भारत सरकार
अंतरिक्ष विभाग
सतीश धवन अंतरिक्ष केंद्र शार
श्रीहरिकोटा रेंज डा.घ. 524 124
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सत्यमेव जयते

Goverment of India
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निविदा सूचना सं. TENDER NOTICE NO. SDSC SHAR/Sr.HPS/PT/RO-LSSF/ 07/2025-2026

भारत के राष्ट्रपति की ओर से वरि. प्रधान क्रय एवं भंडार, सतीश धवन अंतरिक्ष केंद्र श्रीहरिकोटा निम्नलिखित वस्तुओं के लिए ऑनलाइन निविदाएं आमंत्रित करते हैं:- On behalf of President of India, Sr. Head, Purchase and Stores, SDSC SHAR, SRIHARIKOTA invites on line quotations for the following.

क्र.सं. Sl No	संदर्भ सं. Ref. No.	विवरण Description	मात्रा Qty.
01.	**SHAR /LSSF/ 20250002[illegible]6 New E-Procurement [Public Tender – Two Part]**	**Fabrication Contract for Piping & Structures**	**1 Lot**

निविदा दस्तावेजों को डाउनलोड करने की अंतिम तिथि Last Date for downloading of tender documents : 27.05.2025 at 14:00 hrs.
ऑनलाइन निविदा जमा करने की अंतिम तिथि Due Date for submission of bids online : 27.05.2025 at 14:00 hrs.
निविदाएं खोलने की नियत तिथि Due Date for opening of tenders : 27.05.2025 at 14:05 hrs.

निविदाकार के लिए निर्देश Instructions to Tenderers:

निविदाएं ईजीपीएस के माध्यम से ही भेजी जाएं तथा कोई निविदा शुल्क लागू नहीं होगा।
Bids shall be submitted on line through EGPS only and No tender fee shall be applicable.

01. कार्य के सम्पूर्ण विवरण/जानकारी तथा नियम व शर्तों इत्यादि के लिए संलग्न अनुलग्नक को देखें। / For full details/scope of work and terms and conditions etc., please see the enclosed annexures.

02. इच्छुक निविदाकार इसरो की ई-खरीद वेबसाइट इसरो न्यू ई-प्रोकुरमेंट www.eproc.isro.gov.in से ई-निविदा डाउनलोड और अपनी निविदा ई-खरीद पोर्टल पर ऑनलाइन जमा कर सकते हैं। डाक / वाहक / स्वयं द्वारा प्राप्त निविदाओं पर विचार नहीं किया जाएगा। / Interested tenderers can download the e tender from ISRO e-procurement website www.eproc.isro.gov.in and submit the offer on line in the e-procurement portal. Offers sent physically by post/courier/in person will not be considered.

03. निविदा दस्तावेज इसरो की वेबसाइट www.isro.gov.in इसरो न्यू ई-प्रोकुरमेंट वेबसाइट www.eproc.isro.gov.in तथा सतीश धवन अंतरिक्ष केंद्र शार की वेबसाइट www.shar.gov.in पर भी उपलब्ध हैं। इन्हें केवल ई-खरीद पोर्टल से डाउनलोड और निविदा ऑनलाइन जमा कर सकते हैं। / Tender documents are also available on ISRO website www.isro.gov.in,ISRO New e-procurement website www.eproc.isro.gov.in and SDSC SHAR, Sriharikota website www.shar.gov.in. The same can be down loaded and offer submitted on line in the new e-procurement portal only.

04. निर्धारित तिथि/समय के पश्चात प्राप्त बोलियों पर विचार नहीं किया जाएगा। / Quotations received after the due date/time will not be considered.

05. वरि. प्रधान क्रय एवं भंडार, सतीश धवन अंतरिक्ष केंद्र श्रीहरिकोटा के पास किसी भी या सभी निविदाओं को स्वीकार / अस्वीकार करने का अधिकार है। / Sr. Head, Purchase and Stores, SDSC-SHAR, Sriharikota reserves the right to accept or reject any/or all the quotations.

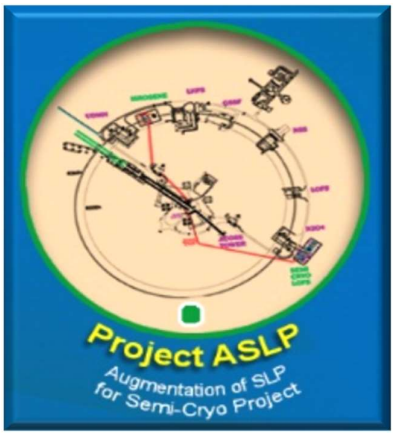
06. GeM GARPTS Report ID: GEM/GARPTS/01052025/8YXBXONQ4JIX

दिनांक DT: 05.05.2025

वरि. प्रधान क्रय एवं भंडार
Sr. HEAD PURCHASE AND STORES

AUGMENTATION OF SECOND LAUNCH PAD PROJECT (ASLP)

TECHNICAL SPECIFICATIONS FOR PIPING, FABRICATION AND ERECTION OF PNEUMATIC EQUIPMENT



April-2025
SATISH DHAWAN SPACE CENTRE SHAR
SRIHARIKOTA – 524124

Technical Specifications for SS304L/SS316L Piping, Fabrication and Erection of Pneumatic Equipment

1.0 INTRODUCTION

Augmentation of Second Launch pad (ASLP) Gas system facilities consist of Second Launch Pad- Umbilical Tower (SLP-UT) , Gas Storage Building (CGSS-SLP), Cryo preparation Building (CPB), Stage Preparation Facilities [L110/L40 service Building, Vehicle assembly Building (VAB), Solid Stage Assembly Building (SSAB) and Second Vehicle assembly building(SVAB)], New LOX and NSS Storage, Isrosene facility, existing UH-25 facility, ACOSS Tower located in front of SLP-UT, Mobile Launch Pedestal (MLP). Now onwards all these facilities in this tender document are called **ASLP Facilities.**

This tender document is for carrying out the following works at all the ASLP Facilities. These buildings are spread across first launch pad complex and Second Launch Pad Complex approximately at a radial distance of 2 km max from SLP-UT. SLP-UT is 10 km from Sriharikota main gate and 25Km from Sullurpeta Bus stand, Tirupathi (Dt).

1.1 Erection of various Pneumatic Equipment'sinSLP-UT,CPB and Gas Storage

1.2 Laying, fabrication and testing of Stainless Steel (SS) 304L/SS316L pipelines in yard, trenches, across road in hume pipes, pipe support welding on the pipe pedestals and clamping of pipe lines.

1.3 Fabrication and testing of pipelines shall be carried out in all ASLP facilities. Apart from the ASLP facilities fabrication and testing shall be carried out for pipe lines connecting between facilities.

1.3.1 Gas storage building (CGSS-SLP).

a) Fabrication of inlet and outlet pipe line headers for high pressure 2 Cu.M -400 bar gas cylinders and interfacing to the inlet and outlet valve boxes.

b) Interfacing of outlet valve box lines to the existing/new equipment of Remote Valve Units (RVUs).

1.3.2 CGSS-SLP to CPB, Liquid Oxygen facility (LOX) New and Old, Liquid Nitrogen Facility, Isrosene facility.

1.3.3 CPB to SLP-UT, New LOX facility, Existing UH25 storage facility to Isrosene Storage facility.

1.3.4 At different elevations in Launch pad (UT) from 0 mtrs to 60 mtrs.

1.3.5 Inside Mobile Launch pedestals (MLP) and Inside Acoustic Tower (In front of SLP-UT).

1.3.6 Along pipe cutouts, columns and different elevations inside the stage preparation facilities (L110/L40 service Building, Vehicle assembly Building (VAB), Solid Stage Assembly Building (SSAB) and Second Vehicle assembly building (SVAB)).

1.4 Qualification, Testing, documentation, interfacing of piping to the equipment, painting and numbering.

1.5 MS Structural fabrication works for pipe supports and cable trays.

1.6 Drilling of Holes in the MS Supports for fixing the clamps.

1.7 Supply of MS structural material as per Table-6

1.8 Supply of cable trays as per Table-6

1.9 The fabrication works involve laying of pipe lines, TIG welding of SS 304L/SS316L piping/tubing, bending, ball run test, radiography, external weld joint Pickling & Passivation, IPA cleaning/rinsing of the entire pipelines, hydro/pneumatic strength tests, leak testing with GN2, MS supports fixing, drilling of holes in the supports, fixing of clamps, documentation, painting along with necessary MS structural fabrication works. The detailed schedule of work is given in **Annexure-I.**

2.0 SCOPE OF WORK

2.1 Erection of Pneumatic Equipment

2.1.1 The details of the pneumatic equipment for erection are given in **Table-1**.

Table-1

Sl. No	Equipment Description	Qty (Nos)	Tentative location & elevation inside building	Equipment size (M)	Approx. weight Each (Kg)
1.	Remote Valve Units (RVU)	01	Gas storage- (CGSS) & 0.0M	1.2x1.0x2.0	500
2.	Remote Regulation Units (RRUs)	03	CPB / CGSS & 0.0M	1.2x1.0x2.0	500
3.	Remote Valve Enclosures (RVEs)	20	UT-SLP & 6 mts to 50 mts	1.2X0.5X0.5	100
4.	Accumulators (5 Cu.M)	02	On ground in Yard & 0.0M	H (3Mtrs) XD (1.5M)	1300

2.1.2 Erection& alignment of Pneumatic Equipment (Remote Valve Enclosures-RVEs – 20 Nos) at different elevations up to 50 meters inside SLP-UT.

2.1.3 Erection& alignment of Pneumatic Equipment (Remote Valve Units-RVUs and Remote Regulation Units-RRUs) inside CPB and CGSS building at SLP.

2.1.4 The equipment shall be handled with utmost care using proper material handling equipment.

2.1.5 Crane/Lift for lifting RVEs inside SLP-UT will be provided by the department at free of cost up to the nearest point. Mounting of RVEs in exact location inside UT shall be planned manually. Required man power for handling & mounting of RVEs is in the scope of the contractor for the above work.

2.1.6 MS structural supports shall be fabricated over the available embedment for properly mounting the equipment as per the approved drawings.

2.1.7 Crane is not available in SLP-CGSS building and in CPB. Erection of RVU-1 No and RRU-03 Nos shall be carried out manually.

2.1.8 For Erection of accumulators (02 Nos) at SHAR, fork lift or Hydra will be provided by department at free of cost.

2.1.9 If any of the equipment gets damaged during handling or erection, the cost of rectification / replacement will be recovered from the contractor.

2.1.10 Equipment Earthing: All equipment and the pipelines shall be earthed through copper conductors – min of 10 Sq.mm as required at site and connected to the main grid inside /outside the room (CGSS Building & CPB).**Total earthing material (copper conductor 100meters length min of 10 Sq.mm and other accessories) is under contract scope. No extra cost will be paid for this work.**

2.2 Fabrication of SS piping/tubing (SS304L/SS316L) in and around ASLP facilities:

The following are the activities to be carried out as part of fabrication.

2.2.1 Flushing of all pipes with IPA/tampon cleaning and purgingwith dry nitrogen before usage of pipe for fabrication Welding of MSsupports for pipe lines. Drilling of holes in the MS supports and fixing of clamps.

2.2.2 Laying of pipe lines in CGSS-SLP cylinder bay for inlet and outlet pipe line headers, inside the rooms and different elevations in stage preparation facilities and inside MLP and Acoustic Tower located in front of UT.

