



**NATIONAL CENTER FOR COMBUSTION RESEARCH
AND DEVELOPMENT (NCCRD)
INDIAN INSTITUTE OF TECHNOLOGY MADRAS
CHENNAI – 600036, INDIA**

Ref. No. ICS/11-12/013/DSTX/TSUN

Date: 5 Jun. 2017

Due date: 30 Jun. 2017

Item name: GAS PIPELINE LAYING WORK

1. Quotations are invited in a **two bid system** for the items shown overleaf (in Annexure I). The offers / bids should be submitted as Technical bid and Financial bid. The Technical bid should consist of all technical details / specifications only. The Financial bid should indicate item-wise price for each item and it should contain all Commercial Terms and Conditions including Taxes, transportation, packing & forwarding, installation, guarantee, payment terms, pricing terms etc. The Technical bid and Financial bid should be put in separate covers and sealed. Both the sealed covers should be put in a bigger cover. The Tender for supply of “ _____ ” should be written on the left side of the Outer bigger cover and sealed.
2. The quotations should be valid for sixty days from the due date and the period of delivery required should also be clearly indicated.
3. The total cost of the equipment in terms of CIP Chennai should be clearly mentioned.
4. Terms of warranty and guarantee should be explicitly mentioned.
5. Packing and delivery charges, customs and clearance duty should be clearly stated.
6. Goods shall not be supplied without an official supply order.
7. Local firms : Quotations should be for free delivery to this institute. If quotations for ex-godown delivery charges should be indicated separately.
8. Firms outside Chennai: Quotations should be for F.O.R. Chennai. If F.O.R. consignor station, freight charges by passenger train / lorry transport must be indicated. If ex-godown, packing, forwarding and freight charges must be indicated.
9. The rate of sales / general taxes and the percentage of such other taxes legally leviable and intended to be claimed should be distinctly shown along with the price quoted. Where this is not done, no claim for sales / general taxes will be admitted at any stage and on any ground whatsoever. The taxes leviable should take into consideration that we are entitled to have Concessional Sales Tax (CST) applicable to non-government educational institutions run with no profit motive for which a concession sales tax certificate will be issued at the time of final settlement of the bill.
10. Payment : Specify the mode of payment and if advanced payment has to be made. Every attempt will be made to make payment within 30 days from the date of receipt of bill / acceptance of goods, whichever is later.
11. IIT Madras is exempt from payment of excise duty and is eligible for concessional rate of customs duty. Necessary certificate will be issued on demand.
12. IIT Madras has the right to accept the whole or any part of the tender or portion of the quantity offered or reject it in full without assigning any reason.
13. The sealed quotation may be sent to

Prof. S. R. Chakravarthy

NCCRD Office

No. 201, Rarefied Gas Dynamics Lab (Behind Aerospace Engineering Dept.)

Chennai – 600036, Ph. (O) +91-44-22575025



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Annexure I

Ref. No. ICS/11-12/013/DSTX/TSUN

Date: 5 Jun. 2017
Due date: 30 Jun. 2017

GAS PIPELINE LAYING WORK

Prebid meeting is scheduled on 21.6.2017 (Wednesday) at 11.00 a.m. in NCCRD Building, IIT Madras

Quotation for supply and installation of gas pipelines along with accessories and sub-systems for operating & calibration gases inside the building of National Center for Combustion Research and Development (NCCRD).

1. Brief description of the required gas pipeline:

Gas pipes are required for Emission analyzer (AVL AMA i60)for operating gas, calibration gas pipe line. Totally 15 no's of gas pipe lines are required. Each line requires two stage of pressure reduction. One regulator is fixed at the cylinder another one is fixed at the control panel which attached near to the emission analyser. The following gases will be used for the emission analyzer. The gas pressure is also mentioned below.

The following are to be followed.

