

वैज्ञानिक तथा औद्योगिक अनुसंधान परिषद्
Council of Scientific & Industrial Research
राष्ट्रीय वांतरिक्ष प्रयोगशालाएं
National Aerospace Laboratories



CSIR - NAL Estd. 1959
ISO 9001 : 2015
Certified Organization

INVITATION FOR BIDS/NIT

Tender No. NAL/PUR/CSMST/105/21-Y

Dated: 08-Oct-2021

CSIR- National Aerospace Laboratories (NAL), Bengaluru, India is one of the premier laboratories under Council of Scientific and Industrial Research (CSIR), an autonomous body under Department of Scientific and Industrial Research, Government of India, New Delhi. CSIR-NAL is a Science and Knowledge based Research, Development and Consulting Organization. It is internationally known for its excellence in Scientific Research in Aerospace Engineering.

The Director, CSIR-NAL invites online quotation for procurement of the following item(s) for day to day research work.

Sl.No.	Description of Items	Unit	Quantity
1	Supply, Fabrication, Installation, Pressure Testing, Painting and Commissioning of Vacuum System with Accessories.	Set	01
Please refer annexure for detailed specification			

Single / Double Bid	Two Bid	Tender Type	Limited
Bid Security (EMD) (in INR)	Bid Security Declaration should be enclosed with quotation	Bid submission end date	28-Oct-2021 10.00 Hrs
Performance Security	3% of the purchase order value	Bid opening date	29-Oct-2021 11.00 Hrs

01. Tender Documents may be downloaded from Central Public Procurement Portal <https://www.etenders.gov.in>. Aspiring Bidders who have not enrolled/ registered in e- procurement should enroll/ register before participating through the website <https://www.etenders.gov.in>. The portal enrolment is free of cost. Bidders are advised to go through instructions provided at 'Instructions for online Bid Submission'.
02. Tenderers can access tender documents on the website (For searching in the NIC site <https://www.etenders.gov.in>, kindly go to Tender Search option, select tender type and select ' Council of Scientific and Industrial Research' in organization tab and select NAL-Bengaluru-CSIR in department type. Thereafter, Click on "Search" button to view all CSIR-NAL, Bengaluru tenders). Select the appropriate tender and fill them with all relevant information and submit the completed tender document online on the website <https://www.etenders.gov.in> as per the schedule given in the next page.
03. Either the Indian Agent on behalf of the Foreign principal or the Foreign principal can bid directly in a tender but not both. However, the offer of the Indian Agent should also accompany the authorization letter from their principal. To maintain sanctity of tendering system, one Indian Agent cannot represent two different Foreign principals in one tender.
04. Unsolicited / conditional / unsigned tenders (Quotations)/Quotations received after the due date and time **shall be summarily rejected**. The Bidder shall comply the terms and conditions of the tender, failing which, the offer shall be liable for rejection.
05. The bids of those Bidders failing to comply with the following clauses will be summarily rejected
 - a. The Bidders proposing to supply finished products directly/indirectly from vendors of countries sharing the land border with India should submit copy of registration done with the Ministry of Home Affairs and Ministry of External Affairs.
 - b. If the Products supplied are not from vendors of countries sharing land border with India, the Bidders have to enclose a declaration to that effect.

पी बी सं. 1779, एचएएल एयरपोर्ट रोड , कोडिहल्ली, बेंगलुरु - 560 017, भारत,
P B No 1779, HAL Airport Road, Kodihalli, Bengaluru - 560 017, INDIA
फोन / Phone : (का./ Off) : +91 - 80 - 2508 6040 - 45, फैक्स / FAX : +91-80-2526 2611



