UNITED STATES DEPARTMENT OF AGRICULTURE

FOREST SERVICE

F. A. SILCOX, CHIEF

STANDARD LOOKOUT STRUCTURE PLANS

1938

PREPARED BY

DIVISION OF ENGINEERING

T.W. NORCROSS, CHIEF

PREFACE

While, generally, Lookout Towers from 60 to 120 feet in height are required for efficient fire detection, there are many locations where the site is such that relatively low structures are entirely adequate.

Where they offer opportunities for unusual scenic panoramas and, at the same time, are conveniently accessible to the public, either by motor or by hiking, they constitute an important point of public contact and, as such, are worthy of the same attention to architectural treatment as any other administrative or recreation structure.

Special sites of this character, sometimes including a combined parking and picnic area with adjacent toilet facilities, call for a design comprising all the purely utilitarian fire detection facilities in a structure of attractive architectural appearance, (with an observation platform for the public), rather than the usual standard wood or steel Lookout Tower.

A few pictures of towers of this type have been included as an introduction to the solely utilitarian Lookout Towers in order to furnish some practical suggestions for designs of this character, based upon prototypes which have already been built and operated with satisfaction and success.

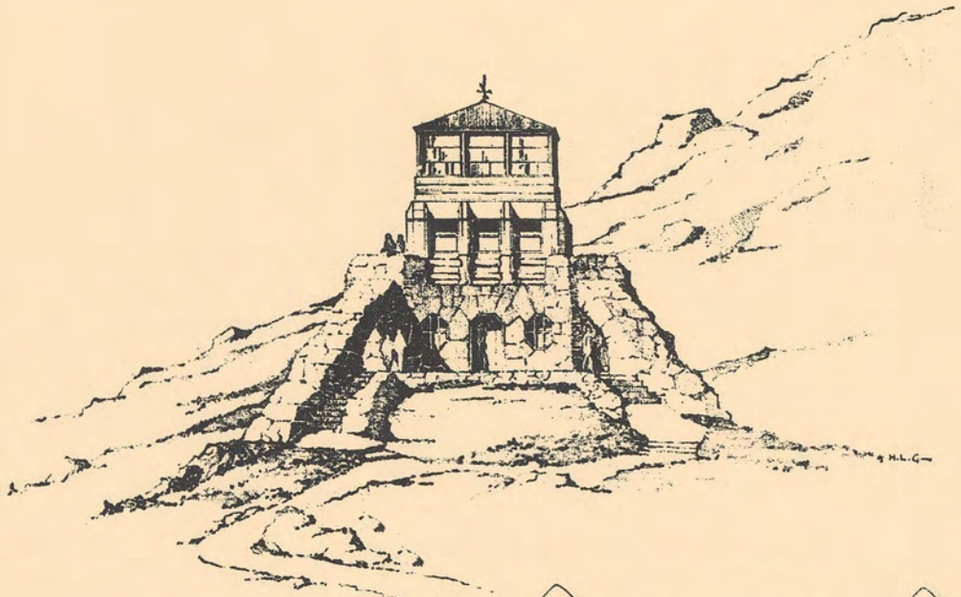
On Guard!

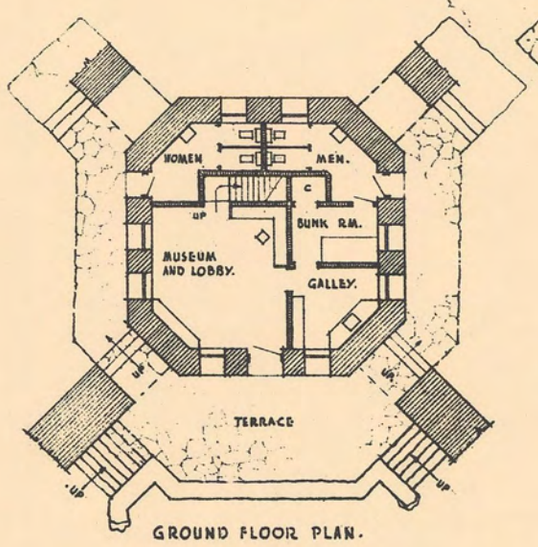
The tower and cab plans presented in this book, are the result of the best Regional Office designs. The plans and specifications have been tested in connection with large purchases providing for alternate bids on timber and steel towers. Although it does not preclude the Regional Offices from designing or purchasing towers or cabs to serve a special purpose, it is intended that those tower and cab types here presented are to be used for all ordinary purposes and are to be accepted as standard for Service-wide use.

In the table of contents will be found those offices which have furnished the tower and cab plans in this book. Additional copies of the reduced sheets of the size used here as well as prints of the normal size drawings may be obtained from the office in which the drawing originated.

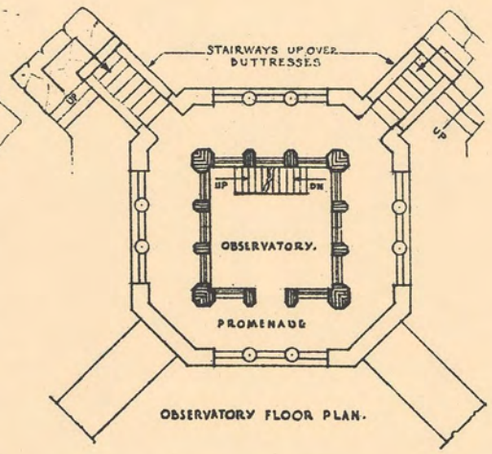
The Lookout Tower Handbook, in presenting under one cover a compilation of standard steel and timber tower plans ranging from 30 to 120 feet in height and including specifications for both materials will be of value to the field in meeting its requirements for well-designed lookout structures.

Generally, all Regions have cooperated splendidly from time to time by furnishing constructive criticisms, suggestions and data all of which has gone toward developing designs for more perfect lookout structures. Special credit must go, however, to Regions 6 and 7, which have incorporated these criticisms, suggestions and data by means of revisions and new designs into the sets of plans included in this book.

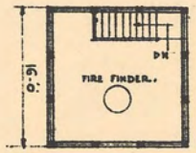




GROUND FLOOR PLAN.



OBSERVATORY FLOOR PLAN.

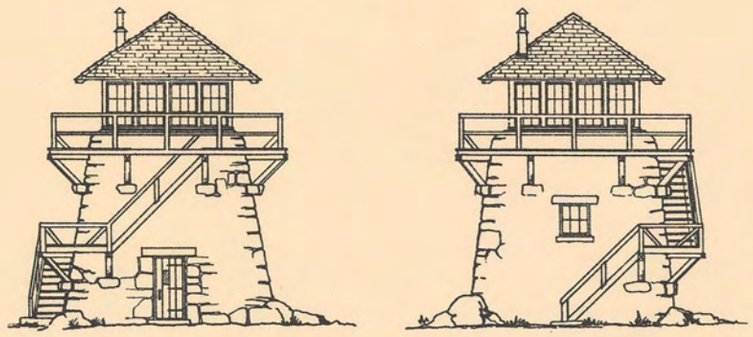


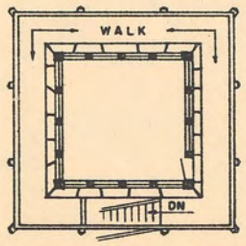
CAB FLOOR.

MOUNTAIN LOOKOUT

REGION 6

PLAN Nº 939



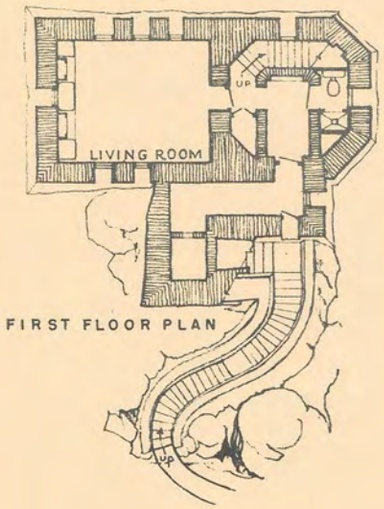


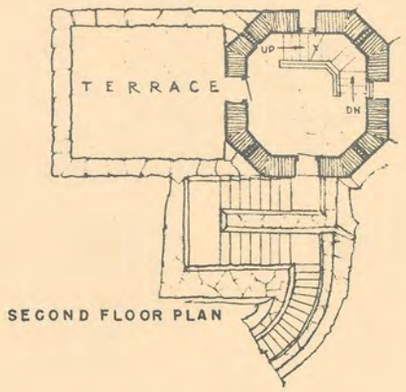
PLAN AT LOOKOUT HOUSE

FIRE TOWER FOR HIGH KNOB

GEORGE WASHINGTON NATIONAL FOREST

REGION 7

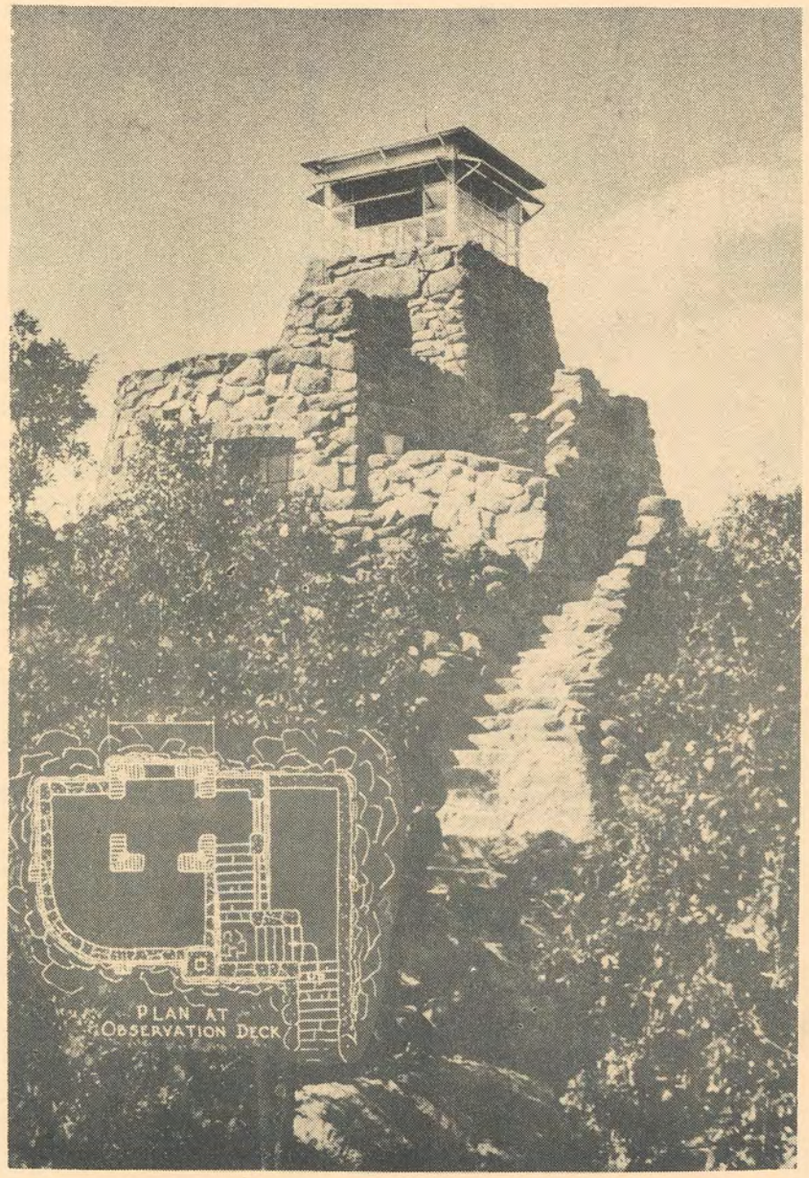




HARNEY PEAK LOOKOUT

HARNEY NATIONAL FOREST

REGION 2



OBSERVATION TOWER AND FIRE LOOKOUT

POINT MONJEAU

LINCOLN NATIONAL FOREST

REGION 3

SECTION I - STEEL TOWERS

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Heights	Cab Size	Cab Material	Drawing No.	Remarks	Region	Page
Introduction						1
30'-0" 41'-3" 54'-0" 67'-6" 82'-6" 99'-9" 120'-0"	7'x 7'	Steel	L-1400 Series	Cab plans on drawing L-1403. See introduction, Section I and III. Drawings L-1404 and L-1405 are special cab plans and are not included in this book.	7	2
30'-0" 41'-3" 54'-0" 67'-6" 83'-1½" 100'-4½" 120'-0"	14' x 14'	Wood	L-1600 Series	Cab plans not included with these drawings. Use 14' x 14' wood cab - see Introduction, Section III.	7	3

SECTION II - TIMBER TOWERS

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Heights	Cab Size	Cab Material	Tower Type	Drawing No.	Remarks	Region	Page
Introduction							4
31'	7' x 7'	Wood	CT-5	L-11900 Series.	Plans of 31' height not included in this book but are available in Region 6. The top three panels of the CT-5 tower type comprise the 31' height.	6	
41'	7' x 7'	Wood	CT-5	L-12000		6	5
For all heights of CT-5 Tower	7' x 7'	Wood	CT-5	L-10002	Alternate Tower Details for cab without catwalk - See Introduction, Section III. For use if cab is to be built without catwalk.	6	6
52'	7' x 7'	Wood	CT-1	L-10100 Series.	Plans of 52' height not included in this book but are available in Region 6. The top five panels of the CT-1 tower type compose the 52' height.	6	
66'	7' x 7'	Wood	CT-1	L-10200 Series.	Plans of 66' height not included in this book but are available in Region 6. The top six panels of the CT-1 tower type compose the 66' height.	6	

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Heights	Cab Size	Cab Material	Tower Type	Drawing No.	Remarks	Region	Page
82'	7' x 7'	Wood	CT-1	L-10300 Series	Plans of 82' height not included in this book but are available in Region 6. The top seven panels of the CT-1 tower type compose the 82' height.	6	
99'	7' x 7'	Wood	CT-1	L-10400 Series.		6	7
119'	7'x 7'	Wood	CT-1	L-10500 Series.		6	8
For all heights of CT-1 tower	7' x 7'	Wood	CT-1	L-10001	Alternate Tower Details for Cab without catwalk - See introduction Section II. For use if cab is to be built without catwalk.	6	9
29'	14' x 14'	Wood	CT-2	L-11300 Series	Plans of 29' height not included in this book are available in Region 6. The top two panels of the CT-2 tower type comprise the 29' height.	6	
41'	14' x 14'	Wood	CT-2	L-11400 Series	Plans of 41' height not included in this book but are available in Region 6. The top three panels of the CT-2 tower type comprise the 41' height.	6	
53'	14' x 14'	Wood	CT-2	L-11500 Series		6	10

SECTION II - TIMBER TOWERS,
Continued

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Heights	Cab Size	Cab Material	Tower Type	Drawing No.	Remarks	Region	Page
20'	14' x 14'	Wood	CT-3	L-11000 Series.	See Introduction, Section II. Plans of the 20' height not included in this book but are available in Region 6.	6	
30'	14' x 14'	Wood	CT-3	L-11100 Series.	See Introduction, Section II. Plans of the 30' height not included in this book but are available in Region 6.	6	
40'	14' x 14'	Wood	CT-3	L-11200 Series.	See Introduction, Section II	6	11
65'	14' x 14'	Wood	CT-4	L-10600 Series.		6	12
83'	14' x 14'	Wood	CT-4	L-10700 Series.	Plans of 83' height not included in this book but are available in Region 6. The top five panels of the CT-4 tower type comprise the 83' height.	6	
100'	14' x 14'	Wood	CT-4	L-10800 Series.		6	13
117'	14' x 14'	Wood	CT-4	L-10900 Series	Plans of 117' height not included in this book, but are available in Region 6. The top seven panels of the CT-4 tower type comprise the 117' height.	6	

SECTION II - TIMBER TOWERS
Continued

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Heights	Cab Size	Cab Material	Tower Type	Drawing No.	Remarks	Region	Page
10'	14' x 14'	Wood	RT-1	L-11600 Series.	Plans of the L-11600 Series not included in this book but are available in Region 6. The top one and two panels, respectively, of the RT-1 tower type comprise the 10' and 24' heights. See also Introduction, Section II.	6	
24'	14' x 14'	Wood	RT-1	L-11700 Series.	Plans of the L-11700 Series not included in this book but are available in Region 6. The top one and two panels, respectively, of the RT-1 tower type comrpise the 10' and 24' heights. See also Introduction, Section II.	6	
40'	14' x 14'	Wood	RT-1	L-11800		6	14
40'			Treated Pole	L-5-01	See Introduction, Section II	9	15

SECTION III - TOWER CABS

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Cab Size	Tower Heights	Cab Material	Tower Type	Drawing No.	Remarks	Region	Page
Introduction							16
With the 7' x 7' Steel Tower, use the 7' x 7' steel cab plans, drawing L-1403, Page 2 B, included with the tower plans in Section I. See also Introduction, Sections I and III.							
With the 14' x 14' Steel Tower, use the 14' x 14' Wood Cab plans in this section. See Introduction, Section III, for the revision necessary to fit the cab as detailed to the Steel Tower.							
7' x 7'	For all heights	Wood	CT-1 & CT-5	B-4101 B-4102 B-4103	See Introduction, Section II for use of cab without catwalk.	6	17
14' x 14'	For all heights	Wood	14' x 14' Steel tower; CT-2, CT-3, CT-4, & RT-1 Timber towers.	B-4201	See Introduction, Section III for use of cab with 14' x 14' Steel Tower.	6	18
7' x 7'	For all heights	Wood		T-2309 T-2409	Flagpole details, see Introduction, Section III.	6	19
7' X 7'	" " "	Steel		L-1409	Mounting for antennae support	6	19a
7' X 7'	" " "	Wood		L-12201	" " " "	6	19b
14' X 14'	" " "	Wood		L-12301	" " " "	6	19c

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Introduction		6	20
Guy Cable Sag Curves for Timber Towers	L-20000 Series	6	21
SECTION V - LIGHTNING PROTECTION			
Introduction			22
SECTION VI - SUGGESTED SPECIFICATIONS FOR STEEL & TIMBER TOWERS AND CARS			
Introduction			23
Specifications for Steel Lookout Towers			24
Specifications for Timber Lookout Towers			25
Specifications for 7' x 7' Wood Lookout House			26
Specifications for 14' x 14' Wood Lookout House			27

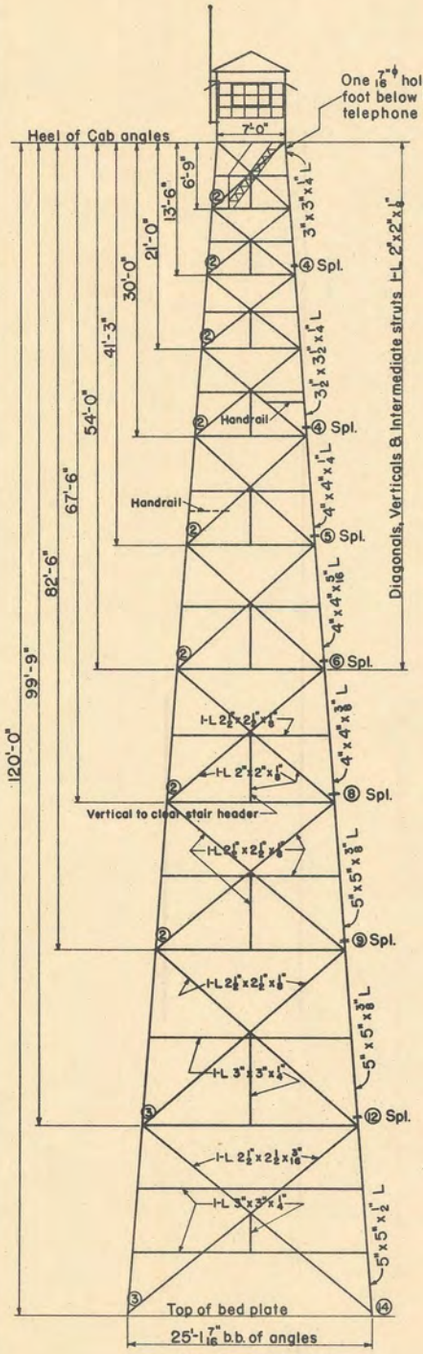
SECTION I

STEEL TOWERS

The drawings in this Section are of steel towers with a 7' x 7' cab and of steel towers with a 14' x 14' cab.

Because the tower drawings for the 7' x 7' cab include details of the cab, it is suggested that advertisements for bids on the tower include bids for the cab.

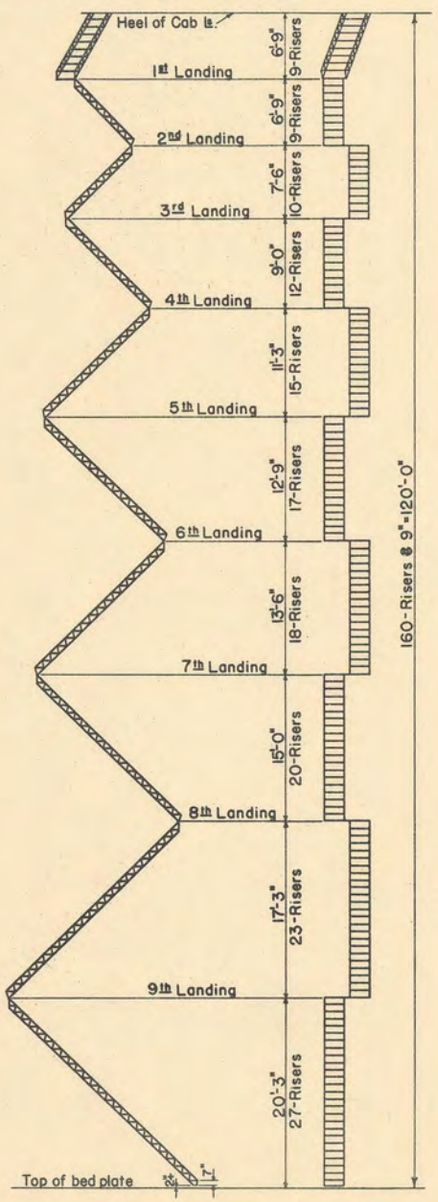
The tower drawings for the 14' x 14' cab do not include details of the cab. The 14' x 14' wood cab drawings are adaptable to the steel towers, with the necessary revisions shown in the introduction to Section III, and may be used for purchasing towers complete with cab.



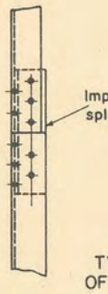
TOWER ELEVATION

BASE DIMENSIONS

Tower Height	b.b. of Leg ls.
At Cab	7'-0"
30'-0"	11'-6 3/8"
41'-3"	13'-2 3/4"
54'-0"	15'-1 7/8"
67'-6"	17'-2 5/16"
82'-6"	19'-5 1/2"
99'-9"	22'-0 3/4"
120'-0"	25'-1 7/16"



STAIR ELEVATION
Handrails not shown



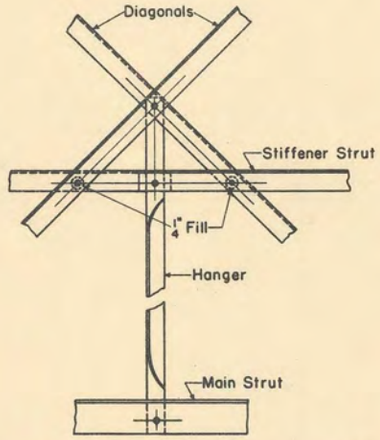
Important:- All holes in leg angle splices must be STAGGERED

Toes of all crimped angles must be even and equal distance from rivet holes

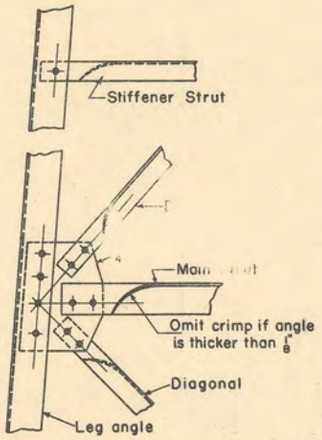
TYPICAL DETAIL OF CRIMPED ANGLES

Grind heel of splice angle to fit

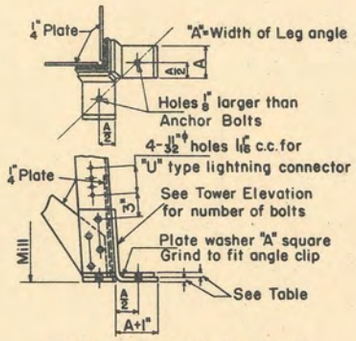
TYPICAL SPLICE FOR LEG ANGLES
For five rivet connection, Others similar



TYPICAL CONNECTION OF DIAGONALS, MAIN STRUTS, STIFFENERS & HANGERS.



DIAGONAL AND STRUT CONNECTIONS TO LEG ANGLE
For two rivet connection, Others similar



TYPICAL DETAIL OF BASE

STRUCTURAL CONNECTIONS

Angle size	Rivet or Bolt size	Min. Pitch	Edge dist. Sheared	Edge dist. Rolled or Planed
2 1/2" or more	3/4" ϕ	2 1/2"	1 1/4"	1 1/8"
2" & 2 1/4"	5/8" ϕ	2 1/4"	1 1/8"	7/8"
1 3/4"	1/2" ϕ	1 3/4"	1"	3/4"
1 1/2"	3/8" ϕ	1 1/2"	7/8"	5/8"

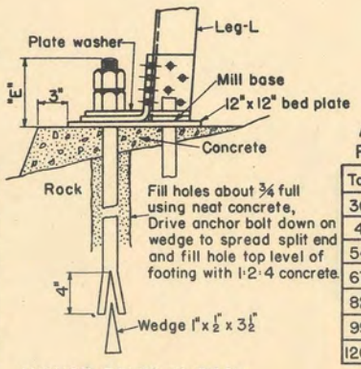
APPROXIMATE WEIGHT OF STRUCTURAL STEEL AND METAL ACCESSARIES
ANCHOR BOLTS NOT INCLUDED

Tower Height	Type of Cab Standard	Type of Cab Platform
30'-0"	5600 lbs.	6000 lbs.
41'-3"	7100 "	7500 "
54'-0"	9000 "	9400 "
67'-6"	11150 "	11550 "
82'-6"	13900 "	14300 "
99'-9"	17550 "	17950 "
120'-0"	22500 "	22900 "

FEDERAL SPECIFICATIONS
Structural Steel, QQ-S-711, Class-A non-copper.
Rivet Steel, QQ-S-711, Class-C non-copper.
Anchor Bolts, QQ-B-71, Grade-1, Class-A, Type-A.

THICKNESS OF BASE CONNECTIONS

Ht. of Tower	Angle Clip	Pl. Washer	Bed Plate
30'-0"	1/2"	1/2"	12" x 1/2" x 1'-0"
41'-3"	5/8"	1/2"	12" x 1/2" x 1'-0"
54'-0"	5/8"	5/8"	12" x 1/2" x 1'-0"
67'-6"	3/4"	5/8"	12" x 1/2" x 1'-0"
82'-6"	3/4"	5/8"	12" x 1/2" x 1'-0"
99'-9"	7/8"	3/4"	12" x 5/8" x 1'-0"
120'-0"	7/8"	3/4"	12" x 3/4" x 1'-0"



ANCHOR BOLTS IN ROCK
For anchor bolts in concrete see R-7 dwg. no. L-1406-A

ANCHOR BOLTS IN ROCK FOUNDATION

Tower	Bolts	Wt. lbs	E
30'-0"	3/4" ϕ x 4'-6"	55	3 3/4"
41'-3"	3/4" ϕ x 4'-6"	58	4"
54'-0"	7/8" ϕ x 5'-2"	82	4 1/2"
67'-6"	1" ϕ x 6'-0"	119	5"
82'-6"	1" ϕ x 6'-0"	127	5"
99'-9"	1 1/8" ϕ x 6'-9"	196	5 3/4"
120'-0"	1 1/4" ϕ x 7'-3"	242	6 1/4"

8-Bolts required for all tower heights.

U. S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE

REGION SEVEN — J.C. DORT — REGIONAL ENGINEER

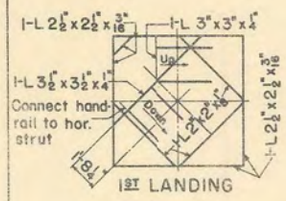
STANDARD STEEL LOOKOUT TOWERS
30' 41'-3" 54' 67'-6" 82'-6" 99'-9" & 120' HIGH
CAB SEVEN FEET SQUARE
ELEVATION AND TYPICAL CONNECTIONS

DESIGNED R.E.P. D.B. — DRAWN A.H.B.
CHECKED E.G.M. — TRACED A.H.B.
RECOMMENDED FOR APPROVAL E.G.M. — DATE August 25-1937
APPROVED J.C. Dort REGIONAL ENGINEER

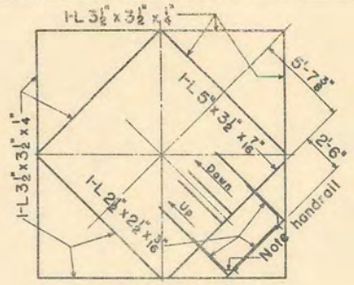
SHEET 1 OF 7

L-1401

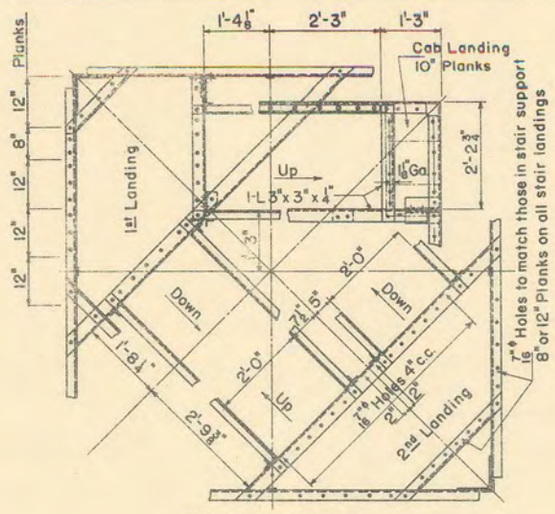
R-7-DRAWING No. L-1402



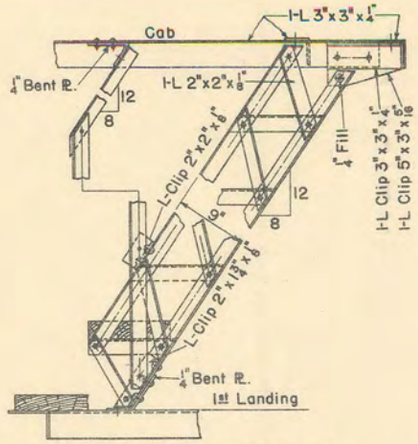
1ST LANDING



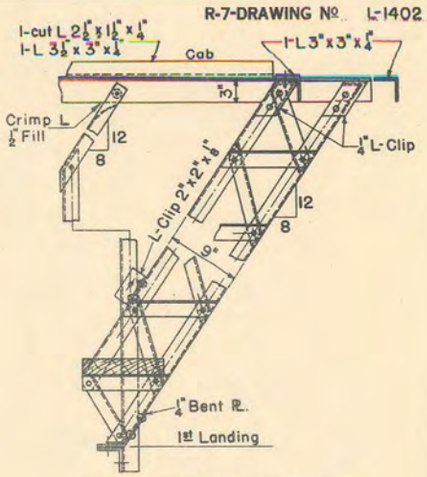
6TH LANDING



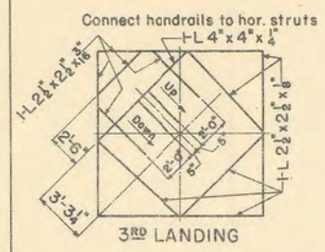
ENLARGED DETAIL
CAB, 1ST & 2ND LANDINGS



INSIDE STAIR STRINGER

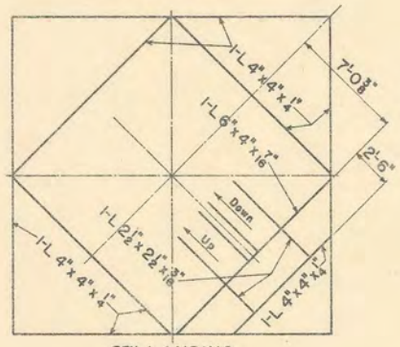


OUTSIDE STAIR STRINGER

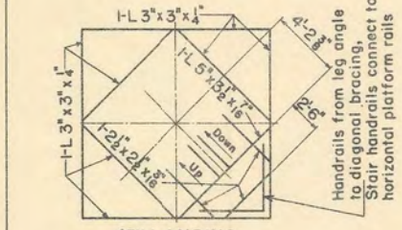


3RD LANDING

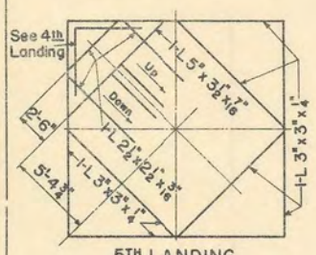
7TH LANDING



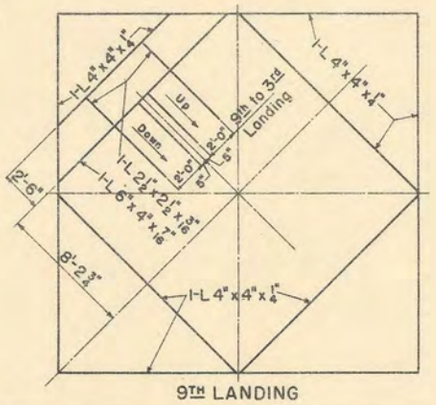
8TH LANDING



4TH LANDING

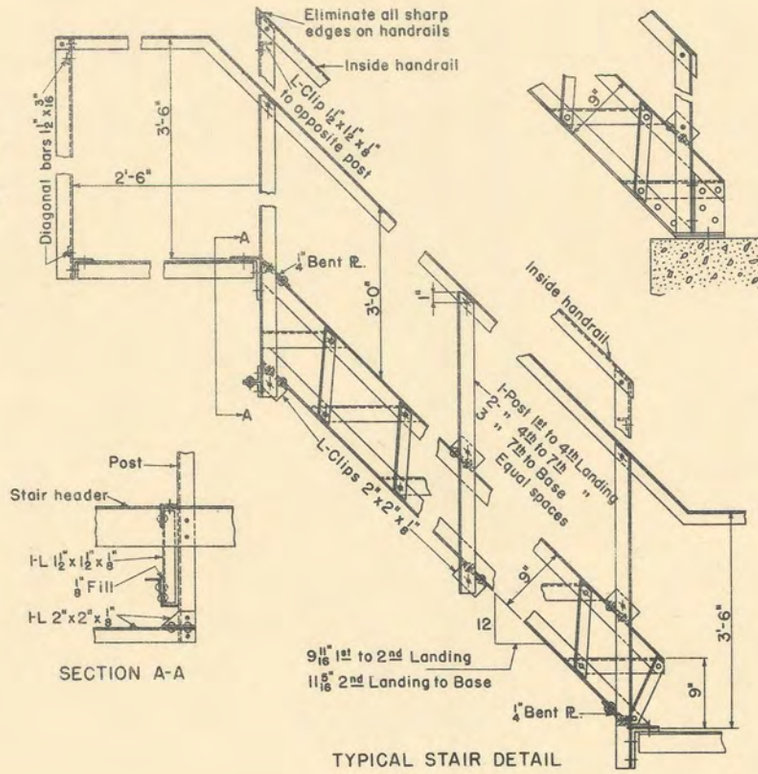


5TH LANDING

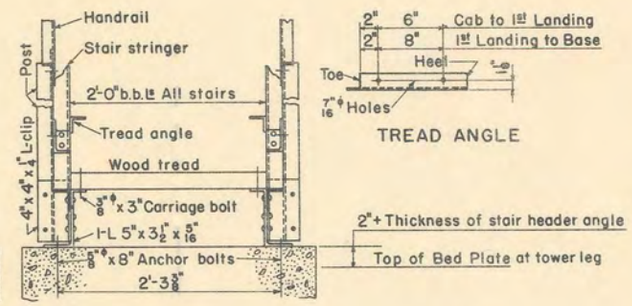


9TH LANDING

NOTE:- Punch 7/16" ϕ holes 4" c.c. in main struts for Landing planks 2nd to 5th Landings.



TYPICAL STAIR DETAIL



TREAD ANGLE

STAIR DETAIL AT BASE

Stair Stringers 1-L 2"x2"x⅛"
Tread Angles do.
Handrail Posts do.
Lattice Angles 1-L 1½"x1½"x⅛"
Handrails do.
2"x10"x2'-0" Wood treads
Cab to 1st Landing
2"x12"x2'-0" Wood treads
1st Landing to Base

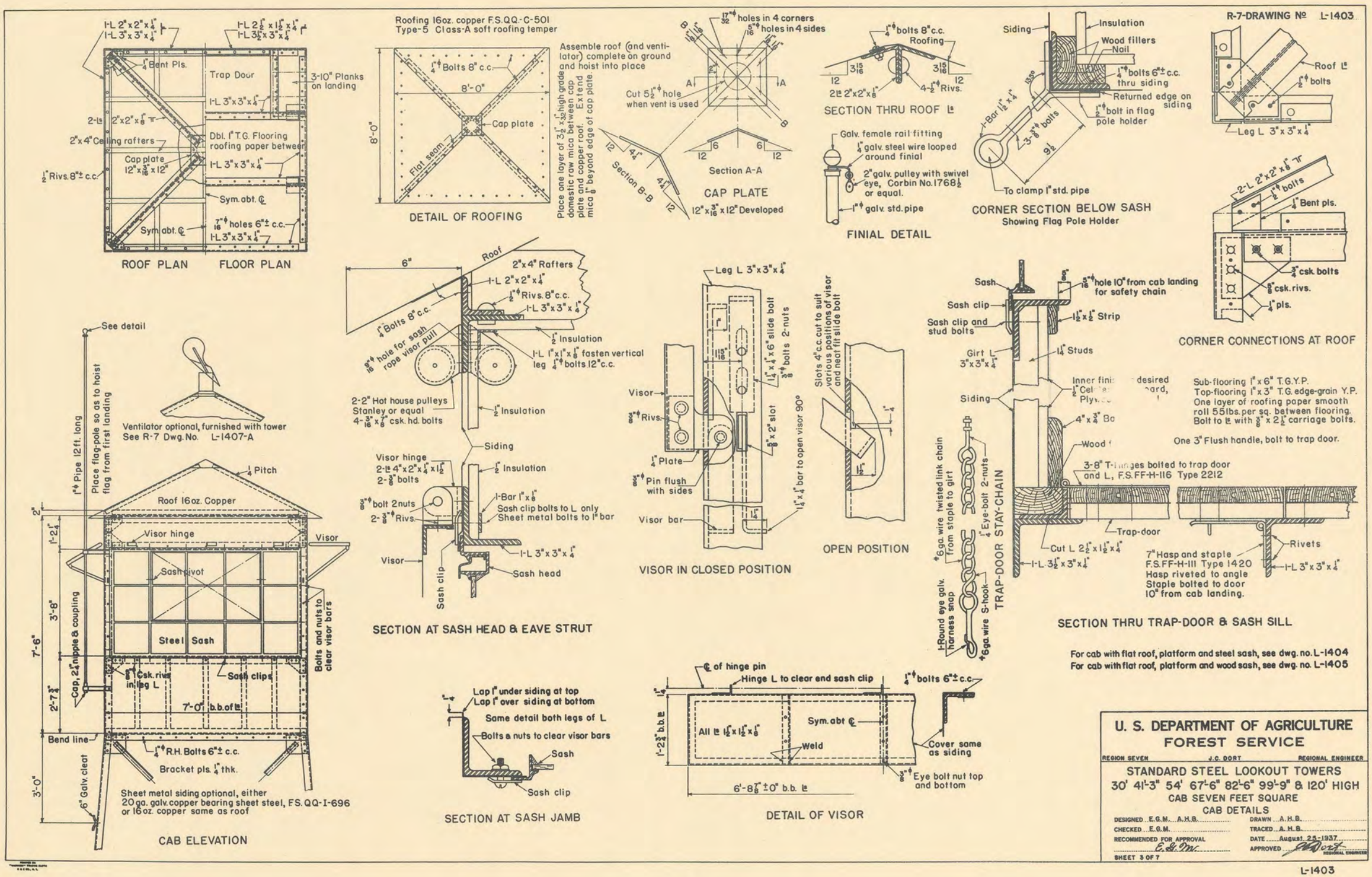
U. S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE

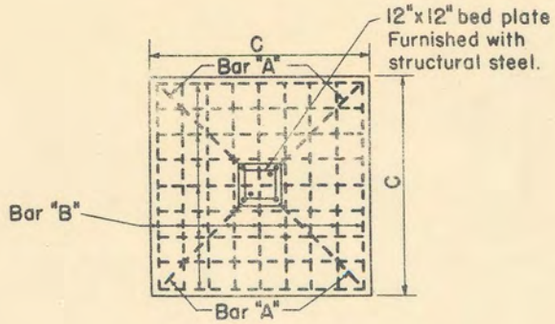
REGION SEVEN — J.C. DORT — REGIONAL ENGINEER

STANDARD STEEL LOOKOUT TOWERS
30' 41'-3" 54' 67'-6" 82'-6" 99'-9" & 120' HIGH
CAB SEVEN FEET SQUARE.
STAIR DETAILS

DESIGNED E.G.M. A.H.B. DRAWN A.H.B.
CHECKED E.G.M. TRACED A.H.B.
RECOMMENDED FOR APPROVAL E.G.M. DATE August 25-1937
APPROVED J.C. Dort REGIONAL ENGINEER
SHEET 2 OF 7

L-1402

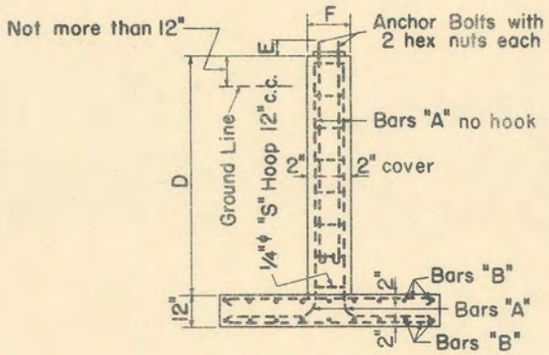

R-7-DRAWING No L-1403
ROOF PLAN
FLOOR PLAN
DETAIL OF ROOFING
Roofing 16oz. copper F.S.QQ.-C-501
Type-5 Class-A soft roofing temper
Assemble roof (and ventilator) complete on ground and hoist into place
Place one layer of 3½" x 1/32" high grade domestic raw mica between cap plate and copper roof. Extend mica 1" beyond edge of cap plate.
Cap plate
Flat seam
Section A-A
Section B-B
CAP PLATE
12" x 3/16" x 12" Developed
SECTION THRU ROOF L
FINIAL DETAIL
Galv. female rail fitting
¼" galv. steel wire looped around finial
2" galv. pulley with swivel eye, Corbin No. 1768½ or equal.
1" galv. std. pipe
CORNER SECTION BELOW SASH
Showing Flag Pole Holder
Siding
Insulation
Wood fillers
Nail
¼" bolts 6" ± c.c. thru siding
Returned edge on siding
½" bolt in flag pole holder
To clamp 1" std. pipe
CORNER CONNECTIONS AT ROOF
Roof L
½" bolts
Leg L 3" x 3" x ¼"
¼" Bent pls.
¾" csk. bolts
⅝" csk. rivs.
¼" pls.
Ventilator optional, furnished with tower
See R-7 Dwg. No. L-1407-A
See detail
1" Pipe 12 ft. long
Place flag-pole so as to hoist flag from first landing
¼ Pitch
Roof 16oz. Copper
Visor hinge
Visor
Sash pivot
Steel Sash
Bolts and nuts to clear visor bars
Cap, 2¼" nipple & coupling
Csk. rivs in leg L
Sash clips
7'-0" b.b. of L
Bend line
¼" R.H. Bolts 6" ± c.c.
Bracket pls. ¼" thk.
6" Galv. cleat
Sheet metal siding optional, either 20 ga. galv. copper bearing sheet steel, F.S. QQ-I-696 or 16 oz. copper same as roof
CAB ELEVATION
Roof
2" x 4" Rafters
¼" Bolts 8" c.c.
½" Insulation
1-L 1" x 1" x ⅛" fasten vertical leg ¼" bolts 12" c.c.
2-2" Hot house pulleys Stanley or equal 4-3/16" x ⅞" csk. hd. bolts
Siding
Visor hinge
2-L 4" x 2" x ¼" x 1½"
2-⅜" bolts
⅜" bolt 2 nuts
2-⅜" Rivs.
1-Bar 1" x ⅛"
Sash clip bolts to L only
Sheet metal bolts to 1" bar
Sash clip
Sash head
SECTION AT SASH HEAD & EAVE STRUT
Leg L 3" x 3" x ¼"
Visor
⅜" Rivs.
¼" Plate
⅜" Pin flush with sides
Visor bar
¼" x ¼" x 6" slide bolt
⅜" bolts 2-nuts
⅝" x 2" slot
¼" x ¼" bar to open visor 90°
VISOR IN CLOSED POSITION
Slots 4" c.c. cut to suit various positions of visor and neat fit slide bolt
OPEN POSITION
Sash
Sash clip
Sash clip and stud bolts
Girt L 3" x 3" x ¼"
Siding
5/16" hole 10" from cab landing for safety chain
1½" x ½" Strip
1¼" Studs
Inner fini... desired
Wood
Sub-flooring 1" x 6" T.G.Y.P.
Top-flooring 1" x 3" T.G. edge-grain Y.P.
One layer of roofing paper smooth roll 55 lbs. per sq. between flooring.
Bolt to L with ⅜" x 2½" carriage bolts.
One 3" Flush handle, bolt to trap door.
3-8" T-hinges bolted to trap door and L, F.S. FF-H-116 Type 2212
Trap-door
Cut L 2½" x 1½" x ¼"
1-L 3½" x 3" x ¼"
7" Hasp and staple F.S. FF-H-111 Type 1420
Hasp riveted to angle
Staple bolted to door 10" from cab landing.
Rivets
1-L 3" x 3" x ¼"
SECTION THRU TRAP-DOOR & SASH SILL
TRAP-DOOR STAY-CHAIN
#6 ga. wire twisted link chain from staple to girt
¼" Eye-bolt 2-nuts
1-Round eye galv. harness snap
#6 ga. wire S-hook
For cab with flat roof, platform and steel sash, see dwg. no. L-1404
For cab with flat roof, platform and wood sash, see dwg. no. L-1405
Lap 1" under siding at top
Lap 1" over siding at bottom
Same detail both legs of L
Bolts & nuts to clear visor bars
Sash
Sash clip
SECTION AT SASH JAMB
℄ of hinge pin
Hinge L to clear end sash clip
¼" bolts 6" ± c.c.
All L 1½" x 1½" x ⅛"
Sym. abt ℄
Weld
Cover same as siding
⅜" Eye bolt nut top and bottom
6'-8⅞" ± 0" b.b. L
DETAIL OF VISOR
U. S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE
REGION SEVEN
J.C. DORT
REGIONAL ENGINEER
STANDARD STEEL LOOKOUT TOWERS
30' 41'-3" 54' 67'-6" 82'-6" 99'-9" & 120' HIGH
CAB SEVEN FEET SQUARE
CAB DETAILS
DESIGNED E.G.M. A.H.B.
CHECKED E.G.M.
RECOMMENDED FOR APPROVAL E.G.M.
DRAWN A.H.B.
TRACED A.H.B.
DATE August 25-1937
APPROVED J.C. Dort
REGIONAL ENGINEER
SHEET 3 OF 7
L-1403



PIER DEMENSIONS

Tower Height	A	B	C	D	E	F	G	Cu. ft. Conc.
30'-0"	11'-6 3/8"	16'-3 11/16"	4'-6"	5'-0"	3 3/4"	1'-4"	4 15/16"	29
41'-3"	13'-2 3/4"	18'-8 1/2"	5'-0"	5'-6"	4"	1'-4"	5 11/16"	35
54'-0"	15'-1 7/8"	21'-5 3/16"	5'-6"	6'-0"	4 1/2"	1'-4"	5 11/16"	41
67'-6"	17'-2 5/16"	24'-3 3/4"	6'-0"	6'-6"	5"	1'-4"	5 11/16"	48
82'-6"	19'-5 1/2"	27'-6 1/4"	6'-6	7'-0"	5"	1'-4"	7 1/16"	55
99'-9"	22'-0 3/4"	31'-2 3/8"	7'-0"	7'-6"	5 3/4"	1'-6"	7 1/16"	66
120'-0"	25'-1 7/16"	35'-6 5/16"	7'-6"	8'-0"	6 1/4"	1'-8"	7 1/16"	78

Concrete listed is for one pier only

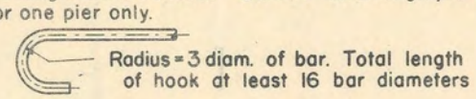


TYPICAL CONCRETE PIER

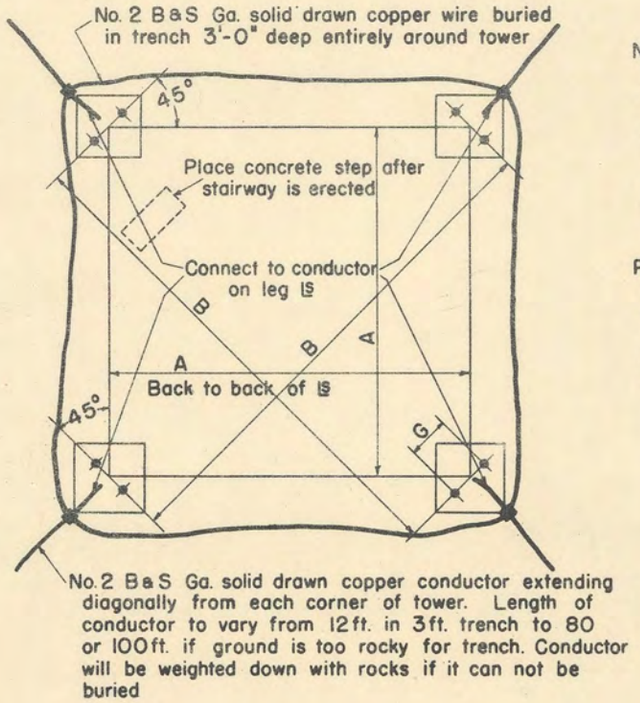
SCHEDULE OF REINFORCING STEEL

Tower Height	Bars "A"			Bars "B"			Hoops "S"	Wt. lbs.	Anchor Bolts			
	No	Size	Length	No	Size	Length			No	Diam	Length	Wt. lbs.
30'-0"	4	3/4"φ	7'-6"	16	1/2"φ	4'-0"	5	103	2	3/4"	3'-1"	12
41'-3"	4	7/8"φ	8'-3"	20	1/2"φ	4'-6"	5	145	2	3/4"	3'-1"	12
54'-0"	4	1"φ	9'-3"	24	1/2"φ	5'-0"	6	200	2	7/8"	3'-7"	20
67'-6"	4	1"	10'-0"	28	1/2"φ	5'-6"	6	263	2	1"	4'-2"	24
82'-6"	4	1 1/8"	10'-9"	32	1/2"φ	6'-0"	7	298	2	1"	4'-2"	30
99'-9"	4	1 1/4"	11'-6"	40	1/2"φ	6'-6"	8	453	2	1 1/8"	4'-8	42
120'-0"	4	1 1/4"	12'-3"	48	1/2"φ	7'-0"	8	526	2	1 1/4"	5'-2"	57

Note:- Length given is finished length unless noted. Bars "A"= Total length, no hook
Quantities listed are for one pier only.



TYPICAL HOOK

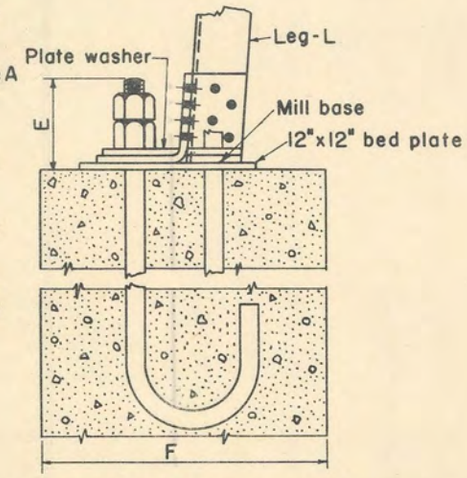


FOUNDATION LAYOUT

Note: Anchor bolts & reinforcing bars shall conform to F.S. QQ-B-71, Grade-1, Class-A
Anchor bolts & Hoop bars, Type A
Reinforcing bars Type-B

Concrete Class A 1½ severe
Mix 1-2-3 (by volume) 6 gal. of water per bag of cement

Paint ends of anchor bolts with one coat of red lead before erecting tower and with a second coat of red lead and a final coat of aluminum after erection



ANCHOR BOLTS IN CONCRETE

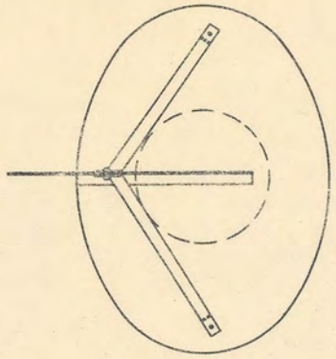
U. S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE

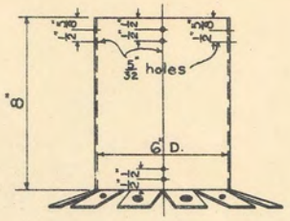
REGION SEVEN J.C. DORT REGIONAL ENGINEER

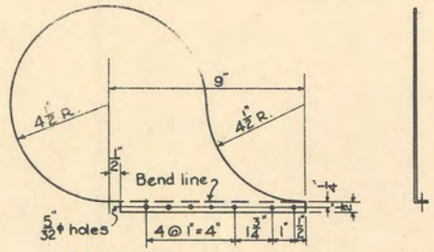
STANDARD STEEL LOOKOUT TOWERS
30' 41'-3" 54' 67'-6" 82'-6" 99'-9" & 120' HIGH
CAB SEVEN FEET SQUARE
FOUNDATION PLAN

DESIGNED S.A.E. A.E. DRAWN N.L.J. A.H.B. TRACED N.L.J. A.H.B.
SCALE NONE CHECKED E.G.M.
APPROVED J.C. Dort DATE AUG. 26-1937

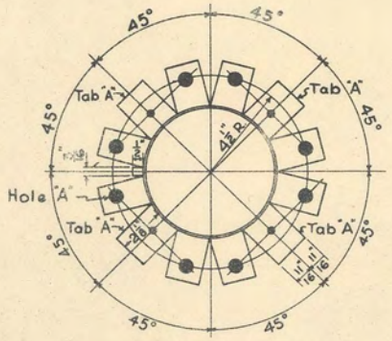
SHEET 8 OF 7



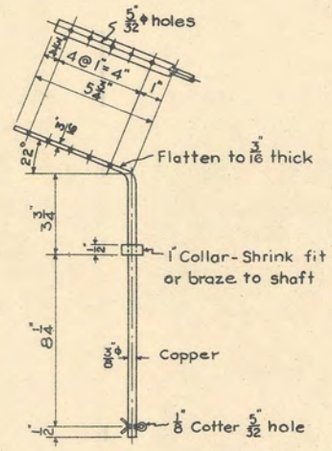




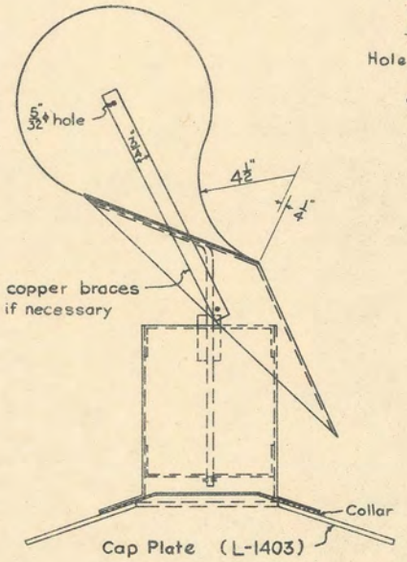
TEMPLATE FOR VANE
16 oz. copper
1- Req'd.



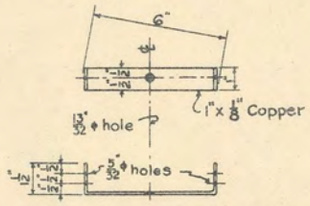
BASE OF STACK
16 oz. copper
1 Req'd.



SPINDLE
1 - Req'd.

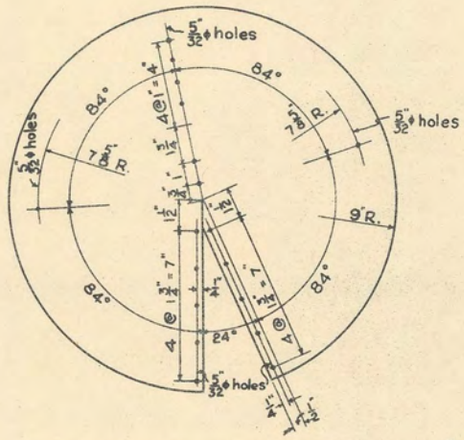


Cap Plate (L-1403)

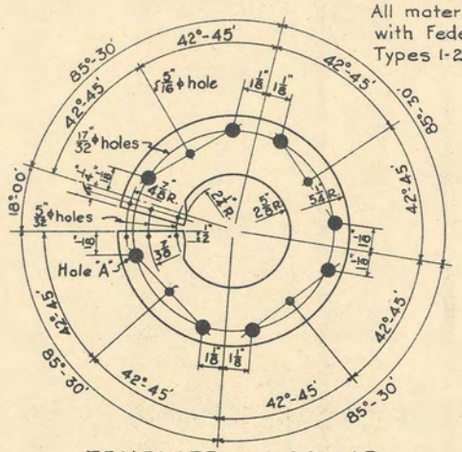


1" x 1/8" BEARINGS
3 Req'd.

Note :
Cone, Vane, Bearing R's, Braces & Spindle to be riveted up complete with copper rivets
All material copper in accordance with Federal Specifications QQ-C-501 Types 1-2 & 5 Class B



TEMPLATE FOR CONE
16 oz. copper
1- Req'd.



TEMPLATE FOR COLLAR
16 oz. copper
1-Req'd.

Revised E.G.M. Aug. 25-1937. Material changed from 24 Ga. Galv. steel to copper as noted.

U. S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE
REGION SEVEN — J.C. DORT REGIONAL ENGINEER

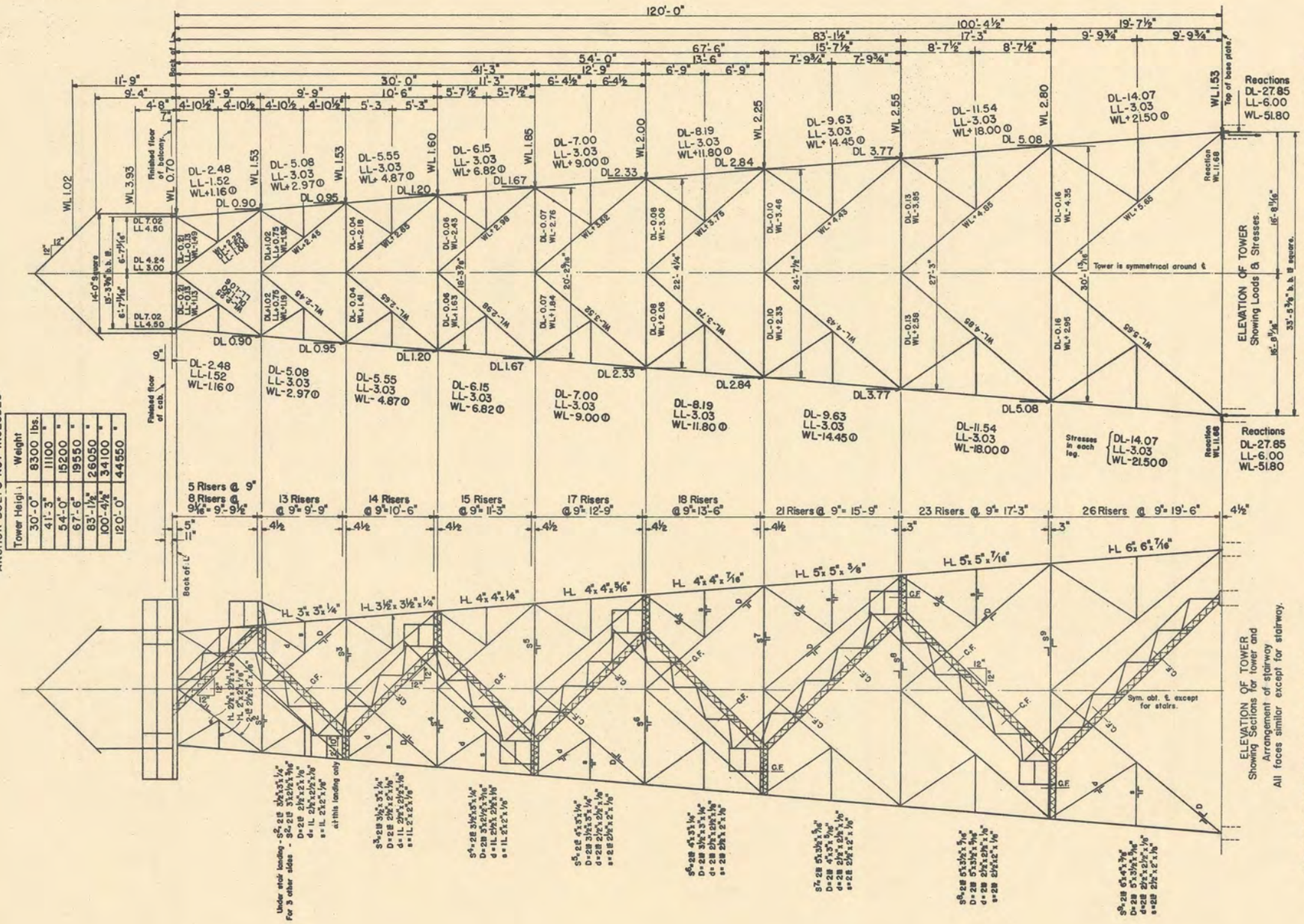
STANDARD STEEL LOOKOUT TOWERS
30' 41'-3" 54' 67'-6" 82'-6" 99'-9" & 120' HIGH
CAB SEVEN FEET SQUARE
VENTILATOR DETAILS

DESIGNED W.I.D. H.D.J. DRAWN H.D.J. TRACED A.A.M.
SCALE 3" = 1'-0" CHECKED H.D.J.
APPROVED JCDort DATE Jan. 1935

SHEET 7 OF 7

Rearranged and retraced - S.M. Speake - July 15, 1938

R-7-DRAWING Nº L-1601



APPROXIMATE WEIGHT OF STRUCTURAL STEEL ANCHOR BOLTS NOT INCLUDED

Tower Height	Weight
30'-0"	8300 lbs.
41'-3"	11100 "
54'-0"	15200 "
67'-6"	19550 "
83'-1½"	26050 "
100'-4½"	34100 "
120'-0"	44550 "

ELEVATION OF TOWER
Showing Loads & Stresses.

ELEVATION OF TOWER
Showing Sections for tower and Arrangement of stairway
All faces similar except for stairway.

Loadings, reactions, and stresses are given in kips for wind blowing on one side. Loadings and reactions are the total on the tower. For wind blowing diagonally increase windload stresses* in corner post by 1.414. Wind loads are based on 30#/□' on cab and 30#/□' on 1½ times exposed area of tower and stairs. Unit stresses permitted: 18000#/□" on net area in tension; 18000-70 l/r [max. 15000] on gross area in compression. Max. l/r permitted: 120 for corner post, 140 for main diagonals and struts, 180 for secondary diagonals and struts with no computed stresses. Shear on shop rivets 13500#/□". Field rivets and bolts 10000#/□". Bearing on shop rivets in single shear 22000#/□", double shear 27000#/□". Bearing on field rivets in single shear 16000#/□", double shear 20000#/□". + = tension, - = compression. Live load on tower is based on 30#/□' on cab floor and platform. Platform framing is designed for live load of 50#/□'. Stairway is designed for live load of 30#/□' on horizontal projection of stair.

Mill corner angles of tower to bear at splices.
2 angle sections for main struts and diagonals to have long leg horizontal.
⊓ sections to have stitch rivets and ring fillers at about 2 ft. intervals.
⊔ sections to have inside angle with vertical leg up, and batten plates at about 2 ft. alternate spacings.
Rivets in tower members ¾" ϕ except for connections of 2" ⊔ and as noted in detail.
Gusset plates 5/16" for tower members.
Working lines as shown above are gage lines except as shown or noted.
℄ of Cross Frames C.F. located as shown at about half point of landings and third points or half point of inclined spans.

FEDERAL SPECIFICATIONS
Structural Steel, QQ-S-711, Class-A non-copper.
Rivet Steel, QQ-S-711, Class-C non-copper.
Anchor Bolts, QQ-B-71, Grade-1, Class-A, Type-A.

STRUCTURAL CONNECTIONS

Size of Angle	Rivets or Bolts	Min. Pitch	Min. Edge Dist. Sheared	Min. Edge Dist. Rolled or Planed
2½" or more	¾"	2½"	1¼"	1⅛"
2" & 2½"	⅝"	2¼"	1⅛"	⅞"
1¾"	½"	1¾"	1"	¾"
1½"	⅜"	1½"	⅞"	⅝"

U. S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE

REGION SEVEN — J.C. DORT — REGIONAL ENGINEER

STANDARD STEEL LOOKOUT TOWERS
30', 41'-3", 54', 67'-6", 83'-1½", 100'-4½" & 120' HIGH
CAB FOURTEEN FEET SQUARE
ELEVATION AND MEMBERS

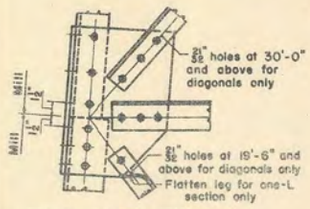
DESIGNED A.E. E.G.M. — DRAWN A.E.
CHECKED E.G.M. — TRACED A.M. N.L.J.
RECOMMENDED FOR APPROVAL E.G.M. — DATE SEPTEMBER 15, 1937
APPROVED J.C. Dort, REGIONAL ENGINEER
SHEET 1 OF 4

L-1601

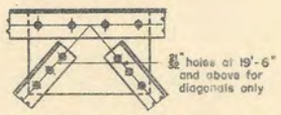
R-7-DRAWING № L-1602

Gusset plates 3/16"
Rivets 3/4", holes 13/16" except as noted

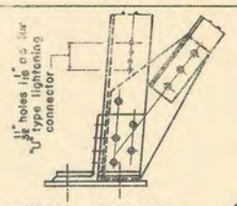
Note for Joint Connections:-
At tower post splices one gusset plate shall be shop riveted to the post member below the splice and the gusset plate on the other leg shop riveted to the member above.
Successive sections of leg angles may be raised from horizontal position by rotating about a loose bolt in upper hole in splice plate and corresponding hole in leg of angle with thick washer between to clear legs.



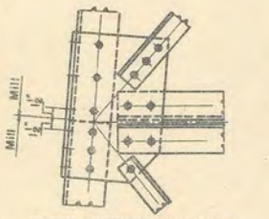
TYPICAL CORNER CONNECTION
at 67'-6" and above except at top and 9'-9"
For connection at 9'-9" see L-1603



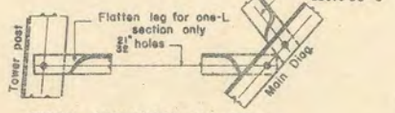
TYPICAL CENTER CONNECTION
at 67'-6" and above except at top
For top connection see L-1603



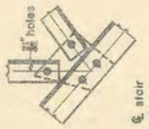
TYPICAL BASE DETAIL
towers 83'-1 1/2" and lower
Details not shown are similar to those for the 120' tower



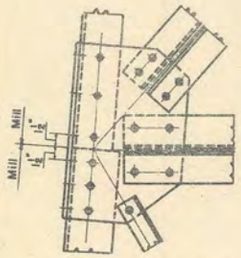
TYPICAL CORNER CONNECTION
at 83'-1 1/2"



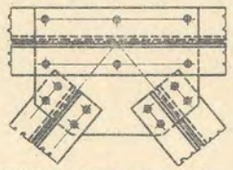
TYPICAL CONNECTION FOR ONE-L STIFFENER STRUTS & DIAGONALS



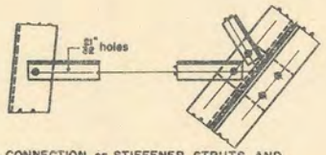
TYPICAL CONNECTION FOR TWO-L STIFFENER STRUTS & DIAGONALS TO MAIN DIAGONALS



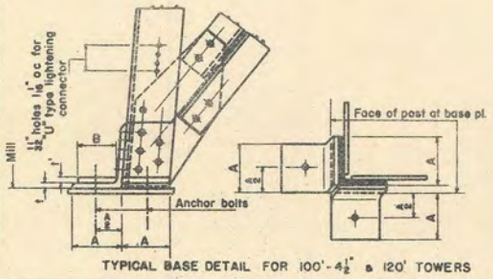
TYPICAL CORNER CONNECTION
at 100'-4 1/2"



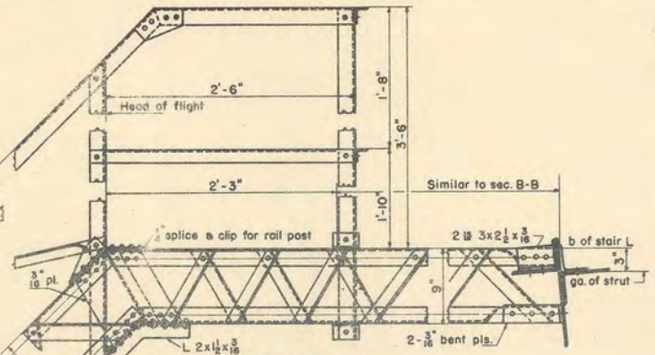
TYPICAL CENTER CONNECTION
at 83'-1 1/2" & 100'-4 1/2"



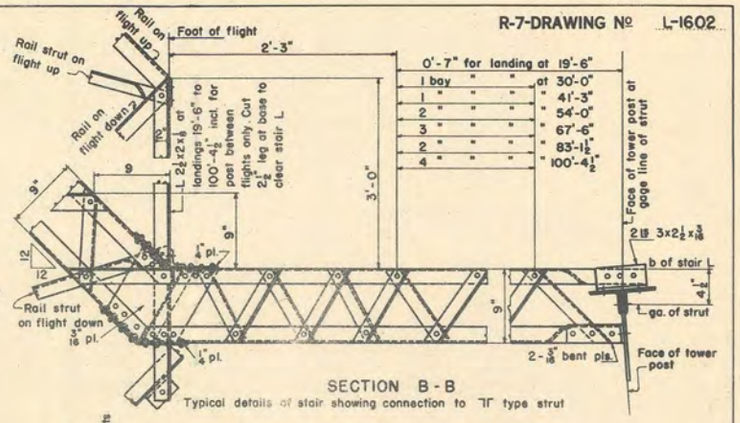
TYPICAL CONNECTION OF STIFFENER STRUTS AND DIAGONALS BELOWE 83'-1 1/2"



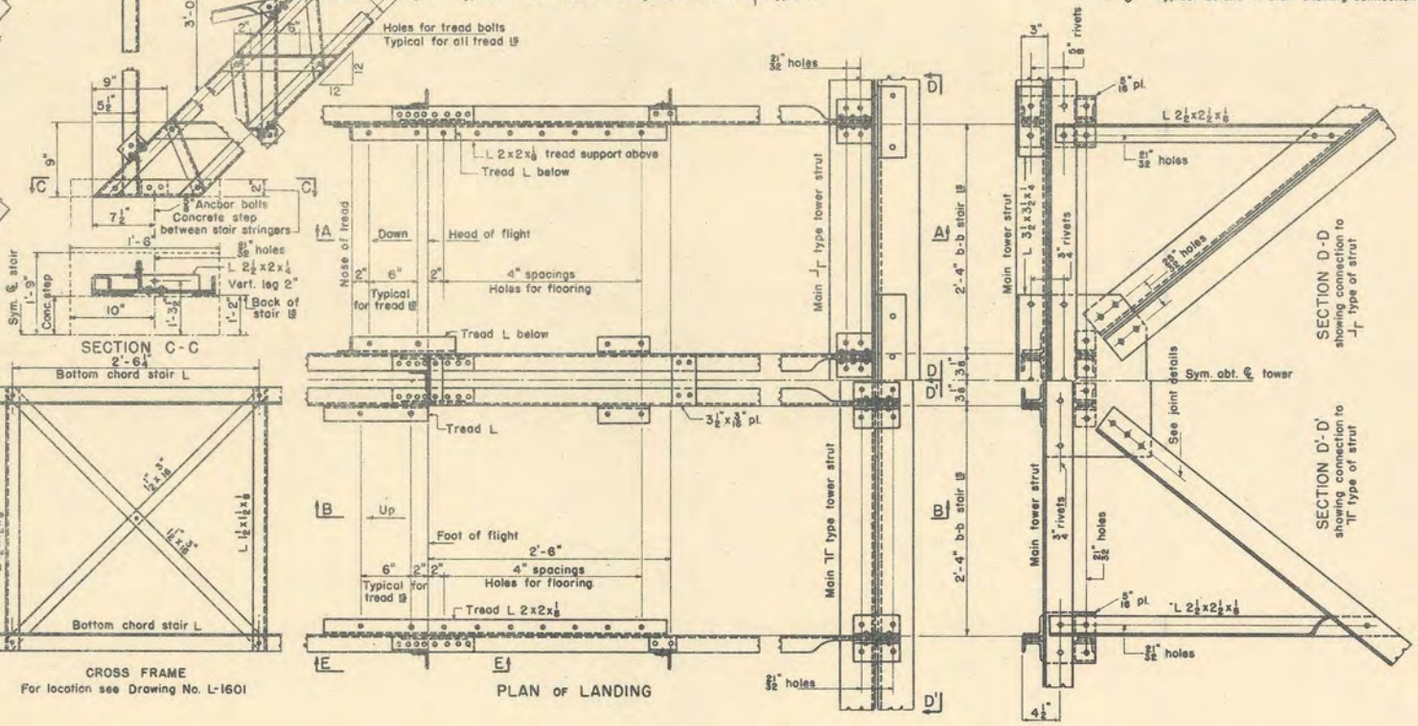
TYPICAL BASE DETAIL FOR 100'-4 1/2" & 120' TOWERS

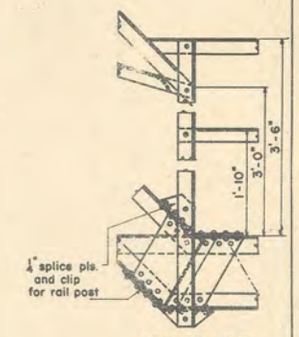


SECTION A-A
Typical details of stair showing connection to ⅃ type strut



SECTION B-B
Typical details of stair showing connection to ⅂ type strut

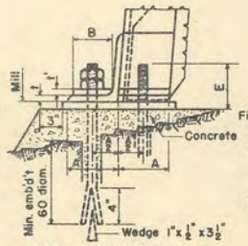




SECTION E-E

SECTIONS FOR STAIRWAY
Stringer ⅃ 2x2x3/16 for flight 83'-1 1/2" to 100'-4 1/2" in 120' tower only.
Stringer ⅃ 2x2x1/8 for all other flights
Tread ⅃ 2x2x1/8
Lacing ⅃ 1 1/2x1 1/2x1/8 except as noted
Rail post ⅃ 2x2x1/8 except as noted
Top rail ⅃ 2x2x1/8
Lower rail ⅃ 1 1/2x1 1/2x1/8
Rail strut ⅃ 1 1/2x1 1/2x1/8
Rail post clip ⅃ 2x2x1/8 except as noted
Wood treads on stair 2"x10"
Tread bolts 3/8"ϕ button head

TOWER POST BASE MATERIALS								
Tower Height	Base L		No. Rivets 3/4"ϕ Per L	Plate Washer			Base Plate
	A	t		B	t'	A	
30'-0"	3 1/2"	1/2"	3	2 3/4"	1/2"	3 1/2"	10"x1/2"x10"
41'-3"	4"	5/8"	3	3"	1/2"	4"	10"x1/2"x10"
54'-0"	4"	5/8"	3	3"	5/8"	4"	10"x1/2"x10"
67'-6"	4"	3/4"	3	3"	5/8"	4"	10"x1/2"x10"
83'-1 1/2"	5"	3/4"	4	3 3/4"	5/8"	5"	12"x1/2"x12"
100'-4 1/2"	5"	7/8"	4	3 3/4"	3/4"	5"	12"x5/8"x12"
120'-0"	6"	7/8"	5	4 1/4"	3/4"	6"	14"x3/4"x14"



ROCK FOUNDATION

Fill holes about 3/4 full using neat conc. Drive anchor bolt down on wedge to spread split end and fill hole to top level of footing with 1:2:4 concrete

ANCHOR BOLTS IN ROCK FOUNDATION			
Tower Height	Bolt	E	Weight Lbs 8 bolts
30'-0"	3/4"ϕx4'-6"	3 3/4"	63
41'-3"	3/4"ϕx4'-6"	4"	63
54'-0"	7/8"ϕx5'-2"	4 1/2"	95
67'-6"	1"ϕx6'-0"	5"	143
83'-1 1/2"	1"ϕx6'-0"	5"	143
100'-4 1/2"	1 1/8"ϕx6'-9"	5 3/4"	205
120'-0"	1 1/4"ϕx7'-3"	6 1/4"	266

Note:-
Rivets 3/8"ϕ, holes 13/16"ϕ except as noted
Bolt 2 stair stringers together for shipment.

U. S. DEPARTMENT OF AGRICULTURE
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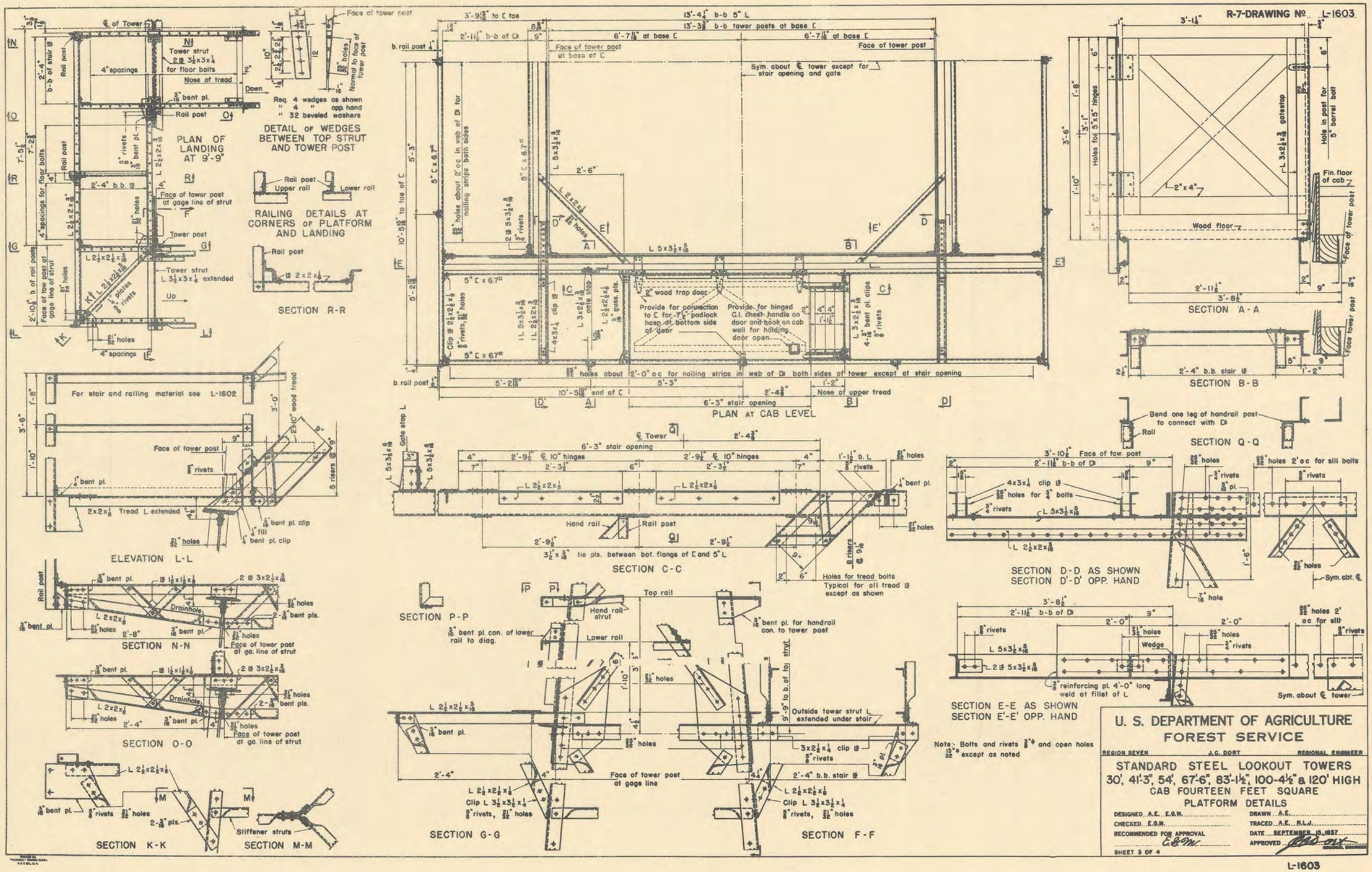
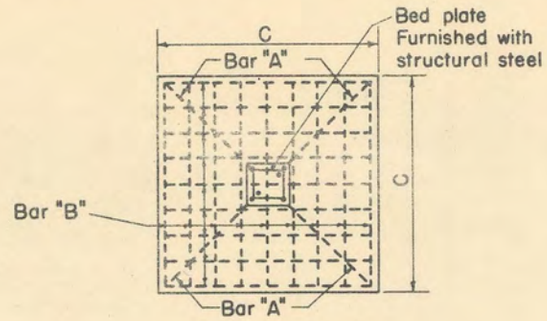
REGION SEVEN — J.C. DORT — REGIONAL ENGINEER

STANDARD STEEL LOOKOUT TOWERS
30', 41'-3", 54', 67'-6", 83'-1 1/2", 100'-4 1/2" & 120' HIGH
CAB FOURTEEN FEET SQUARE
STAIR DETAILS

DESIGNED A.E. E.G.M. — DRAWN A.E.
CHECKED E.G.M. — TRACED A.E. N.L.J.
RECOMMENDED FOR APPROVAL E.G.M. — DATE SEPTEMBER 15, 1937
SHEET 2 OF 4 — APPROVED J.C. Dort REGIONAL ENGINEER

L-1602

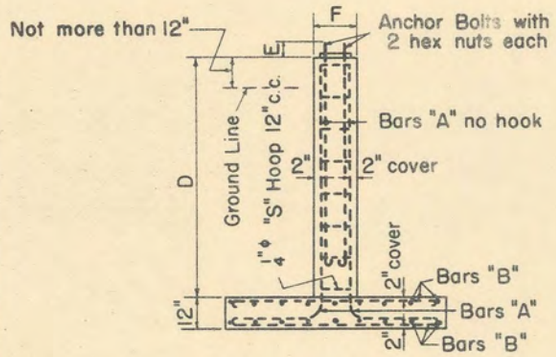

R-7-DRAWING No. L-1603
PLAN OF LANDING AT 9'-9"
DETAIL OF WEDGES BETWEEN TOP STRUT AND TOWER POST
Req. 4 wedges as shown
" 4 " opp. hand
" 32 beveled washers
RAILING DETAILS AT CORNERS OF PLATFORM AND LANDING
SECTION R-R
PLAN AT CAB LEVEL
SECTION A-A
SECTION B-B
SECTION Q-Q
ELEVATION L-L
SECTION C-C
SECTION D-D AS SHOWN
SECTION D'-D' OPP. HAND
SECTION N-N
SECTION O-O
SECTION P-P
SECTION E-E AS SHOWN
SECTION E'-E' OPP. HAND
SECTION K-K
SECTION M-M
SECTION G-G
SECTION F-F
Note:- Bolts and rivets 3/8"ϕ and open holes 13/32"ϕ except as noted
U. S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE
REGION SEVEN
J.C. DORT
REGIONAL ENGINEER
STANDARD STEEL LOOKOUT TOWERS
30', 41'-3", 54', 67'-6", 83'-1½", 100-4½" & 120' HIGH
CAB FOURTEEN FEET SQUARE
PLATFORM DETAILS
DESIGNED A.E. E.O.M.
CHECKED E.O.M.
RECOMMENDED FOR APPROVAL
DRAWN A.E.
TRACED A.E. N.L.J.
DATE SEPTEMBER 15, 1937
APPROVED
SHEET 3 OF 4
L-1603



PIER DIMENSIONS

Tower Height	A	B	C	D	E	F	G	Cu. ft. Conc.
30'-0"	18'-3 7/8"	25'-10 15/16"	4'-6"	5'-0"	3 3/4"	1'-4"	4 15/16"	29
41'-3"	20'-2 9/16"	28'-7 1/16"	5'-0"	5'-6"	4"	1'-4"	5 11/16"	35
54'-0"	22'-4 1/4"	31'-7 3/8"	5'-6"	6'-0"	4 1/2"	1'-4"	5 11/16"	41
67'-6"	24'-7 1/2"	34'-9 7/8"	6'-0"	6'-6"	5"	1'-4"	5 11/16"	48
83'-1 1/2"	27'-3"	38'-6 7/16"	6'-6"	7'-0"	5"	1'-4"	7 1/16"	55
100'-4 1/2"	30'-1 13/16"	42'-7 11/16"	7'-0"	7'-6"	5 3/4"	1'-6"	7 1/16"	66
120-0"	33'-5 3/8"	47'-3 5/8"	7'-6"	8'-0"	6 1/4"	1'-8"	8 1/2"	78

Concrete listed is for one pier only

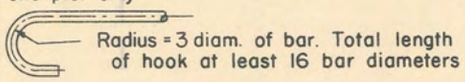


TYPICAL CONCRETE PIER

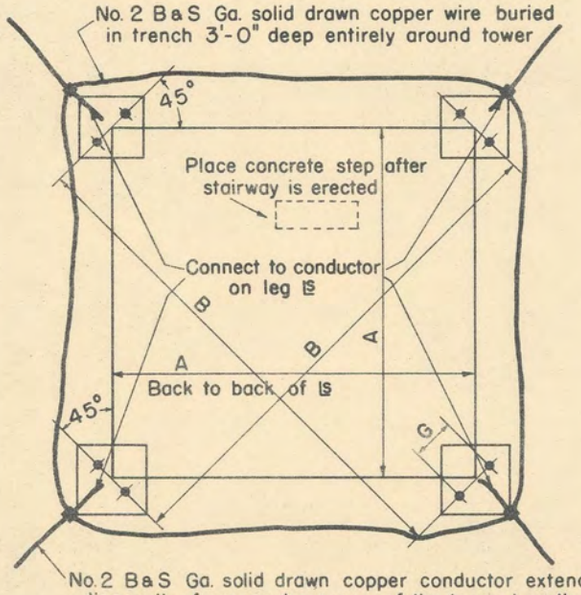
SCHEDULE OF REINFORCING STEEL

Tower Height	Bars "A"			Bars "B"			Hoops "S"	Wt. lbs.	Anchor Bolts			
	No.	Size	Length	No.	Size	Length			No	Diam	Length	Wt. lbs
30'-0"	4	3/4"φ	7'-6"	16	1/2"φ	4'-0"	5	103	2	3/4"	3'-1"	13
41'-3"	4	7/8"φ	8'-3"	20	1/2"φ	4'-6"	5	145	2	3/4"	3'-1"	13
54'-0"	4	1"φ	9'-3"	24	1/2"φ	5'-0"	6	200	2	7/8"	3'-7"	21
67'-6"	4	1"■	10'-0"	28	1/2"φ	5'-6"	6	263	2	1"	4'-2"	30
83'-1 1/2"	4	1 1/8"■	10'-9"	32	1/2"φ	6'-0"	7	298	2	1"	4'-2"	30
100'-4 1/2"	4	1 1/4"■	11'-6"	40	1/2"φ	6'-6"	8	453	2	1 1/8"	4'-8"	44
120'-0"	4	1 1/4"■	12'-3"	48	1/2"φ	7'-0"	8	526	2	1 1/4"	5'-2"	59

Note:- Length given is finished length unless noted. Bars "A" = Total length, no hook
Quantities listed are for one pier only



TYPICAL HOOK

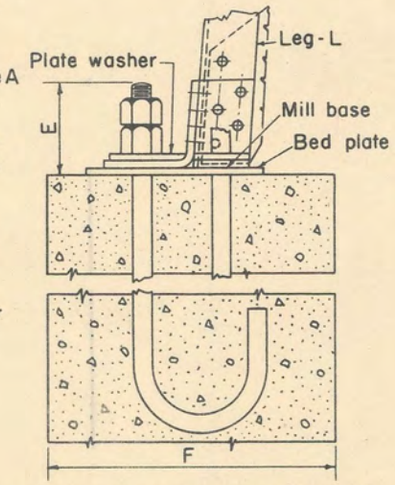


FOUNDATION LAYOUT

Note: Anchor bolts & reinforcing bars shall conform to F.S. QQ-B-71, Grade-1, Class-A
Anchor bolts & Hoop bars, Type A
Reinforcing bars Type-B

Concrete Class A-1 1/2" aggregate
Mix 1-2-3 by volume 6 gal. of water per bag of cement

Paint ends of anchor bolts with one coat of red lead before erecting tower and with a second coat of red lead and a final coat of aluminum after erection



ANCHOR BOLTS IN CONCRETE

U. S. DEPARTMENT OF AGRICULTURE
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REGION SEVEN — J C DORT — REGIONAL ENGINEER

STANDARD STEEL LOOKOUT TOWERS
30', 41'-3", 54', 67'-6", 83'-1 1/2", 100'-4 1/2" & 120 HIGH
CAB FOURTEEN FEET SQUARE
FOUNDATION PLAN

DESIGNED A.E. E.G.M. DRAWN N.L.J. TRACED N.L.J.
SCALE NONE CHECKED N.L.J. E.G.M.
APPROVED J C Dort DATE SEPT. 15, 1937

SHEET 4 OF 4

SECTION II

TIMBER TOWERS

The drawings in this Section are of timber towers for use with a 7' x 7' cab and of timber towers for use with a 14' x 14' cab.

