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**In the Matter of:** )
**Approval of the 2018-2019** )
**Rural Building Manual** )

## NOTICE OF DECISION

### *Appearances*

Chuck Bailey, Supervisor of the Locally Assessed Properties Division, appeared on behalf of the Department of Taxation.

### *Summary*

The matter of the approval of the 2018-2019 Rural Building Costs Manual came before the Nevada Tax Commission (Commission) for hearing in Carson City, Nevada, on March 6, 2017, after due notice to each Assessor. The Commission reviewed the Rural Building Costs Manual and the report of the Department.

## DECISION

The Commission, having considered all evidence and testimony pertaining to the matter, hereby adopts the 2018-2019 Rural Building Costs Manual listing costs without adjustment for unskilled labor as reported by the Department for use by county assessors pursuant to NAC 361.128(2).

BY THE NEVADA TAX COMMISSION THIS 26 DAY OF MAY, 2017.

Deonne E. Contine

Deonne Contine, Executive Director

cc: County Assessors


NEVADA DEPARTMENT OF TAXATION

Division of Local Government Services

# 2018-2019

# ASSESSOR'S HANDBOOK OF RURAL BUILDING COSTS

## DATE OF VALUATION JANUARY 1, 2017

Division of Local Government Services

# 2018-2019

# Rural Building Cost Manual

Department of Taxation
Division of Local Government Services
1550 E. College Parkway, Suite 115
Carson City, NV 89706
Phone 775.684.2100 ● Fax 775.684.2020

## INSTRUCTIONS FOR USE

The Rural Building Manual (RBM) is intended to be an assessment tool used to standardize and streamline improvement valuations for rural properties. It provides a broad listing of structures and improvements which are customarily found in rural areas; moreover, it includes photos and descriptions which may be useful to assessors when classifying improvement quality or computing segregated costs.

Based on current construction practices, all RBM sections report costs found in the Marshall and Swift Cost Manual absent of any adjustments for unskilled farm labor. As such, assessors will not adjust values upward by 33 percent as authorized by NAC 361.128 paragraph 3(b). However, to account for the use of unskilled farm labor in the construction of improvements, assessors may make downward adjustments of 25 percent when appropriate.

All photos contained in the RBM are to be used as a guide to help determine quality, class and style of buildings. Photos are not to be used as a method for determination of whether a building should be valued using the RBM.

If the RBM or the Marshall Swift Cost Manual does not contain costs for a particular kind of structure or improvement, the county assessor may apply to the Executive Director for permission to use alternative recognized cost manuals, cost determinations or subscription services.

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**2018-19 RURAL BUILDING COST MANUAL**

## BASIC FARM BUILDINGS – SECTION 1



## DAIRY BARNS – SECTION 2



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Section 1

# BASIC FARM BUILDINGS

# BASIC FARM BUILDINGS

## METAL BARNS

**LOW QUALITY**

**AVERAGE QUALITY**

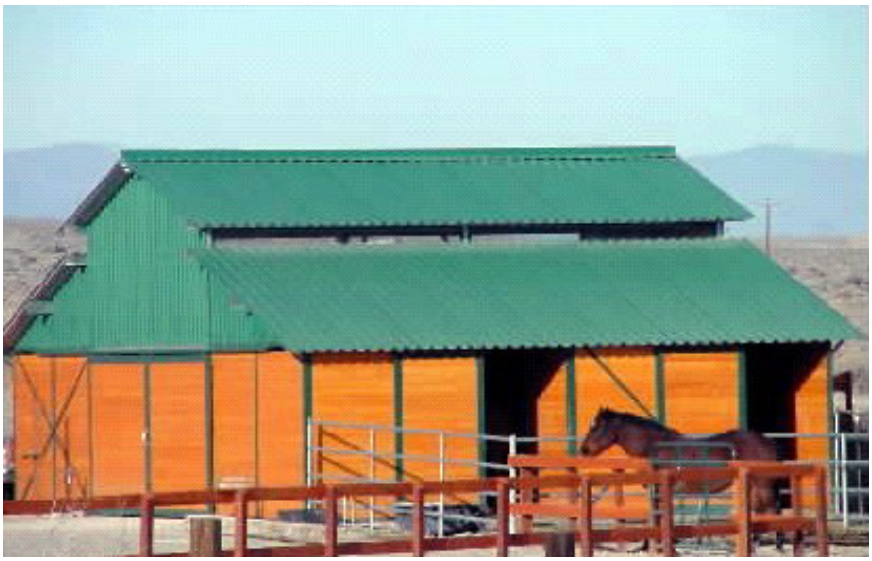
**GOOD QUALITY**

PHOTOS COURTESY OF CHURCHILL COUNTY ASSESSOR

# BASIC FARM BUILDINGS

## WOOD BARNS

**LOW QUALITY**



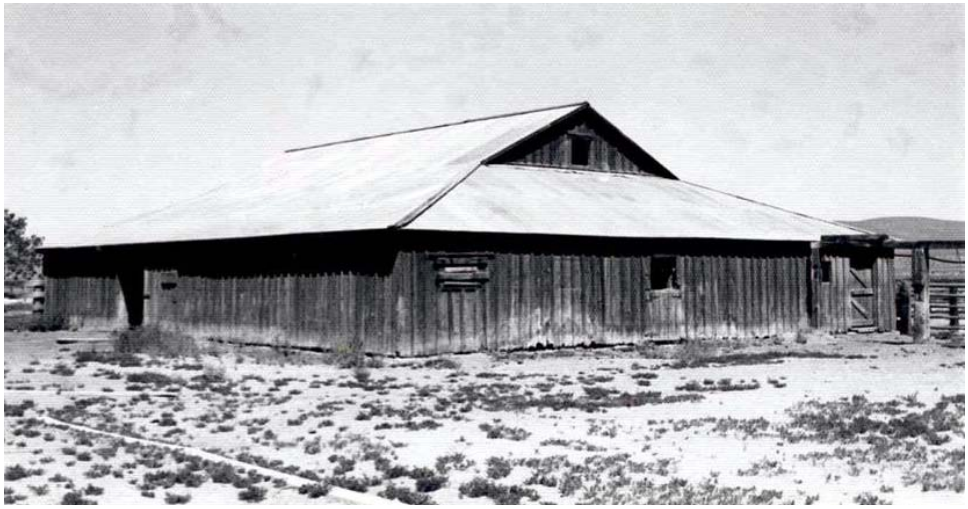
**AVERAGE QUALITY**

**GOOD QUALITY**

PHOTOS COURTESY OF CHURCHILL COUNTY ASSESSOR

# BASIC FARM BUILDINGS

## GENERAL PURPOSE BARNS



**LOW QUALITY**

**AVERAGE QUALITY**

**GOOD QUALITY**

# BASIC FARM BUILDINGS

## GENERAL PURPOSE BARNS

| COMPONENT | CLASS 1<br>LOW QUALITY | CLASS 2<br>AVERAGE QUALITY | CLASS 3<br>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 |

Includes normal stalls commensurate with quality class.

### SQUARE FOOT COSTS

| CLASS | 1,000 | 2,000 | 3,000 | 4,000 | 5,000 | 6,000 | 7,000 | 8,000 | 9,000 | 10,000 | 11,000 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | $ 23.08 | 19.28 | 17.72 | 16.93 | 16.45 | 16.14 | 15.89 | 15.46 | 15.18 | 14.87 | 14.51 |
| 2 | 33.35 | 27.60 | 25.10 | 23.89 | 23.18 | 22.74 | 22.39 | 21.76 | 21.25 | 20.72 | 20.26 |
| 3 | 41.69 | 36.95 | 34.46 | 33.13 | 32.44 | 31.93 | 31.60 | 30.95 | 30.43 | 29.88 | 29.49 |

ADD Concrete or wood floors, or concrete flatwork per square foot: $ 4.07

Lofts per square foot of floor area

Low Quality: $ 4.91
Average Quality: 6.44
Good Quality: 8.45

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 adjusted downward by 25 percent relative to the quality of the finished product.

# BASIC FARM BUILDINGS

## HAY STORAGE BARNS

**AVERAGE QUALITY**

**GOOD QUALITY**

# BASIC FARM BUILDINGS

## HAY STORAGE BARNS

| COMPONENT | CLASS 1<br>LOW QUALITY | CLASS 2<br>AVERAGE QUALITY | CLASS 3<br>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 |

### SQUARE FOOT COSTS

| CLASS | 1,000 | 2,000 | 3,000 | 4,000 | 5,000 | 6,000 | 7,000 | 8,000 | 9,000 | 10,000 | 11,000 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | $ 21.42 | 17.58 | 16.04 | 15.23 | 14.84 | 14.43 | 14.24 | 13.78 | 13.50 | 13.19 | 12.99 |
| 2 | 30.22 | 24.20 | 21.41 | 20.26 | 19.47 | 18.54 | 18.31 | 17.54 | 16.94 | 16.27 | 15.94 |
| 3 | 41.37 | 33.42 | 30.08 | 28.06 | 27.32 | 26.41 | 25.89 | 24.92 | 24.24 | 23.30 | 22.71 |

ADD Concrete or wood floors, or concrete flatwork per square foot: $ 4.07

Lofts per square foot of floor area

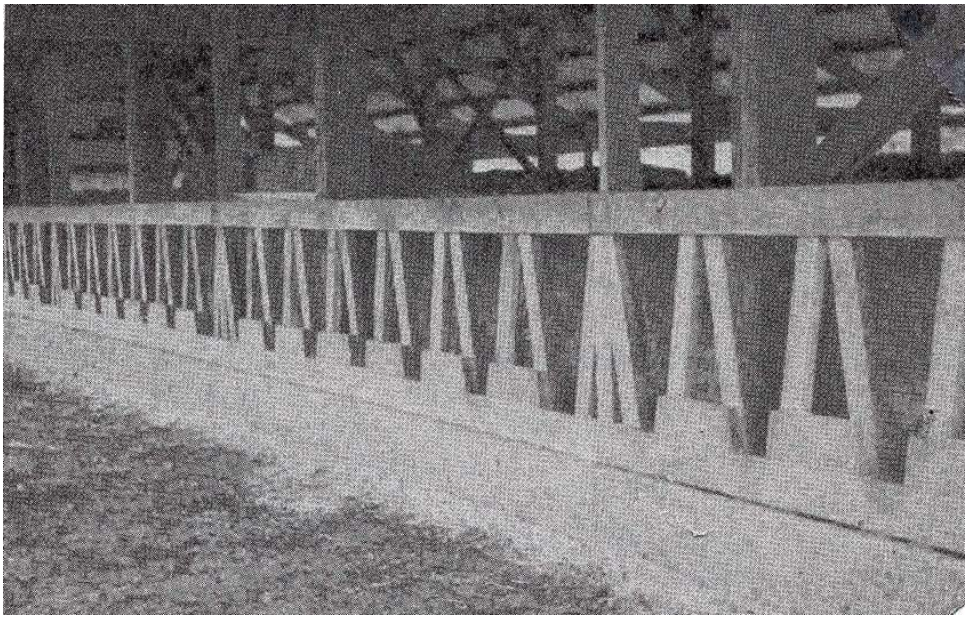
Low Quality: $ 4.91
Average Quality: 6.44
Good Quality: 8.45

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 adjusted downward by 25 percent relative to the quality of the finished product.

# BASIC FARM BUILDINGS

## FEED BARNS

**AVERAGE QUALITY**



**INTERIOR DETAIL**

**GOOD QUALITY**

# BASIC FARM BUILDINGS

## FEED BARNS

| COMPONENT | CLASS 1<br>LOW QUALITY | CLASS 2<br>AVERAGE QUALITY | CLASS 3<br>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 |

Includes normal feed stalls commensurate with quality class.

### SQUARE FOOT COSTS

| CLASS | 1,000 | 2,000 | 3,000 | 4,000 | 5,000 | 6,000 | 7,000 | 8,000 | 9,000 | 10,000 | 11,000 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | $ 14.46 | 13.41 | 12.83 | 12.45 | 12.30 | 12.22 | 12.14 | 12.07 | 12.01 | 11.93 | 11.91 |
| 2 | 17.66 | 16.66 | 15.99 | 15.46 | 15.13 | 14.99 | 14.88 | 14.79 | 14.69 | 14.62 | 14.60 |
| 3 | 23.49 | 22.55 | 21.77 | 21.15 | 20.60 | 20.28 | 20.12 | 20.02 | 19.95 | 19.76 | 19.66 |

ADD Concrete or wood floors, or concrete flatwork per square foot: $ 4.07

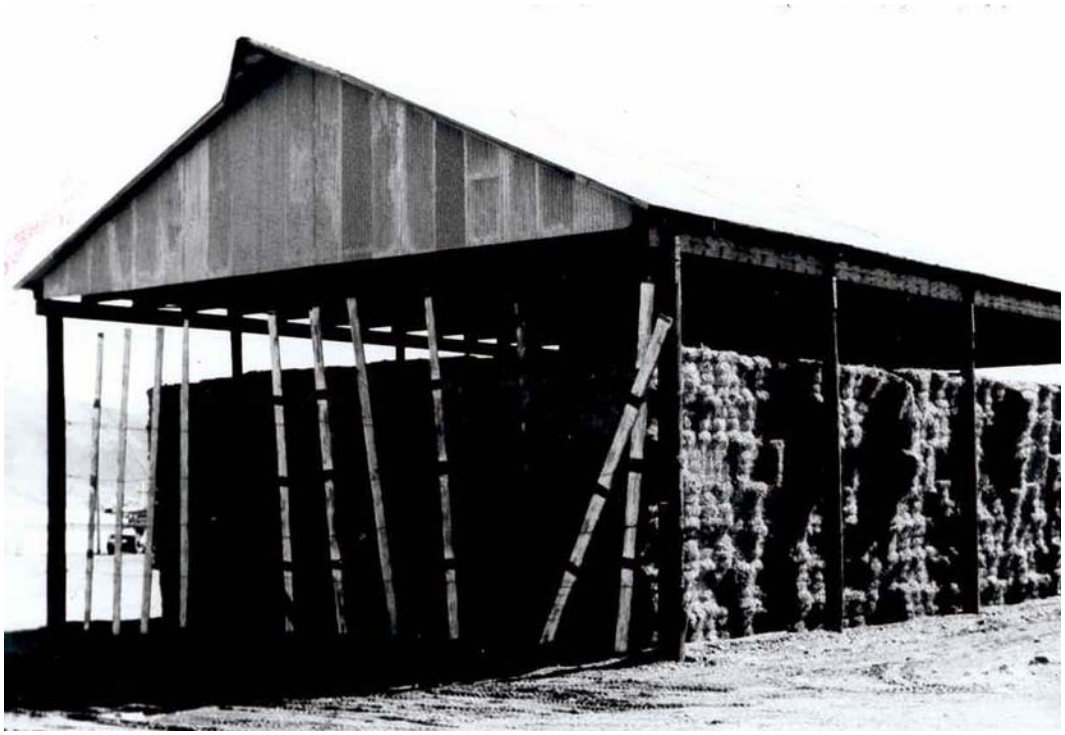
Lofts per square foot of floor area

Low Quality: $ 4.91
Average Quality: 6.44
Good Quality: 8.45

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 adjusted downward by 25 percent relative to the quality of the finished product.

# BASIC FARM BUILDINGS

## POLE BARNS



**AVERAGE QUALITY – ALL SIDES OPEN**
**WOODEN POLES – WOOD FRAME**

**GOOD QUALITY – ALL SIDES OPEN**
**STEEL POLES, STEEL TRUSS & STEEL FRAME**

# BASIC FARM BUILDINGS

## 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 multiplier for good quality materials--heavy steel frame and trusses, wide span, heavy gauge roof cover. Use multiplier for low quality materials--light wood poles and frame with light wood or steel trusses and light gauge roof cover.

