



हुगली कोचीन शिपयार्ड लिमिटेड  
(भारत सरकार का उद्यम)  
**HOOGHLY COCHIN SHIPYARD LIMITED**  
(A Govt. of India Enterprise)



वसुधैव कुटुम्बकम्  
ONE EARTH • ONE FAMILY • ONE FUTURE

**CORRIGENDUM NO: 1**

**Dtd. 07.06.2025**

**Ref. HCSL/PUR/TEN/2025/038, Dtd. 19.05.2025**

**Sub:** Amendment to tender for Design & Supply of Exhaust Support, Rain Hats & Expansion Bellow for Four No. of Tugs at Hooghly Cochin Shipyard Ltd. Nazirgunge Unit, Howrah.

The Amendments are given below:

Sl No.	Description	As per tender	Amended as
1.	Certifications for Rain Hats	Type Approval Certificate Required	Type Approval Certificate <b>Not Required</b>
2.	Last Date for Bid Submission	09.06.2025	16.06.2025

**Amended Annexure -1, Section-B, Technical specification Part 2, clause d; is attached and supersedes respective pages of published tender.**

**Note:**

Self-attested copy of corrigendum 1 to be submitted along with NIT including the latest Annexure-1

All other terms and conditions of the tender remain unaltered.



**For Hooghly Cochin Shipyard Limited**

*dy. Manager (E.V.)  
Johnson Grandage*



**Registered Office:** Administrative Building, HCSL Premises, Satyen Bose Road,  
P.O. Danesh Shaikh Lane, Nazirgunge, Howrah, West Bengal - 711 109.  
☎ +91 (33)-2688 8282 ✉ contact@hooghlycsi.com 🌐 www.hooghlycsi.com

**Shipyard:** Nazirgunge Unit, Satyen Bose Road, P.O. Danesh SK Lane,  
P.S. Sankrail, Howrah, West Bengal - 711109  
☎ +91 (33)-2955 8283

CIN : U35900WB2017GOI223197, GSTIN : 19AAECH3640L1ZD

Rev. No.	Pages	Description	Date	Sign.
0	06	First Issue	14-02-2025	Rakesh
1	06	Rain Hats & Expansion Bellows Added.	08-05-2025	Rakesh
2	06	Scope table added.	09-05-2025	Rakesh
3	06	Changes as per OEM's recommendations & review comments	13-05-2025	Abhishek
4	06	Type Approval requirement for Rain hat is replaced with manufacturer certificate.	06-06-2025	Rakesh



## HOOGHLY COCHIN SHIPYARD LIMITED

HOWRAH - 711 109

YARD NO	01124001, 01224002, 01324003, 01424004	PROJECT: 40 T BOLLARD PULL ASD TUG											
OWNER	INDUSTRIAL HANDLING PRIVATE LIMITED	PURCHASE TECHNICAL SPECIFICATIONS FOR EXHAUST SUPPORTS, RAIN HATS & EXPANSION BELLOW.											
APPROVED	RAKESH SAGAR												
CHECKED	ABHISHEK MISHRA												
PREPARED	ABHISHEK MISHRA												
DATE	13-05-2025	SCALE: - NA	Doc. No.: PTS-01124001-047										
ISSUED TO	NO. DE P.												

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SA



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**SECTION A – GENERAL SPECIFICATIONS****1. Introduction**

The scope of this document is to obtain offer for Exhaust Supports, Rain hats & Expansion Bellow as per the table below :-

Sl. No	Item	Scope
1.	Exhaust Support	Design & Supply
2.	Rain Hats	Supply
3.	Expansion Bellow	Supply

**2. Name & Quantity**

The quantity of items indicated is for only one (01) vessel. The total requirement is to be considered for Four (04) vessel. The technical specification of items shall be as per section-B of this document.

**3. Class & Flag Rule**

The vessel shall be built under the following flag and classification:

Flag : India

Classification : Indian Register of Shipping.

Class notation : +SUL+IY TUG

INWAER SURVEY, AGNI 1(2400m<sup>3</sup>/hr)

Type: "Indian Coastal Vessel"

**4. Design Conditions**

The following ambient conditions shall be considered for the selection of the Vessel's equipment and machinery. Machinery shall be able to deliver its specified output and operate satisfactorily under tropical conditions as mentioned below:

Sea water temperature : max. 32° C min. 5° C

Air temperature outside : max. 40° C min. 10° C

Relative Humidity : max. 90% min. 50%

Engine Room temperature : 45° C

List, rolling, trim and pitch according to limits as per Class

Above requirements to be considered as minimum, any other requirements which are necessary to meet class/IMO/flag rules/regulations shall be considered for design and operation of the equipment.



## **5. Supply of Documents**

All documents shall be in English and in SI unit system and the following documents shall be submitted, where applicable. The drawing approval where required by the Classification Society shall be obtained by the manufacturer.

### **5.1 Documents to be submitted along with offer**

- a) Technical data of the forementioned items.
- b) Preliminary Bill of Materials.
- c) Weight details.
- d) List of spares / tools as required by class (if any).
- e) Compliance Matrix/ Deviation List against PTS.

### **5.2 Documents to be submitted within 21 working days after placement of Order/LOI/As per final agreement**

- a) Detailed Bill of Material.
- b) Detailed drawing for forementioned items.
- c) Technical data of the forementioned items.
- d) Weight details
- e) Details of Installation
- f) List of spares / tools as agreed

### **5.3 Documents to be submitted along with delivery of Machinery and/or Equipment to the Yard (4 sets / vessel unless otherwise mentioned)**

- a) Packing list (with reference to each item of Bill of Materials)

## **6. General Remarks**

### **a) Liability**

Manufacturer shall bear all responsibilities for the shop trials and the delivery of the machinery or equipment.

### **b) Painting**

Painting schedule shall be as per manufacturer's standard and the painting scheme shall be specified.

### **c) Preservation**

Recommended method of preservation and names of recommended preservatives shall be indicated. Maximum R.H. (Relative Humidity) at Howrah in West Bengal is around 80% and minimum R.H is at around 60%.

### **d) Special Tools**

Special tools if any required for installation have to be supplied with the equipment

**SECTION B – TECHNICAL SPECIFICATIONS****PART-1: EXHAUST SUPPORTS**

- a) The exhaust supports supplied must be suitable for marine applications, function smoothly and achieve full specified performance at design and environmental conditions without any undue effect on maintenance or life.
- b) It should withstand air contamination through oil, salt and other contaminants associated with the marine environment.
- c) The exhaust piping arrangement drawing is attached herewith as **Annexure – 1.1 & 1.2**. There are 4 (four) internal combustion engines in the vessel from the exhaust pipes are routed to atmosphere through casing. They are two (02) Main Engines and two (02) Gensets. The type and number of pipe supports shall be as per the attached drawing.
- d) In case of any extra support required for the piping components as per the experience and expertise of the bidding firm, the same shall be mentioned in the technical offer.
- e) The exhaust pipe details and the approximate number of supports are listed below.

