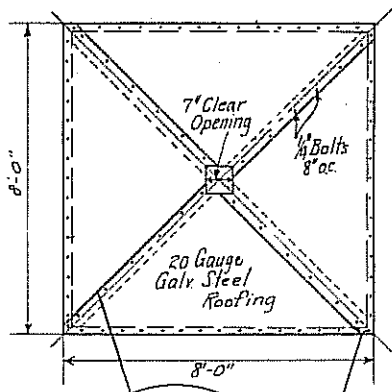
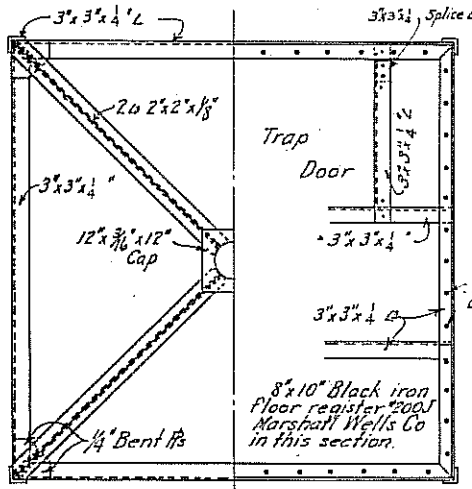
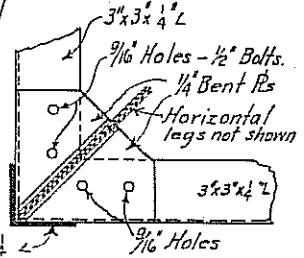
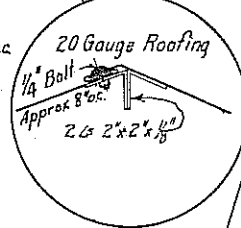


DETAIL OF ROOFING.

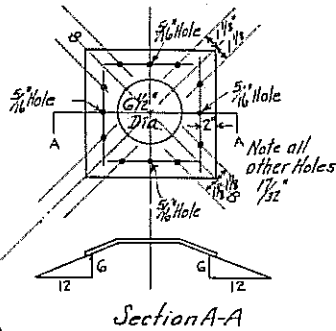
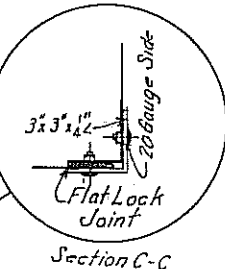
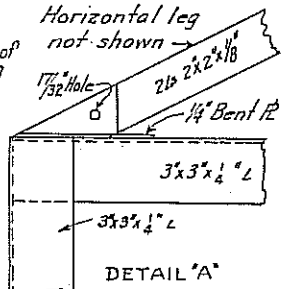
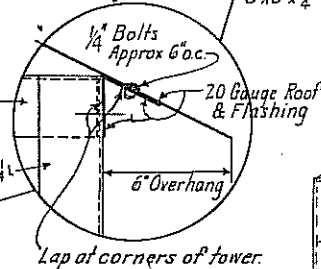
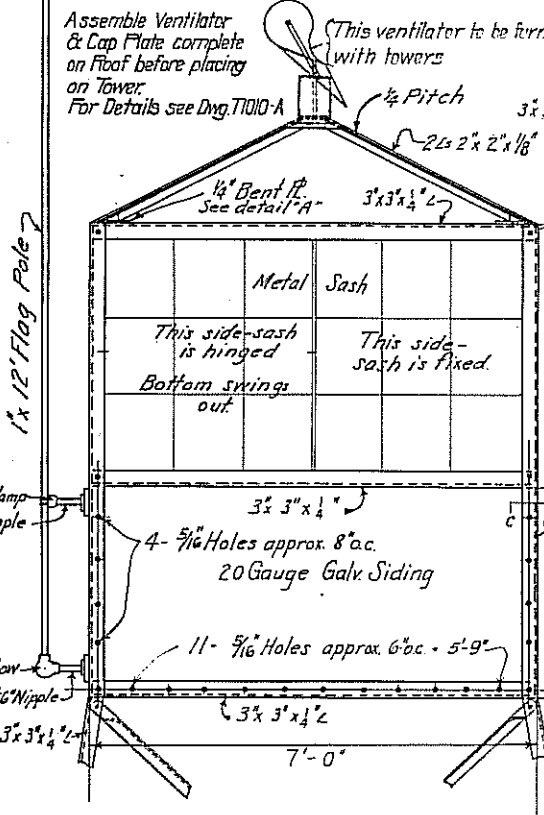
ROOF SECTION FLOOR SECTION



Note:-  
Double 1" floor with building paper between.  
It is suggested that the roof be assembled on the ground and hoisted in place.



Assemble Ventilator & Cap Plate complete on floor before placing on tower.  
For Details see Dwg. T7010-A  
This ventilator to be furnished with towers  
1/2 Pitch  
2x2x2x1/8  
3x3x1/2  
3x3x1/4 L

