

Forestry 121.

W.E. Duggan

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Estimated Tool and Equipment Cost for Various Forest  
Improvement Projects Relative to the Use of a Twenty  
Man Crew

W. E. Duggan

Estimated Tool and Equipment Cost for Various Forest  
Improvements Relative to the Use of a Twenty-Man Crew

In either state or federal forestry practice employees are often required to submit tool and equipment lists for various improvement projects. It is quite obvious that reasonable accuracy is necessary for these estimations since the district budget allotment <sup>may</sup> be based on submitted figures. The following estimates have been tabulated from standardized lists of various state and federal organizations and have been complete as far as practicability permitted. In usual practice, lists have been made for some particular locality and project and then destroyed. If the estimation was desired again the entire work was a matter of repetition.

The value from this type of estimation is as follows:

- I. Close approximations of reasonable accuracy can be submitted for various projects to be included in budget figures.
- II. When necessary to purchase materials through a contract or bid, a check can be made readily as to whether or not a fair price is offered.
- III. Accumulation of improvement project tabulations for any particular locality or region enables the forester to take his allotment and immediately plan work estimates of projects which will not exceed his allotment.



The various improvement projects for this tabulation were made up as being particularly applicable to Tennessee forest areas where the state forester favors and desires the establishment of a 10,000 acre forest every 20 miles in the state. This plan is readily discernible when one notes that Tennessee has 14 million acres of land more adaptable to forestry than anything else. Working crews of twenty men stationed on each 10,000 acres of forest would complete the various improvement projects and then a capable man would be stationed permanently at the forest headquarters, employing men as the necessity demanded. This thought was in mind when a store-house estimation was included to be used first as a bunk-house.

Fire control and development of recreational centers are two main projects which will be started first. To assure adequate fire protection it is necessary to have a well developed system of roads which are coordinated with various headquarters. Illick in his "Outline of General Forestry" lists the major services of forest roads and trails as follows:

1. They open up undeveloped forest regions.
2. They help provide adequate protection.
3. They serve as a carrier of persons and products out of, into, and about the forest.
4. They serve as boundary and subdivision lines.
5. They are helpful to hunters, fishermen, and other forest users.

6. They encourage forest study tours and make possible accurate forest surveys and special forest studies.

He further states that good forestry requires not less than one mile of road for every 250 acres of forest land on areas of intensive use. Road building, telephone line construction, and a lookout tower system seem to be the first objectives for these forest areas. Since the state service has heretofore done very little development work, the tabulations for these projects should have some use for initial purchasing and the assurance of a fair purchase price total. Tabulations for housing and feeding facilities are included for property headquarters since workmen will return each day to headquarters except during fire fighting or other emergencies.

Tools and equipment lists were selected from standard lists and in some cases a combination of different lists, being particularly applicable to Tennessee forest areas. Although the recreational projects estimated do not exactly conform with the latest recreation handbook, they are still serviceable, attractive, and simple in construction. A list pertaining to sample plots in silvicultural work is included not with the idea of making total purchases but for use in estimating the necessary equipment which is to be purchased.

A bibliography and a summary of tools, equipment, and estimates for this particular work accompanies this report. Discount rates have been applied throughout and net prices listed. Where practicable total weights have been added to

enable calculation of approximate freight rates which must necessarily enter most purchases. In the case of lumber estimates a 20 per cent contingency has been added for freight rates and special manufactures since all current southern pine prices were quoted "F. O. B.". Because of changing discount rates and the cost of equipment from various sources an appendix was omitted since it would necessitate applying the rate to listed prices. Following are the tabulations as recorded in the summary sheet.

Summary of Projects Included

Weight and Cost

A. Road Construction-Working Equipment for a Twenty Man  
Road Crew:

	<u>Weight</u>	<u>Cost</u>
Dirt Job (Light to Medium Clearing)	1,223 <sup>a</sup>	\$ 5, 207.20
Dirt Job (Heavy Clearing)	1,223 <sup>a</sup>	5, 217.65
Rock Job (Light Clearing)	1,223 <sup>a</sup>	5, 234.15

B. Itemization of Carpenter Outfit,  
Applicable for Use in Road and  
Trail Construction:

50 53.53

C. Itemization of Blacksmith Outfit:

590 93.55

D. Itemization of Sawfiling Outfit:

4 2.38

E. Tools and Equipment-20 Man Fire  
Fighting Crew:

952 682.86

F. Equipment Necessary for Field Work  
too Distant from Headquarters for  
Daily Return-20 Man Crew

238 181.64

a. Does not include tractor and grader weights which  
are quoted at F. O. B. prices.

Weights included on road estimate sheet.

	<u>Weight</u>	<u>Cost</u>
G. Contents of Standardized Kit, 15-20 Man Use:	178	\$ 23.91
H. Kitchen Equipment for 20 Man Crew-Camp Headquarters:	1,003	205.66
I. <u>Telephone Line Construction</u> (12) <u>Twelve Man Crew</u>	276	131.35
J. Bill of Material for Rangers Cabin-Five Rooms Log Type- U. S. D. A.-Forest Service. <sup>a1</sup>		516.61
K. Bill of Material Accompanying Plan No. 14, 4-Room Log House for a Bunkhouse. To Be Utilized as a Storehouse Later. <sup>a2</sup>		381.71
L. Instruments, Accessories, and Tools Used in Sample Plots in Silvicul- tural Research.		1058.31

<sup>a1</sup>. Taken from Plan No. 16- U. S. D. A.-Forest Service,  
1908, Standard Bldgs.

<sup>a2</sup>. Taken from Plan No. 14- U. S. D. A.- Forest Service,  
1908, Standard Bldgs.

	<u>Weight</u>	<u>Cost</u>
M. Estimate of Mobile Equipment Including Tractor, 2-ton Ford Truck, Ford Dump Truck. (Cubic capacity 1 1/2 yards.)		\$ 5,455.01

Recreational Developments

N. Bill of Material for Camp Ground Table. Dimensions 5'4" long by 3' wide, Southern Pine.		5.96
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O. Water Development.

Hydrant and Spring Boxes.

Prices listed for materials  
but no individuals made since  
the number and size depends  
on locality.

P. Bill of Material for Bulletin Boards-

Inyo Type and Mono Type.	Inyo Type---	2.02
	Mono Type---	2.71

Q. Fire Place Plans.

Tahoe Type Fire Place No. 1, No. 2,  
and San Bernardino Type Fire Place.

R. Low Cost Type of Trash Incinerators, Type with Base Laid in Cement. Mortar-1 part cement, 3 sand.	Weight	Cost \$9.95
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S. Garbage Pit Covers and Boxes.

Bill of Material-Mono Box Type (Southern Pine) Use in Region of Light Snowfall.	5.08
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T. Material for Board Gate

Cut F-3, U. S. D. A.-F. S., Improvement Manual.	8-Foot 12-Foot	3.54 3.89
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U. Material for Double Latrine, Bill

Double Latrine, No. 4, 6'x6'. All Material No. 1 Common-Southern Pine.	39.37
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V. Fence Construction

Again no individual estimation was made  
but prices for necessary materials are  
listed.

W. Fire Line Construction

647	103.17
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ROAD CONSTRUCTION  
#2.

I	T	E	M	Approx Wght. lb	Price each	° 1	° 2	° 3	PRICES		
									° 1	° 2	° 3
Grindstone, W/Fixtures, Foot-Power				72	5.95	1	1	1	5.95	5.95	5.95
Hammers, 4#, Single Jack, Handled				8 each	1.36	1	3	1	1.36	4.08	1.36
Hammers, 8# Double Jack, Handled				10 "	1.58	2	2	2	3.16	3.16	3.16
Hammers, 14# Stone, Handled				16 "	3.10	1	1	2	3.10	3.10	6.20
Machine, Blasting 10-Hole Capacity				35 "	18.00	1	1	1	18.00	18.00	18.00
Machine, Blasting, 50-Hole Capacity				35 "	35.00	0	0	1			35.00
Mattocks, Pick, 6#, W/Handles				9 "	1.10	15	15	9	26.50	26.50	9.90
Needles, Splicing				1 "	.55	2	2	2	1.10	1.10	1.10
Padlocks, Common (Master #500 or Equiv.)				½ "	.34	2	2	2	.68	.68	.68
Peavies				10½ "	4.03	1	1	1	4.03	4.03	4.03
Picks, R.R. 6#, W/Handles				9 "	1.02	6	6	12	6.12	6.12	12.24
Pumps, Gas Bbl., W/Hose (Blackmer)				34 "	10.60	1	1	1	10.60	10.60	10.60
Saws, C. C., 5½' W/Handles				7 "	5.70	3	3	3	17.10	17.10	17.10
Shovels, L.H.R.F.#2				5 "	.23	15	15	18	3.45	3.45	4.14
Spoons, Stump, 7/8" x 5½'				8 "	2.46	1	1	0	2.46	2.46	
Scythe and Snath				2½ "	.40	4	5	4	1.60	2.00	1.60
Wedges, Saw 2½#											
T O T A L S									\$5207.20	\$5217.65	\$5234.15
					Cletrac 40 Tractor 11,500						
					Grader Hand Controls						



# Cletrac



## MODEL 40 DIESEL

### SPECIFICATIONS

	Actual (*) Nebraska Test	Corrected to Sea Level
Maximum Draw-bar Horsepower	57.94	61.18
Draw-bar Pounds Pull—1st Gear	11,134 pounds	11,770 pounds
—2nd Gear	7,451 pounds	7,880 pounds
—3rd Gear	4,939 pounds	5,238 pounds
Maximum Belt Horsepower (*Nebraska Test No. 235)	63.64	67.71
Approximate Shipping Weight . . . . .	11,500 pounds	



# MODEL 40 DIESEL DETAILED SPECIFICATIONS

	STANDARD 40D	40D HILLSIDE SPECIAL	SWAMP SPECIAL
<b>ENGINE</b>			
1.	Bore and Stroke	4-3/8"x5-1/4"	
2.	Number of Cylinders	6	
3.	R.P.M.	1200	
4.	Piston Displacement in Cubic Inches	174	
5.	" " in Cubic Feet per Min.	329	
6.	Dia. of Crankshaft	3"	
7.	Number of Main Bearings	7	
8.	Crankcase Oil Capacity - Gallons	4.	
9.	Oil Pump Capacity - Gallons per Min.	3.4	
10.	Cooling System Capacity - Gallons	7.5	
11.	Water Pump Capacity - Gallons per Min.	45	
12.	Fan Diameter - Inches	22"	
13.	Fan RPM	1800	
14.	Fuel	S.D.F. (*)	
15.	Fuel Tank Capacity - Gallons	30	
16.	Starting	ELECTRIC	
<b>TRANSMISSION AND STEERING</b>			
17.	Clutch Size	11" Double Plate	
18.	Transmission Case Oil Capacity - Gallons(**)	12-1/2	
19.	Transmission Oil Pump - Type	Plunger	
20.	Speeds - M.P.H.		
	Low	1.8	
	2nd	3.	
	High	4.3	
	Rev.	2.2	
21.	Ratio of Engine to Sprocket RPM		
	Low (Standard)	48.1	
	2nd ( " )	29.3	
	High( " )	20.2	
22.	Steering Band Width	3"	
23.	" Bands Total Area - Sq. Inches	216	
<b>TRACK AND TRACK FRAME</b>			
24.	Dia. of Track Frame Shaft	2-3/4"	
25.	Length Track Frame Shaft	65-1/2"	78-1/2"
26.	Size Bushings Track Frame Shaft - 2 Each Frame	2-3/4"x3-1/2"	
27.	Number of Lower Track Wheels	6	
28.	Track Shoe Length - Center to Center of Pins	7-1/4"	
29.	" Width - Standard	15"	28"
30.	Special Widths Available	15"	16"-18"-21"
31.	Length Track on Ground	75"	
32.	Total Ground Contact Area - Sq. Inches	2250	3150
33.	Size Grouser Bolts	3/4"	
34.	" Track Pin	1-1/8"x10-3/8"	
35.	" Bushing	1-21/32"x7-1/16"	
36.	" Roller	2-1/8"x1-7/8"	
37.	Number of Shoes Per Track	31	
38.	Capacity Track Wheel Lub. System - Each Frame	6 Quarts	
<b>DRAWBAR</b>			
39.	Height Above Grouser Tip - Inches	17-3/8"	
40.	Width of Draw Bar Opening	2-1/4"	
41.	Lateral Movement Right and Left of Center	7-1/2"	
42.	Dia. Draw Bar Pin	1-1/8"	
<b>DIMENSIONS</b>			
43.	Length Overall - Inches	132"	
44.	Width Overall - "	65-1/2"	78-1/2"
45.	Height at Dash - "	64-3/4"	89"
46.	Ground Clearance with Grousers	15-1/2"	
47.	Center to Center of Tracks - Gauge	48"	61"
48.	<b>WEIGHT</b> - Pounds	11500	12300
49.	Ground Pressure - Pounds per Sq. Inch	5.1	3.9
50.	<b>TURNING RADIUS</b> - Feet	9'-2"	10'-8"
51.	<b>POWER PULLEY</b> - Dia.	13"	
	Face	8-1/2"	
	Belt Speed - Feet per Min.	3000 at 884 R.P.M.	
52.	Rear P.T.O. - RPM	884	
53.	" Reduction - RPM	510	
54.	Front "	1200	
55.	Size and Type P.T.O. Connection	1-3/8" 6B ASAE Spline	

Same as Standard except widened to give 61" instead of Standard 48" distance between center of tracks. Various combinations of plates and grousers available as special equipment.

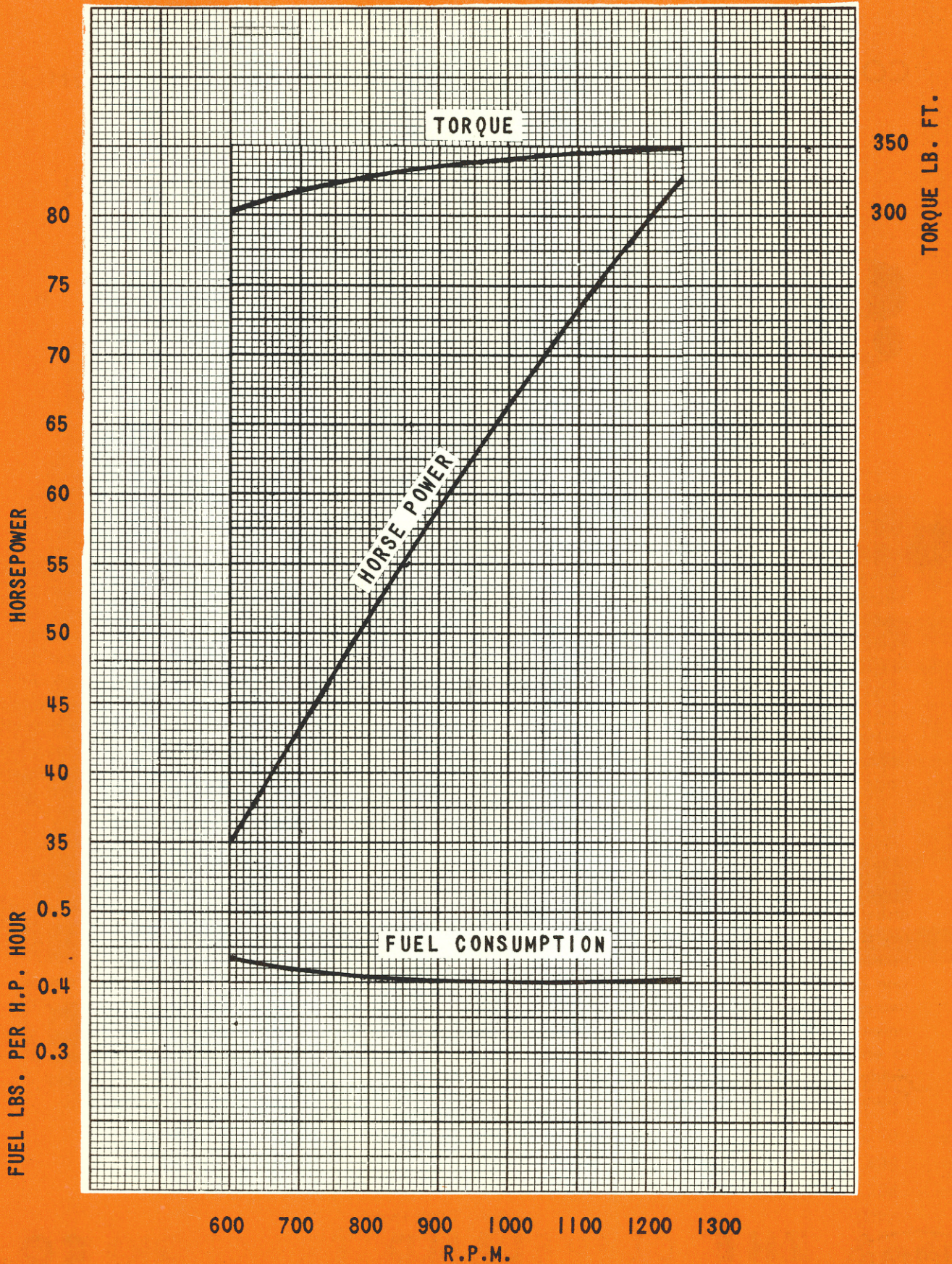
Same as Hillside Special except it has 28" wood cleat assemblies which includes metal retainers, instead of Standard 13" dirt grouser and plates.