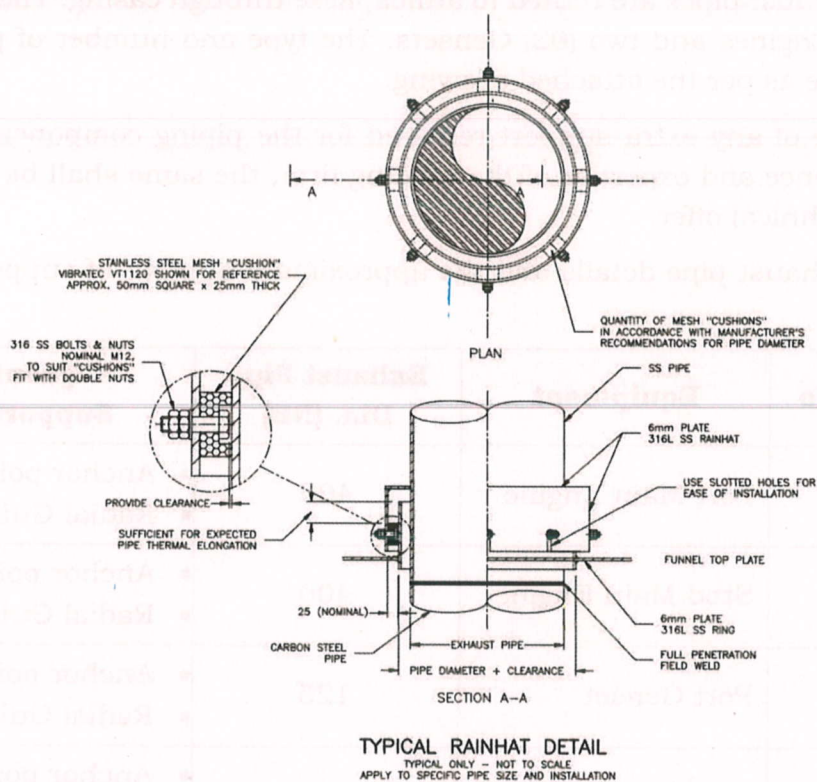
Sl. No	Equipment	Exhaust Pipe Dia. (NB)	Quantity of Support/Vessel
4.	Port Main Engine	400	<ul style="list-style-type: none"> <li>• Anchor point – 2</li> <li>• Radial Guide – 2</li> </ul>
5.	Stbd Main Engine	400	<ul style="list-style-type: none"> <li>• Anchor point – 2</li> <li>• Radial Guide - 2</li> </ul>
6.	Port Genset	125	<ul style="list-style-type: none"> <li>• Anchor point – 4</li> <li>• Radial Guide - 4</li> </ul>
7.	Stbd Genset	125	<ul style="list-style-type: none"> <li>• Anchor point – 3</li> <li>• Radial Guide - 4</li> </ul>

- f) There is a silencer in each exhaust pipe. The dimensions shall be referred from the drawing.
- g) The exhaust pipes and silencers to be properly supported with vibration isolators as mentioned in the drawing.



## **PART-2: RAIN HATS**

- a) The Rain hats shall be made of SS316L.
- b) The cushions shall be made of stainless-steel Mesh suitable for open deck installation (As per Annexure – 1).
- c) Nuts, Bolts & other fasteners shall be SS 316 L.
- d) Manufacture certificate to be provided.
- e) Typical Rainhat as below (the same is available in Sheet 5 of 6 of the attached annexure-1.1):-

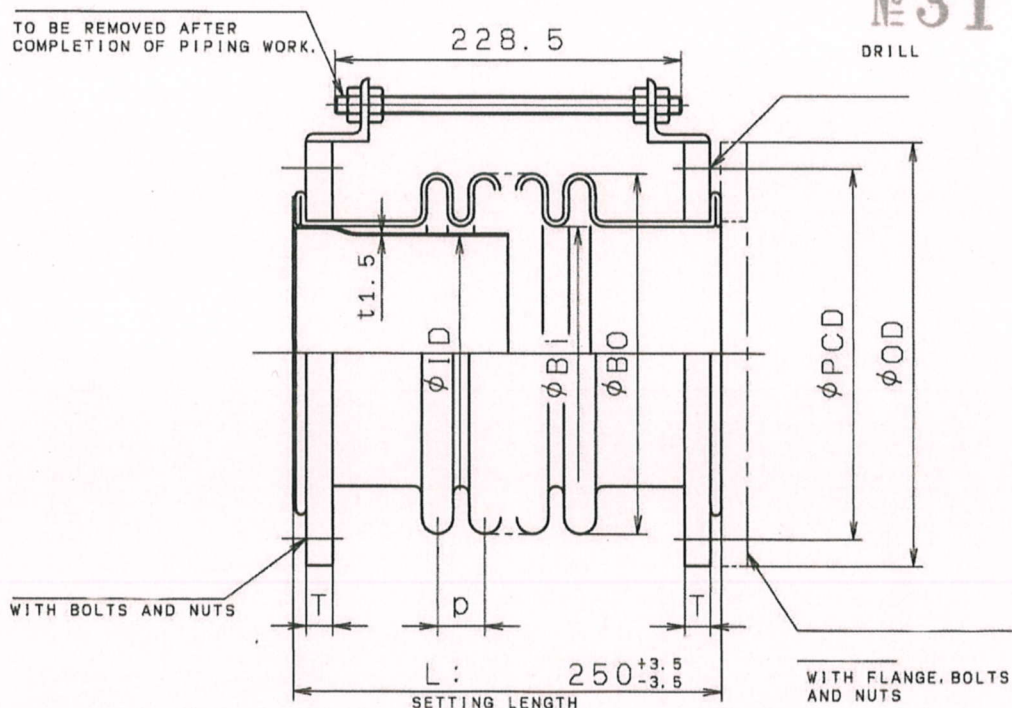


### f) Requirement Table:-

System	Pipe Size	Quantity Required
Main Engine Exhaust System	DN400	2
Diesel Generator Exhaust System	DN125	2

### PART-3: EXPANSION BELLOW

- a) The Exhaust Bellow marked in the Diagram are under the bidder firm's Scope. The item codes of the bellows are marked in the diagram (Annexure-1.1). In case of any additional Bellows mandatorily required for the exhaust Pipe routing based on the experience and expertise of the bidder form, then the same shall be included in Vendor's Scope.
- b) Bellow Type: - Should be Suitable for marine exhaust system. Vendor has to recommend suitable type.
- c) Flange Standards – EN-1092-1
- d) Exhaust System Piping Layout (As per Detail Engineering Model) enclosed as Annexure – 1.2.
- e) Item to be **Type Approved** by any IACS Member (Preferably IRS).
- f) Specifications for the Main Engine Bellows:
  - Hydro Test Pressure: 0.3 MPa
  - Working Temperature: Max. 600 Deg. C.
  - Material: SUS321
  - Reference Drawings: -