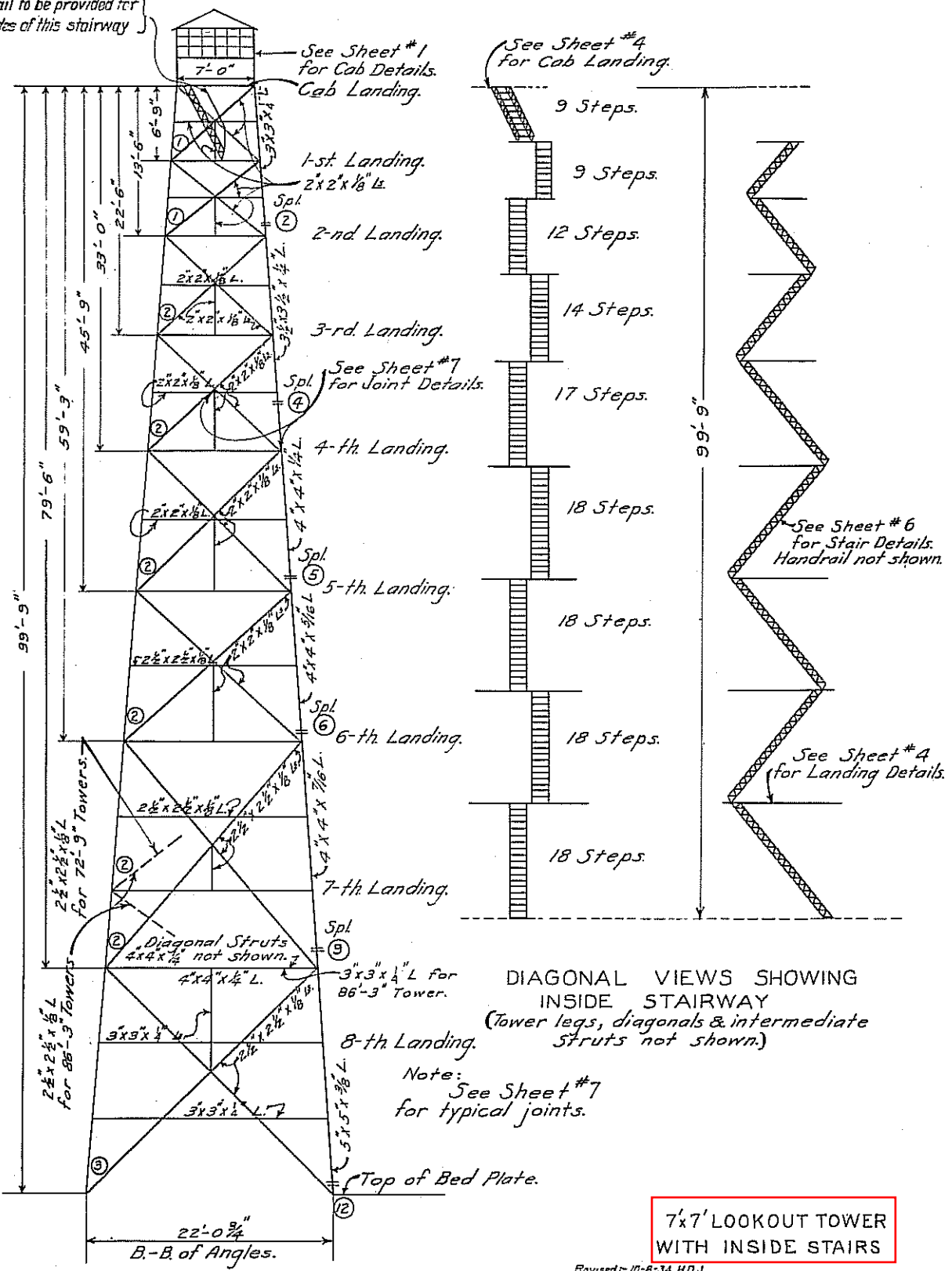


SIDE VIEW OF CAB FRAME

U.S. DEPARTMENT OF AGRICULTURE  
FOREST SERVICE  
7x7 LOOKOUT TOWER  
CAB DETAILS

Revised 10-30-34 H.D.J. DESIGNED R.E.P. DRAWN R.E.P. & W.I.D.  
Revised 10-6-34 H.D.J. APPROVED W.C.S. DATE 9-10-32  
Revised 7-10-32 H.D.J. - 7-17-32 H.D.J. SHEET 1 OF 10

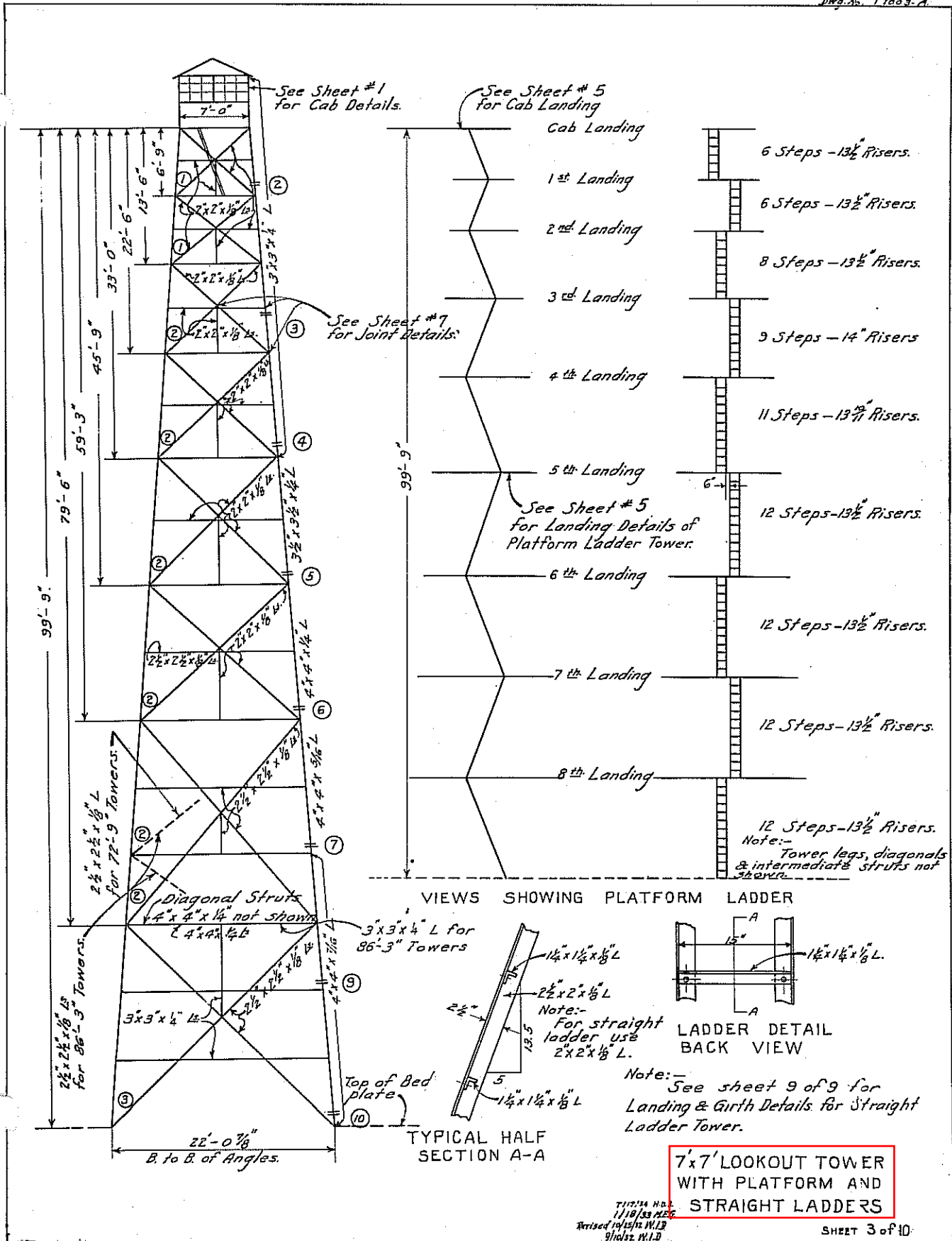
Handrail to be provided for both sides of this stairway



DIAGONAL VIEWS SHOWING INSIDE STAIRWAY (Tower legs, diagonals & intermediate struts not shown.)

Note: See Sheet #7 for typical joints.

7x7' LOOKOUT TOWER WITH INSIDE STAIRS



See Sheet #1 for Cab Details.

See Sheet #5 for Cab Landing

See Sheet #7 for Joint Details:

See Sheet #5 for Landing Details of Platform Ladder Tower.

2 1/2 x 2 1/2 x 1/8 L for 72'-9" Towers.

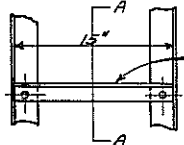
2 1/2 x 2 1/2 x 1/8 L for 86'-3" Towers.