<http://www.nal.res.in>

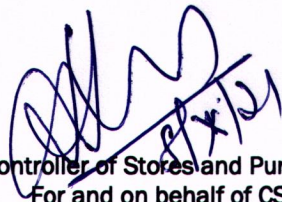


purchasek@nal.res.in



CSIR-National Aerospace Laboratories, Bengaluru-560 017, INDIA

06. Bidders are requested to refer to the instruction regarding Procurement Policies for Make in India issued by Ministry of Commerce and Industry, Department of Industrial Policy and Promotion dated. 28-May-2018 and 4-Jun-2020 and guidelines as and when issued
07. **The prospective bidders are requested to refer to the Standard Terms and Conditions available on NAL Internet (www.nal.res.in) under the icon Tender-Purchase before formulating and submitting their bids**
08. The Director, CSIR- National Aerospace Laboratories, Bengaluru reserves the right to accept any or all the tenders either in part or in full or to split the order without assigning any reasons there for.
09. Participation in this tender is by invitation only and is limited to the selected bidders. Unsolicited offers are liable to be ignored. However, bidders who desire to participate in such tenders in future may bring it to the notice of Procuring Entity and apply for registration


Controller of Stores and Purchase
For and on behalf of CSIR

**SUPPLY, FABRICATION, INSTALLATION, PRESSURE TESTING,
PAINTING AND COMMISSIONING OF VACUUM SYSTEM WITH
ACCESSORIES AS PER FOLLOWING SPECIFICATIONS**

SCHEDULE 1

TECHNICAL SPECIFICATIONS

1. SCOPE OF WORK:

This work is required as add on to the existing vacuum system for various facilities installed at CSMST Division, NAL. The entire work has to be carried out on **turnkey basis**. The firm has to supply, fabricate and install the pipelines and integrate all valves as per the layout/ drawing provided by NAL / In situ guidelines by NAL personnel. The supply of vacuum pumps, pipes, valves, pipe fittings such as flanges, fasteners, gaskets, elbows, tee, pipe clamps, pipe brackets, anchors for fixing the brackets/clamps, necessary civil works, assembly of all the pipe lines and valve junctions as per the drawing, pressure testing, painting (Pneumatic testing) and commissioning of whole piping system is in the scope of supply.

Major tasks involved are as follows:

- a. Supply and installation of vacuum pumps
- b. Fabrication, Supply and installation of vacuum receiver as per NAL drawing
- c. Fabrication and installation of Vacuum pipe lines including valves.
- d. Painting of all pipe lines and brackets.
- e. Supply and installation of vacuum hoses with QDC as per the enclosed specifications

2. DETAILED SCOPE OF WORK

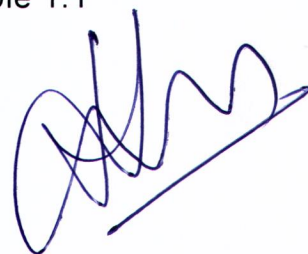
a. Supply and installation of vacuum pumps

- i. Supply of Single stage oil sealed, rotary vane vacuum pump with one charge of Molecular distilled oil as per specification mentioned in Table 1.5.
- ii. Installation of Vacuum Pump with simple Base frame, anchored to the ground.
- iii. Anchoring of vacuum pumps.

Fabrication Supply and installation of vacuum receiver as per NAL drawing

Scope of work involves

- i. Fabrication of Vacuum Receiver
- ii. Anchoring of vacuum receiver to the floor
- iii. pneumatic testing of vacuum receiver and pipe lines to the pressure of 10 bra(g).
- iv. Painting of external surface as per specifications given at Table 1.1
- v. Integrating the vacuum receiver with vacuum pipe line.



c. Fabrication of Vacuum piping.