口径 SIZE	OD (mm)	L (mm)	T (mm)	PCD (mm)	N-W	BI (mm)	BO (mm)	p (mm)	ID (mm)	山数 THREAD	質量 MASS (kg)	図面番号 DRAWING NO.
400A	540	250	24	495	16-25	404	506	45.5	381	3	46.5	C991 24100B1



g) Specifications for the Diesel Generator Bellows:

- I. Hydro Test Pressure: 1.5 x Design Pressure (Min.). Design pressure suitable for this application has to be recommended by the vendor.
- II. Working Temperature: Max. 600 Deg. C.
- III. Material: SS type 321 as per A240/240M

h) Requirement Table:-

Item Code	Equipment Name	Bellow Size	Bellow Setting Length	Quantity Required
MEB-P-1	Main Engine (P)	DN400	250 mm	1
MEB-S-1	Main Engine (S)	DN400	250 mm	1
DGB-P-1, DGB-P-2	Diesel generator (P)	DN125	250 mm	1 Each
DGB-S-1	Diesel generator (S)	DN125	250 mm	1

## ANNEXURE - 1.1

## NOTES:

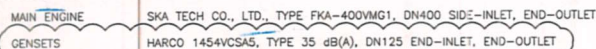
1. REFER TO THE ROBERT ALLAN LTD. DRAWING AND CONTRACT SPECIFICATION PACKAGE IN ITS ENTIRETY. PARTICULAR ATTENTION SHOULD BE PAID TO THE FOLLOWING:

- 21010 STRUCTURAL ARRANGEMENT
- 22010 DECKHOUSE STRUCTURE
- 30000 GENERAL ARRANGEMENT
- 50000 MACHINERY ARRANGEMENT
- 73010 FIRE-FIGHTING SYSTEM ARRANGEMENT
- 81110 MACHINERY SPACE VENTILATION ARRANGEMENT

2. PROVIDE SILENCERS FOR EACH ENGINE RATED FOR A MINIMUM PERFORMANCE OF 35 dB(A).

3. PROVIDE MINIMUM OF ONE SPARK ARRESTING SILENCER IN EACH ENGINE EXHAUST SYSTEM

4. THE FOLLOWING SILENCERS ARE SHOWN:



RESERVATION 1 2

5. PROVIDE ALL SILENCERS WITH SECONDARY NAMEPLATE INCLUDING TYPE, AND SERIAL NUMBER MOUNTED ON THE OUTSIDE OF THE INSULATION.

6. USE LONG RADIUS (1.5 x PIPE DIAMETER) ELBOWS UNLESS NOTED OTHERWISE.

7. INSULATION: INSULATE ALL INTERIOR PIPE AND SILENCERS WITH MINIMUM 25mm THICK REMOVABLE, PRE-SEWN BLANKET TYPE HIGH TEMPERATURE EXHAUST INSULATION. SECURE INSULATION WITH STAINLESS STEEL HOOKS AND WIRE. INSULATION NOT SHOWN BUT ACCOUNTED FOR.

8. MOUNTS: RESILIENTLY MOUNT ENTIRE EXHAUST SYSTEM TO ENSURE NO METAL TO METAL CONTACT BETWEEN EXHAUST AND STRUCTURE. USE CAPTIVE VIBRATION ISOLATORS IN ACCORDANCE WITH VESSEL SPECIFICATION AND SELECT MOUNTS FOR A MINIMUM STATIC DEFLECTION OF 2mm. LOCATE MOUNTS AS FAR FROM HOT EXHAUST AS POSSIBLE AND ATTACH TO MAIN STRUCTURE WITHOUT INDUCING BENDING MOMENTS. DO NOT ATTACH MOUNTS TO UNSUPPORTED PLATE OR MINOR STIFFENERS.

9. EXPANSION JOINTS (BELLOW): TO BE SIZED AND SELECTED BY THE SHIPYARD AFTER FINAL EXHAUST ROUTING IS CONFIRMED. USE MULTI-PLY BELLOWS IN ACCORDANCE WITH THE VESSEL SPECIFICATION. INSTALL EXPANSION JOINTS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS AND UNDER A NOMINAL 12mm TENSION WHEN COLD. VERIFY THE EXPECTED LATERAL AND AXIAL DEFLECTIONS DUE TO THERMAL EXPANSION AND ENGINE MOVEMENT (BETWEEN NO LOAD AND FULL LOAD) ARE WITHIN BOTH THE EXPANSION JOINT MANUFACTURER'S OPERATING LIMITS AND THE ENGINE TURBOCHARGER LOAD LIMITS.

10. PROVIDE WATER DRAINS AT LOW POINTS.

11. ENGINE TURBOCHARGER LOAD LIMITS: ENSURE THAT THE WEIGHTS OF EXHAUST PIPING COMPONENTS USED TO CONNECT THE TURBOCHARGER WITH THE BELLOWS, INCLUDING ELBOWS OR ADAPTORS, DO NOT EXCEED THE MANUFACTURER'S TURBOCHARGER LOAD LIMITS.

## LEGEND:

SUPPORT AND ANCHOR LOCATIONS SHOWN ARE FOR GUIDANCE, ADJUST TO SUIT FINAL EXHAUST ARRANGEMENT

**X** - INDICATES "ANCHOR POINT"  
ARRANGE ANCHOR POINTS WITH VIBRATION ISOLATORS (SEE SPECIFICATION) TO SECURE PIPING AGAINST MOVEMENT IN ALL DIRECTIONS.

**||** - INDICATES "RADIAL GUIDE"  
ARRANGE GUIDES WITH VIBRATION ISOLATORS (SEE SPECIFICATION) AND ENSURE GUIDES ALLOW FOR AXIAL THERMAL EXPANSION & PREVENT RADIAL MOVEMENT.

## MATERIALS:

FOR DRY EXHAUST SYSTEMS ONLY

1. INTERNAL PIPE:  
MILD STEEL, NOT LESS THAN 3mm WALL  
IN GENERAL, STANDARD WEIGHT (SCHEDULE 40) FOR DN100 AND BELOW AND THIN WALL (SCHEDULE 10 OR 10S) ABOVE.
2. EXTERNAL PIPE:  
316L STAINLESS STEEL  
WALL THICKNESS PER INTERNAL PIPE  
MECHANICALLY PREPARED TO ELIMINATE ROUGHNESS AND SCRATCHES THEN ELECTRO POLISHED.
3. FLANGES: PLATE TYPE TO CLASS APPROVAL
4. GASKETS: NON ASBESTOS, SUITED FOR TEMPERATURE AND APPLICATION
5. BUTT WELD FITTINGS THROUGHOUT
6. INSULATION: NON-ASBESTOS, SUITED FOR TEMPERATURE AND APPLICATION

RESERVATIONS: 2

1. GENSET SILENCERS SHOWN FOR REFERENCE, FINAL SELECTED SILENCERS' FIT AND ARRANGEMENT TO BE CONFIRMED BY THE SHIPYARD.
2. ANCHOR RAFT SHOWN FOR CONCEPTUAL REFERENCE ONLY. SHIPYARD TO CONFIRM FINAL SILENCER MOUNTING LOCATIONS DURING PRODUCTION DESIGN.



