

TENDER DETAILS FOR GAS PIPELINE (new specification)

Project no: ICS/11-12/013/DSTX/TSUN

Quotation for supply and installation of gas pipelines along with accessories and sub-systems for gases like Nitrogen, Methane and LPG inside the building of National Center for Combustion Research and Development (NCCRD).

1. Brief description of the building:

The NCCRD building consists of 5 floors. i.e., Ground floor, First floor, second floor, Third floor and Fourth floor. Except the first floor all other floors require gas pipeline.

2. Brief description of the required gas pipeline:

Every floor (Except first floor) will have a cylinder bank area which consists of a facility for storing and chaining of empty cylinders in one row and full cylinders in another row. In addition there will be a panel with relevant equipments for the purposes of distribution of gases to the pipelines (details enclosed).

3. Termination of pipelines:

The gas pipelines will terminate at user points as shown in the lay-out drawings for each floor. The termination shall be with a shut-off valve.

4. Joining of gas pipelines:

The welding of the pipelines shall strictly be of ORBITAL WELDING.

5. Leak testing and labeling:

The entire system shall be leak tested and labeled.

6. Training and commissioning:

The staff of NCCRD shall be given training on operating the pipeline system.

7. 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: 26th July 2016 @ 11.00 am at Admin building 2nd floor conference room.

8. Safety:

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

9. Items required and its description:

Floor-wise description of the items required and their quantity is attached. At the time of execution, any additional quantity of any material utilized/installed to fit the site condition shall be charged separately.

10. Layout:

Plan-view layouts of pipelines for all the floors are attached.

11. The technical bid and price bid should be in the format given for technical specification and requirement.
 12. The bidder should also indicate the technical compliance of materials in the column given.
 13. Choices of brand names for components are given. In case insufficient bids are received in spite of the choice of brand names, the choice of brand names may be reconsidered at the time of considering the bids (before opening financial bid).
 14. A break up of labor charges involved may also be given.
 15. The bidder should give reference of having executed similar jobs of this magnitude.
 16. The pipe sizes given in the attached specifications are nominal. However, if the supplier feels that the sizes are inadequate they may suggest and quote for the actual size and support the same with calculations or documents. Purchase committees discretion is final for qualifying and disqualifying the bid.
 17. Work should be completed within two months.
 18. **Warranty required:** 24months.
 19. Bidder who have attached the first pre-bid meeting need not necessarily attend the second pre-bid meeting.
- 20. Payment:**
- 60% after supply of material without any tax.
 - 30% after installation and commission without tax.
 - 10% after certification by end user.
21. For any technical clarification please contact Mr.P.John George (9042301070 / 044-22575026) or Krishnakumar.D (8124430509)

TECHNICAL SPECIFICATION & REQUIREMENTS FOR PROPOSED GAS PIPING AT NCCRD LABS

TECHNICAL BID

*For technical bid indicate the make and model of compliance to technical specification of requirement.

Ground Floor for N2 & LPG - Thermal Power Lab					
Sl.No.	Item Description	Qty. (Nos./Mtrs.)	Approved Make	Model	Technical compliance (YES / NO)
1	Factory Assembled Manual Change Over Panel for Nitrogen,(1+1 Cylinders), Single Stage,Flow:500SLPM, MOC=Brass Chromeplated & Specially Cleaned, Inlet=230bar/3300psi,Outlet Pressure = 0 to 10 Bar, Diaphragm=Hastelloy, With Inbuilt 10 micron filter at Inlets, With 2 numbers of Inlet Shut-Off Diaphragm Valves, With Safety Relief Valve, With Inlet & Outlet Pressure Gauges according to EN837, With Inlet & Outlet Ports=CL3/8" OD.	1	GCE/Parker/Matheson/Swagelok		
2	Factory Assembled Manual Change Over Panel for LPG,(1+1 Cylinders), Single Stage,Flow:30SLPM, MOC=Brass Chromeplated & Specially Cleaned, Inlet=20bar/300psi,Outlet Pressure = 0 to 3 Bar, Diaphragm=Hastelloy, With Inbuilt 10 micron filter at Inlets, With 2 numbers of Inlet Shut-Off Diaphragm Valves, With Safety Relief Valve, With Inlet & Outlet Pressure Gauges According to EN837, With Inlet & Outlet Ports=CL3/8" OD.	1	GCE/Parker/Matheson/Swagelok		
3	SS Flexible Hose(Internal SS) along with Safety Wire & Cylinder Connectors for N2 & LPG, 1.0 Meter length .	2	GCE/Parker/Matheson/Swagelok		
4	SS Flexible Hose(Internal SS) along with Safety Wire & Cylinder Connectors for LPG to match Indian LPG Cylinders, 1.0 Meter length .	2	GCE/Parker/Matheson/Swagelok		
5	Cylinder Holder to Hold Cylinders, Profiled Stainless Steel Sheet with Belt	4	GCE/Parker/Matheson/Swagelok		
6	Inlet Diaphragm Shut-Off Valve for User Points(2 X 3 Places), MOC: Brass Chromeplated,Working Pressure:50 Bar, Diaphragm:Hastelloy, Inlet & Outlet Ports = 3/8" OD SS.	6	GCE/Parker/Matheson/Swagelok		
7	Seamless SS Tubing, Grade : SS316 ,TP316 3/8" OD, 0.035" Wall thickness	27 mtrs*2no's.	GCE/Centravis/Valex/Parker		
8	Weld Tees for User Point, MOC:SS, 3/8" OD	4	GCE/Centravis/Valex/Parker		
9	Fabrication of MS powder coated structure to store 4no's of full cylinders and 4 no's of empty cylinders. (Fixed to the wall)	2	Indegeneous		

