Annexure 01

# CEYLON SHIPPING CORPORATION

## DRYDOCK SPECIFICATION

(Class Renewal survey No. 1 at 5th year)

## FOR

## M.V. CEYLON PRINCESS

(Built in 2016 June)

## DRYDOCK DUE

## August 2021

**OWNER: CEYLON SHIPPING CORPORATION**

# M.V. CEYLON PRINCESS

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**ATTACHMENTS:**

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b. GENERAL ARRANGEMENT

c. MIDSHIP SECTION

d. SHELL EXPANSION

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f. Rudder calculation

g. Bottom Plug arrangements

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2. CB/DD1/EN 001- 033
3. CB/DD1/EL 001- 020

## 3. ENGIN ROOM VALVE SPECS

WE REQUEST YOU TO QUOTE IN US DOLLARS AND FILL IN BLANKS IN ENCLOSED SHEETS ONLY. FOR GUIDANCE GIVE EXCHANGE RATE 1 USD =_____ USED FOR THIS QUOTE.THIS WILL LEAD TO FASTER COST COMPARISON WITH MORE UNIFORMITY WITH INCOMING QUOTATIONS.YOUR QUOTATION MAY NOT BE CONSIDERED IF ABOVE PROCEDURE NOT COMPLIED WITH.

# DOCK REPAIRS SPECIFICATION

## VESSELS PARTICULARS

| | | |
|---|---|---|
| NAME | : | MV CEYLON PRINCESS |
| MANAGER | : | CEYLON SHIPPING CORPORATION<br>27, MICH Building<br>Sir Razik Fareed Mawatha<br>PO Box 1718<br>Colombo 1<br>Sri Lanka<br>TEL :94 112422807<br>FAX :94 112449486<br>E-MAIL:technical@cscl.lk |
| P.O.R | : | Colombo |
| CALL SIGN | : | 4REB |
| FLAG | : | COLOMBO |
| LOA X LBP X BMLD X DMLD | : | 199.813M X 194.50M X 32.26M X 18.5M |
| Draft (S) | : | 13.299 |
| DIST BET KEEL AND HIGHEST POINT | : | 48.40M |
| Height Keel To Deck line | : | 18.46M |
| GROSS TON | : | 36432.00 TONS. |
| DEADWEIGHT TON | : | 63212.5 MT (SUMMER) |
| TPC | : | 62.3MT |
| YEAR BUILT | : | 2016 |
| KEEL LAID/ LAUNCHED& Del. | : | 17.07.2015 / 23.06.2016 |
| BUILDER | : | AVIC WEIHAI SHIP YARD CO LTD. China |
| KIND OF SHIP/ Hull No | : | Bulk Carrier/AVIC399 |
| CLASSIFICATION/ CLASS NO.: | | DNV-GL |
| IMO NUMBER/OFFICIAL NO. | : | 9734575 / 1366 |
| MAIN ENGINE | : | Man B&W 5S 60ME-C8.2 Tier II |
| AUXILIARY ENGINE | : | DAIHATSU 6/DK20e. 3 SET. |
| BOILER - TYPE X SET | : | Saacke, SAACKE CMB- 1.5+0.96, 120KG/hr. |
| ELECTRIC CURRENT | : | 440 V / 230 V 60HZ 3PHASE + 24 V |
| DOMESTIC SUPPLY | : | 230 V |

CARGO HOLD CAPACITY : (GRAIN 7750.75 / BALE 73680 CBM) 100%

| | |
|---|---|
| #1 CARGO HOLD | 20.00 m x 23.75 m /13,957.79 Cm |
| #2 CARGO HOLD | 23.75 m x 23.75 m /17,658.30 Cm |
| #3 CARGO HOLD | 23.45 m x 18.26 m /15,352.99 Cm |
| #4 CARGO HOLD | 23.75 m x 23.75 m /15,839.60 Cm |
| #5 CARGO HOLD | 23.75 m x 18.00 m /15,942.36 Cm |
| TOTAL | 78750.75 CBM |

BALLAST TANK CAPACITY : (17500 IN $M^3$)

| | |
|---|---|
| FPT | 1372.94 |
| NO.1 WBT (P) | 1622.85 |
| NO.1 WBT (S) | 1639.64 |
| NO.2 WBT (P) | 1834.25 |
| NO.2 WBT (S) | 1834.25 |
| NO.3 WBT (P) | 1840.37 |
| NO.3 WBT (S) | 1840.37 |
| NO.4 WBT (P) | 1117.32 |
| NO.4 WBT (S) | 1117.32 |
| NO.5 WBT (P) | 1175.52 |
| NO.5 WBT (S) | 1175.52 |
| AP Tk | 1136.15 |
| No.3 CH | 15352.99 |
| | |

Fresh Water tank Capacity : 507.85 MT (100%)
FO TANK CAPACITY : 2012.87 $M^{3/}$ 1933.16MT (100%)
DO TANK CAPACITY : 241.47 $M^{3/}$ 201.14 MT (100%)

MAIN ENGINE Control system.
MAKE:KONSBERG
TYPE-:K-chief 600

AUX. ENGINE GOVERNOR-3NOS.
AUX ENGINE MAKE:DAIHATSU
TYPE:6 DK 20e
GOVRNOR:
Make:ZEXEL
TYPE:- RHD 6

**Intermediate Shaft / Bearing & Tail shaft: survey /withdrawal.**

STERN TUBE Seals : Wartsila
Seal type : STERN GUARD OLS4-P / OLS2-P
SEAL RING DWG. NO.: SS003879 & SS3880

ONE Intermediate Shaft Bearing – 445 mm Dia x 650 mm L,
Tail shaft – LENGTH 5050 MM, DIA 420 MM
Tail shaft LINER : 430 mm Fwd/ 3505 mm aft
Intermediate shaft : 350 mm dia x 6400 mm L

PROPELLER AND PROPELLER SHAFT
(PROPELLER)

TYPE: 5 BLADES SOLID NBS TYPE,SKEWED ($32^0$) Right Hand
MATERIAL: NI-AL-BRONNZE Cu3
SIZE: DIA=6700 MM
PITCH: 5804.06MM
MAKER: NAKASHIMA PROPELLER CO.,LTD
Weight : 20395Kg

(PROPELLER SHAFT)
SIZE: D=420 MM X L=5,050MM X 1 SET
MATERIAL:KSF60
MAKER: SHIN KURUSHIMA DOCKYARD CO., LTD.

(INTERMEDIATE SHAFT)
SIZE:DIA=350MM X L=6,400 X 1 SET
MATERIAL :KSF65
MAKER: SHIN KURUSHIMA DOCKYARD CO., LTD

**General description:** The vessel is a single hull bulk carrier with 5 cargo hold and 4 deck cranes.

## PREAMBLE OF THE SPECIFICATIONS

1. The term "OWNER" as used in the preamble to the specifications shall be deemed to mean "Ceylon Shipping Corporation".

   The terms "CONTRACTOR", "YARD", and "SHIPYARD" are to be interpreted to mean the prime contractor to whom the invitation to bid is directed.

   The term "SUBCONTRACTOR" as used herein shall be understood to mean any firm other than the contractor engaged to perform any service to the subject vessel whether hired by the contractor or the owner.

2. Tenders are to be addressed and delivered to the "tendersdrydock@cscl.lk"

CEYLON SHIPPING CORPORATION
27, MICH Building
Sir Razik Fareed Mawatha
PO Box 1718
Colombo 1
Sri Lanka

Attn.: TECHNICAL DEPARTMENT

not later than 02nd July 2021

3. Tenders must specify the total number of **consecutive calendar days** required by the contractor to complete the repairs itemized in the specification. Docking should be carried out during the time span of 01st to 15th September 2021.

4. Shipyard is to furnish individual costs in their tender for all items contained in the “Scheduled job” specification.

5. The vessel shall be considered tendered for repairs when she is off the contractor's shipyard ready to be secured at the wharf. Vessel will be accepted afloat by the owner upon completion of all repairs, renewals and replacements and after all contractor's equipment, tools and appliances, also dirt debris and old material have been removed.

6. For the time the vessel is tendered to the contractor and until she is redelivered to the owner, upon completion of the work, it shall be the responsibility of the contractor to comply with all specifications, equipment, applicable and regulatory to classification bodies that apply to all repairs, renewals, alterations, use of fire, burning welding, riveting and other such methods used in carrying our such work, whether or not specifically stated in the owner's specifications.

7. Contractor to clean and gas free and to obtain gas free certificate for respective spaces in which hot work will be performed.

8. Any tender which includes modifications, alterations and / or special clauses May be rejected by the CSC Technical evaluation committee unless agreed in advance.

9. **Vessel shall be dry-docked immediately after arrival at the contractor's shipyard, unless stipulated otherwise by the owner or mutually agreed between the contractor and the owner.**

10. Where dry-docking is required for regular periodic overhaul, contractor shall allow sufficient time in dock to properly apply paint or carry out other work as called for in the specifications. Additional time in dock for work not mentioned in the specifications shall be mutually agreed upon between the contractor and the owner. In connection with additional days in dock, should the contractor request an interruption of dry-docking, any costs relative to undocking, shifting, mooring, re docking, interruption of repairs, etc., are to be borne by the contractor. The contractor is to state number of days subject vessel is to be held on dry-dock, as well as the cost thereof the carry out the work outlined in the specifications.

11. All scrap in connection with the work specifications, shall be inspected and decided by the owner’s representative, before hand

over them to the shipyard. No extra cost will be applied for any Scrap/garbage removal.

12. When any work performed by the contractor requires the opening of machinery, piping, heat exchangers, fittings, etc., which are directly or indirectly connected to a source of possible leakage into the vessel, such as sea chests, overboard discharge valves, crossovers, connections to the shell of the vessel, tanks or pipelines containing liquid, or any other source of leakage, it shall be the responsibility of the shipyard to fit blanks as necessary to eliminate the possibility of leakage into any space or equipment of the vessel and/or remove the liquids ashore at his own expenses.

    Upon completion of any such repairs, all blank fitted shall be removed and after reassembly, these items shall proven tight. These precautions shall be taken as necessary to prevent any damage to the vessel whether it is afloat or in dry-dock.

