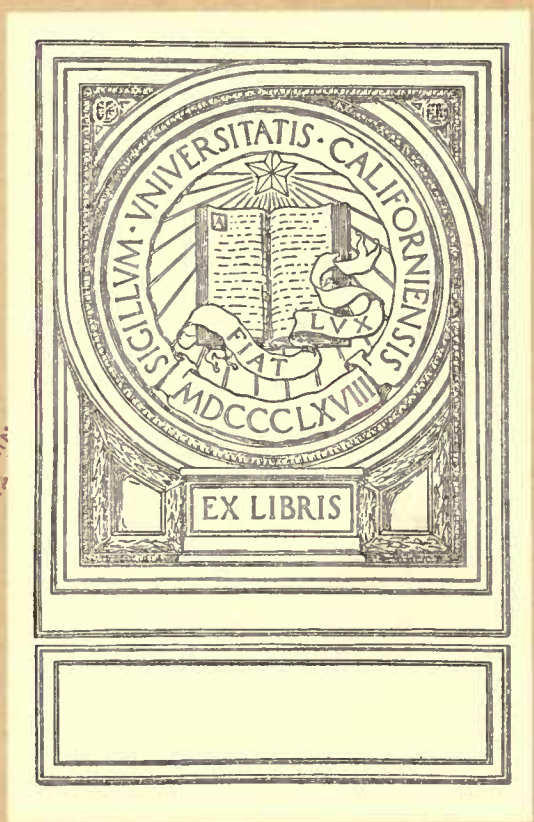

Bank Seals

[U.S. Light-house board]

U. S. LIGHT-HOUSE ESTABLISHMENT.

CONTRACT

FOR

CONSTRUCTION OF CONCRETE BASE

FOR LIGHT AND FOG-SIGNAL STATION, ON

MILE ROCK,

AT

ENTRANCE TO SAN FRANCISCO HARBOR,

CALIFORNIA.

ADVERTISEMENT.

OFFICE OF U. S. LIGHT-HOUSE ENGINEER,

TWELFTH DISTRICT, Room 91, Flood Building.

SAN FRANCISCO, CAL., April ....., 1904.

SEALED proposals will be received at this office until 12 o'clock, noon, Standard time, on....., May ....., 1904, and then publicly opened, for the construction of the concrete base of the light and fog-signal station to be erected on Mile Rock, entrance to San Francisco Harbor, Cal.

Plans and specifications, together with forms of proposal and all other necessary information, may be obtained on application to this office.

The right is reserved to reject any or all bids, and to waive informalities.

THOS. H. HANDBURY,

Lieut. Col., Corps of Engineers, U. S. A., Engineer 12th Light-House District.

SPECIFICATIONS.

GENERAL INFORMATION.

The object of the contract to be entered into under these specifications is to construct the concrete base or pillar of a light and fog-signal station, to be erected on Mile Rock, entrance to San Francisco Harbor, Cal. This station is to consist of a monolith concrete base, enclosed by steel plates, resting on the rock at the level of mean high water. This monolith is to be 34 feet high, and will cover an area of 704 square feet. On the top of this there will be a four-story tower made of structural steel, and surmounted by a lantern. The station will be provided with machinery, in duplicate, for a 10-inch fog whistle, to be operated by compressed air. The motive power of the compression machinery will be some form of mineral oil engine. Accommodations are to be provided for three keepers. The focal plane of the light will be 84 feet 3 inches above the datum plane, which is at the mean of lower low water.

LOCATION.—Mile Rock is about one half a mile inside a line joining the outer heads of San Francisco Harbor, and three eighths of a mile from the nearest point on the south shore. It rises nearly vertical out of the water, which is from forty to fifty feet deep. It has an area at the level of mean high water of about 1,000 square feet, and its highest point is sixteen feet above datum plane.

About one hundred and sixty feet from the rock, on the inshore side, there is another smaller rock extending above high water, which may be found useful in the course of construction, for mooring purposes. Between these there is navigable water. The mean rise and fall of the tide in this locality is about six feet. The tide on both ebb and flood is very swift, and the duration of slack water small.

The ordinary summer afternoon winds of the locality will interfere with the construction work during its early stages—that is, until a height of five or six feet above the foundation is reached.

Parties intending to submit proposals for the construction of this station should visit the locality and study the difficulties to be contended with.

CHARACTER OF MATERIAL AND WORKMANSHIP.—The importance of this work, and the exposed position in which it is to be done, make it imperatively necessary that only the very best of materials and workmanship enter into the construction of the station. It must, therefore, be distinctly understood that these requisites will be insisted upon.

GENERAL CONDITIONS.

The right is reserved to reject any or all bids, and to waive informalities.

These specifications are intended to include everything that pertains to the preparation of the rock to properly receive the structure, and to its erection to the top of the concrete pillar, all outside plating, all bolts, fastenings, etc., necessary to the landing of material and supplies at the station which should be properly be placed in this part of the structure, all doors and windows, and pipes through the concrete and rock down to such depths as may be required, and all fastenings to the rock, and steps forming the landing; also such rings and eye-bolts on Little Mile Rock and in the concrete structure as may be required for mooring purposes.

CEMENT.—All cement for the concrete work will be furnished by the Government

MATERIALS FURNISHED BY THE GOVERNMENT.—All materials and parts of the structure furnished by the Government will be transported from cars or place of storage in San Francisco by the contractor, and cared for by him until placed in position at the station.

PLANT, ETC.—The contractor is to furnish all plant, labor and material, except that which is herein specified as to be furnished by the Government, necessary for the complete and substantial execution of everything described, shown, or reasonably implied in the drawings and specifications.

The contractor will cover and protect the work and material, and be responsible for all damage thereto until the final completion of the contract. He will clear away, from time to time as may be necessary, all dirt and rubbish resulting from the work, and on the final completion he will thoroughly clean all floors and windows, remove all debris, and leave the premises in good order.

DRAWINGS AND SPECIFICATIONS.—The drawings and specifications are intended to correspond and be illustrative of each other, and any work appearing in one and not in the other is to be done the same as though included in both.

No advantage will be taken by the contractor of any omission of information in the specifications or drawings, as full explanations or detailed drawings will be given for any part of the work not sufficiently shown or understood.

The contractor will substitute at his own cost, and without delay, satisfactory work and material for any and all that may be rejected, and will make good any work that may be disturbed thereby.

SUPERVISION OF WORK.—The authorized agents of the Light-House Engineer are to have access to the work and material at all times. An agent will be appointed to superintend the work, and in case of a difference between him and the contractor, the decision of the Light-House Engineer shall be final.

This agent shall be allowed the privilege of going to and from the work on such boats and by such means as the contractor may provide for himself or his material and labor, whenever necessary, without expense to the Government.

The contractor will furnish without expense to the Government such assistance in labor, tools and materials, as may be required in marking lines and fixing points upon the rock, which are necessary to his work.

The Light-House Engineer may, by written notice, require the contractor to dismiss at once such workmen or persons in his employ as he may deem incompetent, careless, or injurious to the work, and such individual may not again be employed on the work.

EXTRA WORK, ETC.—Should any extra work or changes be found necessary during the progress of the work, the value of such work or changes shall be the subject of a written agreement before being commenced, between the Light-House Engineer and the contractor, subject to the approval of the Light-House Board.

All work of every kind and description must be done and completed to the satisfaction of the Light-House Engineer.

DETAILED DESCRIPTIONS.

SHAPE OF PLAN.—The outline of the plan of the structure will be formed by two segments of equal ellipses with corresponding axes at right angles to each other, placed so as to form a symmetrical figure, the distance between the centers of the ellipses being 12 feet 6 inches, and the segments being joined by right lines tangent to both. The major and minor axes of the two ellipses being 25 feet and 21 feet respectively.

This plan will be adjusted to the rock and the structure located thereon as shown upon Plate 1 of the drawings accompanying these specifications. The base of the structure will be at the height of 6 feet above the plane of

a mean of lower low water as established and marked upon the rock; this height being practically that of mean high water.

The pillar is terminated at the top by a moulded cap extending out all around, two feet beyond the general line of the face. Plate XI, Fig. 1.

EXCAVATION.—From the periphery of the base inward for a distance of 3 feet the rock will be excavated where necessary down to reference 6, mean high water, and carefully prepared for the concrete. It will be permitted to use only very small charges of powder, and these only in localities where the rock to which the concrete is to be joined will be in no danger of being shattered or disturbed.

The Light-House Engineer, or his representative, is to be the exclusive judge as to where explosives may be used, and as to the quantity. It may be expected that practically all the excavation will be done by gadding. No concrete will be placed until its foundation has been satisfactorily prepared.

The lower part of the stair well and the pump room adjoining, and a part of the passage out to the landing steps will be in excavation. A small amount of excavation will be required outside the periphery and below reference 6, to accommodate the landing stairs.

Should there be points at which a suitable foundation is not found at the level adopted, at these the contractor will be expected to extend the excavation lower. There will be approximately 70 cubic yards of excavation.

STEEL PLATING, ETC.—The concrete is to be enclosed in a casing of tank steel, $\frac{3}{8}$ inch thick, in sheets 3 feet high by 8 feet in length, or longer if more convenient to the contractor. The edges of the plates are to be at right angles to each other. The laps of the horizontal joints to be 2 inches, the vertical joints to abut, with straps 3 inches wide on the inside. The vertical joints to be practically at the middle of the upper and lower plates. Plates to be arranged alternating out and in, as shown upon the drawings. Rivets to be $\frac{5}{8}$-inch diameter with pitch 4 inches for vertical seams and 6 inches for horizontal. Holes to be punched in plates so that rivets will draw fair.

There will be $\frac{3}{4}$-inch bent iron bolts, 1 foot in length, with heads on the outside, placed about 3 feet apart, the bolts in one row to be opposite the intervals of the next adjoining, for the purpose of anchoring the plates to the concrete. The third row of these stay bolts from the bottom to be provided with eyes one inch in diameter.

The plating will extend into the entrance gallery as far as the door recess. Openings will be provided through the plating at the port holes and at other places wherever necessary. One object of this plating is to form an outer mould for the concrete, and it is to be put in place only as the concrete can be filled in back of it. All plates to be punched, bent, fitted and suitably marked in the shops of the contractor before being sent to the rock.

For the purpose of holding the lower edge of the plating in place, iron bolts 1 inch in diameter and 18 inches long will be firmly fastened into the rock at intervals of 3 feet, so as to permit the plating to pass them alternately inside and out. These bolts to extend 1 foot into the rock and 6 inches above it.

Around the top edge of the concrete there will be an angle iron $3\frac{1}{2}$ inches by $3\frac{1}{2}$ inches by $\frac{1}{2}$ inch, fastened to the concrete by $\frac{3}{4}$-inch anchor rods 18 inches long, one on each side of the chain posts, and one midway between each two posts. This angle will have the corner rounded to curve with a radius of $\frac{3}{4}$ inch. Plate XI, Fig. 1. Holes will be left 6 inches by 6 inches by 6 inches about 6 feet apart, for the insertion of chain posts. Plate XI, Fig. 1, and Plate VI, Fig. 1. Conical holes 4 inches by 4 inches at top and 6 inches by 6 inches at bottom, 2 feet deep and 4 feet apart, to be left as shown on Plate XII, Fig. 1, for the insertion of bolts for holding down the iron superstructure.

CONCRETE.—No care nor expense must be spared to make this the very best that can be manufactured. The cement, which will be furnished by the Government, will be of a well-known and long-established brand, the best that can be obtained in the San Francisco market. This to be taken by the contractor from the place where stored by the Government.

The sand must be clean and sharp, and gravel and broken stone clean, hard, and free from all impurities of every character whatever. The broken stone must be in size such as to go through a screen with 1 inch meshes.

Bidders must submit with their proposals samples of the sand, gravel, and broken stone that they propose to furnish.

The concrete will be mixed in the proportions of one cement, two sand, and four broken stone or coarse gravel, by measurement; with only sufficient water to insure that the materials may be worked with reasonable ease. The water to be added through a hoze nozzle, or other form of sprinkling arrangement, after the materials have been thoroughly mixed dry. The whole mass to be again thoroughly mixed. The custom of throwing water upon the concrete at the place of deposit to make it work easily will not be permitted.

No more than thirty minutes must elapse from the time that the water is first added to the concrete until the tamping is completed.

The concrete must be deposited in layers of about 4 inches and well rammed. The top of each layer to be roughened and prepared to receive the succeeding one so that the junction between the two will be perfect and no seams or interstices visible. In placing new concrete on that thoroughly set great care must be taken to roughen the surface of the old, clean it thoroughly and do all things necessary to insure that the junction will be perfect as possible.

All forms and surfaces against which the concrete is to be placed should be rigid so as not to shake during the process of packing.

After the concrete is in place and the forms removed, all exposed surfaces must be pointed and made smooth and uniform by being covered with a thin coating of mortar composed of one part sand and one part cement, well rubbed on with a wooden trowel.

In some parts of the structure the proportions of the material in the concrete may be slightly varied at the discretion of the Light-House Engineer.

In the upper part of this structure there will be provided a store room having a height of 7 feet 10 inches, with walls 4 feet thick. These walls to be pierced by six holes for the admission of light, which are to have an outside diameter of 2 feet and a diameter of 20 inches at the window frame. Inside of windows a rectangular recess; dimensions on drawings. Port hole windows, glass one inch thick, bronze frame, each fastened to concrete by four bronze screw bolts with nuts imbedded in concrete. Plate XI, Figs. 1 to 7.

CISTERN.—Under the floor of the store room a cistern for fresh water, 8 feet diameter and 10 feet high, will be provided. The top of this to be covered with concrete having bars of ¾-inch twisted iron imbedded in it. A hole will be left in this top for entrance to the cistern, about 20 inches in diameter, and provided with a suitable frame and cover.

A 2½-inch galvanized iron pipe leading from the bottom of the cistern out to the stair well will be provided for drainage purposes. There will be a suitable cock or valve at the lower end of this pipe to which a 2½-inch standard hose can be attached.

The inside of the cistern to be coated with three coats of Sylvester Wash, and one coat of P. & B. paint, all to be put on as may be directed. Plate IV, and Plate XII, Figs. 8, 9 and 10.

STAIRS.—Winding concrete stairs, leading from store room down to entrance passage, will be provided. The diameter of the stair well to be 6 feet; the rise of the steps 8 inches.

At the bottom of the stair well there will be a recess for the accommodation of a small pump, which is to furnish water for cooling the oil engines. The entrance passage will lead from this out through the concrete at a level of 5 feet 4 inches above the mean high water line. There will be a door at the foot of the stairs which will lead to the pump room, and another 4 feet from the entrance to the passage way.

The form of the structure must conform in all respects to the drawings. It is estimated that approximately 770 cubic yards of concrete will be required.

ACCESSORIES.—Piping of every description that is to be imbedded in the concrete, or leading down through the rock into the water, all bolts excepting those intended to fasten the superstructure to its base, port hole frames and lights, ring-bolts and fastenings of every description, and expanded metal and twisted rods that are imbedded in the concrete, all doors and their fastenings forming a part of this concrete pillar, will be furnished and put in place by the contractor.

Around the whole structure extending from the base to the top at a distance of 12 inches inside the plating there will be imbedded in the concrete expanded metal of a character and quality to be approved by the Light-House Engineer. This will have meshes of about 3 inches on a side, and weigh about 9 ounces per square foot. Metal of the same quality and description will be imbedded in the under surface of the stairs, and in the partition wall at the foot of the stairs, as these are being built. A twisted or corrugated bar of iron about ¾ inch square will be imbedded in the newel of the stairs.

A bronze pipe 2 inch interior diameter, ⅜ inch thick, with suitable elbows and connections, will extend from the floor of the pump room to the outer surface of the rock at a level not less than 6 feet below extreme low water. Plate VI, Fig. 3; Plate V.

A 4-inch terra cotta drain pipe will extend from the top of the store room floor down and out at about the level of mean high water.

A 3-inch terra cotta pipe will lead from the foot of the stair well to the outside as may be directed for the purpose of introducing a telephone cable into the structure.

A notch will be left in the side of the stair well for the accommodation of the pump rod and discharge pipe, telephone cable, and for other purposes. The size and location of this will be designated by the Light-House Engineer, and shown on drawings.