Second Floor for N2, CH4& LPG - Combustion Dynamics Lab

SI.No.	Item Description	Qty. (Nos./Mtrs.)	Approved Make	Model	Technical compliance (YES / NO)
1	Factory Assembled Manual Change Over Panel for Nitrogen,(1+1 Cylinders), Single Stage,Flow:10SLPM, MOC=Brass Chromeplated & Specially Cleaned, Inlet=230bar/3300psi,Outlet Pressure = 0 to 10 Bar, Diaphragm=Hastelloy, With Inbuilt 10 micron filter at Inlets, With 2 numbers of Inlet Shut-Off Diaphragm Valves, With Safety Relief Valve, With Inlet & Outlet Normal Gauges According to EN837, With Inlet & Outlet Ports=CL3/8" OD..	1	GCE/Parker/Matheson/Swagelok		
2	Factory Assembled Manual Change Over Panel for Methane,(1+1 Cylinders), MOC= Brass,Specially Cleaned , Flow:500SLPM, Inlet Pressure=300bar;Outlet Pressure = 0 to 10 Bar. With Two numbers of Inlet Shut-Off Valves, With Two numbers of Internal Purge Valves, With Safety Relief Valve, With Inlet & Outlet Pressure Gauges According to EN837, With Outlet Shut-Off Valves With Inlet Port = W21,8X1/14"LH, Outlet Ports = G1/2"OD.	1	GCE/Parker/Matheson/Swagelok		
3	Factory Assembled Manual Change Over Panel for LPG,(1+1 Cylinders), Single Stage,Flow:30SLPM, MOC=Brass Chromeplated & Specially Cleaned, Inlet=20bar/300psi,Outlet Pressure = 0 to 3 Bar, Diaphragm=Hastelloy, With Inbuilt 10 micron filter at Inlets, With 2 numbers of Inlet Shut-Off Diaphragm Valves, With Safety Relief Valve, With Inlet & Outlet Pressure Gauges According to EN837, With Inlet & Outlet Ports=CL3/8"OD.	1	GCE/Parker/Matheson/Swagelok		
4	SS Flexible Hose(Internal SS) along with Safety Wire & Cylinder Connectors for N2, CH4 & LPG,1.0 Meter length .	6	GCE/Parker/Matheson/Swagelok		
5	Cylinder Holder to Hold Cylinders, Profiled Stainless Steel Sheet with Belt	6	GCE/Parker/Matheson/Swagelok		
6	Inlet Diaphragm Shut-Off Valve for User Points for N2 & LPG (2 X 4 Places), MOC: Brass Chromeplated,Working Pressure:50 Bar, Diaphragm:Hastelloy, Inlet & Outlet Ports = 3/8" OD SS.	8	GCE/Parker/Matheson/Swagelok		
7	Inlet Diaphragm Shut-Off Valve for User Points for CH4(1 X 4 Places), MOC: Brass Chromeplated,Working Pressure:50 Bar, Diaphragm:Hastelloy, Inlet & Outlet Ports = 1/2" OD SS.	4	GCE/Parker/Matheson/Swagelok		
8	Seamless SS Tubing, Grade : SS316 ,TP316 3/8" OD, 0.035" Wall thickness	49 mtrs*2no's.	GCE/Centravis/Valex/Parker		
9	Seamless SS Tubing, Grade : SS316 ,TP316 1/2" OD, 0.049" Wall thickness	49mtrs*1no's	GCE/Centravis/Valex/Parker		
10	Weld Tees for User Point, MOC:SS, 3/8" OD	6	GCE/Centravis/Valex/Parker		
11	Weld Tees for User Point, MOC:SS, 1/2" OD	3	GCE/Centravis/Valex/Parker		
12	Fabrication of MS powder coated structure to store 4no's of full cylinders and 4 no's of empty cylinders. (Fixed to the wall)	1	Indegenous		

Second Floor for N2, CH4& LPG - GAS Dynamics Lab

Sl.No.	Item Description	Qty. (Nos./Mtrs.)	Approved Make	Model	Technical compliance (YES / NO)
1	Factory Assembled Manual Change Over Panel for Nitrogen,(1+1 Cylinders), Single Stage,Flow:10SLPM, MOC=Brass Chromeplated & Specially Cleaned, Inlet=230bar/3300psi,Outlet Pressure = 0 to 10 Bar, Diaphragm=Hastelloy, With Inbuilt 10 micron filter at Inlets, With 2 numbers of Inlet Shut-Off Diaphragm Valves, With Safety Relief Valve, With Inlet & Outlet Normal Gauges According to EN837, With Inlet & Outlet Ports=CL3/8" OD..	1	GCE/Parker/Matheson/Swagelok		
2	Factory Assembled Manual Change Over Panel for Methane,(1+1 Cylinders), Single Stage,Flow:200SLPM, MOC=Brass Chromeplated & Specially Cleaned, Inlet=230bar/3300psi,Outlet Pressure = 0 to 10 Bar, Diaphragm=Hastelloy, With Inbuilt 10 micron filter at Inlets, With 2 numbers of Inlet Shut-Off Diaphragm Valves, With Safety Relief Valve, With Inlet & Outlet Pressure Gauges According to EN837, With Inlet & Outlet Ports=CL3/8"OD.	1	GCE/Parker/Matheson/Swagelok		
3	Factory Assembled Manual Change Over Panel for LPG,(1+1 Cylinders), Single Stage,Flow:50SLPM, MOC=Brass Chromeplated & Specially Cleaned, Inlet=20bar/300psi,Outlet Pressure = 0 to 3 Bar, Diaphragm=Hastelloy, With Inbuilt 10 micron filter at Inlets, With 2 numbers of Inlet Shut-Off Diaphragm Valves, With Safety Relief Valve, With Inlet & Outlet Pressure Gauges According to EN837, With Inlet & Outlet Ports=CL3/8"OD.	1	GCE/Parker/Matheson/Swagelok		
4	SS Flexible Hose(Internal SS) along with Safety Wire & Cylinder Connectors for N2, CH4 & LPG, 1.0 Meter length .	6	GCE/Parker/Matheson/Swagelok		
5	Cylinder Holder to Hold Cylinders, Profiled Stainless Steel Sheet with Belt	6	GCE/Parker/Matheson/Swagelok		
6	Inlet Diaphragm Shut-Off Valve for User Point for N2,CH4&LPG(3 X 3 Places), MOC: Brass Chromeplated,Working Pressure:50 Bar, Diaphragm:Hastelloy, Inlet & Outlet Ports = 3/8" OD SS.	9	GCE/Parker/Matheson/Swagelok		
7	Seamless SS Tubing, Grade : SS316 ,TP316 3/8" OD, 0.035" Wall thickness	25 mtrs*3no's.	GCE/Centravis/Valex/Parker		
8	Weld Tees for User Point, MOC:SS, 3/8" OD	6	GCE/Centravis/Valex/Parker		
9	Fabrication of MS powder coated structure to store 4no's of full cylinders and 4 no's of empty cylinders. (Fixed to the wall)	2	Indegeneous		

