQUARE FOOT OF HEAVY DUTY CONCRETE SLAB WORK.			

NOTE: Above costs are based on professional construction labor supervised by a contractor or his job foreman. For farm labor with no professional supervision costs should be reduced up to 25 percent relative to the quality of the finished product.

MISCELLANEOUS COSTS

GRAIN HANDLING SYSTEMS

Cost of handling equipment only does not include grain storage bins. Most grain handling systems are professionally installed with contractor supervision. In cases where unsupervised nonprofessional help such as farm labor is used, reduce the costs listed up to 25 percent, depending on the quality of workmanship.

LOADING AND UNLOADING SYSTEMS

AUGER-TYPE CONVEYORS		BELT-TYPE CONVEYORS	
DIAM.	COST/LIN FT	WIDTH	COST/LIN FT
6"	$ 48	12"	$ 85
8"	$ 66	18"	$ 128
10"	$ 88	24"	$ 150
12"	$ 114	30"	$ 172
14"	$ 137	36"	$ 184
16"	$ 170	48"	$ 237

MISCELLANEOUS COSTS

ELECTRIC POWER PLANTS			
RATING	**COOLING**	**FUEL**	**COST**
3 KILOWATTS	AIR	GASOLINE	$ 2,144
4 KILOWATTS	AIR	GASOLINE	$ 2,978
5 KILOWATTS	AIR	GASOLINE	$ 3,976
6.5 KILOWATTS	AIR	GASOLINE	$ 4,296
10 KILOWATTS	AIR	GASOLINE	$ 6,963
15 KILOWATTS	AIR	GASOLINE	$ 8,182
7.5 KILOWATTS	LIQUID	GASOLINE	$ 5,711
12.5 KILOWATTS	LIQUID	GASOLINE	$ 9,287
20 KILOWATTS	LIQUID	GASOLINE	$ 10,088
4 KILOWATTS	AIR	DIESEL	$ 5,497
8.5 KILOWATTS	AIR	DIESEL	$ 8,623
12 KILOWATTS	AIR	DIESEL	$ 9,347
10 KILOWATTS	LIQUID	DIESEL	$ 8,963
12.5 KILOWATTS	LIQUID	DIESEL	$ 9,475
20 KILOWATTS	LIQUID	DIESEL	$ 11,520
30 KILOWATTS	LIQUID	DIESEL	$ 14,205
45 KILOWATTS	LIQUID	DIESEL	$ 17,870
60 KILOWATTS	LIQUID	DIESEL	$ 17,998
100 KILOWATTS	LIQUID	DIESEL	$ 22,998
ADD For natural gas or LP gas fuel systems:		$ 16.32	per kilowatt
For remote control starting, all gasoline fuel:		$ 62.57	

NOTE: Above costs include minimal current load control switchboard facilities.

Above costs do not include mounting pads.

ADD: (to the plant cost, as determined from the above table) For the following extras:

ALTERNATING CURRENT LOAD CONTROL SWITCHBOARD			AUTOMATIC EMERGENCY SWITCHBOARDS FOR GASOLINE PLANT		
RATING	**VOLTAGE**	**COST EACH**	**RATING**	**VOLTAGE**	**COST EACH***
15 KILOWATTS	240; 230/400	$ 890	15 KILOWATTS	120/240	$ 2,218
20 KILOWATTS	120/240; 240	$ 890	20 KILOWATTS	120/240	$ 2,576
25 KILOWATTS	240; 120/240	$ 890	25 KILOWATTS	120/240	$ 3,578
30 KILOWATTS	240; 120/240	$ 1,977	30 KILOWATTS	120/240	$ 4,007
40 KILOWATTS	120/240; 240	$ 1,977	40 KILOWATTS	120/240	$ 4,508
50 KILOWATTS	480;240	$ 1,977	50 KILOWATTS	120/240	$ 4,936
60 KILOWATTS	480;240	$ 2,190	60 KILOWATTS	120/240	$ 7,441
100 KILOWATTS	480;240	$ 2,190	100 KILOWATTS	120/240	$ 10,805
			ADD FOR DIESEL POWERED PLANTS:		$ 123.65

