



" C " CLASS VESSELS.

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SPECIFICATION OF ALTERATIONS TO REFRIGERATED SPACES NO. 3 LOWER TWEEN DECK, AND THE CONSTRUCTION OF NEW INSULATED SPACE NO. 3 LOWER HOLD, FOR THE CARRIAGE OF FRUIT CARGOES.

GENERAL CONDITIONS.

Tenders are requested for the alterations necessary to No. 3 Lower Tween Deck Refrigerated Spaces, and the construction of new Insulated Space in No. 3 Lower Hold.

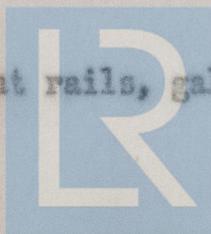
The following is a general outline specification, and Contractors are expected to include for all requirements necessary for an efficient installation. All staging, lifting gear, and all plant necessary, to be supplied by the Contractors, who will be responsible for same. Contractors are to be responsible for any claims under the Workmen's Compensation Act, or under Common Law, for any accident arising during the progress of the work, and are to provide the necessary safeguards, as required by Statutory Rules and Orders, 1925, No. 251 of the Factory & Workshop Act, during the progress of the work.

All work to be carried out to the satisfaction of Owners' representative and Lloyd's Register of Shipping Surveyor, and the workmanship and materials are to be of the best throughout.

Tests of the insulation are to be as arranged with, and carried out to the satisfaction of, Owners' representative.

EXISTING CARGO ROOMS.

All brine piping, meat rails, galvanized iron shelves



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EXISTING CARGO ROOMS. (Contd).

etc. to be stripped out of existing refrigerated cargo chambers, and removed to Engineer's Stores, 25, Sefton Street, Liverpool.

The existing four divisional bulkheads, which now divide the Tween Decks into four compartments, to be removed, thus leaving one large space. (See Drawing No. A.5349). The disturbed insulation to be made good to Owners' approval.

Brine return and delivery leads to be blanked off, as necessary.

Feed and return casings for Tween Deck brine pipe sections to be stripped out and casings made good to accommodate Provision Room sections only.

One set of white pine sparred gratings to be fitted on floor in Tween Deck chamber, also 2" x 2" wood battens fitted on ship sides and bulkheads.

Deck composition in way of divisional bulkheads to be made good, gutterways to be cut out and filled in, and left flush with remainder.

Thermometer tubes to be removed, if necessary, in way of air cooler batteries, and to be refitted in approved positions.

INSULATION WORK. No. 3 LOWER HOLD.VENTILATORS, Etc.

Ventilator openings to No. 3 Lower Hold to be blanked off by portable insulated plugs, which can be readily removed when general cargo is being carried. All air, sounding, and other pipes to be insulated independently and made portable for easy access.



SHIPSIDE.

The shipside in way of Cold Chambers to have 5" x 2" white pine grounds secured to frames by $\frac{3}{4}$ " dia. galvanized belts spaced about 3'0" apart, to form a space 13" deep from shipside plating, and covered with an inner layer of $\frac{3}{4}$ " T. & G. white pine boards, and an outer layer of 1" ^{T. & G.} white pine boards.

A double layer of waterproof paper to be inserted between the two layers.

The 13" space between shipside and T. & G. boards to be packed with granulated cork at between $6\frac{1}{2}$ lbs. and 7 lbs. per cubic foot.

The beam knees are to be cased in the insulation.

FORWARD BULKHEAD.

White pine grounds 5" x 2" to be secured to bulkhead channel stiffeners (at Frame 75) by means of $\frac{3}{4}$ " dia. galvanized belts. Over these grounds an inner layer of $\frac{3}{4}$ " T. & G. boards, and an outer layer of 1" T. & G. boards, to be nailed thereon.

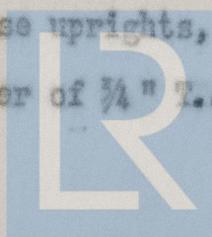
The intervening 16" space to be packed with granulated cork.

Above thrust recess the insulation to be only 12" thick where stiffeners permit.

AFTER BULKHEAD.

To have 10" x 2" grounds erected hard to steel bulkhead (at Frame 52) and spaced to suit stiffeners on the after side of bulkhead.