\* Standard Diesel Fuels.

\*\* Includes Oil Capacity of Transmission, Controlled Differential and both Final Drive Compartments.



# PERFORMANCE CURVE





# ***Only Cletracs have . . . .***

CONTROLLED DIFFERENTIAL STEERING  
CONTINUOUS LUBRICATION ONE PIECE TRACK SHOES  
OVER 20 OTHER  
"TIME TRIED" FEATURES OF CONSTRUCTION

**9 Models of Cletracs . . .**  
E - EN - 20 - 25 - 35 - 55 - 80  
40 DIESEL - 80 DIESEL

## MODEL "40" DIESEL CLETRAC

### ENGINE:

Six-cylinder, water cooled by gear driven pump. Aluminum-alloy, heat-treated pistons checked for balance and matched in sets. Cylinder liners of alloy-steel. Drop-forged connecting rods and crankshaft. Full pressure feed oiling system. Full flow oil filter. Air filter and oil spray air cleaner. Bosch fuel system. A series of fuel filters and fuel cleaners. Dustproof crankcase breather. Electric starting. Engine rests in heavy pressed-steel frame, protected from below by pressed steel crankcase guard. Radiator supported by main frame and shielded by steel-plate radiator guard.

### TRANSMISSION AND STEERING:

Double-plate clutch. Automatic transmission brake to insure quick change of speeds. Transmission case of alloy iron, ribbed for strength and reinforced by 8 through nickel-steel bolts. Transmission oil pump supplies filtered oil to all parts. Dust-tight breathers ventilate transmission case and clutch compartments. Transmission gears and shafts machined from forgings, heat treated and carburized. Smooth-action steering mechanism permits use of both tracks on turns, contributing to ease and safety of tractor control. Cold pressed, welded and riveted, steel-plate main frame rigidly fastened to transmission case.

### TRACK FRAME:

Track frame shaft transmits weight of tractor to track frame and absorbs shocks due to uneven ground. No static load on final drive. The side frame is built up from a single piece of heavy rolled steel, formed into a tube, welded into one piece and houses and protects the continuous track wheel lubrication system and pre-compressed buffer spring. One piece, double tooth, differentially heat-treated sprocket. Double front idler. One piece, forged, differentially heat-treated track shoe. Detachable plates and grousers. Pins, bushings and rollers heat-treated and carburized. All moving parts protected by dust and dirt tight seals.

### DRAWBAR:

Underslung drawbar transmits pull to track frame shaft without putting excessive load on transmission case.

Operator fully protected. Steering and control levers located within easy reach of operator. Foot rest for drivers' feet. Fully upholstered leather seat with arm rests.

Main frame, transmission case, side frames machined and provided with holes for mounting special equipment — many types of which are available.



**THE CLEVELAND TRACTOR CO.**  
Cleveland, Ohio, U.S.A. Cable Address "Cletrac"



# Specifications of Power Controlled and Hand Controlled "Caterpillar" No. 44 Grader

**Weight, shipping (approximate):**  
 With power controls ..... 7,760 lbs.  
 With hand controls ..... 7,100 lbs.

**With Power Controls**  
 Weight on front wheels ..... 3,570 lbs.  
 Weight on rear wheels ..... 4,190 lbs.  
 7,760 lbs.

**With Hand Controls**  
 Weight on front wheels ..... 3,550 lbs.  
 Weight on rear wheels ..... 3,550 lbs.  
 7,100 lbs.

**Dimensions:**  
 Length over-all (with tires) ..... 27'-9"  
 Length over-all (without tires) ..... 17'-7"  
 Width over-all (less blade) ..... 8'-10"  
 Height over-all ..... 6'-10"  
 Wheel base ..... 14'-7"  
 Tread, front (center to center of tires) ..... 4'-6"  
 Tread, rear (center to center of tires) ..... 7'-8"

**\*Controls** ..... \*Power or Hand

**Blade Assembly:**  
 Blade length ..... 10'  
 Blade width ..... 20 3/4"  
 Blade thickness ..... 9/16"  
 Blade beams, size ..... 5"x1 1/8"  
 Blade beams, material ..... High carbon steel  
 Blade reinforcing angles size ..... 4"x3"x 1/2" and 2 1/2"x2"x 3/8"

**Blade Range:**  
 Lift above ground ..... 16"  
 Side shift ..... 3'-4"  
 Pitch position number ..... 15  
 Bank cutting, maximum angle of blade with horizontal ..... 70°  
 Bank cutting, maximum reach above bottom of wheels ..... 7'  
 Shoulder reach (with blade at 45°) distance outside of rear wheel ..... 4'-8"

**Blade Pressure:**  
 With Power Controls  
     Without Scarifier, maximum ..... 7,520 lbs.  
     With Scarifier, maximum ..... 8,440 lbs.  
 With Hand Controls  
     Without Scarifier, maximum ..... 6,750 lbs.  
     With Scarifier, maximum ..... 7,220 lbs.

**Circle:**  
 Diameter ..... 4'-1"  
 Section ..... Angle  
 Size ..... 5"x4"x 3/8"  
 Material ..... Structural steel  
 Circle center to kingbolt, distance ..... 7'-2"  
 Circle, blade and drawbar assembly ..... 1,640 lbs.  
 Circle lock pin diameter ..... 1 1/8"

**Drawbar:**  
 Size ..... 3 3/16"x4 1/8"x3 3/16"x 9/16"  
 Shape ..... Reinforced Z bar  
 Material ..... Structural steel

**Kingbolt:**  
 Shape ..... Steel tubing  
 Diameter ..... 2 3/4" O.D. x 1 1/16" wall  
 Length ..... 25"

**Lifting Mechanism:**  
 Design ..... Worm and gear  
 Gears, material ..... Bronze  
 Worms, material ..... Steel  
 Lifting shaft, diameter ..... 2 3/16"  
 Lifting shaft, material ..... Heat-treated steel  
 Lifting shaft, bearings ..... Self aligning ball, rear; bronze, front  
 Lifting crank, material ..... Steel forging  
 Lifting link, diameter ..... 1 3/8" link—2 1/4" tube  
 Lifting link, material ..... High carbon steel  
 Lifting link, construction ..... Telescoping  
 Connections—link to arm and circle crossbar ..... Ball and socket  
 Take-up for wear ..... Split bearings—shims  
 Springs (compensating lift) ..... On hand controls  
 Handwheels, diameter ..... 38"  
 Handwheels, distance between ..... 20"

**Frame:**  
 Shape ..... Ship channel  
 Size ..... 7"  
 Weight per foot ..... 18.6 lbs.  
 Clearance above ground ..... 4'-4"

**Operator's Platform:**  
 Size (on power controlled) ..... 26"x23 1/2"  
 Size (on hand controlled) ..... 3'x25"  
 Height above ground ..... 33 1/2"

**Axle, Front:**  
 Construction ..... Built up  
 Material ..... 2 steel angles  
 Size ..... 3"x2 1/2"x 3/8" and 4"x3"x 3/8"  
 Length ..... 5'-8"  
 Spindle diameter ..... 2"  
 Spindle, material ..... Forged heat-treated chrome-nickel steel

**Axle, Rear:**  
 Construction ..... Built up  
 Material ..... H beam and Angles  
 Size ..... 5"-2 1/2"x2"x 3/8"  
 Length ..... 8'-10"  
 Side shift ..... 3'-2"  
 Spindle diameter ..... 2 1/8"  
 Spindle, material ..... Forged heat-treated chrome-nickel steel

**Wheels, Front:**  
 Type ..... Leaning  
 Diameter ..... 32"  
 Bearings, type ..... Tapered roller  
 Hubs ..... Dust-proof  
 Tires, type ..... Steel  
 Tires, width and thickness ..... 6"x 5/8"  
 Spokes, number ..... 16  
 Spokes, diameter ..... 3/4"

**Wheels, Rear:**  
 Type ..... Leaning  
 Diameter ..... 40"  
 Bearings, type ..... Tapered roller  
 Hubs ..... Dust-proof  
 Tires, type ..... Steel  
 Tires, width and thickness ..... 6"x 5/8"  
 Spokes, number ..... 18  
 Spokes, diameter ..... 3/4"

**Lubrication** ..... Pressure gun and oil reservoirs

### SPECIAL EQUIPMENT

**Scarifier:**  
 Weight, power controlled ..... 1,275 lbs.  
 Weight, hand controlled ..... 1,323 lbs.  
 Block, material ..... Cast steel  
 Block length ..... 4'  
 Swath width ..... 3'-7 1/2"  
 Teeth, number ..... 11  
 Teeth size ..... 3"x1"  
 Teeth spacing center to center ..... 4 1/2"  
 Lifting links diameter ..... 3"  
 Drawbar size ..... 5"x1 1/2"  
 Lift above ground ..... 14"  
 Pitch positions, number ..... 3  
 Center tooth to kingbolt, distance ..... 2'-8"  
 Center tooth to center of circle, distance ..... 4'-6"  
 Pressure, maximum, power controlled ..... 5,645 lbs.  
 Pressure, maximum, hand controlled ..... 5,670 lbs.  
 Controls, design ..... Worm and gear

**Backsloper:**  
 Flat bottom type ..... 439 lbs.  
 V-bottom type ..... 286 lbs.

\*Available with either hand controls or mechanical power operated controls governing the blade lift, blade side shift, circle reversing, leaning of wheels, rear axle side shift, steering and scarifier lift. Power is supplied by a "Caterpillar" one-cylinder, air-cooled engine, with a bore and stroke of 3 3/8 in. x 4 in., operating at a speed of 1,300 R.P.M.

## CATERPILLAR TRACTOR CO.

— PEORIA, ILLINOIS, U.S.A. —

**Track-Type Tractors . . . Road Machinery  
 Combined Harvesters . . . Diesel Engines**

THERE IS A "CATERPILLAR" DEALER NEAR YOU



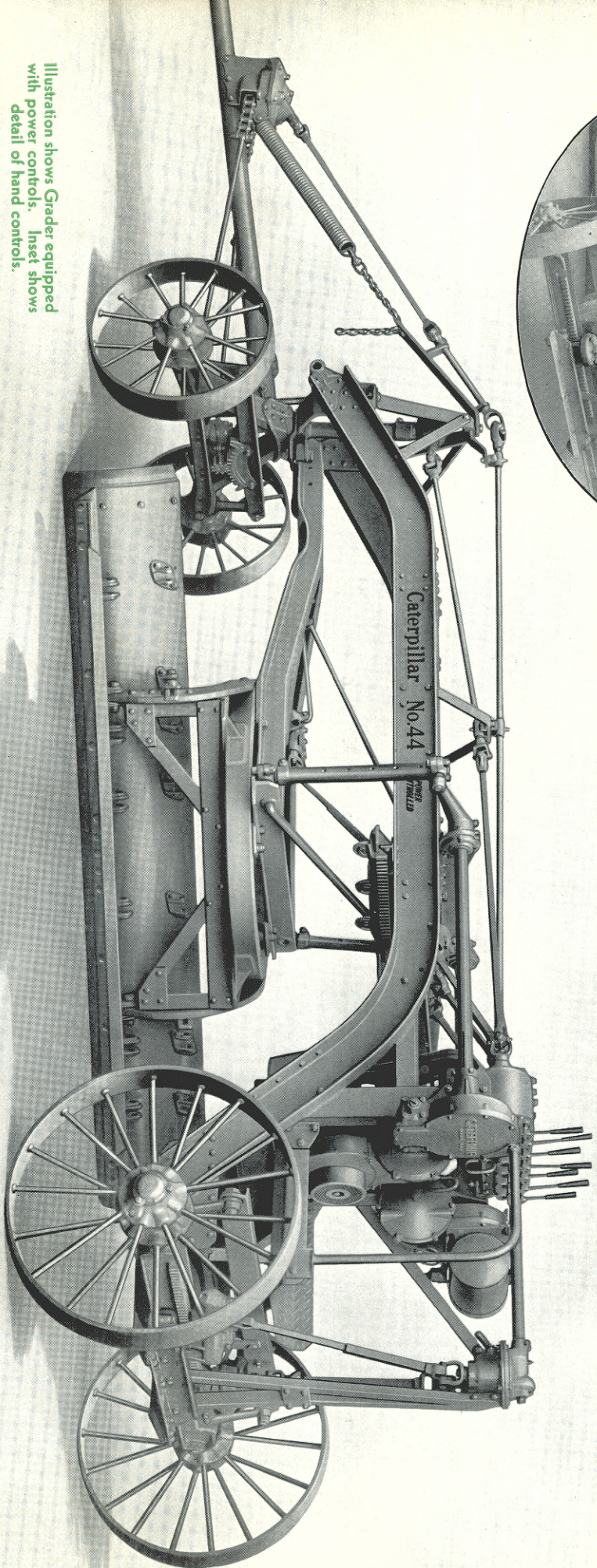
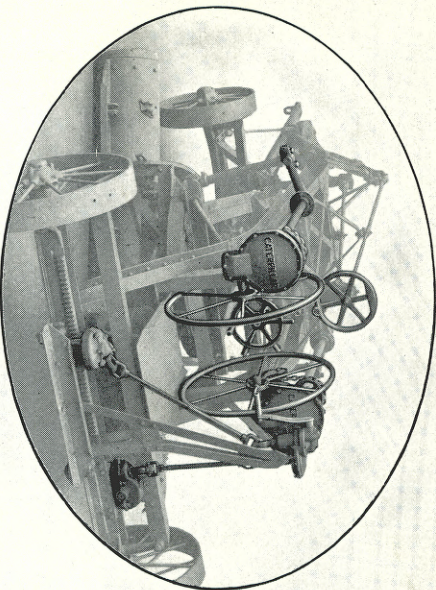


Illustration shows Grader equipped with power controls. Inset shows detail of hand controls.

# "Caterpillar" No. 44 Grader

[SPECIFICATIONS ON OTHER SIDE]



ITEMIZATION OF CARPENTER OUTFIT

Applicable for use in Road and Trail Construction

No.	I	T	E	M		Wght.	Price
1					Set Bits, Auger Wood $\frac{1}{4}$ " to 1" (7 to Set) (Has 13 bits)	4 $\frac{1}{2}$	\$ 15.00
1					Each Bit, Expansion, $\frac{3}{4}$ " to 3" (For screws	.5	2.20
1					Each Bit, Screw Driver (No. 608)	.2	.46
1					Each Brace, Carpenter's Hatchet	2 $\frac{1}{2}$	3.12
1					Each Chest (Carp. Tool Box only)	18	4.50
1					Each Chisel, Cold	1	.41
1					Set Chisels, Wood $\frac{1}{4}$ ", $\frac{1}{2}$ ", and 1" @ .80	2 $\frac{1}{2}$	3.20
1					Each File, 8" Mill, Bastard	.5	.36
4					Each Files, 3-Corner, 6" @ .45	1	1.80
2					Each Hammers, Claw @ .81	2 $\frac{1}{2}$	1.62
1					Each Hatchet, Claw	2	1.87
1					Each Knife, Draw	.5	1.43
1					Each Level, Spirit	1 $\frac{1}{2}$	2.10
1					Each Plane, Small	1 $\frac{3}{4}$	2.22
1					Pair Pliers (Also wire cutter)	1	1.83
1					Each Rasp, Wood	$\frac{1}{2}$	1.07
1					Each Rule, Carpenter's 2'	.2	.25
2					Each Saws, Hand, C. C., 8-Ft., 26" @ 2.00	1	4.00
1					Each Saw, Hand, Rip, 6-Ft., 28"	.8	1.60
1					Each Square, Carpenters	1.8	1.87
1					Each Stone, Oil, Pike 8"	.8	2.62
TOTALS						50	Approx \$53.53



ITEMIZATION OF BLACKSMITH OUTFITS

Quantity	I	T	E	M	Weight Lbs.	Price
1	Each Anvil, Heaviest Available (Cranberry-Solid Steel)				101 #s	
	Not less than 90# With Hardy				90 #s	18.17
1	Dozen Blades, Hack Saw				1½ lbs.	.34
1	Each Can Oil, Spring Bottom				1 lb.	1.15
2	Each Chisels, Cold 7/8" @ .80				4 lbs	1.60
1	Each Cutter, Bolt 30"				9	4.65
1	" Cutter, Cold, Handled. (Hd.15)				4 12 oz	.90
1	" Cutter, Hot, " (0.75 + 0.15)					.90
1	" Drill, post				60	11.00
1	Set Drill Bits for Above ¼" - 1"				6	4.00
2	Each Files, M.B. 12" @ 21¢ ea.					.42
1	Each Flatter, B.S. Not less thn.3"				3½	1.50
1	Each Forge, Portable 23" x 35" Atkins Adjustable				215	24.00
1	Each Frame, HackSaw, Adj.12"				2 #	2.00
1	" Hammer, Ball Peen, 2# @ .59				2 #	1.18
1	" Hammer, B.S. Cross Peen, 2#				2 #	.98
1	" Hammer, Sledge, 8-10#				12	1.50
1	" Rasp, B.S. or Shoeing					.29
1	" Rasp, Wood, ½ Round					.29
1	" Screw Driver, 6" Blade					.31
1	" Tongs, Bolt, 22"					1.13
1	Pair Tongs, Pick-up 24"				3½	1.29
1	Pair Tongs, Straight, L.P., 18"				2½	.90
1	Each Vise, B.S., Leg, 4"-5" Jaw				50	10.06
1	Each Wrench, Monkey, 16" (18" in Cat.)				4	1.34

ITEMIZATION OF BLACKSMITH OUTFITS

PAGE - # 2

Quantity		I	T	E	M	Weight Lbs.	Price
1	Each Wrench, Crescent, 8"					2	.90
	Double-end, Drop Forged Steel.						
1	Each Apron, B.S. Mule Skin leather with Waist Strings					1 $\frac{3}{4}$	2.75
					TOTAL	590	\$93.55

ITEMIZATION OF SAWFILING OUTFIT

Applicable for use in Road and Trail Construction.