Third Floor for N2, CH4& LPG - Burner Development Lab					
Sl.No.	Item Description	Qty. (Nos./Mtrs.)	Approved Make	Model	Technical compliance (YES / NO)
1	Factory Assembled Manual Change Over Panel for Nitrogen,(1+1 Cylinders), Single Stage,Flow:10SLPM, MOC=Brass Chromeplated & Specially Cleaned, Inlet=230bar/3300psi,Outlet Pressure = 0 to 10 Bar, Diaphragm=Hastelloy, With Inbuilt 10 micron filter at Inlets, With 2 numbers of Inlet Shut-Off Diaphragm Valves, With Safety Relief Valve, With Inlet & Outlet Normal Gauges According to EN837, With Inlet & Outlet Ports=CL3/8" OD..	1	GCE/Parker/Matheson/Swagelok		
2	Factory Assembled Manual Change Over Panel for Methane,(1+1 Cylinders), MOC= Brass,Specially Cleaned , Flow: 500SLPM, Inlet Pressure=300bar;Outlet Pressure = 0 to 12 Bar. With Two numbers of Inlet Shut-Off Valves, With Two numbers of Internal Purge Valves, With Safety Relief Valve, With Inlet & Outlet Pressure Gauges Accordning to EN837, With Outlet Shut-Off Valves With Inlet Port = W21,8X1/14"LH, Outlet Ports = G1/2"OD.	1	GCE/Parker/Matheson/Swagelok		
3	Factory Assembled Manual Change Over Panel for LPG,(1+1 Cylinders), Single Stage,Flow:30SLPM, MOC=Brass Chromeplated & Specially Cleaned, Inlet=20bar/300psi,Outlet Pressure = 0 to 3 Bar, Diaphragm=Hastelloy, With Inbuilt 10 micron filter at Inlets, With 2 numbers of Inlet Shut-Off Diaphragm Valves, With Safety Relief Valve, With Inlet & Outlet Pressure Gauges According to EN837, With Inlet & Outlet Ports=CL3/8"OD.	1	GCE/Parker/Matheson/Swagelok		
4	SS Flexible Hose(Internal SS) along with Safety Wire & Cylinder Connectors for N2, CH4 & LPG, 1.0 Meter length .	6	GCE/Parker/Matheson/Swagelok		
5	Cylinder Holder to Hold Cylinders, Profiled Stainless Steel Sheet with Belt	6	GCE/Parker/Matheson/Swagelok		
6	Inlet Diaphragm Shut-Off Valve for User Points for CH4&LPG (2 X 3 Places), MOC: Brass Chromeplated,Working Pressure:50 Bar, Diaphragm:Hastelloy, Inlet & Outlet Ports = 3/8" OD SS.	6	GCE/Parker/Matheson/Swagelok		
7	Inlet Diaphragm Shut-Off Valve for User Points for CH4(1 X 3 Places), MOC: Brass Chromeplated,Working Pressure:50 Bar, Diaphragm:Hastelloy, Inlet & Outlet Ports = 1/2" OD SS.	3	GCE/Parker/Matheson/Swagelok		
8	Seamless SS Tubing, Grade : SS316 ,TP316, 3/8" OD, 0.035" Wall thickness	28 mtrs*2no's.	GCE/Centravis/Valex/Parker		
9	Seamless SS Tubing, Grade : SS316 ,TP316, 1/2" OD, 0.049" Wall thickness	28 mtrs.	GCE/Centravis/Valex/Parker		
10	Weld Tees for User Point, MOC:SS, 3/8" OD	4	GCE/Centravis/Valex/Parker		
11	Weld Tees for User Point, MOC:SS, 1/2" OD	2	GCE/Centravis/Valex/Parker		
12	Fabrication of MS powder coated structure to store 4no's of full cylinders and 4 no's of empty cylinders. (Fixed to the wall)	2	Indegeneous		

Fourth Floor for N2 & LPG - Aero Lab

Sl.No.	Item Description	Qty. (Nos./Mtrs.)	Approved Make	Model	Technical compliance (YES / NO)
1	Factory Assembled Manual Change Over Panel for Nitrogen,(1+1 Cylinders), Single Stage,Flow: 500SLPM, MOC=Brass Chromeplated & Specially Cleaned, Inlet=230bar/3300psi,Outlet Pressure = 0 to 20 Bar, Diaphragm=Hastelloy, With Inbuilt 10 micron filter at Inlets, With 2 numbers of Inlet Shut-Off Diaphragm Valves, With Safety Relief Valve, With Inlet & Outlet Pressure Gauges According to EN837, With Inlet & Outlet Ports=CL3/8" OD..	1	GCE/Parker/Matheson/Swagelok		
2	Factory Assembled Manual Change Over Panel for LPG,(1+1 Cylinders), Single Stage,Flow:30SLPM, MOC=Brass Chromeplated & Specially Cleaned, Inlet=20bar/300psi,Outlet Pressure = 0 to 3 Bar, Diaphragm=Hastelloy, With Inbuilt 10 micron filter at Inlets, With 2 numbers of Inlet Shut-Off Diaphragm Valves, With Safety Relief Valve, With Inlet & Outlet Pressure Gauges Accoring to EN837, With Inlet & Outlet Ports=CL3/8"OD.	1	GCE/Parker/Matheson/Swagelok		
3	SS Flexible Hose(Internal SS) along with Safety Wire & Cylinder Connectors for N2 & LPG, 1.0 Meter length .	4	GCE/Parker/Matheson/Swagelok		
4	Cylinder Holder to Hold Cylinders, Profiled Stainless Steel Sheet with Belt	4	GCE/Parker/Matheson/Swagelok		
5	Inlet Diaphragm Shut-Off Valve for User Points(2X4 Places), MOC: Brass Chromeplated,Working Pressure:50 Bar, Diaphragm:Hastelloy, Inlet & Outlet Ports = 3/8" OD SS.	8	GCE/Parker/Matheson/Swagelok		
6	Seamless SS Tubing, Grade : SS316 ,TP316 3/8" OD, 0.035" Wall thickness	58 mtrs *2no's.	GCE/Centravis/Valex/Parker		
7	Weld Tees for User Point, MOC:SS, 3/8" OD	6	GCE/Centravis/Valex/Parker		
8	Fabrication of MS powder coated structure to store 4no's of full cylinders and 4 no's of empty cylinders. (Fixed to the wall)	2	Indegeneous		

