



STATE OF NEVADA  
DEPARTMENT OF TAXATION

MAIN OFFICE  
3850 Arrowhead Drive  
Carson City, Nevada 89706

JOE LOMBARDO  
*Governor*

GEORGE KELESIS  
*Chair, Nevada Tax Commission*

SHELLIE HUGHES  
*Executive Director*

March 17, 2026

To: All Assessors

Re: Rural Building Costs

**NEVADA TAX COMMISSION  
NOTICE OF DECISION**

The matter of the 2027-2028 Assessor's Handbook of Rural Building Costs, came before the Nevada Tax Commission (the "Commission") for consideration on March 10, 2026, after due notice to each County Assessor. This matter came before the Commission for approval.

**DECISION**

The Commission, having considered all evidence and testimony pertaining to the matter, hereby adopts the 2027-2028 Assessor's Handbook of Rural Building Costs listing costs as reported by the Department for use by the County Assessors pursuant to NAC 361.128(2).

FOR THE COMMISSION:

A handwritten signature in black ink, appearing to read "Shellie Hughes", written over a horizontal line.

SHELLIE HUGHES  
Executive Director  
Nevada Department of Taxation

cc: Connor Marriott, Coordinator of Assessment Standards

## CERTIFICATE OF SERVICE

I hereby certify that on this day I served the foregoing Nevada Tax Commission Notice of Decision upon all parties of record in the proceeding as follows:

By emailing a copy thereof:

Carson City Assessor's Office – Kimberly Adams, [kadams@carsoncity.gov](mailto:kadams@carsoncity.gov)  
Churchill County Assessor's Office – Denise Mondhink-Felton, [denise.felton@churchillcountynv.gov](mailto:denise.felton@churchillcountynv.gov)  
Clark County Assessor's Office – Briana Johnson, [bap@clarkcountynv.gov](mailto:bap@clarkcountynv.gov)  
Douglas County Assessor's Office – Trent Tholen, [ttholen@douglasnv.us](mailto:ttholen@douglasnv.us)  
Elko County Assessor's Office – Janet Iribarne, [jiribarne@elkocountynv.net](mailto:jiribarne@elkocountynv.net)  
Esmeralda County Assessor's Office – Kathleen Keyes, [kkeyes@esmeraldacountynv.gov](mailto:kkeyes@esmeraldacountynv.gov)  
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Lander County Assessor's Office – Lura Duvall, [assessor@landercountynv.org](mailto:assessor@landercountynv.org)  
Lincoln County Assessor's Office – Cydney Dwire, [cdwire@lincolnnv.com](mailto:cdwire@lincolnnv.com)  
Lyon County Assessor's Office – Troy Villines, [tvillines@lyon-county.org](mailto:tvillines@lyon-county.org)  
Mineral County Assessor's Office – Kevin Chisum, [assessor@mineralcountynv.org](mailto:assessor@mineralcountynv.org)  
Nye County Assessor's Office – Sheree Stringer, [sstringer@nyecountynv.gov](mailto:sstringer@nyecountynv.gov)  
Pershing County Assessor's Office – Lauren Basso-Cerini, [lcerini@pershingcountynv.gov](mailto:lcerini@pershingcountynv.gov)  
Storey County Assessor's Office – Jana Seddon, [jseddon@storeycounty.org](mailto:jseddon@storeycounty.org)  
Washoe County Assessor's Office – Chris Sarman, [csarman@wahoecounty.gov](mailto:csarman@wahoecounty.gov)  
White Pine Assessor's Office – Burton Hilton, [bhilton@whitepinecountynv.gov](mailto:bhilton@whitepinecountynv.gov)

Dated at Carson City, Nevada this 17 day of March, 2026.

  
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Hector Sepulveda, Administrative Assistant IV

**NEVADA TAX COMMISSION**  
**March 10, 2026**

**TOPIC:**

Approval of 2027-2028 Assessor's Handbook of Rural Building Costs

**AUTHORITY:**

Nevada Revised Statutes 361.227(6)(a) provides for the Nevada Tax Commission to establish standards for determining the cost of replacement of improvements of various kinds. Nevada Administrative Code 361.128(2)(a) requires assessors to use the Rural Building Cost Manual adopted by the Commission in determining the cost of certain rural buildings.

**RECOMMENDATION:**

The Department recommends the Nevada Tax Commission adopt the 2027-2028 Rural Building Cost Manual for use in costing rural improvements on the 2027-2028 tax roll.

**EXPLANATION:**

The Rural Building Cost Manual is reviewed annually by Department staff. Costs are updated as necessary to reflect current building costs in rural areas. The manual is used to cost improvements typically found on ranches or in rural areas.

**APPLICABLE STATUTES AND/OR REGULATIONS:**

NRS 361.227(6)(a)

NAC361.128(2)(a)

## Executive Summary of Changes

Most changes are small increases, and big swings almost never happen. The largest group of changes—about one-third—falls between 4% and 5%, and more than half sit between 4% and 7%. This shows that costs usually rise a little at a time and don't jump around much. Very large increases or decreases are extremely rare, and even small decreases don't happen often. Almost all changes stay close to the middle, which makes the overall trend steady and predictable.

The data points to a cost environment that moves upward slowly and consistently. The strong cluster around the 4% to 5% range suggests that these increases are typical rather than sudden or surprising. Negative changes are uncommon and usually small, which means there isn't much pressure pushing costs down. Overall, the pattern shows a stable system where costs rise gently and rarely shift in extreme ways.

See the following page for a list of changes from the last approved publication to the current year's publication.

The following table lists changes from the last approved publication to the current year's publication which is being presented for approval:

Page	Last Publication	Current Publication
All	2026-2027 fiscal year	All references to the fiscal year were changed to the current fiscal year of 2027-2028
Intro	Rural Building Costs	The manual is being separated into three parts this year – Section A - Rural Building Costs, Section B - Alternate Costs, and Section C - Alternate Cost Approvals.
<b>Part A</b>	<b>Rural Building Costs</b>	<b>This section provides a broad listing of structures and improvements which are customarily found in such areas. It includes photos and descriptions which may be useful when classifying such property.</b>
Part A Sect 1 Pg 1-32	Rural Building Costs Basic Farm Buildings	This section was updated with current Marshall & Swift Commercial Manual costs, cost multipliers and local factors.
Part A Sect 2 Pg 1-10	Rural Building Costs Dairy Barns	This section was updated with current Marshall & Swift Commercial Manual costs, cost multipliers and local factors, with the exception of vacuum pumps which was obtained from on-line vendors because this specific cost was not contained in Marshall & Swift.
Part A Sect 3 Pg 1-3	Rural Building Costs Bunkhouses	This section was updated with current Marshall & Swift Commercial Manual costs, cost multipliers and local factors.
Part A Sect 4 Pg 1-3	Rural Building Costs Utilities	This section was updated with current Marshall & Swift Commercial Manual costs, cost multipliers and local factors.
Part A Sect 5 Pg 1-12	Rural Building Costs Corrals & Fences	This section was updated with current Marshall & Swift Commercial Manual costs, cost multipliers and local factors, with the exception of the following due to specific costs not being contained in Marshall & Swift and use of on-line vendors: <ul style="list-style-type: none"> <li>- Cattle Squeezes</li> <li>- Round Bottomless Stock Tanks</li> <li>- Automatic Waterers with Heaters</li> <li>- Commercially Manufactured Metal Fence Panels</li> <li>- Commercially Manufactured Metal Gates</li> </ul>

		<ul style="list-style-type: none"> <li>- Professional Roping and Dogging Chute</li> <li>- Bucking Chute</li> <li>- Crowding Alleys</li> <li>- Feeder Panels</li> </ul>
Part A Sect 6 Pg 1-9	Rural Building Costs Miscellaneous Costs	This section was updated with current Marshall & Swift Commercial Manual costs, cost multipliers and local factors, with the exception of Vine Training Systems which were obtained from on-line vendors because these specific costs were not contained in Marshall & Swift.
	On-line vendors used for cost comparison and valuation:	<a href="http://www.coburn.com">www.coburn.com</a> <a href="http://www.farmandranchdepot.com">www.farmandranchdepot.com</a> <a href="http://beavervalleyssupply.com">beavervalleyssupply.com</a> <a href="http://westernranchsupply.com">westernranchsupply.com</a> <a href="http://tractorsupply.com">tractorsupply.com</a> <a href="http://ackermansonline.com">ackermansonline.com</a> <a href="http://www.ranchcity.com">www.ranchcity.com</a> <a href="http://www.fleetfarm.com">www.fleetfarm.com</a> <a href="http://farmranchstore.com">farmranchstore.com</a> <a href="http://valleyvet.com">valleyvet.com</a> <a href="http://north40.com">north40.com</a> <a href="http://globalfuelingsystems.com">globalfuelingsystems.com</a> <a href="http://homedepot.com">homedepot.com</a> <a href="http://www.solartown.com">www.solartown.com</a> <a href="http://grainger.com">grainger.com</a> <a href="http://enphase.com">enphase.com</a> <a href="http://tesla.com">tesla.com</a> <a href="http://stockyardsupply.com">stockyardsupply.com</a> <a href="http://energy.gov">energy.gov</a> <a href="http://peaveymart.com">peaveymart.com</a> <a href="http://lowes.com">lowes.com</a> <a href="http://whitecap.com">whitecap.com</a> <a href="http://cedarstoneindustry.com">cedarstoneindustry.com</a> <a href="http://versatube.com">versatube.com</a> <a href="http://menards.com">menards.com</a> <a href="http://smarchargeamerica.com">smarchargeamerica.com</a> <a href="http://totalfarmandfence.com">totalfarmandfence.com</a>
Part A Sect 7 Pg 1-8	Rural Building Costs Computational Tables	This information remains unchanged from previous years.
<b>Part B</b>	<b>Alternate Costs</b>	<b>This section provides costs typically requested by assessors in the past as well as some items from the Rural Building Costs which didn't typically fit a rural property setting.</b>

Part B Sect 1 Pg 1-2	Alternate Costs Telecom/Communications	This section was updated with current Marshall & Swift Commercial Manual costs, cost multipliers and local factors.
Part B Sect 2 Pg 1-6	Alternate Costs Fueling	This section was updated with current Marshall & Swift Commercial Manual costs, cost multipliers and local factors, with the exception of pumps/dispensers, compressed natural gas filling stations, residential electric car chargers and commercial electric car chargers which were obtained from various internet vendors since these costs are not found in the Marshall & Swift Commercial Manual.
Part B Sect 3 Pg 1-4	Alternate Costs Municipal Utility Plants	This section provides photos, schematics and direction to the costs located in the Marshall & Swift Commercial Manual.
Part B Sect 4 Pg 1-2	Alternate Costs Grease Interceptors	This section provides photos, schematics and costs for concrete grease interceptors.
Part B Sect 5 Pg 1	Alternate Costs Residential Solar	This section is new this year and provides photos, schematics and costs for passive residential solar systems. The costs have been extracted from the M/S Residential Manual.
<b>Part C</b>	<b>Assessors' Alternate Cost Requests &amp; Approvals</b>	<b>This section contains the request and approval letters for use of alternate costs as required by NAC 361.182(4).</b>
Part C Sect 1 Pg 1-18	Assessors' Alternate Cost Approvals	



NEVADA DEPARTMENT OF TAXATION  
Division of Excise & Local Government Services

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2027-2028  
RURAL BUILDING COSTS  
MANUAL

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DATE OF VALUATION JANUARY 1, 2026

## INSTRUCTIONS FOR USE

The Rural Building Costs Manual is divided into three parts. These sections are intended to be an assessment tool to standardize and streamline improvement valuations for the types of properties identified in each part.

Real estate is defined in NRS 361.035, and includes land, houses, buildings, fences, ditches, structures, erections, railroads, other improvements, and property rights. Real property is further defined in NAC 361.11715 as land, fixtures, improvements, on-site enhancements, and any rights, interests, benefits and privileges belonging to or attached to the land.

NAC 361.1127 defines a fixture as an item, other than a trade fixture, that was originally personal property which has been installed or attached to land or an improvement in a permanent manner. By reference, this incorporates Appendix E of the Personal Property Manual into this manual to determine whether fixtures are real or personal property.

Most costs contained in this manual are based on costs extracted from the Marshall and Swift Costing Service Manual. Nevada multipliers have **not** been added to all costs so the local multiplier for the appropriate area must be applied to the costs of the tables with that indication.

Based on current construction practices, all costs found in the Marshall and Swift Cost Manual are 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 this manual 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 this section.

If the sections of this manual or the Marshall Swift Cost Manuals do 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 per NAC 361.128(4).

### **Section A – Rural Building Costs**

Section A is intended for use on rural properties and provides a broad listing of structures and improvements which are customarily found in such areas. It includes photos and descriptions which may be useful to assessors when classifying improvement quality or computing segregated costs.

There is an assumption that the installation of some yard improvements on a rural property would be in a much higher quantity than on a residential lot property; therefore, costs contained in this section include the maximum size adjustment allowed. If smaller quantities are being appraised, the appropriate costs from the Marshall and Swift Commercial or Residential Manuals should be used.

Concrete flatwork costs contained in this section are specific to concrete being poured as a concrete floor during construction of farm buildings or other farm improvements and should be used only when additional concrete flatwork was constructed at the same time (i.e., around feed troughs, horse

barns, etc.). For other concrete flatwork, please refer to the Marshall & Swift Commercial Manual (S66P2 – Yard Improvements) or the Marshall & Swift Residential Manual (C-5 – Yard Improvements) for more appropriate costs.

**Section B – Alternate Costs**

Section B provides improvement valuations for items more typically requested by the assessors because they cannot be found in the Marshall and Swift Costing Service Manuals. The costs provided have been researched and developed utilizing multiple sources.

**Section C – Assessors’ Alternate Cost Approvals**

Section C provides the Executive Director’s list of requested and approved alternate costs as required by NAC 361.128(4).

2027-2028

PART A

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RURAL BUILDING COSTS

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PART A

2027-2028 RURAL BUILDING COSTS

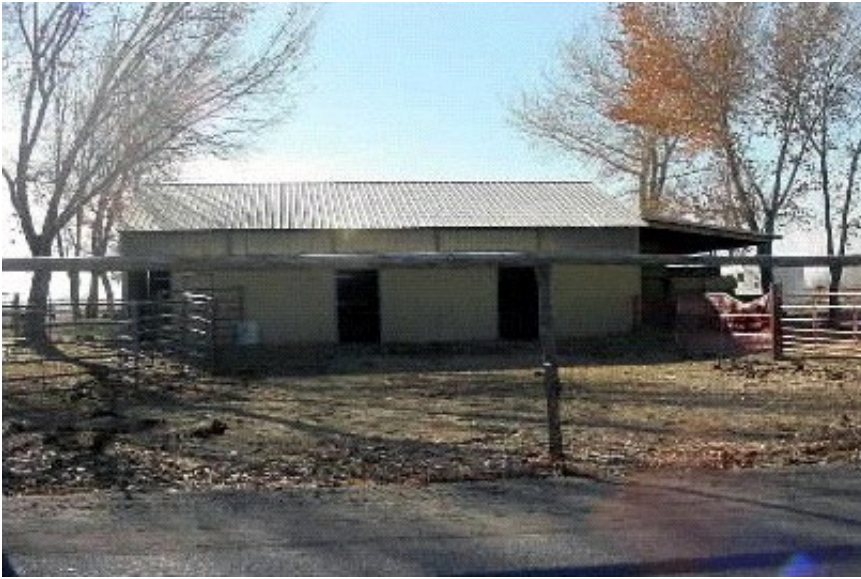
Section 1

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**BASIC FARM BUILDINGS**

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**METAL BARN**



**LOW QUALITY**



**AVERAGE QUALITY**



**GOOD QUALITY**

PHOTOS COURTESY OF CHURCHILL COUNTY ASSESSOR

WOOD BARN



LOW QUALITY



AVERAGE QUALITY



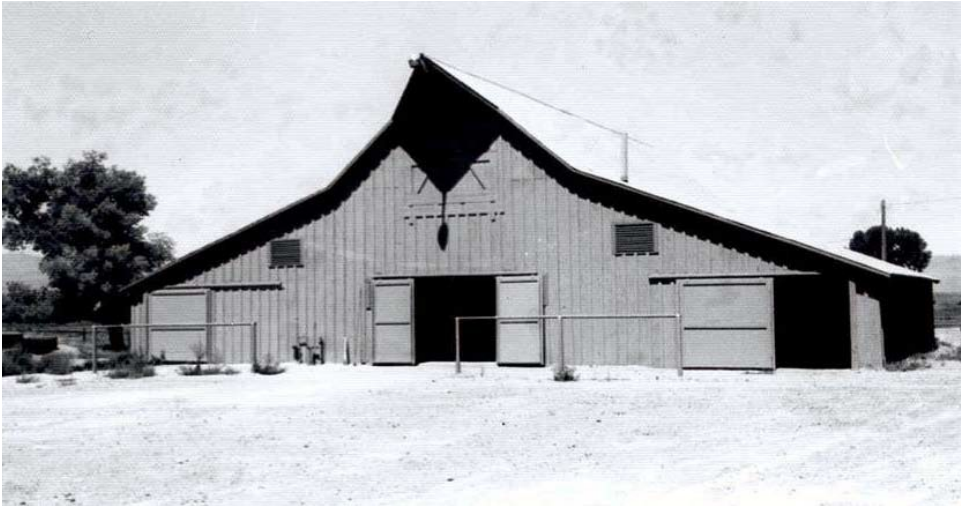
GOOD QUALITY

PHOTOS COURTESY OF CHURCHILL COUNTY ASSESSOR

GENERAL PURPOSE BARN



LOW QUALITY



AVERAGE QUALITY



GOOD QUALITY

**GENERAL PURPOSE BARNs**

General purpose barns are multipurpose buildings that may include livestock stalls, grooming areas, hay/grain storage, supply rooms, equipment maintenance or other specialized areas.

COMPONENT	CLASS 1 LOW QUALITY	CLASS 2 AVERAGE QUALITY	CLASS 3 GOOD QUALITY
<b>Foundation</b>	Perimeter concrete and column footings	Perimeter concrete and column footings	Perimeter concrete and column footings
<b>Floor</b>	Dirt	Dirt	Dirt
<b>Wall Structure</b>	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
<b>Exterior Wall Cover</b>	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
<b>Roof Construction</b>	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
<b>Roof Cover</b>	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
<b>Electrical</b>	Minimal per class	Minimal per class	Minimal per class
<b>Plumbing</b>	Minimal per class	Minimal per class	Minimal per class

Includes normal stalls commensurate with quality class.