No.	I T E M	Lbs. Wght.	Price	
1	Each Hammer, Swedging	0.7	.59	
1	Each Gauge, Raker	) Com- ) bin- ) ation		
1	Each Gauge, Spider			
1	Each Block, Saw-Setting Tool			
4	Each Files, 8", M.B. @ \$0.63	1	.84	
1	Each Container, Canvas		.20	
		<b>TOTAL</b>	<b>4</b>	<b>\$2.38</b>

20 Man Fire-Fighting Crew

Tools and Equipment

Field Crews and Fire-tool Caches

Quantity	I	T	E	M		Wght. Lbs.	Price
6	Axes, d.b., handled, falling				@ 1.69	21	\$ 10.14
4	Buckets, Canvas				@ .50	3	2.00
20	Canteens, 1 Qt. Capacity				.85	10	17.00
48	Candles, 4 doz.				.15	4	.60
2	Canthooks, handled				2.15	14	4.30
1	Compass - For. Service type						3.30
3	Files 8" or 7"				.18	1½	.54
2	Files 10"				.23	1½	.46
	Forest Maps of District (Mounted on Cheese Cloth)						
	Forms, fire report.						
1	Grinders, portable				5.95	72	5.95
8	Handles, saw				.47	2	3.76
5	Hobnails, boxes				.12	2	.60
8	Hoes, hazel, handled				1.50	35	12.00
	Kerosene and gasoline supply						
2	Kits, first aid (Johnson)				2.25	4	4.50
4	Knapsacks				1.00	5	4.00
2	Lanterns, gasolene (Coleman)				5.95	6	11.90
3	" kerosene - stone -				.76	6	2.28
	" bridge, Hedlite or bug						
1	Last, shoe and hammer (Comp. Outfit)				2.85	15	2.85
	Lookout reports						
	Notebooks and pencils.						

Quantity	I	T	E	M		Weight Lbs	Price	
	Outfits:							
1		Saw filing			@ 2.38	4	2.38	
1		Time keeping						
		Pipe or boiler plates for cooking fire.						
2		Pumps, hand	Indian Fire Pumps	No. 85 G	@ 10.00	30	20.00	
16		Rakes, fire or woods hoe -also known as "Council Tool"			1.21	24	19.36	
1		Rasps, wood 14 inch			.82	2	.82	
1		Saws, crosscut 6'			6.30	7	6.30	
1		Saws, falling 6'			6.30	5½	6.30	
10		Shovels, long-handled			.82	5½	8.20	
1/2 doz.		Swatters, handled, 15 inch.			@ \$18. per doz		9.00	
1		Telephone, No. 1375-A	Port. Type		33.50	12	33.50	
		Time slips						
4		Tool, Pulaski			1.60	16	6.40	
1		Torch, Hauck			9.50	6	9.50	
4		Wedges			.15	4	.60	
		Wire, emergency (No. 9)			11.00			
		2 miles length			per 5,280ft	628	22.00	
4		Whetstones, Carborundum			.58	6	2.32	
1		Fire Pumping Outfit					450.00	
		Plows and double trees						
		(Dependent on local conditions)					952 lbs	\$682.86

EQUIPMENT NECESSARY FOR FIELD WORK TOO DISTANT  
FROM HEADQUARTERS - TWENTY MAN CREW

Pg. - #3.

	I	T	E	M	Weight Lbs.	Price
1	Kand M Outfit for 15-20 man outfit.					
	<u>Tentage:</u>					
	1 fly for 10x12 tent(14x16) 14.9 Oz. Duck.				18	7.89
	1 tent, 10x12 feet (12.41 Oz.Duck)				60	22.95
	<u>Bed Rolls:</u>					
10	Bed rolls, made up of 4 single wool blankets per pair @ 4.89				160	97.80
	1 Canvas cover 14.9 Oz.Duck				2.65	53.00
	TOTAL				238 lbs.	\$181.64

CONTENTS    OF    STANDARDIZED    KIT

15-20    Man    Kit

Quantity	I	T	E	M		Weight Lbs.	Price
1	Baking reflector					15	.60
1	Bake pan, 6 $\frac{1}{2}$ x10 $\frac{1}{2}$ x2 $\frac{3}{4}$					1#4oz.	.09
2	Drip pans 13 $\frac{3}{4}$ x10x2				@ .45	2-8oz	.90
1	Container, 12 gals. D14x23 Deep					8	.98
1	Pail, tin, 3.3 - gal.					2-8	.35
1	Pail, tin, 3 gal.					2-8	.35
1	Pail, tin, 2.5 gal.					2	.30
1	Pail, aluminum, 2 $\frac{1}{4}$ gal.					2-5 oz.	.88
1	Pail, tin, 1 $\frac{1}{2}$ gal.					1-4	.28
1	Pail, tin, 1 $\frac{1}{4}$ gal.					1-4	.24
1	Dish pan 4 $\frac{1}{2}$ gal. (Aluminum)					3	.65
1	Bucket, canvas					3	.50
1	Butcher knife - 12 inch.					1	1.00
1	Paring knife					-4	.09
1	Meat fork - 3 tine fork					-8	.09
2	Basting Spoons - 14 inches					-12	.28
1	Can Opener					-8	.09
1	Carborundum					-12	.30
1	File, 8 - inch					-6	.25
2	lbs. Nails					2	.10
1	Clock, alarm					1-8	.75
3	Towels, dish					-12	.18
4	Towels, hand					1-4	.35
24	Plates					22	2.88
20	Bowls, 1 Quart					20	3.40

STANDARDIZED KIT - Pg. #2.

Quantity	I	T	E	M		Weight Lbs.	Price
22	Cups,	retinned				13-8	.88
20	Each,	Knives			@ .09	20	1.80
	"	, Forks				20	1.80
	"	, Spoons				20	.58
4	Tablespoons					1-8	1.08
5	Retinned pans,	3 quart				11-4	1.30
3	Granite pans,	3 quart				8	.60
6	Kettle chains	and hooks				4	.59
TOTALS						171 lbs. 135 oz. or 178 lbs.	23.91



KITCHEN EQUIPMENT FOR 20 MAN CREW-CAMP  
HEADQUARTERS - EACH PROJECT

Quantity	I T E M		Weight Lbs	Price
8	Basins, wash	.25	1-5	.25
2	Brush, scrub	.08	2	.16
1	Beaters, egg, geared	.67	-14	.67
1	Blades, meat saw to fit saw W/outfit - 1 doz.	2.67	6-8	2.67
2	Boards, wash	.46	5	.92
1	Boilers, wash	4.48	16	4.48
36	Bowls, soup, granite	.15	36	5.40
2	Brooms, kitchen	.98	4-8	1.96
1	Bowls, mixing #14-15	.28	1-2	.28
250	Bags, paper #8 - 5 qt.	.89	8	.89
1	Brush, pastry	.09	-6	.09
2	Chore boys	.10	1	.20
1	Cleavers, meat, 12"	2.91	1-8	2.91
1	Clock, Alarm	.75	1-8	.75
40	Cups, Enamel	.10	12	4.00
2	Cans, Garbage, 9 gal. cap.	.93	15	1.86
1	Cutters, Doughnut	.08	-12	.08
40	Cups, Enamel	.10	12	4.00
2	Cans, Garbage, 9 gal. cap.	.93	15	1.86
1	Colander	.17	-10	.17
2	Dippers, $\frac{1}{2}$ qt.	.19	-8	.38
36	Forks, t able	.23	6	8.28

KITCHEN EQUIPMENT - #2.

Quantity	I T E M		Weight Lbs.	Price
1	Fork, meat - 3 tine fork.	.09	-8	.09
1	Griddles, hot cake, #10 12" x 23 $\frac{3}{4}$ "	1.49	14	1.49
	Griddles, Hot cake, Rd., 12"	1.29	14	1.29
1	Grinders, Food, #3	3.00	5-4	3.00
1	Knives, butcher, 8"	.43	-11	.43
1	Knives, butcher, 10"	.72	-12	.72
36	Knives, table	.14	20	5.04
2	Knives, paring	.09	-8	.18
1	Ladles, soup	.15	-5	.15
1	Mashers, Potato	.08	-6	.08
12	Oilcloth, yards	.20	15	2.40
1	Openers, can rotary	1.75	2-3	1.75
8	Pail, 12 qt. Galv. #1512	.54	30	4.32
6	Pans, Bread, Aluminum Indiv- idual 13 $\frac{3}{4}$ x 10 x 2 Loaf	.70	7	4.20
1	Pans, Bread, Raising, 23-Qt.	1.68	10	1.68
2	Pans, Dish Tin 21-Qt.	1.12	7-3	2.24
8	Pans, Dishup 1-Qt. Granite	.08	5	.64
16	Pans, Dishup, 2-Qt. Granite	.10	16	1.60
6	Pans, Dishup, 4-Qt. Granite	.18	9	1.08
2	Pans, drip, 12 x 17	.26	3-10	.52

KITCHEN EQUIPMENT - #3

Quantity	I T E M			Weight Lbs.	Price
1	Pans, fry, Steel Top	12"	.21	2-5	.21
1	Pans, fry	Top 18"	.38	3-12	.38
2	Pans, cake	13 7/8 x 8 7/8 x 1 1/2	.21	2	.42
2	Pans, Muffin	12 Cup, 012 1/2	.59		
1	Pins, Rolling		.19	2	.19
4	Pitcher, Granite	2 1/4 Qt.	.53	12	2.12
42	Plates, table	granite	.10	21	4.20
6	Plates, table	tin	.09	6	.52
4	Pots, coffee	3-Qt. Enameled ware	.68	8-12	2.22
1	Pots, coffee	3-gal.	.93	5-8	.93
4	Pots, tea	3-Qt.	.42	1-7	1.68
1	Pots, sauce w/covers	20	1.13	7-7	1.13
2	Pots, sauce w/covers	12 qt.	.80	5-4	1.60
1	Roaster, #011,	11 x 16 1/2 x 7	.80	5-8	.80
1000	Sacks, paper	12 lbs. per 250	1.69	15	6.76
1	Saw, Meat,	24 inch, 1 doz. blades	2.89	7	2.89
6	Shakers, Salt & Pepper		.08	2-4	.48
2	Sheets, Cookie,	12 x 17 #1217	.30	2-8	.60
1	Sieves, flour	16-18 Mesh to inch.	.24	1-8	.24
1	Skimmer, 4 5/8"		.10	1-8	.10
2	Spoons, mixing	12"	.07	-14	.14
48	Spoons, dessert		.34 per doz.	2	1.36

Kitchen Equipment #4.

Quantity	I T E M			Weight Lbs.	Price
1	Steels, butcher - 14"		1.25	1-1	1.25
1	Strainers, Chinese - 8" Med.		.34	1-4	.14
3	Tables				
	2 - 8' x 3 $\frac{1}{2}$ '				6.00
	1 - 4 $\frac{1}{2}$ x 4'				1.90
20	Towels, hand		.13	7-8	2.60
10	Toweling, dish		.06	2-8	1.60
3	Tubs, wash - 17 gals. Galv.		.75	30	2.25
1	Turner, cake		.15	-10	.15
25	Twine, $\frac{1}{2}$ Pound Balls, Price per lb.		.32	25	8.00
MISCELLANEOUS EQUIPMENT:					
1	Stove, Range - Queen Buckeye Brand - with enameled reser- voir and High Closet, six 8 in. covers; 44 x 27 in. top; 18 x 18 x 12 in. oven; cook- ing height 34 in. Kuch feed for coal or wood. Thermometer in oven door panel. Green and ivory porcelain enameled.		65.00	475	65.00
1	Axes, D.B. 3 $\frac{1}{2}$ lbs. handled		1.65	5	1.65
1	Axes S.B. 3 $\frac{1}{2}$ lbs.		1.38	4	1.38
1	Hammer, Claw, Kelley Brand		.50	1-3	.50
1	Rake, Garden		.45	2-2	.45
1	Saw, C.C. 5 $\frac{1}{2}$ with Handles		5.70	7	5.70
2	Shovel, L. H. R. P. #2		.23	10	.46

Kitchen Equipment - #5.

Quantity	I T E M	.40	Weight lbs.	Price
2	Wedges, felling, 2 $\frac{1}{2}$ lb.		5	.80
4	Locks, Pad. Common	.30	-18	1.20
	total			
	Block, Butcher - Can be made from sycamore or maple from forest property.			

983 lbs.  
338.025 205.66  
or  
1003/65

TELEPHONE LINE CONSTRUCTION

Equipment for a twelve (12) Man Crew

Quantity	I	T	E	M		Weight lbs.oz	Price
	<u>SWAMPERS:</u>						
2	Axes, d.b., 4	lbs.	handled @		1.71	8	3.42
2	Files, 8 inch.	M.B.			.18	1-8	.36
2	WHEATSONES, Axe	Carborandum			.30	4	.60
1	Lineman's belt,	tool			4.75	2-8	4.75
1	Lineman's safety	strap			4.75	2-8	4.75
1	Pair of climbers,	tree			3.66	3-10	3.66
1	Compass surveyors	and Jacob Staff				9	19.20
1	Saw, cross-cut,	5½ ft. handled			5.70	7	5.70
1	Brush hook,	handled			1.34	5	1.34
	<u>EQUIPMENT IN DIGGING HOLES</u>						
	<u>FOR POLES:</u>						
2	Shovels, 7 ft.,	Western Union	R.P.		1.40	11	2.80
2	Flat-toe spoons,	west. Union.					
	Pattern, 7 ft.	handle			2.50	20-10	5.00
2	Bars, steel digging,	octagon					
	shaped, 1 in. x	8 ft.			4.00	58	8.00
1	Bar, tamping,	6 ft.			3.85	30	3.85
	<u>WIRE STRINGING EQUIPMENT:</u>						
2	Pair, 8 inch. plies				@ .67	3	1.34
2	Pair, connectors				@ 2.25	2-8	4.50
1	Axe, d.b. handled,	4 lbs.			1.71	4	1.71
1	Axe, single blade,	short					
	handled, 3½	lbs.			.99	3-8	.99
2	Small 2 sheaves	pulley blocks			1.60	5	3.20

✓

TELEPHONE LINE CONSTRUCTION - #2.

Quantity	I	T	E	M		Weight Lbs.oz	Price	
2					Klein's or Buffalo Grips	1.88	2	3.20
50 ft.					$\frac{3}{4}$ or $\frac{1}{2}$ in. rope	per lb. .35	27	1.40
2					Lineman's belts, tool	4.75	2-8	9.50
2					Lineman's safety straps	4.75	2-8	9.50
2					Pairs, Climbers	3.66	3-10	7.32
20 lbs.					Beeswax or Yellow wax in 1 lb. cakes - 4x8x1 $\frac{1}{4}$	.55 lb	20	11.00
(For wire not in immediate use)								
<u>SOLDERING OUTFIT:</u>								
2					Soldering irons ( $\frac{1}{2}$ and 1 $\frac{1}{2}$ #s)	$\frac{1}{2}$ # .20 1 $\frac{1}{2}$ .40	-12 1-12	.36 .75
10 lbs.					Solder, resin, core for light and medium heavy work	per#.50	13	5.00
10 lbs.					45-55 solid wire solder	per#.52	13	4.95
1					Blow torch - Eclipse Brand	2.29	4-12	2.29
1					Melting ladle - Size 5	.35	3	.35
						267-122 or 276 lbs		\$131.35

BILL OF MATERIAL FOR RANGERS CABIN - FIVE ROOMS

LOGS - U.S.D.A. - FOREST SERVICE

No. Pieces	D I M E N S I O N S	Ft. B.M.	Use in Struc.	Cost
2	6" diam x 7' long *		Porch posts	
11	Ave. diam. 12" x 22'L*		Logs, rear wall	
11	Av.diam. 12" x 21'long*		" " "	
6	Av. diam. 12" x 15'long*		Logs, front wall	
3	Av. diam. 12" x 14'long*		Logs, front ov.porch	
16	Av. diam. 12" x 16'long*		" " " "	
22	Av. diam. 12" x 28'long*		Logs, end, over "	
22	Av. diam. 12" x 28'long*		Logs, partition " "	
11	Av. diam. 12"x14'long.*		" porch over porch	
2	Av. diam. 12"x21'long*		" sill	
8	2" x 6" x 10'	80	Joist sill	1.32 <sup>a</sup>
8	2" x 4" x 10'	56	" "	1.20
36	2" x 8" x 12'	576	Joists	10.60
10	2" x 8" x 16'	213	"	4.97
1	2" x 7" x 14'	17	Sills, frt.por.	.36
1	2" x 4" x 14'	10	" " "	.23
3	2" x 7" x 12'	42	Joists, " "	.90
3	2" x 6" x 10'	30	" rear "	.50
1	4" x 6" x 16'	30	Sill " "	.77
6	6" x 6" x 1'	18	Blocks," "	.52
1	2" x 12" x 18'	36	Steps, frt.&rear	1.23

\*Obtainable from forest property, undressed gives rustic appearance.