2.2.3 Laying of pipe lines over pipe pedestals in the yards and trenches.

2.2.4 Edge preparation, fit up of joints, alignment and TIG welding

2.2.5 Bending of pipe lines to required radius based on pipe size.

2.2.6 Dye penetrant test of root runs and final weld as per procedure.

2.2.7 End to end ball run test of all loops as per the ball sizes mentioned **Table-3.**

2.2.8 100% Radiography of all butt-welded joints.

2.2.9 External pickling and passivation of all weld joints.

2.2.10 Hydro/Pneumatic strength test as per standards.

2.2.11 Cleaning of pipe lines with IPA after fabrication.

2.2.12 Dew point measurement checks (better than -55°C) for hydro tested lines.

2.2.13 Checking of cleanliness as per standards.

2.2.14 Fixing of pipe supports.

2.2.15 Interfacing of pipe lines with equipment/gas cylinders/inlet and outlet valve boxes and associated leak checks with GN2.

2.2.16 Painting of pipelines, tubes and numbering.

The details of SS fabrication work for all schedules from 10S to XXS at ASLP project facilities are as per **Table-2** given below.

Table-2

Sl. No	Item Description	Qty (Nos/Meters)
1.	Fabrication of SS pipe butt weld joints (TIG Welding) **with radiography** on Number of Joints basis as per technical specifications for Pipe Size:10NB	500
2.	Fabrication of SS pipe butt weld joints (TIG Welding) **with radiography** on Number of Joints basis as per technical specifications for Pipe Size:15NB	1500
3.	Fabrication of SS pipe butt weld joints (TIG Welding) **with radiography** on Number of Joints basis as per technical specifications for Pipe Size:25NB	2200
4.	Fabrication of SS pipe butt weld joints (TIG Welding) **with radiography** on Number of Joints basis as per technical specifications for Pipe Size:40NB	700
5.	Fabrication of SS pipe butt weld joints (TIG Welding) **with radiography** on Number of Joints basis as per technical specifications for Pipe Size:50NB	500
6.	Fabrication of SS pipe butt weld joints (TIG Welding) **with radiography** on Number of Joints basis as per technical specifications for Pipe Size:65NB	400
7.	Fabrication of SS pipe butt weld joints (TIG Welding) **with radiography** on Number of Joints basis as per technical specifications for Pipe Size:80NB	150
8.	Fabrication of SS pipe butt weld joints (TIG Welding) **without radiography** on Number of Joints basis as per technical specifications for Pipe Size:10NB	200

Sl. No	Item Description	Qty (Nos/Meters)
9.	Fabrication of SS pipe butt weld joints (TIG Welding) **without radiography** on Number of Joints basis as per technical specifications for Pipe Size:15NB	500
10.	Fabrication of SS pipe butt weld joints (TIG Welding) **without radiography** on Number of Joints basis as per technical specifications for Pipe Size: 25NB	300
11.	Fabrication of SS pipe butt weld joints (TIG Welding) **without radiography** on Number of Joints basis as per technical specifications for Pipe Size:40NB	500
12.	Fabrication of SS Tube butt weld joints (TIG Welding) **with radiography** on Number of Joints basis as per technical specifications for Tube Size:6.00 mm & 6.35 mm	500
13.	Fabrication of SS Tube butt weld joints (TIG Welding) **with radiography** on Number of Joints basis as per technical specifications for Tube Size:10.00 mm to 12.7mm	500
14.	Fabrication of SS Tube butt weld joints (TIG Welding) **without radiography** on number of joints basis as per technical specifications for Tubes Size: Tube Size:6.00 mm & 6.35 mm	500
15.	Fabrication of SS Tube butt weld joints (TIG Welding) **without radiography** on number of joints basis as per technical specifications for Tube Size:10.00 mm to 12.7mm	500
16.	Lying of SS pipelines of sizes varying from 10NB to 40NB at Yard, trenches, UT, in side MLP, ACOSS Tower in front of UT and associated fixing of clamps on pipe lines.	7000mtrs
17.	Laying of SS pipelines of sizes from 50NB to 80NB at Yard, trenches, UT, inside MLP, ACOSS Tower in front of UT and associated fixing of clamps on pipe lines.	5000 mtrs

2.3 TIG Welding

2.3.1 The work includes marking, cutting, profiling, aligning, fit up, tack welding, cleaning, chipping, placement of wind shields (For weather protection). Root and final TIG welding by GTAW process only. Argon purity shall be with 99.99% for both shield & purge gas. DP testing of Root & Final Pass (Both Butt and Socket weld types where ever applicable).X-ray/Gamma Ray radiography for all butt weld joints.

2.3.2 TIG Welding of SS Pipes of material SS304L/SS316L (Size varies from 10 NB to 80 NB of various schedules up to XXS) and SS tubes (Sizes from 6 to 12.7mm).

2.3.3 AISI SS308L/SS316Lmaterial shall be used as filler wire for SS TIG welding. It shall meet the requirements of ASME Sec. IX / AWS A5 standards.

2.3.4 Only 6G qualified welders as per ASME Sec. IX with proven track record shall be employed to carryout welding. Qualification of welder need to be carried out in the presence of department QC engineer suiting to the pipe size / schedule requirements. Fabrication Supervisors, Fitters, Fabricators & Grinders should be well experienced

2.3.5 Cutting and edge preparation of pipelines and fittings shall be carried out only with experienced grinders meant for austenitic Stainless-Steel material.

2.3.6 Each fabrication batch consist of minimum of one welder, one fitter, one grinder and two helpers (Minimum Three fabrication batches shall be deployed at a time in different locations with required equipment, material and also additional team to be deployed when demanded).

2.4 Dye penetrant testing

All pipe/tube welding joints shall be tested with Dye-penetrant test after root and final pass for butt welding and for final pass after fillet/socket welding as per ASME Sec.V. No extra cost will be paid for Dye penetrant testing of weld joints.

2.5 Pipe Bending

2.5.1 Cold bending of pipe shall be made to the required angle by using heavy duty manual or hydraulic bending equipment.

2.5.2 Bend radius of minimum 3D-4D shall be maintained to avoid unwanted thinning. Wrinkles and scratches are not permitted on the bends.

2.5.3 Ovality shall be within 8% as per **ASME B 31.3**. Bending shall be carried out up to size 40NB SCH XXS.

Note:

1. No extra cost will be paid for bending of SS Tubes with outer diameter from 6mm to 12.7mm tubes.

2.6 Pipe Laying

2.6.1 This work includes laying of pipe lines in the building, yard connecting two facilities, different elevations in stage preparation facilities (EL: 0 M to EL: 42.0M), different elevations in SLP-UT(EL: 0 M to EL: 50.0M). The details are given below.

2.6.2 Piping inside CGSS building (Gas Cylinder Bay for inlet and outlet header & Pneumatic Board Room).

2.6.3 Inside CBP Building.

2.6.4 CGSS to Launch pad, New and Old facilities of Liquid Oxygen facility (LOX), Liquid Nitrogen Facility, UH25 storage facility, Isrosene storage facility.

2.6.5 CPB to Launch pad, New and Old facilities of Liquid Oxygen facility (LOX), Liquid Nitrogen Facility, UH25 storage facility, Isrosene storage facility, ACOSS Tower.

2.6.6 Inside Mobile Launch pedestals (MLP) & ACOSS Tower.

2.6.7 Along pipe cutouts, columns and different elevations inside the Stage Preparation Facilities.

2.6.8 Work includes alignment of pipes, maintaining of required slopes, proper fixing of flow components, pipe fittings & instruments, fixing of structural pipe supports, fixing of clamps and interfacing of piping circuits to equipment.

2.6.9 Erection of piping includes doubling of pipes, positioning of completed pipeline segments at required locations as per the piping layouts.

2.6.10 MS supports fixing and drilling of holes in MS supports, fixing of clamps shall be carried out for every 2.5…3.0 Meters of pipe length where ever pipe line routing is carried out. **No extra cost will be paid for fixing clamps to the pipe lines.**

2.7 Ball run test

After completion of pipe welding, ball run test to be carried out after radiography and further testing to ensure required minimum bore. The details of ball sizes are given in **Table-3**. SS balls required for the test to be supplied by the party during testing.

Table-3

Sl. No	Pipe/Tube Size	Pipe bore (mm)	Ball size (Min)
1.	6.35(OD) X 1.22 (thk)	3.91	1.0
2.	12.7 (OD)X 2.1 (thk)	8.5	5.5
3.	10NB-SCH 80	10.7	7.5
4.	10NB- SCH 40	12.48	9.0
5.	15 NB - SCH XXS	6.36	3.0
6.	15 NB - SCH 160	11.74	8.5
7.	15 NB - SCH 80	13.84	10.5
8.	15 NB - SCH 40	15.76	12.5
9.	20NB - SCH 160	15.58	12.5
10.	20NB - SCH 80	18.88	15.5
11.	20NB - SCH 40	20.96	17.5
12.	25NB- SCH XXS	15.22	12.0
13.	25NB- SCH 160	20.7	17.5

Sl. No	Pipe/Tube Size	Pipe bore (mm)	Ball size (Min)
14.	25NB- SCH 80	24.3	21.0
15.	25NB- SCH 40	26.64	23.5
16.	40NB- SCH XXS	27.98	24.5
17.	40NB- SCH 160	34.02	30.5
18.	40NB- SCH 80	38.14	34.5
19.	40NB- SCH 40	40.94	37.5

Note:

If the pipeline joints are not qualified during ball run test, it is the responsibility of the contractor to rectify/repair the weld joints without extra cost.

2.8 Radiography:

2.8.1 All butt-welds shall be subjected to radiographic examination with X-Ray/Gamma Ray source as per ASME sec. V for a sensitivity of 2-2T. In-situ joints for which X-ray is not possible due to its position focal point accessibility, Gamma-ray is permitted

2.8.2 Exclusive radiography machine / gamma ray source has to be arranged by the contractor when sufficient numbers of joints are available for examination. Accumulation of weld joints for want of radiography should not be more than 200 Nos.

2.8.3 D2 films shall be used for gamma rays and D5 films shall be used for X-rays. Elliptical shots (double wall double image) may be employed for size 10NB onwards. For tube joints 6.35 & 12.7mm 3 shots need to be taken.

2.8.4 The penetrometer used shall confirm to ASTM E 1025/ASTM E747 (or) relevant DIN standards.

2.8.5 Radiography shall be carried out by qualified technicians (i.e.) minimum level- I of ISNT/ ASNT and qualification certificates shall be produced with latest renewal to the department before proceeding with the work.

2.8.6 Radiography film shall be evaluated and report shall be submitted by Level II ISNT/ ASNT (or) higher qualified person. However, department inspector will carry out the final evaluation. Department QC/Department NDT Level-II trained inspector decision is final for retake due to rejection (or) radiography owing to bad image quality (or) repair joints. No extra cost will be paid for re-take due to rejection of radiograph owing to bad image quality or repair joints.

2.9 Painting:

2.9.1 High built epoxy primer and finish coat of Aliphatic acrylic polyurethane finish paint shall be applied.

2.9.2 The paints to be applied are special type (epoxy paints) i.e. two component paints. Both the components are to be mixed and applied immediately after mixing.

2.9.3 All the surfaces shall be applied with the one coat of primer of 125…150-micron DFT where ever required and one coat of finish coat of 50…60-micron DFT by the qualified/experienced painters.