Operating gas pipe lines-4no.s

1. H₂/He=>H₂-40% He-60% (2-4 bar)- single gas pipe line required
2. synthetic air=>20%O₂,80%N₂(2-4 bar)- single gas pipe line required
3. O₂(2-4 bar)- single gas pipe line required
4. N₂(2-4 bar)- single gas pipe line required

Calibration gas pipelines- 11no.s

1. C₃H₈ (min 2-4bar, Max-8-10bar) –two pipe lines are required
2. CH₄ (2-4 bar) – two pipe lines are required
3. NO_x (2-4 bar) - two pipe lines are required



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4.CO (2-4 bar)-two pipe lines are required

5.CO₂ (2-4 bar) -required single pipe line

6.O₂ (2-4 bar) -required single pipe line

7. one extra line

Cylinder gas pressure-**Max 200Bar**

Emission analyzer supply gas pressure- **0 to 10Bar(Range)**

2. Joining of gas pipelines& specifications:

The welding of the pipe lines shall strictly be of ORBITAL WELDING.

Pipe line specifications:

Tube size-6mm SS Tube Electro polished (SS 316)

Pneumatic Jerk fitting.

Gas panel equipped with shutoff valves (6mm ferrule fitting)

Low-pressure line 6mm Teflon tube.

3. Leak testing and labeling:

The entire system shall be leak tested and labeled.

4. Training and commissioning:

After completion of work the staff of NCCRD shall be given training on operating the pipeline system by vendor.

5. Pre-bid meeting and site visit:

The bidder should attend the pre-bid meeting and also make a site visit to qualify for submitting the tender.

✓ Date and time of pre-bid meeting 21.6.2017 at NCCRD Conference room at 11.00 a.m.

6. Safety:

The successful bidder shall take all safety precautions and ensure the safety of all their employees and the people in the neighborhood of the work site.



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7. Layout:

Plan-view layouts of pipelines for the ground floors are attached (Fig 1&Fig2).

8. The technical bid and price bid should be in the format given for technical specification and requirement.
9. The bidder should also indicate the technical compliance of materials in the column given.
10. Standards for components are given. In case insufficient bids are received in spite of the standards, the choice standards may be reconsidered at the time of considering the bids (before opening financial bid).
11. A break up of labor charges involved may also be given.
12. The bidder should give reference of having executed similar jobs of this magnitude in a reputed company or institutions.
13. **Warranty required:**24 months from the date of commission and acceptance from NCCRD.
14. **Payment:**
 - 60% after supply of material without any tax
 - 30% after installation and commission without tax
 - 10% after certified by end user
15. For any technical clarification& Drawing clarification, please contact Prof. Ramesh A (aramesh@iitm.ac.in), Mr.LAL MOHAMMED (9884143101,lalmohammedkhan@gmail.com) or Monikandan S U (8489385815,subeshmani21@gmail.com).



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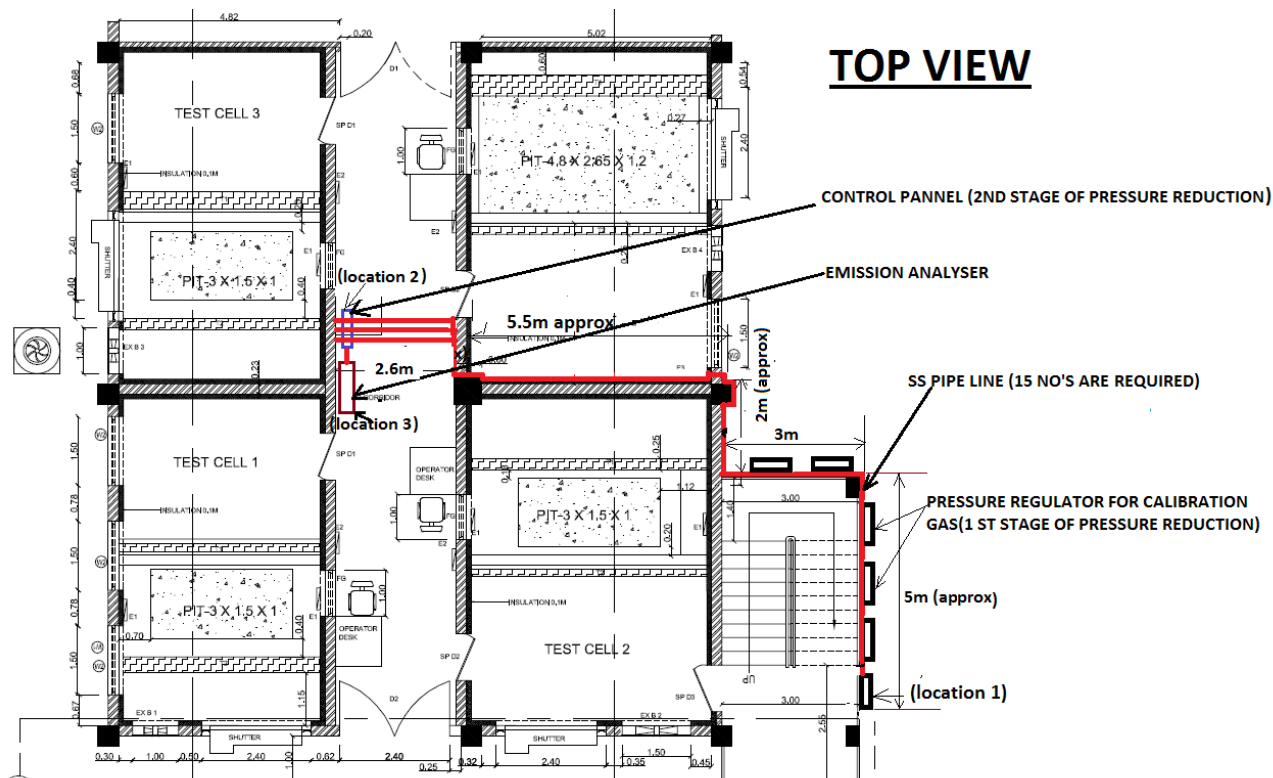