<sup>a</sup>F.O.B. Prices A 20% Contingency charge is to be added for freight changes.



RANGERS CABIN - #2.

No. Pieces	D I M E N S I O N S	Ft. B. M.	Use in Struc.	Cost
31	2" x 4" x 14'	279	Ceiling joists	6.53
4	2" x 6" x 16'	64	Rafter plate	1.53
4	2" x 6" x 14'	56	" "	1.26
8	2" x 4" x 10'	56	Studs, partiti.	1.27
4	2" x 4" x 12'	32	Plates "	.93
2	2" x 4" x 18'	24	Girts and braces partitions.	.78
4	2" x 4" x 12'	32	Rafters, rear pr.	.93
2	2" x 6" x 10'	20	Plates, rear porch	.43
1	2" x 4" x 10'	7	Side of rear " cut in two.	.21
10	2" x 8" x 10')	133)	False jambs, win.	6.00
7	2" x 8" x 14')	131)	" " doors	
	1,125 B.M. 1"x4"	1,125	Matched floor.	38.76
	1,125 B.M. $\frac{3}{4}$ "x4" beaded ceiling	1,125	M & B. ceiling	31.30
	3,075 B.M. $\frac{3}{4}$ "x4" x 10'	3,075	inside "	117.04
	200 linear feet $\frac{1}{4}$ " round			2.00
	262 linear feet $\frac{3}{4}$ " x 4" beaded ceiling	262	M&B Ceil. Planc.	10.26
8	1" x 6" x 10'	40	Roof boards, rear porch	1.26
a 16	2" x 4" x 18'	192	Rafters, sides	
a 8	2" x 4" x 16'	95	" "	
a 14	2" x 4" x 12'	112	" "	
a 8	2" x 4" x 10'	53	" "	
a 6	2" x 6" x 14'	84	" "	
	a Omit if gables are used.			

RANGERS CABIN - #3.

No. Pieces	D I M E N S I O N S	Ft. B.M.	Use in Struc.	COST
a 4	2" x 6" x 12'	48	Rafters Sides	
a 4	2" x 8" x 22'	117	Hip rafters	
a 1	2" x 8" x 16'	21	Ridge board	
a 2	1" x 6" x 16'	16	Saddle boards	
a 8	1" x 4" x 14'	37	front & rear Facia,	
a 2	1" x 4" x 16'	11	" ends	
a 4	1" x 12" x 16'	64	Roof boards	
a 1	1" x 12" x 14'	14	" "	
a 2	1" x 12" x 12'	24	" "	
a 4	1" x 12" x 10'	40	For hips	
a	90 linear feet, ten flashing			
a	1500 B.M. 1" x 6"	1500	Roof Boards	
a	12500 shingles 4"x18"		Roof and porch	
IF ALTERNATIVE ARRANGEMENT FOR GABLE IS USED, SUBSTITUTE THE FOLLOWING IN PLACE OF RAFTERS, ROOF BOARDS, SHINGLES, ETC.				
34	2" x 4" x 18' long	408	Rafters	10.70
6	1" x 4" x 14' long	28		1.00
4	1" x 4" x 16' long	21	Facia sides	1.00
4	1" x 4" x 18' long	24	Verge boards	1.00
4	1,134 B.M. 1" x 6"	1134	Roof boards	31.35
4	1" x 12" x 16' )	64	" "	2.34
2	1" x 12" x 12' )	24	" "	
	388' B.M. $\frac{3}{4}$ " x 4"	388	Plancher M & B	14.82
15	$\frac{1}{2}$ " x 4" x 16'	80	Battens	1.92
	a ibid.			

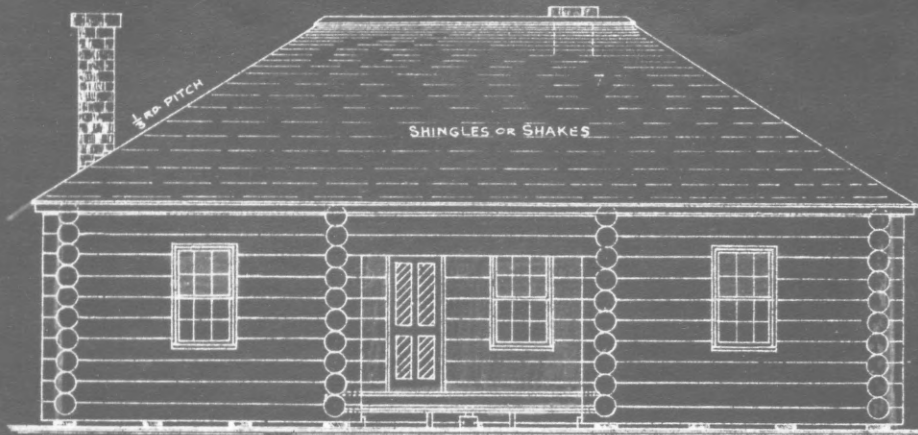
RANGERS CABIN - #4.

No. Pieces	D I M E N S I O N S	Ft. B. M.	Use in Struc.	COST
6	1 " x 6" x 14' )	42	Saddleboards	1.60
2	1 " x 6" x 16' )	16	Extra	
	210' B.M. 1"x12"	210	Gable Ends	5.72
	12,250 shingles 4"x18"*			
	7 perch of rough stone <sup>a</sup>		Chimney	
	7 bushels of lump lime		"	2.80
	1 load of sand		"	2.70
	IF BRICK IS USED:			
	1700 brick		chimney	
	5 bushels of lump lime		"	
	1 cubic yard sand		"	2.70
	3 bushels of lump lime		To Plaster betw. (logs.	1.20
	½ load of sand		" " "	1.35
10	Windows, 12 lights, 10" x 12" with 8" frames and casings			34.60
3	Outside doors, 2"x8"x6'8"			12.84
3	Inside doors, 2'6" x 6'6"			14.16
	45 pounds 3 d nails		Shingles	2.30
	90 pounds 6d nails		Ceiling & floor.	3.35
	30 #s. 8d nails		Boarding	1.20
	12 #s. 10d nails		Studs, sills, rafters, etc.	.48
	45 #s 20d nails		" "	1.80
	6 pair strap hinges and screws (Heavy)			2.94
6	Rim locks, complete			2.10
30	Window bolts			1.50

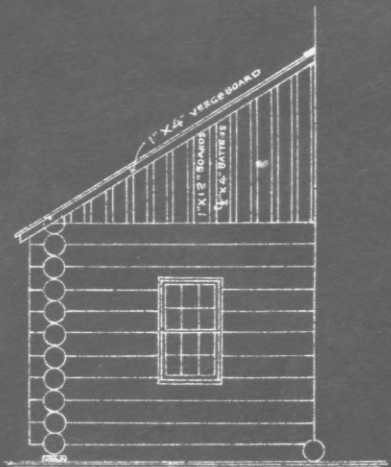
\*To be made by crew from available material on forest property  
<sup>a</sup> Obtainable at site of construction.

RANGERS CABIN - #5.

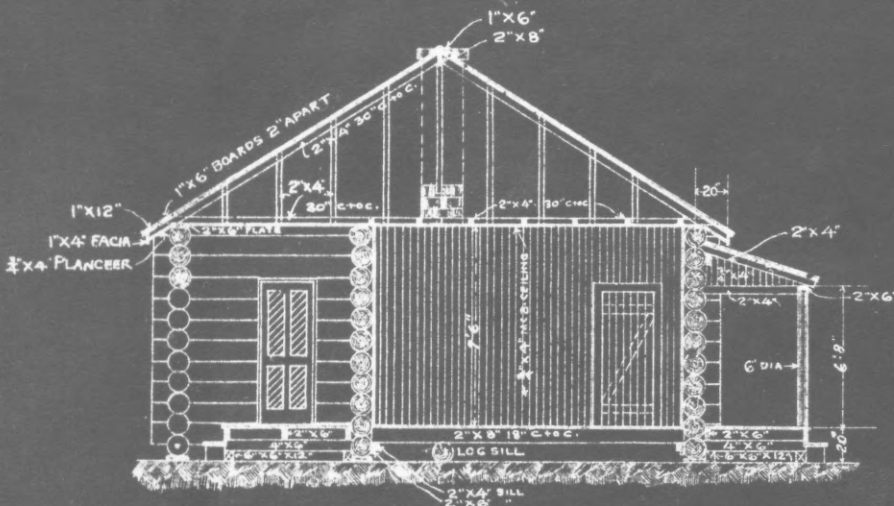
No. Pieces	D I M E N S I O N S	Ft. B.M.	Use in	Struc.	Cost
3	Chimney thimbles				1.26
	25 linear feet ten flashing 14" width				2.15
	IF GABLES ARE DOUBLE BOARDED WITH PAPER ADD THE FOLLOWING:				
13	1" x 12" x 16'	210	Board in	gables	5.50
	48 yds. red rosin bldg. paper				.80
	MATERIAL FOR DOORS:				
(1	1 1/4" x 6" x 10')		Stiles cut to	length.	
(1	1 1/4" x 6" x 12')	( @ \$21.50 per	" "		
1 5	1 1/4" x 4 1/2" x 14')	M F.O.B. Short-	" "		
		leaf Pine	" "		
A <sup>o</sup> 1	1 1/4" x 4 1/2" x 12')		" "		
1	1 1/4" x 8 3/4" x 6'	(@ 24.08 per M	Stiles, cut to	length.	
	102' B.M. 3/4" x 4"	102	M & B ceiling	on doors.	4.00
	DOOR FRAMES:				
) 3	1" x 8" x 14'	pine finish 28)			1.74
) 1	1" x 8" x 12'	pine finish 8(			
) 1	2" x 12" x 14'	pine finish 28			.75
) 4	1/2" x 4" x 14'	doorstop 19			.60
	25 gallons, wood preserver Govt. Specifications, to be applied with brush.				11.25
			TOTAL		430.61
			Plus 20% Contingency-----		86.00
			Total		\$ 516.61
A <sup>o</sup>	- Door and frame estimates already included. However No. 1 C Southern Pine prices are applied to this estimate.				



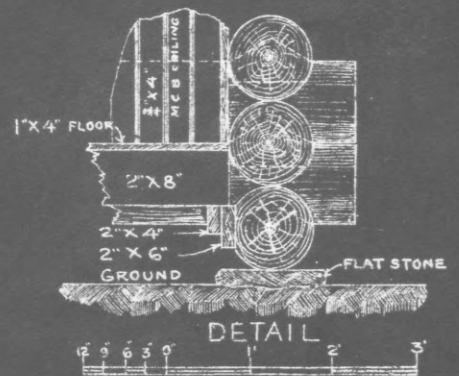
FRONT ELEVATION



HALF ELEVATION SHOWING GABLE ARRANGEMENT

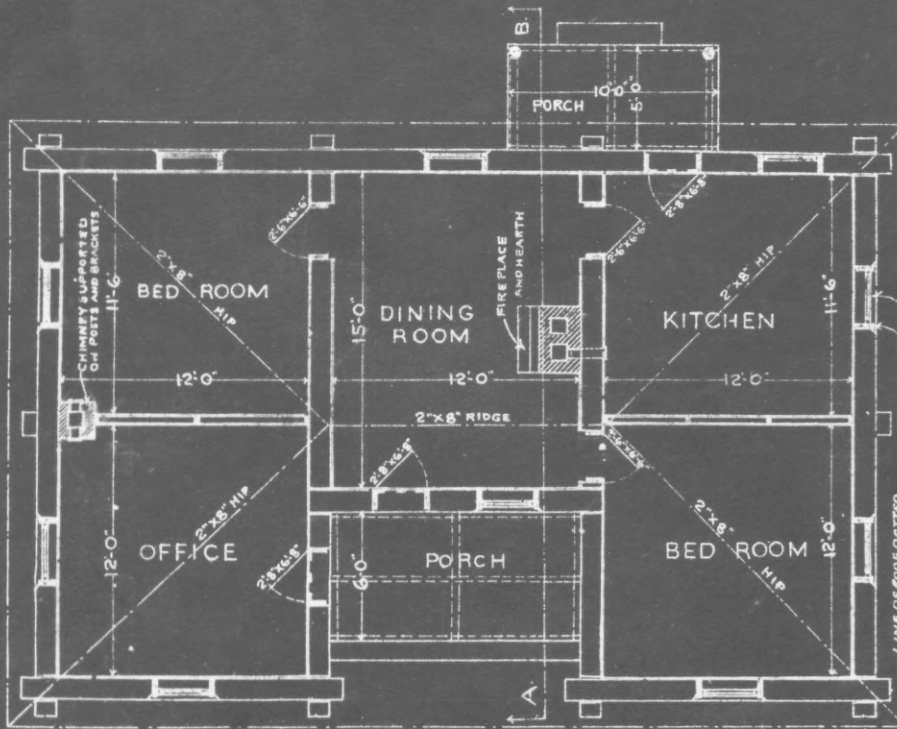


SECTION A-B



DETAIL

SCALE



FLOOR PLAN

SCALE OF FEET

ALL WINDOWS 12 LIGHTS  
10" X 12"  
2" X 8" FALSE JAMBS

U. S. DEPT. OF AGRICULTURE  
FOREST SERVICE  
1908  
STANDARD BUILDINGS  
RANGERS CABIN  
FIVE ROOMS LOGS  
PLAN No 16

BILL OF MATERIAL ACCOMPANYING PLAN NO. 14

4-Room Log House for a Bunkhouse

To be Utilized as a Storehouse  
later.

No. Pieces	D I M E N S I O N S	Ft. B.M.	Use in struc.	Cost
3	6"diam x 7' long		For porch posts	.00
23	Ave. 12"diamx31'l.		Logs on sides and log sill.	
22	Ave. 12" diam. x 26'l.		Logs, ends	
4	2"x6"x14' long	56	Joist sill	1.28
4	2"x4"x14' long	37	Joist sill	.93
6	6"x6"x1' cut from log	18	Blocks for porch sills	
1	4"x6"x12'	24	Porch sill	1.13
3	2"x6"x16'	48	Porch joists	.85
38	2"x8"x12'	608	Floor joists	11.00
10	2"x4"x10')	67	Studding	
3	2"x4"x12')	24	Plates & Girts	3.33
6	2"x4"x14')	56	Plates, girts, and posts.	
2	2 x 6 x 16	32	Bracing under chimney.	.70
2	2 x 6 x 14	28	Rafter Plate	.50
26	2 x 4 x 12)	208	Ceiling Joists	11.88
30	2 x 4 x 16)	330	Rafters	
7	1 x 6 x 16	56	Collar tie	2.24
4	2"x 4 x 10	28	Porch rafters cut in two.	.64
2	2 x 6 x 16	32	Porch rafter plates.	.90
18	1 x 12 x 16	288	Gable Boards	20.25
14	$\frac{1}{2}$ " x 4"x16'	75	Gable battens	2.25
8	1 x 4 x 12	32	Facia	1.50
4	1 x 4 x 10)	13	Facia	
8	1 x 4 x 16)	43	Verge boards	2.20

Bill of Material - #2.

No. Pieces	D I M E N S I O N S	Ft. B.M.	Use in Struc.	Cost
2	1 x 6 x 16 )	16	Saddle boards	
2	1 x 6 x 18 )	18	" "	1.50
2	1 x 12 x 16 )	32	Roof Boards	
2	1 x 12 x 18 )	36	" "	1.85
36	1 x 6 x 16 )	288	" "	
24	1 x 6 x 10 )	120	" "	15.40
4	2 x 8 x 10 )	53	False jambs, win-	
4	2 x 8 x 14 )	75	" " doors	2.95
	360 linear feet $\frac{1}{4}$ round			3.60
2	2 x 12 x 16	64	Steps	2.10
1	2 x 8 x 12	16	"	.45
7	1 x 6 x 16	56	Porch roof boards	1.05
	248 B.M. 1 x 4	248	Plancher	8.25
	570 B.M. 1 x 4	570	Matched flooring	19.80
	600 B.M. $\frac{3}{4}$ "x4" beaded ceiling	600	M & B Ceiling	16.38
	2575' BM $\frac{3}{4}$ "x4"x10' beaded ceiling	2575	Walls	80.95
	10,000 shingles, 4"x18"*		Roof and Porch <del>Chimney</del>	
	5 bushels lump lime		"	2.20
	1 cubic yard sand			1.65
4	Outside doors, 2'8"x6'8" with frames and casings			17.12
5	Inside doors, 2'6"x6'6"			23.60
4	Windows, 12 lights 10"x12" with frames and casings			30.20
*Can be rived from timber on forest area by regular crew.				