CLASS	1,000	2,000	3,000	4,000	5,000	6,000	7,000	8,000	9,000	10,000	11,000
1	\$ 37.38	31.22	28.69	27.41	26.64	26.13	25.73	25.04	24.59	24.08	23.50
2	53.85	44.57	40.53	38.58	37.42	36.71	36.15	35.14	34.32	33.46	32.71
3	67.36	59.71	55.67	53.52	52.42	51.58	51.06	50.01	49.17	48.28	47.65

\*\* includes statewide local multiplier and no labor adjustment

**ADD** Concrete or wood floors, or concrete flatwork per square foot: \$ 5.53

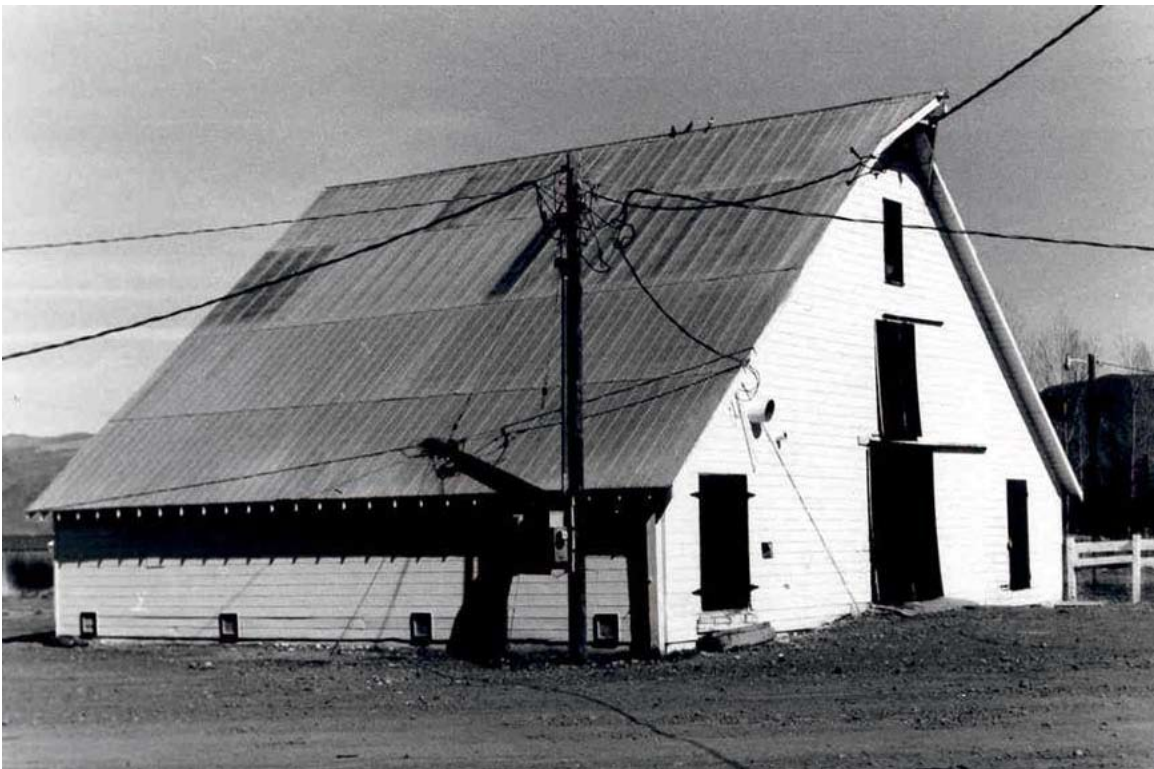
Lofts per square foot of floor area  
 Low Quality: \$ 7.83  
 Average Quality: 10.28  
 Good Quality: 13.48

**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.

HAY STORAGE BARN



AVERAGE QUALITY



GOOD QUALITY

HAY STORAGE BARNs

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

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	\$ 34.68	28.48	25.97	24.67	24.03	23.36	23.07	22.32	21.87	21.37	21.05
2	48.80	39.07	34.58	32.71	31.44	29.94	29.57	28.33	27.36	26.27	25.75
3	66.83	53.99	48.59	45.34	44.14	42.67	41.83	40.26	39.16	37.64	36.69

\*\* includes statewide local multiplier and no labor adjustment

ADD Concrete or wood floors, or concrete flatwork per square foot: \$ 5.53

Lofts per square foot of floor area

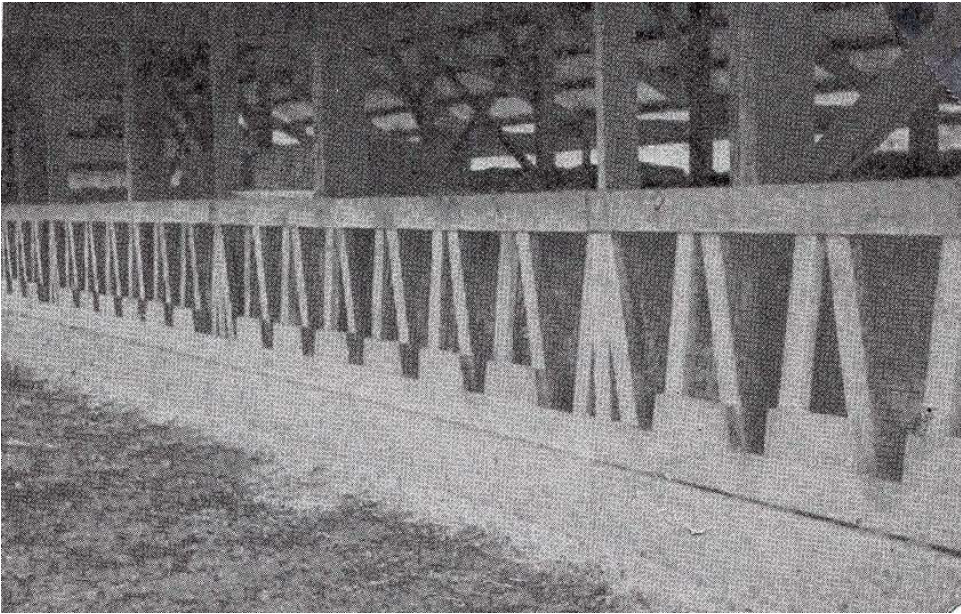
Low Quality: \$ 7.83  
 Average Quality: 10.28  
 Good Quality: 13.48

**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.

FEED BARN



AVERAGE QUALITY



INTERIOR DETAIL



GOOD QUALITY

**FEED BARN**

COMPONENT	CLASS 1 LOW QUALITY	CLASS 2 AVERAGE QUALITY	CLASS 3 GOOD QUALITY
<b>Foundation</b>	Redwood or cedar mudsills	Concrete or masonry piers	Continuous concrete
<b>Floor</b>	Dirt	Dirt	Dirt
<b>Wall Structure</b>	Light wood frame, 10' eave height	Average wood frame, 10' eave height	Good wood frame, 10' eave height
<b>Exterior Wall Cover</b>	Closed sides and open ends	Partially open sides, standard corrugated iron or average wood siding on ends	Partially open sides, good quality siding
<b>Roof Construction</b>	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
<b>Roof Cover</b>	Light metal or composition shingle	Standard gauge corrugated metal	Wood shingles
<b>Electrical</b>	Minimal per class	Minimal per class	Minimal per class
<b>Plumbing</b>	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	\$ 23.42	21.71	20.78	20.17	19.93	19.79	19.66	19.55	19.45	19.31	19.29
2	28.52	26.91	25.82	24.96	24.44	24.21	24.03	23.88	23.73	23.61	23.58
3	37.95	36.43	35.17	34.18	33.29	32.76	32.50	32.34	32.24	31.92	31.77

\*\* includes statewide local multiplier and no labor adjustment

**ADD** Concrete or wood floors, or concrete flatwork per square foot: \$ 5.53

Lofts per square foot of floor area  
 Low Quality: \$ 7.83  
 Average Quality: 10.28  
 Good Quality: 13.48

**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.

POLE BARN



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



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

**POLE BARNs - AVERAGE QUALITY**

<b>Structure</b>	Poles 15' to 20' on center
<b>Floor</b>	Dirt - use square foot additive for concrete
<b>Roof</b>	Average wood trusses or average steel trusses, low pitch, corrugated iron or aluminum cover, gable end enclosed, 2' overhang on 2 sides
<b>Walls</b>	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'	\$ 19.33	18.72	18.15	17.65	17.65	16.99	16.99	16.99	16.99	16.99
25'	18.15	17.65	16.99	16.52	15.95	15.95	15.95	15.95	15.95	15.95
30'	17.30	16.95	16.52	15.87	15.39	15.39	15.39	15.39	15.39	15.39
35'	16.99	16.46	15.92	15.36	14.79	14.79	14.79	14.79	14.79	14.79
40'	16.90	16.42	15.79	15.31	14.76	14.76	14.76	14.76	14.76	14.76
45'	16.82	16.22	15.66	14.06	14.01	14.01	14.01	14.01	14.01	14.01
50'	16.77	16.17	15.52	13.92	13.71	11.73	11.73	11.73	11.73	11.73
60'	16.72	16.12	15.27	13.33	13.28	11.50	11.50	11.50	11.50	11.50
70'	16.42	15.87	14.66	12.85	12.58	11.25	11.25	11.25	11.25	11.25
80'	16.42	15.87	14.06	12.58	12.11	10.98	10.98	10.98	10.98	10.98

\*\* includes statewide local multiplier and no labor adjustment

**ADD** Concrete or wood floors, or concrete flatwork per square foot : \$ 5.53

**QUALITY MULTIPLIERS**

Good Quality: 1.28  
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.

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'	\$ 28.02	25.55	24.26	23.61	23.09	22.61	22.36	22.31	22.26	21.96
25'	25.90	23.61	22.26	21.53	21.18	20.36	20.18	19.88	19.72	19.63
30'	24.69	22.31	21.18	20.28	19.93	19.55	19.28	18.93	18.80	18.72
35'	23.87	21.31	20.18	19.33	18.93	18.77	18.25	18.20	18.15	18.07
40'	23.31	20.71	19.58	18.80	18.68	18.15	17.65	17.60	17.52	17.38
45'	23.01	20.23	18.98	18.20	17.72	17.38	16.99	16.95	16.90	16.82
50'	22.74	19.72	18.90	17.55	17.38	16.95	16.60	16.52	16.34	16.26
60'	22.23	19.58	18.07	17.04	16.90	16.52	16.22	16.04	15.82	15.74
70'	21.91	19.15	17.55	16.95	16.60	16.26	15.82	15.74	15.61	15.57
80'	21.31	18.85	16.95	16.69	16.26	15.74	15.52	15.47	15.39	15.27

\*\* includes statewide local multiplier and no labor adjustment

ADD Concrete or wood floors, or concrete flatwork per square foot : \$ 5.53

QUALITY MULTIPLIERS

Good Quality: 1.28  
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'	\$ 31.78	29.53	28.28	27.55	27.28	26.85	26.63	26.55	26.50	26.29
25'	28.58	26.50	25.25	24.56	24.12	23.79	23.64	23.26	22.66	22.36
30'	26.85	23.99	22.91	22.06	21.76	21.23	21.01	20.83	20.80	20.66
35'	25.34	22.71	22.06	21.10	20.93	20.33	20.15	20.10	19.76	19.72
40'	24.56	22.18	21.06	20.36	20.18	19.68	19.55	19.15	18.98	18.90
45'	23.79	21.31	20.18	19.68	18.98	18.77	18.50	18.30	18.25	18.20
50'	23.09	20.80	19.37	19.15	18.93	18.25	18.20	18.15	17.95	17.82
60'	22.26	20.10	18.72	17.85	17.68	17.12	16.99	16.77	16.65	16.52
70'	21.76	19.55	18.30	17.60	17.07	16.72	16.42	16.39	16.22	16.17
80'	20.98	18.80	17.60	16.90	16.42	15.95	15.87	15.69	15.57	15.34

\*\* includes statewide local multiplier and no labor adjustment

ADD Concrete or wood floors, or concrete flatwork per square foot: \$ 5.53

QUALITY MULTIPLIERS

Good Quality: 1.28  
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.

**SIDE SHEDS - AVERAGE QUALITY**

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

**SQUARE FOOT COSTS**

WITH OPEN SIDES: \$	11.40	TO	\$	14.96
WITH ENCLOSED SIDES:	16.12	TO		21.16

**ADD** Concrete or wood floors, or concrete flatwork per square foot: \$ 5.53

**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.

SHOPS



AVERAGE QUALITY



GOOD QUALITY



GOOD QUALITY – CLASS S

SHOPS

COMPONENT	CLASS 1 LOW QUALITY	CLASS 2 AVERAGE QUALITY	CLASS 3 GOOD QUALITY
Foundation	Light concrete	Standard concrete	Standard concrete
Floor	Concrete	Concrete	Concrete
Wall Structure	Light wood frame, 15' eave height	Average wood frame, 15' eave height	Good wood frame 15' eave height
Exterior Wall Cover	Light metal or low-cost boards	Standard gauge corrugated metal or average wood siding	Good wood siding painted or C-block
Roof Construction	Low to medium pitch, 2"x 4" rafters 24" to 36" on center or light wood trusses	Low to medium pitch, average wood trusses	Low to medium pitch, good wood trusses
Roof Cover	Light metal	Standard gauge metal	Wood shingles
Electrical	2 outlets per 1,000 square foot	4 outlets per 1,000 square foot	4 outlets per 1,000 square foot
Plumbing	1 cold water outlet	2 cold water outlets	1 rough fixture plus 2 cold water outlets
Doors	1 light sliding or swinging door per 2,000 square foot	1 average sliding or swinging door per 2,000 square foot	1 drive through door per 1,000 square foot plus 1 walk-through door
Windows	None	None or few low cost	5 percent of wall area
Shape	Square or rectangular length between 1 and 2 times the width	Square or rectangular length between 1 and 2 times the width	Square or rectangular length between 1 and 2 times the 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	\$ 38.86	36.32	34.01	32.60	31.49	30.71	29.57	28.63	28.07	27.35
2	56.71	50.20	44.13	42.80	40.19	38.90	37.24	36.12	35.01	33.98
3	72.35	59.51	58.58	55.10	52.73	50.75	48.11	46.84	45.19	43.64

\*\* includes statewide local multiplier and no labor adjustment

ADD

For interior finish -

Class 1: \$

2.74 per square foot of floor area

Class 2:

3.37 per square foot of floor area

Class 3:

4.16 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.

**MACHINERY & EQUIPMENT SHEDS**



**AVERAGE QUALITY**



**AVE. QUALITY – 1 SIDE OPEN**



**GOOD QUALITY**



**GOOD QUALITY – 1 SIDE OPEN**

**MACHINERY AND EQUIPMENT SHEDS**

COMPONENT	CLASS 1 LOW QUALITY	CLASS 2 AVERAGE QUALITY	CLASS 3 GOOD QUALITY
<b>Foundation</b>	Light perimeter concrete	Concrete perimeter	Concrete perimeter
<b>Floor</b>	Dirt	Dirt or concrete*	Dirt or concrete*
<b>Wall Structure</b>	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
<b>Exterior Wall Cover</b>	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
<b>Roof Construction</b>	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
<b>Roof Cover</b>	Corrugated metal	Corrugated metal or wood shingle	Standard gauge metal or good wood shingles
<b>Electrical</b>	None	2 outlets per 1,000 square foot	4 outlets per 1,000 square feet
<b>Plumbing</b>	None	None	None
<b>Shape</b>	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	\$ 27.69	22.30	20.51	19.63	19.24	17.84	17.78	17.35	17.19	17.02	16.84
2	38.59	31.66	29.62	28.49	27.90	26.06	25.88	25.47	25.20	25.11	24.85
3	53.26	45.01	42.51	41.19	40.59	38.30	37.92	37.58	37.24	37.11	36.64

\*\* includes statewide local multiplier and no labor adjustment

**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	\$ 22.70	18.16	16.68	15.84	15.33	14.44	14.33	14.01	13.79	13.76	13.58
2	31.92	26.42	24.37	23.32	22.74	21.79	21.42	21.15	20.79	20.74	20.47
3	46.07	38.43	35.88	35.52	34.77	33.44	33.01	32.69	32.11	31.93	31.61

\*\* includes statewide local multiplier and no labor adjustment

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

\$ 5.53

**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.

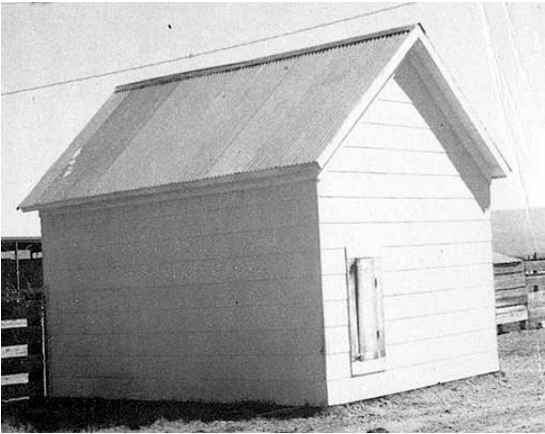
SMALL SHEDS AND PUMP HOUSES



LOW QUALITY



AVERAGE QUALITY



GOOD QUALITY



SMALL SHEDS AND PUMP HOUSES

COMPONENT	CLASS 1 LOW QUALITY	CLASS 2 AVERAGE QUALITY	CLASS 3 GOOD QUALITY
<b>Foundation</b>	Redwood or cedar mudsills	Concrete or masonry piers	Continuous concrete
<b>Floor</b>	Dirt	Dirt*	Dirt*
<b>Wall Structure</b>	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
<b>Exterior Wall Cover</b>	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.
<b>Roof Construction</b>	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.
<b>Roof Cover</b>	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
<b>Electrical</b>	None	Minimal	Minimal
<b>Plumbing</b>	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	\$ 38.77	32.23	31.30	28.08	26.17	24.95	23.64	21.58	20.75	19.88	18.62	17.87
2	45.14	40.27	37.66	34.51	32.61	31.38	30.02	28.09	27.19	26.30	25.07	24.37
3	68.77	56.05	54.02	48.98	44.28	41.91	39.41	36.46	33.83	32.13	29.73	28.21

\*\* includes statewide local multiplier and no labor adjustment

TYPE II (ONE SIDE OPEN)

CLASS	30	50	60	80	100	120	150	200	250	300	400	500
1	\$ 32.27	26.30	24.32	22.77	21.79	20.63	19.36	18.49	17.87	17.10	16.31	15.61
2	40.71	34.81	33.53	29.64	27.19	24.99	24.15	22.76	22.44	20.69	19.63	18.66
3	53.11	47.86	43.94	39.07	36.09	33.45	32.40	30.85	29.33	27.77	26.52	25.37

\*\* includes statewide local multiplier and no labor adjustment  
 ADD

Concrete or wood floors, or concrete flatwork per square foot: \$ 5.53  
 Fiberglass Roll or Batt Insulation: 1.22  
 Gypsum Board Interior: 2.70

**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.

**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.

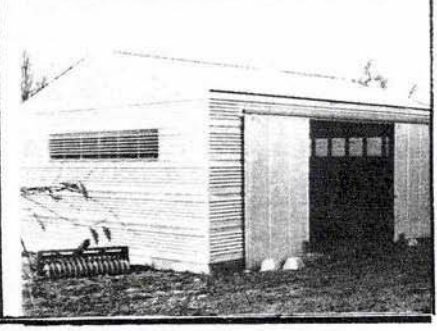
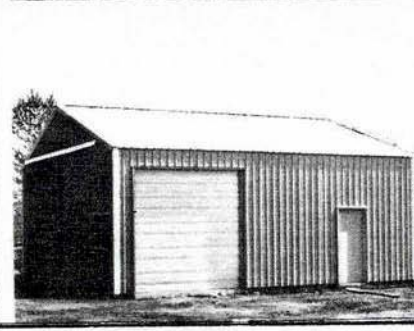
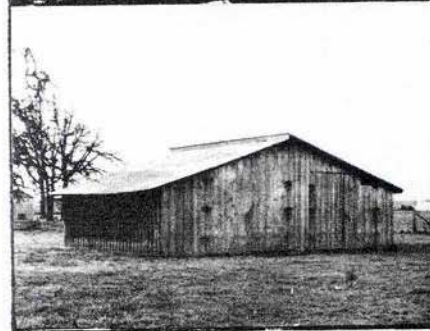
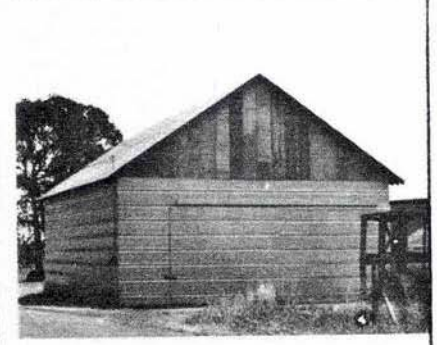
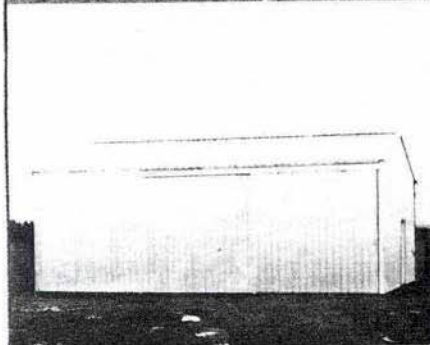
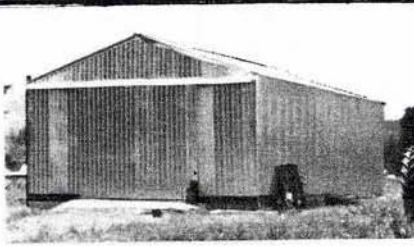
General purpose buildings typically employ simple designs that emphasize maximum utility at minimum cost.