    Cost for above mentioned blanks is to be included when cost for job is quoted.

13. In the event of any dispute between the parties arising under or pursuant to the repair contract, such dispute shall be referred to the decision of **arbitrators in Colombo**, in accordance with English law.

## 1. GENERAL

1.1 The specifications attached hereto describe repairs, renewals and/or alterations to be effected to the above named vessel and are to cover the furnishing of all necessary labor, machinery, materials, equipment and spare parts required for the contractor to complete the items of work outlined herein (expect those items of machinery, equipment and spare parts specified to be furnished by the owner) in accordance with this specification.

1.2 All costs including but not limited to removing and refitting of parts obstructing access, cleaning, derusting, reconnecting and testing components, material, machinery and outfitting, temporary lighting, ventilation, staging,rigging,cranage, creation and assembling aids of any kind, removal and transportation of items to and from the workshop if necessary, reinstallation and cleaning up of work area and areas affected by the work, are to be for contractor's account and are to be taken into consideration when bidding/ quoting for the job.

    Where specifications require the opening of machinery, piping, fittings, etc., it is intended that the cost quoted includes the removal and refitting of and renewal where found necessary- of all disturbed gaskets, packing, fastenings, securings clamps etc and the repair of renewal of damaged insulation.

All costs including but not limited to fitting, connecting, grit-blasting, painting and testing new components, material, machinery and outfitting, removal of liquids and deposits from engine room and pump room, holds, upper/lower stools and other spaces in which contractor performed work are to be for contractor's account and are to be taken into consideration when bidding/ quoting for the job.

1.3 Whenever the word "OVERHAUL" is used in the specifications and no other specific requirements are mentioned, contractor shall allow for disconnecting from existing fittings, removal from position where necessary, dismantling, removal to workshop, opening-up, cleaning, derusting and painting. Elsewhere, arranging for inspection, reassembling in good working order, using new bolts, nuts, joints and packings, fastenings, clamps, etc reinstalling on board as originally fitted and testing to be included and taken into consideration when quoting / bidding for the job.

1.4 Any structural parts specified to be renewed which can be restored to their original condition by fairing, etc. and also any parts specified to be removed for fairing which can be faired in place to the satisfaction of the surveyor and the owner's representatives will be accepted. On the other hand, any parts found broken or which are broken in removal of fairing are to be renewed by the contractor at his expenses.

1.5 All new work (piping, steel plates, brackets, etc.), alternations, repairs, modifications, etc. in cargo holds, on decks or other areas which are to be coated (or are being coated during this dry-docking) are to be suitably prepared, and after approval by the owner's representatives, coated with the same type coatings (approved by the owner's representatives) as have been or are being applied to the balance of these areas; it is being the intention of the owner that all steel surfaces in such areas be coated.
All adjacent coated areas disturbed during the fore-going work shall be similarly prepared and coated.

1.6 All workmanship and/or material is to be of the best quality and any dispute or difference of opinion as to the interpretation of these specifications or any part thereof regarding the quality of material and/or workmanship shall be left to the decision of the owners, whose decision shall be final and binding to both parties. Owner reserve the right to supply materials, spares or goods if required for any work / repair/ service which to be carried out by the contractor.

1.7 The owners reserve the rights to correct errors or omissions in, or to make deductions from, or additions to the specifications. However, the increased or decreased costs, if any and time of completion herein specified shall be adjusted accordingly. Where work specifications increase / decrease, the unit [discounted] rate quoted for the job, will be taken in calculating the final price pro-rata.

1.8 Any particulars of the work involved specified herein are given only for the guidance of the contractor, who will be held responsible for the securing of all necessary dimensions and details, the intent of these specifications being to restore the vessel to first class sailing condition.

1.9 If the contractor considers, it is necessary to use the ship's tools, machinery, etc. this will be granted. However, the contractor will restore all of them to their original condition. under normal circumstances, all jobs are to be undertaken using the contractor’s tools & lifting appliances.

1.10 Tenders must specify the **time required by the contractor in consecutive calendar days to complete** the repairs, renewals, alterations and/or conversions set forth in the specifications attached hereto, and itemized fixed rates for all services to be furnished by the contractor.

1.11 Owners reserve the rights to perform normal overhauls on deck and in the engine room by using their own crew or sub contractor while vessel is on contractor's premises. This may involve hot work, and relevant hot work permit will be applied for by the ship staff and will be granted by the yard’s safety personnel accordingly.

1.12 As well Owners reserve the rights to invite OEM or other service providers or their representatives to perform Service, Repair, Supply of any equipment/Machinery/spares onboard the vessel. The contractor shall permit employees of such subcontractors access to the shipyard and the vessel for such purpose. There will be no surcharge applicable/ levied by the shipyard for the above, either to the Owner or to the subcontractors.

1.13 Before arrival of the vessel at the contractor's shipyard, no work in connection with any of the specifications to be begun without the permission of the owners who also have the rights to cancel any of the specified items against respective credit. Scope of work to be undertaken is to be discussed between the Owner’s representative and the contractor’s SRM prior to commencement of any repairs.

**Following arrival of the vessel at the shipyard, no work exceeding the scope of the specifications to be commenced without the written confirmation of the owner's representatives. Work orders or work completion reports signed by any person other than MASTER / CHIEF ENGR and countersigned by the attending owner’s superintendent, will not be considered.**

1.14 There shall be no departure from these specifications unless directed, in writing, by the owner or the owner's authorized representative. The owner has the right during the performance of this work to make alterations before the particular work is commenced.

1.15 In the event the contractor desires to subcontract any work or services covered by the specifications or additional work agreed upon, the contractor shall give notice of such intention to the owner, together with the name of the subcontractor who will perform the work or service or engage a subcontractor acceptable to the owner.

1.16 With regard to owner-furnished material and equipment, the shipyard is to transport all such items to the point of installation aboard the vessel, whether stored aboard the vessel or delivered to the shipyard. In the latter case, the shipyard is to accept delivery of any such material and store if necessary until the time of installation. No extra surcharge will be levied for this service.

Any unused material, as designated by the owner's representative is to be removed ashore, and held for the owner's disposition.

Any costs in connection with the foregoing are to be included in the bid price of any such items in the specifications.

1.17 It is the intent of the specifications to restore the vessel to the same good condition as existed prior to the repairs being required and to ensure that high quality standard of workmanship shall be maintained with reference to renewals and new work and that all materials shall be of the best quality throughout satisfactory to the owner. All materials requiring a test shall be tested in accordance with paragraph 6 of the preamble and must meet all requirements thereof. All charges and costs for tests to be borne by the contractor.

1.18 No overtime shall be worked for the owner's account unless the owner's representative shall approve the items to be worked on, the maximum number of overtime hours, and the department authorized to perform the overtime and the resultant cost as requested by the owner's representative. Any overtime incurred to meet vessels schedule not for owners account.

1.19 **No extra compensation or added time for any additions, repairs, or alterations will be allowed without approval by the owner's representative, and confirmation in writing by owner’s representative**, for such additions, or alterations before same are commenced. Prior commencement of the work and within 24 hours of the additional work being requested, the contractor shall submit an estimated cost for the additional job scope, and the final cost of the additions, repairs or alterations properly authorized as indicated above shall be arrived at, using bid prices where they exist or by estimating cost during current rates where they do not.

1.20 All charges in connection with towage and pilotage services for entering and leaving the contractor's shipyard will be for the owner. All towage and pilotage services and the charges thereof and other services and charges in connection with shifting the vessel, mooring, wharfage, line handling. Labor and laborers

for shifting, shall be borne by the contractor except where stated otherwise in the specifications that follow, advise costs for tugs pilots per port rules.

1.21 Wherein the specifications refer to one (1) unit to be repaired, and upon investigation it is determined that a second (or more) duplicated unit(s) require similar repairs/ renewals, the price quoted for the first unit shall apply to each additional unit. The cost of additional unit shall take into consideration the cost of removals and replacements that are common to the first unit. Likewise, where a fewer number of units are dealt with than stated in the specification; the cost shall be reduced in proportion to the bid price.

1.22 After completion of all work, contractor has to supply report in duplicate containing all measurements taken and drawings of the modifications performed, which shall be presented to owner's representative not later than upon agreement of amount of the final yard invoice.

1.23 Contractor to confirm that if vessel is in dry-dock over weekend (Saturday, Sunday) or over local holidays, normal work will continue as per the job scope, and if no work authorized by owner's representative is carried out, then no dry-dock charges will be levied.

1.24 Any holidays during expected repair period to be clearly indicated along with the quotes.

1.25 The contractor will provide a bar chart along with the quote, indicating the job schedule and clearly marking the critical jobs that control the period of repair. The yard SRM, during the docking, will indicate on the following day, the updated estimate of expenses incurred for the repairs/ docking if same is not **within 5% of the initial projected costs.**

1.26 It is mutually agreed that payment terms will be as follows:
----- percent of the final agreed amount on redelivery.
----- percent of the final agreed amount after one month.
----- percent of the final agreed amount after Two months.
----- percent of the final agreed amount after three months.

1.27 Proforma invoice to be mailed to the Ceylon Shipping Corporation for approval.

1.28 Contractor will present draft invoice to the owner’s representative, 48 hours prior to redelivery of the vessel, based on the work scope being undertaken until then. Final draft invoice will be submitted to the owner’s representative at least 24 hours prior to redelivery of the vessel.

1.29 **Penalty clause: It is mutually agreed that if the work contracted is not completed within the time stipulated, the contractor shall pay as damages to the owners, for every day**

**or part thereof in excess of the initial quoted time, the sum of <u>US $ 5,000.00</u>**

1.30 In case of any damage to vessel due to circumstances beyond the vessel's control and/or due to negligence by the yard and/or its personnel, yard will be liable for all costs towards repairs to vessel, off-hire and loss of hire costs and all associated costs related to the damage repair with no pre-set limit.

1.31 The contract may be canceled / voided at the sole discretion / election of the owners, if the contractor, due to overload or other reasons, is unable to begin work on arrival of the vessel at the contractor's premises/ shipyard, or unable to undertake any part of the repairs outlined in the specifications within the contract period quoted by the contractor in their bid response. Owner's costs due to such cancellation, will be recoverable from the contractor.