**ROBERT ALLAN**  
Naval Architects & Marine Engineers

Designed in Vancouver, Canada  
www.raal.ca

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This document is for guidance only, indicating the key characteristics of the design's configuration, performance, materials, and standards of construction based on preliminary equipment selection. It is not intended to be the sole basis for construction. The builder, or any other party that uses or relies on or makes decisions based on this document, assumes full responsibility to complete detailed engineering design and finalize equipment selection to a point suitable for construction and implementation.

Engineers and Geoscientists BC Permit to Practice number 1001019

## CONTRACT DESIGN

DESIGN

**Ramparts 2800**  
TUGBOAT

CLIENT

**HOOGLY COCHIN SHIPYARD LTD.**

TITLE

**MACHINERY EXHAUST**  
**ARRANGEMENT**

DRAWN BY  
HK

ENGINEER  
NC

PLOT SIZE  
ANSI B

SHEET  
1 OF 6

2	UPDATED PER CLIENT COMMENTS INCLUDING: - GENSETS UPDATED - GENSETS EXHAUST PIPING AND SILENCERS UPDATED TO DN125 - UPDATED SECONDARY ER AIR INTAKE	NOV. 01/24	HK	NC	DJH
1	FIRST ISSUE	SEP. 13/24	HK	NC	DJH
REV.	REVISIONS	DATE	DWN	CHK	APP.

PROJECT  
224-029

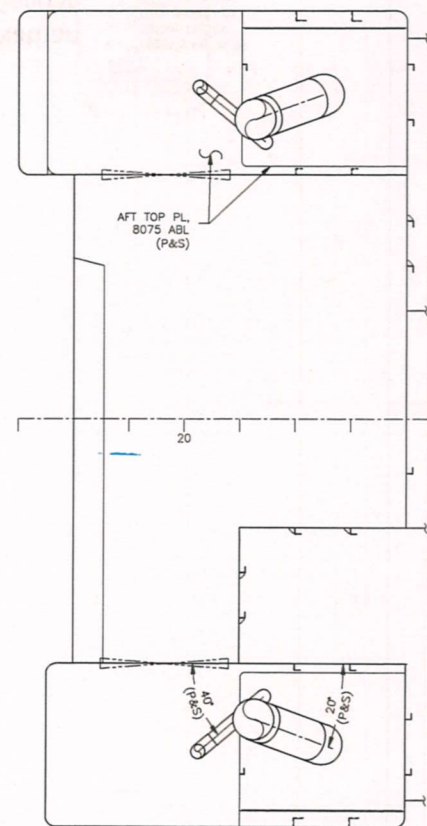
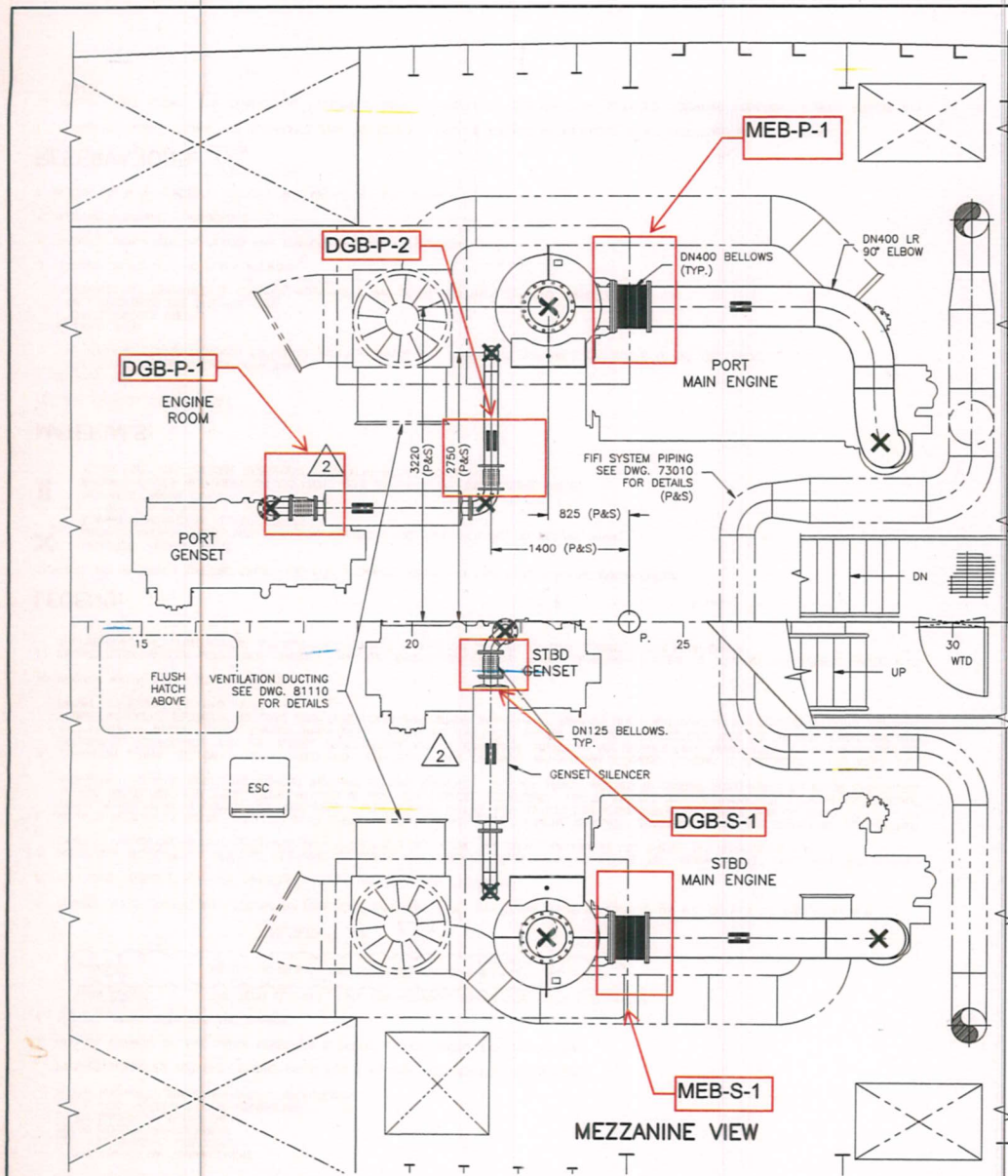
DRAWING  
76000