Fourth Floor for N2, CH4 - Laser Diagnostics and Spray Diagnostics Lab

SI.No.	Item Description	Qty. (Nos./Mtrs.)	Approved Make	Model	Technical compliance (YES / NO)
1	Factory Assembled Manual Change Over Panel for Nitrogen,(1+1 Cylinders), Single Stage,Flow:10SLPM, MOC=Brass Chromeplated & Specially Cleaned, Inlet=230bar/3300psi,Outlet Pressure = 0 to 30 Bar, Diaphragm=Hastelloy, With Inbuilt 10 micron filter at Inlets, With 2 numbers of Inlet Shut-Off Diaphragm Valves, With Safety Relief Valve, With Inlet & Outlet Pressure Gauges According to EN837, With Inlet & Outlet Ports=CL3/8" OD.	1	GCE/Parker/Matheson/Swagelok		
2	Factory Assembled Manual Change Over Panel for Methane,(1+1 Cylinders), Single Stage,Flow:200SLPM, MOC=Brass Chromeplated & Specially Cleaned, Inlet=230bar/3300psi,Outlet Pressure = 0 to 12 Bar, Diaphragm=Hastelloy, With Inbuilt 10 micron filter at Inlets, With 2 numbers of Inlet Shut-Off Diaphragm Valves, With Safety Relief Valve, With Inlet & Outlet Pressure Gauges According to EN837, With Inlet & Outlet Ports=CL3/8" OD.	1	GCE/Parker/Matheson/Swagelok		
3	SS Flexible Hose(Internal SS) along with Safety Wire & Cylinder Connectors for N2 & CH4 1.0 Meter length .	4	GCE/Parker/Matheson/Swagelok		
4	Cylinder Holder to Hold Cylinders, Profiled Stainless Steel Sheet with Belt	4	GCE/Parker/Matheson/Swagelok		
5	Inlet Diaphragm Shut-Off Valve for User Points(N2=6, CH4=3 Places), MOC: Brass Chromeplated,Working Pressure:50 Bar, Diaphragm:Hastelloy, Inlet & Outlet Ports = 3/8" OD SS.	9	GCE/Parker/Matheson/Swagelok		
6	Seamless SS Tubing, Grade : SS316 ,TP316 3/8" OD, 0.035" Wall thickness	64 mtrs for N2 33 mtrs for CH4	GCE/Centravis/Valex/Parker		
7	Weld Tees for User Point, MOC:SS, 3/8" OD	7	GCE/Centravis/Valex/Parker		
8	Fabrication of MS powder coated structure to store 4no's of full cylinders and 4 no's of empty cylinders. (Fixed to the wall)	2	Indegeneous		

Installation of Gas Piping with Orbital Welding with Required Accessories

1	Installation of Gas Panels, Tubing with required Accessories, Orbital welding, Labeling, LEAK TESTING & COMMISSIONING, Training etc.	1	ORBITAL WELDING IS MUST		
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TECHNICAL SPECIFICATION & REQUIREMENTS FOR PROPOSED GAS PIPING AT NCCRD LABS

FINANCIAL BID

Ground Floor for N2 & LPG - Thermal Power Lab							
Sl.No.	Item Description	Qty. (Nos./Mtrs.)	Approved Make	Model	Technical compliance (YES / NO)	Price/Unit	Value
1	Factory Assembled Manual Change Over Panel for Nitrogen,(1+1 Cylinders), Single Stage,Flow:500SLPM, MOC=Brass Chromeplated & Specially Cleaned, Inlet=230bar/3300psi,Outlet Pressure = 0 to 10 Bar, Diaphragm=Hastelloy, With Inbuilt 10 micron filter at Inlets, With 2 numbers of Inlet Shut-Off Diaphragm Valves, With Safety Relief Valve, With Inlet & Outlet Pressure Gauges according to EN837, With Inlet & Outlet Ports=CL3/8" OD.	1	GCE/Parker/Matheson/Swagelok				
2	Factory Assembled Manual Change Over Panel for LPG,(1+1 Cylinders), Single Stage,Flow:30SLPM, MOC=Brass Chromeplated & Specially Cleaned, Inlet=20bar/300psi,Outlet Pressure = 0 to 3 Bar, Diaphragm=Hastelloy, With Inbuilt 10 micron filter at Inlets, With 2 numbers of Inlet Shut-Off Diaphragm Valves, With Safety Relief Valve, With Inlet & Outlet Pressure Gauges According to EN837, With Inlet & Outlet Ports=CL3/8" OD.	1	GCE/Parker/Matheson/Swagelok				
3	SS Flexible Hose(Internal SS) along with Safety Wire & Cylinder Connectors for N2 & LPG, 1.0 Meter length .	2	GCE/Parker/Matheson/Swagelok				
4	SS Flexible Hose(Internal SS) along with Safety Wire & Cylinder Connectors for LPG to match Indian LPG Cylinders, 1.0 Meter length .	2	GCE/Parker/Matheson/Swagelok				
5	Cylinder Holder to Hold Cylinders, Profiled Stainless Steel Sheet with Belt	4	GCE/Parker/Matheson/Swagelok				
6	Inlet Diaphragm Shut-Off Valve for User Points(2 X 3 Places), MOC: Brass Chromeplated,Working Pressure:50 Bar, Diaphragm:Hastelloy, Inlet & Outlet Ports = 3/8" OD SS.	6	GCE/Parker/Matheson/Swagelok				
7	Seamless SS Tubing, Grade : SS316 ,TP316 3/8" OD, 0.035" Wall thickness	27 mtrs*2no's.	GCE/Centravis/Valex/Parker				
8	Weld Tees for User Point, MOC:SS, 3/8" OD	4	GCE/Centravis/Valex/Parker				
9	Fabrication of MS powder coated structure to store 4no's of full cylinders and 4 no's of empty cylinders. (Fixed to the wall)	2	Indegeneous				