Over the face of these uprights, two linings to be securely nailed, the inner layer of $\frac{3}{4}$ " T. & G. boards, and



AFTER BULKHEAD. (Contd).

outer layer of 1" T. & G. boards with waterproof paper between. The 10" space to be packed with granulated cork.

SHAFT TUNNEL.

To be insulated with 10" granulated cork sheathed with two thicknesses of 1" T. & G. boards finished octagonal top.

White pine grounds 10" x 2", spaced 24" apart, to be secured to tunnel plating by suitable angle lugs.

Top of shaft tunnel to be sheathed with 2" thick English Elm doubling in way of hatch and 2'0" beyond each way forward and aft.

3" x 3" English Elm battens over tunnel top and 3" x 3" white pine planed battens on sides of tunnel.

THRUST RECESS.

The sides and top of thrust recess to be insulated with 10" granulated cork. Top of recess to have two layers of 1" T. & G. boards, and the sides one layer of $\frac{3}{4}$ " and one layer of 1" T. & G. boards.

HOLD PILLARS.

These are to be insulated by wrapping with 1" hair felt and 2" of manilla rope, and the whole sheathed with $\frac{1}{16}$ " galvanized steel plates, the laps of which are to be secured by countersunk slotheaded tap bolts.

Angle collars are to be fitted to the deck and deck-head.



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TANK TOP.

The tank top to be insulated with 8" of heavily compressed slab cork and $1\frac{5}{8}$ " Bitumastic Deck Covering, in the following manner :- 8" x 3" pitch pine grounds laid athwartships are to be bolted to angle lugs, spot welded to tank top. These grounds are to be spaced 2'0" apart in way of hatch, and 3'0" apart elsewhere. The space between the grounds to be filled in solid with three layers of heavily compressed slab cork, two layers of 3" and one of 2", each layer being bedded in Bitumen.

The whole is to be covered with one $\frac{5}{8}$ " layer of Bitumastic Deck Covering, laid on felt and then a second layer of 1" Bitumastic Deck Covering reinforced with "SURFASTAL" steel mesh.

Filletts to be formed at the sides and ends for 4" up, the top of the fillet being protected by means of a strip of $\frac{3}{16}$ " thick galvanized angle plate secured to the T. & G. boarding.

In way of the manholes, portable insulated plugs complete with suitable galvanized ring bolts, to be fitted.

CARGO HATCH.

The hatch side and end coamings are to be lined with shaped pitch pine timbers bedded on thickly painted tarred felt and bolted through the coamings by $\frac{1}{2}$ " dia. bolts sunk and neatly dowelled.

A 3" x 3" angle is to be riveted inside the coaming at the bottom to support these timbers. The shaped timbers to have a minimum thickness of 3" at the top, increasing in thickness to give a bevel of 3" per foot depth. The timbers

CARGO HATCH. (Contd.)

to extend to full depth of coaming, but bevelled portion need not exceed 12", the remainder being parallel 6" thick.

The timbers to rest on the 3" x 3" angle on the inside of coaming and a 2" pitch pine face piece to be bolted below the angle, extending the full width of the timber and the F. & A. girder.

The bevelled sides of the timber coaming to be covered with $\frac{1}{8}$ " galvanized steel plates, secured by heavy galvanized countersunk wood screws.

Smithed steel protection plates $\frac{1}{8}$ " thick galvanized are to be fitted to the lower portion of coaming and to be carried with a large radius under the pitch pine face piece below. The $\frac{1}{8}$ " plates to be made flush with the lower edges of the $\frac{1}{8}$ " plates.

Heavy steel castings to be fitted in the hatch corners to prevent chafing.

The hatch beams are to be dealt with in a similar manner to the coamings and to be sheathed all over with $\frac{1}{8}$ " galvanized steel plates.

Special lifting tackle to be provided for shipping and unshipping beams.

Insulated hatches to be fitted in these coamings, and to be constructed as shown in detail on arrangement drawing.

Each plug hatch to be fitted with two lifting handles fitted flush with top of hatch.

Cast iron step plates are to be fitted flush in the coamings in way of hatch ladder.

All hatch plugs and beams to be numbered and marked as required.