2.9.4 All the surfaces to be painted shall be cleaned thoroughly with metallic wire brushes, chipping hammers, emery papers etc., for removing rust, mill scales and old paint coats. Finally, surfaces shall be cleaned with cotton waste.

2.9.5 All tools and consumables required for surface preparation, paint brushes for painting, skilled painters and supervision is in the scope of contractor.

2.9.6 Supply of paints (Primer and finish coat) and thinners, identification of jobs, stage wise supervision are in the scope of department.

2.9.7 The contractor shall offer for stage wise inspection during painting.

2.9.8 **Color scheme**: It will be provided by purchaser at a later stage and in general as per relevant Indian standards and which will be applicable for final coat.

2.9.9 Quantities of painting, stenciling/tagging are given in **Table-4**.

Table-4

Sl. No	Item Description	Quantities
1.	Spray Painting of Cylinder outer surface (Dia 600mm X 12 mtrs Length)	100 Nos
2.	Painting of Accumulators 5 Cu.M (Diameter -1.5 mtrs X Height -3 mtrs) & Structural Material	500 m^2
3.	Painting of SS Tubes & Pipe lines of sizes upto 25NB	10000 mtrs
4.	Painting of pipe lines of sizes varying from 40NB to 80NB	5000 mtrs
5.	Painting of Structural material (Angles and channels) Sizes:25mm to 50mm	4000 mtrs
6.	Painting of Structural material (Angles and channels) Sizes: 75mm to 250mm Angle/Channel	1000 mtrs
7.	Numbering/Stenciling on pipelines, flow Components & equipment: Letter sizes up to 25mm. (Stencil cuts up to 250mm length will be counted as 1 No)	10000 Nos

Sl. No	Item Description	Quantities
8.	Numbering/Stenciling on pipelines & Flow Components & equipment: Letter sizes above 25mm and up to 100mm. (Stencil cuts up to 250mm length will be counted as 1 No)	10000 Nos

Note:

a) Painting of one meter pipe lines includes application of one coat with primer and one finish coat with paint on pipe line after removing pipe clamp, applying paint to pipe clamps & shim plate and re fixing back (clamps will be fixed at 2.5-3.0 Meters distance on avg.). Any existing flow components in the line also to be painted and included in the pipeline painting only.

b) Spray painting gun shall be in the scope of supplier. Air supply for spray gun is in the scope of the department.

2.10 Inspection:

Department Engineer will participate in the following inspection activities,

2.10.1 Fit-up, alignment of equipment and weld edge preparation. Fit-up of all the joints shall be cleared by department engineer prior to the welding.

2.10.2 Witness of all DP tests and clearance for further works.

2.10.3 Review and clearance of all radiography films.

2.10.4 Witness of ball run test, strength tests and pneumatic leak tests.

2.10.5 Witness of pipeline cleanliness tests.

2.10.6 Participation in all critical qualification tests as part of final loops qualification and interfacing with the equipment.

2.10.7 The contractor shall offer for stage wise inspection during painting. The following inspections will be carried out by Department Engineer for painting

a) Pre-surface preparation inspection

b) Inspection of coating on the equipment

c) Evaluating cleaning between coats.

d) DFT measurement through paint thickness measurement gauge.

2.11 Sequence of work execution (From fabrication to system commissioning)

2.11.1 Laying of pipelines and TIG welding as per the approved P&ID.

2.11.2 After welding, as built drawing shall be generated and joint numbers shall be indicated on the pipelines for radiography.

2.11.3 After radiography, ball run test shall be carried out and ensure that pipeline bore is maintained as per the specification.

2.11.4 After ball run test, clearance will be given for purging the pipelines with the dry GN2 gas.

2.11.5 Preparation of pipe supports and fixing of pipe clamps for all the pipe lines.

2.11.6 Hydro /Pneumatic test shall be carried out for the new/existing modified lines based on the operating pressure of the pipe line.

2.11.7 After hydro test, internal cleaning with IPA, external weld joint pickling and passivation, purging with GN2 and dew point measurement shall be carried out. Ensure that dew point shall be better than -55 Deg.C.

2.11.8 Replacement of test gaskets with actual gaskets wherever required.

2.11.9 For all the new/existing modified lines particle check shall be carried out. Ensure that particle size greater than 20micron is NIL.

2.11.10 Fixing of flow components i.e. valves filters wherever applicable.

2.11.11 Integrated leak check along with the pneumatic equipment.

2.11.12 Painting of pipe lines.

2.11.13 Stenciling/tagging of pipe lines and flow components.

2.11.14 Preparation of test packs/reports (for each pipe line number), photo copies/Xerox and binding.

Note: All the above works shall be in the scope of the contractor under department personnel supervision.

3.0 MS Structural Fabrication Works.

3.1 Fabrication of supports for piping & flow components and equipment supports. Suitable anchoring shall be planned using MS structural material and anchor fasteners. Structural work fabrication shall be with SMAW welding with electrodes of AWS E6010/E6011/E6013/E7018.

3.2 Drilling and anchoring of pipe supports, hangers and on the wall /floor/roof embedment shall be carried out in situ based on the site requirement

3.3 Pipe supports to be fabricated for every 2.5-3.0Meters span in the yard, trenches, ceiling and along the columns as per the requirements.

3.4 Cable trays laying and welding of cable trays as per routing finalized by Department Engineer. No separate payment will be made for laying of cable trays.

4.0 Scope of supply

Scope of supply of various elements, materials, consumables, etc., are as follows:

4.1 Department scope:

The following items will be supplied by department at free of cost.

4.1.1 All materials required for the execution of work such as pipes, pipe fittings like tees, elbows, flanges, machined fittings like Nipples, Unions and flow components.

4.1.2 MS structural materials, clamps & shim plates for pipes/tubes.

4.1.3 Radiography source pit and dark room for development of films

4.1.4 Pneumatic supply for purging & testing activities (GN2/Air)

4.1.5 Test gaskets and actual gaskets for equipment/piping

4.1.6 DM water for hydro test

4.1.7 Paints & thinners

4.1.8 IPA for cleaning

4.1.9 Potable water will be supplied by department at specified tapping points.

4.1.10 Electricity required for machine tools like grinders, welding machine etc., (Will be provided at the nearest available power point around 100m away)

4.2 Contractor Scope:

The following machinery, manpower and consumables shall be in the contractor's scope. Machinery scope is not limited to the following. Necessary tools along with machinery shall be in the contractor's scope for executing the scope of given fabrication, erection, testing and commissioning works. Depending on the work front contractor has to mobilize multiple batches **(Minimum three batches for SS welding & one batch for MS welding with required machinery and material at a time(Each batch consists of Welder-1, Fitter-1, Grinder-1 and Helper-2). If required, contactor has to mobilize additional welding team to meet the scheduled works failing which will lead to termination of the contract with proper intimation as per department rules) to meet the schedule of work.**

4.2.1 Man Power

i. Experienced supervisor with 5 to 10 years in the piping fabrication field, who can read the given P & ID drawings and execute the works with systematic planning.
ii. Site engineer / supervisor shall be deployed towards smooth execution of the works and preparation of documents, coordination with radiography team & Department representative.
iii. 6G qualified TIG welders for SS pipe welding.
iv. Structural welder for MS fabrication (SMAW, Gas cutting etc)
v. Qualified skilled fitters.
vi. Skilled grinders and helpers.

vii. Skilled painters
viii. Number of manpower for category wise shall be indicated as part of tender considering the stipulated time period for execution of work.

4.2.2 Machinery

i. TIG welding machines with suitable accessories like cables, torches, electrodes etc.
ii. Safety appliances such as face shield, gloves, eye glasses etc for personnel protection.
iii. Manual arc welding machine for welding of structural steel.
iv. Grinding and cutting machines with necessary attachments.
v. Gas cutting sets.
vi. Hand and magnetic base drilling machine.
vii. Hammer drilling machine for drilling holes in concrete.
viii. Pipe bending machine, hand tube benders and tube cutters.
ix. Material required for Scuff folding for erection of vertical piping.
x. Wind shields while working in open areas.
xi. Machinery in each category wise& Number of machines shall be indicated as part of tender considering the stipulated time period of execution of work.
xii. **For yard pipe line welding, contractor shall have Electrical cable length of minimum 500m to get the free power supply for welding from the nearest facility (or) contractor shall arrange generator power supply on his own for TIG welding/MS Structural support welding for yard pipe lines.**

4.2.3 Consumables

i. SS filler wires for TIG welding.
ii. Electrodes for SMAW (E6010/E6011/E6013/E7018)
iii. Grinding wheels, cutting wheels, emery cloth/papers, cotton waste & SS wire brushes etc.
iv. Paint brushes, cleaning wire brushes, etc.,
v. Industrial gases (Argon, Oxygen, Acetylene), regulator along with flow meter sets for welding and gas cutting.
vi. Dye penetrant test kits along with dye penetrant chemicals with validity (Make CHECKMATE/MAGNAFLUX).

Specifications for the consumables as given below

Table-5

Sl. No	Consumables	Size, mm	Make
1.	SS Filler wires(308L/316L)	1.0/1.2/1.6/2.0/2.4	Philips/ ESAB / Adani
2.	SMAW Electrodes	2.5/3.15/4.0	Philips/ ESAB / Adani/ D & H Scheron
3.	Argon cylinder with commercial grade with 99.99% Purity	50 liters cylinder with pressure 140-150 Bar (g)	Praxair /Inox/ Bhoruka/BOC
4.	Dye penetrant test kit with cleaner/penetrant/ developer	420 ml tins	Magnaflux / Check Mate
5.	Oxygen acetylene cylinders with commercial 99.99% grade	50 liters cylinder with pressure 140-150 Bar (g)	Praxair /Inox/ Bhoruka/BOC

Note: All the above consumables shall be obtained with the manufacturer's certificate for its conformity. Any change in the above make, contractor shall get prior approval from department before usage.

4.2.4 Evaluation of Machinery and Manpower and Consumables

Technical evaluation by the Department Engineer will be carried out for machinery and manpower to ascertain their complete suitability / performance for the jobs described above. Based on this evaluation clearance will be given for taking up the actual job.

4.2.5 Documentation

i. During the execution of work the following documents shall be prepared.
   a) Preparation of Material identification reports
   b) Preparation of line wise weld history sheets
   c) Preparation of isometrics and as built drawings in Auto Cad

ii. Contractor has to generate the following reports/drawings before commencement of hydro/pneumatic test.
   a) Test loop drawings
   b) Ball run test reports
   c) Radiography reports

iii. After commissioning,**3 sets of Loop wise documents** (Line number wise)consisting of the following works /tests shall be submitted with neatly bounded condition:

a) Process and Inst. Diagram in AutoCAD
b) As Built Drawing in AutoCAD
c) Material Inspection Report
d) Joint History Sheet (DP and Radiography)
e) Ball Run Test Report
f) Mechanical Clearance (Pre-Test)
g) Strength test Report (Hydro /Pneumatic)
h) Chemical Cleaning report
i) Cleanliness Report
j) Pneumatic Leak Check Report
k) Moisture Measurement Report
l) Painting Report

4.2.6 Supply of Structural Material:

The following specification has to be followed for supply of structural material.

i. All items shall be manufactured as per IS-2062 and dimensions as per IS-808.
ii. All the items MAKE shall be of SAIL/RINL/TISCO/JINDAL/JSW
iii. All MS Structural material shall be free from scratches, pinholes, rust & bend.
iv. Re-rolled **products are not acceptable.**
v. All items shall bear IS Stamping.
vi. The items shall be inspected by our department engineer prior to dispatch. The scope of inspection is visual, dimensional and verification of manufacturers test certificates.
vii. Test certificates of structural material shall be sent along with consignment.
viii. Perforated GI Cable trays shall be hot dipped galvanized with straight folding, with serial perforation.
ix. Thickness of galvanization on cable trays shall be Min.90 Microns
x. Payment **will be made for actual quantity supplied (within +/- 10% of indicated quantity).**
xi. Weighment of the structural material at department weigh-bridge at SDSC- SHAR, Sriharikota shall be final.
xii. The structural steel/trays / Anchor bolts shall be procured by the party as given in **Table -6**.
xiii. Minimum length of angles and channels shall be 5 to 6 mtrs.