MISCELLANEOUS COSTS

LIVESTOCK SCALES			
TYPE	**SIZE OF PLATFORM**	**CAPACITY**	**IN PLACE COST**
FULL CAPACITY BEAM	14' X 8'	5 TON	$ 8,348
FULL CAPACITY BEAM	16' X 8'	10 TON	$ 8,681
FULL CAPACITY BEAM	22' X 10'	10 TON	$ 12,154

SCALE CAGES			
METAL		**WOOD**	
SIZE	**COST**	**SIZE**	**COST**
14'	$ 1,089	**14' X 8'**	$ 562
16'	$ 1,224	**16' X 8'**	$ 578
22'	$ 1,690	**22' X 10'**	$ 718
24'	$ 1,841	**24' X 10'**	$ 745

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

ADD:	$ 486	FOR TYPE REGISTERING BEAM.
	$ 1,530	ADD FOR PRINTER
	$ 3,997	FOR ELECTRONIC DIGITAL SCALE.

MOTOR TRUCK SCALES

SPECIFICATIONS

Reinforced concrete pit and platform. All steel structure and scale mechanism.

Motor truck scales are of two general types: the beam type (either manual or type registering) and the full automatic dial type. The construction of both, insofar as the weight carrying mechanism is concerned, is very similar. The method of recording the weights makes the difference.

CAPACITY	TOTAL COST
20 TONS	$ 23,363
30 TONS	$ 27,143
40 TONS	$ 31,185
50 TONS	$ 35,228
60 TONS	$ 39,795
70 TONS	$ 46,043

FOR WOOD PLATFORM, DEDUCT:	6 %
FOR STEEL PLATE, ADD:	5 %
FOR AUTOMATIC DIAL MODEL, ADD:	$ 2,678
FOR REMOTE READER-PRINTER, ADD:	$ 5,250

MISCELLANEOUS COSTS

UNDERGROUND FUEL STORAGE

Costs are for complete installation. For multiple installation, two or more tanks in one hole, deduct 7 percent for each extra tank, consider the largest tank as the base. Add $1.73 per square foot for any concrete pad work. Costs do not include electric pumps. See following page 8 in this section for pump costs.

CAPACITY (GALLONS)	COST	CAPACITY (GALLONS)	COST
280	$ 1,890	**4,000**	$ 4,823
550	$ 2,166	**5,000**	$ 5,513
1,000	$ 2,835	**6,000**	$ 6,536
2,000	$ 3,701	**8,000**	$ 7,324
3,000	$ 4,134	**10,000**	$ 8,918

ABOVE GROUND FUEL STORAGE

Costs are for complete installation. Includes holding stand, discharge hose and valve. Does not include any electric pumps. See following Page 8 in this section for pump costs.

CAPACITY (GALLONS)	COST	CAPACITY (GALLONS)	COST
200	$ 588	**2,000**	$ 1,801
350	$ 817	**3,000**	$ 2,242
550	$ 917	**4,000**	$ 2,609
1,000	$ 1,433	**5,000**	$ 3,050

NOTE: To calculate tank volume use the following formula:

Pi x radius squared x length x 7.5 = volume in gallons.

EXAMPLE: A tank five feet in diameter and 14 feet in length;

Pi equals 3.1416;

Radius (one half of diameter) equals 2.5 feet:

3.1416 x 2.5 squared x 14 feet x 7.5 = 2,062 gallons.

TYPE II

TYPE III

TYPE I

TYPE IV TYPE V

ELECTRIC FUEL PUMP COSTS				
TYPE 1				
WITHOUT METER	$ 385	TO	$ 443	
WITH METER	$ 523	TO	$ 581	
TYPE II				
WITHOUT METER	$ 555	TO	$ 712	
WITH METER	$ 620	TO	$ 918	
TYPE III	$ 516	TO	$ 1,032	
TYPE IV	$ 637	TO	$ 1,274	
TYPE V	$ 1,446	TO	$ 1,807	

COMPUTATION TABLES

SECTION 7

MENSURATION PRINCIPLES

PLANE FIGURE	A plane surface bounded by either straight or curved lines and having no thickness.
SOLID	A body, such as a barrel, building, etc.
SQUARE MEASURE	Area calculation requiring only two dimensions, length and width.
CUBIC MEASURE	Cubic or cubage means volume and gives size in terms of its bulk. Calculation requires three dimensions: length times width times depth or height or thickness.

WEIGHTS AND MEASURES

Tables of weights and measures and other information that may be helpful to the assessor-appraiser.