### SQUARE FOOT COSTS

**TYPE "A" (ALL SIDES OPEN)**

| END WIDTH | SIDE LENGTH 34' | 51' | 68' | 85' | 102' | 119' | 136' | 153' | 170' | 187' |
|---|---|---|---|---|---|---|---|---|---|---|
| 20' | $ 11.92 | 11.55 | 11.19 | 10.88 | 10.88 | 10.48 | 10.48 | 10.48 | 10.48 | 10.48 |
| 25' | 11.19 | 10.88 | 10.48 | 10.19 | 9.83 | 9.83 | 9.83 | 9.83 | 9.83 | 9.83 |
| 30' | 10.67 | 10.45 | 10.19 | 9.78 | 9.49 | 9.49 | 9.49 | 9.49 | 9.49 | 9.49 |
| 35' | 10.48 | 10.15 | 9.81 | 9.47 | 9.12 | 9.12 | 9.12 | 9.12 | 9.12 | 9.12 |
| 40' | 10.42 | 10.13 | 9.74 | 9.44 | 9.10 | 9.10 | 9.10 | 9.10 | 9.10 | 9.10 |
| 45' | 10.37 | 10.00 | 9.66 | 8.67 | 8.64 | 8.64 | 8.64 | 8.64 | 8.64 | 8.64 |
| 50' | 10.34 | 9.97 | 9.57 | 8.58 | 8.45 | 7.23 | 7.23 | 7.23 | 7.23 | 7.23 |
| 60' | 10.31 | 9.94 | 9.41 | 8.22 | 8.19 | 7.09 | 7.09 | 7.09 | 7.09 | 7.09 |
| 70' | 10.13 | 9.78 | 9.04 | 7.93 | 7.76 | 6.94 | 6.94 | 6.94 | 6.94 | 6.94 |
| 80' | 10.13 | 9.78 | 8.67 | 7.76 | 7.47 | 6.77 | 6.77 | 6.77 | 6.77 | 6.77 |

ADD Concrete or wood floors, or concrete flatwork per square foot : $ 4.07

QUALITY MULTIPLIERS

Good Quality: 1.26

Low Quality: 0.69

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 adjusted downward by 25 percent relative to the quality of the finished product.

# BASIC FARM BUILDINGS

## POLE BARNS - AVERAGE QUALITY

### SQUARE FOOT COSTS

### 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' | $ 17.28 | 15.75 | 14.96 | 14.56 | 14.24 | 13.94 | 13.79 | 13.76 | 13.73 | 13.54 |
| 25' | 15.97 | 14.56 | 13.73 | 13.28 | 13.06 | 12.55 | 12.45 | 12.26 | 12.16 | 12.10 |
| 30' | 15.23 | 13.76 | 13.06 | 12.51 | 12.29 | 12.05 | 11.89 | 11.67 | 11.60 | 11.55 |
| 35' | 14.72 | 13.14 | 12.45 | 11.92 | 11.67 | 11.58 | 11.25 | 11.22 | 11.19 | 11.14 |
| 40' | 14.37 | 12.77 | 12.07 | 11.60 | 11.52 | 11.19 | 10.88 | 10.85 | 10.80 | 10.71 |
| 45' | 14.19 | 12.48 | 11.70 | 11.22 | 10.93 | 10.71 | 10.48 | 10.45 | 10.42 | 10.37 |
| 50' | 14.02 | 12.16 | 11.65 | 10.82 | 10.71 | 10.45 | 10.23 | 10.19 | 10.08 | 10.03 |
| 60' | 13.71 | 12.07 | 11.14 | 10.51 | 10.42 | 10.19 | 10.00 | 9.89 | 9.76 | 9.71 |
| 70' | 13.51 | 11.81 | 10.82 | 10.45 | 10.23 | 10.03 | 9.76 | 9.71 | 9.63 | 9.60 |
| 80' | 13.14 | 11.62 | 10.45 | 10.29 | 10.03 | 9.71 | 9.57 | 9.54 | 9.49 | 9.41 |

ADD Concrete or wood floors, or concrete flatwork per square foot : $ 4.07

QUALITY MULTIPLIERS Good Quality: 1.26
Low Quality: 0.69

### SQUARE FOOT COSTS

### TYPE "C" (ALL SIDES CLOSED)

| END WIDTH | SIDE LENGTH 34' | 51' | 68' | 85' | 102' | 119' | 136' | 153' | 170' | 187' |
|---|---|---|---|---|---|---|---|---|---|---|
| 20' | $ 19.60 | 18.21 | 17.44 | 16.99 | 16.82 | 16.56 | 16.42 | 16.37 | 16.34 | 16.21 |
| 25' | 17.62 | 16.34 | 15.57 | 15.15 | 14.87 | 14.67 | 14.58 | 14.34 | 13.97 | 13.79 |
| 30' | 16.56 | 14.79 | 14.13 | 13.60 | 13.42 | 13.09 | 12.96 | 12.85 | 12.83 | 12.74 |
| 35' | 15.63 | 14.00 | 13.60 | 13.01 | 12.91 | 12.53 | 12.43 | 12.40 | 12.18 | 12.16 |
| 40' | 15.15 | 13.68 | 12.98 | 12.55 | 12.45 | 12.13 | 12.05 | 11.81 | 11.70 | 11.65 |
| 45' | 14.67 | 13.14 | 12.45 | 12.13 | 11.70 | 11.58 | 11.41 | 11.28 | 11.25 | 11.22 |
| 50' | 14.24 | 12.83 | 11.95 | 11.81 | 11.67 | 11.25 | 11.22 | 11.19 | 11.07 | 10.99 |
| 60' | 13.73 | 12.40 | 11.55 | 11.01 | 10.90 | 10.56 | 10.48 | 10.34 | 10.26 | 10.19 |
| 70' | 13.42 | 12.05 | 11.28 | 10.85 | 10.53 | 10.31 | 10.13 | 10.11 | 10.00 | 9.97 |
| 80' | 12.94 | 11.60 | 10.85 | 10.42 | 10.13 | 9.83 | 9.78 | 9.68 | 9.60 | 9.46 |

ADD Concrete or wood floors, or concrete flatwork per square foot: $ 4.07

QUALITY MULTIPLIERS Good Quality: 1.26
Low Quality: 0.69

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 adjusted downward by 25 percent relative to the quality of the finished product.

# BASIC FARM BUILDINGS

## 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 |

## SQUARE FOOT COSTS

| | | | | | |
|---|---|---|---|---|---|
| | WITH OPEN SIDES: | $ 6.98 | TO | $ | 9.22 |
| | WITH ENCLOSED SIDES: | 10.07 | TO | | 13.29 |
| ADD | Concrete or wood floors, or concrete flatwork per square foot: | $ 4.07 | | | |

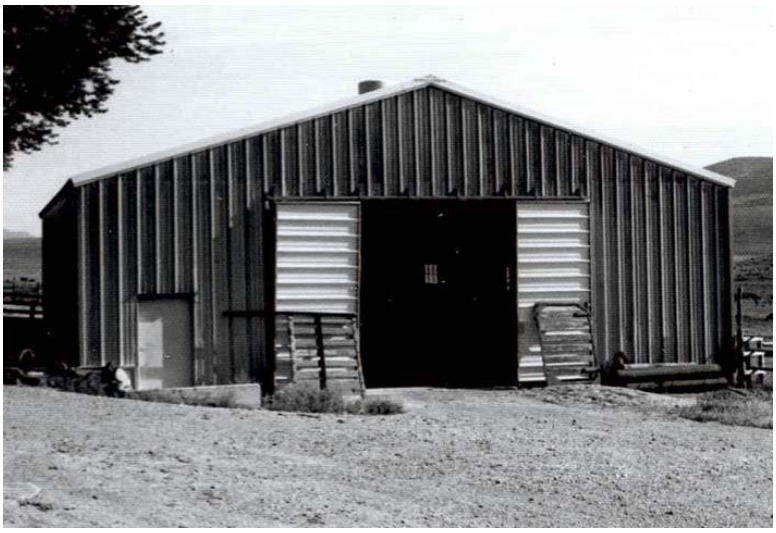
NOTE: Above costs are based on professional construction labor supervised by a contractor or his job foreman. For farm labor with no professional supervision, costs should be adjusted downward by 25 percent relative to the quality of the finished product.

# BASIC FARM BUILDINGS

## SHOPS

**AVERAGE QUALITY**

**GOOD QUALITY**



**GOOD QUALITY – CLASS S**

# BASIC FARM BUILDINGS

## SHOPS

| COMPONENT | CLASS 1<br>LOW QUALITY | CLASS 2<br>AVERAGE QUALITY | CLASS 3<br>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 |

### SQUARE FOOT COSTS

| CLASS | 500 | 1,000 | 1,500 | 2,000 | 2,500 | 3,000 | 4,000 | 5,000 | 6,000 | 8,000 |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | $ 24.55 | 22.95 | 21.48 | 20.60 | 19.90 | 19.40 | 18.68 | 18.08 | 17.73 | 17.28 |
| 2 | 35.90 | 31.78 | 27.94 | 27.10 | 25.44 | 24.63 | 23.57 | 22.87 | 22.16 | 21.51 |
| 3 | 45.77 | 37.65 | 37.06 | 34.86 | 33.36 | 32.11 | 30.43 | 29.63 | 28.59 | 27.61 |

ADD For interior finish -

Class 1: $ 1.66 per square foot of floor area
Class 2: 2.05 per square foot of floor area
Class 3: 2.53 per square foot of floor area

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 adjusted downward by 25 percent relative to the quality of the finished product.

# BASIC FARM BUILDINGS

## MACHINERY & EQUIPMENT SHEDS

**AVERAGE QUALITY**

**AVE. QUALITY – 1 SIDE OPEN**

**GOOD QUALITY**

**GOOD QUALITY – 1 SIDE OPEN**

# BASIC FARM BUILDINGS

## MACHINERY AND EQUIPMENT SHEDS

| COMPONENT | CLASS 1<br>LOW QUALITY | CLASS 2<br>AVERAGE QUALITY | CLASS 3<br>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 |

### SQUARE FOOT COSTS

**TYPE I (ALL SIDES CLOSED)**

| CLASS | 500 | 1,000 | 1,500 | 2,000 | 2,500 | 3,000 | 3,500 | 4,000 | 4,500 | 5,000 | 6,000 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | $ 16.99 | 13.68 | 12.58 | 12.04 | 11.80 | 10.95 | 10.91 | 10.65 | 10.55 | 10.44 | 10.33 |
| 2 | 23.77 | 19.50 | 18.24 | 17.55 | 17.18 | 16.05 | 15.94 | 15.69 | 15.52 | 15.47 | 15.30 |
| 3 | 33.04 | 27.93 | 26.37 | 25.55 | 25.18 | 23.76 | 23.52 | 23.31 | 23.10 | 23.02 | 22.73 |

**TYPE II (ONE SIDE OPEN)**

| CLASS | 500 | 1,000 | 1,500 | 2,000 | 2,500 | 3,000 | 3,500 | 4,000 | 4,500 | 5,000 | 6,000 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | $ 13.96 | 11.17 | 10.26 | 9.75 | 9.43 | 8.88 | 8.81 | 8.62 | 8.48 | 8.46 | 8.35 |
| 2 | 19.71 | 16.31 | 15.05 | 14.40 | 14.04 | 13.45 | 13.22 | 13.06 | 12.83 | 12.80 | 12.64 |
| 3 | 28.63 | 23.88 | 22.30 | 22.08 | 21.61 | 20.78 | 20.52 | 20.32 | 19.96 | 19.85 | 19.65 |

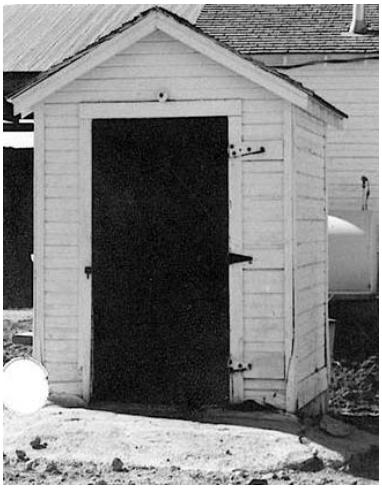
ADD Concrete or wood floors, or concrete flatwork per square foot: $ 4.07

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 adjusted downward by 25 percent relative to the quality of the finished product.

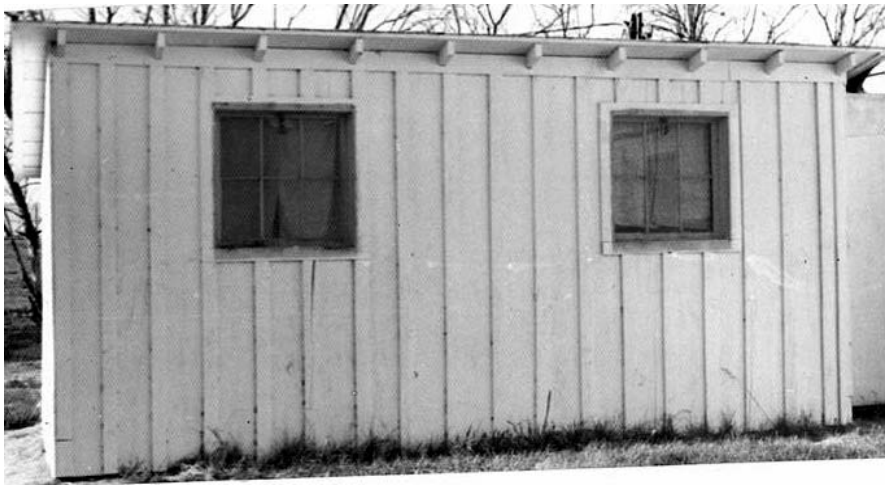
# BASIC FARM BUILDINGS

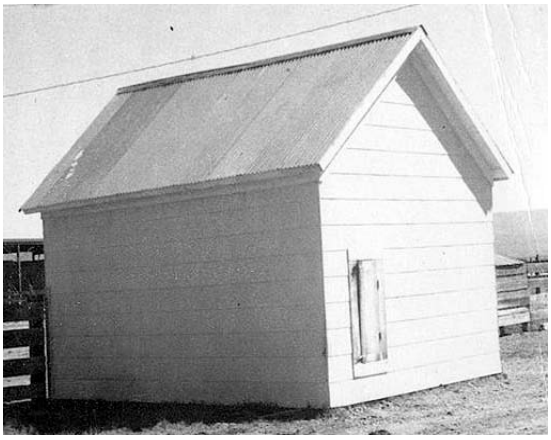
## SMALL SHEDS AND PUMP HOUSES

**LOW QUALITY**



**AVERAGE QUALITY**





**GOOD QUALITY**

# BASIC FARM BUILDINGS

## SMALL SHEDS AND PUMP HOUSES

| COMPONENT | CLASS 1<br>LOW QUALITY | CLASS 2<br>AVERAGE QUALITY | CLASS 3<br>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 |

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.

### SQUARE FOOT COSTS

**TYPE I (ALL SIDES CLOSED)**

| CLASS | 30 | 50 | 60 | 80 | 100 | 120 | 150 | 200 | 250 | 300 | 400 | 500 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | $ 23.22 | 19.30 | 18.74 | 16.82 | 15.67 | 14.94 | 14.16 | 12.93 | 12.43 | 11.91 | 11.15 | 10.70 |
| 2 | 29.37 | 26.20 | 24.50 | 22.45 | 21.21 | 20.41 | 19.53 | 18.27 | 17.69 | 17.11 | 16.31 | 15.85 |
| 3 | 46.90 | 38.22 | 36.84 | 33.40 | 30.20 | 28.58 | 26.87 | 24.87 | 23.07 | 21.91 | 20.28 | 19.24 |

**TYPE II (ONE SIDE OPEN)**

| CLASS | 30 | 50 | 60 | 80 | 100 | 120 | 150 | 200 | 250 | 300 | 400 | 500 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | $ 19.33 | 15.75 | 14.57 | 13.63 | 13.05 | 12.35 | 11.60 | 11.07 | 10.70 | 10.24 | 9.77 | 9.35 |
| 2 | 26.48 | 22.64 | 21.81 | 19.28 | 17.69 | 16.26 | 15.71 | 14.81 | 14.59 | 13.46 | 12.77 | 12.14 |
| 3 | 36.22 | 32.64 | 29.96 | 26.64 | 24.61 | 22.81 | 22.10 | 21.04 | 20.00 | 18.94 | 18.08 | 17.30 |

| | | |
|---|---|---|
| ADD | Concrete or wood floors, or concrete flatwork per square foot: | $ 4.07 |
| | Fiberglass Roll or Batt Insulation: | 0.74 |
| | Gypsum Board Interior: | 1.60 |

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 adjusted downward by 25 percent relative to the quality of the finished product.