Table-6

Sl. No	Item Description	UOM	Qty
Schedule-1 for MS Structural			
a.	ISA 25x25 X3 (t)	Kgs	1100
b.	ISA 40x40X 4(t)	Kgs	2400
c.	ISA 50x50X 5 (t)	Kgs	8100
d.	ISMC 75	Kgs	3000
e.	ISMC 100	Kgs	950
f.	ISMC 150	Kgs	1750
g.	ISMC 200	Kgs	1450
h.	Structural Plate 2000mm(L)X1000mm(W) X 5mm (t)	Kgs	300
i.	Structural Plate 2000mm(L)X1000mm(W) X 8mm (t)	Kgs	500
j.	Structural Plate 2000mm(L)X1000mm(W) X 10mm(t)	Kgs	500
Schedule-2 for Trays			
k.	Supply of Hot dipped galvanized, GI Perforated Cable Tray of width 50 mm (W) X25mm (H) X 2.5 thk	mtrs	300
l.	Supply of Hot dipped galvanized, GI Perforated Cable Tray of width 100 mm (W) X25mm (H) X 2.5 thk	mtrs	150
m.	Supply of Hot dipped galvanized, GI Perforated Cable Tray of width 150 mm (W) X25mm (H) X 2.5 thk	mtrs	200
n.	MS Angle Tray of width 250mm (W) with ISA 40X40X4(t) angle with 2.5mm thick strip between every 0.5 mtrs.	mtrs	300
o.	Supply of MS Angle Tray of width 350mm (W) with ISA 50X50X4(t) angle with 2.5mm thick strip between every 0.5 mtrs.	mtrs	300
Schedule-3 for Perforated Anchor Bolts			
p.	Supply of Anchor Bolts M10x1.5,	Nos	100

Sl. No	Item Description	UOM	Qty
	Length:100mm		
q.	Supply of Anchor Bolts M12x1.5, Length:100mm	Nos	150
r.	Supply of Anchor Bolts M16x1.5, Length:100mm	Nos	50

5.0 Bid/Offer Submission details:

The bid/offer shall be submitted in two parts

- ✓ **Part-I: Technical- Commercial bid** contains the technical information and commercial compliance aspects.
- ✓ **Part-II: Price Bid:** The Price bid should contain the Prices.

Part-I: Techno-Commercial bid:

The tenderer shall necessarily present the following in the techno-commercial bid:

- The tenderer shall furnish **point-wise confirmation (Technical Compliance attached in Annexure-II)** for the technical specifications given in the enquiry.
- The tenderer shall necessarily furnish the details of previously executed orders. Necessary documentary evidence along with end user certificate (confirming the satisfactory performance) shall be submitted along with offer as a mandatory requirement. **Non-compliance of this requirement shall lead to rejection of the offer.**
- **Bidder need to submit un-priced price bid copy (as highlighted below) indicating the description of all the cost elements considered, without indicating the price. Tenderer shall note that indication of price in the techno-commercial bid shall lead to dis-qualification of bid.**
- **Similar work:** The Bidder shall have the experience in executing SS pipe fabrication, Erection of equipment, hydro and pneumatic testing and related documentation works.
- The price bids will be opened only after evaluation and acceptance of the technical bid of the respective tenderer.

Format of Un-Priced Price Bid:

Sl. No	Item Description	Unit	Quantity	Cost/Unit (Rs)	Taxes (GST)	Total cost (Rs)
1.	Fabrication of SS pipe butt weld joints (TIG Welding) **with radiography** on Number of Joints basis as per technical specifications for Pipe Size:10NB	Nos	500	Un-Priced	Un-Priced	Un-Priced
2.	Fabrication of SS pipe butt weld joints (TIG Welding) **with radiography** on Number of Joints basis as per technical specifications for Pipe Size:15NB	Nos	1500	Un-Priced	Un-Priced	Un-Priced
3.	Fabrication of SS pipe butt weld joints (TIG Welding) **with radiography** on Number of Joints basis as per technical specifications for Pipe Size:25NB	Nos	2200	Un-Priced	Un-Priced	Un-Priced
4.	Fabrication of SS pipe butt weld joints (TIG Welding) **with radiography** on Number of Joints basis as per technical specifications for Pipe Size:40NB	Nos	700	Un-Priced	Un-Priced	Un-Priced
5.	Fabrication of SS pipe butt weld joints (TIG Welding) **with radiography** on Number of Joints basis as per technical specifications for Pipe Size:50NB	Nos	500	Un-Priced	Un-Priced	Un-Priced
6.	Fabrication of SS pipe butt weld joints (TIG Welding) **with radiography** on Number of Joints basis as per technical specifications for Pipe Size:65NB	Nos	400	Un-Priced	Un-Priced	Un-Priced
7.	Fabrication of SS pipe butt weld joints (TIG Welding) **with radiography** on Number of Joints basis as per technical specifications for Pipe Size:80NB	Nos	150	Un-Priced	Un-Priced	Un-Priced
8.	Fabrication of SS pipe butt weld joints (TIG Welding) **without radiography** on Number of Joints basis as per technical specifications for Pipe Size:10NB	Nos	200	Un-Priced	Un-Priced	Un-Priced
9.	Fabrication of SS pipe butt weld joints (TIG Welding) **without radiography** on Number of Joints basis as per technical specifications for Pipe Size:15NB	Nos	500	Un-Priced	Un-Priced	Un-Priced

Sl. No	Item Description	Unit	Quantity	Cost/Unit (Rs)	Taxes (GST)	Total cost (Rs)
10.	Fabrication of SS pipe butt weld joints (TIG Welding) **without radiography** on Number of Joints basis as per technical specifications for Pipe Size: 25NB	Nos	300	Un-Priced	Un-Priced	Un-Priced
11.	Fabrication of SS pipe butt weld joints (TIG Welding) **without radiography** on Number of Joints basis as per technical specifications for Pipe Size:40NB	Nos	500	Un-Priced	Un-Priced	Un-Priced
12.	Fabrication of SS Tube butt weld joints (TIG Welding) **with radiography** on Number of Joints basis as per technical specifications for Tube Size:6.00 mm & 6.35 mm	Nos	500	Un-Priced	Un-Priced	Un-Priced
13.	Fabrication of SS Tube butt weld joints (TIG Welding) **with radiography** on Number of Joints basis as per technical specifications for Tube Size:10.00 mm to 12.7mm	Nos	500	Un-Priced	Un-Priced	Un-Priced
14.	Fabrication of SS Tube butt weld joints (TIG Welding) **without radiography** on number of joints basis as per technical specifications for Tubes Size: Tube Size:6.00 mm & 6.35 mm	Nos	500	Un-Priced	Un-Priced	Un-Priced
15.	Fabrication of SS Tube butt weld joints (TIG Welding) **without radiography** on number of joints basis as per technical specifications for Tube Size:10.00 mm to 12.7mm	Nos	500	Un-Priced	Un-Priced	Un-Priced
16.	Bending of SS Pipeline from 10NB up to 15NB (All Schedules)	Nos	1000	Un-Priced	Un-Priced	Un-Priced
17.	Bending of SS Pipeline – 20NB to 25NB (All Schedules)	Nos	1000	Un-Priced	Un-Priced	Un-Priced
18.	Bending of SS Pipeline 40 NB from SCH 40 to 40NB-SCH XXS.	Nos	500	Un-Priced	Un-Priced	Un-Priced
19.	Erection of Remote Valve Units (RVUs) at Storage/CPB	Nos	1	Un-Priced	Un-Priced	Un-Priced
20.	Erection of Remote Regulation Units (RRUs) at Storage/CPB	Nos	3	Un-Priced	Un-Priced	Un-Priced
21.	Erection of Remote Valve Enclosures (RVEs)	Nos	20	Un-Priced	Un-Priced	Un-Priced
22.	Erection of GN2 Accumulators 5 Cu.M (1.5 mtrsdia X 3 mts Height)	Nos	2	Un-Priced	Un-Priced	Un-Priced
23.	Laying of SS pipelines of sizes varying from 10NB to 40NB at Yard, trenches, UT, in side MLP, ACOSS Tower in front of UT	Mtrs	7000	Un-Priced	Un-Priced	Un-Priced

Sl. No	Item Description	Unit	Quantity	Cost/Unit (Rs)	Taxes (GST)	Total cost (Rs)
	and associated fixing of clamps on pipe lines.					
24.	Laying of SS pipelines of sizes from 50NB to 80NB at Yard, trenches, UT, inside MLP, ACOSS Tower in front of UT and associated fixing of clamps on pipe lines.	Mtrs	5000	Un-Priced	Un-Priced	Un-Priced
25.	Spray Painting of Cylinder outer surface (Dia 600mm X 12 mtrs Length)	Nos	100	Un-Priced	Un-Priced	Un-Priced
26.	Painting of Accumulators 5 Cu.M (Diameter -1.5 mtrs X Height -3 mtrs) & Structural Material	m^2	500	Un-Priced	Un-Priced	Un-Priced
27.	Painting of SS pipe lines & Tubes of sizes upto 25NB	Mtrs	10000	Un-Priced	Un-Priced	Un-Priced
28.	Painting of pipe lines of sizes varying from 40NB to 80NB	Mtrs	5000	Un-Priced	Un-Priced	Un-Priced
29.	Painting of Structural material (Angles and channels) Sizes:25mm to 50mm	Mtrs	4000	Un-Priced	Un-Priced	Un-Priced
30.	Painting of Structural material (Angles and channels) Sizes: 75mm to 250mm Angle/Channel	Mtrs	1000	Un-Priced	Un-Priced	Un-Priced
31.	Numbering/Stenciling on pipelines, flow Components & equipment: Letter sizes up to 25mm. (Stencil cuts up to 250mm length will be counted as 1 No)	Nos	10000	Un-Priced	Un-Priced	Un-Priced
32.	Numbering/Stenciling on pipelines & Flow Components & equipment: Letter sizes above 25mm and up to 100mm. (Stencil cuts up to 250mm length will be counted as 1 No)	Nos	10000	Un-Priced	Un-Priced	Un-Priced
33.	MS Structural Material Erection, fabrication, Welding of angles, channels & Plate Material (Material Free Supply by Department)	Kg	20000	Un-Priced	Un-Priced	Un-Priced
34.	Supply of Hot dipped galvanized, GI Perforated Cable Tray of width 50 mm (W) X25mm (H) X2.5 thk	Mtrs	300	Un-Priced	Un-Priced	Un-Priced
35.	Supply of Hot dipped galvanized, GI Perforated Cable Tray of width 100 mm (W) X25mm (H) X2.5 thk	Mtrs	150	Un-Priced	Un-Priced	Un-Priced
36.	Supply of Hot dipped galvanized, GI Perforated Cable Tray of width 150 mm (W) X25mm (H) X2.5 thk	Mtrs	200	Un-Priced	Un-Priced	Un-Priced
37.	Supply of MS Angle Tray of width 250mm (W) with ISA	Mtrs	300	Un-Priced	Un-Priced	Un-Priced