**CLASS ILLUSTRATIONS**

**LOW QUALITY**

**AVERAGE QUALITY**

**GOOD QUALITY**



**GENERAL PURPOSE BUILDINGS**

COMPONENT	CLASS 1 LOW QUALITY	CLASS 2 AVERAGE QUALITY	CLASS 3 GOOD QUALITY
<b>Foundation</b>	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
<b>Floor</b>	Dirt	Concrete	Concrete
<b>Frame and Exterior Walls</b>	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
<b>Interior Walls</b>	Normally unfinished see options	Normally unfinished see options	Normally unfinished see options.
<b>Roof Structure</b>	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
<b>Roof Cover</b>	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
<b>Electrical</b>	None	Minimal	Minimal
<b>Plumbing</b>	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	\$ 22.20	18.98	18.11	17.13	16.73	16.12	15.70	15.50	15.34
2	30.64	26.96	25.88	24.68	24.24	23.52	23.03	22.80	22.56
3	40.51	35.93	34.65	34.20	32.67	31.77	31.15	30.84	30.66

\*\* includes statewide local multiplier and no labor adjustment

<b>ADD</b>	For interior finish -	Class 1:	\$	2.72	per square foot of floor area
		Class 2:		2.92	per square foot of floor area
		Class 3:		3.12	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.

ROOT CELLARS

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

SQUARE FOOT COSTS

CLASS	100	200	300	400	500	600	1,000	1,500	2,000	2,500
1	\$ 31.39	28.56	27.17	26.49	26.01	25.65	25.30	24.95	24.67	24.59
2	43.72	38.23	36.62	35.23	34.49	34.24	32.66	31.82	31.31	30.91
3	104.05	84.81	72.86	66.31	62.59	60.70	53.85	49.69	46.85	44.88

\*\* includes statewide local multiplier and no labor adjustment

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

Class 1: \$ 5.04 per square foot of floor area  
 Class 2: 6.05 per square foot of floor area  
 Class 3: 7.26 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.

**COLD STORAGE WALK-IN BOXES**

TYPE	50 sq ft	100'	150'	200'	300'	400'	500'
COOL BOX	24,531	35,044	42,898	49,786	61,326	70,994	79,452
FREEZE BOX	28,005	39,454	47,853	63,199	74,619	84,286	92,745

\*\* includes statewide local multiplier and no labor adjustment

Wall deduction per linear foot of wall: \$ 194

**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
\$	21.79	21.12	20.02	19.30	17.80	16.39

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

LENGTH	WIDTH			
	30'	40'	60'	70'
30'	29.85	-	-	-
36'	28.53	-	-	-
48'	26.55	24.36	-	-
60'	25.02	22.82	21.73	-
72'	24.14	21.81	20.89	20.01
84'	23.26	21.07	19.97	19.36

LENGTH	WIDTH			
	30'	40'	60'	70'
96'	22.16	20.36	19.36	18.65
108'	21.68	19.84	18.70	18.17
120'	21.07	19.31	18.26	17.60
160'	19.75	17.99	16.85	16.33
200'	-	16.85	16.02	15.54
240'	-	16.15	15.36	14.97

\*\* includes statewide local multiplier and no labor adjustment

OPTIONS:

<b>Electrical</b>	Minimal Service, add per square foot of floor area:	\$	0.35
<b>Plumbing</b>	Minimal Service, add per square foot of floor area:		0.25
<b>Insulation</b>	If 2" thick foamglass is sprayed on walls and ceiling (or equivalent), add per square foot of insulated area:		6.54
<b>Interior Construction</b>	If potato storage area has bins and interior partitions, add per square foot of floor area:		2.74
<b>Concrete</b> (or concrete flatwork)	Add per square foot of concreted area:		5.53

**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.

**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
<b>Foundation</b>	Continuous concrete	Continuous concrete
<b>Floor</b>	Dirt	Dirt
<b>Frame</b>	Heavy timber post and beam. Basic height 14 feet.	Steel frame. Basic height 14 feet.
<b>Exterior Wall</b>	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.
<b>Interior Construction</b>	See options	See options.
<b>Ceiling</b>	Open	Open
<b>Plumbing</b>	Entry service, 2 hose bibs	Entry service, 2 hose bibs.
<b>Electrical</b>	Entry service, 3 outlets	Entry service, 3 outlets
<b>Insulation</b>	2-inch-thick cellulose sprayed walls and ceiling or equivalent	2-inch-thick cellulose sprayed walls and ceiling or equivalent
<b>Roof Frame</b>	Wood rafters, joists, sheathing	Open steel and frame for corrugated metals
<b>Roof Cover</b>	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
<b>AVG</b>	\$ 38.48	36.67	34.86	32.13	29.94	28.90	27.86	26.55
<b>GOOD</b>	52.48	49.64	46.02	41.56	38.41	36.42	34.95	33.38

\*\* includes statewide local multiplier and no labor adjustment

**OPTIONS:**

**Interior Construction**

If potato storage area has bins and interior partitions,  
 add for average quality per square foot: \$ 7.46  
 add for good quality per square foot: 14.55

**Exterior Construction**

Painted metal exterior walls, add per square foot: \$ 1.42  
 Concrete or concrete flatwork per square foot: 5.53

**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**

	<b>5,000</b>	<b>7,000</b>	<b>10,000</b>	<b>15,000</b>	<b>20,000</b>	<b>25,000</b>	<b>30,000</b>	<b>40,000</b>
\$	5.88	5.69	5.46	5.22	5.04	4.90	4.80	4.62

**AIR CONDITIONING**

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

**SQUARE FOOT COSTS**

	<b>5,000</b>	<b>7,000</b>	<b>10,000</b>	<b>15,000</b>	<b>20,000</b>	<b>25,000</b>	<b>30,000</b>	<b>40,000</b>
\$	12.77	12.37	11.86	11.36	10.95	10.65	10.44	10.04

**STEEL BUILDINGS – FARM & RANCH**



**METAL HORSE BARN**



**METAL SHOP– SLANT WALL**



**QUONSET BUILDING**

**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**

LENGTH	WIDTH			
	30'	40'	60'	70'
30'	42.64	-	-	-
36'	40.76	-	-	-
48'	37.93	34.80	-	-
60'	35.74	32.60	31.04	-
72'	34.49	31.16	29.85	28.59
84'	33.23	30.10	28.53	27.65

LENGTH	WIDTH			
	30'	40'	60'	70'
96'	31.66	29.09	27.65	26.65
108'	30.97	28.34	26.71	25.96
120'	30.10	27.59	26.08	25.14
160'	28.22	25.71	24.08	23.32
200'	-	24.08	22.89	22.20
240'	-	23.07	21.95	21.38

**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**

WIDTH	EAVE HEIGHT	LENGTH TO WIDTH RATIO					
		1.0	1.5	2.0	3.0	4.0	5.0
20'	10'	\$ 38.06	36.02	34.65	32.80	31.48	30.54
30'	12'	32.66	31.18	30.40	28.72	27.84	27.18
40'	14'	33.16	31.07	29.74	27.90	26.60	25.69
50'	14'	29.39	28.28	27.54	26.52	25.80	25.28
60'	14'	26.80	25.92	25.34	24.57	24.04	23.79
80'	16'	27.40	26.44	25.78	24.90	24.01	23.60
100'	16'	26.80	25.69	24.90	23.88	23.24	22.64
140'	16'	23.79	23.08	22.45	21.78	21.21	20.88
160'	18'	23.55	22.86	22.36	21.65	21.18	20.82
200'	18'	22.14	21.56	21.18	20.66	20.24	19.97

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.

**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.

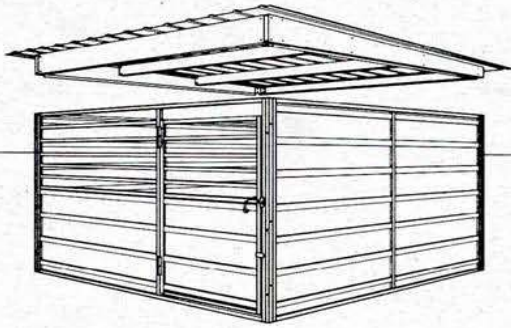
**SLANT WALL BUILDINGS:** deduct 5 percent to 15 percent.

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

COSTS PER SQUARE FOOT		LOW	AVG	GOOD
<b>FLOOR:</b>				
Asphalt:		\$ 3.21	\$ 4.04	\$ 5.12
Concrete:		4.62	5.53	6.64
<b>LIGHTING:</b>				
		0.39	1.10	2.15
<b>INSULATION:</b> (per square foot of insulated wall area)				
Wall:		\$ 1.18	\$ 1.45	\$ 1.73
Roof:		1.52	2.35	3.55
<b>PLUMBING:</b>				
		0.34	0.97	1.97
<b>HEATING:</b> (suspended space heaters):				
		1.63	2.20	3.03

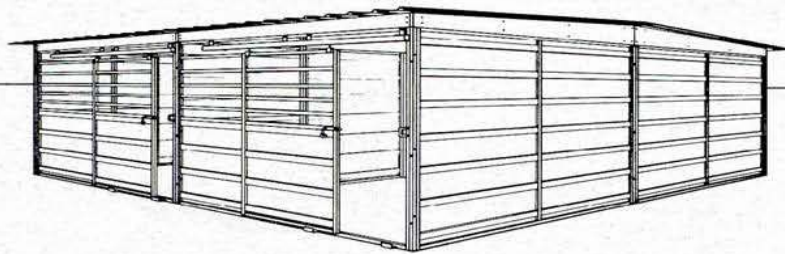
**NOTE:** Above costs are based on professional construction labor supervised by a contractor or his job foreman. For farm labor with no professional supervision, costs should be adjusted downward by 25 percent relative to the quality of the finished product.

**PREFABRICATED METAL HORSE STABLES**



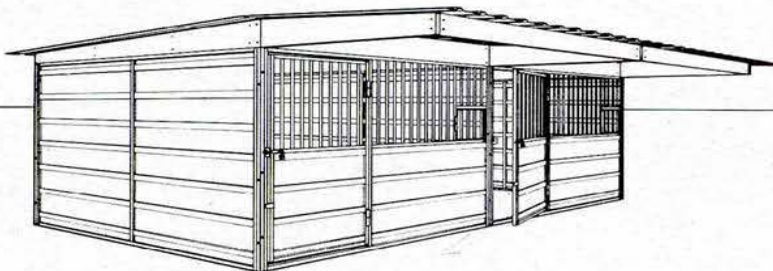
**AVERAGE QUALITY**

**SINGLE STALL**



**AVERAGE QUALITY**

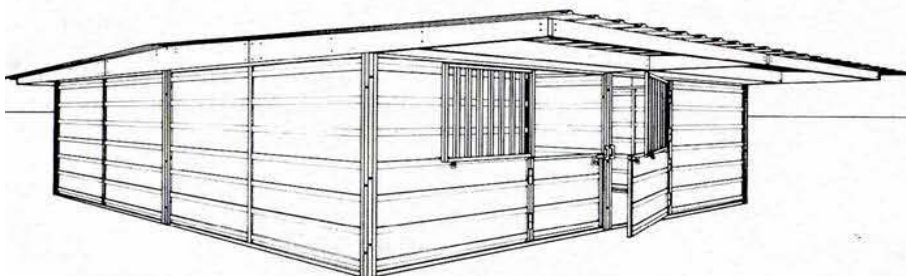
**QUADRUPLE STALL**



**AVERAGE QUALITY**

**DOUBLE STALL**

**WITH PATIO ROOF  
OR OVERHANG**



**AVERAGE QUALITY**

**QUADRUPLE STALL**

**WITH PATIO ROOF  
OR OVERHANG**

**PREFABRICATED METAL HORSE STABLES**

COMPONENT	CLASS 1 LOW QUALITY	CLASS 2 AVERAGE QUALITY	CLASS 3 GOOD QUALITY
<b>Foundation</b>	Light perimeter concrete foundation	Average perimeter concrete foundation	Good perimeter concrete foundation
<b>Floor</b>	Dirt	Dirt	Dirt
<b>Wall Structure</b>	Prefabricated light metal frame	Prefabricated average weight metal frame	Prefabricated heavy-duty metal frame
<b>Exterior Wall Cover</b>	Metal cover light weight	Metal cover average weight	Metal cover heavy duty
<b>Roof Construction</b>	Light open steel system for metal	Average open steel system for metal	Heavy duty open steel system for metal
<b>Roof Cover</b>	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
<b>1</b>	\$ 31.32	\$ 28.72	\$ 26.30
<b>2</b>	41.68	38.30	35.20
<b>3</b>	55.64	51.26	47.26

\*\* includes statewide local multiplier and no labor adjustment

ADD per square foot of patio roof or overhang:

LOW	AVG	GOOD
\$ 7.30	\$ 10.24	\$ 14.37

ADD Concrete or concrete flatwork per square foot: \$ 5.53

**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.

**LIGHT METAL-FRAMED BUILDINGS**

These buildings are typically purchased as do-it-yourself kits with pre-engineered components that fit together. They consist of hollow galvanized steel tubing with sheet panel walls and roof. Add for paved or concrete floors, overhead doors, man doors, windows, electrical and insulation.



**BASIC FARM BUILDINGS**

**LIGHT FRAMED METAL BUILDINGS (CARPORTS, GARAGES)**

<b>SINGLE-CAR CARPORT (12X20), 3:12 roof pitch, 7' wall height, 15 gauge frame, 29 gauge roof, anchors incl., fair qual.</b>	
CARPORT	\$ 1,391.46
ADD FOR TWO WALLS	\$ 455.00
ADD FOR THREE WALLS	\$ 918.00
ADD FOR GABLE KIT	\$ 680.00
<b>DOUBLE-CAR CARPORT (20X20), 3:12 roof pitch, 7' wall height, 15 gauge frame, 29 gauge roof, anchors incl., fair qual</b>	
CARPORT	\$ 2,073.72
ADD FOR TWO WALLS	\$ 444.00
ADD FOR THREE WALLS	\$ 1,142.00
ADD FOR GABLE KIT	\$ 700.00
<b>TRIPLE-CAR CARPORT (24X20), 3:12 roof pitc, 7' wall height, 15 gauge frame, 29 gauge roof, anchors incl., fair qual.</b>	
CARPORT	\$ 2,791.00
ADD FOR TWO WALLS	\$ 493.00
ADD FOR THREE WALLS	\$ 1,516.00
ADD FOR GABLE KIT	\$ 1,260.00
<b>RV CARPORT (16'X42'), 3:12 roof pitch, 14' wall height, 15 gauge frame, 29 gauge roof, anchors incl., fair qual.</b>	
CARPORT	\$ 4,415.00
ADD FOR TWO WALLS	\$ 2,269.00
ADD FOR THREE WALLS	\$ 3,425.00
ADD FOR GABLE KIT	\$ 756.00
<b>SINGLE-CAR CAPPOT (14X21), 3:12 roof pitch, 7' wall height, 15 gauge frame, 29 gauge roof, anchors incl., good qual.</b>	
CARPORT	\$ 2,570.00
ADD FOR TWO WALLS	\$ 921.00
ADD FOR THREE WALLS	\$ 1,498.00
ADD FOR PARTIAL WALL KIT	\$ 881.00
ADD FOR GABLE KIT	\$ 718.00
<b>DOUBLE-CAR CARPORT (24X21), 3:12 roof pitch, 7' wall height, 15 gauge frame, 29 gauge roof, anchors incl., good qual.</b>	
CARPORT	\$ 3,229.00
ADD FOR TWO WALLS	\$ 986.00
ADD FOR THREE WALLS	\$ 1,775.00
ADD FOR PARTIAL WALL KIT	\$ 881.00
ADD FOR GABLE KIT	\$ 866.00
<b>TRIPLE-CAR CARPORT (24X21), 3:12 roof pitch, 9' wall height, 15 gauge frame, 29 gauge roof, anchors incl., good qual.</b>	
CARPORT	\$ 4,075.00
ADD FOR TWO WALLS	\$ 1,055.00
ADD FOR THREE WALLS	\$ 2,165.00
ADD FOR PARTIAL WALL KIT	\$ 881.00
ADD FOR GABLE KIT	\$ 1,182.00
<b>RV CARPORT (16'X42'), 3:12 roof pitch, 14' wall height, 15 gauge frame, 29 gauge roof, anchors incl., good qual.</b>	
CARPORT	\$ 7,860.00
ADD FOR TWO WALLS	\$ 2,139.00
ADD FOR THREE WALLS	\$ 3,176.00
ADD FOR GABLE KIT	\$ 758.00