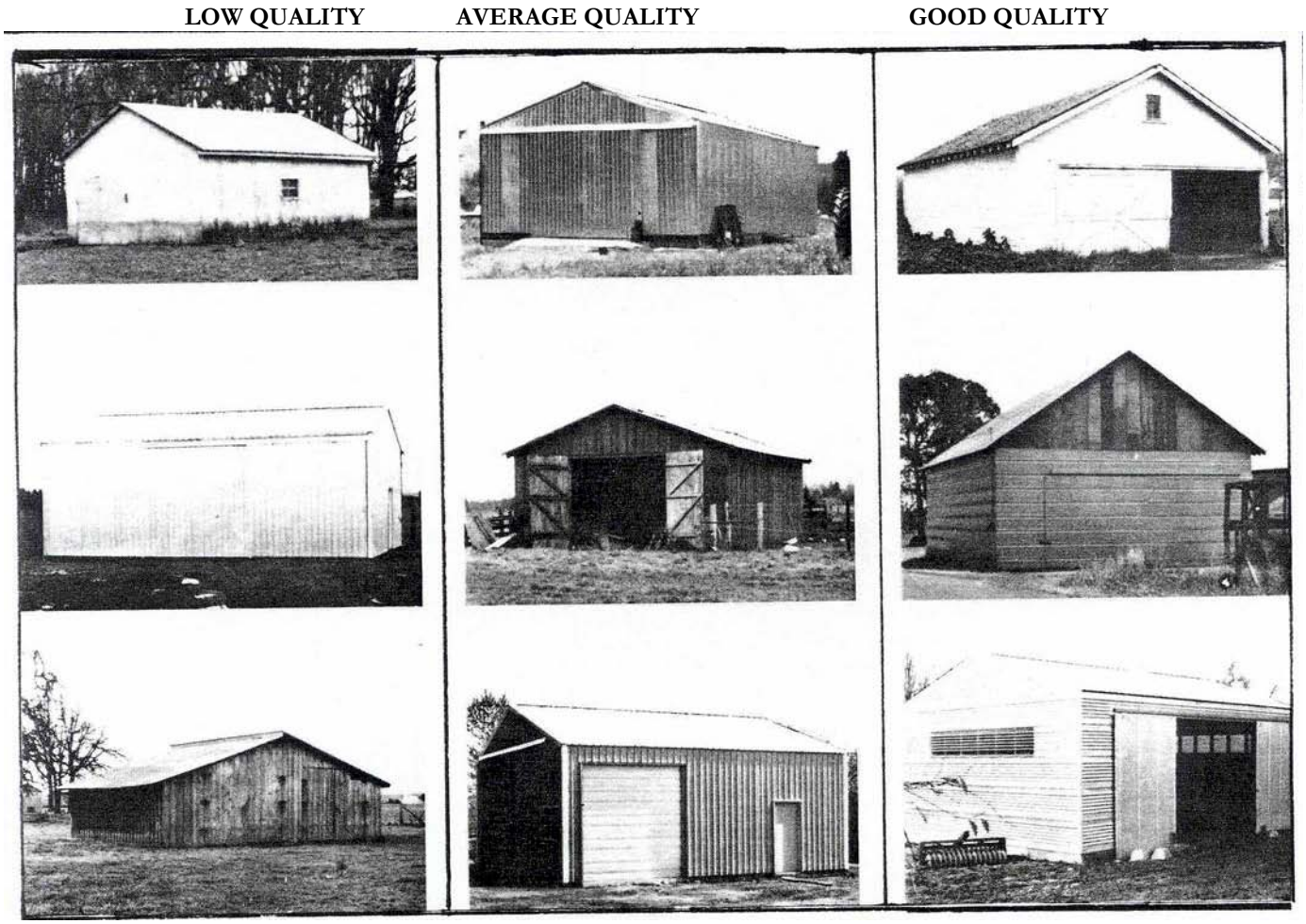
# BASIC FARM BUILDINGS

## GENERAL PURPOSE BUILDINGS

General purpose buildings adapt easily to many different uses, especially as garages, machine repair shops, or storage areas. General purpose buildings may also function as feed storage sheds or livestock shelters.

General purpose buildings typically employ simple designs that emphasize maximum utility at minimum cost.

## CLASS ILLUSTRATIONS



# BASIC FARM BUILDINGS

## GENERAL PURPOSE BUILDINGS

| COMPONENT | CLASS 1<br>LOW QUALITY | CLASS 2<br>AVERAGE QUALITY | CLASS 3<br>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 |

## SQUARE FOOT COSTS

| CLASS | 500 | 1,000 | 1,500 | 2,000 | 2,500 | 3,000 | 3,500 | 4,000 | 4,500 |
|---|---|---|---|---|---|---|---|---|---|
| 1 | $ 13.68 | 11.69 | 11.16 | 10.55 | 10.31 | 9.93 | 9.67 | 9.55 | 9.45 |
| 2 | 19.45 | 17.12 | 16.43 | 15.67 | 15.39 | 14.93 | 14.62 | 14.47 | 14.32 |
| 3 | 25.68 | 22.78 | 21.97 | 21.68 | 20.72 | 20.14 | 19.75 | 19.55 | 19.44 |

ADD For interior finish - Class 1: $ 1.62 per square foot of floor area
Class 2: 1.78 per square foot of floor area
Class 3: 1.94 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: 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 adjusted downward by 25 percent relative to the quality of the finished product.

# BASIC FARM BUILDINGS

## ROOT CELLARS

| COMPONENT | CLASS 1<br>LOW QUALITY | CLASS 2<br>AVERAGE QUALITY | CLASS 3<br>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 |

### SQUARE FOOT COSTS

| CLASS | 100 | 200 | 300 | 400 | 500 | 600 | 1,000 | 1,500 | 2,000 | 2,500 |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | $ 19.28 | 17.55 | 16.70 | 16.28 | 15.98 | 15.76 | 15.54 | 15.33 | 15.16 | 15.11 |
| 2 | 26.98 | 23.59 | 22.60 | 21.74 | 21.29 | 21.13 | 20.16 | 19.64 | 19.32 | 19.07 |
| 3 | 65.62 | 53.49 | 45.95 | 41.82 | 39.47 | 38.28 | 33.96 | 31.34 | 29.55 | 28.31 |

NOTE: Above costs include sod roof covering.
ADD For corrugated metals, light composition or wood shingles;

| | | | |
|---|---|---|---|
| Class 1: | $ | 3.06 | per square foot of floor area |
| Class 2: | | 3.67 | per square foot of floor area |
| Class 3: | | 4.40 | per square foot of floor area |

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 adjusted downward by 25 percent relative to the quality of the finished product.

# BASIC FARM BUILDINGS

## COLD STORAGE WALK-IN BOXES

### TOTAL COST

| TYPE | 50 sq ft | 100' | 150' | 200' | 300' | 400' | 500' |
|---|---|---|---|---|---|---|---|
| COOL BOX | 14,945 | 21,285 | 26,041 | 30,230 | 37,363 | 43,137 | 48,345 |
| FREEZE BOX | 17,051 | 23,957 | 29,069 | 38,438 | 45,571 | 51,345 | 56,553 |

Wall deduction per linear foot of wall: $ 119

NOTE: Above costs represent 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 building walls form exterior wall of box, use above wall deduction. For homemade boxes using farm labor for construction, deduct 30 percent.

## POTATO STORAGE

**TYPE I**

Costs represent low quality construction, partly below grade, performed by unskilled farm labor with minimal quality materials. These are designed for relatively short storage periods. They are commonly called "potato cellars."

| 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 |

### LOW QUALITY
### SQUARE FOOT COSTS

| 4,000 | 5,000 | 7,000 | 10,000 | 15,000 | 20,000 |
|---|---|---|---|---|---|
| $ 13.46 | 13.04 | 12.36 | 11.92 | 10.99 | 10.12 |

# BASIC FARM BUILDINGS

## POTATO STORAGE WAREHOUSE

**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. TYPE II buildings may have other uses.

### SQUARE FOOT COSTS

| | WIDTH | | | |
|---|---|---|---|---|
| LENGTH | 30' | 40' | 60' | 70' |
| 30' | 17.99 | - | - | - |
| 36' | 17.16 | - | - | - |
| 48' | 15.97 | 14.66 | - | - |
| 60' | 15.14 | 13.79 | 13.12 | - |
| 72' | 14.50 | 13.16 | 12.60 | 12.09 |
| 84' | 13.99 | 12.72 | 12.05 | 11.69 |

| | WIDTH | | | |
|---|---|---|---|---|
| LENGTH | 30' | 40' | 60' | 70' |
| 96' | 13.43 | 12.28 | 11.69 | 11.25 |
| 108' | 13.08 | 11.97 | 11.29 | 10.98 |
| 120' | 12.72 | 11.65 | 11.02 | 10.62 |
| 160' | 11.93 | 10.86 | 10.18 | 9.87 |
| 200' | - | 10.18 | 9.67 | 9.39 |
| 240' | - | 9.75 | 9.27 | 9.03 |

OPTIONS:

| | | |
|---|---|---|
| Electrical | | |
| | Minimal Service, add per square foot of floor area: | $ 0.21 |
| Plumbing | | |
| | Minimal Service, add per square foot of floor area: | 0.16 |
| Insulation | | |
| | If 2" thick foamglass is sprayed on walls and ceiling (or equivalent), add per square foot of insulated area: | 4.38 |
| Interior Construction | | |
| | If potato storage area has bins and interior partitions, add per square foot of floor area: | 1.71 |
| Concrete (or concrete flatwork) | | |
| | Add per square foot of concreted area: | 4.07 |

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 adjusted downward by 25 percent relative to the quality of the finished product.

# BASIC FARM BUILDINGS

## POTATO STORAGE WAREHOUSE

**TYPE III**

Costs represent construction at grade level using average or good quality materials with proper supervision and skilled labor. Base wall height ordinarily equals 14 feet. Most common building size equals 50 feet by 100 feet (5,000 square feet). The maximum potato storage period depends on the magnitude of temperature and humidity control equipment; however, costs do not include environmental control. Refer to Page 24 for additional environmental control costs. TYPE III buildings may have other uses.

| 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 |

## SQUARE FOOT COSTS

| | 5,000 | 7,000 | 10,000 | 15,000 | 20,000 | 25,000 | 30,000 | 40,000 |
|---|---|---|---|---|---|---|---|---|
| **AVG** | $ 23.72 | 22.60 | 21.49 | 19.81 | 18.45 | 17.81 | 17.17 | 16.37 |
| **GOOD** | 31.68 | 29.97 | 27.79 | 25.09 | 23.19 | 21.99 | 21.10 | 20.15 |

OPTIONS:

Interior Construction

If potato storage area has bins and interior partitions,

| | |
|---|---|
| add for average quality per square foot: | $ 4.68 |
| add for good quality per square foot: | 9.12 |

Exterior Construction

| | |
|---|---|
| Painted metal exterior walls, add per square foot: | $ 0.67 |
| Concrete or concrete flatwork per square foot: | 4.07 |

NOTE: Above costs for potato storage warehouse assume skilled labor and include contractor fees. For construction performed by ranch or farm labor without contractor supervision, deduct 15 percent to 25 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, including fan room, louver system, humidifiers, perforated air pipe, and control panel.

### SQUARE FOOT COSTS

| 5,000 | 7,000 | 10,000 | 15,000 | 20,000 | 25,000 | 30,000 | 40,000 |
|---|---|---|---|---|---|---|---|
| $ 3.57 | 3.46 | 3.32 | 3.18 | 3.06 | 2.98 | 2.92 | 2.81 |

### AIR CONDITIONING

Includes complete refrigeration unit and controls in addition to the air and humidity system listed above.

### SQUARE FOOT COSTS

| 5,000 | 7,000 | 10,000 | 15,000 | 20,000 | 25,000 | 30,000 | 40,000 |
|---|---|---|---|---|---|---|---|
| $ 7.78 | 7.54 | 7.23 | 6.92 | 6.67 | 6.49 | 6.36 | 6.12 |

# BASIC FARM BUILDINGS

## STEEL BUILDINGS – FARM & RANCH

**METAL HORSE BARN**

**METAL SHOP– SLANT WALL**

**QUONSET BUILDING**

# BASIC FARM BUILDINGS

## QUONSET BUILDINGS

Costs per square foot of floor area represent 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. Adjust low quality buildings down 30 percent and good quality buildings up 25 percent based on the quality of the finished building and extra additives. Base height equals 20 feet at the center of the arch. Add or deduct 5 percent for each foot of deviation from base.

### SQUARE FOOT COSTS

| | WIDTH | | | |
|---|---|---|---|---|
| LENGTH | 30' | 40' | 60' | 70' |
| 30' | 25.70 | - | - | - |
| 36' | 24.51 | - | - | - |
| 48' | 22.81 | 20.95 | - | - |
| 60' | 21.63 | 19.70 | 18.74 | - |
| 72' | 20.72 | 18.79 | 18.00 | 17.27 |
| 84' | 19.98 | 18.17 | 17.21 | 16.70 |

| | WIDTH | | | |
|---|---|---|---|---|
| LENGTH | 30' | 40' | 60' | 70' |
| 96' | 19.19 | 17.55 | 16.70 | 16.08 |
| 108' | 18.68 | 17.10 | 16.13 | 15.68 |
| 120' | 18.17 | 16.64 | 15.74 | 15.17 |
| 160' | 17.04 | 15.51 | 14.55 | 14.10 |
| 200' | - | 14.55 | 13.81 | 13.42 |
| 240' | - | 13.93 | 13.25 | 12.91 |

## PRE-ENGINEERED STEEL BUILDINGS

Costs per square foot of floor area represent Average Quality prefabricated galvanized steel buildings, with minimum doors, windows, and additional features erected on concrete footings without floors, lights, or heat. Multipliers appear below for other types of skin coverings. Adjust low quality buildings down 25 percent and good quality buildings upwards 25 percent based on the quality of the finished building and extra additives.

### AVERAGE QUALITY

| | EAVE | LENGTH TO WIDTH RATIO | | | | | |
|---|---|---|---|---|---|---|---|
| WIDTH | HEIGHT | 1.0 | 1.5 | 2.0 | 3.0 | 4.0 | 5.0 |
| 20' | 10' | $ 22.98 | 21.75 | 20.92 | 19.81 | 19.01 | 18.44 |
| 30' | 12' | 19.72 | 18.83 | 18.36 | 17.35 | 16.81 | 16.41 |
| 40' | 14' | 20.02 | 18.76 | 17.96 | 16.85 | 16.06 | 15.52 |
| 50' | 14' | 17.74 | 17.08 | 16.63 | 16.01 | 15.58 | 15.27 |
| 60' | 14' | 16.18 | 15.65 | 15.30 | 14.83 | 14.52 | 14.37 |
| 80' | 16' | 16.55 | 15.96 | 15.57 | 15.03 | 14.50 | 14.25 |
| 100' | 16' | 16.18 | 15.52 | 15.03 | 14.42 | 14.04 | 13.67 |
| 140' | 16' | 14.37 | 13.94 | 13.55 | 13.15 | 12.81 | 12.61 |
| 160' | 18' | 14.22 | 13.80 | 13.50 | 13.07 | 12.79 | 12.57 |
| 200' | 18' | 13.37 | 13.02 | 12.79 | 12.47 | 12.22 | 12.06 |

See following pages for additional features.

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 adjusted downward by 25 percent relative to the quality of the finished product.

# BASIC FARM BUILDINGS

## 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.

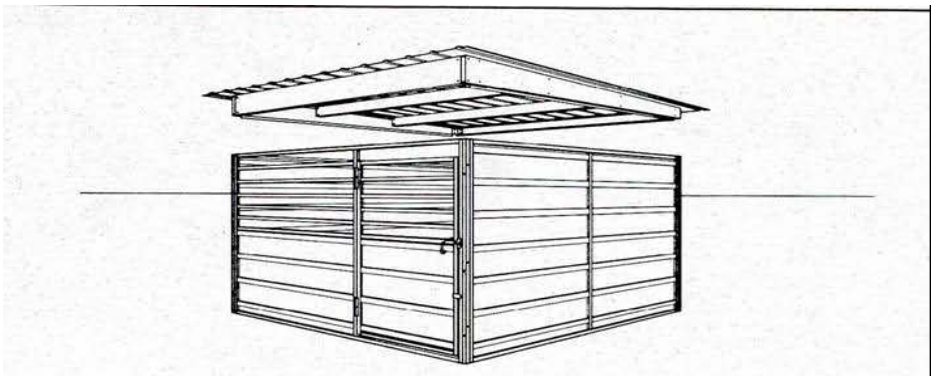
Costs based on square foot of floor area, unless otherwise noted.

| COSTS PER SQUARE FOOT | LOW | AVG | GOOD |
|---|---|---|---|
| **FLOOR:** | | | |
| **Asphalt:** | $ 2.04 | $ 2.58 | $ 3.27 |
| **Concrete:** | 3.36 | 4.07 | 4.95 |
| | | | |
| **LIGHTING:** | 0.24 | 0.67 | 1.31 |
| **INSULATION:** (per square foot of insulated wall area) | | | |
| **Wall:** | $ 0.72 | $ 0.87 | $ 1.06 |
| **Roof:** | 0.93 | 1.42 | 2.15 |
| | | | |
| **PLUMBING:** | 0.21 | 0.61 | 1.20 |
| | | | |
| **HEATING:** (suspended space heaters): | 1.00 | 1.36 | 1.84 |

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 adjusted downward by 25 percent relative to the quality of the finished product.