The heights of timber towers, drawings of which are included in this Section, together with those heights listed as available in the Table of Contents of this handbook, have been made to correspond with the heights of steel towers included in Section I. This is for the purpose of advertising for competitive steel and timber bids.

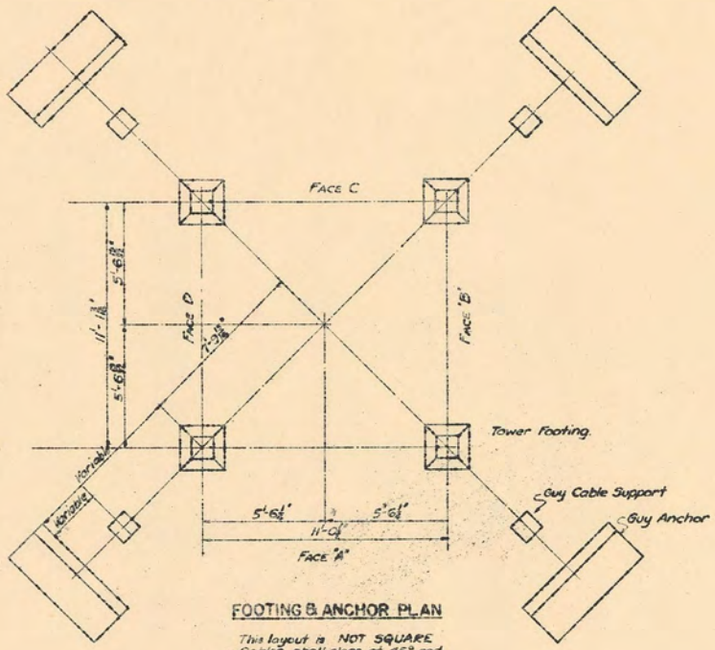
Towers may be purchased with or without cabs. If cabs are desired for 7' x 7' towers, for competitive bids between wood and steel, use the 7' x 7' timber tower cab, shown in Section III, without catwalk, and use the steel tower cab shown in Section 1. Drawing L-10001, page 9, should be included with the timber tower drawings.

The type CT-3 tower in this Section, Page 11, is not recommended for general use, but only where a long pack haul is necessary, a case in which the advantage of the smaller and shorter members would outweigh the disadvantages of its less desirable design.

EMERGENCY LOOKOUTS

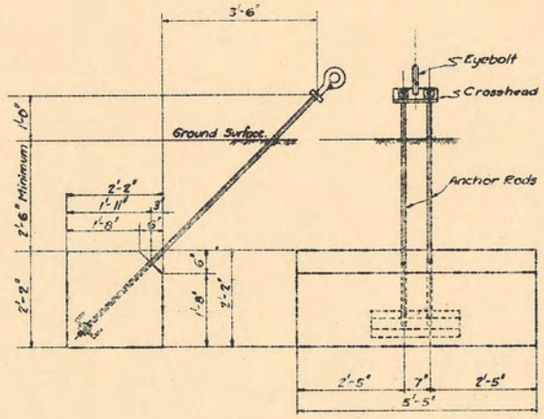
The use of the observation mast, drawing L5-01 in this Section, Page 15, is discouraged for general purposes. It is here presented as a suggestion for use at secondary observation points but should never be used when it is to be occupied for long periods.

The Round Timber tower, drawing L-11800, in this Section, Page 14, to be used with the 14' x 14' wood cab is also discouraged for general purposes. It should never be used in heights over 40 feet and then only in locations where it is impossible to bring in, either by truck haul or horse pack, any of the steel or treated timber types.

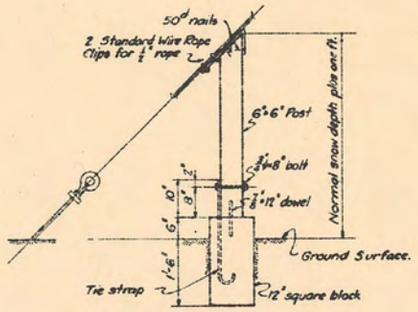


FOOTING & ANCHOR PLAN

This layout is NOT SQUARE. Cables shall slope at 45° and variable dimensions for guy anchors shall be determined in the field to fit the ground.

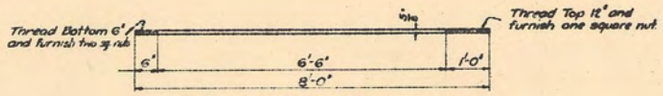


ANCHOR DETAIL



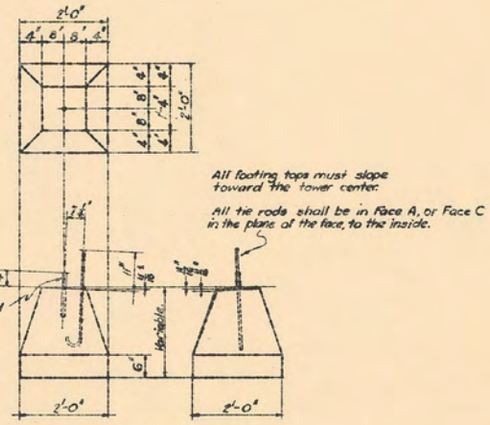
GUY CABLE SUPPORT

Use of this support is optional and shall be determined in the field.



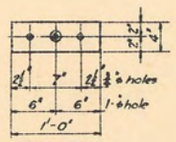
ANCHOR ROD

Make 8 - ⅞"φ x 8'-0" galvanized rods. Threading and nuts as shown.



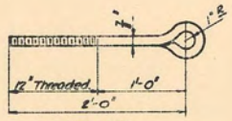
TOWER FOOTING

Footing tops to be about six inches above ground surface.



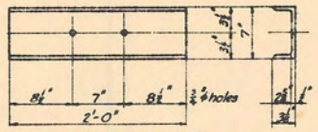
CROSSHEAD

Make 4 - 4"x1"x1'-0" plate Mild steel, galvanized.



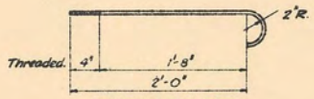
EYEBOLT

Make 4 - ⅞"φ x 2'-0" galvanized eyebolt. Eye forged and welded. Furnish two hex. nuts each.



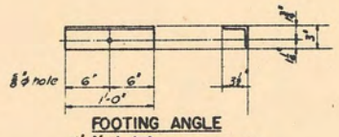
ANCHOR PLATE

7"x⅜"x3½" Channel C42 (BSC9) Make 4 as shown, galvanized.



FOOTING TIE ROD

⅞"φ x 2'-7" galvanized rod Furnish one square nut ea. Make 4.

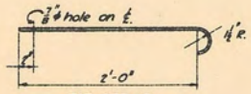


FOOTING ANGLE

3½"x⅜"x3"x1'-0" galvanized angle. Make 4. This angle is held down by the footing tie rod, and passes over it.

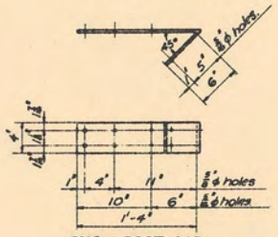
In addition to detailed material, furnish:

8 - ⅞"φ x 12" dowels, plain galvanized.
4 - ⅞"x8" machine bolts "
4 - ⅞" malleable washers "



TIE STRAP

⅜"x3"x2'-6" galvanized strap. Make 4.



SNOW POST CAP

¼"x4"x1'-10" galvanized plate. Make 4.

CONCRETE

1-3-5 Mix.
Volume - Approximately 5 yds.
Cement - 5.5 barrels.
Sand - 2.5 cu. yds.
Gravel - 4.1 cu. yds.

Revised Jan 22-1941

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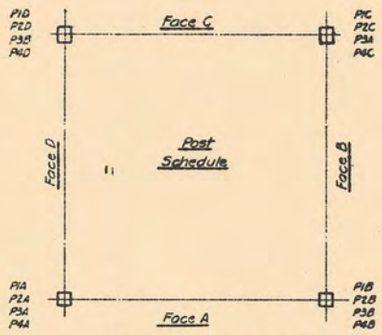
REGION SIX — JAMES FRANKLAND, REGIONAL ENGINEER

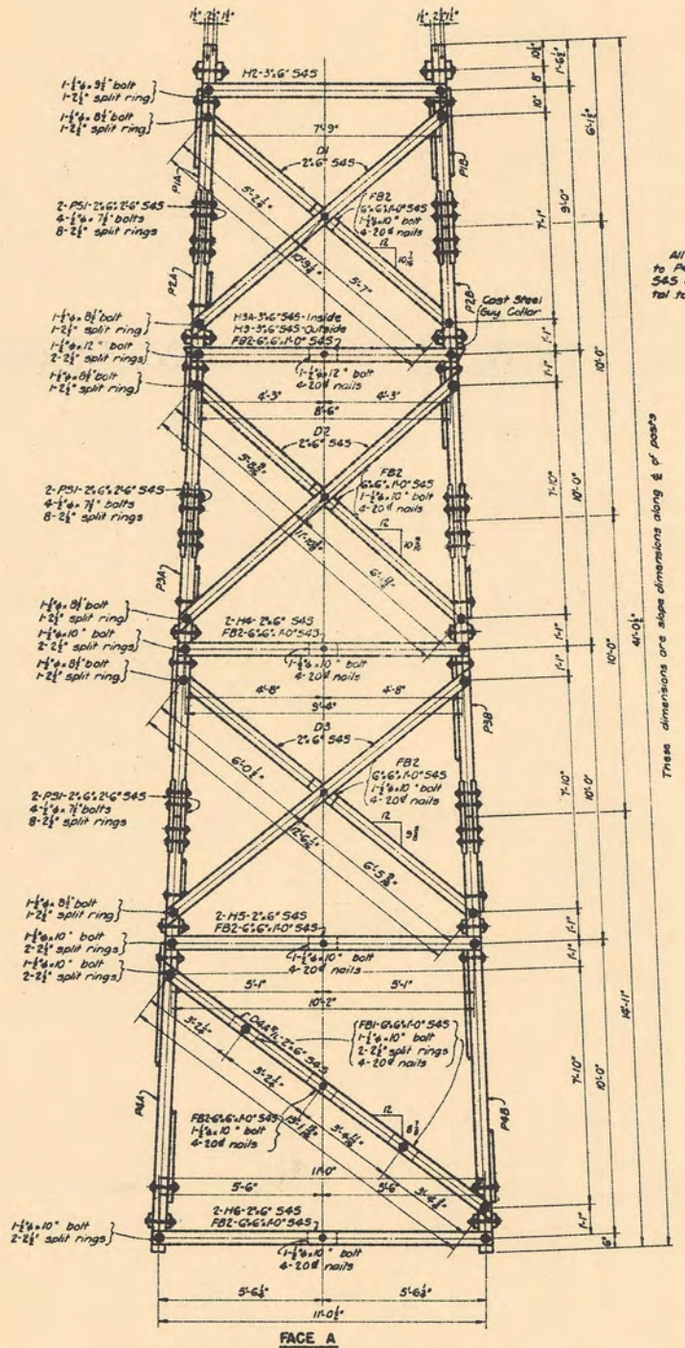
STANDARD LOOKOUT TOWER
41-FOOT TYPE CT-5
FOUNDATION PLAN

DESIGNED S.C.O. DRAWN S.C.O. TRACED S.C.O.
SCALE NONE CHECKED W.D.S.
APPROVED ASSISTANT REGIONAL FORESTER DATE MARCH 1938

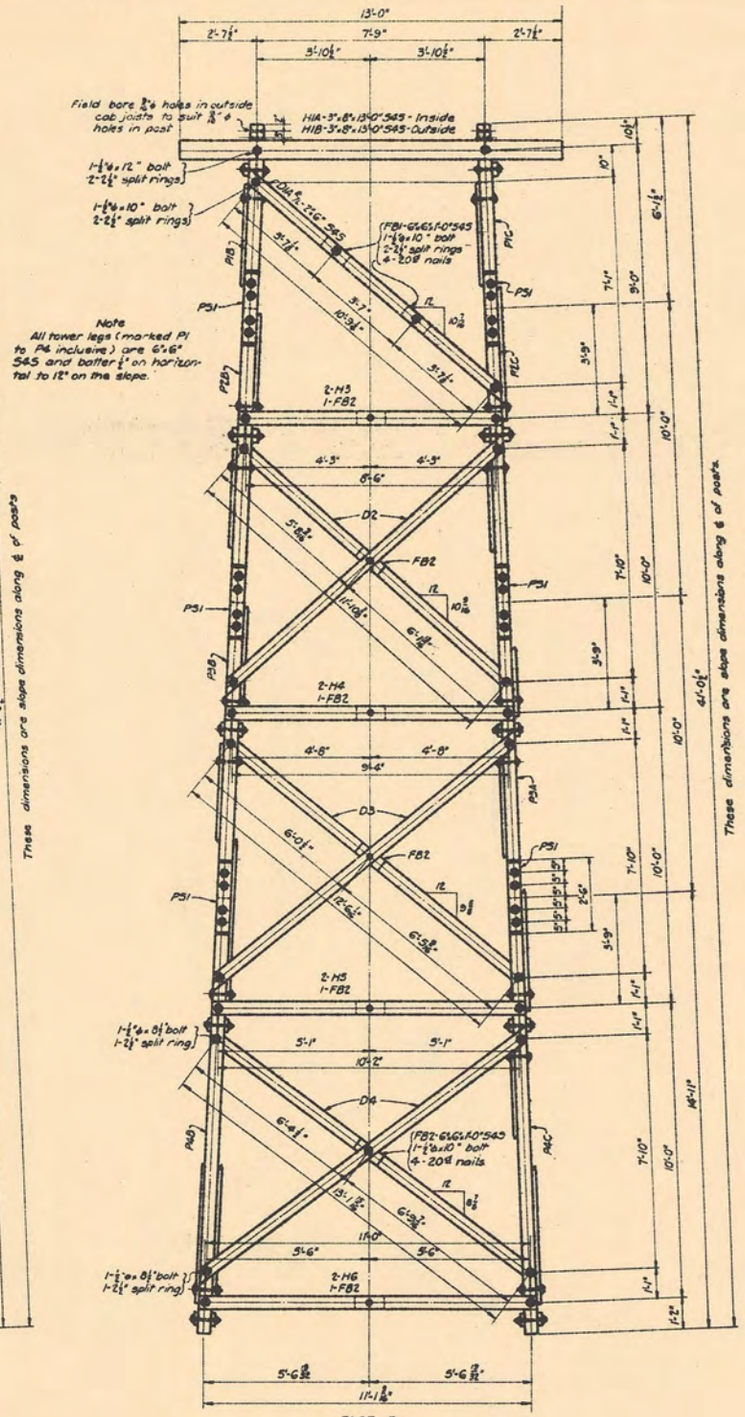
SHEET 1 OF 8 SHEETS L-12001



Erection schedule of posts by panels from top of tower



Face C same as Face A except bottom panel has two diagonals D4 instead of diagonals D4A R/L.



Joint hardware details same as Face A, except as noted. See Face A for sizes of marked members where not otherwise shown.

Face D same as Face B except top panel has two diagonals D1 instead of diagonals D1A R/L.

U. S. DEPARTMENT OF AGRICULTURE
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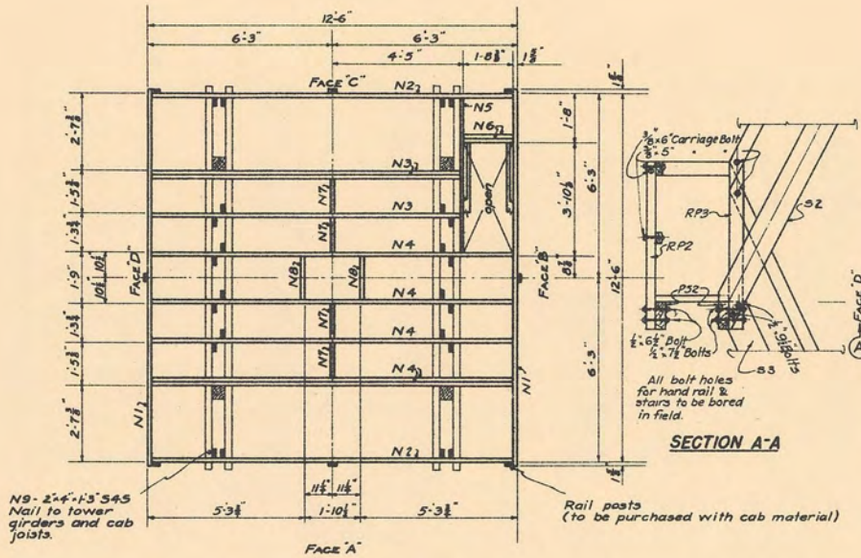
REGION SIX — JAMES FRANKLAND-REGIONAL ENGINEER

STANDARD LOOKOUT TOWER
41-FOOT TYPE CT-5
GENERAL PLAN

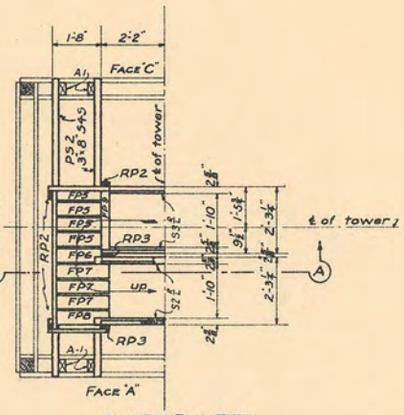
DESIGNED W.G. DRAWN W.G. TRACED H.R.S.
SCALE 1"=1'-0" CHECKED W.O.S.
APPROVED ASSISTANT REGIONAL FORESTER DATE MARCH 1939

SHEET 2 OF 8 SHEETS L-12002

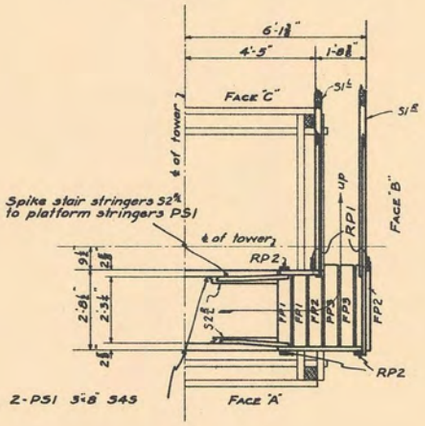


PLAN
CAB JOIST

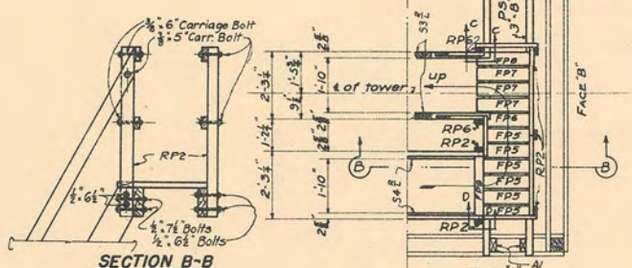
SECTION A-A



PLATFORM TWO

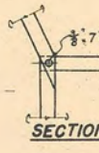


PLATFORM ONE

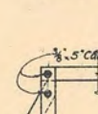


PLATFORM THREE

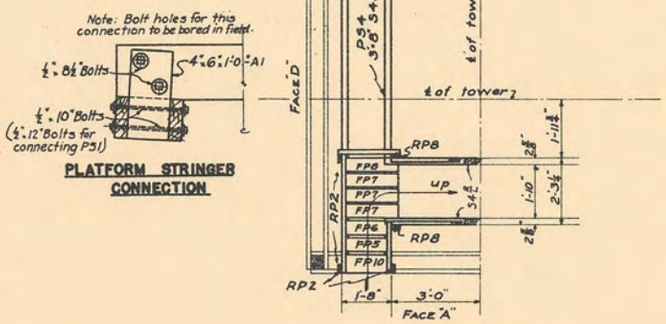
SECTION B-B



SECTION C-C

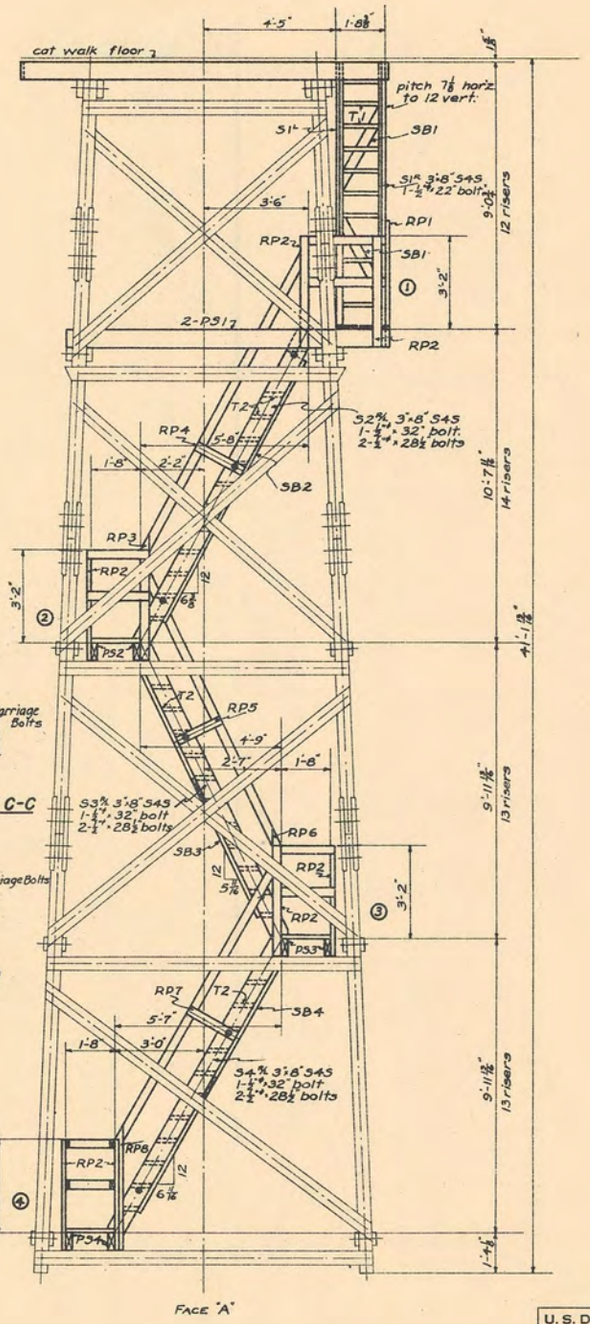


SECTION D-D



PLATFORM FOUR

PLATFORM STRINGER CONNECTION



ELEVATION

MATERIAL SIZES

Cab Joists	2"×8"	S4S	treated
Stair Stringers	3"×8"	"	"
Stair Treads	2"×8"	"	"
Platform Stringers	3"×8"	"	"
Platform Floor Plank	2"×6"	"	"
Rail Posts	3"×4" & 2"×4"	"	"
Stair Stringer Sways	2"×4"	"	"
Hand Rails	2"×4"	"	untreated

Stair stringers to bear directly on platform stringers and not on platform plank.

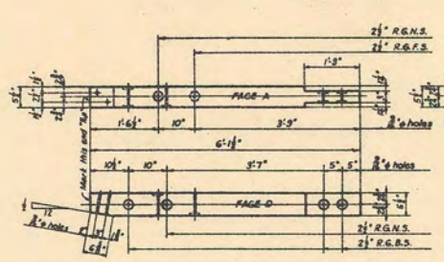
Revised July 25-1940 by W.D.S.

U. S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE
REGION SIX — JAMES FRANKLAND REGIONAL ENGINEER

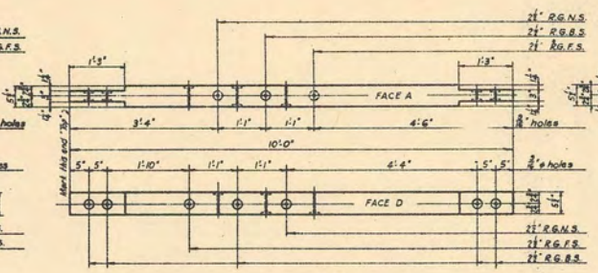
STANDARD LOOKOUT TOWER
41-FOOT TYPE CT-5
STAIR LAYOUT

DESIGNED W.G. DRAWN W.G. TRACED L.L.L.
SCALE 1/2"=1'-0" CHECKED W.D.S.
APPROVED ASSISTANT REGIONAL FORESTER DATE MARCH-1938

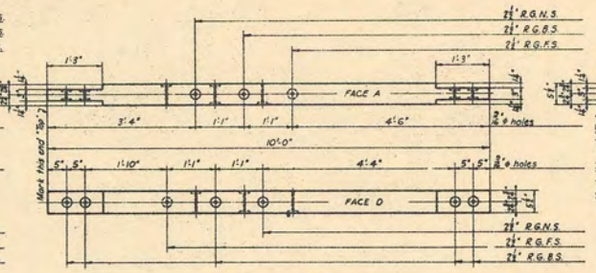
SHEET 3 OF 8 SHEETS L-12003



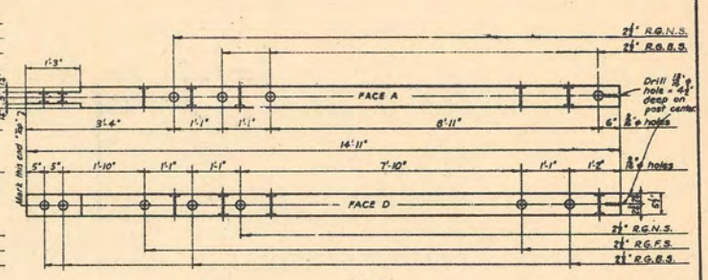
P1A
Make 1 - 6"x6"x6'-1½" S4S



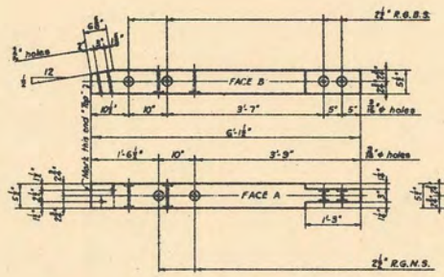
P2A
Make 1 - 6"x6"x10'-0" S4S



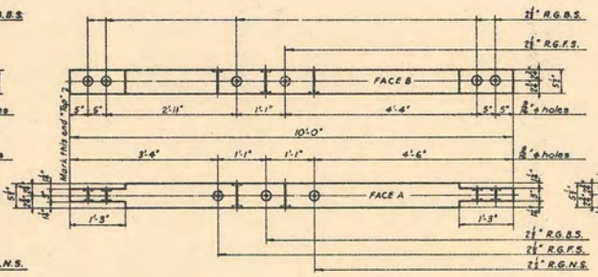
P3A
Make 2 - 6"x6"x10'-0" S4S



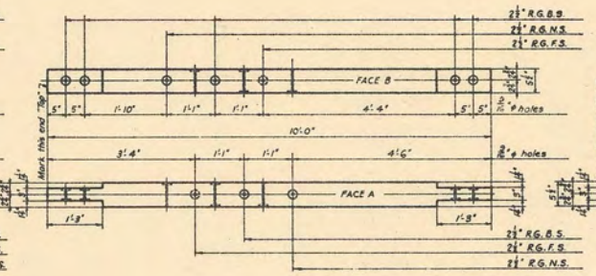
P4A
Make 1 - 6"x6"x14'-11" S4S



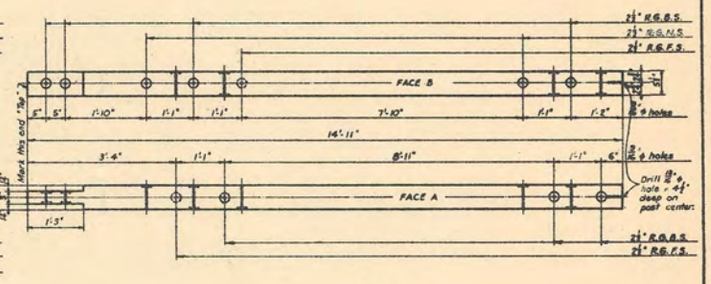
P1B
Make 1 - 6"x6"x6'-1½" S4S



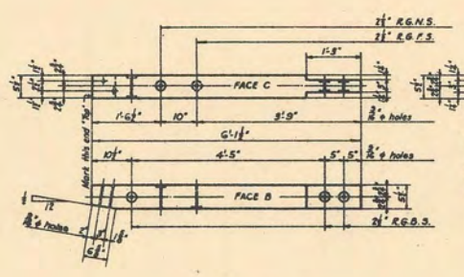
P2B
Make 1 - 6"x6"x10'-0" S4S



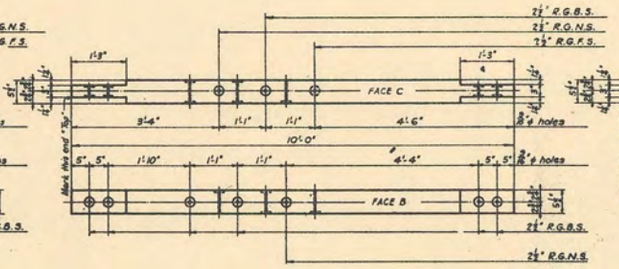
P3B
Make 2 - 6"x6"x10'-0" S4S



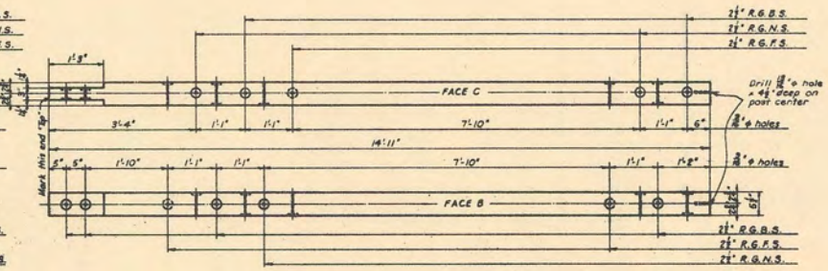
P4B
Make 1 - 6"x6"x14'-11" S4S



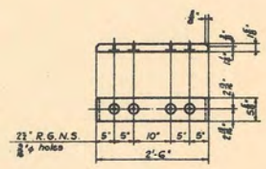
P1C
Make 1 - 6"x6"x6'-1½" S4S



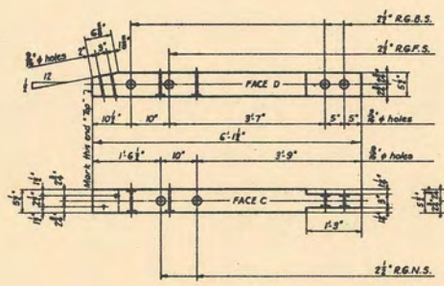
P2C
Make 1 - 6"x6"x10'-0" S4S



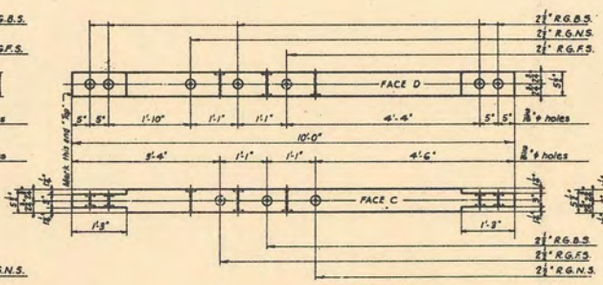
P4C
Make 1 - 6"x6"x14'-11" S4S



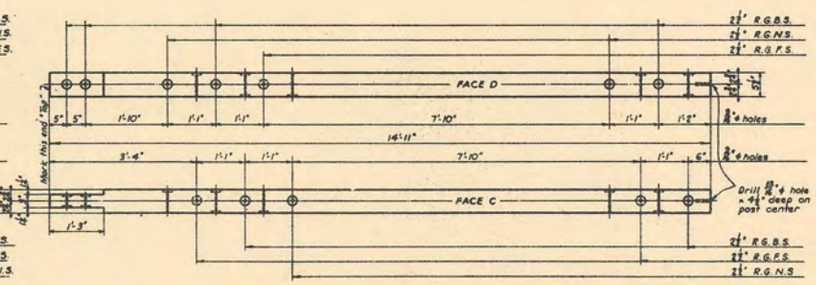
PS1
Make 24 - 2"x6"x2'-6" S4S



P1D
Make 1 - 6"x6"x6'-1½" S4S



P2D
Make 1 - 6"x6"x10'-0" S4S



P4D
Make 1 - 6"x6"x14'-11" S4S

NOTE:

R.G.B.S. = Ring groove both sides
R.G.N.S. = Ring groove near side
R.G.F.S. = Ring groove far side

Revised 2-26-41 by W.B. P4 dowel holes from 15/16"ϕ.

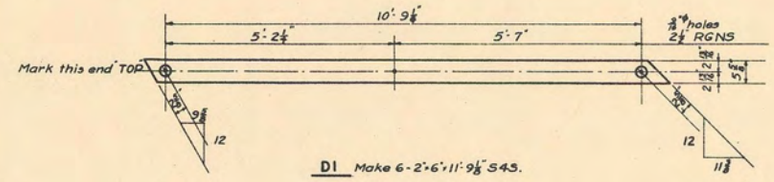
U. S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE

REGION SIX JAMES FRANKLAND, REGIONAL ENGINEER

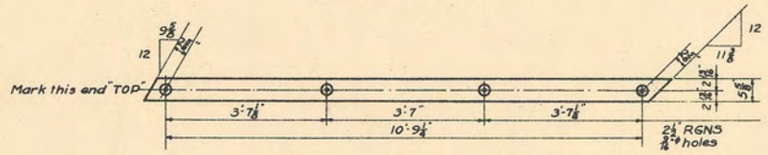
STANDARD LOOKOUT TOWER
41 FOOT TYPE CT-5
SHOP DETAILS

DESIGNED W.G. DRAWN H.R.S. TRACED W.G.
SCALE NONE CHECKED W.G.S.
APPROVED ASSISTANT REGIONAL FORESTER DATE APRIL 6, 1938

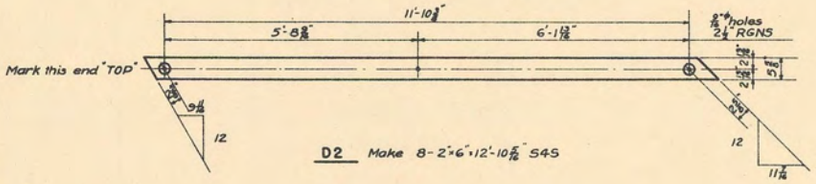
SHEET 4 OF 8 SHEETS L-12004A



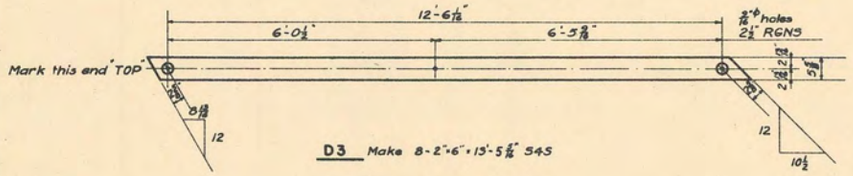
D1 Make 6-2"×6"×11'-9 1/8" S4S.



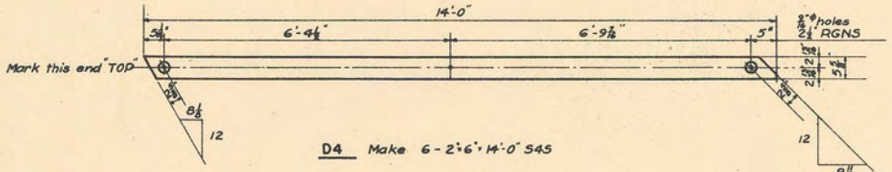
DIA^R Make 1-2"×6"×11'-9 1/8" S4S as shown (RGNS)
DIA^L Make 1-2"×6"×11'-9 1/8" S4S opp. hand (RGFS)



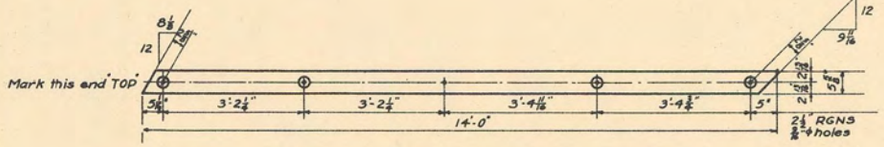
D2 Make 8-2"×6"×12'-10 5/16" S4S



D3 Make 8-2"×6"×13'-5 5/16" S4S

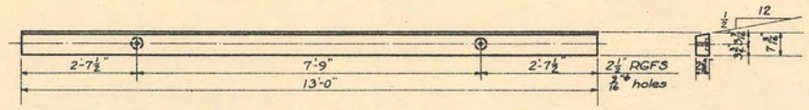


D4 Make 6-2"×6"×14'-0" S4S

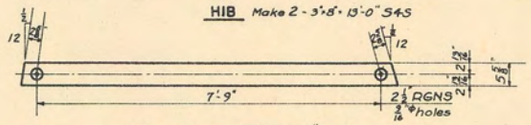


D4A^R Make 1-2"×6"×14'-0" S4S as shown (RGNS)
D4A^L Make 1-2"×6"×14'-0" S4S opp. hand (RGFS)

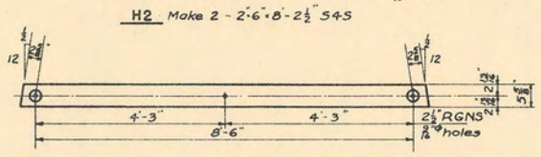
H1A Make 2-3"×8"×13'-0" S4S



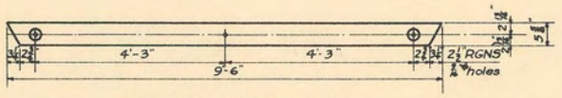
H1B Make 2-3"×8"×13'-0" S4S



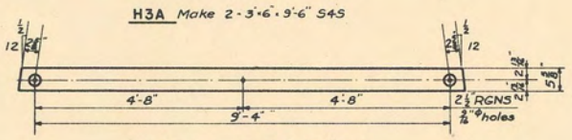
H2 Make 2-2"×6"×8'-2 1/2" S4S



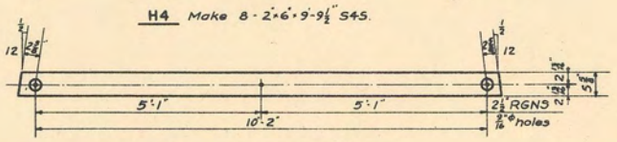
H3 Make 6-3"×6"×8'-11 1/2" S4S



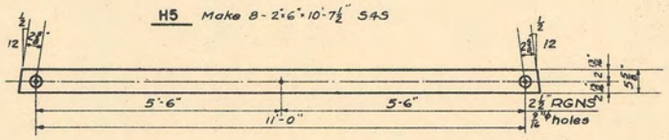
H3A Make 2-3"×6"×9'-6" S4S



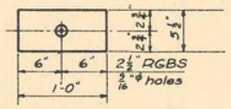
H4 Make 8-2"×6"×9'-9 1/2" S4S.



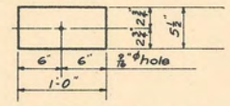
H5 Make 8-2"×6"×10'-7 1/2" S4S



H6 Make 8-2"×6"×11'-5 1/2" S4S



FB1 Make 4-6"×6"×1'-0" S4S



FB2 Make 31-6"×6"×1'-0" S4S

Revised 3-8-39 by W.O.
DIA R/L

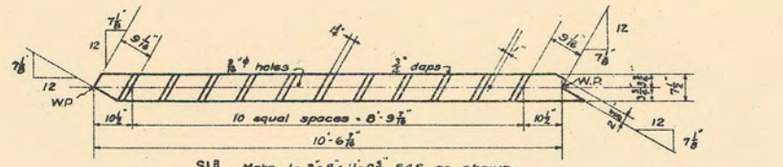
U. S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE

REGION SIX — J. FRANKLAND REGIONAL ENGINEER

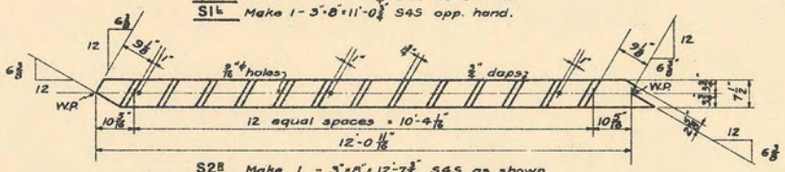
STANDARD LOOKOUT TOWER
41-FOOT TYPE CT-5
SHOP DETAILS

DESIGNED W.G. DRAWN H.R.S. TRACED L.L.L.
SCALE NONE CHECKED W.D.S.
APPROVED ASSISTANT REGIONAL FORESTER DATE APRIL 1938

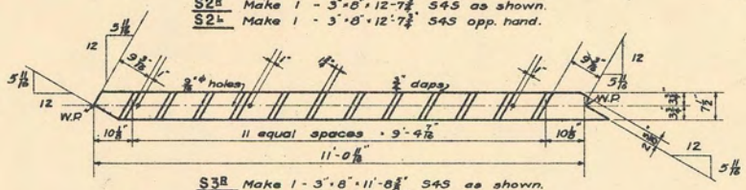
SHEET 5 OF 8 SHEETS L-12004B



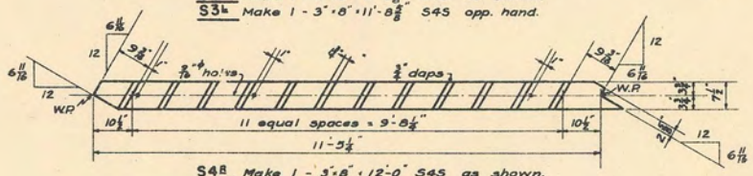
S1R Make 1 - 3"×8"×11'-0 3/4" S4S as shown.
S1L Make 1 - 3"×8"×11'-0 3/4" S4S opp. hand.



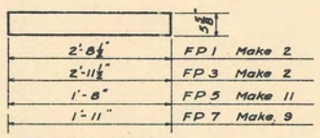
S2R Make 1 - 3"×8"×12'-7 3/4" S4S as shown.
S2L Make 1 - 3"×8"×12'-7 3/4" S4S opp. hand.



S3R Make 1 - 3"×8"×11'-8 5/8" S4S as shown.
S3L Make 1 - 3"×8"×11'-8 5/8" S4S opp. hand.

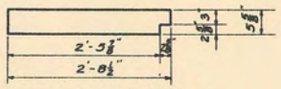


S4R Make 1 - 3"×8"×12'-0" S4S as shown.
S4L Make 1 - 3"×8"×12'-0" S4S opp. hand.

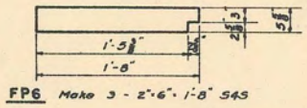


FP1 Make 2
FP3 Make 2
FP5 Make 11
FP7 Make 9

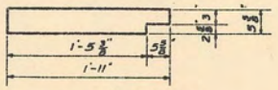
FP1-FP3-FP5-FP7
2"×6" S4S



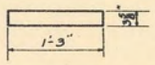
FP2 Make 2 - 2"×6", 2'-8 1/2" S4S



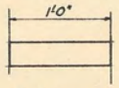
FP6 Make 3 - 2"×6"×1'-8" S4S



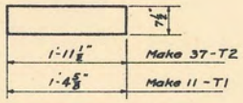
FP8 Make 3 - 2"×6"×1'-11" S4S



N9 Make 24-2"×4"×1'-3" S4S

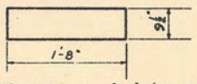


A-1 Make 14-4"×6"×1'-0" S4S.

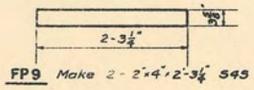


Make 37-T2
Make 11-T1

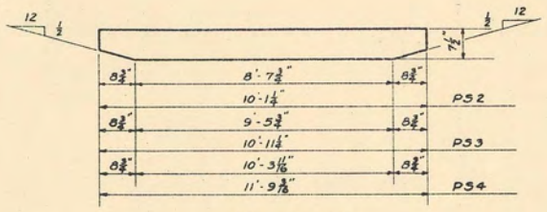
STAIR TREADS 2"×8" S4S



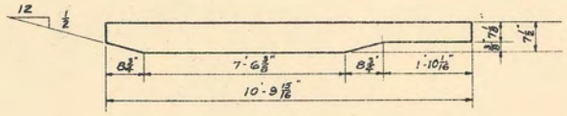
FP10 Make 1 - 2"×10"×1'-8" S4S



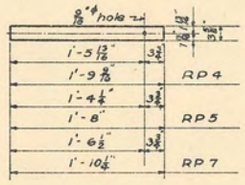
FP9 Make 2 - 2"×4"×2'-3 1/4" S4S



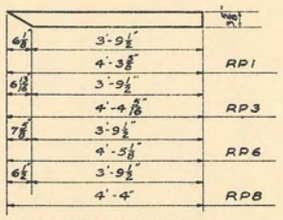
PS2-PS3-PS4
Make 2 each 3"×8" S4S



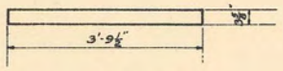
PS1 Make 2 - 3"×8"×10'-9 15/16" S4S



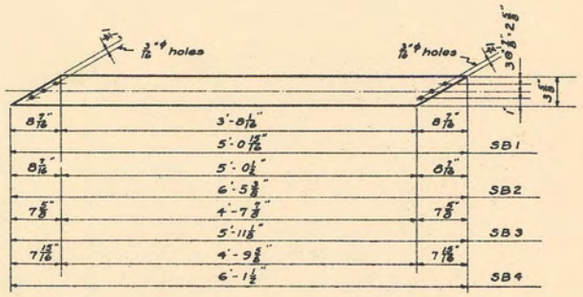
RP4-RP5-RP7
Make 2 each 2"×4" S4S



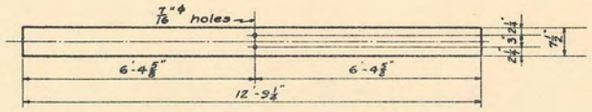
RP1-RP3-RP6-RP8
Make 2 each 3"×4" S4S



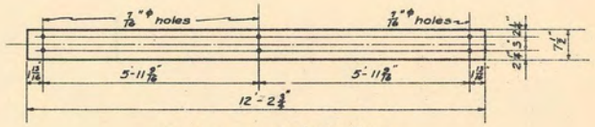
RP2 Make 13 - 3"×4"×3'-9 1/2" S4S



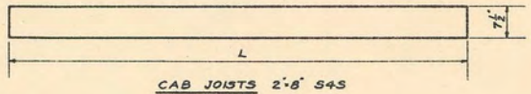
SB1-SB2-SB3-SB4
Make 2 each 2"×4" S4S



N1 Make 2 - 2"×8"×12'-9 1/4" S4S



N2 Make 2 - 2"×8"×12'-2 3/4" S4S



CAB JOISTS 2"×8" S4S

Mark	No. req'd	Length - L
N3	3	10'-4 3/4"
N4	5	12'-2 3/4"
N5	1	5'-2 3/8"
N6	2	1'-8 3/8"
N7	4	1'-2 1/8"
N8	2	1'-5 3/8"

Revised July 25-1940 by W.D.S.

U. S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE
REGION SIX — J. FRANKLAND REGIONAL ENGINEER

STANDARD LOOKOUT TOWER
41-FOOT TYPE CT-5
SHOP DETAILS

DESIGNED W.G. DRAWN L.L.L. TRACED L.L.L.
SCALE NONE CHECKED B.C.G.
APPROVED [signature] ASSIST. REGIONAL FORESTER DATE APRIL 1938

SHEET 6 OF 8 SHEETS L-12004C

TREATED TOWER MATERIAL

ITEM	No.	MARK	SIZE	LENGTH	DESCRIPTION	F.B.M.
1	1	P1A	6"x6"	8'-1½"	Top Posts	27
2	1	P1B	"	8'-1½"	" "	27
3	1	P1C	"	8'-1½"	" "	27
4	1	P1D	"	8'-1½"	" "	27
5	1	P2A	"	12'-0"	Intermediate Posts	36
6	1	P2B	"	12'-0"	" "	36
7	1	P2C	"	12'-0"	" "	36
8	1	P2D	"	12'-0"	" "	36
9	2	P3A	"	12'-0"	" "	72
10	2	P3B	"	12'-0"	" "	72
11	1	P4A	"	16'-11"	Bottom Posts	54
12	1	P4B	"	16'-11"	" "	54
13	1	P4C	"	16'-11"	" "	54
14	1	P4D	6"x6"	16'-11"	" "	54
15	24	PS1	2"x6"	2'-6"	Post Splices	60
16	6	D1	"	11'-9⅛"	Top Diagonals	72
17	1	D1A^{R}	"	11'-9⅛"	" "	12
18	1	D1A^{L}	"	11'-9⅛"	" "	12
19	8	D2	"	12'-10 5/16"	Interm. Diagonals	104
20	8	D3	"	13'-5 5/16"	" "	112
21	6	D4	"	14'-0"	Bottom Diagonals	84
22	1	D4A^{R}	"	14'-0"	" "	14
23	1	D4A^{L}	"	14'-0"	" "	14
24	2	H2	2"x6"	8'-2½"	Top Horizontals	18
25	6	H3	3"x6"	8'-11½"	Interm. "	81
26	2	H3A	3"x6"	9'-6"	" "	30
27	8	H4	2"x6"	9'-9½"	" "	80
28	8	H5	"	10'-7½"	" "	88
29	8	H6	2"x6"	11'-5½"	Bottom "	96
30	4	FB1	6"x6"	1'-0"	Filler Blocks	12
31	31	FB2	6"x6"	1'-0"	" "	93
32					TOTAL F.B.M.	1594

As required by specifications, material for posts is listed 2'-0" greater than shop detail lengths to eliminate seasoning end checks.

UNTREATED LUMBER

ITEM	No.	MARK	SIZE	LENGTH	DESCRIPTION	F.B.M.
1	2	—	2"x4"	14'-0"	Handrails	19
2	11	—	"	12'-0"	"	89
3	1	—	"	9'-0"	"	6
4	1	—	"	7'-0"	"	5
5						
6						
7						
8						
9						
10						
11						
12						
13						
14					TOTAL F.B.M.	119

TREATED STAIR MATERIAL

FOR TOWER USING CAB WITH CATWALK

ITEM	No.	MARK	SIZE	LENGTH	DESCRIPTION	F.B.M.
1	2	H1A	3"x8"	13'-0"	Top Horizontals	52
2	2	H1B	"	13'-0"	" "	52
3	1	S1^{R}	"	11'-0¾"	Stair Stringers	24
4	1	S1^{L}	"	11'-0¾"	" "	24
5	1	S2^{R}	"	12'-7¾"	" "	26
6	1	S2^{L}	"	12'-7¾"	" "	26
7	1	S3^{R}	"	11'-8⅝"	" "	24
8	1	S3^{L}	"	11'-8⅝"	" "	24
9	1	S4^{R}	"	12'-0"	" "	24
10	1	S4^{L}	"	12'-0"	" "	24
11	2	PS1	3"x8"	10'-9 15/16"	Platform Stringers	44
12	2	PS2	3"x8"	10'-1¼"	" "	44
13	2	PS3	"	10'-11¼"	" "	44
14	2	PS4	3"x8"	11'-9 3/16"	" "	48
15	2	SB1	2"x4"	5'-0 1/16"	Stair Braces	8
16	2	SB2	"	6'-5⅜"	" "	10
17	2	SB3	"	5'-11⅞"	" "	8
18	2	SB4	2"x4"	6'-1½"	" "	10
19	2	N1	2"x8"	12'-9¼"	Cab Joists	35
20	2	N2	"	12'-2¾"	" "	35
21	3	N3	"	10'-4¾"	" "	45
22	5	N4	"	12'-2¾"	" "	88
23	1	N5	"	5'-2⅞"	" "	8
24	2	N6	"	1'-8⅜"	" "	6
25	4	N7	"	1'-2⅛"	" "	7
26	2	N8	2"x8"	1'-5¾"	" "	4
27	2	RP1	3"x4"	4'-3⅝"	Handrail Posts	10
28	14	RP2	"	3'-9½"	" "	56
29	2	RP3	"	4'-4 9/16"	" "	10
30	2	RP4	2"x4"	1'-9 9/16"	" "	3
31	2	RP5	"	1'-8"	" "	3
32	2	RP6	3"x4"	4'-5⅛"	" "	10
33	2	RP7	2"x4"	1'-10¼"	" "	3
34	2	RP8	3"x4"	4'-4"	" "	10
35	2	FP1	2"x6"	2'-8½"	Floor Planks	6
36	2	FP2	"	2'-8½"	" "	6
37	2	FP3	"	2'-11½"	" "	6
38	11	FP5	"	1'-8"	" "	20
39	3	FP6	"	1'-8"	" "	5
40	9	FP7	"	1'-11"	" "	18
41	3	FP8	2"x6"	1'-11"	" "	6
42	2	FP9	2"x4"	2'-3¼"	" "	4
43	1	FP10	2"x10"	1'-8"	" "	4
44	24	N9	2"x4"	1'-3"	Cab Joist Ties	20
45	11	T1	2"x8"	1'-4⅝"	Stair Treads	22
46	37	T2	2"x8"	1'-11½"	" "	99
47	14	A1	4"x6"	1'-0"	Stringer Ties	28
48						
49					TOTAL F.B.M.	1093

NOTE:

All the material listed shall be furnished S4S.

Treated Material and Untreated Lumber, listed in the left column, shall be purchased with all orders.

Treated Stair Material, listed in the center column, shall be purchased only for towers where a catwalk is to be constructed with the cab.

Alternate Treated Stair Material, listed in the right column, shall be purchased only for towers where the catwalk is to be omitted. See sheet L-10002 for details of stairs with catwalk omitted.

ALTERNATE TREATED STAIR MATERIAL

FOR TOWER WHERE CATWALK IS OMITTED

ITEM	No.	MARK	SIZE	LENGTH	DESCRIPTION	F.B.M.
1	2	HA	3"x8"	8'-4"	Top Horizontals	36
2	2	HB	"	8'-4"	" "	36
3	1	S1A^{R}	"	11'-6 9/16"	Stair Stringers	24
4	1	S1A^{L}	"	11'-6 9/16"	" "	24
5	1	S2A^{R}	"	11'-8⅛"	" "	24
6	1	S2A^{L}	"	11'-8⅛"	" "	24
7	1	S3^{R}	"	11'-8⅝"	" "	24
8	1	S3^{L}	"	11'-8⅝"	" "	24
9	1	S4^{R}	"	12'-0"	" "	24
10	1	S4^{L}	3"x8"	12'-0"	" "	24
11	1	PS1A	3"x10"	9'-5 3/16"	Platform Stringers	25
12	2	PS2	3"x8"	10'-1¼"	" "	44
13	2	PS3	"	10'-11¼"	" "	44
14	2	PS4	3"x8"	11'-9 3/16"	" "	48
15	2	SB1A	2"x4"	5'-0⅜"	Stair Braces	8
16	2	SB2A	"	5'-1 7/16"	" "	8
17	2	SB3	"	5'-11⅞"	" "	8
18	2	SB4	2"x4"	6'-1½"	" "	10
19	2	N1A	2"x8"	7'-3¼"	Cab Joists	21
20	9	N2A	"	8'-8"	" "	108
21	1	N3A	"	1'-4⅞"	" "	3
22	1	N4A	"	3'-2⅜"	" "	6
23	2	N5A	"	1'-9¼"	" "	6
24	2	N6A	"	1'-5¾"	" "	4
25	2	N7A	2"x8"	1'-2⅛"	" "	4
26	2	RP1A	3"x4"	4'-6⅜"	Handrail Posts	10
27	1	RP2A	"	3'-7⅝"	" "	4
28	1	RP2B	"	3'-7⅝"	" "	4
29	2	RP3A	"	4'-7⅝"	" "	10
30	2	RP4A	2"x4"	1'-7¼"	" "	3
31	2	RP5	"	1'-8"	" "	3
32	2	RP6	3"x4"	4'-5⅛"	" "	10
33	2	RP7	2"x4"	1'-10¼"	" "	3
34	2	RP8	3"x4"	4'-4"	" "	10
35	19	FP5	2"x6"	1'-8"	Floor Planks	32
36	4	FP6	"	1'-8"	" "	7
37	11	FP7	"	1'-11"	" "	22
38	4	FP8	2"x6"	1'-11"	" "	8
39	3	FP9	2"x4"	2'-3¼"	" "	6
40	1	FP10	2"x10"	1'-8"	" "	4
41	20	N9	2"x4"	1'-3"	Cab Joist Ties	18
42	12	T1A	2"x8"	1'-5½"	Stair Treads	24
43	36	T2	"	1'-11½"	" "	96
44	12	RP2	3"x4"	3'-9½"	Handrail Posts	48
45	14	A-1	4"x6	1'-0"	Stringer Ties	28
					TOTAL FBM	961

Revised July 25-1940 by W.D.S.

U. S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE

REGION SIX — J. FRANKLAND — REGIONAL ENGINEER

STANDARD LOOKOUT TOWER
41-FOOT TYPE CT-5
BILL OF LUMBER

DESIGNED W.G. DRAWN L.L.L. TRACED L.L.L.
SCALE CHECKED W.
APPROVED [signature] DATE APRIL 1938
ASSISTANT REGIONAL FORESTER

SHEET 7 OF 8 SHEETS L-12005

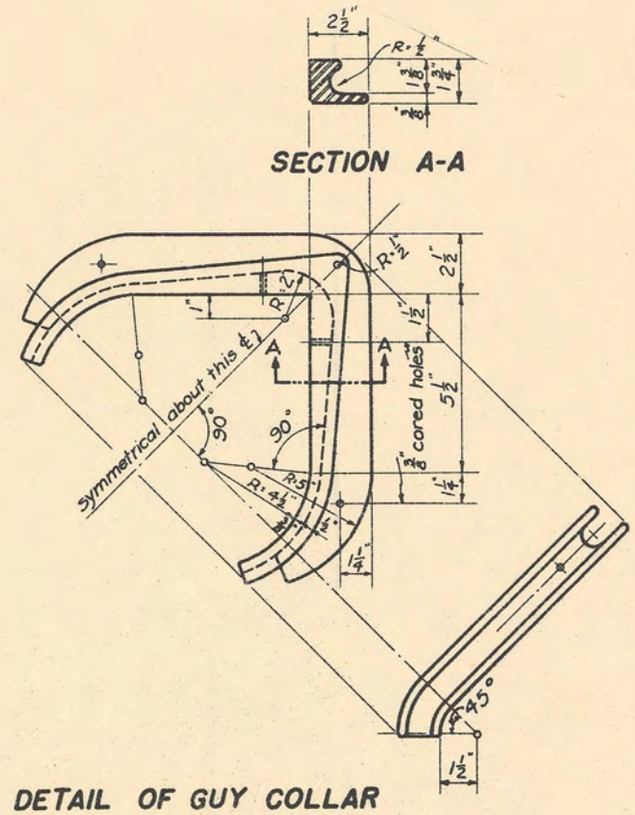
BILL OF IRON

No.	Size	Length	Description	Location	Weight
77	1/2"φ	7 1/2"	Machine Bolts	Post Splices	40
93	"	8 1/2"	" "	Diagonals to Posts	54
8	"	9 1/2"	" "	Top Horizontals to Posts.	5
87	"	10"	" "	Lower " " "	57
27	"	12"	" "	Middle " " "	21
* 1	"	22"	" "	Stair Stringers	2
6	"	28 1/2"	" "	" "	11
3	"	32"	" "	" "	7
273	2 1/2"		"TECO" or equal split rings		75
765	1/2"		Malleable C.I. Washers		95
4			Cast Steel Guy Collars	See Detail.	60
32	1/2"		Drop Forged Cable Clips		21
	1/2"		6/19 Plough Steel Wire Rope	Length to suit field.	
4	1/2"		Thimbles for 1/2"-6/19	wire rope.	3
	20d		Common Nails.	FB, FP, SB, Cab Joists	22
	40d		" "	S1, S2, ST1, ST2	15
	30d		" "	N9	5
	10d		" "	RP	3
46	1/2"	6 1/2	Machine Bolts	Stair Stringers	21
40	3/8"	5"	Carriage Bolts	Hand Rail	8
12	"	6"	" "	" "	3
4	"	7"	" "	" "	1

60-3/8" Cut Washers.
All above items except C.S. Guy Collar to be galvanized.

* The asterisked item shall be revised as follows for towers where the alternate stair material is used:
Replace 1-1/2"φ×22" bolt with 2-1/2"φ×22 1/2" bolt.

This note is applicable only to towers having no catwalk (see sheet L-10002)



DETAIL OF GUY COLLAR
Scale 3"=1'-0"
Material-Cast Steel

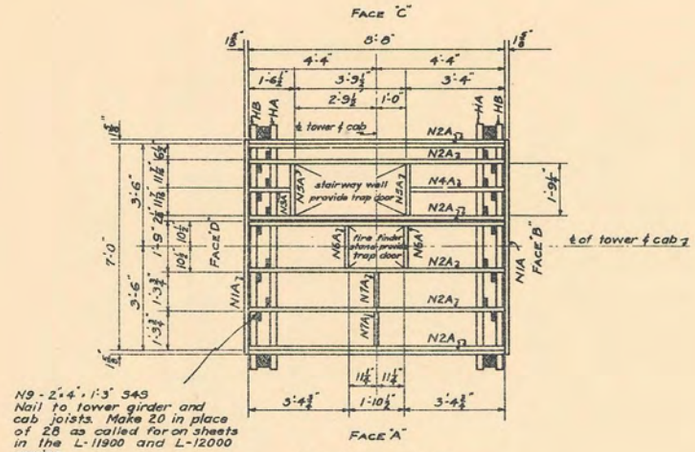
Revised. July 25-1940 by W.D.S.

U. S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE
REGION SIX J. FRANKLAND REGIONAL ENGINEER

STANDARD LOOKOUT TOWER
41-FOOT TYPE CT-5
BILL OF HARDWARE

DESIGNED W.G. DRAWN L.L.L. TRACED L.L.L.
SCALE 3"=1'-0" CHECKED B.C.O.
APPROVED J. Frankland DATE APRIL 1940
ASSISTANT REGIONAL FORESTER

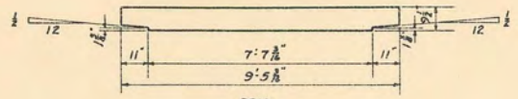
E G



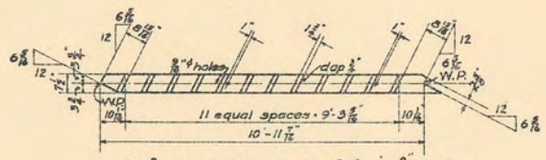
N9 - 2"×4" × 1'-3" S4S
Nail to tower girder and cab joists. Make 20 in place of 28 as called for on sheets in the L-11900 and L-12000 series.

CAB JOIST LAYOUT

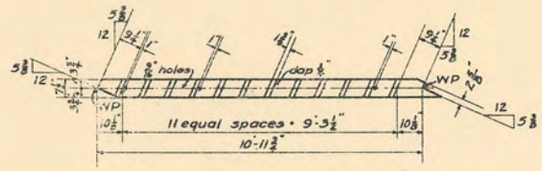
For 7'×7' cab without catwalk. see drawings B-4101, B-4102 and B-4103 for other cab details.



Make 1 - 3"×10"×9'-5 3/16" S4S to replace 2-PS1 and PT as detailed on sheets in the L-11900 to L-12000 series.

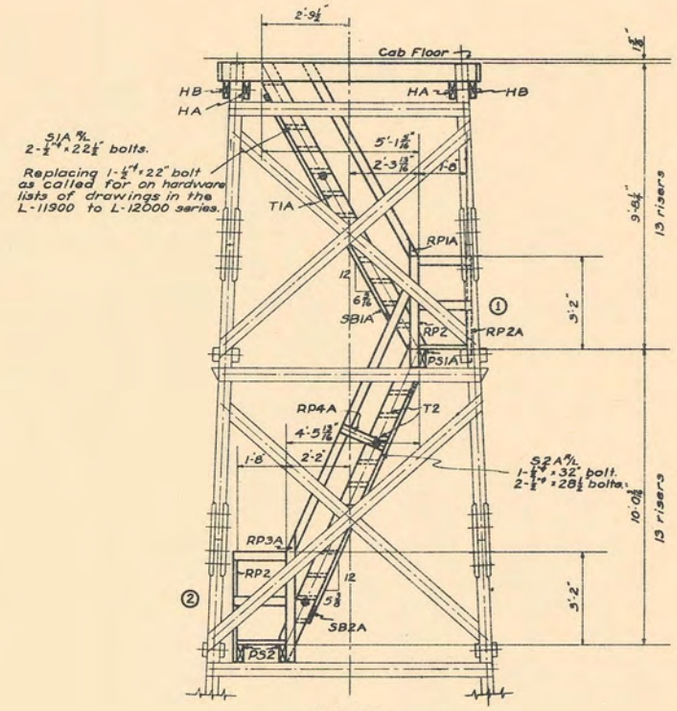


S1A^R Make one as shown 3"×8"×11'-6 9/16" S4S
S1A^L Make one opposite hand 3"×8"×11'-6 9/16" S4S



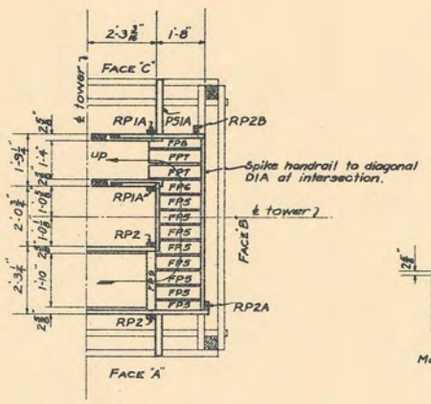
S2A^R Make one as shown 3"×8"×11'-8⅛" S4S
S2A^L Make one opposite hand 3"×8"×11'-8⅛" S4S.

NOTE - These stair stringers marked S1A^R/L and S2A^R/L are to replace respectively those pieces marked S1^R/L and S2^R/L as detailed on sheets in the L-11900 to L-12000 series.



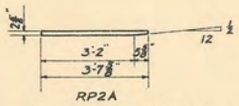
FACE "A"
CT-5 TOWER
ALTERNATE STAIR LAYOUT

For 7'×7' tower using cab without catwalk. Stair layout below second panel same as for tower using standard cab with catwalk.

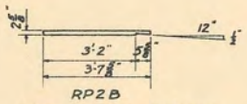


PLATFORM ONE

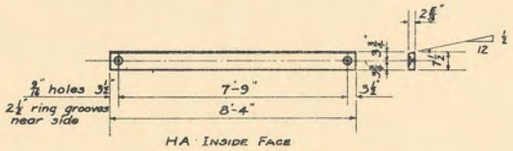
NOTE - The plan layout of Platform One is to replace that shown on drawings in the L-11900 and L-12000 series when the cab is built without catwalk.
See drawings in the L-11900 and L-12000 series for plan layout of platforms in lower panels.



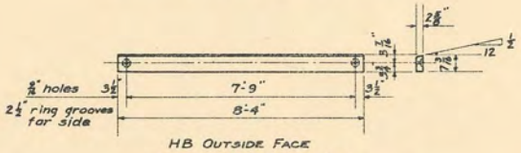
RP2A
Make one from 3"×4" S4S



RP2B
Make one from 3"×4" S4S



HA INSIDE FACE
Make 2 - 3"×8"×8'-4" S4S
To replace member H1A detailed on sheets in the L-11900 to L-12000 series.

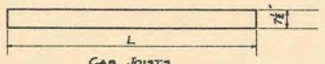


HB OUTSIDE FACE
Make 2 - 3"×8"×8'-4" S4S
To replace member H1B detailed on sheets in the L-11900 to L-12000 series.

GENERAL NOTES

All details on sheets in the L-11900 to L-12000 series except those details or changes noted on this sheet, apply both to the 7'×7' tower cab with catwalk and to the 7'×7' tower cab without catwalk.
As detailed or called for on sheets in the L-11900 to L-12000 series, and in addition to the substitutions or replacments detailed on this sheet, the following revisions of quantities are to be made if this sheet is to be used.

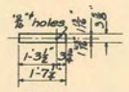
FP5	8 additional.
FP6	1 "
FP7	2 "
FP8	1 "
FP9	1 "
T2	1 less
RP2	1 "
FP1	make none.
FP2	" "
FP3	" "
FP4	" "



Cab Joists
2"×8" S4S

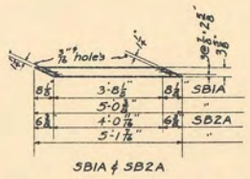
MARK	NO REQ'D	LENGTH-L
N1A	2	7'-3½"
N2A	9	8'-8"
N3A	1	1'-4⅞"
N4A	1	3'-2⅞"
N5A	2	1'-9½"
N6A	2	1'-5½"
N7A	2	1'-2⅞"

NOTE - These pieces to replace all pieces marked from N1 to N8 inclusive as detailed on sheets in the L-11900 to L-12000 series.

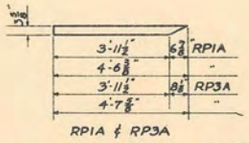


RP4A
Make two from 2"×4" S4S
To replace pieces RP4 as detailed on sheets in the L-11900 to L-12000 series.

T1A
Make 12 from 2"×8" S4S
To replace pieces T1 as detailed on sheets in the L-11900 to L-12000 series.



SB1A & SB2A
Make two each from 2"×4" S4S
To replace pieces SB1 & SB2 as detailed on sheets in the L-11900 to L-12000 series.



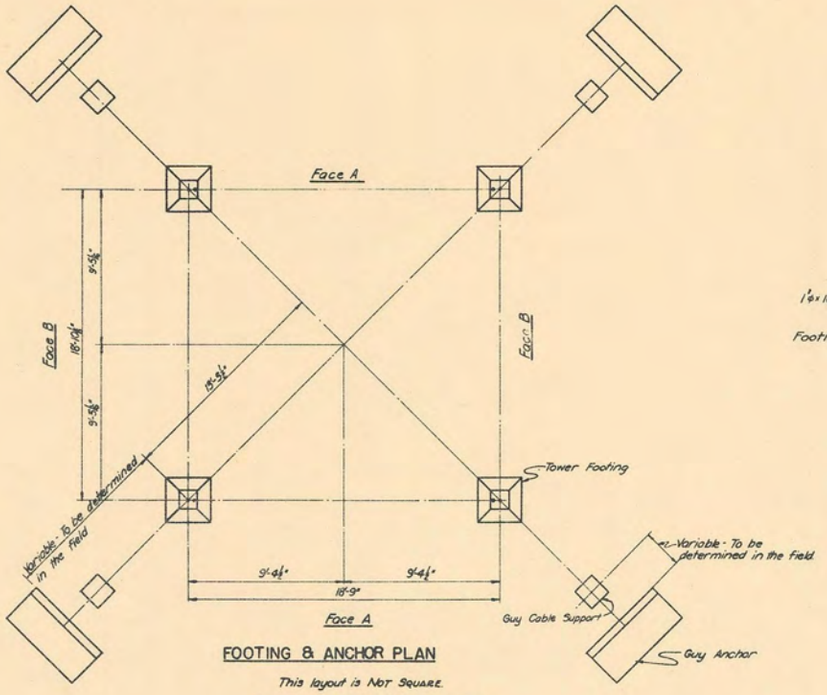
RP1A & RP3A
Make two each from 3"×4" S4S
To replace pieces RP1 & RP3 as detailed on sheets in the L-11900 to L-12000 series.

U.S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE
REGION SIX JAMES FRANKLAND REGIONAL ENGINEER

ALTERNATE DETAILS
STANDARD LOOKOUT TOWER TYPE CT-5
FOR 31 AND 41 FT. HEIGHTS
FOR TOWER CAB WITHOUT CATWALK

DESIGNED W.G. DRAWN W.G. TRACED L.L.L.
SCALE ½"=1'-0" CHECKED M.A.J.
APPROVED [signature] ASSISTANT REGIONAL FORESTER DATE MARCH 1958

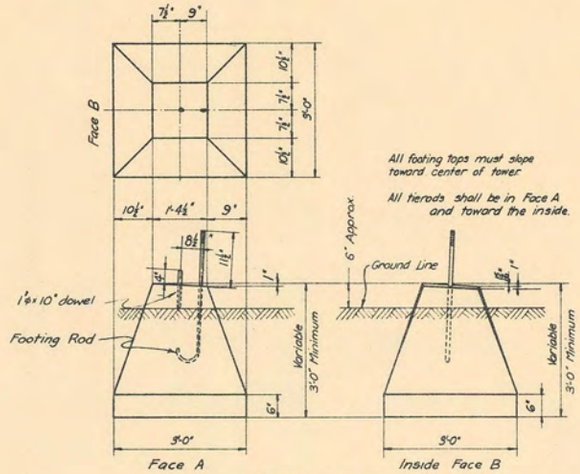
SHEET 1 OF 1 SHEETS L-10002



FOOTING & ANCHOR PLAN

This layout is NOT SQUARE.

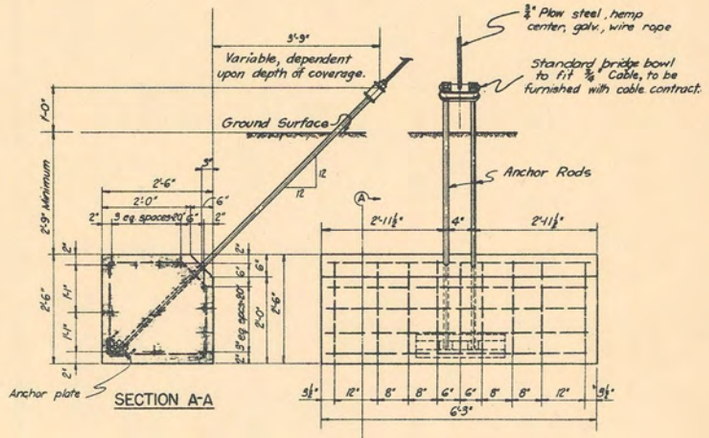
Cables shall slope at 45° and location of anchors shall be computed accordingly.

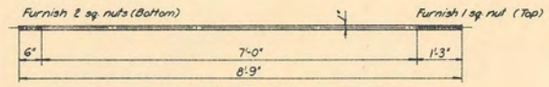


TOWER FOOTING

9'-0", 9'-0" Concrete block of variable height. Top bevelled two ways at ¾" to 12".

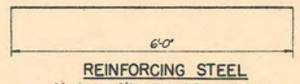
4 Required





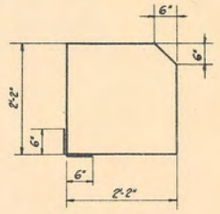
ANCHOR ROD

1"φ x 8'-9" Rod. Thread ends as indicated. Furnish 3 sq. nuts for each rod. Make 8- galvanized.



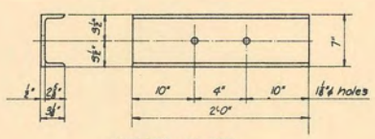
REINFORCING STEEL

44 pieces of ½"φ x 6'-0" deformed bars



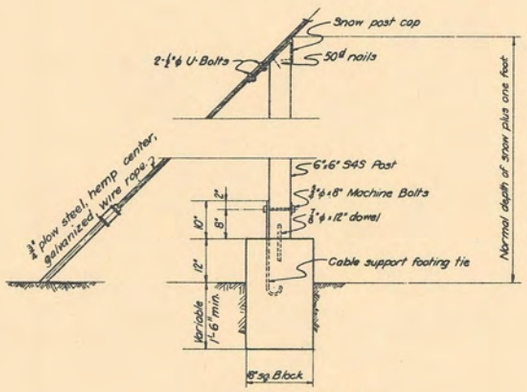
REINFORCING TIES

36 pieces of ⅝"φ x 9'-5" deformed bars.



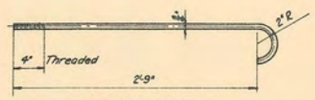
ANCHOR PLATE

7" x 5½" x ½" Channel C42 (B.S.C.S.) Make 4- galvanized



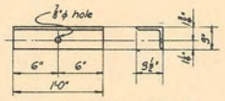
GUY CABLE SUPPORT

4 Required where tower is located in regions of heavy snow.



FOOTING ROD

⅝"φ x 3'-4" Rod - galvanized
Furnish 1 sq. nut each - Make 4.



FOOTING ANGLE

3½" x 3" x ⅜" x 1'-0" angle, galvanized.

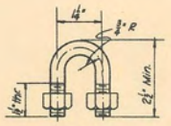
4 Required

For assembly of this angle to top end of footing rod see Drawing L-10402, general tower elevations.

Furnish all detailed material and in addition furnish:

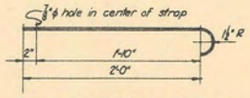
4-⅝"φ x 12" dowels, plain
4-1⅛"φ x 10" dowels, plain
4-⅝"φ x 8" machine bolts
4-⅝"φ malleable washers

All galvanized.



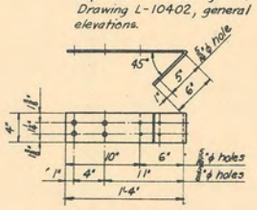
U-BOLT

½"φ galvanized U-bolt - Make 8
Furnish 2 hex. nuts each bolt.



CABLE SUPPORT FOOTING TIE

⅝"φ x 3½" 2'-6" strap, galvanized - Make 4.



SNOW POST CAP

4" x ½" x 1'-10" galvanized strap. Make 4.

CONCRETE

Mix: 1-3-5
Approximate volume: 8.94 cu yds.
Cement - 10.2 bbls
Sand - 4.7 cu yds.
Gravel - 7.8 cu yds.

Quantities are based on minimum dimensions as shown.

Revised 4-18-40 W.D.S.
Revised 3-8-39 by W.O.
Dimensions added to Sect. M. Guy Anchor.
Revised Mar. 31, 38. B.C.O.