<b>EXTRAS:</b>	
ADD FOR CONCRETE FLOOR PER SQ FT OF FLOOR AREA	\$ 5.53
ADD FOR ASPHALT PAVED FLOOR PER SQ FT OF FLOOR AREA	\$ 4.04
ADD FOR OVERHEAD DOOR, MANUAL, PER SQ FT OF OPENING	\$ 25.01
ADD FOR OVERHEAD DOOR, ELECTRIC, PER INSTALLATION	\$ 2,951.92
ADD FOR EACH MAN DOOR, PER SQ FT OF OPENING	\$ 29.89
ADD FOR EACH WINDOW, DOUBLE HUNG, PER SQ FT OF OPENING	\$ 26.53
ADD FOR ELECTRICITY PER SQ FT OF BUILDING	\$ 0.33
ADD FOR INSULATION PER SQ FT OF BUILDING	\$ 0.97

## BASIC FARM BUILDINGS

**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.

PART A

2027-2028 RURAL BUILDING COSTS

Section 2

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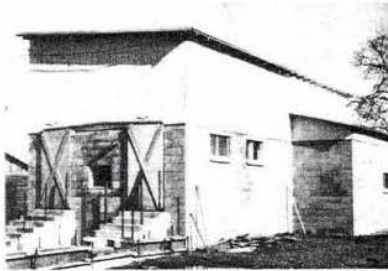
DAIRY BARNS

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PHOTOS COURTESY OF CHURCHILL COUNTY ASSESSOR

LOW QUALITY



AVERAGE QUALITY



GOOD QUALITY

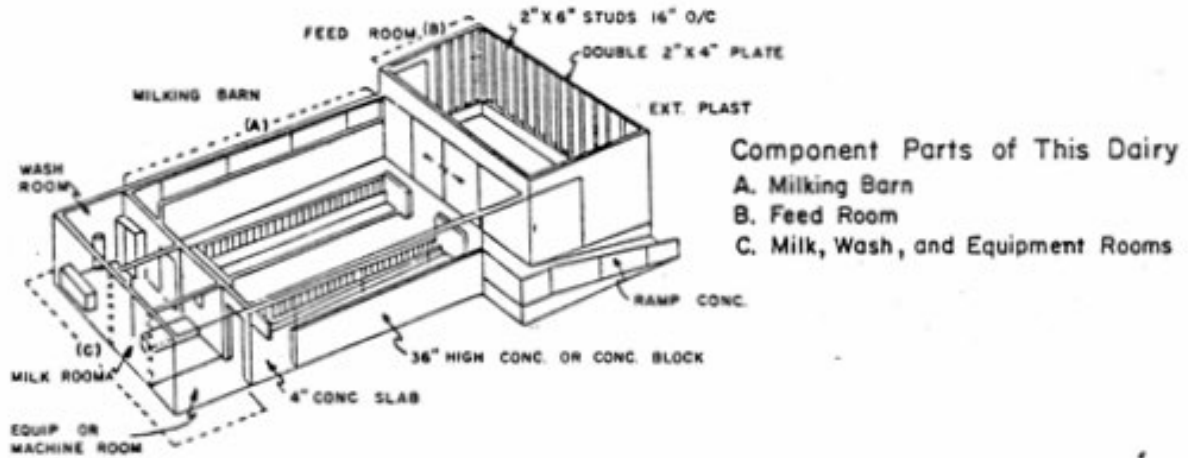


VERY GOOD QUALITY



# DAIRY BARNS

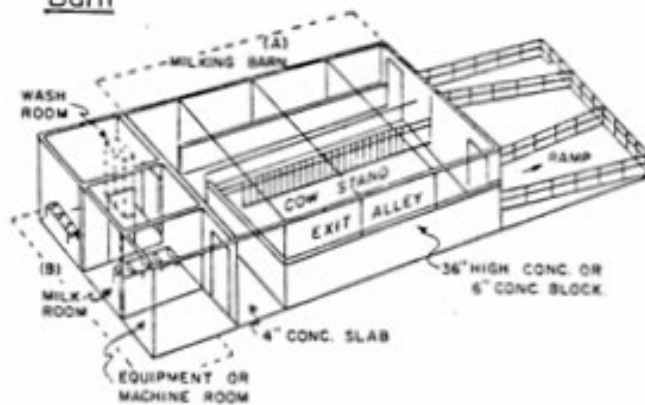
## Stanchion Barn



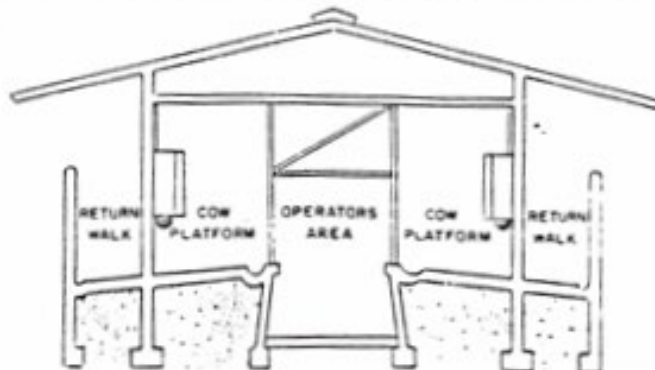
## Typical Walk-Through Barn

Component Parts of This Dairy

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



## Cross Section Modern Herrington-Type Dairy Barn



Section 2

**MILKING PARLORS**

<b>SITE PREPARATION</b>	Basically, level terrain, no excavation, minimum fill.
<b>FOUNDATION</b>	Reinforced concrete for one story height. Foundation and footings formed and poured monolithically with floor slab.
<b>FLOORS</b>	Concrete well-formed gutters, elevated slab.
<b>CEILING</b>	Open unfinished, paint only, bottom of roof.
<b>INTERIOR</b>	Type found in dairies and milking parlors, smooth plaster or epoxy paints. Minimum cow stanchions and stalls conforming to the quality of the building. Neither equipment nor machinery is included.
<b>PLUMBING</b>	Basic plumbing required for building, usual floor drains and hose bibs. Does not include milk piping, pumps or storage.
<b>HEATING - COOLING</b>	Minimum, space heaters and evaporative coolers.
<b>ELECTRICAL LIGHTING</b>	Basic electrical service required for dairies. Does not include machinery or equipment.
<b>EXTERIOR WALLS</b>	8" concrete block, bearing walls or reinforced concrete 36-inch high with 2" x 6" stud framing – 16" on center above.
<b>ROOF STRUCTURE AND COVER</b>	Wood joists, wood or composition deck. Asphalt shingles to 290 pounds.
<b>COST RANGE RATING</b>	Based on cost per square foot of floor area.

**SQUARE FOOT COST**

<b>QUALITY</b>			
<b>LOW</b>	<b>AVERAGE</b>	<b>GOOD</b>	<b>VERY GOOD</b>
\$ 84.55	\$ 105.33	\$ 132.74	\$ 169.34

**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.

**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
<b>CEILING</b> (Gypsum board - taped and painted):	\$ 3.40	3.75	4.15	4.60
<b>INSULATION</b>				
Walls:	\$ 1.17	1.44	1.72	2.10
Roof:	1.51	2.33	3.52	5.30
<b>WALL ORNAMENTATION</b> (*apply only to ornamented area):				
	LOW	AVERAGE	GOOD	VERY GOOD
<b>CERAMIC TILE</b> (*cost based on square foot of area covered):	21.01	25.78	30.54	35.31
<b>ROOF COVER</b> (Wood shingle):	8.27	10.28	12.81	15.95
<b>AUTOMATIC GATES</b> (*based on cost per stall):	\$ 1,921	\$ 2,046	\$ 2,171	\$ 2,296
<b>AUTOMATIC FEED EQUIPMENT</b> (*based on cost per stall):	\$ 1,390	1,519	1,647	1,776
			FOR AUGER ADD: \$	1,390

**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.

**MILK STORAGE, WASH, AND EQUIPMENT ROOMS**

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

**SQUARE FOOT COSTS**

QUALITY

LOW	AVERAGE	GOOD	VERY GOOD
\$ 42.39	\$ 58.59	\$ 96.79	\$ 127.75

**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.

MILKING STORAGE, WASH AND EQUIPMENT ROOMS

ADDITIONAL FEATURES

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

FEATURE	LOW	QUALITY		
		AVERAGE	GOOD	VERY GOOD
<b>INSULATION</b>				
Walls:	1.17	1.44	1.72	2.10
Roof:	1.51	2.33	3.52	5.30
<b>WALL ORNAMENTATION</b> (*apply only to ornamented area):				
<b>CERAMIC TILE</b> (*cost based on square foot of area covered):				
	21.01	25.78	30.54	35.31
<b>ROOF COVER</b>				
(Wood shingle):	8.27	10.28	12.81	15.95

**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.



**FEEDER FENCE w HEADLOCK**

**WASH PEN AND HOLDING AREA**

<b>FLOOR OR RAMP</b>	Sloping concrete slab rough finish 6" thick.
<b>WALLS</b>	Concrete block 8" - height 5'.
<b>FENCING</b>	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 3/4".
<b>GATES</b>	Metal gates (2 usually) 12 linear feet each, 5-rail.
<b>SPRINKLER</b>	Hooded rainbird type or equivalent including piping and pump.
<b>COST RANGE RATING</b>	Based on cost per square foot of floor area.

**WASH PEN AND HOLDING AREA**

QUALITY			
LOW	AVERAGE	GOOD	VERY GOOD
\$ 28.88	\$ 33.23	\$ 37.40	\$ 41.64

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

QUALITY			
LOW	AVERAGE	GOOD	VERY GOOD
\$ 10.65	\$ 14.45	\$ 19.71	\$ 27.03

**METAL RAIL FENCE  
WELDED IRON RAILS**

Iron pipe post 2-1/2" to 4" in diameter - 7' to 10' on center in concrete:  
\$ 20.85 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: \$ 19.62 per linear foot.  
4-Cable: \$ 20.23 per linear foot.

**METAL GATES**

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

**STAINLESS STEEL REFRIGERATED HOLDING TANKS**

<b>SIZE GALLONS</b>	<b>TANK ONLY</b>	<b>COMPLETE SYSTEM</b>
500	\$ 13,292	\$ 24,557
1,000	24,991	35,087
1,250	29,247	40,283
1,500	32,706	43,771
2,000	40,421	53,384
2,500	46,542	64,871
3,000	51,070	76,360
4,000	61,719	94,731
5,000	69,181	112,273

\*\* includes statewide local multiplier and no labor adjustment

**VACUUM PUMP SYSTEMS**

8-20 STALLS WITH 3 PHASE ELECTRIC MOTORS

PER COW STALL: \$ 1,190

\*\* includes statewide local multiplier and no labor adjustment

**REFRIGERATION COMPRESSORS**

<b>HORSE POWER</b>	<b>COST</b>
3.0	\$ 13,689
4.0	19,977
5.0	26,265
7.5	32,554
10.0	38,842
15.0	45,130

\*\* includes statewide local multiplier and no labor adjustment

**FEED FENCING w HEADLOCKS**

<b>TYPE</b>	<b>COST</b>
STEEL	\$ 42.60 per LF
LOCKABLE STEEL	64.05 per LF
SELF-LOCKING STEEL	122.33 EACH

**NOTE:** See following page for listing of additional equipment.

**DAIRY EQUIPMENT  
PLATE COOLERS**

**NUMBER OF STALLS**

	<b>6</b>	<b>8</b>	<b>12</b>	<b>20</b>	<b>24</b>
<b>\$</b>	6,948	10,286	13,625	16,963	20,301

**HERRINGBONE STALLS**

<b>SIZE</b>	<b>STALLS</b>	<b>COST</b>
DOUBLE 3	6	\$ 17,220
DOUBLE 4	8	20,543
DOUBLE 6	12	30,814
DOUBLE 10	20	51,357
DOUBLE 12	24	54,378

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

**MILK TRANSFER LINES**

<b>TYPE</b>	<b>SIZE</b>	<b>COST PER LF</b>
STAINLESS STEEL	18 GAUGE - 1.5"	\$ 11.67
STAINLESS STEEL	18 GAUGE - 2.0"	14.80
STAINLESS STEEL	16 GAUGE - 2.0"	19.28
STAINLESS STEEL	16 GAUGE - 2.5"	26.77
STAINLESS STEEL	16 GAUGE - 3.0"	32.35
GLASS PIPE	1.5"	90.16
GLASS PIPE	2.0"	111.70

**NOTE:** Flushing systems require twice the amount of pipe.

**Electric pulsator or hydropulsator;**

Manual on & off: \$ 789 to \$ 1,264 EACH  
Automatic off, add: \$ 1,319 to \$ 3,948

PART A

2027-2028 RURAL BUILDING COSTS

Section 3

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**BUNK HOUSES**

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**BUNK HOUSES**



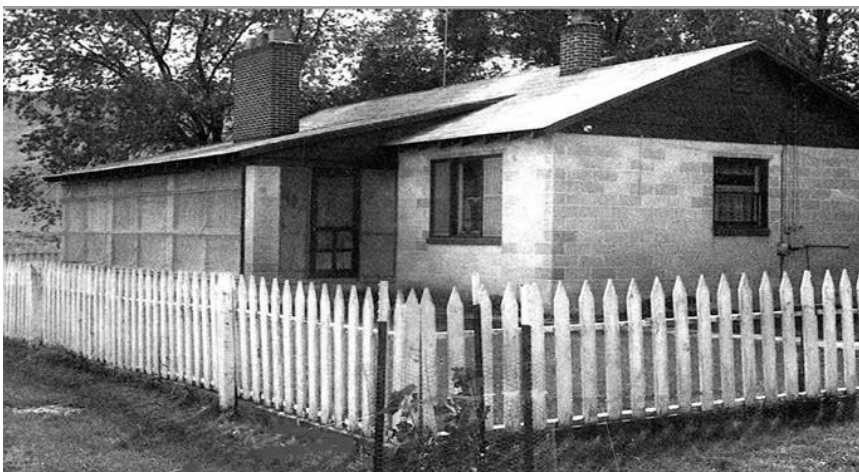
**CLASS I  
LOW QUALITY**



**CLASS 2  
AVERAGE QUALITY**



**CLASS 3  
GOOD QUALITY**



**CLASS 4  
VERY GOOD QUALITY**

**BUNK HOUSES**

<b>COMPONENT</b>	<b>CLASS 1 LOW QUALITY</b>	<b>CLASS 2 AVERAGE QUALITY</b>	<b>CLASS 3 GOOD QUALITY</b>	<b>CLASS 4 VERY GOOD QUALITY</b>
<b>Foundation</b>	Thickened slab around perimeter	Thickened slab around perimeter	Thickened slab around perimeter	Spread footing around perimeter and thickened slab at partitions
<b>Floor</b>	4" concrete slab	4" concrete slab	4" concrete slab	4" concrete slab
<b>Walls</b>	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
<b>Exterior Cover</b>	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
<b>Interior Finish</b>	None	Gypsum board or plywood partitions painted	Gypsum board or plywood partitions painted	Sheet rock finished
<b>Roof Framing</b>	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
<b>Roofing</b>	Composition or used metal sheeting	Composition or metal sheeting	Aluminum or corrugated iron or light wood shingles	Good grade composition shingles or wood shingles
<b>Doors</b>	Two or three cheap doors	Three or four average doors	One average door each room	One good door each room
<b>Windows</b>	Few and small	One window each room	One steel or aluminum window in each room	One steel sash or aluminum window in each room
<b>Electrical</b>	Minimum outlets	Minimum outlets	Average or better outlets	Average or better outlets adequate amount
<b>Heating &amp; Cooling</b>	None	None	None	None

**BUNK HOUSES**

CLASS	SQUARE FEET								
	400	600	800	1,000	1,200	1,500	2,000	2,500	3,000
1	\$ 37.49	35.43	34.39	33.26	32.85	31.85	31.13	30.51	30.23
2	50.03	47.36	46.16	44.68	44.13	42.88	41.91	41.17	40.85
3	67.72	64.34	62.71	60.89	60.20	58.57	57.38	56.44	55.94
4	121.52	112.62	108.50	103.29	101.66	97.21	94.07	91.35	90.16

\*\* includes statewide local multiplier and no labor adjustment

1. Utility hook-up costs included.

2. Interior plumbing not included

Add for Class 1:	\$	1,329	per fixture
Class 2:		2,042	per fixture
Class 3:		3,112	per fixture
Class 4:		4,834	per fixture

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

4. Floor covering not included.

Add asphalt tile or linoleum:	\$	8.52	per sq ft
Add installed carpet:		8.65	per sq ft

5. Cooling systems not included.

Add window units:	\$	-	per sq ft
Add for evaporative coolers, roof or wall units only:		4.53	per sq ft

6 Heating systems not included.

Add floor or wall furnace:		2.61	per sq ft
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7 Insulation not included.

Add for	Roof:	2.35	per sq ft
	Walls:	1.45	per sq ft

\*\* includes statewide local multiplier and no labor adjustment

**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.

PART A

2027-2028 RURAL BUILDING COSTS

Section 4

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**UTILITIES**

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**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**

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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

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**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	<b>1,937</b>	<b>2,269</b>	2,662	2,813		3,236	3,846
80	2,039	2,371	<b>2,764</b>	<b>2,915</b>		3,338	3,948
120	2,242	2,574	2,967	3,118		<b>3,541</b>	<b>4,151</b>
220	2,953	3,286	3,678	3,829		4,252	4,863
315	3,376	3,709	4,101	4,252		4,675	5,286
525	4,011	4,343	4,736	4,887		5,310	5,920

\*\* includes statewide local multiplier and no labor adjustment

EXAMPLE:	3/4 HP & 80 GAL TANK	\$	2,764
	6" WELL AT 60' DEPTH		3,780
	TOTAL COST	\$	6,544

**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	<b>1,763</b>	2,186	2,579	3,032		3,757	4,651	5,018	8,136
80	1,865	<b>2,288</b>	<b>2,680</b>	3,133		3,858	4,753	5,120	8,238
120	2,068	2,491	2,883	<b>3,336</b>		4,061	4,956	5,289	8,407
220	2,779	3,202	3,595	4,048		<b>4,773</b>	<b>5,667</b>	5,963	9,081
315	3,202	3,625	4,018	4,471		5,196	6,090	<b>6,278</b>	9,395
525	3,837	4,260	4,652	5,105		5,831	6,725	6,991	<b>10,108</b>

\*\* includes statewide local multiplier and no labor adjustment

EXAMPLE:	1 HP PUMP & 120 GAL TANK	\$	3,336
	8" WELL AT 100' DEPTH.		9,500
	TOTAL COST	\$	12,836

**WELL DRILLING**

**WELL DRILLING**

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

4" - 6" WELL: \$ 63 per foot  
8" - 10" WELL: 95 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.

**SEPTIC TANKS**

This 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.