DOORS.—At the point fixed for the entrance door the opening will be 6 feet high by 2 feet 6 inches wide. It will be closed by a door 3 feet wide by 6 feet 6 inches high, opening outward into a recess. The door will close all round against a shoulder 3 inches wide, which shall be guarded by a bronze angle frame, faces 3 inches wide and ½ inch thick. This frame to be fastened at intervals of 18 inches by ¾-inch bronze bolts extending through the inside leg of the angle 12 inches into the concrete, and there securely made fast. The outer end of the bolts to be provided with thread and nut. The outside face of the outer leg of the angle to be planed to a true surface, so as to fit closely to a similar surface to be fastened to the door, which, when closed, will be practically watertight. Plate VII.

The door to be 4 inches thick, made of two thicknesses of 2 inch by 4 inch planed, clear, straight-grained, well-seasoned, white oak, free from sap, rot, knots, windshakes, or other imperfections. The pieces to be beaded on one edge and put together diagonally with ½-inch bronze bolts, washers on both ends. Between the pieces there will be a layer of thick asphalt paper.

Around the inside edge of the door there will be a bronze frame, 3 inches wide and ½ inch thick, planed on one side to fit against the corresponding surface of the frame fastened to the concrete. This will be fastened to the door with ½-inch bronze bolts and nuts, the inside ends of bolts to be screw-head shaped to fit into countersunk holes to be made in the frame. Washers to be provided for outside ends of bolts.

On the center line of the door and about 4 feet 6 inches from the bottom there will be an opening 7½ inches diameter, in which will be placed, suitably fastened by a bronze frame, a piece of plate glass ½ inch thick. Plate X, Figs. 1, 2 and 3.

The door will be hung upon three pairs of heavy bronze strap hinges, made and fastened as shown on the drawings. Plate VII, and Plate X, Figs. 2 and 3. Suitable slide bolts and fastenings to be provided at top and bottom and outer edge of the door. Plate X, Figs. 2 to 9.

The door leading into the pump room from the foot of the stairs to be made in a similar manner of two thicknesses of same quality of oak, 1½ inches thick and 4 inches wide, joined together by ½-inch bolts with

washers. The door frame and the frame around the door on the inside will be similar to that prescribed for the entrance door. Suitable hinges and fastenings will be provided. Details of these doors and their fastenings are shown on Plates VII, VIII, IX and X.

All metal used in and about these doors to be of best quality tough bronze.

For the purpose of gaining access to this entrance from the outside, there will be steps, made of concrete, leading from low water to the base of the structure, and from thence up to the entrance floor a ladder. The material of this will be bronze. Rounds 1¼ inches diameter, length of face 3 feet 6 inches and 10 inches apart. To be 4 inches out from face of iron plating and extended into the concrete 12 inches, and there firmly fastened. There will be similar hand rails on each side of the entrance. Plates VII and VIII.

LANDING PLATFORM.—There will be a platform 3 feet by 6 feet at the top of the pillar extending 3 feet beyond the face of the plating, constructed as shown on the drawings. Plate XII, Figs. 1 to 7.

PAINTING.—As the plating is extended upward it is to be thoroughly cleaned of dirt and rust, made perfectly dry, and given a coat of pure boiled linseed oil put on hot. When this has become hardened it will be followed by a coat of red lead and graphite in equal parts, mixed with boiled linseed oil. A final coat of white lead ground in linseed oil will be put on as the work is completed.

TIME.—The actual work of excavating on the rock to prepare it for the concrete must be commenced, weather conditions permitting, within 30 calendar days from the date of notification of approval of the contract by the Secretary of Commerce and Labor, and all work contemplated under the contract must be pushed to completion at the earliest practicable moment by taking advantage of every favorable condition of tide and weather as it occurs.

If the work contemplated by the contract be not completed to the satisfaction of the Light-House Engineer by the end of 240 calendar days from the date of said notification of approval of contract, irrespective of weather conditions, the contractor then becomes liable for the expenses that may accrue as defined in the next following paragraph of these specifications.

STEEL TOWER.—The structural steel portion of this station, that is to be built upon the concrete base to be constructed under these specifications, will form the subject of a separate contract. In case the work required under these specifications be not completed within the above specified time, the contractor must pay all the extra expenses arising from storage, cartage, care and handling of material of the superstructure and from other causes, in consequence of his delay. The amount of these expenses to be deducted from the money due him on final settlement of his accounts.

PAYMENTS.—The work will be paid for in two payments of 50 per centum each of the contract price, provided that from the first payment 20 per centum shall be deducted and retained until the final completion of the work. The first payment shall be made when the structure shall have been completed to a height of 20 feet above its base. The second and final payment, including the retained percentage, shall be made when the work contemplated by the contract is all entirely completed to the satisfaction of the Light-House Engineer, after deduction of such amounts as may have accrued in consequence of delay in completion as described in the paragraph next preceding.

[Before filling out this bid the instructions to bidders should be carefully read.]

BID.

(DATE:).....

.....

.....

I (or we), ...

.....

..... of the

..... State of .....

engaged in .....hereby agree to furnish all the labor and material, except cement, for, and construct a monolith concrete base or pillar of a light and fog-signal station to be erected on Mile Rock, at the entrance to San Francisco Harbor, California, in accordance with the terms of the advertisement dated April....., 1904, and the specifications and plans herewith, for the sum of.....dollars ($.....).
100

The same to be completed on or before the.....day of.....

(Signature:).....

(Address:).....

(Signature:).....

(Address:).....

To the

ENGINEER 12th LIGHT-HOUSE DISTRICT,

Room 91, Flood Building, San Francisco, Cal.

GUARANTY TO ACCOMPANY PROPOSAL.

We, ...

of.....in the County of.....

and State of.....and..... of

.....in the County of.....and State of.....

.....hereby undertake that if the bid of.....

..... herewith accompanying, dated.....

for furnishing all the labor and material, except cement, for, and constructing a monolith concrete base or pillar of a light and fog-signal station to be erected on Mile Rock, at the entrance to San Francisco Harbor, California, be accepted as to any or all of the items of supplies, materials, and services proposed to be furnished thereby, or as to any portion of the same within sixty days from the date of the opening of proposals therefor, the said

bidder .....will, within ten days after notice of such acceptance, enter into a contract with the proper officer of the United States to furnish such articles of supplies and materials and such services of those proposed to be furnished by said bid as shall be accepted, at the prices offered by said bid and in accordance with the terms and conditions of the advertisement inviting said proposals, and will give bond with good and sufficient sureties for the faithful and proper fulfillment of such contract. And we bind ourselves, our heirs, executors, and administrators, jointly and severally, to pay to the United States, in case the said bidder shall fail to enter into such contract or give such bond within ten days after said notice of acceptance, the difference in money between the amount of the bid of said bidder on the articles or services so accepted and the amount for which the proper officer of the United States may contract with another party to furnish said articles and services, if the latter amount be in excess of the former.

Given under our hands and seals this.....day of.....

.....

In presence of—

..... as to .....*

..... as to .....*

* Affix adhesive seal.

STATE OF.....
County of..... } ss.

I, ..., one of the guarantors named in the foregoing guaranty, do swear that I am pecuniarily worth the sum of..... dollars over and above all my debts and liabilities.

.....

Subscribed and sworn to before me this.....day of.....

at.....

[1].....

STATE OF.....
County of..... } ss.

I, ..., one of the guarantors named in the foregoing guaranty, do swear that I am pecuniarily worth the sum of..... dollars over and above all my debts and liabilities.

.....

Subscribed and sworn to before me this.....day of.....

at.....

[1].....

I, [2].....do hereby certify that.....

..... and ....., the guarantor above named,.....

personally known to me, and that, to the best of my knowledge and belief, [3].....is pecuniarily worth, over and above all his debts and liabilities, the sum stated in the accompanying affidavit subscribed by him.

.....

I, ..., do hereby certify that.....

....., the guarantor above named, is personally known to me, and that, to the best of my knowledge and belief, he is pecuniarily worth, over and above all his debts and liabilities, the sum stated in the accompanying affidavit subscribed by him.

.....

[1] The oath to be taken before a notary public or some other officer having general authority to administer oaths. If the officer has an official seal it must be affixed, otherwise the proper certificate as to his official character must be furnished.

[2] This certificate to be by a judge or clerk of a United States court, a United States district attorney, United States commissioner, postmaster, or a judge or clerk of a State court of record with the seal of said court attached. If the official can make the certificate as to both sureties, it will not be necessary to fill out the next form below.

[3] He or each.

INSTRUCTIONS TO BIDDERS.

N. B.—Failure to comply with these instructions renders the bid informal and liable to be rejected.

1. All bids must be made upon the printed form annexed hereto.

2 Each bid must state the sum for which the entire work, as shown on the drawings and described in the specifications, will be completed.

3. The bidder's place of residence, with county and State, should be given after his signature, which must be written in full.

4. Anyone signing a bid as the agent of another, or of others, should file with it legal evidence of his authority to do so.

5. When firms bid, the firm name and the full name of each member thereof should be written at the beginning of the bid; for instance, "Smith, Brown & Co., of the City of New York, a firm composed of John S. Smith, Charles B. Brown, and John W. Robinson." The bid should be signed in the firm name without a seal. When corporations bid, the bid should be signed with the corporate name by some person duly authorized to do so (evidence of whose authority should be appended), and sealed with the corporate seal.

6. Bidders should satisfy the United States of their ability to furnish the material and perform the work for which they bid.

7. Reasonable grounds for supposing that any bidder is interested in more than one bid for the same item will cause the rejection of all bids in which he is interested.

8. Bids submitted by different members of the same firm or copartnership will not be considered.

9. The right is reserved to reject any or all bids, and to waive any defects.

10. All bids must be enclosed in an envelope endorsed, "Proposal for Concrete Base of Light-Station on Mile Rock, San Francisco Harbor," and then enclosed in another envelope and directed to the "Engineer Twelfth Light-House District, Room 91, Flood Building, San Francisco, Cal."

11. All bids will be publicly opened at the time specified in the advertisement. Bidders are invited to be present and witness the opening of the bids.

12. The form of contract to be entered into may be seen at this office. Bidders are to be understood as accepting the terms and conditions contained in such form of contract.

13. The plans and specifications, together with these instructions, will form part of the contract.

14. Should the bidder to whom the contract may be awarded fail to enter into contract within ten days after notice has been given him that his bid has been accepted, he will be considered a defaulting contractor, and recommendation will be made to the Secretary of Commerce and Labor that hereafter no proposal of his be considered.

15. A bond, with one corporate surety or with two individual sureties, in the sum of $..... will be required for the faithful performance of the contract. Each surety will be required to qualify in double the amount of the bond.

16. A firm will not be accepted as a surety, nor will a partner be accepted as a surety for a copartner, or for a firm of which he is a member. An officer of a corporation will not be accepted as surety for such corporation. In no case will a married woman be accepted as a surety.

17. No bid will be accepted or contract entered into until approved by the Light-House Board.

18. Transfers of contracts, or of interests in contracts, are prohibited by law.

19. Payment will be made as specified.

20. The work must be completed and delivered as specified.

21. No proposal will be considered unless accompanied by a guaranty in manner and form as directed in these instructions.

22. All bids and guaranties must be made in duplicate, upon printed forms to be obtained at this office.

23. The guaranty attached to each copy of the bid must be signed by two responsible guarantors, to be certified as good and sufficient guarantors by a judge or clerk of United States court, United States district attorney, United States commissioner, postmaster, or judge or clerk of a State court of record, with the seal of said court attached, or by one guaranty or surety company duly authorized in accordance with the provisions of an act of Congress approved August 13, 1894.

24. Each guarantor must justify in the sum of twenty (20) per cent of the amount of the bid. The liability of the guarantors and the bidder is expressed in the guaranty attached to the bid.

CONTRACT.

N. B.—In executing this contract the directions on page 29 should be carefully followed.

Articles of Agreement, made and entered into between .....

.....

.....

.....

.....

.....

.....

of the first part, and THOS. H. HANDBURY, Lieutenant-Colonel, Corps of Engineers, U. S. A., Engineer Twelfth Light-House District, acting for and in behalf of the United States of America, of the second part, witnesseth:

That the party of the first part, in consideration of the matters hereinafter referred to and set out, and of the specifications and drawings attached hereto, and forming a part of this contract, covenants and agrees, to and with the party of the second part, to furnish all the material and labor necessary for, and to construct a concrete base or pillar for the light and fog-signal station to be erected on Mile Rock, at the entrance to the Harbor of San Francisco, California, all as more particularly set forth in the specifications and drawings above referred to, and to complete the same within two hundred and forty (240) calendar days from the date of notification to the party of the first part that the contract has been approved by the Secretary of Commerce and Labor.

And the said party of the first part further agrees to conform in every particular to the stipulations and conditions stated in this contract, and to the specifications and drawings for the work, hereto annexed, which are to be considered as a part of the same, and to be governed in all matters regarding said work and the materials used therein by the said party of the second part, or the authorized agent or agents thereof; and that the said

work and materials used therein shall be subjected to a rigid inspection to be made by the party of the second part, or its agent or agents, and that this inspection shall be final.

And the said party of the second part covenants and agrees to pay the party of the first part, in full payment for said work and materials used therein, as follows: When the structure shall have been completed to a height of 20 feet above its base 50 per centum of the contract price will be paid, provided that from this payment 20 per centum shall be deducted and retained until the final completion of the work. The second and final payment, including the retained percentage, shall be made when the work contemplated by the contract is all entirely completed to the satisfaction of the Light-House Engineer, after deduction of such amounts as may have accrued in consequence of delay in completion, as described in the specifications.

And it is expressly understood and agreed that, as each payment hereinbefore stipulated is made, possession of the material, labor and articles which are paid for by such payments shall pass to, and the title thereto shall be vested in the United States.

If, in any event, the party of the first part shall delay or fail to commence the delivery of the material or the performance of the work specified herein, or shall, in the judgment of the officer of the Light-House Board in charge, fail to prosecute faithfully and diligently the work in accordance with the specifications and requirements of this contract, then, in either case, the party of the second part, or his successor, shall have power, with the sanction of the Light-House Board, to annul this contract by giving notice in writing to that effect to the party (or parties, or either of them) of the first part; and the party of the second part shall be thereupon authorized, if an immediate performance of the work or delivery of the materials be in his opinion required by the public exigency, to proceed to provide for the same by open purchase or contract, as prescribed in section 3709 of the Revised Statutes of the United States; but the party of the first part shall remain liable to the party of the second part for the damages occasioned to him by the said noncompliance, delay, or negligence: *Provided, however,* That if the party (or parties) of the first part shall by freshets, ice, or other force or violence of the elements, and by no fault of his or their own, be prevented either from commencing or completing the work, or delivering the materials at the time agreed upon in this contract, such additional time may, in writing, be allowed him or them for such commencement or completion as, in the judgment of the party of the second part, or his successor, shall be just and reasonable, any additional expense incurred by the United States on account of inspection or otherwise during the period of extension to be deducted from the contract price of the work; but such allowance and extension

shall in no manner affect the rights or obligations of the parties under this contract, but the same shall subsist, take effect, and be enforceable precisely as if the new date for such commencement or completion had been the date originally herein agreed upon.

It is further understood and agreed that in case of failure on the part of the party of the first part to complete this contract as specified and agreed upon, that the said United States shall have the right to recover any or all damages incurred by reason of said failure by the party of the first part, and shall also have the right to recover whatever sums may be expended by the party of the second part in completing the said contract in excess of the price herein stipulated to be paid to the party of the first part for completing the same.

And it is further stipulated and agreed that no Member of or Delegate to Congress shall be admitted to any share or part of this contract or agreement, or to any benefit to arise therefrom; and this contract shall be in all its parts subject to the terms and conditions of sections 3739, 3740, and 3742 of the Revised Statutes of the United States.

And it is also expressly understood and provided that nothing herein contained shall be so construed as to authorize any officer or agent of the United States to bind the United States by contract beyond the amount appropriated by Congress.

And it is further covenanted and agreed that no member of the Light-House Board, inspector, lightkeeper, or other person in any manner connected with the Light-House Service, shall be interested, either directly or indirectly, in this contract, or be entitled to any benefit to arise therefrom; and for any violation of this covenant and agreement the party of the first part shall forfeit all moneys which may become due under this contract.

Provided, also, that it is expressly understood and agreed that this contract, or any part thereof, shall not be sublet nor assigned, but that it shall be well and truly carried out and fulfilled in good faith by the above-recited party of the first part, and that payment on account thereof shall be made to the aforesaid party of the first part, ...successors, heirs, executors, or administrators.

And provided further, that this contract shall not be binding upon the United States until it shall have been approved by the Light-House Board.