Sl. No	Item Description	Unit	Quantity	Cost/Unit (Rs)	Taxes (GST)	Total cost (Rs)
	40x40X4(t) angle with 2.5mm thick strip between every 0.5 mtrs.					
38.	Supply of MS Angle Tray of width 350mm (W) with ISA 50x50X4(t) angle with 2.5mm thick strip between every 0.5 mtrs.	Mtrs	300	Un-Priced	Un-Priced	Un-Priced
39.	ISA 25x25 X3 (t)	Kg	1100	Un-Priced	Un-Priced	Un-Priced
40.	ISA 40x40X 4(t)	Kg	2400	Un-Priced	Un-Priced	Un-Priced
41.	ISA 50x50X 5 (t)	Kg	8100	Un-Priced	Un-Priced	Un-Priced
42.	ISMC 75	Kg	3000	Un-Priced	Un-Priced	Un-Priced
43.	ISMC 100	Kg	950	Un-Priced	Un-Priced	Un-Priced
44.	ISMC 150	Kg	1750	Un-Priced	Un-Priced	Un-Priced
45.	ISMC 200	Kg	1450	Un-Priced	Un-Priced	Un-Priced
46.	Structural Plate 2000mm(L)X1000mm(W) X 5mm (t)	Kg	300	Un-Priced	Un-Priced	Un-Priced
47.	Structural Plate 2000mm(L)X1000mm(W) X 8mm (t)	Kg	500	Un-Priced	Un-Priced	Un-Priced
48.	Structural Plate 2000mm(L)X1000mm(W) X 10mm(t)	Kg	500	Un-Priced	Un-Priced	Un-Priced
49.	Supply of Anchor Bolts M10x1.5, Length:100mm	Nos	100	Un-Priced	Un-Priced	Un-Priced
50.	Supply of Anchor Bolts M12x1.5, Length:100mm	Nos	150	Un-Priced	Un-Priced	Un-Priced
51.	Supply of Anchor Bolts M16x1.5, Length:100mm	Nos	50	Un-Priced	Un-Priced	Un-Priced

Format of Priced Price Bid:

Sl. No	Item Description	Unit	Quantity	Cost/Unit (Rs)	Taxes (GST)	Total cost (Rs)
1.	Fabrication of SS pipe butt weld joints (TIG Welding) with **radiography** on Number of Joints basis as per technical specifications for Pipe Size:10NB	Nos	500			
2.	Fabrication of SS pipe butt weld joints (TIG Welding) **with radiography** on Number of Joints basis as per technical specifications for Pipe Size:15NB	Nos	1500			
3.	Fabrication of SS pipe butt weld joints (TIG Welding) **with radiography** on Number of Joints basis as per technical specifications for Pipe Size:25NB	Nos	2200			
4.	Fabrication of SS pipe butt weld joints (TIG Welding) **with radiography** on Number of Joints basis as per technical specifications for Pipe Size:40NB	Nos	700			
5.	Fabrication of SS pipe butt weld joints (TIG Welding) **with radiography** on Number of Joints basis as per technical specifications for Pipe Size:50NB	Nos	500			
6.	Fabrication of SS pipe butt weld joints (TIG Welding) **with radiography** on Number of Joints basis as per technical specifications for Pipe Size:65NB	Nos	400			
7.	Fabrication of SS pipe butt weld joints (TIG Welding) **with radiography** on Number of Joints basis as per technical specifications for Pipe Size:80NB	Nos	150			
8.	Fabrication of SS pipe butt weld joints (TIG Welding) **without radiography** on Number of Joints basis as per technical specifications for Pipe Size:10NB	Nos	200			
9.	Fabrication of SS pipe butt weld joints (TIG Welding) **without radiography** on Number of Joints basis as per technical specifications for Pipe Size:15NB	Nos	500			

Sl. No	Item Description	Unit	Quantity	Cost/Unit (Rs)	Taxes (GST)	Total cost (Rs)
10.	Fabrication of SS pipe butt weld joints (TIG Welding) **without radiography** on Number of Joints basis as per technical specifications for Pipe Size: 25NB	Nos	300			
11.	Fabrication of SS pipe butt weld joints (TIG Welding) **without radiography** on Number of Joints basis as per technical specifications for Pipe Size:40NB	Nos	500			
12.	Fabrication of SS Tube butt weld joints(using TIG Welding) **with radiography** on Number of Joints basis as per technical specifications for Tube Size:6.00 mm & 6.35 mm	Nos	500			
13.	Fabrication of SS Tube butt weld joints(using TIG Welding) **with radiography** on Number of Joints basis as per technical specifications for Tube Size:10.00 mm to 12.7mm	Nos	500			
14.	Fabrication of SS Tube butt weld joints(using TIG Welding) **without radiography** on number of joints basis as per technical specifications for Tubes Size: Tube Size:6.00 mm & 6.35 mm	Nos	500			
15.	Fabrication of SS Tube butt weld joints(using TIG Welding) **without radiography** on number of joints basis as per technical specifications for Tube Size:10.00 mm to 12.7mm	Nos	500			
16.	Bending of SS Pipeline from 10NB up to 15NB (All Schedules)	Nos	1000			
17.	Bending of SS Pipeline –20NB to 25NB (All Schedules)	Nos	1000			
18.	Bending of SS Pipeline 40 NB from SCH 40 to 40NB-SCH XXS.	Nos	500			
19.	Erection of Remote Valve Units (RVUs) at Storage/CPB	Nos	1			
20.	Erection of Remote Regulation Units (RRUs) at Storage/CPB	Nos	3			
21.	Erection of Remote Valve Enclosures (RVEs)	Nos	20			
22.	Erection of GN2 Accumulators 5 Cu.M (1.5 mtrsdia X 3 mts Height)	Nos	2			
23.	Laying of SS pipelines of sizes varying from 10NB to 40NB at	Mtrs	7000			

Sl. No	Item Description	Unit	Quantity	Cost/Unit (Rs)	Taxes (GST)	Total cost (Rs)
	Yard, trenches, UT, in side MLP, ACOSS Tower in front of UT and associated fixing of clamps on pipe lines.					
24.	Laying of SS pipelines of sizes from 50NB to 80NB at Yard, trenches, UT, inside MLP, ACOSS Tower in front of UT and associated fixing of clamps on pipe lines.	Mtrs	5000			
25.	Spray Painting of Cylinder outer surface (Dia 600mm X 12 mtrs Length)	Nos	100			
26.	Painting of Accumulators 5 Cu.M (Diameter -1.5 mtrs X Height -3 mtrs) & Structural Material	m^2	500			
27.	Painting of SS pipe lines & Tubes of sizes upto 25NB	Mtrs	10000			
28.	Painting of pipe lines of sizes varying from 40NB to 80NB	Mtrs	5000			
29.	Painting of Structural material (Angles and channels) Sizes:25mm to 50mm	Mtrs	4000			
30.	Painting of Structural material (Angles and channels) Sizes: 75mm to 250mm Angle/Channel	Mtrs	1000			
31.	Numbering/Stenciling on pipelines, flow Components & equipment: Letter sizes up to 25mm. (Stencil cuts up to 250mm length will be counted as 1 No)	Nos	10000			
32.	Numbering/Stenciling on pipelines & Flow Components & equipment: Letter sizes above 25mm and up to 100mm. (Stencil cuts up to 250mm length will be counted as 1 No)	Nos	10000			
33.	MS Structural Material Erection, fabrication, Welding of angles, channels & Plate Material (Material Free Supply by Department)	Kg	20000			
34.	Supply of Hot dipped galvanized, GI Perforated Cable Tray of width 50 mm (W) X25mm (H) X2.5 thk	Mtrs	300			
35.	Supply of Hot dipped galvanized, GI Perforated Cable Tray of width 100 mm (W) X25mm (H) X2.5 thk	Mtrs	150			
36.	Supply of Hot dipped galvanized, GI Perforated Cable Tray of width 150 mm (W) X25mm (H) X2.5 thk	Mtrs	200			

Sl. No	Item Description	Unit	Quantity	Cost/Unit (Rs)	Taxes (GST)	Total cost (Rs)
37.	Supply of MS Angle Tray of width 250mm (W) with ISA 40x40X4(t) angle with 2.5mm thick strip between every 0.5 mtrs.	Mtrs	300			
38.	Supply of MS Angle Tray of width 350mm (W) with ISA 50x50X4(t) angle with 2.5mm thick strip between every 0.5 mtrs.	Mtrs	300			
39.	ISA 25x25 X3 (t)	Kg	1100			
40.	ISA 40x40X 4(t)	Kg	2400			
41.	ISA 50x50X 5 (t)	Kg	8100			
42.	ISMC 75	Kg	3000			
43.	ISMC 100	Kg	950			
44.	ISMC 150	Kg	1750			
45.	ISMC 200	Kg	1450			
46.	Structural Plate 2000mm(L)X1000mm(W) X 5mm (t)	Kg	300			
47.	Structural Plate 2000mm(L)X1000mm(W) X 8mm (t)	Kg	500			
48.	Structural Plate 2000mm(L)X1000mm(W) X 10mm(t)	Kg	500			
49.	Supply of Anchor Bolts M10x1.5, Length:100mm	Nos	100			
50.	Supply of Anchor Bolts M12x1.5, Length:100mm	Nos	150			
51.	Supply of Anchor Bolts M16x1.5, Length:100mm	Nos	50			

6.0 Offer Validity:

The validity of the offers / tenders should be 90 days from the date of opening of the tenders. Tenders with offer validity less than the period mentioned above, will not be considered for evaluation.

7.0 General conditions of the contract:

7.1 **Due to interconnected nature of work scope, over all L1 will be selected towards awarding the contract. Party shall submit the acceptance for the same.**

7.2 Contractor shall clearly indicate deviations if any from indent specifications in the offer, otherwise contractor has to accept all the terms and conditions put by the Department.

7.3 **Period of contract: Period of Contract is for 24 months** from the date of release of purchase order.

7.4 **Quantity variation:** The quantity variation of + 25% is permissible on the Total contract value based on site requirements. Price will be considered for this variation based on unit prices of the purchase order.

8.0 Tender evaluation:

The following documents shall be submitted along with the Techno-commercial bid for prequalification of Bidder.

8.1 Contractor should have executed fabrication contracts involving erection and commissioning of piping (i.e. SS TIG Welding for pipe & tube, bending of SS pipes, radiography of SS butt welded joints) and MS structures (i.e. MS material supply, fabrication & erection works) during the last five years by considering last financial year ending with March-2025 shall be submitted for tender evaluation. Single PO for similar works of Rs.100 Lakhs (or)Two POs for similar works of Rs.80 Lakhs each (or)Three POs for similar works of Rs.50 Lakhs each.

(or)

Contractor should have executed fabrication contracts involving erection and commissioning of piping (i.e. SS TIG Welding for pipe & tube, bending of SS pipes, radiography of SS butt welded joints) and MS structures (ie. MS material supply, fabrication & erection works) with a minimum cumulative value of all purchase orders amounting to INR 110 Lakhs (in the last five years by considering last financial year ending with March-2025).

