

ification for the construction of two timber lighters for the Anglo Mexican Petroleum Co.Ltd. Calle Prat. Valparaiso.

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ral. The contractor binds himself to build two lighters in accordance with the following specification and conditions:-- the lighters are to be built of Maule Oak and Oregon Pine of good quality, sound and dry; they will be decked over and have hatches, they are to be bolted together with  $\frac{3}{4}$ " diam. rolled brass bolts and rivetted over brass washers, the keel, stem, stern knee and false keel; also with yellow metal  $\frac{5}{8}$ " diam. rivets closed over brass washers on all faces. The outer planking from the keel to the lower rubbing fender is to be nailed on with yellow metal spikes and above this to the upper rubbing fender with galv. iron spikes and all other through bolts are to be  $\frac{3}{4}$ " galv. iron with washers; further, the hull is to be sheathed with Muntz metal of 18 oz. to a height of one foot above water line when empty. The contractor is to state the date on which delivery can be made in the river at Constitution ready for towing to their destinations.

of the lighters. The bow and stern are to be the same. The top of keel rabbet will be the same fore and aft, i.e. 30" from the centre (see plan).

Characteristics of the lighters	Length vertical to vertical	80' 6"
	Width overall timbers	22' 0"
	Depth at centre from top of keel rabbet	9' 6"

g. The hulls are to be of the best Maule oak and Oregon pine in accordance with specification and plans and under the supervision of an inspector appointed by the Anglo Mexican Petroleum Co.Ltd., who is to have the right of entry to the contractor's shops during working hours. The outside bottoms will be bolted with  $\frac{3}{4}$ " diam. brass bolts rivetted over brass washers (keel, stem, stern knees and keelsons) and nailed, up to the lower rubbing fender, with brass spikes 5" & 4 $\frac{1}{2}$ " long; all above this to be bolted with galv. iron bolts  $\frac{3}{4}$ " diam. rivetted over galv. iron washers and 5" & 6" galv. iron spikes. Heads of nails and bolts to be puttied. Seams from keel to lower rubbing fender to be caulked with three runs of oakum and above this with two runs also the keel and stem seams are to be cord caulked. When the bottoms are finished and before tarring and sheathing, these will be tested with water inside the lighters up to the height indicated by the inspector, and any leaks whatever are to be caulked, and all defective planks removed; after passing inspection the bottoms will be tarred with good tar, felt covered and upper tacked, and 18 oz. Muntz metal sheathed, sheets to be four feet long and 14" wide and nailed on with 1" composition nails to a height of one foot above water level when light, i.e. complete with fittings, oil tank, pump and boiler in boiler room, boiler with water, two small tanks, bitts anchors & chains, hand capstan (Weights to be given by the buyers). jib crane, stores & two small bilge pumps, etc. The rest of the hull outside is to have three coats of white zinc paint; hatches, hatch coamings & interior of the lighters are also to receive three coats of zinc paint up to the deck beams, including ribs, beams, stanchions, etc. The sides of the lighters inside the upper and lower rubbing fenders up to water line, are to be oregon pine 6"x 3" thick; deck to be of the same material.

To be of sound timber 11" x 9" and in three pieces with 9" splices bolted with four  $\frac{3}{4}$ " diam. brass bolts head down and rivetted over brass washers at least  $\frac{1}{8}$ " thick.

The keel where spliced is not to be checked for timbers, the timbers are to be cut accordingly.

To be a natural curve 11"x 9" and the splice with the keel to be 4'0" long and the upper splice about 2 feet. The "albanitas" should have from centre of top of keel rabbet to outside, not less than 4" of "albanita" to receive the spikes without injury.



Stern Knees To be 11" x 9" in one piece, well let into the keel and reinforced with natural curves bolted with  $\frac{3}{4}$ " brass bolts rivetted over brass washers and should have, from centre of top of keel rabbet to outside not less than 4" of "albanita" to receive the spikes without injury.