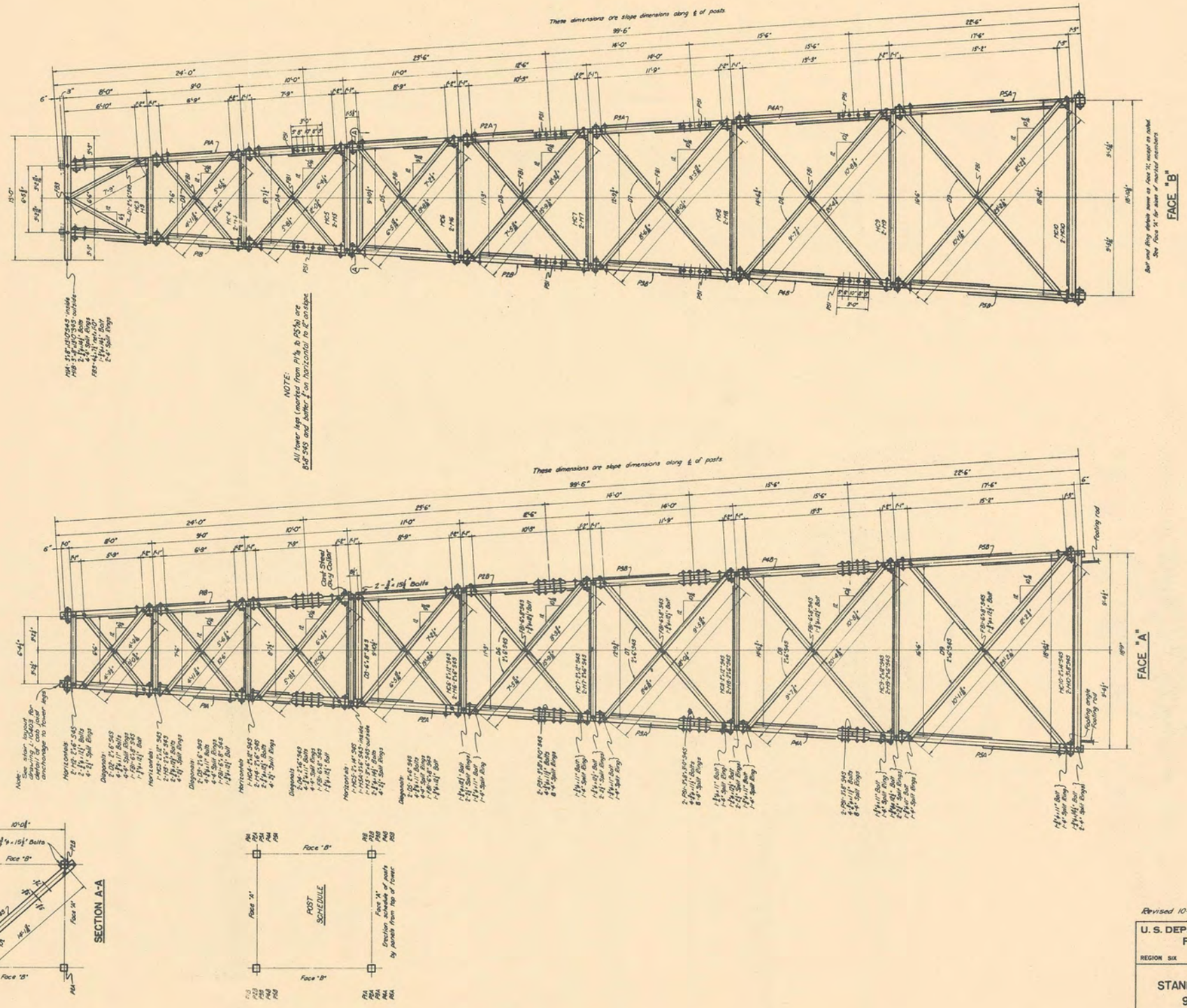
U. S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE

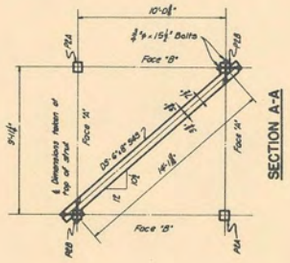
REGION SIX — J. FRANKLAND REGIONAL ENGINEER

STANDARD LOOKOUT TOWER
99-FOOT TYPE CT-1
FOUNDATION DETAILS

DESIGNED B.C.O. DRAWN B.C.O. TRACED B.C.O.
SCALE NO. CHECKED W.O.S.
APPROVED [signature] ASSISTANT REGIONAL FORESTER DATE JAN. 1938

SHEET 1 OF 8 SHEETS L-10401





Revised 10-5-39 by A.S., /vg

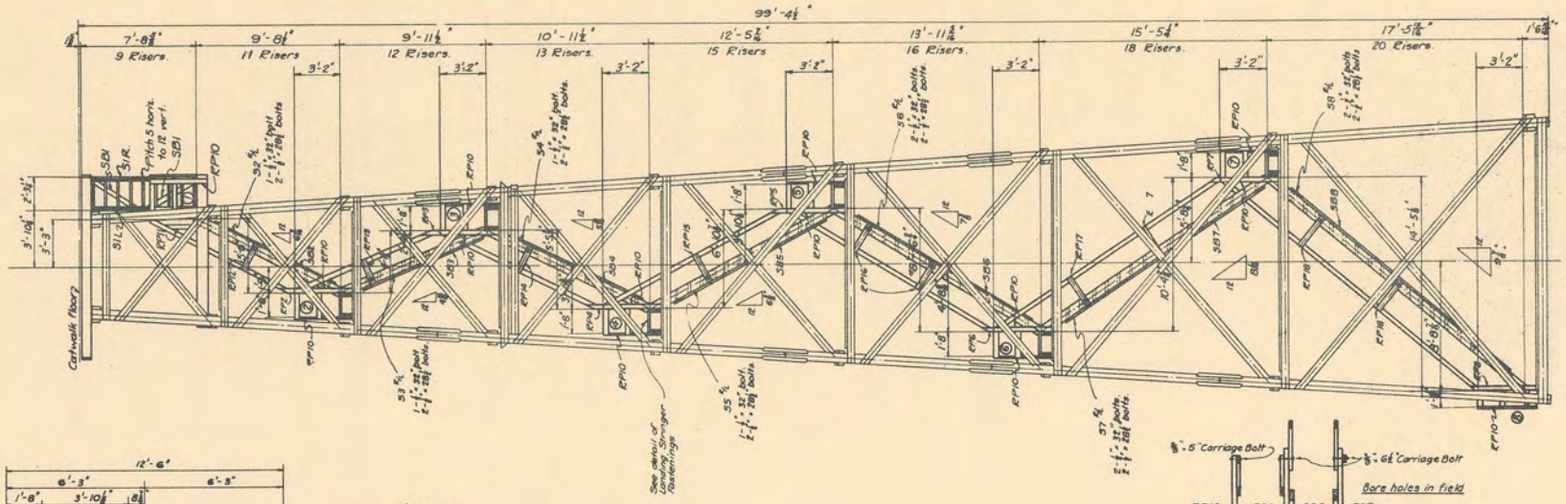
U. S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE

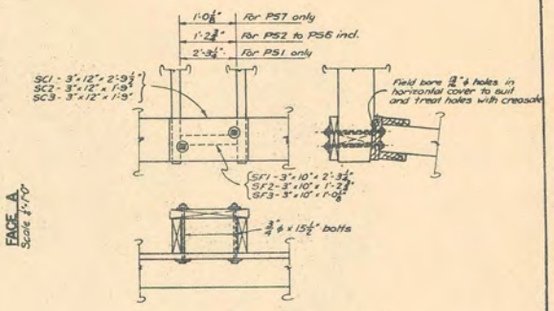
REGION SIX — JAMES FRANKLAND REGIONAL ENGINEER

STANDARD LOOKOUT TOWER
99-FOOT TYPE CT-1
GENERAL PLAN

DESIGNED: W.G. DRAWN: H.R.S. TRACED: H.R.S.
SCALE: 1/8"=1'-0" CHECKED: W. D. B.
APPROVED: DATE: JANUARY 1938
ACT. ASSISTANT REGIONAL FORESTER

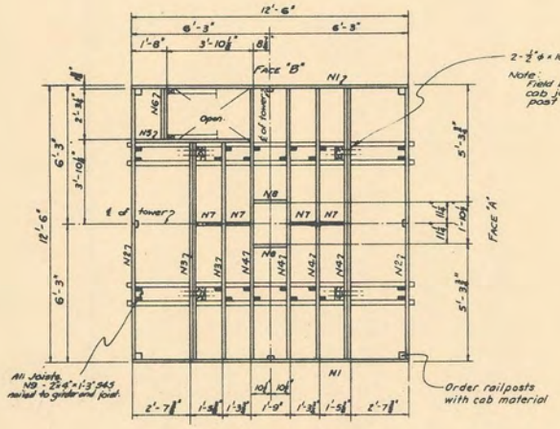
SHEET 2 OF 8 SHEETS L-10402



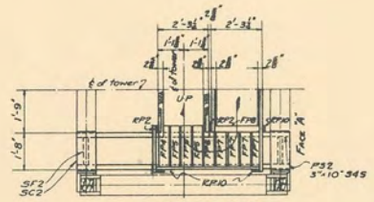


PLATFORM STRINGER FASTENINGS

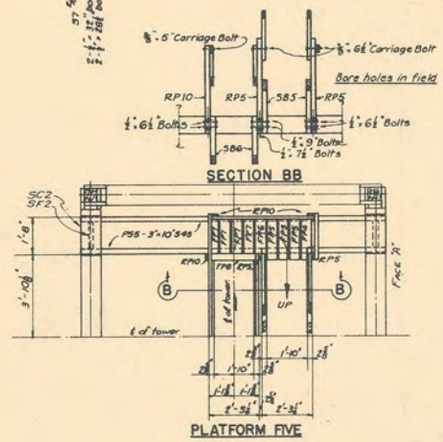
Scale ⅜"=1'-0"



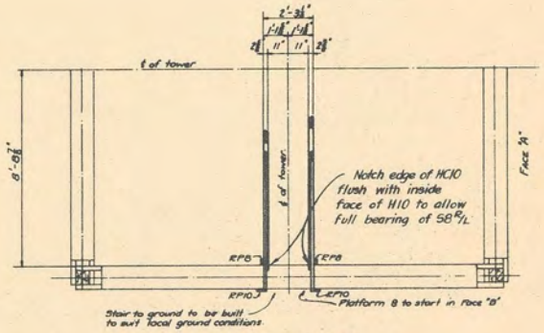
CAB JOIST LAYOUT



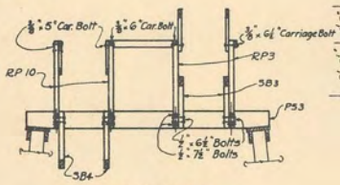
PLATFORM TWO



PLATFORM FIVE



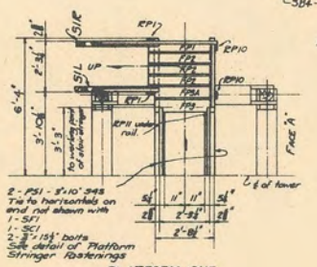
PLATFORM EIGHT



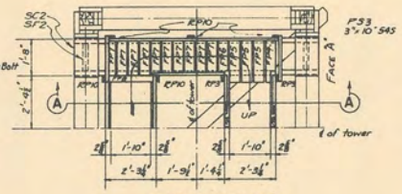
SECTION AA

Bore holes in field

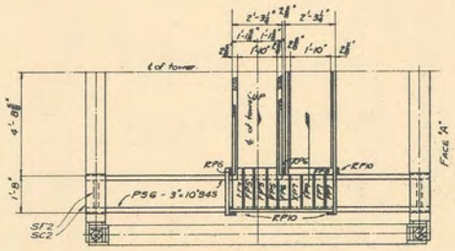
SECTION BB



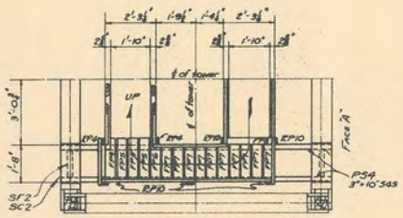
PLATFORM ONE



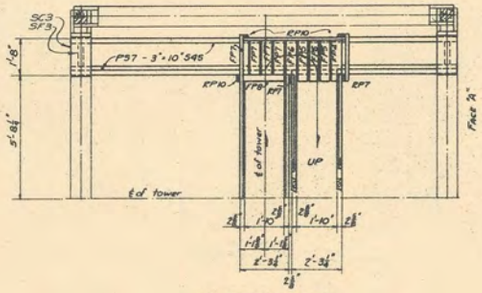
PLATFORM THREE



PLATFORM SIX



PLATFORM FOUR



PLATFORM SEVEN

MATERIAL SIZES

Cab Joists	2"x8"	S4S	Treated
Stair Stringers	3"x8"	"	"
Stair Treads	2"x8"	"	"
Platform Stringers	3"x10"	"	"
Platform floor plank	2"x6"	"	"
Rail posts	2"x4" & 3"x4"	"	"
Stair Stringer Sways	2"x4"	"	"
Handrails	2"x4"	"	Untreated.

Stair stringers to bear directly on platform stringers, and not on platform plank.

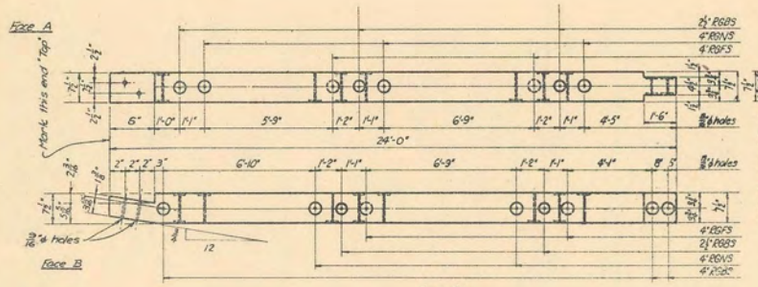
Revised 4-19-40 W.D.S.
Revised 10-5-39 A.S.
Revised 2-4-38 H.E.S.

U. S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE
REGION SIX — JAMES FRANKLAND REGIONAL ENGINEER

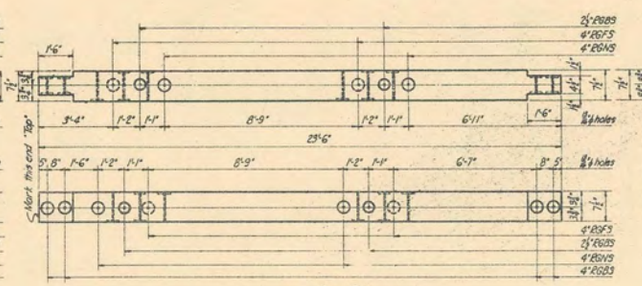
STANDARD LOOKOUT TOWER
99-FOOT TYPE CT-1
STAIR LAYOUT

DESIGNED W.G. DRAWN W.G. TRACED B.C.O.
SCALE ⅜"=1'-0" EXCEPT AS NOTED CHECKED W.D.S.
APPROVED ACT ASSISTANT REGIONAL FORESTER DATE JANUARY 1936

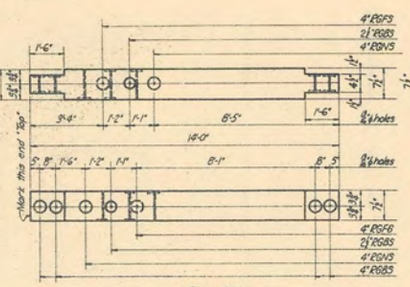
SHEET 3 OF 8 SHEETS L-10403.



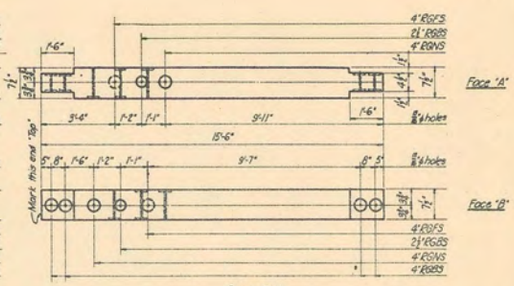
Post P1A
Make 2-8"x8"x24'-0" S4S



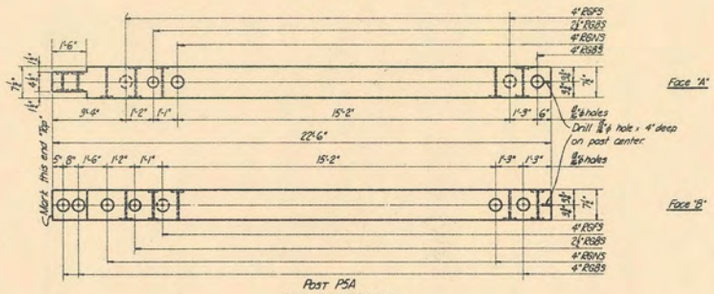
Post P2A
Make 2-8"x8"x23'-6" S4S



Post P3A
Make 2-8"x8"x14'-0" S4S

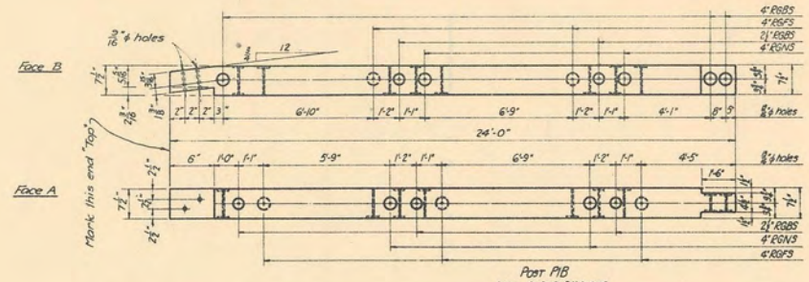


Post P4A
Make 2-8"x8"x15'-6" S4S

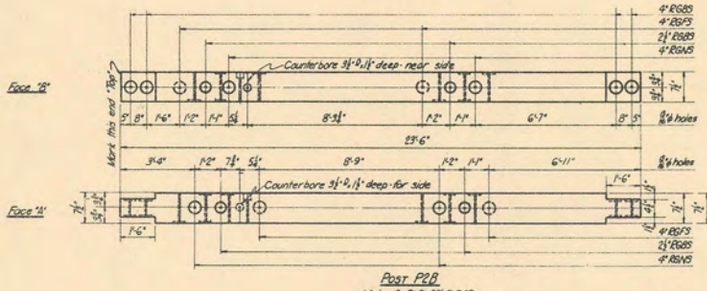


Post P5A
Make 2-8"x8"x22'-6" S4S

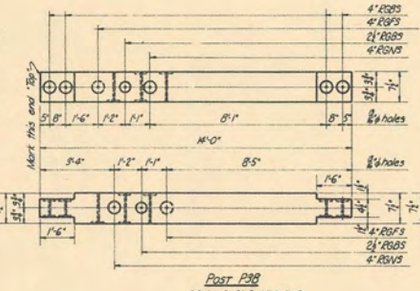
RGBS - Ring Groove Both Sides
RGNS - Ring Groove Near Side
RGFS - Ring Groove Far Side



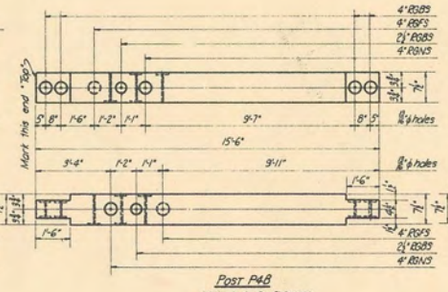
Post P1B
Make 2-8"x8"x24'-0" S4S



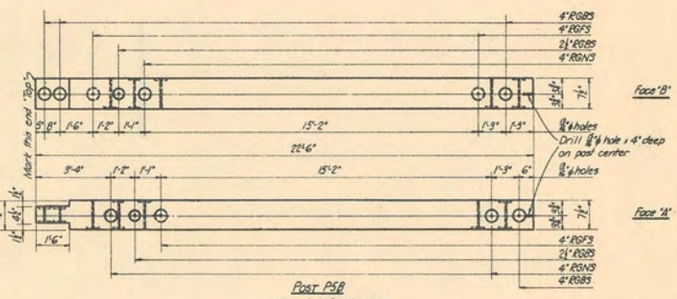
Post P2B
Make 2-8"x8"x23'-6" S4S



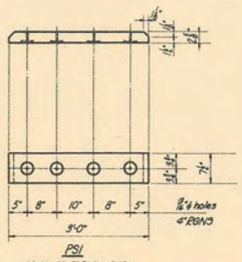
Post P3B
Make 2-8"x8"x14'-0" S4S



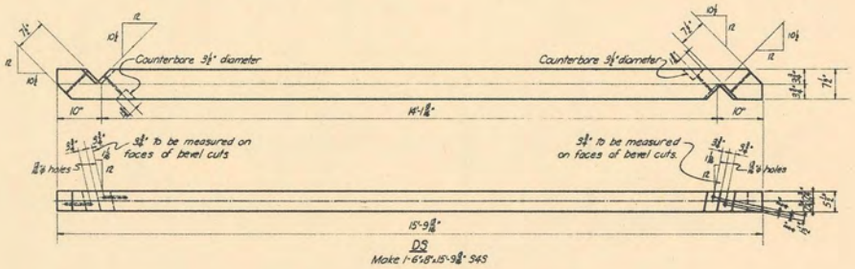
Post P4B
Make 2-8"x8"x15'-6" S4S



Post P5B
Make 2-8"x8"x22'-6" S4S



PS1
Make 32-3"x8"x30" S4S



D3
Make 1-6"x8"x15'-9 3/8" S4S

Revised 10-6-39 by A.S.
Revised 3-8-39 by W.B.
D.S.
Rev. 2-4-38. MES

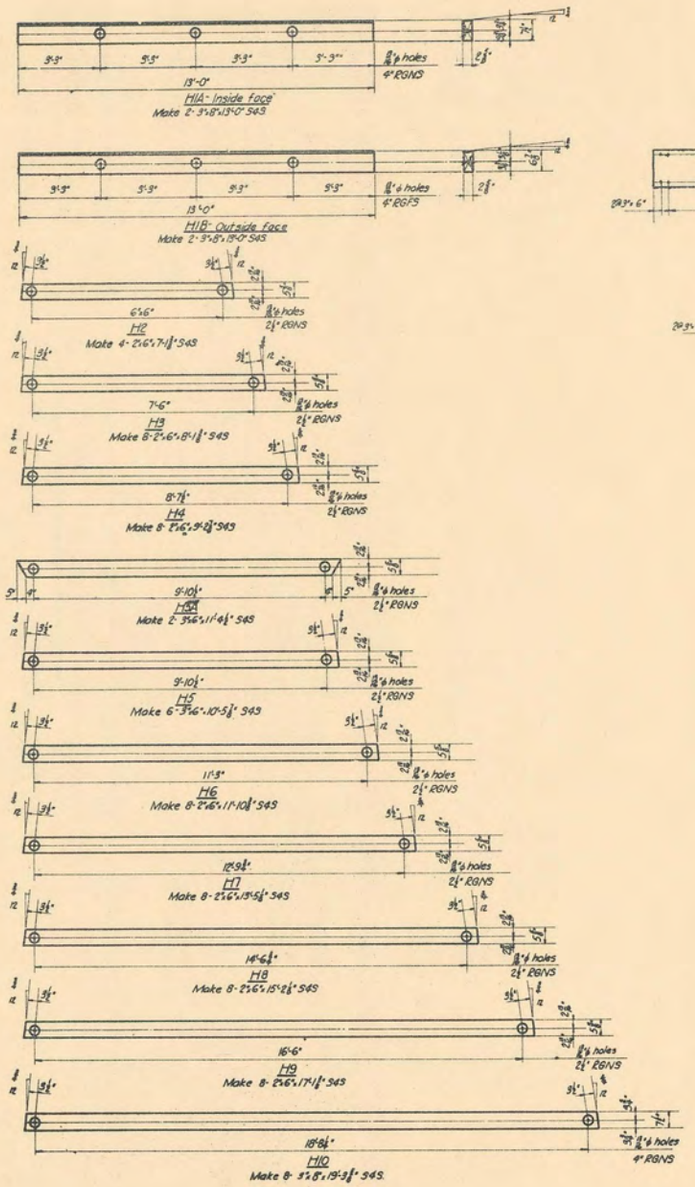
U. S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE

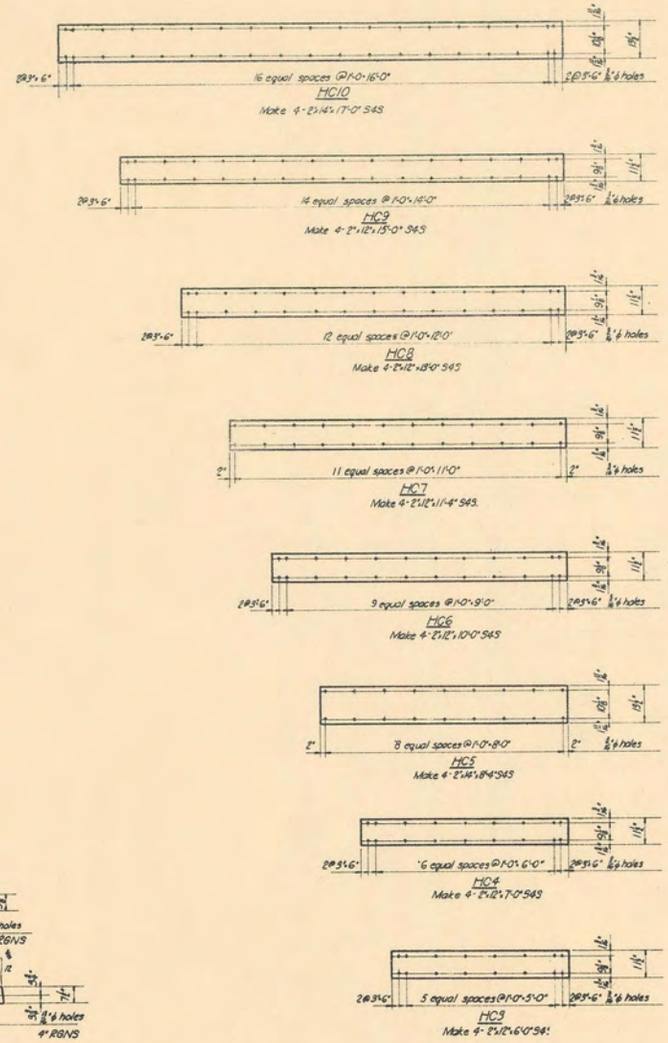
REGION SIX — J. FRANKLAND — REGIONAL ENGINEER

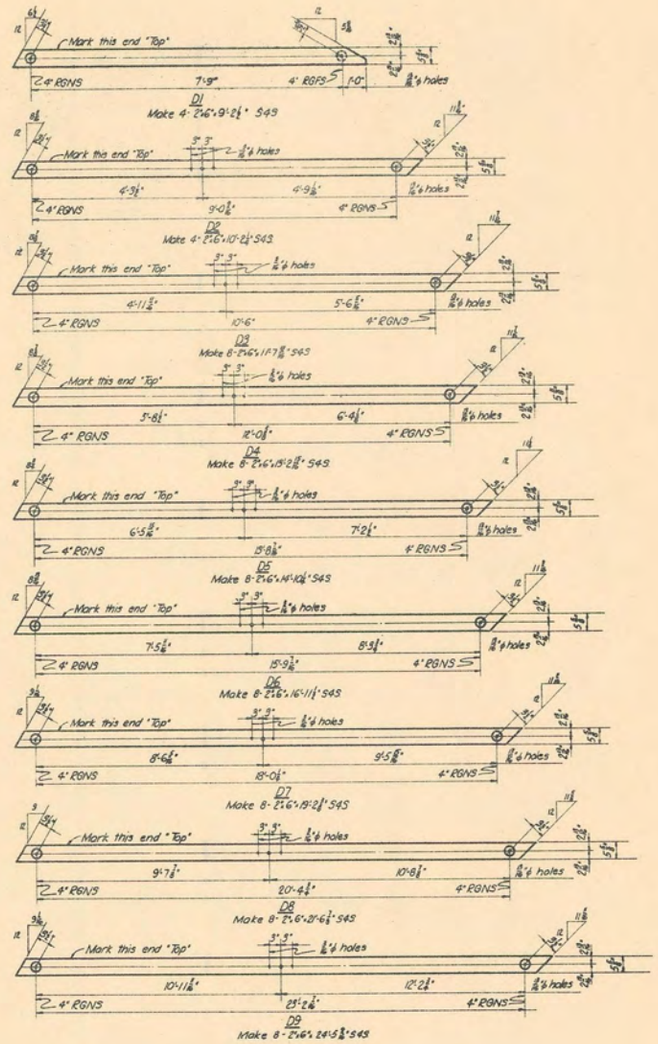
STANDARD LOOKOUT TOWER
99-FOOT TYPE CT-1
SHOP DETAILS

DESIGNED W.G. — DRAWN H.R.S. — TRACED H.R.S.
SCALE NONE — CHECKED W. R. B.
APPROVED — DATE JANUARY-1937
ACT ASSISTANT REGIONAL FORESTER

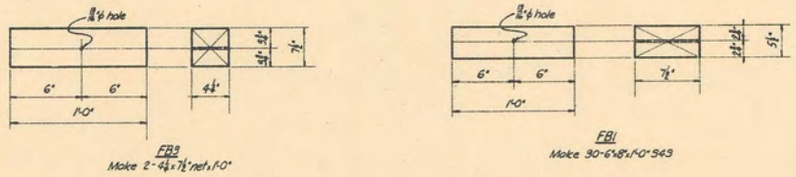
SHEET 4 OF 8 SHEETS L-10404A







RGBS - Ring Groove Both Sides
RGNS - Ring Groove Near Side
RGFS - Ring Groove Far Side



Revised 3-8-39 by W.B.
HC10, HC10, HC5.

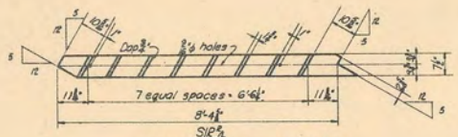
U. S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE

REGION SIX — J. FRANKLAND — REGIONAL ENGINEER

STANDARD LOOKOUT TOWER
99-FOOT TYPE CT-1
SHOP DETAILS

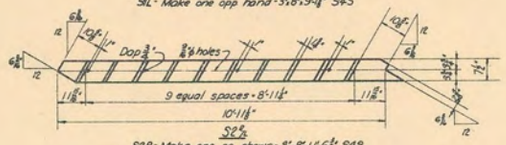
DESIGNED W.G. DRAWN H.R.S. TRACED H.R.S.
SCALE NONE CHECKED B.C.D.
APPROVED ASST. REGIONAL FORESTER DATE JAN. 1938

SHEET 5 OF 8 SHEETS L-10404B



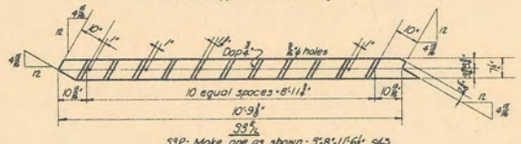
S1R/L

S1R - Make one as shown - 3"x8"x9'-1 1/2" S4S
S1L - Make one opp hand - 3"x8"x9'-1 1/2" S4S



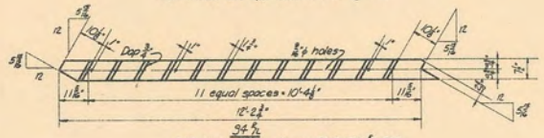
S2R/L

S2R - Make one as shown - 3"x8"x11'-6 1/4" S4S
S2L - Make one opp hand - 3"x8"x11'-6 1/4" S4S



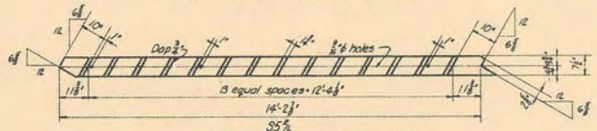
S3R/L

S3R - Make one as shown - 3"x8"x11'-6 1/4" S4S
S3L - Make one opp hand - 3"x8"x11'-6 1/4" S4S



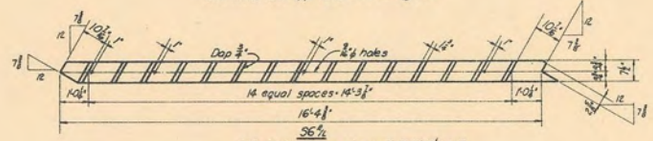
S4R/L

S4R - Make one as shown - 3"x8"x12'-10 1/2" S4S
S4L - Make one opp hand - 3"x8"x12'-10 1/2" S4S



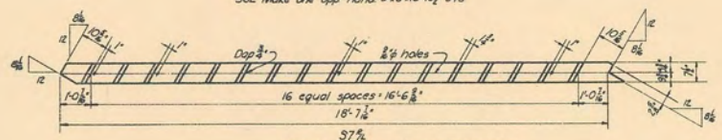
S5R/L

S5R - Make one as shown - 3"x8"x14'-9 1/2" S4S
S5L - Make one opp hand - 3"x8"x14'-9 1/2" S4S



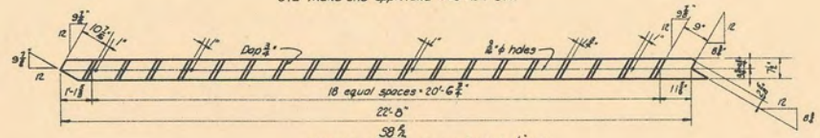
S6R/L

S6R - Make one as shown - 3"x8"x16'-10 1/2" S4S
S6L - Make one opp hand - 3"x8"x16'-10 1/2" S4S



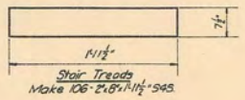
S7R/L

S7R - Make one as shown - 3"x8"x19'-1" S4S
S7L - Make one opp hand - 3"x8"x19'-1" S4S

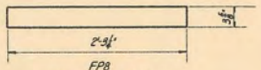


S8R/L

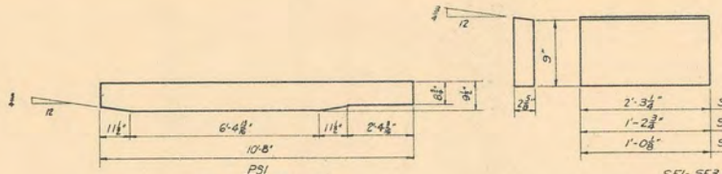
S8R - Make one as shown - 3"x8"x23'-1 1/2" S4S
S8L - Make one opp hand - 3"x8"x23'-1 1/2" S4S



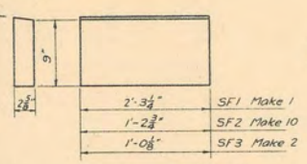
Stair Treads
Make 106 - 2"x8"x1'-11 1/2" S4S.



FP8
Make 6 - 2"x4"x2'-3 1/4" S4S.

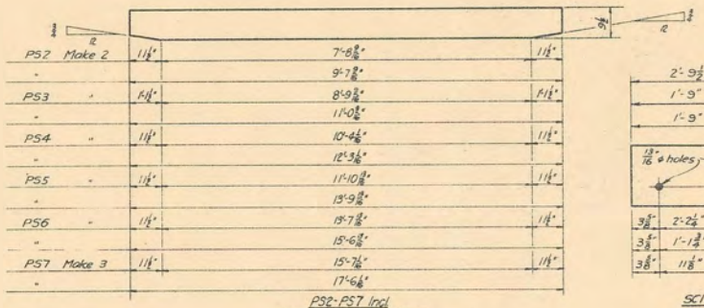


PS1
Make 2 - 3"x10"x10'-0" S4S.



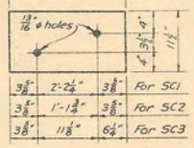
2'-3 1/4"	SF1 Make 1
1'-2 3/8"	SF2 Make 10
1'-0 5/8"	SF3 Make 2

SF1 - SF3 incl.
Make from 3"x10" S4S



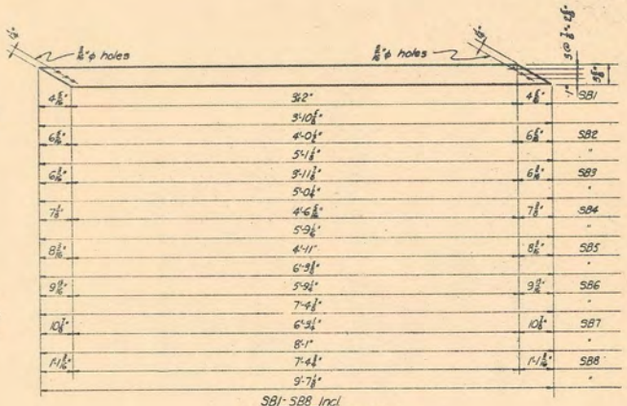
PS2	Make 2	11 1/4"	7'-8 3/8"
"			9'-7 3/8"
PS3	"	11 1/4"	8'-9 3/8"
"			11'-0 3/8"
PS4	"	11 1/4"	10'-4 1/8"
"			12'-3 1/8"
PS5	"	11 1/4"	11'-10 3/8"
"			13'-9 3/8"
PS6	"	11 1/4"	13'-7 3/8"
"			15'-6 3/8"
PS7	Make 3	11 1/4"	15'-7 1/8"
"			17'-6 1/8"

PS2 - PS7 Incl
Make from 3"x10" S4S.



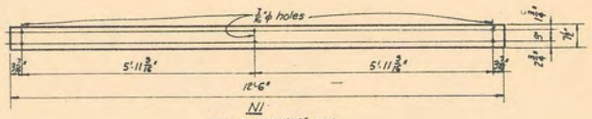
2'-9 1/2"			SC1 Make 1
1'-9"			SC2 Make 10
1'-9"			SC3 Make 2
3 5/8"	2'-2 1/4"	3 5/8"	For SC1
3 5/8"	1'-1 3/4"	3 5/8"	For SC2
3 5/8"	11 1/8"	6 1/4"	For SC3

SC1 - SC3 incl.
Make from 3"x12" S4S

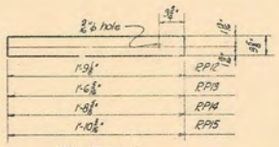


4 5/16"	3'-2"	4 5/8"	SB1
	3'-10 5/8"		
6 5/16"	4'-0 1/4"	6 5/8"	SB2
	5'-1 1/4"		"
6 5/16"	5'-11 1/4"	6 5/8"	SB3
	5'-0 1/4"		"
7 1/8"	4'-6 5/8"	7 1/8"	SB4
	5'-9 1/4"		"
8 5/16"	4'-11"	8 5/16"	SB5
	6'-9 1/4"		"
9 13/16"	5'-9 1/4"	9 13/16"	SB6
	7'-4 1/4"		"
10 1/8"	6'-5 1/4"	10 1/8"	SB7
	8'-1"		"
11 1/16"	7'-4 1/4"	11 1/16"	SB8
	9'-7 1/8"		"

SB1 - SB8 Incl
Make 2 of each of 2"x4" S4S

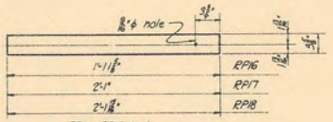


N1
Make 2 - 2"x8"x12'-6" S4S



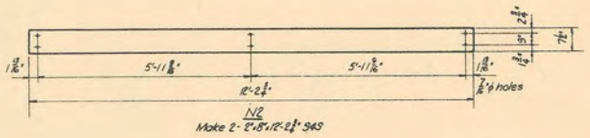
1'-9 1/4"	RP12
1'-6 3/8"	RP13
1'-8 1/8"	RP14
1'-10 1/8"	RP15

RP12 - RP15 Incl
Make 2 of each of 2"x4" S4S

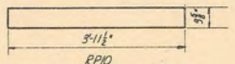


1'-11 1/8"	RP16
2'-1"	RP17
2'-1 3/8"	RP18

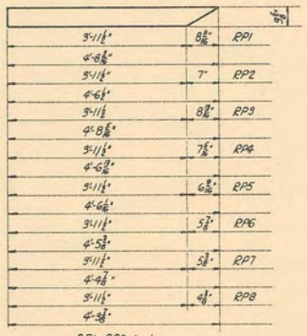
RP16 - RP18 Incl
Make 4 of each of 2"x4" S4S



N2
Make 2 - 2"x8"x12'-2 1/2" S4S

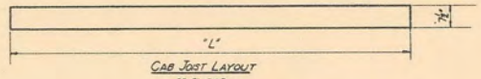


RP10
Make 26 - 3"x4"x3'-11 1/2" S4S

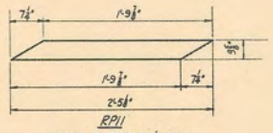


3'-11 1/2"	
4'-8 5/16"	
3'-11 1/2"	8 9/16" RP1
4'-6 1/2"	
3'-11 1/2"	7" RP2
4'-6 1/2"	
3'-11 1/2"	8 9/16" RP3
4'-8 5/16"	
3'-11 1/2"	7 5/8" RP4
4'-6 3/8"	
3'-11 1/2"	6 9/16" RP5
4'-6 1/2"	
3'-11 1/2"	5 3/8" RP6
4'-5 3/8"	
3'-11 1/2"	5 1/8" RP7
4'-4 1/8"	
3'-11 1/2"	4 3/8" RP8
4'-3 3/8"	

RP1 - RP8 Incl
Make 2 of each of 3"x4" S4S.

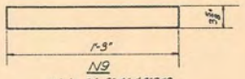


CAB JOIST LAYOUT
2"x8" S4S

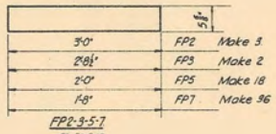


RP11
Make 2 - 2"x4"x2'-5 1/4" S4S

Mark	No. Reqd	Length "L"
N3	3	9'-9 7/8"
N4	5	12'-2 1/2"
N5	1	5'-2 1/4"
N6	2	2'-3 1/4"
N7	4	1'-2 1/8"
N8	2	1'-5 1/4"

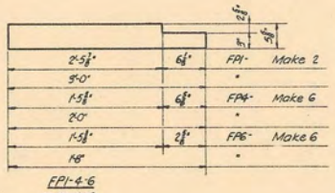


N9
Make 24 - 2"x4"x1'-3" S4S.



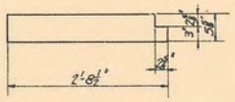
3'-0"	FP2 Make 3
2'-8 1/4"	FP3 Make 2
2'-0"	FP5 Make 18
1'-8"	FP7 Make 36

FP2-3-5-7
2"x6" S4S



2'-5 1/4"	6 1/4"	FP1 Make 2
3'-0"		"
1'-5 1/4"	6 1/4"	FP4 Make 6
2'-0"		"
1'-5 1/4"	2 1/4"	FP6 Make 6
1'-8"		"

FP1-4-6
2"x6" S4S



FP3A
Make 1 - 2"x6"x2'-8 1/4" S4S.

Rev. 4-22-40 W.D.S.
Rev. 10-6-39 A.S.
Rev. 4-12-38 B.C.O.
Rev. 1-5-38 H.R.S.

U. S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE

REGION SIX — J. FRANKLAND — REGIONAL ENGINEER

STANDARD LOOKOUT TOWER
99-FOOT TYPE CT-1
SHOP DETAILS

DESIGNED W.G. DRAWN H.R.S. TRACED H.R.S.
SCALE NONE CHECKED B.C.O.
APPROVED ACT. ASSISTANT REGIONAL FORESTER DATE JANUARY 1938

SHEET 6 OF 8 SHEETS L-10404C

TREATED TOWER MATERIAL

ITEM	No	MARK	SIZE	LENGTH	DESCRIPTION	FBM
1	2	P1A	8"×8"	26'-0"	Top Posts	278
2	2	P1B	"	26'-0"	" "	278
3	2	P2A	"	26'-0"	Intermediate Posts	278
4	2	P2B	"	26'-0"	" "	278
5	2	P3A	"	16'-0"	" "	170
6	2	P3B	"	16'-0"	" "	170
7	2	P4A	"	17'-6"	" "	192
8	2	P4B	"	17'-6"	" "	192
9	2	P5A	"	24'-6"	Bottom Posts	278
10	2	P5B	8"×8"	24'-6"	" "	278
11	32	P51	3"×8"	3'-0"	Post Splices	192
12	1	D5	6"×8"	15'-9 3/8"	Diagonal Strut	64
13	4	H2	2"×6"	7'-1 1/8"	Horizontals	32
14	8	H3	"	8'-1 1/8"	"	72
15	8	H4	2"×6"	9'-2 1/8"	"	80
16	2	H5A	3"×6"	11'-4 1/2"	"	36
17	6	H5	3"×6"	10'-5 1/8"	"	108
18	8	H6	2"×6"	11'-10 1/8"	"	96
19	8	H7	"	13'-5 1/8"	"	112
20	8	H8	"	15'-2 1/8"	"	128
21	8	H9	2"×6"	17'-1 1/8"	"	144
22	8	H10	3"×8"	19'-3 3/8"	"	320
23	4	HC3	2"×12"	6'-0"	Horizontal Covers	48
24	4	HC4	2"×12"	7'-0"	" "	56
25	4	HC5	2"×14"	8'-4"	" "	84
26	4	HC6	2"×12"	10'-0"	" "	80
27	4	HC7	"	11'-4"	" "	96
28	4	HC8	"	13'-0"	" "	112
29	4	HC9	2"×12"	15'-0"	" "	128
30	4	HC10	2"×14"	17'-0"	" "	168
31	4	D1	2"×6"	9'-2 1/4"	Diagonals	40
32	4	D2	"	10'-2 1/4"	"	48
33	8	D3	"	11'-7 7/8"	"	96
34	8	D4	"	13'-2 3/8"	"	112
35	8	D5	"	14'-10 1/8"	"	128
36	8	D6	"	16'-1 1/2"	"	144
37	8	D7	"	19'-2 1/8"	"	160
38	8	D8	"	21'-6 5/8"	"	176
39	8	D9	2"×6"	24'-5 5/8"	"	208
40	30	FB1	6"×8"	1'-0"	Fill Blocks	120
41	2	FB3	4"×7 1/2" net	1'-0"	" "	8
42					Total FBM.	5788

UNTREATED LUMBER

ITEM	No	MARK	SIZE	LENGTH	DESCRIPTION	FBM
1	2		2"×4"	6'-0"	Hand Rails	8
2	6		"	8'-0"	" "	32
3	4		"	10'-0"	" "	27
4	11		"	12'-0"	" "	88
5	5		"	14'-0"	" "	47
6	2		"	18'-0"	" "	24
7	2		"	20'-0"	" "	27
8	2		2"×4"	24'-0	" "	32
9					Total FBM.	285
10						

TREATED STAIR MATERIAL

FOR TOWER USING CAB WITH CATWALK.

ITEM	No.	MARK	SIZE	LENGTH	DESCRIPTION	FBM
1	2	H1A	3"×8"	13'-0"	Horizontals	56
2	2	H1B	"	13'-0"	"	56
3	2	S1E	"	9'-1 5/8"	Stair Stringers	40
4	2	S2E	"	11'-6 3/8"	" "	48
5	2	S3E	"	11'-6 1/8"	" "	48
6	2	S4E	"	12'-10 5/8"	" "	56
7	2	S5E	"	14'-9 5/8"	" "	64
8	2	S6E	"	16'-10 1/8"	" "	72
9	2	S7E	"	19'-1"	" "	80
10	2	S8E	3"×8"	23'-1 1/8"	" "	96
11	106	None	2"×8"	1'-11 1/2"	Stair Treads	283
12	2	SB1	2"×4"	3'-10 5/8"	Stair Braces	5
13	2	SB2	"	5'-1 1/8"	" "	8
14	2	SB3	"	5'-0 1/8"	" "	8
15	2	SB4	"	5'-9 1/8"	" "	8
16	2	SB5	"	6'-3 1/8"	" "	9
17	2	SB6	"	7'-4 7/8"	" "	11
18	2	SB7	"	8'-1"	" "	12
19	2	SB8	2"×4"	9'-7 1/8"	" "	13
20	2	PS1	3"×10"	10'-8"	Platform Stringers	60
21	2	PS2	"	9'-7 3/8"	" "	50
22	2	PS3	"	11'-0 3/8"	" "	60
23	2	PS4	"	12'-3 1/16"	" "	70
24	2	PS5	"	13'-9 3/8"	" "	70
25	2	PS6	"	15'-6 3/8"	" "	80
26	3	PS7	3"×10"	17'-6 1/8"	" "	135
27	2	FP1	2"×6"	3'-0"	Platform Floor Plank	6
28	3	FP2	"	3'-0"	" " "	9
29	2	FP3	"	2'-8 1/2"	" " "	6
30	1	FP3A	"	2'-8 1/2"	" " "	3
31	6	FP4	"	2'-0"	" " "	12
32	18	FP5	"	2'-0"	" " "	36
33	6	FP6	"	1'-8"	" " "	10
34	36	FP7	2"×6"	1'-8"	" " "	60
35	6	FP8	2"×4"	2'-3 1/2"	" " "	10
36	2	RP1	3"×4"	4'-8 3/8"	Hand Rail Posts	10
37	2	RP2	"	4'-6 1/2"	" " "	10
38	2	RP3	"	4'-8 5/8"	" " "	10
39	2	RP4	"	4'-6 5/8"	" " "	10
40	2	RP5	"	4'-6 5/8"	" " "	10
41	2	RP6	"	4'-5 5/8"	" " "	10
42	2	RP7	"	4'-4 1/8"	" " "	10
43	2	RP8	"	4'-3 1/8"	" " "	10
44	26	RP10	"	3'-11 1/4"	" " "	104
45	2	RP11	2"×4"	2'-5 1/8"	" " "	4
46	2	RP12	"	1'-9 1/4"	" " "	3
47	2	RP13	"	1'-6 1/8"	" " "	3
48	2	RP14	"	1'-8 1/8"	" " "	3
49	2	RP15	"	1'-10 1/8"	" " "	3
50	4	RP16	"	1'-11 1/8"	" " "	5
51	4	RP17	"	2'-1"	" " "	7
52	4	RP18	"	2'-1 15/16"	" " "	7
53						
54	2	N1	2"×8"	12'-6"	Cab Stringers	37
55	2	N2	"	12'-2 1/8"	" "	37
56	3	N3	"	9'-9 1/8"	" "	40
57	5	N4	"	12'-2 1/8"	" "	93
58	1	N5	"	5'-2 1/8"	" "	8
59	2	N6	"	2'-3 1/8"	" "	7
60	4	N7	"	1'-2 1/8"	" "	8
61	2	N8	2"×8"	1'-5 1/8"	" "	4
62	24	N9	2"×4"	1'-3"	" " Ties	27
63	1	SF1	3"×10"	2'-3 1/2"	Platform Stringer Fill Block	8
64	10	SF2	"	1'-2 3/4"	" " " "	35
65	2	SF3	"	1'-0 1/8"	" " " "	8
66	1	SC1	3"×12"	2'-9 1/2"	Platform Stringer Cap	9
67	10	SC2	"	1'-9"	" " "	54
68	2	SC3	"	1'-9"	" " "	12
69					Total FBM	2256

ALTERNATE TREATED STAIR MATERIAL

FOR TOWER WHERE CATWALK IS OMITTED

ITEM	No.	MARK	SIZE	LENGTH	DESCRIPTION	FBM
1	2	H1A	3"×8"	8'-0"	Horizontals	32
2	2	H1B	3"×8"	8'-0"	"	32
3	2	S1AE	"	10'-0 1/8"	Stair Stringers.	40
4	2	S2AE	"	10'-4 3/8"	" "	48
5	2	S3AE	"	11'-6 1/8"	" "	48
6	2	S4E	"	12'-10 5/8"	" "	56
7	2	S5E	"	14'-9 5/8"	" "	64
8	2	S6E	"	16'-10 1/8"	" "	72
9	2	S7E	"	19'-1"	" "	80
10	2	S8E	3"×8"	23'-1 1/8"	" "	96
11	97	None	2"×8"	1'-11 1/2"	Stair Treads	259
12	8	None	2"×8"	1'-5 1/2"	" "	16
13	2	SB1A	2"×4"	4'-1 15/16"	" Braces	6
14	2	SB2A	"	4'-5 1/8"	" "	6
15	2	SB3A	"	5'-0 1/8"	" "	8
16	2	SB4	"	5'-9 1/8"	" "	8
17	2	SB5	"	6'-3 1/8"	" "	10
18	2	SB6	"	7'-4 7/8"	" "	11
19	2	SB7	"	8'-1"	" "	12
20	2	SB8	2"×4"	9'-7 1/8"	" "	13
21	2	PS1A	3"×10"	8'-6 1/8"	Platform Stringers	45
22	2	PS2	"	9'-7 3/8"	" "	50
23	2	PS3	"	11'-0 3/8"	" "	60
24	2	PS4	"	12'-3 1/16"	" "	70
25	2	PS5	"	13'-9 3/8"	" "	70
26	2	PS6	"	15'-6 3/8"	" "	80
27	3	PS7	3"×10"	17'-6 1/8"	" "	135
28	5	FP1	2"×6"	2'-0"	Platform Floor Plank	10
29	15	FP5	"	2'-0"	" " "	30
30	5	FP6	"	1'-8"	" " "	9
31	32	FP7	2"×6"	1'-8"	" " "	55
32	7	FP8	2"×4"	2'-3 1/2"	" " "	12
33	9	FP9	2"×6"	1'-6"	" " "	14
34	2	FP10	"	1'-6"	" " "	3
35	5	FP11	"	1'-9"	" " "	9
36	2	FP12	2"×6"	1'-9"	" " "	4
37	2	RP1A	3"×4"	4'-7 1/4"	Hand Rail Posts	10
38	2	RP2A	"	4'-9 5/8"	" " "	10
39	2	RP3A	"	4'-7 1/4"	" " "	10
40	2	RP4	"	4'-6 5/8"	" " "	10
41	2	RP5	"	4'-6 1/8"	" " "	10
42	2	RP6	"	4'-5 1/8"	" " "	10
43	2	RP7	"	4'-4 1/8"	" " "	10
44	2	RP8	"	4'-3 1/8"	" " "	10
45	26	RP10	"	3'-11 1/4"	" " "	104
46	2	RP14	2"×4"	1'-8 5/8"	" " "	3
47	2	RP15	"	1'-10 1/8"	" " "	3
48	4	RP16	"	1'-11 1/8"	" " "	5
49	4	RP17	"	2'-1"	" " "	7
50	4	RP18	"	2'-1 15/16"	" " "	7
51	2	RP20	"	1'-7 1/4"	" " "	3
52	2	RP21	"	1'-4 1/8"	" " "	2
53	2	RP22	2"×4"	1'-6 3/8"	" " "	3
54	2	N1A	2"×8"	7'-3 1/4"	Cab Stringers	21
55	9	N2A	"	7'-0"	" "	84
56	1	N3A	"	0'-10 3/8"	" "	1
57	1	N4A	"	2'-10 3/8"	" "	4
58	2	N5A	"	1'-9 1/4"	" "	5
59	2	N6A	"	1'-6"	" "	4
60	2	N7A	2"×8"	1'-2 1/16"	" "	4
61	16	N9	2"×4"	1'-3"	" " Ties.	20
62	8	SF2	3"×10"	1'-2 3/4"	Platform Stringer Fill Block	25
63	2	SF3	"	1'-0 1/8"	" " " "	8
64	4	SF4	"	1'-0 3/4"	" " " "	13
65	8	SC2	3"×12"	1'-9"	Platform Stringer Cap	42
66	2	SC3	"	1'-9"	" " "	12
67	4	SC4	"	1'-7"	" " "	21
68					Total FBM	2054

NOTES

All the listed material shall be finished S4S.

All material listed in the left column, consisting of Treated Tower Material and Untreated Lumber, shall be purchased with all orders.

Treated Stair Material, listed in the center column, shall be purchased only for towers where a catwalk is to be constructed with the cab.

Alternate Treated Stair Material, listed in the right column, shall be purchased only for towers where the catwalk is to be omitted. See sheet L-10001 for details of stairs with catwalk omitted.

As required by specifications, material for Posts is listed 2'-0" greater than shop detail length to eliminate seasoning end checks.

Revised 4-19-40 W.D.S.
Revised 10-6-39 A.S.
Revised 4-25-38. B.C.O.

U. S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE
REGION SIX JAMES FRANKLAND, REGIONAL ENGINEER

STANDARD LOOKOUT TOWER
99-FOOT TYPE CT-1
BILL OF LUMBER

DESIGNED W.G. DRAWN B.C.O. TRACED B.C.O.
SCALE NONE CHECKED
APPROVED ASSISTANT REGIONAL FORESTER DATE APRIL 8, 1938

SHEET 7 OF 8 SHEETS L-10408

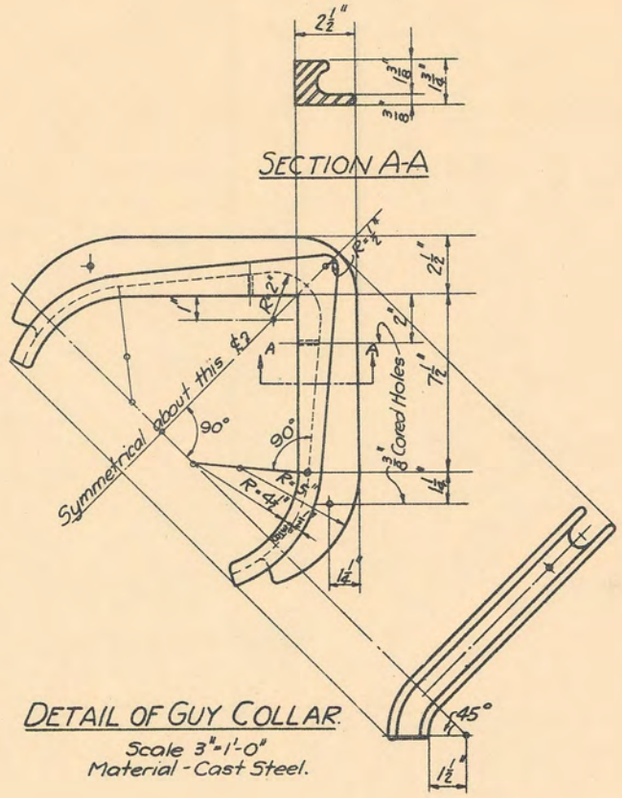
BILL OF IRON

	No.	Size	Length	Description	Location	Weight
	135	3/4"	11"	Machine bolts	Diagonals to Posts	225
	70	"	11 1/2"	" "	Post Splices	120
	90	"	12 1/2"	" "	Horizontals to Posts	167
	24	"	14 1/2"	" "	" " "	48
	5	"	15 1/2"	" "	Strut "D5" to Posts	10
	691	3/4"		Malleable C.I. Washers		228
*	18	1/2"	28 1/2"	Machine bolts	Stair Stringers	28
*	11	"	32"	" "	" "	19
	380	1/2"		Malleable C.I. Washers		60
	132	2 1/2"		"Teco" or similar Split Rings		36
	308	4"		" " " " "		205
	4			Cast Steel Guy Collars	See Detail.	80
	16	3/4"		Drop forged cable clips		16
	4			Bridge Bowls for 3/4" - 6/19	Wire Rope.	40
		3/4"		6×19 plow steel wire rope guys. Length to suit topography		
		60d		Common Nails		60
		40d		" "		72
		10d		" "		13
*	23	1/2"	10"	Machine Bolts	Cab Joists to Posts	15
*	29	3/4"	15 1/2"	" "	Platform Stringer Fasten.	67
	12	1/2	9"	" "	Stair Str. to Hand Rail Posts	7
	46	"	7 1/2"	" "	Plat. Str. " " " "	24
o	80	"	6 1/2"	" "	Stair Str. " " " "	37

All above except C.S. Guy Collars to be galvanized.

* The asterisked items shall be revised as follows.
for towers where the alternate stair material is used:
Purchase only 16 - 1/2"φ × 28 1/2" bolts. 19 - 1/2"φ × 10" bolts
10 - 1/2"φ × 32" "
These additions shall be made to the list:
2 - 1/2" × 22 1/2" bolts. 5 - 1/2"φ × 11 1/2" bolts
1 - 1/2" × 26" " 2 - 3/4"φ × 15 1/2" bolts
This note is applicable only to towers having no catwalk (as sheet L-10001).

o HAND RAIL BOLTS. ADD TO ABOVE BILL.
38 - 3/8" × 5" Carriage Bolts
18 - 3/8 × 6" " "
14 - 3/8 × 6 1/2" " "



DETAIL OF GUY COLLAR.
Scale 3"=1'-0"
Material - Cast Steel.

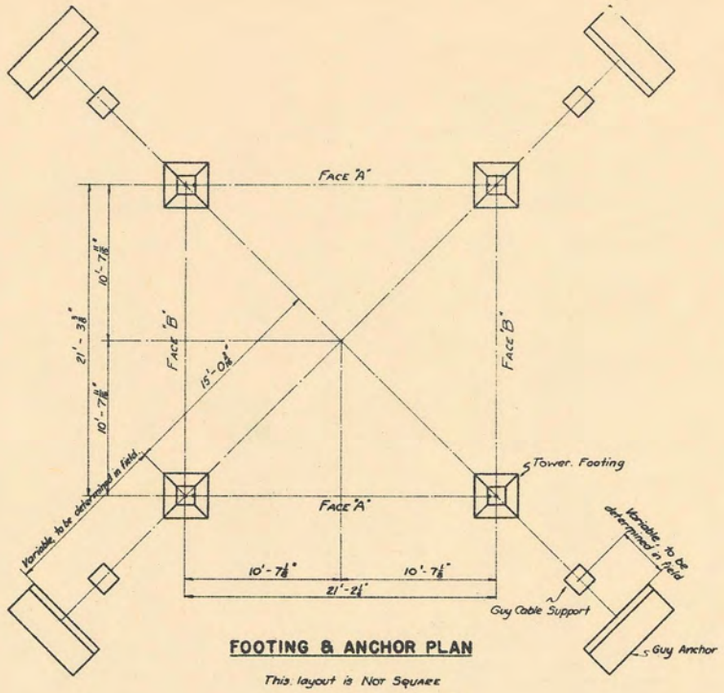
NOTE:
This list includes an approximate 10% overage of bolts, washers, split rings and nails.

Revised 10-6-39 by A.S.
Revised 4-22-40 W.D.S.

U. S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE
REGION SIX JAMES FRANKLAND, REGIONAL ENGINEER

STANDARD LOOKOUT TOWER
99-FOOT TYPE CT-1
BILL OF HARDWARE

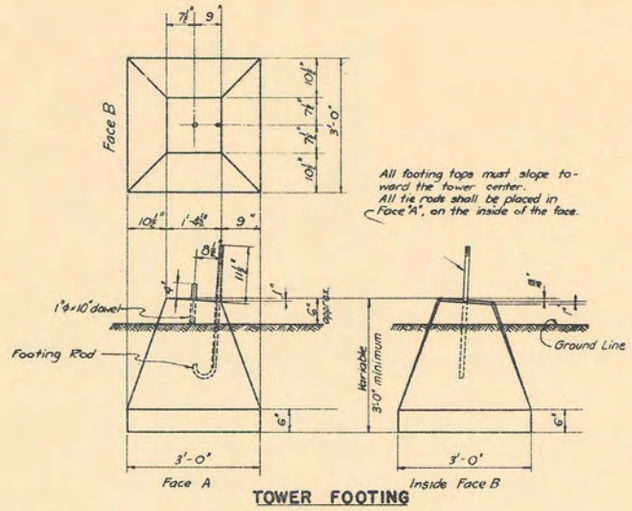
DESIGNED W.G. DRAWN B.C.O. TRACED B.C.O.
SCALE CHECKED
APPROVED J. Frankland DATE APRIL 1938
ASSISTANT REGIONAL FORESTER



FOOTING & ANCHOR PLAN

This layout is Not Square

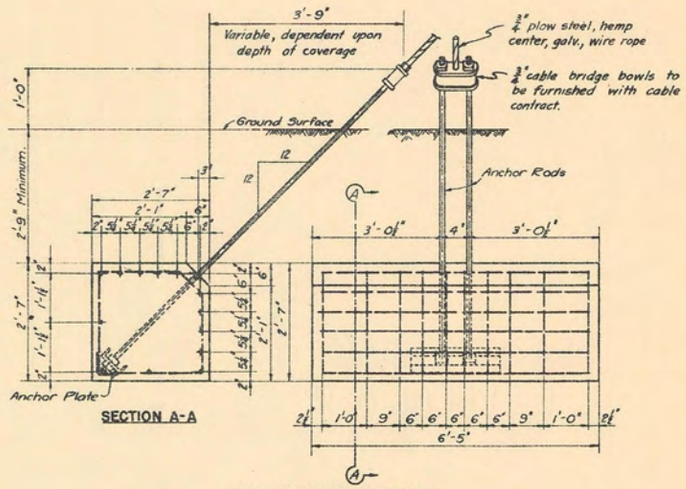
Cables shall slope at 45° and location of guy anchors shall be computed accordingly.



TOWER FOOTING

3'-0" × 3'-0" concrete block, of variable height. Top bevelled two ways at ¾ : 12 slope

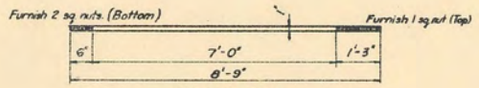
4 Required



SECTION A-A

GUY ANCHOR DETAIL

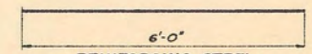
4 Required



ANCHOR ROD

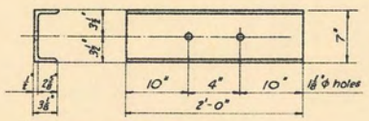
1" φ × 8'-9" Rod, galvanized. Thread ends as indicated. Furnish 3 sq. nuts each rod.

Make 8.



REINFORCING STEEL

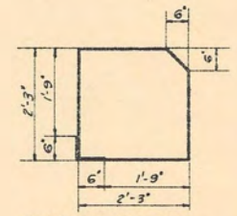
52 pieces - ½"φ × 6'-0" deformed bars



ANCHOR PLATE

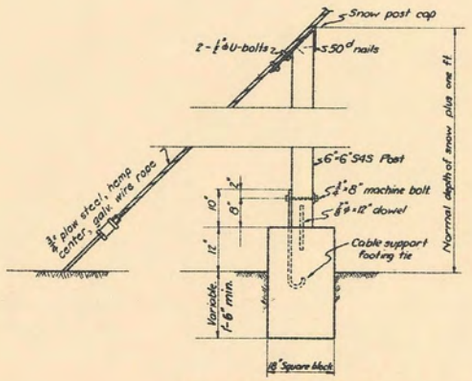
7" × 3½" × ½" × 2'-0" Channel. C42 (BSC9) Galvanized.

Make 4



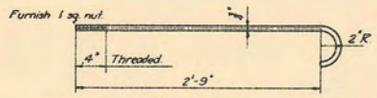
REINFORCING TIES

Make 40 - ⅜"φ × 9'-9" deformed bars.



GUY CABLE SUPPORT

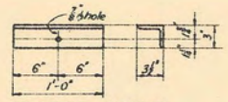
4 Required where tower is located in region of heavy snow.



FOOTING ROD

¾"φ × 3'-4" galvanized rod Furnish 1 sq. nut each rod.

Make 4



FOOTING ANGLE

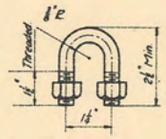
3½" × 3" × ⅜" × 1'-0" galvanized angle.

Make 4.

For the assembly of this angle to top end of footing rod see drawing L-10502, general elevation.

Furnish all detailed material, and in addition furnish,

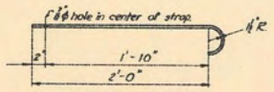
4 - ⅝"φ × 12" dowels, plain.
4 - 1"φ × 10" dowels, plain.
4 - ⅝" × 8" machine bolts.
4 - ⅝" malleable washers.
} All galvanized



U-BOLT

½"φ galvanized bolt. Furnish 2 hex. nuts each.

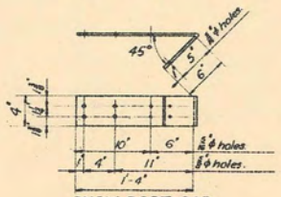
Make 8



CABLE SUPPORT TIE

⅜" × 3" × 2'-6" galvanized strap.

Make 4.



SNOW POST CAP

4" × ⅜" × 1'-10" galvanized strap.

Make 4.

CONCRETE

Mix 1:3:5
Approximate volume 9.5 cu yds.
Cement · 10.9 bbls.
Sand · 5.0 yds.
Gravel · 8.3 yds.

Quantities shown are based upon minimum dimensions as shown

Concrete Footings revised 3-11-40 W.D.S.

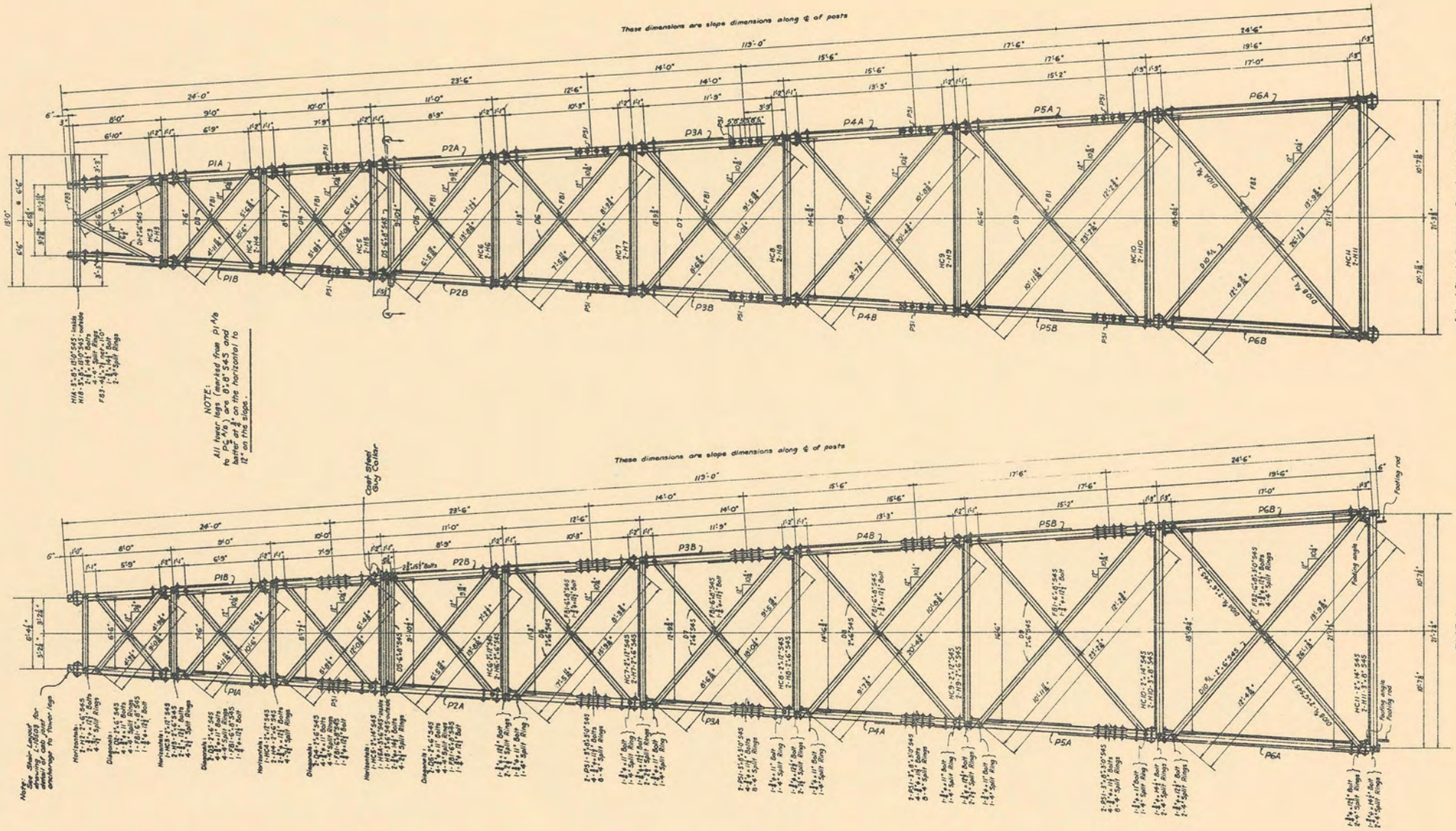
U. S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE

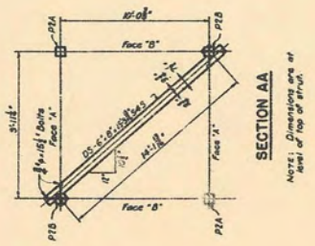
REGION SIX — JAMES FRANKLAND, REGIONAL ENGINEER

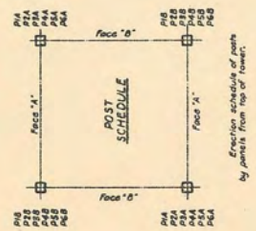
STANDARD LOOKOUT TOWER
119-FOOT TYPE CT-1
FOUNDATION PLAN

DESIGNED B.C.O. DRAWN B.C.O. TRACED B.C.O.
SCALE NONE CHECKED
APPROVED DATE DEC 17, 1937
ACT. ASSISTANT REGIONAL FORESTER

SHEET 1 OF 8 SHEETS L-10501







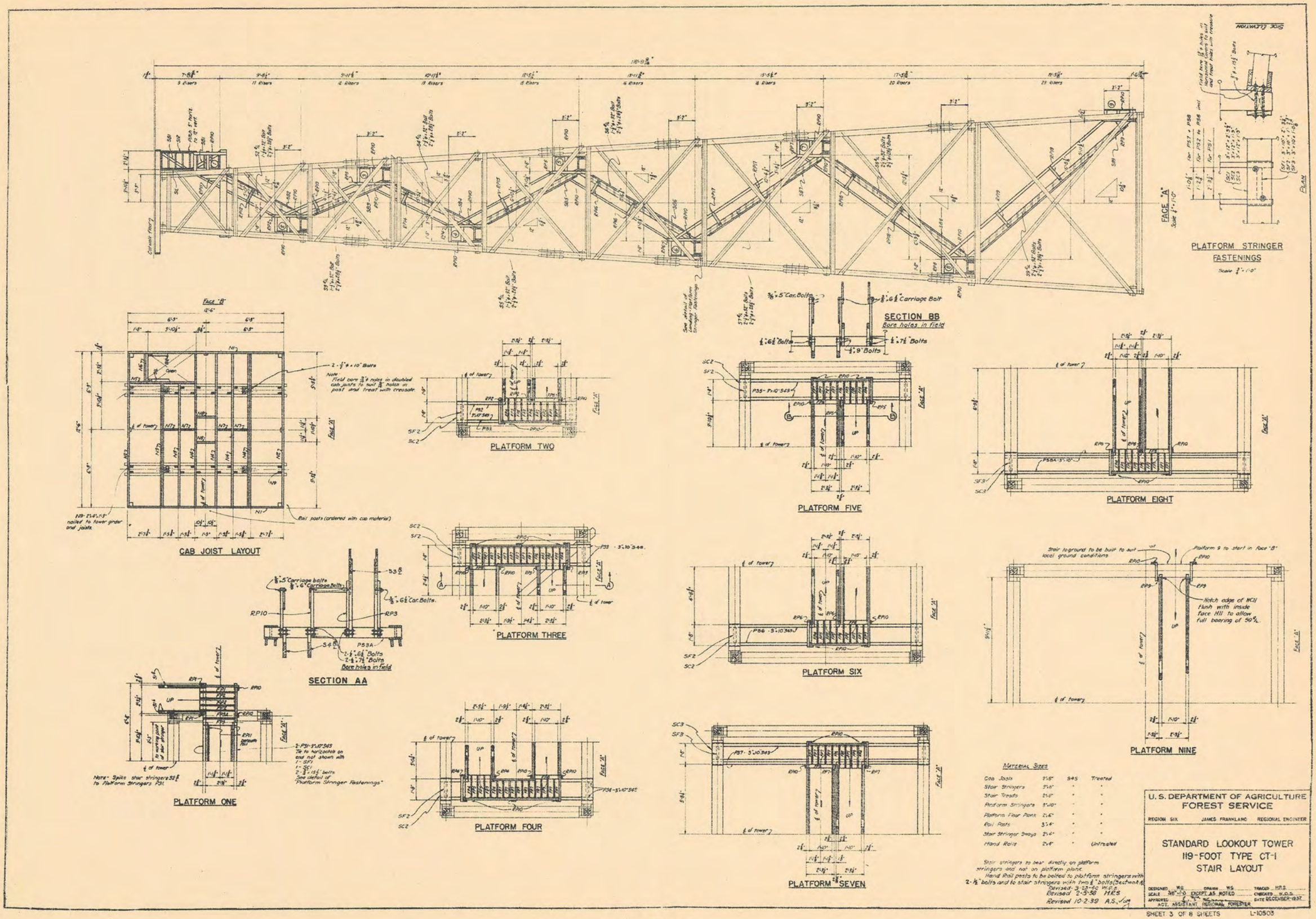
Revised 10-4-39 by A.S.

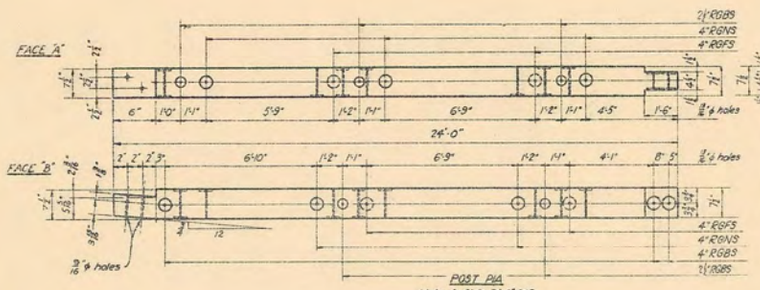
U. S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE
REGION SIX — JAMES FRANKLAND REGIONAL ENGINEER

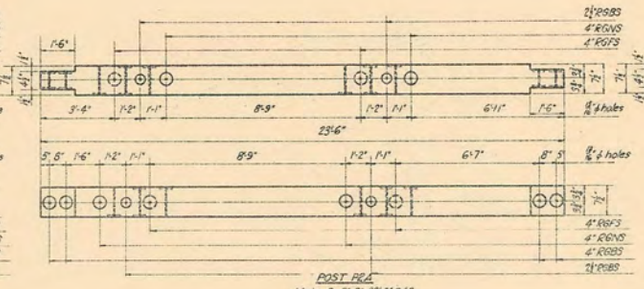
STANDARD LOOKOUT TOWER
119 FOOT TYPE CT-1
GENERAL PLAN

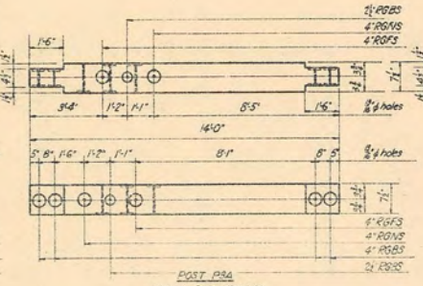
DESIGNED W.G. DRAWN W.G. TRACED W.G.
SCALE 1/4" = 1'-0" CHECKED W.G.B.
APPROVED ACT. ASSISTANT REGIONAL FORESTER DATE DEC. 19, 1937

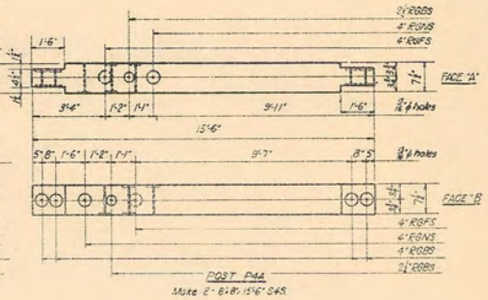
SHEET 2 OF 8 SHEETS L-10502

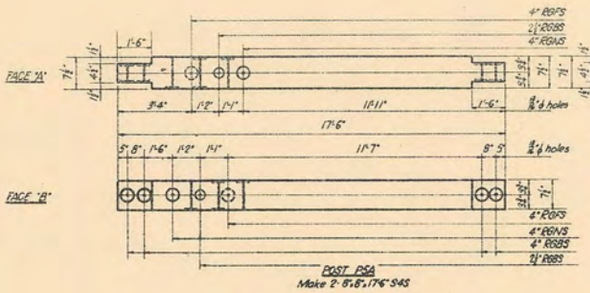

PLATFORM STRINGER FASTENINGS
SECTION BB
Bore holes in field
PLATFORM TWO
PLATFORM FIVE
PLATFORM EIGHT
CAB JOIST LAYOUT
PLATFORM THREE
SECTION AA
PLATFORM SIX
PLATFORM NINE
PLATFORM ONE
PLATFORM FOUR
PLATFORM SEVEN
FACE "A"
FACE "B"
Material Sizes
Cab Joists 2"x8" S4S Treated
Stair Stringers 2"x8" " "
Stair Treads 2"x8" " "
Platform Stringers 3"x10" " "
Platform Floor Plank 2"x6" " "
Rail Posts 3"x4" " "
Stair Stringer Sways 2"x4" " "
Hand Rails 2"x4" " Untreated
Stair stringers to bear directly on platform stringers and not on platform plank.
Hand Rail posts to be bolted to platform stringers with 2-½" bolts and to stair stringers with two ½" bolts (Section A-A)
Revised 3-23-40 W.D.S.
Revised 2-5-38 H.R.S.
Revised 10-2-39 A.S.
U.S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE
REGION SIX JAMES FRANKLAND REGIONAL ENGINEER
STANDARD LOOKOUT TOWER
119-FOOT TYPE CT-1
STAIR LAYOUT
DESIGNED W.G. DRAWN W.G. TRACED H.R.S.
SCALE 3/8"=1'-0" EXCEPT AS NOTED CHECKED W.D.S.
APPROVED ACT. ASSISTANT REGIONAL FORESTER DATE DECEMBER-1937
SHEET 3 OF 8 SHEETS L-10503

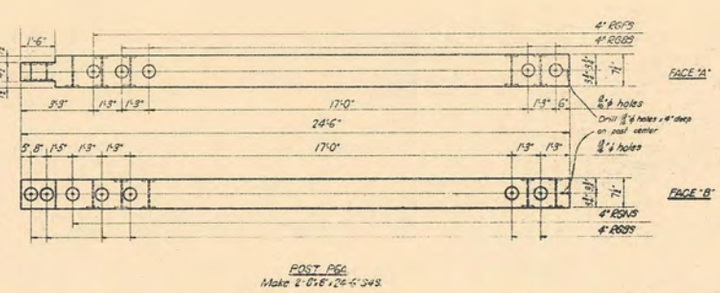


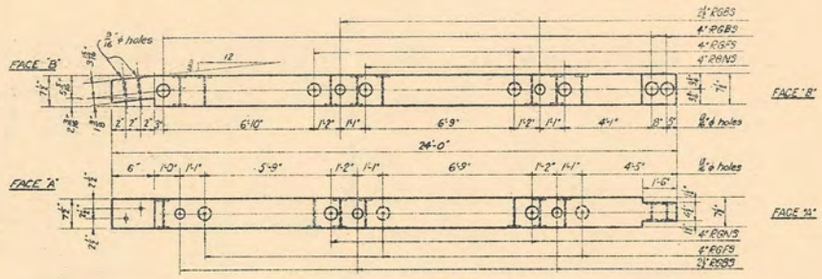


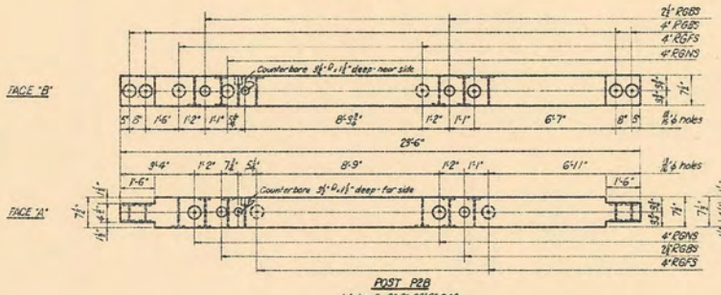


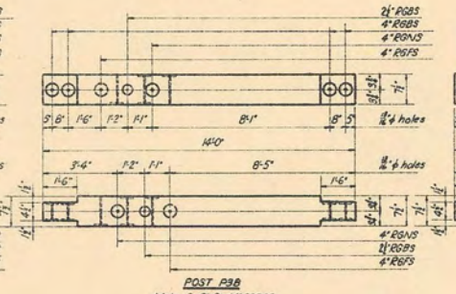


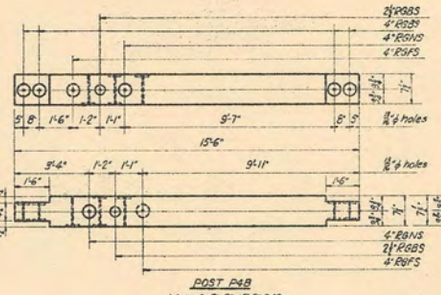


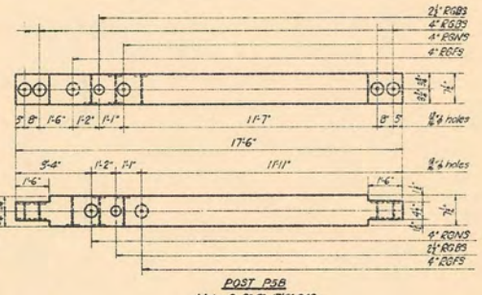


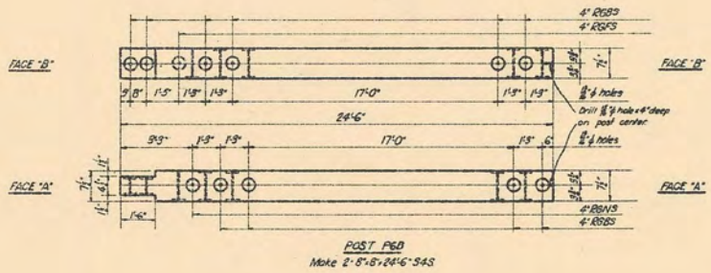


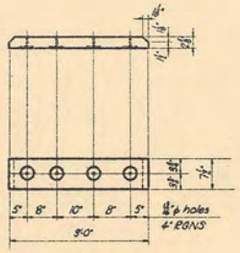


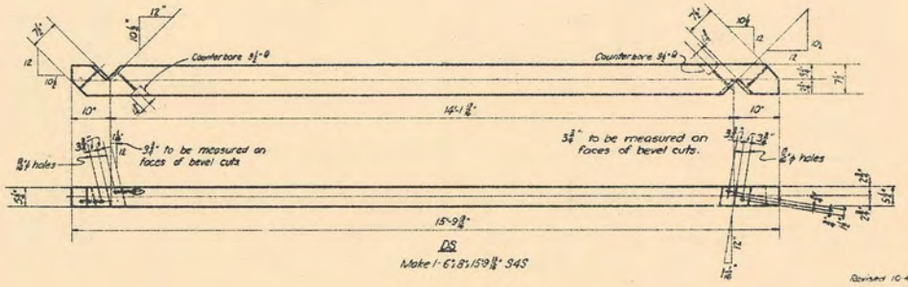












RGBS - Ring Groove Both Sides
RGNS - Ring Groove Near Side
RGFS - Ring Groove Far Side

Revised 10-4-39 by A.S.
Revised 3-8-39 by W.G.
DS

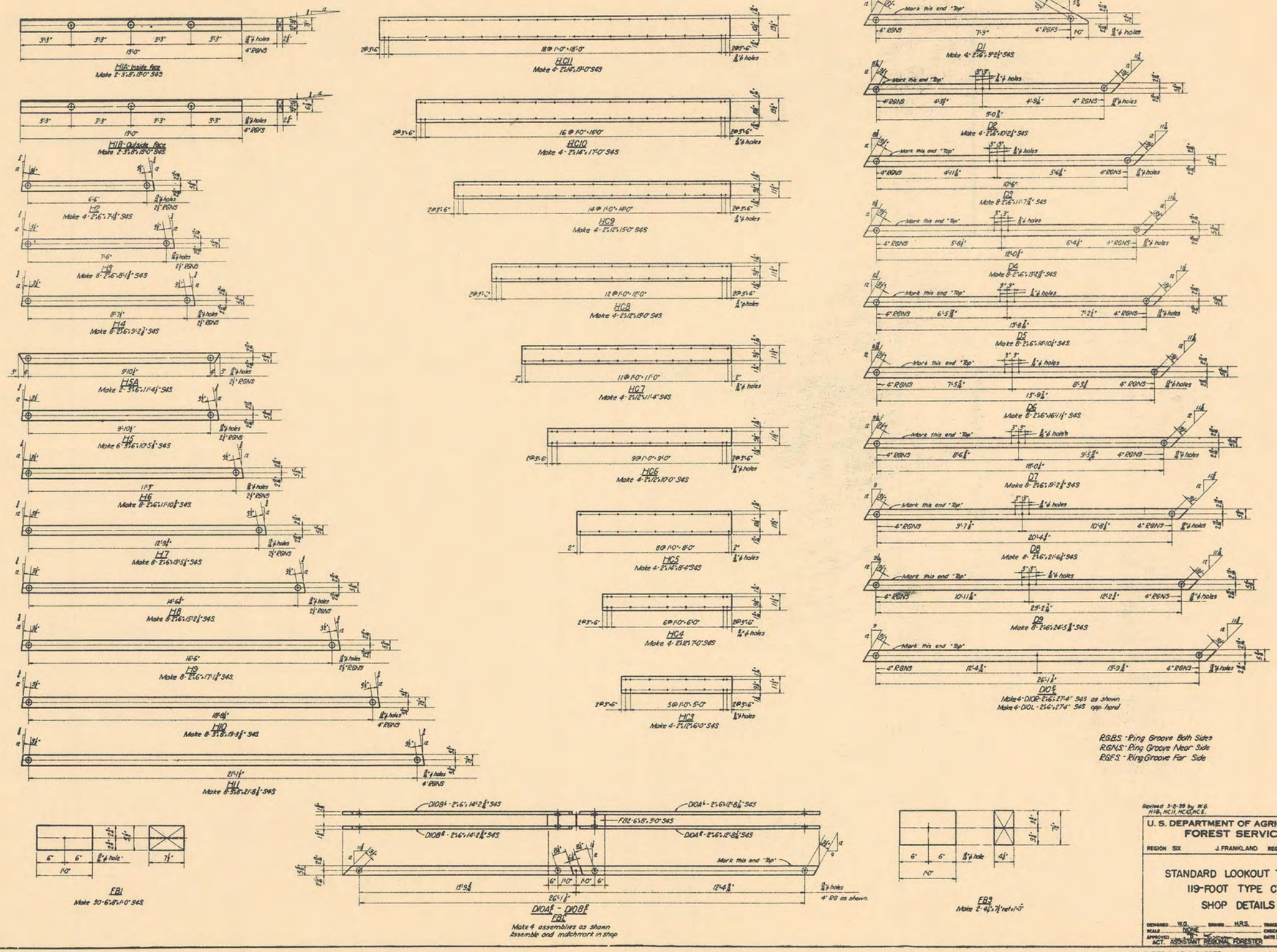
U. S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE

REGION SIX J. FRANKLAND REGISTRAR, STRUCTURES

STANDARD LOOKOUT TOWER
119-FOOT TYPE CT-1
SHOP DETAILS

DESIGNED W.G. DRAWN H.R.B. TRACED H.R.S.
SCALE NONE CHECKED
APPROVED ACT. ASSISTANT REGIONAL FORESTER DATE DECEMBER 1939

SHEET 4 OF 8 SHEETS L-10504A



Revised 3-8-39 by W.G.
H1B, HC11, HC10, HC5.