Bill of Materials #3.

No. Pieces	D I M E N S I O N S	Use in	Struc.	Cost.
	9 pair of strap hinges, with screws			2 97
9	Rim locks, complete			3 15
	1 doz. window bolts			60
4	Chimney thimbles			1 68
	700 bricks <sup>a</sup>		Chimney	
10	linear feet, tin flashing			
	35 pounds 3d nails		Shingles	1 75
	65 pounds 6d nails		Flooring, ceiling and partitions.	2 93
	30 pounds 8d nails		Sheathing	1 20
	10 pounds 10d nails		Studding, joists	
	35 pounds 20d nails		rafters, etc.	1 40
	If gables are double boarded with paper between, add the following:			
12	1"x12" x 16'	192	Gable Boards	10 00
	42 yards red rosin bldg. paper			80
			TOTAL	\$ 318 11
	Material for Doors <sup>b</sup>		Stiles, cut to	
2	1½"x6"x18'		lengths.	Plus 20%
5	1½"x4½"x5'6"		"	Contingency
4	1½"x4½"x18'		"	for freight.
2	1½"x4½"x10'		"	
			Total	\$ 381. 71
6	2" x 4" x 9'6"		Studs	
5	½" x 1 3/8" x 18'		Stops	
1	1½"x8¾"x10'		Stiles	

<sup>a</sup>For this particular region layered sandstone is applicable and can be obtained easily by the regular crews.

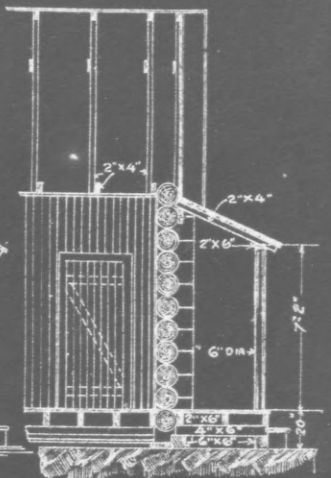
<sup>b</sup>Total estimate already included.



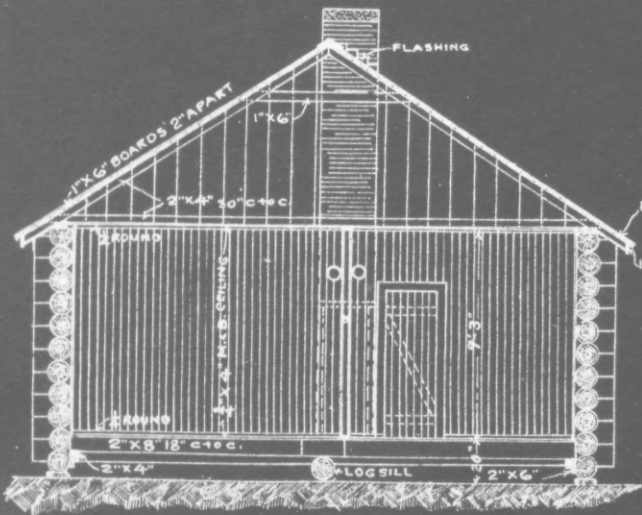




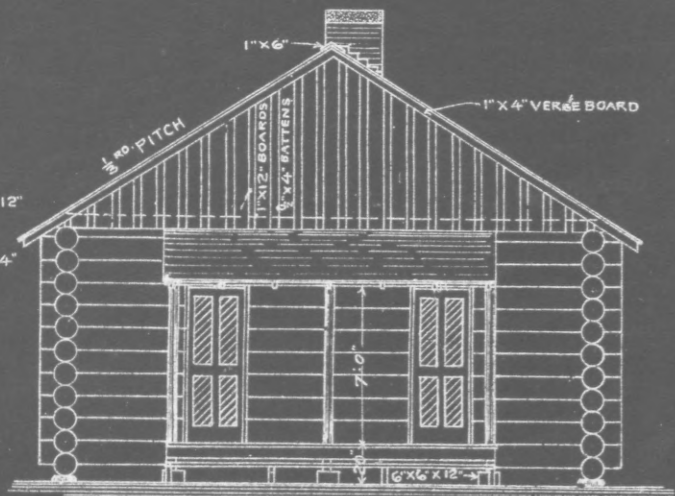
SIDE ELEVATION



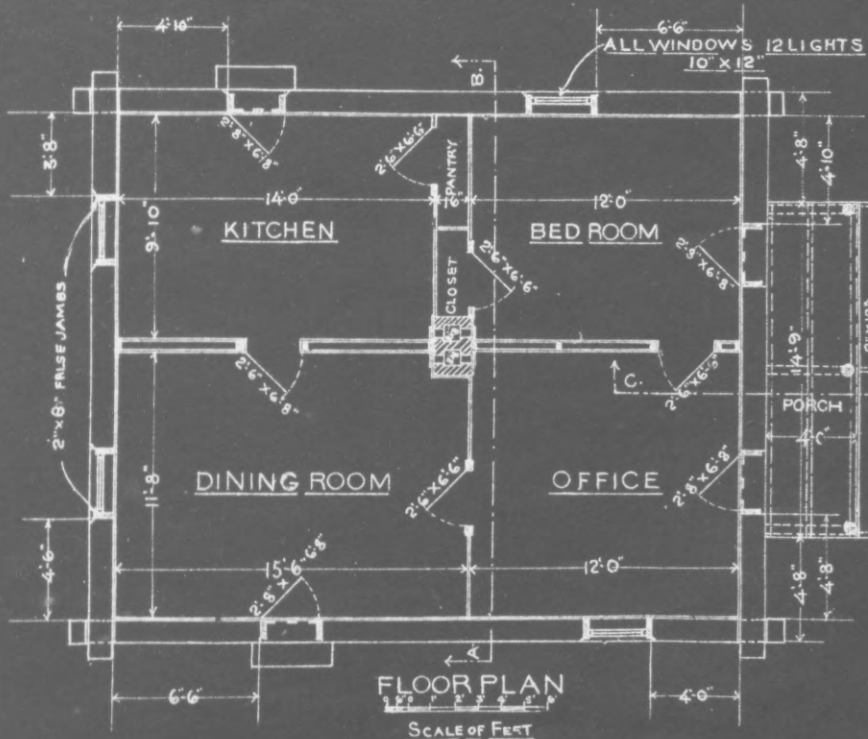
SECTION C-D



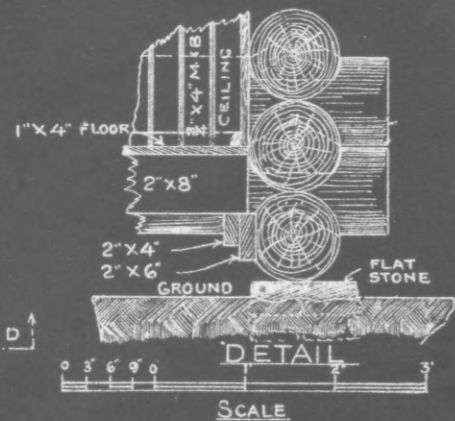
SECTION A-B



FRONT ELEVATION



FLOOR PLAN  
SCALE OF FEET



DETAIL  
SCALE

U. S. DEPT. OF AGRICULTURE  
FOREST SERVICE  
1908  
STANDARD BUILDINGS  
RANGERS CABIN  
FOUR ROOM LOGS  
PLAN No 14

I N S T R U M E N T S

Item (Description)		Price
Alidade, 30 inch scale	1*	9.15
Aneroid barometer	*	16.20
Auger, soil, Nebraska Design		9.00
Bark measurer, Swedish		
Bark scratcher		
Calipers, tree	18 inch. 34 inch	8.50 11.50
Camera, with carrying case, color screens, films, ground glass, special lenses, photometer, set of numbers, sky filter, and tripod. (A camera of this type for a Government organization and discount rate would approximate \$200. This isn't listed since most organizations have this equipment)		
Chain, surveyor's, 66** ft. stand.*		15.84
	100** ft. stand.*	
Compass, 3½" Needle*		19.20
Containers, (increment - core) Glass tubes will suffice if handled carefully - 1 doz. glass, per gross, Height 6", D. ½"		3.90
Drafting boards*		.66
Drafting instruments*		18.00
Geotome		8.00
Hypsometer, F.S. Standard and Faustman *		7.20
Increment borer * (preferably two sizes with extra bits)		15.00
Lenses, hand*		2.07
Level, Abney*		13.80
*These prices were obtained by deducting 40% discount rate from the quoted catalog prices.		
**Two lengths may be advantageously used in circular plots depending on type of topography.		

I N S T R U M E N T S

#2.

Item	Price
Microscope* field, low power.	27.00
Mirror, angle*	7.80
Mirror, ring *	.24
Pins, Surveyor's (Set of 11)	3.18
Plane tables, large and small, with Board *	5.40
with Tripod.	27.00
Plumb bobs *	.30
Potentiometer, soil acidity	150.00
Quadrant frames, Dimen 10'x4'x10" (incl.lathes)	1.10
999 Count *	1.80
Register, Tally 9999 Count*	2.70
Rods, measuring rods.	2.50
Rods, stadia *	28.80
Rules, 12-inch; steel with 1/10 inch. division; wood	1.10
with 1/8inch divisions.	.10
Scales, engineer's* 12-inch boxwood	2.00
Slide Rule *	5.10
staff, Jacob's*	1.50
T-Square, drafting*	1.74
Tapes, diameter, Lufkin*	2.19
10 ft. 20-ft. and 50 ft.	1.32
10 ft.	2.34
20 ft.	4.20
50 ft.	3.54
Tapes, surveyor's, 50 ft. 100 ft. 1-Chain, 2 - Chain	9.00
	15.84
Transit, with tripod*	231.00

\* These prices were obtained by deducting 40% discount rate from the quoted catalog prices.

## ACCESSORIES

#3

I T e M	Width "	No.	Price
Brushes, paint, several sizes	3 $\frac{1}{2}$ "	1	1.25
and stiff wire -	1"	1	.10
	4"	1	1.50
Canteen (with cover)		1	1.00
Carrying case, hand, canvas			.50
Chalk, crayon & precipitated	Per gross		.33
Cheesecloth (or cheap muslin)			
Climbers, tree 15-18" Klein Brand			4.00
Crayons, artist's in different colors; keel (red, blue, black)	Dixon Assort. 3 doz in Assortment. --		2.50
Iron, angle (for corners)		144	2.28
Knapsack			1.15
Ladder, sectional			8.45
Maps, county, forest, road, State locality	From immed.		
Nails, assort. sixpenny, eightpenny, twelvepenny, finishing.	6D 100# @ 8D " @ 12D " @	3.35 3.25 3.10	3.35 3.25 3.10
Numbering machine and tape			4.50
Paint		2 gals.	1.70
Phloroglucin-10 grms			3.15
Pins, wire (for reproduction)	14" 3/16" Round, Nickel Plated		1.40
Pipe, iron (for corners)	1"-100'		7.28
Posts, concrete for hubs or permanent corners)		50 .35	17.50
Press, plant, with blotters and papers		2 1.15	2.30
Protractors, metal & xylonite			.50

## ACCESSORIES

#4

I T E M	width <sup>17</sup>	No.	Price
Repair outfit, tape, complete, Lufkin No. 576			8.80
Rope, clothesline & 50' manilla (or hemp) $\frac{3}{4}$ - 50 ft.			1.50
Sacks, chalk, seed, soil - Kraft paper 1000		1000	@15.20
Safety belt, lineman's			4.75
Scales, postal, 25 # capacity			9.00
Screws, assorted sizes	Sizes 8 9 10 & 12	1	.55
Scribe, timber			.60
Signs, tin (for location) survey, boundary, information, etc.	14"x18"	50	@ .10
sling seat (for climbing trees)			1.25
Soil cans			1.67
Spray gun, paint			16.50
Stamps, rubber (tree numbering)			2.50
Staples, fence. - galvanized		100#	3.70
Stencils (for signs)	1 $\frac{1}{2}$ "		1.65
Tacks, carpet - $\frac{1}{4}$ lb. boxes	10 boxes		.05
Tacks, thumb - 200	2 "		.16
Tags, tree		100	1.50
Tatum holder, metal			1.65
Triangles, xylonite 30 <sup>o</sup> x60 <sup>o</sup> , 4, 6, 7, 8, 9, 10, 12, 14, 16, 18 .65, .85, 1.15, 1.85, 2.40, 3.40			.30 .40 .45 .50
Trunk for instruments & records			4.65
Twine		20#s	.30

ACCESSORIES

#5.

I T E M	Width	No.	Price
Wire, copper, noninsulated	1000 ft.	26½ per lb.	5.30
wire - stove, 50 ft.coils	12	@ .04	.42
" - telephone No. 12	1320	2.50	2.50
" -copper, rubber cov.	1000	8.00 M	8.00
<u>TOOLS</u>			
Axes, hand & single bit			1.05
Brush cutters, (pruners)			5.50
Chisel, cold & carpenter's 5" - 1 "			.15 .67
Connectors, wire			2.25
Cutters, wire			1.92
Dies, set of			15.00
Draw - share <del>files</del>			1.00
Files : Flat - 12" rat-tail - 12" triangular			.60 .45 .25
HAMMERS: Carpenter's Special Claw Machinist's Light sledge			.55 .67 1.30
Hatchet:			1.05
Knives: Bolo Butcher Hand Machete			2.25 .87 .50 2.25
Mattock			1.05
Pliers			.35
Rasp, 12"			1.10
Saws, Carpenter's hand - 26"long, 11 pts. per in.			2.53
Crosscut			5.50
Screw drivers: Large - Blade 8"			.46
Small - Blade 2½"			.25

TOOLS

#6

Item							Price	
Shovel, long-handled							1.34	
Spade, Nursery (Ames Brand)							2.91	
Whetstone - Oil and water stone							1.25	
						Total-	\$1058.39	



ESTIMATE OF MOBILE EQUIPMENT

	Cletrac 40 D(Diesel)Tractor, FOB Factory	\$ 3325.00		
	Ford V-8 Pickup	600.25*		
	Ford 2-Ton V-8 Truck: Load Space of 157 inch stake is 142 inches long, 82 inches wide, 42 inches high, 131 $\frac{1}{2}$ inch stake, 106 inches by 82 inches by 42 inches high. Dual wheels and helpers spring	750.36*		
	Dump Truck, Load Space of Hydraulic Dump truck is 84 inches long, 66 inches wide, 12 $\frac{5}{8}$ ths inch sides. Cubic capacity 1 $\frac{1}{2}$ yards. Direct on Armlift Hoist Optional 131 $\frac{1}{2}$ " wheel base, dual wheels, and helper springs.	779.40*		
	<b>TOTAL</b>	<b>\$ 5455.01</b>		
	*Discount rates have been applied. Trade-in values will lower these prices after initial purchasing.			