Scope of work involves

- i. supply of pipes, valves, flanges, gauges, gaskets, fasteners, fittings, pipe clamps, pipe supports, anchor fasteners, elbows, Tee etc. as mentioned in the BOM.
- ii. Fabrication and routing of Vacuum pipe line as per the layout mentioned in the drawing.
- iii. Pneumatic testing of the pipe line as per user requirement.
- iv. Providing M.S. Support to the pipe line and anchoring it to wall / Floor.
- v. Installation of vacuum pumps as per the layout drawing.
- vi. Providing M.S. base frame to the vacuum pumps, fabricated out of ISMC100.
- vii. Vacuum stand test of the entire vacuum piping.

f. Supply of End Connection Accessories

- i. Supply of Polyurethane (P.U) Spiral Tube as per specification mentioned in table 1.6
- ii. Supply of Quick disconnect couplings with NRV on both ends as per specification mentioned in table 1.7

e. Painting of all pipe lines with supports and brackets

Scope of work involves

- i. Painting of all vacuum lines with white color including primer as per the table 1.1.
- ii. Painting of all brackets and M.S. Support with black color including primer as per table 1.1.

DRAWINGS:

NAL will provide the layout drawings. Based on these drawings, the supplier has to supply, fabricate and install the pipe lines as per the enclosed layout drawings. Some minor changes may happen during the execution of the work, for which the vendor should accept. Bill of materials are given in the layout drawings which are attached here with.

3. GENERAL SPECIFICATIONS

Table 1.1 Painting details

Surface preparation: Mechanical wire brushing	PRIMER	BP ROZC IS2074	MIN. 30 MICRONS	GREY	BERGER
	FINISH	BERGERTHANE FINISH/ LUXSOL HIGH GLOSS ENAMAL PAINT	Min.30 microns	Vacuum line: White Brackets: Black.	BERGER

Table 1.2 Ball Valves specifications

Make	L&T
Bore	Full Bore
Construction	3-piece
Seat	PTFE
End Connections	Socket Weld

Table 1.3 Pipe Specifications

Make	Tata / Jindal
Type	Carbon steel pipes to IS 1239 class C
Pipe fittings	Seamless forged fittings

Table 1.4 Vacuum Gauge Specifications

(Note: Gauge should have valid calibration certificate)

Make	Forbes Marshall
Dial Sizes	100mm,
Accuracy	(10~90% of scale): +/- 0.5 % FSD
Standard Range / Working Pressure	-760 to 0 mm Hg
Operating Temperature	-29° C to 270° C
Ambient Temperature	20° C to 65° C
Sensing Element / Element Materials	Bourdon Tube / SS316
Movement / Connection Material	SS316
Standard Connections	1/2"NPTM
Casing / Dial	Stainless Steel
Pointer Window Options	Glass
Weather Protections	IP55
Mounting Options	Bottom Entry - Direct Mounting
Accessory	Adapter for gauge ½" BSPTF and other side ½" BSPTM for process connection

Table 1.5 Vacuum Pump Specifications

(Note: Vacuum Pump should accompany with valid Test & warranty certificate)

SL	Particulars	Value	
01	Nominal Pumping speed@50 Hz	60	
02	Make	HHV	
03	Model	SP65	
02	Ultimate vacuum (Total Pressure)	Gas ballast closed	0.1 mbar
		Gas ballast open	1.5 mbar
03	Max Nominal Power rating@50 Hz	1.5 kW	
04	Inlet Connection	G 1 ¼" F	
05	Exhaust Connection	G 1 ¼" F	
06	Operating Voltage	3 Phase, 380-440 V, 50 Hz	
07	Ma. Pump speed	1500rpm	
08	Ambient temperature	10 to 40°C	
09	KF 40 clamp set with both side flanges	12 sets	
10	KF 40 O ring holder with O ring	12 sets	
10	SS Corrugated flexible hose with KF40 flange welded on both sides (SS Bellows)	150mm Length with KF 40 connections on both sides - 4 sets	
11	Quantity	04 Nos	

Table 1.6 Polyurethane (P.U) Spiral Tube Specifications

SL	Particulars	Value
01	Outer Diameter of Tube	12 mm
02	Inner Diameter of Tube	8 mm
03	Operating Pressure	10 bar(g)
04	Operating Temperature	15°C to 60°C
05	Working Length (Expanded Length)	15 meter
06	End Connections	¼" BSPTM Metallic Fitting
07	End Connection protection	Spring Guarded
08	Tube Color	White