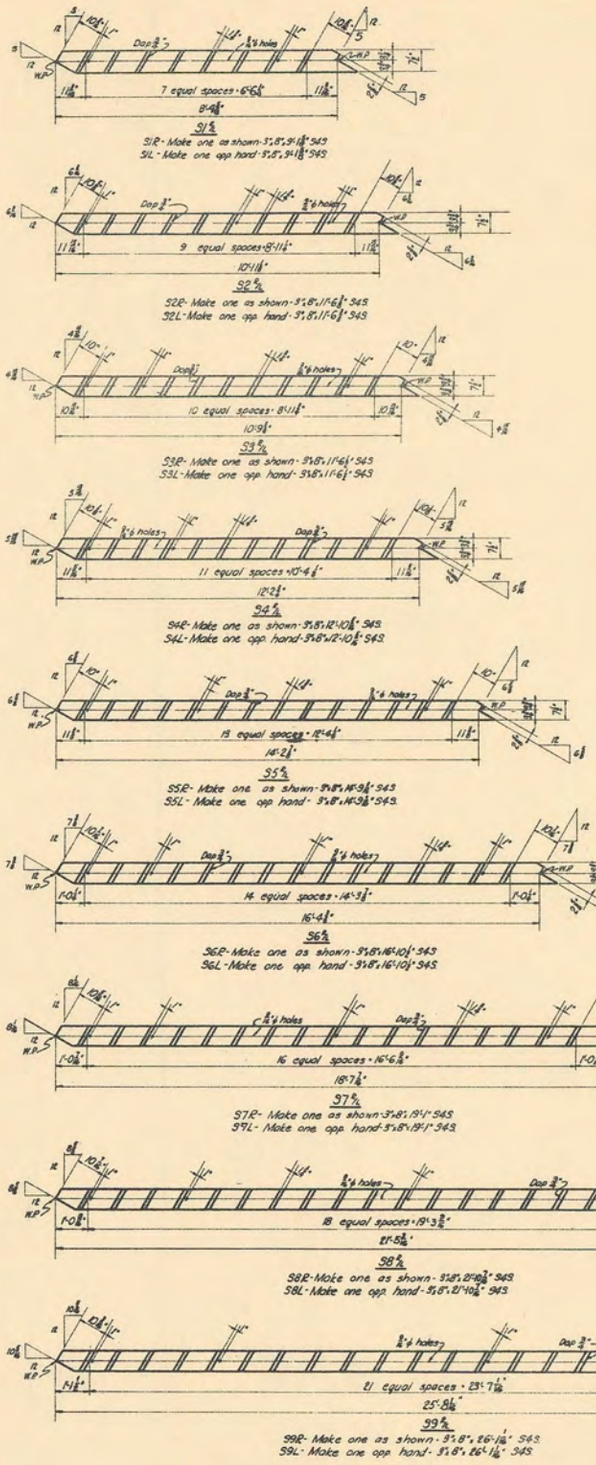
U. S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE

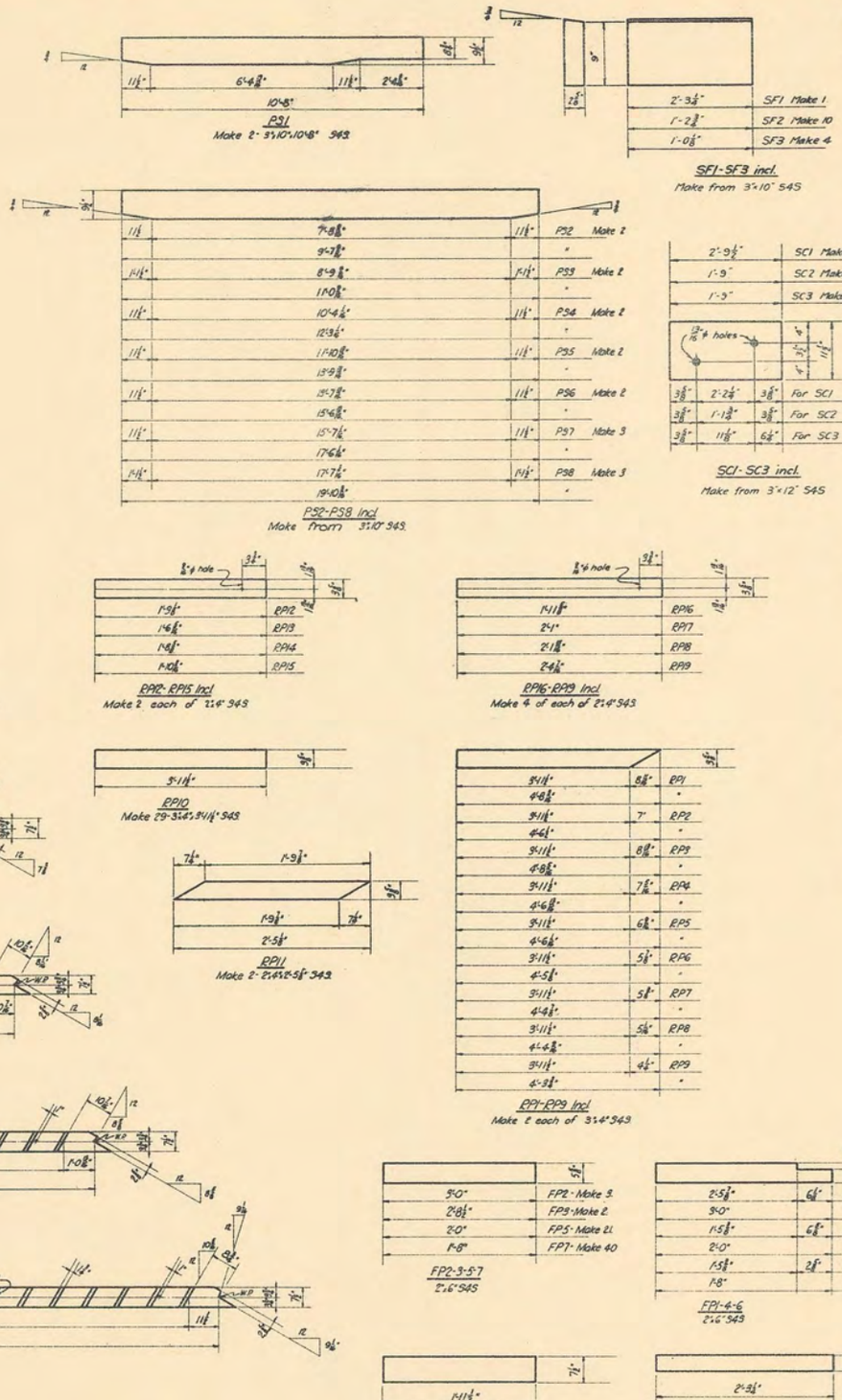
REGION SIX — J. FRANKLAND — REGIONAL ENGINEER

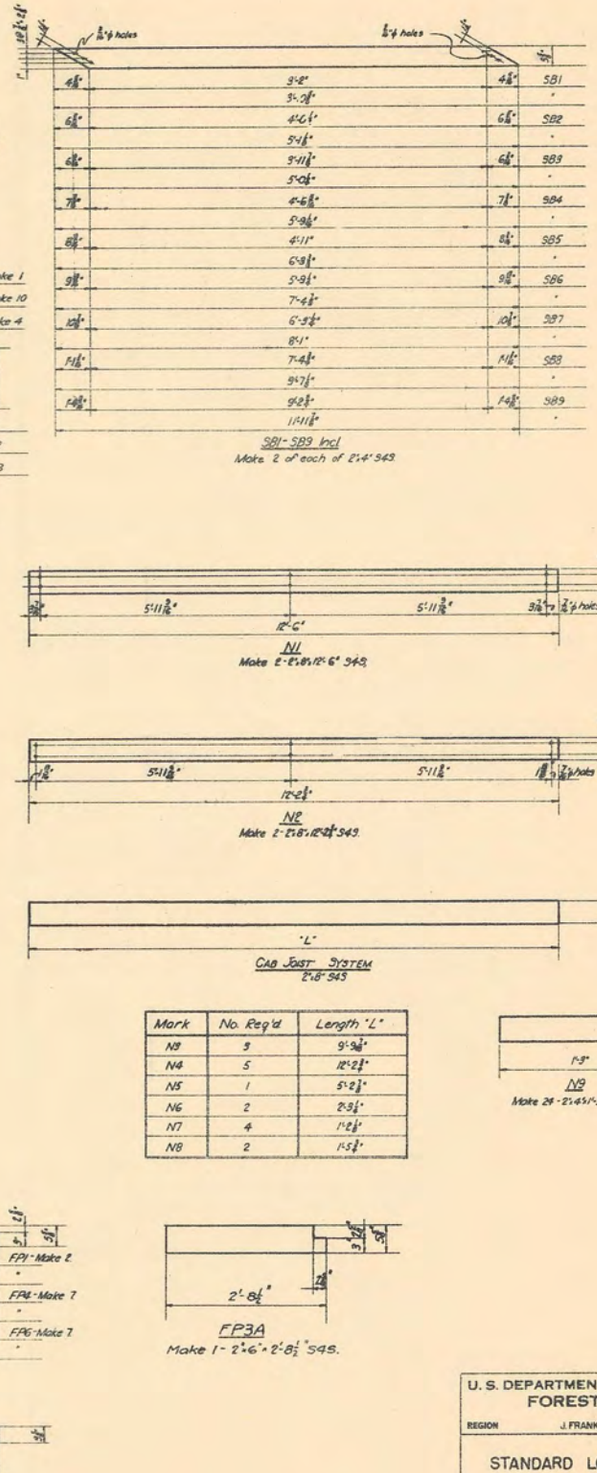
STANDARD LOOKOUT TOWER
119-FOOT TYPE CT-1
SHOP DETAILS

DESIGNED W.G. — DRAWN H.R.S. — TRACED H.R.S.
SCALE NONE — CHECKED
APPROVED — DATE DEC. 1939
ACT. ASSISTANT REGIONAL FORESTER

SHEET 5 OF 8 SHEETS. L-10504B







Mark	No. Req'd	Length "L"
N3	9	9'-9⅝"
N4	5	12'-2½"
N5	1	5'-2½"
N6	2	2'-3½"
N7	4	1'-2½"
N8	2	1'-5½"

Revised - 4-22-40 W.D.S.
Revised 10-4-39 A.S.
Revised 4-12-38 B.C.O.
Revised 2-5-38 - HES

U. S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE

REGION — J. FRANKLAND — REGIONAL ENGINEER

STANDARD LOOKOUT TOWER
119-FOOT TYPE CT-1
SHOP DETAILS

DESIGNED W.G. DRAWN H.R.S. TRACED H.R.S.
SCALE NONE CHECKED
APPROVED J. [illegible] DATE JAN 1948
ACT. ASSISTANT REGIONAL FORESTER

SHEET 6 OF 8 SHEETS L-10504C.

TREATED TOWER MATERIAL

ITEM	No.	MARK	SIZE	LENGTH	DESCRIPTION	F.B.M.
1	2	P1A	8"×8"	26'-0"	Top Posts	278
2	2	P1B	"	26'-0"	" "	278
3	2	P2A	"	26'-0"	Intermediate Posts	278
4	2	P2B	"	26'-0"	" "	278
5	2	P3A	"	16'-0"	" "	170
6	2	P3B	"	16'-0"	" "	170
7	2	P4A	"	17'-6"	" "	192
8	2	P4B	"	17'-6"	" "	192
9	2	P5A	"	19'-6"	" "	213
10	2	P5B	"	19'-6"	" "	213
11	2	P6A	"	26'-6"	Bottom Posts	299
12	2	P6B	8"×8"	26'-6"	" "	299
13	40	PS1	3"×8"	3'-0"	Post Splices	240
14	1	DS	6"×8"	15'-9 9/16"	Diagonal Strut	64
15	4	H2	2"×6"	7'-1 1/8"	Horizontals	32
16	8	H3	"	8'-1 1/8"	"	72
17	8	H4	2"×6"	9'-2 1/8"	"	80
18	2	H5A	3"×6"	11'-4 1/4"	"	36
19	6	H5	3"×6"	10'-5 1/4"	"	108
20	8	H6	2"×6"	11'-10 3/8"	"	96
21	8	H7	"	13'-5 1/8"	"	112
22	8	H8	"	15'-2 1/8"	"	128
23	8	H9	2"×6"	17'-1 1/8"	"	144
24	8	H10	3"×8"	19'-3 3/8"	"	320
25	8	H11	3"×8"	21'-8 1/4"	"	352
26	4	HC3	2"×12"	6'-0"	Horizontal Covers	48
27	4	HC4	2"×12"	7'-0"	" "	56
28	4	HC5	2"×14"	8'-4"	" "	84
29	4	HC6	2"×12"	10'-0"	" "	80
30	4	HC7	"	11'-4"	" "	96
31	4	HC8	"	13'-0"	" "	112
32	4	HC9	2"×12"	15'-0"	" "	128
33	4	HC10	2"×14"	17'-0"	" "	168
34	4	HC11	2"×14"	19'-0"	" "	187
35	4	D1	2"×6"	9'-2 1/4"	Diagonals	40
36	4	D2	"	10'-2 1/4"	"	48
37	8	D3	"	11'-7 15/16"	"	96
38	8	D4	"	13'-2 15/16"	"	112
39	8	D5	"	14'-10 1/16"	"	128
40	8	D6	"	16'-11 1/8"	"	144
41	8	D7	"	19'-2 3/8"	"	160
42	8	D8	"	21'-6 1/8"	"	176
43	8	D9	"	24'-5 5/16"	"	208
44	8	D10E	"	27'-4"	Bottom Diagonals	224
45	8	D10AE	"	12'-8 7/16"	" "	112
46	8	D10BE	2"×6"	14'-2 7/16"	" "	128
47	30	FB1	6"×8"	1'-0"	Fill Blocks	120
48	4	FB2	6"×8"	3'-0"	" "	48
49	2	FB3	4 1/4"×7 1/16"	1'-0"	" "	8
50					Total FBM	7355

UNTREATED LUMBER

ITEM	No.	MARK	SIZE	LENGTH	DESCRIPTION	F.B.M.
1	1		2"×4"	6'-0"	Hand Rails	4
2	6		"	8'-0"	" "	32
3	5		"	10'-0"	" "	33
4	12		"	12'-0"	" "	96
5	5		"	14'-0"	" "	47
6	2		"	18'-0"	" "	24
7	2		"	20'-0"	" "	27
8	2		"	24'-0"	" "	32
9	2		2"×4"	26'-0"	" "	35
10					Total FBM.	330

TREATED STAIR MATERIAL

FOR TOWER USING CAB WITH CATWALK.

ITEM	No.	MARK	SIZE	LENGTH	DESCRIPTION	F.B.M.
1	2	H1A	3"×8"	13'-0"	Horizontals	56
2	2	H1B	3"×8"	13'-0"	"	56
3	2	S1E	"	9'-1 5/8"	Stair Stringers.	40
4	2	S2E	"	11'-6 5/8"	" "	48
5	2	S3E	"	11'-6 5/8"	" "	48
6	2	S4E	"	12'-10 5/16"	" "	56
7	2	S5E	"	14'-9 11/16"	" "	64
8	2	S6E	"	16'-10 1/4"	" "	72
9	2	S7E	"	19'-1"	" "	80
10	2	S8E	"	21'-10 7/16"	" "	88
11	2	S9E	3"×8"	26'-1 11/16"	" "	112
12	128	None	2"×8"	1'-11 1/2"	Stair Treads	341
13	2	SB1	2"×4"	3'-10 3/8"	" Braces	7
14	2	SB2	"	5'-1 5/8"	" "	8
15	2	SB3	"	5'-0 1/4"	" "	8
16	2	SB4	"	5'-9 1/4"	" "	8
17	2	SB5	"	6'-3 3/4"	" "	11
18	2	SB6	"	7'-4 3/8"	" "	11
19	2	SB7	"	8'-1"	" "	12
20	2	SB8	"	9'-7 1/8"	" "	13
21	2	SB9	2"×4"	11'-11 3/8"	" "	16
22	2	PS1	3"×10"	10'-8"	Platform Stringers	60
23	2	PS2	"	9'-7 13/16"	" "	50
24	2	PS3	"	11'-0 3/16"	" "	60
25	2	PS4	"	12'-3 1/16"	" "	70
26	2	PS5	"	13'-9 3/16"	" "	70
27	2	PS6	"	15'-6 13/16"	" "	80
28	3	PS7	"	17'-6 13/16"	" "	135
29	3	PS8	3"×10"	19'-10 13/16"	" "	150
30	1	FP1	2"×6"	3'-0"	Platform Floor Plank	3
31	3	FP2	"	3'-0"	" " "	9
32	1	FP3	"	2'-8 1/2"	" " "	3
33	7	FP4	"	2'-0"	" " "	14
34	21	FP5	"	2'-0"	" " "	42
35	7	FP6	"	1'-8"	" " "	14
36	40	FP7	2"×6"	1'-8"	" " "	80
37	7	FP8	2"×4"	2'-3 1/2"	" " "	15
38	2	RP1	3"×4"	4'-8 13/16"	Hand Rail Posts	10
39	2	RP2	"	4'-6 1/4"	" " "	10
40	2	RP3	"	4'-8 13/16"	" " "	10
41	2	RP4	"	4'-6 13/16"	" " "	10
42	2	RP5	"	4'-6 13/16"	" " "	10
43	2	RP6	"	4'-5 1/8"	" " "	10
44	2	RP7	"	4'-4 3/8"	" " "	10
45	2	RP8	"	4'-4 13/16"	" " "	10
46	2	RP9	"	4'-3 3/8"	" " "	10
47	29	RP10	3"×4"	3'-11 1/4"	" " "	116
48	2	RP11	2"×4"	2'-5 1/8"	" " "	4
49	2	RP12	"	1'-9 1/8"	" " "	3
50	2	RP13	"	1'-6 13/16"	" " "	3
51	2	RP14	"	1'-8 1/8"	" " "	3
52	2	RP15	"	1'-10 3/8"	" " "	3
53	4	RP16	"	1'-11 3/8"	" " "	5
54	4	RP17	"	2'-1"	" " "	9
55	4	RP18	"	2'-1 13/16"	" " "	9
56	4	RP19	2"×4"	2'-4 13/16"	" " "	9
58	2	N1	2"×8"	12'-6"	Cab Stringers	35
59	2	N2	"	12'-2 1/8"	" "	35
60	3	N3	"	9'-9 1/8"	" "	40
61	5	N4	"	12'-2 1/8"	" "	93
62	1	N5	"	5'-2 1/8"	" "	8
63	2	N6	"	2'-3 1/4"	" "	8
64	4	N7	"	1'-2 1/8"	" "	11
65	2	N8	2"×8"	1'-5 1/8"	" "	5
66	24	N9	2"×4"	1'-3"	" "	20
67	1	FP3A	2"×6"	2'-8 1/2"	Platform Floor Plank	3
68	1	SF1	3"×10"	2'-3 1/4"	Plat. Stringer Fill Block	8
69	10	SF2	"	1'-2 3/8"	" " " "	35
70	4	SF3	"	1'-0 1/8"	" " " "	13
71	1	SC1	3"×12"	2'-9 1/2"	Platform Stringer Cap	9
72	10	SC2	"	1'-9"	" " "	54
73	4	SC3	"	1'-9"	" " "	21
74					Total FBM	2662

ALTERNATE TREATED STAIR MATERIAL

FOR TOWER WHERE CATWALK IS OMITTED

ITEM	No.	MARK	SIZE	LENGTH	DESCRIPTION	F.B.M.
1	2	HA	3"×8"	8'-0"	Horizontals	32
2	2	HB	3"×8"	8'-0"	"	32
3	2	S1AE	"	10'-0 1/8"	Stair Stringers	40
4	2	S2AE	"	10'-4 1/4"	" "	48
5	2	S3AE	"	11'-6 1/8"	" "	48
6	2	S4E	"	12'-10 5/16"	" "	56
7	2	S5E	"	14'-9 11/16"	" "	64
8	2	S6E	"	16'-10 1/4"	" "	72
9	2	S7E	"	19'-1"	" "	80
10	2	S8E	"	21'-10 7/16"	" "	88
11	2	S9E	3"×8"	26'-1 11/16"	" "	112
12	119	None	2"×8"	1'-11 1/2"	Stair Treads	317
13	2	SB1A	2"×4"	4'-1 13/16"	" Braces	7
14	2	SB2A	"	4'-5 13/16"	" "	7
15	2	SB3A	"	5'-0 11/16"	" "	8
16	2	SB4	"	5'-9 1/4"	" "	8
17	2	SB5	"	6'-3 3/8"	" "	11
18	2	SB6	"	7'-4 3/8"	" "	11
19	2	SB7	"	8'-1"	" "	12
20	2	SB8	"	9'-7 1/8"	" "	13
21	2	SB9	2"×4"	11'-11 3/8"	" "	16
22	2	PS1A	3"×10"	8'-6 13/16"	Platform Stringers	45
23	2	PS2	"	9'-7 13/16"	" "	50
24	2	PS3	"	11'-0 3/16"	" "	60
25	2	PS4	"	12'-3 1/16"	" "	70
26	2	PS5	"	13'-9 3/16"	" "	70
27	2	PS6	"	15'-6 13/16"	" "	80
28	3	PS7	"	17'-6 13/16"	" "	135
29	3	PS8	3"×10"	19'-10 13/16"	" "	150
30	6	FP4	2"×6"	2'-0"	Platform Floor Plank	12
31	18	FP5	"	2'-0"	" " "	36
32	6	FP6	"	1'-8"	" " "	12
33	36	FP7	2"×6"	1'-8"	" " "	72
34	8	FP8	2"×4"	2'-3 1/4"	" " "	13
35	9	FP9	2"×6"	1'-6"	" " "	14
36	2	FP10	"	1'-6"	" " "	3
37	5	FP11	"	1'-9"	" " "	10
38	2	FP12	2"×6"	1'-9"	" " "	4
39	2	RP1A	3"×4"	4'-7 1/2"	Hand Rail Posts	10
40	2	RP2A	"	4'-9 3/16"	" " "	10
41	2	RP3A	"	4'-7 3/8"	" " "	10
42	2	RP4	"	4'-6 13/16"	" " "	10
43	2	RP5	"	4'-6 1/16"	" " "	10
44	2	RP6	"	4'-5 3/8"	" " "	10
45	2	RP7	"	4'-4 7/8"	" " "	10
46	2	RP8	"	4'-4 3/8"	" " "	10
47	2-	RP9	"	4'-3 3/4"	" " "	10
48	29	RP10	3"×4"	3'-11 1/2"	" " "	116
49	2	RP14	2"×4"	1'-8 5/8"	" " "	3
50	2	RP15	"	1'-10 3/16"	" " "	3
51	4	RP16	"	1'-11 3/8"	" " "	5
52	4	RP17	"	2'-1"	" " "	9
53	4	RP18	"	2'-1 13/16"	" " "	9
54	4	RP19	"	2'-4 13/16"	" " "	9
55	2	RP20	"	1'-7 7/16"	" " "	3
56	2	RP21	"	1'-4 3/8"	" " "	3
57	2	RP22	2"×4"	1'-6 13/16"	" " "	3
58	2	N1A	2"×8"	7'-3 3/8"	Cab Stringer	21
59	9	N2A	"	7'-0"	" "	84
60	1	N3A	"	0'-10 3/8"	" "	2
61	1	N4A	"	2'-10 3/8"	" "	4
62	2	N5A	"	1'-9 1/4"	" "	5
63	2	N6A	"	1'-6"	" "	4
64	2	N7A	2"×8"	1'-2 13/16"	" "	4
65	16	N9	2"×4"	1'-3"	" "	13
66	8	None	2"×8"	1'-5 1/2"	Stair Treads.	16
67	4	SF4	3"×10"	1'-0 3/8"	Plat. Stringer Fill Block	13
68	8	SF2	"	1'-2 3/8"	" " " "	25
69	4	SF3	"	1'-0 1/8"	" " " "	13
70	4	SC4	3"×12"	1'-7"	Platform Stringer Cap	21
71	8	SC2	"	1'-9"	" " "	42
72	4	SC3	"	1'-9"	" " "	21
73					Total FBM	2459

NOTES

All the listed material shall be finished S4S.

All material listed in the left column, consisting of Treated Tower Material and Untreated Lumber, shall be purchased with all orders.

Treated Stair Material, listed in the center column, shall be purchased only for towers where a catwalk is to be constructed with the cab.

Alternate Treated Stair Material, listed in the right column, shall be purchased only for towers where the catwalk is to be omitted. See sheet L-10001 for details of stairs with catwalk omitted.

As required by specifications, material for Posts is listed 2'-0" greater than shop detail length to eliminate seasoning end checks.

U. S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE

REGION SIX — JAMES FRANKLAND, REGIONAL ENGINEER

STANDARD LOOKOUT TOWER
119-FOOT TYPE CT-1
BILL OF LUMBER

DESIGNED W.G. DRAWN W.D.S. TRACED W.D.S.
SCALE CHECKED B.C.O.
APPROVED ASSISTANT REGIONAL FORESTER DATE APRIL 1938

Revised-9-25-40-W.D.S.
Revised 10-4-39 A.S.M.
Revised 4-25-38 B.C.O.
Revised 4-13-38 B.C.O.-W.G.

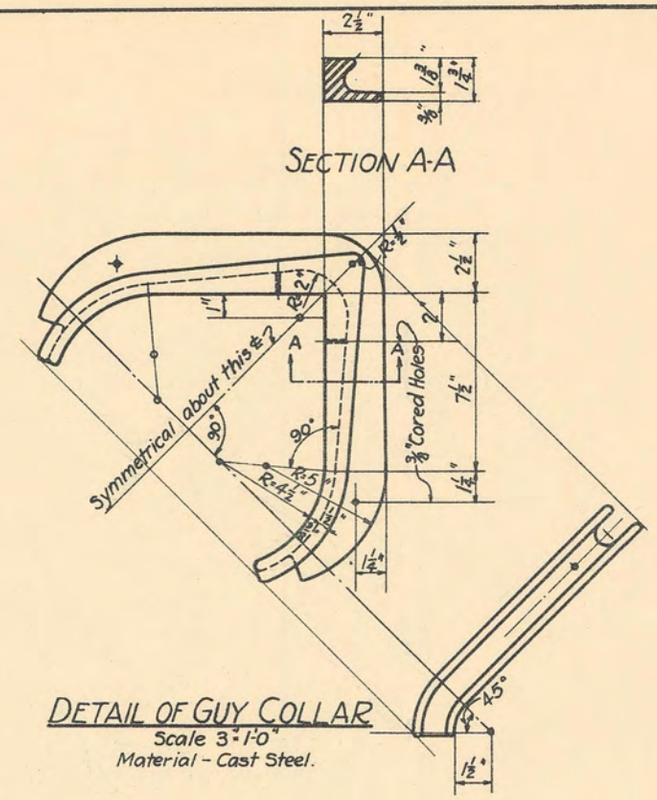
SHEET 7 OF 8 SHEETS

L-10505

BILL OF IRON

	No.	Size	Length	Description	Location	Weight.
	135	3/4"	11"	Machine Bolts	Diagonals to Posts	225
	85	"	11½"	" "	Post Splices	146
	120	"	12½"	" "	Horizontals to Posts	222
	33	"	14½"	" "	" " "	69
	5	"	15½"	" "	Strut "DS" to Posts	10
	821	3/4"		Malleable C.I. Washers		271
*	20	½"	28½"	Machine Bolts	Stair Stringers	35
*	12	"	32"	" "	" "	23
	400	½"		Malleable C.I. Washers.		100
	132	2½"		"Teco" or equal Split Rings		36
	380	4"		" " " " "		250
	4			Cast Steel Guy Collars	See Detail.	80
	16	3/4"		Drop forged cable clips		16
	4			Bridge Bowls for 3/4"-6/19 Wire	Rope	40
		3/4"		6/19 Plough steel Wire Rope Guys	Length to suit field	
		60d.		Common Nails		65
		40d.		" "		80
		10d.		" "		15
*	23	½"	10"	Machine Bolts	Cab joists to Tower Posts. Rail Posts to Platf. Stringers	14
*	33	3/4"	15½"	" "	Platform Stringer Fast.	76
	90	½"	6½"	" "	Hand Rail Posts to Platf. Strgrs.	41
	46	½"	7½"	" "	" " " " " "	24
	11	½"	9"	" "	" " " " " "	7
	47	5/8	5"	Carriage Bolts	Hand Rails to Posts	10
	30	"	6"	" "	" " " "	7
	10	"	6½"	" "	" " " "	2

* The asterisked items shall be revised as follows for towers where the alternate stair material is used:
Purchase only: 18 - ½"φ × 28½" bolts. 19 - ½"φ × 10" bolts
11 - ½"φ × 32" bolts.
These additions shall be made to the list:
2 - ½"φ × 22½" bolts. 2 - ¾"φ × 15½" bolts
1 - ½"φ × 26" bolts. 5 - ½"φ × 11½" bolts
This note is applicable only to towers having no catwalk (as sheet L-10001).



DETAIL OF GUY COLLAR
Scale 3" = 1'-0"
Material - Cast Steel.

NOTE:
This list includes an approximate 10% overage of bolts, washers, split rings and nails.

Note: All material listed above except C.S. guy collar shall be galvanized.

Revised - 3-30-40 W.D.S.
Revised 10-4-39 by A.S.

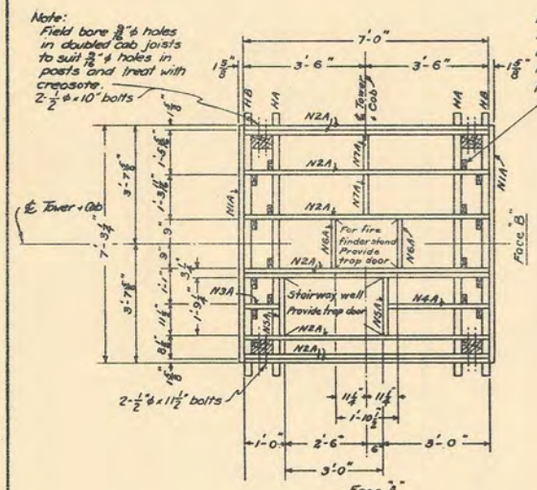
U. S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE
REGION SIX J. FRANKLAND REGIONAL ENGINEER

STANDARD LOOKOUT TOWER
119-FOOT TYPE CT-1
BILL OF HARDWARE

DESIGNED W.G. DRAWN W.D.S. TRACED W.U.S.
SCALE 3" = 1'-0" CHECKED
APPROVED J. Frankland ASSISTANT REGIONAL FORESTER DATE JAN. - 1938.

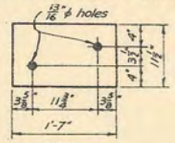
SHEET 8 OF 8 SHEETS L-10506

Note:
Field bore $\frac{13}{16}$"ϕ holes in doubled cab joists to suit $\frac{13}{16}$"ϕ holes in posts and treat with creosote.
2-$\frac{1}{2}$"ϕ×10" bolts

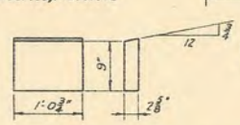


CAB JOIST LAYOUT
for 7X7 cab without catwalk.
See drawings B-4101, B-4102 and B-4103 for other cab details

N9-2"X4"X1'-3" S4S nail to tower girder and joists. Make 16 in place of 24 called for on detail of piece in the L-10100 to L-10500 series, inclusive

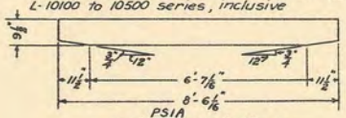


SC4
Make from 3"×12" S4S
Make 4

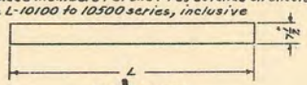


SF4
Make from 3"×10" S4S
Make 4
Scale 1"=1'-0"

These pieces to replace 1-SF1, 1SC1, 2-SF2 and 2-SC2 as detailed on sheets in the L-10100 to 10500 series, inclusive



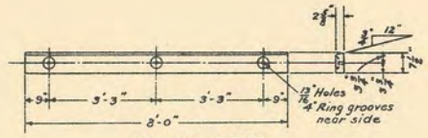
PS1A
Make 2-3"X10"X8'-6$\frac{1}{16}$" S4S
To replace members PS1 and PT as detailed on sheets in the L-10100 to 10500 series, inclusive



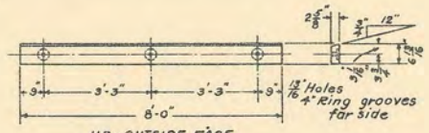
CAB JOISTS
2"X8" S4S

Mark	No. Req'd.	Length-L
N1A	2	7'-3$\frac{1}{4}$"
N2A	9	7'-0"
N3A	1	0'-10$\frac{3}{8}$"
N4A	1	2'-10$\frac{3}{8}$"
N5A	2	1'-9$\frac{1}{4}$"
N6A	2	1'-6"
N7A	2	1'-2$\frac{1}{16}$"

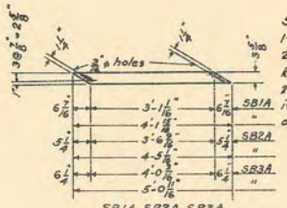
These pieces to replace all pieces marked from N1 to N8 inclusive as detailed on sheets in the L-10100 to L-10500 series, inclusive



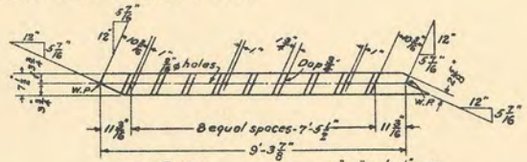
HA - INSIDE FACE
Make 2-3"X 8"X 8'-0" S4S
To replace member H1A, detailed on sheets in the L-10100 to L-10500 series, inclusive



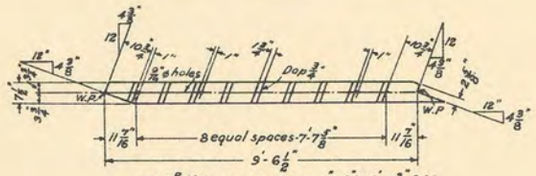
HB - OUTSIDE FACE
Make 2-3"X 8"X 8'-0" S4S
To replace member H1B, detailed on sheets in the L-10100 to L-10500 series, inclusive



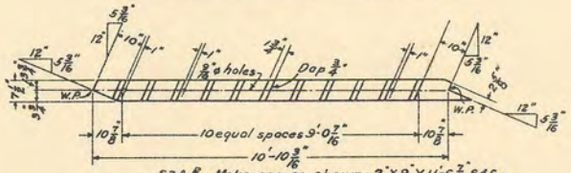
SB1A, SB2A, SB3A
Make 2 each from 2"X4" S4S
To replace pieces SB1, SB2, SB3 respectively as detailed on sheets in the L-10100 to L-10500 series, inclusive.



S1A R Make one as shown-3"X8"X10'-0$\frac{1}{8}$" S4S
S1A L Make one opposite hand 3"X8"X10'-0$\frac{1}{8}$" S4S

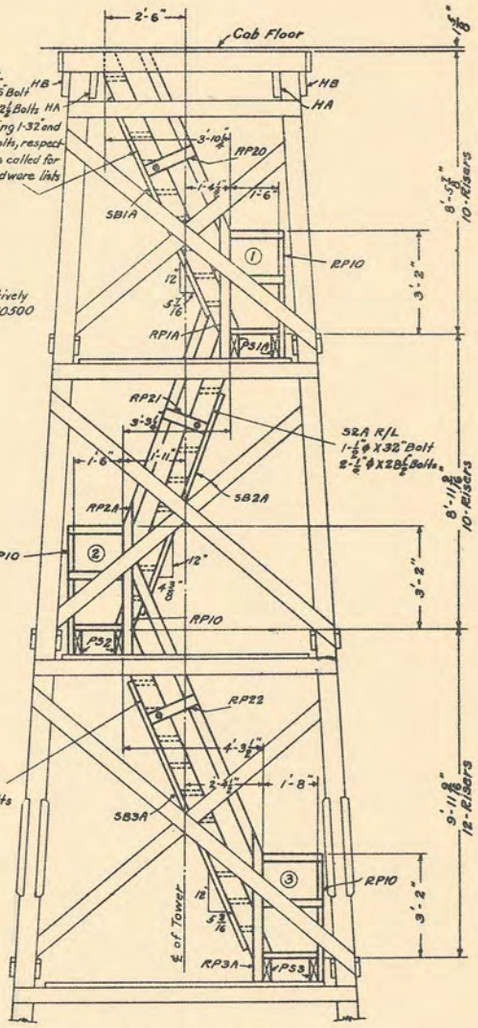


S2A R Make one as shown-3"X8"X10'-4$\frac{3}{4}$" S4S
S2A L Make one opposite hand-3"X8"X10'-4$\frac{3}{4}$" S4S



S3A R Make one as shown-3"X8"X11'-6$\frac{7}{8}$" S4S
S3A L Make one opposite hand-3"X8"X11'-6$\frac{7}{8}$" S4S

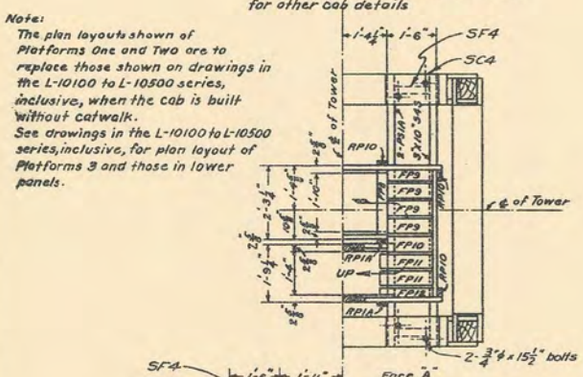
Note: These stair stringers, marked S1A R/L, S2A R/L, S3A R/L, are to replace respectively those pieces marked S1 R/L, S2 R/L, S3 R/L, as detailed on sheets in the L-10100 to L-10500 series, inclusive.



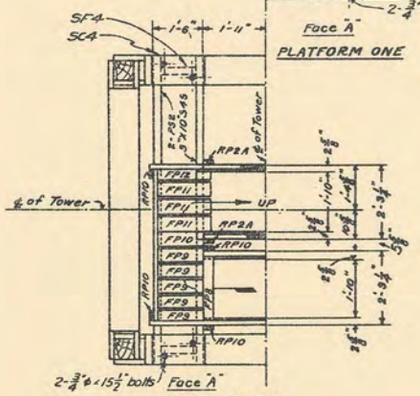
ALTERNATE STAIR LAYOUT
CT-1 Tower
Face "A"

Stair Layout for 7X7 tower using cab without catwalk.
Stair Layout below third panel same as for tower using standard cab with catwalk.

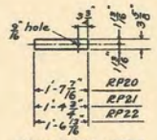
Note:
The plan layouts shown of Platforms One and Two are to replace those shown on drawings in the L-10100 to L-10500 series, inclusive, when the cab is built without catwalk.
See drawings in the L-10100 to L-10500 series, inclusive, for plan layout of Platforms 3 and those in lower panels.



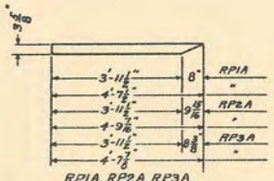
PLATFORM ONE



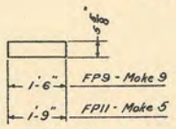
PLATFORM TWO



RP20, RP21, RP22
Make 2 each from 2"X4" S4S
To replace pieces RP11, RP12, and RP13 as detailed on sheets in the L-10100 to L-10500 series, inclusive.



RP1A, RP2A, RP3A
Make 2 each from 3"X4" S4S
To replace pieces RP1, RP2, RP3, respectively, as detailed on sheets in the L-10100 to L-10500 series, inclusive.



FP9, FP11
2"X6" S4S

FP10, FP12
Make 2 each from 2"X6" S4S

Because of changes in plan layout of Platforms One and Two make no FP1, FP2, or FP3 as detailed on sheets in the L-10100 to L-10500 series, inclusive. The quantities listed on those sheets are to be revised as follows: 1 less FP4, 3 less FP5, 1 less FP6, 4 less FP7, and 1 additional FP8.

GENERAL NOTES:
All details on sheets in the L-10100 to L-10500 series, inclusive, except those details or changes noted on this sheet, apply both to the 7X7 tower cab with catwalk and 7X7 tower cab without catwalk.
8 stair treads 2"X8"X1'-5$\frac{1}{2}$" are to be substituted for 9 stair treads 2"X8"X1'-11$\frac{1}{2}$" as detailed and called for on sheets in the L-10100 to L-10500 series, inclusive.

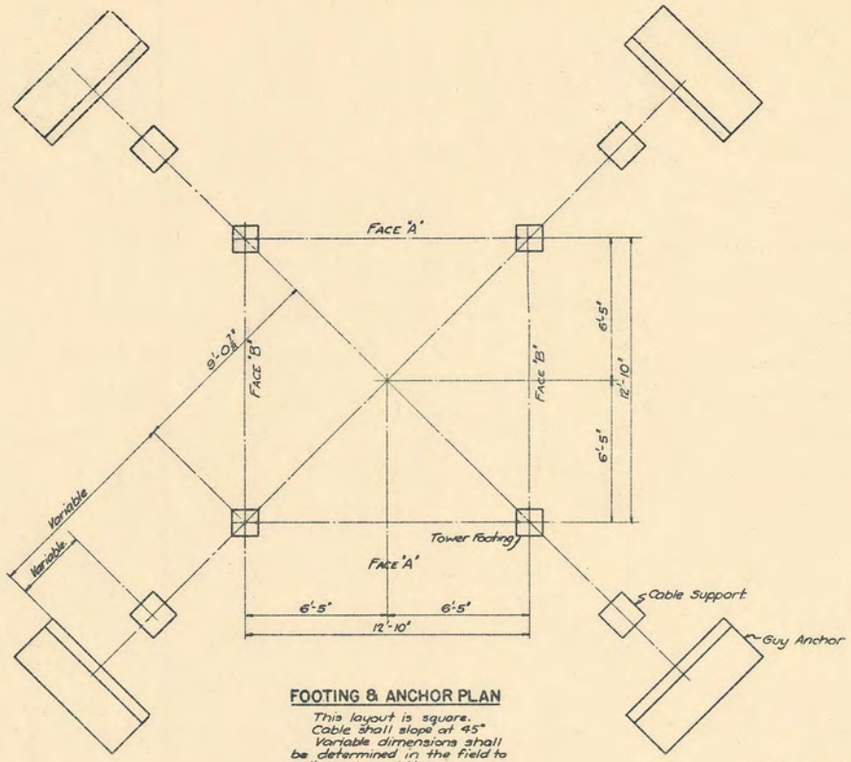
Revised 8/7/40 by W.D.S.
Revised 10/5/39 by A.S.
Revised 4/20/38 by W.G.

U.S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE
REGION SIX JAMES FRANKLAND REGIONAL ENGINEER

ALTERNATE DETAILS
STANDARD LOOKOUT TOWER TYPE CT1
FOR 52, 66, 82, 99 AND 119 FT. HEIGHTS
FOR TOWER CAB WITHOUT CATWALK

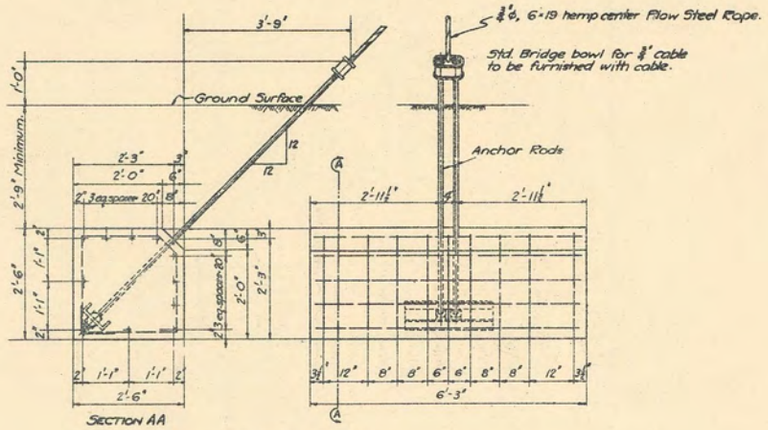
DESIGNED W.G. DRAWN W.G. TRACED E.H.C.
SCALE: 1/4"=1'-0" CHECKED W.G.S.
APPROVED ASSISTANT REGIONAL FORESTER DATE Jan. 15, 1938

SHEET 1 OF 1 SHEETS 1-10001

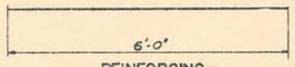


FOOTING & ANCHOR PLAN

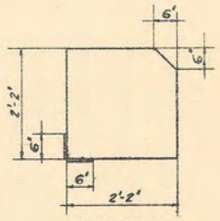
This layout is square.
Cable shall slope at 45°
Variable dimensions shall be determined in the field to suit local conditions.



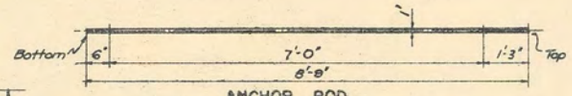
ANCHOR DETAIL



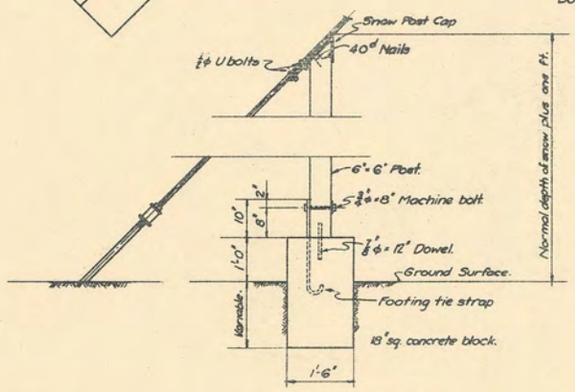
REINFORCING
44 pieces of ¼"φ × 6'-0" deformed bars.



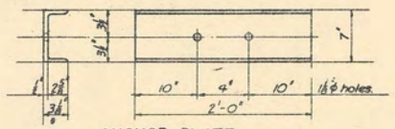
REINFORCING
36 pieces ⅜"φ × 9'-5" deformed bars.



ANCHOR ROD
1⅛"φ × 9'-0" rod. Thread ends as indicated.
Furnish 3 sq. nuts ea. rod. Make 8 galvanized.



GUY CABLE SUPPORT

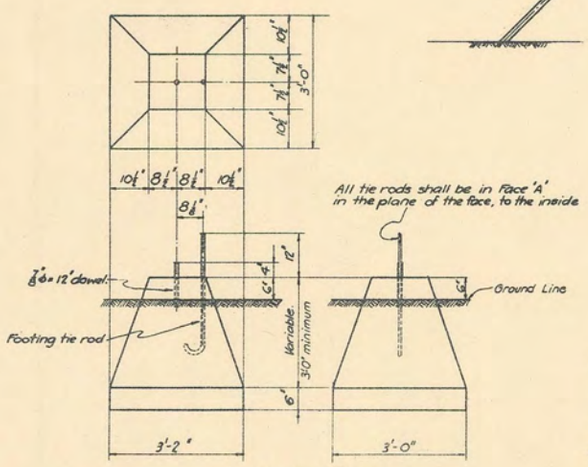


ANCHOR PLATE
7" × 3½" × ¼" Channel C42 (BSC9)
Make 4. galvanized

Furnish all detailed material plus
8 - ⅞"φ × 12" plain dowels, galvanized.
4 - ⅞"φ × 8" machine bolts "
4 - ⅞" malleable washers "

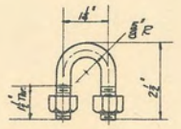
CONCRETE

Mix 1:3:5
Approximate Volume 9 c. yds.
Cement 10 bbls.
Sand 4.7 cu. yds.
Gravel 7.8 cu. yds.

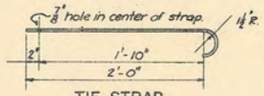


TOWER FOOTING

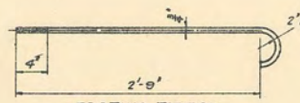
Footing tops shall project about six inches above ground.



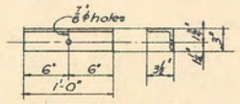
U-BOLT
¼"φ galvanized U-bolt
Make 8.
Furnish 2 hex. nuts each.



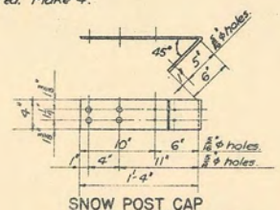
TIE STRAP
⅜" × 3" × 2'-6" strap, galvanized.
Make 4.



FOOTING TIE ROD
⅞"φ × 3'-4" rod, galvanized.
Furnish one sq. nut ea. Make 4.



FOOTING ANGLE
3½" × 3" × ⅜" Angle, galvanized
Make 4.
To tie down lower horizontals attached to footing tie rod.



SNOW POST CAP
4" × ¼" × 1'-10" galvanized strap.
Make 4.

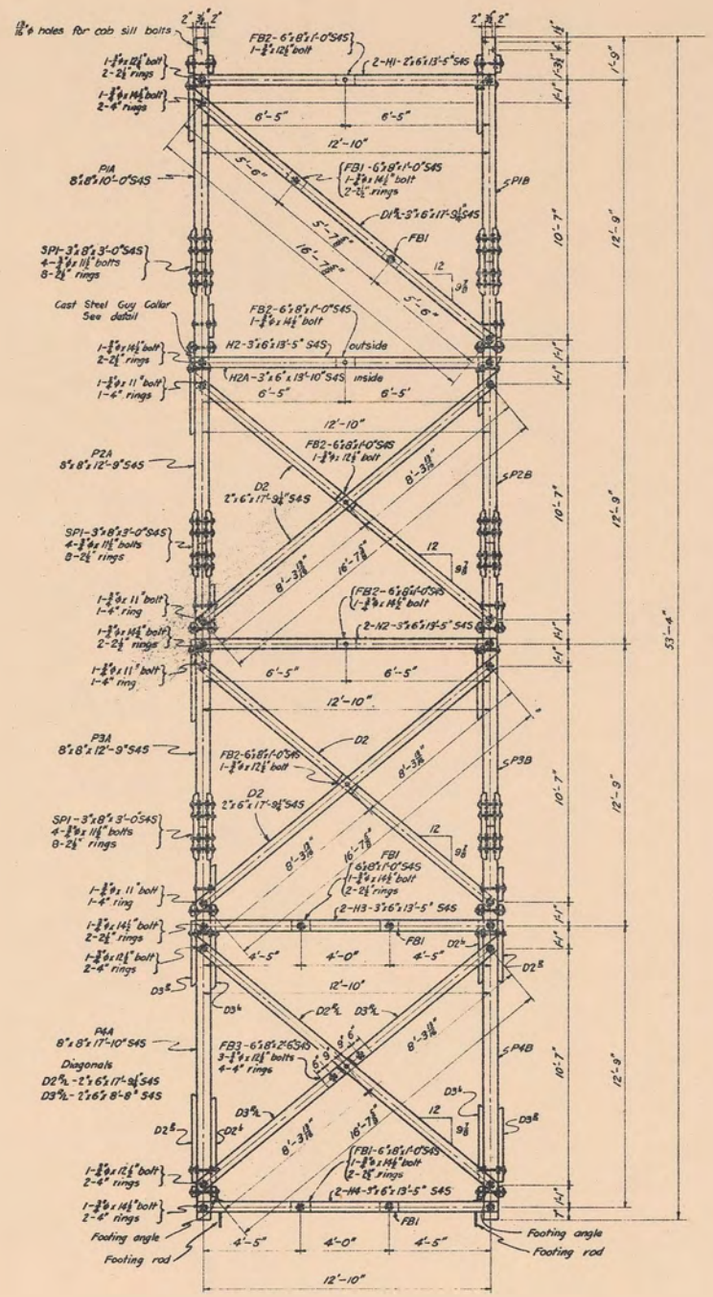
Footings Revised Feb. 1941 by W.D.S.

U. S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE
REGION SIX JAMES FRANKLAND, REGIONAL ENGINEER

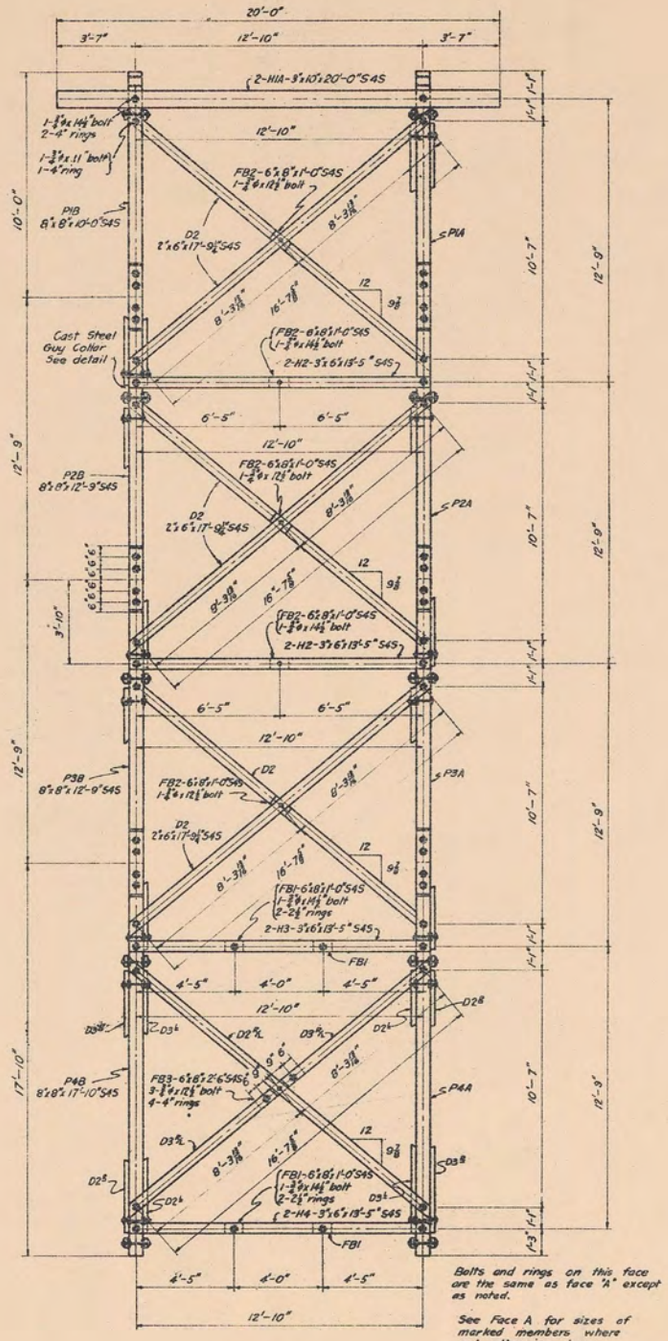
STANDARD LOOKOUT TOWER
53-FOOT TYPE CT-2
FOUNDATION PLAN

DESIGNED B.C.Q. DRAWN B.C.Q. TRACED B.C.Q.
SCALE NONE CHECKED
APPROVED ASSISTANT REGIONAL FORESTER DATE MARCH 1938

SHEET 1 OF 7 SHEETS L-11501



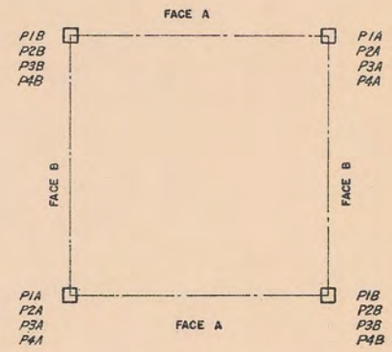
FACE A



FACE B

Bolts and rings on this face are the same as face "A" except as noted.

See Face A for sizes of marked members where not otherwise shown.



POST SCHEDULE

U. S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE

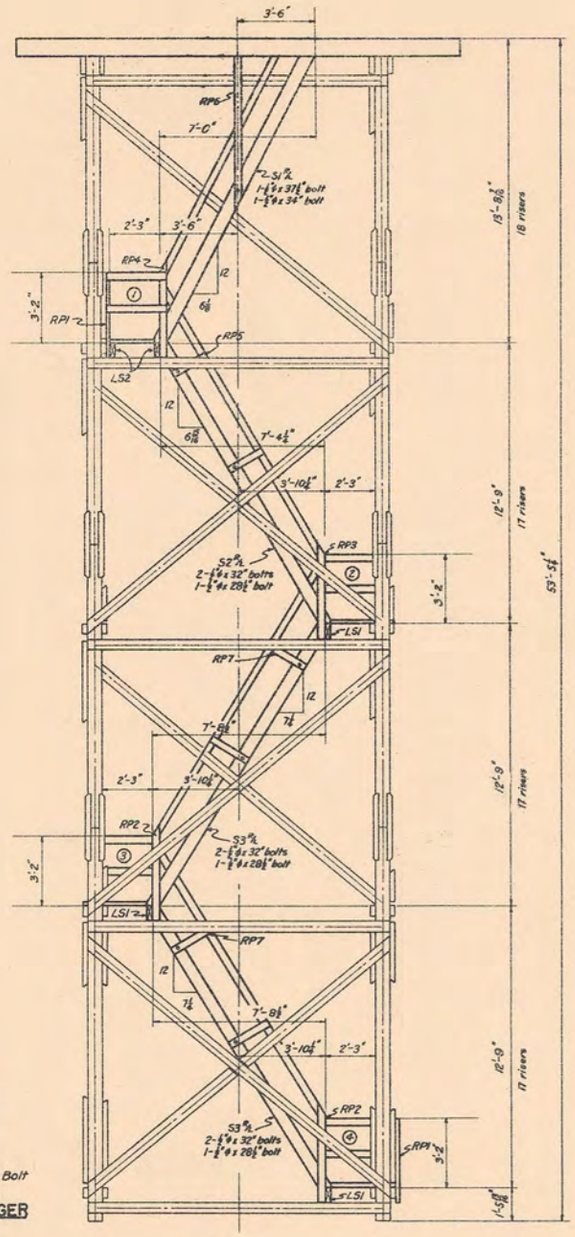
REGION SIX — J. FRANKLAND, REGIONAL ENGINEER

STANDARD LOOKOUT TOWER
53 FOOT - TYPE CT2
GENERAL PLAN

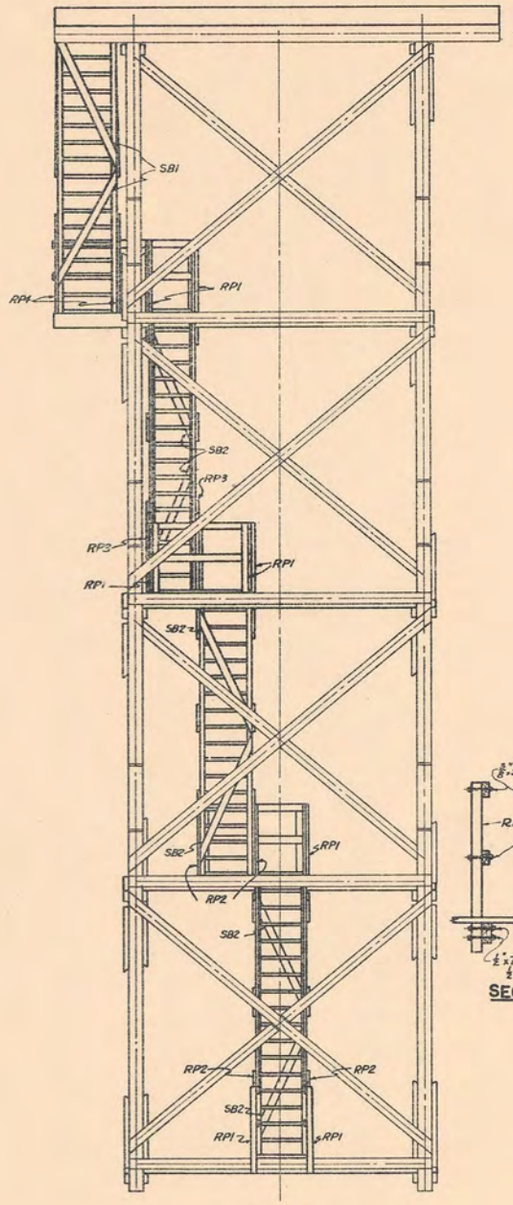
DESIGNED B.C.O. DRAWN B.C.O. TRACED H.W.S.
SCALE 1/8" = 1'-0" CHECKED
APPROVED ASSISTANT REGIONAL FORESTER DATE APRIL, 1938

Revised 7/6/38 - H.S.

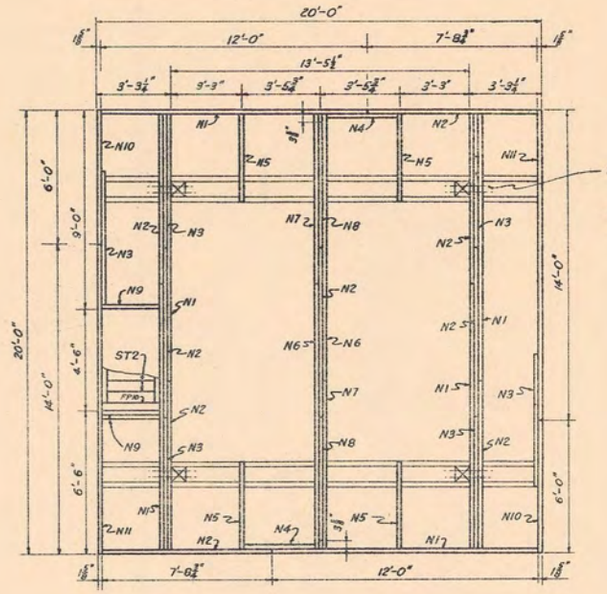
SHEET 2 OF 7 SHEETS L-11502



FACE A

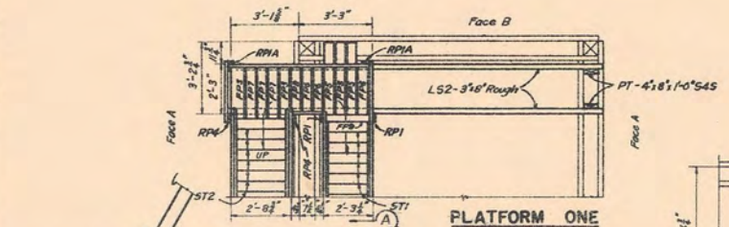


FACE B

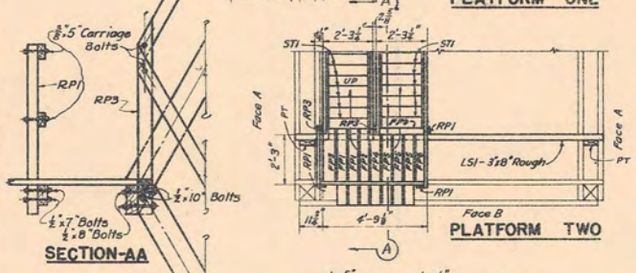


HOUSE & CATWALK SILLS

PLATFORM STRINGER CONNECTION

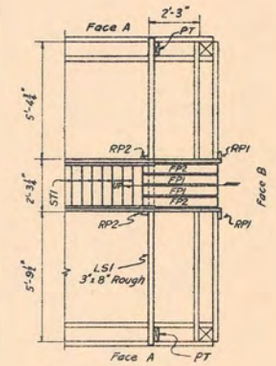


PLATFORM ONE

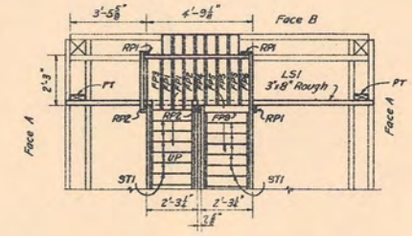


SECTION-AA

PLATFORM TWO



PLATFORM FOUR



PLATFORM THREE

NOTE

Stair stringers to rest directly on joists, not on platform planks.

MATERIAL SIZES

House & Catwalk Sills	2"x10"	S4S Treated	Platform Floor Plank	2"x6"	S4S Treated
Stair Stringers	3"x8"	S4S "	Rail Posts	3"x4" & 2"x4"	S4S "
Stair Treads	2"x8"	S4S "	Stair Stringer Sways	2"x4"	S4S "
Platform Stringers	3"x8"	Rgh "	Hand Rail	2"x4"	S4S Untreated

Revised January, 1941 by W.D.S

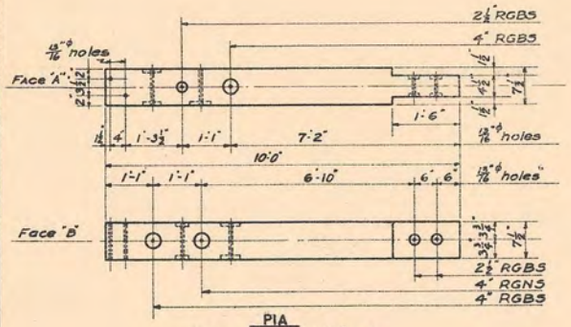
U. S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE

REGION SIX — J. FRANKLAND, REGIONAL ENGINEER

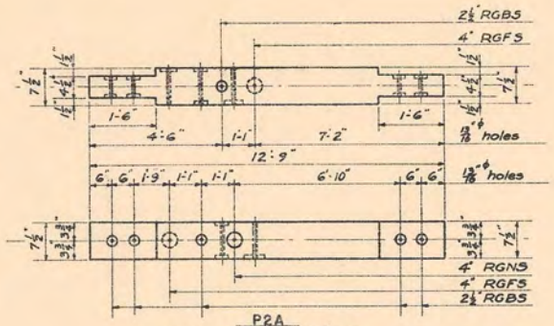
STANDARD LOOKOUT TOWER
53 FOOT – CT2
STAIR LAYOUT

DESIGNED B.C.O. DRAWN R.W.S. TRACED R.W.S.
SCALE 1" = 1'-0" CHECKED
APPROVED J. Frankland DATE APRIL 1938
ASSISTANT REGIONAL FORESTER

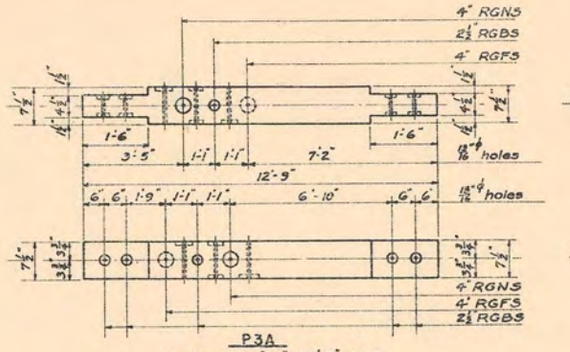
SHEET 3 OF 7 SHEETS L-11503



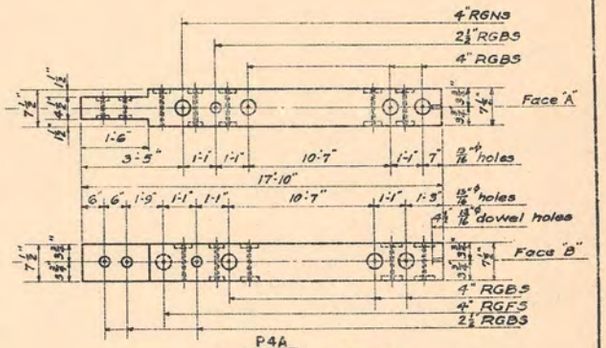
P1A
Make 2 - 8" x 8" x 10'-0" S4S



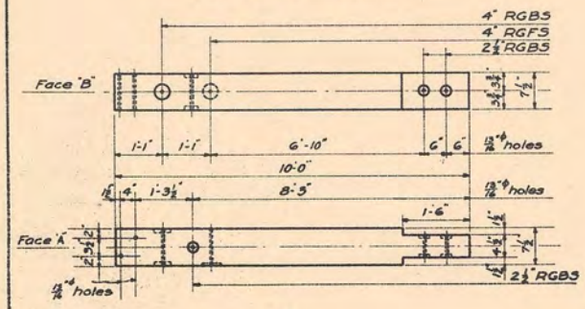
P2A
Make 2 - 8" x 8" x 12'-9" S4S



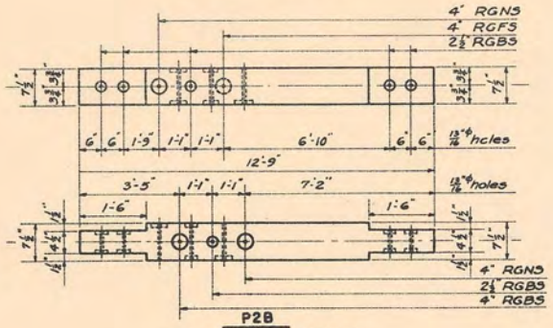
P3A
Make 2 - 8" x 8" x 12'-9" S4S



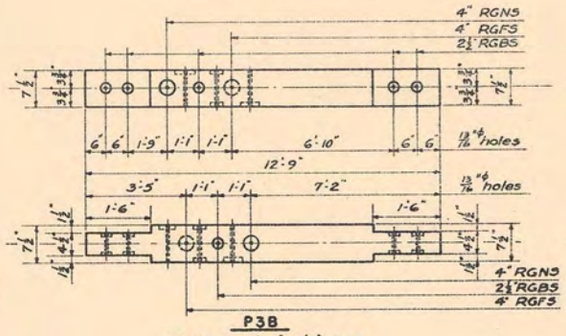
P4A
Make 2 - 8" x 8" x 17'-10" S4S



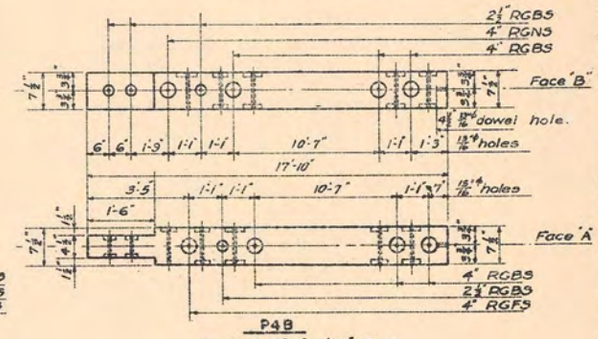
P1B
Make 2 - 8" x 8" x 10'-0" S4S



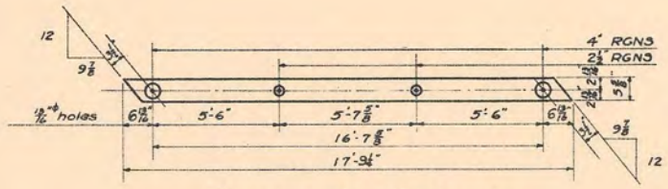
P2B
Make 2 - 8" x 8" x 12'-9" S4S



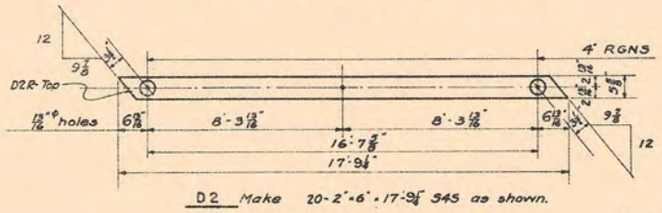
P3B
Make 2 - 8" x 8" x 12'-9" S4S



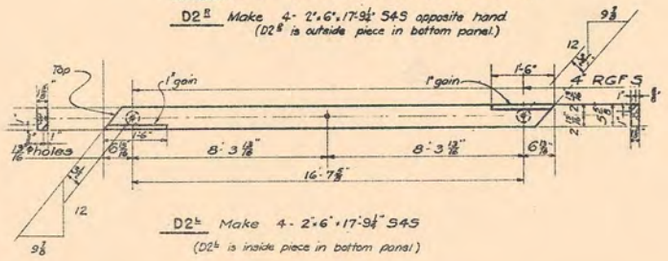
P4B
Make 2 - 8" x 8" x 17'-10" S4S



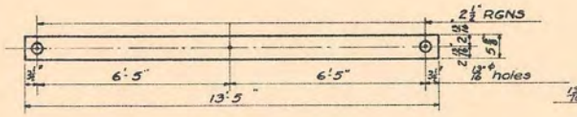
D1R Make 2 - 3" x 6" x 17'-9¼" S4S as shown.
D1L Make 2 - 3" x 6" x 17'-9¼" S4S opposite hand.



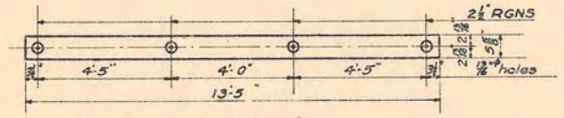
D2 Make 20 - 2" x 6" x 17'-9¼" S4S as shown.
D2R Make 4 - 2" x 6" x 17'-9¼" S4S opposite hand (D2R is outside piece in bottom panel.)



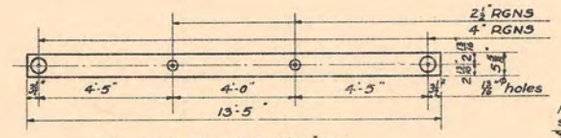
D2L Make 4 - 2" x 6" x 17'-9¼" S4S
(D2L is inside piece in bottom panel.)



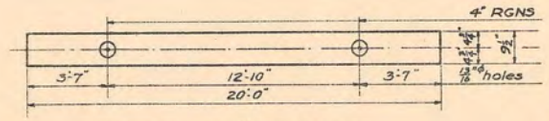
H1 Make 4 - 2" x 6" x 13'-5" S4S as shown.
H2 Make 14 - 3" x 6" x 13'-5" S4S as shown.



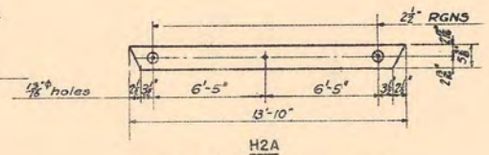
H3 Make 8 - 3" x 6" x 13'-5" S4S



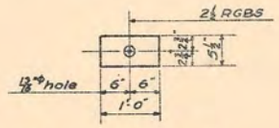
H4 Make 8 - 3" x 6" x 13'-5" S4S



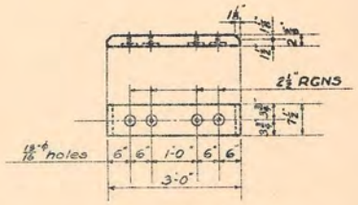
H1A Make 4 - 3" x 10" x 20'-0" S4S



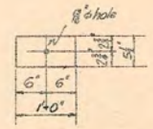
H2A
Make 2 - 3" x 6" x 13'-10" S4S as shown



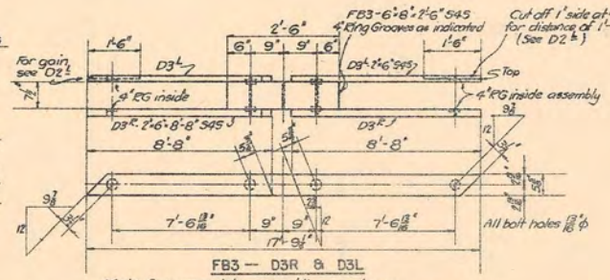
FB1 Make 20 - 6" x 8" x 1'-0" S4S



SP1 Make 24 - 3" x 8" x 3'-0" S4S



FB2 Make 20 - 6" x 8" x 1'-0" S4S



FB3 — D3R & D3L
Make four complete assemblies as shown.
D3L - 2" x 6" x 8'-8" S4S R&T dap as shown. D3R - 2" x 6" x 8'-8" S4S as shown
FB3 - 6" x 8" x 2'-6" S4S as shown.

Revised 7/6/39 - W.S.

NOTE:
RGNS - ring groove near side.
RGFS - ring groove far side.
RGBS - ring groove both sides.

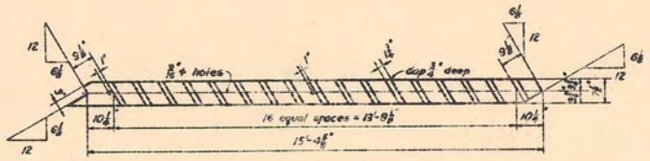
U. S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE

REGION SIX — J. FRANKLAND — REGIONAL ENGINEER

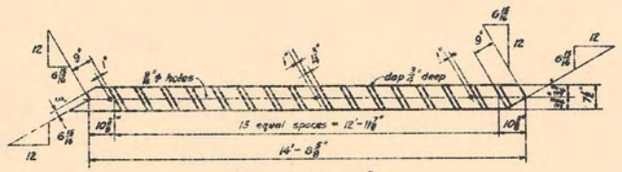
STANDARD LOOKOUT TOWER
53-FOOT TYPE "CT-2"
SHOP DETAILS

DESIGNED B.C.O. DRAWN L.L.L. TRACED L.L.L.
SCALE SLOWE CHECKED B.C.O.
APPROVED J. Frankland ASSISTANT REGIONAL FORESTER DATE APRIL 1939

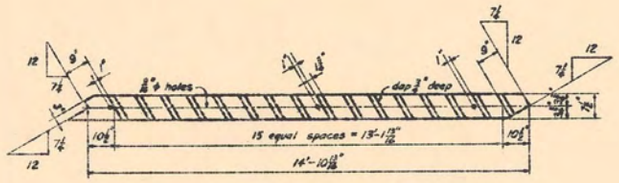
SHEET 4 OF 7 SHEETS L-11504A



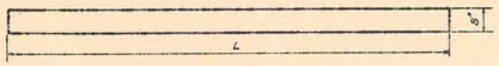
Stair Stringer S1 R/L
3"x8"x16'-0" S4S
Make 1 as shown
Make 1 opposite hand



Stair Stringer S2 R/L
3"x8"x15'-3 1/8" S4S
Make 1 as shown
Make 1 opposite hand

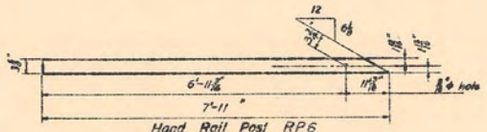


Stair Stringer S3 R/L
3"x8"x15'-5" S4S
Make 2 as shown
Make 2 opposite hand

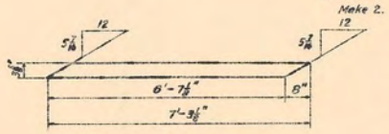


Landing Stringers
3"x8" Rough

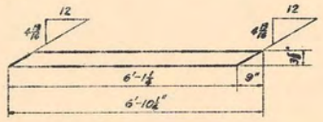
NO. REQ'D	MARK	LENGTH L
3	LS1	13'-11"
2	LS2	17'-0"



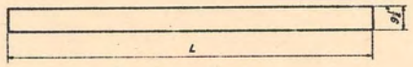
Hand Rail Post RP6
2"x8"x 7'-11" S4S
Make 2.



Stair Brace SB1
2"x4"x 7'-3 1/8" S4S
Make 2

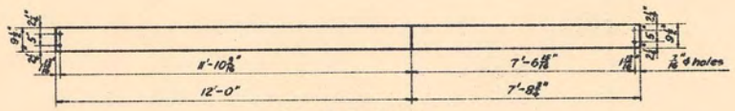


Stair Brace SB2
2"x4"x 6'-10 1/4" S4S
Make 6

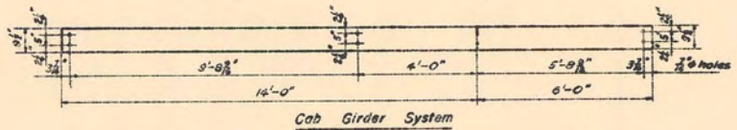


Cab Girder System
2"x10" S4S

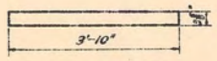
MARK	NO. REQ'D.	LENGTH L
N1	6	12'-0"
N2	9	7'-8 3/4"
N3	6	6'-0"
N4	2	3'-2 1/2"
N5	4	4'-0"
N8	2	5'-8 3/8"
N9	3	2'-8 3/8"



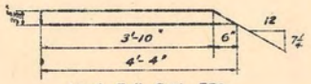
Cab Girder System
N6
Make 2 - 2"x10"x 12'-0" S4S
N7
Make 2 - 2"x10"x 7'-8 3/4" S4S



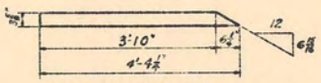
Cab Girder System
N11
Make 2 - 2"x10"x 14'-0" S4S
N10
Make 2 - 2"x10"x 6'-0" S4S



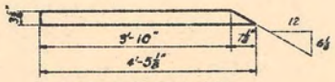
Hand Rail Post RP1
3"x4"x 3'-10" S4S
Make 10
Scale 3/4"=1'-0"
Also make 2 same pattern
2"x4"x 3'-10" S4S
Mark RP1A.



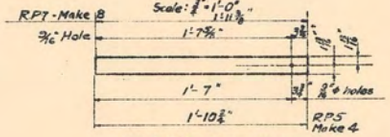
Hand Rail Post RP2
3"x4"x 4'-4" S4S
Make 4
Scale: 3/4"=1'-0"



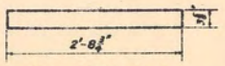
Hand Rail Post RP3
3"x4"x 4'-4 1/4" S4S
Make 2
Scale: 3/4"=1'-0"



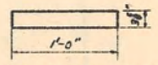
Hand Rail Post RP4
3"x4"x 4'-5 3/8" S4S
Make 2
Scale: 3/4"=1'-0"



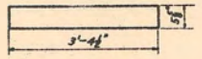
Hand Rail Posts RP5 & RP7
2"x4" S4S



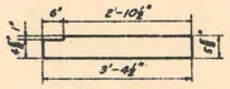
Floor Plank FP10
2"x4"x 2'-8 3/4" S4S
Make 1
No Scale



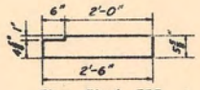
Landing Stringer Ties PT
4"x8"x 1'-0" S4S
Make 10
No Scale



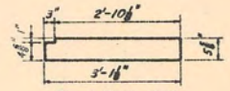
Floor Plank FP1
2"x6"x 3'-4 1/2" S4S
Make 6
Scale: 3/4"=1'-0"



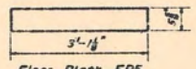
Floor Plank FP2
2"x6"x 3'-4 1/2" S4S
Make 4
Scale: 3/4"=1'-0"



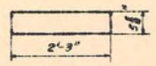
Floor Plank FP3
2"x6"x 2'-6" S4S
Make 4
Scale: 3/4"=1'-0"



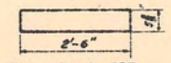
Floor Plank FP4
2"x6"x 3'-1 1/8" S4S
Make 2
Scale: 3/4"=1'-0"



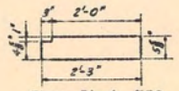
Floor Plank FP5
2"x6"x 3'-1 1/8" S4S
Make 9
Scale: 3/4"=1'-0"



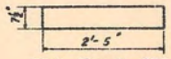
Floor Plank FP6
2"x6"x 2'-3" S4S
Make 5
Scale: 3/4"=1'-0"



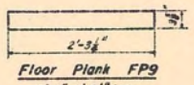
Floor Plank FP7
2"x6"x 2'-6" S4S
Make 3
Scale: 3/4"=1'-0"



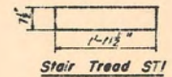
Floor Plank FP8
2"x6"x 2'-3" S4S
Make 1
Scale: 3/4"=1'-0"



Stair Tread ST2
2"x8"x 2'-5" S4S
Make 17
No Scale



Floor Plank FP9
2"x4"x 2'-3 1/4" S4S
Make 3
No Scale



Stair Tread ST1
2"x8"x 1'-11 1/2" S4S
Make 48
No Scale

Revised 2-12-41 by W.D.S.

U. S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE
REGION SIX — J. FRANKLAND, REGIONAL ENGINEER

STANDARD LOOKOUT TOWER
53-FOOT TYPE CT-2
SHOP DETAILS

DESIGNED B.C.O. DRAWN R.W.S. TRACED R.W.S.
SCALE AS NOTED CHECKED
APPROVED ASSISTANT REGIONAL FORESTER DATE APRIL 1940

SHEET 5 OF 7 SHEETS L-15048

TREATED MATERIAL

Item	No.	Mark	Size	Length	DESCRIPTION	FBM
1	2	P1A	8"×8"	12'-0"	Top Posts	128
2	2	P1B	"	"	" "	128
3	2	P2A	"	14'-9"	Intermediate Posts	171
4	2	P2B	"	"	" "	171
5	2	P3A	"	"	" "	171
6	2	P3B	"	"	" "	171
7	2	P4A	"	19'-10	Bottom Posts	213
8	2	P4B	8"×8"	"	" "	213
9	24	SP1	3"×8"	3'-0"	Splice Plates	144
10	4	H1	2"×6"	13'-5"	Horizontals	56
11	4	H1A	3"×10"	20'-0"	"	200
12	14	H2	3"×6"	13'-5"	"	294
13	2	H2A	"	14'-2"	"	48
14	8	H3	"	13'-5"	"	168
15	8	H4	"	13'-5"	"	168
16	4	D1 R/L	3"×6"	17'-9¼"	Diagonal	108
17	28	D2 R/L	2"×6"	17'-9¼"	"	504
18	16	D3 R/L	2"×6"	8'-8"	"	144
19	20	FB1	6"×8"	1'-0"	Fill Block	80
20	20	FB2	"	1'-0"	" "	80
21	4	FB3	6"×8"	2'-6"	" "	40
22	2	S1 R/L	3"×8"	16'-0"	Stair Stringer	64
23	2	S2 R/L	"	15'-3⅛"	" "	64
24	4	S3 R/L	"	15'-5"	" "	128
25	3	LS1	"	13'-11"	Landing Stringer (Rgh.)	84
26	2	LS2	3"×8"	17'-0"	" " (Rgh.)	72
27	6	N1	2"×10"	12'-0"	Cab Girders	120
28	9	N2	"	7'-8¾"	" "	120
29	6	N3	"	6'-0"	" "	60
30	2	N4	"	3'-2½"	" "	12
31	4	N5	"	4'-0"	" "	27
32	2	N6	"	12'-0"	" "	40
33	2	N7	"	7'-8¾"	" "	27
34	2	N8	"	5'-8⅜"	" "	20
35	3	N9	"	2'-8¾"	" "	15
36	2	N10	"	6'-0"	" "	20
37	2	N11	2"×10"	14'-0"	" "	47
38	48	ST1	2"×8"	1'-11½"	Stair Treads	128
39	17	ST2	2"×8"	2'-5"	" "	57
40	10	PT	4"×8"	1'-0"	Platform Ties	27
41	6	FP1	2"×6"	3'-4½"	Floor Plank	21
42	4	FP2	"	3'-4½"	" "	14
43	4	FP3	"	2'-6"	" "	10
44	2	FP4	"	3'-1⅛"	" "	7
45	9	FP5	"	3'-1⅛"	" "	30
46	5	FP6	"	2'-3"	" "	12
47	3	FP7	"	2'-6"	" "	8
48	1	FP8	2"×6"	2'-3"	" "	3
49	3	FP9	2"×4"	2'-3¼"	" "	5
50	1	FP10	"	2'-8¾"	" "	2
51	10	RP1	3"×4"	3'-10"	Hand Rail Posts	40
52	4	RP2	"	4'-4"	" " "	20
53	2	RP3	"	4'-4½"	" " "	10
54	2	RP4	3"×4"	4'-5⅛"	" " "	10
55	4	RP5	2"×4"	1'-10¾"	" " "	5
56	2	RP6	"	7'-11"	" " "	11
57	2	SB1	"	7'-3⅛"	Stair Braces	11
58	2	SB2	2"×4"	6'-10¼"	" "	28
59	2	RP1A	2"×4"	3'-10"	Hand Rail Posts	5
60	8	RP7	2"×4"	1'-11⅜"	" " "	11
					TOTAL FBM.	4795

UNTREATED MATERIAL

Item	No.	Mark	Size	Length	DESCRIPTION	FBM
1	1		2"×4"	8'-0"	Hand Rails.	6
2	2		"	9'-0"	" "	12
3	4		"	11'-0"	" "	30
4	2		"	12'-0"	" "	16
5	1		"	14'-0"	" "	10
6	6		"	16'-0"	" "	64
					Total F.B.M.	138

All material shall be furnished S4S with the exception of items 25 and 26 (LS1 and LS2) which shall be furnished Rough

As required by specifications, material for Posts is listed 2'-0" greater than shop detail length to eliminate seasoning end checks

Revised February 1941 by W.B.