LIMBER HATCHES AND BILGE INSULATION.

Limber hatches are to be fitted over the bilge in the holds.

Bevelled pitch pine coamings to be arranged in a fore and aft direction over the bilge to take the limber plugs.

The lower coaming to be rabbeted on the top edge, to take finish of Bitumastic Deck Covering on tank top.

The upper coaming to be similarly rabbeted to take finish of sheeting over the bilge insulation.

The insulated plugs are to be arranged about three frame spaces long and to be 2'0" clear in width, to be framed in pitch pine, and fitted with two thicknesses of white pine T. & G. boards, top and bottom, the intervening spaces being filled with 5" granulated cork. The plugs to be fitted with two ring bolts for lifting ~~marks~~ purposes; a thick ground to be fitted in way of these bolts. The end plugs on each side of the holds to be arranged as Key plugs.

The remainder of the bilges not covered by the limber hatches to be insulated with 6" of granulated cork retained in position between suitable grounding, and sheeted with a top layer of 1½" white pine T. & G. boards, and under layer of 1" T. & G. boards.

The insulation to be arranged on top of existing ceiling.

UNDERSIDE OF DECK.

White pine grounds 5" x 2" bolted to beams by ¾" dia. galvanized bolts spaced about 3'0" apart. Over the face of the grounds two linings of ¾" T. & G. white pine boards to be fitted, and the 9" space filled in with granulated cork.



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BATTENS.

3" x 3" white pine battens, spaced at 12" centres, to be laid on tank top and turn of bilge.

2" x 2" white pine battens to be fitted on ship's side bulkheads, and thrust recess side, to be arranged at 12" centres.

THERMOMETER TUBES.

Lower hold to be provided with six galvanized iron thermometer tubes 2½" bore, fitted in approved position, extending into hold for the full depth.

The portion of tube extending into hold to be perforated and made portable, and protected by a suitable portable casing, which can be removed when general cargo is being carried.

The two forward tubes to be carried up to new refrigerator engine room on upper deck, the four aft tubes to bridge deck.

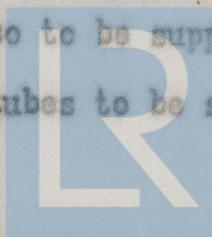
Tubes to be fitted with Brass Lockfast caps, name of compartment clearly marked thereon, mounted upon teak deck bases 3" high, and made watertight to deck.

Where the tubes pass through the tween deck chambers they are to be insulated with 1½" of granulated cork sheeted with No. 12 W.G. galvanized steel plates.

THERMOMETERS.

Twelve brass cased thermometers filled with Wakefield's C.O.2 Indicators, suitably calibrated, to be supplied by Contractors, and attached to deck thermometer caps by means of a cord. Twelve thermometers also to be supplied as spares.

200 glass indicator tubes to be supplied.



SCUPPERS.

Two trapped scuppers of approved make to be supplied and fitted by Owners. Contractors to make provision for these when insulating and applying Bitumastic Deck Covering to tank top.

EVAPORATOR ROOM.

The evaporator room to be insulated in similar manner to the cargo chamber, complete with pitch pine door and frame, hinges and fasteners, sill plate, gratings and C.O.2 bottle racks.

Cold ends of Brine Circulating Pumps to be suitably insulated, the insulation to be made portable for access, and cold piping in machinery room insulated with sectional cork, bound with canvas, wired and painted, all to be to approval of Owners' representative.

AIR COOLERS.

The insulation of air cooler spaces for existing Tween Deck, and two air cooler spaces for No.3 Lower Hold, fitted complete with wood bulkheads, partitions, air regulators, and baffles, fresh and foul air plugs, etc.

Brine leads and returns from machinery room to respective cold chambers to be efficiently insulated.

AIR DUCTS.

One complete outfit of air screens with teak air regulating slides to be supplied and fitted for Tween Deck chamber.

One complete outfit of fixed corner air ducts complete with galvanized iron supports, teak air regulating slides, etc. for Lower Hold.



PAINTING.

All exposed woodwork to receive two good coats of best quality insulation varnish.

A separate price to be given for coating all surfaces of wood work, including grounds, with "TORITNA", during the erection of the wood work, and prior to the application of insulation varnish.

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