**SEPTIC TANK COSTS**  
**CAPACITY (GAL)**

QUALITY	LOW	AVG	GOOD
1000 GAL	\$ 2,453	3,009	3,565
1250 GAL	3,293	3,822	4,350
1500 GAL	3,897	4,592	5,287
LEACH LINES (per ft)	17.64	22.90	28.16
DRAINFIELD MULT.	1.25	1.25	1.25
PLASTIC PIPE 4"-6" (per ft)	10.65	14.14	17.64

**\*\* includes statewide local multiplier and no labor adjustment**

**MOBILE HOME HOOKUPS**

TYPE	LOW	AVG	GOOD
Water	\$ 1,223	1630	2,295
Electric	1,818	2633	3,793
Sewer	1,367	2006	2,558
Gas	577	872	1,404

**\*\* includes statewide local multiplier and no labor adjustment**

Add for each lineal foot over base      \$      11.15                      to                      \$                      18.47

**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: \$11.15 to \$18.47

PART A

2027-2028 RURAL BUILDING COSTS

Section 5

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CORRALS AND FENCES

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**CORRALS AND FENCES**



**RAILROAD TIE POSTS  
10' OC  
POLE RAIL FENCE  
AVERAGE QUALITY  
LESS 15 %**

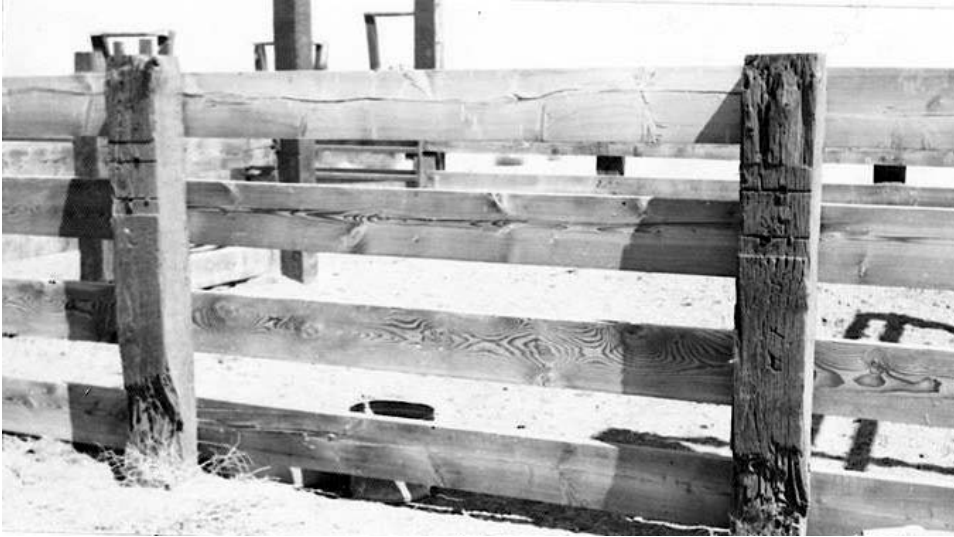


**RAILROAD TIE POSTS  
POLE RAIL FENCE  
WITH FEED TROUGH  
AVERAGE QUALITY**



**RAILROAD TIE POSTS  
CABLE FENCE  
WITH FEED TROUGH  
AVERAGE QUALITY**

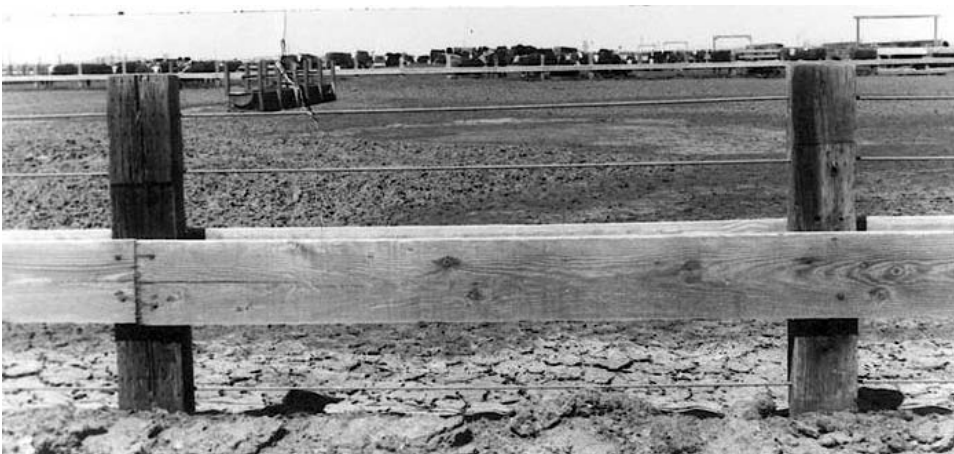
**CORRALS AND FENCES**



**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**

**CORRAL FENCING  
COST PER LINEAR FOOT**

TYPE	LOW	FAIR	AVG	GOOD
WOOD	\$ 14.14	\$ 17.01	\$ 20.55	\$ 24.72

<b>Examples</b>	4-4"	4-6"	5-6"	7-6"
<b>of Rails</b>	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	\$ 5.17	\$ 5.86	\$ 6.54	\$ 7.23

<b>Examples:</b>	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)
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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.

TYPE	LOW	FAIR	AVG
4" PIPE, CABLE RAILS	\$ 20.36	21.03	21.69
4" PIPE, 2" PIPE RAILS	25.98	26.81	27.63

**WOODEN FEED TROUGHS**

TYPE	LOW	FAIR	AVG	GOOD
W/O FENCE	\$ 11.02	\$ 14.55	18.65	26.31
WITH FENCE	\$ 15.50	20.10	24.58	32.02

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

**CONCRETE**

In-place cost for flatwork per square foot: \$ 5.53 to \$ 6.64  
 Cost per square foot of wall area: \$ 31.78

**METAL FENCING AND GATES**



**5' CHAIN LINK FENCE  
NO TOP RAIL**



**COMMERCIALY  
MANUFACTURED GATE  
GOOD QUALITY**



**EXPANDED TUBE  
STEEL GATE**



**IRON PIPE CORRAL  
AND HOLDING PEN**

**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	\$ 14.08	20.40	26.81	33.04	39.26
ADD FOR RAILS	3.14	3.14	3.40	3.40	3.40
ADD FOR PRIVACY SLATS	9.53	14.51	19.58	24.90	29.93
ADD FOR 3 STRAND BARBED WIRE	4.07	4.07	4.58	4.58	4.58

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	\$ 11.89	\$ 18.94	\$ 25.29	\$ 36.68

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

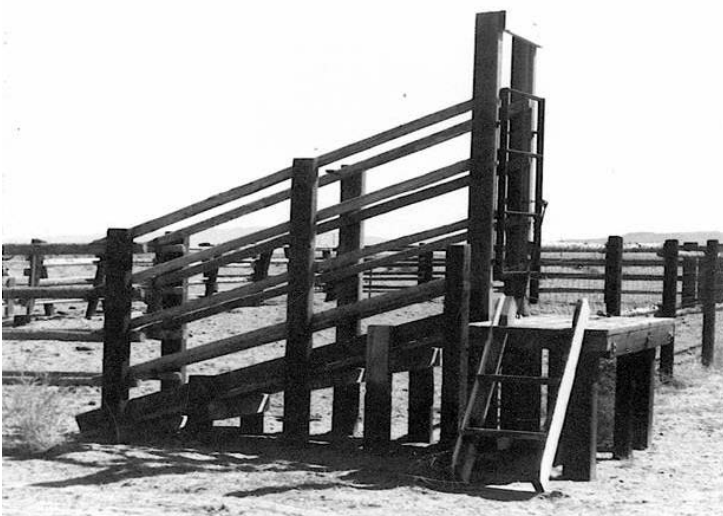
**PLASTIC FENCING**

TYPE	COST
POLYMER GRID , 5', 2" * 6" TOP RAIL	\$ 21.68
VINYL FENCE, 5" * 5" POSTS, 3 - 2" * 6" RAILS	28.12

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

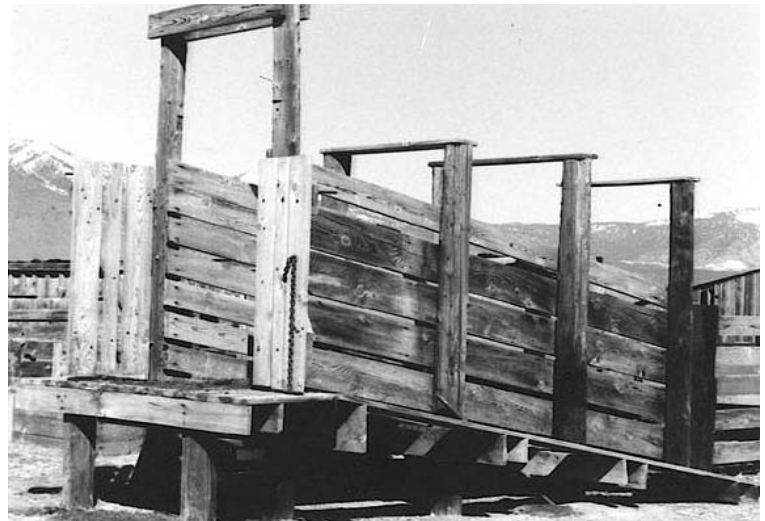
**NOTE:** Above costs are based on professional construction labor supervised by a contractor or his job foreman. For farm labor with no professional supervision, costs should be adjusted downward by 25 percent relative to the quality of the finished product.

**CORRAL LOADING CHUTES**



**LIGHT SPACED CHUTE**

**HEAVY SPACED CHUTE**



**HEAVY SOLID CHUTE**

**CORRAL LOADING CHUTE**  
**COST PER LINEAR FOOT INCLUDING BOTH SIDES**

SPACED	LIGHT CHUTE	\$ 105.14 per lf
	HEAVY CHUTE (INCLUDES PLATFORM)	112.07
SOLID	LIGHT CHUTE	119.00
	HEAVY CHUTE (INCLUDES PLATFORM)	125.93

**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** **\$ 7,108**

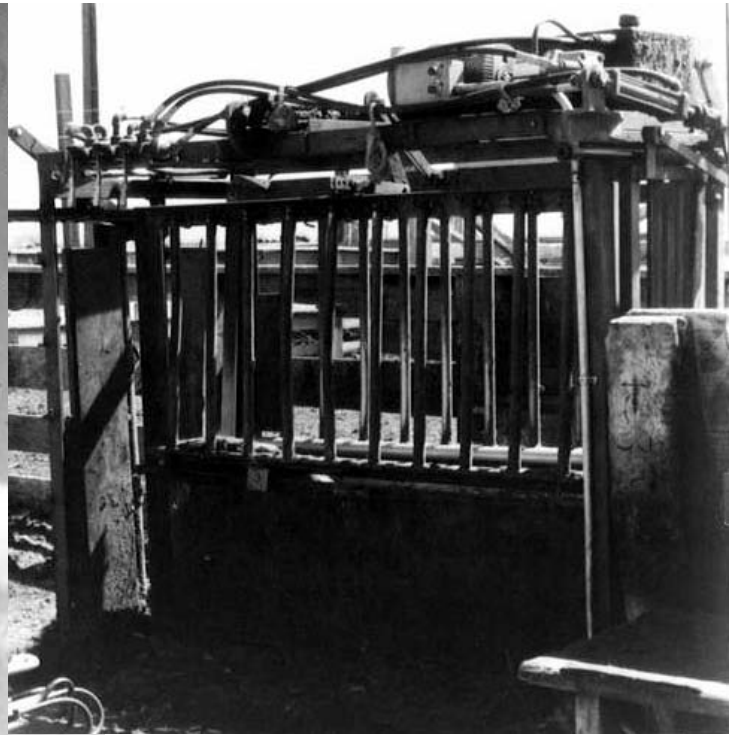


**CALF TABLE**

**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'
	\$ 3,648	\$ 4,959	\$ 6,270	\$ 7,581

### CATTLE SQUEEZE

STATIONARY MODEL, LIGHT	\$ 2,971
STATIONARY MODEL, HEAVY	6,783
HEAVY DUTY, HYDRAULIC	11,140
CALF TABLE	1,805



**HEAVY STATIONARY SQUEEZE**

### WINDMILLS AND STEEL TOWERS

FAN		TOWER		INSTALLATION	TOTAL COST
6'	\$ 3,210	21'	\$ 3,397	\$ 3,423	\$ 10,030
6'	3,210	27'	4,410	3,316	10,936
6'	3,210	33'	5,449	3,667	12,326
8'	4,133	21'	3,397	3,164	10,694
8'	4,133	27'	4,410	2,694	11,238
8'	4,133	33'	5,449	3,106	12,688
10'	7,165	27'	4,410	3,771	15,347
10'	7,165	33'	5,449	3,820	16,434
12'	11,333	27'	4,410	5,283	21,026
12'	11,333	33'	5,449	5,694	22,476
14'	18,005	27'	4,410	7,311	29,727
14'	18,005	33'	5,449	9,414	32,868
16'	24,301	33'	5,449	10,490	40,240

Includes complete steel wheel, tower and installation excluding well.

**CATTLE AND HORSE WATERING TANKS**

**ROUND BOTTOMLESS STOCK TANKS**

**25.5" Deep, Galvanized Corrugated**

PER FOOT OF DIAMETER - 22 GAUGE METAL \$ 49.12  
 12 GAUGE METAL \$ 83.28

**ADD:** 10 GAUGE METAL 25%  
 PER SQUARE FOOT OF CONCRETE SLAB \$ 5.53

**GALVANIZED WITH BOTTOM 25.5" TO 27" DEEP**

PER FOOT OF DIAMETER - 22 GAUGE METAL \$ 61.40  
 12 GAUGE METAL \$ 107.58

**ADD:** 10 GAUGE METAL 25%  
 PER SQUARE FOOT OF CONCRETE BASE \$ 5.53

\*\* includes statewide local multiplier and no labor adjustment

**COMMERCIALY MANUFACTURED AUTOMATIC WATERERS WITH HEATERS**

LEN	WDTH	HGHT	GAL	HEAD	COST
20	18	25	3	30 50	\$ 861
30	24	25	9	80 120	861
32	28	25	13	100 200	861
42	28	25	20	200 300	942
66	28	25	35	300 400	1,011
84	24	16	40	350 450	1,050
90	28	25	50	400 550	1,129
90	36	25	120	500 700	1,257
120	28	25	120	500 700	1,300

**COMMERCIALY MANUFACTURED METAL WATER TROUGHS (GALVANIZED TANK)**

GALLONS			
175	300	500	900
\$ 271	\$ 377	\$ 500	\$ 755

**ALL OTHER WATER TROUGHS**

1 cubic foot = 7.5 gallons

VOLUME	COST /	GAL	Cu Ft
LESS THAN 100 GALLONS	\$	4.81	\$ 36.02
100 TO 175 GALLONS		4.40	32.92
176 TO 300 GALLONS		3.98	29.82
301 TO 500 GALLONS		3.57	26.72
OVER 500 GALLONS		3.15	23.62

**CORRALS AND FENCES**

**COMMERCIALLY MANUFACTURED FENCE PANELS**

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

Add \$ 14.29 to \$ 21.72 EACH

64" HEIGHT, 5 RAIL MEDIUM DUTY	6'	\$ 235
	8'	239
	10'	268
	12'	291
	14'	359
	16'	393

64" HEIGHT, 5 RAIL EXTRA HEAVY DUTY	6'	\$ 363
	8'	393
	10'	444
	12'	502
	14'	565
	16'	609

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

**COMMERCIALLY MANUFACTURED METAL GATES WITH LEVER LATCH**

WIDTH			
6 FOOT	8 FOOT	12 FOOT	16 FOOT
\$ 342	\$ 371	\$ 485	\$ 593

**COMMERCIALLY MANUFACTURED  
PROFESSIONAL ROPING AND DOGGING CHUTE**

FIRST SECTION WITH RELEASE GATE	\$ 3,521
SECOND SECTION	2,071
STRIPPING CHUTE	1,999

\*\* includes statewide local multiplier and no labor adjustment

**COMMERCIALLY MANUFACTURED BUCKING CHUTE**

FIRST SECTION	\$ 9,139
ADDITIONAL SECTIONS, EACH	7,260

## CORRALS AND FENCES

### COMMERCIALLY MANUFACTURED CROWDING ALLEYS

24' x 60" INCLUDES FRAMES & HEADGATE w STAND	\$ 8,608
24' x 60" ADD-ON SECTION	2,849
ALLEY STOPS ADD	419
10' CUTOUT GATE INCLUDING FRAME AND 10' PANEL	3,319

\*\* includes statewide local multiplier and no labor adjustment

### CURVED CROWDING ALLEYS

180 DEGREE SWEEP, 10' GATE & 24' ADJUSTABLE ALLEY WITH A1 CAGE & 10' X 20' LEAD-UP	\$ 20,708
180 DEGREE SWEEP, 10' GATE & 24' ADJUSTABLE ALLEY	14,528
BLOCKING DOOR ADD	1,320
ADJUSTABLE ALLEY BOW	465

\*\* includes statewide local multiplier and no labor adjustment

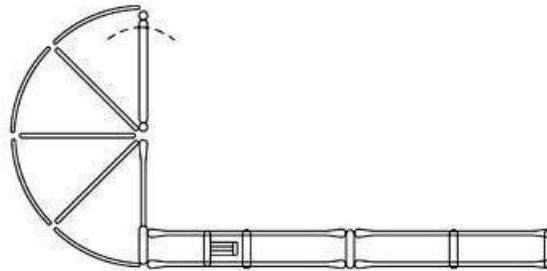
### COMMERCIALLY MANUFACTURED FEEDER PANEL

SIZE	EACH
6' x 64"	\$ 812
8' x 64"	1,050
10' x 64"	1,101
12' x 64"	1,264
16' x 64"	1,516

\*\* includes statewide local multiplier and no labor adjustment

### HEADGATES

SELF CATCH HEAVY DUTY	\$ 2,155
SELF CATCH LIGHT DUTY	935



**180' SWEEP w CROWDING ALLEY**

## PART A

### 2027-2028 RURAL BUILDING COSTS

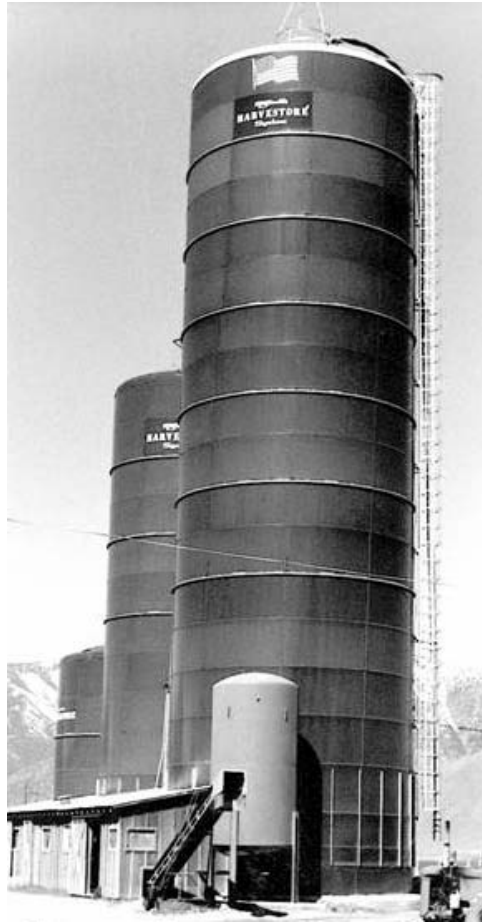
#### Section 6

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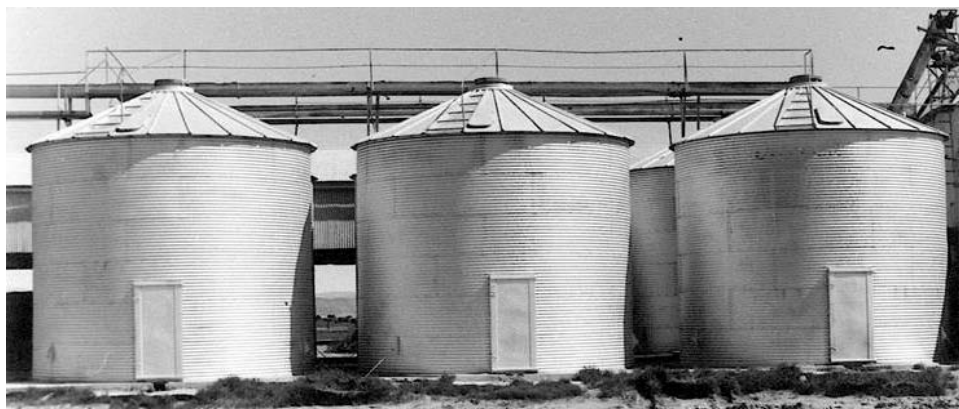
## MISCELLANEOUS COSTS

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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.