BILL OF MATERIAL FOR CAMP GROUND TABLE

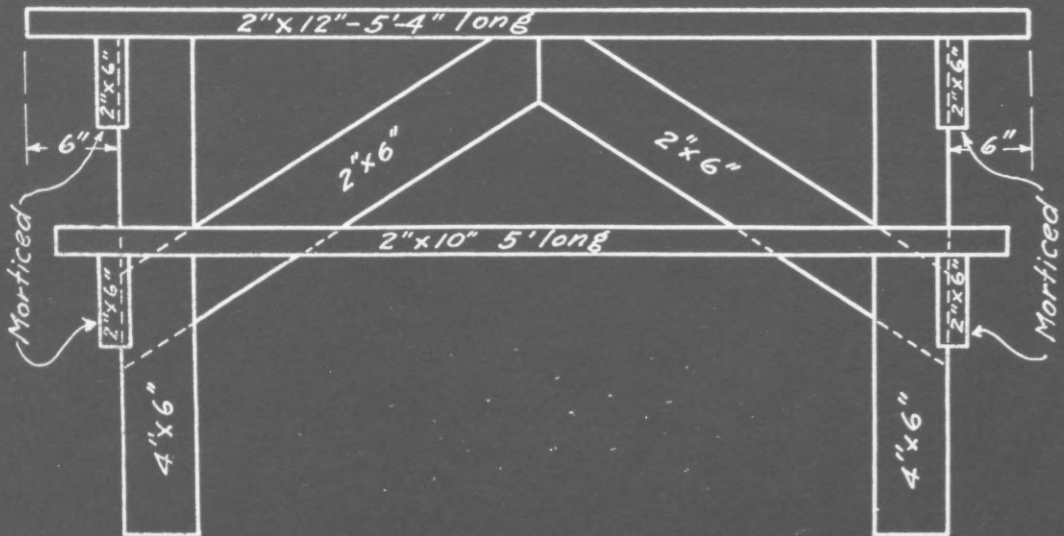
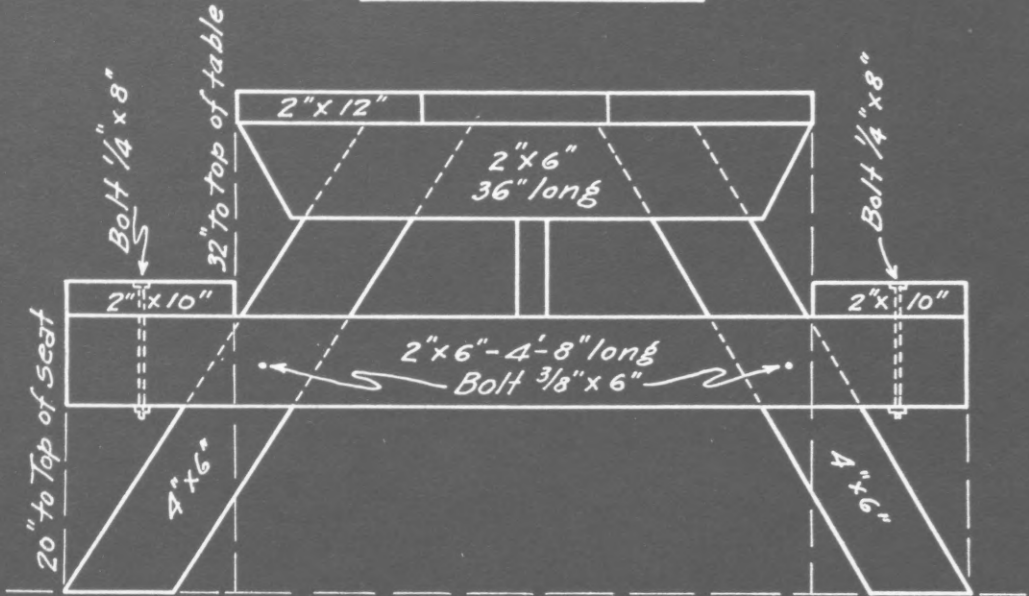
Dimensions 5'4" Long x 3' Wide -

Southern Pine

No. Pieces	D I M E N S I O N S	Ft. B.M.	Use in	Struc.	Cost
3	2" x 12" x 6'	36	Top of	Table	.80
2	2" x 10" x 10'	36	Seat		1.00
4	4" x 6" x 5'	40	Legs		1.06
2	2" x 6" x 5' )	10	Cross ties and	braces.	.22
2	2" x 6" x 3' )	6			.45
					<u>3.53</u>
			Plus 20% Contingency		.70
					<u>4.23</u>
4	a. Bolts $\frac{1}{2}$ " x 8" with washers		Holding seat		.16
4	Bolts $\frac{3}{8}$ " x 6" with washers		Attaching cross	brace to legs	.20
25	Nails 30d				.04
25	Nails 20d				.04
10	Nails 12d				.04
1	Gallon, Gray Paint				1.25
				Total	\$5.96
1	4 inch paint brush if necessary to purch.				1.65

a. All bolts should be riveted or cut with a chisel so that the nuts cannot be removed.

PLAN FOR HEAVY TABLE  
LASSEN TYPE



G.M.  
2-1-28

WATER DEVELOPMENT

Hydrant and Spring Boxes

Materials necessary are listed here rather than single estimations.

HYDRANT:

One inch pipe cut to dimensions @  $9\frac{1}{2}\text{¢}$  per ft.

Faucet - hand-turn type  $\frac{3}{4}$ " @ 65¢ each.

Elbow fittings, galvanized, for 1 inch pipe @ 12¢ each.

Drain, metal imbedded in stone rim @ 1.60 ea.

Cement @ 45¢ for 85lb. bag

SPRING BOXES:

Concrete Tile @ 1.25-30 inches.

One inch pipe gal. cut to dimensions @  $9\frac{1}{2}\text{¢}$  per foot.

CEMENT MORTAR:

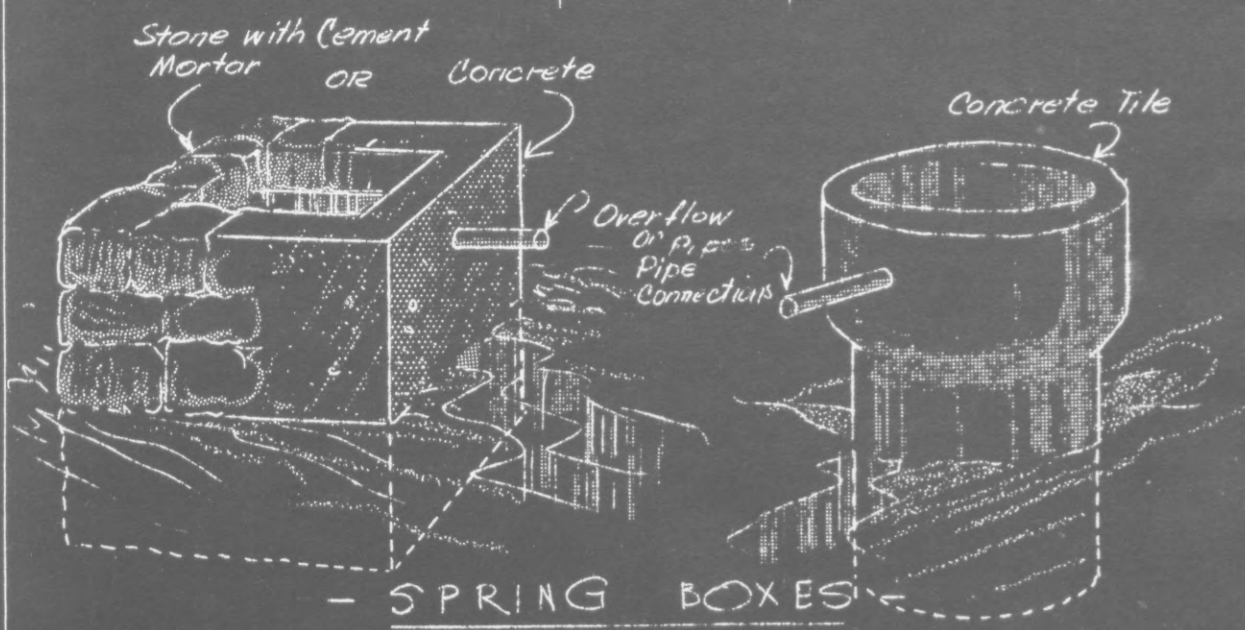
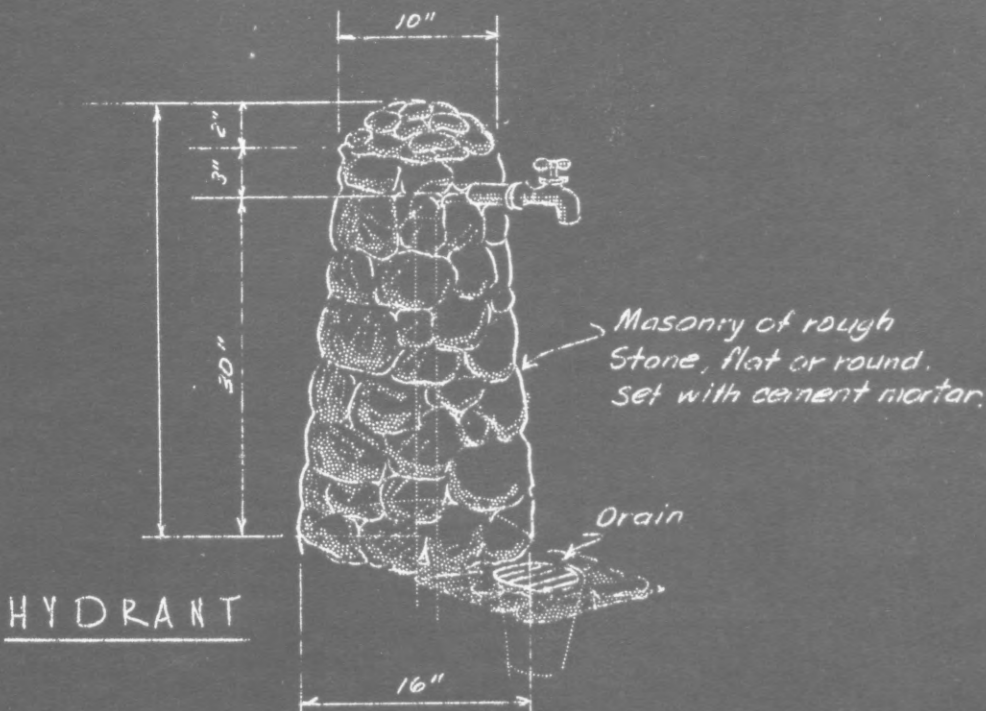
Cement @ 45¢ for 85 lb. bag

CONCRETE:\*

Cement @ 45¢ for 85 lb. bag

Sand @ \$2.50 per cubic yard.

\* Gravel available from stone on forest property or location of spring.



*Tight fitting covers will be made for boxes.*

U.S. DEPARTMENT OF AGRICULTURE  
FOREST SERVICE • REGION 9

• WATER DEVELOPMENT •

RECREATION HDBK. PLAN NO. 49a

Bulletin Boards

Inyo Type and Mono Type

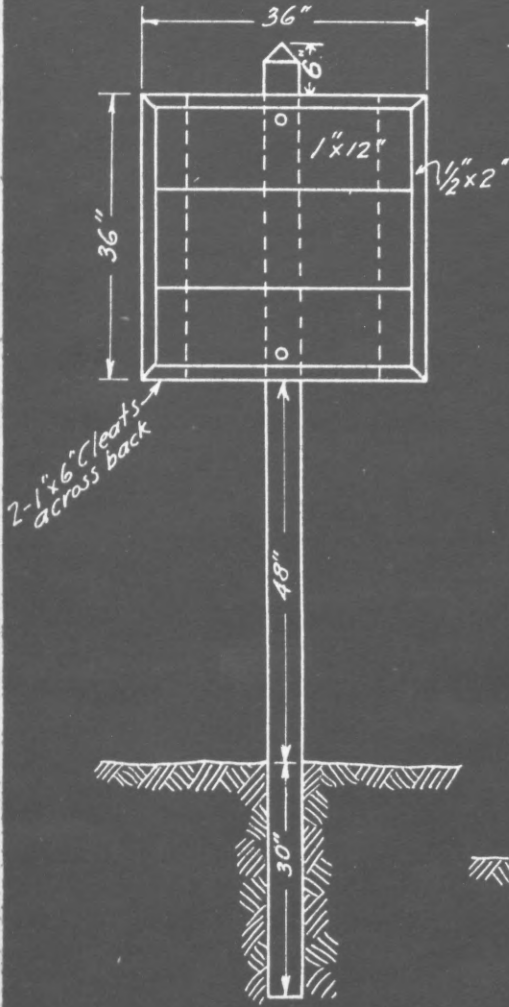
Bill of Material (Southern Pine)

No. Pieces	Dimensions	Ft. BM	Use in Structure	Cost
<u>INYO TYPE</u>				
1	4"x4"x10'	14		\$ 60
1	1"x12"x9'	9		30
2	1/2"x2"x6'	2		20
1	1"x6"x6'	3		40
2	1/4"x6" Bolts with washers.			18
1/4 lb.	3d Common nails			04
Total				I 72
Plus 20% contingency for lumber				30
Total				\$ 2.02
<u>MONO TYPE</u>				
2	4"x4"x11'	30	}	
2	4"x4"x4'	12		1 35
9	5/8"x6"x4'	18		75
30 ft.	1/4" round	30 Linear		30
1/4 lb.	6d Finishing Nails			04
1 lb.	60d. Spikes			05
Total				\$ 2 49
Plus 20% contingency on lumber				22
Total				\$ 2 71



# BULLETIN BOARDS

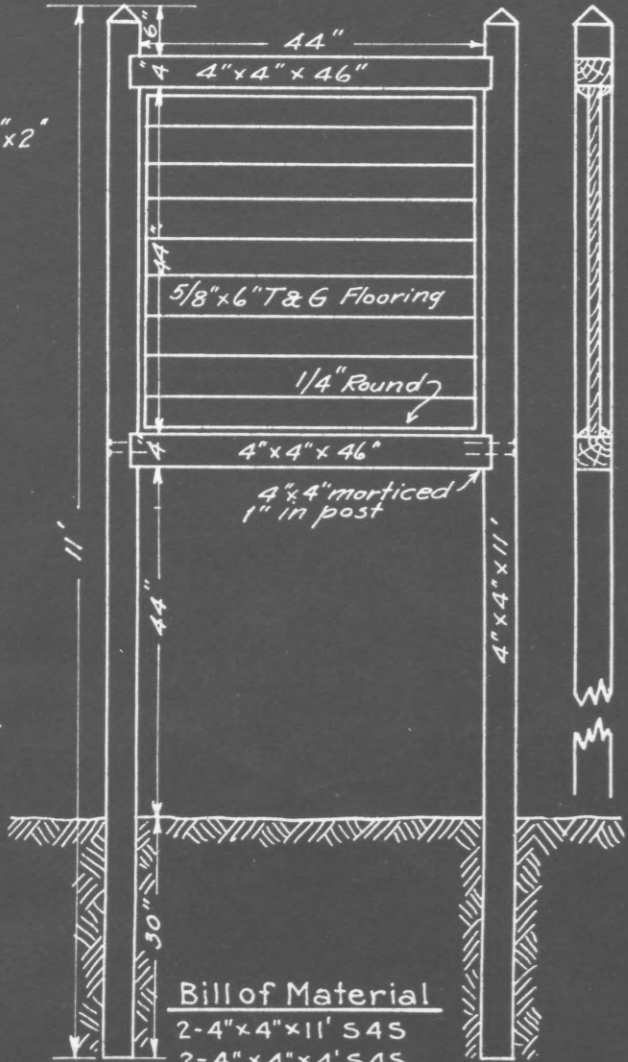
## INYO TYPE



### Bill of Material

- 1-4" x 4" x 10' S4S
- 1-1" x 12" x 9' S4S
- 2-1/2" x 2" x 6' S4S
- 1-1" x 6" x 6' S4S
- 2-1/4" x 6" Bolts with Washers
- 1/4" # 3<sup>d</sup> Common nails

## MONO TYPE



### Bill of Material

- 2-4" x 4" x 11' S4S
- 2-4" x 4" x 4' S4S
- 9-5/8" x 6" x 4'
- 30ft. 1/4" Round
- 1/4" # 6<sup>d</sup> Finishing Nails
- 1<sup>#</sup> 60<sup>d</sup> Spikes



Fire Place Plans

Tahoe Type Fire Place No. 1, No. 2, and San Bernardino Type  
Fire Place

Materials to be purchased.

Heavy stove pipe for chimney @ 25¢ per 24" joint.

1" pipe for fire irons @ 9 1/4¢ per foot.

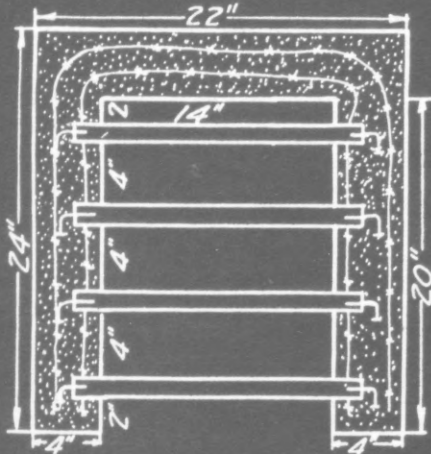
Cement to hold rock together @ 45¢ per 50 lb. bag.

40d spikes to go in ends of fire irons. @ 4¢ per lb.

No definite estimation is listed here since the size and numbers depend on the number of campers visiting the areas which is dependent on locality, availability, road development, etc.

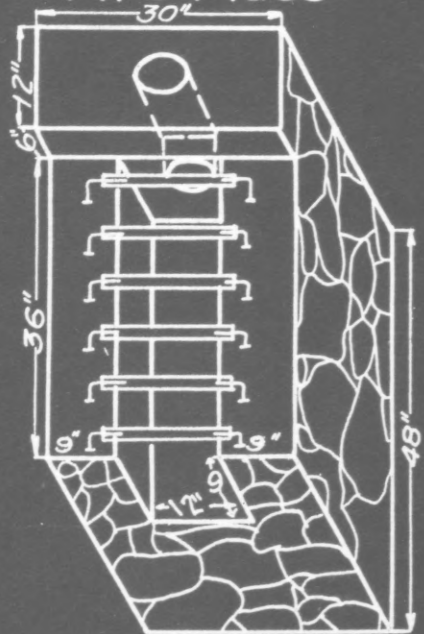
# Fire Place Plans

Tahoe Type Fire Place  
NO 1



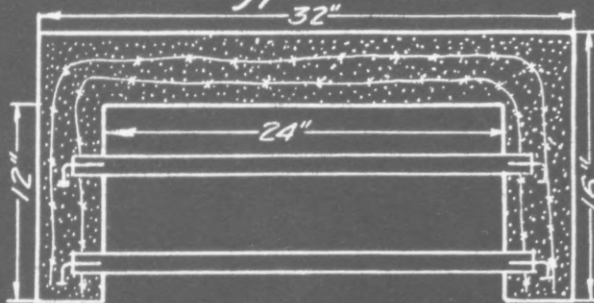
Use 1" pipe for fire irons. 40d bent spikes in end of all fire irons. All irons sunk in cement flush with top of fire place. Ends of pipes filled with cement. Use 8-10 pieces barbed wire to reinforce cement. Height of fire place 12".