And for the true and faithful performance of all and singular the covenants, articles, and agreements hereinbefore particularly set forth, the subscribers hereunto bind themselves, jointly and severally, their and each of their successors, heirs, executors, and administrators.

Thus covenanted, made, and agreed by the said parties, this.....day of.....

anno Domini one thousand nine hundred and four, as witness their hands.

Signed and delivered in presence of—

WITNESSES:

.....

.....

.....

.....

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.....

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.....

NOTE.—The bondsmen must not sign the contract.

BOND WITH CONTRACT.

KNOW ALL MEN BY THESE PRESENTS, That we.....

.....

.....

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.....

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.....

.....

....., as sureties, are held and firmly bound unto the United States of America in the sum of..... dollars ($.....), lawful money of the United States, to be paid to the said United States, or its authorized agent, as liquidated damages; for which payment, well and truly to be made, we, and each of us do bind ourselves, and each of our successors, heirs, executors, and administrators, jointly and severally, firmly by these presents.

Sealed with our seals, dated this.....day of.....

.....

The condition of the above obligation is such that if the said.....

.....

.....

.....

successors, heirs, executors or administrators, shall well and truly execute the contract hereto annexed which .....ha.....entered into with Thos. H. Handbury, Lieutenant-Colonel, Corps of Engineers, U. S. A., Engineer Twelfth Light-House District, for and in behalf of the United States, by which..... covenant.....and agree.....to construct a concrete base or pillar for the light and fog-signal station to be erected on

Mile Rock, at the entrance to the Harbor of San Francisco, California,..... according to all the conditions of the said contract, and shall promptly make payments to all persons supplying said.....labor and materials in the prosecution of the work provided for in such contract, then this obligation to be void; otherwise to remain in full force and virtue.

Signed and sealed in the presence of— WITNESSES:

....[L. S.]

....[L. S.]

....[L. S.]

....[L. S.]

....[L. S.]

NOTES.

If the contract be made by an incorporated company, the corporate seal should be impressed on, or affixed to, each copy of both the contract and the bond, and a certificate, under the corporate seal of the company, showing that the person who signs in its behalf is, at the time of signing, the officer he purports to be, and as such is duly authorized to sign sealed instruments in behalf of the company, should be affixed to at least one copy of the contract.

All signatures of sureties should have affixed to them adhesive seals, and their names should be written in full.

The residence of sureties and witnesses should be given.

The bondsmen must qualify in the forms following.

The bondsmen must not sign the contract.

BONDSMEN'S OATHS.

STATE OF.....
County of..... } ss.

....., being duly sworn, deposes and says that he resides at No. .....street, in the.....of.....in the State of.....; and that the value of his property, over and above all debts and liabilities incurred by him, is over.....dollars ($.....), and that he is fully responsible for the amount of his obligation in the foregoing bond by him executed.

(Signature of surety:).....

Sworn to and subscribed this.....day of....., 190....., before me.

(Signature of officer administering oath, with seal, if any.) .....[L. S.]

.....

STATE OF.....
County of..... } ss.

....., being duly sworn, deposes and says that he resides at No. .....street, in the.....of.....in the State of.....; and that the value of his property, over and above all debts and liabilities incurred by him, is over.....dollars ($.....), and that he is fully responsible for the amount of his obligation in the foregoing bond by him executed.

(Signature of surety:).....

Sworn to and subscribed this.....day of....., 190....., before me.

(Signature of officer administering oath, with seal, if any.) .....[L. S.]

.....

NOTES.

If the affidavits of the sureties be made before a notary public, his seal should be impressed thereon; if made before a justice of the peace, the usual certificate attesting the official character of the magistrate should be appended.

Each surety will qualify in double the amount of the bond.

Form of Justification by Corporate Surety.

[*This form of justification is to be used when a guaranty or surety company is upon the bond of the contractors, instead of two individual sureties.*]

STATE OF.....
County of..... } ss.

Personally appeared before me,..... on this.....day of.....one thousand nine hundred and four, known to me to be the ..... of the..... .....the corporation described in and which executed the annexed bond of.....as surety thereon, and who, being by me duly sworn, deposes and says that he resides at.....in the State of..... .....that he is the.....of the said..... .....Company, and knows the corporate seal thereof; that said company is duly and legally incorporated under the laws of the State of.....; that said company has complied with the provisions of the Act of Congress of August 13, 1894, allowing certain corporations to be accepted as surety on bonds; that the seal affixed to the annexed bond of ..... is the corporate seal of the said..... Company and was affixed thereto by order and authority of the board of directors of said company; and that he signed his name thereto by like order and authority as..... of said company; and that he is acquainted with.....and knows him to be the.....of said company; and that the signature of said .....subscribed to said bond is in the genuine handwriting of said.....and was thereto subscribed by order and authority of said board of directors, and in the presence of said deponent; and that the assets of said company, unincumbered and liable to execution, exceed its claims, debts, and liabilities of every nature whatsoever, by more than the sum of.....dollars ($.....).

Deponent further says that..... residing

at.....in the State of.....has been duly appointed as the agent of said company to accept service of process against said company in the.....judicial district of.....and is authorized to enter an appearance in behalf of said company in any action, suit, or proceeding brought against it in said judicial district.

.....

Sworn to, acknowledged before me, and subscribed in my presence this.....day of .....190.....

.....

NOTES.

If the above affidavit be made before a notary public, his seal should be impressed; if made before a justice of the peace, the usual certificate attesting the official character of the magistrate should be appended.

The surety company will qualify in double the amount of the bond.

CERTIFICATE OF SOLVENCY.

I CERTIFY that I have made due and diligent personal inquiry as to the ability of the signers of the foregoing bond, and am satisfied that they are good and sufficient, and fully responsible for the sum of.....

.....dollars ($.....) each.

(Signature of certifying official.).....

.....

DATE:.....190 .

NOTES.

The surety's certificate of solvency must be signed by an officer of the Government known to the Treasury Department. This form need not be used when a guaranty or surety company is upon the bond of a contractor.

Directions as to Execution of Contracts.

1. The contract papers proper, comprising the specifications, drawings, if any, contract, bond, bondsmen's oaths, justification by corporate surety—when a guaranty or surety company is upon the bond of the contractor, instead of two individual sureties—and certificate of solvency, should be made in quadruplicate, and each copy should be the exact counterpart of the others, so that any one of them may be used as an original.

2. Before signatures are appended to the papers, all dates should be written in, and all remaining blank spaces ruled out, with ink.

3. Interlineations and erasures are to be avoided when possible; but when they are unavoidable, either in the specifications, the contract, or the bond, they should be noted, word by word, immediately above the signature of the witnesses, specifying the number of each line where they occur; and certificates should be made that each specific correction or alteration was made before the contract was signed.

4. The full name and the residence of each signer of a contract and bond should be written in the body of the contract and bond.

5. When firms contract, the name of the firm and the full name of each member thereof should be written at the beginning of the contract; for instance, "Smith, Brown & Co., of the city of New York, a firm composed of John S. Smith, Charles B. Brown, and John W. Robinson." The contract should be signed in the firm name without seal. The bondsmen must not sign the contract.

6. When an *incorporated* company enters into contract, the corporate name of the company should be written at the beginning of the contract and bond; for instance, "The Smith and Brown Dredging Company, a corporation created by and existing under the laws of the State of New York, of the city of New York, in said State." The contract and bond should then be signed with the corporate name by a person duly authorized to do so, sealed with the corporate seal, and a certificate, under the corporate seal of the company, showing the signer's authority to sign sealed instruments in its behalf, should be appended to one copy of the contract. In the event that the corporation has no corporate seal, a seal of wax or wafer should be affixed to the bond and adopted and used for the time being as the seal of the corporation, and the fact that such corporation has no corporate seal should be shown by affidavit duly made before a notary public, whose official seal should be affixed thereto.

7. A bond for the faithful performance of the contract will be required. Seals of wax or wafer should be affixed to the signatures of principals and sureties, if individuals; and corporate seals should be affixed as required by Rule 6. The bond should bear the same date, or a date subsequent to that of the contract.

8. An individual or individuals, doing business under a firm name, should sign the bond in his, or their, individual names. Firm names should not be signed to the bond.

9. Each signature to a contract or bond should be made in the presence of at least one witness, who should sign his name as a witness.

10. A firm will not be accepted as a surety, nor will a partner be accepted as a surety for a copartner, nor for a firm of which he is a member. An officer of a corporation will not be accepted as surety for such corporation. In no case will a married woman be accepted as a surety, and when an unmarried woman (widow or spinster) is given as a surety, she must be described as such in the body of the bond.

11. When a person signs a contract or bond as the agent or attorney in fact of another person, evidence of his authority to sign the same should be furnished. The authority to execute an instrument under seal should itself be under seal, and it should also be duly acknowledged before an officer empowered to take acknowledgments.

12. There must be not less than two individual sureties, but one corporate surety duly qualified under the Act of Congress of August 13, 1894, may be accepted as sole surety. The contractor and sureties should sign (execute) each bond. Each member of a firm should sign the bond personally or by attorney; in the latter case, a certified copy of the power of attorney under which the signature is made should be appended to the contract. Each surety must qualify in double the amount of the bond. This direction applies to corporate as well as individual sureties, and corporate sureties should also attach to each bond a copy of the last statement of their assets and liabilities, as rendered pursuant to Section 4 of the Act of Congress of August 13, 1894. Each surety should make and sign an affidavit of the amount he is worth over and above all debts and liabilities, and such exemptions as may be allowed by law. Sureties, other than corporate sureties, should state under oath that they are not responsible as sureties on any other bond, or, if so liable, the amount of such liability. When the required oath is taken before a justice of the peace, a certificate in the usual form should be appended, attesting his official character. This inconvenience can be avoided by having the oath taken before a notary public, in which case the notarial seal must be affixed or impressed.

13. A judge or clerk of a United States court, a United States district attorney, United States commissioner, postmaster, or a judge or clerk of a State court of record, with the seal of said court attached, should certify that the sureties are sufficient to pay the penalty of the bond, and except in the case of a judge of a United States court, or a United States attorney, if the person certifying has no seal, his official character should be duly certified. The foregoing does not apply to corporate sureties who have complied with Rule 12 of these directions relative to evidence of their ability to meet double the entire obligation of their bond.

14. Corporate sureties, duly qualified to do business, under the Act of Congress of August 13, 1894, and who have filed with the Solicitor of the Department of Commerce and Labor evidence of their authority to do business, from the Department of Justice, need not furnish a certificate of such authority with each contract on which they are bondsmen.

15. When contracts and bonds have been thus prepared, and signed and sealed by the officer making them, in behalf of the United States, they should be forwarded to the Board for approval.

16. When approved by the Board and by the Secretary of the Department of Commerce and Labor, two copies will be returned to the officer making the contract, one for delivery to the contractor and the other for file.

Frank Soule

U. S. LIGHT-HOUSE ESTABLISHMENT.

CONTRACT

FOR

Construction of a Structural Steel Tower

FOR A

Light and Fog-Signal Station

ON

MILE ROCK,

ENTRANCE TO SAN FRANCISCO HARBOR,

CALIFORNIA.

ADVERTISEMENT.

OFFICE OF U. S. LIGHT-HOUSE ENGINEER,

TWELFTH DISTRICT, Room 91, Flood Building.

SAN FRANCISCO, CAL., ..., 1904.

SEALED proposals will be received at this office until 12 o'clock, noon, Standard time, on..... ..... , 1904, and then publicly opened, for the construction of a tower built of structural steel upon a concrete base which will be prepared for its reception, for a light and fog-signal station on Mile Rock, entrance to San Francisco Harbor, Cal.

Plans and specifications, together with forms of proposal and all other necessary information, may be obtained on application to this office.

The right is reserved to reject any or all bids, and to waive informalities.

THOS. H. HANDBURY,

Lieut. Col., Corps of Engineers, U. S. A., Engineer 12th Light-House District.

SPECIFICATIONS.

GENERAL INFORMATION.

The object of the contract to be entered into under these specifications is to obtain, on the part of the Government, a tower built of structural steel upon a concrete base which will be prepared for its reception, on Mile Rock, at the entrance to San Francisco Harbor, California. This tower will be four stories high, surmounted by a lantern, and will be used as a light and fog-signal station. The station will be provided with machinery for a 10-inch fog whistle which will be operated by compressed air. The motive power of the compressing machinery will be some form of mineral oil engine, in duplicate. Accommodations are to be provided in the tower for three keepers and a reasonable supply of provisions and oil for operating the station. The top of the concrete base on which the tower stands is 40 feet above the plane of a mean of lower low waters. The focal plane of the light will be 84 feet 3 inches above this datum.

LOCATION.—Mile Rock is about one half a mile inside a line joining the outer heads of San Francisco Harbor, and three eighths of a mile from the nearest point of the mainland to the southward. It rises nearly vertically out of the water, which is from forty to fifty feet deep.

About one hundred and sixty feet from the rock on the inshore side there is another smaller rock extending above high water, which may be found useful in the course of construction for mooring purposes. Between these there is navigable water. The mean rise and fall of the tide in this locality is about 6 feet. The tide on both ebb and flood is very swift, and the duration of slack water short.

The ordinary summer afternoon winds of the locality may create waves which will prevent landing directly from a boat on the rock.

Parties intending to submit proposals for doing this work should visit the locality and study the difficulties to be contended with while carrying on their operations.

CHARACTER OF MATERIAL AND WORKMANSHIP.—The importance of this work and the exposed position in which it is to be placed, make it imperatively necessary that only the very best material and workmanship enter into its construction. It must, therefore, be distinctly understood that these requisites will be insisted upon.

The right is reserved to reject any or all bids, and to waive informalities.

GENERAL CONDITIONS.

The contractor for this work is expected to furnish all the material and labor necessary to place the structure hereinafter described upon the concrete base, furnish all machinery, except such as will hereafter be described as to be furnished by the United States, and make all connections to the same as are necessary to a fog-signal and light station, as is contemplated by these specifications, complete in every respect and in good

working order. The contract price will include the cost of everything connected with the station, with the exceptions mentioned, that is not included in the work done in connection with the concrete base, which in general may be described as including all that portion which lies on and above the floor of the store room in the concrete base, and the small pump located in the pump room, with its connections.

MATERIAL FURNISHED BY THE GOVERNMENT.—The Government will furnish the lens and its stand, which are to be placed in the lantern; two 20 H. P. Hornsby-Akroyd engines, with air compressors attached, but no piping, reservoirs or other necessary accompaniments; and two Crosby automatic governors. All of which must be transported from the cars or place of storage in San Francisco, Cal., by the contractor, and cared for by him until placed in position at the station.

PLANT, ETC.—The contractor is to furnish all the plant, labor, material and machinery, except that which is herein specified as to be furnished by the Government, necessary for the complete and substantial execution of everything described, shown, or reasonably implied in the drawings and specifications.

PROTECTION OF WORK, ETC.—The contractor will cover and protect the work, material and machinery, and be responsible for all damage thereto until the final completion of the contract. He will clear away from time to time, as may be necessary, all dirt and rubbish resulting from the work, and on the final completion he will thoroughly clean all floors and windows, remove all debris, and leave the premises in good order.

DRAWINGS AND SPECIFICATIONS.—The drawings and specifications are intended to correspond and be illustrative of each other, and any work appearing in one and not in the other is to be done the same as though included in both.

No advantage will be taken by the contractor of any omission of information in the specifications or drawings, as full explanations, or detailed drawings, will be given for any part of the work not sufficiently shown or understood.

The contractor will substitute at his own cost and without delay, satisfactory work and material for any and all that may be rejected, and will make good any work that may be disturbed thereby.

SUPERVISION OF WORK.—The authorized agents of the Light-House Engineer are to have access to the work and material at all times. Agents will be appointed to superintend the work in its various stages, and in case of a difference between one of these and the contractor, the decision of the Light-House Engineer shall be final.

The agent appointed to superintend the construction of the work upon the concrete base shall be allowed the privilege of going to and from the work on such boats and by such means as the contractor may provide for transporting himself or his material and employees, whenever required, without expense to the Government.

The contractor will furnish, without expense to the Government, such assistance in labor, tools and material, as may from time to time be required in marking lines and fixing points necessary in the progress of the work.

The Light-House Engineer may, by written notice, require the contractor to dismiss at once such workmen or persons in his employ as he may deem incompetent, careless, or injurious to the work, and such individuals may not again be employed on the work.