1.32 The owner is at liberty to use his crew to carryout repair work during the docking either in the dry dock or at the lay berth always without hindrance to the yard's work plan and always following the yard's and local safety procedures. The owner's representative will inform the SRM at least 12 hrs prior to the commencement of the work by ship staff.

1.33 If the yard submits their standard terms and condition along with the quote, then the yard should specify clearly separately on a letter any item that is in conflict of what the owners require. Failing this the terms and condition said here will be deemed final.

1.34 While the superintendent from Ceylon Shipping Corporation on behalf of Owners, will be fully responsible for placing the order, monitoring the docking, confirming additional orders during the course of docking and negotiating the final invoice, the full responsibility of payment of the yard invoice will be the sole responsibility of the Vessel's owners - Ceylon Shipping Corporation Ltd.

1.35 Use of Asbestos is forbidden on board the vessel. The yard to confirm in writing and ensure that all repairs are carried out without use of Asbestos packing and lagging. No form of Asbestos is to brought on board during the period of repairs. Yard to provide proof in form of certificates to the vessel's master prior departure listing all NON Steel, wood and Plastic materials used in carrying out repairs and confirm that these materials are Asbestos Free.

1.36 Yard will, on vessel's arrival take over the vessel's security from the SSO and hand over the security back to SSO prior departure. The take over and hand over is to be fully documented.

1.37 During the course of repairs, yard is obliged to consult with the Owner's superintendent prior arranging Class Surveyor's

visit. Cost of Surveyor’s visit and waiting time for arrangement without approval of Owner’s superintendent will be for yard’s account.

## 2 Itemized Prices

### 2.1 Cleaning And Painting Work:-

Hull Cleaning (per/1 sq.m)

a. Low pressure fresh water wash USD_____

b. Solvent washing of oily places USD_____

c. Hard scraping off loose paint and rust. USD_____

d. Mechanical wire brushing. USD_____

e. Power tooling USD_____

f. Washing and cleaning with high pressure water jet (min 200 bar) USD_____

g. Grit blasting to SA - 2 USD_____

Spot blasting for above USD_____

h. Grit blasting to SA - 2.5 USD_____

Spot blasting for above USD_____

i. Grit blasting to SA - 1.5 USD_____

Spot blasting for above USD_____

j. Grit sweeping. USD_____

k. Surcharge (pcnt) for Grit blasting, sweeping in ballast tanks. USD_____

l. Price for necessary staging per Cu m for above. USD_____

**Hull Painting With Owners Paint (Per 1 SQ M)**

a. First and subsequent anticorrosive coats. USD_____

b. First and subsequent antifouling SPC coats. USD_____

c. Touching up anticorrosive. USD_____

d. Touching up antifouling SPC USD_____

e. Surcharge (pcnt) for painting in tanks. USD_____

f. Price for necessary staging for above Cu.m. USD_____

g. Painting draft marks, ships names, por, plimsoll marks, bulbous bow marks, tank division marks, tug marks etc (two coats) USD_____

h. Touch up on spots (Derusting/primer/final coat) USD _____ ( Quote for a spot rate)

## 2.2 **STEEL PLATE RENEWAL:-**

| TOTAL STEEL RENEWED IN TONS. | PRICE/KG. | SHAPED SINGLE CURVATURE. | SHAPED DOUBLE CURVATURE. |
|---|---|---|---|
| 2 TO 10 | | | |
| 10 TO 20 | | | |
| 20 TO 50 | | | |
| 50 TO 100 | | | |
| 100 TO 200 | | | |
| ABOVE 200 | | | |

**Note:-**

a. Incase of renewal of less than 2 tons, add under said percentage to prices stated for 2 - 10 tons.

| Steel | Percentage |
|---|---|
| up to 100kg | _____ |
| 100kg to 500kg | _____ |
| 500kg to 2000kg | _____ |

b. Above prices refer to ordinary ship building steel and to welded construction.
c. Unit steel weight is assumed 8kg/dm3.
d. Weight of steel to be calculated on sizes actually fitted, without allowing for wastage, and quoted price to apply for calculation of cost of work, whatever be the size and extent of the work.

## **STEEL PLATE RENEWAL:**

| TOTAL STEEL RENEWED IN TONS. | PRICE/KG. | SHAPED SINGLE CURVATURE. |
|---|---|---|
| 2 TO 10 | | |

| | | |
|---|---|---|
| 10 TO 20 | | |
| 20 TO 50 | | |
| 50 TO 100 | | |
| 100 TO 200 | | |
| ABOVE 200 | | |

**Note:-**

a. Incase of renewal of less than 2 tons, add under said percentage to prices stated for 2 - 10 tons.

| Steel | Percentage |
|---|---|
| up to 100kg | _____ |
| 100kg to 500kg | _____ |
| 500kg to 2000kg | _____ |

b. Unit steel weight is assumed 8kg/dm3.

c. Weight of steel to be calculated on sizes actually fitted, without allowing for wastage, and quoted price to apply for calculation of cost of work, whatever be the size and extent of the work.

## STEEL PLATE RENEWAL:

| TOTAL STEEL RENEWED IN TONS. | PRICE/KG. | SHAPED SINGLE CURVATURE. |
|---|---|---|
| 2 TO 10 | | |
| 10 TO 20 | | |
| 20 TO 50 | | |
| 50 TO 100 | | |
| 100 TO 200 | | |
| ABOVE 200 | | |

**Note:-**

a. Incase of renewal of less than 2 tons, add under said percentage to prices stated for 2 - 10 tons.

| Steel | Percentage |
|---|---|
| up to 100kg | _____ |
| 100kg to 500kg | _____ |
| 500kg to 2000kg | _____ |

b. Unit steel weight is assumed 8kg/dm3.

c. Weight of steel to be calculated on sizes actually fitted, without allowing for wastage, and quoted price to apply for calculation of cost of work, whatever be the size and extent of the work.

2.3 **Internal Steel Work:-**

a. Tank top plates, straight bulkheads surcharge pcnt. _____

b. Tank margin plates, casing plates, bulkwark plates, shell frames, brackets, stringer, bulwark caprail and stanchions surcharge pcnt. _____

c. For corrugated bulkheads and joggle plates surcharge pcnt. _____

2.4.1 **Fairing On Spot:-**
Quote per 1 sq m.

a. Shell plates. USD_____

b. Deck and internals. USD_____

2.4.2 **Off, Fairing And Refitting:-**
Quote per 1 sq.m.

a. Shell plates. USD_____

b. Deck and internals. USD_____

## 2.5 Pipe Repairs:-

2.5.1

a. Supplying and fitting steel pipe (SA 106 GR B sch 40 or equivalent) using existing flanges according to Column A.

b. Steel bends according to Column B.

d. Steel flanges according to Column C.

e. Surcharge in percentage of prices for steel material for renewal of copper pipes, bends and flanges USD_____.

| PIPE DIAMETER IN MM | A PER METER | B PER BEND | C PER FLANGE | DECK AND BHD PENETRATION PCS. |
|---|---|---|---|---|
| UP TO 12MM | | | | |
| 12 - 25 MM | | | | |
| 25 - 50MM | | | | |
| 50 - 75MM | | | | |

| | | | | |
|---|---|---|---|---|
| 75 - 1OOMM | | | | |
| 100 - 125MM | | | | |
| 125 - 200MM | | | | |
| 150 - 200MM | | | | |
| 200 - 250MM | | | | |
| 250 - 300MM | | | | |

**NOTES:-**

a. Staging, clamping, testing and painting included.
b. Additional percentage surcharge for galvanized steel. _____
c. Additional percentage surcharge for pipes in Engine Room. _____
d. Additional percentage surcharge for renewal in pump room, deep tanks and cargo tanks. _____
e. Additional percentage surcharge for renewal in double bottom, pipe tunnels & cofferdams. _____

f. Additional percentage surcharge for thick walled schedule 80 pipes. _____
g. Additional percentage surcharge for Yorcalbro pipes. _____
h. Additional percentage surcharge for Stainless steel SUS 304 pipes _____
i. Additional percentage surcharge for Stainless steel SUS 316L pipes _____
j. Additional percentage surcharge for stainless steel K SUS 316 L pipe _____
k. Additional percentage surcharge for stainless steel K SUS 304 pipe _____
l. Additional percentage surcharge for STPG- Sch 40 pipe _____

2.6 **Quote for Renewal of the following:**

a. Bulkwarks / Rate per kg USD _____ /kg.

b. Checkered plate per kg USD _____ /kg.

2.7 **Weld Seams Cleaning (includes staging):**

a. Per meter blasting of weld seams USD _____ /M.

b. Per meter rotary brushing of weld seams USD _____ /M.

c. Per meter price for chipping, V-out and rewelding both sides of seams/butts (8-20mmthick) USD _____ /M.

2.8 **Manholes (double bottom, topside tanks):**

a. opening and closing including renewal of gasket per pc. USD _____ /pc.

b. Renewal of SS studs/nuts and washer per pc. USD _____ /pc.

2.9 Renewal of owner supplied packing in Mcgregor type cargo hatch cover, including grit blasting to SA1 and priming. Price per running mtr USD _____ /M.

## 3. Repair Period General Services

***All items to be quoted. Sevices to be utilized will be decided as per the requirements of the vessel and the facilities provided by the yard.***

3.1 **Shore Electric Power**

Kind of Power source:-
440 V AC, 3 Phases, 60 HZ.

400 A, stabilized

a. Price per time connection /disconnection USD _____ /time.

b. Price per KW-HR USD _____ /kw-hr.

Note:-
**Readings on contractor's power meter to be confirmed /recorded/ signed before and after use of shore power by ship's electrician and contractor's electrician jointly.**

3.2 **Cooling Sea Water**

Cooling sea water to be supplied to the ship's plants as listed below and as directed when vessel in docks. Cooling sea water to be supplied continuously with proper inlet pressure.