San Bernardino Type  
Fire Place



Fire place is 4' long, 2½' wide, 1½' high. 2' high to Chimney. 6 pieces 1x16" pipe across top. 40d bent spikes in ends of all pipes. Ends of pipe filled with cement and sunk in cement flush with top of

Tahoe Type Fire Place No. 2 fire place.



Use 1" pipe for fire irons. 40d bent spikes in end of irons. All irons sunk in cement flush with top of fire place. Use 8-10 pieces barbed wire to reinforce cement. Height of fire place 12"

G.M.  
G.H. 29-28

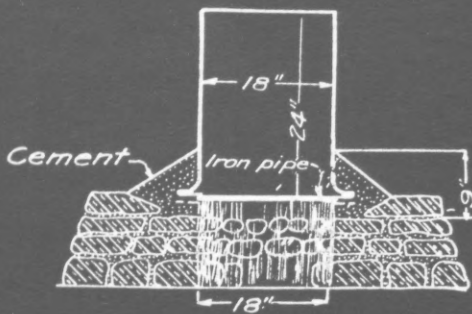
Low Cost Type of Trash Incinerators

Type with Base Laid in Cement

Mortar-1 part cement, 3 sand.

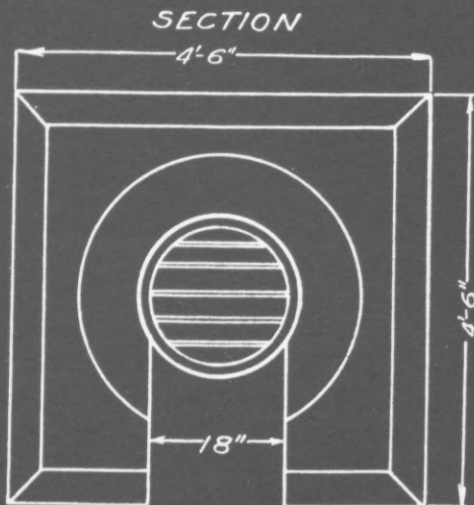
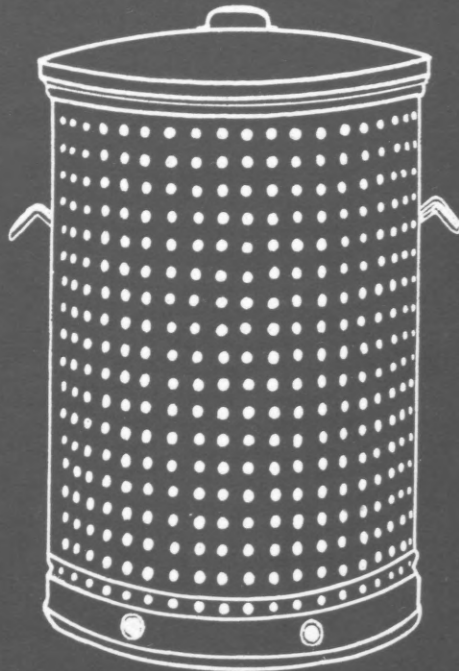
No.	Item	Cost
1	Steel drum or 16 gauge pipe, approximately 18" diameter and 24" high.	\$ 2 45
3	Lugs 1 1/2"x 1 1/2" riveted on opposite sides at base.	20
3	Sacks cement } 1/3 mixture	2 85
9	Sacks sand }	4 05
3	Pieces pipe @ 9 1/4¢ per foot 1-1"x24" long 2-1"x18" long	40
		Total \$ 9 95
Rock for base structure is available from forest property.		

## Types of Trash Incinerators



Rock laid in cement mortar. 1 part cement, 3 sand.

A standard type of movable burner



PLAN  
Material

1' 16 gauge Black iron pipe  
18" dia. 24" high with 2" flared  
bottom, old pipe or old gasoline  
drum with 3 lugs 1½ x 1½ riveted  
on opposite sides at base.  
3 sacks cement, 9 sk's sand (1-3)  
3 pc's 1" pipe 24" long, 2 pc's 18" long.

NO.	Size.	Weight.
2 Heavy	19-¾ x 31-¼	36#
3 " "	22-½ x 35-½	56

GM.  
GH 2-9-28.

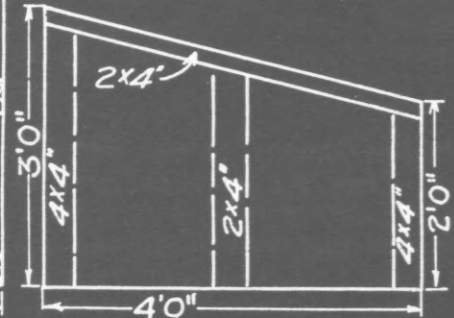
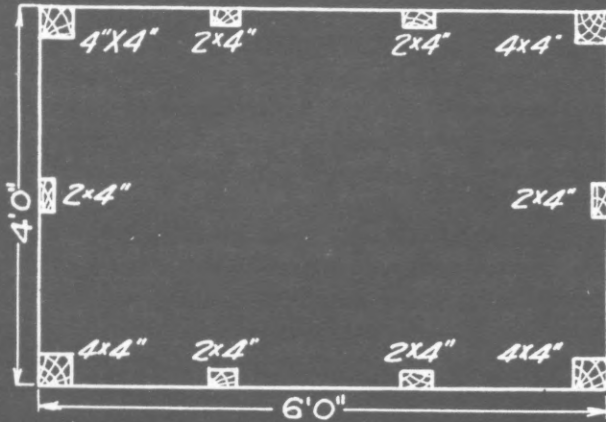
Garbage Pit Covers and Boxes

Bill of Material-Mono Box Type (Southern Pine).

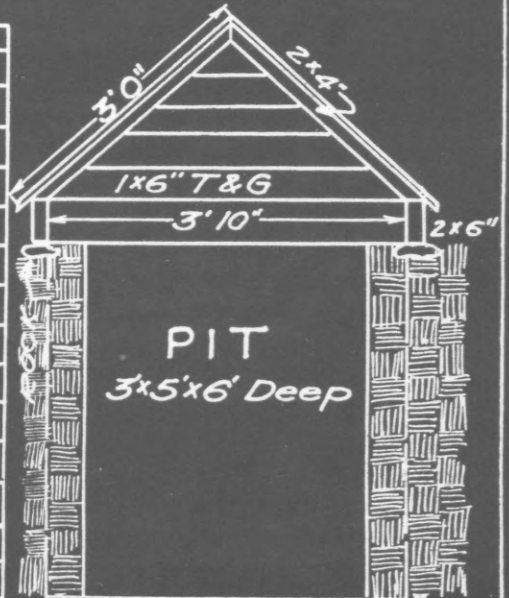
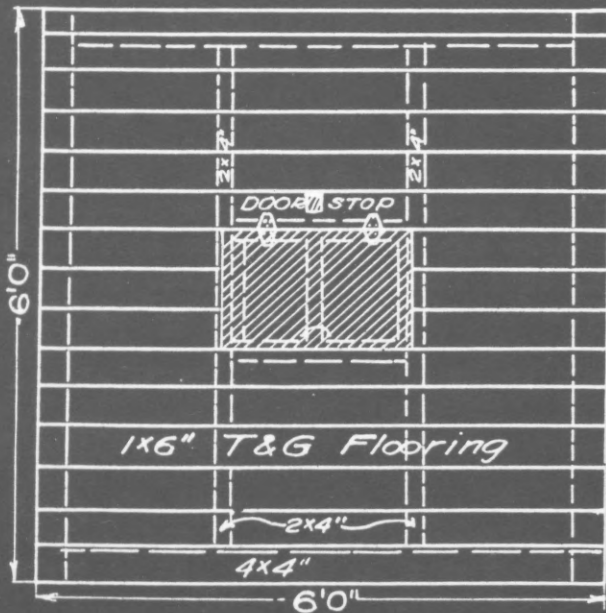
(Use in Region of Light Snowfall)

No.	Dimensions	Ft. BM	Cost
1	4"x4"x10'	15	\$ 55
4	2"x4"x10'	30	65
10	1"x8"x10' Rustic Siding or Shiplap	70	2 42
6	1"x8"x6'	24	40
	Hardware:		
1	Pair 3" Strap Hinges		09
1	Door Lift		08
2	Pounds 8D common nails		08
	Door 2'x2" at lower center of top with stop to prevent leaving open.		
			Total \$ 4 27
			Plus 20% contingency on lumber 81
			Total \$ 5 08
	This type of cover can be removed from one location to another as pits are filled.		

## Garbage Pit Covers & Boxes Mono Box Type



## Cleveland Type Pit Cover D1 Roof Type Pit Cover



G.M.  
GH 28-28

Material for Board Gate

Cut F-3

No.	Item	Feet B.M.	Cost
	8 Foot Gate		
1	1 1/4"x8"x16'	14	\$ 68
1	1 1/4"x6"x12'	6	
1	1 1/4"x6"x8'	5	
2	1"x4"x16'	12	
1	1"x4"x10'	4	
1	1"x3"x6'	2	20
6	Bolts 3/8"x4"		18
14	Bolts 3/8"x2 3/4"		42
16	Bolts 3/8"x2 3/4"		48
1	Bolt 1/2"x1 1/2"		05
1	Pair hinges, Screw strap 14" hinge		53
			<u>Total \$ 3 19</u>
			Plus 20% contingency on lumber 35
			<u>\$ 3 54</u>

Material for Board Gate

Cut F-3

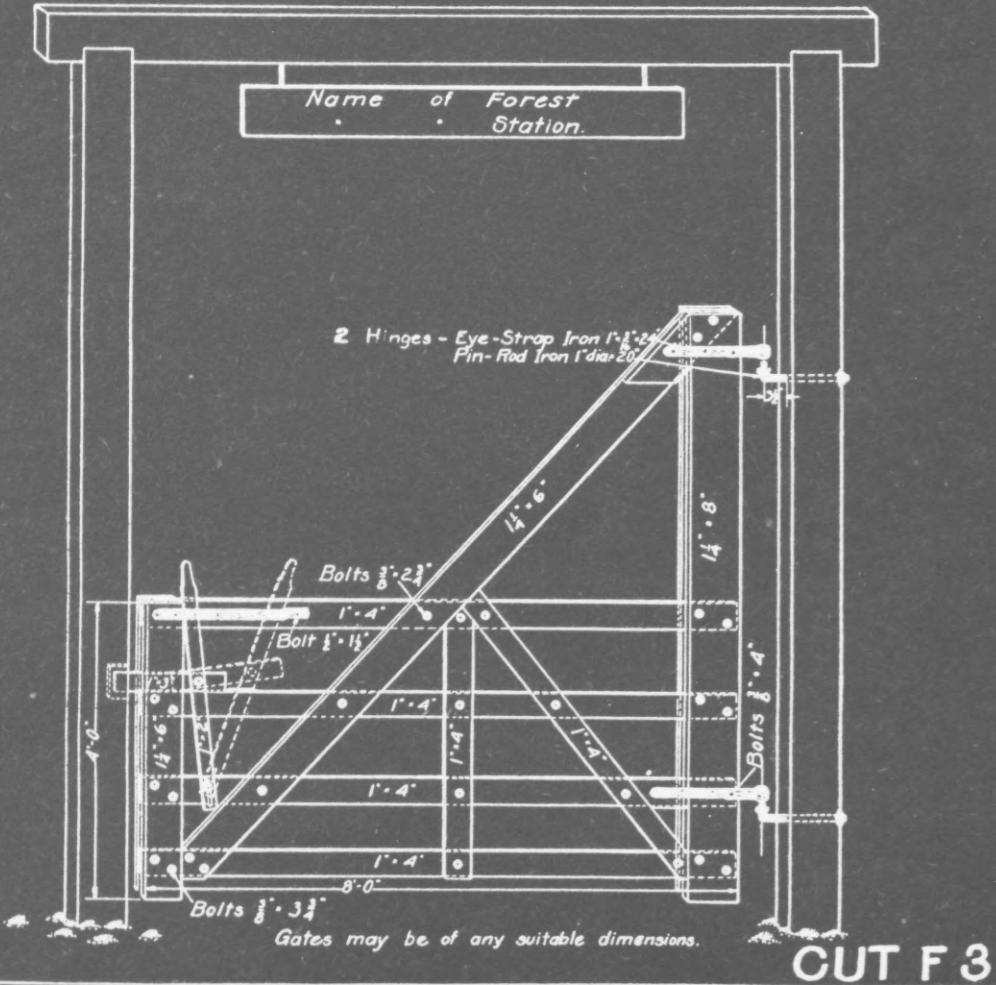
No.	Item	Feet B.M.	Cost
	12 Foot Gate		
2	1 $\frac{1}{4}$ "x8"x12'	20	\$ 45
1	1 $\frac{1}{4}$ "x6"x16'	10	45
1	1 $\frac{1}{4}$ "x6"x8'	5	
5	1"x4"x12'	20	70
1	1"x3"x6'	20	23
	Hardware as listed on preceding page.		
			1 66
			Total \$ 3 49
	Plus 20% contingency on lumber		
			40
			\$ 3 89



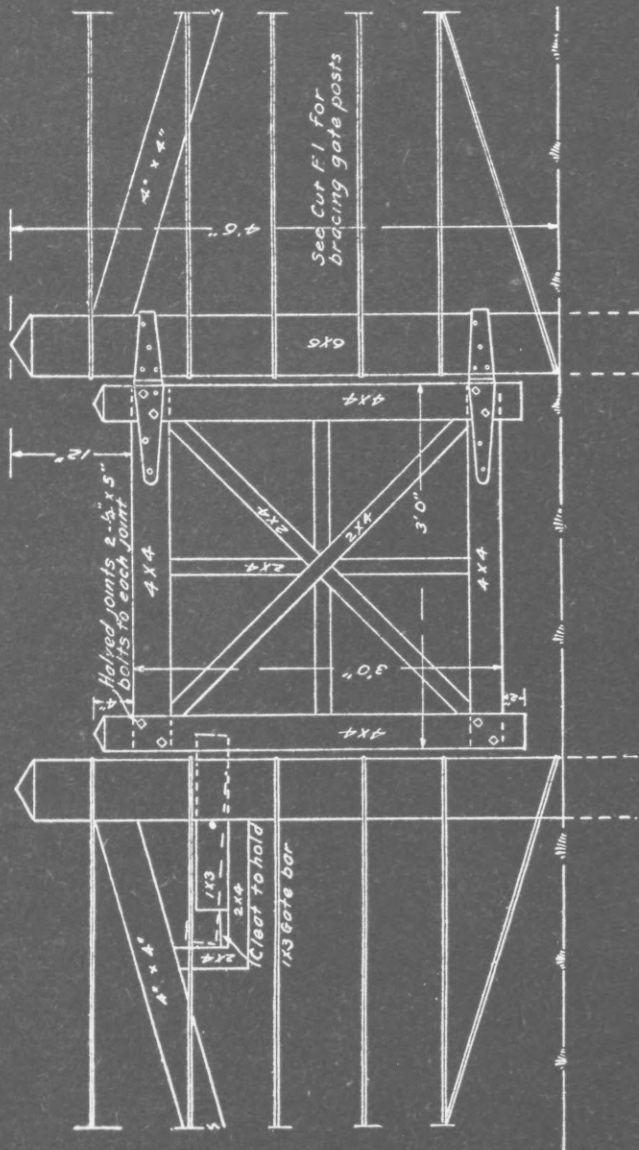
# BOARD GATE

8 Foot Gate		LUMBER BILL		Hardware	
1 piece	1 1/4" x 8' x 16'-0"	2 pieces	1 1/4" x 8' x 12'-0"	6 bolts	3/8" x 4"
1 "	1 1/4" x 6' x 12'-0"	1 "	1 1/4" x 6' x 16'-0"	14 "	3/8" x 3 3/8"
1 "	1 1/4" x 6' x 8'-0"	1 "	1 1/4" x 6' x 8'-0"	16 "	3/8" x 2 3/8"
2 "	1" x 4' x 16'-0"	5 "	1" x 4' x 12'-0"	1 "	1/2" x 1 1/2"
1 "	1" x 4' x 10'-0"	1 "	1" x 3' x 6'-0"		
1 "	1" x 3' x 6'-0"				

The same general plan should be followed for the construction of pole gates. Pole gates should have single end members. Braces and Rails should be at points of contact with other members to insure solid construction. Eye section of hinge should pass thru end member in same manner as the hook section in gate post. Bolts, not nails, should be used to fasten all members together.