EXTRA WORK, ETC.—The contract price is intended to include the cost of all things necessary to the station completed and in working order; but, should any extra work or changes be found necessary during the progress of the work, the value of such work or changes shall be the subject of a written agreement before being commenced, between the Light-House Engineer and the contractor, subject to the approval of the Light-House Board.

All work of every kind and description must be done and completed to the satisfaction of the Light-House Engineer.

DETAILED DESCRIPTION.

SHAPE OF PLAN, ETC.—The outline of the plan of the concrete structure on which this tower is to rest will be formed by two segments of equal ellipses with corresponding axes at right angles to each other, placed so as to form a symmetrical figure, the distance between the centers of the two ellipses being 12 feet 6 inches, and the segments being joined by right lines tangent to both. The major and minor axes of the two ellipses being 25 feet and 21 feet respectively.

The outline of the plan of the first story of the tower will be one foot inside of and parallel to this. The outlines of the plans of the second and third stories will be circular, having a diameter of 18 feet. The plan of the fourth story will also be circular in outline with a diameter of 13 feet 4 inches. The diameter of the lantern will be 8 feet 9½ inches.

The general shape of the structure and the arrangement of its different parts are shown upon Plates II, III, IV and V, of the drawings which accompany these specifications, and which, with the specifications, are to form a part of the contract. Further details are shown upon succeeding plates, which will be referred to from time to time in these specifications.

ACCESSIBILITY OF PARTS.—In designing this tower the general idea has been kept in view that every part of it, both outside and inside, shall at all times be accessible for the purpose of easy examination and cleansing of rust. Compressed air being always available for sand blast purposes it will be an easy matter, even in this exposed position, to prevent deterioration of the iron work by thorough cleansing and painting.

MATERIAL.—All the material which enters into the construction of this tower, except where otherwise stated or reasonably implied, will be of structural steel, shaped and put together as shown upon the drawings or herein specified. The material must be the best of its kind and suitable for the purpose. The workmanship must be first class in every respect and in accordance with the latest practice.

It is understood and agreed that the contractor is to make his own estimate of the material and work required, and to do everything in accordance with the drawings or specifications, or which may reasonably be required under them.

Iron castings shall be of tough gray iron, cleaned and chipped and otherwise made finished pieces of work, in keeping with the careful work required in the steel construction.

Bronze to be tough and of the usual U. S. Government standard.

The steel used must meet the "Standard Specifications of the Association of American Steel Manufacturers" for medium steel.

The tests must be done at the mill, and the mill certificate of tests will be accepted for the physical and chemical qualities, provided they meet the requirements of the above-mentioned standard. The contractor must, however, whenever called upon, furnish, without expense to the Government, prepared specimens of the several kinds of material as may be required by the Light-House Engineer, to fully determine their character.

The edges of all plates which go to make up the outside walls must be parallel and at right angles, and these, together with the edges of all plates used in floors, roofs, etc., must be planed so as to fit the adjoining edge perfectly.

The dimensions of rivets called for on the drawings shall be understood to mean the actual size of the cold rivet before heating. All rivets to be soft steel, standard chemical and physical properties. They shall fit neatly into the holes, fill the same completely, and form perfect heads when driven. All bolts used as permanent fittings in frames, walls or floors, to be turned to snug fit.

All holes shall be accurately spaced so that when the parts are assembled rivets may be easily inserted, and may not exceed the diameter of the rivet by more than 1-16th inch, and must not crack or bend metal on being

punched. Any corrections necessary shall be made with reamers. No drifting to enlarge unfair holes will be allowed. Riveted members shall have all parts well pinned up and drawn together with bolts before riveting is commenced. All slovenly-looking rivets shall be cut out and replaced. For permanent fittings all bolt holes in frames, walls, or floors, must be drilled to receive turned bolts in close fit. Other bolt holes may be punched.

All screw threads must be tight fits in the nuts, and all threads shall be U. S. standard.

All work possible, consistent with transportation and the assembling of parts, should be done in the shop, so as to reduce to a minimum the work to be done on the concrete base.

ASSEMBLING OF PARTS, ETC.—The tower shall be set up in the shops of the contractor, either as a whole or in stories, and suitably held together by bolts and temporary rivets, to insure the accurate fitting of the parts.

After being inspected in this condition it shall be systematically marked so that the parts can be readily reassembled and prepared for transportation. All pins, nuts, bolts, and other small parts shall be boxed or crated so that they can be easily handled, and to insure against loss or damage.

Should the inspector, through an oversight or otherwise, accept material or workmanship which is defective or contrary to the intent of the specifications, this material, no matter in what state of the completion of the work, may be rejected and the contractor required to replace it with other and satisfactory material.

The surfaces of all parts that are to come together must first be thoroughly cleaned by wire brushes, sand blast, or other means, down to the gray metal, then given a heavy coat of red lead and boiled linseed oil. This requirement to apply to work done in the shop as well as that done in the field.

No painting other than this just described will be required in the shop.

CHANGE OF FORMS AND SIZES OF MATERIALS.—Before submitting his proposal the contractor should satisfy himself that he can readily obtain structural steel of the shapes and weights required by these specifications. Should it so happen during the process of construction that the state of the market is such that some of the exact forms and sizes specified cannot be obtained within a reasonable time, then other shapes that can be obtained and which will answer the same purpose, may be substituted for these, upon written consent of the Light-House Engineer, and provided always that the substituted material be of the same strength as that which it replaces, or greater, and that there be no increase of cost to the Government on account of the substitution. Always bearing in mind that the surface of the metal must all be accessible to the sand blast.

DETAILS OF CONSTRUCTION.

FRAME.—The skeleton consists of four principal columns, numerous auxiliary posts, engine room and watch room walls, and angle studding in all walls, aligned, braced and secured at each floor with channel or angle caps or sills and numerous knee braces.

COLUMNS.—They are four in number, two extending unbroken from store room floor and two unbroken from engine room floor, to watch room floor. Below the kitchen floor the columns are composed of 8-inch I, 25½ lbs., reinforced by two channels 12 inches, 20½ lbs., riveted thereto with ⅝-inch rivets, 4 inches pitch for 2 feet at each end and 6 inches pitch for the balance. The continuous I beam portion of columns, above kitchen floor, forms direct attachment for walls to which they are riveted with ⅝-inch rivets, 4 inches pitch, the lines of rivets staggered. Plate XIII, Figs. 2, 3, 5, 6, 8, 9, 12, 13 and 14. Each column has a cast iron base (Plate XIII, Figs. 13, 14 and 15) securely anchored into concrete substructure as shown; one column resting near circular stair well has load distributed by three 6-inch I 14¾ lbs., carefully bedded and leveled to proper plane of support.

All the connections, shelves, braces, hitches at floors or elsewhere (Plates XIII and XVI) are to be carefully fitted in accordance with drawings.

POSTS.—Around and within the walls of the engine room at intervals and following an outline shown (Plate XIV, Fig. 3), and defined by previously constructed substructure, are a series of posts of 8-inch I beams, 25½ lbs., and one 8-inch I, 11¼ lbs., each independently anchored to concrete with 1¼-inch bent and twisted bolts, and securely attached at top to braces or caps and floor skeleton. Plate XIII, Figs. 1, 4, 7, 8, 9 and 10. The engine room wall is riveted to these posts with ⅝-inch rivets pitched 4 inches, the lines of riveting staggered. In the watch room, securely riveted to braces and floors top and bottom, and supporting walls of steel plates similarly riveted as in engine room, are four 8-inch I beam posts, 25½ lbs. Plate XVI, Figs. 1, 2 and 3; Plate XVII, Figs. 1 and 2.

STUDDING.—In all exterior walls angle studs 4 inches by 4 inches by 5-16ths inch are required; to be spaced as shown on drawings (Plate XIII, Fig. 7; Plate XVI, Figs. 1 and 8); between kitchen floor and living room ceiling they are continuous, crimped at ends over sill circumferential angles. To these angle studs the walls are to be riveted with ⅝-inch rivets pitched 4 inches.

All columns, posts and studs are to be straight, cut to exact required lengths and machined on ends to insure perfect fit and even bearing.

PEDESTALS.—The cast iron blocks (Plate XIII, Figs. 13, 14 and 15) are to have faces planed which receive the machined ends of columns. The bottom of block resting on I beams at circular stairs also to be planed.

FLOORS.—For all the floors, beginning with the engine room, there is a steel frame composed of principal and secondary beams supporting steel plate floors in the engine room, wood floor on wood joists in kitchen, living room and watch room; and for the watch room ceiling, lantern floor and balcony, a cast iron covering, all in conformity to drawings. Plate XIV, Figs. 1 to 4; Plate XV, Figs. 1 to 4; Plates XVI and XVII.

ENGINE ROOM FLOOR FRAME.—The principal beams, 12-inch I beams, 31½ lbs., and 12-inch channels, 20½ lbs. (Plate XIV, Fig. 3) with such of the secondary beams as land upon the concrete are to be bedded upon ⅜-inch wall plates into the concrete with tops flush with top of same. Care must be taken that stair and trap-door openings are exactly accommodated. Plate XIII, Figs. 16 to 22. Since the tops of all beams are to be at a common level, it will be necessary to cope the 6-inch I beams and 3-inch T's under the flanges of the principal beams at their connections, which must be done to neat finish fit. A circumferential angle, 3 inches by 3 inches by ¼ inch (Plate XIII, Fig. 8 and Plate XIV, Fig. 3) following the interior outline of the concrete finish, cut in between imbedded beams, attached thereto, and supported at frequent intervals upon small clips anchored into concrete, is to be furnished, bent and finished to a nicety to act as a stiffener to floor plates and a protection to concrete.

The steel floor plates are to be riveted to the tops of all members of floor frame with ⅝-inch rivets with heads countersunk on upper side, and spaced 6 inches from centers single gauge, or 6 inches from alternate sides in double gauge. The landing platform at this floor is already provided.

KITCHEN AND BOAT DECK FRAME.—The principal beams, 10-inch I's, 35 lbs., arranged as per plans (Plate XIII, Figs. 1 to 6, 8 and 9, and Plate XIV, Figs. 2 and 4), are supported by attachment to columns and to engine room posts, in turn support the wood kitchen floor and steel boat deck, engine room ceiling, and super-imposed tower. Where necessary beams are to be coped together, all end cuts and fittings to be neat and snug. All beams or extensions of beams forming boat deck are secured rigidly at outer extremities to tops of columns, to braces, and to curved 10-inch channel, 15 lbs., wall cap. Plate XIII, Figs. 1, 4, 8 and 9, and Plate XIV, Fig. 4. The slight inclination of deck plates is to be accommodated by beveled strips on tops of beams finished to suit the various positions and consequent inclinations.

Along all supports, principal or secondary, of the boat deck, the plates are to be riveted every 4 inches on single gauge and 4 inch pitch staggered on double gauge.

Secondary beams of 10-inch channels, 15 lbs., under tower are to be accurately fitted, finished, coped and fastened in accordance with drawings. Plate XIV, Fig. 4.

LIVING ROOM FRAME.—The principal beams, 8-inch I's, 25½ lbs., framed as shown, with proper stair opening, forming an intermediate floor and brace system in the first section of circular tower construction, are attached directly to and supported by the columns. Plate XV, Fig. 1. The walls at this level are stiffened by a 3-inch L, the horizontal leg of which is flush with the tops of beams and which is riveted to walls between studs with ⅝-inch rivets, 4 inches pitch, thus also forming a rest for wooden joists. Plate XV, Fig. 1, and Plate XVI, Figs. 9, 10 and 11.

WATCH ROOM FLOOR FRAME.—With principal beams 10 I beams, 35 lbs., delivering their loads directly to columns and secondary 6-inch I beams, 14¾ lbs., completing braced circle, with circular 10-inch channel, 15 lbs., forming cap, and with interior groups of 10-inch channels as per drawings (Plate XV, Figs. 2 and 3, and Plate XVI, Figs. 1, 2, 3 and 4), furnishing support and fastenings for wood floor, steel plate promenade deck and for the watch room wall with surmounting lantern, the construction details for riveting, cutting, fitting, coping, etc., must conform to requirements exacted for other similar floors. Note the ladder attachments to frame shown on special detail. Plate XII, Fig. 11.

LANTERN FLOOR FRAME.—This frame supporting cast iron lantern floor and deck and tower consists of principal 6-inch I's, 14¾ lbs., and 6-inch circular channel cap, 13 lbs. (Plate XV, Fig. 4 and Plate XVII, Figs. 1, 2 and 3) is supported upon and securely attached to posts, and is to be constructed in detail with all special features required for other floors; the methods of attaching cast iron shown on plans to be carefully followed. Plate XVII, Figs. 1, 2 and 8.

THE LANTERN.—To follow standard specifications for 3d order lantern, hereafter.

FLOOR COVERINGS.—The engine room, boat deck and watch room deck are to have steel plate coverings ½ inch thick, of the number and shapes indicated (Plate XIII, Figs. 4 and 12; Plate XIV, Figs. 1 and 2; Plate XV, Fig. 3; Plate XVI, Figs. 1 and 2), all joints to be made watertight by having adjoining and abutting sheets planed and fitted tight with butt strap seats. The plates at joints are to be riveted with ⅝-inch rivets, 4 inches pitch, countersunk on upper side and at contact surfaces with supporting frames with the same pitch for decks, and 6 inches pitch for floors. All butt straps on deck floors and in all seams of walls to be caulked. The cast iron deck and floor with checkered walking surface is to be made in sections as shown (Plate XVII, Figs. 1 and 2, 6, 7, 8, 9 and 10), each joint surface being planed to an accurate watertight fit, also the vertical supporting ribs are to be planed on their lower or bearing surfaces. All fittings for attaching floor to frame, lantern to floor, ladder to floor, sockets for fence posts and trap door details, are to correspond with drawings (Plate XIII, Figs. 26 and 27; Plate XVI, Figs. 1, 2 and 4; Plate XVII, Figs. 1, 2 and 9 and 10), and to be accurate for location and finish.

WALL COVERINGS.—The entire exterior of the frame, exclusive of openings, is to be covered with ⅜-inch steel plates, of dimensions and arrangements indicated (Plates II and III), general elevations, cut, planed, edges parallel at right angles, fitted, punched and bent, and riveted to place with watertight joints, sealed by butt straps. The plates are to be riveted with ⅝-inch rivets to butt straps, 4 inches pitch staggered, to all studding, posts, columns and caps on 4 inches pitch; the base rings of engine room (Plate XIII, Figs. 7, 10 and 11), kitchen (Plate XIII, Figs. 2, 3 and 5) and watch room walls (Plate XVI, Figs. 1 and 2), two 4 inches by 4 inches by ⅝ inch square root L's, are secured to wall plates with ¾-inch rivets, 4 inches pitch. All openings are to be finished with planed edges perfectly smooth and true.

At each inset in the tower elevations a projecting cornice construction is required (Plate XIII, Figs. 1 and 27; Plate XVI, Figs. 1, 2 and 4, and Plate XVII, Figs. 1 and 2) made by extending the deck floor plates beyond walls and supporting such projection by steel brackets arranged and fastened as shown (Plate XIII, Figs. 4, 26 and 27; Plate XVI, Figs. 1, 2 and 4, and Plate XVII, Figs. 1 and 2), a finish being given by small angle encircling the plates at outer edges. On boat and watch room decks a foot guard is provided, consisting of a similar angle on top of plates at outer edges, bent to suit and fastened as shown. Plate XIII, Fig. 26, and Plate XVI, Fig. 4. The cast iron cornice at lantern deck carries a finish mould with its floor members.

DOORS AND SHUTTERS.—All window openings, and all door openings above engine room (the engine room doors being themselves storm doors, Plate XVIII, Figs. 1 to 10) are to be provided with steel protection shutters, rolling clear from openings during ordinary weather, which are to be made in accordance with drawings (Plate XX, Figs. 1 to 10, and Plate XXI, Figs. 1 to 7), rectangular, straight and smooth edges, bent to proper radius, and supplied with hangers, stops, bolts, rings, chains and bronze rollers. The sills or thresholds of outside doors are to be of cast iron, the details of which are found on drawings. Plate XVIII, Figs. 2, 3, 4 and 8, and Plate XXI, Figs. 1, 2 and 3.

The double steel frame doors for engine room are to conform to the details (Plate XVIII, Figs. 1 to 10), particular attention being given to the accuracy of hanging, fitting and securing same, whether open or closed, especially securing rigidity and reducing to a minimum the tendency to rattle under stress of weather.