Quote price per 24 hrs in maintaining service for the following:

a. For provision refrigeration plant USD _____ /24hrs
b. For air con refrigerating plant USD _____ /24hrs
c. For atmospheric condenser cooling USD _____ /24hrs
d. For auxiliary engine cooling USD _____ /24hrs
e. for sanitary line USD _____ /24hrs

Quote cost for connecting and disconnecting once for each.

a. For provision refrigeration plant USD _____ /time
b. For air conditioning plant USD _____ /time
c. For atmospheric condenser cooling USD _____ /time
d. For auxiliary engine cooling USD _____ /time
e. for sanitary line USD _____ /time

**3.3 Compressed Air**

To provide two compressed air lines of 7kg/cm2 pressure, one to the deck and another to be connected to ship's service air line.
To maintain a continuous and sufficient supply of compressed air to each unit through out the repair duration.

a. Price per day in service USD _____ /day.

b. Price per time, connection and disconnection USD _____ /time.

3.4 **Ballast Water**

a. Price per ton, supply of ballast sea water USD _____ /ton.

b. Price per time conn/disconnection USD _____ /time.
**Please clarify if the charges are made per tank or per connection used on board. One connection brought on board can be used for ballasting many tanks.**

3.5 **Ventilation Fans**

a. Price per time per pc.fan connection and disconnection USD _____ /time.

b. Price per unit per day service USD _____ /day.

3.6 **Temporary Lighting**

a. Price per day service USD _____ /day.

b. Price per time connection and disconnection USD _____ /time.

Note :Please note that price of temporary lighting for any work undertaken by the contractor, is to be included in the initial quote for the job.

3.7 **Tank Cleaning**

To clean tanks upon authorization of the Superintendent and remove sludge/mud from their bottoms.

Cost for cleaning ballast /FW tanks

a. Price per M3 for deep/wing tanks USD _____ /M3.

b. Price per M3 for double bottom tanks USD _____ /M3.

c. Cementing of FW tanks based on capacity of the tanks USD _____ /MT.

Cost for cleaning bunker tanks

a. Price per M3 for wing tank USD _____ /M3.

b. Price per M3 for double bottom tank USD _____ /M3.

c. Price per M3 removal/disposal of oily sludge USD _____ /M3.

d. Price per M3 removal/disposal of mud USD _____ /M3.

3.8 **Garbage Disposal**

a. Quote price per day, collection USD _____ /M3.

3.9 **Fresh Water**

a. Price per M3 USD _____ /M3.

b. Price per time, connection and disconnection USD _____ /time.

Note:-

Readings on contractor's flow meter to be confirmed /recorded before and after use by Chief Officer and contractor's personnel jointly.

3.9.1 **Bilge Water Disposal**

Quote price for disposal of bilge water and accumulations from engine room . Quote to include providing necessary pumps and collection tanks.

a. Price per M3 of bilge accumulations USD _____ / M3

3.10 **Crane Service**

a. Crane for handling ships stores/spares and provision
Price per hour USD _____ /hr.

Note: please advise minimum charge per use if any.

3.11 **Telephone Service**

Temporary telephone service to be provided onboard. Any long distance call, including by ship's crew, must not be accepted unless written approval received from owner's superintendent.

To record every outgoing phone call and attach its copy to work done list. Contractor to provide facsimile transmission services to owner's Superintendent.

a. Price per time, conn and disconnection USD _____ /time.

b. Price per day, phone rent USD _____ /day.

b. Any requirement from yard as per local rules to keep any minimum no of telephones on board.

3.12 **Staging**

To furnish robust, safe scaffoldings where necessary to ensure safe access and working condition .

a. Price per M per plank, hanging staging USD _____ /M/Plank

b. Price per M3, tower staging (with Owner supply Scaffolding material) USD _____ /Cu m

C. Price per M3, tower staging (With yard supply Scaffolding material) USD _____ /Cu m

d. Cherry picker (per shift) USD _____ /shift.

Note:-
Above quotation to include cost for erecting /removing staging. Kindly note that no “minimum” staging will be accepted, and cost for staging will be calculated on that actually required for the job on hand.

3.13 **Firewatch**

a. Daily rate for fire watch USD _____ /Shift

b. Necessary number of watchmen per day as per local/ shipyard regulations _____

c. Any requirement from yard as per local rules to keep any minimum no fire watch on board. _____

3.14 **Fire Line**

Price per day for providing contractor’s pressurized fire hoses as and where required for fire protection during the docking USD _____ / day

a. Any requirement from yard as per local rules to keep any minimum no fire lines on board or can it be connected to ship's fire line.

3.15 **Gasfree**

a. First gas check by chemist USD _____ /visit

b. Each subsequent checks USD _____ /visit

3.16 **Alleyway Cover**

To furnish adequate cover sheet over the floors listed below and remove, them prior vessel sails out. This is to be put on written authorization of the master.
- Alley way on poop deck
- Alley way on upper deck
- Officer's saloon and smoking room
- Crew's messroom and smoking room USD _____ / M2

Lumpsum cost for alleyway, stairway and accommodation space protection USD _____ / M2

3.17 **Scupper Chute**

Scupper chute to be fitted to all deck and hull discharge before painting of hull commenced and remove upon completion of same.

No of deck scuppers leading to ship side: **18** nos.

a. Price per pc including fitting/removal USD _____ /Pc.

b. Lumpsum charge for fitting and removal of scupper chutes as necessary USD _____

3.18 **Bottom Plugs**

a. Screwing out and fitting per piece including renewal of lead gasket and removing and renewal of the cement over the plugs USD _____ /Pc.

b. Renewal of plug per pc USD _____ /Pc.

3.19 **Labor Cost**

| | Normal Hours | Weekly Overtime | Sun & Holiday Over time |
|---|---|---|---|
| a. Skilled | | | |
| b. Semiskilled | | | |
| c. Unskilled | | | |

**4. DryDocking**

4.1 Mooring and unmooring

The vessel to be delivered at the time dock master embarked on the vessel after arrival at contractor's territorial water and redelivered at disembarkation of dock master upon completion of all repair works.
Tugs and riggers to be supplied to assist vessel on arrival and departure from repair yard and into and out of dry dock.

Quote price per move USD_____

Pilotage into and out of dock USD_____ / move

Any shifting of vessel between berths for yard convenience to be for yard account. Advise total number of moves anticipated.

**If above costs are included in the drydocking cost, kindly mention the same.**

4.2 **DryDocking**

Incase of conventional drydock, vessel to be drydocked on soft topped blocks with suitable height for work specified. Contractor to arrange blocks in a configuration which ensures safe and proper weight distribution during the entire period vessel remains in drydock.

For guidance vessel is flat bottom with no rise of floor.

a. Quote total running calendar days in drydock to complete specified work, and subsequent days alongside repair berth to complete all repairs.
In drydock:_____ days, at wharf _____ days.

**Above mentioned days to be calendar days, including weekends and holidays**

b. Docking and undocking, including first day drydock dues. USD_____

c. Dockrent per day for subsequent days USD_____

d. To advise drydocking condition
* Max. recommended displacement _____ MT
approx mean draft _____ mtrs.
Guidance: Vessel will be as light as possible.

* Trim by stern _____ mtrs (max _____ M)

4.3 **Docking Blocks**

a. Keel blocks shifting per pc. USD_____

b. Side blocks shifting per pc. USD_____

4.4 **Wharfage**

a. Per day wharfage cost during repair period USD _____ /day.

## 5. Hull Cleaning and Painting

Immediately after emptying the dry-dock, the vessel shall be inspected by the contractor, the owner's representative and the representative of the paint company [as appointed by the owners]. This inspection will be for the purpose of assessing the extent and type of fouling present and checking the dry film thickness and adhesion of the existing coating. Following this inspection, the representative of the paint company will discuss and agree with the owner's representative the condition found and the recommendations regarding the surface preparation and coating systems. After agreement is reached, a meeting will be held with all parties concerned, to include the shipyard and their sub-contractors if any, the owner's representative and the representative of the paint company - the purpose being to establish the procedures to be followed in surface preparation, the coating system to be applied, the method of application and the subsequent inspection prior application of further coats of paint. Only after this procedure has been agreed and signed by all parties, the agreed work should commence. The representative of the paint company and the owner's representative or person nominated by him, will carry out inspection throughout the preparation and coating processes. Should any shortcoming be detected in the agreed procedure, the owner's representative will take up the matter with the shipyard, and the shortcoming will be rectified by taking appropriate corrective action immediately. All cost/ additional time in rectifying these shortcomings, will be on the contractor's account.

5.1 Hull cleaning and surface preparation all external hull and bottom plating:

***The hull cleaning and surface preparation etc. will be decided after the vessel docks and is examined in consultation with the painting inspector.***

Total area of topside, flat bottom, boottop and vertical bottom

| | |
|---|---|
| BOTTOM (FLAT PART) | : 4958 $m^2$ |
| V.BOTTOM,BOOTTOP,RUDDER(OUT SIDE) | : 6134 $m^2$ |
| TOP SIDE, BULWARK,BOWCHOCK(O/SIDE) | : 2498 $m^2$ |

**The yard to quote below for reference purpose.**

a. To remove oil spill marks by suitable solvent

Price per M2 USD _____ /M2.

Allow for : 100 M2 USD_____

b. Quote cost for cleaning topside, vertical area, flat bottom, propeller and rudder and rudder trunking by fresh water jet **min pressure 400bar**

[Contractor to state what pressure is available at the yard if the above mentioned pressure is not available].

Price per M2 USD_____ /M2.

**Total area :** 13590 $m^2$ USD_____

c. Quote cost for scraping off Marine growth adhered on hull plate

Price per M2 USD_____ /M2.

Allow for : 200 M2 USD_____

d. Rusted spots on topsides, vertical area and flat bottom to be grit blasted to SA 2.0. There will be no 'minimum area' charge applicable or acceptable, and charges will be pro rata on actual area of blasting required and agreed upon.

Price per M2 USD_____ /M2.

**Allow for: M2** USD_____

e. Entire topside to be grit sweep to remove all existing paint

Price per M2 USD_____ /M2.

**Allow for :** USD_____

f. Entire underwater hull from keel up to top of boot top including flat bottom to be grit sweep to remove all existing paint.