Table 1.7 Specifications for Quick disconnect coupling with NRV on both ends

SL	Particulars	Value
01	Construction	Two piece (Connector & Nipple)
02	Connector	¼" BSPF
03	Nipple	¼" BSPTM
04	Operating Pressure	10 bar(g)
05	Material	Carbon steel

Acceptance Test Plan:

1. All the parts supplied will be inspected for meeting the specifications as mentioned at Section 3.
2. Vacuum pumps will be inspected for the smooth operation and to achieve the specified vacuum level.
3. Vacuum reservoir has will be inspected as per the drawing for meeting material specifications and will be pneumatic tested a@ 10 barg.
4. The complete pipe line will be subjected to Pneumatic test @10 barg .
5. Quality of workman ship should be satisfactory.

TERMS AND CONDITIONS

1) WARRANTY:

The total work must be guaranteed for raw materials and workmanship for a period of 12 months after being put in operation at NAL and accepted by NAL. During the warranty period, all the defective parts should be replaced by the contractor to NAL's satisfaction, free of cost.

2) QUALITY & WORKMANSHIP:

The quality and workmanship shall comply with the specifications in all respects and to the satisfaction of NAL.

3) Minor changes

Firm should agree to carry out any minor changes like pipe routing change etc., to meet the scope of work, if any.

4) BILL OF QUANTITIES

The firm has to complete the whole job based on the given layout. However, quantities mentioned in the BOM has to be supplied whether used in the fabrication or not.

5) CLARIFICATION:

For any clarifications on the specifications and drawings, please contact Senior Stores and Purchase officer, NAL.

- 6) No electrical works are in the scope of supplier. Powering of vacuum pumps will be NAL scope.



SCHEDULE – 3
LIST OF DRAWINGS ENCLOSED

- 1) CSMST-VACUUM LINE-001 – Schematic View of Vacuum Line - 1
- 2) CSMST-VACUUM LINE-002 – Schematic View of Vacuum Line – 2
- 3) GA of Vacuum Receiver, Dwg. No. CSM VAC01

BILL OF MATERIALS - VACUUM LINE - ADDITIONAL REQUIREMENT

P.No.	DESCRIPTION	QTY	SIZE	MATERIAL	REMARKS
1	PIPE (ERW)	10	DN 25 x Sch 40 x 6000	IS - 1239 CL. C	
2	ELBOW (SMLS) L.R. 90°	30	DN 25 x Sch 40 x BW	SA - 234 WPB	
3	Tee (SMLS) EQUAL	02	DN 80 X Sch 40 X BW	SA - 234 WPB	
4	Tee (SMLS) UNEQUAL	10	DN 80 X DN 80 X DN 40 X BW	SA - 234 WPB	
5	BALL VALVE (3-piece)	06	DN 25 x SW	C.S.	
6	THREADED COLLAR (1/2 Coupling)	30	DN 15	C.S.	
7	SPIRAL TUBE WITH SPRING GAURD	20	DIA 12 x 1/4" BSPTMX15 meter Extended L	P.U	
8	QUICK DISCONNECT COUPLING	30	1/4" BSPF (QDC with NRV)	C.S.	
9	Elbow Reducer (SMLS) L.R. 90°	01	DN 80 X DN 40	SA - 234 WPB	
10	Concentric Reducer (SMLS)	10	DN 40 X DN 25	SA - 234 WPB	
11	VACUUM GAUGE (0 to -760 mm Hg)	12	100 OD, 1/2" BSPTM X Direct Mounting	STD	
12	HOSE HANGER / U - CLAMP	12	25MM W X 6MM THK X 200MM LG	M.S	
13	Threaded Tee (SS) EQUAL	12	DN 25	-	
14	HEX NIPPLE	20	DN 25 X DN 15	-	
15	ELBOW (SMLS)	10	DN 80 X Sch 40	SA-234 WPB	
16	PIPE (ERW)	10	DN 80 x Sch 40 x 6000	IS - 1239 CL. C	
17	BALL VALVE (3-piece)	06	DN 25 x THREADED	C.S.	
18	DELETED	-	-	-	
19	Tee (SMLS) EQUAL	12	DN 25 X Sch 40 X BW	SA - 234 WPB	
20	BALL VALVE	01	DN 80 x CL 150 X SORF	C.S.	
21	DELETED	-	-	-	
22	ELBOE Reducer (SMLS) L.R. 90°	12	DN 25 x DN 15 X BW	SA - 234 WPB	
23	Pipe Nipple	12	DN 15 X 75 LG	C.S.	
24	Teflon Tape	20	CHAMPION	-	
25	FLANGE	20	DN 80 x CL 150 X SORF	SA-105	
26	BOLTS + NUT + WASHER (Heavy)	80+80+160	M16 X 75 LG	SA-193 Gr. B	
27	GASKET	15	DN 80 x CL 150 X SORF X 3 THK	PTFE	
28	DELETED	-	-	-	
29	L-Angle	05	75 X 75 X 4 THK	M.S	
30	U-CLAMP With Double Nut & Washer	25	M16 X DN 80 Pipe	SA-193 Gr.B	
31	U-CLAMP With Double Nut & Washer	30	M10 X DN 25 Pipe	SA-193 Gr.B	