Second Floor for N2, CH4& LPG - Combustion Dynamics Lab

Sl.No.	Item Description	Qty. (Nos./Mtrs.)	Approved Make	Model	Technical compliance (YES / NO)	Price/Unit	Value
1	Factory Assembled Manual Change Over Panel for Nitrogen,(1+1 Cylinders), Single Stage,Flow:10SLPM, MOC=Brass Chromeplated & Specially Cleaned, Inlet=230bar/3300psi,Outlet Pressure = 0 to 10 Bar, Diaphragm=Hastelloy, With Inbuilt 10 micron filter at Inlets, With 2 numbers of Inlet Shut-Off Diaphragm Valves, With Safety Relief Valve, With Inlet & Outlet Normal Gauges According to EN837, With Inlet & Outlet Ports=CL3/8" OD..	1	GCE/Parker/Matheson/Swagelok				
2	Factory Assembled Manual Change Over Panel for Methane,(1+1 Cylinders), MOC= Brass,Specially Cleaned , Flow:500SLPM, Inlet Pressure=300bar;Outlet Pressure = 0 to 10 Bar. With Two numbers of Inlet Shut-Off Valves, With Two numbers of Internal Purge Valves, With Safety Relief Valve, With Inlet & Outlet Pressure Gauges According to EN837, With Outlet Shut-Off Valves With Inlet Port = W21,8X1/14"LH, Outlet Ports = G1/2"OD.	1	GCE/Parker/Matheson/Swagelok				
3	Factory Assembled Manual Change Over Panel for LPG,(1+1 Cylinders), Single Stage,Flow:30SLPM, MOC=Brass Chromeplated & Specially Cleaned, Inlet=20bar/300psi,Outlet Pressure = 0 to 3 Bar, Diaphragm=Hastelloy, With Inbuilt 10 micron filter at Inlets, With 2 numbers of Inlet Shut-Off Diaphragm Valves, With Safety Relief Valve, With Inlet & Outlet Pressure Gauges According to EN837, With Inlet & Outlet Ports=CL3/8"OD.	1	GCE/Parker/Matheson/Swagelok				
4	SS Flexible Hose(Internal SS) along with Safety Wire & Cylinder Connectors for N2, CH4 & LPG,1.0 Meter length .	6	GCE/Parker/Matheson/Swagelok				
5	Cylinder Holder to Hold Cylinders, Profiled Stainless Steel Sheet with Belt	6	GCE/Parker/Matheson/Swagelok				
6	Inlet Diaphragm Shut-Off Valve for User Points for N2 & LPG (2 X 4 Places), MOC: Brass Chromeplated,Working Pressure:50 Bar, Diaphragm:Hastelloy, Inlet & Outlet Ports = 3/8" OD SS.	8	GCE/Parker/Matheson/Swagelok				
7	Inlet Diaphragm Shut-Off Valve for User Points for CH4(1 X 4 Places), MOC: Brass Chromeplated,Working Pressure:50 Bar, Diaphragm:Hastelloy, Inlet & Outlet Ports = 1/2" OD SS.	4	GCE/Parker/Matheson/Swagelok				
8	Seamless SS Tubing, Grade : SS316 ,TP316 3/8" OD, 0.035" Wall thickness	49 mtrs*2no's.	GCE/Centravis/Valex/Parker				
9	Seamless SS Tubing, Grade : SS316 ,TP316 1/2" OD, 0.049" Wall thickness	49mtrs*1no's	GCE/Centravis/Valex/Parker				
10	Weld Tees for User Point, MOC:SS, 3/8" OD	6	GCE/Centravis/Valex/Parker				
11	Weld Tees for User Point, MOC:SS, 1/2" OD	3	GCE/Centravis/Valex/Parker				
12	Fabrication of MS powder coated structure to store 4no's of full cylinders and 4 no's of empty cylinders. (Fixed to the wall)	1	Indegeneous				

Second Floor for N2, CH4& LPG - GAS Dynamics Lab

Sl.No.	Item Description	Qty. (Nos./Mtrs.)	Approved Make	Model	Technical compliance (YES / NO)	Price/Unit	Value
1	Factory Assembled Manual Change Over Panel for Nitrogen,(1+1 Cylinders), Single Stage,Flow:10SLPM, MOC=Brass Chromeplated & Specially Cleaned, Inlet=230bar/3300psi,Outlet Pressure = 0 to 10 Bar, Diaphragm=Hastelloy, With Inbuilt 10 micron filter at Inlets, With 2 numbers of Inlet Shut-Off Diaphragm Valves, With Safety Relief Valve, With Inlet & Outlet Normal Gauges According to EN837, With Inlet & Outlet Ports=CL3/8" OD..	1	GCE/Parker/Matheson/Swagelok				
2	Factory Assembled Manual Change Over Panel for Methane,(1+1 Cylinders), Single Stage,Flow:200SLPM, MOC=Brass Chromeplated & Specially Cleaned, Inlet=230bar/3300psi,Outlet Pressure = 0 to 10 Bar, Diaphragm=Hastelloy, With Inbuilt 10 micron filter at Inlets, With 2 numbers of Inlet Shut-Off Diaphragm Valves, With Safety Relief Valve, With Inlet & Outlet Pressure Gauges According to EN837, With Inlet & Outlet Ports=CL3/8"OD.	1	GCE/Parker/Matheson/Swagelok				
3	Factory Assembled Manual Change Over Panel for LPG,(1+1 Cylinders), Single Stage,Flow:50SLPM, MOC=Brass Chromeplated & Specially Cleaned, Inlet=20bar/300psi,Outlet Pressure = 0 to 3 Bar, Diaphragm=Hastelloy, With Inbuilt 10 micron filter at Inlets, With 2 numbers of Inlet Shut-Off Diaphragm Valves, With Safety Relief Valve, With Inlet & Outlet Pressure Gauges According to EN837, With Inlet & Outlet Ports=CL3/8"OD.	1	GCE/Parker/Matheson/Swagelok				
4	SS Flexible Hose(Internal SS) along with Safety Wire & Cylinder Connectors for N2, CH4 & LPG, 1.0 Meter length .	6	GCE/Parker/Matheson/Swagelok				
5	Cylinder Holder to Hold Cylinders, Profiled Stainless Steel Sheet with Belt	6	GCE/Parker/Matheson/Swagelok				
6	Inlet Diaphragm Shut-Off Valve for User Point for N2,CH4&LPG(3 X 3 Places), MOC: Brass Chromeplated,Working Pressure:50 Bar, Diaphragm:Hastelloy, Inlet & Outlet Ports = 3/8" OD SS.	9	GCE/Parker/Matheson/Swagelok				
7	Seamless SS Tubing, Grade : SS316 ,TP316 3/8" OD, 0.035" Wall thickness	25 mtrs*3no's.	GCE/Centravis/Valex/Parker				
8	Weld Tees for User Point, MOC:SS, 3/8" OD	6	GCE/Centravis/Valex/Parker				
9	Fabrication of MS powder coated structure to store 4no's of full cylinders and 4 no's of empty cylinders. (Fixed to the wall)	2	Indegeneous				