Price per M2 USD_____ /M2.

**Allow for :** USD_____

Cost to include all staging/ cherry-pickers of cranage necessary for the above jobs, and for any temporary lighting required for any of the work.

Notes:-

Edges of grit blasted area to be feathered for good keying. All blasted areas to be inspected by owner's superintendent after cleaned by dry compressed air. Blasting during night time should be avoided. If this is not possible, owner reserves the right to stop work if adequate lighting is not provided. If work is stopped for the above reason, owners will not accept any extra cost for delay in vessel's docking schedule.

5.2 **Coating** - (PAINTS OWNER SUPPLY)

Paint coat thickness to be full fill the requirement of the Class regulation so that the dry docking can be skipped at the next intermediate survey.
All paint to be applied with airless spray unless otherwise agreed with owners superintendent. NO COATING IS TO BE CARRIED OUT IF ANY OTHER VESSEL IN THE SAME DOCK IS BEING BLASTED AND GRIT REACHES THIS MIDNIGHT SUN.

Suitable means to be taken to obtain straight line between colors below and above deep load line to be applied.

To fit scupper chute to the hull discharges directed by owner's superintendent prior hull repainting commenced and ensured no deck drains dripping down over the wet paint area

No of deck scuppers leading to ship side: 12 nos.

_ Pcs x US __ / PC) USD_____

All renewed corrosion protective anodes, speed log sensor and echo sounder probe, portholes in way of hull, and other non-paintable areas to be covered up by protective film or sheet during spray painting. Propeller to be protected from splatter during painting. To remove all these protective coatings/ covers upon completion of repainting work.

**Cost lump sum for scupper chutes and protection during painting**
**USD**_____

Coating process must proceed following strictly to the manufacturer's information or instruction given by attending manufacturer's representative. On completion of grit blasting/ sweeping, surface to be washed with low pressure fresh water and given a coat of primer immediately. If surface preparation is spoilt owing to any delay in applying the primer coat, then cost for preparing the surface once again, is to be on contractor's account.

***The areas and the coating sequence mentioned below is for quotation and reference purpose. The exact area, no. of coats etc. will be decided after examining the general condition after docking in consultation with the painting inspector.***

**CHECKED FROM PAINTING SCHEDULE**

**5.2.1 TOP SIDES** (Total area :2498 M2)

| No. of coats | DFT | Product | Price |
|---|---|---|---|
| 1 x T/U | 30% 150 | A/C Primer | USD_____ |
| 1 x T/U | 30% 35 | A/C Primer | USD_____ |
| 1 x F/C | 100% 30 | CR Coating | USD_____ |

**5.2.2 VERTICAL BOTTOM** (Total area :6134 M2)

| No. of coats | DFT | Product | Price |
|---|---|---|---|
| 1 x T/U | 30% 150 | A/C Primer | USD_____ |
| 1 x T/U | 30% 100 | A/C Primer | USD_____ |
| 1 x F/C | 100% 100 | Antifouling SPC | USD_____ |
| 1 x F/C | 100% 100 | Antifouling SPC | USD_____ |

**5.2.3 BOOT TOP** (Total area : M2)

| No. of coats | DFT | Product | Price |
|---|---|---|---|
| 1 x T/U | 30% 150 | A/C Primer | USD _____ |
| 1 x T/U | 30% 100 | A/C Primer | USD _____ |
| 1 x T/U | 30% 100 | A/C Primer | USD _____ |
| 1 x F/C | 100% 100 | CR Coating | USD _____ |

**5.2.4 FLAT BOTTOM** (Total area :4958 M2)

| No. of coats | DFT | Product | Price |
|---|---|---|---|
| 1 x T/U | 30% 150 | A/C Primer | USD _____ |
| 1 x T/U | 30% 100 | A/C Primer | USD _____ |
| 1 x F/C | 100% 130 | Antifouling SPC | USD _____ |

5.3 **Distinguishing Marks**

Following marks to be painted with two full coats of paint, except where otherwise advised.

a. 3 sets of vessels name (on bows and stern)
b. 1 set port of registry (on stern)
c. 6 sets of draft marks (fwd, midship, stern)
d. 2 sets of plimsoll marks (midship)
e. 42 sets of tank separating marks (port and stbd)
f. 2 sets of bulbous bow marks (on bow)
g. 6 sets of tugboat marks ( port and stbd )
h. Cargo manifold marks ( 20 P and S)
i. IMO no marking at stern
j. Pilot boarding (9M) marks P&S

**Cost of above lumpsump including staging etc.** USD_____

***3.4 Tank cleaning***

**a. Fuel oil/ Lub oil/ sludge** USD_____ /$M^3$
**b. Fuel oil DB** USD_____ /$M^3$
**c. Bilge water** USD_____ /$M^3$
**d. Fresh water** USD_____ /$M^3$
**e. Ballast tank** USD_____ /$M^3$

**5.5 Ballast tank washing (SW)** USD_____ /tank

**Removing/disposing of the wash water/sludge collected from above tank cleaning or tank washing should be on contractor's account.**

**6.0 Sea Chests**

Remove all securings, lockings and grids of sea chests. Sea chests and their grids to be cleaned by scraping and high pressure jet. All

grids and sea chests internal to be perfectly dry for examination by class surveyor and owner's superintendent. To apply 2 coats of A/F paint internally as specified for flat bottom. Refit the grids to sea chests using new locking split pins of stainless steel wire material SUS 30H WR, new stainless steel washers and nuts/ bolts as may be required.

Total 3 nos sea chests & locations and dimensions as shown

High sea chest : 1 no. size: 1600 X 800 mm (PORT)FR. 28-29

Low sea chest : 1 no. size: 1800x800 (STBD)FR. 29-30

E/FIRE P/P S.C : 1 no. size, 640mm x 504mm (STBD)FR. 229-230

Quoted price to include all necessary staging, lighting etc.

Total USD_____

**7. Bottom Plugs**

All ballast tank bottom plugs to be opened and re-closed. These plugs to be inspected by owner's superintendent after reclosing and prior to applying mastic putty. Lead gaskets to be renewed accordingly. Quoted cost to include removing the cement covering or weld strip locking the plug, and refitting / renewing same on completion of job, at least 12 hours prior to undocking.

**Total no. of bottom plugs for Ballast tanks including forepeak tank and void spaces**.

| | | |
|---|---|---|
| 1. F.P.TANK (C) | : | 1 |
| 2. APT | : | 1 |
| 3. APT ( P/S ) | : | 0 |
| 4. C.W.T. (P/S) | : | 0 |
| 5. B.T. ( C ) | : | |
| 6. NO. 1 – 5, W.B.T(P/S) | : | 10 |
| 7. VOID SPACE | : | 0 |
| 8. Other | : | 6 |

Total: 18 PCS USD_____

**8. Corrosion Protection Anodes**

Zinc anodes to be renewed on Water ballast tanks, rudder and sea chests as required/instructed by owner's superintendent. Anodes renewal to be carried out prior to blasting jobs. Quoted cost to include cropping of existing wasted anodes as directed by the owner’s representative, as found necessary, and rewelding new anodes as directed.
Original anodes type Aluminum anodes,

BOLTED ANODES –

1. Water Ballast Tanks - **314 NOS**.
TYPE : (90+110)MM X300 MM X100 MM
MATERIAL : Al-Zn-In
WEIGHT: 7.4 KG
( 5 year Life)

**3. On the Rudder – 28Nos**
TYPE : 600 MMx150 MMx50 MM
MATERIAL : Al-Zn-In
WEIGHT : 11.25Kg
( 5 year Life)

Ship's hull is protected by a Cathodic ( ICCP) protection system.

Cost for supply and fitting of ANODES USD_____ per unit

Total cost for **only removing & fitting** of owner's supplied anodes
USD _____ per unit

Above quoted price to include all necessary staging, surface preparation etc.

**WATER BALLAST TANK ANODES**

**314**Nos Al-Zn-In, with weight 7.4Kg (90+110x300x100mm)

| W.B.T ZINC ANODES | QUANTITY |
|---|---|
| NO.1 W.B.T(P/S) | 36 |
| NO.2 W.B.T(P/S) | 48 |
| NO.3 W.B.T(P/S) | 54 |
| NO.4 W.B.T(P/S | 46 |
| NO.5 W.B.T(P/S) | 32 |
| NO.1 TS W.B.T(P/S) | 18 |
| NO.2 TS W.B.T(P/S) | 18 |
| NO.3 TS W.B.T(P/S) | 22 |
| | |
| AP TK | 20 |
| F.P.T | 20 |

Cost for supply and fitting of ANODES USD_____ per unit

Total cost for **only removing & fitting** of owner's supplied anodes
USD _____ per unit

**9. Intermediate Shaft / Bearing & Tail shaft: survey /withdrawal.**

**BELOW IS FOR QUOTATION AND REFERENCE PURPOSE ONLY. ONLY THE RENEWAL OF SEALS ARE PLANNED DURING THIS DOCKING. TAIL SHAFT WITHDRWAL WILL BE CARRIED OUT if required only.**

STERN TUBE : 2350MM LENGTH ,DIA AFT-5350MM
Seal type : EVK2RV-472LR(WATER COOLED)
SEAL RING DWG. NO.: NA-002424800017
MAKER : MICASA CORPORATION

ONE Intermediate Shaft Bearing – 445 mm Dia x 650 mm L,
Tail shaft – LENGTH 5050 MM, DIA 420 MM
Tail shaft LINER : 430 mm Fwd/ 3505 mm aft
Intermediate shaft : 350 mm dia x 6400 mm L

PROPELLER AND PROPELLER SHAFT(PROPELLER)
TYPE: 5 BLADES SOLID NBS TYPE,SKEWED ($32^0$) Right Hand
MATERIAL: NI-AL-BRONNZE Cu3
SIZE: DIA=6700 MM
PITCH: 5804.06MM
MAKER: NAKASHIMA PROPELLER CO.,LTD
Weight : 20395Kg

(PROPELLER SHAFT)
SIZE: D=420 MM X L=5,050MM X 1 SET
MATERIAL:KSF60
MAKER: SHIN KURUSHIMA DOCKYARD CO., LTD.