False Keels To be 10" x 9" reinforced with a 10" x 3" plank on either side of the false keels and are to run from stem to stern from the knees; to be bolted on with  $\frac{3}{4}$ " diam. brass bolts rivetted to every second timber and suitably fixed to the false keel with  $\frac{3}{4}$ " galv. iron through bolts rivetted over  $\frac{3}{4}$ " galv. washers. These are to be in three pieces with 3" to 4" scarves and rivetted to the keel with  $\frac{3}{4}$ " brass bolts over brass washers.

Keelsons There will be two keelsons on either side, at the centre of the bilge of 9" x 3", spiked on with  $6\frac{1}{2}$ " spikes &  $5\frac{1}{8}$ " diam. brass through bolts rivetted over  $5\frac{1}{8}$ " washers.

Knees. The knees are to be double from the keel upwards 4" thick, which, joined give 8". At the lower end these are to be 7" deep and at the upper end 4". The two sections to be bolted together with  $5\frac{1}{8}$ " galv. iron bolts.

The sections of the knees are to butt end to end, properly fitted and the pieces are to be the longest obtainable, not twisted, permitting the knees to be solid and strong, i.e. that the hand work be of the best; also notches are to be cut to receive the iron knees at the upper end of the knees (at every second knee) (see plan).

Sister Keelsons In the bottom there will be three sister keelsons on either side, 6" thick, which will run from stem to stern up to the height of the false keel at the centre, on which to build a full length platform to take the petroleum tanks. These are to be firmly bolted to the knees with galv. iron clinched bolts and will be fitted in their respective positions.

Centre to Centre of Knees. The knees will be placed 15" centre to centre.

Sleepers. The sleepers to take the beams will be 11" x 4" spiked to each knee with 6" galv. iron spikes.

Beams. The deck beams are to be 10" x 10" at the ends of the hatches and the others 9" x 9" the ends being 7" x 7", all bolted to the ribs which will be 5" to  $5\frac{1}{2}$ " thick with corresponding width.

The deck camber of beams is to be  $5\frac{1}{4}$ "

The 10" x 10" beams to have  $8\frac{1}{2}$ " at ends

The 9" x 9" " " " "  $7\frac{1}{2}$ " " "

Note. All tongued into the knees.

Rubbing Fenders Outside on the sides there will be two rubbing fenders of Maule Oak; the upper one being 9" x 6" bolted to the knees and protected by a half round iron strip 4" x  $5\frac{1}{8}$ ", with nuts on the inside of the knees; and the lower one will be 9" x 5" with its half round iron strip the same as the upper one, bolted with a reinforcing beam inside the hold, 9" x 6" with bolts and nuts as the upper one. Bolts, nuts and washers to be  $\frac{3}{4}$ " galv. iron the distance between the rubbing fenders to be 21".

Stanchions Under the beams at either end of the hatches there will be a 9" x 9" stanchion and various others where necessary, i.e. under the capstan, the two small tanks and also under the beams carrying the boiler and pump platform, to be let in and fitted with iron knee fastenings as instructed.

Knees for Fastening The knees for fastening to be 5" to  $5\frac{1}{2}$ " thick with corresponding width and are to be bolted and rivetted to the outside rubbing fenders and tongued at the joints.

Hooks There will be two  $4\frac{1}{2}$ " hooks both fore and aft, by 5" to  $5\frac{1}{2}$ " thick. The upper ones to be bolted to the lower rubbing fender



and the lower ones to be rivetted on with  $\frac{3}{4}$ " galv. iron bolts and washers.

ts. There will be two bitts, one forward and one aft, these to be 12"x 12" well strengthened on the deck with a doubling piece of 11"x 9" and tongued into the false keel at a suitable height, they will stand 2'9" above the deck and will have a  $\frac{3}{4}$ " galv. iron bar from port to starboard.

use Timbers To be well fitted and bolted where possible, of sound timber and suitable dimensions, i.e. strong and of sufficient thickness to take the planking spikes.

anking. From keel to water line to be of Maule oak sound and without faults, at least 2" thick of suitable widths; from the water line upwards to be Oregon pine 6"x 3". The first five planks on either side of the keel to be  $2\frac{1}{4}$ " thick of corresponding widths and fixed with 5" approved composition spikes if not imported ones, the rest of the planking to water lines to have  $4\frac{1}{2}$ " brass spikes. The Oregon pine planks to have 6" galv. iron spikes.