REV.  
2

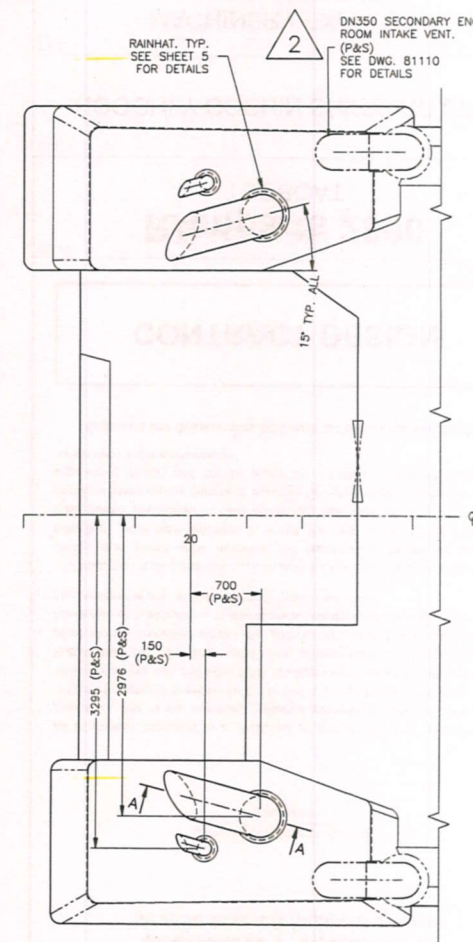
Nathan Cajiuaat  
R.N. Digitally signed by  
Nathan Cajiuaat  
Date: 2024.11.01  
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13A





BOAT DECK PLAN



FUNNEL TOP VIEW



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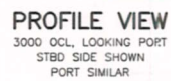
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TITLE

**MACHINERY EXHAUST ARRANGEMENT**

SCALE	1:50	PLOT SIZE	ANSI B	SHEET	2 OF 6
PROJECT	224-029	DRAWING	76000	REV.	2

14A



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## CONTRACT DESIGN

TITLE
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### MACHINERY EXHAUST ARRANGEMENT

SCALE
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1:75

PLOT SIZE	ANSI B
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SHEET  
3 OF 6

PROJECT 224-029

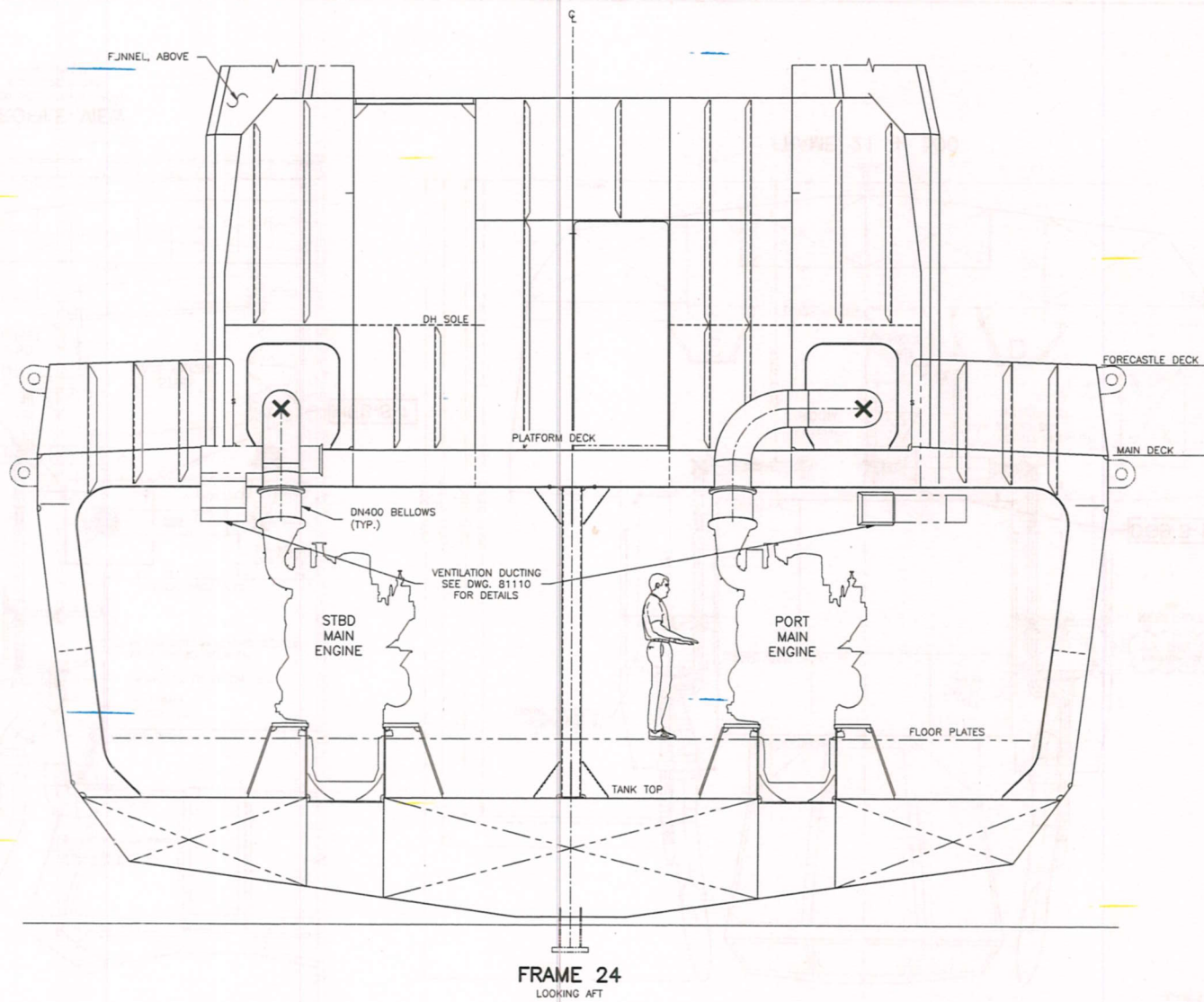
DRAWING
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76000

REV.	2
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15A





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**CONTRACT DESIGN**

TITLE

**MACHINERY EXHAUST ARRANGEMENT**

SCALE

1:50

PLOT SIZE  
ANSI B

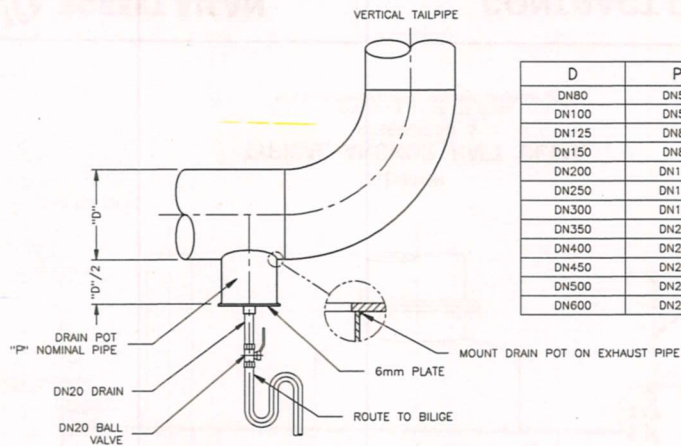
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4 OF 6