(INTERMEDIATE SHAFT)
SIZE:DIA=350MM X L=6,400 X 1 SET
MATERIAL :KSF65
MAKER: SHIN KURUSHIMA DOCKYARD CO., LTD

Drawings of stern tube seal, intermediate shaft and bearing and propeller shaft etc. attached

a. Check the clearances of the stern tube bearings including check including checking by feeler gauge and documentation of values measured before dismantling.
b. Propeller rope guard, cap and K-nut to be removed. Propeller to be removed as per maker's specification and lowered on dock.
c. Intermediate shaft bearing to be removed, inspect , measure wear.
d. Intermediate shaft coupling bolts on engine flywheel and tail shaft flange to be opened up and removed. Bolts to be marked before removal, clean and dye check before refitting.
e. Intermediate shaft to be removed and kept aside. Associated piping if any, to be disconnected as required and blanked off if necessary.
f. To remove the seal assy. from place, inspect condition of mating ring, clean / machine mating surface if necessary. To inspect /renew inflatable ring, if necessary. To remove spare seal fitted on tail shaft, inspect and assemble the seal assy. To fit a new seal on tail shaft as spares seal.
g. Tail shaft to be withdrawn in the engine room and trueness to be checked.

h. Shaft liner and Shaft taper, key and keyway to be cleaned, inspect, magnaflux test to be carried out in presence of class surveyor/owner' superintendent.
i. Tailshaft to be refitted in position. Seal assemblies to reinstall, and ‘run out’ to be checked and adjusted to be within maker’s specified limit.
j. Shaft alignment to check and jack load test to be done to check load on intermediate shaft bearing and stern tube bearing.
k. Propeller to be mounted and nut tightened and locked as per maker’s specifications/ instructions / push up graphs. Propeller cone to be refilled with yard supply tallow and to be refitted.
l. Plummer block bearing and intermediate shaft to be repositioned, aligned, coupling bolts fitted and tightened. Bearing clearances to be recorded before opening and after fitting the shaft/ bearing and same to be recorded.
m. Any scoring/ cracks etc. in the shaft to be ground/machined, rewelded, NDT checked as per class requirements and remachined to original.

Quote for the above mentioned job inclusive of cleaning, staging and other necessary works which may include removal/ shifting and refitting of floor plates and their support angles, hand rails, sounding pipes etc, and preparation of area for hot work if found necessary.

a. Disconnection and removal of intermediate shaft, cleaning of plummer block, reassembling of shaft/bearing and noting its clearances USD_____
b. Withdrawal of tailshaft, magnaflex test and reinstallation. USD_____
c. Removal and refit of propeller USD_____
d. Dismantling, overhauling, calibration, reassembly of stern tube seal assy, inflatable ring USD_____
e. Cost of renewal of bearing forward and aft stern tube bearing USD_____
f. Cost of repair by welding and machining. Assume length of 1m for repair USD_____
g. Cost of checking the trueness of the shaft USD_____

**Without removing the Propeller**

h. Quote for replacing owner supplied Stern seals **insitu,** under OEM representative’s supervision USD_____

## 10. Propeller

TYPE: 5 BLADES SOLID NBS TYPE,SKEWED ($32^0$) Right Hand
MATERIAL: NI-AL-BRONNZE Cu3
SIZE: DIA=6700 MM
PITCH: 5804.06MM
MAKER: NAKASHIMA PROPELLER CO.,LTD
Weight : 20395Kg

**ALL JOBS BELOW TO BE QUOTED. JOB SCOPE TO BE DECIDED AFTER EXAMINATION.**

Propeller to be examined and surveyed. Propeller to be polished on all blades by power sanding, 3R part to be examined by dyepenetrant, inspected by class surveyor. Cavitation pits/ damaged portion if found on the blades to be repaired by brazing and ground off to original profile . Cost of staging, temporary lighting etc to be included in the prices quoted below.

a. Quote cost for repairing eroded pits by brazing and ground off to flat for estimation: dia 30 x 2mm dept x 30 pits
Material: NI-AL-Br CU3 USD _____

b. Quote cost for
Normal polish USD _____
Super polishing to rupert scale A USD _____

c. Cost for carrying out Non destructive test on blades.
USD _____

d. Cost of underwater polishing USD _____

## 11. Propeller Shaft

Using the same staging for polishing the propeller, remove rope guards. To measure the stern bush wear down readings in attendance of Chief Engineer. Rope guard to be refitted by intermittent welding and net cutter to be furnished around the rope guard. Record of wear down readings to be submitted to class surveyor and owner's superintendent, soon after measurement. Anode to be fitted with yard supply.

a. Cost for removing / refitting rope guard USD _____
b. Cost for calibration. USD _____
c. Price to weld 4 pcs net cutter around refitted rope guard.
Net cutter to yards supply USD _____
d. Price for fitting the yard supply anodes USD _____

## 12. Rudder

Type of rudder : Streamline semi balanced
Rudder upper and lower sleeve: Bronze
Rudder neck bearing bush: Bronze
Rudder pintle bush: PHENOL RESIN
Rudder area : 19.22 M2
Balancing ratio: 0.306
Aspect ratio: 2
Rudder body: 7199 kg
Rudder stock: 4915 kg

**SCOPE OF JOB TO BE DECIDED UPON INSPECTION**

Rudder to be inspected visually for damage. Rudder wear down, top and bottom pintle clearances to calibrate per class requirement and record submitted to class surveyor and owners superintendent. Quoted costs to include all staging and lighting as necessary.

a. Quote cost of carrying out calibration . Rudder wear down, top and bottom pintle bush clearance, inclusive of removal and rewelding of pintle inspection plate as necessary USD_____

b. Cost of removing/rewelding inspection plate (per piece ) to remove the plate for inspection, carry out hardening of pintle nut and clearances and rewelded in place upon inspection by owners USD_____

c. Price per M rebuilding up wasted welding seams after gauging and veeing. USD_____

d. Removing and refitting of rudder drain plugs with new gaskets ( 2 nos) USD_____

e. Pressure testing with air/soap solution (0.5 bar) each time USD_____ /time

f. Repacking transom space gland packing (**packing yard supply**) USD_____

g. Cavitation pits to be filled by welding for estimation assume a pit is 100 MM in dia and 5Mm dept. USD_____

**13. Rudder Top and Bottom Pintle bushes**

On reviewing the clearances at the top neck bearing and bottom pintle, if found in excess or near limits, and if renewal of the bushes is decided upon, quote for necessary work involved in the removal and refitting of the rudder, opening, removing and refitting of the pintles nuts/ pins and tightening to original specifications, removal of worn pintle bushes and renewal/ refitting of new bushes [yard supply].

a. Chip off and remove cement from palm bolt flange between rudder/rudder stock and re-cement same [with yard supply cement] upon completion. USD_____

b. Dismantling and refitting of palm bolts, pintle nut and other fastenings as required for the job, and refitting of same on completion USD_____

c. Labour, equipment and crane service to dismantle, unshipping, shipping

and re-fitting of the rudder as required USD_____

d. To calibrate the pintles, sleeves and liner at both spaces USD_____

e. To remove upper stock bush and lower pintle bushes and fit new bushes [yard supply] which have been machined/ made to required specifications as necessary. Locking/ keep plates to be removed and refitted as necc USD_____

f. To carry out magnaflux test in way of sleeve areas for detection of cracks USD_____

g. To calibrate and record all pintle/ bush clearances before and after the renewal of the phenol resin / bronze bushes USD_____

i. Weld build up on bush housing and boring to required size including key stoppers if needed. USD_____

j. To machine upper and lower shaft bushes with yard supplied material USD_____

k. Alignment check after repairs USD_____

l. To carry out serving test to the satisfaction of owner's representative and class surveyor upon job completion USD_____

m. To remove the lipseal from the rudder stock and renew with new seal and O-ring USD _____

n. Jumping collar/bar to check, replace if required and record clearance. USD _____

o. Examine rudder pintle castings for cracks USD _____

p. Repair of pintle casting cracks if found USD _____

Above mentioned costs to include all staging, supports, lifting tackle, temporary lighting, cranage, ventilation if necessary, opening and refitting of pintle inspection/ access plates as required, testing/ inspections at various stages to class surveyor’s requirements.

## 14. Anchors and cables

Anchor cables port/stbd side to be ranged out on dock bottom for cleaning by HP fresh water jet of minimum 400 bar and inspection [allow for manual turning of relevant sections of chain to gain access to undersides for cleaning/ access]. Anchor shackle pins, swivels, kenter shackles link studs to be examined by owner's superintendent. Anchors and cables to be sprayed with bituminous paint, kenter shackles to be marked by hemp cloth and secured by stainless band and painted with red and white paint before restoring

Forward Anchor (2 Nos): 9900 kgs (Each). stockless anchor
Port side chain 78 mm dia x 330.00 M, GRADE G3 (a) chain steel
Stbd side chain 78 mm dia X 330.00 M, GRADE G3(a) chain steel

a. Quote cost for lowering using yard cranes if necessary /ranging out/ restoring anchor and its cable. Cost

to include opening and refitting of bitter end if found necessary USD _____ /2 sets

b. Quote cost for cleaning by HP fresh water wash of minimum 400 bar USD _____ /2sets

c. Cables to be calibrated and recorded . Quote cost for calibration USD _____ /2sets

d. Quote cost for applying bitumastic coat over anchors and cables. Coating product to be supplied by yard USD _____ /2sets

e. Price for marking over shackles as indicated earlier. Coating/ marking products and material to be supplied by the yard. USD _____ /2 sets

f. Price per pc rewelding slacked link stud (one side only) USD _____ /pc

g. Price per piece
Kenter shackle pin USD _____ /pc
D-Shackle pin USD _____ /pc

h. Repair of anchor crown/shank pin by building up and machining inclusive of dismantling, reassembling and transportation charges to and from USD _____ /anchor

i. Shifting first chain shackle on the place of last one and vice versa. USD _____ /shackle

j. Renewal of missing lead pellets

k. To install new anchor and chain to the stbd chain locker and mark same USD _____

**15. Chain Locker**

Both chain lockers to clean and remove all water and mud from their bottoms . One full coat of bitumastic solution to be applied to the entire internal surface of both lockers. Resecuring of shackles in the lockers to be checked by Chief officer.
Size =1.8m x 2.1MX 6.6M/each

**QUOTE FOR RECOATING TO BE DONE UPTO 3M FROM BOTTOM**

a. Price per M3, pumping out/disposal of remaining water USD _____ /M3

b. Price per MT. collecting and disposal of mud from the lockers USD _____ /MT

c. Price for scraping, cleaning and applying full coat of bitumastic solution over both lockers interior (owners supply coating) USD _____ / LOCKER

**16. Hull Thickness Gauging**

Quote cost for carrying out random SPOT thickness gauging of various areas of hull plating, deck plating, tank/hold bulkheads and structures as required in DNV-GL Class Renewal Survey No 1.