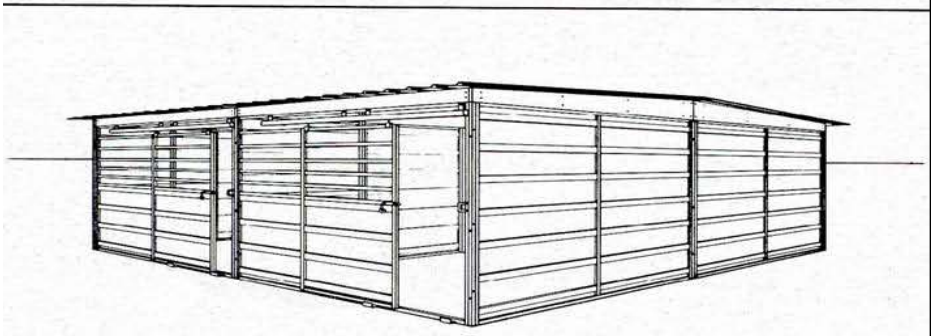
# BASIC FARM BUILDINGS

## PREFABRICATED METAL HORSE STABLES



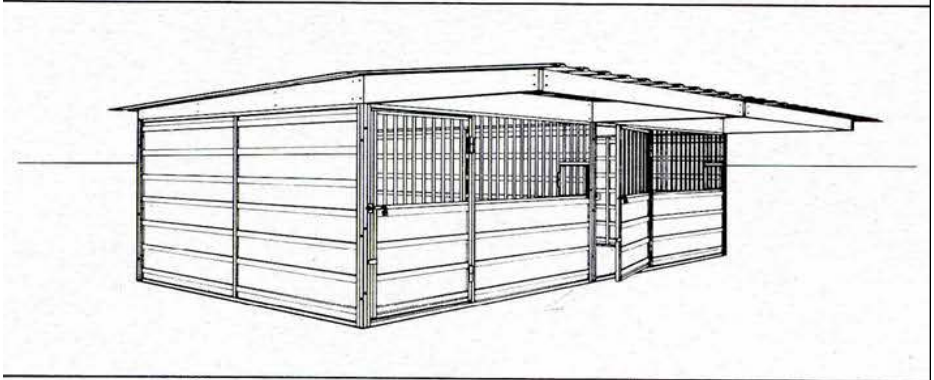
**AVERAGE QUALITY**

**SINGLE STALL**



**AVERAGE QUALITY**

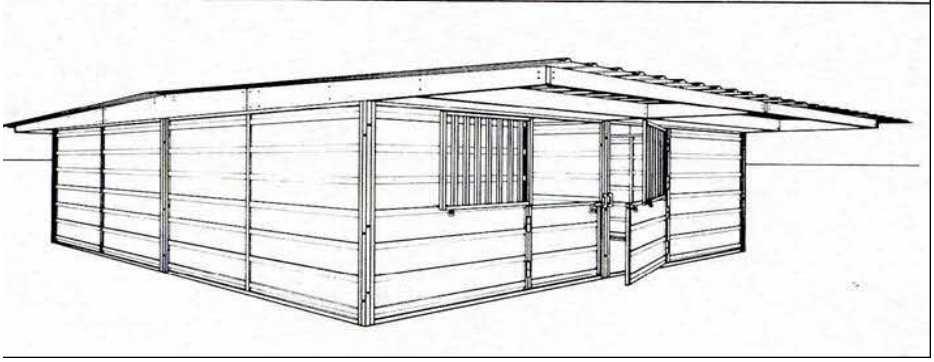
**QUADRUPLE STALL**



**AVERAGE QUALITY**

**DOUBLE STALL**

**WITH PATIO ROOF OR OVERHANG**



**AVERAGE QUALITY**

**QUADRUPLE STALL**

**WITH PATIO ROOF OR OVERHANG**

# BASIC FARM BUILDINGS

## PREFABRICATED METAL HORSE STABLES

| COMPONENT | CLASS 1<br>LOW QUALITY | CLASS 2<br>AVERAGE QUALITY | CLASS 3<br>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 |

## SQUARE FOOT COSTS

| CLASS | ONE STABLE 144 SF | TWO STABLES 288 SF | FOUR STABLES 576 SF |
|---|---|---|---|
| 1 | $ 18.95 | $ 17.37 | $ 15.91 |
| 2 | 25.26 | 23.21 | 21.32 |
| 3 | 33.69 | 31.03 | 28.61 |

ADD per square foot of patio roof or overhang:

| LOW | AVG | GOOD |
|---|---|---|
| $ 4.34 | $ 6.10 | $ 8.57 |

ADD Concrete or concrete flatwork per square foot: $ 4.07

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 adjusted downward by 25 percent relative to the quality of the finished product.

Section 2

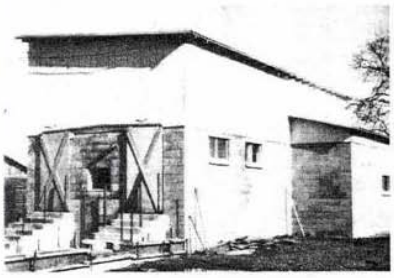
# DAIRY BARNS

# DAIRY BARNS

PHOTOS COURTESY OF CHURCHILL COUNTY ASSESSOR

# DAIRY BARNS

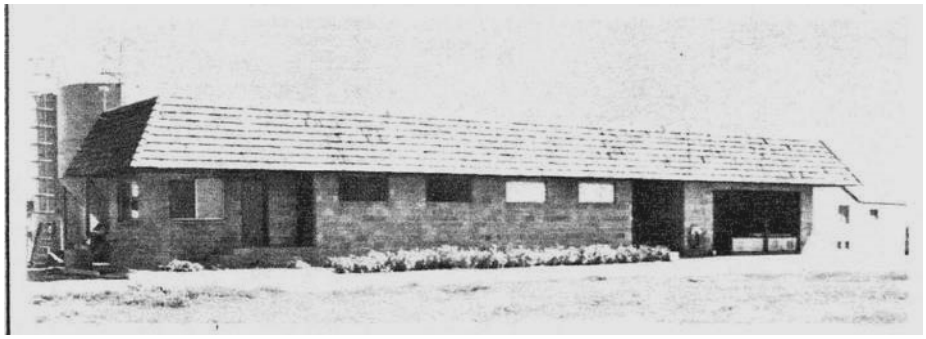
**LOW QUALITY**



**AVERAGE QUALITY**

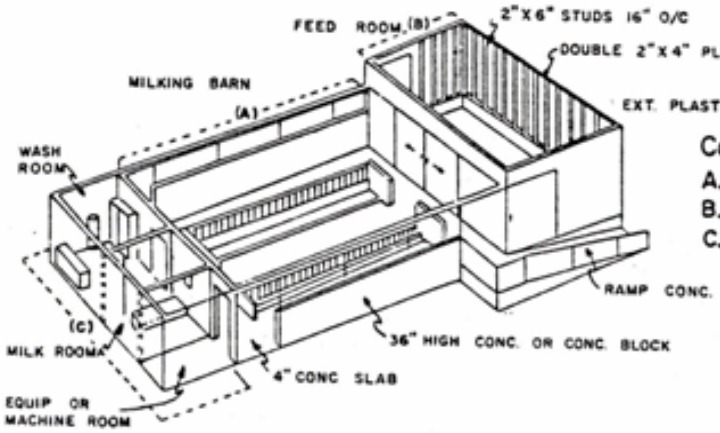
**GOOD QUALITY**

**VERY GOOD QUALITY**



# DAIRY BARNS

## Stanchion Barn

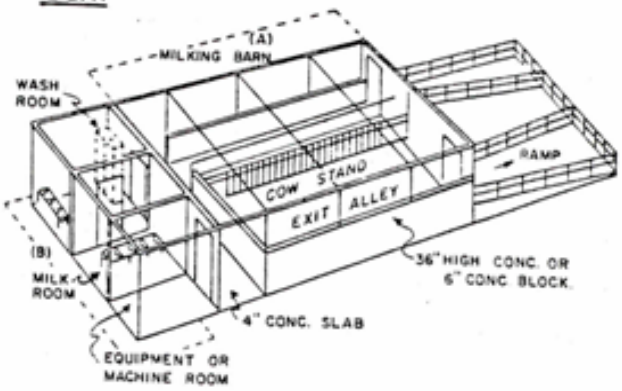



Component Parts of This Dairy
A. Milking Barn
B. Feed Room
C. Milk, Wash, and Equipment Rooms

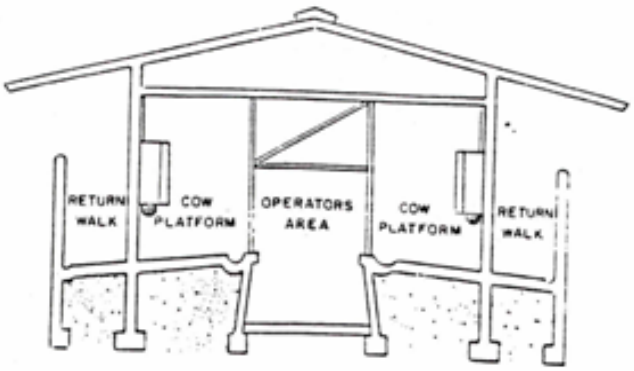
## Typical Walk-Through Barn

Component Parts of This Dairy

A. Milking Barn
B. Milk, Wash,and Equipment Rooms




## Cross Section Modern Herrington-Type Dairy Barn




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. |

## SQUARE FOOT COST

**QUALITY**

| LOW | AVERAGE | GOOD | VERY GOOD |
|---|---|---|---|
| $ 52.83 | $ 65.78 | $ 82.89 | $ 105.48 |

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 adjusted downward by 25 percent relative to the quality of the finished product.

# DAIRY BARNS

## MILKING PARLORS

## ADDITIONAL FEATURES

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

| FEATURE | | QUALITY LOW | AVERAGE | GOOD | VERY GOOD |
|---|---|---|---|---|---|
| **CEILING** | | | | | |
| (Gypsum board - taped and painted): | | $ 2.08 | 2.30 | 2.54 | 2.82 |
| **INSULATION** | | | | | |
| | Walls: | $ 0.72 | 0.87 | 1.06 | 1.29 |
| | Roof: | 0.93 | 1.42 | 2.15 | 3.25 |

| **WALL ORNAMENTATION** (*apply only to ornamented area): | LOW | AVERAGE | GOOD | VERY GOOD |
|---|---|---|---|---|
| **CERAMIC TILE** (*cost based on square foot of area covered): | 12.83 | 15.77 | 18.71 | 21.65 |
| **ROOF COVER** (Wood shingle): | 5.02 | 6.24 | 7.77 | 9.68 |
| **AUTOMATIC GATES** (*based on cost per stall): | $ 1,211 | $ 1,289 | $ 1,368 | $ 1,446 |
| **AUTOMATIC FEED EQUIPMENT** (*based on cost per stall): | $ 869 | 951 | 1,034 | FOR AUGER ADD: $ 869<br>1,115 |

FEED STORAGE BINS (see pages 3 & 4, section 6)

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 adjusted downward by 25 percent relative to the quality of the finished product.

# DAIRY BARNS

## 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. |

### SQUARE FOOT COSTS

### QUALITY

| LOW | AVERAGE | GOOD | VERY GOOD |
|---|---|---|---|
| $ 26.49 | $ 36.61 | $ 62.25 | $ 81.88 |

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 adjusted downward by 25 percent relative to the quality of the finished product.

# DAIRY BARNS

## MILKING STORAGE, WASH AND EQUIPMENT ROOMS

## ADDITIONAL FEATURES

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

| | QUALITY | | | |
|---|---|---|---|---|
| **FEATURE** | **LOW** | **AVERAGE** | **GOOD** | **VERY GOOD** |
| **INSULATION** | | | | |
| Walls: | 0.72 | 0.87 | 1.06 | 1.29 |
| Roof: | 0.93 | 1.42 | 2.15 | 3.25 |
| **WALL ORNAMENTATION** (*apply only to ornamented area): | | | | |
| **CERAMIC TILE** (*cost based on square foot of area covered): | | | | |
| | 12.83 | 15.77 | 18.71 | 21.65 |
| **ROOF COVER** | | | | |
| (Wood shingle): | 5.02 | 6.24 | 7.77 | 9.68 |

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 adjusted downward by 25 percent relative to the quality of the finished product.

**FEEDER FENCE w HEADLOCK**

# DAIRY BARNS

## 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. |

**QUALITY**

| LOW | AVERAGE | GOOD | VERY GOOD |
|---|---|---|---|
| $ 13.80 | $ 15.06 | $ 16.50 | $ 18.08 |

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

**QUALITY**

| LOW | AVERAGE | GOOD | VERY GOOD |
|---|---|---|---|
| $ 7.03 | $ 9.05 | $ 11.63 | $ 14.97 |

METAL RAIL FENCE
WELDED IRON RAILS

Iron pipe post 2-1/2" to 4" in diameter - 7' to 10' on center in concrete:
$ 16.65 per linear 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: $ 13.40 per linear foot.
4-Cable: $ 15.02 per linear foot.

METAL GATES

54" to 64" high - welded iron rails or pipe with bracing:
19.62 per linear foot of gate width.

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 adjusted downward by 25 percent relative to the quality of the finished product.

# DAIRY BARNS

## DAIRY EQUIPMENT

## STAINLESS STEEL REFRIGERATED HOLDING TANKS

| SIZE GALLONS | TANK ONLY | COMPLETE SYSTEM |
|---|---|---|
| 500 | $ 8,380 | $ 15,769 |
| 1,000 | 15,751 | 22,531 |
| 1,250 | 18,428 | 25,868 |
| 1,500 | 20,600 | 28,108 |
| 2,000 | 25,449 | 34,281 |
| 2,500 | 29,289 | 41,657 |
| 3,000 | 32,120 | 49,035 |
| 4,000 | 38,790 | 60,832 |
| 5,000 | 43,443 | 72,096 |

## VACUUM PUMP SYSTEMS

8-20 STALLS WITH 3 PHASE ELECTRIC MOTORS
PER COW STALL: $ 462

## REFRIGERATION COMPRESSORS

| HORSE POWER | COST |
|---|---|
| 3.0 | $ 5,668 |
| 4.0 | 8,283 |
| 5.0 | 10,897 |
| 7.5 | 13,512 |
| 10.0 | 16,127 |
| 15.0 | 18,741 |

## FEED FENCING w HEADLOCKS

| TYPE | COST |
|---|---|
| STEEL | $ 26.82 per LF |
| LOCKABLE STEEL | 40.25 per LF |
| SELF-LOCKING STEEL | 78.55 EACH |

NOTE: See following page for listing of additional equipment.

# DAIRY BARNS

## DAIRY EQUIPMENT

### PLATE COOLERS

**NUMBER OF STALLS**

| 6 | 8 | 12 | 20 | 24 |
|---|---|---|---|---|
| $ 4,344 | 6,453 | 8,563 | 10,672 | 12,781 |

### HERRINGBONE STALLS

| SIZE | STALLS | COST |
|---|---|---|
| DOUBLE 3 | 6 | $ 10,847 |
| DOUBLE 4 | 8 | 12,949 |
| DOUBLE 6 | 12 | 19,423 |
| DOUBLE 10 | 20 | 32,372 |
| DOUBLE 12 | 24 | 34,306 |

NOTE: Above costs include manually operated gates.
Larger or other sizes, use a combination of above.

### MILK TRANSFER LINES

| TYPE | SIZE | COST PER LF |
|---|---|---|
| STAINLESS STEEL | 18 GAUGE - 1.5" | $ 7.49 |
| STAINLESS STEEL | 18 GAUGE - 2.0" | 9.51 |
| STAINLESS STEEL | 16 GAUGE - 2.0" | 12.38 |
| STAINLESS STEEL | 16 GAUGE - 2.5" | 17.19 |
| STAINLESS STEEL | 16 GAUGE - 3.0" | 20.77 |
| GLASS PIPE | 1.5" | 57.90 |
| GLASS PIPE | 2.0" | 71.73 |

NOTE: Flushing systems require twice the amount of pipe.