DIAMETER	TOTAL COST								
	30'	35'	40'	45'	50'	60'	70'	80'	90'
12'	\$ 19,034	22,433	25,832	29,005	32,177	38,409	-	-	-
14'	22,207	25,946	29,685	33,197	36,709	44,074	51,212	-	-
16'	23,000	26,739	30,478	34,330	38,182	45,547	53,251	60,616	-
18'	24,699	28,778	32,857	37,049	41,241	49,399	57,500	65,714	73,645
20'	27,645	32,177	36,709	41,468	46,226	55,404	64,298	73,645	82,709
22'	32,404	37,616	42,827	48,096	53,364	64,298	74,495	84,975	96,022
24'	-	-	-	-	61,465	73,645	85,825	97,721	110,184
30'	-	-	-	-	-	99,987	116,699	132,561	149,556

\*\* includes statewide local multiplier and no labor adjustment

No chute, deduct per vertical foot of height \$ -  
 Flat roof, deduct per square foot of floor area \$ 9.17  
 No roof, deduct per square foot of floor area \$ 17.28

**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'
\$ 15,182	15,975	16,882	17,675	18,808	19,714	20,734	N/A	N/A	21,867

**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.

STEEL GRAIN BINS										
SIZE DIAM	HGHT	CAPACITY (BUSHEL)		COST W/O DRY BIN		COST WITH DRY BIN		SLAB FLOOR		
15	7		1,257		\$	8,640		\$	12,567	\$ 1,154
15	11		1,792			11,299			16,676	1,269
15	15		2,329			13,534			19,818	1,450
15	18		2,864			15,347			22,235	1,680
18	11		2,647			12,567			18,247	1,559
18	15		3,422			15,588			22,597	1,619
18	18		4,189			17,763			25,739	1,680
21	11		3,693			13,897			20,180	2,139
21	15		4,753			17,763			25,739	2,211
21	18		5,813			21,389			31,298	2,296
24	11		4,949			17,038			24,772	2,707
24	15		6,344			20,664			30,452	2,828
24	18		7,739			25,860			37,581	2,948
27	11		6,409			20,180			29,606	3,474
27	15		8,182			25,014			36,010	3,625
30	15		10,278			30,331			43,623	4,018
30	18		12,473			35,648			51,720	4,229
30	22		14,668			41,086			-	4,441
30	26		16,863			45,678			-	4,864
36	15		15,297			42,536			61,628	5,921
36	18		18,473			48,215			70,389	6,284
36	22		21,648			56,191			-	6,525

\*\* includes statewide local multiplier and no labor adjustment

ADD:

PER SQUARE FOOT OF CONCRETE SLAB \$ 5.53

LADDERS	\$ 121	PLUS	\$ 17.28	PER LINEAR FOOT
SAFETY CAGES	33.53	TO	41.69	PER FOOT INSTALLED
AUGER AND DRIVE	719	PLUS	77.64	PER FOOT OF TANK DIAMETER
SPREADERS	1,402	TO	2,103	EACH
STIRRATORS	327.48	TO	499.07	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 (BUSHEL)	CAPACITY (TONS)	COST
6	10'	120	3.0	\$ 3,202
6'	16'	240	6.0	4,562
6'	21'	360	9.0	5,166
6'	25'	480	12.0	5,831
6'	28'	600	15.0	6,405
7'	11'	157	4.0	4,411
7'	14'	239	6.0	4,773
7'	16'	321	8.0	5,136
7'	19'	403	10.0	5,498
9'	14'	300	7.8	6,586
9'	17'	450	11.3	7,975
9'	20'	590	14.8	8,640
9'	25'	855	21.4	9,969
9'	28'	1,000	25.0	10,513
9'	31'	1,130	28.5	10,936
12'	20'	870	21.8	14,863
12'	25'	1,345	33.6	16,797
12'	31'	1,825	45.6	19,214
12'	36'	2,300	57.5	20,664
12'	42'	2,780	69.5	22,597

\*\* includes statewide local multiplier and no labor adjustment

ADD:

PER SQUARE FOOT OF HEAVY DUTY CONCRETE SLAB \$ 6.64

**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.

AUGER-TYPE			CONVEYOR		
DIAM	COST/LIN FT		WIDTH	COST/LIN FT	
6"	\$	121	12"	\$	208
8"		164	18"		323
10"		218	24"		377
12"		294	30"		434
14"		342	36"		463
16"		425	48"		595



**FEED MILL and COMPONENTS**

MISCELLANEOUS COSTS

ELECTRIC POWER PLANTS

HOME GENERATOR SETS

RATING - KW	GASOLINE	DIESEL
3.0	\$ 5,311	\$ 6,373
4.0	\$ 6,448	\$ 7,737
5.0	\$ 7,657	\$ 9,188
7.0	\$ 10,276	\$ 12,331

\*\* includes statewide local multiplier and no labor adjustment

COMMERCIAL INDUSTRIAL GENERATORS

RATING - KW	GASOLINE	DIESEL
10.0	\$ 24,554	\$ 30,465
12.5	\$ 28,843	\$ 35,612
15.0	\$ 32,038	\$ 39,446
20.0	\$ 37,272	\$ 46,316
25.0	\$ 39,744	\$ 47,175
30.0	\$ 42,215	\$ 48,034
40.0	\$ 50,674	\$ 57,990
50.0	\$ 55,736	\$ 64,376
60.0	\$ 72,801	\$ 84,752
100.0	\$ 89,867	\$ 105,127
150.0	\$ 120,955	\$ 143,699

\*\* includes statewide local multiplier and no labor adjustment

For Air Cooling, Deduct: 15%  
 For natural or LP gas fuel systems, Add per KW: \$ 39.81  
 For remote control starting, gasoline fuel, Add: \$ 152.60

**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

ALTERNATING CURRENT LOAD CONTROL SWITCHBOARD			AUTOMATIC EMERGENCY SWITCHBOARD FOR GASOLINE PLANT				
RATING KW	AMPS	VOLTAGE	COST EACH	RATING KW	AMPS	VOLTAGE	COST EACH
15	130	240; 230/400	\$ 2,545	15	130	120/240	\$ 996
20	170	120/240; 240	3,604	20	170	120/240	2,877
25	210	240; 120/240	4,663	25	210	120/240	4,758
30	250	240; 120/240	5,722	30	250	120/240	6,639
40	330	120/240; 240	6,782	40	330	120/240	8,520
50	420	480;240	7,841	50	420	120/240	10,400
60	500	480;240	8,900	60	500	120/240	12,281
100	830	480;240	9,960	100	830	120/240	14,162

ADD FOR DIESEL POWERED PLANTS: \$ 292  
 FOR CIRCUIT BREAKERS: \$ 1,088 TO \$ 6,218

**SCALES**



**LIVESTOCK SCALE with WOOD CAGE**

**LIVESTOCK SCALES**

BEAM TYPE	SIZE	CAPACITY	COST
FULL CAPACITY	14' X 8'	5 TON	\$ 24,108
FULL CAPACITY	16' X 8'	10 TON	\$ 31,781
FULL CAPACITY	22' X 10'	15 TON	\$ 45,255

\*\* includes statewide local multiplier and no labor adjustment

**SCALE CAGES**

SIZE	METAL	COST	WOOD SIZE	COST
14'		\$ 2,656	14' X 8'	\$ 1,323
16'		2,985	16' X 8'	\$ 1,360
22'		4,121	22' X 10'	\$ 1,688
24'		4,490	24' X 10'	\$ 1,753

\*\* includes statewide local multiplier and no labor adjustment

FOR TYPE REGISTERING BEAM, ADD.	\$ 1,185
FOR PRINTER, ADD	2,523
FOR ELECTRONIC DIGITAL SCALE, ADD.	7,794

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 fully 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	\$ 61,628
30 TONS	\$ 71,900
40 TONS	\$ 82,775
50 TONS	\$ 93,349
60 TONS	\$ 105,433
70 TONS	\$ 122,048

**\*\* includes statewide local multiplier and no labor adjustment**

FOR WOOD PLATFORM, DEDUCT:	6%
FOR STEEL PLATE, ADD:	5%
FOR AUTOMATIC DIAL MODEL, ADD: \$	3,081
FOR REMOTE READER-PRINTER, ADD:	14,863
FOR CARD PRINTER, ADD:	3,456



VINYARDS

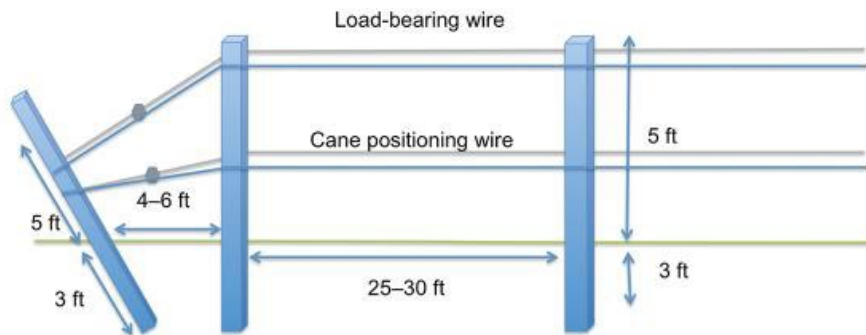
Vine Training Systems

Vine Training Systems are instrumental in good canopy management and productivity of the grape vines. The costs shown here include the T-posts, wire clips, two rows of trellis wire, and pencil rod stakes.

VINYARD STAKE & TRELLIS SYSTEM	EACH VINE	PER ACRE
4X7 (VINES 4' APART; ROWS 7' APART); EVERY VINE (7' T POST WITH WIRE CLIPS, STAKES, 2 ROWS OF WIRE FOR TRELLIS)	\$ 6.60	\$ 10,270.51



I-Trellis with End Post Configuration



PART A

2027-2028 RURAL BUILDING COSTS

Section 7

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COMPUTATIONAL TABLES

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## MEASUREMENT PRINCIPLES

<b>PLANE FIGURE</b>	A plane surface bounded by either straight or curved lines having no thickness.
<b>SOLID</b>	A body, such as a barrel, building, etc.
<b>SQUARE MEASURE</b>	Area calculation requiring only two dimensions, length and width.
<b>CUBIC MEASURE</b>	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 or 36 inches
1 rod	5 1/2 yards or 16 1/2 feet or 25 links
1 furlong	40 rods or 220 yards or 660 feet
1 mile	8 furlongs or 320 rods or 1,760 yards or 5,280 feet

### SURVEYOR'S LINEAR MEASURE

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

**WEIGHTS AND MEASURES****SQUARE MEASURE**

1 square foot	144 square inches
1 square yard	9 square feet or 1,296 square inches
1 square rod	1 pole or perch or 30 1/4 square yards or 272 1/4 square feet
1 rood	40 square rods or 1,210 square yards or 1/4 acre
1 acre	160 square rods or 4,840 square yards or 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 or 7.481 gallons
1 cubic yard	27 cubic feet
1 cord foot	16 cubic feet
1 cord of wood	8 cord feet or 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 or 1 quadrant
1 circumference	360 degrees or 4 quadrants

**BOARD MEASURE**

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

Square feet of surface area equal square of one side multiplied by the given factor.

<u>REGULAR SHAPED</u>	<u>NUMBER OF SIDES</u>	<u>FACTOR</u>
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
hendecagon	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	CIRCUMFERENCE	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

### -----AREA COVERED IN ACRES

TOTAL SYSTEM LENGTH (IN FEET) <u>2/</u>	PERCENT OF WATER APPLIED IN LAST 100 FEET <u>1/</u>	TOTAL ACRES OF SQUARE FIELD TWICE LENGTH OF SYSTEM	WITH GUN <u>3/</u> SPRINKLER CORNERS USED ONLY	WITH GUN SPRINKLER USED ON ENTIRE CIRCLE <u>3/</u>	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.

2027-2028

PART B

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ALTERNATE COSTS

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PART B

2027-2028 ALTERNATE COSTS

Section 1

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TELECOM/COMMUNICATIONS

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TELECOM / COMMUNICATION EQUIPMENT SHELTERS



LOW QUALITY



AVERAGE QUALITY



GOOD QUALITY

## TELECOM/COMMUNICATIONS

### 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.

CLASS	100	150	200	300	500	750
1	\$ 192.78	\$ 166.16	\$ 151.64	\$ 129.86	\$ 108.68	\$ 95.37
2	\$ 234.80	\$ 197.89	\$ 180.35	\$ 153.73	\$ 126.86	\$ 108.71
3	\$ 276.23	\$ 229.04	\$ 208.47	\$ 177.01	\$ 144.34	\$ 121.35

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

PART B

2027-2028 ALTERNATE COSTS

Section 2

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FUELING COSTS

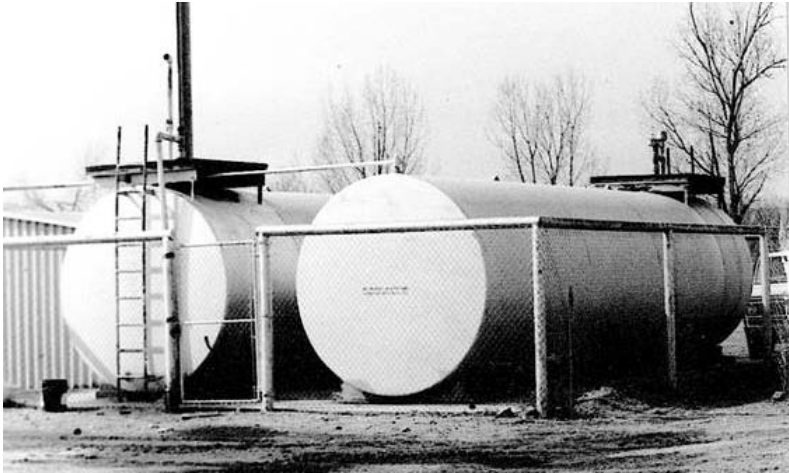
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**BULK FUEL TANKS**

**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 3 in this section for pumps/dispenser costs.

GALLONS	COST	GALLONS	COST
200	\$ 5,885	3,000	\$ 12,326
350	6,223	4,000	14,380
550	6,682	5,000	16,434
1,000	7,915	7,500	22,597
2,000	9,969	10,000	28,277



**NOTE:** To calculate tank volume use the following formula:

$$\text{Volume in gallons} = \text{Pi} \times \text{radius squared} \times \text{length} \times 7.5.$$

**EXAMPLE:** A tank five feet in diameter and 14 feet in length; Pi equals 3.1416;

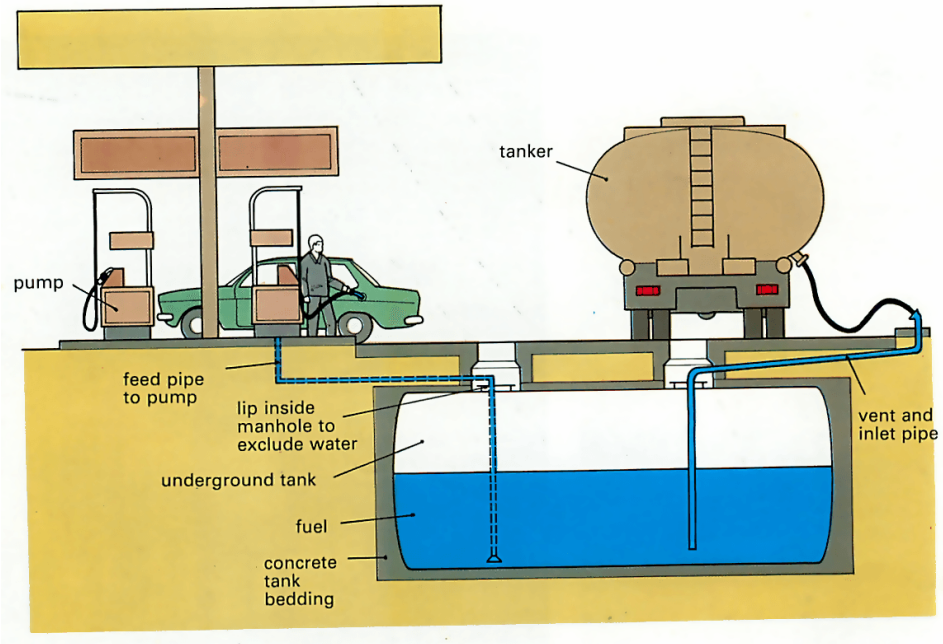
Radius (one-half of diameter) equals 2.5 feet:  $3.1416 \times 2.5 \text{ squared} \times 14 \text{ feet} \times 7.5 = 2,062$  gallons.

**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.

UNDERGROUND FUEL STORAGE

GALLONS	COST	GALLONS	COST
300	\$ 10,755	4,000	\$ 27,672
550	12,326	5,000	31,660
1,000	16,193	6,000	37,340
2,000	21,147	8,000	42,052
3,000	23,685	10,000	50,632



PUMPS/DISPENSERS

<b>TYPE I</b>				
	WITHOUT METER	\$	399	TO \$ 1,243
	WITH METER		456	TO 1,243
<b>TYPE II</b>				
	WITHOUT METER	\$	665	TO \$ 1,248
	WITH METER		1,009	TO 1,699
<b>TYPE III</b>		\$	1,353	TO \$ 2,030
<b>TYPE IV</b>		\$	1,970	TO \$ 3,958
<b>TYPE V</b>		\$	4,985	TO \$ 6,465



TYPE I—NO METER



TYPE I METER



TYPE II—WITH METER



TYPE III



TYPE IV



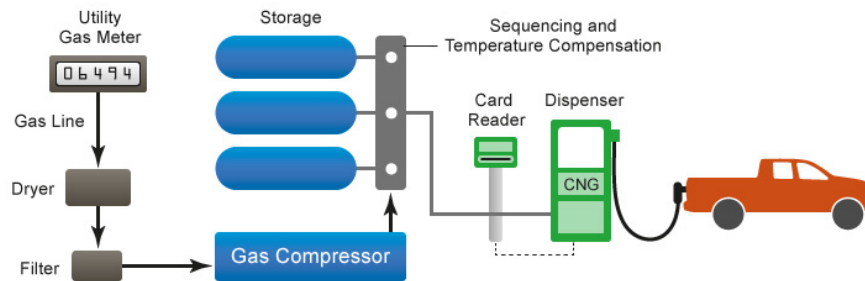
TYPE V

**COMPRESSED NATURAL GAS FILLING STATIONS**

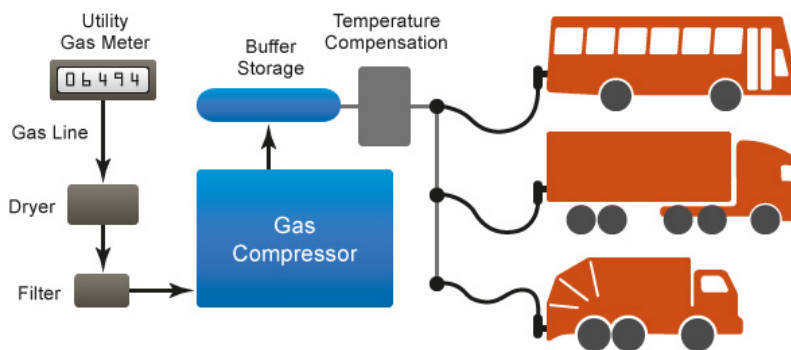
Costs are for complete installation of a compressed natural gas fueling station. Costs include compressor, gas inlet, dispenser, installation and other costs identified below.

