

SECTION VISUGGESTED 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 oab) 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 Look-out 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:

<u>Minimum Nominal Thickness</u>	<u>Penetration of Creosote</u>
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	1-1/2" 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", 2 1/4" 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 either 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 tenon construction and shall be glued up and shipped assembled. Cup-board doors and drawers, bread 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. 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.

<u>Western Red Cedar</u>	- 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" x 5-1/2" x 3/8" 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 sill, 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.