All the inner lining to be of Maule oak 2" thick, fixed with  $4\frac{1}{2}$ " galv. iron spikes. The planks are to be planed on the edges and all should be steam bent.

Note. It is very important that, before the planking is done, all timbers and hawse timbers be straightened and lined up to the inspector's satisfaction.

ingers and Covering Boards. The stringers to be 13"x 5" over the beams and knees and the covering boards 11"x 5", all of Maule oak and will be bolted and rivetted over washers with 5/8" bolts.

ks. The deck planking to be 6"x 3" Oregon pine with 5" galv. iron spikes. To be caulked with two runs of oakum and tar of approved quality. The heads of spikes etc. to be puttied.

ches, Hatch Coamings and Hatch Covers. There will be two hatches, one to take the petroleum tank to be 29'4" x 14'4" wide and the other 8'4" long x 15'4" wide, see plan, for the pump and boiler room. The hatch sides are to be 18" high x  $5\frac{1}{2}$ " thick, reinforced with 9"x 9" coamings well bolted to the coamings with  $\frac{3}{4}$ " galv. iron bolts. The coamings are to have  $\frac{3}{4}$ " galv. iron stays as shown on the plan. On the underside, running fore and aft of the deck, there will be 7"x 5" carlings at approved distances from each other and these to be scarfed to the knees and coamings (see plan).

se Pipes & Fairleads will be supplied and fitted by the Contractor, in cast iron.

Note. The hawse pipe for the chain and the fairlead for the tow-rope are to be joined by one piece of cast iron, rivetted to an iron plate which is to be firmly bolted on the bow of the lighter; a further two cast iron fairleads are to be supplied and fitted by the Contractor on the stern to take the mooring ropes. (see plan)

pper Pipes To be supplied and fitted by the Contractor, in 3" inside diam. lead pipe, 3/16" thick; three on either side of the lighters.

ms. These will be protected by 4"x 5/8" half round iron, to the inspector's instructions.

ts. There will be two cast iron bitts forward and two aft, to be supplied and fitted by the contractor. A drawing of these to be supplied by the buyer for their manufacture.

lers. The lighters are to be fitted with rudders capable of steering them when light. The tillers to be supplied by the contractor in wrought iron according to the buyer's instructions. A drawing of the rudder to be furnished by the contractor for the



buyer's approval, scale  $\frac{1}{8}"=1'$ .

Fore Peak. Will have a platform as shown on the plan, a stores locker & chain lockers all as per plan. The store to have a hinged door and padlock. A 2" Maule oak partition will be fitted by the contractor as per drawing.

After Peak. To have a platform, two bunks and partition as per plan.

After Pump & Boiler Room To have a floor on three beams with 6"x6" struts in the centre and 2" flooring fixed with  $4\frac{1}{8}"$  spikes. The ends of the beams to rest on suitable knees.

Bases. The contractor is to fix the bases for the small petroleum and water tanks according to the inspector's orders.

Manway Hatches to be 24"x 24", three on each lighter, with wood covers, 2"x  $\frac{3}{8}"$  iron bars and padlocks.

Ladders. The contractor will supply and fix three iron ladders on each lighter, 15" wide, the sides being 2"x  $\frac{1}{2}"$  and the treads  $\frac{3}{4}"$  iron bars, 9" centre to centre.

Hadd Bilge Pumps. Each lighter is to have two ( $2\frac{1}{2}"$  Goulds Diaphragm Suction pumps, one forward and one aft, under test) with  $2\frac{1}{2}"$  galv. iron suction pipe and strainer. These will be supplied and fitted by the contractor.

Deck Lights. Each lighter is to have six deck lights, three on either side of the petroleum tank (see plan) ~~on the~~ hatches 12"x 4" with strong brass frames, supplied and fitted by the contractor.

Half Round Iron Bars. The rubbing fenders of the lighters, both upper and lower, are to be fitted with half round iron bars 4"x  $\frac{5}{8}"$  supplied and fitted by the contractor, who will also supply all the necessary  $\frac{3}{4}"$  countersunk galv. iron bolts & washers.