<p><b>SMALL FAST-FILL STATION</b>                  1-4 vehicles/day                  fueling cycle: 70% of fuel dispensed 2 hrs 2 times a day</p>	<p>Includes: 8 scfm compressor, 2-5 psi inlet gas pressure, 3,780 scf storage, 1 single-hose dispenser, installation at 65% of equipment costs, priority panel, credit card reader and gas dryer</p>	<p>\$ 68,400</p>
<p><b>MEDIUM TIME-FILL STATION</b>                  75-80 light/medium-duty vehicles/day                  fueling cycle: 1 time/day for 10 hrs</p>	<p>Includes: 100-175 scfm compressor, 30 psi inlet gas pressure, 10-40 dual-hose posts, 1 time-fill panel; 10hr fueling window, installation at 65% of equipment costs</p>	<p>\$ 912,000</p>

**Fast-Fill Station**



**Time-Fill Station**



**ELECTRIC CAR CHARGERS**

**Residential (Small – 1-2 Kw)** - Costs include car charger, electrical work and installation costs. Level 1 is standard for home charging and consists of a 120V wall plug and charger.

Level 2 chargers supply alternating current (AC) from the electric grid, which has to be converted by the electric car’s battery to direct current (DC) since EV batteries can only accept DC current. This conversion makes Level 2 chargers much slower than DC fast charger.

The costs in this table include a pedestal and electricity to the pedestal.

**ELECTRIC CAR CHARGERS (RESIDENTIAL)**

30-AMP 120v ELECTRIC CAR CHARGER	SINGLE UNIT	\$	4,523
30-AMP 120vELECTRIC CAR CHARGER	DOUBLE UNIT	\$	5,355



**FUELING COSTS**

**Commercial (Large)** – There are two categories of commercial car charging stations:

Level 2 chargers (240 volts – 3-20 kW – 8-10 hrs)

Level 2 chargers supply alternating current (AC) from the electric grid, which has to be converted by the electric car’s battery to direct current (DC) since EV batteries can only accept DC current. This conversion makes Level 2 chargers much slower than DC fast charger.

DC Fast chargers (480+ volts – 25-50Kw – 1 hr)

Costs in this table include car charger, electrical work and installation costs.

LEVEL I, 62.5 Kw, 120-V, SINGLE UNIT	\$	8,667
LEVEL I, 62.5 Kw, 120-V, DOUBLE UNIT	\$	10,783
LEVEL II, 240-V, DOUBLE UNIT	\$	33,992
LEVEL III, 480-V, DC FAST CHARGER UNIT	\$	191,086



PART B

2027-2028 ALTERNATE COSTS MANUAL

Section 3

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MUNICIPAL UTILITY PLANTS

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**WASTE-WATER TREATMENT PLANTS**

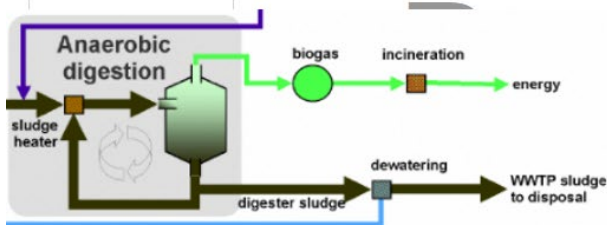
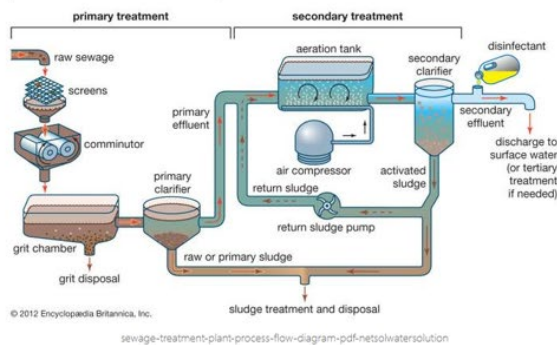
Municipal wastewater treatment plants speed up the natural process of water filtration from homes, businesses, and industries to produce effluents suitable for discharge into surface waters.

The following sections provide information and each of the process and offers suggested cost locations in the Marshall & Swift Commercial Costing Manual and the Department's Personal Property Manual for these facilities' real property improvements and/or fixtures and personal property business equipment.

Municipal wastewater treatment plants allow for the collection and treatment of industrial and domestic sewage and wastewater before discharging it into water bodies, onto the land or reusing it.

## Treatment Process

1 Pretreatment/Screening	The raw sewage is passed through screening equipment to remove foreign objects such as plastic, rags, wood fragments, and grease (coarse solids). The coarse solids material is disposed of in a landfill. The screened wastewater is pumped into the activation tank for grit removal.
2 Communitor	The screened wastewater is pumped into the communitor to cut up solids in the raw sewage.
3 Grit Removal	Heavy material such as sand and gravel (grit) is removed from the wastewater. This material is disposed of in a landfill. The wastewater is sent to the primary clarifier.
4 Primary Clarifier	The material that settles at a slower rate than material in grit removal, is taken out using clarifier tanks. The settled material, called primary sludge, is pumped off the bottom and sent to sludge treatment and disposal. The wastewater exits the tank from the top as primary effluent. Floating debris such as grease, is skimmed off the top and sent with the settled material to digesters. Chemicals are also added to remove phosphorus.
5 Aeration/Activated Sludge	The wastewater receives most of its treatment in this stage. Through biological degradation, the pollutants are consumed by microorganisms and transformed into cell tissue, water, and nitrogen. The wastewater is sent to the secondary clarifier.
6 Secondary Clarifier	Secondary clarifiers allow treated wastewater to separate from the biologically treated material in the aeration tanks. This yields secondary effluent. The activated sludge is pumped from the bottom of the clarifier and is returned to the aeration tanks.
7 Filtration	Clarified effluent is filtered. The material captured on the disc filters is backwashed and returned to pretreatment/screening.
8 Disinfection	Ultraviolet/chemical disinfection is used after the filtration step to assure the treated wastewater is free of bacteria.
9 Oxygen Uptake	The treated water is aerated if necessary to bring the dissolved oxygen levels up and the water is released back into the water supply.
10 Sludge Treatment/Disposal	The primary sludge pumped from the primary clarifiers along with the activated sludge must be treated to reduce volume and produce a usable end product (if needed).
11 Air Floatation Thickening	Activated sludge is removed by attaching the biological solids to minute bubbles of air. The floating mass is then removed using surface skimmers. The water that is removed is sent back to screening and pumping for treatment.
12 Anaerobic Digestion	The activated sludge is pumped into the primary digester where it is heated and mixed. Anaerobic bacteria is used for treatment. The pollutants are digested and converted to cell mass, water, methane gas, and carbon dioxide gas.
13 Gravity Belt Thickening	After digestion, sludge is pumped to the gravity belt thickener to be thickened. Polymer is added to the sludge as it is pumped from the digester to allow the water to drain away from the solids. The polymer treated sludge is directed to a porous, traveling belt where the water (filtrate) drains through the belt and into a collection basin. It is very high in ammonia and is pumped to a holding tank where it is metered back to the beginning for further treatment. The thickened sludge is pumped into storage and used later for agricultural.



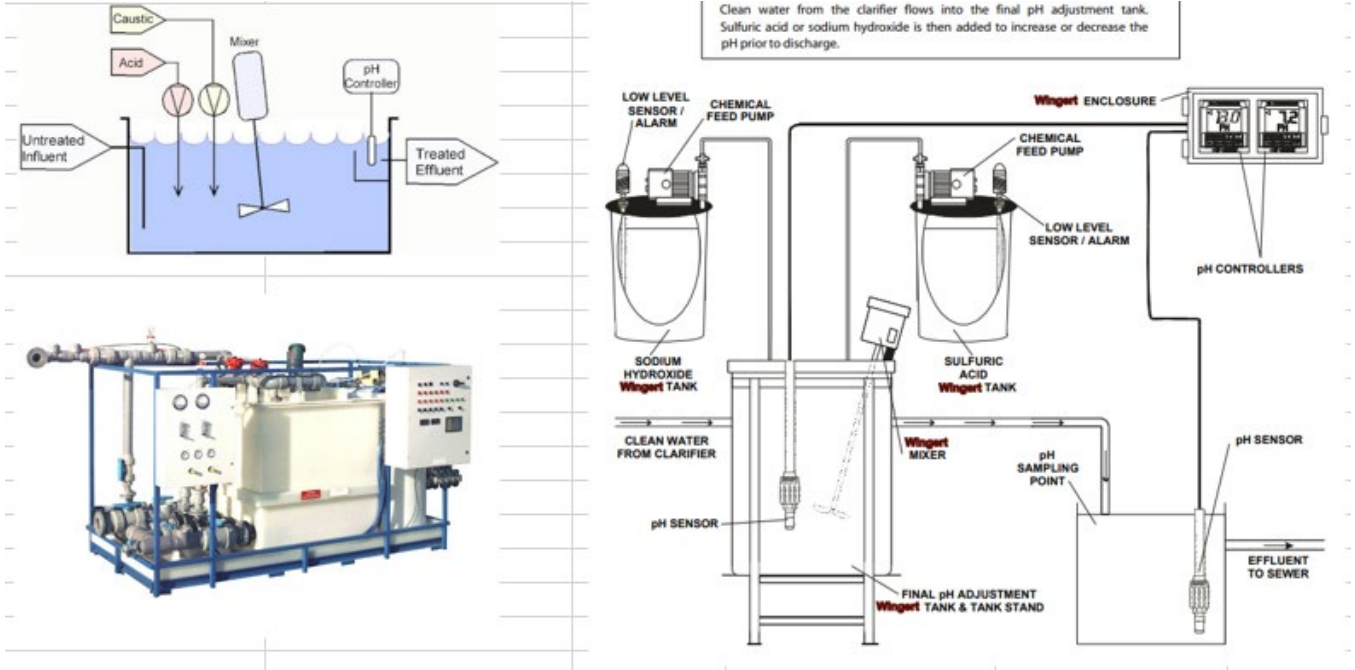
**MUNICIPAL UTILITY PLANTS**

Asset Group	Item	Description	Valuation Method	Cost Source	Comment
<b>Real Property Improvements, Fixtures</b>					
<b>Land</b>	Fee simple ownership	The amount of land necessary to support the treatment of water	Market		
<b>Site Preparation, Land Enhancements</b>	Construction Survey				
	Grading			M & S, Sec. 51	Earthwork
	Drainage Features			M&S, Sec. 66, p. 1	Public Utilities
	Erosion Protection features			M&S, Sec. 66, p. 1	Public Utilities
	Diversion Channels			M&S, Sec. 66, p. 1	Public Utilities
	Detention Ponds			M&S, Sec. 66, p. 1	Public Utilities
	Culverts for road crossings			M&S, Sec. 66, p. 1	Public Utilities
	Containment berms/dikes			M&S, Sec. 66, p. 1	Public Utilities
	Firebreak			M&S, Sec. 51	Earthwork
<b>Buildings</b>	Operations and Maintenance Building		RCNLD	M&S, Sec. 14, p.15	Heavy industrial
<b>Access</b>	Facility Access Roads	Paved or gravel surfaced	RCNLD	M&S, Sec. 66, p. 1	Residential street improvements
<b>Concrete Flatwork</b>	Tank foundations/sidewalks		RCNLD	M&S, Sec. 66, p.2	
<b>Ponds</b>	Treatment and holding		RCNLD	M&S, Sec. 66, p. 1	Catch Basins
<b>Outside Area Lighting</b>	Provides operations and maintenance personnel with illumination.		RCNLD	M&S, Sec. 66, P.5; also Sec. 54, P.5	
<b>Fencing/Gates</b>	Chain link fencing	Chain-link metal fabric security fencing, 8 foot tall with one-foot barbed wire or razor wire on top	RCNLD	M&S, Sec. 66, pp. 4-5	
	Controlled access gates		RCNLD	M&S, Sec. 66, pp. 4-5	

# MUNICIPAL UTILITY PLANTS

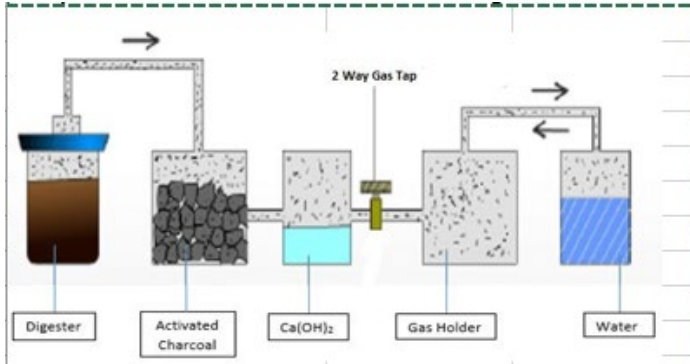
Asset Group	Item	Description	Valuation Method	Cost Source	Comment
pH Neutralization	Tanks			Acquisition	
	Tank Stands			Acquisition	
	Chemical Feed Pumps			Acquisition	
	Programmable Controllers			Acquisition	
	Controller Enclosures			Acquisition	
	Low Level Sensor/Alarms			Acquisition	
	pH Sensors			Acquisition	
	Mixers			Acquisition	
	Piping			Acquisition	

pH neutralization systems are used to neutralize high acidic or high alkaline wastewater.

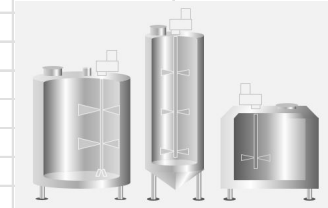


# MUNICIPAL UTILITY PLANTS

Asset Group	Item	Description	Valuation Method	Cost Source	Comment
Anaerobic Digestion System	Pumps		RCNLD	M&S, Sec. 62, p. 1	Industrial Pumps
	Digester		Acquisition		
	Piping		RCNLD	M&S, Sec. 62, pp. 2-3	Piping
	Tank		RCNLD	M&S, Sec. 61	
	Tank Cover				Incl. in M/S Tank Cost



Asset Group	Item	Description	Valuation Method	Cost Source	Comment
Tanks	Double-Wall Tank		RCNLD	M&S, Sec. 61	
	Stainless Steel Tank		RCNLD	M&S, Sec. 61	
	Prestressed Concrete Tank		RCNLD	M&S, Sec. 61	
	Mix Tank		RCNLD	M&S, Sec. 61	
	Storage Tanks		RCNLD	M&S, Sec. 61	
	Rolled, Tapered Panel Bolted Tank		RCNLD	M&S, Sec. 61	
	Folding Frame Tank		Acquisition		
	Portable Storage Tank		Acquisition		



Rolled, Tapered Panel Bolted Tank	Folding Frame Tank	Mix Tanks	Double Wall Tanks
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## MUNICIPAL UTILITY PLANTS

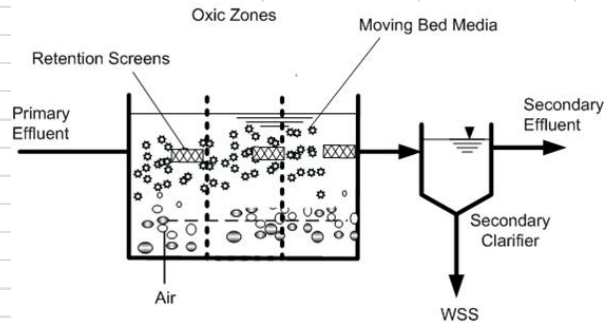
Asset Group	Item	Description	Valuation Method	Cost Source	Comment
Moving Bed Bioreactor	Screens		Acquisition		
	Piping		RCNLD	M&S, Sec. 62, pp. 2-3	Piping
	Tanks		RCNLD	M&S, Sec. 61	


The process takes place in an aeration tank where influent enters. The tanks are open at the top, exposing the water to open air for aerobic filtration to take place.

The basin is full of thousands of small plastic chips, called media or carriers. This allows biofilm to grow on them. The carriers mimic the density of water, allowing them to mix throughout the fluid. The biofilm that is created are microorganisms that consume the waste in the water, leaving it cleaner.

An aeration grid is essentially a fan located at the bottom of the aeration tank. It helps keep carriers on the move so they can come into contact with all the waste present and efficiently decompose it. It also introduces more oxygen into the tank.

There is a sieve, or mesh material, which allows water to pass through but keeps the plastic carriers inside the basin allowing the filtered water to move to the next phase in the filtration process.



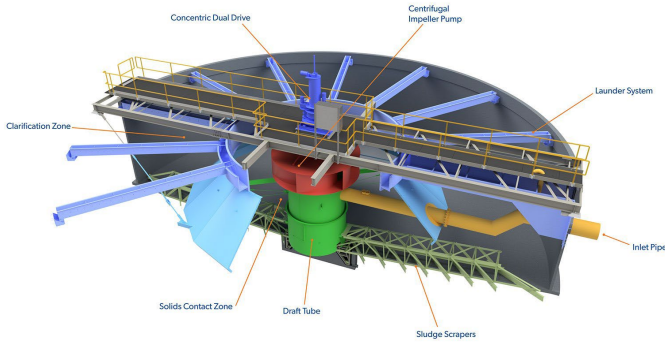
Asset Group	Item	Description	Valuation Method	Cost Source	Comment
Sump/Sewage Pump	Sump Pump		RCNLD	M&S Sect 53, Pg 9	
					
		<p>Large sump pumps are used to transfer liquid and solid waste from one place to another.</p>			

# MUNICIPAL UTILITY PLANTS

Asset Group	Item	Description	Valuation Method	Cost Source	Comment
Clarifiers/Components	Container Filter		Acquisition		
	Microsand Filter		Acquisition		
Solids-Contact Clarifier	Drive Unit		RCNLD	M&S Sect 53, Pg 11	
	Centrifugal Pump		RCNLD	M&S Sect 53, Pg 11	
	Piping		RCNLD	M&S, Sec. 62, pp. 2-3	
	Sludge Scrapers		Acquisition		
	Draft Tube		Acquisition		

Clarifiers are settling tanks built with mechanical means for continuous removal of solids being deposited by sedimentation. It is used to remove solid particulates or suspended solids from wastewater for clarification and/or thickening. Solid contaminants (sludge) settle at the bottom of the tank where it is collected by a scraper mechanism.