8.2 Work completion certificates shall be submitted along with offer for the above POs. Without this offer will not be considered.

8.3 P.O copies with only structural steel welding, P.O copies with only CS/GI

pipe with arc welding are not acceptable.

8.4 List of working personnel: Welders - **Min.3 welders** (**6G qualified TIG welders for SS pipe welding**), Fitters-Min.3 fitters, Grinders-Min.3grinders, helpers-as per the requirement), fabrication supervisors-as per the requirement, drafts man (Min.2) and skilled personnel for documentation (Min two numbers) & one welding batch for MS.

8.5 List of Machinery & Equipment to be used for the work (like TIG welding machines-Min.3Numbers, Grinding-Min.3numbers, gas welding equipment, and bending and other equipment as per project requirement).

8.6 **Compliance:** Point wise compliance to the tender specifications shall be submitted and any deviation from the specification shall be highlighted clearly in the offer. Technical compliance duly filled by the party as per Annexure-II to be submitted along with the offer.

9.0 Manpower & Schedules

9.1 Contractor has to deploy **Minimum of three Welding Batches (Each batch consists of Welder-1, Fitter-1, Grinder-1 and Helper-2) for SS & one batch for MS** to carryout the job. In case of additional requirement, party shall deploy additional one or two **Welding Batches** in case of requirement. Such additional manpower shall be deployed within 7 days notice.

9.2 Tentative start of work will be intimated to Contractor **Two weeks** in-advance.

9.3 The contractor will be allowed to work beyond office hours if required and including holidays to meet the project schedule.

9.4 Site will be kept open for round the clock basis (Contractor shall be allowed to work in three shifts for carrying out site works). Accordingly, manpower shall be planned by the contractor.

9.5 In order to complete the work in time, it is recommended to deploy adequate manpower and supervisors and the work shall be carried out in two or three shifts based on requirement.

9.6 Progress review meetings once in a week will be conducted for monitoring the status of works and the contractor's site representative need to attend with all relevant inputs.

10.0 Payment terms

10.1 100% payment after receipt and acceptance of material for supply items.

10.2 Payment shall be as per completed portion of the fabricated/ erected/painting on PRO-RATA basis once in a month after duly certified by the Department Engineer.

10.3 Security deposit of 3% PO value (excluding material supply part) shall be submitted to the purchaser after release of P.O (within 10 days) and the

same shall be returned to the supplier on successful completion of work contract.

10.4 The works as described above shall be treated as completed only after certification of the Department Engineers.

10.5 The purchaser reserves Right to cancel the contract at any time in case of failure of the contractor to fulfill the various requirements mentioned in the Purchase order (like number of welding batches etc.)

11.0 Working Personnel terms & conditions

11.1 **Security**: The contractor shall follow entry permit and gate pass system for his laborers and materials white entering gate. Contractor supervisor shall ensure that their personnel are strictly confined to the assigned job and place of work.

11.2 **Safety**: Contractor has to give an undertaking that they will comply with prevailing safety norms at site put forth by department. Safety officer shall have full access to contractor's storage shed/office for inspection.

11.3 **Group Insurance**: Group insurance for workmen shall be taken for this work. The proof of such insurance shall be submitted immediately after awarding the contract prior to the commencement of work. Group Insurance for men for a minimum amount of Rs. 10.0 Lakhs shall be insured for this work.

11.4 **Medical Assistance**: While executing this contract work, if any of the workers engaged by contract agency is injured, they will be provided with first-aid by department. However, contract agency has to take care of subsequent medical treatment elsewhere.

11.5 **Minimum wages**: The contractor shall ensure minimum wages as prescribed in minimum wages Act as per the State / Central Government Act. He and his work force have to follow safety standard prescribed. Contractor has to comply with all labor regulations as prescribed in various Acts in respect of himself and his man power.

11.6 **Labor law**: The contractor shall not employ persons below 18 years of age

11.7 Conveyance for personnel from and to work spot has to be arranged by the contractor.

12.0 Contractor terms & conditions

12.1 Sriharikota is an island and situated around 100kms north of Chennai and the work site is located at about 10kms from main entrance gate. Contractors have to make their own transport for their personnel for carrying out the work which is spread over 16 Sq. km area.

12.2 Department's permission shall be obtained by contractor for establishing shed/ office with an under taking for construction of shed with non-flammable material and for demolition of the same after completion of work with party's expenses.

12.3 The contractor shall take enough care to ensure to progress of the work without any material and personnel damage. It is the sole responsibility of contractor to ensure all safety norms to his personnel during transportation between work spot and Department/Contractor stores, and work in prefabrication area, in storage shed and in yard. Department will not hold responsibility to any mishap to the contractor personnel.

12.4 The contractor shall get approval from Department for the specifications of all items in his scope of supply, bought out items if any, before placing orders for the same.

12.5 The contractor shall be responsible for the safe storage of radiography sources of his sub-contractor. Radiography source shall be stored in a room which is located about 5 Km from the work spot. However, transportation of source from the storage room to the work spot and back shall be the responsibility of contractor.

12.6 The contractor shall take prior approval from the Department for awarding sub contract for full / partial works in the contract if any and the payment for the subcontractor shall be the responsibility of the contractor. The Department reserves the right to pay the subcontractor directly from the running bills in case the contractor fails to pay his sub-contractor in the interest of completion of work.

12.7 The supplied materials shall be entered to the SDSC premises only through Department Stores and Security endorsements. M.S structural material will be weighed in department Weigh Bridge. Payment towards the supply shall be made as per the department weighment receipt.

12.8 The purchaser will take over the system only after completion of final pneumatic leak check & contamination checks on the total integrated system by contractor. If any modification of the pipe line is called for during the above activity same shall be carried out by the party without any additional cost.

Annexure-II

Technical Compliance
(To be submitted by the bidder along with Technical Bid)

Tenderer shall furnish point-wise confirmation for the following. Change of specifications/ deviations (if any) shall be brought out in the offer with detailed justification.

Sl. No	ISRO Description	Technical Compliance (by the party)
Scope of work		
1.	Acceptance for the terms and conditions given in Introduction of Specification. Any Obligation or clarification shall be listed if any	
2.	The details of the pneumatic equipment for erection are given in **Table-1.**	
3.	Erection & alignment of Pneumatic Equipment (Remote Valve Enclosures-RVEs – 20 Nos) at different elevations up to 50 meters inside SLP-UT	
4.	Erection & alignment of Pneumatic Equipment (Remote Valve Units-RVUs and Remote Regulation Units-RRUs) inside CPB and CGSS building at SLP	
5.	The equipment shall be handled with utmost care using proper material handling equipment.	
6.	Crane/Lift for lifting RVEs inside SLP-UT will be provided by the department up to the nearest point. Mounting of RVEs in exact location inside UT shall be planned manually. Required man power for mounting of RVEs is in the scope of the contractor for the above work.	
7.	MS structural supports shall be fabricated over the available embedment for properly mounting the equipment as per the approved drawings.	
8.	Crane is not available in SLP-CGSS building and in CPB. Erection of RVU-1 No and RRU-03 Nos shall be carried out manually.	
9.	If any of the equipment gets damaged during handling or erection, the cost of rectification / replacement will be recovered from the contractor.	
10.	Equipment Earthing: All equipment and the pipelines shall	

Sl. No	ISRO Description	Technical Compliance (by the party)
	be earthed through copper conductors– 10 Sq.mm as required at site and connected to the main grid inside /outside the room (CGSS Building & CPB). **Total earthing material (copper conductor 100meters length min 10 Sq.mm and other accessories) is under contract scope. No extra cost will be paid for this work.**	
11.	**Fabrication of SS piping/tubing (SS304L/SS316L) in and around ASLP facilities:** The following are the activities to be carried out as part of fabrication. ✓ Flushing of all pipes with IPA/tampon cleaning and purging with dry nitrogen before usage of pipe for fabrication Welding of MS supports for pipe lines. Drilling of holes in the MS supports and fixing of clamps. ✓ Laying of pipe lines in CGSS-SLP cylinder bay for inlet and outlet pipe line headers, inside the rooms and different elevations in stage preparation facilities and inside MLP and Acoustic Tower located in front of UT. ✓ Laying of pipe lines over pipe pedestals in the yards and trenches. ✓ Edge preparation, fit up of joints, alignment and TIG welding ✓ Bending of pipe lines to required radius based on pipe size. ✓ Dye penetrant test of root runs and final weld as per procedure. ✓ End to end ball run test of all loops as per the ball sizes mentioned Table-3. ✓ 100% Radiography of all butt-welded joints. ✓ External pickling and passivation of all weld joints. ✓ Hydro/Pneumatic strength test as per standards. ✓ Cleaning of pipe lines with IPA after fabrication. ✓ Dew point measurement checks (better than -55°C) for hydro tested lines. ✓ Checking of cleanliness as per standards. ✓ Fixing of pipe supports. ✓ Interfacing of pipe lines with equipment/gas	

Sl. No	ISRO Description	Technical Compliance (by the party)
	cylinders/inlet and outlet valve boxes and associated leak checks with GN2. ✓ Painting of pipelines, tubes and numbering.	
12.	Party shall give compliance for SS fabrication work for all schedules from 10S to XXS details given in **Table-2** of Annexure-1.	
TIG Welding		
13.	The work includes marking, cutting, profiling, aligning, fit up, tack welding, cleaning, chipping, placement of wind shields (For weather protection). Root and final TIG welding by GTAW process only. Argon purity shall be with 99.99% for both shield & purge gas. DP testing of Root & Final Pass (Both Butt and Socket weld types where ever applicable).X-ray/Gamma Ray radiography for all butt weld joints.	
14.	TIG Welding of SS Pipes of material SS304L/SS316L (Size varies from 10 NB to 80 NB of various schedules up to XXS) and SS tubes (Sizes from 6 to 12.7mm).	
15.	AISI SS308L/SS316Lmaterial shall be used as filler wire for SS TIG welding. It shall meet the requirements of ASME Sec. IX / AWS A5 standards.	
16.	Only 6G qualified welders as per ASME Sec. IX with proven track record shall be employed to carryout welding. Qualification of welder need to be carried out in the presence of department QC engineer suiting to the pipe size / schedule requirements. Fabrication Supervisors, Fitters, Fabricators &Grinders should be well experienced	
17.	Cutting and edge preparation of pipelines and fittings shall be carried out only with experienced grinders meant for austenitic Stainless-Steel material.	
18.	Each fabrication batch consist of minimum of one welder, one fitter, one grinder and two helpers (Minimum Three fabrication batches shall be deployed at a time in different locations with required equipment, material and also additional team to be deployed when demanded).	
19.	**Dye penetrant testing:** All pipe/tube welding joints shall be tested with Dye-penetrant test after root and final pass for butt welding and	

Sl. No	ISRO Description	Technical Compliance (by the party)
	for final pass after fillet/socket welding as per ASME Sec.V. No extra cost will be paid for Dye penetrant testing of weld joints.	
Pipe Bending:		
20.	Cold bending of pipe shall be made to the required angle by using heavy duty manual or hydraulic bending equipment.	
21.	Bend radius of minimum 3D-4D shall be maintained to avoid unwanted thinning. Wrinkles and scratches are not permitted on the bends	
22.	Ovality shall be within 8% as per ASME B 31.3. Bending shall be carried out up to size 40NB SCH XXS.	
23.	No extra cost will be paid for bending of SS Tubes with outer diameter from 6mm to 12.7mm tubes.	
Pipe Laying:		
24.	This work includes laying of pipe lines in the building, yard connecting two facilities, different elevations in stage preparation facilities (EL: 0 M to EL: 42.0M), different elevations in SLP-UT (EL: 0 M to EL: 50.0M). The details are given below.	
25.	Piping inside CGSS building (Gas Cylinder Bay for inlet and outlet header& Pneumatic Board Room).	
26.	Inside CBP Building.	
27.	CGSS to Launch pad, New and Old facilities of Liquid Oxygen facility (LOX), Liquid Nitrogen Facility, UH25 storage facility, Isrosene storage facility.	
28.	CPB to Launch pad, New and Old facilities of Liquid Oxygen facility (LOX), Liquid Nitrogen Facility, UH25 storage facility, Isrosene storage facility, ACOSS Tower.	
29.	Inside Mobile Launch pedestals (MLP)& ACOSS Tower.	
30.	Along pipe cutouts, columns and different elevations inside the Stage Preparation Facilities.	