PROJECT  
224-029

DRAWING  
76000

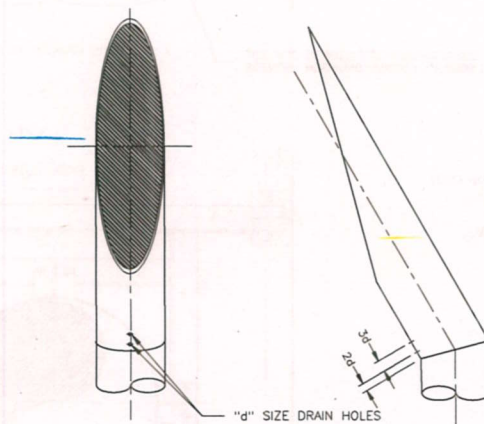
REV.  
2

16A



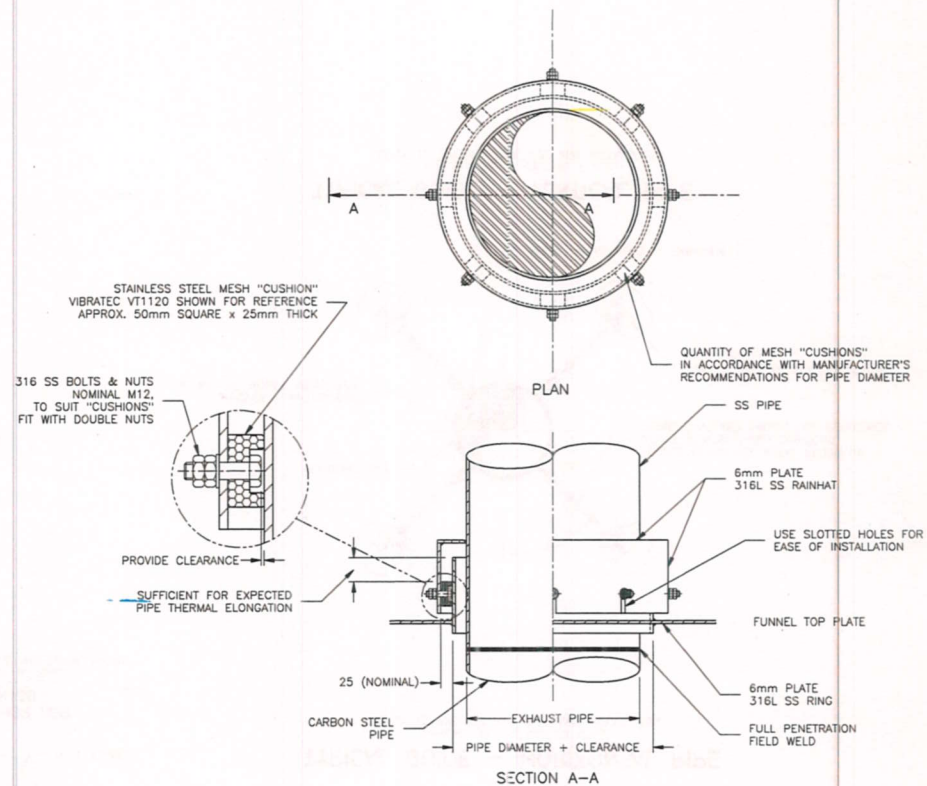
D	P
DN80	DN50
DN100	DN50
DN125	DN80
DN150	DN80
DN200	DN100
DN250	DN150
DN300	DN150
DN350	DN200
DN400	DN200
DN450	DN200
DN500	DN250
DN600	DN250

**TYPICAL WATER DRAIN DETAIL**  
MANUAL CONDENSATE/RAIN DRAIN  
TYPICAL ONLY - NOT TO SCALE  
APPLY TO SPECIFIC PIPE SIZE AND INSTALLATION



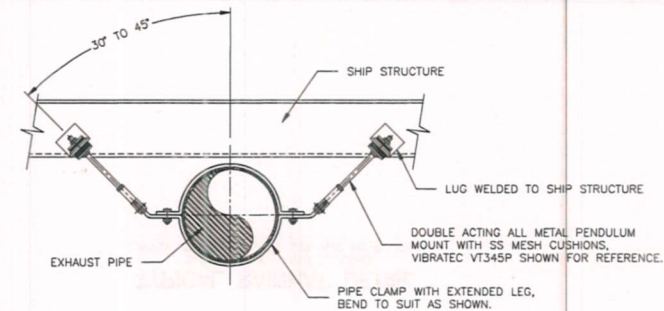
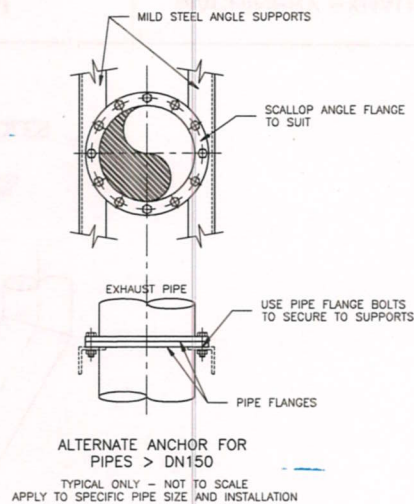
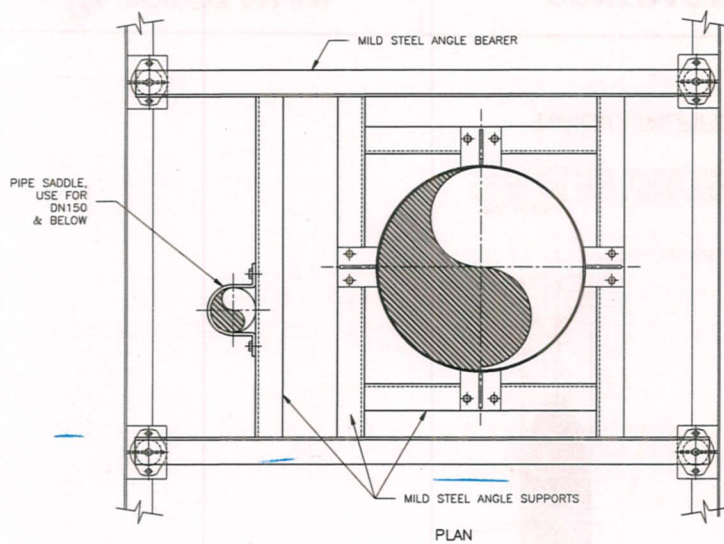
DRAIN HOLES:  
FOR PIPE SIZES DN80 TO DN125, PROVIDE 1 HOLE  $d = \#15$   
FOR PIPE SIZES DN150 TO DN250, PROVIDE 2 HOLES  $d = \#20$   
FOR PIPE SIZES DN300 AND ABOVE, PROVIDE 2 HOLES  $d = \#25$