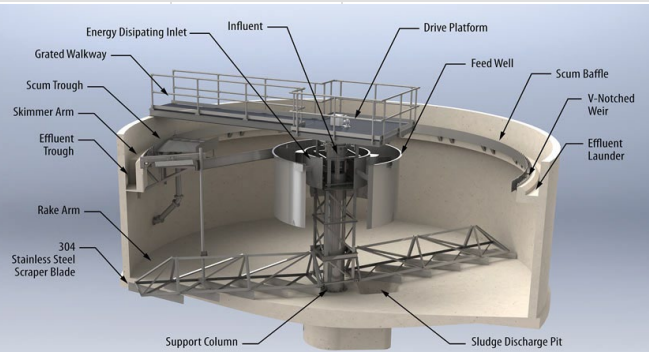
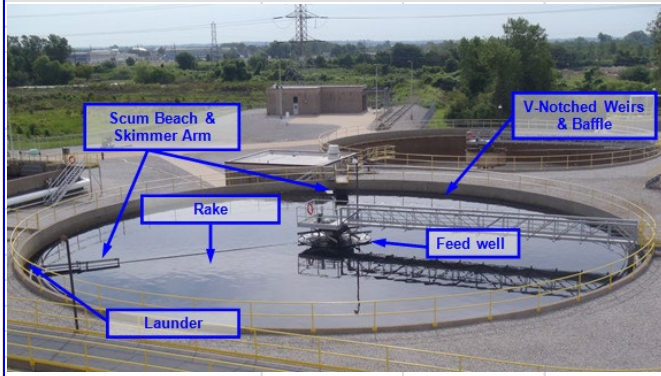
Solids CONTACT CLARIFIER™



Asset Group	Item	Description	Valuation Method	Cost Source	Comment
Skimming Tank	Tank		RCNLD	M&S, Sec. 61	
	Skimmer		Acquisition		
	Piping		RCNLD	M&S, Sec. 62, pp. 2-3	

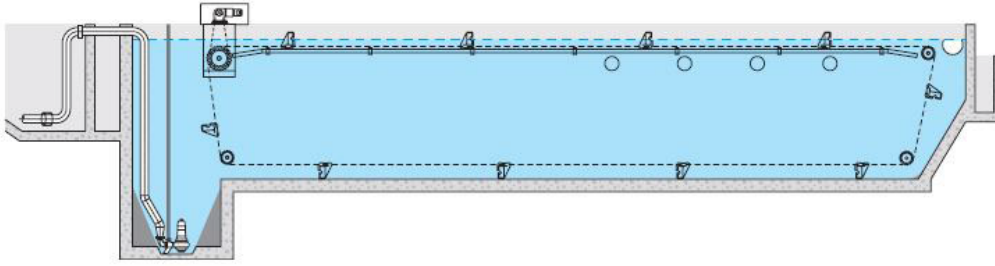
A skimming tank is a chamber that has floating matter like oil, fat, grease, etc. which rises and remains on the surface of the waste water until it is removed. The liquid flows out from partitions in the bottom of the tank.

The floating matter (scum) is removed with skimmer arms which sweep the scum to the scum trough.



# MUNICIPAL UTILITY PLANTS

Asset Group	Item	Description	Valuation Method	Cost Source	Comment
Sludge Removal System	Tank		RCNLD	M&S, Sec. 61	
	Piping		RCNLD	M&S, Sec. 62, pp. 2-3	
	Scraper System		Acquisition		

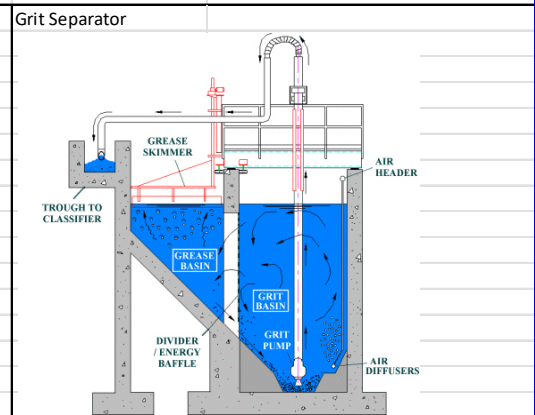
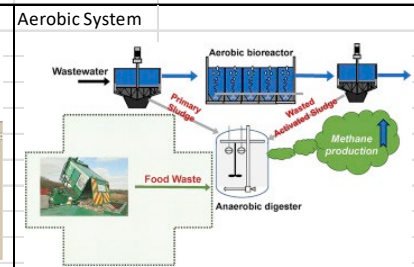
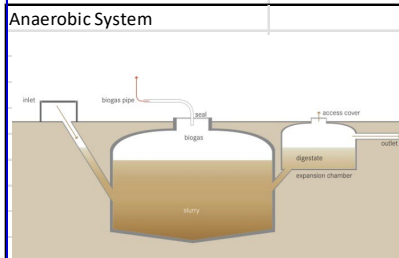


### 4-shaft scraper (collecting bottom and floating sludge)

How it works: Chain and flight scrapers convey the bottom sludge into a hopper and the floating sludge into the scum pipe.

Application: e. g. municipal and industrial wastewater treatment plants.

Asset Group	Item	Description	Valuation Method	Cost Source	Comment
Anaerobic Digester	Tank		RCNLD	M&S, Sec. 61	
	Tank Cover			Incl. in M/S Tank Cost	
	Piping		RCNLD	M&S, Sec. 62, pp. 2-3	
Aerobic Digester	Tank		RCNLD	M&S, Sec. 61	
	Bioreactor		Acquisition		
	Piping		RCNLD	M&S, Sec. 62, pp. 2-3	
Grit Separator			Acquisition		



# MUNICIPAL UTILITY PLANTS

Asset Group	Item	Description	Valuation Method	Cost Source	Comment
	Grating		Acquisition		
	Safety Rails		Acquisition		
	Stairs		Acquisition		
	Ladders		Acquisition		
					

2027-2028 ALTERNATE COSTS MANUAL

Section 4

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MISCELLANEOUS COSTS

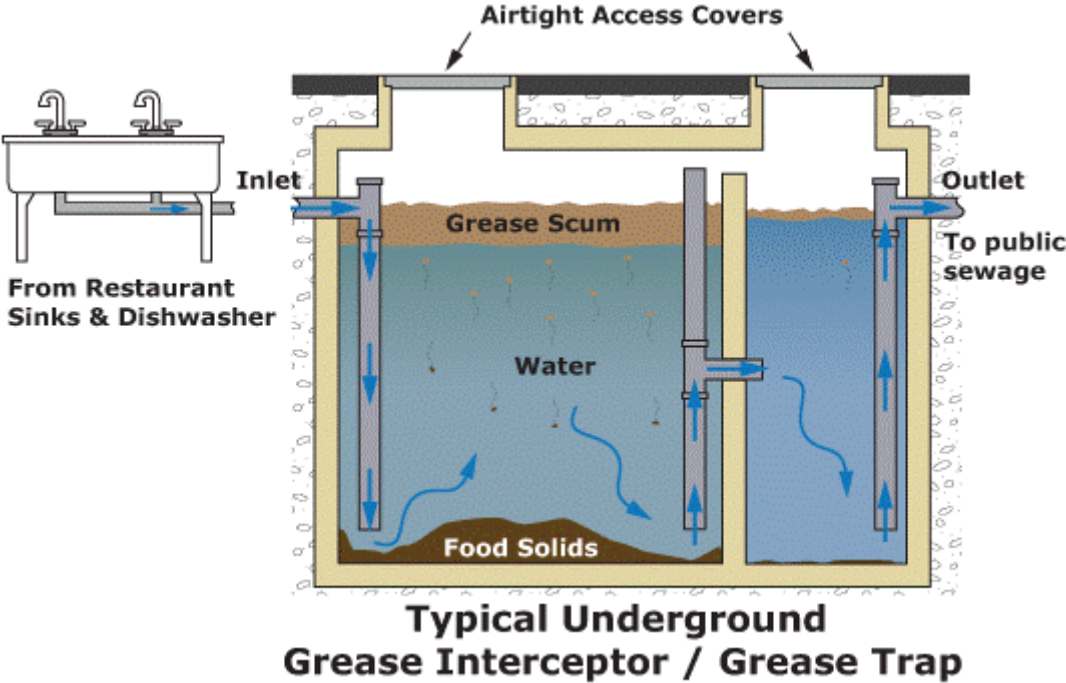
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**GREASE INTERCEPTORS**

Gravity grease interceptors are in-ground tanks designed to reduce the amount of animal and vegetable fats, oils, and greases in wastewater from institutional and commercial food handling establishments. This table indicates complete costs for the tank installation.

**PRECAST CONCRETE GREASE INTERCEPTOR**

750 GAL	\$	14,121
1000 GAL	\$	16,976
1500 GAL	\$	19,778
2500 GAL	\$	27,431
3000 GAL	\$	33,402
5000 GAL	\$	48,531



**SAND/OIL INTERCEPTORS**

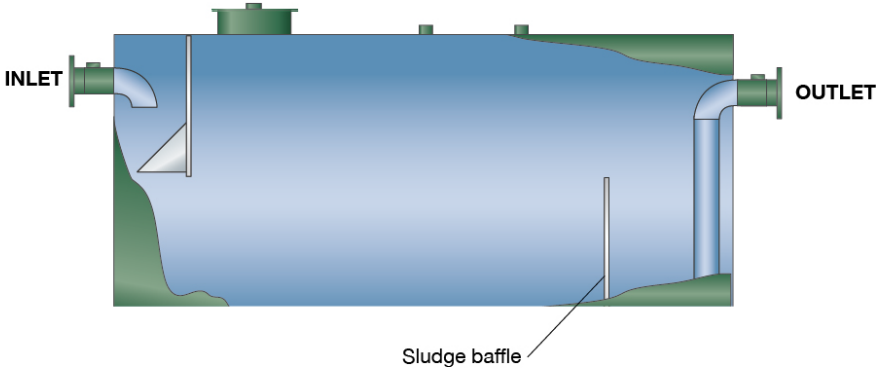
Sand/oil interceptors are in-ground tanks designed to capture dirt, sand, sweepings, minor petroleum spills, etc. from car washes and vehicle maintenance facilities to keep these substances out of our wastewater system.

**PRECAST CONCRETE OIL & SAND INTERCEPTOR**

750 GAL	\$	14,121
1000 GAL	\$	16,976
1200 GAL	\$	18,527
1500 GAL	\$	19,778

**Single-Basin Oil/Sand Interceptor**

Simple oil/sand "knock-out" design.



Single Basin Interceptors have a single collection chamber and sludge baffle to remove sand, grit, grease and free oil.

2027-2028 ALTERNATE COSTS MANUAL

Section 5

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RESIDENTIAL SOLAR

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**RESIDENTIAL SOLAR**

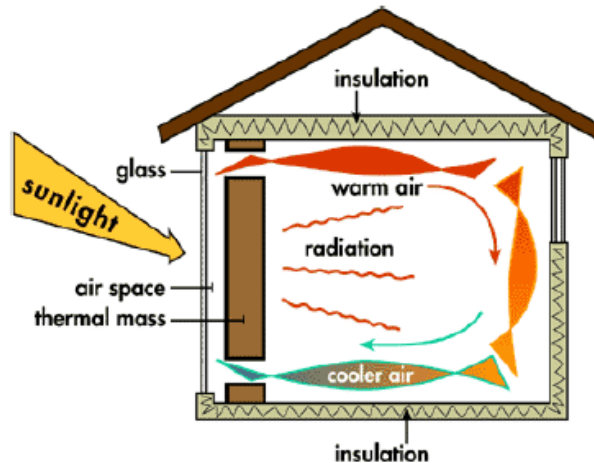
**Passive Solar Heating & Cooling**

Passive solar heating and cooling systems consist of an assembly of natural and architectural components (collector, absorber, thermal storage, distribution, and control) that convert solar energy into thermal energy. These systems do not have any mechanical devices requiring auxiliary power, instead parts of the building are used to collect and store solar heat. These are examples of various components that might be part of the passive solar system:

- Collector: south-facing windows, sunrooms, skylights, panels
- Absorber, Thermal Storage and Distribution: concrete, brick, stone or tile walls and floors, water storage tanks, insulation
- Control: roof overhang, vents and dampers, window glazing, blinds and awnings

Some components may be considered part of the quality/class of the house.

PASSIVE SOLAR		
Item	Description	Per Sq Ft Cost
TYPE A - PASSIVE SOLAR, SF OF RESIDENCE	NO COLLECTORS; USES SOLARIUM, SKYLIGHT, SOLAR WALLS	\$ 11.72
TYPE B - PASSIVE SOLAR, SF OF RESIDENCE	NO COLLECTORS; USES WATER FILLED TANKS	\$ 11.72



2027-2028 ALTERNATE COSTS MANUAL

Section 6

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MH FOUNDATIONS

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**MOBILE HOME FOUNDATIONS**

Mobile home foundation costs contained in this section have the typical amenities found when mobile homes are installed. For other amenities not listed or for additions/deductions not included here, please refer to the Marshall & Swift Costing Manual.

<b>MH FOUNDATIONS WITH TIE-DOWN SYSTEM</b>	
Continuous Conc Foundation wall, 18" high, per lf	\$ 26.62
Concrete Block Foundtion Wall, deduct from Continuous Conc Fdtn Wall, per lf	\$ (1.22)
Slab Foundation (No Wall), 4" conc unreinforced, per sf	\$ 1.74
Slab Foundation (No Wall) Deduct for Size, 750 sf to 2000 sf	12%
Concrete Ribbon, Single Wide	\$ 693.09
Concrete Ribbon, Double Wide	\$ 1,100.84
Concrete Ribbon, Triple Wide, less 10% for size	\$ 1,338.51
Piers, Concrete, Precast, 2'x2', each pier	\$ 21.96
Piers, Concrete, formed in place	\$ 81.68
Tie Down System, each (0'-40' = 2; 41'-60' = 3; 61'-80' = 4; over 80' = 5)	\$ 163.49

2027-2028

PART C

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ASSESSORS' ALTERNATE COST  
APPROVALS

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# TABLE OF CONTENTS

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## 2027-2028 – PART C ASSESSORS' ALTERNATE COST APPROVALS

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<b>INTRODUCTION</b> .....	<b>1</b>
HUMBOLDT COUNTY .....	2
WASHOE COUNTY.....	3

**INTRODUCTION**

Per NAC 361.128(4), county assessors may apply to the Executive Director for permission to use alternative recognized costs manuals, cost determinations or subscription services when no publication or manual provided for their use applies to improvements of a particular occupancy or construction type.

The Department must respond within 30 days after receiving such an application and notify each county assessor of that approval.

The Executive Director shall submit to the Commission annually a list of the alternative recognized cost manuals, cost determinations and subscription services that he/she has approved for use.

The following pages are the requests and approvals for the 2027-2028 cost year.



STATE OF NEVADA  
DEPARTMENT OF TAXATION

Web Site: <https://tax.nv.gov>

Call Center: (866) 962-3707

LAS VEGAS OFFICE  
700 E. Warm Springs Rd, Suite 200  
Las Vegas, Nevada 89119  
Phone (702) 486-2300  
Fax (702) 486-2373

JOE LOMBARDO  
*Governor*  
GEORGE KELESIS  
*Chair, Nevada Tax Commission*  
SHELLIE HUGHES  
*Executive Director*

CARSON CITY OFFICE  
3850 Arrowhead Dr.  
Carson City, Nevada 89706  
Phone: (775) 684-2000  
Fax: (775) 684-2020

RENO OFFICE  
4600 Kietzke Lane, Suite L235  
Reno, NV 89502  
Phone: (775) 687-9999  
Fax: (775) 688-1303

February 10, 2026

Andy Heiser, Assessor  
Humboldt County Assessor  
50 W. Fifth Street  
Winnemucca, NV 89445

Dear Sir:

Pursuant to NAC 361.128(4), county assessors may apply to the Executive Director for permission to use alternative recognized cost manuals, cost determinations or subscription services when no publication or manual applies to improvements of a particular occupancy or construction type. The Department has received your request dated February 2, 2026 to use alternative costs for a 101-MW alternating current photovoltaic solar facility and ancillary facilities, including solar arrays and battery storage for FY 2026-2027.

The Department finds the use of the Trended Historic Cost or Trended Gross Book Cost is applicable in this case. This cost, as described above, is hereby approved for use for the 2026-2027 fiscal year. This needs to be applied for and analyzed annually to see if more applicable costs are available.

Please contact Connor Marriott at (775)684-2038, if you have any questions. A copy of this approval is being sent to all county assessors.

A handwritten signature in blue ink, appearing to read "Shellie Hughes".

---

Shellie Hughes  
Executive Director, Department of Taxation



STATE OF NEVADA  
DEPARTMENT OF TAXATION

Web Site: <https://tax.nv.gov>

Call Center: (866) 962-3707

LAS VEGAS OFFICE  
700 E. Warm Springs Rd, Suite 200  
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JOE LOMBARDO  
*Governor*  
GEORGE KELESIS  
*Chair, Nevada Tax Commission*  
SHELLIE HUGHES  
*Executive Director*

CARSON CITY OFFICE  
3850 Arrowhead Dr., 2<sup>nd</sup> Floor  
Carson City, Nevada 89706-7937  
Phone: (775) 684-2000  
Fax: (775) 684-2020

RENO OFFICE  
4600 Kietzke Lane, Suite L235  
Reno, NV 89502  
Phone: (775) 687-9999  
Fax: (775) 688-1303

October 15, 2025

Chris S. Sarman  
Washoe County Assessor  
1001 E. Ninth St Bldg D-100  
Reno, NV 89512

Dear Mr. Sarman:

Pursuant to NAC 361.128(4), county assessors may apply to the Executive Director for permission to use alternative recognized cost manuals, cost determinations or subscription services when no publication or manual applies to improvements of a particular occupancy or construction type. The Department has received your request dated October 15, 2025 to use alternative costs for FY 2026-27 for:

- the Fish Springs Solar Project, a 230 MW Photovoltaic power plant with battery storage;
- the Dodge Flat Solar Project, a 270 MW photovoltaic power plant with battery storage; and
- the Turquoise Solar Project, a 60 MW photovoltaic power plant with battery storage.

The Department finds the use of the Trended Historic Cost or Trended Gross Book Cost is applicable in these cases. The costs, as described above, are hereby approved for use for the 2026-2027 fiscal year. This needs to be applied for and analyzed annually to see if more applicable costs are available.

Please contact Cheryl Erskine at 775-684-2038, if you have any questions. A copy of this approval is being sent to all county assessors.

A handwritten signature in blue ink, appearing to read "Shellie Hughes".

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Shellie Hughes  
Executive Director, Department of Taxation