NOTE

- Existing Lines shown in dotted
- Additional Requirement is shown in Solid line with dotted box
- Additional Requirement is 11 Drop down lines of 25 NB + Extension of 100 NB Line (approx 40 meter)
- Over Head Line at 6 Meters above Ground
- Drop down Line length upto 1.5 Meters above ground

- VACUUM POINT
- ⊕ BALL VALVE
- ⊕ VACUUM GAUGE WITH GAUGE COCK
- ⊕ THREADED COLOR WITH PLUG
- ⊕ FILTER
- ⊕ SPIRAL PU TUBE

TOLERANCE

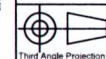
Except as stated
SURFACE
FINISH

Except as stated

SCALE

Except as stated

SIZE : A1



CSIR - NATIONAL AEROSPACE LABORATORIES
BANGALURU, INDIA
Centre for Societal Missions & Special Technologies

TITLE: CSMST CENTRALISED PRESSURE AND VACUUM LINE

SUB-TITLE:

SHEMATIC VIEW OF VACUUM LINE-1

DRG. NO.

CSMST-GEN-MB-V&P LINE-000-000-001

PROJECT NO.: ---

	NAME	SIGN	DATE
DESIGN	JRS		
DRAWN	SATISHA		28.05.21
CHECK	JRS		
APPD	JRS		

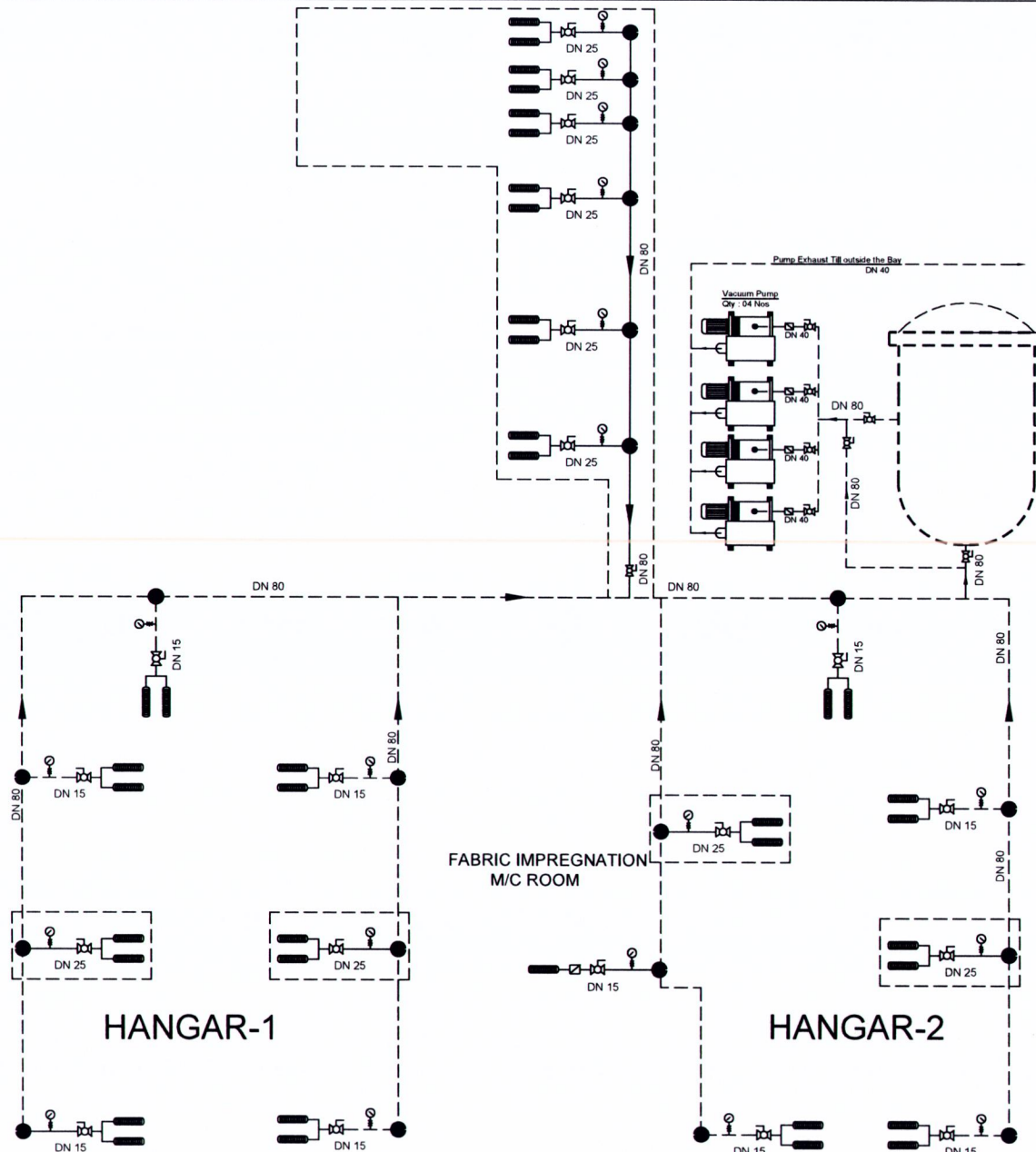
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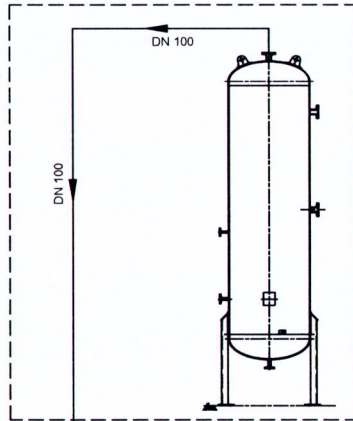
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FABRIC IMPREGNATION
M/C ROOM