Diagonal Struts 4" x 4" x 1/4 not shown 2 4" x 4" x 1/4 L

3" x 3" x 4" L for 86'-3" Towers

Top of Bed plate

TYPICAL HALF SECTION A-A



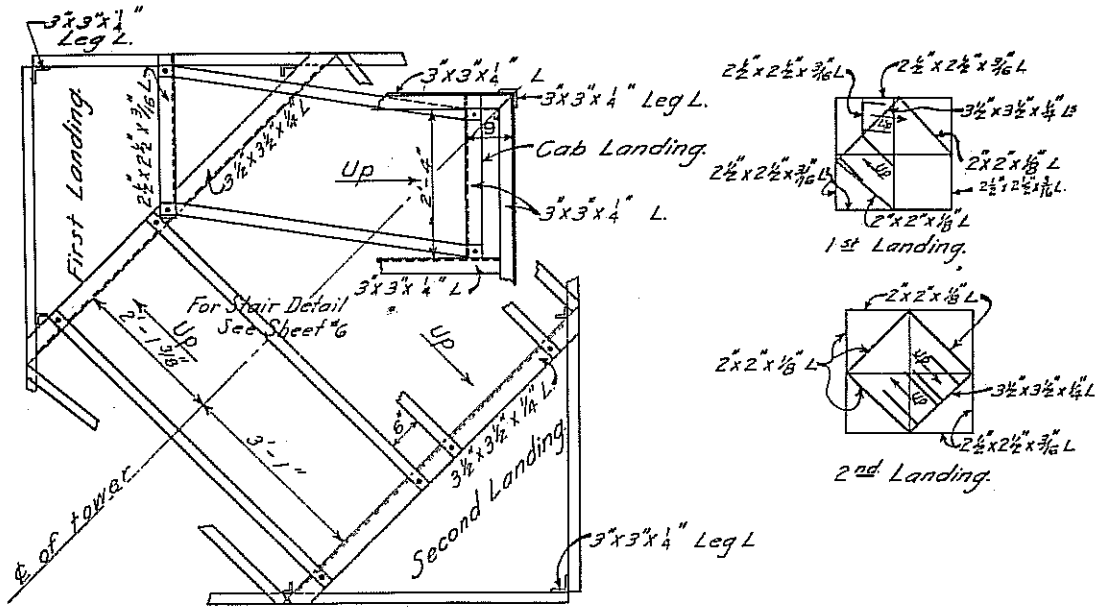
LADDER DETAIL BACK VIEW

Note: For straight ladder use 2" x 2" x 1/8 L.

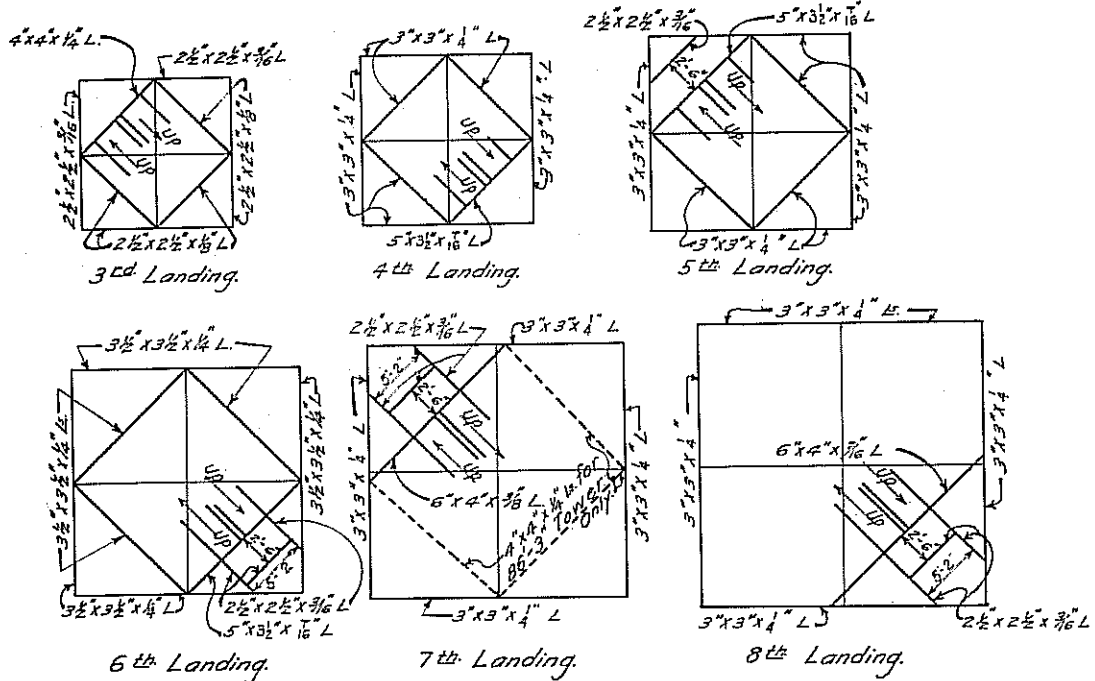
Note: See sheet 9 of 9 for Landing & Girth Details for Straight Ladder Tower.

**7' x 7' LOOKOUT TOWER WITH PLATFORM AND STRAIGHT LADDERS**

T1003A HD. 1/18/33 P.E.C. Revised 10/15/32 W.L.B. 9/10/32 W.L.B.



ENLARGED DETAIL VIEW OF CAB,  
1-ST. & 2-ND. LANDINGS.

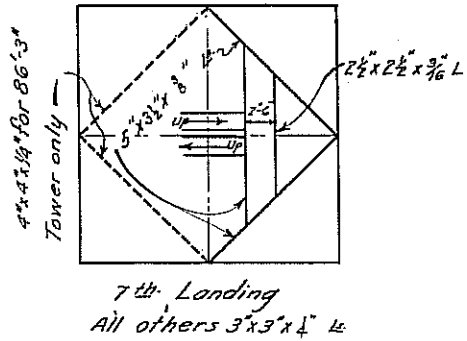
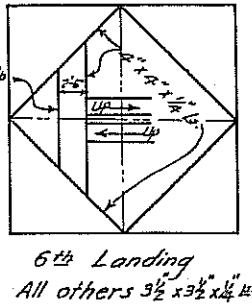
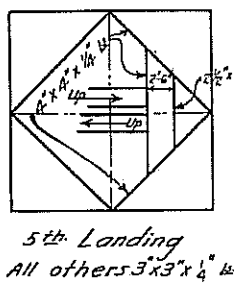
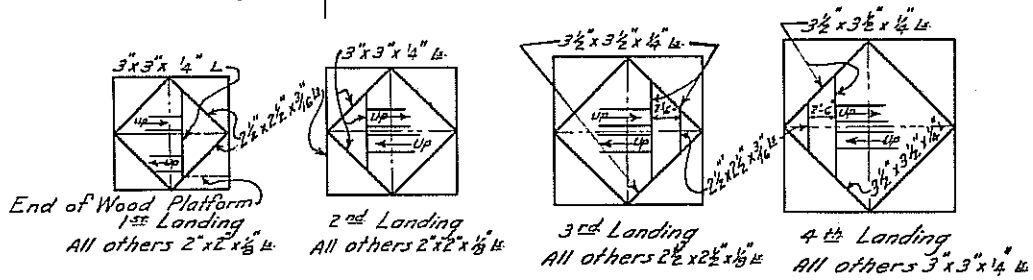
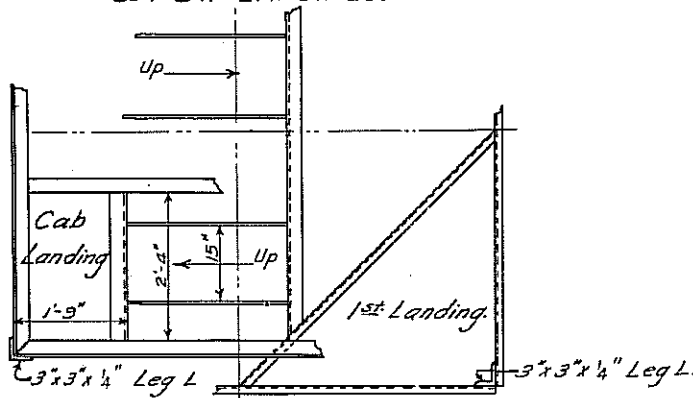


Note:  
Guard railing for 6<sup>th</sup>, 7<sup>th</sup> and  
8<sup>th</sup> landings see DWG. T1006-A  
Sheet 6 of 9.