Electric pulsator or hydropulsator;

| | | | | | | |
|---|---|---|---|---|---|---|
| Manual on & off: | $ | 507 | to | $ | 812 | EACH |
| Automatic off, add: | $ | 847 | to | $ | 2,535 | |

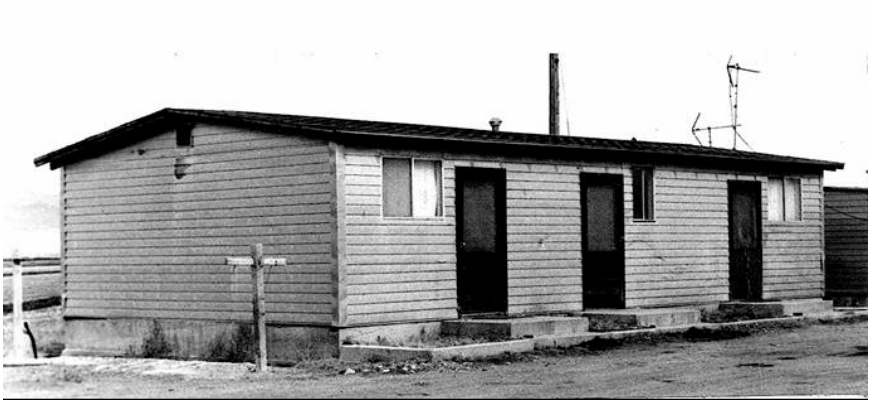
Section 3

# BUNK HOUSES

# BUNK HOUSES

**CLASS I**

**LOW QUALITY**

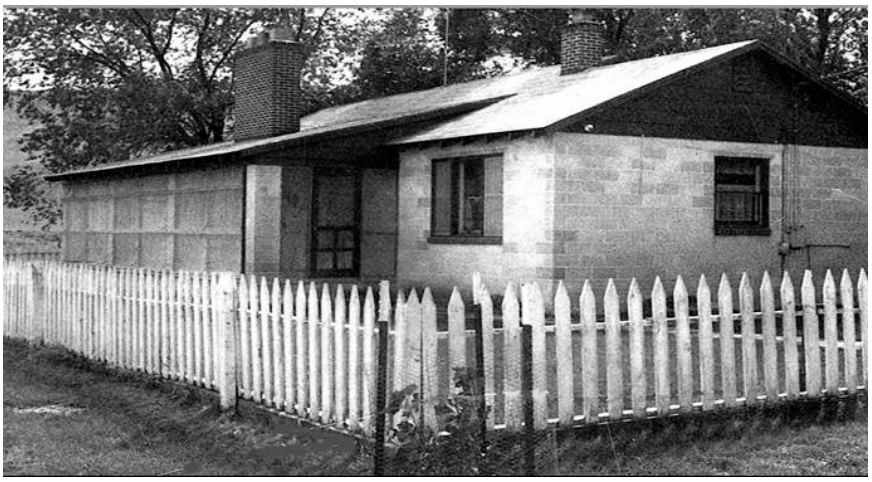


**CLASS 2**

**AVERAGE QUALITY**

**CLASS 3**

**GOOD QUALITY**



**CLASS 4**

**VERY GOOD QUALITY**

# BUNK HOUSES

| COMPONENT | CLASS 1<br>LOW QUALITY | CLASS 2<br>AVERAGE QUALITY | CLASS 3<br>GOOD QUALITY | CLASS 4<br>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 |
| **Heating & Cooling** | None | None | None | None |

# BUNK HOUSES

| | SQUARE FEET | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| CLASS | 400 | 600 | 800 | 1,000 | 1,200 | 1,500 | 2,000 | 2,500 | 3,000 |
| 1 | $ 23.48 | 22.19 | 21.54 | 20.83 | 20.57 | 19.95 | 19.50 | 19.11 | 18.94 |
| 2 | 31.39 | 29.71 | 28.96 | 28.03 | 27.68 | 26.90 | 26.29 | 25.83 | 25.63 |
| 3 | 42.52 | 40.39 | 39.37 | 38.23 | 37.80 | 36.77 | 36.02 | 35.43 | 35.12 |
| 4 | 76.25 | 70.66 | 68.08 | 64.81 | 63.79 | 61.00 | 59.02 | 57.32 | 56.57 |

1. Utility hook-up costs included.

2. Interior plumbing not included

| | | | |
|---|---|---|---|
| Add for | Class 1: | $ 807 | per fixture |
| | Class 2: | 1,233 | per fixture |
| | Class 3: | 1,883 | per fixture |
| | Class 4: | 2,915 | per fixture |

3. Domestic well or septic system not included. Refer to Section 4 for costs

4. Floor covering not included.

| | | | |
|---|---|---|---|
| Add asphalt title or linoleum: | | $ 5.18 | per sq ft |
| Add installed carpet: | | 5.25 | per sq ft |

5. Cooling systems not included.

| | | | |
|---|---|---|---|
| Add window units: | | $ - | per sq ft |
| Add for evaporative coolers, roof or wall units only: | | 2.76 | per sq ft |

6. Heating systems not included.

| | | | |
|---|---|---|---|
| Add floor or wall furnace: | | 1.58 | per sq ft |

7. Insulation not included.

| | | | |
|---|---|---|---|
| Add for | Roof: | 1.42 | per sq ft |
| | Walls: | 0.87 | per sq ft |

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 adjusted downward by 25 percent relative to the quality of the finished product.

Section 4

# UTILITIES

# UTILITIES

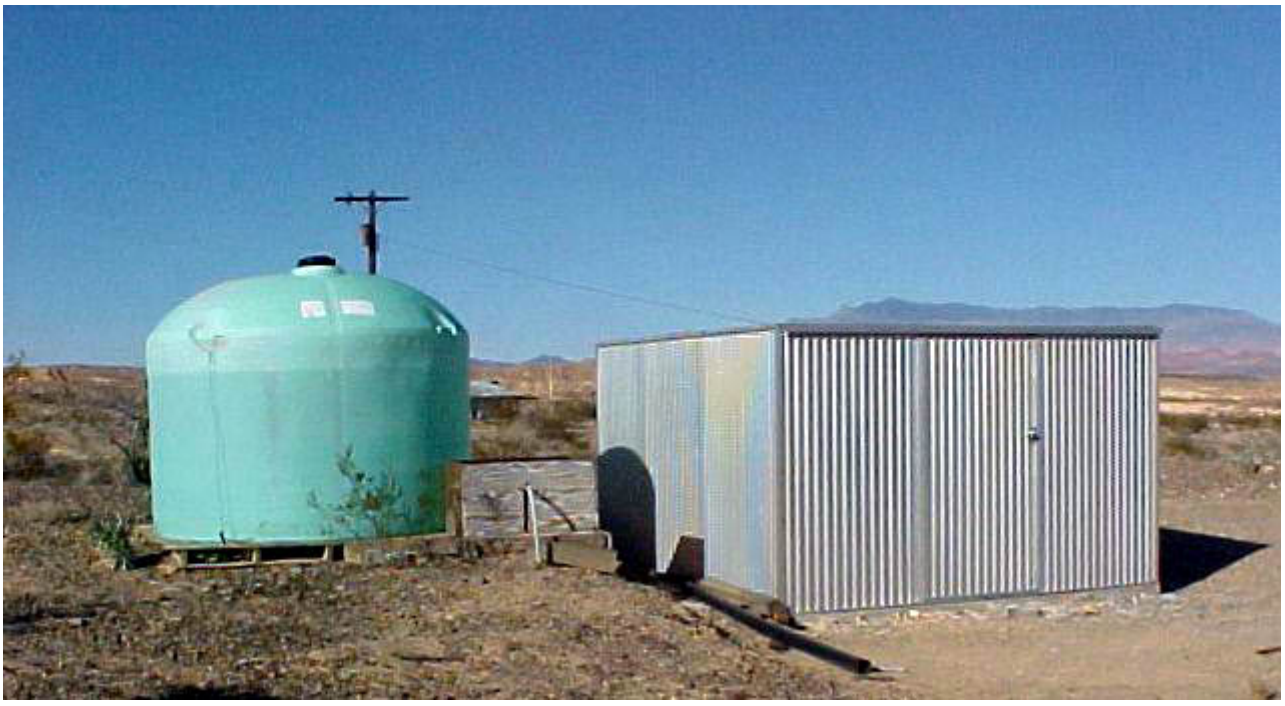
## DOMESTIC WATER SYSTEMS - SEPTIC SYSTEMS - MOBILE HOME HOOKUPS

NOTE: The costs offered in this section represent general or average costs. Actual costs in specific geographic areas may vary substantially thereby requiring each assessor to substitute locally relevant cost data.

Residence and bunkhouse costs already include utility hookups. Mobile home hookup costs appear on Page 3 of this section.

### 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 |



# UTILITIES
## DOMESTIC WATER SYSTEMS

### JET PUMPS

Includes a completely installed shallow well system package. Does not include well drilling. **Bold** cells show typical configurations.

| TANK (GAL) | PUMP MOTOR (HP) 1/3 | 1/2 | 3/4 | 1 | 1 1/2 | 2 |
|---|---|---|---|---|---|---|
| **40** | 1,233 | 1,446 | 1,715 | 1,794 | 2,074 | 2,466 |
| **80** | 1,298 | 1,511 | 1,780 | **1,859** | 2,139 | 2,531 |
| **120** | 1,424 | 1,637 | 1,906 | 1,984 | **2,265** | 2,657 |
| **220** | 1,872 | 2,085 | 2,354 | 2,433 | 2,713 | 3,105 |
| **315** | 2,141 | 2,354 | 2,623 | 2,702 | 2,982 | 3,375 |
| **525** | 2,539 | 2,752 | 3,021 | 3,100 | 3,380 | 3,773 |

| | | |
|---|---|---|
| EXAMPLE: | 3/4 HP & 80 GAL TANK | $ 1,780 |
| | 6" WELL AT 60' DEPTH | 2,280 |
| | TOTAL COST | $ 4,060 |

### SUBMERSIBLE PUMPS

Includes pump, piping at well, pressure tank, and pad. Does not include well drilling. **Bold** cells show typical configurations.

| TANK (GAL) | PUMP MOTOR (HP) 1/3 | 1/2 | 3/4 | 1 | 1 1/2 | 2 | 3 | 5 |
|---|---|---|---|---|---|---|---|---|
| **40** | 1,220 | 1,485 | 1,738 | 2,033 | 2,481 | 3,049 | 3,234 | 5,174 |
| **80** | 1,285 | **1,550** | 1,803 | 2,098 | 2,546 | 3,114 | 3,296 | 5,236 |
| **120** | 1,410 | 1,676 | 1,928 | **2,223** | 2,672 | 3,240 | 3,403 | 5,342 |
| **220** | 1,859 | 2,124 | 2,377 | 2,672 | **3,120** | **3,688** | 3,829 | 5,768 |
| **315** | 2,128 | 2,394 | 2,646 | 2,941 | 3,389 | 3,957 | **4,025** | 5,964 |
| **525** | 2,526 | 2,792 | 3,044 | 3,339 | 3,787 | 4,355 | 4,473 | **6,413** |

| | | |
|---|---|---|
| EXAMPLE: | 1 HP PUMP & 120 GAL TANK | $ 2,223 |
| | 8" WELL AT 100' DEPTH. | 5,700 |
| | TOTAL COST | $ 7,923 |

### WELL DRILLING

| | | | |
|---|---|---|---|
| Drilling & casing costs per foot of well depth | 4" - 6" WELL: | $ 38 | per foot |
| (includes gravel and concrete packing) | 8" - 10" WELL: | 57 | per foot |

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 adjusted downward by 25 percent relative to the quality of the finished product.

# UTILITIES

## SEPTIC TANKS

The first table contains average septic tank costs gathered from a statewide market survey of excavating and construction companies conducted in 1991, adjusted for time. The second table contains costs derived from the current Marshall Swift Commercial Manual without any adjustment for farm labor. Assessors should apply their knowledge of local market conditions to select an appropriate value.

Segregated by common sizes, these costs represent septic tanks installed and connected in normal soil with leach fields and lines, but do not include hookup costs, which are included with residences or bunkhouses. For mobile homes, add the sewer hookup costs listed below.

### 1991 MARKET SURVEY

| | CAPACITY (GAL) | | |
|---|---|---|---|
| AREA | 1,000 | 1,250 | 1,500 |
| CARSON CITY | $ 3,456 | 3,805 | 4,170 |
| RENO | 3,990 | 4,283 | 4,998 |
| ELKO | 3,571 | 4,053 | 4,529 |
| PAHRUMP | 2,617 | 2,863 | 3,571 |
| LAS VEGAS | 2,440 | 2,918 | 3,517 |

### MARSHALL SWIFT JUNE 2015

| | CAPACITY (GAL) | | |
|---|---|---|---|
| QUALITY | 1,000 | 1,250 | 1,500 |
| LOW | $ 2,216 | 2,843 | 3,293 |
| AVERAGE | 2,750 | 3,363 | 3,923 |
| GOOD | 3,283 | 3,883 | 4,551 |

### MOBILE HOME HOOKUPS

| TYPE | LOW | AVG | GOOD |
|---|---|---|---|
| Water | $ 743 | 995 | 1,395 |
| Electric | 1,109 | 1601 | 2,309 |
| Sewer | 835 | 1223 | 1,555 |
| Gas | 351 | 532 | 852 |

WATER hookups include trenching, pipe, and labor from unit to city main or domestic well system.

ELECTRIC hookups include pole, box, overhead wiring, and conduit for a 100 ampere system.

SEWER hookups include trenching, pipe, and labor to a city sewer main or septic system.

GAS hookups include trenching, pipe, and labor from unit to a gas main or a tank and regulator.

NOTE: Mobile home hookup costs do not include connector, service, or user fees.

Hookup costs do include combined piping for 40 linear feet of water and sewer lines.

For either water or sewer piping costs exceeding base, ADD per linear foot: $6.64 to $11.01