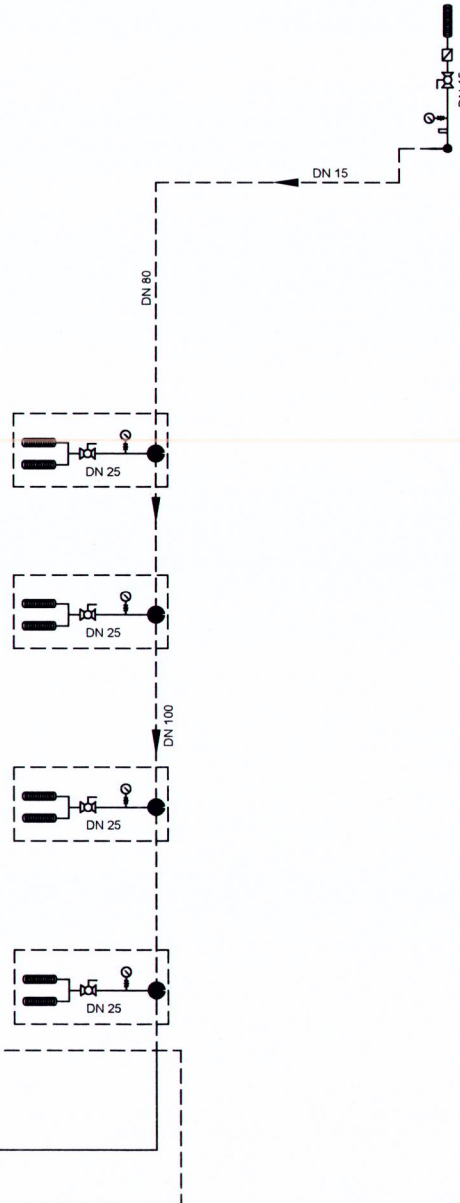
HANGAR-1

HANGAR-2





HANGAR-3



BILL OF MATERIALS - VACUUM LINE					
P.No.	DESCRIPTION	QTY	SIZE	MATERIAL	REMARKS
1	PIPE (ERW)	10	DN 100 x Sch 40 x 6000	IS - 1239 CL. C	
2	VACUUM PUMP	04	HHV MAKE SP 65		
3	PIPE (ERW)	04	DN 25 x Sch 40 x 6000	IS - 1239 CL. C	
4	ELBOW (SMLS) L.R. 90°	06	DN 100 x Sch 40 x BUTTWELD	SA - 234 WPB	
5	ELBOW (SMLS) L.R. 90°	10	DN 25 x Sch 40 x BUTTWELD	SA - 234 WPB	
6	Tee (SMLS) UNEQUAL	06	DN 100 x DN 100 x DN 40 X Sch 40 x BW	SA - 234 WPB	
7	BALL VALVE (3-piece)	05	DN 25 x THREADED	C.S.	
8	BALL VALVE (3-piece)	05	DN 25 x SW	C.S.	
9	HEX NIPPLE	15	DN 25 x DN 15	C.S.	
10	THREADED COLLAR (1/2 Coupling)	20	DN 15 x THREADED	C.S.	
11	SPIRAL TUBE WITH SPRING GAUARD	10	DIA 12 x 1/4" BSPTM X 15 meter Extended	P.U	
12	QUICK DISCONNECT COUPLING	10	1/4" BSPF (QDC with NRV)	C.S.	
13	Elbow Reducer (SMLS) L.R. 90°	02	DN 100 X DN 50	SA - 234 WPB	
14	Reducer (SMLS)	06	DN 40 X DN 25	SA - 234 WPB	
15	VACUUM GAUGE (0 to -760 mm Hg)	06	100 OD, 1/2" BSPTM X Direct Mounting	STD	
16	Tee (SMLS) EQUAL	05	DN 25 X Sch 40 X BW	SA - 234 WPB	
17	HOSE HANGER / U - CLAMP	10	25MM W X 6MM THK X 200MM LG	M.S	
18	SS Corrugated flexible hose KF40	04	300 MM	S.S	
19	FLANGE KF 40	04	KF 40 connections	S.S	
20	Tee THREADED EQUAL	10	DN 25	SS	
21	FLANGE	20	DN 100 X CL 150 X SORF	C.S.	
22	FLANGE KF 40 & CLAMP	04	DN 40 X KF 40	C.S.	
23	ELBOE Reducer (SMLS) L.R. 90°	05	DN 25 x DN 15 X BW	SA - 234 WPB	
24	Pipe Nipple	06	DN 15 X 75 LG	C.S.	
25	BOLTS + NUT + WASHER (Heavy)	150+150+300	M16 X 75 LG	SA-193 Gr. B	
26	GASKET	15	DN 100 x CL 150 X SORF X 3 THK	PTFE	
27	BLIND FLANGE	05	DN 40 X CL 150 X SORF	SA-105	
28	L-Angle	05	75 X 75 X 4 THK	M.S	
29	U-CLAMP With Double Nut & Washer	25	M16 X DN 100 Pipe	SA-193 Gr.B	
30	U-CLAMP With Double Nut & Washer	30	M10 X DN 25 Pipe	SA-193 Gr.B	