METRIC MEASURE

Millimeter	0.001 meter
Centimeter	0.01 meter
Decimeter	0.1 meter
Meter	39.3685 inches
Kilometer	1,000 meters
Kilometer	. 62137 miles
Meter	1.0935 yards
Meter	3.2807 feet
1 foot	0.30480 meter
1 foot	30.48 centimeters
1 inch	2.54 centimeters

LINEAR MEASURE

1 foot	12 inches
1 yard	3 feet, 36 inches
1 rod	5 1/2 yards, 16 1/2 feet, 25 links
1 furlong	40 rods, 220 yards, 660 feet
1 mile	8 furlongs, 320 rods, 1,760 yards, 5,280 feet

SURVEYOR'S LINEAR MEASURE

1 link	7.92 inches
1 rod	25 links
1 chain	4 rods, 100 links, 66 feet
1 furlong	10 chains
1 mile	8 furlongs, 80 chains

SQUARE MEASURE

1 square foot	144 square inches
1 square yard	9 square feet, 1,296 square inches
1 square rod	1 pole or perch, 30 1/4 square yards, 272 1/4 square feet
1 rood	40 square rods, 1,210 square yards, 1/4 acre
1 acre	160 square rods, 4,840 square yards, 43,560 square feet
1 square mile	640 acres

SURVEYOR'S SQUARE MEASURE

1 square rod	625 square links
1 square chain	16 square rods
1 acre	10 square chains
1 square mile	640 acres

CUBIC MEASURE

1 cubic foot	1,728 cubic inches, 7.481 gallons
1 cubic yard	27 cubic feet
1 cord foot	16 cubic feet
1 cord of wood	8 cord feet, 128 cubic feet
1 perch of masonry	24 3/4 cubic feet
1 bushel	1.2445 cubic feet

ANGLES AND ARCS

1 minute	60 seconds
1 degree	60 minutes
1 right angle	90 degrees, 1 quadrant
1 circumference	360 degrees, 4 quadrants

BOARD MEASURE

1 board foot	length in feet times width in feet times thickness in inches

AREAS

Square foot area of surface equals square of one side multiplied by factors shown.

REGULAR SHAPED	NUMBER OF SIDES	FACTOR
Equilateral triangle	3	.433
Pentagon	5	1.721
Hexagon	6	2.598
Heptagon	7	3.634
Octagon	8	4.828
Nonagon	9	6.182
Decagon	10	7.694
Undecagon	11	9.366
Dodecagon	12	11.196

MEASURES AND THEIR EQUIVALENTS

A gallon of water (U. S. Standard) weights 8 1/3 pounds and contains 231 cubic inches.

A cubic foot of water contains 7 1/2 gallons, 1,728 cubic inches and weighs 62 1/2 pounds.

Doubling the diameter of a pipe increases its capacity four times.

To find the capacity of tanks any size, given the dimensions of a cylinder in inches, to find its capacity in U. S. gallons; square the diameter, multiply by the length and by .0034. (Note: See table on tank capacities.)

Rectangular tanks: multiply the length by the width by the depth (all in inches) and divide the result by 231. The answer is the capacity in gallons.

Thirty one and one half (31 1/2) gallons water equals one barrel by weight.

British Thermal Unit (BTU) is the amount of the heat required to raise one pound of water one degree Fahrenheit.

A ton of refrigeration is measured by the displacement of the amount of heat required to melt a ton of ice in 24 hours. One motor horsepower of an electrically powered unit is normally required to produce one ton of refrigeration. Twelve thousand British Thermal Units (12,000 BTU) equals one ton.

Kilowatts multiplied by 1.3405 equal horsepower.

Kilowatts equals .746 multiplied by the horsepower.

WEIGHTS

BRICK: Common brick of the national size weigh from 4 1/2 to five pounds; pressed and paving, from six to seven, depending upon clay, burning and size.

LIME: On the basis of 53 pounds to the cubic foot, lime weighs about 66 pounds to the bushel, but in bulk it is often sold on the basis of 80 pounds or 200 pounds to the barrel of 2 1/4 bushels.