FIG 1: OVERALL LAYOUT



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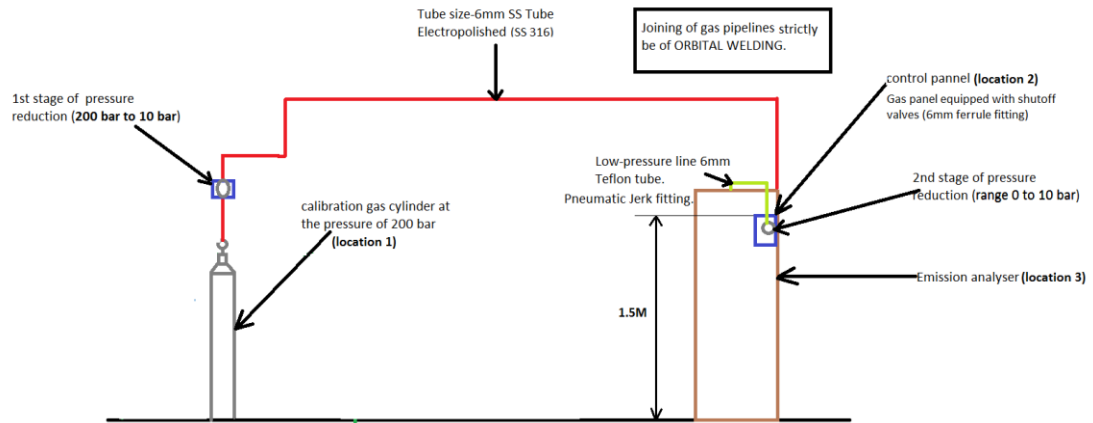


FIG 2: PIPE LINE LAYOUT

Technical specifications & requirements for Operating & Calibration gas pipeline for Automotive Lab