NOTE:

- Existing Lines shown in dotted
- Additional Requirement is shown in Solid line with dotted box
- Additional Requirement is 04 Drop down lines of 25 NB + DN 100 Line till Reciever & Inter connection between two parallel DN 100 Lines
- Over Head Line at 6 Meters above Ground
- Drop down Line length upto 1.5 Meters above ground

- VACUUM POINT
- ⊕ BALL VALVE
- ⊕ VACUUM GAUGE WITH GAUGE COCK
- ⊕ THREADED COLOR WITH PLUG
- ⊕ FILTER
- ⊕ SPIRAL PU TUBE

TOLERANCE		CSIR - NATIONAL AEROSPACE LABORATORIES BANGALURU, INDIA		PROJECT NO.: --	
Except as stated	SURFACE FINISH	Centre for Societal Missions & Special Technologies		NAME	SIGN
Except as stated		TITLE: CSMST CENTRALISED PRESSURE AND VACUUM LINE		DESIGN	JRS
Except as stated	SCALE	SUB-TITLE:		DRAWN	SATISHA
Except as stated	SIZE: A1	SHEMATIC VIEW OF VACUUM LINE-2		CHECK	JRS
DRG. NO.		CSMST-GEN-MB-V&P LINE-000-000-002		APPD	JRS
Third Angle Projection				ISSUE	
				0	

BID-SECURING DECLARATION FORM

Date: _____

Bid No. _____

To (insert complete name and address of the purchaser)

I/We. The undersigned, declare that:

I/We understand that, according to your conditions, bids must be supported by a Bid Securing Declaration.

I/We accept that I/We may be disqualified from bidding for any contract with you for a period of one year from the date of notification if I am /We are in a breach of any obligation under the bid conditions, because I/We

(a)	have withdrawn/modified/amended, impairs or derogates from the tender, my/our Bid during the period of bid validity specified in the form of Bid; or
(b)	having been notified of the acceptance of our Bid by the purchaser during the period of bid validity
	(i) fail or refuse to execute the contract, if required, or
	(ii) fail or refuse to furnish the Performance Security, in accordance with the Instructions to Bidders.

I/We understand this Bid Securing Declaration shall cease to be valid if I am/we are not the successful Bidder, upon the earlier of (i) the receipt of your notification of the name of the successful Bidder; or (ii) thirty days after the expiration of the validity of my/our Bid.

Signed: (insert signature of person whose name and capacity are shown)
in the capacity of (insert legal capacity of person signing the Bid Securing Declaration).

Name: (insert complete name of person signing the Bid Securing Declaration)

Duly authorized to sign the bid for an on behalf of: (insert complete name of Bidder)

Dated on _____ day of _____ (insert date of signing)

Corporate Seal (where appropriate)

Note:

1. In case of a Joint Venture, the Bid Securing Declaration must be in the name of all partners to the Joint Venture that submits the bid.
2. Bid Security declaration must be signed in by the Proprietor/CEO/MD or equivalent level of Officer of the company.