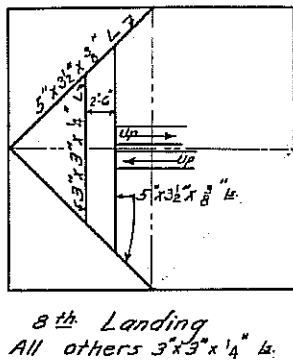
Note:  
For 86'-3" tower  
all main struts @ 7<sup>th</sup>  
Landing are 4x4x1/4"

7x7' LOOKOUT TOWER  
LANDING DETAILS FOR  
INSIDE STAIRS

ENLARGED DETAIL VIEW OF CAB  
& 1-ST. LANDINGS.



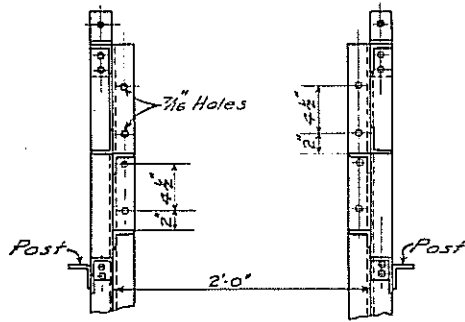
Note:- For 86'-3" tower all main struts at 7th Landing are 4" x 4" x 1/4"



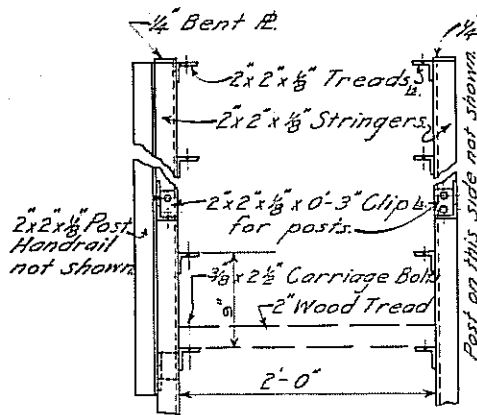
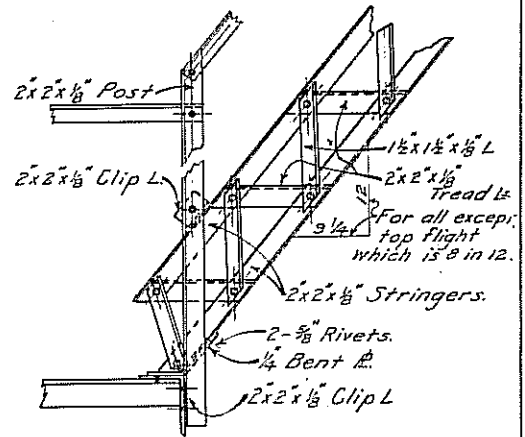
7' x 7' LOOKOUT TOWER  
LANDING DETAILS FOR  
PLATFORM LADDER

Note  
Handrails required on both  
sides of all stairways

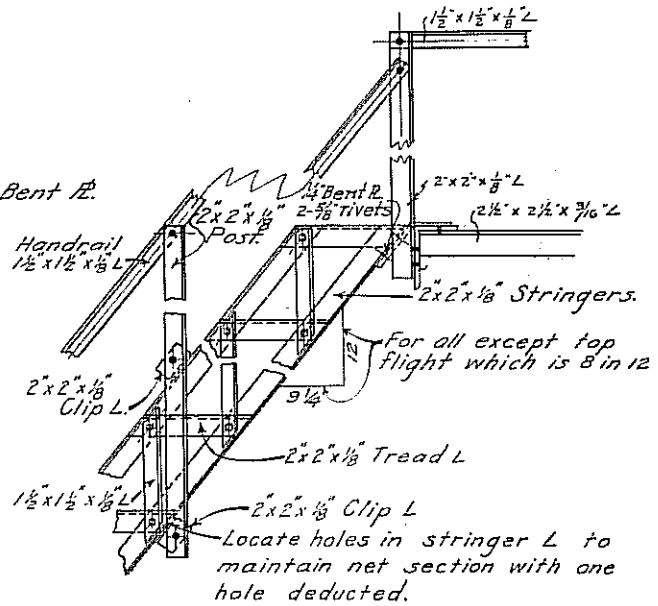
TYPICAL STAIR DETAIL  
AT LANDINGS



TOP VIEW

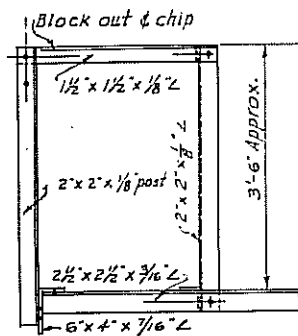


FRONT VIEW

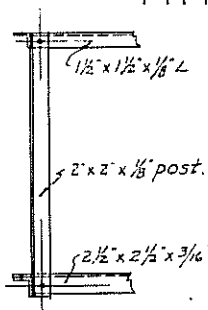


SIDE VIEW

TYPICAL STAIR DETAIL



SIDE VIEW

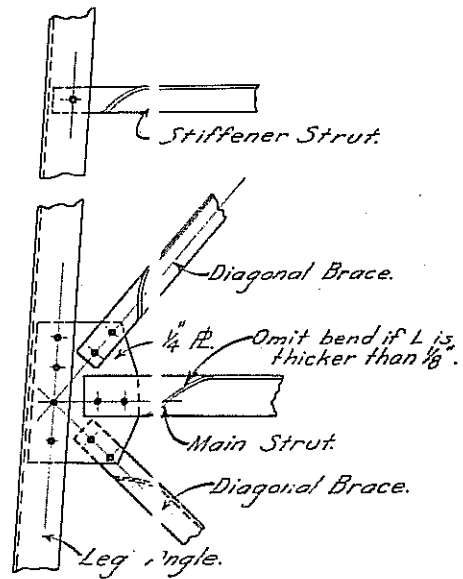
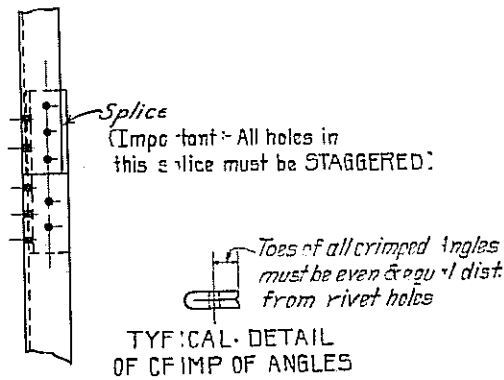