ANCHORAGE.—The superstructure is secured to concrete substructure by anchor bolts at foot of each column and post and at intervals around the base of first story walls, all in accordance with drawings. Plate XIII, Figs. 7, 10, 13, 14 and 15; Plate VI, Fig. 1, and Plate XIV, Fig. 3. Holes will be left in the concrete into which these bolts are to be inserted and made tight by grouting, lead or sulphur. Holes in circular wall angles should correspond with these.

RAILINGS.—Around the outside edge of the engine deck, including protection for landing platform, the boat, watch room and lantern decks, are to be constructed two chain guard rails, strung upon wrought iron posts in conformity to drawings. See Plates II and III, Plate VI, Fig. 1, Plate XII, Figs. 1 and 2, Plate XIII, Figs. 27 and 28, Plate XVI, Fig. 4, Plate XIX, Figs. 1, 2 and 4, for number, location and details. Chains for all decks and for landing platform excepting engine floor deck, must be so arranged as to admit of stripping in sections of reasonable lengths and weights. The chain to be ⅝-inch iron, the posts to fit closely their sockets and to be provided with necessary keys, pins, etc.

VENTILATORS.—Suitable adjustable ventilators to be provided for each room as may be required and designated.

FLASHINGS.—All openings for various utilities, as pipes, vents, etc., must be made watertight by methods indicated on drawings (Plate XIII, Fig. 26), or as may be approved during construction.

FLAG POLE.—A staff of standard, extra strong, galvanized iron pipe, with 3-inch butt reduced by 2½ inches to 1½ inches at tip, with a total length of 32 feet, finished complete with brass sheaves, cap and ball. A suitable flag halyard, with cleat, to be furnished. Flag pole to be fastened to watch room and lantern deck as shown. Plates II and III, and Plate XVI, Figs. 5, 6 and 7.

DERRICK.—For handling boat and supplies, a swinging boom derrick is to be furnished, boom to be selected stock, straight grained, thoroughly seasoned Oregon pine, 25 feet long, dressed and framed to sizes and fittings shown (Plate XXV, Figs. 1, 8, 9, 12, 13 and 14), with large coiling cleats, and given two coats of linseed oil and tar before

being taken to station. Two pairs of double 10-inch blocks, wood shell, swivel hooks on lower fall block only, and 10-inch sheave at mast, together with sufficient 3½-inch manila rope to reave to hoisting engine in engine room, and admit of use of full hoist and swing of derrick, are to be furnished, all of approved make and design.

The method of attachment of boom and falls to frame and mechanism for controlling direction of leads through kitchen walls to engine room below is clearly shown on drawing (Plate XXV, Figs. 1, 2 and 3), and is to be accurately realized in the construction. The sliding shutter behind vertical rollers is to be carefully shaped, edges planed and bent to admit of easy movement in opening and shutting. Plate XXV, Figs. 2, 3, 4 and 5.

The edges of the slots passing the leads must be smooth, true and rounded, so as not to cut rope by any accidental contact. All sheaves must be metaline bushed or self-lubricating. Guy lines, lashings, cleats, eye-bolts and all other appliances and appurtenances necessary to the successful use of the derrick to be furnished as required.

BOAT.—The contractor will furnish a suitable and strong whitehall boat about 20 feet in length without more than 5 feet beam. The same to be furnished with two pairs of oarlocks and oars, sail, mast, rudder, and all things necessary to complete boat, with blocks and tackle for raising and lowering the same at the station. Also canvas cover, cradle on bronze castors, lashings, fastenings, all to the satisfaction of the Light-House Engineer. All metal trimmings of the boat to be bronze.

STAIRS.—From the store room floor to the living room a series of steel and iron stairs are to be provided, three flights in all, with necessary stringers, step brackets, cast iron treads, railings, hangers, fastenings, etc. Plate XXII, Figs. 1 to 22. All well openings are to have cast iron nose, trim of design like step nosing. Plate XXII, Figs. 1 to 4, 16 and 17. Engine room to kitchen stairs must fit accurately the position indicated, great care being required in forming the reverse bends in the 10-inch channel strings, and they must be properly supported about midway by rods from floor above, all in accordance with drawings. Plate XXII, Figs. 2, 18 to 22. The ornamental railings are to be in neat, workmanlike finish, and to conform to details shown. Plate XXII, Figs. 9 and 10. Pipe railings are also to receive studied treatment in detail and in place, in smoothness of finish, symmetry of exposed threads, etc. Plate XXII, Fig. 4.

All cast iron treads are to have checkered wearing surfaces, neat in fit, of various shapes to suit the curves and angles in stair cases. Plate XXII, Figs. 1, 2, 3, 7 and 8. Under sides of cast iron treads must in all cases fit accurately to their supports. All stairs are to carry from floor to floor in steps of equal risers of the number indicated.

LADDERS.—From living room to watch room and lantern are wrought iron ladders, to be made as per details (Plate XII, Figs. 11, 12, 13 and 14; Plate XVII, Figs. 9 and 10), and secured at top to steel or iron work.

FOG-SIGNAL MACHINERY, etc.

The machinery for operating the fog-signal at this station will consist of two Hornsby-Akroyd oil engines, rated at 20 H. P., each with an air compressing outfit, each having a capacity of not less than 110 cubic feet per minute. These engines are expected to furnish singly sufficient compressed air to operate a 10-inch whistle, blowing with a characteristic of 3 three seconds blast and silent intervals of 27 seconds, the air pressure at the whistle being 70 lbs. per square inch.

There will be two air receivers, a high pressure, 4 feet diam., 6 feet 6 inches high, and a low pressure, 4 feet diam., 8 feet high. The high pressure to be placed in the store room under the engine room, and the low pressure, to be suspended in the engine room from the kitchen floor beams. A regulating valve will be placed in the pipe joining the two receivers, to keep the pressure in the low pressure, from which the whistle is supplied, at a constant pressure.

The whistle valve will be opened and closed by a Crosby Automatic Signal Apparatus. This apparatus will be furnished in duplicate. The two will be fastened to a board of suitable material and finish, and set up and properly connected for performing the functions for which they are designed.

The two Hornsby-Akroyd engines, and the Crosby Automatic machines will be furnished to the contractor, as hereinbefore mentioned, but all receivers, gauges, valves, pipes, connections, and other appliances necessary to the proper working of the same must be furnished and put together by the contractor.

There will be a small brass pump, a duplicate of which is also to be furnished, placed in the pump room at the foot of the concrete stairs. This is to furnish sea water for cooling the engines and supplying the water closet, located in the room below the engines. The pump is to be so geared that it may be operated by either of the engines, or by hand, as may be desired.

A supply tank for this sea water, of about 120 gallons, will be placed in the kitchen.

An arrangement of the engines, pipes, and general connections of the air and water systems of the station is outlined on Plates XXVI and XXVII. This will be adhered to as far as practicable.

HOISTING ENGINE.—A small double-cylinder hoisting engine, with double drums and gipsy head on end of shaft, will be furnished and installed, with which to operate the derrick.

Compressed air will be the only motive power used at the station.

WHISTLE.—A 10-inch brass whistle, to be made from drawing which will be furnished, must be supplied and put in place by the contractor.

CONNECTIONS, ETC.—All piping, connections, fastenings, cocks, valves, gauges, tools, implements, etc., shown upon the drawings, or which may be required as necessary to the successful installation and operation of this machinery, will be furnished in place by the contractor.

In connection with this machinery the contractor will furnish a small sand blast outfit, for the purpose of cleansing the metal material of the station. This he may use for the purpose as described under the head of painting.

WATER CLOSET.—A modern water closet of appropriate and approved design, to be selected by the Light-House Engineer, must be furnished and put in place in the room below the engine room. Sea water will be used in this closet. A soil pipe, suitably trapped at lower end with bronze back valve, will be provided, leading down through the concrete base. Into this the soil pipe from the water closet, and all drain, overflow and waste pipes, will lead. Suitable ventilation must be provided for this pipe.

FURNITURE.—A table, cast iron white enameled sink, hand pump, oil stove of design to be approved by the Light-House Engineer, set up in place in thorough working order, with an outfit of kitchen utensils with three substantial kitchen chairs, with all required cupboards, lockers, shelves, hooks, etc., will be furnished by the contractor for the kitchen.

For the living rooms the contractor will furnish three iron bedsteads, with removable wire woven mattresses of form and dimensions as may be required, three small tables and one of larger size, with drawers, five arm chairs, lockers, drawers, shelves, hooks, etc.

It is understood that in the contract price is included the cost of all davits, cleats, eye-bolts, ring-bolts, fastenings of every kind and description that may be required by the Light-House Engineer as being necessary to the complete equipment of the station.

PAINTING.—After the structure is erected, and before any preservative whatever is placed upon the metal, it must be thoroughly cleaned of every particle of scale, rust or oxidation, down to the gray metallic surface. When this is done the surface must immediately be covered with a coating of red lead and pure linseed oil. In the course of a week, when this has become thoroughly dry and hard, a coat of red lead and graphite, in equal parts, ground in pure linseed oil, will be put on. When this in turn has become dry and hard, a coat of white lead and linseed oil will be put on, to be followed, when dry, with a second coat of like material.

All parts of the structure, both outside and inside, will be treated in this manner, excepting that the last two coats of the engine room floor, the stairs and their railings, the lantern floor and all decks outside the walls of the structure, shall be colored with a black pigment. The two final coats of the guard chains and their posts may be lead-colored.

SPECIFICATIONS

FOR

LANTERN FOR APPARATUS OF THE THIRD ORDER.

The lantern is shown on Plates I to IX of lantern plans. It is to be circular in plan and composed of a parapet, glass sashes with helical bars, architrave, roof and ventilator and provided with a glass-paneled door which will give access to the lantern gallery.

PARAPET.—The circular lantern parapet is shown on Plate VIII, Figs. 1 to 9 and 18, 19, and 22, and is composed of nine castings, seven large and two small. They must be sound castings, neatly molded and of the proper curvature. They are to be finished at surfaces of contact with the lantern floor, with each other, the door jambs and sill, the glass sash, filling pieces and glass stops and secured to the lantern floor by thirty-two, and to each other by forty ⅝-inch rough bolts through drilled holes. Their upper flanges are to have ⅝-inch drilled and reamed holes for bolts securing the glass sashes and filling pieces and the vertical flanges of the small plates either side of the door opening are to have ⅝-inch drilled and reamed holes for bolts securing the sill and jambs. Three of the large plates, and both of the small plates, are to be provided with air channels for the registers, which are to be faced at surfaces of contact with valve seats, nuts, and perforated plates, and drilled and tapped for the 5-16-inch screws securing the same. The plain parapet plates are to have a small rib under upper flange, as shown by dotted lines in Fig. 1.

AIR REGISTER.—The brass air registers for the five parapet plates mentioned above are shown on Plate VIII, Figs. 17 to 22, and consist each of a valve, valve seat, valve stem, nut, and perforated plate. The valve must be a good, sound, neatly molded casting, finished all over, nicely drilled for the valve stem, on which it must easily turn when in place, and neatly fitted to the raised surface of the valve seat upon which it must fit perfectly airtight when closed.

The valve seat must be a good, sound, neatly molded casting, finished all over, and secured to the parapet plates by six 5-16-inch countersunk brass screws. It must be neatly fitted to the inside lining of the lantern.

The valve stem and handle must be a good, sound, neatly molded casting, finished all over, and neatly chased at one end for the nut. The space between the handle and the collar (the latter is to be screwed on and pinned) will form the journal for the valve.

The nut must be a good, sound casting, finished all over, neatly chased for the valve stem, and secured to the parapet plates by four 5-16-inch countersunk brass screws.

The perforated plate, which can be of rolled brass, must be provided with eighty-seven ¼-inch neatly spaced and drilled holes, as shown; it must be of the proper curvature and nicely fitted, and secured by six 5-16-inch round head brass screws to the parapet plates.

GLASS SASH.—The bronze glass sashes, eighteen in number, are shown on Plate V, Figs. 1 to 25, and Plate VI, Figs. 1 and 2. They must be good, sound castings, carefully and neatly molded, true to pattern and correct in curvature. They are to be finished at surfaces of contact with the parapet plates, door jambs, glass stops and

architrave castings and faced where they abut each other, the filling pieces and door lintel; the rabbets receiving the glass panes will not be finished beyond that necessary to touch them up with a file, they must therefore have sharp, clean, and true edges after leaving the mold and must not vary in depth and width from the dimensions shown on the drawings. The sashes are to have drilled, reamed, and countersunk holes through which they will be secured to the parapet and architrave castings, by thirty-four turned bolts with countersunk heads as shown on Plate V, Fig. 29, and they are to be secured to each other at their abutting faces by fifty-two 9-16-inch machine screws finished all over as shown on Plate V, Fig. 30, and the holes for these screws are to be drilled, tapped, counter-drilled and reamed as shown on the drawings in order to suit the position of the sashes.

The sashes either side of the door opening are to be drilled and tapped for the ⅝-inch screws securing the jambs. See also Plate IV, Fig. 13.

The upper sashes above the door opening are to be drilled as shown on Plate VI, Figs. 1 and 2, for the ¼-inch screws securing the jambs. See also Plate IV, Fig. 12.

All the sashes are to be drilled deep enough and correctly tapped for the ¼-inch and ⅜-inch brass tap bolts securing the (*a*) glass stops.

The helical parting strips are to be neatly cut out as shown, in order that the ¼-inch tap bolts may have a secure hold within the bars.

Care must be exercised in machining and setting the glass sashes in place in order that the panes may be interchangeable, and the contractor must furnish a template to the glass benders by which the panes and half panes are to be cut, as shown on Plate VI, Figs. 36 to 38.

The template must be correctly cut and bent and stiffened by battens in order to hold its shape. Two lines at right angles to each other must be scribed off on the convex side, to which the half panes must conform when they are applied to the template.

FILLING PIECES.—The bronze filling pieces, seventeen in number, are shown on Plate V, Figs. 26 to 28. They must be good, sound castings, carefully and neatly molded, true to pattern and correct in curvature. They are to be finished at surfaces of contact with the parapet plates and architrave castings and faced where they abut the glass sashes. The rabbets receiving the glass panes will be as specified above for the sashes. The filling pieces will be secured to the parapet and architrave castings by sixty-eight turned bolts, as shown on Plate V, Fig. 29, through drilled, reamed, and countersunk holes, and they are to be drilled and tapped for the ¼-inch tap bolts securing the glass stops in the manner specified for the sashes.

DOOR.

The door by which the lantern gallery is accessible is shown in detail on Plate IV, Figs. 1 to 15, Plate VI, Figs. 1 and 2, and Plate VII, Figs, 1 to 35, and will consist of two jambs, a sill, a lintel, and a door with its locks and fixtures, as follows:

JAMBS.—The two jambs, one right and one left, are shown on Plates IV and VI. They must be good, sound castings, neatly molded and true to pattern. They are to be finished at surfaces of contact with the sill, parapet plates, glass sashes, glass stops, and lintel, and the rabbets neatly and correctly planed for the door and recessed for the weather strip. They must be correctly fitted to the sill below on which they are to rest; drilled, reamed, and countersunk for the ⅝-inch turned bolts and screws securing them to the parapet plates and glass sashes, neatly fitted to the upper glass sash and secured thereto by ¼-inch countersunk brass screws, as shown on the drawings, and then fitted and secured to the lintel. The upper part of one of the jambs is to be drilled and tapped for the ½-inch screws securing the upper hinge for the door, and the upper part of both jambs is to be drilled and tapped for the ⅜-inch screws securing the fishplates and the ⅝-inch turned tap bolts securing the lintel.

a See clause relating to tap bolts under Glass Stops, page 21.

SILL.—The sill is shown on Plate IV, and must be a good, sound casting, neatly molded and of the proper curvature. It must be finished at surfaces of contact with the lantern floor, the parapet plates, the jambs and the door, and neatly recessed for the weather strip. It is to be secured to the lantern floor by four ⅝-inch rough bolts through drilled holes and to the parapet plates by four ⅝-inch turned bolts through drilled and reamed holes.

LINTEL.—The lintel is shown on Plates IV and VI, and must be a good, sound casting, neatly molded and of the proper curvature. It is to be finished at surfaces of contact with the jambs, the rain drip, glass stops, fishplates and door, and neatly recessed for the weather strip. It must be nicely fitted between the jambs and secured thereto by wrought-iron fishplates, tapped for ⅜-inch countersunk brass screws and drilled and reamed for the ⅝-inch turned tap bolts. It is to be neatly tapped in the manner specified above for the glass sash for the tap bolts securing the rain drip.