MISCELLANEOUS

WEIGHT AND MEASURE EQUIVALENTS

1 cubic inch of cast iron weighs 0.26 pounds

1 cubic inch of wrought iron weighs 0.28 pounds

1 cubic inch of water weighs .036 pounds

1 cubic foot of water weighs 62.321 pounds

1 United States gallon weighs 8.34 pounds

1 Imperial gallon weighs 10.00 pounds

1 United States gallon equals 231.01 cubic inches

1 Imperial gallon equals 277.274 cubic inches

1 cubic foot of water equals 7.48 U. S. gallons

1 gallon (water) weighs 8.34 pounds

1 gallon equals .1337 cubic feet

1 gallon equals .1074 bushels

1 cubic foot equals .8032 bushels

1 barrel (oil) equals 42 gallons

1 barrel (water) equals 31.5 gallons

A span is 9 inches

A hand, horse measurement, is 4 inches

A knot, nautical, is 6,080.27 feet

A fathom, nautical, is 6 feet

A stone is 14 pounds

Pressure in pounds per square inch of column of water equals .434 times the height of the column in feet.

A square acre is approximately 208.7 feet on each side.

1 acre is about 8 rods by 20 rods, or any two combinations of rods whose product is 160.

To convert bushels to tons, multiply number of bushels by 60 and divide the product by 2,000 (average maximum weight of commodities 60 pounds per bushel).

To convert gallons to bushels, divide gallons by 9.35. Answer in bushels.

To convert cubic measure into bushels, multiply by 0.8035.

AREAS AND MEASUREMENTS

To find the circumference of a circle, multiply the diameter by 3.1416.

To find the diameter, multiply circumference by 0.3183 or divide circumference by 3.1416.

To find the radius, multiply circumference by 0.15915.

To find the side of an inscribed square, multiply the diameter by 0.07071 or multiply the circumference by 0.2251.

To find the side of an equal square, multiply the diameter by 0.8863 or multiply the circumference by 0.2821.

SQUARE: A side multiplied by 1.4142 equals the diameter of its circumscribing circle.

A side multiplied by 4.443 equals the circumference of its circumscribing circle.

A side multiplied by 1.126 equals the diameter of an equal circle.

A side multiplied by 3.547 equals circumference of an equal circle.

To find the area of a circle, multiply the circumference by one-quarter of the diameter or multiply the square of the diameter by 0.7854 or multiply the square of the circumference by 0.07958 or multiply the square of one-half of the diameter by 3.1416.

To find the surface of a sphere or globe, multiply the diameter by the circumference or multiply the square of the diameter by 3.1416 or multiply four times the square of the radius by 3.1416.

To find tank capacities, diameter square times .0034 equals gallons per inch of height - Base 42 gallons per barrel.

To find area of a triangle, multiply base by 1/2 perpendicular height.

To find area of an ellipse, product of both diameters times .7854.

To find area of a parallelogram, base times altitude.

To find cubic inches in a ball, multiply cube of diameter by .5236.

To find cubic contents of a cone, multiply area of base by one third the altitude.

Area of rectangle equals length multiplied by width.

Surface of frustum of cone or pyramid equals sum of circumference of both ends times 1/2 slant height plus area both ends.

Contents of frustum of cone or pyramid: multiply area of two ends and get square root, add the two areas and times 1/3 altitude.

CONVERSION TABLES

TABLE FOR AREA AND CAPACITY OF CIRCULAR TANKS

DIAMETER		SQUARE			BARRELS
3	9.42	7.07	53	6	1.26
4	12.57	12.57	94	10	2.24
5	15.71	19.63	147	16	3.5
6	18.85	28.27	212	23	5.0
7	21.99	38.48	288	31	6.8
8	25.13	50.27	376	42	9.0
9	28.27	63.62	477	51	11.3
10	31.42	78.54	587	63	14.0
11	34.56	95.03	711	76	16.9
12	37.69	113.10	846	91	20.2
13	40.84	132.73	993	107	23.7
14	43.98	153.94	1,151	124	27.4
15	47.12	176.72	1,322	142	31.5
16	50.26	201.06	1,054	162	35.8
17	53.41	226.98	1,698	182	40.4
18	56.55	254.47	1,903	204	45.3
19	59.69	283.53	2,121	228	50.5
20	62.83	314.16	2,350	252	56.0
21	65.97	346.36	2,591	278	61.7
22	69.12	380.13	2,843	305	67.7
23	72.26	415.48	3,108	334	74.0
24	75.40	452.39	3,384	364	80.6
25	78.54	490.87	3,672	394	87.4
26	81.68	530.93	3,971	427	94.6
27	84.82	572.56	4,283	460	102.0
28	87.97	615.75	4,606	495	109.7
29	91.11	660.52	4,941	531	117.6
30	94.25	706.86	5,287	568	125.8
31	97.39	754.77	5,646	606	134.4
32	100.53	804.25	6,016	646	143.2
33	103.67	855.30	6,398	687	152.3
34	106.81	907.92	6,791	730	161.6
35	109.96	962.11	7,197	773	171.3
36	113.10	1,017.88	7,614	818	181.3
37	116.24	1,075.21	8,043	864	191.5
38	119.38	1,134.11	8,483	911	202.0
39	122.52	1,194.59	8,936	960	212.7
40	125.66	1,256.64	9,400	1,010	223.8