PARTIAL REAR VIEW

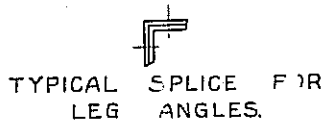
TYPICAL LANDING

7'x7' LOOKOUT TOWER  
STAIR DETAILS

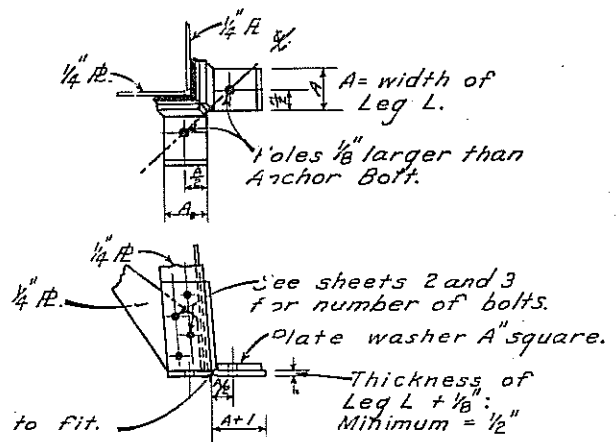
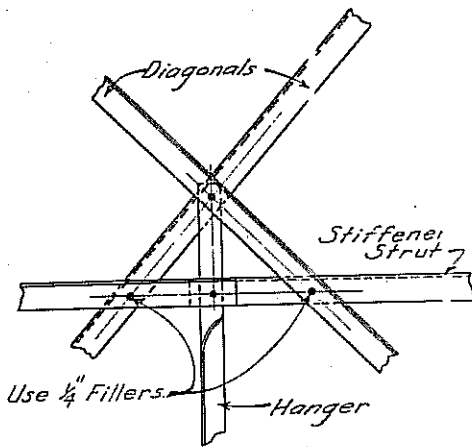
Revised 10-9-34 H.D.J.  
Revised 5/4/34 L.T.B. 9/10/34 W.L.B. - 1/12/34 R.E.G.  
SHEET 6 of 10



DIAGONAL AND STRUT CONNECTIONS TO LEG ANGLE.



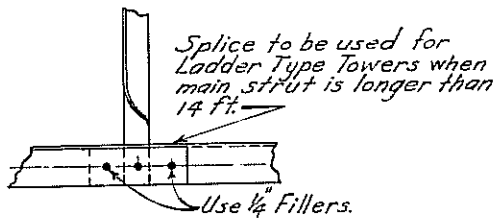
TYPICAL SPLICE FOR LEG ANGLES.



TYPICAL DETAIL OF ANCHOR PLATES

THICKNESS OF PLATE WASHER

Ht. of Tower	Stair Type	Ladder Type
45'-9"	5/8"	1/2"
59'-3"	3/4"	1/2"
72'-9"	3/4"	5/8"
79'-6"	7/8"	3/4"
86'-3"	7/8"	3/4"
99'-9"	1"	7/8"



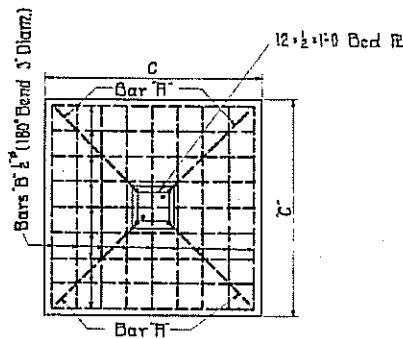
TYPICAL CONNECTION OF DIAGONALS, MAIN STRUTS, STIFFENERS & HANGERS.

7'x7' LOOKOUT TOWER  
TYPICAL CONNECTIONS

Revised 10-8-34 H.D.J.  
Revised 1/10/35 M.E.G.  
9/10/32 W.L.D.

SHEET 7 of 10

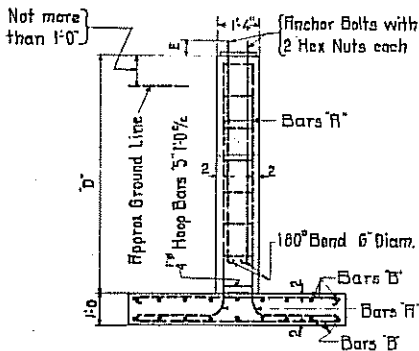
### DIMENSIONS OF ONE PIER FOR TOWER WITH INSIDE STAIRS



Height	A	B	C	D	E	Bars A No Dia Lg	Bars B No Lg Spa	Stirrups No Req'd	Anchor Bolt Size	Cut off concrete
45'-9"	13'-10 1/2"	19'-8"	5'-3"	5'-3"	3 1/2"	4 1/2" 7'-10"	16 4'-9" 1'-7"	6	3/4" x 5'-0"	37
59'-3"	15'-11 1/2"	22'-6 1/2"	5'-6"	6'-0"	4"	4 1/2" 8'-10"	20 5'-0" 1'-3"	6	3/4" x 5'-2"	41
72'-9"	18'-0 1/2"	25'-5 1/2"	5'-9"	6'-6"	4 1/2"	4 1/2" 9'-6"	24 5'-3" 1'-0"	7	3/4" x 5'-7"	45
79'-6"	19'-0 1/2"	26'-10 1/2"	6'-0"	7'-0"	4 1/2"	4 1/2" 10'-2"	28 5'-6" 1-1"	7	1" x 6'-0"	49
86'-3"	20'-0 1/2"	28'-3 1/2"	6'-6"	7'-3"	4 1/2"	4 1/2" 10'-8"	32 6'-0" 1-0 1/2"	7	1" x 6'-0"	55
99'-9"	22'-0 1/2"	31'-2 1/2"	6'-9"	7'-6"	5"	4 1/2" 11'-2"	36 6'-3" 9 1/2"	7	1 1/4" x 6'-9"	59

Note: Lengths given are finished lengths

### DIMENSIONS OF ONE PIER FOR TOWER WITH PLATFORM LADDER & STRAIGHT LADDER



Height	A	B	C	D	E	Bars A No Dia Lg	Bars B No Lg Spa	Stirrups No Req'd	Anchor Bolt Size	Cut off concrete
45'-9"	13'-10 1/2"	19'-8"	5'-0"	4'-6"	3 1/2"	4 1/2" 7'-3"	16 4'-6" 1'-6"	5	3/4" x 3'-8"	33
59'-3"	15'-11 1/2"	22'-6 1/2"	5'-3"	5'-3"	3 1/2"	4 1/2" 7'-10"	16 4'-9" 1'-7"	6	3/4" x 5'-0"	37
72'-9"	17'-11 1/2"	25'-5 1/2"	5'-6"	6'-0"	3 1/2"	4 1/2" 8'-10"	20 5'-0" 1'-3"	6	3/4" x 5'-2"	41
79'-6"	19'-0 1/2"	26'-10 1/2"	5'-8"	6'-3"	4"	4 1/2" 9'-2"	24 5'-2" 1'-0"	7	3/4" x 5'-7"	43
86'-3"	20'-0 1/2"	28'-4 1/2"	5'-9"	6'-8"	4 1/2"	4 1/2" 9'-6"	24 5'-3" 1'-0"	7	3/4" x 5'-7"	45
99'-9"	22'-0 1/2"	31'-2 1/2"	6'-0"	7'-0"	4 1/2"	4 1/2" 10'-2"	28 5'-6" 1-1"	7	1" x 5'-7"	49

TYPICAL CONCRETE PIER

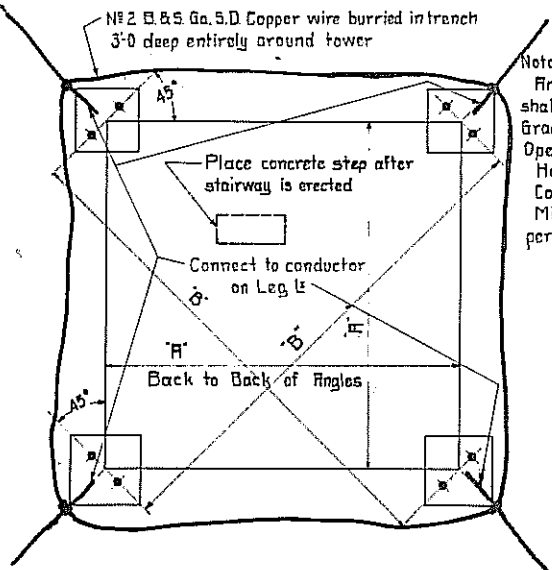
### APPROX SHIPPING WEIGHT COMPLETE TOWER