After the pieces mentioned above have been assembled and secured in place they must form a perfect rabbet for the door and the cut made for the weather strip must present an unbroken recess all around the opening. The weather strip is to be of the best quality of rubber, in one piece if practicable, ¼ by 5-16 inch in section. A duplicate piece is to be furnished protected from deterioration for future use.

DOOR.—The door, which is to be in two castings bolted together, is shown on Plate IV. They must be good and sound, carefully and neatly molded, true to pattern and of the proper curvature. They are to be finished at surface of contact with each other, the glass stops, the upper glass pane and the door rabbets, and secured to each other by four ⅝-inch turned bolts (and faced washers) through drilled, reamed, and countersunk holes.

The lower section of the door is to be provided with two panels of ⅛-inch sheet steel secured in place by ¼-inch button head rivets and round head screws as shown, spaced not more than 2 inches apart; but the button head rivets must be replaced at the hinges by round head screws from the inside which must not interfere in any way with the screws securing the hinges. The ¼ by 1 by 1½ inch angles are to be neatly bent where required and attached to the door by ¼-inch round head screws; one of the vertical angles must be provided with a small ear, forged on to take the 5-16-inch screws securing the fitting piece. Plate VII, Figs. 12 to 16. The battens of the door lining are to be of the sizes shown, neatly bent and secured by ¼-inch round head screws except under the fitting piece of the lock case, where they may be counter-sunk, and they must also be neatly fitted to the lower locking rod bearing and all adjoining pieces. The lower section of the door is to be drilled and reamed for the passage of the pinion shaft, and the boss on the outside faced for the handle. It is also to be drilled for the 9-16-inch bolts, securing the pulling handles. The upper section of the door is to be neatly tapped for the ¼-inch tap bolts and screws securing the glass stops in the manner already specified for the glass sashes, and provided in the pane opening with proper brass strips for the glass pane, securely fastened in place by ¼-inch countersunk screws spaced not more than 6 inches apart. The finishing strip on the outside of the door will spread out under the upper hinge as a facing pad for the same.

Both parts of the door are to be neatly drilled and tapped for the ½-inch brass countersunk screws securing the hinges.

NOTE.—If the contractor desires to cast the door in one piece, including the outside panel in the lower portion and the rabbets for the glass pane in the upper part instead of proceeding in the manner specified above, he must refer to fig. 18, plate III.

HINGES.—The brass hinges, three in number, are shown on Plate VII, Figs. 1 to 7. Those supporting the lower section of the door are to be right and left hand, as shown on Plate IV, Fig. 2. They must be good, sound castings, finished all over, neatly drilled for the finished steel pins, which are to be fastened in place in the manner shown on the drawings. The leaves of the hinges are to be secured to the parapet plates and door by ten ½-inch countersunk brass screws on each side, and the lower edge of the bottom hinge will form a neat continuation of the rain drip as shown.

The upper hinge must be a good sound casting, finished all over, neatly drilled for the finished steel pin,

which is to be secured as specified above. It is to be fastened to the jamb and the door by eight ½-inch brass countersunk screws, and the door leaf of the hinge will form a continuation of the vertical glass stop on the upper section of the door.

LOCK.—The door will be secured in the rabbets by two steel rods thrown in opposite directions by a steel pinion. They are to be finished all over and provided with a neatly cut rack on the lock case end, as shown on Plate VII, Figs. 30 to 32.

The steel pinion and shaft are shown on Plate VII, Figs. 28 and 29. They are to be finished all over and the shaft chased at both ends for the handles.

The brass handles, two in number, are shown on Plate VII, Figs. 26, 27, and 33 to 35. They must be sound, neatly molded castings, finished all over and tapped for the ends of the pinion shaft to which one is to be pinned, and the other secured by a faced nut as shown.

The lock case is shown on Plate VII, Figs. 22 to 25. It must be a good, brass casting, finished all over, and secured to the fitting piece by four 5-16-inch countersunk brass screws each.

The brass fitting piece for the lock case is shown on Plate VII, Figs. 12 to 16. It must be a good, sound casting, finished all over, except inside, neatly fitted to the door lining, battens and door ledge, and secured by two 5-16-inch countersunk brass screws, tapped for the 5-16-inch screws securing the lock case, and drilled and reamed for the passage of the pinion shaft.

The upper and lower bearings for the rods are shown on Plate VII, Figs. 17 to 21. They must be good, sound. brass castings, finished all over, drilled for the passage of the rods, and carefully secured to the door by nine ¼-inch countersunk brass screws each.

The door is to be provided also with inside and outside handles as shown on Plate I, Figs. 1, 2, 8 and 9, and Plate IV, Figs. 1 to 5. They must be good, sound, neatly molded brass castings, finished all over, and securely attached to the door by two 9-16-inch finished bolts through gas-pipe separators and faced nuts.

The rain drip for the bottom of the door (Plate VII, Figs. 8 to 11) must be a good, sound, neatly molded brass casting, finished at surfaces of contact and neatly fitted to hinge and door to which it is to be secured by four ¼-inch brass tap bolts.

ARCHITRAVE.—The circular lantern architrave is composed of nine castings, as shown on Plate II, Figs. 24 to 30. They must be good and sound, neatly molded and correct in curvature, and are to be finished at surfaces of contact with each other, the glass sash, the filling pieces, the glass stops and the roof plates. They will be secured to the glass sash and filling pieces by ⅝-inch turned bolts through drilled and reamed holes, to each other by eighteen ⅝-inch rough bolts through drilled holes, and drilled for the ⅝-inch rough bolts securing the roof castings. Each casting will be provided with a rib in the center to which the battens securing the steel lining will be fastened and a boss cored for the passage of a ⅝-inch radial rod and faced on the outside for the nut.

ROOF.—The conical lantern roof is shown on Plate II, Figs. 9 to 14, and will be composed of nine castings, which must be good and sound, neatly molded, and true to pattern. They are to be finished at surfaces of contact with each other, with the architrave and the ventilator molding, and are to be secured to the architrave by thirty-six and to each other by eighty-one ⅝-inch rough bolts through drilled holes, and drilled for the ⅝-inch bolts securing the molding. All the plates are to be provided with two bosses each, drilled as shown and faced on the outside for the collar of the roof railing stanchion.

The roof railing is shown on Plate II, Figs. 20 to 23, and will be composed of eighteen stanchions and six pieces of railing, all of wrought iron. The stanchions are to be drilled for the railing and drilled and tapped for the 5-16-inch countersunk screws securing the same; they are to be turned below for a snug fit into the roof plate bosses, faced under the collar, and provided with faced nuts and washers as shown on the drawings.

The railings are to be neatly bent to the proper radius, scarfed at their ends, and drilled for the 5-16-inch screws securing them in the stanchions.

MOLDING.—The ventilator molding is shown on Plate II, Figs. 5 to 8. It must be a good, sound casting, neatly molded, and true to pattern. It is to be finished at surfaces of contact with the roof castings and the ventilator ball, and is to be secured to the roof by nine 5/8-inch rough bolts through drilled holes.

VENTILATOR BALL.—The ventilator ball, shown on Plate II, Figs. 1 to 4, must be a good, sound casting, neatly molded, turned out and faced at surfaces of contact with the molding below. The upper boss is to be tapped and faced for the pinnacle, and the lower part of the ball provided with openings as shown.

The brass pinnacle is to be finished all over, chased at one end for the ventilator ball.

ROOF AND PARAPET LINING.—The interior of the lantern roof is to be lined as shown on Plate I, Fig. 3, and Plate VIII, Fig. 16, with nine sheets of zinc 1-32 inch thick, fastened to the flanges of the roof castings by pinching strips of 3-32 by 1¼-inch hoop iron and ¼-inch round head brass screws spaced staggered not more than 8 inches apart from center to center. The upper ends of the sheets will be pinched to the roof plates by a rosette casting, their lower ends will pass back of the ribs ½ inch as shown on Plate VIII, Fig. 16, and be supported by the steel lining.

The vertical portion of the roof plates and architrave above the glass sashes and filling pieces are to be lined on the interior with nine pieces of ⅛-inch sheet steel as shown, the plates must be neatly bent and fitted in place and secured at the bottom by the brass stops and to the vertical ribs of the architrave and the flanges of the roof plates by ⅛ by 1¼-inch pinching strips of hoop iron and ¼-inch round head brass screws, eight to each strip. The ¼ by 1½-inch battens at the upper edges of the plates are to be secured by ¼-inch button head rivets spaced not more than 8 inches apart and then neatly chamfered as shown.

The interior sides of the parapet castings are to be lined with ten pieces of ⅛-inch sheet steel, seven large, two small, and a piece at the sill, as shown on the drawings. They must be neatly curved and fitted in place, secured by ⅛ by 1¼-inch hoop iron pinching strips and ¼-inch brass round head screws spaced staggered not more than 8 inches apart from center to center. The upper ends of the sheets are provided with ¼ by 1½-inch hoop iron battens fastened by ¼-inch button head rivets spaced not more than 8 inches apart; the lower ends are secured by the washboard. Five of the plates (three large and two small) are to be neatly cut out for the valve seat of the air registers, as shown on Plate VIII, Figs. 19 and 22.

All the sheet metal work specified as well as the panels specified for the door must be free from indentations, and fitted in a neat and workmanlike manner.

ROSETTE.—The rosette casting mentioned above is shown on Plate III, Figs. 1 to 4. It must be a good, sound casting, neatly molded, with bosses faced for the collars and drilled and tapped for the suspension rods. It is also to be drilled for the stud securing it to the roof and faced for the nut, and it must be neatly fitted to the pinching strips of the zinc lining.

The cast iron beam for the rosette must be good and sound, and cored for 1⅛-inch stud, which must be neatly riveted in while hot. It will be provided with a faced nut.

WASHBOARD.—The washboard castings, nine in number, are shown on Plate IV, Figs. 16 and 17. They must be good and sound, neatly molded and of the proper curvature. They are to be neatly fitted to each other, the lantern floor and the lining and secured to the latter by ten 5-16-inch countersunk screws each.

SPIDER FRAME.—The spider frame, which is to be of wrought iron, is shown on Plate III, Figs. 5 to 12. The suspension rods shown in Fig. 12 must be neat, straight forgings, threaded at both ends, and provided at one end with a faced collar and at the other with faced nuts.

The radial rods, shown by figs. 5 and 8 to 11, must be neatly forged in two pieces each. They are to be threaded where shown and provided with faced nuts; they are to be neatly drilled and faced for the suspension

rods, and drilled for the pins securing the two parts together, the latter to be provided with split pins. The cast iron washers are to be faced where they come in contact with the faced shoulders of the forks, and they must be neatly fitted to the lining and pinching strips as shown.

The spider ring (Figs. 5 to 7) is to be turned all over; it must be accurately drilled for the radial rods and drilled and tapped for the ⅜-inch screws securing the lens bearings. The four lens bearings (Figs. 25 and 26) must be sound brass castings, finished all over, provided with two ⅜-inch steel set screws and secured to the upper face of the ring by two ⅜-inch countersunk brass screws each.

TIN CONE.—A tin cone, shown on Plate III, Figs. 13, 23 and 24, neatly made of IXXX tin, with locked, flattened, and soldered seams, is to be furnished and fitted to the spider frame. The cone is to be stiffened around its openings by a ¼-inch steel wire, and is to be secured to a ring made of ¼ by 2-inch flat iron by nine ¼-inch round head brass screws. Small nipples are to be soldered to the cone at places where it is penetrated by the suspension rods. A hood made of the same material and in the same manner as specified above, supported by four galvanized iron standards, is to be fitted to the cone as shown.

SPRING CURTAINS.—The curtain fixtures are shown on Plate I, Figs. 3 and 7, Plate III, Figs. 13 to 22, and Plate VIII, Fig. 16.

The fourteen hangers, shown on Plate III, Figs. 13 to 22, must be neatly molded brass castings finished all over except beneath; they are to be neatly drilled or slotted to suit the ends of the rollers and accurately spaced and secured to the steel lining by three ¼-inch round head brass screws each.

The rollers, 1 inch in diameter, must be of a good quality of block tin free from all defects and thoroughly japanned inside and out before attachments are secured. They are to be provided at one end with a simple journal and at the other with the best quality of spring ratchet attachment both of which are to be securely fastened concentric to the rollers. The rollers must also be perfectly straight and round and provided with a groove or slot along their length in which the curtains are to be secured.

The curtains are to be of the best quality of Irish linen of the widths shown on the drawings and 7 feet 6 inches long. They must be neatly and strongly hemmed around all their edges, securely fastened to the rollers and provided at their lower edges with a nickel-plated brass curtain rod, ⅛ by ½ inch, to which must be strongly attached two nickel-plated brass pulling rings each.

The arrangement of the curtains is such that when in place the upper and shorter ones will overlap the lower and longer, as shown on the drawings. The spring rollers mentioned above must be strong enough to take up easily the whole length of the curtain, which must roll evenly, neatly, and closely upon the roller, and must not be over 2⅛ inches in diameter when the length has been taken up.

GLASS STOPS.—The glass stops for the lantern are to be made of brass and they must be good, sound, neatly molded castings, finished at all surfaces of contact with each other, with the glass sash, the filling pieces, the parapet plates, the architrave door, jambs, and lintel, and neatly drilled and faced for the tap bolts.

They are shown on Plate VI, Figs. 3 to 33, and Plate VIII, Figs. 10 to 13, and will consist of the upper and lower curved stops (Figs. 22 and 23) at the architrave and parapet plates, separated from each other horizontally by the upper and lower small stops (Figs. 3 to 7 and 17 to 21, which they must neatly abut. The small glass stops shown by Figs. 8 to 16, Plate VI, and Figs. 10 to 13, Plate VIII, must have the shapes shown thereon and are to act as fishplates at the joints between the glass sashes. Those shown on Plate VIII, Figs. 10 to 13, are to be provided with handles, which are to be finished all over. The glass stop shown on Plate VI, Figs. 24 to 28, will also form a rain drip above the door, and it must neatly abut the small glass stop shown on Plate VI, Fig. 15.

The helical glass stops shown on Plate VI, Figs. 29 to 31, are to be secured to the helical bars of the glass sash and must correctly abut the small glass stops at their ends.

The vertical glass stops each side of the door are shown on Plate VI, Figs. 32 and 33. One of them must be notched out and accurately fitted to the hinge on the upper part of the left-hand jamb.

The glass stops for the door are shown in section on Plate IV, Figs. 9, 10 and 13. They are four in number, two curved and two straight—one of the latter must be in two pieces on account of the hinge—and all of them are to be secured to the door by at least five ¼-inch tap bolts on each side. They must neatly abut the hinge, and each other where they miter at the corners.

The brass stops, shown on Plate VI, Figs. 34 and 35, must be attached to the fitting pieces and sashes below the architrave castings on the inside of the lantern, as shown on Plate VIII, Fig. 16.

All the tap bolts for securing the glass stops are to be of brass, and well made. They must screw up moderately tight with a light wrench to a good firm bearing upon the stops when the latter are in place.

All the glass stops mentioned above must be attached to the lantern in a neat and workmanlike manner, and show fair and continuous lines all around the structure without breaks at the abutting joints.

LANTERN LADDER.—A ladder made in accordance with the drawings on Plate VII, Figs. 36 to 39, of ⅜ by 2-inch steel stringers, with double iron rounds, faced at the shoulder and riveted to the stringers, is to be furnished.

LANTERN GLASS.

GENERAL.—The glass for the third-order lantern is shown on Plate IX, Figs. 1 to 24, and will consist of fifty-four panes of curved glass, ¼ inch in thickness. A variation of not over 1-32d of an inch will be allowed on either side of the thickness called for.

LANTERN GLASS.—The lantern glass will consist of twenty-eight full panes (Figs. 1 to 6), three vertical half panes for either side of door (Figs. 7 to 12), twenty-one horizontal half panes (Figs. 13 to 18), and two panes for the door (Figs. 19 to 24).

The panes must be of the best quality of selected plate glass, as stated above; their surfaces must be perfectly smooth and highly polished, free from distorted reflections, flaws, or cloudiness. The panes must be neatly and correctly cut to the dimensions shown on the drawings and bent as shown. They must be thoroughly annealed after bending, and allowances must be made and the proper precautions taken before annealing in order that the panes may be of the proper shape, form, and curvature after the final cooling. The panes must be interchangeable, and must conform in every respect to the templets furnished to the glass benders by the contractor for the lantern.