Sl. No	ISRO Description	Technical Compliance (by the party)
31.	Work includes alignment of pipes, maintaining of required slopes, proper fixing of flow components, pipe fittings & instruments, fixing of structural pipe supports, fixing of clamps and interfacing of piping circuits to equipment.	
32.	Erection of piping includes doubling of pipes, positioning of completed pipeline segments at required locations as per the piping layouts.	
33.	MS supports fixing and drilling of holes in MS supports, fixing of clamps shall be carried out for every 2.5…3.0 Meters of pipe length where ever pipe line routing is carried out. **No extra cost will be paid for fixing clamps to the pipe lines.**	
34.	**Ball run test** After completion of pipe welding, ball run test to be carried out prior to the radiography and further testing to ensure required minimum bore. The details of ball sizes are given in **Table-3**. SS balls required for the test to be supplied by the party during testing	
35.	**If the pipeline joints are not qualified during ball run test, it is the responsibility of the contractor to rectify/repair the weld joints without extra cost.**	
Radiography		
36.	All butt-welds shall be subjected to radiographic examination with X-Ray/Gamma Ray source as per ASME sec. V for a sensitivity of 2-2T. In-situ joints for which X-ray is not possible due to its position focal point accessibility, Gamma-ray is permitted	
37.	Exclusive radiography machine / gamma ray source has to be arranged by the contractor when sufficient numbers of joints are available for examination. Accumulation of weld joints for want of radiography should not be more than 200 Nos.	
38.	D2 films shall be used for gamma rays and D5 films shall be used for X-rays. Elliptical shots (double wall double image) may be employed for size 15NB onwards. For tube joints 6.35 & 12.7mm 3 shots need to be taken	

Sl. No	ISRO Description	Technical Compliance (by the party)
39.	The penetrometer used shall conform to ASTM E 1025/ASTM E747 (or) relevant DIN standards	
40.	Radiography shall be carried out by qualified technicians (i.e.) minimum level- I of ISNT/ ASNT and qualification certificates shall be produced with latest renewal to the department before proceeding with the work	
41.	Radiography film shall be evaluated and report shall be submitted by Level II ISNT/ ASNT (or) equivalent qualified person. However, department inspector will carry out the final evaluation. Department QC/Department NDT Level-II trained inspector decision is final for retake due to rejection (or) radiography owing to bad image quality (or) repair joints. No extra cost will be paid for re-take due to rejection of radiograph owing to bad image quality or repair joints	
Painting		
42.	High built epoxy primer and finish coat of Aliphatic acrylic polyurethane finish paint shall be applied	
43.	The paints to be applied are special type (epoxy paints) i.e. two component paints. Both the components are to be mixed and applied immediately after mixing	
44.	All the surfaces shall be applied with the one coat of primer of 125…150-micron DFT where ever required and one coat of finish coat of 50…60-micron DFT by the qualified painters	
45.	All the surfaces to be painted shall be cleaned thoroughly with metallic wire brushes, chipping hammers, emery papers etc., for removing rust, mill scales and old paint coats. Finally, surfaces shall be cleaned with cotton waste	
46.	All tools and consumables required for surface preparation, paint brushes for painting, skilled painters and supervision is in the scope of contractor	
47.	Supply of paints (Primer and finish coat) and thinners, identification of jobs, stage wise supervision shall be in the scope of department	
48.	**Color scheme**: It will be provided by purchaser at a later stage and in general as per relevant Indian standards and which will be applicable for final coat	
49.	Quantities of painting, stenciling/tagging shall be as per	

Sl. No	ISRO Description	Technical Compliance (by the party)
	Table-4	
50.	Painting of one-meter pipe lines shall include application of one coat with primer and one finish coat with paint on pipe line after removing pipe clamp, applying paint to pipe clamps & shim plate and re fixing back (clamps will be fixed at 2.5-3.0 Meters distance on avg.). Any flow components existed in the line also shall be painted and included in the pipe line painting only	
51.	Spray painting gun shall be in the scope of supplier. Air supply for spray gun shall be in the scope of the department	
Inspection		
52.	Department Engineer will participate in the following inspection activities, a. Fit-up, alignment of equipment and weld edge preparation. Fit-up of all the joints shall be cleared by department engineer prior to the welding. b. Witness of all DP tests and clearance for further works. c. Review and clearance of all radiography films. d. Witness of ball run test, strength tests and pneumatic leak tests. e. Witness of pipeline cleanliness tests. f. Participation in all critical qualification tests as part of final loops qualification and interfacing with the equipment. g. The contractor shall offer for stage wise inspection during painting. The following inspections will be carried out by Department Engineer for painting e) Pre-surface preparation inspection f) Inspection of coating on the equipment g) Evaluating cleaning between coats. h) DFT measurement through paint thickness measurement gauge	
Sequence of work execution (From fabrication to system commissioning)		
53.	1. Laying of pipelines and TIG welding as per the approved P&ID.	

Sl. No	ISRO Description	Technical Compliance (by the party)
	2. After welding, as built drawing shall be generated and joint numbers shall be indicated on the pipelines for radiography. 3. After radiography, ball run test shall be carried out and ensure that pipeline bore is maintained as per the specification. 4. After ball run test, clearance will be given for purging the pipelines with the dry GN2 gas. 5. Preparation of pipe supports and fixing of pipe clamps for all the pipe lines. 6. Hydro /Pneumatic test shall be carried out for the new/existing modified lines based on the operating pressure of the pipe line. 7. After hydro test, internal cleaning with IPA, external weld joint pickling and passivation, purging with GN2 and dew point measurement shall be carried out. Ensure that dew point shall be better than -55 Deg.C. 8. Replacement of test gaskets with actual gaskets wherever required. 9. For all the new/existing modified lines particle check shall be carried out. Ensure that particle size greater than 20micron is NIL. 10. Fixing of flow components i.e. valves filters wherever applicable. 11. Integrated leak check along with the pneumatic equipment. 12. Painting of pipe lines. 13. Stenciling/tagging of pipe lines and flow components. 14. Preparation of test packs/reports (for each pipe line number), photo copies/Xerox and binding. **Note: All the above works shall be in the scope of the contractor under department personnel supervision.**	
MS Structural Fabrication Works		
54.	Fabrication of supports for piping & flow components and equipment supports. Suitable anchoring shall be planned using MS structural material and anchor fasteners.	

Sl. No	ISRO Description	Technical Compliance (by the party)
	Structural work fabrication shall be with SMAW welding with electrodes of AWS E6010/E6011/E6013/E7018	
55.	Drilling and anchoring of pipe supports, hangers and on the wall /floor/roof embedment shall be carried out in situ based on the site requirement	
56.	Pipe supports shall be fabricated for every 2.5-3.0 Meters span in the yard, trenches, ceiling and along the columns as per the requirements	
57.	Cable trays laying and welding of cable trays shall be as per routing finalized by Department Engineer. No separate payment will be made for laying of cable trays.	
Scope of supply:		
58.	Scope of supply of various elements, materials, consumables, etc., are as follows: **Department scope:** The following items will be supplied by department at free of cost. 1. All materials required for the execution of work such as pipes, pipe fittings like tees, elbows, flanges, machined fittings like Nipples, Unions and flow components. 2. MS structural materials, clamps & shim plates for pipes/tubes. 3. Radiography source pit and dark room for development of films 4. Pneumatic supply for purging & testing activities (GN2/Air) 5. Test gaskets and actual gaskets for equipment/piping 6. DM water for hydro test 7. Paints & thinners 8. IPA for cleaning 9. Potable water will be supplied by department at specified tapping points. 10. Electricity required for machine tools like grinders, welding machine etc., (Will be provided at the nearest available power point around 100m away)	
59.	**Contractor Scope:** The following machinery, manpower and consumables shall	

Sl. No	ISRO Description	Technical Compliance (by the party)
	be in the contractor's scope. Machinery scope is not limited to the following. Necessary tools along with machinery shall be in the contractor's scope for executing the scope of given fabrication, erection, testing and commissioning works. Depending on the work front contractor has to mobilize multiple batches **(Minimum three batches for SS welding & one batch for MS welding with required machinery and material at a time (Each batch consists of Welder-1, Fitter-1, Grinder-1 and Helper-2). If required, contactor has to mobilize additional welding team to meet the scheduled works failing which will lead to termination of the contract with proper intimation as per department rules) to meet the schedule of work.**	
60.	**Man Power** 1. Experienced supervisor with 5 to 10 years in the piping fabrication field, who can read the given P & ID drawings and execute the works with systematic planning. 2. Site engineer / supervisor shall be deployed towards smooth execution of the works and preparation of documents, coordination with radiography team & Department representative. 3. 6G qualified TIG welders for SS pipe welding. 4. Structural welder for MS fabrication (SMAW, Gas cutting etc) 5. Qualified skilled fitters. 6. Skilled grinders and helpers. 7. Skilled painters 8. Number of manpower for category wise shall be indicated as part of tender considering the stipulated time period for execution of work.	
61.	**Machinery** 1. TIG welding machines with suitable accessories like cables, torches, electrodes etc. 2. Safety appliances such as face shield, gloves, eye glasses etc for personnel protection.	