Section 5

# CORRALS AND FENCES

# CORRALS AND FENCES

**RAILROAD TIE POSTS**
**10' OC**

**POLE RAIL FENCE**

**AVERAGE QUALITY**
**LESS 15 %**

**RAILROAD TIE POSTS**

**POLE RAIL FENCE**
**WITH FEED TROUGH**

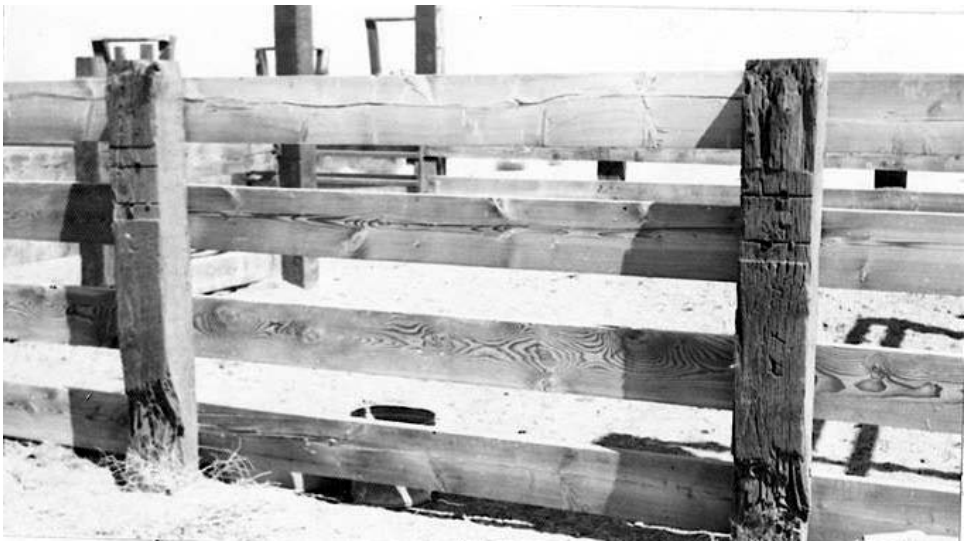
**AVERAGE QUALITY**

**RAILROAD TIE POSTS**

**CABLE FENCE**
**WITH FEED TROUGH**

**AVERAGE QUALITY**

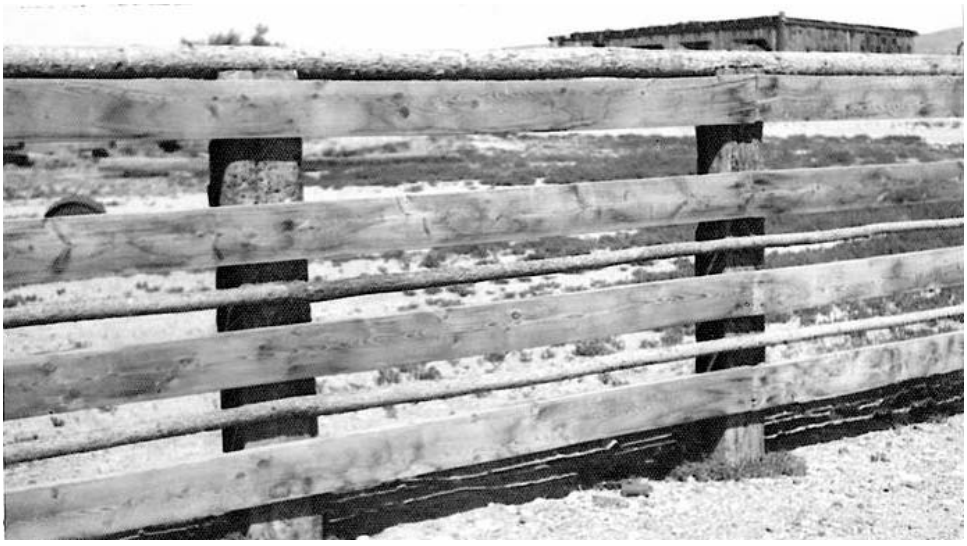
# CORRALS AND FENCES



**RAILROAD TIE POSTS 6' OC**

**2" X 8" FENCE RAILS**

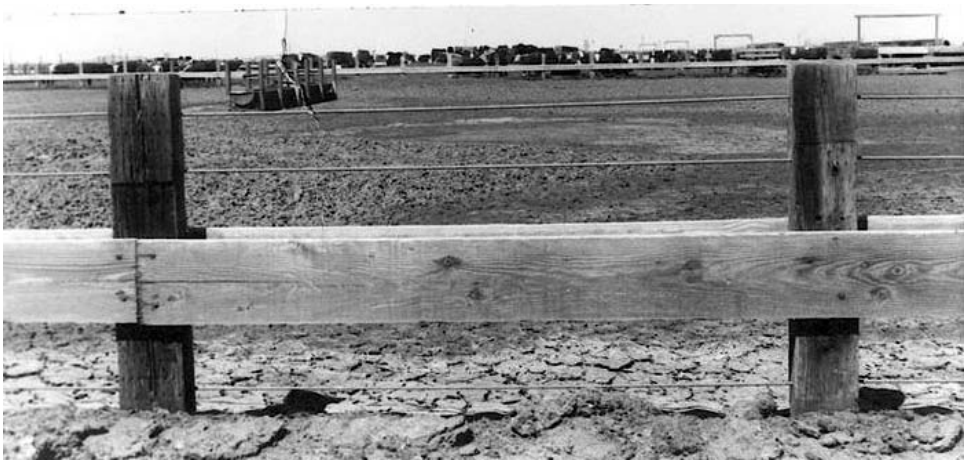
**AVERAGE QUALITY PLUS 15%**



**RAILROAD TIE POSTS 8' OC**

**2" X 8" FENCE RAILS WITH POLES**

**GOOD QUALITY**



**RAILROAD TIE POSTS**

**CABLE FENCE WITH FEED TROUGH**

**AVERAGE QUALITY**

# CORRALS AND FENCES

## CORRAL FENCING

## COST PER LINEAR FOOT

| TYPE | LOW | FAIR | AVG | GOOD |
|---|---|---|---|---|
| WOOD | $ 8.90 | $ 10.71 | $ 12.93 | $ 15.56 |
| Examples | 4-4” | 4-6” | 5-6” | 7-6” |
| of Rails | 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 include railroad tie posts eight feet on center with two inch thick rails. Reduce fair – good quality 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.

| TYPE | LOW | FAIR | AVG | GOOD |
|---|---|---|---|---|
| WIRE | $ 3.24 | $ 3.89 | $ 4.54 | $ 5.20 |
| Examples: | 2 or 3 strands barbed or hog/cattle fence | 3 or 4 strands barbed or light grade woven or welded wire | 5 or 6 strands barbed or horse fence (medium welded wire) | 7 or 8 strands barbed or bull panels (heavy welded wire) |

Base costs include 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.

## PIPE AND CABLE FENCES

| TYPE | LOW | FAIR | AVG |
|---|---|---|---|
| 4" PIPE, CABLE RAILS | $ 12.84 | 13.25 | 13.66 |
| 4" PIPE, 2" PIPE RAILS | 16.37 | 16.89 | 17.41 |

## WOODEN FEED TROUGHS

| TYPE | LOW | | FAIR | | AVG | | GOOD |
|---|---|---|---|---|---|---|---|
| W/O FENCE | $ 6.93 | | $ 9.16 | | 11.74 | | 16.55 |
| WITH FENCE | $ 9.75 | | 12.65 | | 15.47 | | 20.15 |

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

## CONCRETE

In-place cost for flatwork per square foot: $ 4.07 to $ 4.95

Cost per square foot of wall area: $ 19.94

# CORRALS AND FENCES

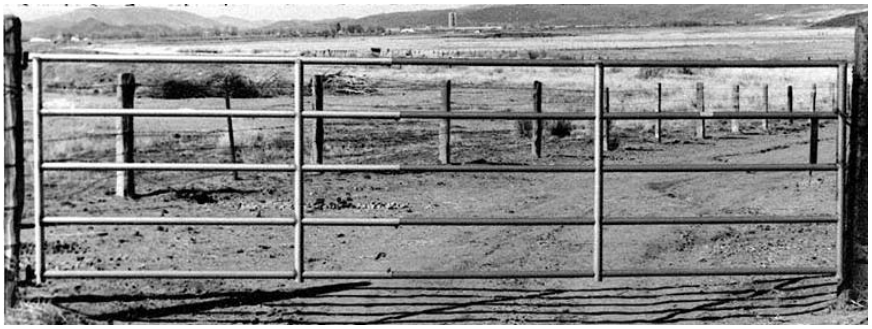
## METAL FENCING AND GATES

**5’ CHAIN LINK FENCE**

**NO TOP RAIL**

**COMMERCIALLY MANUFACTURED GATE**

**GOOD QUALITY**



**EXPANDED TUBE STEEL GATE**

**IRON PIPE CORRAL AND HOLDING PEN**

# CORRALS AND FENCES

## 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 center.

| TYPE | HEIGHT 4' | 6' | 8' | 10' | 12' |
|---|---|---|---|---|---|
| 2" INCH MESH AVERAGE QUALITY | $ 8.82 | 12.71 | 16.74 | 20.67 | 24.47 |
| ADD FOR RAILS | 1.96 | 1.96 | 2.12 | 2.12 | 2.12 |
| ADD FOR PRIVACY SLATS | 5.95 | 9.07 | 12.21 | 15.64 | 18.75 |
| ADD FOR 3 STRAND BARBED WIRE | 2.54 | 2.54 | 2.86 | 2.86 | 2.86 |

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

## PORTABLE HORSE CORRALS & GATES

| TYPE | LOW | FAIR | AVG | GOOD |
|---|---|---|---|---|
| METAL PIPE OR PORTABLE PANELS | $ 7.62 | $ 12.14 | $ 16.21 | $ 23.51 |

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

## PLASTIC FENCING

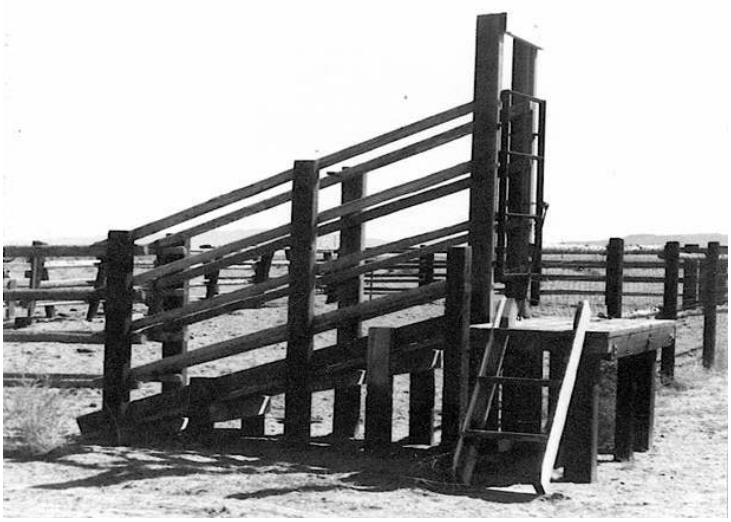
| TYPE | COST |
|---|---|
| POLYMER GRID , 5', 2" * 6" TOP RAIL | $ 14.16 |
| VINYL FENCE, 5" * 5" POSTS, 3 - 2" * 6" RAILS | 17.70 |

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

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 adjusted downward by 25 percent relative to the quality of the finished product.

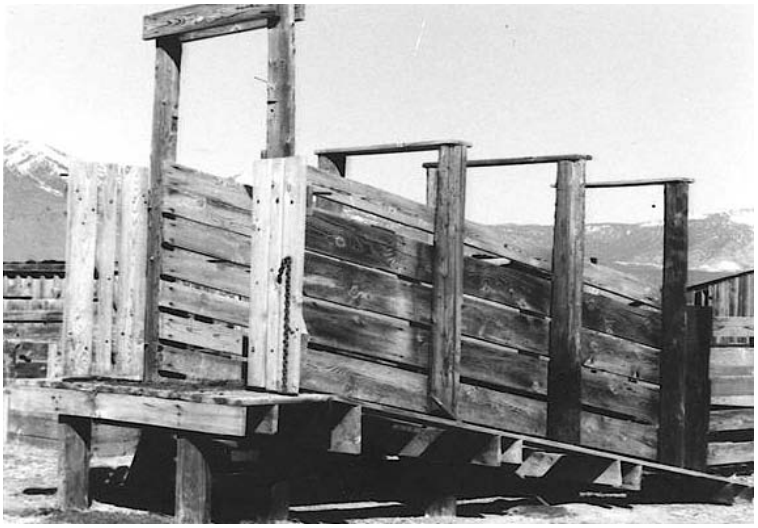
# CORRALS AND FENCES

## CORRAL LOADING CHUTES



**LIGHT SPACED CHUTE**

**HEAVY SPACED CHUTE**



**HEAVY SOLID CHUTE**

# CORRALS AND FENCES

## CORRAL LOADING CHUTE

## COST PER LINEAR FOOT INCLUDING BOTH SIDES

| | | |
|---|---|---|
| SPACED | LIGHT CHUTE | $ 66.10 per lf |
| | HEAVY CHUTE (INCLUDES PLATFORM) | 70.50 |
| SOLID | LIGHT CHUTE | 74.91 |
| | HEAVY CHUTE (INCLUDES PLATFORM) | 79.32 |

## 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.

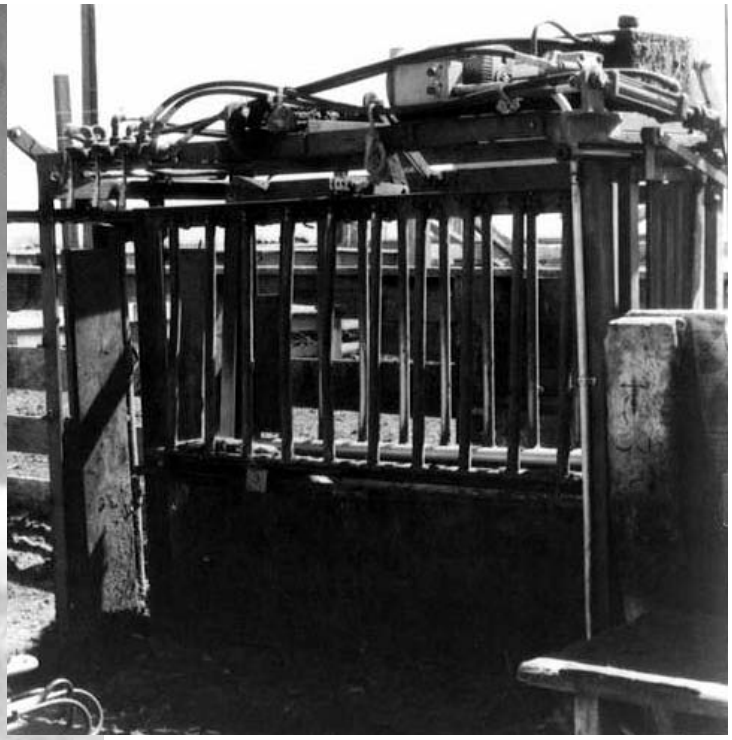
**COMPLETE IN PLACE COST** $ 4,785

**CALF TABLE**

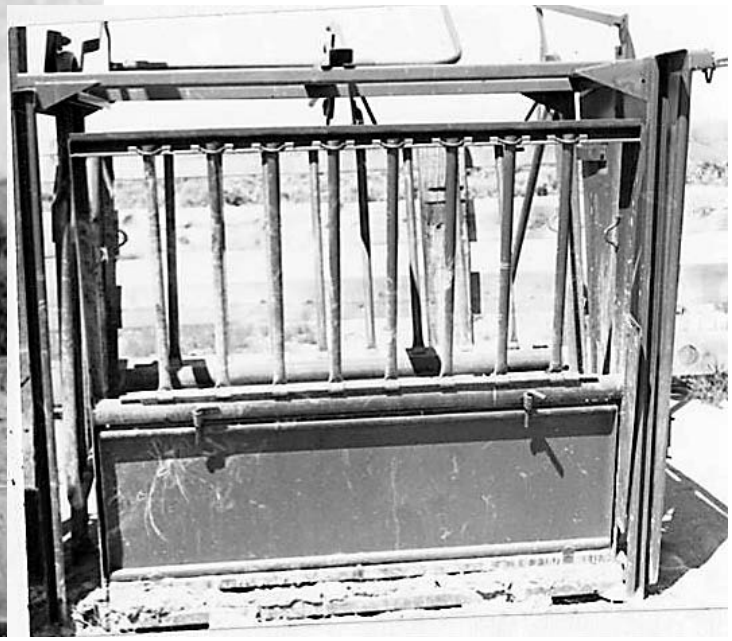
# CORRALS AND FENCES

## WINDMILLS & CATTLE SQUEEZES

SMALL WINDMILL



HYDRAULIC SQUEEZE



LIGHT STATIONARY SQUEEZE

# CORRALS AND FENCES

## COMMERCIALLY MANUFACTURED HEAVY DUTY CATTLEGUARDS

| 7.5' x 8' | 7.5' x 10' | 7.5' x 12' | 7.5' x 15' |
|---|---|---|---|
| $ 2,420 | $ 3,269 | $ 4,118 | $ 4,967 |

## CATTLE SQUEEZE

| | |
|---|---|
| STATIONARY MODEL, LIGHT | $ 1,869 |
| STATIONARY MODEL, HEAVY | 3,843 |
| HEAVY DUTY, HYDRAULIC | 14,602 |
| CALF TABLE | 1,221 |

**HEAVY STATIONARY SQUEEZE**

## WINDMILLS AND STEEL TOWERS

| FAN | TOWER | INSTALLATION | TOTAL COST |
|---|---|---|---|
| 6' $ 2,027 | 21' $ 2,145 | $ 2,162 | $ 6,334 |
| 6' 2,027 | 27' 2,781 | 2,087 | 6,895 |
| 6' 2,027 | 33' 3,445 | 2,320 | 7,792 |
| 8' 2,600 | 21' 2,145 | 1,981 | 6,727 |
| 8' 2,600 | 27' 2,781 | 1,682 | 7,063 |
| 8' 2,600 | 33' 3,445 | 1,915 | 7,960 |
| 10' 4,502 | 27' 2,781 | 2,359 | 9,641 |
| 10' 4,502 | 33' 3,445 | 2,368 | 10,314 |
| 12' 7,130 | 27' 2,781 | 3,318 | 13,229 |
| 12' 7,130 | 33' 3,445 | 3,551 | 14,126 |
| 14' 11,272 | 27' 2,781 | 4,557 | 18,610 |
| 14' 11,272 | 33' 3,445 | 5,911 | 20,628 |
| 16' 15,301 | 33' 3,445 | 6,591 | 25,337 |

Includes complete steel wheel, tower and installation excluding well.