U. S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE

REGION SIX JAMES FRANKLAND, REGIONAL ENGINEER

STANDARD LOOKOUT TOWER
53-FOOT TYPE CT-2
BILL OF LUMBER

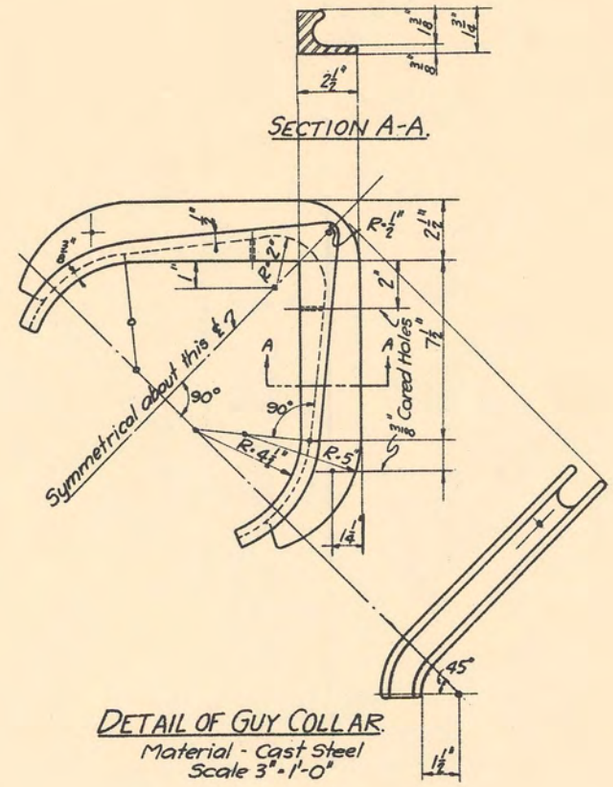
DESIGNED B.C.O. DRAWN B.C.O. TRACED B.C.O.
SCALE CHECKED
APPROVED ASSISTANT REGIONAL FORESTER DATE APRIL 28, 1938

SHEET 6 OF 7 SHEETS L-11505

BILL OF IRON

No.	Size	Length	Description	Location	Weight
44	3/4"	11"	Machine Bolts	Diagonal ends D2	78
53	"	11 1/2"	" "	Post Splices	97
48	"	12 1/2"	" "	Diagonals D2 & D3. H1	93
90	"	14 1/2"	" "	D1; H-1A, 2, 2A, 3 & 4; N to P	197
458	3/4"		Malleable C.I. Washers		151
211	2 1/2"		"Teco" or similar Split Rings		58
132	4"		" " " " "		88
3	1/2"	2'-4 1/2"	Machine Bolts.	Stairs - bottom & interm. panels	5
6	"	2'-8"	" "	" " " "	11
1	"	2'-10"	" "	Stairs - top panel	2
1	"	3'-1 1/2"	" "	" " "	2
150	1/2"		Cut Washers.		6
	3/4"	6×19	Plow Steel Wire Rope.	Length to suit topography	✓
16	3/4"		Standard Wire Rope Clips.		15
4	3/4"		Bridge Bowls.		40
4			Cast Steel Guy Collars.	See detail.	80
	10d		Common Nails		7
	20d		" "		25
	40d		" "		20
30	1/2"	7"	Machine Bolts	Hand Rail to Stringers	15
26	"	8"	" "	" " " "	14
22	"	8 1/2"	" "	Platform Stringer Ties	12
5	"	10	" "	Hand Rail Posts to Strgrs.	3
11	"	15"	" "	Platform Stringer Ties	10
33	3/8"	5"	Carriage Bolts	Hand Rail	7
22	"	6"	" "	" "	5
6	"	8"	" "	" "	2
65	"		Cut Washers for 3/8" Bolts		1

All above items except C.I. Guy Collars to be galvanized.



NOTE
This list includes an approximate 10% overage of bolts, washers, split rings and nails.

Quantity of 14 1/2" bolts changed 12-6-39 by A.S.

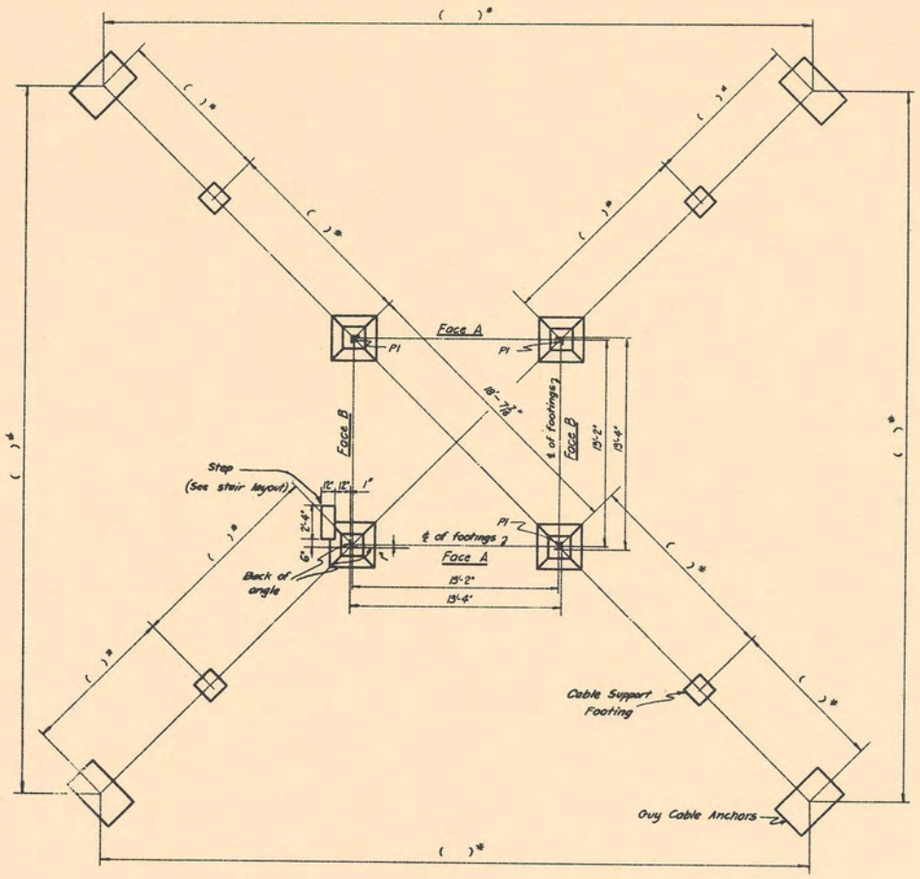
U. S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE

REGION SIX JAMES FRANKLAND, REGIONAL ENGINEER

STANDARD LOOKOUT TOWER
53-FOOT TYPE CT-2
BILL OF HARDWARE

DESIGNED B.C.O. DRAWN B.C.O. TRACED B.C.O.
SCALE CHECKED
APPROVED ASSISTANT REGIONAL FORESTER DATE APRIL 26, 1938.

SHEET 7 OF 7 SHEETS L-11506



FOOTING LAYOUT

All dimensions marked thus ( )* are to be determined in the field

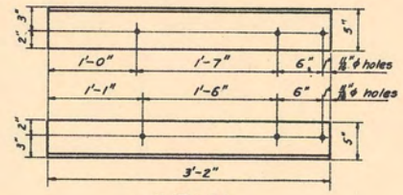
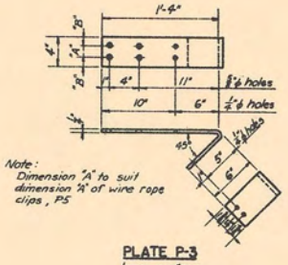


PLATE P-1

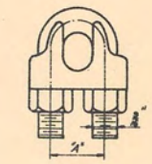
5"x5"x 3/8"x 3'-2" Angle
Scale 1 1/2"=1'-0"
Make 4.



Note: Dimension "A" to suit dimension "A" of wire rope clips, P5

PLATE P-3

1/4"x 4"x 1'-10" Plate
Scale 1 1/2"=1'-0"
Make 4



P-5

Standard 5/8" Wire Rope Clip
Must conform with the above dimensions

Full Size
Provide 32

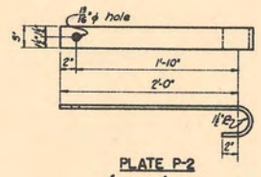


PLATE P-2

3/8"x 5"x 2'-6 1/2" Plate
Scale 1 1/2"=1'-0"
Make 4

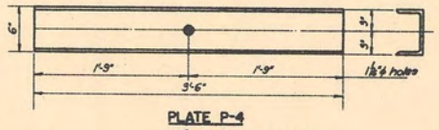
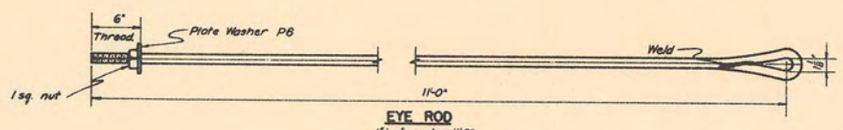


PLATE P-4

6"x 18#"x 3'-6" Ship Channel
Scale 1 1/2"=1'-0"
Make 4



EYE ROD

1"ϕ diameter x 11'-0"
Scale 1 1/2"=1'-0"
Make 4
Furnish 1 sq. nut with each rod.

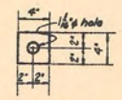
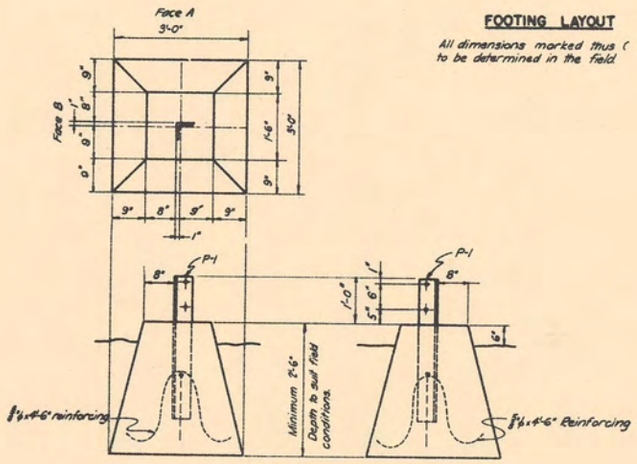


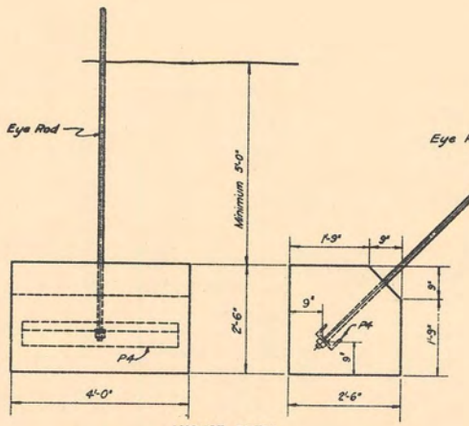
PLATE WASHER P6

1/4"x 4"x 4" Plate
Scale 1 1/2"=1'-0"
Make 4.



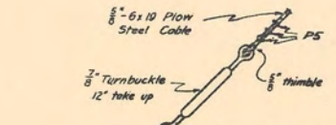
POST FOOTING

Scale 3/4"=1'-0"

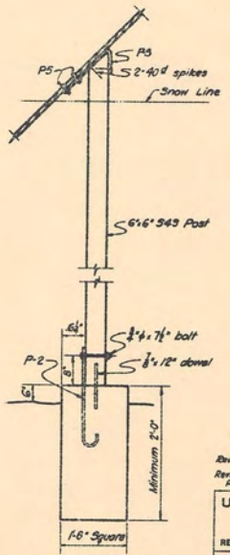


ANCHOR DETAIL

Scale 3/4"=1'-0"



GENERAL NOTE
All hardware to be galvanized



CABLE SUPPORT

Scale 3/4"=1'-0"

Furnish all detailed material and in addition furnish:
4-1/2"ϕ x 12" dowels
4-1/2"ϕ x 7 1/2" machine bolts
4-1/2"ϕ malleable washers
4-7/8" turnbuckles, Eye-Clevis.
4-5/8" thimbles

Revised 10-2-39 by A.B., / H.G.
Revised 3-8-39 by H.G.
P-3, P-5, size of guy cable from 1/2".

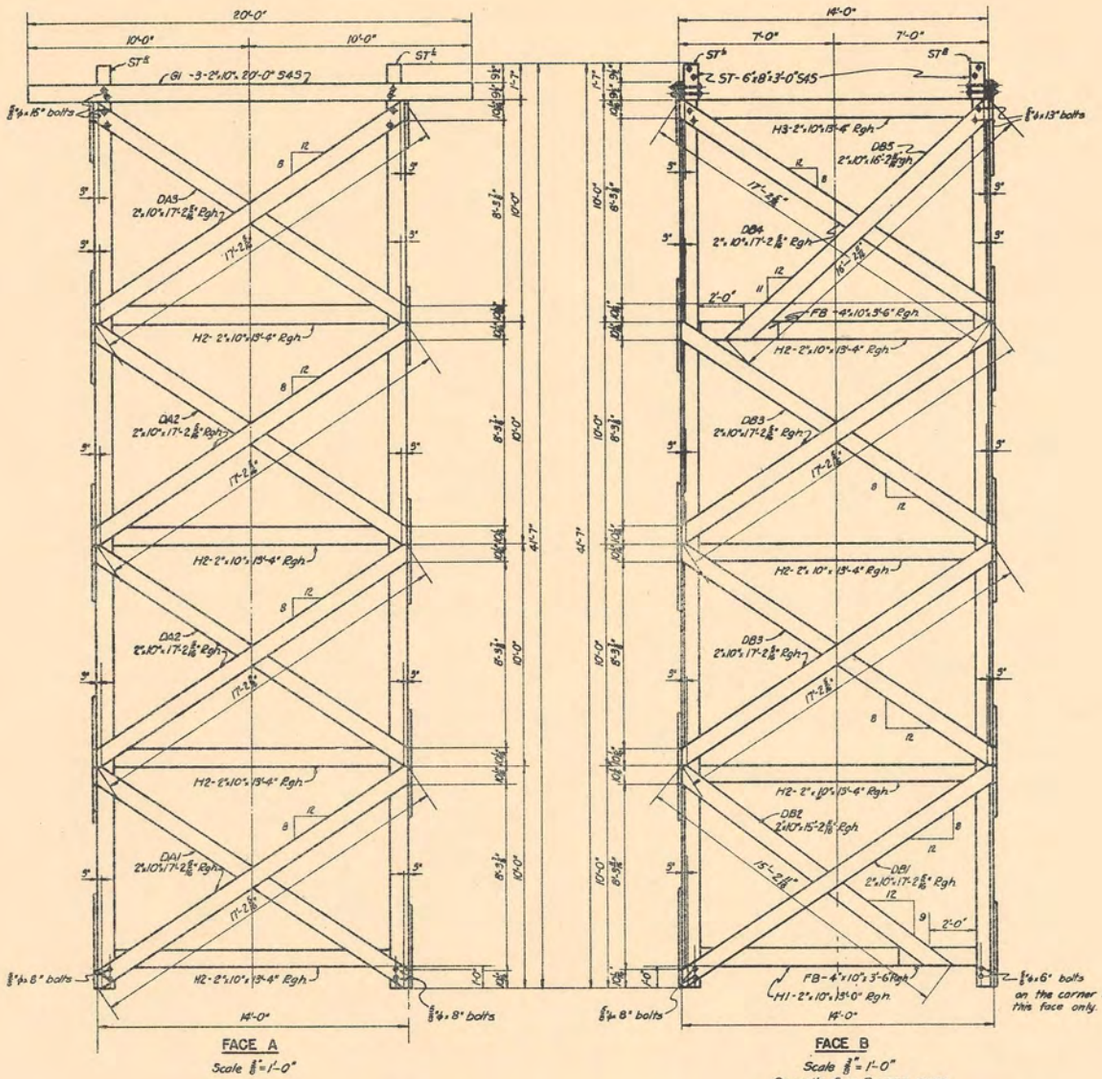
U. S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE

REGION SIX — J. FRANKLAND — REGIONAL ENGINEER

STANDARD LOOKOUT TOWER
40-FOOT TYPE CT-3
FOUNDATION DETAILS

DESIGNED R.W.S. DRAWN R.W.S. TRACED H.R.S.
SCALE AS NOTED CHECKED 12/7
APPROVED ASSISTANT REGIONAL FORESTER DATE JAN. 1938

SHEET 1 OF 7 SHEETS. L-11201.



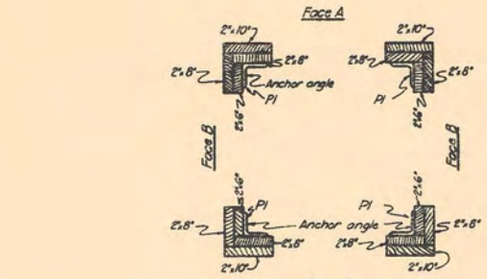
FACE A

Scale 3/8" = 1'-0"

FACE B

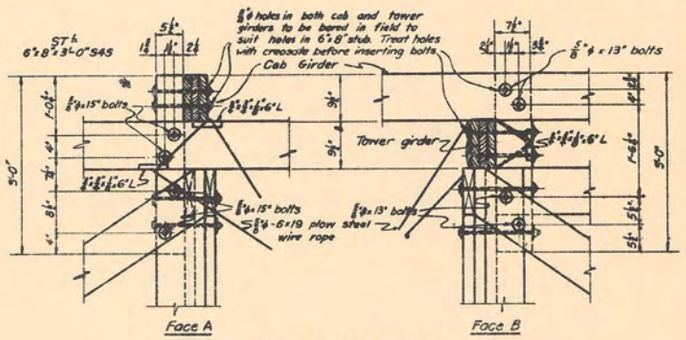
Scale 3/8" = 1'-0"

Opposite face B uses same diagonal system as face A



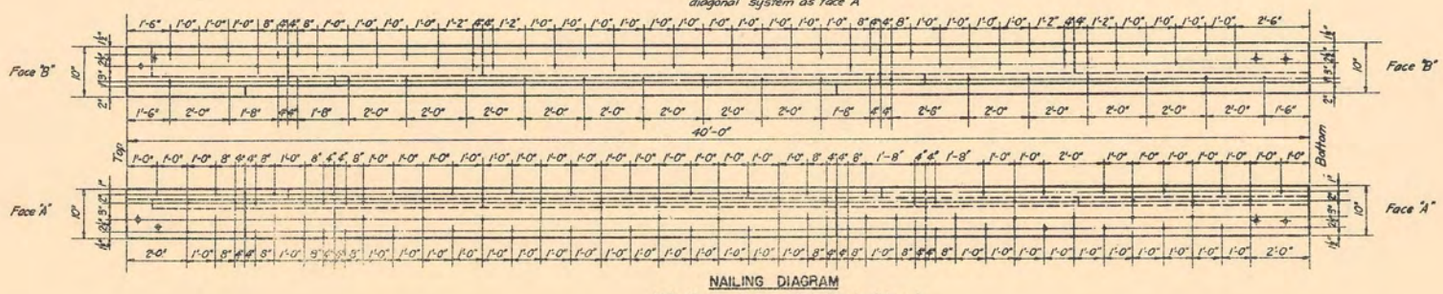
POST ASSEMBLY

No Scale



STUB & CABLE DETAILS

Scale 1" = 1'-0"



NAILING DIAGRAM

This diagram is for fabrication in field only.
Use 40d galvanized wire nails
No Scale

Revised 10-2-39 by A.S., /W.G.
Revised 3-8-39 by W.G.
Size of cable from 1/2"

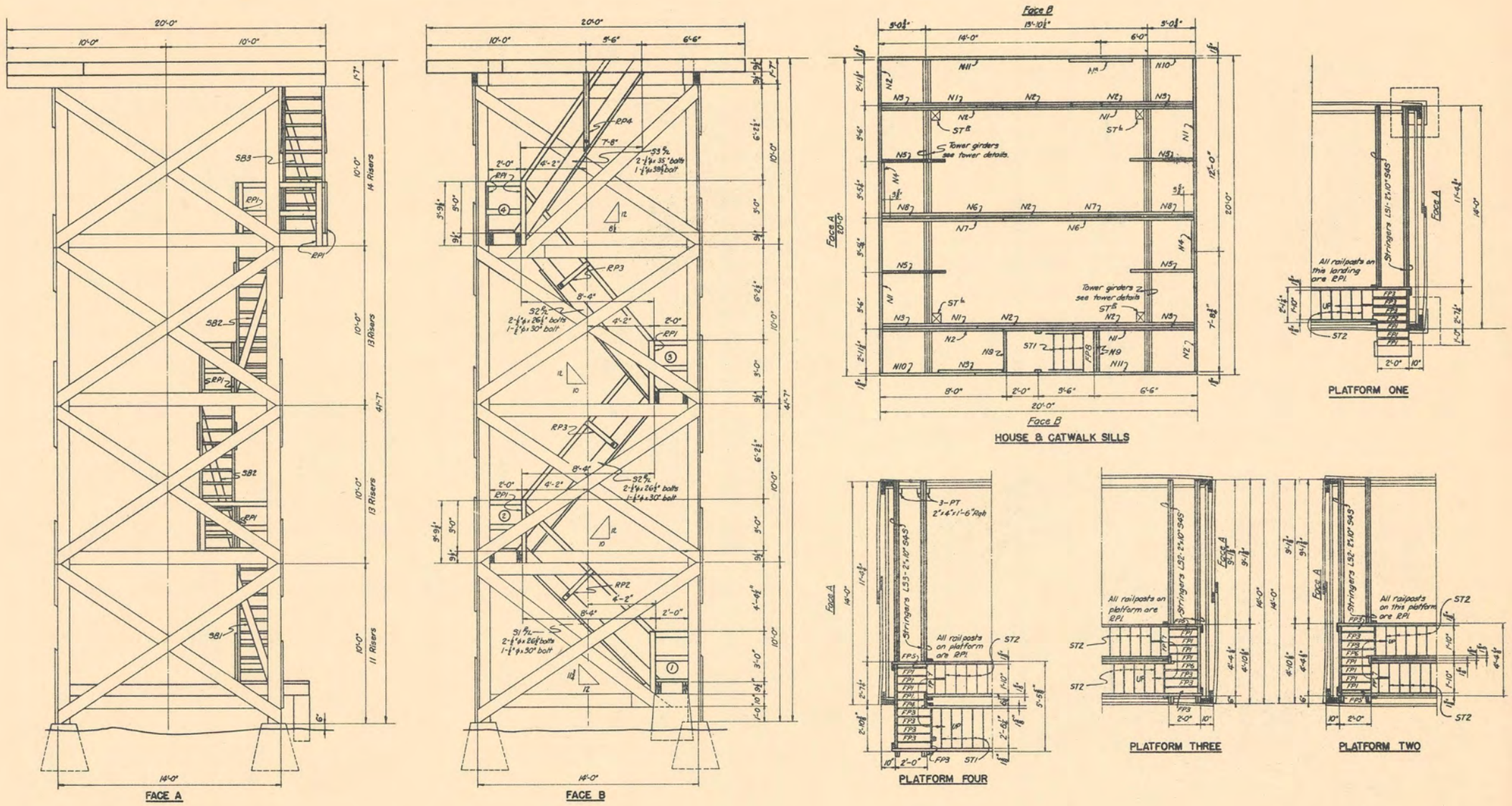
U. S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE

REGION SIX J. FRANKLAND REGIONAL ENGINEER.

STANDARD LOOKOUT TOWER
40-FOOT TYPE CT-3
GENERAL PLAN

DESIGNED P.W.S. DRAWN R.W.S. TRACED H.R.S.
SCALE NOTED CHECKED
APPROVED ASSISTANT REGIONAL FORESTER DATE FEBRUARY-1938

SHEET 2 OF 7 SHEETS L-11202.



Revised 10-3-39 by A.S., J.W.G.

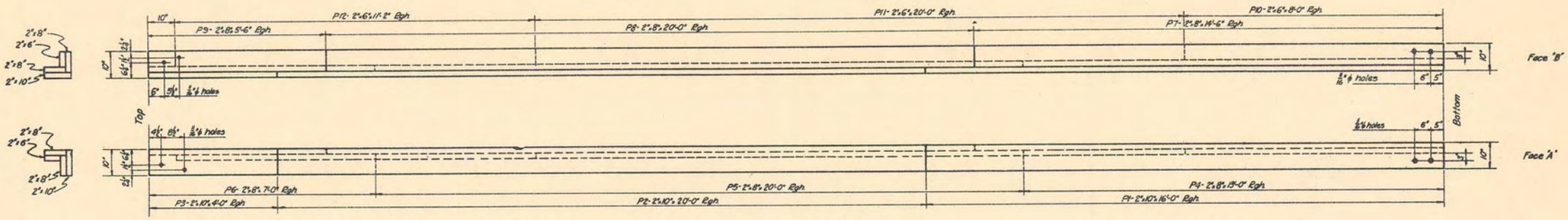
U. S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE

REGION SIX J. FRANKLAND REGIONAL ENGINEER

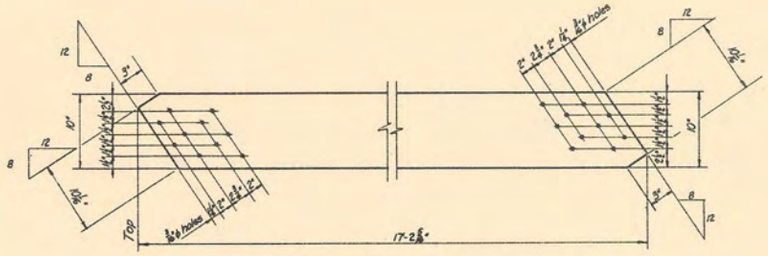
STANDARD LOOKOUT TOWER
40-FOOT TYPE CT-3
STAIR LAYOUT

DESIGNED R.W.S. DRAWN R.W.S. TRACED H.R.S.
SCALE 3/8"=1'-0" CHECKED W.G.
APPROVED [signature] ASSISTANT REGIONAL FORESTER DATE FEBRUARY 1938

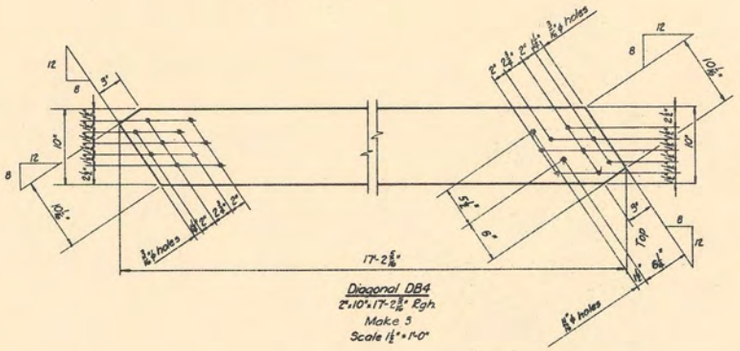
SHEET 3 OF 7 SHEETS L-11203



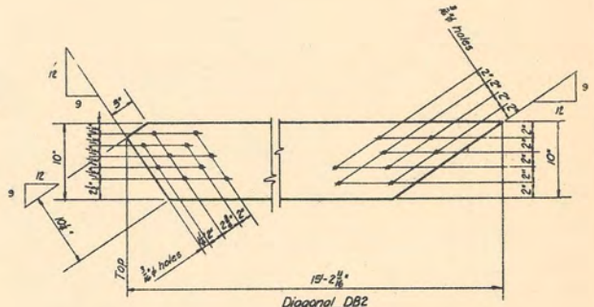
Posts
Make 2 as shown
Make 2 opp hand
Scale 3/4"=1'-0"



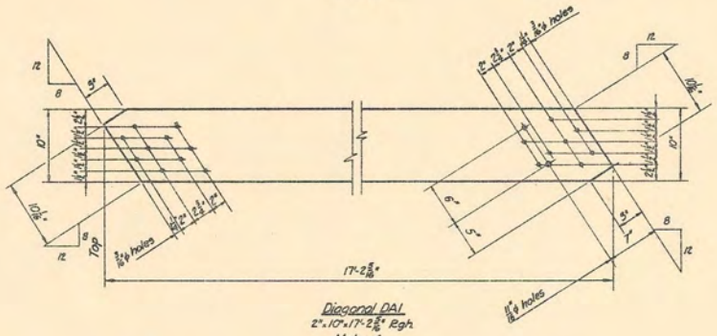
Diagonal DA2
2"x10"x17'-2 5/16" Rgh
Make 8
Scale 1 1/2"=1'-0"



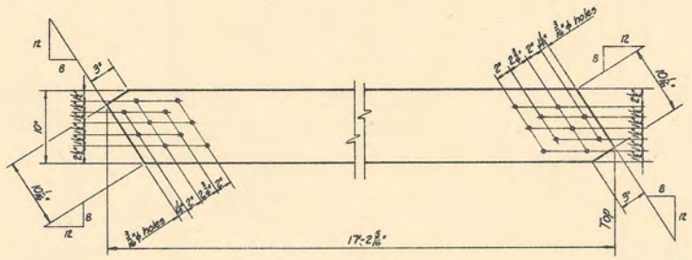
Diagonal DB4
2"x10"x17'-2 5/16" Rgh
Make 3
Scale 1 1/2"=1'-0"



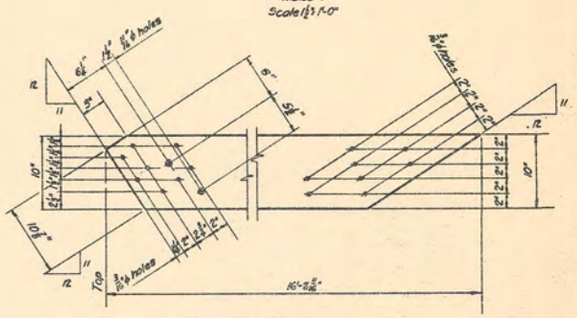
Diagonal DB2
2"x10"x15'-2 11/16" Rgh
Make 1
Scale 1 1/2"=1'-0"



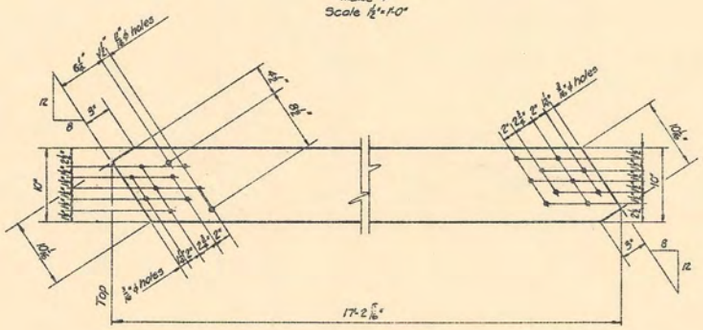
Diagonal DA1
2"x10"x17'-2 5/16" Rgh
Make 4
Scale 1 1/2"=1'-0"



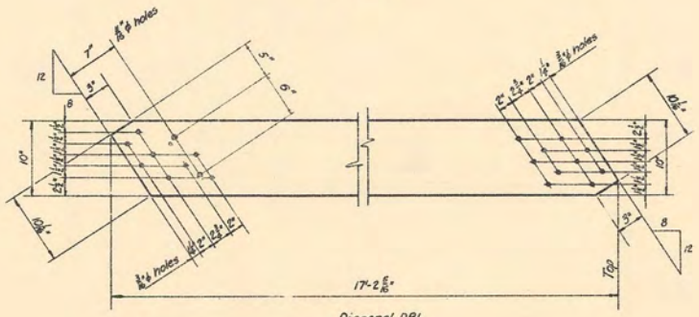
Diagonal DB3
2"x10"x17'-2 5/16" Rgh
Make 8
Scale 1 1/2"=1'-0"



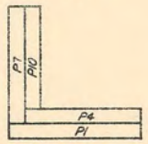
Diagonal DB5
2"x10"x16'-2 5/16" Rgh
Make 1
Scale 1 1/2"=1'-0"



Diagonal DA3
2"x10"x17'-2 5/16" Rgh
Make 4
Scale 1 1/2"=1'-0"



Diagonal DB1
2"x10"x17'-2 5/16" Rgh
Make 3
Scale 1 1/2"=1'-0"



Note to shop: 13/16" ϕ holes to be bored with starter pieces (P1, P4, P7, & P10) assembled. Two columns to be assembled as shown above & two opposite hand. After boring, starter pieces to be matchmarked (A, B, C, & D for each of the four assembled posts respectively) for erection.

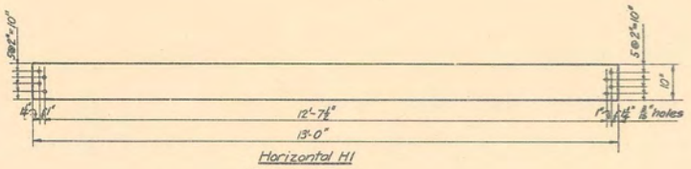
U. S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE

REGION SIX — J. FRANKLAND REGIONAL ENGINEER

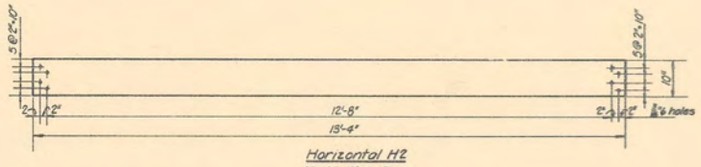
STANDARD LOOKOUT TOWER
40-FOOT TYPE CT-3
SHOP DETAILS

DESIGNED R.W.S. DRAWN R.W.S. TRACED H.R.B.
SCALE NOTED CHECKED
APPROVED ASSISTANT REGIONAL FORESTER DATE FEBR. 1948

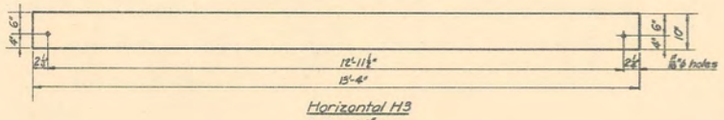
SHEET 4 OF 7 SHEETS L-11204A.



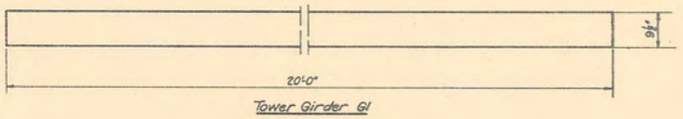
Horizontal H1
2"x10"x13'-0" Rgh.
Make 2
Scale ¾"=1'-0"



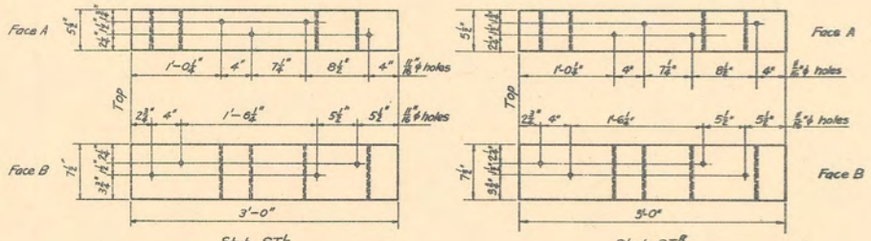
Horizontal H2
2"x10"x13'-4" Rgh.
Make 14
Scale ¾"=1'-0"



Horizontal H3
2"x10"x13'-4" Rgh.
Make 2
Scale ¾"=1'-0"

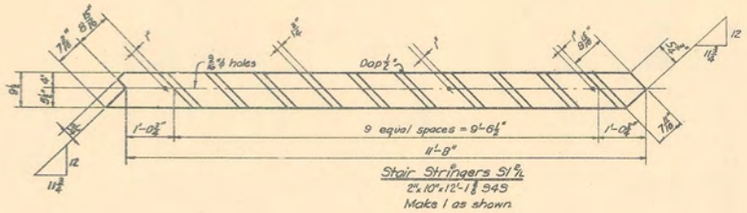


Tower Girder G1
2"x10"x20'-0" S4S
Make 6
Scale ¾"=1'-0"

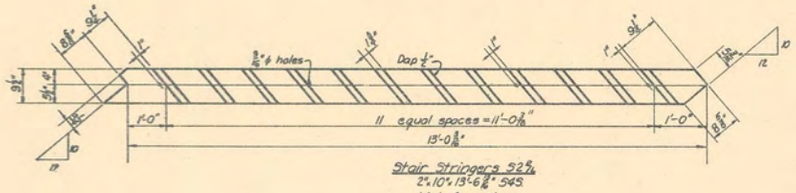


Stub ST^L
6"x8"x3'-0" S4S
Make 2
Scale 1½"=1'-0"

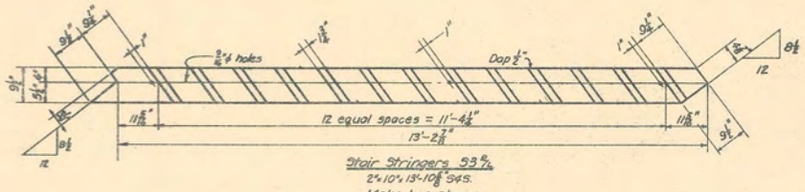
Stub ST^R
6"x8"x5'-0" S4S
Make 2
Scale 1½"=1'-0"



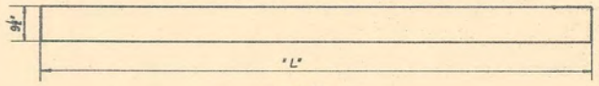
Stair Stringers S1 %
2"x10"x12'-1⅞" S4S
Make 1 as shown
Make 1 opp hand
Scale ¾"=1'-0"



Stair Stringers S2 %
2"x10"x13'-6 5/16" S4S
Make 2 as shown
Make 2 opp hand
Scale ¾"=1'-0"

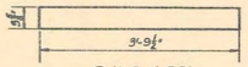


Stair Stringers S3 %
2"x10"x13'-10⅝" S4S
Make 1 as shown
Make 1 opp hand
Scale ¾"=1'-0"

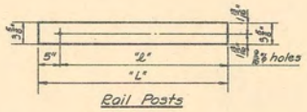


2"x10" S4S
Landing Stringers

Mark	Make	"L"
LS1	4	15'-0"
LS2	8	14'-0"
LS3	4	17'-0"

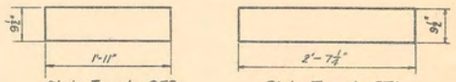


Rail Post RP1
2"x4"x3'-9½" S4S
Make 19



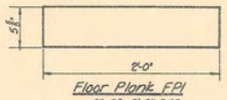
Rail Posts
2"x4" S4S

Mark	Make	"L"	"L"
RP2	2	2'-1 15/16"	2'-6 15/16"
RP3	4	1'-11 15/16"	2'-4 15/16"

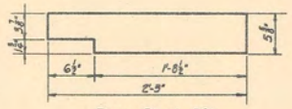


Stair Treads ST2
2"x10"x1'-11" S4S
Make 34

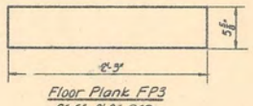
Stair Treads ST1
2"x10"x2'-7½" S4S
Make 19



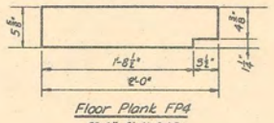
Floor Plank FP1
2"x6"x2'-0" S4S
Make 15



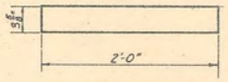
Floor Plank FP2
2"x6"x2'-3" S4S
Make 1



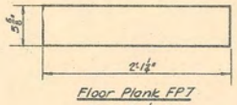
Floor Plank FP3
2"x6"x2'-3" S4S
Make 14



Floor Plank FP4
2"x6"x2'-0" S4S
Make 1



Floor Plank FP5
2"x4"x2'-0" S4S
Make 3



Floor Plank FP7
2"x6"x2'-1½" S4S
Make 3

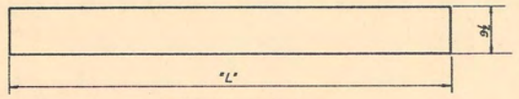
Revised 10-3-39 by A.S., /W.B.

U. S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE
REGION SIX — J. FRANKLAND REGIONAL ENGINEER

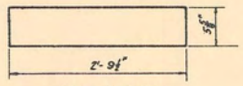
STANDARD LOOKOUT TOWER
40-FOOT TYPE CT-3
SHOP DETAILS

DESIGNED R.W.S. DRAWN R.W.S. TRACED H.R.S.
SCALE 1"=1'-0" EXCEPT AS NOTED CHECKED A.W.S.
APPROVED ASSISTANT REGIONAL FORESTER DATE FEB. 1938

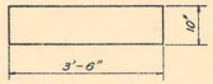
SHEET 5 OF 7 SHEETS L-11204B



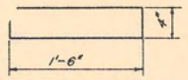
Cab Girder System
2"x10" S4S



Floor Plank FP8
2"x6"x 2'-9½" S4S
Make 1

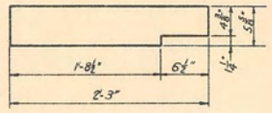


Fill Block FB
4"x10"x 3'-6" Rgh
Make 2

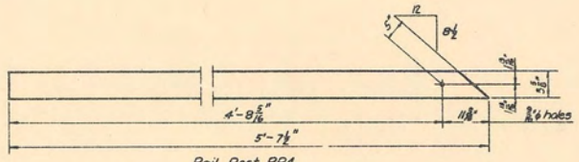


Platform Tie PT
2"x4"x 1'-6" Rgh
Make 3

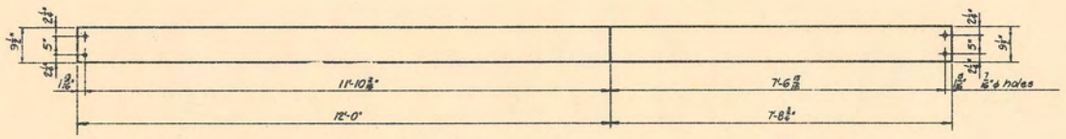
Mark	No. Req'd	Length "L"
N1	6	12'-0"
N2	9	7'-8 3/32"
N3	6	6'-0"
N4	2	5'-2"
N5	4	4'-0"
N8	2	5'-8 3/32"
N9	3	2'-9½"



Floor Plank FP6
2"x6"x 2'-3" S4S
Make 2



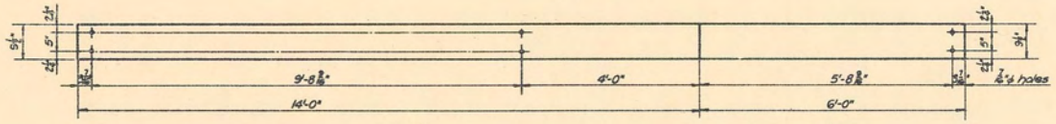
Rail Post RP4
2"x4"x 5'-7½" S4S
Make 2



N6
2"x10"x 12'-0" S4S
Make 2

N7
2"x10"x 7'-8 3/32" S4S
Make 2

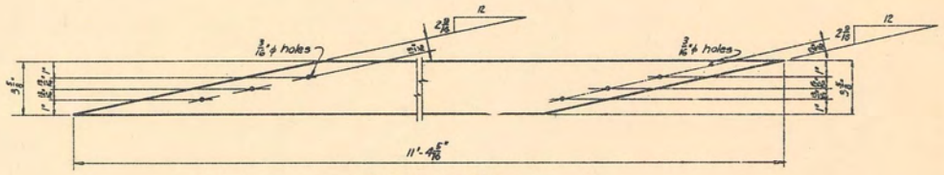
Scale ¾"=1'-0"



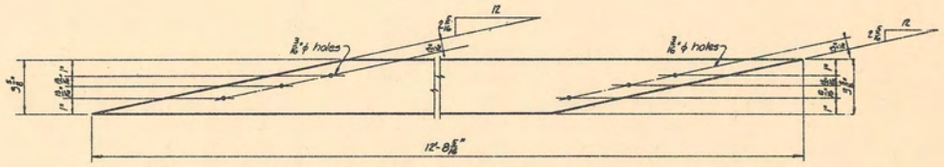
N11
2"x10"x 14'-0" S4S
Make 2

N10
2"x10"x 6'-0" S4S
Make 2

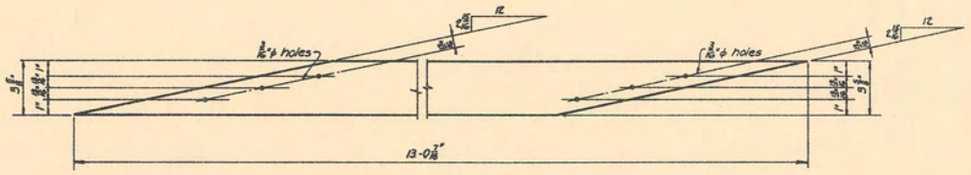
Scale ¾"=1'-0"



Stair Bracing SB1
2"x4"x 11'-4 5/16" S4S
Make 1
Scale 3"=1'-0"



Stair Bracing SB2
2"x4"x 12'-8 5/16" S4S
Make 2
Scale 3"=1'-0"



Stair Bracing SB3
2"x4"x 13'-0 7/16" S4S
Make 1
Scale 3"=1'-0"

Revised 10-3-39 by A.S., W.G.

U. S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE

REGION SIX — J. FRANKLAND REGIONAL ENGINEER

STANDARD LOOKOUT TOWER
40-FOOT TYPE CT-3
SHOP DETAILS

DESIGNED R.W.S. DRAWN R.W.S. TRACED H.R.S.
SCALE 1" = 1'-0" OR AS NOTED CHECKED
APPROVED ASSISTANT REGIONAL FORESTER DATE FEBR. 1939

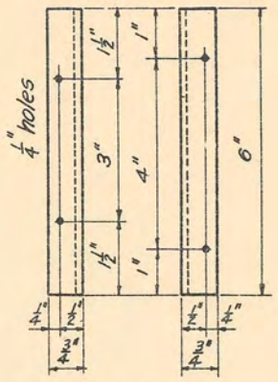
SHEET 6 OF 7 SHEETS L-11204C

TREATED TIMBERS

NO	MARK	SIZE	LENGTH	DESCRIPTION	F.B.M.
4	P1	2"x10"	16'-0"	Rgh. Post Members	107
4	P2	2"x10"	20'-0"	" " "	133
4	P3	2"x10"	4'-0"	" " "	27
4	P4	2"x8"	13'-0"	" " "	75
4	P5	2"x8"	20'-0"	" " "	107
4	P6	2"x8"	7'-0"	" " "	37
4	P7	2"x8"	14'-6"	" " "	85
4	P8	2"x8"	20'-0"	" " "	107
4	P9	2"x8"	5'-6"	" " "	32
4	P10	2"x6"	8'-0"	" " "	32
4	P11	2"x6"	20'-0"	" " "	80
4	P12	2"x6"	11'-2"	" " "	48
4	DA1	2"x10"	17'-2 5/16"	" Diagonals	120
8	DA2	2"x10"	17'-2 5/16"	" "	240
4	DA3	2"x10"	17'-2 5/16"	" "	120
3	DB1	2"x10"	17'-2 5/16"	" "	90
1	DB2	2"x10"	15'-2 11/16"	" "	27
8	DB3	2"x10"	17'-2 5/16"	" "	240
3	DB4	2"x10"	17'-2 5/16"	" "	90
1	DB5	2"x10"	16'-2 11/16"	" "	30
2	H1	2"x10"	13'-0"	" Horizontals	47
14	H2	2"x10"	13'-4"	" "	327
2	H3	2"x10"	13'-4"	" "	47
6	G1	2"x10"	20'-0"	S4S Tower Girder	200
2	FB	4"x10"	3'-6"	Rgh Fill Blocks	23
4	ST1/R	6"x8"	3'-0"	S4S Tower Stubs	48
2	S1 1/2	2"x10"	12'-1 3/8"	" Stair Stringers	47
4	S2 1/2	2"x10"	13'-6 13/16"	" " "	93
2	S3 1/2	2"x10"	13'-10 5/8"	" " "	47
4	LS1	2"x10"	15'-0"	" Landing Stringers	107
8	LS2	2"x10"	14'-0"	" " "	187
4	LS3	2"x10"	17'-0"	" " "	120
19	RP1	2"x4"	3'-9 1/2"	" Rail Posts	51
2	RP2	2"x4"	2'-6 11/16"	" " "	4
4	RP3	2"x4"	2'-4 1/16"	" " "	8
2	RP4	2"x4"	5'-7 1/2"	" " "	8
34	ST2	2"x10"	1'-11"	" Stair Treads	114
13	ST1	2"x10"	2'-7 1/4"	" " "	65
15	FP1	2"x6"	2'-0"	" Floor Plank	30
1	FP2	2"x6"	2'-3"	" " "	3
14	FP3	2"x6"	2'-3"	" " "	32
1	FP4	2"x6"	2'-0"	" " "	2
3	FP5	2"x4"	2'-0"	" " "	4
2	FP6	2"x6"	2'-3"	" " "	5
3	FP7	2"x6"	2'-1 1/4"	" " "	7
1	FP8	2"x6"	2'-9 1/2"	" " "	3
6	N1	2"x10"	12'-0"	" Cab Girder System	120
9	N2	2"x10"	7'-8 3/4"	" " " "	120

TREATED TIMBERS

NO.	MARK	SIZE	LENGTH	DESCRIPTION	F.B.M.
6	N3	2"x10"	6'-0"	S4S Cab Girder System	60
2	N4	2"x10"	3'-2"	" " " "	12
4	N5	2"x10"	4'-0"	" " " "	27
2	N6	2"x10"	12'-0"	" " " "	40
2	N7	2"x10"	7'-8 3/4"	" " " "	27
2	N8	2"x10"	5'-8 3/8"	" " " "	20
3	N9	2"x10"	2'-9 1/2"	" " " "	15
2	N10	2"x10"	6'-0"	" " " "	20
2	N11	2"x10"	14'-0"	" " "	47
1	SB1	2"x4"	11'-4 5/16"	" Stair Bracing	8
2	SB2	2"x4"	12'-8 5/16"	" " "	19
1	SB3	2"x4"	13'-0 7/16"	" " "	9
3	PT	2"x4"	1'-6"	Rgh. Platform Ties	3
				Total	4,003



Angle Detail
3/4" x 3/4" x 1/8" x 6"
Make 24

HARDWARE

NO.	SIZE	LENGTH	DESCRIPTION
2	5/8"φ	6"	Bolts
15	5/8"φ	8"	"
18	5/8"φ	13"	"
18	5/8"φ	15"	"
3	1/2"φ	30"	"
6	1/2"φ	26 1/2"	"
2	1/2"φ	35"	"
1	1/2"φ	38 1/2"	"
88	5/8"φ		Malleable Washers
26	1/2"φ		" "
24	3/4"x3/4"x1/8"	6"	Angles (see detail)
100#	40d		Common Nails
35#	12d		" "
25#	10d		" "
	5/8"-6x19		Galv. Plow Stl. hemp center
wire rope (length to suit field topography)			

NOTES

Hardware list consists of approx. 10% increase over required amt.

All hardware to be galvanized.

UNTREATED TIMBER

NO.	SIZE	LENGTH	DESCRIPTION	F.B.M.
8	2"x4"	14'-0"	Hand Rails	75
7	2"x4"	12'-0"	" "	56
1	2"x4"	6'-0"	" "	4
			Total	135

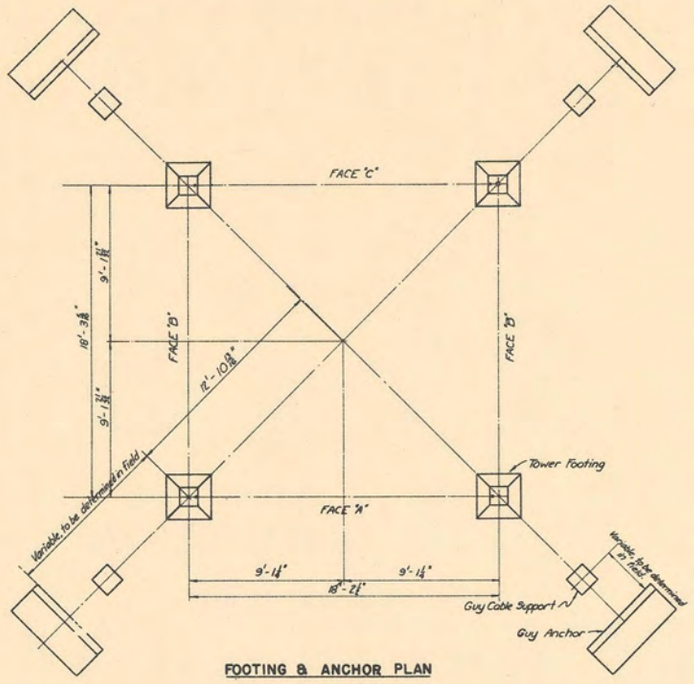
Revised 10-3-39 by A.S., W.G.

U. S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE

REGION SIX — JAMES FRANKLAND, REGIONAL ENGINEER

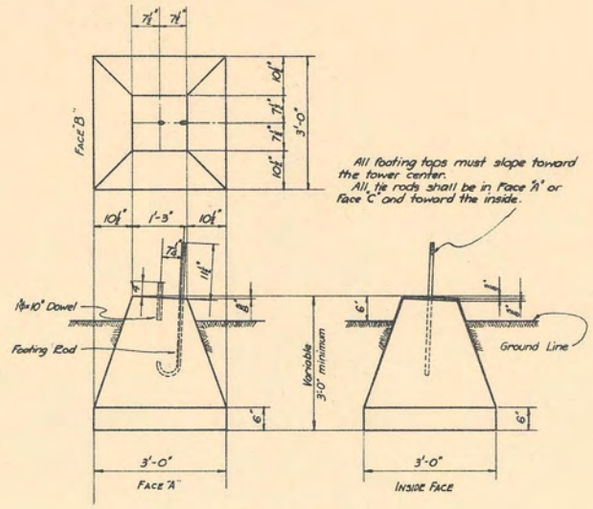
STANDARD LOOKOUT TOWER 40-FOOT, TYPE CT-3
BILL OF MATERIAL
FOR SUPERSTRUCTURE

DESIGNED R.W.S. DRAWN R.W.S. TRACED H.R.S.
SCALE NONE CHECKED W.G.
APPROVED J. Frankland DATE
ASSISTANT REGIONAL FORESTER

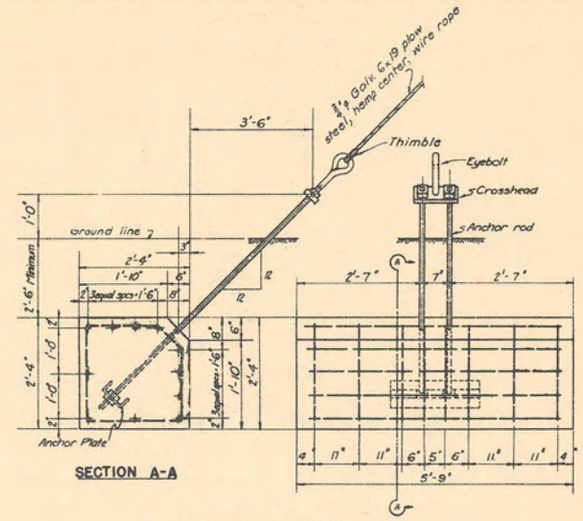


FOOTING & ANCHOR PLAN

This layout is NOT SQUARE
Cables shall slope at 45° and location of guy anchors shall be computed accordingly.

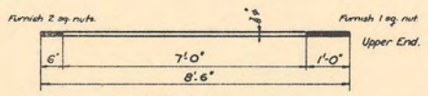


TOWER FOOTING



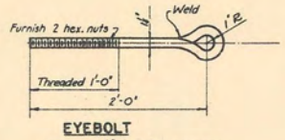
SECTION A-A

ANCHOR DETAIL



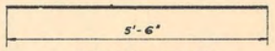
ANCHOR ROD

Make 8 - ⅞"φ x 8'-6" Galvanized Rod
Thread ends as indicated and furnish 3 sq. nuts each rod.



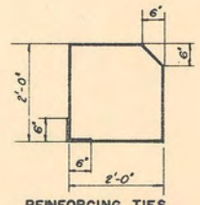
EYEBOLT

Make 4 - 1⅛"φ x 2'-0" galvanized eyebolts. Eye forged and welded. Furnish 2 hex. nuts each bolt.



REINFORCING BARS

Make 44 - ½"φ x 5'-6" deformed bars.



REINFORCING TIES

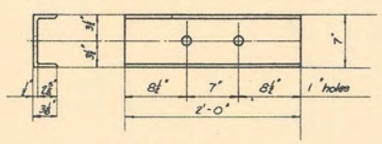
Make 32 - ⅜"φ x 8'-10" Reinforcing deformed bars.

In addition to detailed material, furnish the following items:

4 - ⅞"φ x 12" Plain dowels
4 - 1"φ x 10" Plain dowels
4 - ⅞" x 8" Machine bolts
4 - ⅞" Malleable washers.
} All galvanized

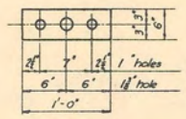
CONCRETE

Mix - 1:3:5
Volume - 8.95 cu. yds - approximate
Cement 10.0 Bbls
Sand 4.5 yds.
Gravel 7.6 yds.



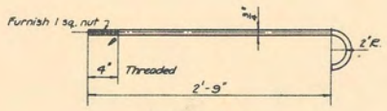
ANCHOR PLATE

7" x 3½" x ¼" Channel C42 (BSC9)
Make 4 as shown. Galvanized



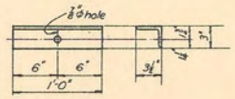
CROSSHEAD

Make 4 6" x 1½" x 1'-0" Plate
Mild steel, galvanized



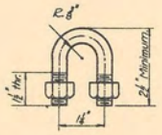
FOOTING ROD

¾"φ x 3'-4" Rod. Furnish one square nut each. Galvanized - Make four



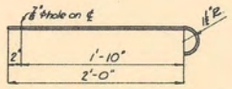
FOOTING ANGLE

3½" x 3" x ⅜" x 1'-0" galvanized angle. Make four
See tower detail - sheet 2. This clip attached to footing rod.



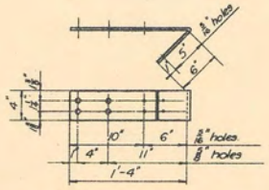
U-BOLT

½"φ galvanized bolt. Make 8.
Furnish 2 hex. nuts each bolt



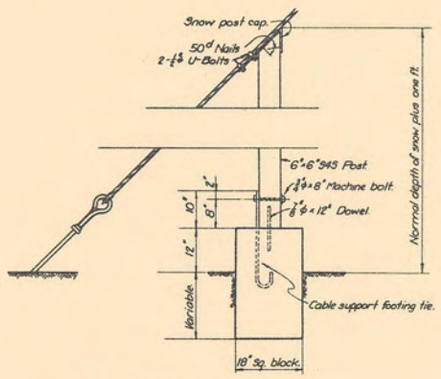
CABLE SUPPORT FOOTING TIE

⅜" x 3" x 2'-6" strap, galvanized. Make four



SNOW POST CAP

½" x 4" x 1'-10" galvanized plate. Make 4



GUY CABLE SUPPORT

Revised 12-5-39 by A.S.

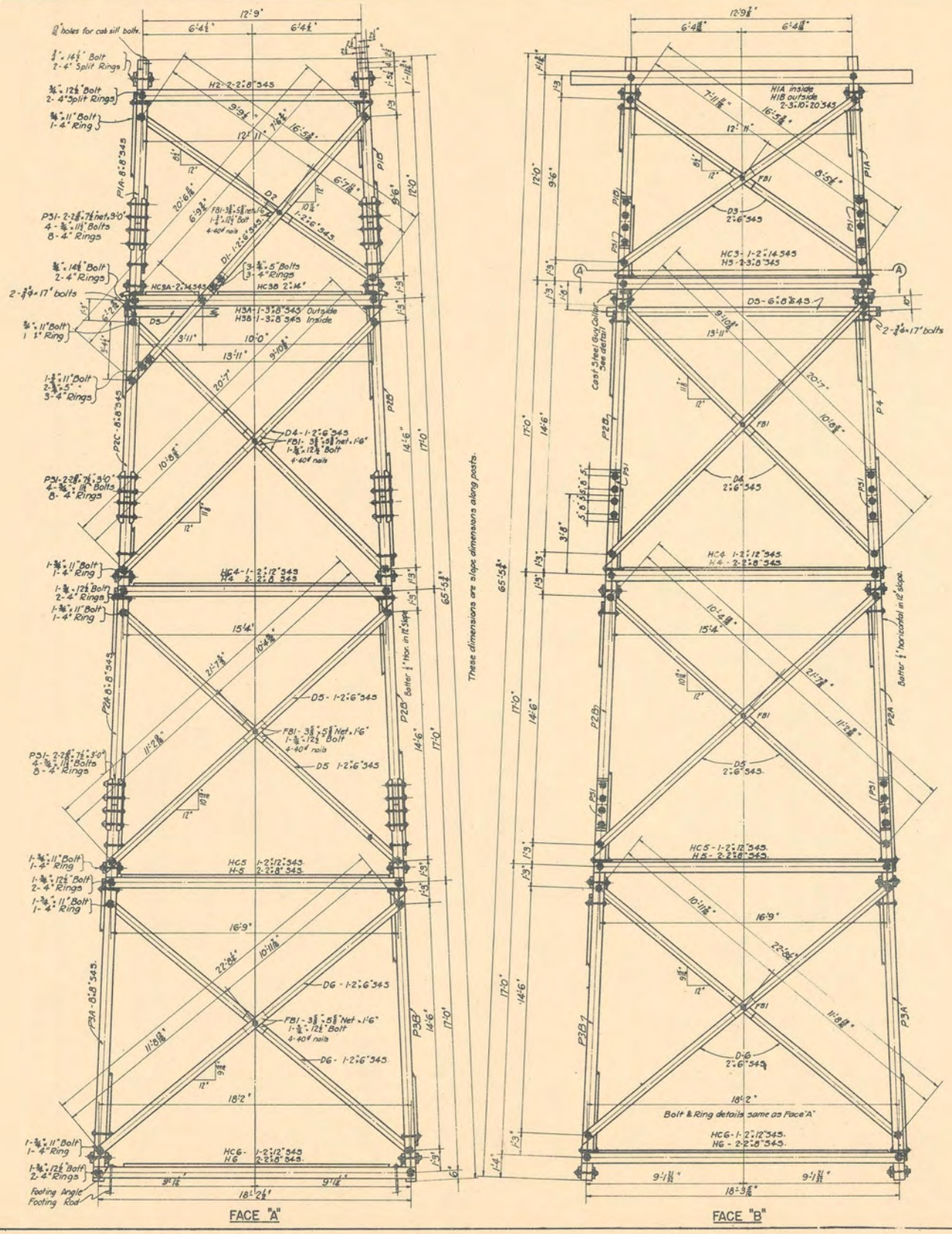
Revised 5-2-38 B.C.O.

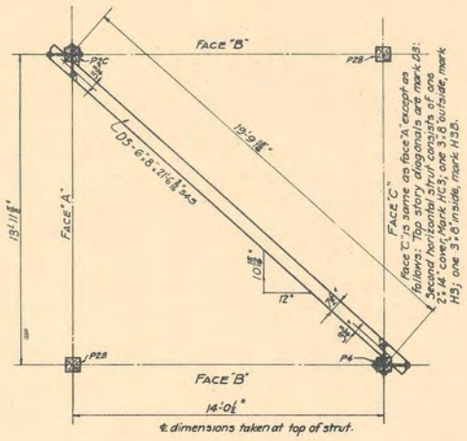
U. S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE
REGION SIX J. FRANKLAND REGIONAL ENGINEER

STANDARD LOOKOUT TOWER
65-FOOT TYPE CT-4
FOUNDATION DETAILS

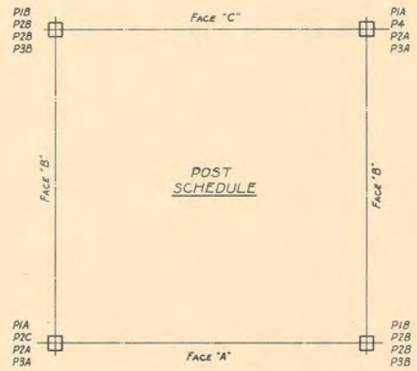
DESIGNED B.C.O. DRAWN B.C.O. TRACED B.C.O.
SCALE NONE CHECKED
APPROVED ACT. ASSISTANT REGIONAL FORESTER DATE NOV. 1937

SHEET 1 OF 7 SHEETS L-10601





SECTION A-A



Erection schedule of posts by panels from top of tower.

Revised 12-5-39 by A.S.

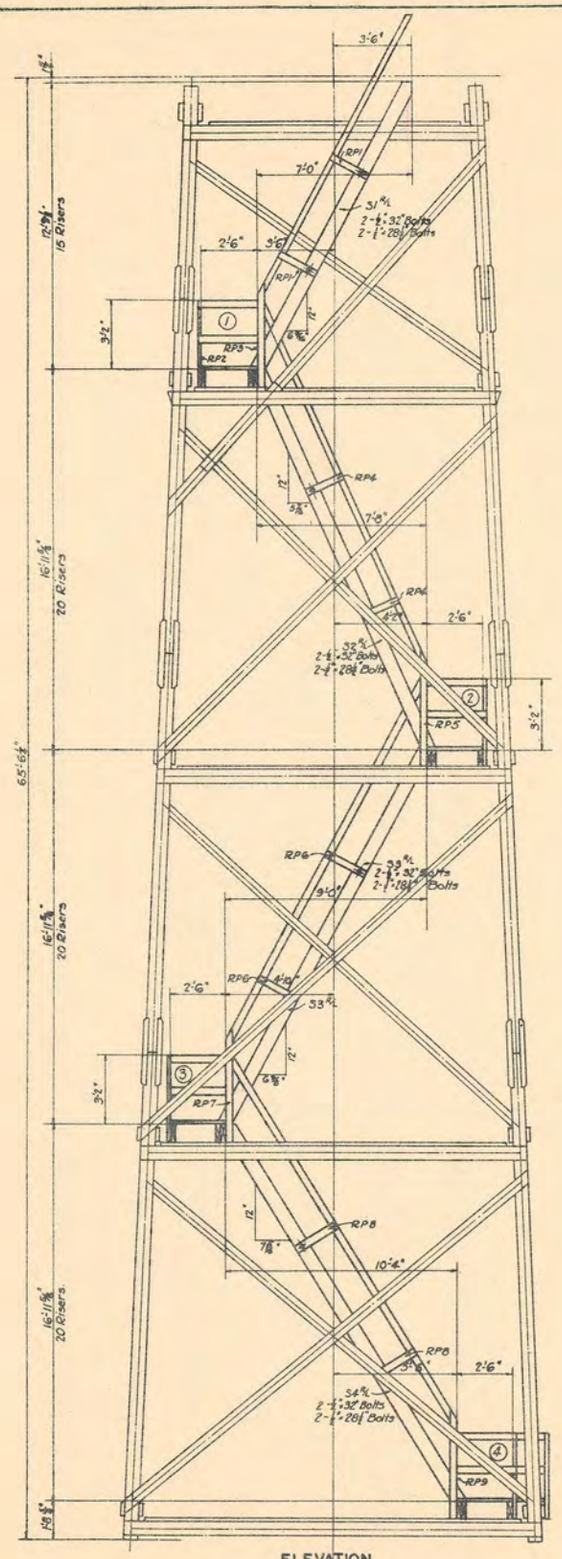
U. S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE

REGION SIX — J. FRANKLAND — REGIONAL ENGINEER

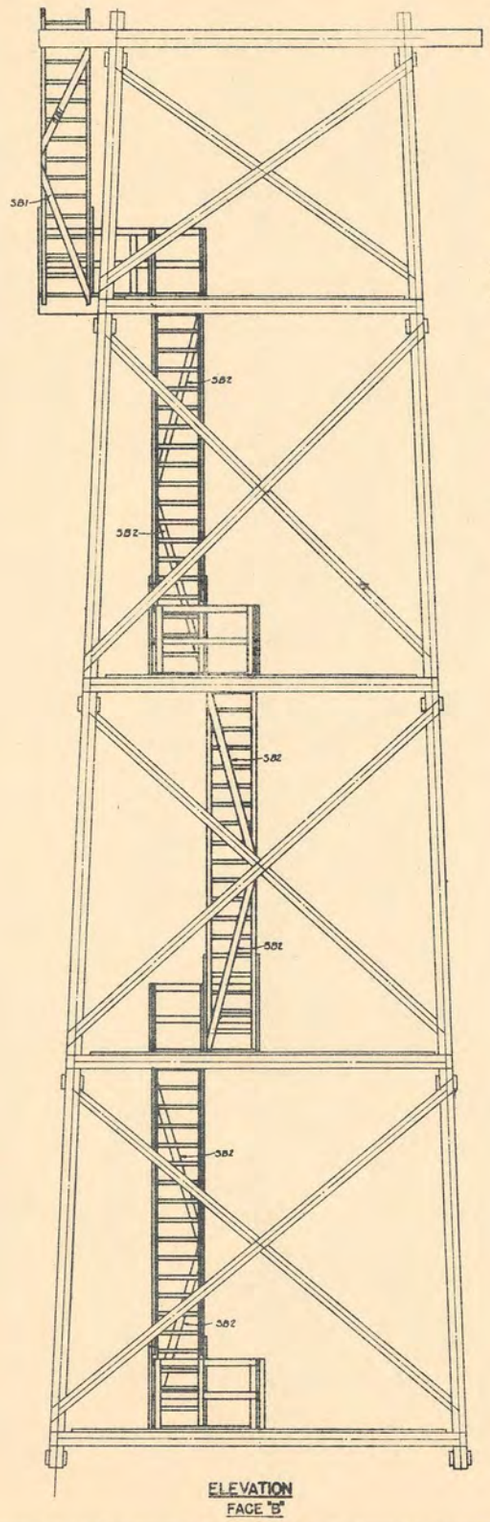
STANDARD LOOKOUT TOWER
65-FOOT TYPE CT-4
GENERAL PLAN

DESIGNED W.D.S. DRAWN W.D.S. TRACED W.D.S.
SCALE 3/8" = 1'-0" CHECKED
APPROVED ACT. ASSISTANT REGIONAL FORESTER DATE NOVEMBER 1937

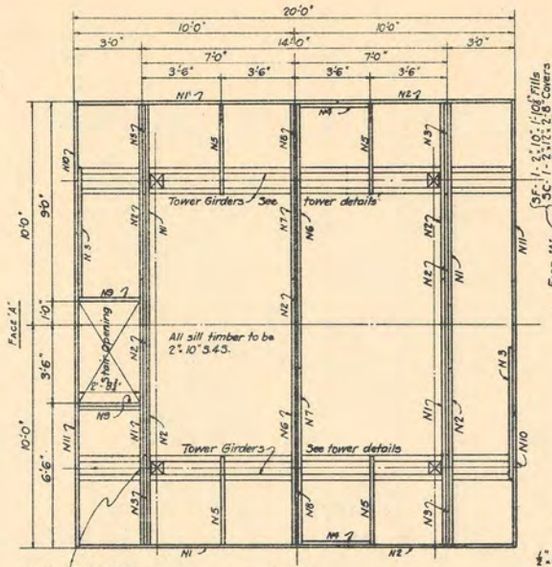
SHEET 2 OF 7 SHEETS L-10602.



ELEVATION
FACE "A"

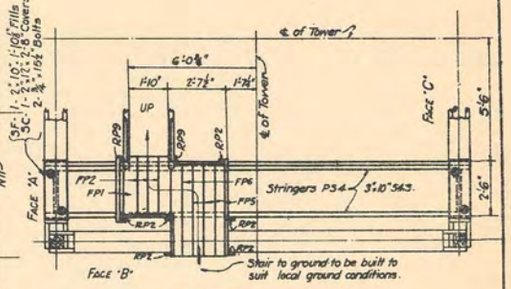


ELEVATION
FACE "B"

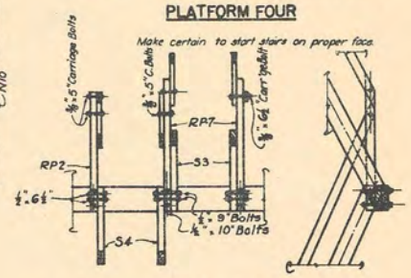


Note: Drill in field to match tower stump and fasten with ½"ϕ bolts

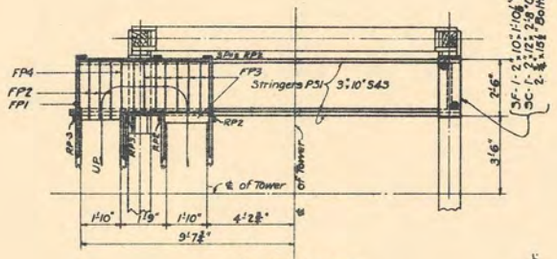
HOUSE & CATWALK SILLS



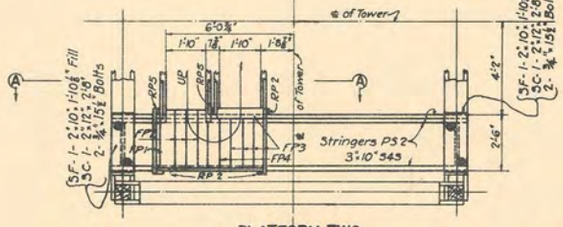
PLATFORM FOUR



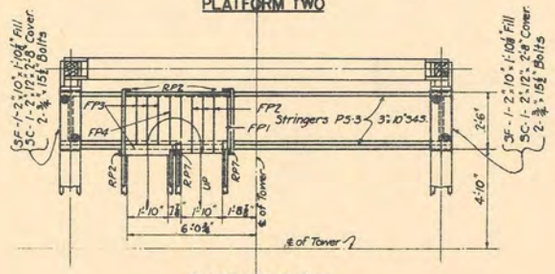
SECTION AA
Bore holes in field



PLATFORM ONE



PLATFORM TWO

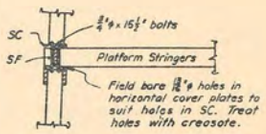


PLATFORM THREE

MATERIAL SIZES

House & Catwalk Sills	2"x10" S4S	Treated
Stair Stringers	3"x8" "	"
Stair Treads	2"x8" "	"
Platform Stringers	3"x10" "	"
Platform Floor Plank	2"x6" "	"
Rail Posts	3"x4½", 4" "	"
Stair Stringer Sways	2"x4" "	"
Hand Rail	2"x4" "	Untreated.

Stair stringers to rest directly on joists, not on Platform plank



SECTION THROUGH
PLATFORM STRINGER
FASTENINGS

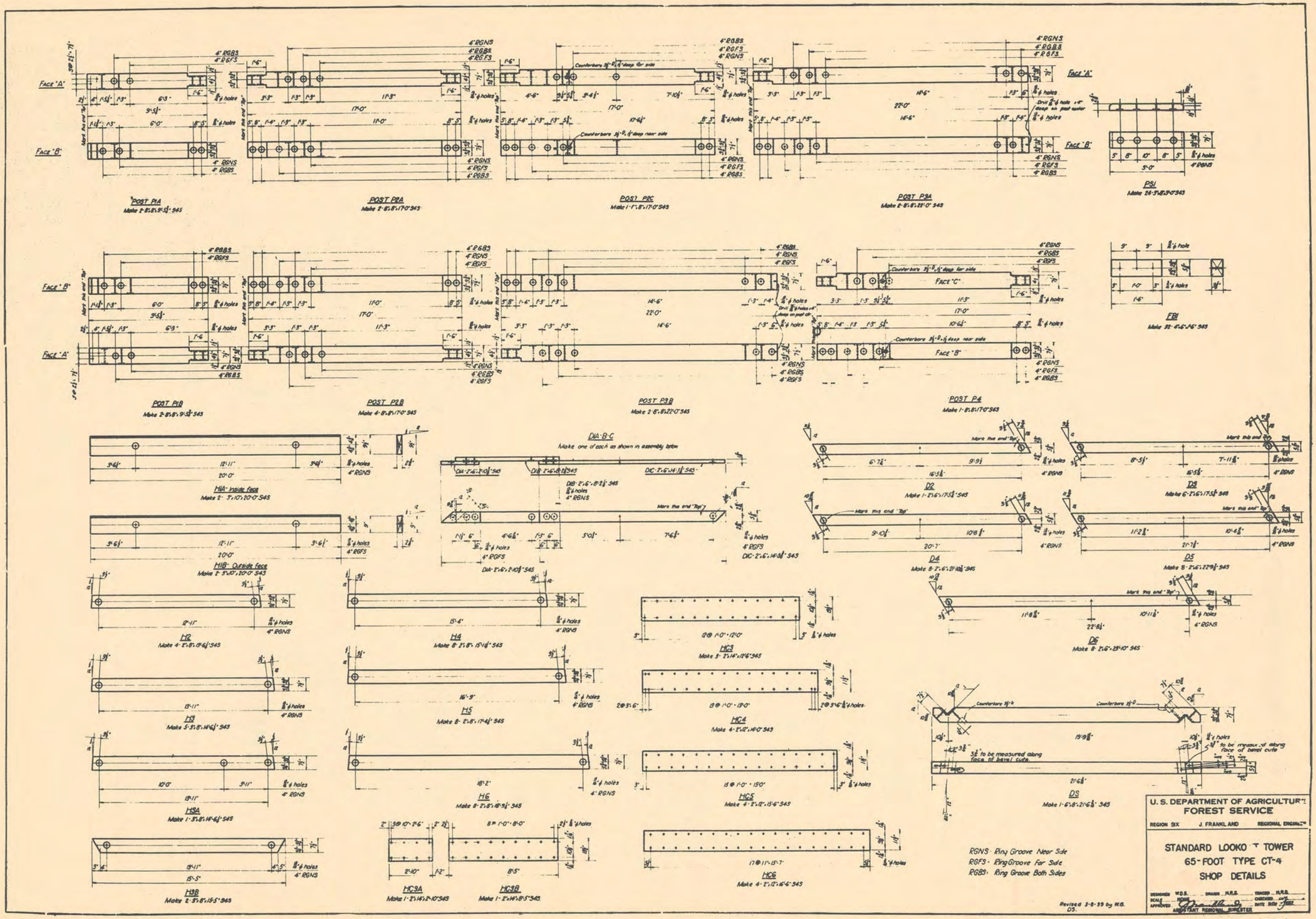
Revised 5-9-40 by W.D.S.
Revised 12-6-39 by A.S.

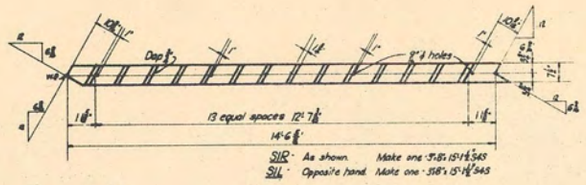
U. S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE
REGION SIX J. FRANKLAND REGIONAL ENGINEER

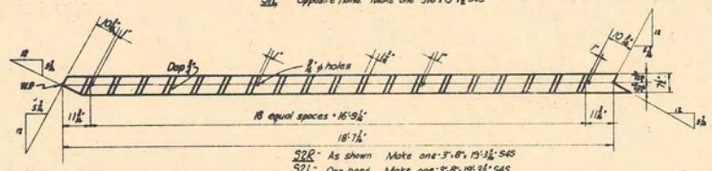
STANDARD LOOKOUT TOWER
65-FOOT TYPE CT-4
STAIR LAYOUT

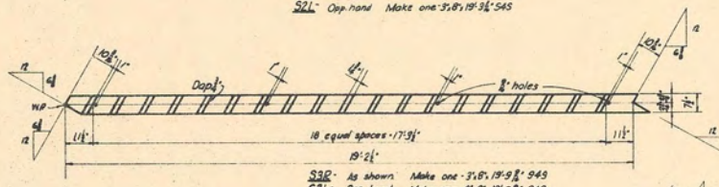
DESIGNED W.D.S. DRAWN W.D.S. TRACED W.D.S.
SCALE 3/16"=1'-0" CHECKED
APPROVED DATE NOVEMBER 1937
ACT. ASSISTANT REGIONAL FORESTER

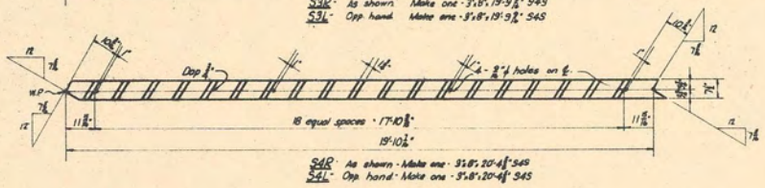
SHEET 3 OF 7 SHEETS L-10603

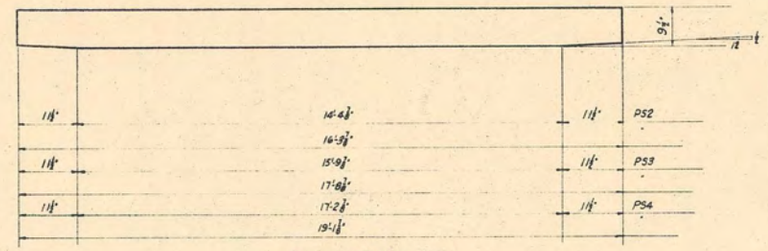

POST P1A
POST P2A
POST P2C
POST P3A
P5I
POST P1B
POST P2B
POST P3B
POST P4
P6I
H1A- Inside face
H1B- Outside face
DIA-B-C
Make one of each as shown in assembly below
D2
D3
D4
D5
D6
D8
H2
H4
H9
H5
H9A
H6
H9B
HC3
HC4
HC5
HC6
HC9A
HC9B
RGNS- Ring Groove Near Side
RGFS- Ring Groove Far Side
RGBS- Ring Groove Both Sides
U. S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE
REGION SIX
J. FRANKLAND
REGIONAL ENGINEER
STANDARD LOOKOUT TOWER
65-FOOT TYPE CT-4
SHOP DETAILS
Revised 3-8-39 by W.G.D.S.
SHEET 4 OF 7 SHEETS
L-10804A



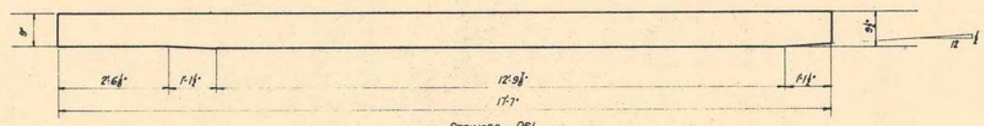




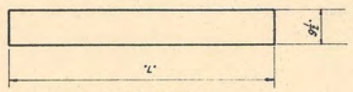




STRINGERS - PS2 to 4 inclusive.
Make three each - 3"x10" S4S

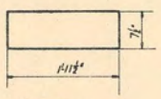


STRINGER - PS1
Make three - 3"x10"x 17'-7" S4S.

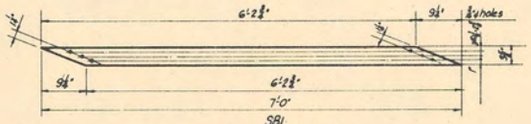


CAB GIRDER SYSTEM
2"x10" S4S

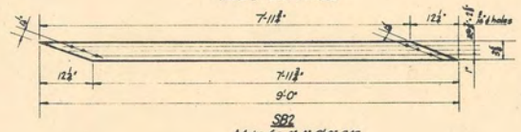
Mark	No. Req'd	Length 'L'
N1	6	12'-0"
N2	9	7'-8 1/2"
N3	6	6'-0"
N4	2	3'-2 1/2"
N5	4	4'-0"
N8	2	5'-8 1/2"
N9	3	2'-8 1/2"



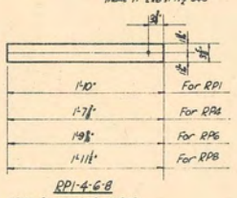
STAIR TREADS
Make 71 - 2"x8"x 1'-11 1/2" S4S



SB1
Make 2 - 2"x6"x 7'-0" S4S



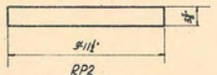
SB2
Make 6 - 2"x4"x 9'-0" S4S



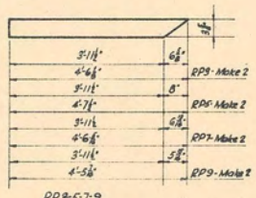
RP1-4-6-8
Make four each - 2"x4" S4S

N6
Make 2 - 2"x10"x 12'-0" S4S

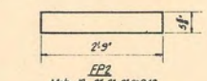
N7
Make 2 - 2"x10"x 7'-8 1/2" S4S



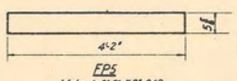
RP2
Make 17 - 3"x4"x 3'-11 1/2" S4S



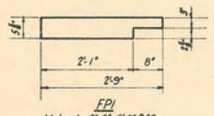
RP3-5-7-9
Make 2 each - 3"x4" S4S



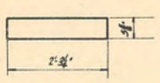
FP2
Make 12 - 2"x6"x 2'-9" S4S



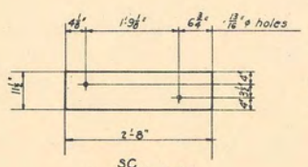
FP5
Make 4 - 2"x6"x 4'-2" S4S



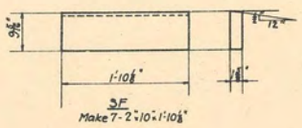
FP1
Make 4 - 2"x6"x 2'-9" S4S



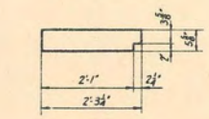
FP3
Make 18 - 2"x6"x 2'-3 1/4" S4S



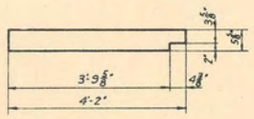
SC
Make 7 - 2"x12"x 2'-8"



SF
Make 7 - 2"x10"x 1'-10 1/8"



FP4
Make 3 - 2"x6"x 2'-3 1/4" S4S



FP6
Make 1 - 2"x6"x 4'-2" S4S

N11
Make 2 - 2"x10"x 14'-0" S4S

N10
Make 2 - 2"x10"x 6'-0" S4S

Revised 5-13-40 W.D.S.
Revised 12-6-39 by A.S.