For Hull Plating charge per point. _____ / point
For Deck Plating charge per point. _____ / point
For Cargo hold/ Bulk heads charge per point. _____ / point
For DB Tanks/void spaces charge per point. _____ / point

For structural members charge per point. / point
For larger diameter pipes charge per point. / point

**17. Overhaul of Governors**

Quote cost for overhaul of auxiliary engine governors, inclusive of disconnecting and removal from site, opening and overhaul, replacement of worn parts , reassembly and test run to satisfaction, refitting in place and operational test. Running test on engine also to be carried out at no costs to the owners. Work to be carried out by makers authorized service centre.

AUX. ENGINE GOVERNOR-3NOS.
AUX ENGINE MAKE:DAIHATSU
TYPE:6 DK 20e
GOVRNOR:
Make:ZEXEL
TYPE:- RHD 6
Please quote per governor. USD

**18. Main Switch-board Overhaul and Cleaning**

Quote cost for carrying out the cleaning and overhaul/ tightening/ dry-dock routine maintenance of the Main Switch-boards in the engine control room, and all associated auxiliary distribution pannels in the engine room.

Cost for maintenance of the ECR MAIN switchboards USD
Cost for maintenance of the Emergency switchboard USD
Cost for maintenance of auxiliary distribution panels USD

Above mentioned job to be carried out at night [with no extra overtime compensation] and to include provision of temporary lighting and ventilation at work areas and access ways as required, and cost for same to be included in the quote.

**19. Repairs / Renewal of Shipside Frames and Brackets**

Quote the price per/kg applicable for the renewal of sections of shipside frames in water ballast tanks which may be found damaged. Cost to include the cropping and removal of the damaged sections of frames, surface preparation, fabrication and welding of suitable replacement sections where necessary, and subsequent surface preparation and painting of affected area of shipside exterior with owner’s supplied paint (frame and shipside interior will be painted by vessel’s staff. The unit price will be applicable for the actual weight of steel renewed in these small sections, and no further ‘wastage factor’ will be applicable.

**Cost per Kg USD**

**20. Rewinding of Electric Motors**
Kindly advise the cost for

a)removal, dismantling, rewinding (including varnishing and baking), reassembly with new bearings (including dressing up of shaft seatings and bearing housing areas if found necessary), bench test on

completion of work, and return to the vessel. Advise cost for motors of following rating: 1kw, 3kw, 5kw, 10kw, 15kw, 20kw, 30kw, 40kw, 60kw.
b) removal, dismantling, reassembly with new bearings (including dressing up of shaft seatings and bearing housing areas if found necessary), bench test on completion of work, and return to the vessel

**Advise cost for motors of following rating: 1kw, 3kw, 5kw, 10kw, 15kw, 20kw, 30kw, 40kw, 60kw**. ----------**USD**

## 21. Ship Side Valves

To open, clean, lap and overhaul as required, and present for inspection to surveyor's and superintendent's satisfaction, and to box back after completion. Price to include replacement of damaged nuts/bolts, renewal of joints and gland packing, cleaning and lapping of valve & seat, etc, cleaning of the valve body and thereafter painting the interior with one coat of yard's supplied apexior. Also quote for supply and fitting of new valve if found necessary.
List of valves to be overhauled is attached.
Quote cost for overhaul of individual valves and also lumpsum for overhaul of all valves mentioned Below.
**Ship Side Valves** - More details attached in Attachment 3

## 22. Scheduled Jobs

Bellow mentioned job lists, are seperately attached with full job specification. If any clarification needed, contact technical@cscl.lk

**M.V. Ceylon Princess**

| Job No | Description | Delegation | Remarks |
|---|---|---|---|
| DK/001 | Close up inspection, preparation, touch up painting, for all Cargo Holds & Hatch Coming | Dock Yard | -------- USD/ $M^2$ & -------- USD/ spot |
| DK/002 | Inspection of Ballast tank valves controls inspection & repair No 3P & No 5P valve | Dock Yard | --------USD/ unit or ----------USD lump sum for 68 units |
| DK/003 | Freeing of Hatch cover rollers | Dock Yard | --------USD/ unit |
| DK/004 | Overhaul of ballast & Bilge eductor | Dock Yard | ----------USD |
| DK/005 | Overhaul & Calibration of Ballast and draft gauges | Dock Yard | --------USD/ unit |
| DK/006 | Overhaul of Cargo hold bilge non return valves (5 Cargo hold) | Dock Yard | --------USD/ unit |
| DK/007 | 'Repair holding base of safety line stauntions on main deck Port side and Stbd side | Dock Yard | ----------USD |
| DK/008 | 'Overhaul of all steel protective boxes | Dock Yard | ----------USD |
| DK/009 | Overhaul of all ventilation flaps | Dock Yard | ----------USD |
| DK/010 | Inspection and overhaul of all Mushroom ventilations | Dock Yard | ----------USD ( Spare owner supply) |
| DK/011 | Anchor Cable calibration, marking and painting | Dock Yard | --------USD/ unit |
| DK/012 | Port/Stbd side Windlass brake adjustment mechanism to be adjusted | Dock Yard | --------USD/ unit ( Spare owner supply) |
| DK/013 | Port and Stbd side Windlass mild steel brake drum to be replaced with SS | Dock Yard | ------USD/ unit overhaul------USD/ unit fabricate |
| DK/014 | Mooring winch mild steel brake drum to be replaced with SS | Dock Yard | --------USD/ unit |
| DK/015 | 4 nos Flood lights to bridge wings | Dock Yard | --------USD/ unit |
| DK/016 | Sacrifice anode in ship side (impressed current system) | Dock Yard | --------USD/ unit |
| DK/017 | Load test of Accommodation and combination (pilot assist) ladders | Dock Yard | --------USD/ unit |
| DK/018 | Fixed CO2 fire extinguishers system 5 year maintanance | Dock Yard | --------USD/ unit |
| DK/019 | Life boat davit load test, dynamic test of winch break system, free falls releasing system | Dock Yard | --------USD/ unit |

| | | | |
|---|---|---|---|
| DK/020 | Renewal of Life boat/rescue boat davits , suez canal, bunker davit and provision crane wire falls. | Dock Yard | --------USD/ unit |
| DK/021 | Load test of the suez canal davit, bunker davits & Provision crane | Dock Yard | --------USD/ unit |
| DK/022 | Removing salt impurities in ballast water treatment plant | Dock Yard | --------USD/ unit( WB tank) & --------USD/ unit( Rudder) |
| DK/023 | Maintenance for crane no 1,2,3,4 | Dock Yard | -------- USD/ $M^2$ |
| DK/024 | 'Load test for deck crane no 1,2,3,4 | Dock Yard | --------USD/ unit |
| DK/025 | Bottom, Boot top, top side inspection, preparation and painting | Dock Yard | --------USD/ step --------USD/ meter of hand rail |
| DK/026 | Cleaning and painting of chain lockers | Dock Yard | --------USD/ boat |
| DK/027 | Transducer of Echo sounder/Doppler logs check and clean | Dock Yard | --------USD/ boat |
| DK/028 | Fire line pressure test | Dock Yard | --------USD/ unit |
| DK/029 | Hatch covers pressure test for water tightness | Dock Yard | --------USD/ Crane |
| | | | |
| | | | |
| | | | |
| EL/001 | All Deck crane main motors and hydraulic cooler motors to be serviced and bearing replaced (4 Deck Crane Motors) | Dock Yard | --------USD/ unit & --------USD/ unit |
| EL/002 | All engine room blower motors to be serviced and bearing replaced | Dock Yard | --------USD/ unit |
| EL/003 | All generator alternators to be serviced | Dock Yard | --------USD/ unit |
| EL/004 | Main switch board to be serviced and all Meters to be callibrated | Dock Yard | --------USD/ unit |
| EL/005 | 'Emergency switch board to be serviced and all Meters to be callibrated SaierNico Marine Switch board | Dock Yard | --------USD/ unit |
| EL/006 | Main engine control system and alarm panel of Kongsberg to be serviced and callibrated | Dock Yard | --------USD/ unit |
| EL/007 | Main engine MAN B&W control system to be callibrated and serviced | Dock Yard | --------USD/ unit |
| EL/008 | All tanks sounding/tempreture sensors of Ballast Control System to be serviced, repaired and callibrated | Dock Yard | --------USD/ unit |
| EL/009 | ICCP System maintenance ( K.C. Ltd Korea) | Dock Yard | --------USD |
| EL/010 | MGPS System maintenance ( K.C. Ltd Korea) | Dock Yard | --------USD |
| EL/011 | 'Load test of all Deck cranes | Dock Yard | --------USD/ unit |
| EL/012 | Steering gear motors to be serviced and bearings to be replaced | Dock Yard | --------USD/ unit |
| EL/013 | M/E Auxiliary blower motors to be serviced and replaced bearing | Dock Yard | --------USD/ unit |
| EL/014 | Low temprature cooling water system motors to be serviced and replaced bearing | Dock Yard | --------USD/ unit |
| EL/015 | Fire and GS pump motors to be serviced and replaced bearing | | |
| EL/016 | Bilge and GS pump motors to be serviced and replaced bearing | | |
| EL/017 | Main Air Compressor motors to be serviced and replaced bearing | | |
| EL/018 | Ballast pump motors to be serviced and replaced bearing | | |