**TYPICAL TAILPIPE DRAIN HOLES**



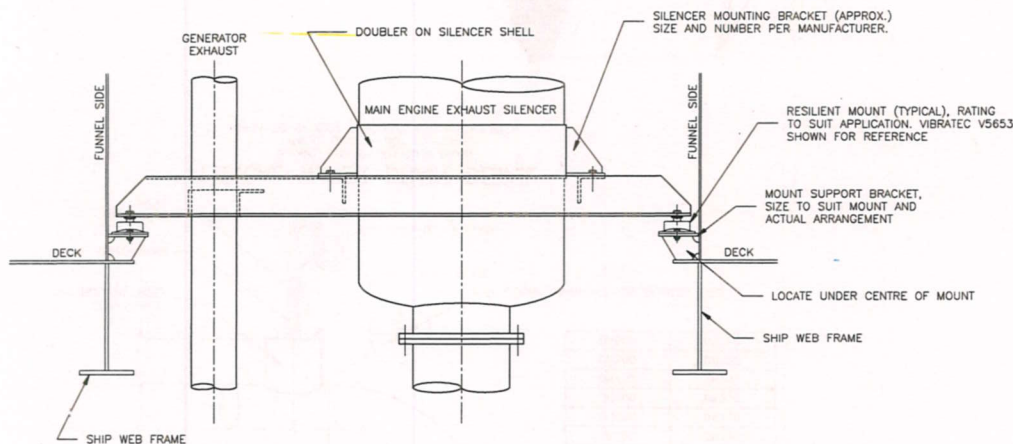
**TYPICAL RAINHAT DETAIL**  
TYPICAL ONLY - NOT TO SCALE  
APPLY TO SPECIFIC PIPE SIZE AND INSTALLATION





### TYPICAL GUIDE - HORIZONTAL PIPE

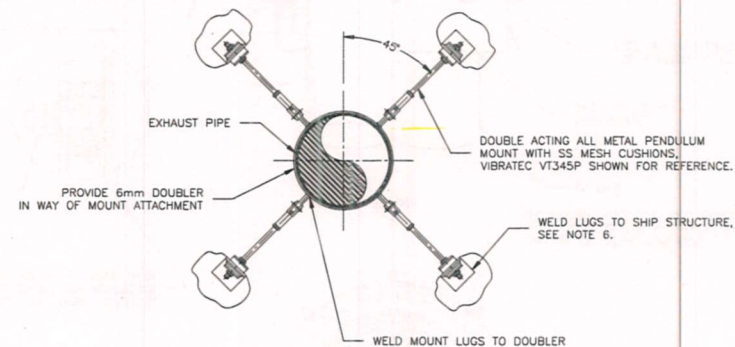
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APPLY TO SPECIFIC PIPE SIZE AND INSTALLATION