U. S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE
REGION SIX — J. FRANKLAND, REGIONAL ENGINEER

STANDARD LOOKOUT TOWER
65-FOOT TYPE CT-4
SHOP DETAILS

DESIGNED W.D.S. DRAWN W.D.S. TRACED H.R.S.
SCALE CHECKED
APPROVED ASSISTANT REGIONAL ENGINEER DATE NOVEMBER 1937

SHEET 5 OF 7 SHEETS. L-10604B

BILL OF TREATED TIMBER

No.	Mark	Size	Length	Description	F.B.M.
2	P1A	8"x8"	11'-5¾"	Top Post	128
2	P1B	"	11'-5¾"	" "	128
2	P2A	"	19'-0"	Intermediate Post	213
4	P2B	"	19'-0"	" "	426
1	P2C	"	19'-0"	" "	107
2	P3A	"	24'-0"	Bottom Post	256
2	P3B	"	24'-0"	" "	256
1	P4	8"x8"	19'-0"	Intermediate Post.	107
24	PS1	3"x8"	3'-0"	Post Splices	144
2	H1A	3"x10"	20'-0"	Tower Girders	100
2	H1B	3"x10"	20'-0"	" "	100
4	H2	2"x8	13'-6¼"	Horizontal Struts.	75
5	H3	3"x8"	14'-6¼"	" "	160
1	H3A	"	14'-6¼"	" "	32
2	H3B	3"x8"	15'-5"	" "	64
8	H4	2"x8"	15'-11¼"	" "	171
8	H5	"	17'-4¼"	" "	192
8	H6	2"x8"	18'-9¼"	"	213
1	HC3A	2"x14"	2'-10"	Horizontal Strut Covers	7
1	HC3B	"	8'-5"	" " "	21
3	HC3	2"x14"	12'-6"	" " "	98
4	HC4	2"x12"	14'-0"	" " "	112
4	HC5	"	15'-6"	" " "	128
4	HC6	2"x12"	16'-6"	" " "	144
1	D1A	2"x6"	2'-10⅞"	Diagonals	3
1	D1B	"	8'-2⅛"	"	9
1	D1C	"	14'-3⅜"	"	16
1	D2	"	17'-5¾"	"	18
6	D3	"	17'-5¾"	"	108
8	D4	"	21'-10 7/16"	"	176
8	D5	"	22'-9⅞"	"	192
8	D6	2"x6"	23'-10"	"	192
32	FB1	4"x6"	1'-6"	Diagonal Fills	96
1	D5	6"x8"	21'-6 3/16"	" Strut	88
2	S1 R/L	3"x8"	15'-1½"	Stair Stringers	64
2	S2 R/L	"	19'-3 11/16"	" "	80
2	S3 R/L	"	19'-9 9/16"	" "	80
2	S4 R/L	3"x8"	20'-4⅝"	" "	88
71	None	2"x8	1'-11½"	Stair Treads	189
4	FP1	2"x6"	2'-9"	Platform Floor Plank	12
12	FP2	"	2'-9"	" " "	36
18	FP3	"	2'-3¼"	" " "	42
3	FP4	"	2'-3¼"	" " "	7
4	FP5	"	4'-2"	" " "	18
1	FP6	2"x6"	4'-2"	" " "	4
4	RP1	2"x4"	1'-10"	Hand Rail Posts	5
17	RP2	3"x4"	3'-11½"	" " "	68
2	RP3	3"x4"	4'-6⅞"	" " "	10
4	RP4	2"x4"	1'-7⅜"	" " "	5
2	RP5	3"x4"	4'-7½"	" " "	10
4	RP6	2"x4"	1'-9 9/16"	" " "	5
2	RP7	3"x4"	4'-6 5/16"	" " "	10
4	RP8	2"x4"	1'-11½"	" " "	5
2	RP9	3"x4"	4'-5 7/16"	" " "	10
3	PS1	3"x10"	17'-7"	Platform Stringers	135
3	PS2	"	16'-3⅞"	" "	135
3	PS3	"	17'-8⅞"	" "	135
3	PS4	3"x10"	19'-1⅞"	" "	150
6	N1	2"x10"	12'-0"	Cab Stringers	120
9	N2	"	7'-8¾"	" "	120
6	N3	"	6'-0"	" "	60
2	N4	"	3'-2¾"	" "	13
4	N5	2"x10"	4'-0"	" "	27

No.	Mark	Size	Length	Description	F.B.M.
2	N6	2"x10"	12'-0"	Cab Stringers	40
2	N7	"	7'-8¾"	" "	27
2	N8	"	5'-8⅜"	" "	20
3	N9	"	2'-8¾"	" "	15
2	N10	"	6'-0"	" "	20
2	N11	2"x10"	14'-0"	" "	47
2	SB1	2"x4"	7'-0"	Stair Sway Braces	9
6	SB2	2"x4"	9'-0"	" " "	36
7	SC	2"x12"	2'-8	" Stringer Caps	36
7	SF	2"x10"	1'-10⅛	" " Fills	23
				Total Treated Timber	6196

BILL OF UNTREATED TIMBER

No.	Mark	Size	Length	Description	F.B.M.
5		2"x4"	10'-0"	Hand Rail	33
4	"	"	12'-0"	" "	32
2		"	16'-0"	" "	21
6		2"x4"	22'-0"	" "	88
				Total Untreated Timber	174

NOTE-All material to be S4S.

As required by specifications, material for Posts is listed 2'-0" greater than shop detail length to eliminate seasoning end checks.

Revised 12-6-39 A.S.
Revised 4-25-38. B.C.O.

Revised- 5-14-40 by W.D.S.

U. S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE

REGION SIX — J. FRANKLAND — REGIONAL ENGINEER

STANDARD LOOKOUT TOWER
65-FOOT TYPE CT-4
BILL OF LUMBER

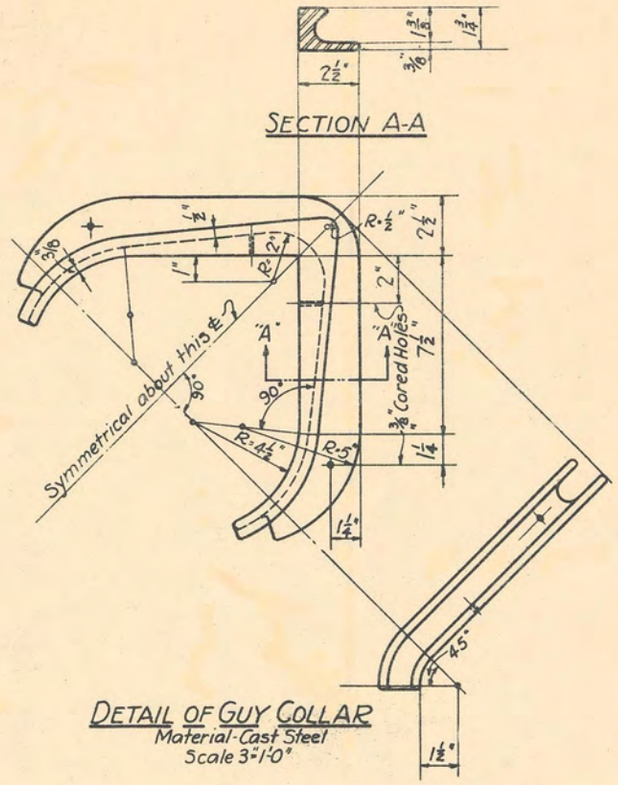
DESIGNED W.D.S. DRAWN W.D.S. TRACED W.D.S.
SCALE CHECKED
APPROVED J. Frankland DATE JAN.-1938.
ASS'T. REGIONAL FORESTER

SHEET 6 OF 7 SHEETS. L-10605

BILL OF IRON.

No.	Size	Length	Description	Location	Weight
5	3/4"	5"	Machine Bolts	Diagonal D1	5
70	"	11"	" "	Posts to Diagonals	115
52	"	11 1/2"	" "	Post Splices	94
48	"	12 1/2"	" "	Diagonal Intersections	93
14	"	14 1/2"	" "	Post to H-1 & H-3	32
9	"	15"	" "	Post to Cab Stringers	20
5	3/4"	17"	" "	Post to D.S.	12
430	3/4"		Malleable C.I. Washers.		165
9	1/2"	32"	Machine Bolts	Stair Stringers	17
9	1/2"	28 1/2"	" "	"	15
215	1/2"		Malleable C.I. Washers		30
	10d.		Common Nails		15
	40d.		" "		60
	50d.		" "		50
255	4"		"Teco" or equal Split Rings		169
	3/4"		6/19 Gal. Plough Steel Wire Rope - Length to suit topography		
24	3/4"		Wire Rope Clips		36
4	3/4"		Thimbles		3
4			Cast steel Guy Collars	See detail.	80
15	3/4"	15 1/2"	Machine Bolts		35
46	1/2"	6 1/2"	" "		21
3	"	9"	" "		2
40	"	10"	" "		26
26	3/8"	5"	Carriage Bolt		5
16	"	6"	" "		4
4	"	6 1/2"	" "		1

All above except C.S. guy collar to be galvanized



DETAIL OF GUY COLLAR
Material-Cast Steel
Scale 3"=1'-0"

NOTE
This list includes an approximate 10% overage of bolts, washers, split rings and nails.

Revised 5-15-40 WDS.
Rev. 12-6-39 A.S.
Rev. 4-28-38 B.C.O.

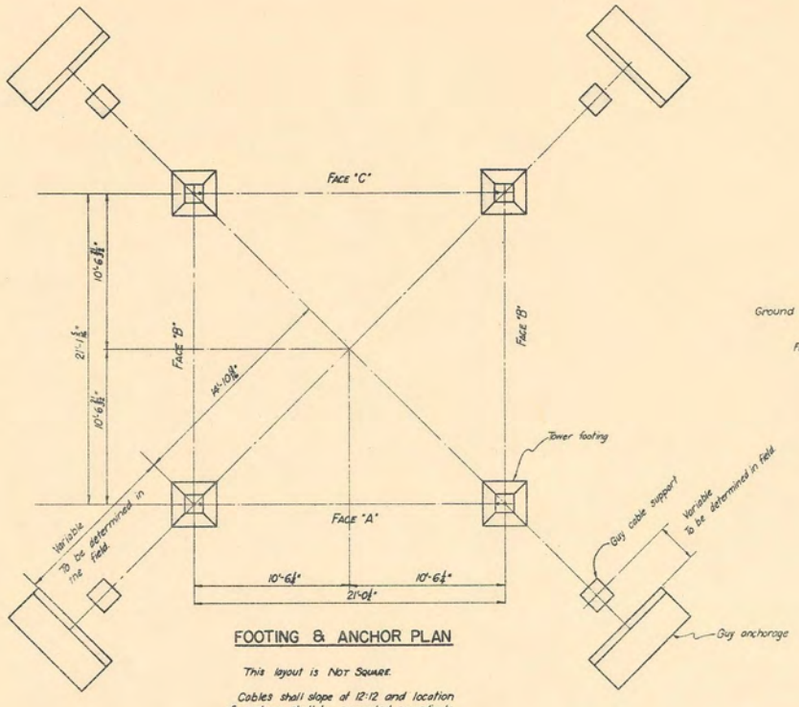
U. S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE

REGION SIX — J. FRANKLAND — REGIONAL ENGINEER

STANDARD LOOKOUT TOWER
65-FOOT TYPE CT-4
BILL OF HARDWARE

DESIGNED W.D.S. DRAWN W.D.S. TRACED W.D.S.
SCALE CHECKED
APPROVED J. Frankland DATE JAN. 1938
ASS'T. REGIONAL FORESTER

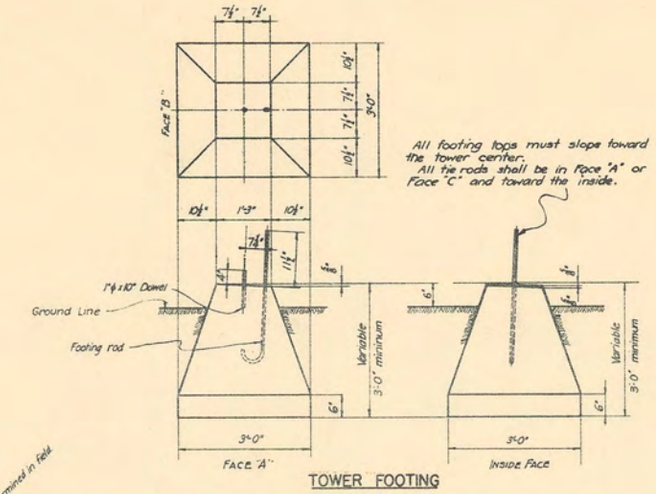
SHEET 7 OF 7 SHEETS L-10606.



FOOTING & ANCHOR PLAN

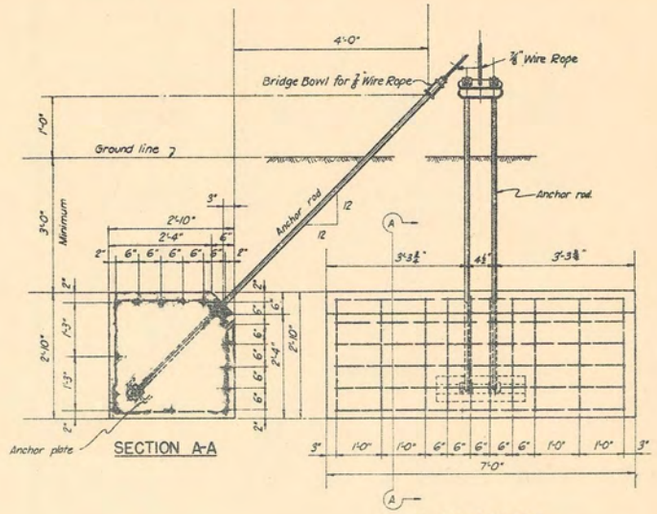
This layout is NOT SQUARE.

Cables shall slope at 12:12 and location of anchors shall be computed accordingly.

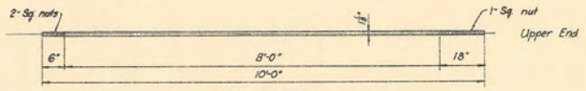


TOWER FOOTING

3'-0" x 3'-0" Concrete block of variable height. Top bevelled two ways at ½ to 12 slope.

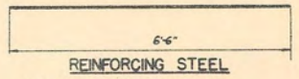


GUY ANCHOR DETAIL



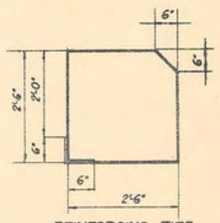
ANCHOR ROD

1⅛"φ x 10'-0" Rod. Thread ends as indicated. Furnish 3 square nuts for each rod. Galvanized - Make 8.



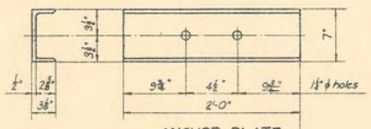
REINFORCING STEEL

52 pieces of ½"φ x 6'-6" deformed bars.



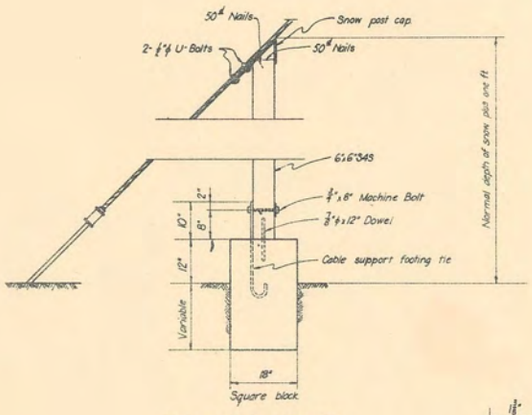
REINFORCING TIES

40 pieces of ⅝"φ x 10'-6" deformed bars.

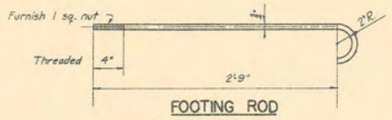


ANCHOR PLATE

7" x 3⅝" x ½" - Channel C42 (BSC9). Galvanized. Make 4.

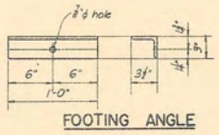


GUY CABLE SUPPORT



FOOTING ROD

¾"φ x 3'-4" Rod - Furnish 1 square nut each. Galvanized - Make 4.



FOOTING ANGLE

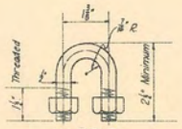
3½" x 3" x ⅜" x 1'-0" Galvanized angle. Make 4.

See tower detail - sheet 2. This clip attached to footing rod.

Furnish all material detailed and in addition furnish:

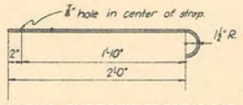
- 4 - ⅞"φ x 12" Dowels - Plain.
- 4 - 1"φ x 10" Dowels - Plain.
- 4 - ¾" x 8" Machine bolts.
- 4 - ¾" Malleable washers.

} All galvanized



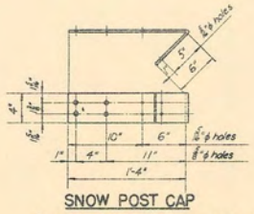
U-BOLT

½"φ Galvanized bolt, furnish 2 hex. nut each bolt. Make 8.



CABLE SUPPORT FOOTING TIE

⅜" x 3" x 2'-6" Strap. Galvanized - Make four.



SNOW POST CAP

¼" x 4" x 1'-10" Galvanized Plate - Make 4.

CONCRETE

Mix - 1:3:5
Volume - Approximately 12 c. yds.
Cement - 13.5 Bbls.
Sand - 6.2 C. Yds.
Gravel - 10.3 C. Yds.

Revised 12-4-39 by A.S.

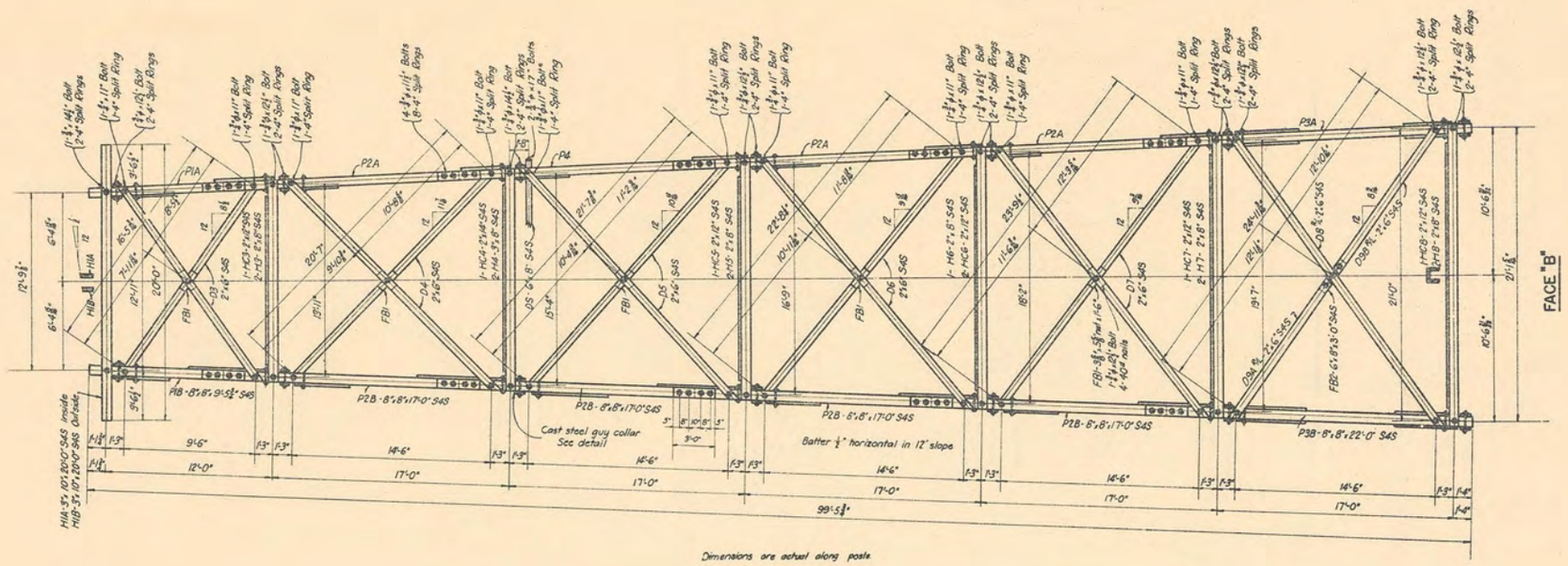
U. S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE

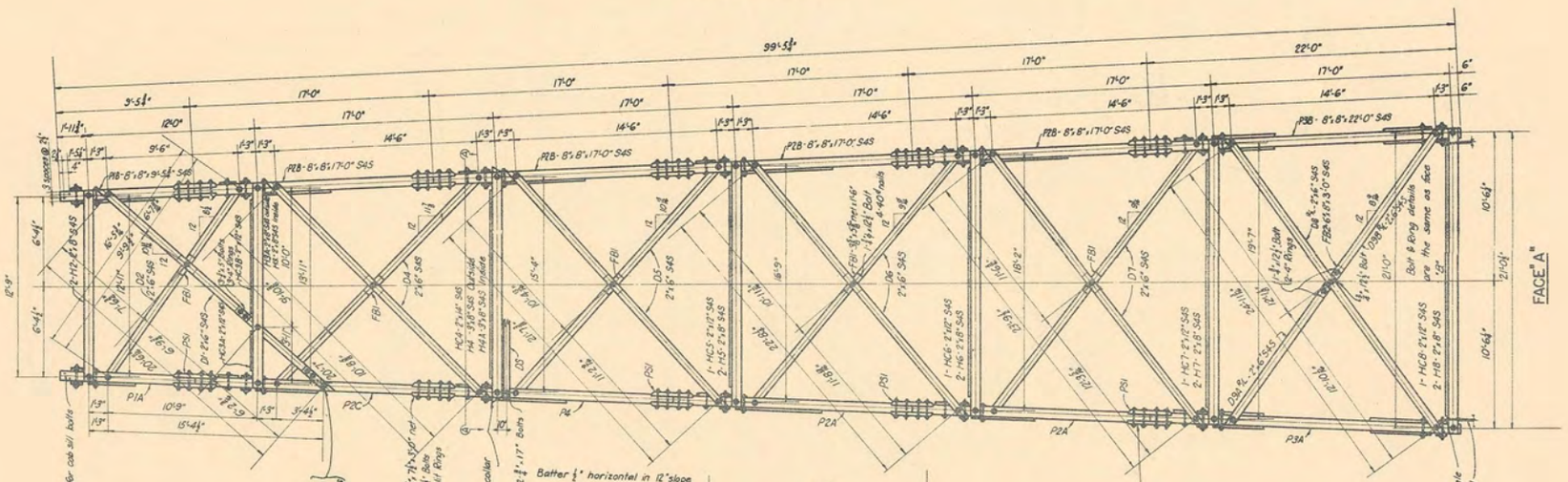
REGION SIX — J. FRANKLAND, REGIONAL ENGINEER

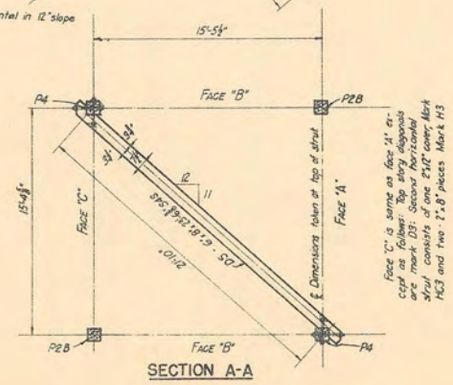
STANDARD LOOKOUT TOWER
100-FOOT TYPE CT-4
FOUNDATION DETAILS

DESIGNED B.C.O. DRAWN B.C.O. TRACED B.C.O.
SCALE NONE CHECKED
APPROVED ACT. ASSISTANT REGIONAL FORESTER DATE NOV. 1937

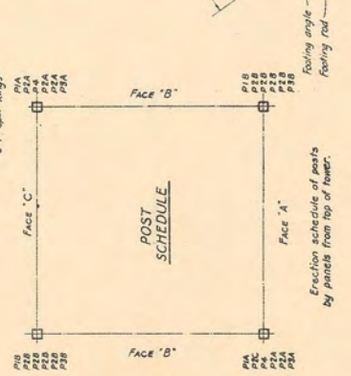
SHEET 1 OF 8 SHEETS L-10801







SECTION A-A



Revised 12-4-39 by A.S.

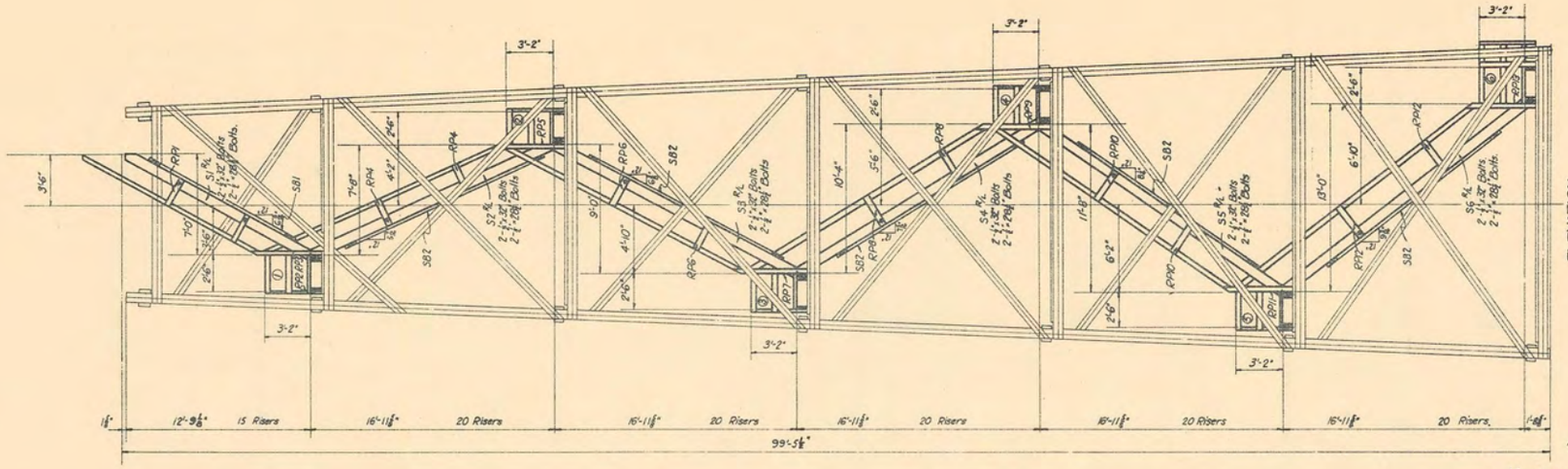
U. S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE

REGION SIX — J. FRANKLAND — REGIONAL ENGINEER

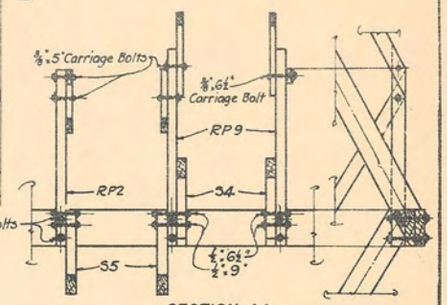
STANDARD LOOKOUT TOWER
100-FOOT TYPE CT-4
GENERAL PLAN

DESIGNED W.D.S. DRAWN B.C.D. TRACED H.R.S.
SCALE 1/16" = 1'-0" CHECKED
APPROVED DATE Mar. 1941
ACT. ASSISTANT REGIONAL FORESTER

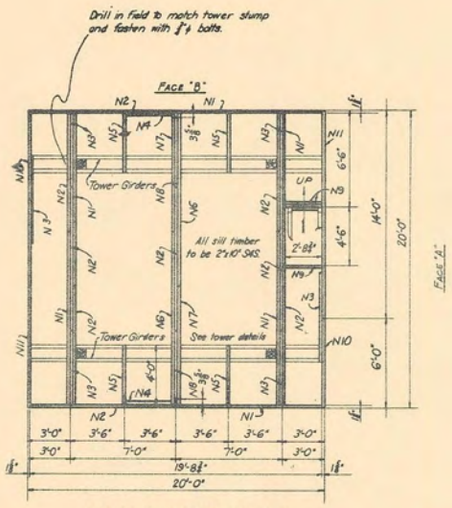
SHEET 2 OF 8 SHEETS. L-10802.



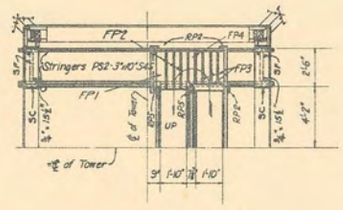
ELEVATION
Face 'A'



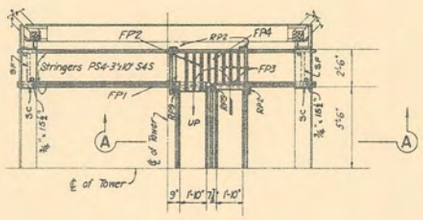
SECTION AA
Bore holes in field



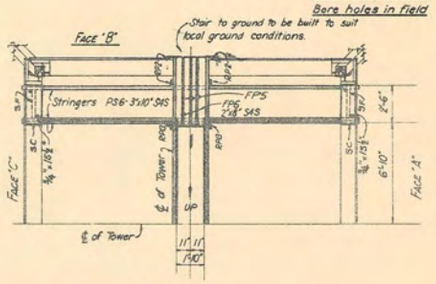
HOUSE & CATWALK SILLS



PLATFORM TWO

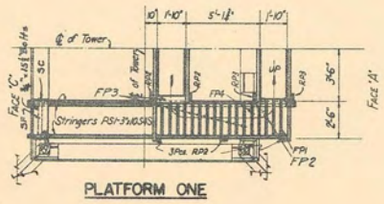


PLATFORM FOUR

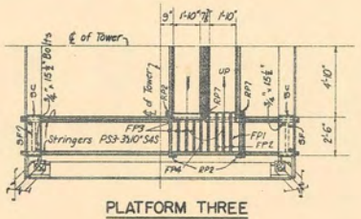


PLATFORM SIX

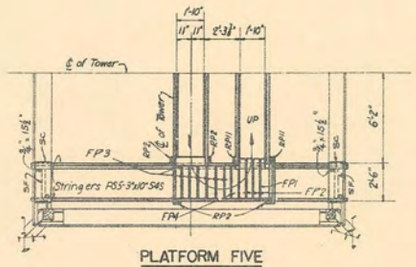
Make certain to start stairs in the proper face



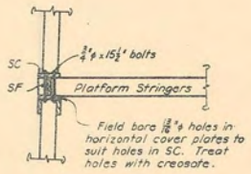
PLATFORM ONE



PLATFORM THREE



PLATFORM FIVE



SECTION THRCUGH PLATFORM STRINGER FASTENINGS

Stair stringers to rest directly on joists and not on platform plank

MATERIAL SIZES

House & Catwalk Sills	2"x10" S4S	Treated	
Stair Stringers	3"x8"	"	"
Stair Treads	2"x8"	"	"
Platform Stringers	3"x10"	"	"
Platform Floor Plank	2"x6"	"	" (Except as Noted)
Rail Posts	3"x4" & 2"x4"	"	"
Stair Stringer Sways	2"x4"	"	"
Hand Rails	2"x4"	"	Untreated

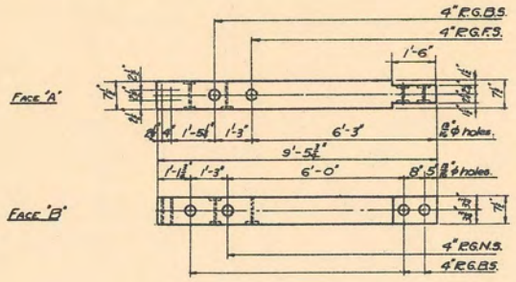
Revised - 5-13-40 by W.D.S.
Revised 11-13-39 by A.S.

U. S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE
REGION SIX JAMES FRANKLAND REGIONAL ENGINEER

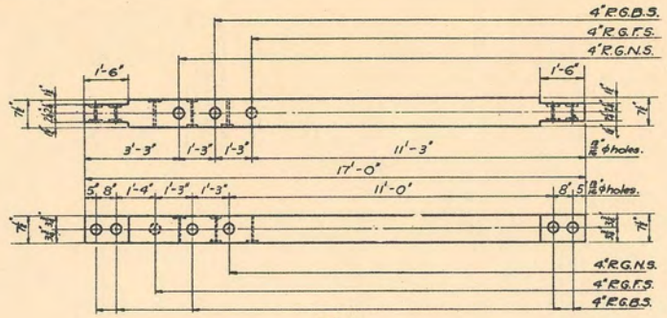
STANDARD LOOKOUT TOWER
100-FOOT TYPE CT-4
STAIR LAYOUT

DESIGNED W.D.S. DRAWN S.C.Q. TRACED H.P.S.
SCALE 1/4"=1'-0" CHECKED
APPROVED ACT. ASSISTANT REGIONAL FORESTER DATE NOVEMBER 1937

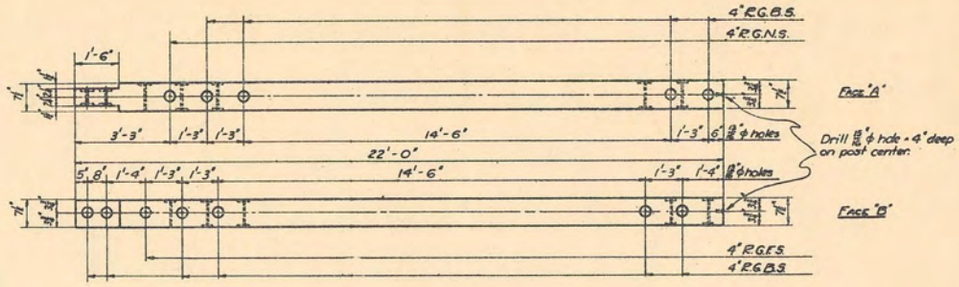
SHEET 3 OF 8 SHEETS L-10803.



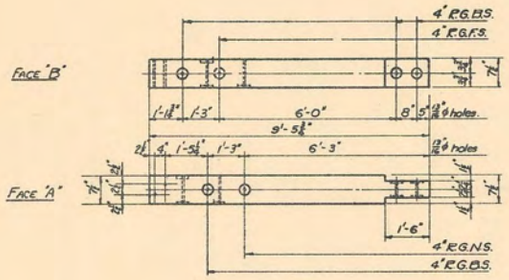
P1A
Make 2 - 8" x 8" x 9'-5¾" S4S.



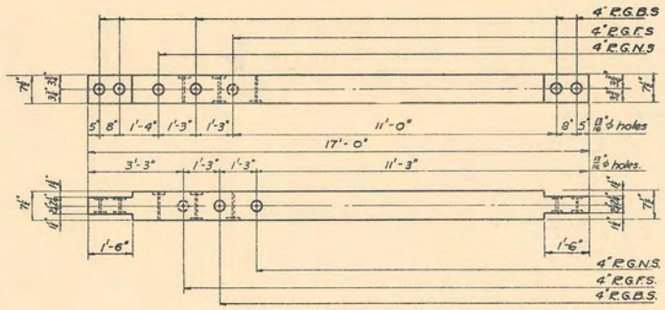
P2A
Make 5 - 8" x 8" x 17'-0"



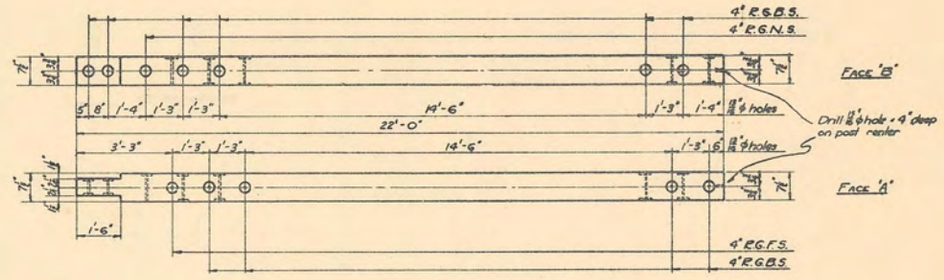
P3A
Make 2 - 8" x 8" x 22'-0"



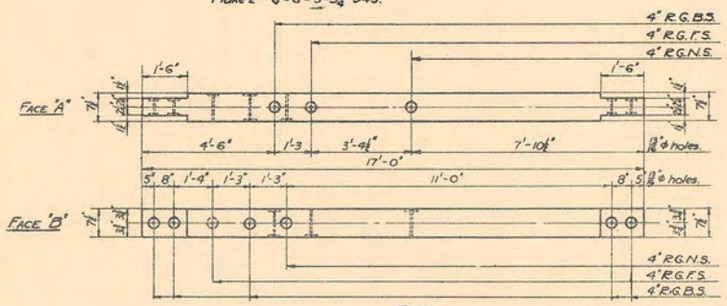
P1B
Make 2 - 8" x 8" x 9'-5¾" S4S.



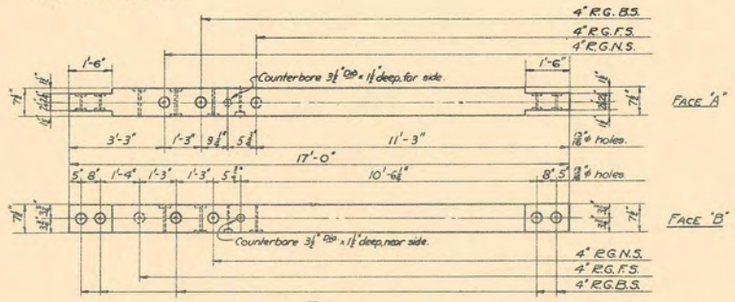
P2B
Make 8 - 8" x 8" x 17'-0" S4S.



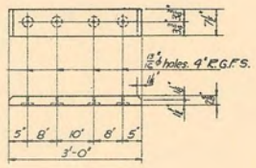
P3B
Make 2 - 8" x 8" x 22'-0" S4S.



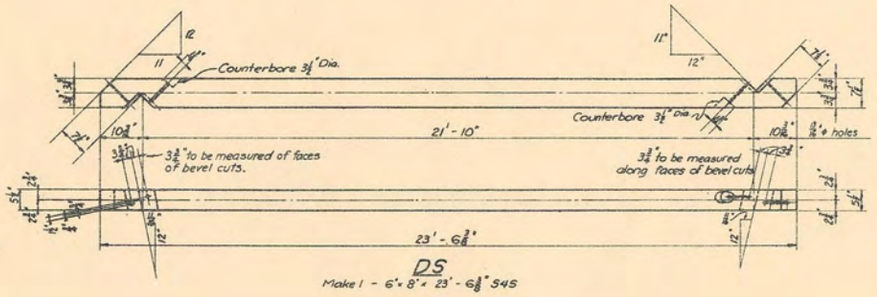
P2C
Make 1 - 8" x 8" x 17'-0" S4S.



P4
Make 2 - 8" x 8" x 17'-0" S4S



P51
Make 40 - 3" x 8" x 3'-0" S4S.



D5
Make 1 - 6" x 8" x 23'-6¾" S4S

R.G.N.S = Ring Groove Near Side.
R.G.F.S = Ring Groove Far Side.
R.G.B.S = Ring Grooves Both Sides

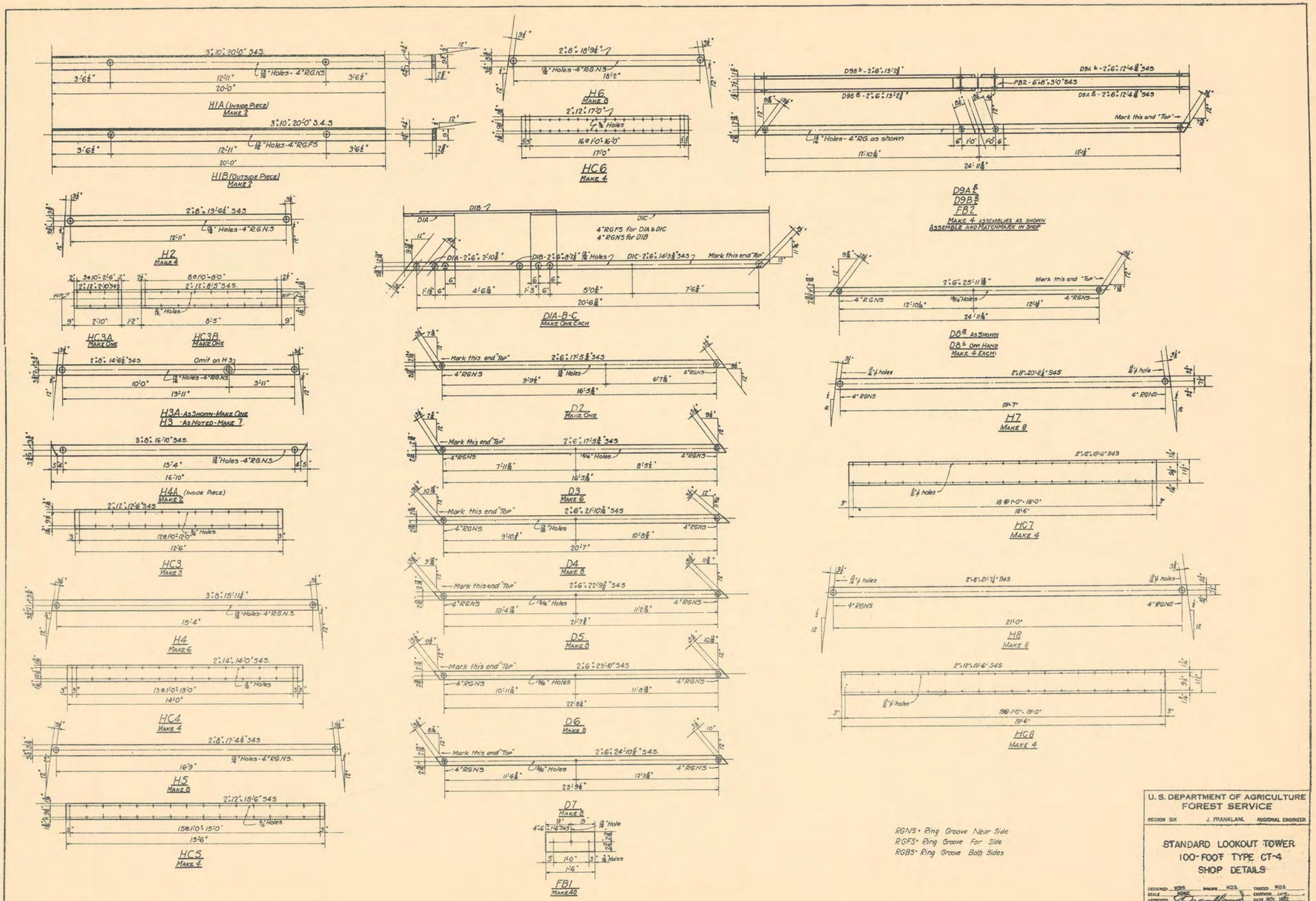
Revised 3-8-39 by W.G.
D5.

U. S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE
REGION SIX J. FRANKLAND, REGIONAL ENGINEER

STANDARD LOOKOUT TOWER
100-FOOT TYPE CT-4
SHOP DETAILS

DESIGNED W.D.R. DRAWN B.C.O. TRACED B.C.O.
SCALE NONE CHECKED
APPROVED ASSISTANT REGIONAL FORESTER DATE DEC. 6, 1937

SHEET 4 OF 8 SHEETS L-10804A



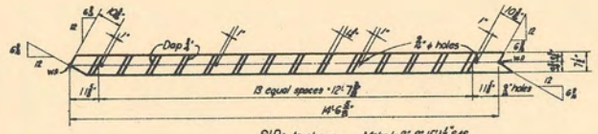
U. S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE

REGION SIX — J. FRANKLAND — REGIONAL ENGINEER

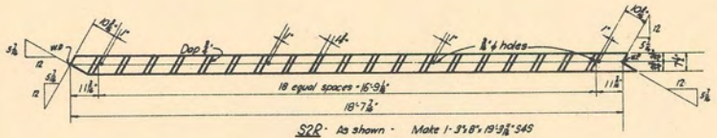
STANDARD LOOKOUT TOWER
100-FOOT TYPE CT-4
SHOP DETAILS

DESIGNED W.D.S. DRAWN W.D.S. TRACED W.D.S.
SCALE NONE CHECKED
APPROVED DATE NOV. 1942

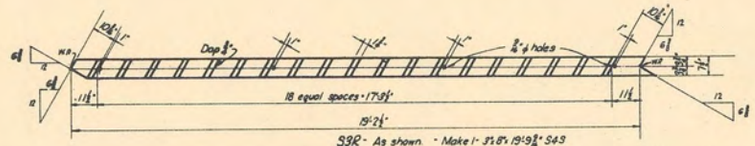
SHEET 5 OF 8 SHEETS L-10804B



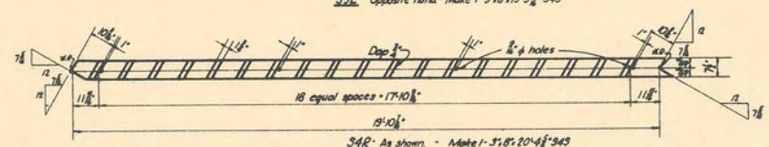
S1R - As shown - Make 1-3"x8"x15'-4 1/2" S4S
S1L - Opposite hand - Make 1-3"x8"x15'-4 1/2" S4S



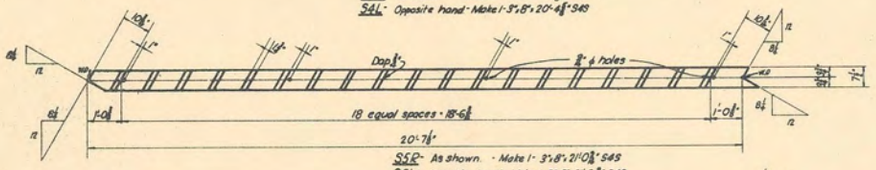
S2R - As shown - Make 1-3"x8"x19'-9 3/8" S4S
S2L - Opposite hand - Make 1-3"x8"x19'-9 3/8" S4S



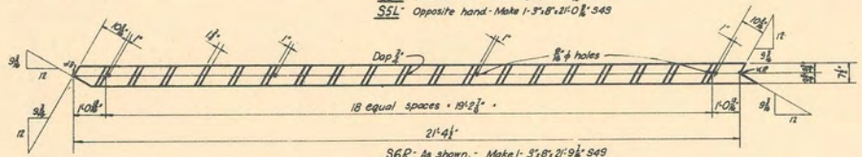
S3R - As shown. - Make 1-3"x8"x19'-9 3/8" S4S
S3L - Opposite hand - Make 1-3"x8"x19'-9 3/8" S4S



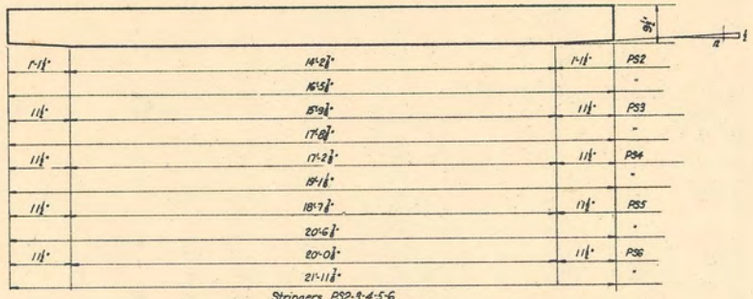
S4R - As shown. - Make 1-3"x8"x20'-4 5/8" S4S
S4L - Opposite hand - Make 1-3"x8"x20'-4 5/8" S4S



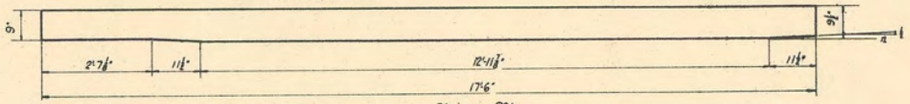
S5R - As shown. - Make 1-3"x8"x21'-0 3/8" S4S
S5L - Opposite hand - Make 1-3"x8"x21'-0 3/8" S4S



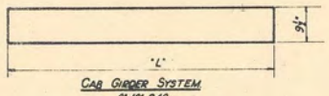
S6R - As shown. - Make 1-3"x8"x21'-9 3/8" S4S
S6L - Opposite hand. Make 1-3"x8"x21'-9 3/8" S4S



Stringers PS2-3-4-5-6
Make 3 each of 3"x10" S4S

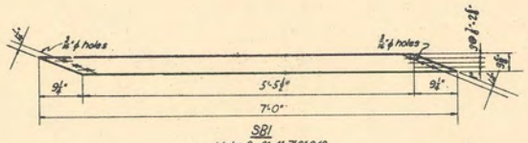


Stringer PS1
Make 3 - 3"x10"x17'-6" S4S

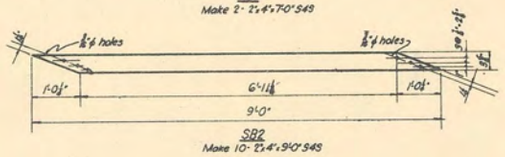


CAB GIRDER SYSTEM
2"x10" S4S

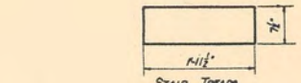
MARK	No. REQD	LENGTH "L"
N1	6	12'-0"
N2	9	7'-8 1/2"
N3	6	6'-0"
N4	2	3'-2 1/2"
N5	4	4'-0"
N8	2	5'-8 1/2"
N9	3	2'-8 1/2"



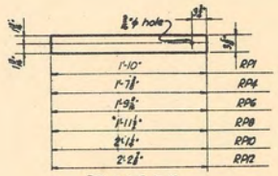
SB1
Make 2 - 2"x4"x7'-0" S4S



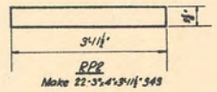
SB2
Make 10 - 2"x4"x9'-0" S4S



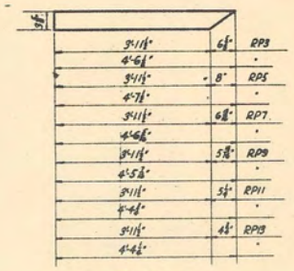
STAIR TREADS
Make 110 - 2"x8"x1'-11 1/2" S4S



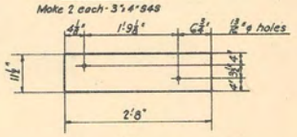
RP1-4-6-8-10-12
Make 4 each - 2"x4"x9' S4S



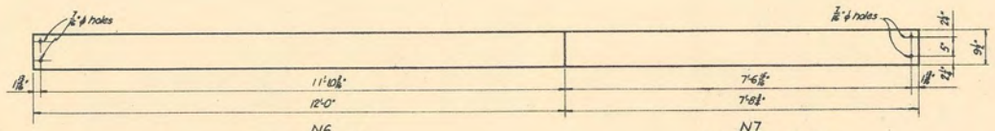
RP2
Make 22 - 3"x4"x3'-11 1/2" S4S



RP3-5-7-9-11-13
Make 2 each - 3"x4" S4S

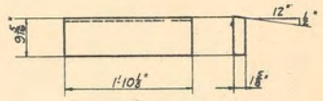


SC
Make 11 - 2"x12"x2'-8

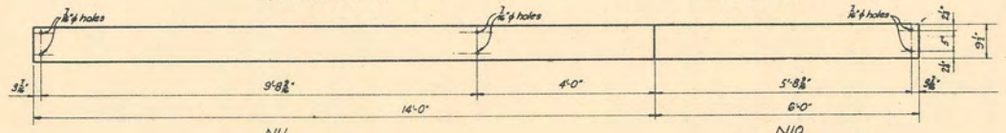


N6
Make 2 - 2"x10"x12'-0" S4S

N7
Make 2 - 2"x10"x7'-8 1/2" S4S

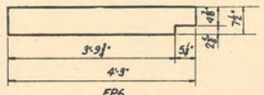


SF
Make 11 - 2"x10"x1'-10 1/8"

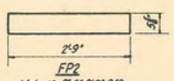


N11
Make 2 - 2"x10"x14'-0" S4S

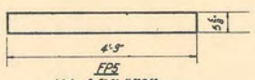
N10
Make 2 - 2"x10"x6'-0" S4S



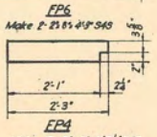
FP6
Make 2 - 2"x8"x4'-9" S4S



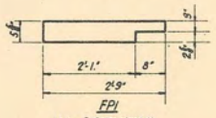
FP2
Make 15 - 2"x6"x2'-9" S4S



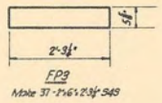
FP5
Make 2 - 2"x6"x4'-3" S4S



FP4
Make 5 - 2"x6"x2'-3 1/4" S4S



FP1
Make 5 - 2"x6"x2'-9" S4S



FP3
Make 37 - 2"x6"x2'-3 1/4" S4S

U.S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE
REGION SIX — J. FRANKLAND — REGIONAL ENGINEER

STANDARD LOOKOUT TOWER
100-FOOT TYPE CT-4
SHOP DETAILS

DESIGNED W.D.S. DRAWN W.D.S. TRACED H.P.S.
SCALE NONE CHECKED
APPROVED ASSISTANT REGIONAL FORESTER DATE NOV. 1937

SHEET 6 OF 8 SHEETS C-1080-6C

BILL OF TREATED LUMBER

No.	Mark.	Size	Length	Description	F.B.M.
2	P1A	8"x8"	11'-5¾"	Top Posts	128
2	P1B	"	11'-5¾"	" "	128
5	P2A	"	19'-0"	Intermediate Posts	533
8	P2B	"	19'-0"	" "	854
1	P2C	"	19'-0"	" "	107
2	P3A	"	24'-0"	Bottom Posts	256
2	P3B	"	24'-0"	" "	256
2	P4	8"x8"	19'-0"	Intermediate Post	213
40	PS1	3"x8"	3'-0"	Post Splices	240
1	DS	6"x8"	23'-6⅜"	Diagonal Strut.	96
2	H1A	3"x10"	20'-0"	Tower Girder	100
2	H1B	3"x10"	20'-0"	" "	100
4	H2	2"x8"	13'-6¼"	Top Horizontal	75
7	H3	"	14'-6¼"	Intermediate Horizontal.	149
1	H3A	2"x8"	14'-6¼"	" "	21
6	H4	3"x8"	15'-11¼"	" "	192
2	H4A	3"x8"	16'-10"	" "	72
8	H5	2"x8"	17'-4¼"	" "	192
8	H6	"	18'-9¼"	" "	213
8	H7	"	20'-2¼"	" "	235
8	H8	2"x8"	21'-7¼"	Bottom Horizontal.	235
3	HC3	2"x12"	12'-6"	Horizontal Strut Covers	84
1	HC3A	"	2'-10"	" " "	6
1	HC3B	2"x12"	8'-5"	" " "	18
4	HC4	2"x14"	14'-0"	" " "	131
4	HC5	2"x12"	15'-6"	" " "	128
4	HC6	"	17'-0"	" " "	144
4	HC7	"	18'-6"	" " "	160
4	HC8	2"x12"	19'-6"	" " "	160
1	D1A	2"x6"	2'-10⅜"	Diagonals	3
1	D1B	"	8'-2⅛"	"	9
1	D1C	"	14'-3⅜"	"	16
1	D2	"	17'-5¾"	"	18
6	D3	"	17'-5¾"	"	108
8	D4	"	21'-10 7/16"	"	176
8	D5	"	22'-9⅞"	"	192
8	D6	"	23'-10"	"	192
8	D7	"	24'-10⅝"	"	208
8	D8 R/L	"	25'-11 13/16"	"	208
8	D9A R/L	"	12'-4 13/16"	"	112
8	D9B R/L	2"x6"	13'-2⅜"	"	112
40	FB1	4"x6"	1'-6"	Fills	120
4	FB2	6"x8"	3'-0"	Fills	48
2	S1 R/L	3"x8"	15'-1½"	Stair Stringers	64
2	S2 R/L	"	19'-3 11/16"	" "	80
2	S3 R/L	"	19'-9 9/16"	" "	80
2	S4 R/L	"	20'-4⅝"	" "	88
2	S5 R/L	"	21'-0 9/16"	" "	88
2	S6 R/L	3"x8"	21'-9 7/16"	" "	88
3	PS1	3"x10"	17'-6"	Platform Stringers	135
3	PS2	"	16'-5⅞"	" "	135
3	PS3	"	17'-8⅞"	" "	135
3	PS4	"	19'-1⅛"	" "	150
3	PS5	"	20'-6⅞"	" "	165
3	PS6	3"x10"	21'-11⅞"	" "	165
2	SB1	2"x4"	7'-0"	Sway braces for Stairs	9
10	SB2	2"x4"	9'-0"	" " " "	60
5	FP1	2"x6"	2'-9"	Platform Floor Plank	15
15	FP2	"	2'-9"	" " "	45
37	FP3	"	2'-3¼"	" " "	87
5	FP4	"	2'-3¼"	" " "	12
2	FP5	2"x6"	4'-3"	" " "	10
2	FP6	2"x8"	4'-3"	" " "	12
110		2"x8	1'-11½"	Stair Treads.	293

No.	Mark	Size	Length	Description	F.B.M.
4	RP1	2"x4"	1'-10"	Hand Rail Posts	5
22	RP2	3"x4"	3'-11½"	" " "	88
2	RP3	3"x4"	4'-6⅛"	" " "	10
4	RP4	2"x4"	1'-7⅜"	" " "	5
2	RP5	3"x4"	4'-7½"	" " "	10
4	RP6	2"x4"	1'-9 9/16"	" " "	5
2	RP7	3"x4"	4'-6 5/16"	" " "	10
4	RP8	2"x4"	1'-11½"	" " "	5
2	RP9	3"x4"	4'-5 3/16"	" " "	10
4	RP10	2"x4"	2'-1¼"	" " "	8
2	RP11	3"x4"	4'-4¾"	" " "	9
4	RP12	2"x4"	2'-2⅞"	" " "	8
2	RP13	3"x4"	4'-4¼"	" " "	9
6	N1	2"x10"	12'-0"	Cab Stringers	120
9	N2	"	7'-8¾"	" "	120
6	N3	"	6'-0"	" "	60
2	N4	"	3'-2¾"	" "	13
4	N5	"	4'-0"	" "	27
2	N6	"	12'-0"	" "	40
2	N7	"	7'-8¾"	" "	27
2	N8	"	5'-8¾"	" "	20
3	N9	"	2'-8¾"	" "	15
2	N10	"	6'-0"	" "	20
2	N11	2"x10"	14'-0"	" "	47
11	SC	2"x12"	2'-8"	Stair Stringer Caps	60
11	SR	2"x10"	1'-10⅛"	" " Fills	37
				Total treated Lumber	9452

BILL OF UNTREATED LUMBER

No.	Mark	Size	Length	Description	F.B.M.
9		2"x4"	10'-0"	Hand Rail	60
6		"	12'-0"	" "	48
2		"	16'-0"	" "	21
10		2"x4"	22'-0"	" "	147
				Total Untreated Lumber	276

NOTE- All material to be S4S

As required by specifications, material for Posts is listed 2'-0" greater than shop detail length to eliminate seasoning end checks.

Revised - 5-14-40 by W.D.S.
Revised 12-5-39 A.S.
Revised 4-25-38 B.C.O.

U. S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE

REGION SIX — J. FRANKLAND — REGIONAL ENGINEER

STANDARD LOOKOUT TOWER
100-FOOT TYPE CT-4
BILL OF LUMBER

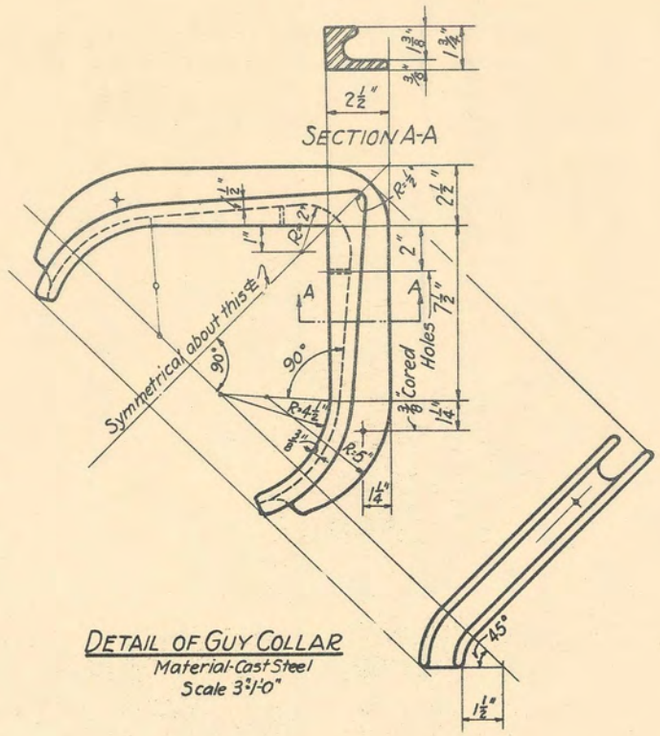
DESIGNED W.D.S. DRAWN W.D.S. TRACED W.D.S.
SCALE — CHECKED
APPROVED J. Frankland ASS'T. REGIONAL FORESTER DATE JAN. 1938

SHEET 7 OF 8 SHEETS. L-10805

BILL OF IRON

No.	Size	Length	Description	Location	Weight
5	3/4"	0'-5"	Machine Bolts	Diagonal D1	5
88	"	0'-11"	" "	Diagonals to Posts	153
88	"	0'-11 1/2"	" "	Post Splices	159
100	"	1'-0 1/2"	" "	Hor. Struts to Posts & Diagonals	185
14	"	1'-2 1/2"	" "	" " " "	30
10	"	1'-3"	" "	Posts to Cab Sills	23
5	3/4"	1'-5"	" "	Posts to DS1	12
650	3/4"		Malleable C.I. Washers		228
14	1/2"	2'-4 1/2"	Machine Bolts	Stair Stringers	24
14	1/2"	2'-8"	" "	" "	27
280	1/2"		Malleable C.I. Washers.		34
	10d.		Common Nails		20
	40d.		" "		85
	50d.		" "		75
380	4"		"Teco" or equal Split Rings		252
	7/8"		6/19 Plough Steel Wire Rope	Length to be determined in field.	
16	7/8"		Rope Clips		37
4			Bridge Bowls for 7/8" Wire Rope		80
4			Cast Steel Guy Collars	See detail.	80
24	3/4"	15 1/2"	Machine Bolts	Stairs	55
57	1/2"	6 1/2"	" "	"	26
5	"	7 1/2"	" "	"	3
7	"	9"	" "	"	5
43	"	10"	" "	"	28
41	3/8"	5"	Carriage Bolts	"	8
18	"	6"	" "	"	4
5	"	6 1/2"	" "	"	1

All above to be galvanized except C.S. guy collar.



DETAIL OF GUY COLLAR
Material-Cast Steel
Scale 3"=1'-0"

NOTE
This list includes an approximate 10% overage of bolts, washers, split rings and nails.

Revised 5-15-40 W.D.S.
Rev. 12-5-39 A.S.
Rev. 4-28-38 B.C.O.

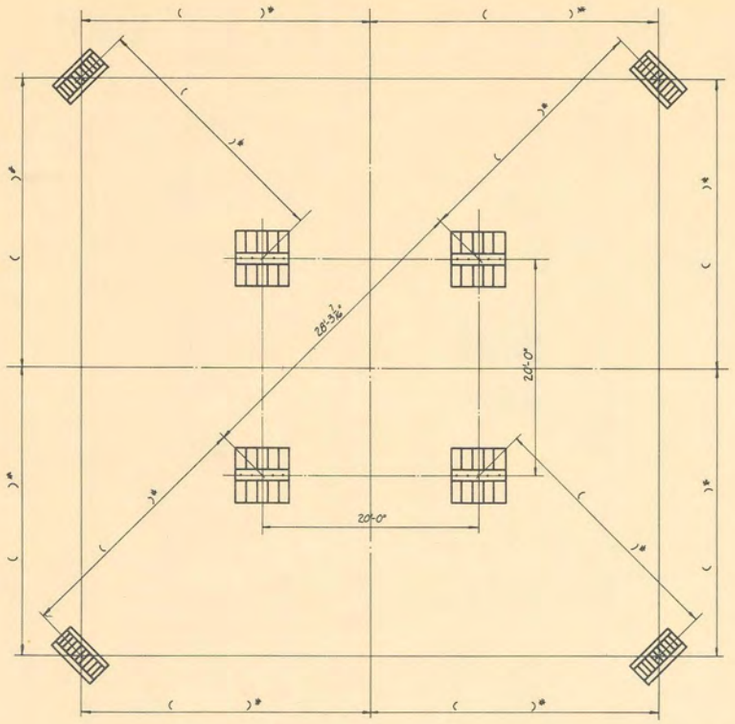
U. S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE

REGION SIX — J. FRANKLAND — REGIONAL ENGINEER

STANDARD LOOKOUT TOWER
100-FOOT TYPE CT-4
BILL OF HARDWARE

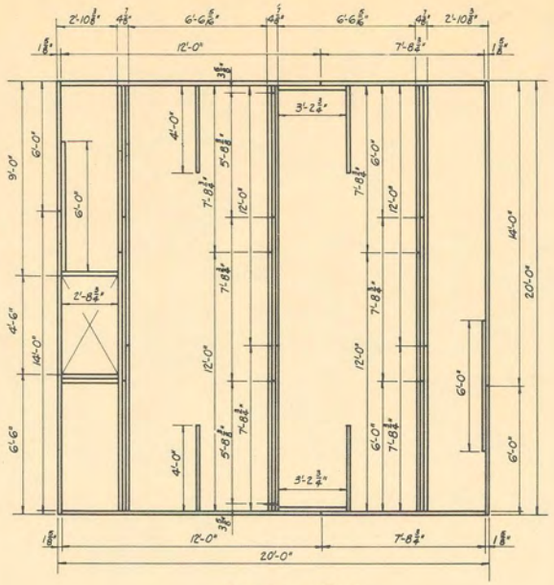
DESIGNED W.D.S. DRAWN W.D.S. TRACED W.D.S.
SCALE — CHECKED BCO
APPROVED J. Frankland ASS'T. REGIONAL FORESTER DATE JAN. 1938

SHEET 8 OF 8 SHEETS L 10806.



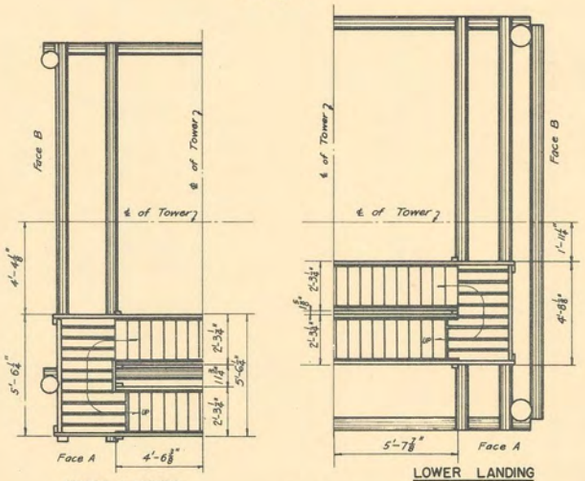
FOUNDATION PLAN

All dimensions marked ( )* must be determined from conditions in field.
No Scale



CAB SILL LAYOUT

All material is 2"x10" S4S
Scale 3/8" = 1'-0"



UPPER LANDING **LOWER LANDING**

Scale 3/8" = 1'-0"

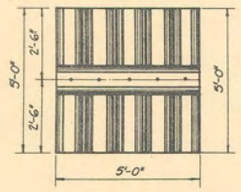
POLES

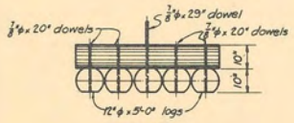
No.	Min. Dia.	Length	Description
4	5 1/2"	14'-2"	Top Horizontal, Face A
2	5 1/2"	15'-9"	3rd " "
2	5 1/2"	18'-0"	2nd " "
2	5 1/2"	20'-7"	Bottom " "
1	5 1/2"	19'-7"	3rd Panel Diagonal, Face A
3	5 1/2"	17'-3"	3rd " " "
4	5 1/2"	20'-11"	2nd " " "
4	5 1/2"	23'-11"	Bottom " " "
4	8"	41'-3 3/16"	Posts
25	12"	5'-0"	Footings
1	5 1/2"	22'-0"	Diagonal Strut
1	5 1/2"	8'-0"	3rd Panel Landing Brace
2	6"	18'-4"	" " " Stringers
2	6"	17'-11"	2nd " " "
1	5 1/2"	17'-0"	2nd Panel Stair Brace
1	5 1/2"	20'-0"	1st Panel Stair Brace
4	10"	20'-0"	Top Horizontal, Face B
2	5 1/2"	15'-8"	3rd " "
2	5 1/2"	17'-11"	2nd " "
2	5 1/2"	20'-6"	Bottom " "
4	5 1/2"	17'-2"	3rd Panel Diagonals, Face B
4	5 1/2"	20'-10"	2nd " " "
4	5 1/2"	23'-10"	Bottom " " "

LUMBER

No.	Size	Length	Description
2	3"x10"	14'-0"	Top Panel Stair Stringers
2	3"x10"	18'-0"	Intermediate Stair Stringers
2	3"x10"	22'-0"	Bottom Stair Stringers
2	2"x4"	18'-0"	Intermediate Hand Rails
2	2"x4"	22'-0"	Bottom Hand Rails
12	2"x4"	12'-0"	Hand Rails, H.R. Posts etc.
2	2"x4"	22'-0"	Stair Braces
8	2"x6"	12'-0"	Floor Plank
9	2"x10"	12'-0"	Stair Treads
7	1"x4"	12'-0"	Stair Tread Cleats
8	2"x10"	12'-0"	Cab Sills
11	2"x10"	8'-0"	Cab Sills
10	2"x10"	6'-0"	Cab Sills
6	2"x10"	4'-0"	Cab Sills
3	2"x10"	3'-0"	Cab Sills
2	2"x10"	14'-0"	Cab Sills
2	6"x6"	9'-0"	* Fill Blocks (Rough)

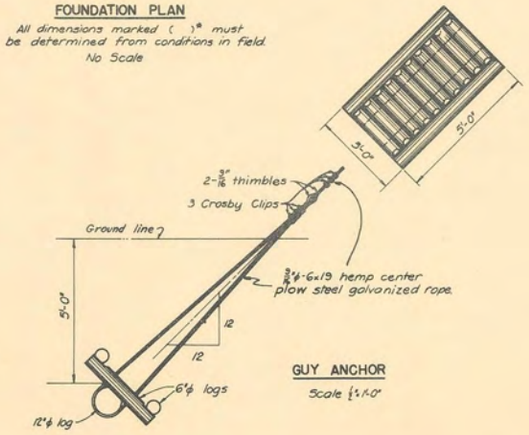
All lumber is S4S unless marked with an *.





FOOTINGS

Scale 1/4" = 1'-0"



GUY ANCHOR

Scale 1/2" = 1'-0"

HARDWARE

No.	Size	Length	Description	No.	Size	Length	Description
23	5/8"φ	12"	Machine Bolts	6	1/2"	32"	Tie Rods
37	5/8"φ	13"	" "	10	1/2"	28 1/2"	" "
28	5/8"φ	14"	" "	245	5/8"		Mall Washer
18	5/8"φ	16"	" "	32	1/2"		Cut Washer
17	5/8"φ	18"	" "	100	2 1/2"		Teco Split Rings
5	5/8"φ	23 1/2"	" "	40#	10d		Common Nails
18	3/8"φ	20"	Dowels	15#	16d		" "
5	3/8"φ	28"	"	20#	20d		" "
36	1/2"φ		Crosby Clips				
8	1/2"φ		Thimbles				

Notes

All hardware is to be galvanized.
Hardware list consists of an approximate 10% increase over exact quantity to be required.
Guy Cable to be 3/8"φ-6x19 hemp center galvanized plow steel rope.

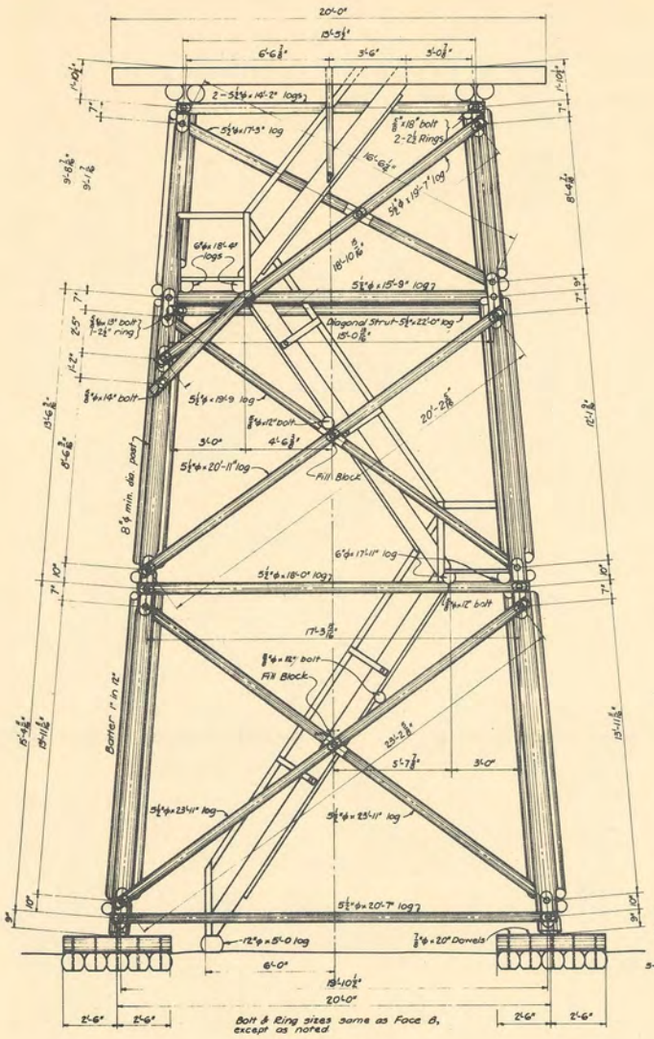
Revised 3-8-33 by W.G.
Guy Cable from 1/2"

U. S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE
REGION SIX JAMES FRANKLAND REGIONAL ENGINEER

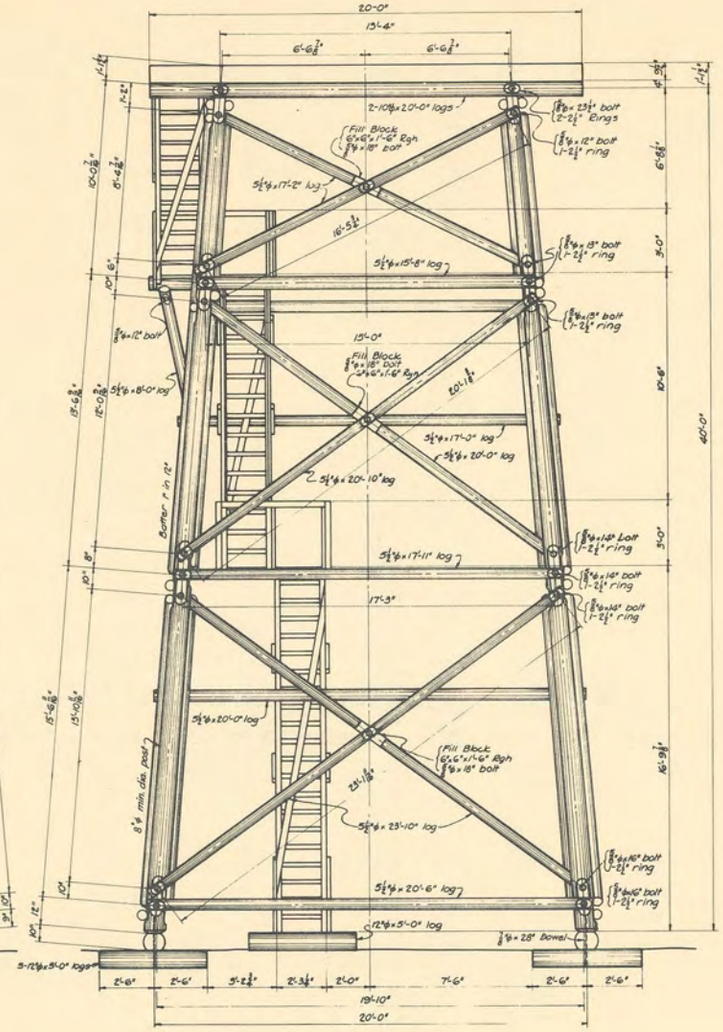
STANDARD LOOKOUT TOWER
40-FOOT TYPE RT-1
FOUNDATION PLAN

DESIGNED R.W.S. DRAWN R.W.S. TRACED H.R.S.
SCALE AS NOTED CHECKED
APPROVED ASSISTANT REGIONAL FORESTER DATE MARCH 1938

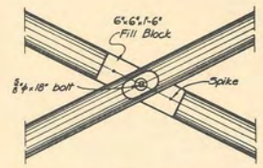
SHEET 1 OF 2 SHEETS L-11801.



FACE A

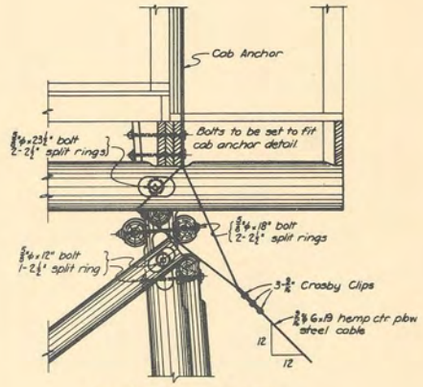


FACE B



TYPICAL DIAGONAL INTERSECTION

Scale 1" = 1'-0"



CAB ANCHOR & POST DETAIL

Scale 1" = 1'-0"

Face B

General Notes

All post connections with horizontals and diagonals to be coupled with ⅝"φ bolts and 2½" Teco split rings.

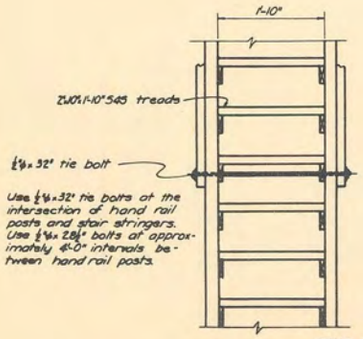
All contact surfaces on post connections to be dapped in each member to obtain flat parallel surfaces 3½" in width.

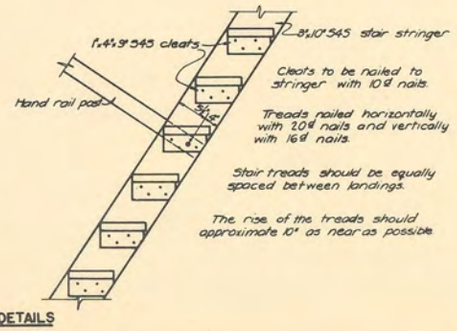
All contact surfaces with malleable washers to be perpendicular to axis of bolts and wide enough to give complete bearing surface.

All diagonals and horizontals to extend at least 4" from the bolt hole to the end of the member.

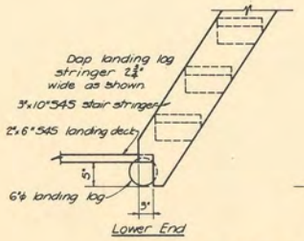
Sawn Lumber Sizes

Hand Rail	2"x4"	S4S
Hand Rail Posts	2"x4"	"
Stair Stringers	3"x10"	"
Stair Bracing	2"x4"	"
Floor Plank	2"x6"	"
Stair Tread	2"x10"	"
Fill Block	6"x6"	Rgh.
Stair Tread Cleats	1"x4"	S4S
Landing Deck	2"x10"	"

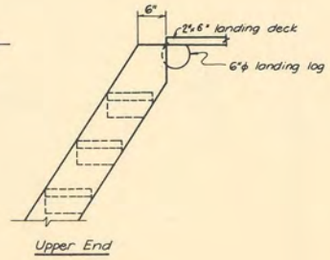




STAIR TREAD DETAILS



Lower End



Upper End

STAIR STRINGER DETAILS

Revised 3-8-39 by W.G.
Guy Cable from ⅜".

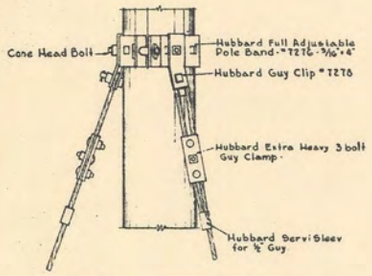
U. S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE

REGION SIX — JAMES FRANKLAND REGIONAL ENGINEER

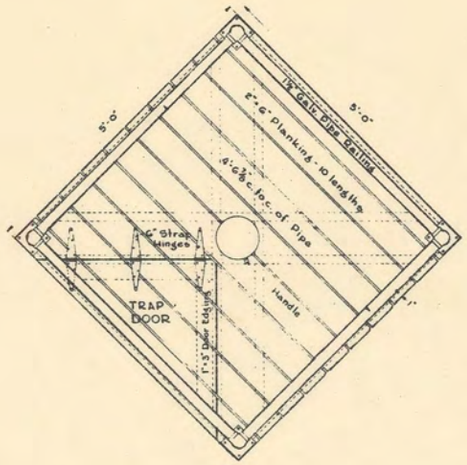
STANDARD LOOKOUT TOWER
40-FOOT TYPE RT-1
GENERAL PLAN

DESIGNED R.W.S. DRAWN R.W.S. TRACED R.W.S. & H.R.S.
SCALE 3/8" = 1'-0" EXCEPT DETAILS CHECKED A.W.S.
APPROVED ASSISTANT REGIONAL FORESTER DATE MARCH 1938

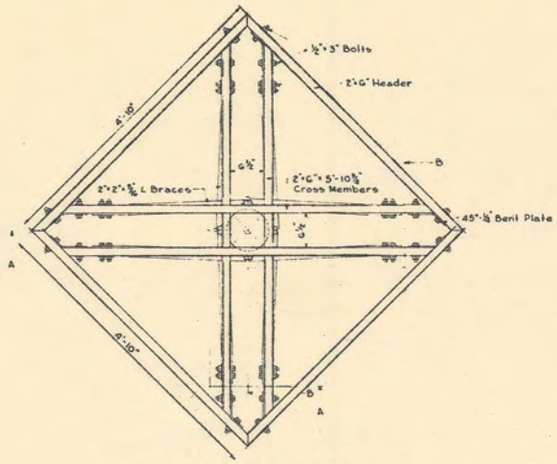
SHEET 2 OF 2 SHEETS L-11802



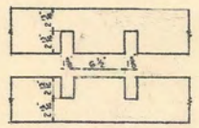
DETAIL OF GUY CONNECTION TO POLE
Scale 1½" = 1'-0"



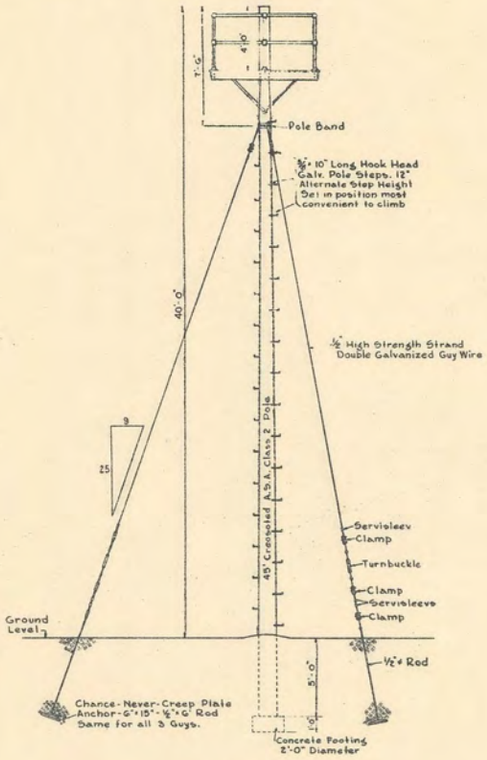
TOP
Scale 1" = 1'-0"



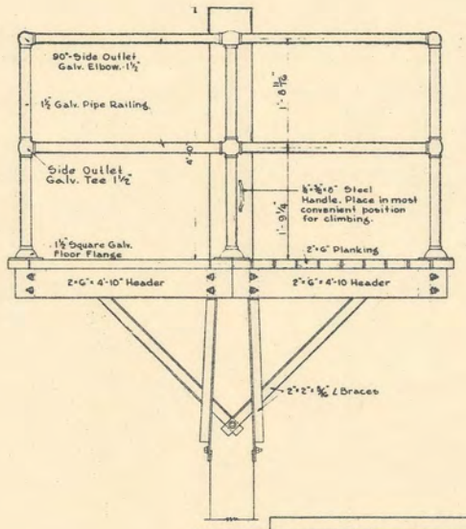
PLAN OF FRAMING
Scale 1" = 1'-0"



METHOD OF CROSSING 2"x6"s AT POLE
Scale 1½" = 1'-0"



ASSEMBLY
Scale ¼" = 1'-0"



FRONT
Scale 1" = 1'-0"

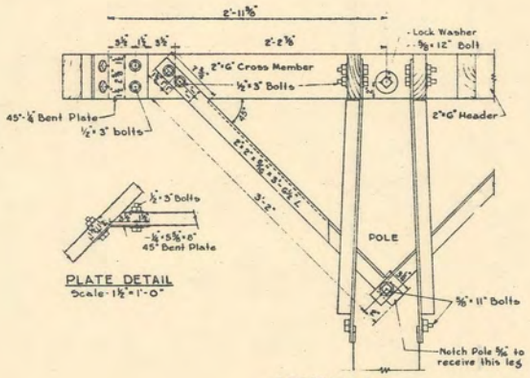
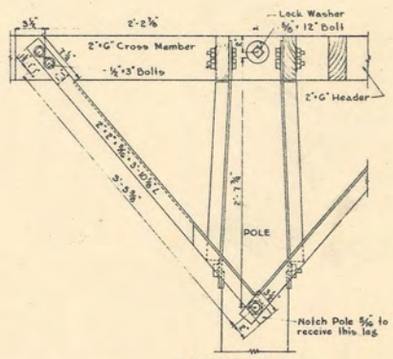


PLATE DETAIL
Scale 1½" = 1'-0"

SECTION A-A



SECTION B-B

DETAIL OF BRACING
Scale 1½" = 1'-0"

BILL OF MATERIAL

ITEM	NO.	SIZE	DESCRIPTION	REMARKS	ITEM	NO.	SIZE	DESCRIPTION	REMARKS
Pole	1	45' A.S.A. Class 2	Creosoted Southern Pine	To be framed before Treating	Bolts	48	½"x3"	Galv. Machine	For Braces & Framing
Platform	2	2'-6"x12'-0"	1" Dimen. South. Pine or Doug. Fir	Cross Members	Washers	4	⅝"	M.I. Galv. Nut Lock	
"	7	2"x6"x10'-0"	" " " " " "	Headers and Floor	"	96	9/16" Hole	Hubbard #7803 Galv. Round	
"	1	1"x3"x5'-0"	" " " " " "	Trap Door Edging	"	4	9/16" Hole	" #7808 " "	
Nails	3#	10d		For Floor and Trap Door	Pole Band	1	Hubbard #7276	Full Adjustable ⅝"x4"	
Hinges	3	6"	Strap-Galvanized	Complete with screws	Handle	1	⅝"x⅝"x6"	Flat Rolled Steel Bar	Bend & Drill as shown
Bracing	4	2"x2"x⅜"x3'-0⅜"	Steel Angles	Cut Leg & Drill as shown	Guy Clips	3	Hubbard #7276	Complete with #7250 Cone Head Bolts.	
"	4	2"x2"x⅜"x5'-10⅝"	" "	" " " "	Leg Screws	2	½"x2"	Galvanized	For Handle
Plates	8	5⅝"x8"x⅛"	Steel	Bend & Drill as shown	Railing	4	1½"	#4 M.I. Galv. Side Outlet Tee	Lap Pipe with one side outlet L.H.
Railing	8	1½"x4'-4½"	Galv. W. I. Pipe	Thread Ends R.H. 4 pcs. L end L.H.	Guy Wire		120'-½"	High Strength Strand Doub. Galv.	Strength 18,000#
"	8	1½"x1'-6 9/16"	" " " "	Thread 4 pcs. R.H. 4 pcs. R.H. L.H.	Guy Clamps	12	Hubbard #7460	Extra Heavy - 3 bolt	
"	4	1½"	#2 M.I. Galv. 90° Side Outlet Elbows	Tap two with one L.H. outlet	Turnbuckles	3	⅝"x9"	Galv. Eye & Eye	
"	4	1½"	M.I. Galv. Square Floor Flanges	R.H.	Servi Sleeve	12	Hubbard #7456	Galv.	
"	16	⅛"x1½"	Galv. Lag Screws	For Floor Flanges	Guy Anchors	3	Chance #615-26	Never-Creep Plate	6"x15" Plate, ½"x6' Rod
Bolts	2	⅝"x12"	Galv. Machine	For Bolting Cross Members to Pole	Pole Steps	36	Hubbard #7126	⅝"x10" Long Hook Head	
"	2	⅝"x11"	" "	" " Braces to Pole	Cement	1 bag		1:2½:4 Mix	For Concrete Footing

U. S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE

REGION NINE — H. COLEMAN REGIONAL ENGINEER

OBSERVATION MAST FOR EMERGENCY LOOKOUT

DESIGNED SHANNEE & E.R.R. DRAWN E.R.R. TRACED E.R.R.
SCALE AS SHOWN CHECKED
APPROVED REG. ENGINEER DATE 2-25-37
APPROVED DIV. OPERATION 2-20-37

Revised - 7-6-37

L5-01 (B16)

SECTION III

TOWER CABS

The 7' x 7' steel tower cab drawing is included with the drawings of the tower in Section I and are not repeated in this Section. The 14' x 14' steel tower uses the 14' x 14' wood cab, drawings of which are included in this Section.