PANES REQUIRED.—The number of panes mentioned above and shown on Plate IX are those for one lantern; the total number of panes that will be required are those for.....lanterns.

INSPECTION.—The glass will be inspected at the works of the glass benders, who must afford all assistance necessary to perform this inspection. Should any of the panes show that they are not up to the requirements of the specifications, they will be rejected, and the faulty panes must be promptly replaced by others acceptable in every respect to the Government.

WORKMANSHIP.—The glass must be the product of the most skilled workmanship; the panes must be perfectly clear, and their edges straight and smooth. None but first-class work will pass inspection. The glass benders must properly box the glass before shipment to the contractors.

ERECTION AT THE SHOP.—The lantern is to be completely erected at the shop with curtains, glass, etc., in place and must not be taken down until inspected and marked by an agent of the Light-House Board. The marks are to be cut in by a chisel, and when the work has been painted they are to be duplicated in large figures painted on with white lead.

MATERIAL AND WORKMANSHIP.—The wrought iron to be used for the lantern must be free from imperfections, and must be capable of bearing a tensile strain of not less than 50,000 pounds per square inch of cross section.

All castings must be entirely free from imperfections, such as honeycomb, blowholes, etc.; they must be straight, out of wind, and must have a clean and smooth surface. The iron in the castings must be light gray in color, close grained, and of such quality that a rough bar ¾ inch square, supported at points 12 inches apart, will break under a load of not less than 930 pounds applied at the center.

The Light-House Engineer or his agent may test specimens of the iron by straining or breaking, but no piece that has been strained and possibly crippled shall be used in the structure. The tests referred to shall be at the expense of the contractor.

The bolt heads and nuts throughout the structure are to be hexagonal, if not otherwise specified. The screw threads must be sharp and clean and the bolts of proper lengths.

The brass must contain not less than 90 per cent. of copper; it must have a close texture, and no scrap is to be used in the alloy.

The bronze should be of a good tough quality, of close texture and capable of bearing shock. A mixture of 83 copper, 15 tin, 1½ zinc, and ½ lead should show a tensile strength of 30,000 to 35,000 pounds per square inch.

The work must be the production of the most skilled workmanship.

OILING AND PAINTING.—After the metal work has been thoroughly cleaned by the removal of sand, rust, etc., and when the surfaces are perfectly dry, the metal work is to receive one coat of linseed oil, applied hot, and two coats of pure red lead, ground in linseed oil. A succeeding coat shall not be applied unless the one previously applied has become perfectly dry and hard.

All planed, turned, and finished surfaces must receive before shipment a coat of white lead and tallow.

MISCELLANEOUS.—All portions of the work must be thoroughly inspected before painting, and the contractor must afford to the Light-House Engineer or his agent every assistance necessary to perform this inspection.

The contractor will furnish to the Light-House Engineer a list of the exact weights of all the pieces, including the glass. He must, before shipment, box all bolts, glass, and small pieces of the structure.

If any omission be discovered, either in the drawings or in the specifications, the contractors shall not take advantage of it, but will refer for information to the Light-House Engineer, the right to order any details to be provided without additional cost to the Government, should it become evident that such details were originally intended or that they will be essential to the proper construction of the work, being reserved. Full explanations and complete detail drawings will be furnished for any part of the work not sufficiently shown or understood.

CARPENTER WORK.

Lumber to be used shall be best quality Oregon pine and redwood, well seasoned and free from sap, shakes, loose knots, or other defects. All to be dressed on all surfaces.

FLOOR JOISTS.—Oregon pine, 4 inches by 4 inches, spaced 1 foot on centers. All floor joists to be notched ¼ inch where resting on steel beams.

Over partitions of living rooms fill in to watch room floor with 2 inch by 4 inch Oregon pine. Plate XXIII, Fig. 14. Wood floors to be Oregon pine, vertical grained, 3 inches tongued and grooved to finish to 1⅛ inches thick, blind-nailed, hand-planed smooth.

SHEATHING.—It must be understood that all sheathing is to be arranged in panels or sections, which can be removed so that the condition of the ironwork behind it may at any time be inspected.

Oregon pine blocks are bolted to steel parts, nailing strips for sheathing to rest against these, and be fastened by 3-inch brass screws, round-headed, with washers. Sheathing, redwood tongued and grooved, V-grooves, blind-nailed. Plate XXIV, Figs. 1, 4, 6 and 7.

Bedroom and closet partitions on living room floor to be 1¼ inches by 4 inches tongued and grooved redwood, V joint, let into grooved and molded 2 inches by 3 inches redwood at top and bottom. Plate XXIII, Figs. 14 and 15.

Door frames 3 inches by 3 inches redwood, rabbeted for door and grooved for sheathing. Plate XXIII, Figs. 16 and 18.

Base to be ¾ inch by 6 inches molded redwood. Plate XXIV, Fig. 1.

Redwood molding at ceiling line. Plate XXIV, Fig. 1.

WINDOWS.—Windows to be of the number, forms and dimensions shown on the elevations, plans and details. Plates II, III, VI, XIX, XX, XXIV.

FRAMES.—1⅜-inch Oregon pine pulley stiles; pulleys 2½ inches diameter; all parts of pulleys brass. Head of frame 2 inches thick, parting strip ⅜ inch thick, sills redwood, 3 inches thick; inside stop redwood, ½ inch thick. All frames to be secured in place with brass screws at sill and two ⅜-inch bolts on each side of frame and two through each head. Plate XX, Figs. 5, 6 and 9, and Plate XXIV, Fig. 6.

Sash for all windows to be mill made of No. 1 seasoned sugar pine, 2¼ inches thick, and divided as shown on elevations.

Glass in all windows to be plate, ¼ inch thick, all to be properly bedded and back-puttied and extra well secured.

All sash to be hung with some form of brass or bronze chain to be approved by the Light-House Engineer, and to be furnished with lifts and locks of same material, put on with screws of similar material.

Sash stops to be secured with screws with washers.

DOORS.—Doors to be of the number, forms and dimensions shown on drawings. All to be mill-made of selected redwood, with panels as shown.

Kitchen door and watch room door to be 2¼ inches thick, to have frames of clear Oregon pine 2¼ inches thick, rabbeted for doors. Frames to be secured with three ⅜-inch bolts on each side and two bolts through head.

Kitchen door to be hung with three, and watch room door with two 5 inch by 5 inch brass, loose-pin butts and furnished with 4 inch by 4 inch brass mortise locks, with escutcheons and keys each, all of brass.

Closet doors to be hung with 4 inch by 4 inch brass, loose-pin butts and furnished with same hardware mentioned above.

Provide approved transom openers of brass for all transoms.

All hardware to be put on with brass screws. All building hardware to be approved by the Light-House Engineer.

Thresholds for inside doors to be molded of oak or ash.

All windows and outside doors to be provided with outside shutters as described under Steel Work.

Casings for all window and door openings throughout ⅞ inch thick, of selected vertical-grained redwood, molded, as shown on drawings, and strongly secured in place with brass screws.

All casings, sheathing on walls, and moldings to be secured in place with brass screws, so as to admit of easy removal for the purpose of exposing the steel work for inspection.

Kitchen cupboards and lockers to be as detailed on Plate XXIII.

Sink to have 1⅛-inch sugar pine back board with cap molding of same wood, and 1¾-inch sugar pine drain board and countertop to adjoining cupboard, same over flour bin 1¼ inch thick.

All cupboards and lockers to be fitted up with drawers, movable shelves, doors, bins, etc., of selected redwood, and furnished with all necessary hinges, drawer pulls, cupboard catches, etc., of brass.

All glass in doors of cupboards and tool case in engine room to be selected 21-ounce glass.

Lockers, desk and seats in watch room to be of redwood. Seat to have drawers in front, with curved face. and to have back to radius of wall and neatly fitted around projecting wall finish.

Furnish twelve brass screw hooks under sink.

Furnish two dozen cast bronze clothes-hooks, 3¼ inches long for bedroom closets.

Bedroom lockers over closets to have redwood doors, with brass hinges and catches, and movable shelf behind.

WATER CLOSET in basement to have step up from floor of 1⅛-inch Oregon pine, on 2 inch by 4 inch Oregon pine framing, and to have ⅞ inch by 4 inch tongued and grooved V-joint redwood partitions. Door to same to be 1¼ inches thick with long panel of open work, louvre pattern slats; to have brass hinges and brass slide bolt on inside.

PAINTING.—Pulley stiles to be given two coats of light brown oil. All interior woodwork, sheathing. casings, floor joists and under side of floors to be well sand-papered and to receive two coats of white shellac, alcohol and varnish, each coat when dry and hard to be rubbed down with pumice stone and then finished with hard oil finish. The thresholds to receive three coats of boiled linseed oil. The exterior of the door and window frames to be painted white. Protect the floor from all stains during the painting, and clean off all stains or spots from the windows on completion.

TIME.—The actual work of preparing the material for this structure must be commenced in the shops of the contractor within thirty days from the date of notification of approval of the contract by the Secretary of Commerce and Labor, and must from that date be pushed rapidly to completion; and the work of erection upon the concrete base must be commenced within fifteen days from the date of notification that the same is ready to receive its superstructure; provided, that if the contractor so desires, four calendar months shall have elapsed since the date of said notification of the approval of this contract. After the work of erection on the concrete base has been commenced it must be pushed to completion as rapidly as the conditions of wind and weather will permit.

PAYMENTS.—The work will be paid for in two payments of 50 per centum each of the contract price, provided that from the first payment 20 per centum shall be deducted and retained until the final completion of all the work required by the contract to the satisfaction of the Light-House Engineer. The first payment shall be made when the frame work and walls, including the lantern, and the stairs, shall have been assembled, and inspected in the shops of the contractor, marked and made ready for transportation, as required by these specifications. This material will then become the property of the United States, but will remain in the custody of the contractor, who will be held responsible for its safe-keeping, transportation, and final erection upon its concrete base, all at his own expense.

The second payment will be made, including the retained percentage from the first payment, when all the work contemplated by this contract shall have been entirely completed to the satisfaction of the Light-House Engineer.

INSTRUCTIONS TO BIDDERS.

N. B.—Failure to comply with these instructions renders the bid informal and liable to be rejected.

1. All bids must he made upon the printed form annexed hereto.

2. Each bid must state the sum for which the entire work, as shown on the drawings and described in the specifications, will be completed.

3. The bidder's place of residence, with county and State, should be given after his signature, which must be written in full.

4. Anyone signing a bid as the agent of another, or of others, should file with it legal evidence of his authority to do so.

5. When firms bid, the firm name and the full name of each member thereof should be written at the beginning of the bid; for instance, "Smith, Brown & Co., of the City of New York, a firm composed of John S. Smith, Charles B. Brown, and John W. Robinson." The bid should be signed in the firm name without a seal. When corporations bid, the bid should be signed with the corporate name by some person duly authorized to do so (evidence of whose authority should be appended), and sealed with the corporate seal.

6. Bidders should satisfy the United States of their ability to furnish the material and perform the work for which they bid.

7. Reasonable grounds for supposing that any bidder is interested in more than one bid for the same item will cause the rejection of all bids in which he is interested.

8. Bids submitted by different members of the same firm or copartnership will not be considered.

9. The right is reserved to reject any or all bids, and to waive any defects.

10. All bids must be enclosed in an envelope endorsed, "Proposal for Steel Superstructure of Light-Station on Mile Rock, San Francisco Harbor," and then enclosed in another envelope and directed to the "Engineer Twelfth Light-House District, Room 91, Flood Building, San Francisco, Cal."

11. All bids will be publicly opened at the time specified in the advertisement. Bidders are invited to be present and witness the opening of the bids.

12. The form of contract to be entered into may be seen at this office. Bidders are to be understood as accepting the terms and conditions contained in such form of contract.

13. The plans and specifications, together with these instructions, will form part of the contract.

14. Should the bidder to whom the contract may be awarded fail to enter into contract within ten days after notice has been given him that his bid has been accepted, he will be considered a defaulting contractor, and recommendation will be made to the Secretary of Commerce and Labor that hereafter no proposal of his be considered.

15. A bond, with one corporate surety or with two individual sureties, in the sum of $..... will be required for the faithful performance of the contract. Each surety will be required to qualify in double the amount of the bond.

16. A firm will not be accepted as a surety, nor will a partner be accepted as a surety for a copartner, or for a firm of which he is a member. An officer of a corporation will not be accepted as surety for such corporation. In no case will a married woman be accepted as a surety.

17. No bid will be accepted or contract entered into until approved by the Light-House Board.

18. Transfers of contracts, or of interests in contracts, are prohibited by law.

19. Payment will be made as specified.

20. The work must be completed and delivered as specified.

21. No proposal will be considered unless accompanied by a guaranty in manner and form as directed in these instructions.

22. All bids and guaranties must be made in duplicate, upon printed forms to be obtained at this office.

23. The guaranty attached to each copy of the bid must be signed by two responsible guarantors, to be certified as good and sufficient guarantors by a judge or clerk of United States court, United States district attorney, United States commissioner, postmaster, or judge or clerk of a State court of record, with the seal of said court attached, or by one guaranty or surety company duly authorized in accordance with the provisions of an act of Congress approved August 13, 1894.

24. Each guarantor must justify in the sum of twenty (20) per cent of the amount of the bid. The liability of the guarantors and the bidder is expressed in the guaranty attached to the bid.

[Before filling out this bid the instructions to bidders should be carefully read.]

B D.

(DATE:).....

.....

.....

We (or I), ...

.....

..... of the

..... State of .....

engaged in business under the name and style of.....

hereby agree to furnish all the material and labor necessary to completely construct in accordance with the accompanying advertisement, instructions to bidders, specifications and drawings, the superstructure of the light and fog-signal station to be erected upon Mile Rock, at the entrance to San Francisco Harbor, California, and to do all things that may be required by the contract to be entered into, and of which said specifications and drawings

are to form a part, for the sum of.....

..... dollars ($..... $\frac{}{100}$).

We (or I) make this proposal with a full knowledge of the kind, quality and quantity of the material and articles required, and the work to be done, and if it be accepted will, after receiving written notice of such acceptance, enter into contract within the time designated in the specifications, with good and sufficient sureties for the faithful performance thereof.

(Signature:).....

(Address:).....

(Signature:).....

(Address:).....

To the LIGHT-HOUSE ENGINEER,

Room 91, Flood Building, San Francisco, Cal.

GUARANTY TO ACCOMPANY PROPOSAL.

We, ...

of.....in the County of.....

and State of.....and..... of

.....in the County of.....and State of.....

.....hereby undertake that if the bid of.....

..... herewith accompanying, dated.....

for furnishing.....

.....

.....

.....

.....

be accepted as to any or all of the items of supplies, materials, and services proposed to be furnished thereby, or as to any portion of the same within sixty days from the date of the opening of proposals therefor, the said

bidder .....will, within ten days after notice of such acceptance, enter into a contract with the proper officer of the United States to furnish such articles of supplies and materials and such services of those proposed to be furnished by said bid as shall be accepted, at the prices offered by said bid and in accordance with the terms and conditions of the advertisement inviting said proposals, and will give bond with good and sufficient sureties for the faithful and proper fulfillment of such contract. And we bind ourselves, our heirs, executors, and administrators, jointly and severally, to pay to the United States, in case the said bidder shall fail to enter into such contract or give such bond within ten days after said notice of acceptance, the difference in money between the amount of the bid of said bidder on the articles or services so accepted and the amount for which the proper officer of the United States may contract with another party to furnish said articles and services, if the latter amount be in excess of the former.

Given under our hands and seals this.....day of.....

.....

In presence of—

..... as to .....*

..... as to .....*

* Affix adhesive seal.

STATE OF.....
County of..... } ss.

I, ..., one of the guarantors named in the foregoing guaranty, do swear that I am pecuniarily worth the sum of..... dollars over and above all my debts and liabilities.

.....

Subscribed and sworn to before me this.....day of.....

at.....

[1].....

STATE OF.....
County of..... } ss.

I, ..., one of the guarantors named in the foregoing guaranty, do swear that I am pecuniarily worth the sum of..... dollars over and above all my debts and liabilities.

.....

Subscribed and sworn to before me this.....day of.....

at.....

[1].....

I, [2].....do hereby certify that.....

..... and ....., the guarantor above named,.....

personally known to me, and that, to the best of my knowledge and belief, [3].....is pecuniarily worth, over and above all his debts and liabilities, the sum stated in the accompanying affidavit subscribed by him.

.....

I, ..., do hereby certify that.....