DETAIL OF SINGLE GATE

- MATERIAL FOR GATE**
- 1 pc. 4x4 - 14'0" No 2 clear any spec. s+s or rough
  - 1 pc. 2x4 - 14'0" No 2 clear any spec. s+s or rough
  - 2-10" heavy strap hinges with 2" screws
  - 8-1/2" x 5" bolts
  - 1" 10d common nails
  - 1/4 Gal. outside white paint.

CUT F 4

Bill of Material for Double Latrine

Double Latrine, No. 4, 6 feet by 6 feet

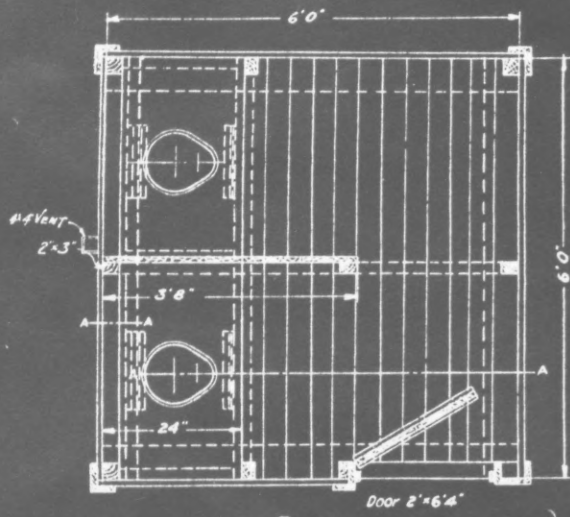
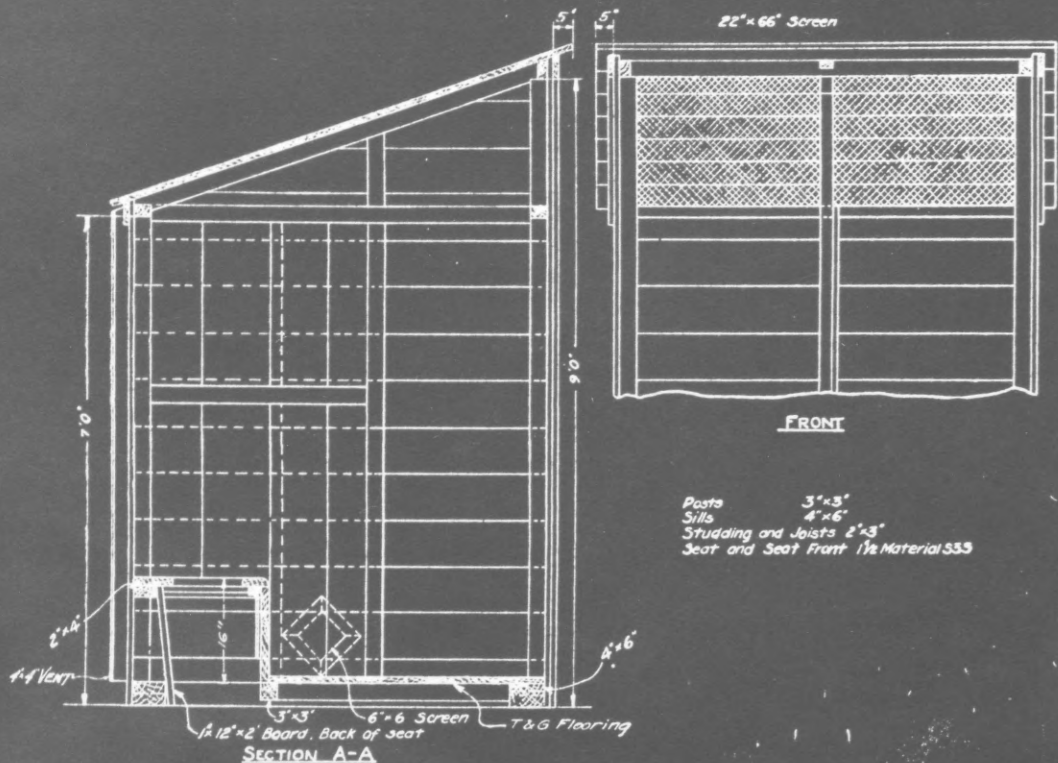
All Material No. 1 Common-Southern Pine.

No.	Dimensions	Feet B.M.	Use in Structure	Cost
2	4"x6"x12'	48	Sills	\$ 1 32
2	3"x3"x16'	24	Corner posts	82
5	2"x3"x7' }	20	Studding and door jambs	
2	2"x3"x12' }	12	Plates	1 06
3	2"x3"x7' }	12	Rafters	
2	1"x10"x7' }	12		37
2	2"x3"x10' }	10	Partition and	22
2	1"x12"x5½'	12	roof braces	52
1	1½"x24"x6'	24	Seat-3" to be ripped off for back.	80
1	1"x4"x7'	3	Seat cleats Screw to under- side.	38
1	1½"x16"x8'	22	Seat front (2' extra for lids)	80
1	2"x4"x8' }	7		
1	2"x3"x8' }	4	Seat supports	43
1	3"x3"x6' }	5	and floor joists	22
20	1"x8"x12' }	160	Rustic siding	
11	1"x8"x8' }	66	or shiplap	8 63
70	Sq. ft. heavyweight good quality, prepared roofing.		Roof covering	
9	1"x10"x7'	54	Roof sheathing	1 10
			Carried forward \$	

No.	Dimensions	Feet B.M.	Use in Structure	Cost
			Brought forward	\$
1	1"x4"x8' } extra	3		33
1	1"x12"x8' }	8		26
1	2"x3"x8' extra	4		22
16	5/8"x4"x6' T & G Flooring	32	Floor	1 05
1	1"x4"x14'	5	Barge Boards	33
1	1"x4"x14' }	5		
2	1"x4"x12' }	8	Trim, screen	2 00
4	1"x4"x10' }	16	Corner facing	
4	1"x4"x8' }	12	and vent	
3	1"x4"x7' }	9		
1	Threshold 2 feet long			
2	1"x4"x7' }	6	Door frame	35
1	1"x4"x2' }	1		
24	Linear feet 1/2"x2" screen frames.	24		1 22
16	Linear feet 1"x2"	16	Door stops	83
2	1"x4"x7' }	6	Door casing	35
2	1"x4"x3' }	2	and apron	
		Carried forward	\$	

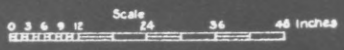
No.							Cost
	Carried forward Hardware						\$
4	Pair 3" strap or T-hinges for seat @ .09					\$	36
1	Pair 5" strap or T-hinges for door @ .20						20
4	Finch hooks and eyes for seats @ .15						60
2	Doz. 1½" screws for cleats for seat						10
1	Rim lock						35
	1 piece 6"x18" sheet metal for guard for seat front.						90
1	Stock door 2'x6'4"					4	28
	24"x84" screen-copper or galvanized.						35
3	lbs. 40d. common nails						12
3	lbs. 16d. common nails						12
8	lbs. 10d. common nails						32
8	lbs. 8d. common nails						32
4	lbs. 8d. common nails						16
1	lb. 1 inch galvanized roofing nails						08
	Paint:						
1	Gallon French gray					1	25
1	4" paint brush					1	65
	Total					\$	34 .77
	Plus 20% contingency on						
	lumber						4 .60
	Total					\$	39 .37





LATRINE No. 4.

**6' x 6' DOUBLE LATRINE**  
FOR LOCALITIES OF  
LIGHT SNOWFALL



W. H. F.  
2-1-20

## Fence Construction

Specifications Applicable to Tennessee Areas. Posts 8' Apart.

Location	Minimum Size	Length	Depth set in Earth
Gate posts (Drive or Horse)	8"x8" or 10" round	16'	4'
Gate posts (Walk gates)	6"x6" or 6" round	8'6"	4'
Corner posts	6"x6" or 6" round	8'6"	4'
End Posts (Where used)	6"x6" or 6" round	8'6"	4'
Second posts	6"x6" or 6" round	8'6"	4'
Line posts	4"x5" or 5" round	7'	2½'
<p>Posts which, after setting, project more than 4'4" above the ground should be trimmed to same height. Tops should be sawed or hewed in form of a pyramid.</p> <p style="text-align: center;">Anchor Blocks</p> <p>Anchor Blocks 2"x8"x24" sawed or split, securely fastened to posts with three 60d. wire nails.</p> <p>Foundation Blocks. 3"x10"x10".</p> <p style="text-align: center;">Braces</p> <p>Corner and Gate 4"x4" sawed, or 5" round.</p> <p>Beam over Gate 8"x8" of proper length or 10" round, notch over posts.</p>			



Wire and Staples:

Twisted galvanized 2-ply #12 smooth 5-strands in cattle country. (or barbed wire).

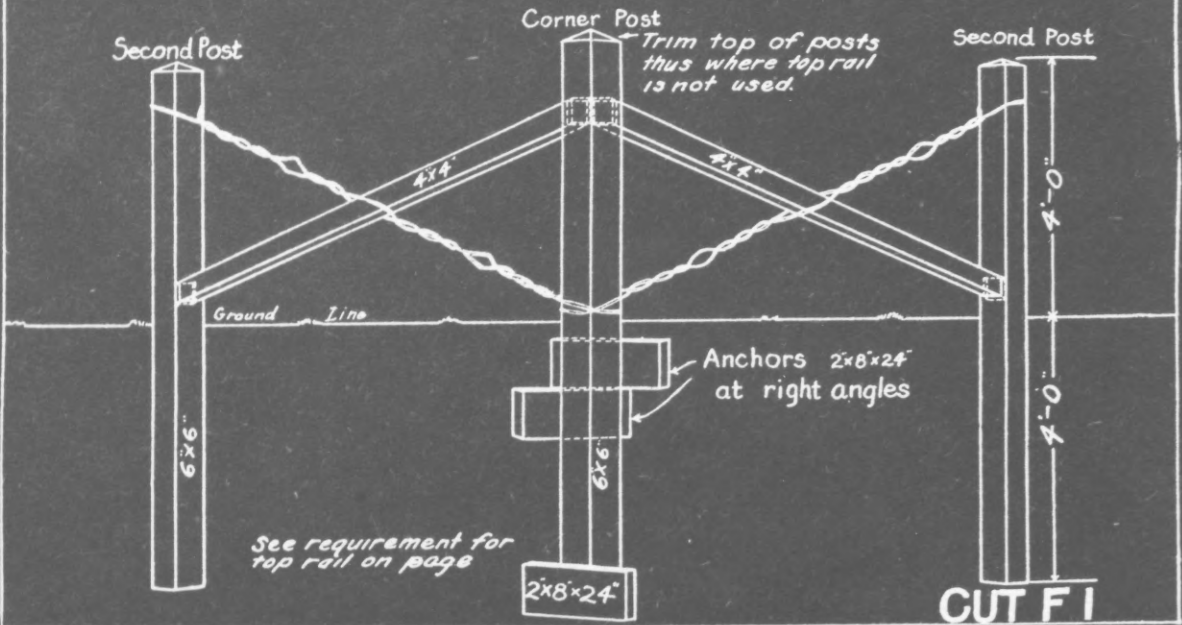
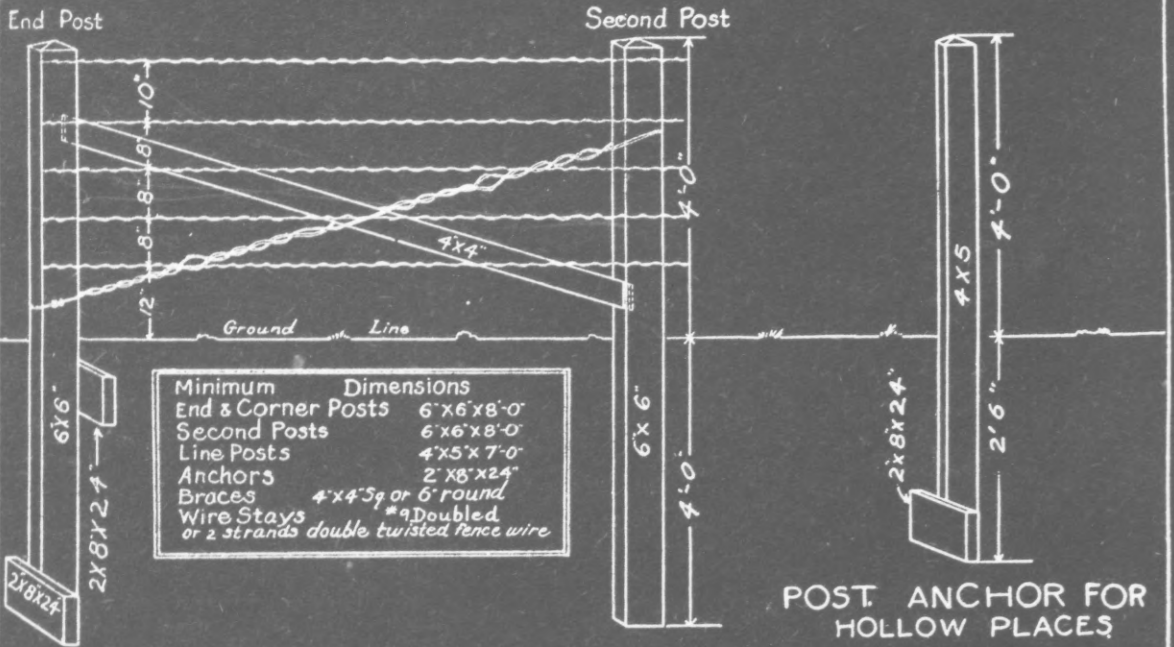
If creosote treatment is applied, a simple open tank treatment can be applied by construction with steel drums or wooden tanks (lined with metal). Cost of transportation for treated poles to location would probably offset advantage of treated poles. Also durable species are available for this area.

Data for Figuring Fence Construction  
 (Estimates May Be Approximated from the Listed Costs.)

		Item			Cost
		<p>Poles (durable species) can be obtained from forests property at or adjacent area of use. Durability and close availability will probably offset cost of creosote butt treatment. If not, equipment for a simple creosoting outfit is listed as follows:</p>			
		<p>2 steel tanks or drums-one equipped with 1" coil at base for heating by steam. @ \$2.50 each.</p>			\$ 5 00
		<p>Furnace with tank arrangement and pipes for flue for heating. (Constructed of heavy sheeting)</p>			5 45
		<p>100 feet of 1½" pipe for steam coils and steam passage from furnace allowing 24' from fire.</p>			12. 38
		<p>Wire:</p>			
		<p>Barbed wire, Galvanized hog wire, 4 point, 92 lbs per spool @ \$2.89</p>			2 89
		<p>Staples (fence) 1", @ .06 per lb.</p>			06
					\$ 25 78

	Item	Cost
	Amount carried forward	\$ 25 78
	Anchor Blocks: Can be split from available species on forest property.	
	Braces: If sawed material is desired 4"x4" material and 8"x8" material can be obtained at the following prices.	
	4"x4" @ \$32.10 per M.B.M. (Longleaf pine)	32 10
	8"x8" @ \$31.50 per M.B.M. (Longleaf pine)	31 50
	Fence stretchers and hoist, 6 lbs.	<u>1 15</u>
		TOTAL \$ 98 33

# METHOD OF BRACING AND ANCHORING POSTS OF FOREST SERVICE FENCES



Fire Line Construction  
Standard Requirements for Plow Units

Quan.	Item	Weight lbs.	Cost
1	Truck, 2 ton, listed under mobile equip.		
1	Plow, about 195 lbs.	195	\$ 32 50
2	Extra plow shares, 16" @ 2.90	28	5 80
1	Set plow bolts, extra (10) 2 $\frac{1}{2}$ "	1.4	21
1	10 inch monkey wrench	2	1 28
1	Pair pliers-Crescent Universal	.6	39
1	Chain, log, 5/16"x14', with hooks, breaking strength 5440 lbs.	17	1 79
6	Cold shut links @ .09	1.5	54
1	Clevis with grab hook for 5/16 chain, 2 $\frac{1}{2}$ "x6".	2.8	24
1	Set plow handles, extra	5	30
100	Feet No. 12 wire	25	35
1	Lantern, gas, 12 mantles	3	5 95
1	Dozen candles		15
1	Canvas container for small tools	1	20
1	Peavy, W1 handle 2 $\frac{1}{4}$ "x4 $\frac{1}{2}$ '	8.3	3 73
2	Shovels @ .23	10	46
2	Axes, D.B., handles @ 1.69	6	3 38
2	Saws, X-cut, 5 $\frac{1}{2}$ ' @ 5.70 with handles.	14	11 40
			carried forward.

Quan.	Item	Weight lbs.	Cost
1	Carried Torch, Hauck	6	\$ 9 50
4	Saw Wedges, 1½ lb. @ .15	4	60
2	Saw hammers, @ 1.00	.7	2 00
1	Tractor-(Already listed under "Mobile Equipment".		
1	Disc harrow, 8 discs, 18" in diameter.	315	<u>32 40</u>
	Total	647 lbs	Total \$103.17.

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