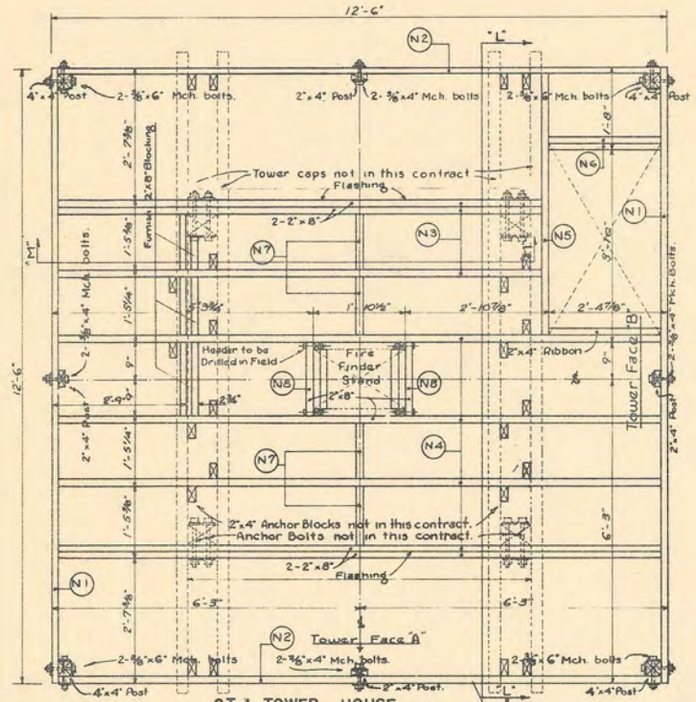
In order, however, to use the 14' x 14' wood cab on the 14' x 14' steel tower, certain revisions of detail are necessary, which are as follows:

1. As detailed on drawings of 14' x 14' steel tower, bolt 4" x 6" S4S treated sills to 5" x 3½" x 5/16" angles at cab level. It is suggested that the contractor furnishing the tower material be also required to furnish and treat the 4" x 6" sill. The four sill pieces are to be cut to required length and the horizontal bolt holes in the sill are to be bored to suit the holes in the 5" x 3½" x 5/16" angles.

   Horizontal holes are also to be bored in the sill to suit the four anchorage straps as shown on sheet B-4203 of the cab drawings, the details of which must be revised to fit the 6" depth of the sill in place of the 10" depth of the cab girder. Before preservative treatment is given, all of the 4" x 6" sill pieces must be completely and accurately framed so that no cutting or boring will be necessary in the final use of the pieces. The sill pieces are to be plainly marked for their correct location.

2. Because the steel tower framing itself makes provision for supporting the catwalk, the cab joists are to be framed as shown on sheet B-4201 for cab types G-TH and G-HP. 2" x 8" joists are to be used, however, in place of 2" x 6" joists called for on this drawing. The reason for this is that the 14' x 14' wood cab drawings call for a center sill which is not provided for on the steel tower.

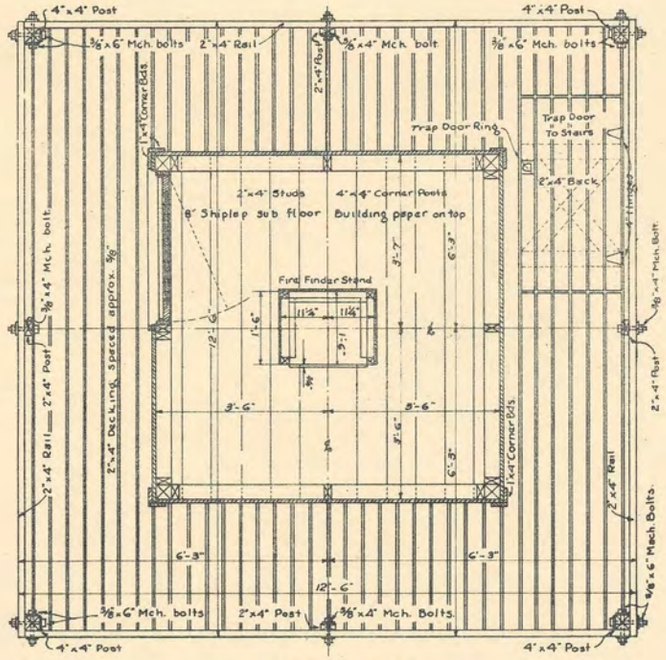
3. Such untreated catwalk and trap door material as indicated on the steel tower drawing, L-1603, is to be purchased rather than the catwalk material as called for on 14' x 14' wood cab drawings.



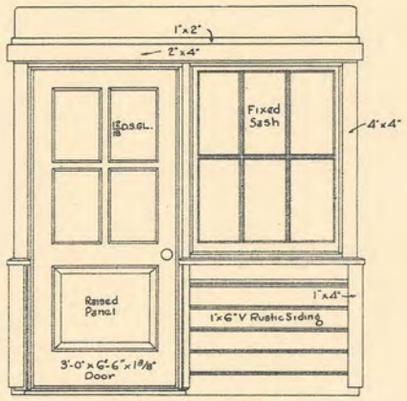
CT-1 TOWER HOUSE
FLOOR & CATWALK FRAMING PLAN
SCALE 3/4" = 1'-0"

NOTE: All 3/8"x4" Mach Bolts to have 2 - 1 1/4" cut washers each. All to be Galv.

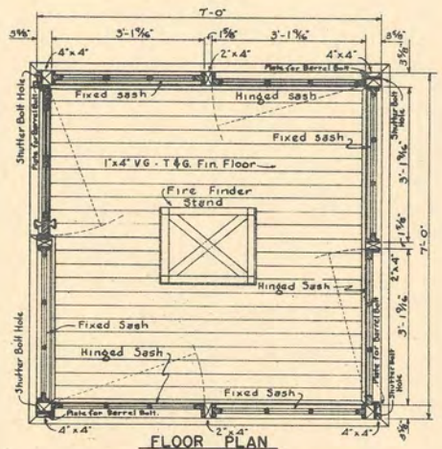
NOTE: All timbers marked (N) are not in contract but are indicated hereon for the information of the field.



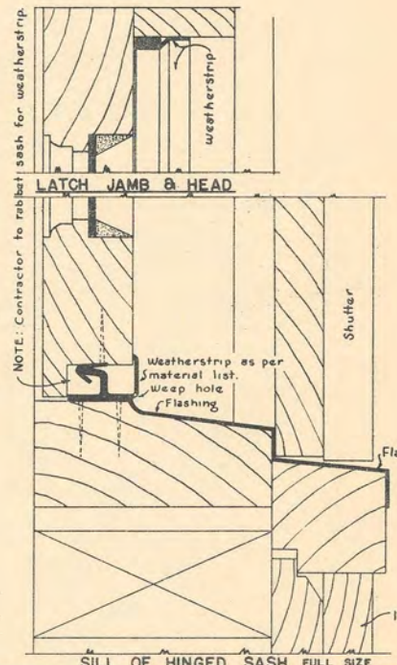
CATWALK PLAN
SCALE 3/4" = 1'-0"



LEFT ELEVATION
SCALE 3/4" = 1'-0"



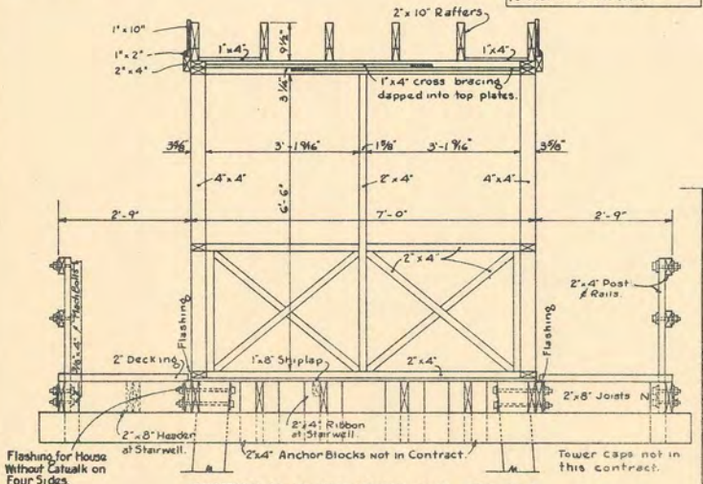
FLOOR PLAN
SCALE 3/4" = 1'-0"



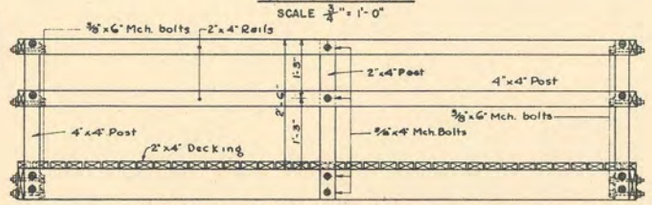
NOTE: Contractor to rabbet sash for weatherstrip.

LATCH JAMB & HEAD

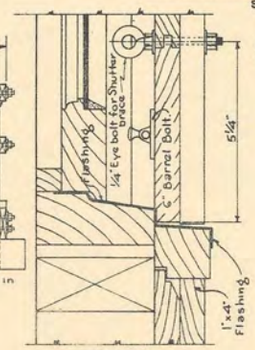
SILL OF HINGED SASH FULL SIZE



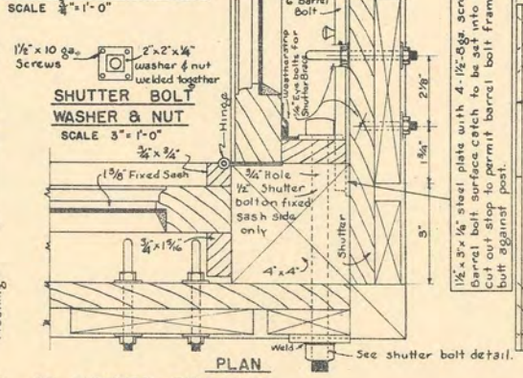
SECTION "L-L" INCLUDING CAB FRAMING
SCALE 3/4" = 1'-0"



ELEVATION OF CATWALK & RAILS
SCALE 3/4" = 1'-0"

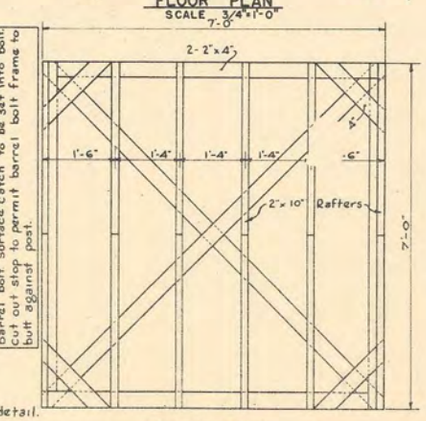


SECTION
(FIXED SASH)



PLAN

DETAIL OF SHUTTER FASTENINGS
SCALE 6" = 1'-0"



RAFTER PLAN
SCALE 3/4" = 1'-0"

REVISED 5-20-40 C.F.R.

U.S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE

REGION SIX — JAMES FRANKLAND ASST. REG. FORESTER

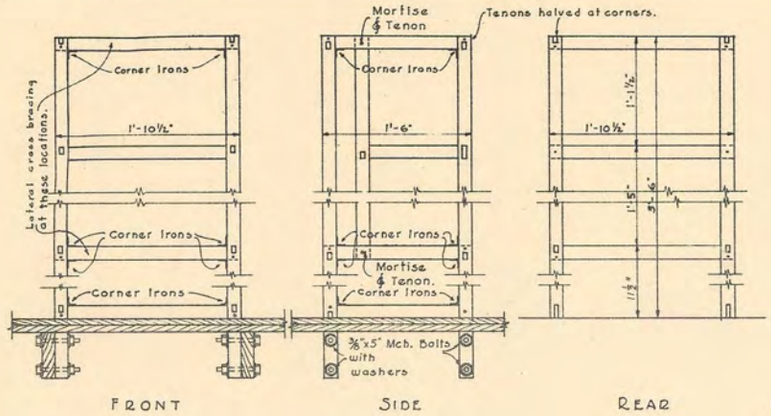
STANDARD - 1936

7' x 7' LOOKOUT HOUSE

DESIGN REVISED 4-28-38 C.F.R.

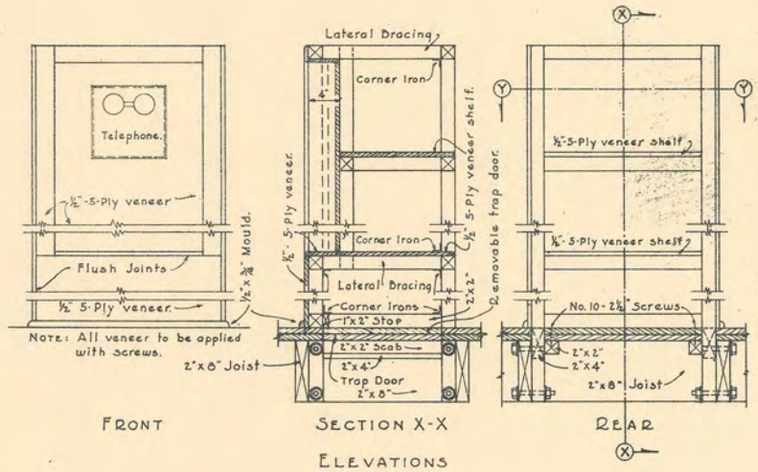
DESIGNED H.L. DRAWN C.F.R. TRACED C.F.R.
SCALE AS NOTED CHECKED
APPROVED [signature] DATE 4-28-38
ACT. ASSISTANT REGIONAL FORESTER

SHEET 1 OF 3 SHEETS S-4101

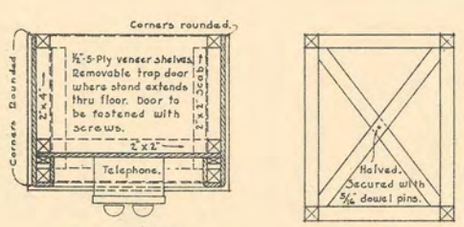


FRAME DETAILS
Scale, 1½" = 1'-0"

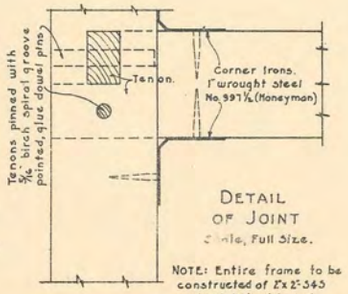
NOTE: Entire frame to be constructed of 2"x2", S4S, No. 1, select, kiln dried fir.



ELEVATIONS
Scale, 1½" = 1'-0"

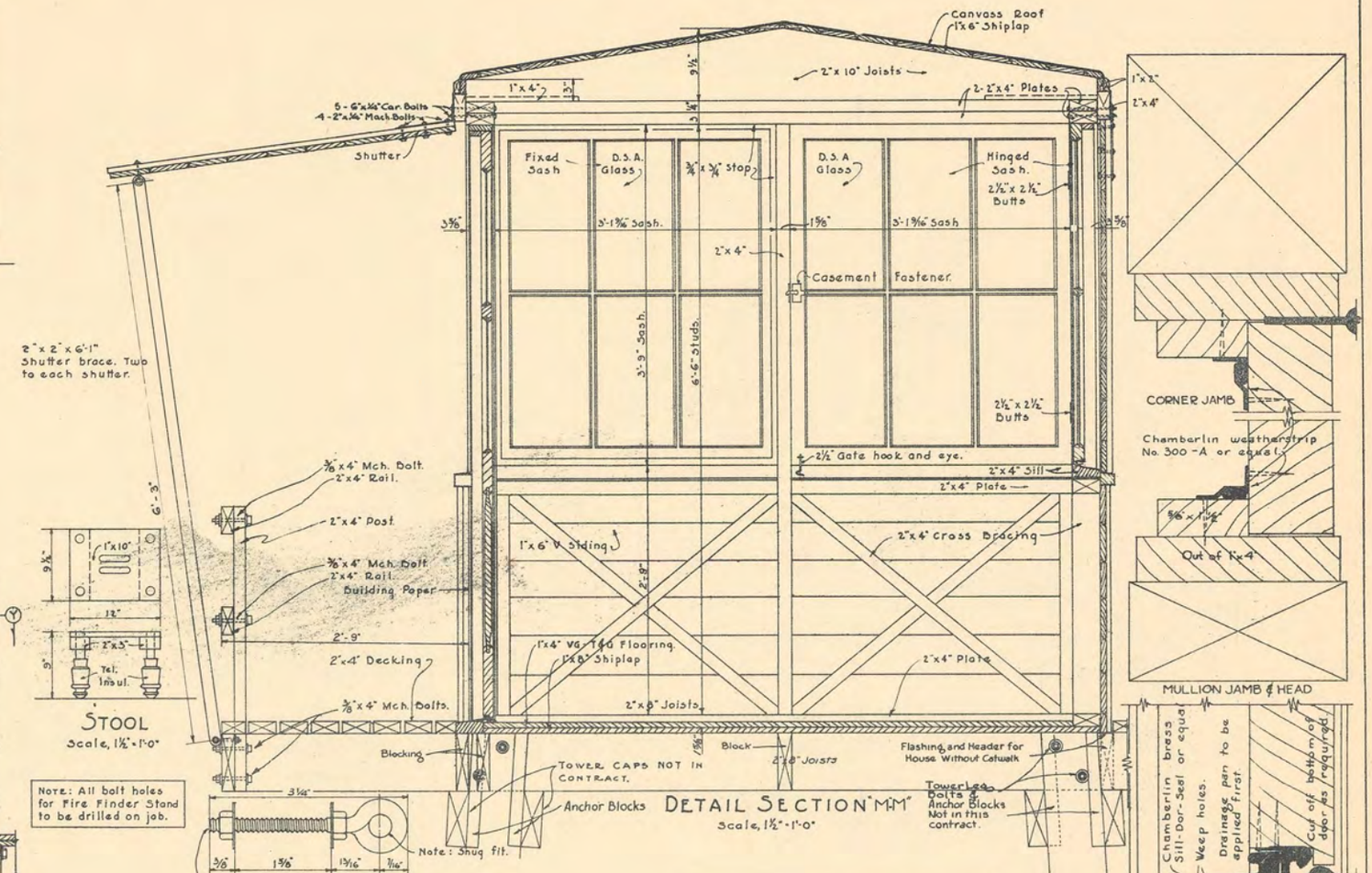


DETAIL OF FIRE FINDER STAND
Scale, 1½" = 1'-0"



DETAIL OF JOINT
Scale, Full Size.

NOTE: Entire frame to be constructed of 2"x2" S4S select kiln dried fir.



Revised May 21, 1940 C.F.R.
Revised, Dec. 3, 1936. Feb. 16, 1937. Feb 19, 1938 CFR

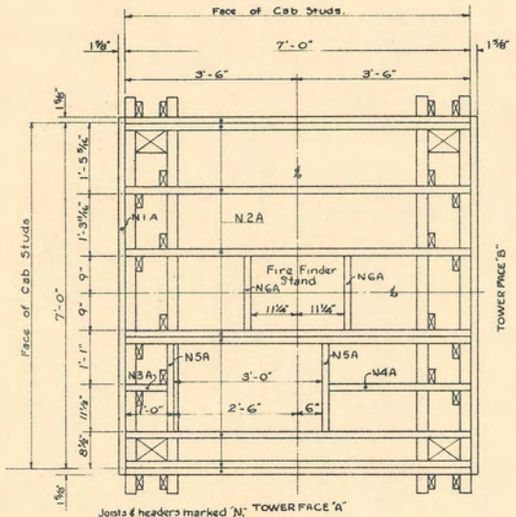
U.S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE
REGION SIX - JAMES FRANKLAND, ASS'T. REG. FORESTER

STANDARD — 1936

7' x 7' LOOKOUT HOUSE

DESIGNED H.L. DRAWN H.L. TRACED M.P.A.
SCALE AS NOTED CHECKED M.P.A.-CFR.
APPROVED [signature] ASSISTANT REGIONAL FORESTER DATE NOV. 16, 1936

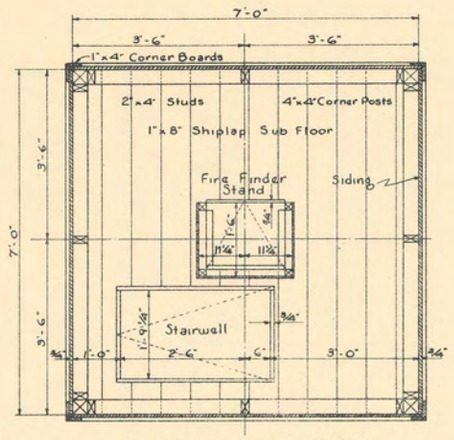
SHEET 2 OF 3 SHEETS B-4102



Joists & headers marked "N" tower legs & horizontals, & 2"x4" Anchor blocks not in this contract.

CT-1 TOWER JOIST LAYOUT

FOR HOUSE WITHOUT CATWALK AS SHOWN ON SHEET L-10001.
CT-5 TOWER JOIST LAYOUT FOR HOUSE WITHOUT CATWALK SHOWN ON SHEET L-10002.



FRAMING PLAN BELOW SASH

-GENERAL NOTE-

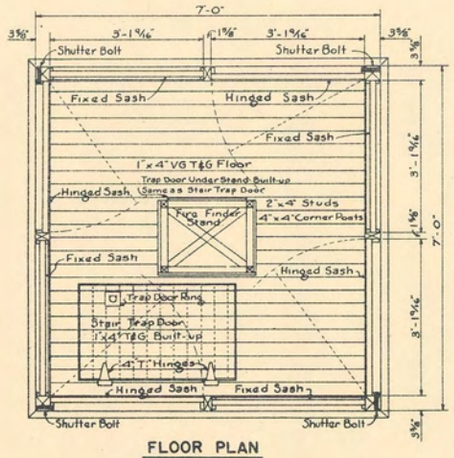
Sheets B-4101 and B-4102 are to be used in combination with this sheet for "HOUSE WITHOUT CATWALK."

Shutters do not apply to this house.

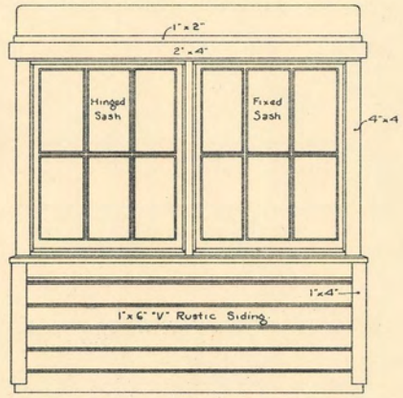
The following details on the above sheets shall apply:
Sheet B-4101: DETAIL OF SHUTTER FASTENINGS (WITHOUT SHUTTER)
FIXED SASH SECTION
CORNER PLAN

SECTION "L-L" (WITHOUT CATWALK).
RAFTER PLAN.
DETAIL OF HINGED SASH.

Sheet B-4102: DETAIL OF FIRE FINDER STAND.
STOOL.
DETAIL SECTION "M-M" (WITHOUT DOOR SECTION, CATWALK AND SHUTTERS).



FLOOR PLAN



ELEVATION TOWER FACE "B"

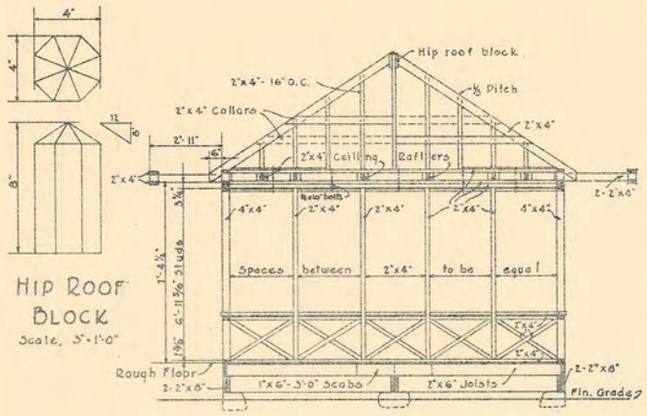
U. S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE

REGION SIX JAMES FRANKLAND ASS'T. REG. FORESTER

STANDARD - 1936
7'x7' LOOKOUT HOUSE
WITHOUT CATWALK

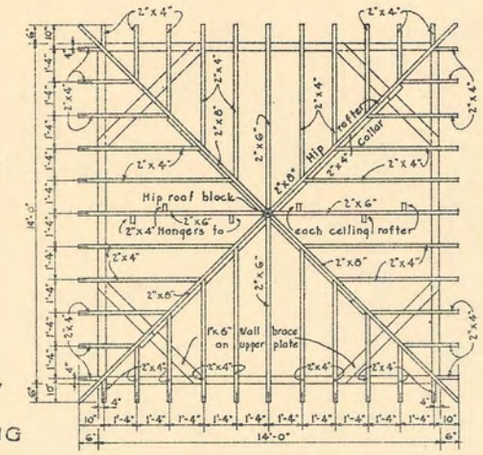
DESIGN REVISED 5-23-38 C.F.R.
DESIGNED H.L. DRAWN C.F.R. TRACED C.F.R.
SCALE 3/4" = 1'-0" CHECKED
APPROVED [signature] DATE 5-23-38
ACT. ASSISTANT REGIONAL FORESTER

SHEET 3 OF 3 SHEETS B-4103 -

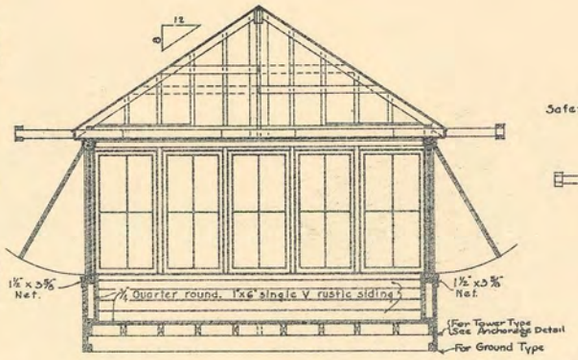


HIP ROOF BLOCK
Scale, 3"=1'-0"

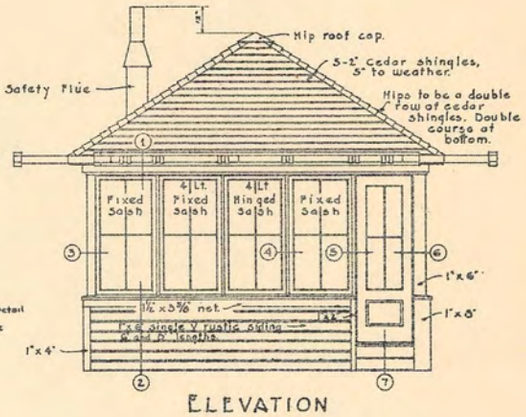
SECTION SHOWING SIDEWALL FRAMING
Scale, 3/8"=1'-0"



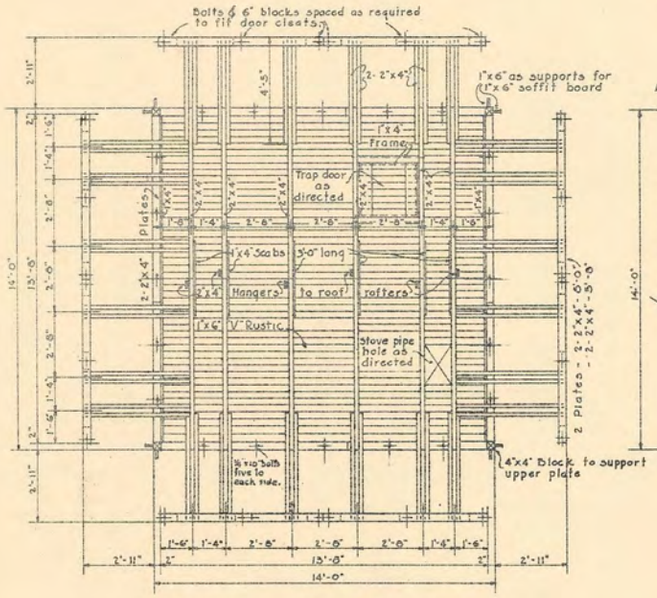
ROOF FRAMING PLAN
Scale, 3/8"=1'-0"
NOTE: All rafters shown above to be SISIE, Full Size.



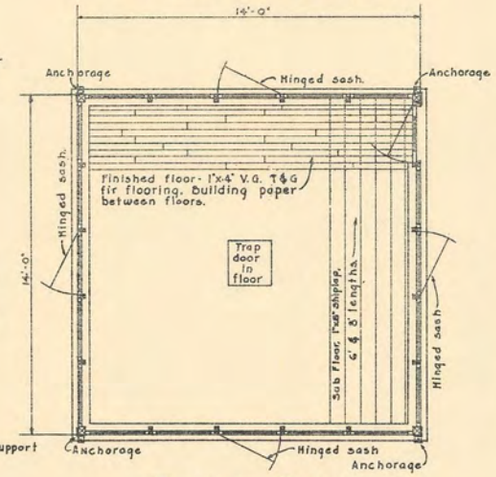
SECTION
Scale, 3/8"=1'-0"



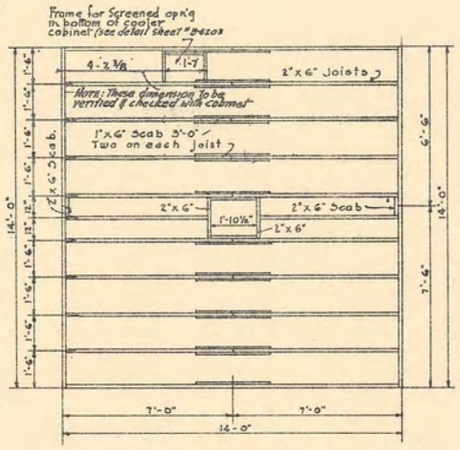
ELEVATION
Scale, 3/8"=1'-0"



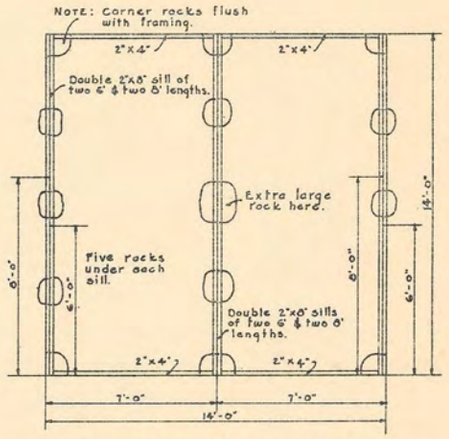
CEILING FRAMING PLAN
Scale, 3/8"=1'-0"



FLOOR PLAN
Scale, 3/8"=1'-0"



JOIST FRAMING PLAN
Scale, 3/8"=1'-0"



FOUNDATION & SILL PLAN
FOR TYPES G-TH & G-HP.
Scale, 3/8"=1'-0"

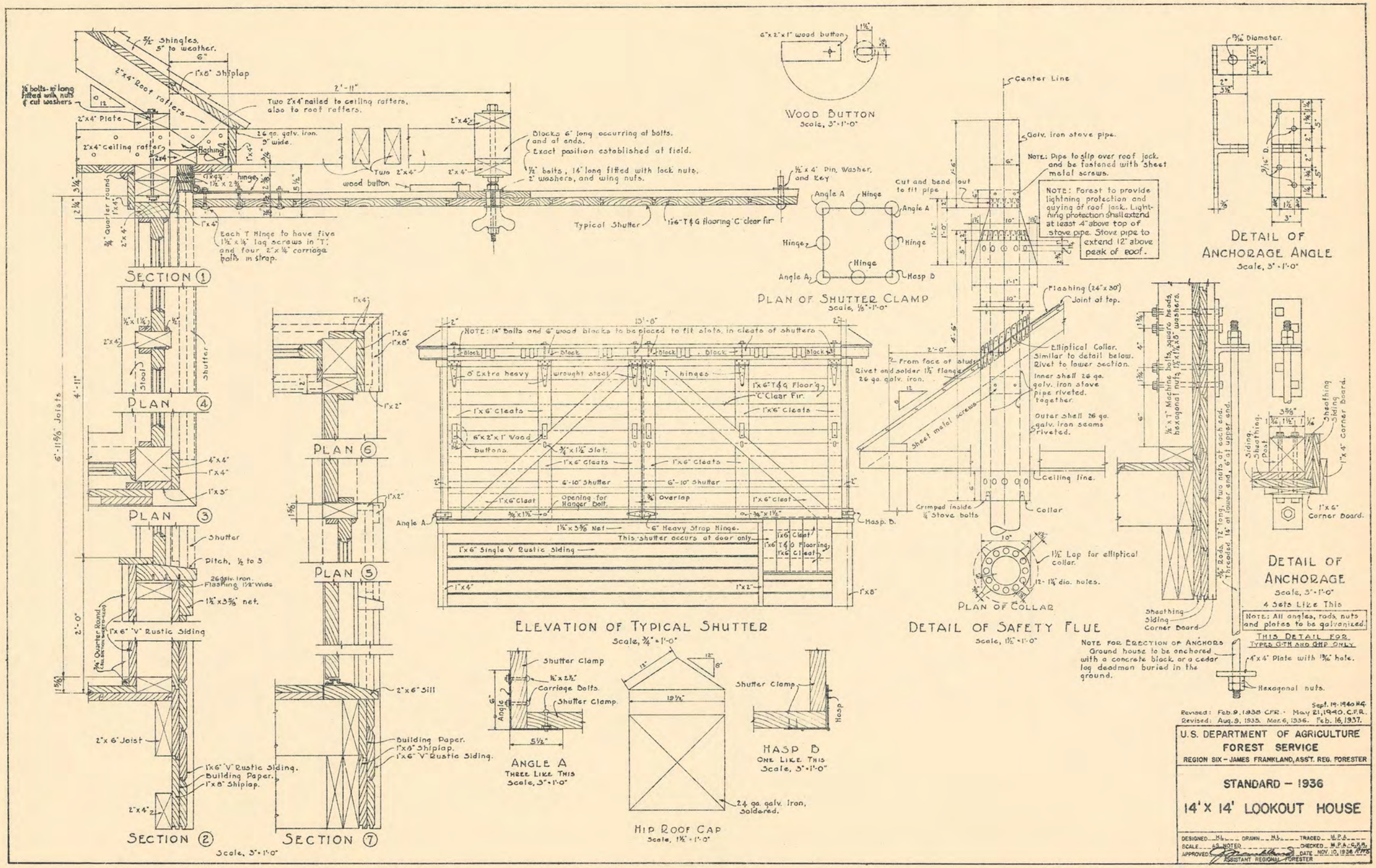
SEPT. 19, 1940 H.G.
May 21, 1940 C.F.R.
Revised: Mar. 6, 1936. Feb. 16, 1937. Feb. 9, 1938 CFR.

U.S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE
REGION SIX – JAMES FRANKLAND, ASS'T. REG. FORESTER

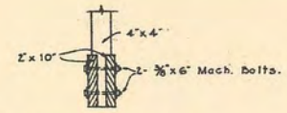
STANDARD – 1936
14' x 14' LOOKOUT HOUSE

DESIGNED H.L. DRAWN H.L. TRACED M.P.A.
SCALE AS NOTED CHECKED M.P.A.-G.F.R.
APPROVED [signature] DATE NOV. 10, 1936
ASSISTANT REGIONAL FORESTER

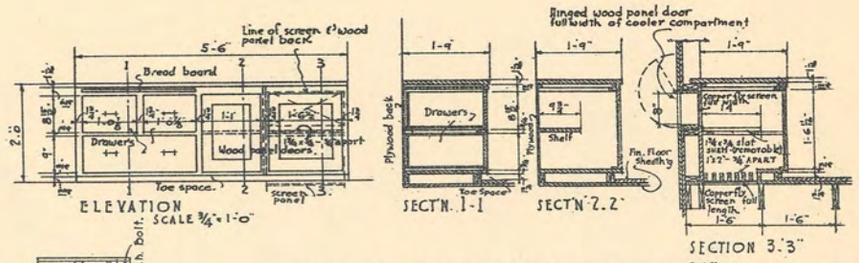
SHEET 1 OF 5 SHEETS B-4201



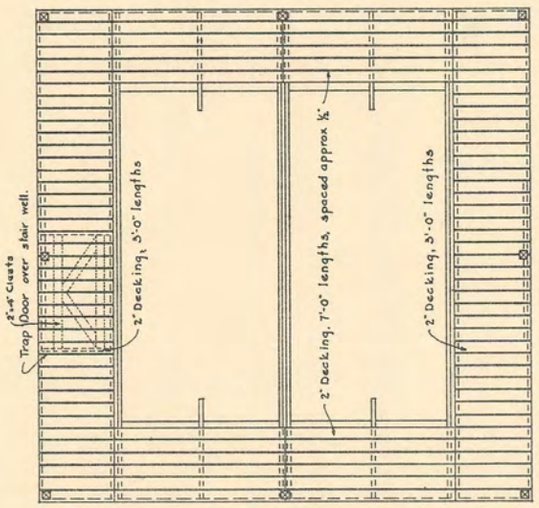
SHEET 2 OF 5 SHEETS B-4202.



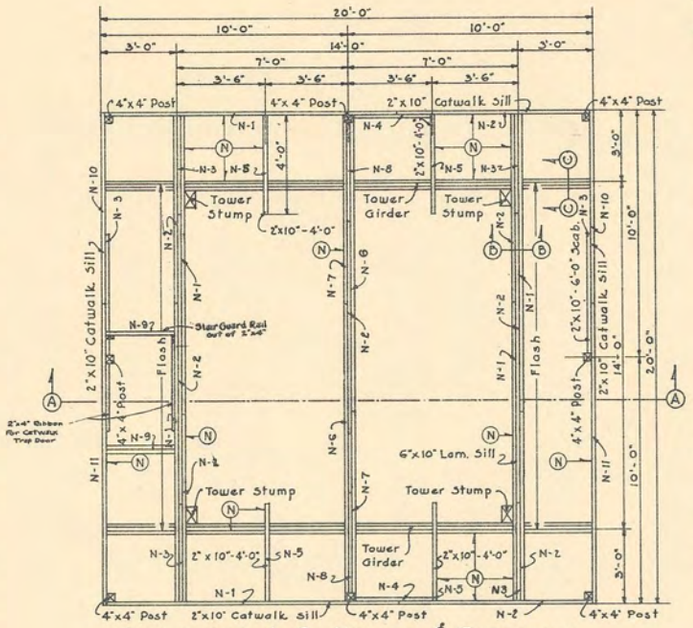
SIDE POST IN SILL
Scale, 1"=1'-0"



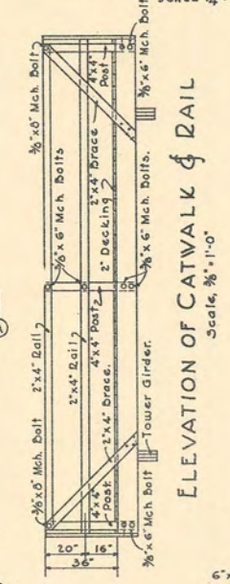
DETAILS OF COOLER CABINET "A" (MAKE ONE(1) THUS)
SCALE 3/4"=1'-0"



DECKING OF CATWALK
Scale, 3/8"=1'-0"

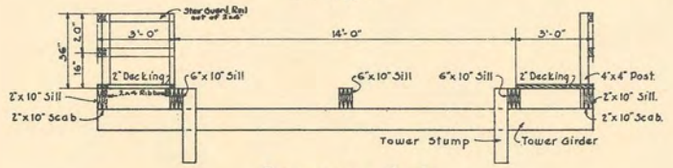


SILLS FOR L.O. HOUSE & CATWALK
Scale, 3/8"=1'-0"

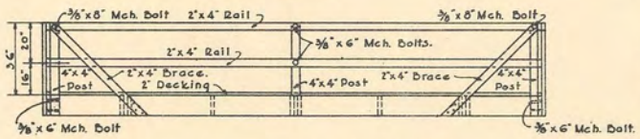


ELEVATION OF CATWALK & RAIL
Scale, 3/8"=1'-0"

NOTE: All timbers marked (N) are not in this contract, but are indicated hereon for the information of the field.



SECTION A-A
Scale, 3/8"=1'-0"

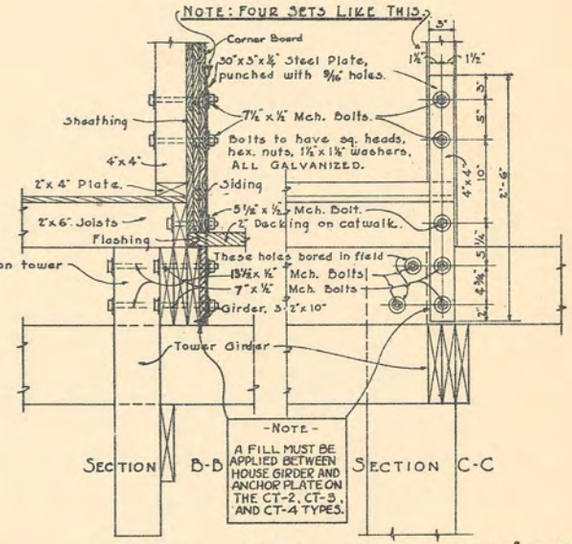


ELEVATION OF CATWALK & RAIL
Scale, 3/8"=1'-0"

NOTE: Above plan indicates Tower Girders and Stumps for Type CT-3 Lookout Tower. See detailed drawing for this type or for Types —— CT-2, and CT-4.

LEGEND

TYPE T-TH - Tower Type, Truck Haul.
TYPE G-TH - Ground Type, Truck Haul.
TYPE T-HP - Tower Type, Horse Pack.
TYPE G-HP - Ground Type, Horse Pack.



-NOTE-
A FILL MUST BE APPLIED BETWEEN HOUSE GIRDER AND ANCHOR PLATE ON THE CT-2, CT-3, AND CT-4 TYPES.

ANCHORAGE DETAILS TYPE T-TH & T-HP
Scale, 1 1/2"=1'-0"

NOTE: All bolts to be machine bolts with two 1 1/2" washers per bolt.
ALL GALVANIZED

NOTE: THIS SHEET FOR USE ONLY WHEN L.O. HOUSE IS BUILT ON TOWER - TYPES T-TH & T-HP

Revised May 21, 1940. C.F.R. | Revised Sept. 19, 1940 H.L.
Revised: Mar. 5, 1936. Feb. 16, 1937. Feb. 8, 1938 C.E.R.

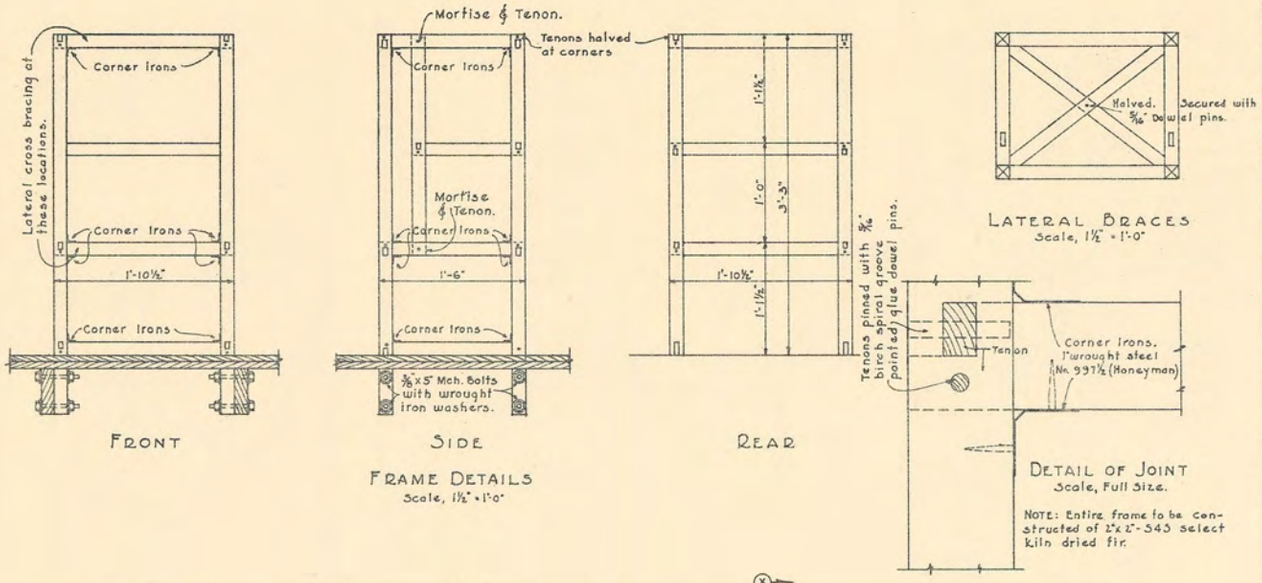
U.S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE
REGION SIX - JAMES FRANKLAND, ASS'T. REG. FORESTER

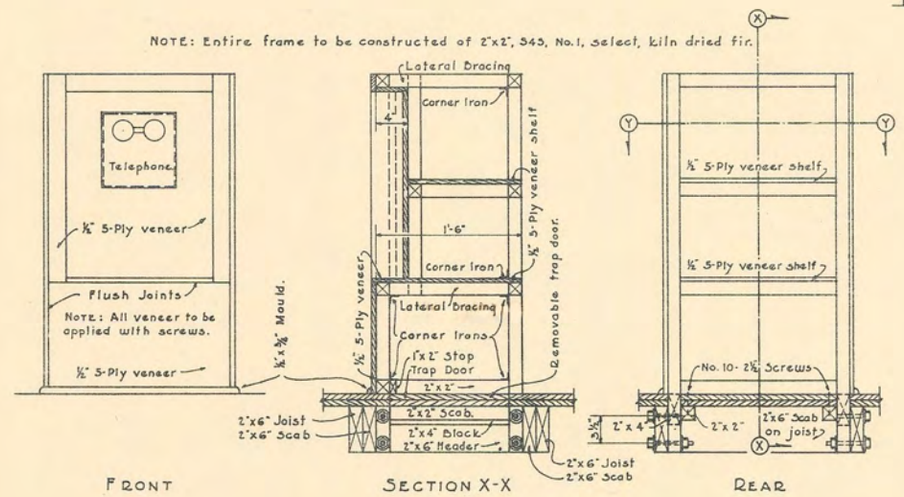
STANDARD - 1936

14' X 14' LOOKOUT HOUSE

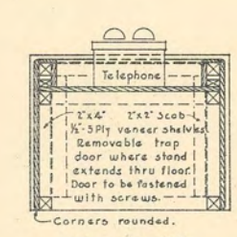
DESIGNED H.L. DRAWN H.L. TRACED M.P.A.
SCALE AS NOTED CHECKED H.P.A. - C.E.R.
APPROVED [signature] ASSISTANT REGIONAL FORESTER DATE NOV. 10, 1936 & 1939

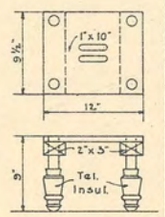
SHEET 3 OF 5 SHEETS. B-4203

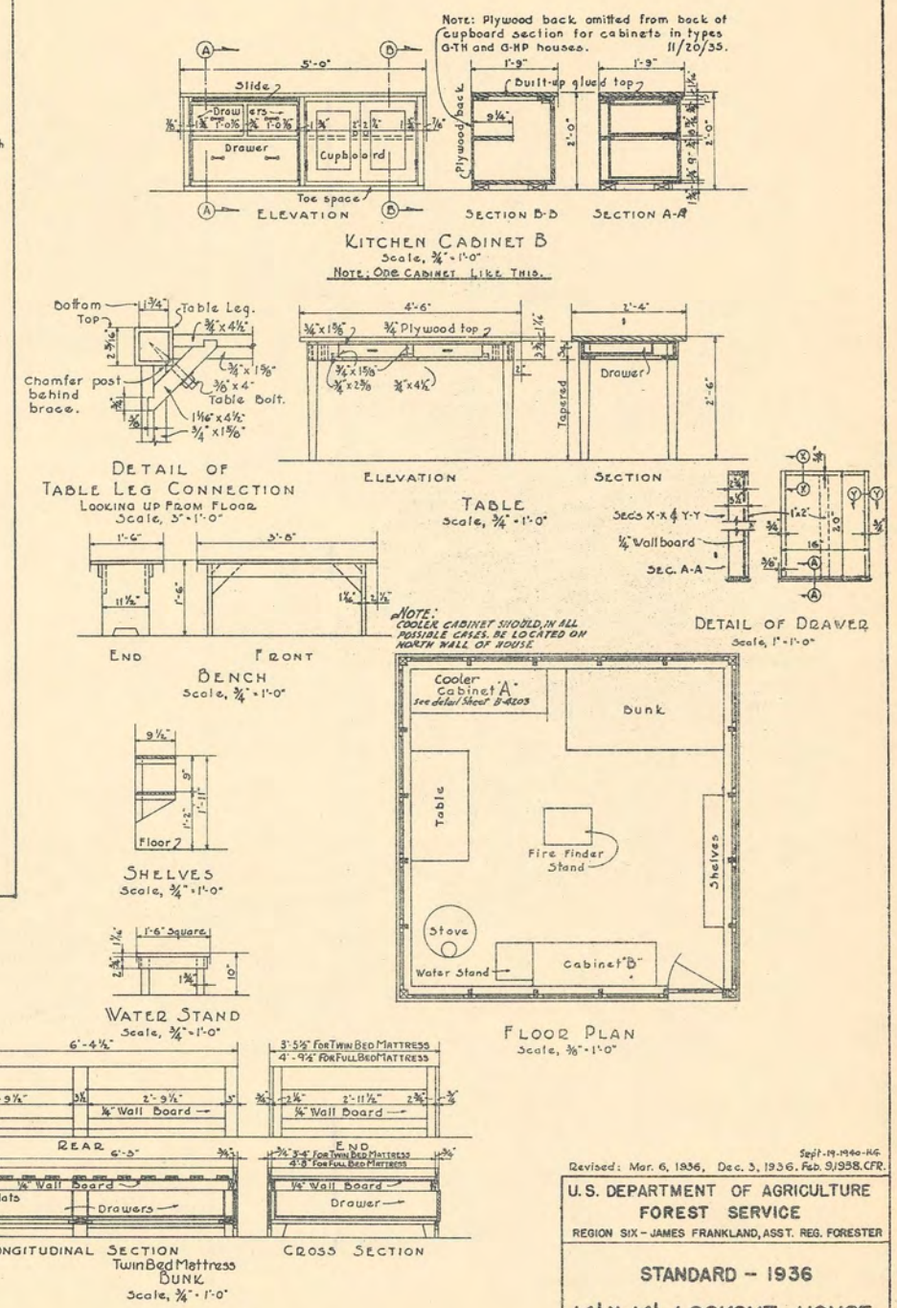




DETAILS OF FIRE FINDER STAND







DETAILS OF FURNITURE AND KITCHEN CABINETS

Sept-19-1940-HG
Revised: Mar. 6, 1936, Dec. 3, 1936. Feb. 9, 1938. CFR.

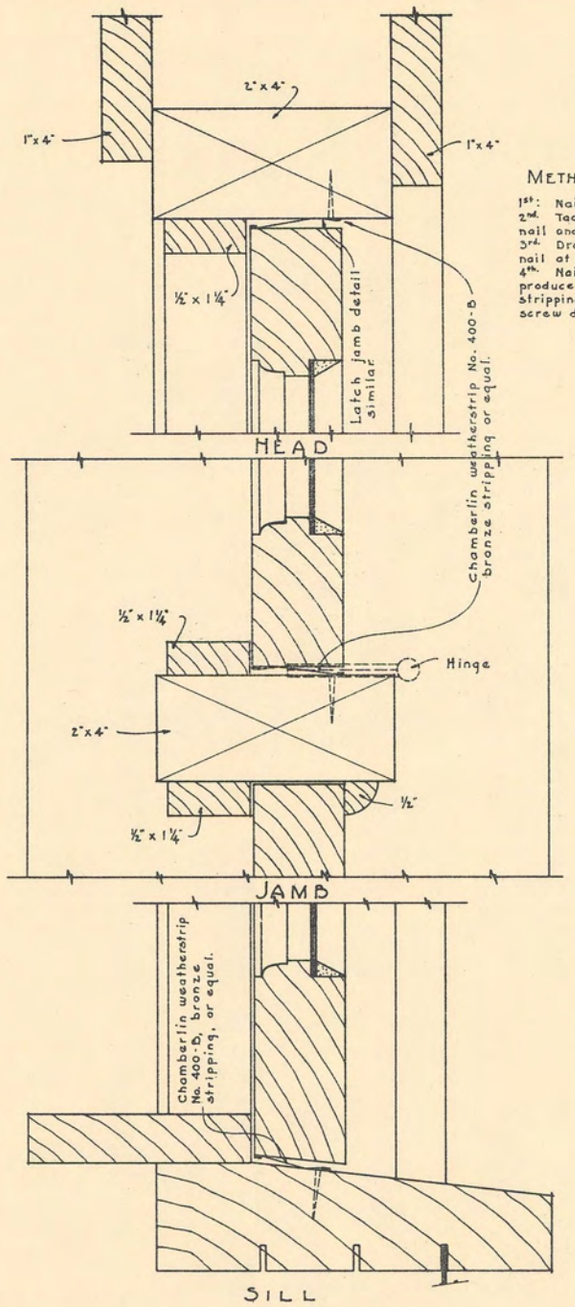
U. S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE
REGION SIX – JAMES FRANKLAND, ASST. REG. FORESTER

STANDARD – 1936

14' X 14' LOOKOUT HOUSE

DESIGNED H.L. DRAWN H.L. TRACED M.P.A.
SCALE AS NOTED CHECKED M.P.A.-C.F.R.
APPROVED ASSISTANT REGIONAL FORESTER DATE NOV. 10, 1936

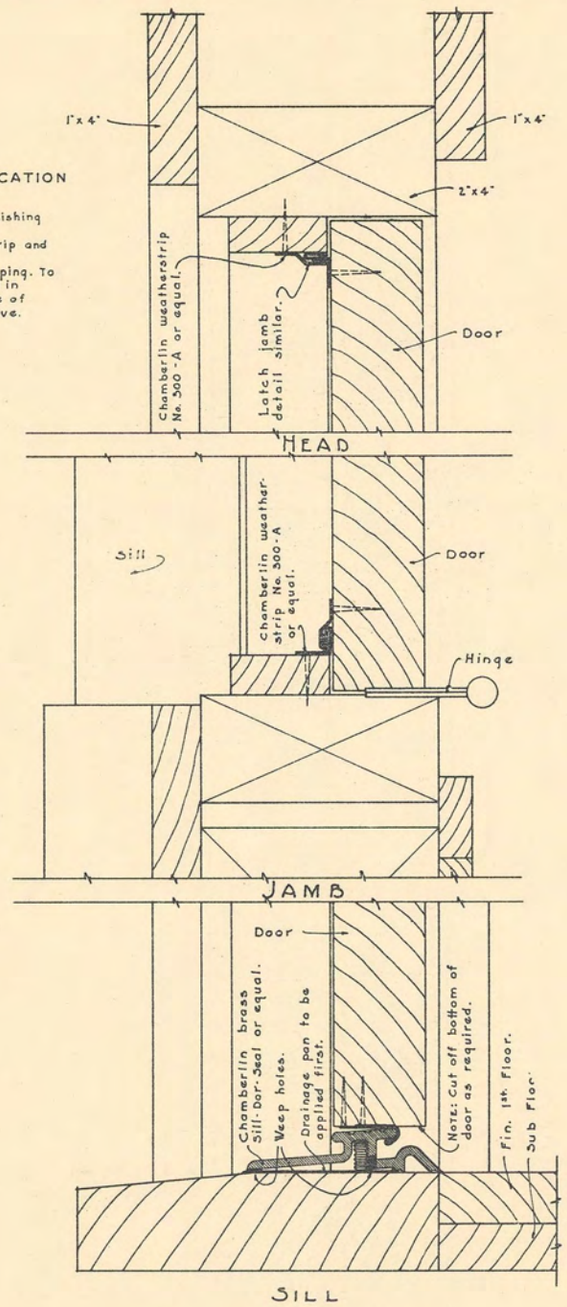
SHEET 4 OF 5 SHEETS B-4204



F.S. WINDOW DETAIL

METHOD OF APPLICATION

1st: Nail strip at top.
2nd. Tack bottom with finishing nail and stretch taught.
3rd. Draw in center of strip and nail at center.
4th. Nail balance of stripping. To produce spring as desired in stripping, run sharp edge of screw driver along groove.



F.S. DOOR DETAIL

SHOWING METHOD OF APPLYING WEATHERSTRIPPING

Revised Feb 9, 1938 C.F.R.

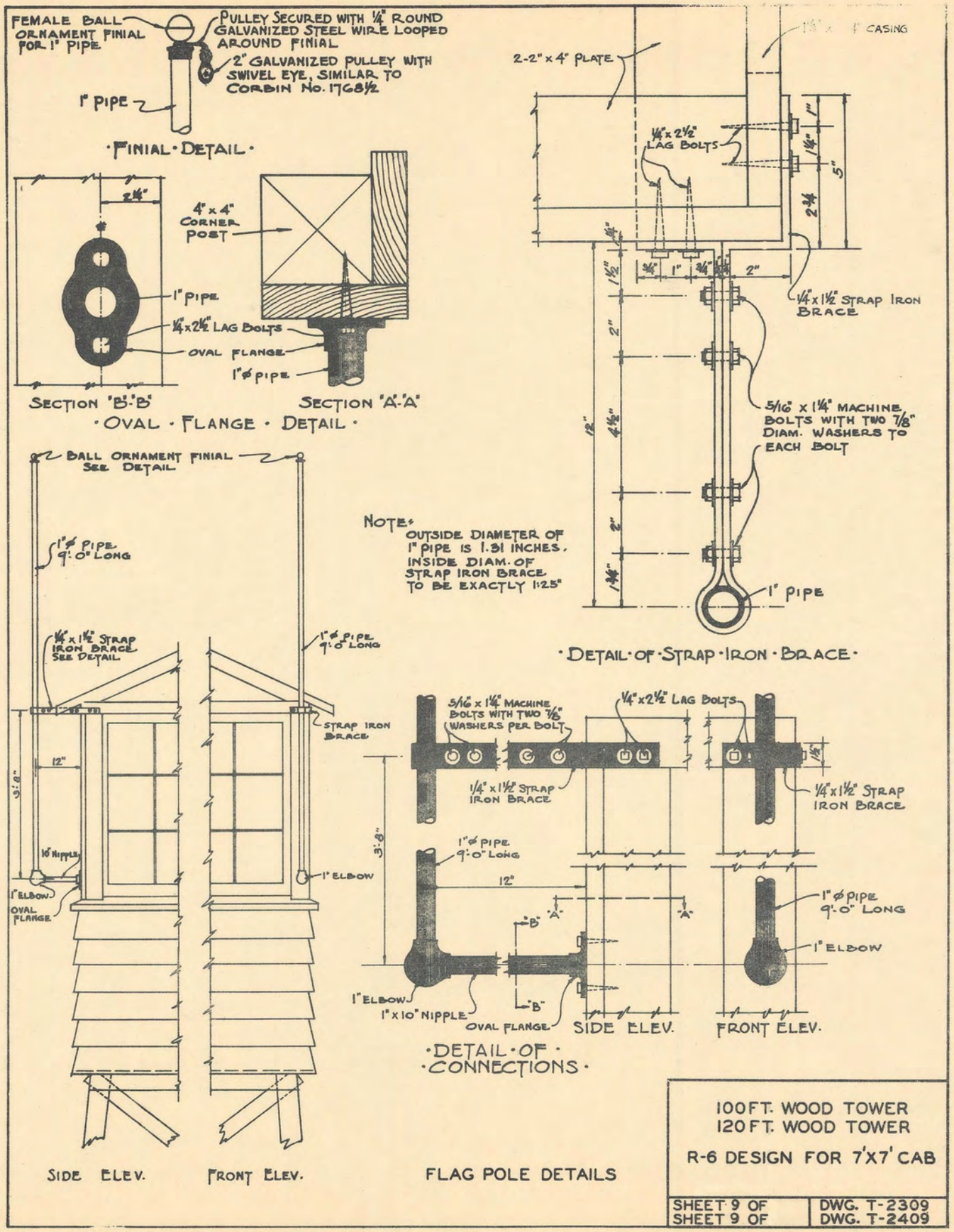
U.S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE
REGION SIX – JAMES FRANKLAND, ASS'T. REG. FORESTER

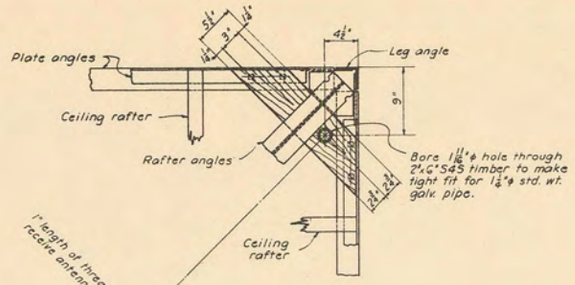
STANDARD – 1936

14' x 14' LOOKOUT HOUSE

DESIGNED H.L. DRAWN H.L. TRACED M.P.A.
SCALE AS NOTED CHECKED M.P.A. C.E.R.
APPROVED ASSISTANT REGIONAL FORESTER DATE NOV. 10, 1938

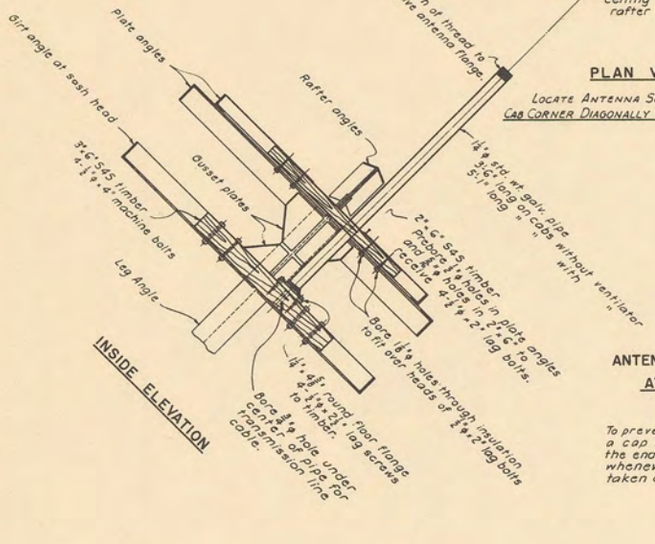
SHEET 5 OF 5 SHEETS B-4205


FEMALE BALL ORNAMENT FINIAL FOR 1" PIPE
PULLEY SECURED WITH 1/4" ROUND GALVANIZED STEEL WIRE LOOPED AROUND FINIAL
2" GALVANIZED PULLEY WITH SWIVEL EYE, SIMILAR TO CORBIN No. 1768 1/2
1" PIPE
·FINIAL·DETAIL·
2 1/4"
4" x 4" CORNER POST
1" PIPE
1/4" x 2 1/2" LAG BOLTS
OVAL FLANGE
1" ø PIPE
SECTION "B"-"B"
SECTION "A"-"A"
·OVAL·FLANGE·DETAIL·
2-2" x 4" PLATE
CASING
1/4" x 2 1/2" LAG BOLTS
1/4" x 1 1/2" STRAP IRON BRACE
5/16" x 1 1/4" MACHINE BOLTS WITH TWO 7/8" DIAM. WASHERS TO EACH BOLT
1" PIPE
·DETAIL·OF·STRAP·IRON·BRACE·
NOTE: OUTSIDE DIAMETER OF 1" PIPE IS 1.31 INCHES. INSIDE DIAM. OF STRAP IRON BRACE TO BE EXACTLY 1.25"
BALL ORNAMENT FINIAL SEE DETAIL
1" ø PIPE 9'-0" LONG
1/4" x 1 1/2" STRAP IRON BRACE SEE DETAIL
1" ø PIPE 9'-0" LONG
STRAP IRON BRACE
12"
3'-8"
10" NIPPLE
1" ELBOW
OVAL FLANGE
1" ELBOW
SIDE ELEV.
FRONT ELEV.
5/16" x 1 1/4" MACHINE BOLTS WITH TWO 7/8" WASHERS PER BOLT
1/4" x 2 1/2" LAG BOLTS
1/4" x 1 1/2" STRAP IRON BRACE
1/4" x 1 1/2" STRAP IRON BRACE
1" ø PIPE 9'-0" LONG
12"
3'-8"
"A"
"A"
"B"
"B"
1" ø PIPE 9'-0" LONG
1" ELBOW
1" ELBOW
1" x 10" NIPPLE
OVAL FLANGE
SIDE ELEV.
FRONT ELEV.
·DETAIL·OF·CONNECTIONS·
SIDE ELEV.
FRONT ELEV.
FLAG POLE DETAILS
100 FT. WOOD TOWER
120 FT. WOOD TOWER
R-6 DESIGN FOR 7'X7' CAB
SHEET 9 OF
SHEET 9 OF
DWG. T-2309
DWG. T-2409



PLAN VIEW

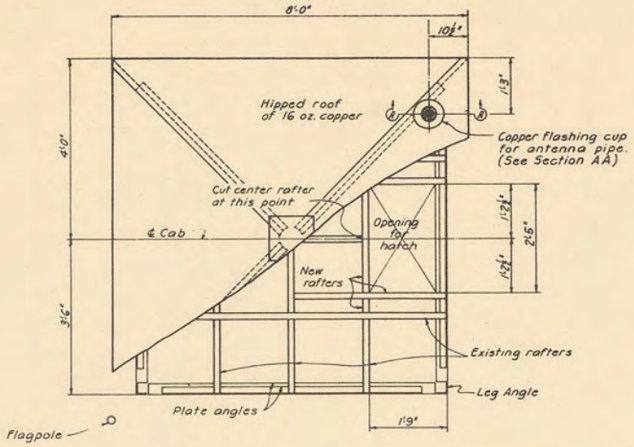
LOCATE ANTENNA SUPPORT AT CAB CORNER DIAGONALLY OPPOSITE FLAGPOLE



ANTENNA PIPE MOUNTING AT CAB CORNER

Scale: 1 1/2" = 1'-0"

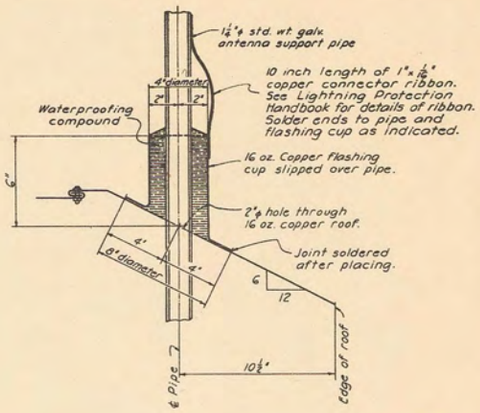
To prevent entrance of water, a cap is to be screwed over the end of the support pipe whenever the antenna is taken down.



CUT-AWAY ROOF PLAN

SHOWING LAYOUT OF FLASHING FOR ANTENNA PIPE AND REVISED FRAMING OF CEILING RAFTERS IF CAB HAS NO CATWALK AND A HATCH IS TO BE INSTALLED.

Scale: 3/4" = 1'-0"



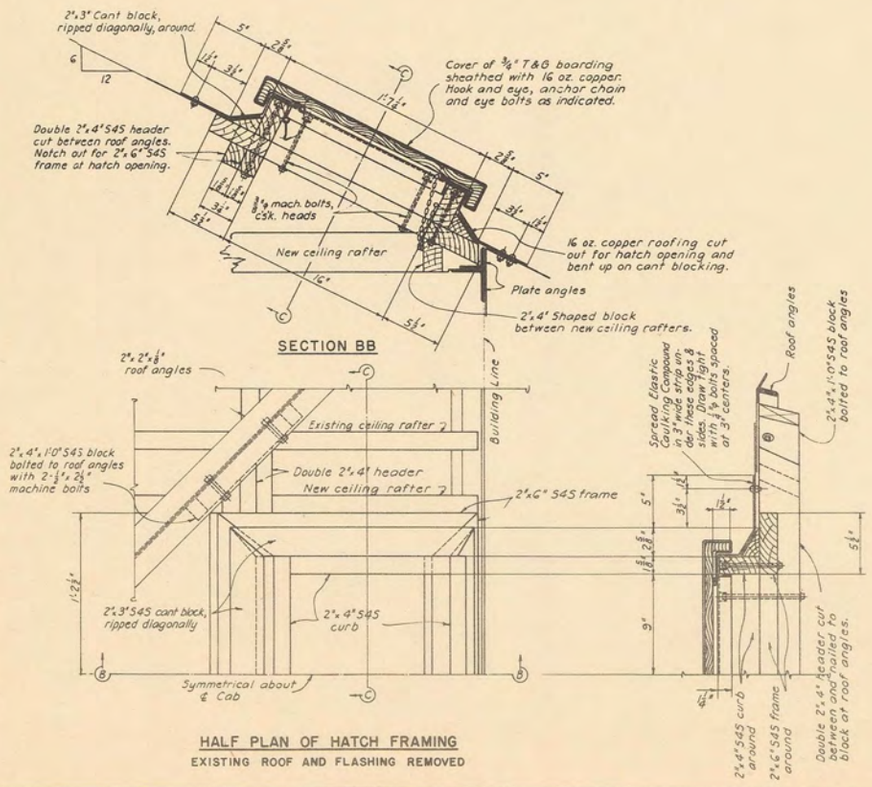
SECTION AA

Scale: 1 1/2" = 1"

MOUNTING DETAILS

FOR HIPPED ROOF CAB WITHOUT PLATFORM

SEE REGION 7 DRAWING NO. L-1403 FOR CAB DETAILS



SECTION BB

HALF PLAN OF HATCH FRAMING

EXISTING ROOF AND FLASHING REMOVED

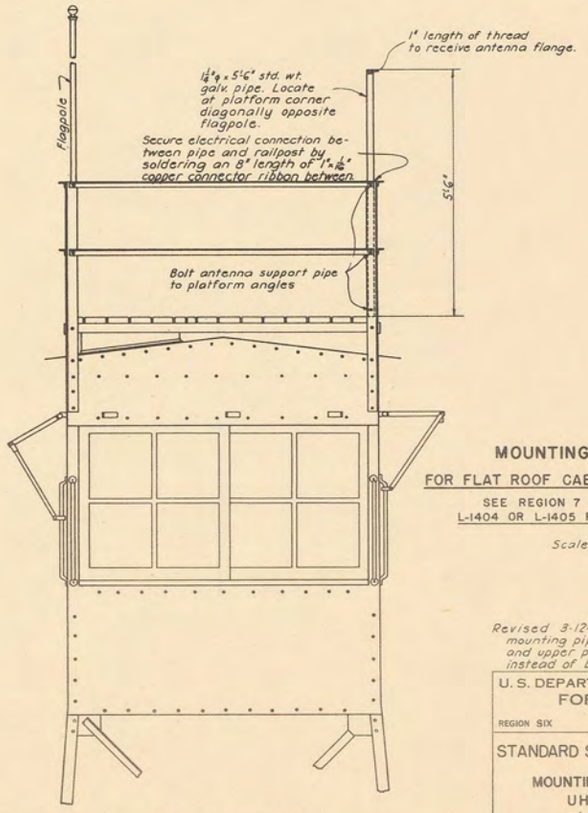
SECTION CC

HATCH DETAILS

Scale: 3/16" = 1"

16 oz. copper flashing around hatch, and cover with its copper sheathing, are to be furnished completed and ready for installation on the job. Joints in flashing and cover sheathing are to be single locked and soldered tight.

Hatch required if cab has no catwalk or other means of access for adjustment of antenna.



CAB ELEVATION

MOUNTING DETAIL

FOR FLAT ROOF CAB WITH PLATFORM

SEE REGION 7 DRAWING NOS. L-1404 OR L-1405 FOR CAB DETAILS

Scale: 3/4" = 1'-0"

Revised 3-12-42 by W.G. mounting pipe grounding details added and upper pipe steady block lagged instead of bolted to plate angles.

U. S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE

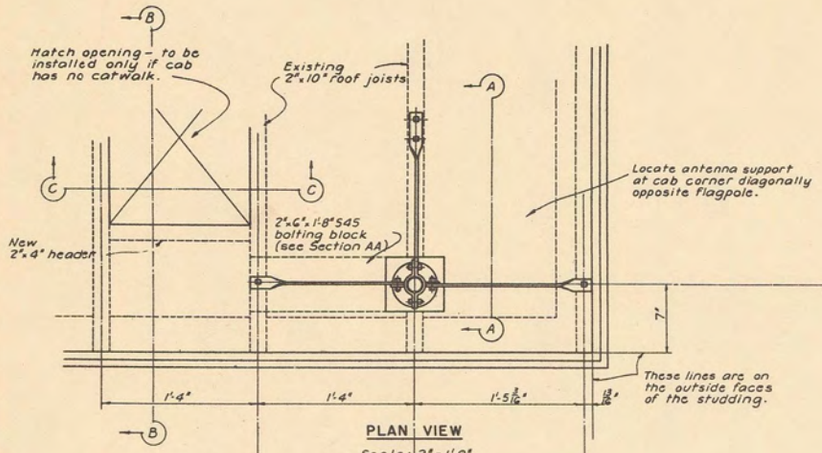
REGION SIX — JAMES FRANKLAND, REGIONAL ENGINEER

STANDARD STEEL LOOKOUT TOWERS

MOUNTING OF SUPPORT FOR UHF ANTENNA ON 7'x7' STEEL CABS

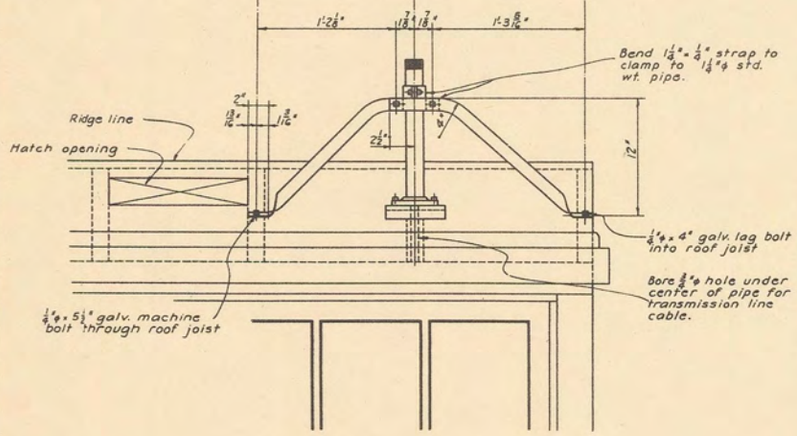
DESIGNED W.G. DRAWN W.G. TRACED W.G.
SCALE AS NOTED CHECKED
APPROVED ACT. ASSISTANT REGIONAL FORESTER DATE NOV., 1941

L-1409



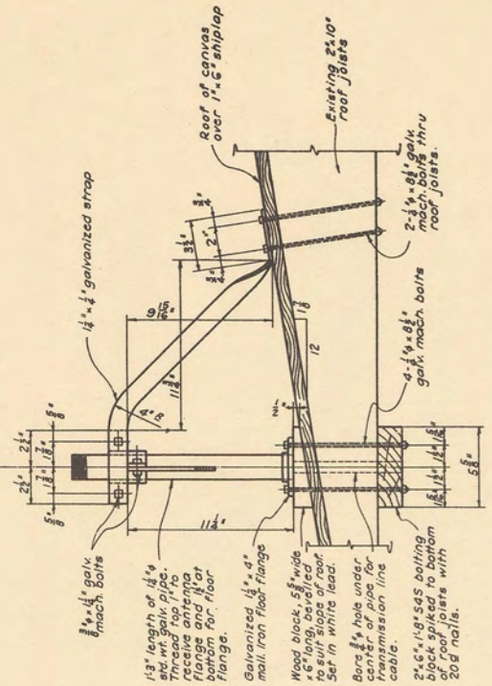
PLAN VIEW

Scale: 2" = 1'-0"



SIDE ELEVATION

Scale: 2" = 1'-0"



SECTION AA

Scale: 3" = 1'-0"

Bore machine bolt holes thru roof for drive fit. Set bolts in white lead.

ANTENNA PIPE MOUNTING DETAILS

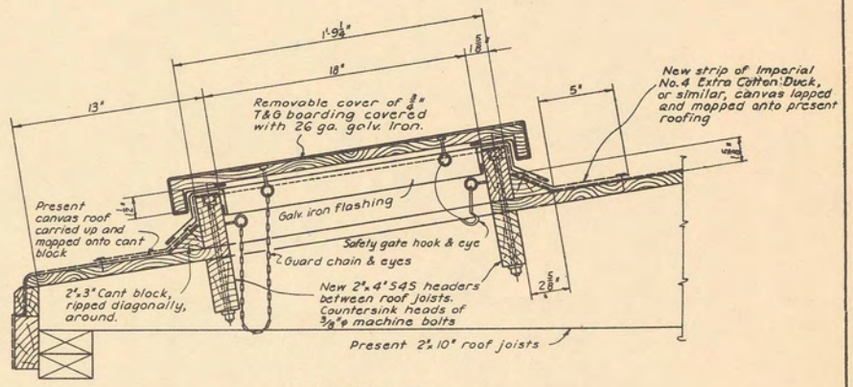
AT CAB CORNER

To prevent entrance of water, a cap is to be screwed over the end of the support pipe whenever the antenna is taken down.

HATCH DETAILS

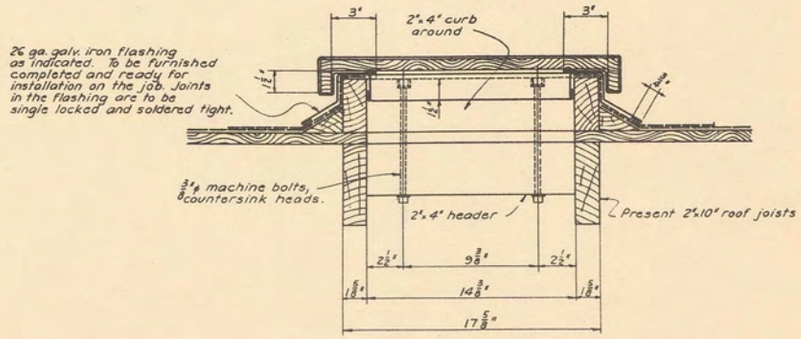
Scale: 3" = 1'-0"

Hatch required if cab has no catwalk or other means of access for installation and adjustment of antenna.



SECTION BB

(See Plan View of Mounting Details)



SECTION CC

(See Plan View of Mounting Details)

U. S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE

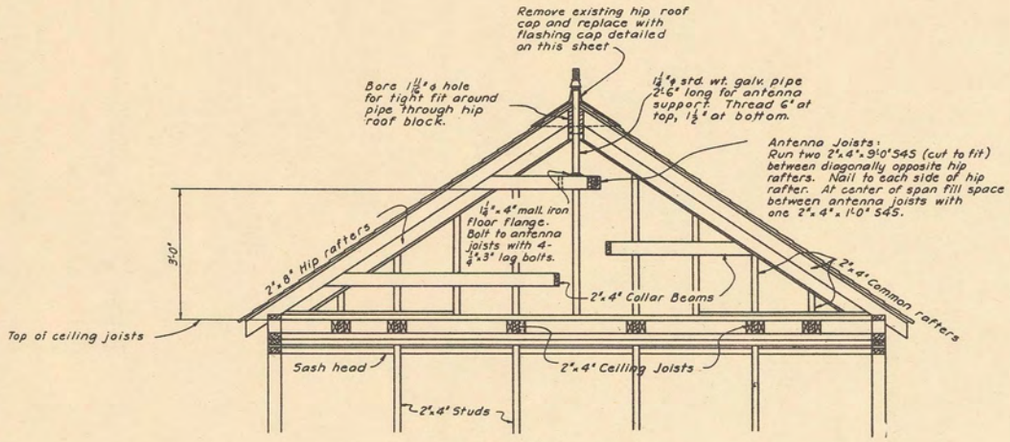
REGION SIX — JAMES FRANKLAND, REGIONAL ENGINEER

STANDARD WOOD LOOKOUT TOWERS

MOUNTING OF SUPPORT FOR UHF ANTENNA ON 7'x7' WOOD CABS

DESIGNED W.G. DRAWN W.G. TRACED W.G.
SCALE AS NOTED CHECKED
APPROVED ACT. ASSISTANT REGIONAL FORESTER DATE JAN., 1942

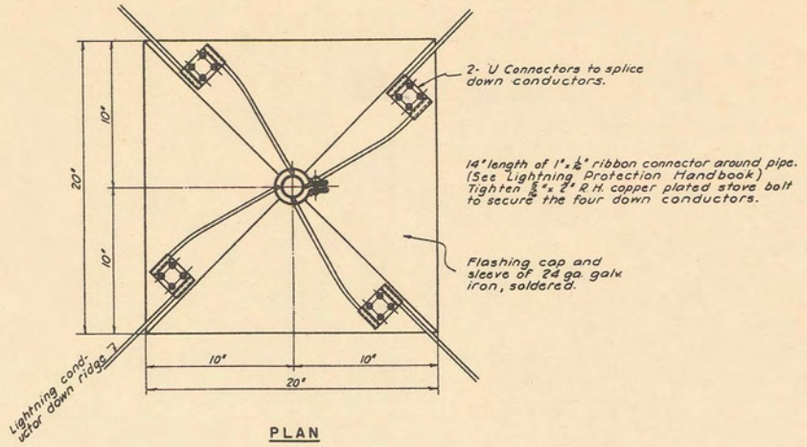
L-12201



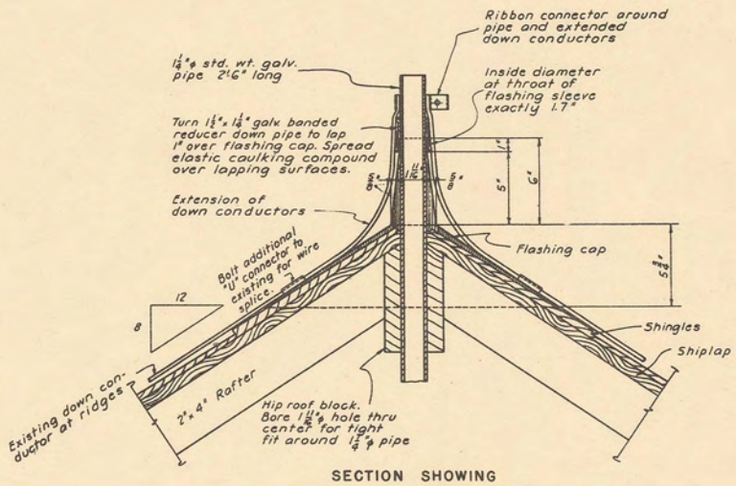
INTERIOR SECTION SHOWING ROOF FRAMING AND ANTENNA PIPE MOUNTING

Scale: 3/4" = 1'-0"

To prevent entrance of water, a cap is to be screwed over the end of the support pipe whenever the antenna is taken down.



PLAN



SECTION SHOWING DETAILS OF FLASHING CAP AND ALTERATION TO LIGHTNING PROTECTION

Scale: 1/8" = 1"

Remove existing lightning protection terminal and supports. Replace according to details shown above. Additional lightning protection materials needed are as follows:

- 4- "U" Connectors
- 16- 5/16"x 1" R.H. copper plated stove bolts
- 7 ft. #2 B&S ga. S.D. bare solid copper wire
- 14 in. 1"x 1/16" dead soft flat ribbon connector
- 1- 5/16"x 2" R.H. copper plated stove bolt

See Lightning Protection Handbook for details of above materials.

U. S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE

REGION SIX JAMES FRANKLAND, REGIONAL ENGINEER

STANDARD WOOD LOOKOUT TOWERS

MOUNTING OF SUPPORT FOR UHF ANTENNA ON 14'x 14' WOOD CABS

DESIGNED W.G. DRAWN W.G. TRACED W.G.
SCALE AS NOTED CHECKED
APPROVED ACT. ASSISTANT REGIONAL FORESTER DATE FEB., 1942

L-12301

SECTION IV

GUY CABLE SAG CURVES FOR TIMBER TOWERS

All timber towers included in this handbook have been designed to resist the overturning effect of wind by means of guy cables. As well as allowing economies in tower design and details, the use of guy cables decreases considerably the amount of sway resulting from wind as compared to a tower designed to resist wind without guys.

However, to be the most effective, guys must be tightened to the sags given by the curves on pages 21a to 21g. Field inspection shows that on very few towers are the guys sufficiently tight to do their work. The towers are designed to withstand these pulls and there need be no fear of harming the tower by tightening the guys to the sags given by the curves.

In erecting a tower the guys should be put in place and tightened as soon as the tower is erected to the panel point where the guys are attached. The guys should be tightened simultaneously or in small increments in rotation, keeping the sags as nearly equal as practicable in order to prevent unbalanced loads. After the proper sags are obtained the tower should be checked for plumb and the guys adjusted to plumb the tower. As new wire rope is subject to considerable permanent stretch, guys should be periodically tightened to the proper sag until there is no more stretch.

The sags shown by the curves on pages 21a to 21g have been computed on the assumption that the average temperature at the tower is 60° F. The guys are first to be adjusted to the sags given by the curves regardless of temperature, and then corrected for the difference between the temperature of the air at the time of adjustment and 60° F.

The amount of the adjustment will vary with the difference in temperature and the length of the guy. It will amount to one full turn of the adjusting nut for each 100 foot length of guy and each 20° difference in temperature. If the temperature at the time of adjustment is greater than 60° the guy shall be loosened, and if less than 60° the guy shall be tightened.

The following is an illustrative example:

Assumed conditions.