TECHNICAL BID

SI.No.	Item Description	Qty. (Nos./Mtrs.)	Standards	Make	Model No	Technical compliance (YES / NO)
1	<p>The pressure regulator which will be mounted above the calibration and Operating gas cylinder (location 1) with the following specifications: Seperate Panel for each Operational & Calibration Gas cylinder with the following specifications: Gas Purity 6.0 Grade, MOC=SS316L, Specially Cleaned, Inlet Pressure =200bar, Outlet Pressure = 0 to 15 Bar, Diaphragm=Hastelloy, With 1 Number of Inlet Diaphragm Shut-Off Valves, With 1 Number of Internal Purge Diaphragm Valves, With Safety Relief Valve, With Inlet & Outlet Normal Gauges, With Inlet & Outlet Ports = 1/4" FNPT, Leak Rate : 10-8 mbar l/s of Helium Outlet Fittings for above Panel, MOC:SS316L, 1/4"MNPTX1/4" OD.</p>	15	EN ISO 2503/ CGA-E4 Pressure Gauges in Regulators : EN 837/ ASTM A 276 AISI 316L/EN 562 Class 1.6 NG 50			
2	<p>Flexible hose which will connect each cylinder and pressure regulator(S.No:1) at location 1 should have the following specifications: SS Flexible Hose(Internal SS) along with Safety Wire & Cylinder Connectors for Operational Gases, 1.5 Meter Length. Operating Pressure : 200 Bar</p>	15				
3	Cylinder Holder to Hold Cylinders with Belt.	15				
4	<p>The SS pipe line between location 1 & location 2 should have the following specifications: SS316L Tube 1/4"OD x 0.035" WT ,TP316L, Electropolished, (10 Ra internal surface finish)</p>	402	ASTM A269 / A632/TRGL/ DIN EN 10217-7 / DIN EN 10216-5			
5	<p>Flash Back Arrestor for Hydrogen to be located between emission analyser and point of use regulator should have the following specifications: MOC:SS 316, Operating Pressure : 10 Bar, Inlet & Outlet = 1/4" OD, Compression Fitting.</p>	1	EN 730 / ISO 5175, BAM & UL Approved/ EN 730-1			

6	<p>The pressure regulator at location 2 should have the following specifications: Point of Use Regulators for Operational & Calibration Gases, Gas Purity 6.0 Grade, Wall Mounting, Single Stage, Inlet Pressure : 20 Bar, Outlet Pressure : 0 to 5 Bar, MOC : SS316L, Specially Cleaned, Inlet Diaphragm Shut-Off Valve, With Hasteloy Diaphragm, Assembled with Outlet Pressure Gauges With Inlet & Outlet Ports = 1/4"FNPT. Leak Rate : 10-8 mbar l/s of Helium</p>	With inbuilt	13	<p>EN ISO 2503/ DIN 12918 Pressure Gauges in Regulators : EN 837/ ASTM A 276 AISI 316L/EN 562 Class 1.6 NG 50</p>			
7	<p>The pressure regulaor for C3H8 mix at location 2 should have the following specifications: Point of Use Regulators for C3H8 Mix(Calibration Gas), Gas Purity 6.0 Grade, Wall Mounting, Single Stage, Inlet Pressure : 20 Bar, Outlet Pressure : 0 to 10 Bar, MOC : SS316L, Specially Cleaned, inbuilt Inlet Diaphragm Shut-Off Valve, With Hasteloy Diaphragm, Assembled with Outlet Pressure Gauges With Inlet & Outlet Ports = 1/4"FNPT. Leak Rate : 10-8 mbar l/s of Helium</p>	With	2	<p>EN ISO 2503/ DIN 12918 Pressure Gauges in Regulators : EN 837/ ASTM A 276 AISI 316L/EN 562 Class 1.6 NG 50</p>			
8	<p>Inlet Fittings for Point of Use Regulators, MOC:SS316L, 1/4"MNPTX1/4"OD.</p>		15	<p>ASTM A276/ ASME SA479/UNSPSC (10.0) : 40142613/UNSPSC (11.0501) : 40142613/UNSPSC (13.0601) : 40183110/UNSPSC (15.1) : 40183110/UNSPSC (17.1001) : 40141700/UNSPSC (4.03) : 40141720 ☒</p>			
9	<p>Outlet Fittings for Point of Use Regulators, MOC:SS316L, 1/4"MNPTX6MM OD.</p>		15	<p>ASTM A276/ ASME SA479/UNSPSC (10.0) : 40142613/UNSPSC (11.0501) : 40142613/UNSPSC (13.0601) : 40183110/UNSPSC (15.1) : 40183110/UNSPSC (17.1001) : 40141700/UNSPSC (4.03) : 40141720 ☒</p>			
10	<p>Teflon Tube from Point of Use Regulator to Emission Analyser</p>		30				

Installation of Gas Piping with Orbital Welding with Required Accessories.

1	<p>Installation of Gas Panels,Point of Use Regulators, Tubing with required Accessories, Orbital welding, Labeling, LEAK TESTING & COMMISSIONING, Training etc.(Pressure Test with Helium Gas)</p>		1	<p>ORBITAL WELDING IS MUST Orbital Welding: Section IX of ASME Weld Fittings: ASTM A 276 Testing of fittings as per ASME B 31.1</p>			
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