Brass Work for Rudder to be supplied and fitted by the contractor with the necessary copper rivets.

Capstans To be supplied by the buyer but fitted by the contractor as per plan.

Note. The deck is to be strengthened under the capstans and levelled, the capstan seated on tarred felt, and seated with through bolts, washers and nuts.

Cranes. The contractor is to supply and fit a jib crane on each lighter capable of lifting 30 cwts. on the jib end, 3ft. clear of the side of the lighter. Details which must be complied with by the contractor as follows:-- The derrick is to be 26 ft. long 10" diam. at the deck & 8" diam. at the top with a shoulder to take the rigging ring. The Jib to be 31 ft. long 7" diam. at the middle and 6" diam. at the ends. Derrick and jib to be Oregon pine sound and dry and without appreciable cracks. The contractor is to supply  $\frac{5}{8}"$  diam. galv. iron rigging with all the necessary ironwork and shackle rings, lifts with sheaves and galv. flexible  $\frac{5}{8}"$  diam. cable, so that the contractor delivers the crans complete with all fittings ready to be fitted with the lifting gear which will be supplied and fitted by the Company, I.E. blocks manilla ropes, sheaves, hooks, etc.

Anchors and Chains. These will be supplied by the Company but put in place by the contractor.

Fenders. These will be delivered by the Company, but the rings are to be supplied and fixed by the contractor.

Rings. Each lighter is to have 6 rings  $\frac{3}{4}"$  diam. on either side, 3" inside diam. x 5" outside and the ring bolts are to have washers and nuts. (see plan)



Summary of Materials, etc.

To be supplied & fitted by the

contractor.

Muntz metal sheets 4' x 14" & 16 ozs. per sq.ft.  
 Composition nails 1" long for sheathing.  
 Sheet felt.  
 Copper tacks.  
 Timber of all kinds.  
 Brass and Galv. Iron spikes of stipulated sizes.  
 Brass bolts,  $\frac{3}{4}$ ", 5/8" diam. for rivets  
 Galv. iron bars  $\frac{3}{4}$ ", 5/8" &  $\frac{1}{2}$ " diam.  
 Copper bolts 5/8" diam. for rivets.  
 Brass & Galv. iron washers of stipulated sizes.  
 Flat iron bars for hatch locks & ladders.  
 Countersunk  $\frac{3}{4}$ " nails.  
 Cleats, etc. etc.  
 Countersunk head bolts, nuts & washers galv.  
 Half round iron bars for fenders 4" x 5/8"  
 Rivets of various sizes.  
 Iron plates 3/8"  
 Fender rings.  
 Four tested bilge pumps.  
 3/4" galv. iron pipes with flanges etc.  
 2 1/2" galv. strainers.  
 Fairleads } C.I. as per plans.  
 Hawse pipes }  
 Bitts  
 Derricks & Jibs as specified in Oregon pine.  
 Back stays & rigging, 5/8" galv. wire rope.  
 Wrought iron screws under approval.  
 Ironwork for cranes  
 Lifts with sheaf blocks & galv. flex. 5/8. rope.  
 Ropes, pulleys and accessories.  
 Tarpaulins on manway hatches to close these if necessary.  
 Paint, putty, tar, caulking material, pitch, English oakum,  
 lead pipe  
 Equipment, tow ropes, Chains, Anchors, } To be supplied by  
 2 anchor jibs with fittings if } the Company. ~~if~~  
 necessary

Disputes. In case on any dispute between the Company and the contractor, the Manager of the Anglo Mexican Petroleum Co. Ltd. Valparaiso, known as the buyer or the Company in this contract and specification will have the final decision and there will be no claim of any kind.

General. The minor modifications or details omitted in this specification which the inspector may consider necessary are to be supplied, i.e. the contractor is to supply and execute these.

Modifications of importance will be called for in writing and the price agreed on beforehand by the contractor.

This contract is made in Valparaiso and exact copies taken.

(Signed) W. Marshall  
 M. J. N. A.



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