1. CT-1 type of tower.
2. 99' height.
3. 80' difference in elevation between anchorage and attachment of guy to tower.
4. 85° temperature at time of adjustment.

Procedure.

1. For above conditions Drawing L-20002 shows proper sag is 2-3/4". Adjust guys to this sag.

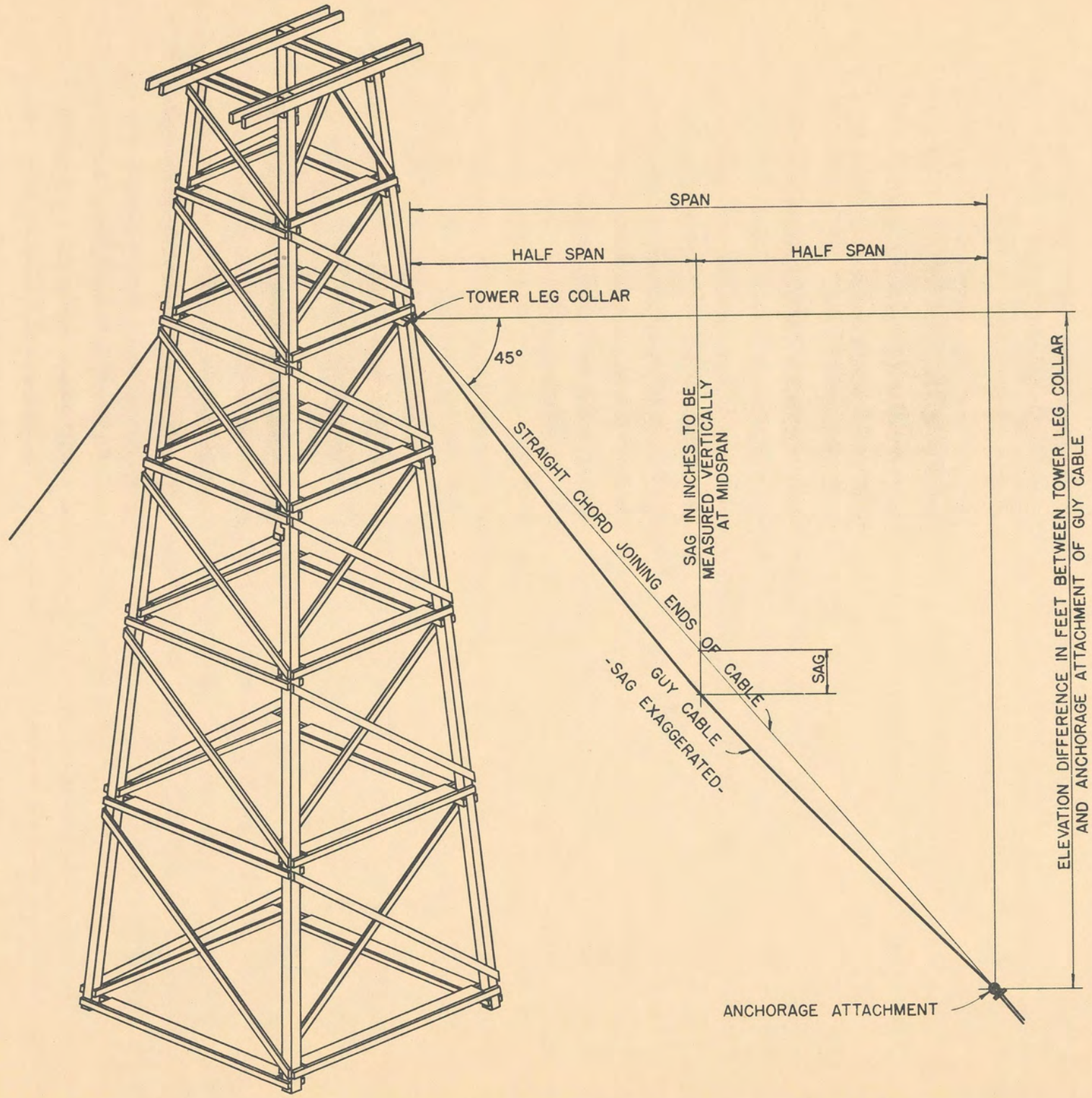
2. Figure number of turns on adjusting nuts to loosen guy the proper amount, as follows:

   Length of guy 140 feet.
   Difference between 85° and $60^{\circ} = 25^{\circ}$.
   Then number of turns necessary will be $\frac{140}{100} \times \frac{25}{20} = 1.75$ or 1-3/4 turns.

3. Readjust guys by loosening 1-3/4 turns on adjusting nuts.

In order to check the amount of sag in a particular guy by other than visual means, the following suggestion is offered. Stretch a chalk line or fine wire line tightly enough between the tower leg collar and the anchorage attachment, to eliminate as much as possible any sag in the line. Keeping it parallel to the straight chord joining the ends of the guy cable as shown in the Illustrative Diagram, drawing No. L-20001, move the chalk line or fine wire line down until it becomes tangent to the guy cable at its greatest sag point. The vertical sag from the guy cable to the chalk or fine wire line may then be easily measured at either the tower leg collar end or the anchorage attachment end. Another method is to use two carpenter's rules, one at each end of the guy. Hold each rule so that the ends are below the guy an amount equal to the desired sag. Tighten up guy until the point of greatest sag is in line with the ends of the rule. This can be done by eye.

When the tower is not occupied during the winter, the lookout should, on leaving the tower, loosen the guys by four full turns of the adjusting nuts. When occupying the tower the next season, he shall adjust the guys as previously outlined.



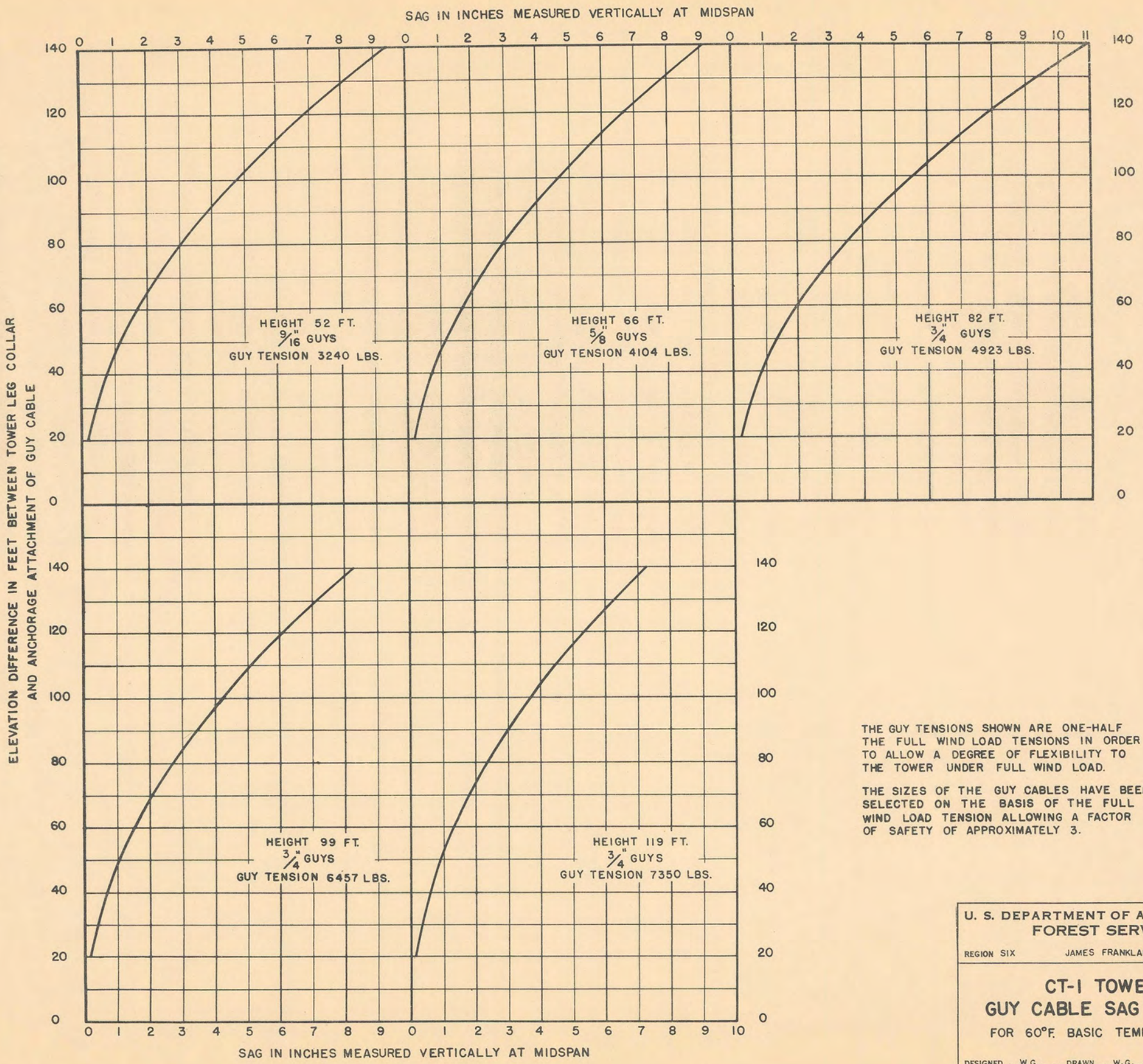
U. S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE

REGION 6 J. FRANKLAND REGIONAL ENGINEER

ILLUSTRATIVE DIAGRAM GUY CABLE SAGS

DESIGNED W.G. DRAWN W.G. TRACED W.G.
SCALE CHECKED
APPROVED DATE 12-28-37
ASST. REGIONAL FORESTER

L-20001



THE GUY TENSIONS SHOWN ARE ONE-HALF THE FULL WIND LOAD TENSIONS IN ORDER TO ALLOW A DEGREE OF FLEXIBILITY TO THE TOWER UNDER FULL WIND LOAD.

THE SIZES OF THE GUY CABLES HAVE BEEN SELECTED ON THE BASIS OF THE FULL WIND LOAD TENSION ALLOWING A FACTOR OF SAFETY OF APPROXIMATELY 3.

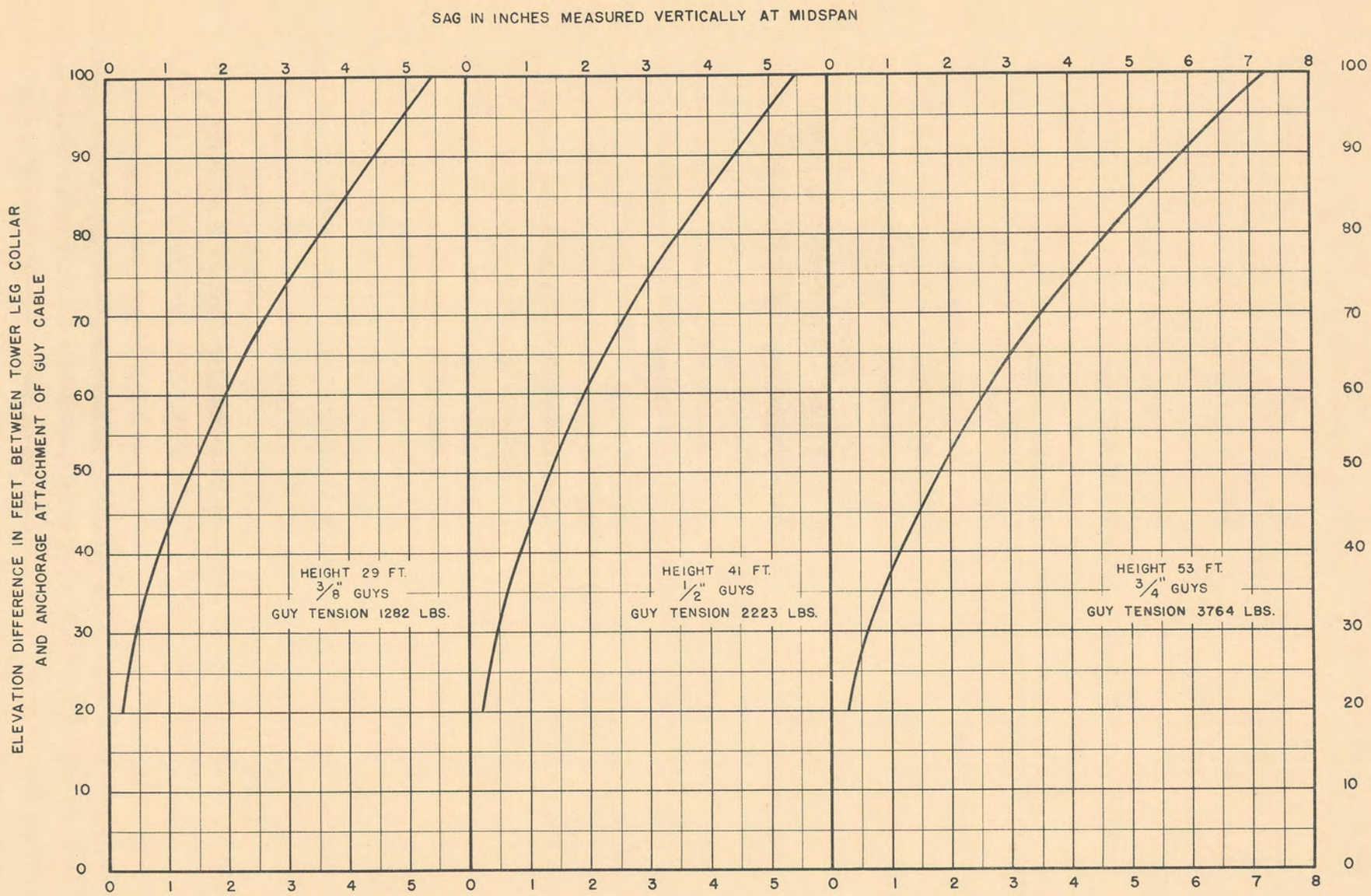
U. S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE

REGION SIX — JAMES FRANKLAND, REGIONAL ENGINEER

CT-1 TOWER
GUY CABLE SAG CURVES
FOR 60°F. BASIC TEMPERATURE

DESIGNED W.G. DRAWN W.G. TRACED R.G.S.
SCALE CHECKED
APPROVED DATE 2-7-39
ACT. ASS'T. REGIONAL FORESTER

L-20002



THE GUY TENSIONS SHOWN ARE ONE-HALF THE FULL WIND LOAD TENSIONS IN ORDER TO ALLOW A DEGREE OF FLEXIBILITY TO THE TOWER UNDER FULL WIND LOAD.

THE SIZES OF THE GUY CABLES HAVE BEEN SELECTED ON THE BASIS OF THE FULL WIND LOAD TENSION ALLOWING A FACTOR OF SAFETY OF APPROXIMATELY 3.

U. S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE

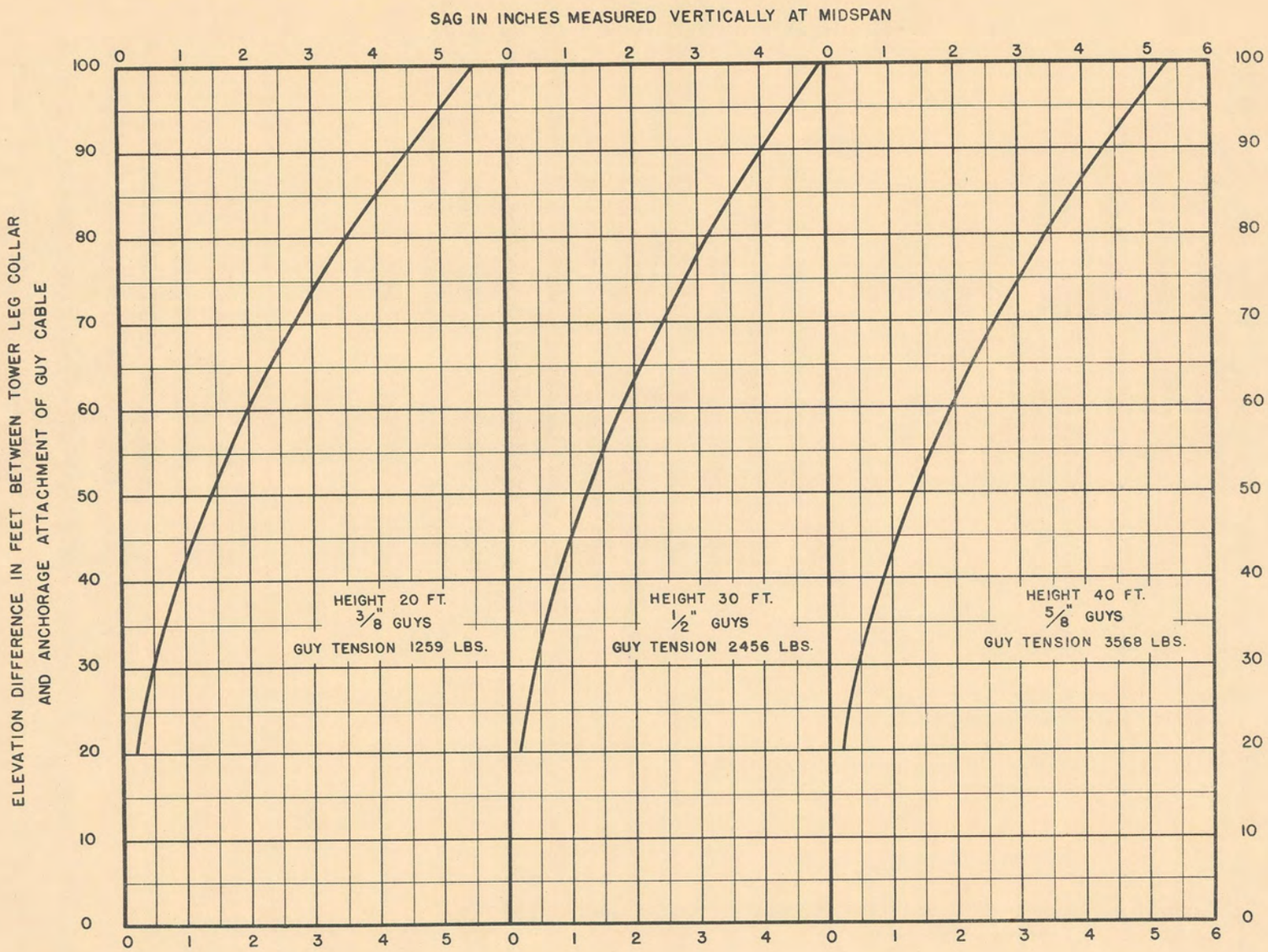
REGION SIX JAMES FRANKLAND REGIONAL ENGINEER

CT-2 TOWER
GUY CABLE SAG CURVES

FOR 60°F. BASIC TEMPERATURE

DESIGNED W.G. DRAWN W.G. TRACED R.G.S.
SCALE CHECKED
APPROVED DATE 2-8-39
ACT. ASST. REGIONAL FORESTER

L-20003



THE GUY TENSIONS SHOWN ARE ONE-HALF THE FULL WIND LOAD TENSIONS IN ORDER TO ALLOW A DEGREE OF FLEXIBILITY TO THE TOWER UNDER FULL WIND LOAD.

THE SIZES OF THE GUY CABLES HAVE BEEN SELECTED ON THE BASIS OF THE FULL WIND LOAD TENSION ALLOWING A FACTOR OF SAFETY OF APPROXIMATELY 3.

U. S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE

REGION SIX JAMES FRANKLAND REGIONAL ENGINEER

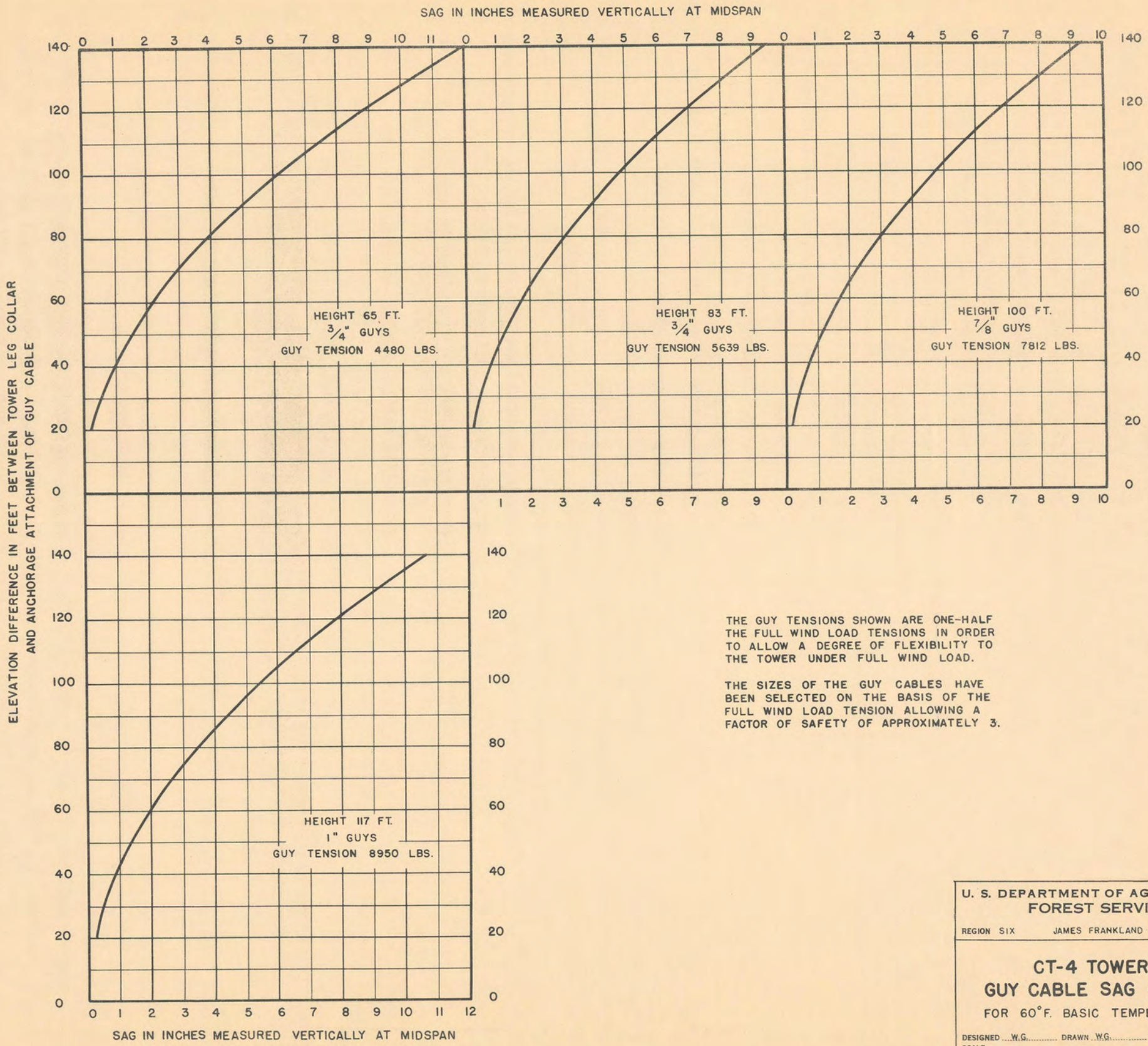
CT-3 TOWER
GUY CABLE SAG CURVES

FOR 60° F. BASIC TEMPERATURE

DESIGNED W.G. DRAWN W.G. TRACED R.G.S.
SCALE CHECKED
APPROVED DATE 2-8-39
ACT. ASST. REGIONAL FORESTER

L-20004

21C



THE GUY TENSIONS SHOWN ARE ONE-HALF THE FULL WIND LOAD TENSIONS IN ORDER TO ALLOW A DEGREE OF FLEXIBILITY TO THE TOWER UNDER FULL WIND LOAD.

THE SIZES OF THE GUY CABLES HAVE BEEN SELECTED ON THE BASIS OF THE FULL WIND LOAD TENSION ALLOWING A FACTOR OF SAFETY OF APPROXIMATELY 3.

U. S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE

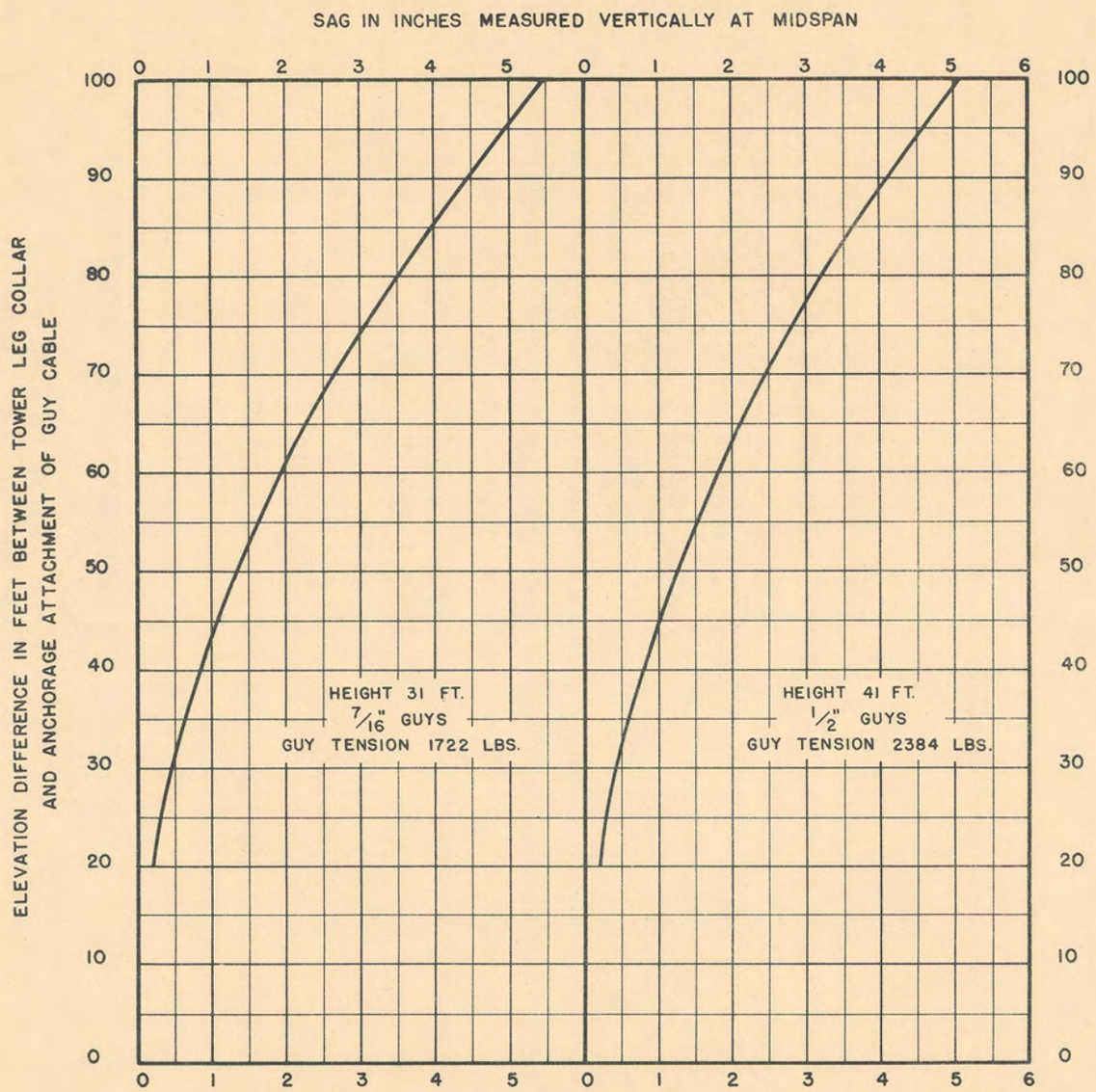
REGION SIX JAMES FRANKLAND REGIONAL ENGINEER

CT-4 TOWER
GUY CABLE SAG CURVES

FOR 60°F. BASIC TEMPERATURE

DESIGNED W.G. DRAWN W.G. TRACED R.G.S.
SCALE CHECKED
APPROVED J. L. Frankland DATE 2-9-39
ACT. ASST. REGIONAL FORESTER

L-20005



THE GUY TENSIONS SHOWN ARE ONE-HALF THE FULL WIND LOAD TENSIONS IN ORDER TO ALLOW A DEGREE OF FLEXIBILITY TO THE TOWER UNDER FULL WIND LOAD.

THE SIZES OF THE GUY CABLES HAVE BEEN SELECTED ON THE BASIS OF THE FULL WIND LOAD TENSION ALLOWING A FACTOR OF SAFETY OF APPROXIMATELY 3.

U. S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE

REGION SIX — JAMES FRANKLAND, REGIONAL ENGINEER

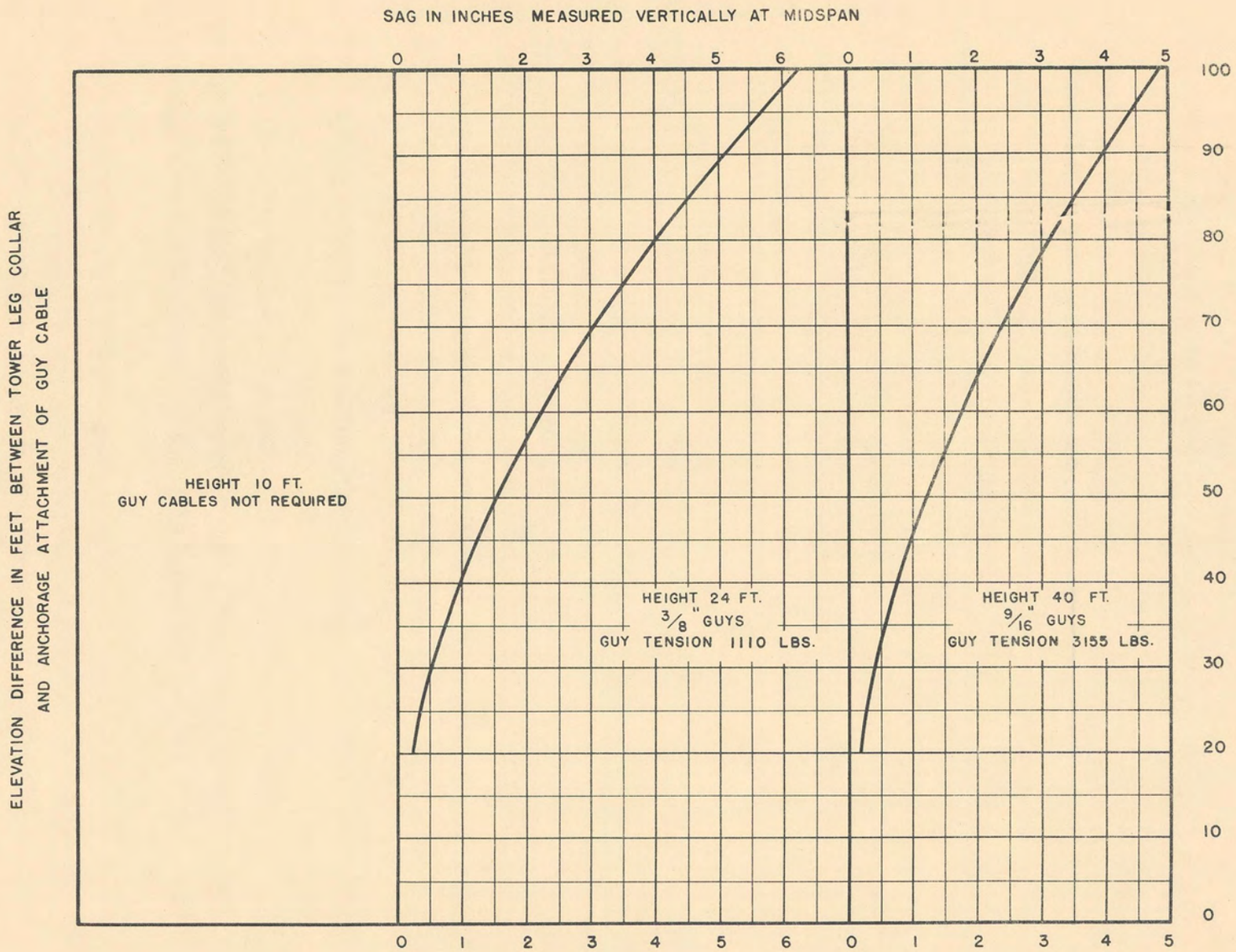
CT-5 TOWER
GUY CABLE SAG CURVES

FOR 60°F. BASIC TEMPERATURE

DESIGNED W.G. DRAWN W.G. TRACED R.G.S.
SCALE CHECKED
APPROVED DATE 2-10-39
ACT. ASST. REGIONAL FORESTER

L-20006

21E



THE GUY TENSIONS SHOWN ARE ONE-HALF THE FULL WIND LOAD TENSIONS IN ORDER TO ALLOW A DEGREE OF FLEXIBILITY TO THE TOWER UNDER FULL WIND LOAD.

THE SIZES OF THE GUY CABLES HAVE BEEN SELECTED ON THE BASIS OF THE FULL WIND LOAD TENSION ALLOWING A FACTOR OF SAFETY OF APPROXIMATELY 3.

U. S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE

REGION SIX JAMES FRANKLAND REGIONAL ENGINEER

RT-1 TOWER
GUY CABLE SAG CURVES
FOR 60°F. BASIC TEMPERATURE

DESIGNED W.G. DRAWN W.G. TRACED R.G.S.
SCALE CHECKED
APPROVED DATE 2-9-39
ACT. ASST. REGIONAL FORESTER

21F

L-20007

SECTION V

LIGHTNING PROTECTION

For detailed information on the standard type of lightning protection with which all lookout structures and other Forest Service buildings on exposed high points or ridges should be provided, the 1940 edition of the Lightning Protection Handbook should be consulted.

This handbook supersedes the 1932 publication of the United States Department of Agriculture, Forest Service, and embodies such information contained in that publication as is believed necessary for Forest Service purposes. Rules which are pertinent in all cases are listed and standard protective systems for several types of structures are illustrated.

Copies of this handbook are on file in each Regional Office.

SECTION VI

SUGGESTED SPECIFICATIONS FOR STEEL AND TIMBER TOWERS AND CABS

The specifications presented in this Section are offered as suggestions for use by the Regions. Copies of proposals for purchase of towers are on file in Regional Offices. In case a local purchase is to be made these proposals should be reviewed for arrangement to secure competitive bids between wood and steel and for revisions to the specifications which may have been made since printing this book.

The accompanying specifications have been used on several competitive bid advertisements for steel and timber towers. Much thought has been given toward making the specifications fairly alternate for both the steel and timber interests. Inspection clauses in both sets of specifications have been so written as to allow the receipt of high quality material and workmanship if the agency making the purchase will make close and adequate inspection. There is a strong possibility of the loss of much time during erection if defective material with faulty fabrication is allowed to be shipped. Too much stress cannot be laid on the seriousness of inadequate inspection.

The steel tower specifications include the steel cab for the 7' x 7' tower. The specifications contain a paragraph giving the contractor the option of furnishing a steel house for 14' x 14' towers as a substitution for the wood 14' x 14' house.

The specifications for the wood cabs are divided into two sets: First the "Specifications for 7' x 7' Lookout House"; second, the "Specifications for 14' x 14' Lookout House." If interior furniture and fire finder stand are desired they must be specified in bid items for both wood and steel. (See pages 27c and 28d).

SPECIFICATIONS FOR STEEL LOOKOUT TOWERS

1. General

These specifications are based on many years of experience with lookout towers and similar structures, and in the light of this experience, towers to be satisfactory must conform to these specifications. The design and details of the structure have been made to meet the requirements of the Forest Service, and bids on towers differing in design or detail cannot be considered.

2. Inspection

The quality of material used, the fabrication, the galvanizing and the preparation for shipment of the material shall, at all times during the processing, be subject to inspection by the Government. Such inspection will be for compliance with specifications only. The contractor shall furnish such equipment, records and assistance as is necessary for the proper inspection of the work. The contractor will further completely assemble and erect such panels of the towers as the Forest Service inspector may require.

3. Work to be Done

The bidder to whom the award is made will be required to furnish all labor and material necessary to the complete fabrication of one or more towers of heights specified, including all structural steel shapes, plates and bars, sheet metal, copper for roof, and ventilator, when called for - (copper or galvanized iron or copper bearing steel for siding at option of purchasing agency); galvanized and glazed metal sash, including putty and necessary fastenings; structural bolts, carriage bolts for fastening down the cab flooring, landings, and stair treads; brass bolts or machine screws with nuts necessary to sheet metal work; cleat and fittings for attaching same to corner angles of cab; hinges, hasp and trap door stay chain. All structural shapes and metal, including sheet metal, shall be completely fabricated so that it will not be necessary to do any cutting, bending, drilling, punching or reaming in erecting the tower or towers.

The contractor will also be required to furnish all material necessary for the erection of the cab, according to the attached plans for the steeltowers, and including cab flooring, necessary wood framing and trim, insulating material, wood screws and other hardware. In addition, the contractor will furnish, fabricate and treat all lumber for the stair treads and landing platforms. The stair tread and landing platform lumber shall be fabricated so that it will not be necessary to do any cutting or boring in its use on the tower, after which it shall be treated as hereafter specified. The Government will furnish all material, including anchor bolts and reinforcing steel, for tower and stair footings, all lightning protection and lock for cab trap door.

4. Materials

Ferrous sheet metal for siding shall be pure iron or copper bearing steel.

Bolts for structural field connections shall be of mild steel square head, with hexagonal nuts and spring steel locking devices, having six spring steel jaws, or approved locking devices equally effective. Locking devices must provide an effective

and permanent lock when tightened against the hexagonal nuts furnished. Bolts shall be of such length that at least one, and not more than three, full threads will be exposed after installation. The threads shall be outside the holes of the connected members, except as required to secure tight connections. Bolts and nuts shall be galvanized after threading, and the threads cleaned after galvanizing so that the nut turns freely on the bolt.

Bolts in tension shall have double nuts. Metal siding and roofing shall be attached to structural shapes with a 1/4" round head brass bolt for machine screws with nuts. Three-eighths (3/8") inch carriage bolts shall be furnished for fastening down cab flooring, stair treads and landings (which will be of 2" lumber, nominal dimension).

Metal sash shall be equal to Fenestra Sash manufactured by the Detroit Steel Products Company. The sash on each side of the tower shall be composed of 15 lights with 6-light ventilators as shown, which shall be pivoted so that the top part swings in and the bottom out. Sash shall be of one piece for each side, and shall be galvanized after fabrication. Provision shall be made for fastening the ventilator in any open position and locking it. The sash shall be weatherproof so that no water can beat in through the sash or connections. The sash shall be so constructed as to obstruct the view as little as possible. Plans of the sash and weather-proofing details shall be submitted for approval before fabrication is authorized.

5. Fabrication

All pieces shall be of sizes called for on the attached design drawings, shall be straight and true, and carefully cut to length. The holes in all structural connections shall be punched, sub-punched and reamed or drilled from the solid, as the contractor may elect.

Unless otherwise stated, the holes in all structural connections shall not exceed the diameter of the bolt which it is to accommodate by more than one thirty-second (1/32) of an inch.

Unless otherwise stated, the sizes of rivets or bolts for structural connections shall be the dimensions given in table of "Structural Connections," which dimensions are for the width of the leg of the smallest angle through which the rivet or bolt passes.

All joints and splices shall be made in accordance with the details on the attached design drawings. The ends of all angles 1/8" thick (except stiffener strut splices) shall be bent together before punching, as indicated on the attached details. The number of bolts for each joint is indicated on the attached drawings; the number in the article indicating the number of bolts on each side of the joint as in the main leg members or the number of bolts in each end of each connecting member as diagonals or struts. All secondary struts bracing the main leg angles, all diagonal struts bracing the main struts laterally, and all landing members shall be connected with at least one bolt, and ring fills shall be provided if these members do not pass the same plane.

Splice angles, foot plates and gusset plates attached to the main leg members shall be fastened by bolts, except as noted in cab construction, and each piece will be separately galvanized.

All angles shall have the vertical leg down and all unequal angles shall have the long leg vertical except as shown on cab details.

Stair landings shall be in sizes, shapes and positions shown on drawings. From the first to the fifth landing, inclusive, the floor boards will extend from stair header to outside of main struts, perpendicular to stair header. Flooring will consist of either 2" x 8", or 2" x 12" plank, nominal dimension.

Details of holes for floor bolts at second landing are typical from third to ninth landings, inclusive. Holes for floor bolts in main struts shall be so spaced as to fall on perpendicular lines through corresponding holes in header.

Each leg angle will have a seven-sixteenth (7/16") inch punched hole near the top (under the cab) for telephone ground connection, and four eleven-thirty-seconds inch (11/32") punched holes near the bottom, (just above the diagonal connection), spaced one and one-sixteenth inches (1-1/16") on centers for attaching the standard "U" type lightning connector.

Lumber Specifications:

The lumber shall be Southern Yellow Pine. Lumber for stair landings and stair treads shall be clear vertical grain. Lumber for finish and sub-floor shall be "A" vertical grain flooring. Baseboard and strip beneath windows shall be "A" finish. All other lumber shall be No. 1 common. Douglas Fir, of a comparable grade, may be furnished in place of Southern Yellow Pine.

Lumber for stair, treads and landings shall be pressure treated with either Zinc Chloride, Chromated Zinc Chloride, or Wolman salts. Such treatment shall be in accordance with Section 4, Preservative Treatment, of "Specifications for Timber Lookout Towers."

6. Shop Drawings

Contractors shall furnish the purchasing agency with two sets of shop drawings for approval, and one set formally approved, or approved subject to minor correction, will be returned to the contractor before fabrication is started. One set of shop drawings, as approved, shall be shipped with each tower for field reference. The Government will check shop details for sizes of members, sufficiency of joints, overall dimensions and other features affecting the shape and strength of the tower. No detailed dimensions will be checked and the contractor will be responsible for these and the fit of members during erection. Bidder's time of delivery shall include an allowance of four calendar days for checking and approving shop drawings; this period to be determined as being the four days following the date of the receipt of the shop drawings by the purchasing agency. No extension of the contract time will be granted because of revisions necessitating re-submission before formal approval. The shop drawings shall also include a detailed bolt list showing the number, type, size and location of all bolts necessary to the erection of each and every part of the completed towers.

7. Erection Diagram

The contractor shall furnish the purchasing agency with one copy of an erection diagram or diagrams, showing location and match marking of the various members of each height of tower to be furnished, by which the position of each member and also the size bolts to use at each joint may be known. He shall also ship two copies of the erection diagram with each tower.

8. Marking

Each member shall be match marked before galvanizing, with incised figures, and/or letters or combinations thereof, to indicate its position in the tower

9. Galvanizing

After all the shop work has been finished, all structural parts of the towers, except anchor bolts, shall be thoroughly galvanized by using the hot process in accordance with ASTM Specification A-123-33.

The galvanizing shall consist of a heavy coating of spelter, evenly and uniformly distributed over all surfaces of angle members, and ferrous metal cab parts. Spelter shall be applied in such a manner that it will not peel off in transportation or in the course of erecting the tower. Any spelter which peels, cracks or blisters under ordinary handling shall be prima facie evidence of poor workmanship and cause for rejection.

The bolts, nuts and locking devices (except brass bolts) shall be galvanized by the hot process.

10. Preparation for Shipment

All members that form one tower shall be put up in bundles, the bundles to be tagged with the tower number and with the proper erection mark. The bolts are to be boxed. All bolts necessary to put any one tower together, with the excess allowance specified, shall be separately boxed according to size. Erection and shop drawings shall be shipped in a bolt box and protected from injury by corrugated cardboard.

11. Optional Steel Cab for 14' x 14' Tower and Optional Steel Stair Treads, Catwalks and Landing Platforms

Where a wooden cab is required by the specified plans for the 14' x 14' steel lookout tower, bidder, at his option, may substitute an insulated steel cab with wood interior floor as shown on the plans equivalent in design and construction to the wood cabs now required. The type of insulation furnished for such steel cabs must be in full accord with generally accepted commercial practice to afford adequate protection against the elements. The window spacing and the door with glass shall be so arranged as to provide maximum outlook area and minimum "blind area" consistent with adequate strength in structural design. Bidders electing to furnish steel cabs must furnish with their bid drawings or blueprints showing in detail the cab they propose to furnish. For stair treads, catwalks, and landing platforms, bidders on steel towers may offer instead of wood, non-skid steel treads. Bidders electing to furnish steel treads must furnish with their bid detailed description of the treads they propose to furnish.

All metal parts must be galvanized in accordance with the specifications.

SPECIFICATIONS FOR TIMBER LOOKOUT TOWERS

1. General

The design and details of the structure for which plans are attached have been made to meet the requirements of the Forest Service, U. S. Department of Agriculture, and bids on towers differing in detail or design cannot be considered, except that minor changes in detail submitted by the successful bidder may be approved by the Government. The approval of any changes will not relieve the bidder of responsibility for accurate fabrication so that the towers will fit accurately when assembled.

The contractor will be required, in accordance with these specifications, to furnish, fabricate and treat all lumber for the tower, stairs and cab joists as shop detailed on the drawings. In addition, he will be required to furnish all lumber for stair and landing platform rails.

The Government will furnish lock for cab trap door, and cement and aggregate for all footings and anchorages. All other material shown and/or listed on the drawings shall be furnished by the contractor.

All lumber items which have been shop detailed on the plans shall be accurately fabricated to the dimensions shown, in accordance with that part of these specifications covering fabrication, so that it will not be necessary to do any cutting or boring in erecting the tower.

All lumber items which have been shop detailed shall be treated, after fabrication, in accordance with that part of these specifications covering preservative treatment.

2. Inspection

A representative of the Forest Service will inspect the lumber, fabrication and treatment. The quality of lumber and preservative used, the fabricating plant and the preservative treatment shall, at all times during the progress of fabrication and treatment, be subject to inspection by the Government. Any rejected material shall be immediately removed from the vicinity of the work. The contractor will furnish an official inspection certificate from the lumber association under whose rules the lumber is graded, certifying to the grade of all lumber used, and also a certificate of treatment, as provided in that part of these specifications, covering preservative treatment. The contractor will further completely assemble and erect such panels of the towers as the Forest Service inspector may require. Inspection by Government Inspectors will be for compliance with specifications only.

3. Lumber for Tower

The intent of these specifications is to secure timber in which the tendency to distort during seasoning and treatment after fabrication will be minimized, for which straight grained lumber at uniform growth in accordance with these specifications is essential.

All lumber shall be selected and inspected in accordance with the following requirements:

(a) Kinds of wood

Southern Yellow Pine, of the grade Prime Structural, conforming to Paragraphs 325 and 336 of the 1936 Standard Specifications for Grades of Southern Pine Lumber and Timber issued by the Southern Pine Association, as these paragraphs may apply to the various sizes of timber used in the structure, except that the requirement for species designation (longleaf), for density, and for heartwood is waived. In addition the material shall be free from compression wood. The contrast in color between springwood and summerwood shall be sharp, and the summerwood shall be dark in color.

8" x 8" posts shall show on each inch of each end not less than six rings per inch, measured on a radial line. All other material shall show on each inch of each end not less than four rings per inch, measured on a radial line. In Boxed heart pieces, measurement or rings per inch shall begin at the pith.

Douglas Fir shall be old growth Coast type of the Grade Select Structural, conforming to paragraphs 210, 214, and 218 of the 1934 Grading Rules of the West Coast Lumbermen's Association. In addition no piece over 2 inches in nominal thickness shall have boxed heart, and the rate of growth specified above for Southern Yellow Pine shall also apply.

Bidders shall state in their proposal the species of wood they propose to furnish.

(b) Pieces unsuitable for the use intended due to the presence of defects admissible under the grading rules shall be rejected.

(c) Crook: All lumber used structurally in the tower, including stair and landing platform stringers, shall be inspected for crook. Pieces 16' long with a crook of more than 1" will not be accepted. Pieces other than those 16' long shall not have more than a proportional crook. No piece shall have more than 1/2" crook in any 8' length. Crook shall be considered as a deviation from a straight line extending from a narrow edge at one end of the piece to the corresponding edge at the other end. Crooks are measured at the point of greatest deviation of the narrow face from this straight line.

(d) Sapwood: In view of the fact that all structural material is to be treated, it shall preferably have a high percentage of sapwood unless otherwise specified.

(e) Decay: No piece shall contain red heart or evidence of decay of any kind.

(f) Defects: Checks or other defects, including any crook greater than that specified in paragraph 3(c), that develop during seasoning or treatment which may impair the value of the pieces for the use intended shall cause rejection of the pieces. All lumber shall be straight and free from wind.

(g) Slope of Grain: All lumber used in members that have ring grooves at the ends, shall not have a slope of grain greater than one inch crosswise in any 12 inch length of the piece.

(h) Seasoning: Douglas fir lumber (2" thick or less) shall be cut rough and seasoned (air-dried or kiln-dried) to a moisture content not to exceed 18%. Douglas fir timbers over 2 inches thick shall be seasoned to a moisture content not to ex

ceed 18% in the outer two inches. As an alternate to air-drying or kiln-drying, the contractor may use the Boulton process to season the timbers to the above specified moisture content. The surfacing, fabricating, and treatment shall be done after seasoning to the sizes and dimensions shown on the drawings.

4. Preservative Treatment

Stair stringers, stair treads, landing platform planks and handrail posts shall be given a pressure treatment with Zinc Chloride, chromated Zinc Chloride or Wolman Salts. All other material shall be pressure treated with either creosote or a 50-50 mixture by volume of creosote and petroleum oil.

(a) Preservatives

Zinc Chloride: Shall conform to the latest standard specification of the American Wood Preservers Association for Zinc Chloride.

Chromated Zinc Chloride: The mixture shall contain not less than 81.5 per cent of zinc chloride in accordance with the above specification and not more than 18.5 per cent commercial sodium bichromate.

Creosote: Creosote when fresh shall be Grade 1 oil according to specification 4F of the American Wood preservers Association and shall have a residue above 355° C of not more than 20%. A 3% tolerance will be permitted in used oil.

Petroleum Oil: Petroleum Oil shall have an asphalt base and shall comply with the following requirements:

1. The flash point shall be not less than 220° Fahrenheit (Cleveland open cup).

2. The viscosity (Saybolt-Universal) shall be between 60 and 180 seconds at 180° F, and shall not be more than 1300 seconds at 100° F.

3. The percentage of water and sediment shall not be more than 1%.

Wolman Salts: Wolman salts shall be tanalith (to resist decay and termites) with the following composition:

Sodium Fluoride	- Minimum %	23.12
Arsenate	- Minimum %	23.13
Dichromate	- Minimum %	34.68
Dinitrophenol	- Minimum %	11.57
Insolubles in hot water	- Maximum %	0.50

(b) Treatment

Zinc Chloride Treatment: Shall be according to the latest standard specification of the American Wood Preservers Association. Net retention of dry salt shall be not less than 3/4 pounds per cubic foot.

Chromated Zinc Chloride: Shall be according to the best practice for such treatment. Net retention of the dry salt shall be not less than 3/4 pounds per cubic foot.

Wolman Salt Treatment: Shall be according to the best practice for such treatment. Net retention of dry salts shall be not less than 5/10 pounds per cubic foot.

Creosote Treatment: It is essential that the creosote treatment result in a dry, clean product, with a minimum amount of pieces that will bleed after erection. Material shall not be treated with another charge unless the other material is of substantially the same size and requires a similar treatment. Treatment in a charge with poles or larger square timbers will not be allowed. All material shall be fully fabricated before treatment.

Southern Pine shall be pressure treated by the empty cell process with initial air, according to Specification 35-c, of the American Wood Preservers' Association, and in addition shall be given a steam bath of one hour at the end of the treatment. Steam pressures shall be not more than 22 pounds per square inch, and a final drip vacuum shall be applied after the steam bath. The final retention of oil shall be 8 pounds per cubic foot.

Douglas Fir shall be pressure treated by the empty cell process with initial air, according to Specification 45-a of the American Wood Preservers' Association, and in addition shall be given an expansion bath of not less than two hours at the end of the treatment. Final retention of preservative shall be 8 pounds per cubic foot for all material. All timber 4" and over in thickness shall be incised on all four faces. Timber less than 4" in thickness may be incised on all four faces and shall be incised on the wide faces. Incising shall be done on a Greenlee, or similar incising machine, with power driven rolls designed to incise so as to obtain a uniform depth of penetration of preservative with a minimum loss of structural strength. The incising teeth shall be so designed that the point is sharp and the edges wedge-shaped so that upon entering or leaving the wood a separation and spreading of the fibres is accomplished. The teeth shall be spaced approximately 1" transversely staggered and 2-1/2" longitudinally.

The depth of the incisions shall be such as to secure a minimum penetration of preservative conforming to the following scale:

Minimum Nominal Thickness	Penetration of Creosote
3	1/4"
4	5/16"
6	3/8"
8	7/16"
10	1/2"
12 and over	9/16".

A certificate of treatment, signed by the plant superintendent, shall be furnished with each charge treated. If the bidder intends to sublet the treating he shall submit the name of the concern that is to do the treating for approval before the treatment is started.

Any pieces, which have been so affected by treatment as to impair their usefulness for the purpose intended, will be rejected.

5. Fabrication

The contractor shall check the drawings and report any errors or discrepancies to the Purchasing Officer. After errors are corrected the contractor shall fabricate the lumber to the exact dimensions shown on the corrected drawings, and mark each piece with its identifying mark as shown on the shop details.

The size of holes is generally shown, but in all cases shall be bored 1/16" larger than the metal for bolts and 1/16" smaller for dowels and drifts. Bolt holes in timber over 6" thick that is not assembled in the shop shall be bored from both sides of the piece.

Ring grooves shall be cut, where possible, on the face on which wane does not appear, with a sharp tool of such design as to leave a clean cut without tearing the grain or leaving slivers around the edge of the groove. The grooves shall be 1/32" wider than the thickness of the ring and the core shall be sufficiently greater than the inside diameter of the ring to expand the perimeter of the ring 1/8". Ring grooves shall be exact depth to provide bearing on one-half of width of ring.

Tenons at ends of posts shall be accurately laid out and cut by dado. Saw cuts will not be allowed for this feature of the work. After tenons are cut each post shall be assembled with the adjacent post and splice plates, and holes for the splices shall be bored while assembled. Splice plates and posts are then to be matchmarked for erection so that they occupy the same relative position in the erected structure as when bored. The contractor shall furnish an erection diagram on which all matchmarked members are noted for use during erection. Outside faces of posts shall be marked for face (A, B, or C) and top or bottom of each post shall be indicated. All posts shall be ordered two feet longer than the required length and after seasoning shall be cut to the required length in order to eliminate end checks.

6. Lumber for Stair and Platform Rails

Lumber for stair rails and platform rails shall be B and better heartwood of Douglas Fir or Southern Yellow Pine, and shall not be treated with any wood preservative.

7. Shop Drawings

One set of larger scale copies of drawings referred to will be furnished successful bidder by the Government. Additional sets may be purchased from the Government.

8. Hardware

Split ring connectors shall be TECO beveled split rings, or equal, galvanized in accordance with ASTM standards.

Bolts shall be standard machine bolts with square heads and nuts, and shall be galvanized after threading and the threads cleaned after galvanizing so that the nut turns freely on the bolt. All tower structure and foundation hardware shall be galvanized in accordance with ASTM standards, if required by drawings to be galvanized.

The hardware material lists furnished with the plans as well as the treated and untreated lumber lists, are given for the convenience of the contractor, but do not guarantee that the items listed are of sufficient quantity. It is intended that the contractor shall furnish material necessary to complete the job, with at least an additional 5%, (one extra for items under 20) of machine bolts and nuts, washers, and nails.

9. Guy Cable

Guy cable shall be of the type and size called for on the plans and of sufficient length for all four guys plus an additional 60 feet. The length shall be computed assuming a 45° cable slope and level ground.

Guy cable for each tower shall be furnished in one length, except when foundation plans require a bridge bowl at the guy anchor end in which case the cable shall be furnished in two equal lengths with a standard bridge bowl for the size cable furnished attached, and socketed according to best commercial practice, at each end of the two lengths.

SPECIFICATIONS FOR 7' x 7' WOOD LOOKOUT HOUSE
Drawings B4101 - B4102 - B4103 - T2309

1. General

It is intended that these specifications, and the plans furnished, shall cover the completed structure in its entirety and the contractor shall report any errors, omissions, or inconsistencies that may exist to the Purchasing Office before starting the work.

The contractor shall refer to the bid items in the advertisement to determine whether he is to furnish the 7' x 7' house with or without catwalk.

House with Catwalk shall include door, shutters, and trap-door in catwalk as shown on sheets B-4101 and B-4102 of working drawings.

House without Catwalk shall include hinged window sash in place of door, and trap door in floor as shown on sheet B-4103 of working drawings. Details as shown on sheets B-4101 and B-4102 shall apply to this house, unless otherwise herein specified. This house shall be furnished without shutters.

All material quantities listed in these specifications or those specifications referred to are for the convenience of the contractor but do not guarantee that the items listed are of sufficient quantity or that some item might not be omitted. It is intended that the contractor shall furnish all material necessary to complete the structure, including all hardware except lock for trap door.

All house lumber to be protected from the weather until shipment and to be adequately protected during transit.

2. Plans

The contractor shall furnish complete sets of detail erection plans as follows: One set shall be sent to the Purchasing Office; for each structure shipped, one set shall be sent to the Forest or agency which is to erect the structure, and one set shall be boxed with the hardware. These plans shall fully and completely identify, by marks and names, each piece in the structure. Each erection plan shall include a list showing the bundle numbers of the pieces as marked on the plans.

The Forest Service will furnish the successful bidder one complete set of plans for shop and drafting use. Additional plans, if required, may be purchased from the Forest Service.

3. Workmanship

The quantities of each material furnished and the workmanship of fabrication shall be such as to permit of the assembly of a strong, tight, well-finished, workmanlike structure, complete in accordance with the attached plans. Any material shipped, whether inspected at the contractor's plant or not, that is deemed unsatisfactory by the Forest Service as to grade fabrication

or workmanship shall be replaced immediately at the contractor's expense.

4. Inspection

The contractor shall furnish one or more official inspection certificates from the lumber association under whose rules the lumber is graded, certifying to the grade of all lumber used in framing, millwork and siding, or the lumber before fabrication shall bear the grade mark and trade mark of the association under whose rules the lumber is furnished.

Upon receiving notice of award the contractor shall notify the Purchasing Office of his intention to start work. A representative of the Forest Service shall have access to the contractor's plant or mill at all times during fabrication. The contractor shall furnish such equipment, records and assistance as is necessary for proper inspection of the material. All material, furnished and/or fabricated by the contractor, shall be inspected before crating at a place designated by the contractor and approved by the Forest Service, if elsewhere than at the contractor's plant.

5. Fabrication

(a) All joints and pieces shall be cut or fabricated accurately to the correct measurement, including such mitering, dapping, chamfering, notching, mortising as necessary.

(b) Where wall sheathing is called for, it shall be cut square or diagonally as specified, to fit its designated location, and shall have suitable bearing surface for nailing at the ends.

(c) Roof sheathing, if in lengths shorter than the full lengths required, shall be cut to fit between center to center or rafters.

(d) Sub-flooring shall be cut in lengths so as to provide full bearing for nailing at ends.

(e) All joints shall be broken or staggered for the plates, roof and wall sheathing and other places where necessary to insure rigidity.

(f) All openings, where doubled, shall provide for a continuous support for the lintels to the floor.

(g) All bridging, whether solid or herring-bone, shall be cut to fit between the joists.

(h) Ceiling joists or wall ties, where they extend above the roof surfaces, shall be snubbed off to fit the top line of the rafter.

(i) Furniture, if specified in bid item, shall be furnished as shown on the plans. Material shall be fabricated to the exact size to fit the opening or space shown. The face frames shall be of mortise and tenon construction and shall be glued up and shipped assembled. Cupboard doors and drawers, break boards, etc., shall come assembled. Shelving, ends, cleats, drawer runners, tops, etc., shall be fabricated ready for assembly.

6. Lumber Grades

All lumber shall conform to the grading rules of the association certifying to its grade. Lumber is to be furnished as hereinafter specified disregarding the particular kind of wood as may be called for on the plans. Unless otherwise specified, all lumber shall be kiln dried to not more than an average 15% moisture content, except post material, which need not be kiln dried.

(a) Posts, joists, rafters and 2" (nominal thickness) catwalk material shall be of a grade not below No. 1 in any species catwalk flooring to be 2" x 6" in size. Sheathing shall be of a grade not below No. 2 in any species, except that sheathing in Northern white pine, Idaho white pine, sugar pine, or Ponderosa pine may be of a grade not below No. 3 common.

(b) Furniture, if specified, door and window sash stock and frames, interior and exterior trim and mouldings, shall be "C" grade, clear and better in any species. Cabinet top stock shall be finished from 1-1/4" nominal thickness rough stock to standard finished thickness of the species to be furnished, and shall be "C" grade clear and better in any species commonly used for this purpose.

(c) Exterior wall finish (and interior and ceiling finish if specified on the working drawings) shall be 1" x 6", "C" grade clear and better "V" joint rustic in any species commonly used for this purpose.

(d) Flooring shall be 1" x 4" tongue and groove, vertical grain, of a grade B and better in any of the harter softwood species commonly used for this purpose, such as Douglas Fir or Southern Pine.

(e) Where plywood or wallboard is shown, No. 1 grade, S1S, shall be furnished. Cupboard doors shall be No. 1 grade,S2S.

7. Size of Frame

7' 0" x 7' 0" outside of studding.

8. Lumber Lengths

All pieces are to be full length, omitting any splices. All pieces are to be cut to exact measures ready for erection.

9. Sheet Metal

All sheet metal shall be 26 gauge galvanized iron unless otherwise shown or specified. Flashings shall be furnished for house with catwalk as shown on Sheet B-4101 of working drawings, and for the house without catwalk as noted on Sheet B-4101.

10. Building Paper

The building paper shall be two layers of heavy Kraft paper cemented together with a bituminous cement. The contractor shall allow sufficient waste to insure full coverage of shown or specified surface. Building paper shall be furnished for all structures to be placed between sub-floor and finish floor, between exterior wall finish and sheathing, and where otherwise

shown or specified.

11. Roof Finish

As shown on the plans, the roof finish is to be #4 medium texture duck canvas, weighing not less than 23.93 ounces per square yard. If seams are necessary, they shall be sewed before shipping out. Sides and ends are to be lapped over and tacked down with small flat staples.

12. Window Sash and Door

All window sash shall be 3' 1-5/8" x 3' 9-1/4" net outside dimension, six light barn sash, and shall fit accurately between the studs. All sash shall be given a priming coat of aluminum and spar varnish paint brush application.

Door for house with catwalk shall be 3' 0" x 6' 6" x 1-3/8", four light top panels and raised lower panels as shown on Sheet B-4101 of working drawings. Door shall be given a priming coat of aluminum and spar varnish, paint brush application.

All glass shall be Double Strength "A", free from excessive bubbles and waves. Glass shall be sorted before glazing and best panes shall be placed in lower half of sash or lower lights of door. Contractor shall furnish two extra window sash panes with points and putty.

Contractor shall furnish two extra window stops.

13. Fire-Finder Stand (If specified in bid item)

The fire-finder stand shall be classified as furniture and shall be furnished prefabricated.

14. Hardware

The contractor shall include, as part of this contract, all nails, bolts, nuts, washers and other rough and finish hardware necessary to complete the structure.

This material list is given for the convenience of the contractor, but does not preclude that the items given are of sufficient quantity or that some items might not be omitted. It is intended that the contractor shall furnish material necessary to complete the job.

(a) Rough Hardware:

House with Catwalk. The following rough hardware applies only to house with catwalk, except the last item listed for fire-finder stand detail which applies to both the house with catwalk and to the house without catwalk:

QUANTITY	DESCRIPTION	REMARKS
60 only	1/4" x 3" Lag Screws, Galv.	Shutter Hinges
48 only	1/4" x 2" Mach. Bolts, Nuts & Cut Washers, Galv.	" "
32 only	1/4" x 3-1/4" Eye Bolts with 3/8" eye inside diameter, as detailed on sheet B-4102 of working drawings. Each to include 2 cut washers and 2 nuts. All to be galvanized	Shutter Brace
16 only	3/8" x 3" Mach. bolts with nut and 2 cut washers each, all to be galvanized.	" "
16 only	1/4" x 2 Mach. bolts with nuts and washers galv.	" "
16 only	1½" x 7", 12 gauge galv., iron, punched for 1/4" bolts, detailed on sheet B-4102 of working drawings.	" "
4 only	Shutter bolt washer and nut per detail on sheet B-4101 of working drawings, 1/2" nut welded to 2" x 2" x 1/4" steel plate drilled for four 1-1/2" x 10 gauge wood screws, each to include 1/2" x 7-1/2" mach. bolt with one cut washer and four 1-1/2" x 10 gauge wood screws. All above to be galvanized after welding.	Shutter Bolt
3-1/2 doz	3/8" x 4" Mach. bolts, each with nut and two cut washers, galvanized.	Catwalk Rail
8 only	3/8" x 5" Mach. bolts, each with nut and two cut washers, galvanized.	Fire-Finder Stand Detail

All above bolt threads shall be brushed with steel brush after galvanizing.

(b) Nails: The contractor shall furnish sufficient quantity of the various nail sizes necessary to complete the structure.

All nails shall be galvanized.

(c) Finish Hardware:

House with Catwalk only:

QUANTITY	DESCRIPTION	REMARKS
1 only	Mortise Thumb Latch, 2 handles, latch case approx. 3-1/4" x 2-7/8" x 7/8", 2¼ backset, galvanized latch bolt with 3/4" throw, handles approx. 9-3/8" overall, black Japanned.	Door
1 pair	3-1/2" x 3-1/2" Butts, galvanized, loose brass pin.	"
6 pair	8" Tee Hinges, extra heavy galvanized.	Shutters
4 only	6" Barrel Bolts, galvanized.	Shutter Fastener
1 pair	4" Tee Hinges, heavy galvanized.	Trap door
1 only	Trap Door Ring, plate approx. 3-1/2" x 3-3/4" wrought steel, Black Japanned finish.	Trap door
3 pair	2-1/2" x 2-1/2" butts, cadmium plated, loose brass pin.	Hinged Sash
3 only	Casement fasteners, reversible, base approx. 1-7/8" x 1-1/8" projection 1-3/4", with rim strike, cast brass, genuine Bower Barff	" "
4 only	2-1/2" Gate Hooks and Eyes, galvanized.	" "
3 sets	Weather strip, visible interlocking zinc or cold rolled bronze	" "
1 set	Chamberlin Brass Sill, Dor-Seal #840 or similar	Door
1 set	Weather Strip, visible interlocking zinc or cold rolled bronze	"

All above finish hardware shall be furnished with screws to match.

House without Catwalk only:

QUANTITY	DESCRIPTION	REMARKS
4 pair	2-1/2" x 2-1/2" butts, cadmium plated, loose brass pin	Hinged Sash
4 only	Casement fasteners, reversible, base approx. 1-7/8" x 1-1/8", projection 1-3/4", with rim strike, cast brass, genuine Bower Barff finish.	" "
4 only	2-1/2" Gate hooks and eyes, galvanized.	" "
1 only	4-1/2" Hinged Hasp, cadmium plated or galvanized.	Trap Door
4 sets	Weather Strip, visible interlocking, zinc or cold rolled bronze	Hinged Sash

All above finish hardware shall be furnished with screws to match.

15. Paint

Contractor shall furnish all paint and varnish as follows:

Sufficient outside wall paint for three coats over outside surfaces of house and catwalk, including the under side of the house and catwalk, using SILVER GRAY color for all exterior surfaces except window sash, door, and under side of shutters which shall be PALE GREEN color.

Sufficient oil enamel, PALE GREEN color, for two coats to cover inside walls, ceiling, window sash and door.

Canvas deck on roof to be primed with two coats of boiled linseed oil and finished with two coats of outside flexible paint, SILVER GRAY color.

Sufficient clear varnish for two coats to cover fire-finder stand; stand is specified in bid item.

Sufficient boiled linseed oil for two coats to cover floor of the house.

Sufficient turpentine to thin paint and clean brushes.

All above paint and varnish shall conform to U. S. Government specifications for paint as follows:

For outside paint - - -	Specification	No. TTP 36
For oil enamel inside -	"	No. TTP 51
For varnish - - - - - -	"	No. TTV 71.

Bidders shall indicate in bid the names of manufacturers, brands and colors of materials they propose to furnish and none but approved materials and colors will be accepted.

16. Marking

Each bundle is to be marked with blue or black keel or stencil, identifying contents. Each box of hardware, etc., is to be similarly marked. Each package is to be marked in red, showing weight in pounds.

17. Packing

Lumber is to be securely tied with metal bands in bundles. Short lengths, two feet and under, may be bundled in weights of approximately ten to twenty-five pounds. Lengths of six feet and over shall not weigh over sixty pounds per bundle. Hardware and paints are to be packed in metal banded cases not larger than a ten-gallon kerosene case and not weighing over seventy-five pounds each when packed. Protection strips are to be placed under the metal bands around all finished lumber to prevent them from sinking into the wood.

The sash is to be in bundles of not over fifty pounds each, securely tacked together, with solid protection of light lumber across glass on both sides of bundle.

The door is to be protected with light boards securely nailed on eigher side of the glass.

18. Flagpole

The contractor shall furnish the iron pipe flagpole complete with fittings as detailed on Sheets T-2309 and T-2409. All flagpole material and hardware items to be galvanized, with the threads of bolts and screws brushed with steel brush after galvanizing.

SPECIFICATIONS FOR 14' x 14' WOOD LOOKOUT HOUSE

Drawings B-4201, B-4202, B-4203, B-4204,
B-4205, T-2309.

1. General

It is intended that these specifications and the plans furnished shall cover the completed structure in its entirety and the contractor shall report any errors, omissions, or inconsistencies that may exist to the Chief, Division of Engineering, U. S. Forest Service, Washington, D. C., before starting the work.

All material quantities listed in these specifications or those specifications referred to are for the convenience of the contractor, but do not guarantee that the items given are of sufficient quantity or that some item might not be omitted. It is intended that the contractor shall furnish all material necessary to complete the structure, including all hardware except lock for trap door. All house lumber to be protected from the weather until shipment and to be adequately protected during transit.

2. Plans

The contractor shall furnish complete sets of detail erection plans as follows: One set shall be sent to the Chief, Division of Engineering, Forest Service, Washington, D. C., for each type and size structure shipped; one set for each tower shall be sent to the Forest or agency which is to erect the structure, and one set shall be boxed with the hardware. These plans shall fully and completely identify, by marks and names, each piece of the structure. These marks and names shall coincide with bundle marks or names to facilitate erection. The contractor shall also furnish with each set of erection plans a list showing the bundle numbers of the pieces as marked on the plans. Care shall be taken so that the markings for the same pieces on the erection plans, on the list, and in the bundle shall coincide.

The Forest Service will furnish the contractor with one complete set for shop and drafting use. Additional sets, if required, shall be purchased by the contractor from the Forest Service.

3. Workmanship

The quantities of each material furnished and the workmanship of fabrication shall be such as to permit of the assembly of a strong, tight, well-finished, workmanlike structure, complete in accordance with the attached plans. Any material shipped, whether inspected at the contractor's plant or not, that is deemed unsatisfactory by the Forest Service as to grade, fabrication or workmanship, shall be replaced without delay at the contractor's expense.

4. Inspection

The contractor shall furnish one or more official inspection certificates from the lumber association under whose rules the lumber is graded, certifying to the grade of all lumber used in framing, millwork and siding, or the lumber before fabrication shall bear the grade-mark and trade-mark of the association under whose rules the lumber is furnished.

Upon awarding of the bid, the contractor shall notify the Purchasing Officer in writing of his intention to start work. A Forest Service representative shall have access to the contractor's plant at all times during fabrication. The contractor shall furnish such equipment, records, and assistance as is necessary for the proper inspection of the work. All material, furnished and/or fabricated by the contractor, shall be inspected before crating at a place designated by the contractor and approved by the Forest Service if other than at the contractor's plant.

5. Fabrication

(a) All joints and pieces shall be cut or fabricated accurately to the correct measurement, including such mitering, dapping, chamfering, notching, or mortising as necessary.

(b) Where wall sheathing is called for, it shall be cut square or diagonally, as shown on the plans to fit its designated location and shall have suitable bearing surface for nailing at the ends.

(c) Roof sheathing, if in lengths shorter than the full lengths required, shall be cut to fit between center to center of rafters.

(d) Sub-flooring shall be cut in lengths so as to provide full bearing for nailing at ends.

(e) All joints shall be broken or staggered for the plates, roof and wall sheathing and other places where necessary to insure rigidity.

(f) All openings, where doubled, shall provide for a continuous support for the lintels to the floor.

(g) All bridging, whether solid or herring-bone, shall be cut to fit between the joints.

(h) Ceiling joists or wall ties, where they extend above the roof surface, shall be snubbed off to fit the top lines of the rafter.

(i) Where furniture is specified or shown on the plans, it shall be fabricated to the exact size to fit the opening or space shown. The face frames shall be of mortise and tennon construction and shall be glued up and shipped assembled. Cupboard doors and drawers, bread boards, etc., shall come assembled. Shelfing, ends, cleats, drawer runners, tops, etc., shall be fabricated ready for assembly.

6. Lumber Grades

All lumber shall conform to the grading rules of the Association certifying to its grade. Lumber is to be furnished as hereinafter specified, disregarding the particular kind of wood as may be called for on the plans. All lumber shall be kiln dried to not more than an average 15% moisture content, unless otherwise specified, except post material which need not be kiln dried.

(a) Posts, joists, rafters, and 2" (nominal thickness) catwalk material shall be of a grade not below No. 1 in any species. Catwalk flooring to be 2 x 6 in size. Sheathing shall be of a grade not below No. 2 in any species except that sheathing in northern white pine, Idaho white pine, sugar pine, or Ponderosa pine may be of a grade not below No. 3 Common.

(b) Furniture, if specified, door and window sash stock and frames, interior and exterior trim and moldings, shall be "C" grade clear and better in any species. Cabinet top stock shall be furnished from 1-1/4" nominal thickness rough stock to standard finished thickness of the species to be furnished, and shall be "C" grade clear and better if any species commonly used for this purpose.

(c) Exterior wall finish (and interior and ceiling finish if specified on the working drawings) shall be 1" x 6", "C" grade clear and better "V" joint rustic in any species commonly used for this purpose.

(d) Flooring in cab shall be 1" x 4" tongue and groove, vertical grain, of a grade "B" and better in any of the harder softwood species commonly used for this purpose, such as Douglas Fir or Southern Pine.

(e) Where plywood or wallboard is shown, No. 1 grade, S1S, shall be furnished. Cupboard doors shall be No. 1 grade, S2S.

7. Size of Frame

14' 0" x 14' 0" outside of studding.

8. Lumber Lengths

(a) For Type T-TH (Tower type for truck haul).
All pieces are to be full length, omitting splices shown on plans. All pieces are to be cut to exact measure ready for erection.

(b) For Type G-TH (Ground type for truck haul).
Same cutting as (a).

(c) For Type T-HP (Tower type for horse packing).
All pieces are to be cut and spliced as shown on plans. No pieces are to be over 8' 0" long, except hip rafters, and 2" x 4" rails.

(d) For Type G-HP (Ground type for horse packing).
Same cutting as (c).

9. Sheet Metal

All sheet metal shall be 26-gauge galvanized iron, except hip roof cap which shall be 24-gauge galvanized iron.

Flashings, hip roof cap, and roof jack shall be furnished as detailed on sheets B-4202 and B-4203 of working drawings.

Each section of the roof jack is to be furnished prefabricated and drafted separately. The contractor shall furnish enough sheet metal screws to insure proper installation.

10. Building Paper

The building paper shall be two layers of heavy Kraft paper cemented together with a bituminous cement. The contractor shall allow sufficient waste to insure full coverage of shown or specified surface. Building paper shall be furnished for all structures to be placed between sub-floor and finish floor, between exterior wall finish and sheathing, and where otherwise shown or specified.

11. Roof

(a) Framing: All rafters shall be S1S1E full size.

Rafters shall not be spliced but furnished in full length.
Rafters shall be fitted to the hip roof block, so trimming will not be necessary on the job.

(b) Finish: Shingles shall be 5 butts to 2", 16" long and laid 5" to the weather and are to have a double course at the eaves, with shingle hip. They shall be western red cedar, tidewater red cypress or California redwood, and shall conform to the Commercial Standard CS31-35, in lieu of reference to which the following grades may be used.

Western Red Cedar	- Vertical grain, grade No. 1 in accordance with the rules of the Red Cedar Shingle Bureau Bureau dated 1935.
Tidewater Red Cypress	- Vertical grain, grade No. 1, paragraphs 155-159, inclusive, in accordance with the rules of the Southern Cypress Association, dated June 1, 1934.
California Redwood	- Vertical grain, grade No. 1, paragraph 13, in accordance with the rules of the California Redwood Association, dated October, 1936.

12. Window Sash and Door

Window sash shall be 30-7/8" x 60" x 1-3/8" net outside measurements, four light barn sash, and shall fit accurately between the studs. The contractor shall furnish two extra window stops.

Door shall be 2' 4" x 6' 10" x 1-3/8", four light top panel and raised lower panel as shown on Sheet B-4201 of working drawings.

All glass shall be double strength "A" free from excessive bubbles and waves. The glass shall be sorted before glazing and the best panes shall be placed in lower half of sash and lower lights of door. Contractor shall furnish six extra panes with points and putty.

Window sash and door shall be given a priming coat of aluminum and spar varnish brush application.

13. Furniture - (If specified in bid item)

The contractor shall furnish all furniture complete as shown on sheets B-4203 and B-4204 of working drawings to include rough and finish hardware as shown.

14. Hardware

The contractor shall include as part of this contract all nails, bolts, nuts, washers, and other rough and finish hardware necessary to complete the structure.

The material list is given for the convenience of the contractor, but does not preclude that the items given are of sufficient quantity or that some items may be omitted. It is intended that the contractor shall furnish material necessary to complete the job.

(a) Rough Hardware: All of the following galvanized bolts, screws, and threaded rods are to have their threads brushed with a steel brush after galvanizing so that the nuts will turn easily.

QUANTITY	DESCRIPTION	REMARKS
120 only	1/4" x 1-1/2" lag bolts, galvanized	Shutters
96 only	1/4" x 2" Machine bolts & washers, galvanized.	"
8 only	1/2" x 4" Pines, galv., punched per detail on sheet No.B-4202, with washers and key.	"
3 only	6"x5-1/2"x3/8" x 1-1/2" angle iron, galv. per detail Angle A, sheet No. B-4202. Drilled for 1/2" carriage bolts	Shutter clamps
9 only	1/2" x 2-1/2" carriage bolts, nuts and washers, galv.	" "
2-1/2 doz.	2" coarse thread screws, galv. 1 washer each.	Shutter buttons
24 only	1/2" x 14" mach. bolts, threaded 7", each with 4 wrought washers and 4 hex nuts. All to be galv.	Shutter supports
24 only	1/2" wing nuts, galvanized.	" "
10 only	1/4" x 1-1/2" lag screws, galv.	Catwalk trap door (T-TH & T-HP)
8 only	1/4" x 3" mach. bolts, nuts and washers, galvanized	" " " " "
18 only	3/8" x 4" mach. bolts, nuts and 2 cut washers, galvanized	Cooler (T-TH & T-HP)
8 only	3/8" x 5" mach. bolts, nuts and 2 cut washers, galvanized	Fire-Finder Stand
24 only	3/8" x 6" mach. bolts, nuts and 2 cut washers, galvanized	Catwalk rail and cooler (T-TH & T-HP)
8 only	3/8" x 8" mach. bolts, nuts and 2 cut washers, galvanized	Catwalk rail and cooler (T-TH & T-HP)

QUANTITY	DESCRIPTION	REMARKS
8 only	5" x 3-1/2" x 3/8" angles, 3" long, galvanized	Anchorage (G-TH & G-HP)
4 only	4" x 4" x 3/8" plates, galvanized	" " "
4 only	72" x 3/4" rods, galvanized	" " "
16 only	3/4" Hex. nuts, galvanized	" " "
16 only	1/2" x 7" mach. bolts, nuts, and 2 cut washers, galvanized	" " "
4 only	30" x 3" x 1/4" steel plate, galv. (Note revision necessary if cab used on steel tower).	" (T-TH & T-HP)
8 only	1/2" x 6" mach. bolts, nuts and 2 cut washers, galvanized	" " "
8 only	1/2" x 4-1/2" mach. bolts, nuts and 2 cut washers, galvanized	" " "
8 only	1/2" x 12" mach. bolts, nuts and 2 cut washers, galvanized	" " "
4 only	1/2" x 2-3/4" mach. bolts, nuts and 2 cut washers, galvanized	" " "

(b) Nails: The following nails are the minimum quantities that will be accepted:

(For Types G-TH and G-HP)

25 lbs. 16 d common, galv.	1 lb. 4 d finish, galv.
20 lbs. 12 d common, galv.	2 lbs. 6 d finish, galv.
15 lbs. 10 d common, galv.	2 lbs. 10 d finish, galv.
25 lbs. 8 d common, galv.	15 lbs. 6 d casing, galv.
10 lbs. 6 d common, galv.	12 lbs. 3 d shingle, galv.

(For Types T-TH and T-HP)

Same as for Types G-TH and G-HP with following additional:

10 lbs. 20 d common, galv.
15 lbs. 16 d common, galv.
15 lbs. 12 d common, galv.

(c) Finish Hardware:

QUANTITY	DESCRIPTION	REMARKS
1 only	Mortise thumb latch, 2 handles, latch case approx. 3-1/4" x 2-7/8" x 7/8", 2-1/4" backset galvanized latch bolt with 3/4" throw, handles approx. 9-3/8" overall, black Jap.	Door

QUANTITY	DESCRIPTION	REMARKS
1 pair	3-1/2" x 3-1/2" butts, galvanized, loose brass pin	Door
4 pair	2-1/2" x 2-1/2" butts, cadmium plated, fast brass pins	Window Sash
4 only	Casement fasteners, reversible, base approx. 1-7/8" x 1-1/8", projection 1-3/4", with mortise strike cast brass, genuine Bower Barff finish	" "
4 only	Casement adjusters, bar and tube type, bar approx. 3/8" diameter, tube approx. 5/8" diameter, length overall closed 12", extended 20-1/8" tube and red wrought bronze, other cast bronze imitation Bower Barff finish	Window Sash
2 pair	2-1/2" x 2-1/2" butts, galvanized fast brass pin	Cooler Types (T-TH & T-HP)
3 only	Trap door rings, 3-1/2" x 3-3/4" plate, wrought steel, black Jap.	Trap doors for cooler & catwalk
1 set	Chamberlin brass s ill, Dor-Seal #840 or similar	Door
1 set	Weather strip, visible interlocking zinc or cold rolled bronze	Door
4 sets	Spring bronze weather strip, flexible, hemmed edge	Window Sash
12 pair	8" Tee hinges, extra heavy, galv. (No screws).	Shutters
4 pair	6" Strap hinges, heavy, galvanized	Shutter clamps
1 only	Hasp, safety, double hinges, 4-1/2" x 1-1/2", galv. or cadmium plated	" "
1 pair	6" Tee hinges, extra heavy, galv.	Catwalk trap door, T-TH & T-HP

All finish hardware shall be furnished with screws to match.

Screen for cooler shall be copper or antique bronze and shall be not less than 16 mesh to one inch.

15. Paint

The contractor shall furnish all paint and varnish as follows:

For Types G-TH and G-HP; Sufficient outside paint for three coats to cover outside surface of house, using SILVER GRAY color for all exterior surfaces except window sash, door and under side of shutters, for which sufficient paint for three coats of PALE GREEN color shall be furnished.

Sufficient oil enamel, PALE GREEN color, for two coats to cover the inside walls, ceiling, window sash and door.

Sufficient clear varnish to cover all furniture items with two coats.

Sufficient boiled linseed oil to cover the house floor with two coats.

Sufficient turpentine to thin paint and clean brushes.

For Types T-TH and T-HP; Shall be furnished same as Types G-TH and G-HP, and in addition sufficient SILVER GRAY paint to cover with three coats all surfaces of the catwalk including floor, railing, under side of catwalk, cooler, hopper, basket, and under side of house.

All paints and varnish shall conform to U. S. Government Specifications for paint as follows:

For outside paint	-	Specification No. TTP 36
For oil enamel, inside	-	Specification No. TTP 51
For varnish	-	Specification No. TTV 71.

16. Marking

Each bundle shall be marked with blue or black keel or stencil, identifying contents. Each piece shall be numbered to correspond with the packing list and plans. Each box of hardware, etc., shall be similarly marked.

17. Packing

(a) Types T-HP and G-HP for horse packing:

Lumber shall be securely tied with metal bands in bundles of 50-75 pounds in weight. Short lengths, two feet and under, may be bundled in weights of approximately 10 to 25 pounds. Lengths of 6 feet and over shall not weigh over 50 to 60 pounds per bundle. Hardware and paints shall be packed in metal banded cases not larger than a 10-gallon kerosene case and not weighing over 75 pounds each when packed. Protection strips shall be placed under metal bands around all finished lumber to prevent bands from sinking into the wood.

The door shall be protected with light boards securely nailed on either side of the glass.

The sash shall be in bundles of not over 50 pounds each, securely tacked together, with solid protection of light lumber across glass on both sides of bundle.

(b) Types T-TH and G-TH for truck haul:

Lumber shall be securely tied with metal bands in bundles not to exceed 100 pounds in weight and of bulk capable of being handled by one man. 2" x 6" pieces for floor joists (2" x 8" joists if cab is to be used on steel tower) need not be bundled.

Hardware, paints, etc., shall be cased as for horse packing but weights may run to 100 pounds if desired.

Door and sash shall be crated as for horse packing but weights may run to 100 pounds if desired.

18. Flagpole

The contractor will be required to furnish the iron pipe flagpole complete with fittings as detailed on sheet T-2309, 2409. All flagpole material and hardware items are to be galvanized, with threads of bolts and screws brushed with steel after galvanizing.

19. Revisions Necessary for Use of 14' x 14' Wood Cab on Steel Tower

(a) Furnish four sills for bolting to 5" x 3-1/2" x 5/16" angles at cab level. Sills to be 4" x 6" S4S, and treated with Zinc Chloride as specified in Section 4 of Specifications for Timber Lookout Towers. They shall be cut to length, and bored to suit holes in the 5" x 3-1/2" x 5/16" tower angles.

Horizontal holes are also to be bored in the sill to suit the four anchorage straps as shown on drawing B-4203, the details of which must be revised to fit the 6" depth of sill in place of the 10" depth of cab girder. Sills are to be fully framed and accurately bored before treatment. Sill pieces are to be plainly marked for erection in their correct locations.

(b) Joists shall be framed in accordance with Joist Framing Plan for Type G-TH on Sheet B-4201, but shall be 2" x 8", instead of 2" x 6".

(c) Trap door material shall be that specified on steel tower drawings B-10603. Catwalk floor shall be 2" x 12" S4S nailed to 2" x 4" nailing strips. Nailing strips to be bolted to 5" channels. All nails and bolts shall be galvanized and are to be furnished by contractor. Joists, trap door and catwalk lumber to be treated with Zinc Chloride as specified for such treatment in Paragraph 19(a) above.