Height	Inside Stairs	Platform Ladder	Straight Ladder
45'-9"	7000*	6000*	5800*
59'-3"	9000*	7700*	7400*
72'-9"	11300*	9900*	9300*
79'-6"	12700*	11200*	10400*
86'-3"	14700*	12900*	11900*
99'-9"	17200*	15400*	13900*

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

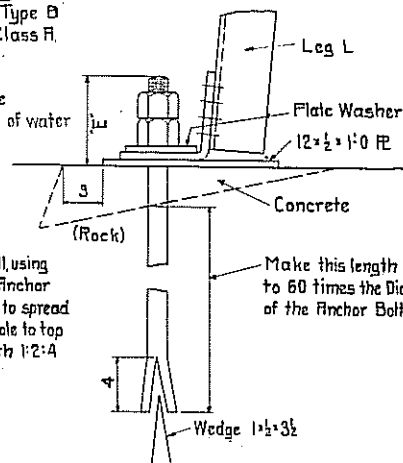
No 2 B.S.S. Ga. 5.D. Copper wire buried in trench 3'-0" deep entirely around tower

No 2 B.S.S. Ga. 5.D. Copper conductor extending diagonally from each corner of tower (Length of conductor to vary from 12'-0" in 3'-0" deep trench to 80'-100" if ground is too rocky in dig trench. In latter case conductor will be laid on surface and weighted down with rocks)



FOUNDATION LAYOUT

Note  
Anchor Bolts & Reinforcing Bars shall conform to F.5. 90-B71, Type B Grade 1 (Deformed Structural) Class B, Open Hearth Steel.  
Hoop Bars: Type A Plain Concrete: Class A 1 1/2 Severe Mix 1:2-5 1/4 (by volume) 6 gals of water per bag of cement



SETTING ANCHOR BOLTS IN ROCK

### 7' x 7' LOOKOUT TOWER FOUNDATION LAYOUT

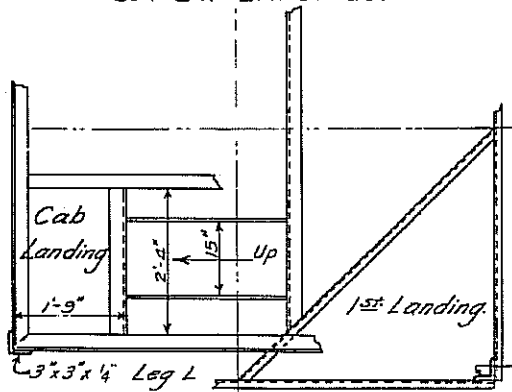
Revised by JD 6-5-34 & 10-9-34 H.D.J.

6-11-34 H.W.W.

Sheet 8 of 10



ENLARGED DETAIL VIEW OF CAB  
& 1-ST. LANDINGS.



Extend this rail of ladder and fasten to bottom of cab.

1 1/2 x 1 1/2 x 1/8 Handrail on this side of platform.

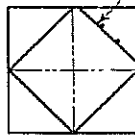
Straight ladder fixed to diagonal strut on this side of tower.

2 1/2 x 2 1/2 x 3/16 L

End of wood platform.

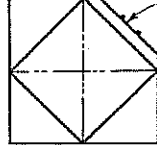
1st Landing of All others 2 x 2 x 1/8 L

2 1/2 x 2 1/2 x 3/16 L

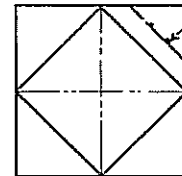


2nd Landing

2 1/2 x 2 1/2 x 3/16 L



3rd Landing



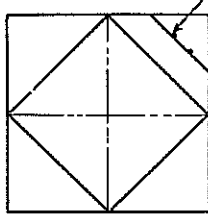
4th Landing

All others 2 x 2 x 1/8 L

All others 2 1/2 x 2 1/2 x 3/16 L

All others 3 x 3 x 1/4 L

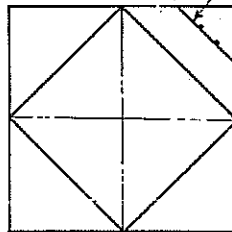
2 1/2 x 2 1/2 x 3/16 L



5th Landing

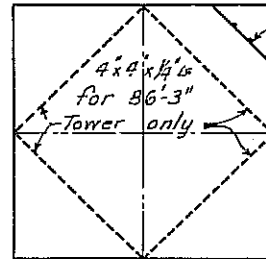
All others 3 x 3 x 1/4 L

2 1/2 x 2 1/2 x 3/16 L



6th Landing

All others 3 1/2 x 3 1/2 x 1/4 L



7th Landing

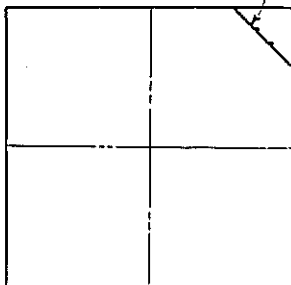
All others 3 x 3 x 1/4 L

Note:- For 86'-3" tower all main struts at 7th Landing are 4 x 4 x 1/4 L.

Note:-

Slope of ladder parallels slope of tower leg angle.

2 1/2 x 2 1/2 x 3/16 L



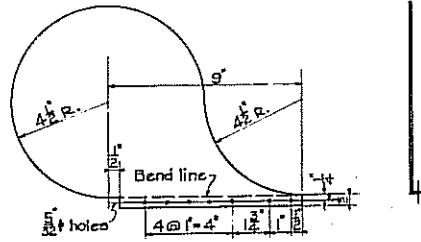
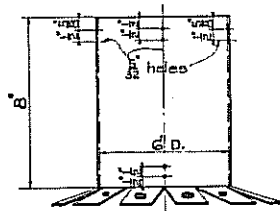
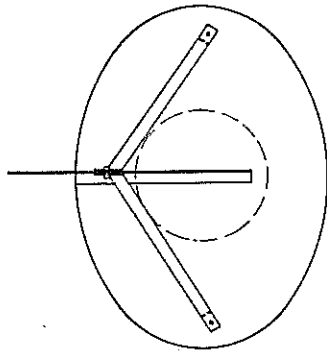
8th Landing

All others 3 x 3 x 1/4 L

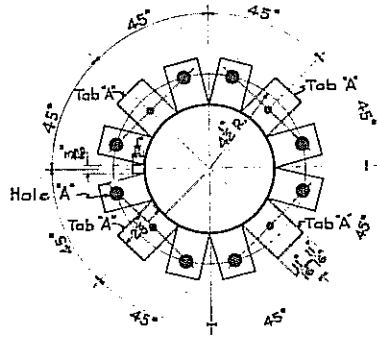
7' x 7' LOOKOUT TOWER  
LANDING & GIRTH DETAILS  
FOR STRAIGHT LADDER

Revised: 7/17/34 H.D.J.  
11/16/39 M.E.G.  
10/29/52 W.L.D.