Notes on next page.

To find capacity of cylindrical tanks standing on end. To find the capacity in cubic feet of a round tank or cistern, multiply the square of the average diameter by the depth and multiply the product by .785.

*To find the capacity in barrels (oil) equals diameter squared times .1399 times height.

** To find the capacity in gallons equals diameter squared times 5.8748 times height.

CONVERSION TABLES

TABLE FOR CONVERSION OF LINEAL FEET INTO BOARD FEET

2 by 4	.667 board feet
3 by 4	1.000 board feet
2 by 6	1.000 board feet
2 by 8	1.333 board feet
2 by 10	1.667 board feet
2 by 12	2.000 board feet
2 by 14	2.333 board feet
2 by 16	2.667 board feet
3 by 6	1.500 board feet
4 by 6	2.000 board feet
4 by 10	3.333 board feet
4 by 12	4.000 board feet
6 by 6	3.000 board feet
6 by 8	4.000 board feet
10 by 12	10.000 board feet
12 by 12	12.000 board feet

BOARD MEASURE

Multiply thickness in inches by width in inches, divide product by 12 and multiply result by the length in feet. The result is board measure content.

EXAMPLE

Two inches times 10 inches equal 20 square inches divided by 12 equals 1.667 board feet times 1,000 lineal feet equals 1,667 board feet.

CENTER PIVOT IRRIGATION SYSTEM DATA

TOTAL SYSTEM LENGTH (IN FEET) 2/	PERCENT OF WATER APPLIED IN LAST 100 FEET 1/	AREA COVERED IN ACRES: TOTAL ACRES OF SQUARE FIELD TWICE LENGTH OF SYSTEM	AREA COVERED IN ACRES: WITH GUN 3/ SPRINKLER CORNERS USED ONLY	AREA COVERED IN ACRES: WITH GUN SPRINKLER USED ON ENTIRE CIRCLE 3/	AREA COVERED IN ACRES: WITHOUT END GUN
600	30.6	33.1	30.8	35.3	26.0
650	28.4	38.8	36.0	40.6	30.5
700	26.5	45.0	41.5	46.2	35.3
750	24.9	51.7	47.3	52.1	40.6
800	23.4	58.8	53.4	58.4	46.2
850	22.1	66.3	59.8	65.1	52.1
900	21.0	74.4	66.5	72.1	58.4
960	19.9	82.9	73.6	79.5	65.1
1,000	19.0	91.8	81.1	87.3	72.1
1,050	18.1	101.2	89.0	95.4	79.5
1,100	17.4	111.1	97.3	103.8	87.3
1,150	16.6	121.4	106.0	112.7	95.4
1,200	16.0	132.2	115.1	121.9	103.9
1,250	15.4	143.5	124.6	131.4	112.7
1,300	14.8	155.2	134.5	141.4	121.9
1,320	14.6	16.0	138.5	145.4	125.7
1,350	14.3	167.4	144.7	151.6	131.4
1,400	13.8	180.0	155.4	162.3	141.4
1,450	13.3	193.1	166.5	173.3	151.6
1,500	12.9	206.6	178.0	184.6	162.3

1/ Less volume of end gun when used.

2/ Generally outside drive wheel is approximately 50 feet from end.

3/ Based on 100 feet gun coverage.

EXAMPLE: System is 900 feet long. Then 21 percent of water is applied in last 100 feet; 66.5 acres are covered with gun used in corners only.