Third Floor for N2, CH4& LPG - Burner Development Lab

Sl.No.	Item Description	Qty. (Nos./Mtrs.)	Approved Make	Model	Technical compliance (YES / NO)	Price/Unit	Value
1	Factory Assembled Manual Change Over Panel for Nitrogen,(1+1 Cylinders), Single Stage,Flow:10SLPM, MOC=Brass Chromeplated & Specially Cleaned, Inlet=230bar/3300psi,Outlet Pressure = 0 to 10 Bar, Diaphragm=Hastelloy, With Inbuilt 10 micron filter at Inlets, With 2 numbers of Inlet Shut-Off Diaphragm Valves, With Safety Relief Valve, With Inlet & Outlet Normal Gauges According to EN837, With Inlet & Outlet Ports=CL3/8" OD..	1	GCE/Parker/Matheson/Swagelok				
2	Factory Assembled Manual Change Over Panel for Methane,(1+1 Cylinders), MOC= Brass,Specially Cleaned , Flow: 500SLPM, Inlet Pressure=300bar;Outlet Pressure = 0 to 12 Bar. With Two numbers of Inlet Shut-Off Valves, With Two numbers of Internal Purge Valves, With Safety Relief Valve, With Inlet & Outlet Pressure Gauges According to EN837, With Outlet Shut-Off Valves With Inlet Port = W21,8X1/14"LH, Outlet Ports = G1/2"OD.	1	GCE/Parker/Matheson/Swagelok				
3	Factory Assembled Manual Change Over Panel for LPG,(1+1 Cylinders), Single Stage,Flow:30SLPM, MOC=Brass Chromeplated & Specially Cleaned, Inlet=20bar/300psi,Outlet Pressure = 0 to 3 Bar, Diaphragm=Hastelloy, With Inbuilt 10 micron filter at Inlets, With 2 numbers of Inlet Shut-Off Diaphragm Valves, With Safety Relief Valve, With Inlet & Outlet Pressure Gauges According to EN837, With Inlet & Outlet Ports=CL3/8"OD.	1	GCE/Parker/Matheson/Swagelok				
4	SS Flexible Hose(Internal SS) along with Safety Wire & Cylinder Connectors for N2, CH4 & LPG, 1.0 Meter length .	6	GCE/Parker/Matheson/Swagelok				
5	Cylinder Holder to Hold Cylinders, Profiled Stainless Steel Sheet with Belt	6	GCE/Parker/Matheson/Swagelok				
6	Inlet Diaphragm Shut-Off Valve for User Points for CH4&LPG (2 X 3 Places), MOC: Brass Chromeplated,Working Pressure:50 Bar, Diaphragm:Hastelloy, Inlet & Outlet Ports = 3/8" OD SS.	6	GCE/Parker/Matheson/Swagelok				
7	Inlet Diaphragm Shut-Off Valve for User Points for CH4(1 X 3 Places), MOC: Brass Chromeplated,Working Pressure:50 Bar, Diaphragm:Hastelloy, Inlet & Outlet Ports = 1/2" OD SS.	3	GCE/Parker/Matheson/Swagelok				
8	Seamless SS Tubing, Grade : SS316 ,TP316, 3/8" OD, 0.035" Wall thickness	28 mtrs*2no's.	GCE/Centravis/Valex/Parker				
9	Seamless SS Tubing, Grade : SS316 ,TP316, 1/2" OD, 0.049" Wall thickness	28 mtrs.	GCE/Centravis/Valex/Parker				
10	Weld Tees for User Point, MOC:SS, 3/8" OD	4	GCE/Centravis/Valex/Parker				
11	Weld Tees for User Point, MOC:SS, 1/2" OD	2	GCE/Centravis/Valex/Parker				
12	Fabrication of MS powder coated structure to store 4no's of full cylinders and 4 no's of empty cylinders. (Fixed to the wall)	2	Indegenous				

Fourth Floor for N2 & LPG - Aero Lab

Sl.No.	Item Description	Qty. (Nos./Mtrs.)	Approved Make	Model	Technical compliance (YES / NO)	Price/Unit	Value
1	Factory Assembled Manual Change Over Panel for Nitrogen,(1+1 Cylinders), Single Stage,Flow: 500SLPM, MOC=Brass Chromeplated & Specially Cleaned, Inlet=230bar/3300psi,Outlet Pressure = 0 to 20 Bar, Diaphragm=Hastelloy, With Inbuilt 10 micron filter at Inlets, With 2 numbers of Inlet Shut-Off Diaphragm Valves, With Safety Relief Valve, With Inlet & Outlet Pressure Gauges According to EN837, With Inlet & Outlet Ports=CL3/8" OD..	1	GCE/Parker/Matheson/Swagelok				
2	Factory Assembled Manual Change Over Panel for LPG,(1+1 Cylinders), Single Stage,Flow:30SLPM, MOC=Brass Chromeplated & Specially Cleaned, Inlet=20bar/300psi,Outlet Pressure = 0 to 3 Bar, Diaphragm=Hastelloy, With Inbuilt 10 micron filter at Inlets, With 2 numbers of Inlet Shut-Off Diaphragm Valves, With Safety Relief Valve, With Inlet & Outlet Pressure Gauges Accoring to EN837, With Inlet & Outlet Ports=CL3/8"OD.	1	GCE/Parker/Matheson/Swagelok				
3	SS Flexible Hose(Internal SS) along with Safety Wire & Cylinder Connectors for N2 & LPG, 1.0 Meter length .	4	GCE/Parker/Matheson/Swagelok				
4	Cylinder Holder to Hold Cylinders, Profiled Stainless Steel Sheet with Belt	4	GCE/Parker/Matheson/Swagelok				
5	Inlet Diaphragm Shut-Off Valve for User Points(2X4 Places), MOC: Brass Chromeplated,Working Pressure:50 Bar, Diaphragm:Hastelloy, Inlet & Outlet Ports = 3/8" OD SS.	8	GCE/Parker/Matheson/Swagelok				
6	Seamless SS Tubing, Grade : SS316 ,TP316 3/8" OD, 0.035" Wall thickness	58 mtrs *2no's.	GCE/Centravis/Valex/Parker				
7	Weld Tees for User Point, MOC:SS, 3/8" OD	6	GCE/Centravis/Valex/Parker				
8	Fabrication of MS powder coated structure to store 4no's of full cylinders and 4 no's of empty cylinders. (Fixed to the wall)	2	Indegeneous				