Sl. No	ISRO Description	Technical Compliance (by the party)
	3. Manual arc welding machine for welding of structural steel. 4. Grinding and cutting machines with necessary attachments. 5. Gas cutting sets. 6. Hand and magnetic base drilling machine. 7. Hammer drilling machine for drilling holes in concrete. 8. Pipe bending machine, hand tube benders and tube cutters. 9. Material required for Scuff folding for erection of vertical piping. 10. Wind shields while working in open areas. 11. Machinery in each category wise& Number of machines shall be indicated as part of tender considering the stipulated time period of execution of work. 12. **For yard pipe line welding, contractor shall have electrical cable length of minimum 500m to get the free power supply for welding from the nearest facility (or) contractor shall arrange generator power supply on his own for TIG welding/MS Structural support welding for yard pipe lines.**	
62.	**Consumables** 1. SS filler wires for TIG welding. 2. Electrodes for SMAW (E6010/E6011/E6013/E7018) 3. Grinding wheels, cutting wheels, emery cloth/papers, cotton waste & SS wire brushes etc. 4. Paint brushes, cleaning wire brushes, etc., 5. Industrial gases (Argon, Oxygen, Acetylene), regulator along with flow meter sets for welding and gas cutting. 6. Dye penetrant test kits along with dye penetrant chemicals with validity (Make CHECKMATE/MAGNAFLUX).	
63.	Specification of the consumables shall be as per **Table-5** of **Annexure-1** **Note:** All the above consumables shall be obtained with the	

Sl. No	ISRO Description	Technical Compliance (by the party)
	manufacturer's certificate for its conformity. Any change in the above make, contractor shall get prior approval from department before usage.	
64.	Technical evaluation by the Department Engineer will be carried out for machinery and manpower to ascertain their complete suitability / performance for the jobs described above. Based on this evaluation clearance will be given for taking up the actual job.	
65.	**Documentation** 1. During the execution of work the following documents shall be prepared. a) Preparation of Material identification reports b) Preparation of line wise weld history sheets c) Preparation of isometrics and as built drawings in Auto Cad 2. Contractor has to generate the following reports/drawings before commencement of hydro/pneumatic test. a) Test loop drawings b) Ball run test reports c) Radiography reports 3. After commissioning,3 sets of Loop wise documents (Line number wise) consisting of the following works /tests shall be submitted with neatly bounded condition: a) Process and Inst. Diagram in AutoCAD b) As Built Drawing in AutoCAD c) Material Inspection Report d) Joint History Sheet (DP and Radiography) e) Ball Run Test Report f) Mechanical Clearance (Pre-Test) g) Strength test Report (Hydro /Pneumatic) h) Chemical Cleaning report i) Cleanliness Report j) Pneumatic Leak Check Report k) Moisture Measurement Report l) Painting Report	
66.	**Supply of Structural Material:** The following specification has to be followed for supply of structural material. 1. All items shall be manufactured as per IS-2062 and dimensions as per IS-808.	

Sl. No	ISRO Description	Technical Compliance (by the party)
	2. All the items MAKE shall be of SAIL/RINL/TISCO/JINDAL/JSW 3. All MS Structural material shall be free from scratches, pinholes, rust & bend. 4. Re-rolled products are not acceptable. 5. All items shall bear IS Stamping. 6. The items shall be inspected by our department engineer prior to dispatch. The scope of inspection is visual, dimensional and verification of manufacturers test certificates. 7. Test certificates of structural material shall be sent along with consignment. 8. Perforated GI Cable trays shall be hot dipped galvanized with straight folding, with serial perforation. 9. Thickness of galvanization on cable trays shall be Min.90 Microns 10. Payment will be made for actual quantity supplied (within +/-10% of indicated quantity). 11. Weighment of the structural material at department weigh-bridge at SDSC- SHAR, Sriharikota shall be final. 12. The structural steel/trays / Anchor bolts shall be procured by the party as given in **Table -6** of **Annexure-1.** 13. Minimum length of angles and channels shall be 5 to 6 mtrs.	
Bid/Offer Submission details		
67.	The bid/offer shall be submitted in two parts ✓ **Part-I: Technical- Commercial bid** contains the technical information and commercial compliance aspects. ✓ **Part-II: Price Bid:** The Price bid should contain the Prices.	
68.	**Part-I: Techno-Commercial bid:** **The tenderer shall necessarily present the following in the techno-commercial bid:**	

Sl. No	ISRO Description	Technical Compliance (by the party)
	• The tenderer shall furnish **point-wise confirmation (Technical Compliance attached in Annexure-II)** for the technical specifications given in the enquiry.	
69.	The tenderer shall necessarily furnish the details of previously executed orders. Necessary documentary evidence along with end user certificate (confirming the satisfactory performance) shall be submitted along with offer as a mandatory requirement. **Non-compliance of this requirement shall lead to rejection of the offer.**	
70.	**Bidder need to submit un-priced price bid copy (as highlighted below) indicating the description of all the cost elements considered, without indicating the price. Tenderer shall note that indication of price in the techno-commercial bid shall lead to dis-qualification of bid.**	
71.	**Similar work:** The Bidder shall have the experience in executing SS pipe fabrication, Erection of equipment, hydro and pneumatic testing and related documentation works.	
72.	The price bids will be opened only after evaluation and acceptance of the technical bid of the respective tenderer.	
73.	**Offer Validity:** The validity of the offers / tenders should be 90 days from the date of opening of the tenders. Tenders with offer validity less than the period mentioned above, will not be considered for evaluation.	
74.	**General conditions of the contract:** **Due to interconnected nature of work scope, over all L1 will be selected towards awarding the contract. Party shall submit the acceptance for the same.**	
75.	Contractor shall clearly indicate deviations if any from indent specifications in the offer, otherwise contractor has to accept all the terms and conditions put by the Department.	
76.	**Period of contract: Period of Contract is for 24 months**	

Sl. No	ISRO Description	Technical Compliance (by the party)
	from the date of release of purchase order.	
77.	**Quantity variation:** The quantity variation of + 25% is permissible on the Total contract value based on site requirements. Price will be considered for this variation based on unit prices of the purchase order.	
Tender Evaluation:		
78.	**The following documents shall be submitted along with the Techno-commercial bid for prequalification of Bidder.** Contractor should have executed fabrication contracts involving erection and commissioning of piping (i.e. SS TIG Welding for pipe & tube, bending of SS pipes, radiography of SS butt welded joints) and MS structures (i.e. MS material supply, fabrication & erection works) during the last five years by considering last financial year ending with March-2025 shall be submitted for tender evaluation. Single PO for similar works of Rs.100Lakhs (or) Two POs for similar works of Rs.80Lakhs each (or) Three POs for similar works of Rs.50 Lakhs each. **(or)** Contractor should have executed fabrication contracts involving erection and commissioning of piping (i.e. SS TIG Welding for pipe & tube, bending of SS pipes, radiography of SS butt welded joints) and MS structures (ie. MS material supply, fabrication & erection works) with a minimum cumulative value of all purchase orders amounting to INR 110 Lakhs (in the last five years by considering last financial year ending with March-2025).	
79.	Work completion certificates shall be submitted along with offer for the above POs. Without this offer will not be considered.	
80.	P.O copies with only structural steel welding, P.O copies with only CS/GI pipe with arc welding are not acceptable.	
81.	List of working personnel: Welders - **Min.3 welders** (**6G qualified TIG welders for SS pipe welding**), Fitters-	

Sl. No	ISRO Description	Technical Compliance (by the party)
	Min.3 fitters, Grinders-Min.3 grinders, helpers-as per the requirement), fabrication supervisors-as per the requirement, drafts man (Min.2) and skilled personnel for documentation (Min two numbers) & one welding batch for MS.	
82.	List of Machinery &Equipment to be used for the work (like TIG welding machines-Min.3Numbers, Grinding-Min.3numbers, gas welding equipment, and bending and other equipment as per project requirement).	
Manpower & Schedules		
83.	Contractor has to deploy **Minimum of three Welding Batches (Each batch consists of Welder-1, Fitter-1, Grinder-1 and Helper-2) for SS & one batch for MS** to carry out the job. In case of additional requirement, party shall deploy additional one or two **Welding Batches** in case of requirement. Such additional manpower shall be deployed within 7 days notice.	
84.	Tentative start of work will be intimated to Contractor **Two weeks** in-advance.	
85.	The contractor will be allowed to work beyond office hours if required and including holidays to meet the project schedule.	
86.	Site will be kept open for round the clock basis (Contractor shall be allowed to work in three shifts for carrying out site works). Accordingly, manpower shall be planned by the contractor.	
87.	In order to complete the work in time, it is recommended to deploy adequate manpower and supervisors and the work shall be carried out in two or three shifts based on requirement.	
88.	Progress review meetings once in a week will be conducted for monitoring the status of works and the contractor's site representative need to attend with all relevant inputs.	
Payment terms		
89.	100% payment after receipt and acceptance of material for	

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	supply items.	
90.	Payment shall be as per completed portion of the fabricated/ erected/painting on PRO-RATA basis once in a month after duly certified by the Department Engineer.	
91.	Security deposit of 3% PO value (excluding material supply part) shall be submitted to the purchaser after release of P.O (within 10 days) and the same shall be returned to the supplier on successful completion of work contract.	
92.	The works as described above shall be treated as completed only after certification of the Department Engineers.	
93.	The purchaser reserves Right to cancel the contract at any time in case of failure of the contractor to fulfill the various requirements mentioned in the Purchase order (like number of welding batches etc.)	
Working Personnel terms & conditions		
94.	**Security**: The contractor shall follow entry permit and gate pass system for his laborers and materials white entering gate. Contractor supervisor shall ensure that their personnel are strictly confined to the assigned job and place of work	
95.	**Safety**: Contractor has to give an undertaking that they will comply with prevailing safety norms at site put forth by department. Safety officer shall have full access to contractor's storage shed/office for inspection	
96.	**Group Insurance**: Group insurance for workmen shall be taken for this work. The proof of such insurance shall be submitted immediately after awarding the contract prior to the commencement of work. Group Insurance for men for a minimum amount of Rs. 10.0 Lakhs shall be insured for this work	
97.	**Medical Assistance**: While executing this contract work, if any of the workers engaged by contract agency is injured, they will be provided with first-aid by department. However, contract agency shall take care of subsequent medical treatment elsewhere	
98.	**Minimum wages**: The contractor shall ensure minimum wages as prescribed in minimum wages Act as per the State / Central Government Act. He and his work force have to	

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	follow safety standard prescribed. Contractor has to comply with all labor regulations as prescribed in various Acts in respect of himself and his man power	
99.	**Labor law:** The contractor shall not employ persons below 18 years of age	
100.	Conveyance for personnel from and to work spot has to be arranged by the contractor	
Contractor terms & conditions		
101.	Sriharikota is an island and situated around 100kms north of Chennai and the work site is located at about 10kms from main entrance gate. Contractors have to make their own transport for their personnel for carrying out the work which is spread over 16 Sq. km area	
102.	Department's permission shall be obtained by contractor for establishing shed/ office with an under taking for construction of shed with non- flammable material and for demolition of the same after completion of work with party's expenses	
103.	The contractor shall take enough care to ensure to progress of the work without any material and personnel damage. It is the sole responsibility of contractor to ensure all safety norms to his personnel during transportation between work spot and Department/Contractor stores, and work in prefabrication area, in storage shed and in yard. Department will not hold responsibility to any mishap to the contractor personnel.	
104.	The contractor shall get approval from Department for the specifications of all items in his scope of supply, bought out items if any, before placing orders for the same	
105.	The contractor shall be responsible for the safe storage of radiography sources of his sub-contractor. Radiography source shall be stored in a room which is located about 5 Km from the work spot. However, transportation of source from the storage room to the work spot and back shall be the responsibility of contractor	
106.	The contractor shall take prior approval from the Department for awarding sub contract for full / partial works in the contract if any and the payment for the subcontractor	

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	shall be the responsibility of the contractor. The Department reserves the right to pay the subcontractor directly from the running bills in case the contractor fails to pay his sub-contractor in the interest of completion of work	
107.	The supplied materials shall be entered to the SDSC premises only through Department Stores and Security endorsements. M.S structural material will be weighed in department Weigh Bridge. Payment towards the supply shall be made as per the department weighment receipt	
108.	The purchaser will take over the system only after completion of final pneumatic leak check & contamination checks on the total integrated system by contractor, if any modification of the pipe line during the above activity shall be carried out by the party without any additional cost	