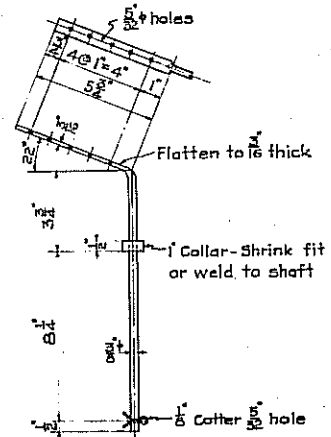
SHEET 9 of 10



**TEMPLATE FOR VANE**  
24 ga. Galv. Metal  
1- Req'd.

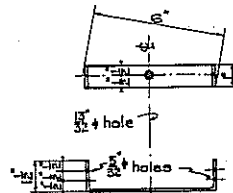
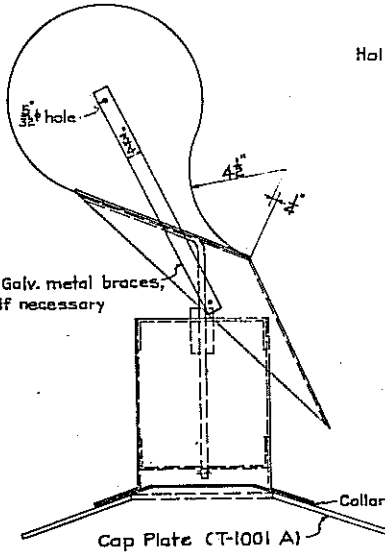


**BASE OF STACK**  
24 ga. Galv. Metal  
1 Req'd.



**SPINDLE**  
1- Req'd.

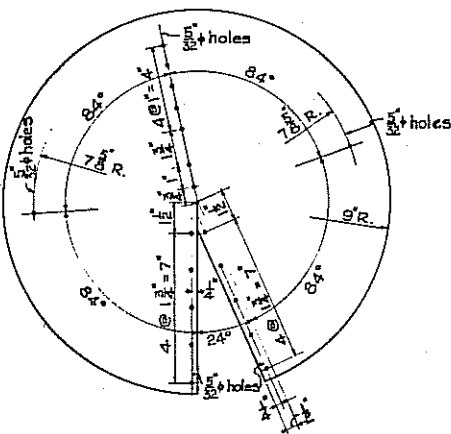
24 Ga. Galv. metal braces,  
bend if necessary



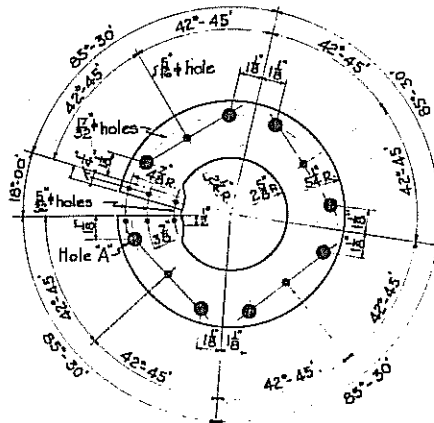
**1x8 BEARING PLATE**  
3 Req'd.

Note:

Cone, Vane, Bearing Pls, Braces & Spindle to be riveted up complete with copper rivets



**TEMPLATE FOR CONE**  
24 ga. Galv. Metal  
1- Req'd.



**TEMPLATE FOR COLLAR**  
24 ga. Galv. Metal  
1- Req'd.

**7' x 7' LOOKOUT TOWER  
DETAILS OF VENTILATOR**

## LOOKOUT TOWER CONSTRUCTION

Lookout towers are built for three different uses. From 10 to 50 feet in height by 10' steps for supporting the standard L-4 lookout house in which the lookout lives. Over 50' in height for observation purposes on primary points. Light towers of any height for use along routes or at emergency points.

Towers up to 50' will be of wood construction with two types of cross bracing. Ten, twenty, and thirty-foot towers will be wood braced. Forty and fifty-foot towers will be cable braced. Towers over 50' will be steel construction. Light towers of the platform type will be wood braced up to 50' in height.

It is a pretty well settled fact that the simplest and cheapest way to build towers 30' or over in height is to assemble them on the ground and then raise the whole tower as a completed structure, putting in the stairways afterward and building the house after the stairs are in. Methods of cutting, fitting and assembling towers are detailed on the plans for each type of tower, as well as the mechanics of raising the tower after it is assembled.

The tower, if 40 or 50' in height, should be raised with two hoists. It can be done with one hoist but there is considerable danger of the tower falling while the hoist is being moved from one gin pole to the other, as the tower must be supported in the air at an angle of 45° while the change is being made. If two hoists are used the second hoist takes the lift at once as soon as the first hoist has raised the tower to its maximum lift, and the tower is kept moving until it is set on the foundation. The first hoist is also a great aid in taking the weight of the tower after it passes the center of gravity and commences to drop into place. This can be done by slacking off on a pair of double blocks by hand, but is not done so easily or uniformly.

The Spokane Warehouse has the hoist outfits set up in units as follows:

- 1 hoist
- 250 feet 1/2" steel cable
- 150 feet 1/2" " "
- 12 Crosby clamps
- 2 steel blocks, single for 1/2" cable
- 2 steel blocks, double for 3/4" rope
- 600 feet 1/2" rope
- 600 feet 3/4" rope

This is sufficient equipment to raise one tower, but for high towers the first five items should be doubled, and orders for hoisting equipment should specify if single or double equipment is desired. Only a limited number of these units are available and each Forest must schedule the use of this equipment so that it is returned to the warehouse in the shortest time possible or reshipped to some other Forest. If the

construction job is properly planned it should not be necessary for the hoisting equipment to be on the job more than two or three days at the most.

### Raising the Gin Pole

It is usually necessary to use a short gin pole which can be raised by hand, to raise the heavy pole needed for raising the tower. After the heavy pole has been raised about 30° the hoist attached to it can be used to assist with the raising, or to do the whole job. Guy lines and hoisting tackle should all be in place before the pole is raised.

On those sites where there is standing timber available, it is advisable to spot trees to be used as gin poles and leave them standing until the tower is up. Trees should be guyed just the same as a gin pole when used for that purpose. The tower guys can be used to guy the gin pole until the tower is up. It is good practice to run the hoist rigging out to a stump or deadman and then take a good pull with the hoist and test out the gin pole before the tower is picked up.

### Suggested List of Tower Tools and Equipment

- 1 - Necessary tools for any concrete work
- 1 - Hoist, hand, with anchor and hoisting cable
- 2 - Blocks, single snatch, 6x1 sheave
- 12 - Clamps, cable, 2-bolt or 3-bolt
- 2 - Wrenches, monkey, 10"
- 2 - Hammers, 4-pound single jack
- 1 - Hammer, 8-pound double jack
- 2 - Peavies, light weight
- 1 - Chest, carpenter's; tools complete; portable
- 1 - Slick, 3" socket, long-handled, chisel
- 1 - Chisel, 1 $\frac{1}{2}$ ", made of heavy drill steel, 10" handle, for any heavy chiseling
- 1 - Bit, car, 13/16" with long twist, length overall 17", for 3/4" bolts
- 1 - Bit, car, 9/16" with long twist, length overall 17", for 1/2" bolts
- 1 - Brace, carpenter's, with long sweep
- 1 - Chain, log, 14' steel test, with grab and open-hook
- 1 - Block and tackle set, 1 single and 1 double wooden block, sheaves 3/4"x4", and 200' 5/8" rope. Have extra rope on hand also.