### TYPICAL ANCHOR RAFT DETAIL

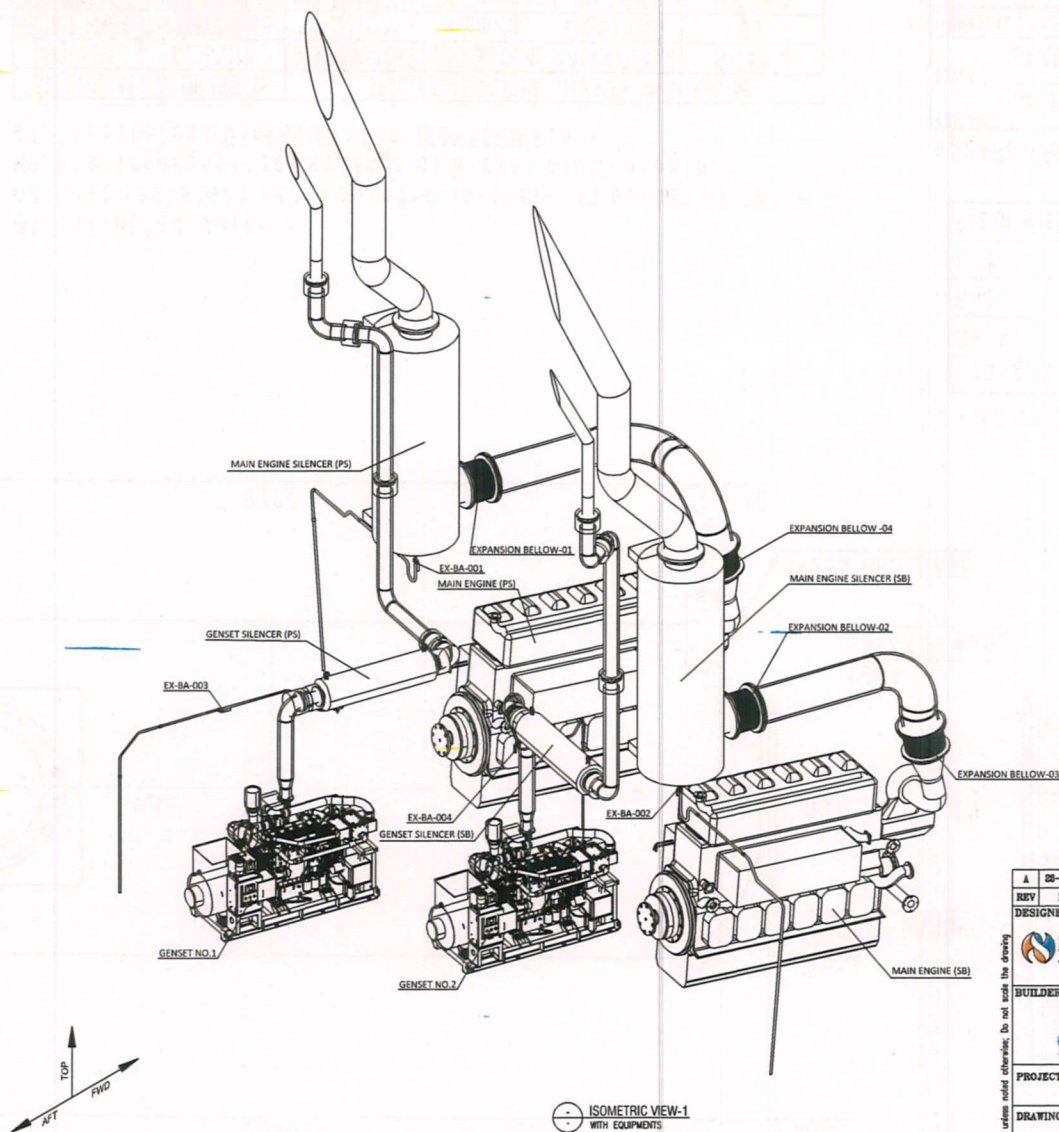
RESERVATION 3

TYPICAL ONLY - NOT TO SCALE  
APPLY TO SPECIFIC PIPE SIZE AND INSTALLATION





### TYPICAL GUIDE - VERTICAL PIPE

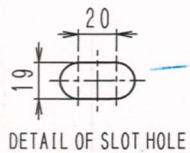
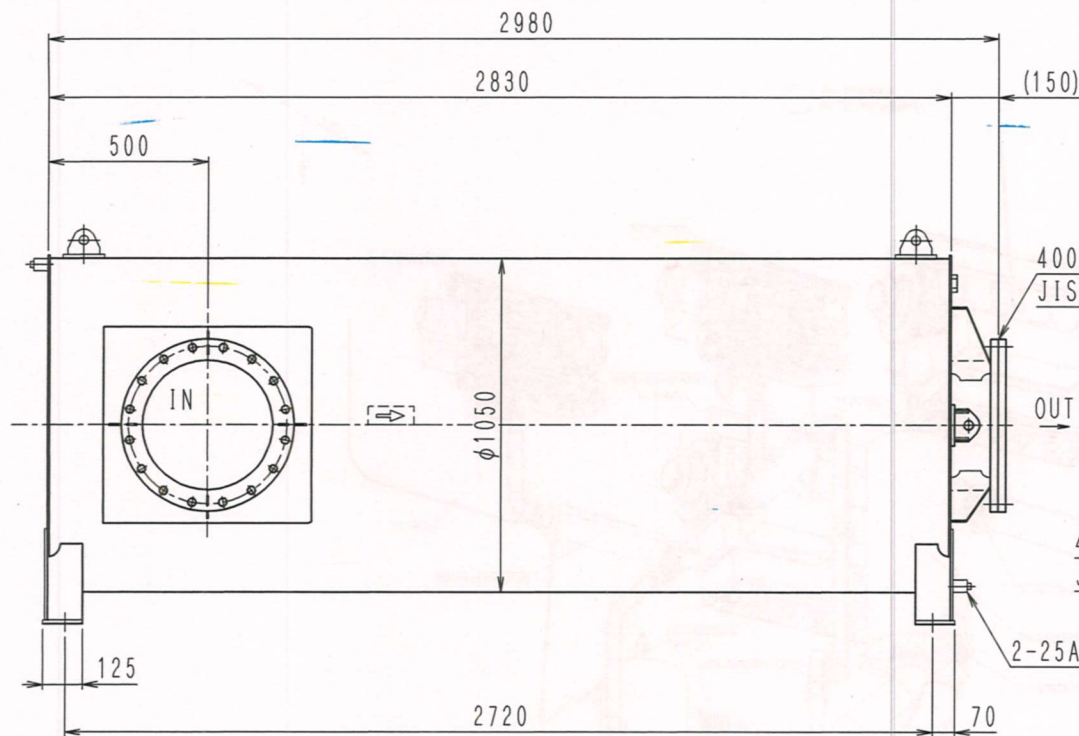
TYPICAL ONLY - NOT TO SCALE  
APPLY TO SPECIFIC PIPE SIZE AND INSTALLATION



All dimensions in mm unless stated otherwise. Do not scale the drawing.

A		08-04-2025	AVU	APS	ISSUED FOR REVIEW  Revision Subject		
REV	DATE	DRAWN	CHECKED				
DESIGNER				<b>S&amp;O MARITIME SERVICES PVT. LTD.</b> Cheriyappalassery, Mekkad PO, Nedumbassery (NH-544) Ernakulam 683588, Kerala, India E-mail : info@SandOmaritime.com, Web : www.SandOmaritime.com			
							
BUILDER				<b>HOOGHY COCHIN SHIPYARD LTD</b> Satyen Bose Road, P.O. Danesh St. Lane, Howrah - 711 109, West Bengal, India.			
							
PROJECT/VESSEL					YARD NO:		
40T BOLLARD PULL TUG					01124001/01224002		
DRAWING NAME							
ARRANGEMENT AND ISOMETRIC DRAWING-MACHINERY EXHAUST SYSTEM							
DRAWING NO:		REV	SHEET	SCALE	SIZE		
01124001/01224002-700-323		A	03 OF 14	NTS	A2		
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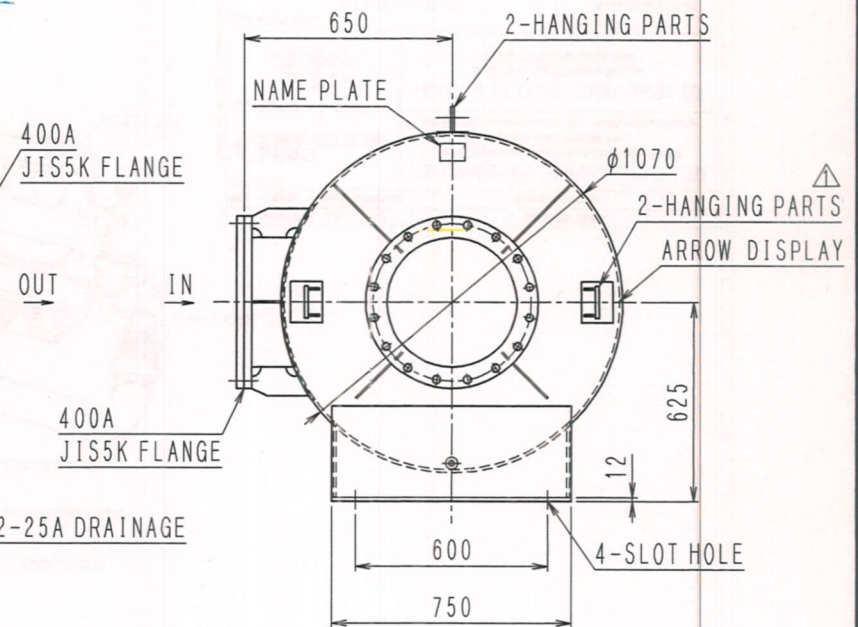




- ※1. Estimated value  
 ※2. Heat resistant resin painted (silver) It paints it twice  
 ※3. Electrodeposited coatings of Nickel plus Chromium  
 ※4. Electroless Nickel Plated (KANIGEN Plated)

No.	REVISION	DATE
△	English translation, Add, hanging parts	2025. 01. 23 M. Tomita

SPECIFICATIONS OF ENGINE		SPECIFICATIONS OF SILENCER WITH ENGINE	
MODEL	6L25HX	ATTENUATION	25dB (A) O. A.
OUTPUT POWER	1343kW/750min <sup>-1</sup>	MAIN MATERIAL	SS400
GAS QUANTITY OF FLOW	5.09m <sup>3</sup> /s (500℃※1)	GAS VELOCITY INLET	42m/s
		GAS VELOCITY OUTLET	42m/s
NOISE LEVEL		WEIGHT	930kg
		FLANGE SIZE INLET	400A
		FLANGE SIZE OUTLET	400A
		HEAT RESIST TEMP	500℃



## • ACCESSORIES

Flange	400A JIS5K	SS400	2PCS
Gasket	400A JIS5K	Non-Asbestos	2PCS
Bolt	M22x85	CS ※3	32PCS
Nut	M22	CS ※4	32PCS
Plain washer	M22	CS ※3	64PCS

\*SPARK ARRESTER BUILT-IN

FOR SHIP

CUSTOMER IHI Power Systems Co., Ltd.		LOCATION Hooghly Cochin Shipyard Ltd.	
TITLE EXHAUST GAS SILENCER		TYPE FKA-400VMG1	
APPROVAL	CHECKER	DESIGNER	TRACER
M. Tomita	T. Mochizuki	T. Mochizuki	
SCALE 1:16		SIZE A3	UNIT mm
PARTS No. 11601744-000		DATE 2024. 07. 29	
DRAWING No. 1B42453-000			

SK Tech CO., LTD.