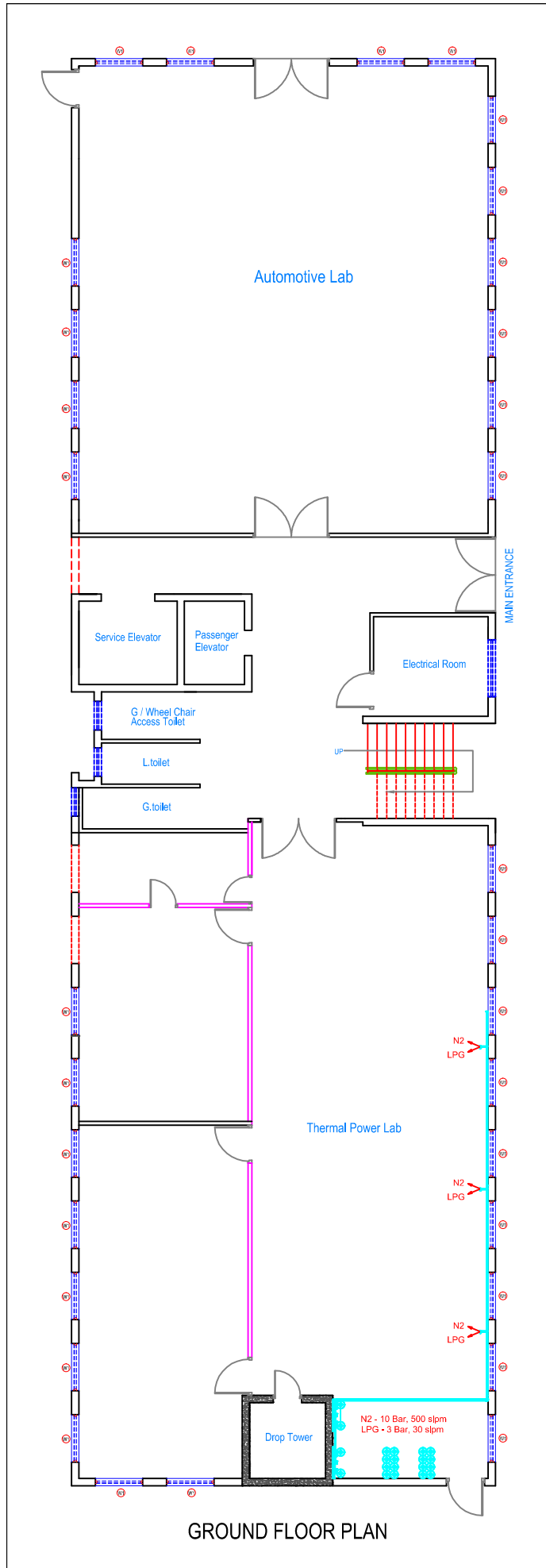
Fourth Floor for N2, CH4 - Laser Diagnostics and Spray Diagnostics Lab

SI.No.	Item Description	Qty. (Nos./Mtrs.)	Approved Make	Model	Technical compliance (YES / NO)	Price/Unit	Value
1	Factory Assembled Manual Change Over Panel for Nitrogen,(1+1 Cylinders), Single Stage,Flow:10SLPM, MOC=Brass Chromeplated & Specially Cleaned, Inlet=230bar/3300psi,Outlet Pressure = 0 to 30 Bar, Diaphragm=Hastelloy, With Inbuilt 10 micron filter at Inlets, With 2 numbers of Inlet Shut-Off Diaphragm Valves, With Safety Relief Valve, With Inlet & Outlet Pressure Gauges According to EN837, With Inlet & Outlet Ports=CL3/8" OD.	1	GCE/Parker/Matheson/Swagelok				
2	Factory Assembled Manual Change Over Panel for Methane,(1+1 Cylinders), Single Stage,Flow:200SLPM, MOC=Brass Chromeplated & Specially Cleaned, Inlet=230bar/3300psi,Outlet Pressure = 0 to 12 Bar, Diaphragm=Hastelloy, With Inbuilt 10 micron filter at Inlets, With 2 numbers of Inlet Shut-Off Diaphragm Valves, With Safety Relief Valve, With Inlet & Outlet Pressure Gauges According to EN837, With Inlet & Outlet Ports=CL3/8"OD.	1	GCE/Parker/Matheson/Swagelok				
3	SS Flexible Hose(Internal SS) along with Safety Wire & Cylinder Connectors for N2 & CH4 1.0 Meter length .	4	GCE/Parker/Matheson/Swagelok				
4	Cylinder Holder to Hold Cylinders, Profiled Stainless Steel Sheet with Belt	4	GCE/Parker/Matheson/Swagelok				
5	Inlet Diaphragm Shut-Off Valve for User Points(N2=6, CH4=3 Places), MOC: Brass Chromeplated,Working Pressure:50 Bar, Diaphragm:Hastelloy, Inlet & Outlet Ports = 3/8" OD SS.	9	GCE/Parker/Matheson/Swagelok				
6	Seamless SS Tubing, Grade : SS316 ,TP316 3/8" OD, 0.035" Wall thickness	64 mtrs for N2 33 mtrs for CH4	GCE/Centravis/Valex/Parker				
7	Weld Tees for User Point, MOC:SS, 3/8" OD	7	GCE/Centravis/Valex/Parker				
8	Fabrication of MS powder coated structure to store 4no's of full cylinders and 4 no's of empty cylinders. (Fixed to the wall)	2	Indegeneous				
TOTAL FOR MATERIAL FOR ALL LABS							
TAX FOR MATERIAL							
TRANSPORTATION							
GRAND TOTAL FOR MATERIAL SUPPLY UPTO NCCRD							

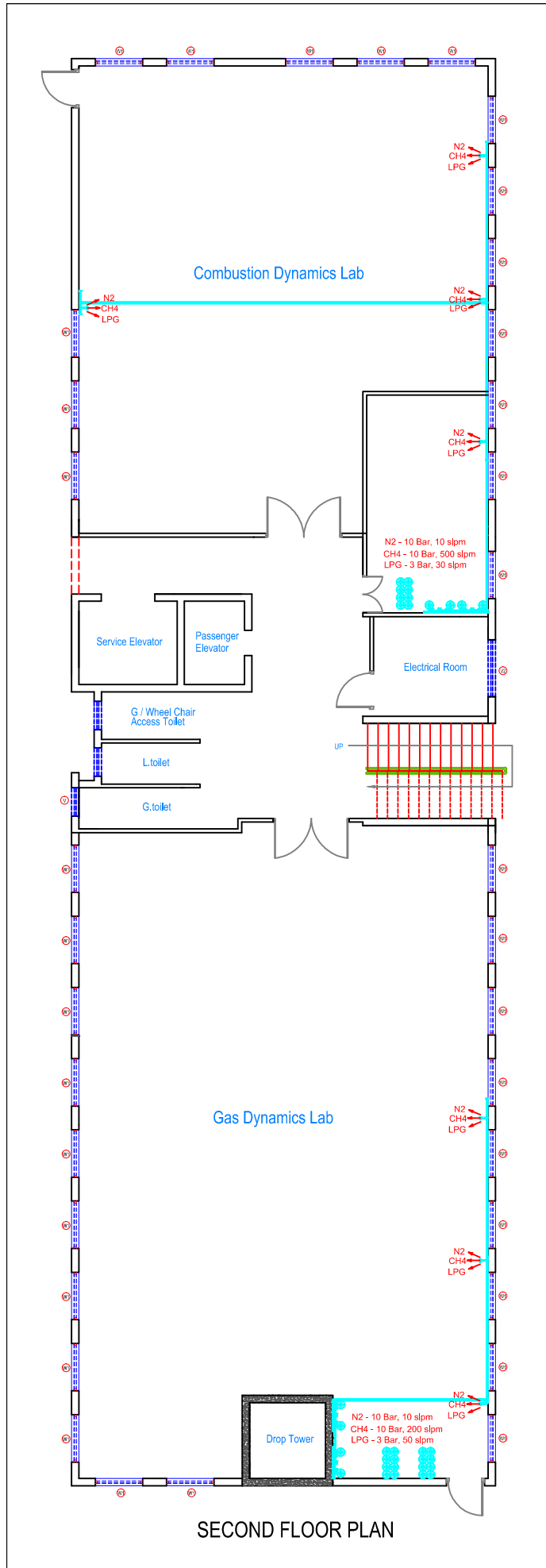
Installation of Gas Piping with Orbital Welding with Required Accessories (Total labour charges).