### Steel Towers

Steel towers will be ordered through Procurement Division. Erection instructions are included with each set of material. A list of wrenches needed for the erection job includes:

<u>Type of Wrench</u>	<u>Size of Opening</u>	<u>Armstrong Cat. No.</u>	<u>Williams Cat. No.</u>
Construction	31/32" or		
"	1"	#226	#1206B
"	1-1/8"	#227A	#1207A
Engineers	7/16"	#1A	#1701
"	19/32"	#2	#1002
"	3/4"	#4-A	#1704
" double-end	11/16" and 7/8"	#1030	#1030
" " "	1" and 1-1/8"	#1735	#1735

These wrenches should be ordered at the same time that the tower is ordered so that they will be on hand in time for erection. One set to a forest would appear to be ample.

### Guying

Under no circumstances will steel towers be guyed. They are designed to withstand a gale of 100 miles per hour without guying, and to put guys on them would set up stresses which would be fatal to the tower. (Paragraph amended 8-12-38.)

### Steel Tower Specifications

#### 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.

The bidder will be required to furnish all structural steel shapes; metal sash glazed with clear double-strength glass; sheet metal; rivets and bolts (number required plus 5 percent), including bolts for fastening down the cab flooring, landings and stair tread; anchor bolts and reinforcement bars for footings; and two base plates for 1" pipe with provision for attaching to corner angles of cab to make one or more complete towers as specified. The Government will furnish hinges and lock for cab trap door; ventilator base and ventilator; cast-iron floor register; iron pipe flagpole; lumber for cab floor, landings and stair tread; and cement and aggregates for tower and stair or ladder footings. 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 assembling the tower.

#### 2. Material

Structural steel and rivets shall conform to U. S. Government master specifications F.S.B. #351a, "Steel, Structural for Bridges", Class A, "Structural Steel, Noncopper" and Class C, "Rivet Steel, Noncopper." Reinforcing bars shall conform to U. S. Government master

specifications F.S.B. #350a "Bars Reinforcement, Type B, Grade 1", and anchor bolts shall be type A, grade 1. Successful bidder will be required to furnish certified analysis showing chemical and physical properties of the run or runs of steel covering the material from which the towers are fabricated.

Sheet metal for roofing and siding shall be pure iron or copper bearing steel, 20 gauge.

Bolts for field connections shall be of mild steel with hexagonal heads and hexagonal self-locking nuts equivalent to those manufactured by the Dardet Threadlock Corporation, 120 Broadway, New York, N. Y. Bolts shall be of such length that they will extend entirely through the nut but not more than 1/4" beyond. The threads shall be entirely outside the holes of the connected members. Metal siding and roofing shall be attached to structural shapes with 1/4" round-head brass bolts or machine screws. Three-eighths-inch carriage bolts shall be furnished for fastening down cab flooring, stair treads, and landings (which will be of two-inch lumber).

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 18 lights and one-half of each sash shall be hinged so that the top part swings in and the bottom out. Provision shall be made for fastening the sash in any open position and locking it. The sash shall be weatherproof, so that no water can beat in through the sash or connections or between the sash and the cab structure. The sash shall be so constructed as to obstruct the view as little as possible. Plans of the sash and weatherproofing details shall be submitted for approval before fabrication is authorized.

### 3. 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 punched holes shall be so accurately spaced that the tower will go together without the necessity of reaming the holes or of drifting or distorting the material.

As indicated on the accompanying drawings, the maximum length of members for towers with inside stairway will be approximately 22', and the maximum length of members for towers with ladders will be approximately 14'.

Unless otherwise stated, all punched holes shall not exceed the diameter of the bolt which it is to accommodate by more than 1/32 of an inch.

Unless otherwise stated on the accompanying design drawings, the following sizes shall be used for rivets or bolts for structural connections. The dimension given is for the width of the leg of the smallest angle through which the rivet or bolt passes.

Size of legSize of rivet or bolt

2-1/2" or wider	3/4"
2" and 2-1/4"	5/8"
1-3/4"	1/2"
1-1/2"	3/8"

The following minimum pitch and edge distance shall be adhered to:

Size of bolt or rivet	Minimum pitch	Edge Distance	
		For Sheared plate	For rolled or planed edges
3/4	2-1/2	1-1/4	1-1/8
5/8	2-1/4	1-1/8	7/8
1/2	1-3/4	1	3/4
3/8	1-1/2	7/8	5/8

All joints and splices shall be made in accordance with the details on the accompanying 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 circle 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 and 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 one bolt. All members passing each other shall be connected with at least one bolt, and ring fills shall be provided if these members do not pass in the same plane.

Splice angles, foot plates and gusset plates attached to the main leg members will be fastened by bolts, and each piece will be separately galvanized. The gusset plates shall be attached to the leg angles with four bolts each.

All angles shall have the vertical leg down and all unequal angles shall have the long leg vertical.

Landings are indicated on the attached drawings. Landings for towers with inside stairway shall be 2'6"x4'6" below the fifth landing, and as large as practicable above the fifth landing. Landings for platform ladder towers shall be 2'6"x3'6" below the fourth landing, and as large as practicable above the fourth landing. Seven-sixteenth inch holes shall be punched in the landing angles or struts approximately 6" apart for fastening down the landing plank.

Each leg angle will have two seven-sixteenth inch punched holes, one placed near the top (under the cab) and one placed near the bottom of the tower. The holes shall be so placed as to maintain the net section.

(These holes are to be used for making ground wire connections in insulating the towers from lightning.)

#### 4. Shop Drawings

The successful bidder will be required to submit two sets of shop drawings for approval before fabrication is started. In case shop drawings covering similar towers have been approved the bidder may refer to these and no additional shop drawings will be required.

#### 5. Galvanizing

After all the shop work has been finished, all structural parts of the tower shall be thoroughly galvanized by using the hot process.

The galvanizing shall consist of a heavy coating of prime spelter, evenly and uniformly distributed over all surfaces of the angle members, ladder runs, and 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 and nuts (except brass bolts) shall be galvanized by the hot process. Carriage bolts shall have standard threads which shall be carefully cleaned so that the nuts can be easily turned on the bolts. The threads of structural bolts and self-locking nuts shall be cut after galvanizing.

All galvanizing excepting that of the bolts and nuts may be subjected to the following tests:

A solution of sulphate of copper shall be made, using commercial copper sulphate crystals in water having a specific gravity of 1.185 at seventy (70) degrees Fahrenheit. The testing solution shall have a maximum temperature not exceeding seventy (70) degrees Fahrenheit or a minimum temperature of not less than sixty (60) degrees Fahrenheit. A sample piece galvanized shall be immersed in a standard solution, as above described, for one minute, and then removed, immediately washed thoroughly in water and wiped dry. This process shall be repeated. If, after the fourth immersion, there shall be a copper colored deposit on the sample, or if the zinc should be removed, the lot from which the sample was taken shall be rejected.

#### 6. Marking

Each member shall be marked to indicate its position in the tower. The successful bidder shall mail to each destination two copies of an erection diagram of the tower which will show by the erection mark on the steel itself the position of each member and also the size bolts to use at each joint. The erection diagram may be included as a part of the shop drawings.



7. 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 one tower together, with an excess allowance of 5%, being separately boxed.