....., the guarantor above named, is personally known to me, and that, to the best of my knowledge and belief, he is pecuniarily worth, over and above all his debts and liabilities, the sum stated in the accompanying affidavit subscribed by him.

.....

[1] The oath to be taken before a notary public or some other officer having general authority to administer oaths. If the officer has an official seal it must be affixed, otherwise the proper certificate as to his official character must be furnished.

[2] This certificate to be by a judge or clerk of a United States court, a United States district attorney, United States commissioner, postmaster, or a judge or clerk of a State court of record with the seal of said court attached. If the official can make the certificate as to both sureties, it will not be necessary to fill out the next form below.

[3] He or each.

CONTRACT.

N. B.—In executing this contract the directions on the last page should be carefully followed.

Articles of Agreement, made and entered into between .....

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of the first part, and THOS. H. HANDBURY, Lieutenant-Colonel, Corps of Engineers, U. S. A., Engineer Twelfth Light-House District, acting for and in behalf of the United States of America, of the second part, witnesseth:

That the party of the first part, in consideration of the matters hereinafter referred to and set out, and of the specifications and drawings attached hereto, and forming a part of this contract, covenants and agrees, to and with the party of the second part, to furnish all the labor and materials necessary for, and to construct the superstructure of the light and fog-signal station to be erected on Mile Rock, at the entrance to San Francisco Harbor, Cal., to commence the work and push forward the same to completion, all as more particularly set forth in the specifications and drawings above referred to.

And the said party of the first part further agrees to conform in every particular to the stipulations and conditions stated in this contract, and to the specifications and drawings for the work, hereto annexed, which are to be considered as a part of the same, and to be governed in all matters regarding said work and the materials used therein by the said party of the second part, or the authorized agent or agents thereof; and that the said work and materials used therein shall be subjected to a rigid inspection to be made by the party of the second part, or its agent or agents, and that this inspection shall be final.

And the said party of the second part covenants and agrees to pay the party of the first part, in full payment for said material and labor, and the erection of said structure as follows:

The work will be paid for in two payments of 50 per centum each of the contract price, provided that from the first payment 20 per centum shall be deducted and retained until the final completion of all the work required by the contract, to the satisfaction of the Light-House Engineer. The first payment shall be made when the frame work and walls, including the lantern, and the stairs, shall have been assembled and inspected in the shops of the party of the first part, marked and made ready for transportation, as required by the specifications above referred to. This material will then become the property of the United States, but will remain in the custody of the party of the first part, who will be responsible for its safe-keeping, transportation, and final erection upon its concrete base, all at his own expense.

The second payment will be made, including the retained percentage from the first payment, when all the work contemplated by this contract shall have been entirely completed to the satisfaction of the Light-House Engineer.

And it is expressly understood and agreed that, as each payment hereinbefore stipulated is made, possession of the material, labor and articles which are paid for by such payment shall pass to, and the title thereto shall be vested in the United States.

If, in any event, the party of the first part shall delay or fail to commence the delivery of the material or the performance of the work specified herein, or shall, in the judgment of the officer of the Light-House Board in charge, fail to prosecute faithfully and diligently the work in accordance with the specifications and requirements of this contract, then, in either case, the party of the second part, or his successor, shall have power, with the sanction of the Light-House Board, to annul this contract by giving notice in writing to that effect to the party (or parties, or either of them) of the first part; and the party of the second part shall be thereupon authorized, if an immediate performance of the work or delivery of the materials be in his opinion required by the public exigency, to proceed to provide for the same by open purchase or contract, as prescribed in section 3709 of the Revised Statutes of the United States; but the party of the first part shall remain liable to the party of the second part for the damages occasioned to him by the said noncompliance, delay, or negligence: *Provided, however,* That if the party (or parties) of the first part shall by freshets, ice, or other force or violence of the elements, and by no fault of his or their own, be prevented either from commencing or completing the work, or delivering the materials at the time agreed upon in this contract, such additional time may, in writing, be allowed him or them

for such commencement or completion as, in the judgment of the party of the second part, or his successor, shall be just and reasonable, any additional expense incurred by the United States on account of inspection or otherwise during the period of extension to be deducted from the contract price of the work; but such allowance and extension shall in no manner affect the rights or obligations of the parties under this contract, but the same shall subsist, take effect, and be enforceable precisely as if the new date for such commencement or completion had been the date originally herein agreed upon.

It is further understood and agreed that in case of failure on the part of the party of the first part to complete this contract as specified and agreed upon, that the said United States shall have the right to recover any or all damages incurred by reason of said failure by the party of the first part, and shall also have the right to recover whatever sums may be expended by the party of the second part in completing the said contract in excess of the price herein stipulated to be paid to the party of the first part for completing the same.

And it is further stipulated and agreed that no Member of or Delegate to Congress shall be admitted to any share or part of this contract or agreement, or to any benefit to arise therefrom; and this contract shall be in all its parts subject to the terms and conditions of sections 3739, 3740, and 3742 of the Revised Statutes of the United States.

And it is also expressly understood and provided that nothing herein contained shall be so construed as to authorize any officer or agent of the United States to bind the United States by contract beyond the amount appropriated by Congress.

And it is further covenanted and agreed that no member of the Light-House Board, inspector, lightkeeper, or other person in any manner connected with the Light-House Service, shall be interested, either directly or indirectly, in this contract, or be entitled to any benefit to arise therefrom; and for any violation of this covenant and agreement the party of the first part shall forfeit all moneys which may become due under this contract.

Provided, also, that it is expressly understood and agreed that this contract, or any part thereof, shall not be sublet nor assigned, but that it shall be well and truly carried out and fulfilled in good faith by the above-recited party of the first part, and that payment on account thereof shall be made to the aforesaid party of the first part, ...successors, heirs, executors, or administrators.

And provided further, that this contract shall not be binding upon the United States until it shall have been approved by the Light-House Board.

And for the true and faithful performance of all and singular the covenants, articles, and agreements hereinbefore particularly set forth, the subscribers hereunto bind themselves, jointly and severally, their and each of their successors, heirs, executors, and administrators.

Thus covenanted, made, and agreed by the said parties, this.....day of.....anno Domini one thousand nine hundred and four, as witness their hands.

Signed and delivered in presence of—

WITNESSES:

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NOTE.—The bondsmen must not sign the contract.

BOND WITH CONTRACT.

KNOW ALL MEN BY THESE PRESENTS, That we.....

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....., as sureties, are held and firmly bound unto the United States of America in the sum of..... dollars ($.....), lawful money of the United States, to be paid to the said United States, or its authorized agent, as liquidated damages; for which payment, well and truly to be made, we, and each of us do bind ourselves, and each of our successors, heirs, executors, and administrators, jointly and severally, firmly by these presents.

Sealed with our seals, dated this.....day of.....

.....

The condition of the above obligation is such that if the said.....

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successors, heirs, executors or administrators, shall well and truly execute the contract hereto annexed which .....ha.....entered into with Thos. H. Handbury, Lieutenant-Colonel, Corps of Engineers, U. S. A., Engineer Twelfth Light-House District, for and in behalf of the United States, by which.....

covenant and agree to furnish all the labor and material necessary to completely construct the superstructure of the light and fog-signal station to be erected upon Mile Rock, entrance to San Francisco Harbor, California, according to all the conditions of the said contract, and shall promptly make payments to all persons supplying said.....labor and materials in the prosecution of the work provided for in such contract, then this obligation to be void; otherwise to remain in full force and virtue.

Signed and sealed in the presence of—

WITNESSES:

.....	.....[L. S.]
.....	.....[L. S.]
.....	.....[L. S.]
.....	.....[L. S.]
.....	.....[L. S.]

NOTES.

If the contract be made by an incorporated company, the corporate seal should be impressed on, or affixed to, each copy of both the contract and the bond, and a certificate, under the corporate seal of the company, showing that the person who signs in its behalf is, at the time of signing, the officer he purports to be, and as such is duly authorized to sign sealed instruments in behalf of the company, should be affixed to at least one copy of the contract.

All signatures of sureties should have affixed to them adhesive seals, and their names should be written in full.

The residence of sureties and witnesses should be given.

The bondsmen must qualify in the forms following.

The bondsmen must not sign the contract.

BONDSMEN'S OATHS.

STATE OF.....
County of..... } ss.

....., being duly sworn, deposes and says that he resides at No. .....street, in the.....of.....in the State of.....; and that the value of his property, over and above all debts and liabilities incurred by him, is over.....dollars ($.....), and that he is fully responsible for the amount of his obligation in the foregoing bond by him executed.

(Signature of surety:).....

Sworn to and subscribed this.....day of....., 190....., before me.

(Signature of officer administering oath, with seal, if any.) .....[L. S.]

.....

STATE OF.....
County of..... } ss.

....., being duly sworn, deposes and says that he resides at No. .....street, in the.....of.....in the State of.....; and that the value of his property, over and above all debts and liabilities incurred by him, is over.....dollars ($.....), and that he is fully responsible for the amount of his obligation in the foregoing bond by him executed.

(Signature of surety:).....

Sworn to and subscribed this.....day of....., 190....., before me.

(Signature of officer administering oath, with seal, if any.) .....[L. S.]

.....

NOTES.

If the affidavits of the sureties be made before a notary public, his seal should be impressed; if made before a justice of the peace, the usual certificate attesting the official character of the magistrate should be appended.

Each surety will qualify in double the amount of the bond.

Form of Justification by Corporate Surety.

[*This form of justification is to be used when a guaranty or surety company is upon the bond of a contractor, instead of two individual sureties.*]

STATE OF..... } ss.
County of..... }

Personally appeared before me,..... on this.....day of.....one thousand nine hundred and four, known to me to be the ..... of the..... .....the corporation described in and which executed the annexed bond of.....as surety thereon, and who, being by me duly sworn, deposes and says that he resides at.....in the State of..... .....that he is the.....of the said..... .....Company, and knows the corporate seal thereof; that said company is duly and legally incorporated under the laws of the State of.....; that said company has complied with the provisions of the Act of Congress of August 13, 1894, allowing certain corporations to be accepted as surety on bonds; that the seal affixed to the annexed bond of ..... is the corporate seal of the said..... Company and was thereto affixed by order and authority of the board of directors of said company; and that he signed his name thereto by like order and authority as..... of said company; and that he is acquainted with.....and knows him to be the.....of said company; and that the signature of said .....subscribed to said bond is in the genuine handwriting of said.....and was thereto subscribed by order and authority of said board of directors, and in the presence of said deponent; and that the assets of said company, unincumbered and liable to execution, exceed its claims, debts, and liabilities of every nature whatsoever, by more than the sum of.....dollars ($.....).

Deponent further says that..... residing

at.....in the State of.....has been duly appointed as the agent of said company to accept service of process against said company in the.....judicial district of.....and is authorized to enter an appearance in behalf of said company in any action, suit, or proceeding brought against it in said judicial district.

.....

Sworn to, acknowledged before me, and subscribed in my presence this.....day of .....190.....

.....

NOTES.

If the above affidavit be made before a notary public, his seal should be impressed; if made before a justice of the peace, the usual certificate attesting the official character of the magistrate should be appended.

The surety company will qualify in double the amount of the bond.

CERTIFICATE OF SOLVENCY.

I CERTIFY that I have made due and diligent personal inquiry as to the ability of the signers of the foregoing bond, and am satisfied that they are good and sufficient, and fully responsible for the sum of.....

.....dollars ($.....) each.

(Signature of certifying official.).....

.....

DATE:.....190 .

NOTES.

The surety's certificate of solvency must be signed by an officer of the Government known to the Department of Commerce and Labor.

This form need not be used when a guaranty or surety company is upon the bond of a contractor.

Directions as to Execution of Contracts.

1. The contract papers proper, comprising the specifications, drawings, if any, contract, bond, bondsmen's oaths, justification by corporate surety—when a guaranty or surety company is upon the bond of the contractor, instead of two individual sureties—and certificate of solvency, should be made in quadruplicate, and each copy should be the exact counterpart of the others, so that any one of them may be used as an original.

2. Before signatures are appended to the papers, all dates should be written in, and all remaining blank spaces ruled out, with ink.

3. Interlineations and erasures are to be avoided when possible; but when they are unavoidable, either in the specifications, the contract, or the bond, they should be noted, word by word, immediately above the signature of the witnesses, specifying the number of each line where they occur; and certificates should be made that each specific correction or alteration was made before the contract was signed.

4. The full name and the residence of each signer of a contract and bond should be written in the body of the contract and bond.

5. When firms contract, the name of the firm and the full name of each member thereof should be written at the beginning of the contract; for instance, "Smith, Brown & Co., of the city of New York, a firm composed of John S. Smith, Charles B. Brown, and John W. Robinson." The contract should be signed in the firm name without seal. The bondsmen must not sign the contract.

6. When an *incorporated* company enters into contract, the corporate name of the company should be written at the beginning of the contract and bond; for instance, "The Smith and Brown Dredging Company, a corporation created by and existing under the laws of the State of New York, of the city of New York, in said State." The contract and bond should then be signed with the corporate name by a person duly authorized to do so, sealed with the corporate seal, and a certificate, under the corporate seal of the company, showing the signer's authority to sign sealed instruments in its behalf, should be appended to one copy of the contract. In the event that the corporation has no corporate seal, a seal of wax or wafer should be affixed to the bond and adopted and used for the time being as the seal of the corporation, and the fact that such corporation has no corporate seal should be shown by affidavit duly made before a notary public, whose official seal should be affixed thereto.

7. A bond for the faithful performance of the contract will be required. Seals of wax or wafer should be affixed to the signatures of principals and sureties, if individuals; and corporate seals should be affixed as required by Rule 6. The bond should bear the same date, or a date subsequent to that of the contract.

8. An individual or individuals, doing business under a firm name, should sign the bond in his, or their, individual names. Firm names should not be signed to the bond.

9. Each signature to a contract or bond should be made in the presence of at least one witness, who should sign his name as a witness.

10. A firm will not be accepted as a surety, nor will a partner be accepted as a surety for a copartner, nor for a firm of which he is a member. An officer of a corporation will not be accepted as surety for such corporation. In no case will a married woman be accepted as a surety, and when an unmarried woman (widow or spinster) is given as a surety, she must be described as such in the body of the bond.

11. When a person signs a contract or bond as the agent or attorney in fact of another person, evidence of his authority to sign the same should be furnished. The authority to execute an instrument under seal should itself be under seal, and it should also be duly acknowledged before an officer empowered to take acknowledgments.

12. There must be not less than two individual sureties, but one corporate surety duly qualified under the Act of Congress of August 13, 1894, may be accepted as sole surety. The contractor and sureties should sign (execute) each bond. Each member of a firm should sign the bond personally or by attorney; in the latter case, a certified copy of the power of attorney under which the signature is made should be appended to the contract. Each surety must qualify in double the amount of the bond. This direction applies to corporate as well as individual sureties, and corporate sureties should also attach to each bond a copy of the last statement of their assets and liabilities, as rendered pursuant to Section 4 of the Act of Congress of August 13, 1894. Each surety should make and sign an affidavit of the amount he is worth over and above all debts and liabilities, and such exemptions as may be allowed by law. Sureties, other than corporate sureties, should state under oath that they are not responsible as sureties on any other bond, or, if so liable, the amount of such liability. When the required oath is taken before a justice of the peace, a certificate in the usual form should be appended, attesting his official character. This inconvenience can be avoided by having the oath taken before a notary public, in which case the notarial seal must be affixed or impressed.

13. A judge or clerk of a United States court, a United States district attorney, United States commissioner, postmaster, or a judge or clerk of a State court of record, with the seal of said court attached, should certify that the sureties are sufficient to pay the penalty of the bond, and except in the case of a judge of a United States court, or a United States attorney, if the person certifying has no seal, his official character should be duly certified. The foregoing does not apply to corporate sureties who have complied with Rule 12 of these directions relative to evidence of their ability to meet double the entire obligation of their bond.

14. Corporate sureties, duly qualified to do business, under the Act of Congress of August 13, 1894, and who have filed with the Solicitor of the Department of Commerce and Labor evidence of their authority to do business, from the Department of Justice, need not furnish a certificate of such authority with each contract on which they are bondsmen.

15. When contracts and bonds have been thus prepared, and signed and sealed by the officer making them, in behalf of the United States, they should be forwarded to the Board for approval.

16. When approved by the Board and by the Secretary of Commerce and Labor, two copies will be returned to the officer making the contract, one for delivery to the contractor and the other for file.