1	Installation of Gas Panels, Tubing with required Accessories, Orbital welding, Labeling, LEAK TESTING & COMMISSIONING, Training etc.	1	ORBITAL WELDING IS MUST				
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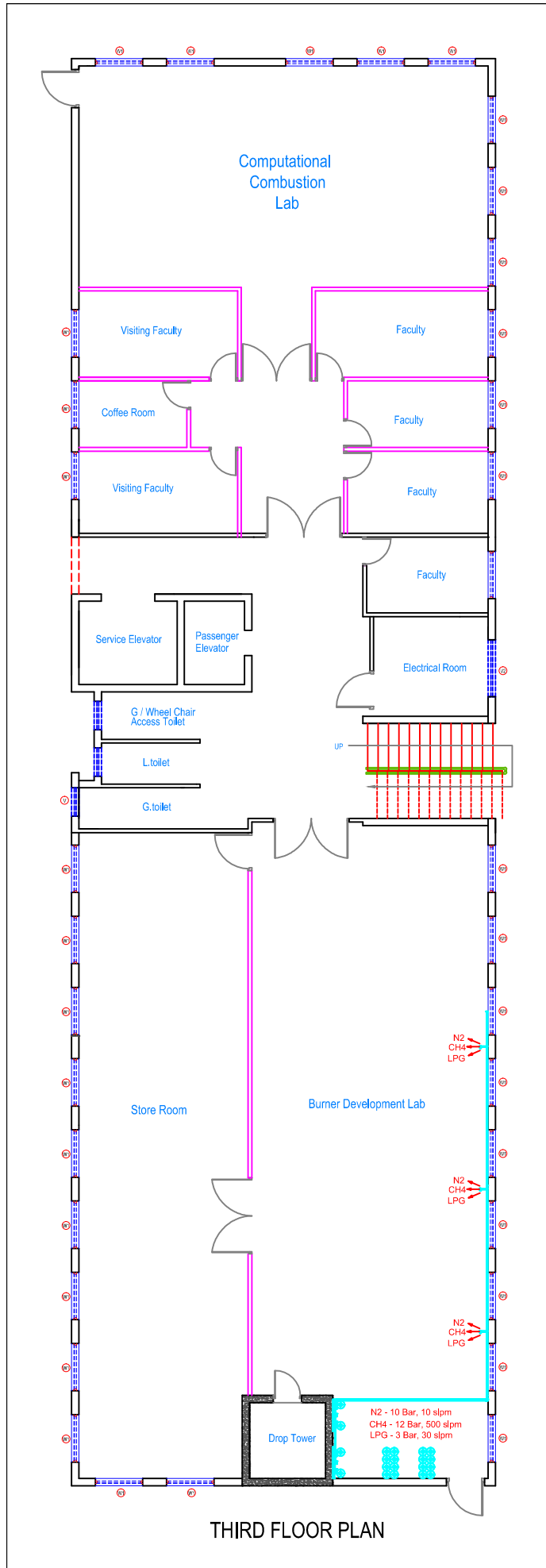
SERVICE TAX							
TOTAL FOR INSTALLATION							
GRAND TOTAL FOR MATERIAL + INSTALLATION							



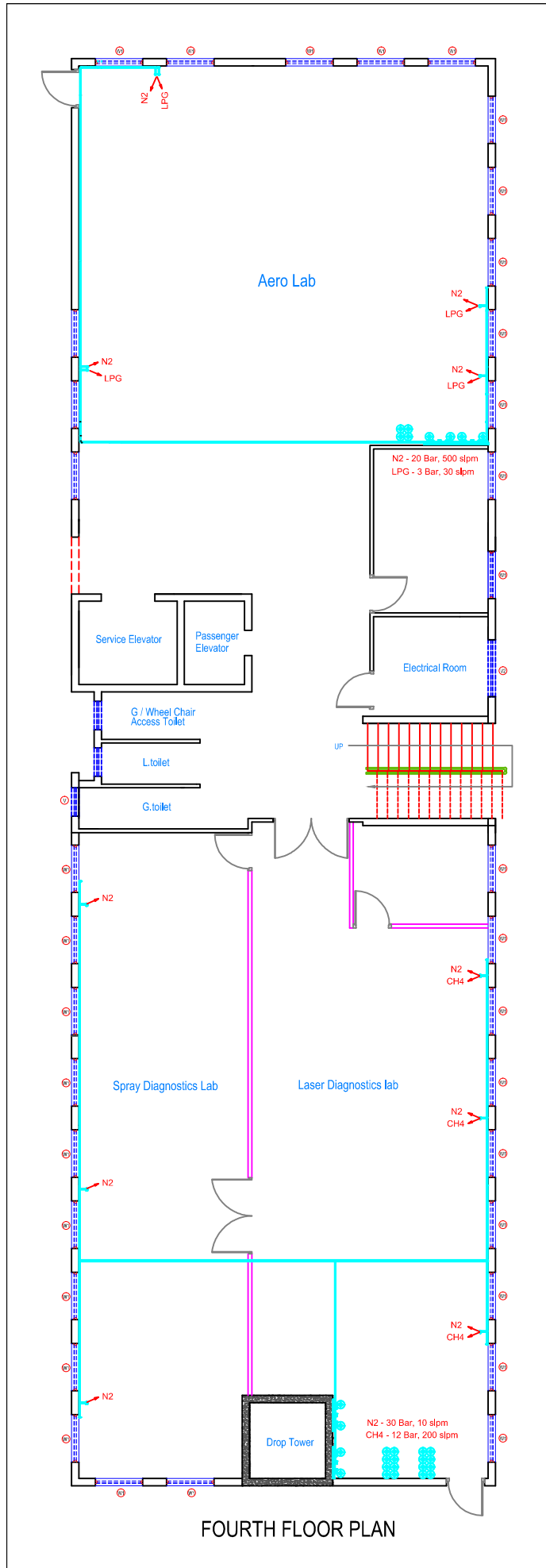
GROUND FLOOR PLAN



SECOND FLOOR PLAN



THIRD FLOOR PLAN



FOURTH FLOOR PLAN