| | | | |
|---|---|---|---|
| EL/019 | Sea Water Cooling pump motors to be serviced and replaced bearing | | |
| EL/020 | Shore calibration of calibratores | | |
| | | | |
| EN/001 | 'All sea suction and overboard valves. | Dock Yard | --------USD/ unit |
| EN/002 | Stern tube AFT seals replacement and inspection of the FWD seals and chrome liner | Dock Yard | --------USD |
| EN/003 | 1) To clean propeller, 2) To carry out propeller polishing, 3) To carry out dye penetrant test for cracks | Dock Yard | --------USD |
| EN/004 | Rudder and rudder carrier bearing inspection | Dock Yard | --------USD |
| EN/005 | Boiler internal and external inspection and survey | Dock Yard | --------USD |
| EN/006 | Main engine selected units(as per surveyor request) main bearings, cross head bearings and bottom end bearings inspection and survey | Dock Yard | ------USD/unit(Main) & ------USD/unit(X. H.ead) ) |
| EN/007 | All air bottle survey | Dock Yard | --------USD |
| EN/008 | Main engine turbocharger overhaul | Dock Yard | --------USD/ unit |
| EN/009 | 'All auxiliary engine governor overhau | Dock Yard | --------USD/ unit |
| EN/010 | Bunker davit modification to be done | Dock Yard | --------USD/ unit |
| EN/011 | All three main S.W Pump discharge pipe line elbows renewa | Dock Yard | --------USD |
| EN/012 | All main S.W Pump discharge butterfly valves to be replaced with NR valves | Dock Yard | --------USD/ unit |
| EN/013 | Main Engine all five unit fuel oil pressure boosters ( Fuel pump) to be overhauled | Dock Yard | --------USD/ unit |
| EN/014 | 'Renewal of RO Plant piping | Dock Yard | --------USD/ unit |
| EN/015 | Interconnecting valve to be fitted to FWG Suction line from main sw pipe | Dock Yard | --------USD/ unit |
| EN/016 | LT cooler sea water inlet and outlet pipes to be renewed | Dock Yard | --------USD/ m |
| EN/017 | OceanGuard Ballast Water Management System | Dock Yard | --------USD/ unit |
| EN/018 | Higher capacity sludge pump and compatible motor to be installed | | |
| EN/019 | 'Main Engine air cooler to be cleaned | Dock Yard | --------USD |
| EN/020 | Boiler Dump condensor (Atmos condenser) to be cleaned | Dock Yard | --------USD |
| EN/021 | All engine room coolers to be clean | Dock Yard | --------USD/ unit |
| EN/022 | **Thrust bearing to be inspected and clearence to check** | Maker | |
| EN/023 | Waste oil tank extractor fan and air bubbling arrangement to be fitted | Dock Yard | -------USD/ unit |
| EN/024 | Galley AC to be repaired | Dock Yard | --------USD |
| EN/025 | Drain Holes to be cut in ER lower deck shipside plates (Stiffeners) allowing water to drain in to bilges | Dock Yard | --------USD |
| EN/026 | Provision crane inspections to be done | Dock Yard | --------USD |
| EN/027 | Deck Crane No 1,2,3 & 4 Jib foot and Sheave Bearings to be inspected and replaced where neccessary. All Crane rocking tests and Load tests to be carried out | Dock Yard | --------USD/ Plate cooler & --------USD/ Tube cooler |
| EN/028 | Fresh water generator ejector pump SW discharge line renewal | Dock Yard | --------USD |
| EN/029 | RO Plant SW pump inlet line renewa | Dock Yard | --------USD |

| | | | |
|---|---|---|---|
| EN/030 | CSM Items : No 1 and No 2 M/E LO Pumps, No 2 M/E Jacket water pump, No 1, No 2 and No 3 LT cooling pumps, No 1 and No 3 Main Sea water pumps | Dock Yard | --------USD/ unit |
| EN/031 | | | |
| EN/032 | | | |
| EN/033 | | | |

| | Valve | System | DN | Valve Type | Name on plate | Location | Dimentions on Drwg (MPa) | Dimentions from local check (bar) |
|---|---|---|---|---|---|---|---|---|
| | **Overboard Discharge Valves** | | | | | | | |
| 1 | Ballast Pump 1 to OVBD | Bilge, Ballast & Fire Fighting System In E/R | DN350 | Butterfly V. | BWV09 | E/R | 1DN350 | 10DN350 |
| 2 | Ballast Pump 2 to OVBD | Bilge, Ballast & Fire Fighting System In E/R | DN350 | Butterfly V. | BWV10 | E/R | 1DN351 | 10DN350 |
| 3 | Ballast Stipp. Eductor Discharge OVBD | Bilge, Ballast & Fire Fighting System In E/R | DN150 | Stop Check v. | BWV16 | E/R | 0.6DN150 | 6DN150 |
| 4 | Bilge Eductor for C/H Discharge OVBD | Bilge, Ballast & Fire Fighting System In E/R | DN125 | Stop Check v. | BGV27 | E/R | 0.6DN125 | 6DN125 |
| 5 | Main Bilge Pump to OVBD | Bilge, Ballast & Fire Fighting System In E/R | DN250 | Stop Check v. | BGV13 | E/R | 0.6DN250 | 6DN250 |
| 6 | Oily Bilge Water Sepatrator to OVBD | E/R Oily Water Separating System | DN40 | Stop Check v. | OWV04 | E/R | 0.6DN50 | 25DN50 |
| 7 | Sewage Discharge OVBD | Sewage Treatment Plant system | DN150 | Storm Vv | SWV01 | E/R | 0.6DN150 | 5DN150 |
| 8 | Ref. chamber Discharge OVBD | Layout of Sanitary Drain Piping (Grey water) | DN100 | Stop Check v. | GPV01 | E/R | 2.5DN100 | 25DN100 |
| 9 | Sea Water Cooling Pump to OVBD | Cooling Sea Water System | DN300 | Stop Check v. | CSV19 | E/R | 0.5DN300 | 10DN300 |
| 10 | Fresh water Generator Sea Water outlet OVBD | Cooling Sea Water System | DN80 | Stop Check v. | CSV20 | E/R | 0.5DN80 | 25DN80 |
| 11 | Boiler Blow to OVBD | Feed Water System | DN40 | Boiler Side Drain V. | FEV08 | E/R | 2.5DN32 | 25DN40 |
| 13 | BWTS Back Flushing to OVBD | Bilge, Ballast & Fire Fighting System In E/R | DN125 | Butterfly V. | BWV34 | E/R | 1DN125 | 10DN125 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 14 | F.P. TK. Ballast water Overflow to OVBD (P) | Ship's Air, Sounding and Filling Pipes | DN300 | Stop Check v. | AVV101 | Fwd below Boatswain store | 0.6DN300 | 10DN300 |
| 15 | F.P.TK. Ballast Water Overflow to OVBD (S) | Ship's Air, Sounding and Filling Pipes | DN300 | Stop Check v. | AVV102 | Fwd below Boatswain store | 0.6DN300 | 10DN300 |
| 16 | AFT. Mooring winch Cooling Water to OVBD | Hydraulic diagram of Mooring Winch | DN50 | Stop Check v. | FFV244 | S.G Room | | 25DN50 |
| 17 | Bilge Eductor for C/L Discharge OVBD | Bilge, Ballast & Fire Fighting System In E/R | DN80 | Stop Check v. | BGV130 | Fwd below Boatswain store | 0.6DN80 | 25DN80 |
| | **Sea Suction Valves** | | | | | | | |
| 18 | Low Sea Suction | Bilge, Ballast & Fire Fighting System In E/R | DN500 | Remote Controled Butterfly Valve Flanged | CSV24 | E/R | 1DN500 | 6DN500 |
| 19 | Low Sea Chest Air Vent | Bilge, Ballast & Fire Fighting System In E/R | DN50 | Stop Valve(Bronze) | CSV22 | E/R | 2.5DN50 | 25DN50 |
| 20 | Low Sea Chest Steam blow | E/R Steam System | | Stop Valve | STV24 | E/R | 2.5DN15 | 25DN20 |
| 21 | From Central FW Cooler | Bilge, Ballast & Fire Fighting System In E/R | DN200 | Stop Check Valve | CSV21 | E/R | 0.6DN200 | 10DN200 |
| 22 | High Sea Suction | Bilge, Ballast & Fire Fighting System In E/R | DN500 | Remote Controled Butterfly Valve Flanged | CSV25 | E/R | 1DN500 | 6DN500 |
| 23 | High Sea Chest Air Vent | Bilge, Ballast & Fire Fighting System In E/R | DN50 | Stop Valve(Bronze) | CSV23 | E/R | 2.5DN50 | 25DN50 |
| 24 | High Sea Chest Steam blow | E/R Steam System | | Stop Valve | STV25 | E/R | 2.5DN15 | 25DN20 |
| 25 | Emergency F.P Suction Valve | Emergency Fire Pump Room | DN125 | | EFV01 | E.F.P Room | 0.4DN125 | 4DN125 |
| 26 | E.F.P Sea suction Air pipe | Emergency Fire Pump Room | DN65 | Stop Valve | EFV03 | E.F.P Room | 2.5DN65 | 25DN65 |
| 27 | Compressed air blow for sea chest | Emergency Fire Pump Room | DN20 | Stop Valve | EFV04 | E.F.P Room | 2.5DN20 | 25DN20 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 28 | Aft Draft Sensor Inlet | Aft Draft Sensor Inlet | DN40 | Globe valve | | E/R | DN40 | 25DN40 |
| 29 | Mid Draft (P) Sensor inlet | Mid Draft (P) Sensor inlet | DN65 | Stop Valve | | pipe tunnel | DN65 | 16DN25 |
| 30 | Mid Draft (S) Sensor inlet | Mid Draft (S) Sensor inlet | DN65 | Stop Valve | | pipe tunnel | DN65 | 16DN25 |
| 31 | FWD Draft Sensor inlet | FWD Draft Sensor inlet | DN25 | Globe valve | | E.F.P Room | DN25 | 25DN25 |