# CORRALS AND FENCES

## CATTLE AND HORSE WATERING TANKS

### ROUND BOTTOMLESS STOCK TANKS

25.5 INCH DEEP, GALVANIZED CORRUGATED

| | | |
|---|---|---|
| PER FOOT OF DIAMETER - 22 GAUGE METAL | $ | 32.44 |
| 12 GAUGE METAL | $ | 53.48 |
| ADD: 10 GAUGE METAL | | 25% |
| PER SQUARE FOOT OF CONCRETE SLAB | $ | 4.07 |

### COMMERCIALLY MANUFACTURED METAL WATER TANKS

25.5" TO 27" DEEP, GALVANIZED WITH BOTTOM

| | | |
|---|---|---|
| PER FOOT OF DIAMETER - 22 GAUGE METAL | $ | 40.55 |
| 12 GAUGE METAL | $ | 69.09 |
| ADD: 10 GAUGE METAL | | 25% |
| PER SQUARE FOOT OF CONCRETE BASE | $ | 4.07 |

### COMMERCIALLY MANUFACTURED AUTOMATIC WATERERS WITH HEATERS

| LEN | WDTH | HGHT | GAL | HEAD | COST |
|---|---|---|---|---|---|
| 20 | 18 | 25 | 3 | 30 50 | $ 433 |
| 30 | 24 | 25 | 9 | 80 120 | 575 |
| 32 | 28 | 25 | 13 | 100 200 | 684 |
| 42 | 28 | 25 | 20 | 200 300 | 775 |
| 66 | 28 | 25 | 35 | 300 400 | 875 |
| 84 | 24 | 16 | 40 | 350 450 | 911 |
| 90 | 28 | 25 | 50 | 400 550 | 985 |
| 90 | 36 | 25 | 120 | 500 700 | 1,075 |
| 120 | 28 | 25 | 120 | 500 700 | 1,200 |

### COMMERCIALLY MANUFACTURED METAL WATER TROUGHS

(GALVANIZED TANK)

| GALLONS | | | |
|---|---|---|---|
| 175 | 300 | 500 | 900 |
| $ 174 | $ 235 | $ 314 | $ 476 |

### ALL OTHER WATER TROUGHS

1 cubic foot = 7.5 gallons

| VOLUME | COST / GAL | Cu Ft |
|---|---|---|
| LESS THAN 100 GALLONS | $ 3.03 | $ 22.70 |
| 100 TO 175 GALLONS | 2.76 | 20.73 |
| 176 TO 300 GALLONS | 2.50 | 18.76 |
| 301 TO 500 GALLONS | 2.24 | 16.79 |
| OVER 500 GALLONS | 1.97 | 14.82 |

# CORRALS AND FENCES

## COMMERCIALLY MANUFACTURED METAL FENCE PANELS

Portable or stationary, not including posts. For wooden posts (RR Ties)

Add $ 7.24 to $ 18.69 EACH

| | | |
|---|---|---|
| 64" HEIGHT, 5 RAIL MEDIUM DUTY | 6' | $ 140 |
| | 8' | 186 |
| | 10' | 206 |
| | 12' | 223 |
| | 14' | 259 |
| | 16' | 284 |

| | | |
|---|---|---|
| 64" HEIGHT, 5 RAIL EXTRA HEAVY DUTY | 6' | $ 223 |
| | 8' | 266 |
| | 10' | 293 |
| | 12' | 332 |
| | 14' | 380 |
| | 16' | 414 |

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

## COMMERCIALLY MANUFACTURED METAL GATES w LEVER LATCH

| WIDTH | | | |
|---|---|---|---|
| 6 FOOT | 8 FOOT | 12 FOOT | 16 FOOT |
| $ 226 | $ 268 | $ 335 | $ 416 |

## COMMERCIALLY MANUFACTURED PROFESSIONAL ROPING AND DOGGING CHUTE

| | |
|---|---|
| FIRST SECTION WITH RELEASE GATE | $ 2,699 |
| SECOND SECTION | 1,449 |
| STRIPPING CHUTE | 1,399 |

## COMMERCIALLY MANUFACTURED BUCKING CHUTE

| | |
|---|---|
| FIRST SECTION | $ 5,463 |
| ADDITIONAL SECTIONS, EACH | 3,867 |

# CORRALS AND FENCES

## COMMERCIALLY MANUFACTURED CROWDING ALLEYS

| | |
|---|---|
| 24' x 60" INCLUDES FRAMES & HEADGATE w STAND | $ 2,586 |
| 24' x 60" ADD-ON SECTION | 1,063 |
| ALLEY STOPS ADD | 183 |
| 10' CUTOUT GATE INCLUDING FRAME AND 10' PANEL | 901 |

## CURVED CROWDING ALLEYS

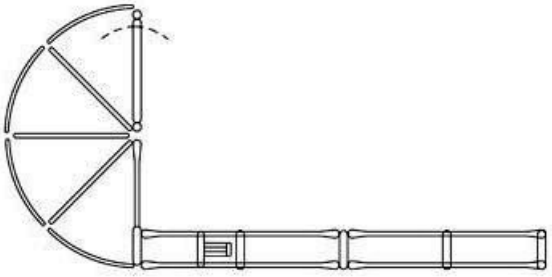
| | |
|---|---|
| 180 DEGREE SWEEP, 10' GATE & 24' ADJUSTABLE ALLEY WITH A1 CAGE & 10' X 20' LEAD-UP | $ 5,724 |
| 180 DEGREE SWEEP, 10' GATE & 24' ADJUSTABLE ALLEY | 4,109 |
| BLOCKING DOOR ADD | 777 |
| ADJUSTABLE ALLEY BOW | 183 |

## COMMERCIALLY MANUFACTURED FEEDER PANEL

| SIZE | EACH |
|---|---|
| 6' x 64" | $ 383 |
| 8' x 64" | 468 |
| 10' x 64" | 559 |
| 12' x 64" | 649 |
| 16' x 64" | 842 |

## HEADGATES

| | |
|---|---|
| SELF CATCH HEAVY DUTY | $ 1,780 |
| SELF CATCH LIGHT DUTY | 842 |

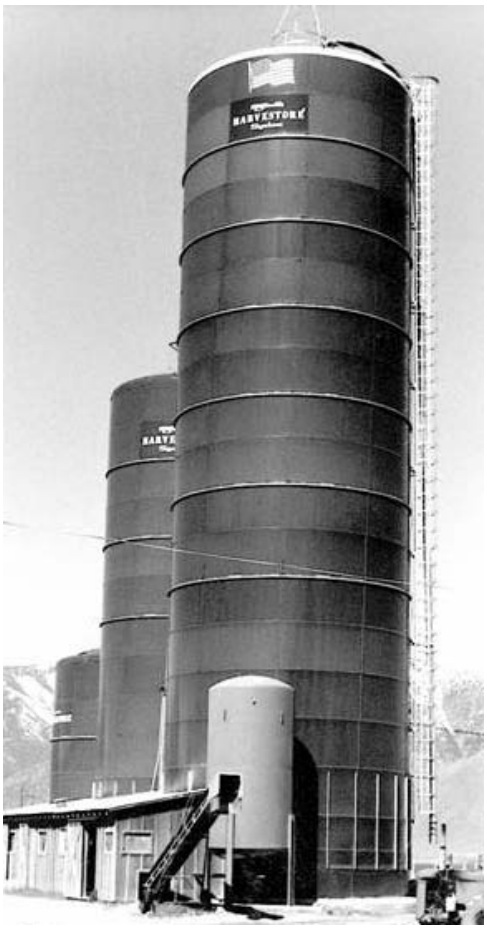


**180' SWEEP w CROWDING ALLEY**

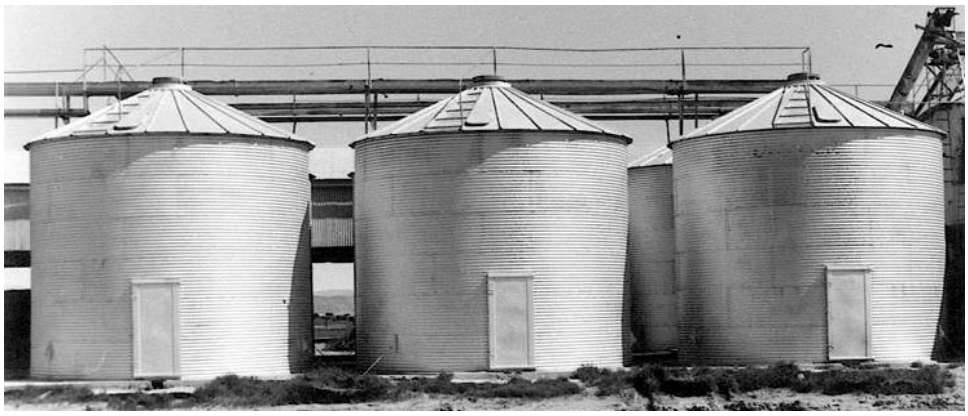
Section 6

# MISCELLANEOUS COSTS

Most of the costs in this section are based on professional construction labor supervised by a contractor or his job foreman. Few of these costs should be adjusted downward for farm labor with no professional supervision, as most of these items are professionally installed with contractor supervisor.




**SILO: GLASS-LINED STEEL**



**GRAIN STORAGE BINS with CONVEYOR**

## FARM SILOS

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

**TOTAL COST**

| DIAMETER / HEIGHT | 30' | 35' | 40' | 45' | 50' | 60' | 70' | 80' | 90' |
|---|---|---|---|---|---|---|---|---|---|
| 12' | $ 12,312 | 14,472 | 16,632 | 18,684 | 20,736 | 24,840 | - | - | - |
| 14' | 14,364 | 16,740 | 19,116 | 21,438 | 23,760 | 28,512 | 33,156 | - | - |
| 16' | 14,904 | 17,280 | 19,656 | 22,194 | 24,732 | 29,484 | 34,452 | 39,312 | - |
| 18' | 15,984 | 18,630 | 21,276 | 23,976 | 26,676 | 31,968 | 37,260 | 42,444 | 47,736 |
| 20' | 17,820 | 20,790 | 23,760 | 26,838 | 29,916 | 35,856 | 41,688 | 47,628 | 53,460 |
| 22' | 20,844 | 24,300 | 27,756 | 31,158 | 34,560 | 41,580 | 48,276 | 55,080 | 62,100 |
| 24' | - | - | - | - | 39,852 | 47,736 | 55,620 | 63,180 | 71,280 |
| 30' | - | - | - | - | - | 64,800 | 75,600 | 86,130 | 96,660 |

| | | |
|---|---|---|
| No chute, deduct per vertical foot of height | $ | - |
| Flat roof, deduct per square foot of floor area | $ | 5.92 |
| No roof, deduct per square foot of floor area | $ | 11.18 |

NOTE: For silos constructed from other materials, multiply the costs above by these factors:

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

## SILO UNLOADER

**EACH**

| 12' | 14' | 16' | 18' | 20' | 22' | 24' | 26' | 28' | 30' |
|---|---|---|---|---|---|---|---|---|---|
| $ 9,774 | 10,260 | 10,908 | 11,448 | 12,204 | 12,744 | 13,392 | N/A | N/A | 14,148 |

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 adjusted downward by 25 percent relative to the quality of the finished product.

## 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.

| SIZE DIAM | SIZE HGHT | CAPACITY (BUSHELS) | COST W/O DRY BIN | COST WITH DRY BIN | SLAB FLOOR |
|---|---|---|---|---|---|
| 15 | 7 | 1,257 | $ 5,213 | $ 7,623 | $ 729 |
| 15 | 11 | 1,792 | 6,895 | 10,090 | 796 |
| 15 | 15 | 2,329 | 8,240 | 11,996 | 908 |
| 15 | 18 | 2,864 | 9,249 | 13,565 | 1,054 |
| 18 | 11 | 2,647 | 7,623 | 11,155 | 975 |
| 18 | 15 | 3,422 | 9,417 | 13,790 | 1,015 |
| 18 | 18 | 4,198 | 10,707 | 15,583 | 1,054 |
| 21 | 11 | 3,693 | 8,464 | 12,220 | 1,345 |
| 21 | 15 | 4,753 | 10,707 | 15,583 | 1,390 |
| 21 | 18 | 5,813 | 13,005 | 18,834 | 1,446 |
| 24 | 11 | 4,949 | 10,314 | 15,023 | 1,693 |
| 24 | 15 | 6,344 | 12,556 | 18,386 | 1,771 |
| 24 | 18 | 7,739 | 15,695 | 22,870 | 1,850 |
| 27 | 11 | 6,409 | 12,220 | 17,825 | 2,186 |
| 27 | 15 | 8,182 | 15,135 | 21,749 | 2,287 |
| 30 | 15 | 10,278 | 18,274 | 26,570 | 2,522 |
| 30 | 18 | 12,473 | 21,525 | 31,503 | 2,657 |
| 30 | 22 | 14,668 | 25,001 | - | 2,803 |
| 30 | 26 | 16,863 | 27,803 | - | 3,055 |
| 36 | 15 | 15,297 | 25,897 | 37,557 | 3,728 |
| 36 | 18 | 18,473 | 29,373 | 42,826 | 3,952 |
| 36 | 22 | 21,648 | 34,194 | - | 4,120 |

ADD: PER SQUARE FOOT OF CONCRETE SLAB $ 4.07

| | | | | |
|---|---|---|---|---|
| LADDERS | $ 74 | PLUS | $ 10.50 | PER LINEAR FOOT |
| SAFETY CAGES | 20.46 | TO | 25.34 | PER FOOT INSTALLED |
| AUGER AND DRIVE | 437 | PLUS | 42.60 | PER FOOT OF TANK DIAMETER |
| SPREADERS | 852 | TO | 1,278 | EACH |
| STIRRATORS | 196.19 | TO | 302.70 | PER FOOT OF TANK DIAMETER |

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 adjusted downward by 25 percent relative to the quality of the finished product.

## 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.

| DIAMETER (FEET) | HEIGHT (FEET) | CAPACITY (BUSHELS) | CAPACITY (TONS) | COST |
|---|---|---|---|---|
| 6 | 10' | 120 | 3.0 | $ 1,951 |
| 6' | 16' | 240 | 6.0 | 2,780 |
| 6' | 21' | 360 | 9.0 | 3,139 |
| 6' | 25' | 480 | 12.0 | 3,559 |
| 6' | 28' | 600 | 15.0 | 3,896 |
| 7' | 11' | 157 | 4.0 | 2,691 |
| 7' | 14' | 239 | 6.0 | 2,887 |
| 7' | 16' | 321 | 8.0 | 3,111 |
| 7' | 19' | 403 | 10.0 | 3,363 |
| 9' | 14' | 300 | 7.8 | 4,036 |
| 9' | 17' | 450 | 11.3 | 4,821 |
| 9' | 20' | 590 | 14.8 | 5,213 |
| 9' | 25' | 855 | 21.4 | 6,054 |
| 9' | 28' | 1,000 | 25.0 | 6,390 |
| 9' | 31' | 1,130 | 28.5 | 6,671 |
| 12' | 20' | 870 | 21.8 | 8,969 |
| 12' | 25' | 1,345 | 33.6 | 10,202 |
| 12' | 31' | 1,825 | 45.6 | 11,659 |
| 12' | 36' | 2,300 | 57.5 | 12,556 |
| 12' | 42' | 2,780 | 69.5 | 13,790 |

ADD: PER SQUARE FOOT OF HEAVY DUTY CONCRETE SLAB $ 4.95

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 adjusted downward by 25 percent relative to the quality of the finished product.

## 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, adjust the costs listed downward by 25 percent, depending on the quality of workmanship.

## GRAIN LOADING AND UNLOADING SYSTEMS

### CONVEYOR

**AUGER-TYPE**

| DIAM | COST/LIN FT |
|---|---|
| 6" | $ 76 |
| 8" | 103 |
| 10" | 135 |
| 12" | 185 |
| 14" | 213 |
| 16" | 269 |

**BELT-TYPE**

| WIDTH | COST/LIN FT |
|---|---|
| 12" | $ 129 |
| 18" | 202 |
| 24" | 235 |
| 30" | 275 |
| 36" | 291 |
| 48" | 376 |

**FEED MILL and COMPONENTS**

## ELECTRIC POWER PLANTS

### HOME GENERATOR SETS

| RATING - KW | GASOLINE | DIESEL |
|---|---|---|
| 3.0 | $ 3,148 | $ 3,778 |
| 4.0 | 3,819 | 4,582 |
| 5.0 | 4,533 | 5,440 |
| 7.0 | 6,099 | 7,319 |

### COMMERCIAL INDUSTRIAL GENERATORS

| RATING - KW | GASOLINE | DIESEL |
|---|---|---|
| 10.0 | $ 14,500 | $ 18,006 |
| 12.5 | 17,069 | 21,089 |
| 15.0 | 19,005 | 23,413 |
| 20.0 | 21,820 | 27,195 |
| 25.0 | 22,987 | 27,416 |
| 30.0 | 24,153 | 27,638 |
| 40.0 | 28,891 | 33,265 |
| 50.0 | 31,623 | 36,784 |
| 60.0 | 41,485 | 48,554 |
| 100.0 | 51,346 | 60,325 |
| 150.0 | 69,478 | 82,853 |

For Air Cooling, Deduct: 15%

For natural or LP gas fuel systems, Add per KW: $ 25.56

For remote control starting, gasoline fuel, Add: $ 98.00

NOTE: Above costs include minimal current load control switchboard facilities. Above costs do not include mounting pads

### ALTERNATING CURRENT LOAD CONTROL SWITCHBOARD

### AUTOMATIC EMERGENCY SWITCHBOARD FOR GASOLINE PLANT

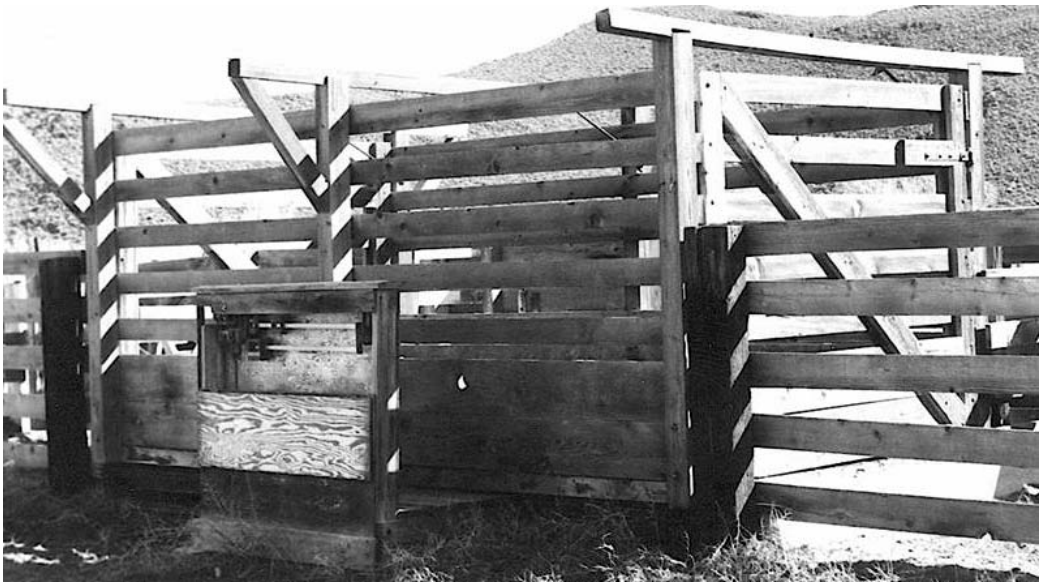
| RATING KW | RATING AMPS | VOLTAGE | COST EACH | RATING KW | RATING AMPS | VOLTAGE | COST EACH |
|---|---|---|---|---|---|---|---|
| 15 | 130 | 240; 230/400 | $ 1,505 | 15 | 130 | 120/240 | $ 588 |
| 20 | 170 | 120/240; 240 | 2,134 | 20 | 170 | 120/240 | 1,980 |
| 25 | 210 | 240; 120/240 | 2,763 | 25 | 210 | 120/240 | 3,371 |
| 30 | 250 | 240; 120/240 | 3,392 | 30 | 250 | 120/240 | 4,763 |
| 40 | 330 | 120/240; 240 | 4,020 | 40 | 330 | 120/240 | 6,155 |
| 50 | 420 | 480;240 | 4,649 | 50 | 420 | 120/240 | 7,546 |
| 60 | 500 | 480;240 | 5,278 | 60 | 500 | 120/240 | 8,938 |
| 100 | 830 | 480;240 | 5,907 | 100 | 830 | 120/240 | 10,330 |

ADD FOR DIESEL POWERED PLANTS: $ 188

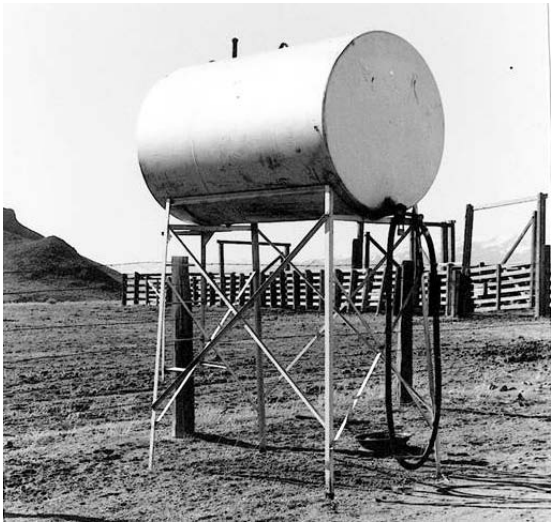
FOR CIRCUIT BREAKERS: $ 643 TO $ 3,672

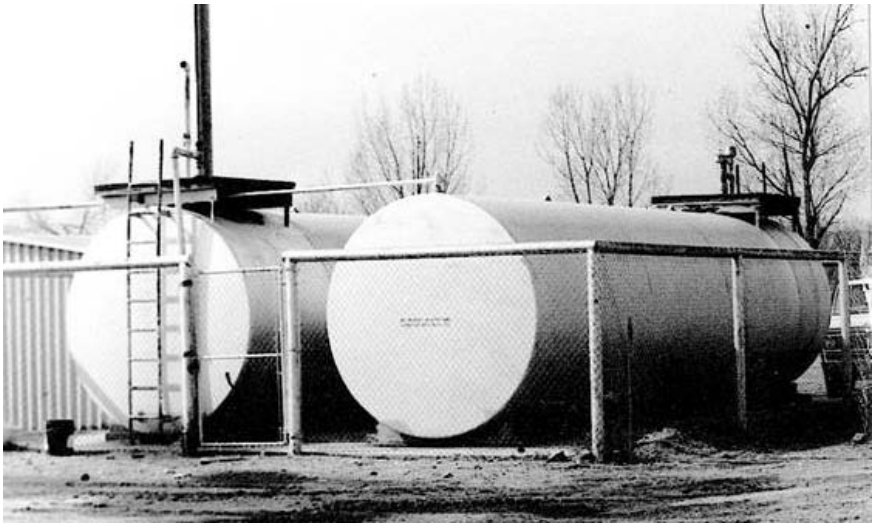
.

## SCALES AND FUEL TANKS



**LIVESTOCK SCALE with WOOD CAGE**





**BULK FUEL TANKS**

## LIVESTOCK SCALES

| BEAM TYPE | SIZE | CAPACITY | COST |
|---|---|---|---|
| FULL CAPACITY | 14' X 8' | 5 TON | $ 15,135 |
| FULL CAPACITY | 16' X 8' | 10 TON | 20,068 |
| FULL CAPACITY | 22' X 10' | 15 TON | 28,476 |

## SCALE CAGES

| METAL | | WOOD | |
|---|---|---|---|
| SIZE | COST | SIZE | COST |
| 14' | $ 1,706 | 14' X 8' | $ 906 |
| 16' | 1,917 | 16' X 8' | 931 |
| 22' | 2,646 | 22' X 10' | 1,156 |
| 24' | 2,883 | 24' X 10' | 1,200 |

| | |
|---|---|
| FOR TYPE REGISTERING BEAM, ADD. | $ 761 |
| FOR PRINTER, ADD | 1,581 |
| FOR ELECTRONIC DIGITAL SCALE, ADD. | 4,877 |

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.

## 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 | $ 37,557 |
| 30 TONS | 43,723 |
| 40 TONS | 50,225 |
| 50 TONS | 56,896 |
| 60 TONS | 64,183 |
| 70 TONS | 73,993 |

| | |
|---|---|
| FOR WOOD PLATFORM, DEDUCT: | 6% |
| FOR STEEL PLATE, ADD: | 5% |
| FOR AUTOMATIC DIAL MODEL, ADD: | $ 2,859 |
| FOR REMOTE READER-PRINTER, ADD: | 9,417 |
| FOR CARD PRINTER, ADD: | 2,130 |

## UNDERGROUND FUEL STORAGE

Costs are for complete installation and are based on professional construction labor supervised by a contractor or his job foreman. For farm labor with no professional supervision, costs should be adjusted downward by 25 percent relative to the quality of the finished product. For multiple installation, two or more tanks in one hole, deduct 7 percent for each extra tank, consider the largest tank as the base. Costs do not include electric pumps. See following page 8 in this section for pump costs.

| GALLONS | COST | GALLONS | COST |
|---|---|---|---|
| **300** | $ 6,390 | **4,000** | $ 16,480 |
| **550** | 7,343 | **5,000** | 18,947 |
| **1,000** | 9,698 | **6,000** | 22,310 |
| **2,000** | 12,556 | **8,000** | 25,113 |
| **3,000** | 14,126 | **10,000** | 30,270 |

## ABOVE GROUND HORIZONTAL BULK (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.

| GALLONS | COST | GALLONS | COST |
|---|---|---|---|
| **200** | $ 3,554 | **3,000** | $ 7,343 |
| **350** | 3,756 | **4,000** | 8,576 |
| **550** | 4,025 | **5,000** | 10,034 |
| **1,000** | 4,737 | **7,500** | 13,453 |
| **2,000** | 5,942 | **10,000** | 16,817 |

## ELECTRONIC FUEL DISPENSERS

| | | | |
|---|---|---|---|
| **TYPE 1** | | | |
| WITHOUT METER | $ 347 | TO | $ 889 |
| WITH METER | 702 | TO | 1,111 |
| **TYPE II** | | | |
| WITHOUT METER | $ 480 | TO | $ 1,262 |
| WITH METER | 863 | TO | 1,512 |
| **TYPE III** | $ 844 | TO | $ 1,265 |
| **TYPE IV** | $ 1,232 | TO | $ 2,464 |
| **TYPE V** | $ 3,108 | TO | $ 4,024 |

NOTE: To calculate tank volume use the following formula: Volume in gallons = Pi x radius squared x length x 7.5.

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.

## FUEL DISPENSERS


**TYPE I—NO METER**


**TYPE I METER**

**TYPE II—WITH METER**


**TYPE III**


**TYPE IV**


**TYPE V**

## PREFABRICATED TELECOM / COMMUNICATION EQUIPMENT SHELTERS

Costs are for complete installation of small prefabricated modular buildings used for weather- and vandal-resistant equipment storage. Costs include a foundation and all wall, roof, and floor panels. Steel wall vents and entry door, and minimum electrical. Air conditioning and equipment power panel and wiring are not included.

### SQUARE FOOT COSTS

| CLASS | 100 | 150 | 200 | 300 | 500 | 750 |
|---|---|---|---|---|---|---|
| 1 | $ 117.02 | $ 100.50 | $ 91.69 | $ 79.02 | $ 65.80 | $ 57.81 |
| 2 | $ 142.08 | $ 119.49 | $ 109.03 | $ 93.06 | $ 76.53 | $ 65.63 |
| 3 | $ 167.13 | $ 138.49 | $ 126.37 | $ 107.09 | $ 87.27 | $ 73.50 |

NOTE: For very low quality metal or fiberglass structures, reduce Class 3 costs by 55%.

PREFABRICATED EQUIPMENT SHELTER

## TELECOM / COMMUNICATION EQUIPMENT SHELTERS

**LOW QUALITY**

**AVERAGE QUALITY**

**GOOD QUALITY**

Section 7

# COMPUTATIONAL TABLES

## MENSURATION PRINCIPLES

| | |
|---|---|
| **PLANE FIGURE** | A plane surface bounded by either straight or curved lines 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, measures and other information helpful to the assessor-appraiser.

### METRIC MEASURE

| | |
|---|---|
| Millimeter | 0.001 meters |
| Centimeter | 0.01 meters |
| Decimeter | 0.1 meters |
| Meter | 39.3685 inches |
| Kilometer | 1,000 meters |
| Kilometer | 0. 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 |

# WEIGHTS AND MEASURES

## 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 feet of surface area equals square of one side multiplied by the given factor.

| REGULAR SHAPED | NUMBER OF SIDES | FACTOR |
|---|---|---|
| Equilateral triangle | 3 | 0.433 |
| 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) weighs 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 any size tank: 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 0.0034. (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.

Watts = Volts multiplied by Amps

Horsepower equals Kilowatts multiplied by 1.3405.

Kilowatts equal horsepower multiplied by 0.746.

## WEIGHTS

**BRICK:** Common brick of the national size weigh from 4 1/2 to five pounds; pressed and paving brick, from six to seven pounds, 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 often sells on the basis of 80 pounds to the bushel 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 0.036 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 0.1337 cubic feet
1 gallon equals 0.1074 bushels
1 cubic foot equals 0.8032 bushels
1 barrel (oil) equals 42 gallons
1 barrel (water) equals 31.5 gallons

A span is 9 inches
A hand, horse measurement, equals 4 inches
A knot, nautical, equals 6,080.27 feet
A fathom, nautical, equals 6 feet
A stone equals 14 pounds

Pressure in pounds per square inch of column of water equals 0.434 times the height of the column in feet.

A square acre measures approximately 208.7 feet on each side.

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

## MISCELLANEOUS

## WEIGHT AND MEASURE EQUIVALENTS

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 the 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 0.7854.

To find area of a parallelogram, base times altitude.

To find cubic inches in a ball, multiply cube of diameter by 0.5236.

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 / FOOT

| DIAMETER | CIRCUMFRENCE | AREA | GALLONS | | BARRELS (OIL) |
|---|---|---|---|---|---|
| 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 | 3.50 |
| 6 | 18.85 | 28.27 | 212 | 23 | 5.00 |
| 7 | 21.99 | 38.48 | 288 | 31 | 6.80 |
| 8 | 25.13 | 50.27 | 376 | 42 | 9.00 |
| 9 | 28.27 | 63.62 | 477 | 51 | 11.30 |
| 10 | 31.42 | 78.54 | 587 | 63 | 14.00 |
| 11 | 34.56 | 95.03 | 711 | 76 | 16.90 |
| 12 | 37.69 | 113.10 | 846 | 91 | 20.20 |
| 13 | 40.84 | 132.73 | 993 | 107 | 23.70 |
| 14 | 43.98 | 153.94 | 1,151 | 124 | 27.40 |
| 15 | 47.12 | 176.72 | 1,322 | 142 | 31.50 |
| 16 | 50.26 | 201.06 | 1,054 | 162 | 35.80 |
| 17 | 53.41 | 226.98 | 1,698 | 182 | 40.40 |
| 18 | 56.55 | 254.47 | 1,903 | 204 | 45.30 |
| 19 | 59.69 | 283.53 | 2,121 | 228 | 50.50 |
| 20 | 62.83 | 314.16 | 2,350 | 252 | 56.00 |
| 21 | 65.97 | 346.36 | 2,591 | 278 | 61.70 |
| 22 | 69.12 | 380.13 | 2,843 | 305 | 67.70 |
| 23 | 72.26 | 415.48 | 3,108 | 334 | 74.00 |
| 24 | 75.40 | 452.39 | 3,384 | 364 | 80.60 |
| 25 | 78.54 | 490.87 | 3,672 | 394 | 87.40 |
| 26 | 81.68 | 530.93 | 3,971 | 427 | 94.60 |
| 27 | 84.82 | 572.56 | 4,283 | 460 | 102.00 |
| 28 | 87.97 | 615.75 | 4,606 | 495 | 109.70 |
| 29 | 91.11 | 660.52 | 4,941 | 531 | 117.60 |
| 30 | 94.25 | 706.86 | 5,287 | 568 | 125.80 |
| 31 | 97.39 | 754.77 | 5,646 | 606 | 134.40 |
| 32 | 100.53 | 804.25 | 6,016 | 646 | 143.20 |
| 33 | 103.67 | 855.30 | 6,398 | 687 | 152.30 |
| 34 | 106.81 | 907.92 | 6,791 | 730 | 161.60 |
| 35 | 109.96 | 962.11 | 7,197 | 773 | 171.30 |
| 36 | 113.10 | 1,017.88 | 7,614 | 818 | 181.30 |
| 37 | 116.24 | 1,075.21 | 8,043 | 864 | 191.50 |
| 38 | 119.38 | 1,134.11 | 8,483 | 911 | 202.00 |
| 39 | 122.52 | 1,194.59 | 8,936 | 960 | 212.70 |
| 40 | 125.66 | 1,256.64 | 9,400 | 1,010 | 223.80 |

NOTE: Capacity of cylindrical tanks standing on end.

## CONVERSION TABLES

NOTES on cylindrical tanks: 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 0.785.

*To find the capacity in barrels (oil) equals diameter squared times 0.1399 times height.

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

## TABLE FOR CONVERSION OF LINEAR FEET INTO BOARD FEET

| | |
|---|---|
| 2 by 4 | 0.667 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 linear 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.