



TECHNICAL SCOPE OF WORK

SUPPLY, FABRICATION, ERECTION / INSTALLATION, TESTING &
COMMISSIONING OF MECHANICAL WORKS FOR CNG STATIONS/
DECOMPRESSION STATION/ LNG-LCNG STATION

Document No: GGL/TS/CNG/SERVICE/MECH HOOK-UP/SOW

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1. INTRODUCTION

Gujarat Gas Ltd (GGL), a Group Company of Gujarat State Petroleum Corporation Ltd., (State Government undertaking), is in business of distribution Natural Gas to Industrial/ Commercial/ Non-Commercial/ Domestic Customers, CNG and LCNG Stations in various cities authorized to GGL by PNGRB Viz: in the state of Gujarat, Maharashtra, Punjab, Haryana, Rajasthan, Madhya Pradesh and Dadra Nagar Haveli Union Territory etc.

This document is brief for finalizing Bidder for supply SS Tubes, Fittings, Valves, LCV Stand, HP Flexible Hoses, Accessories, Pneumatic Materials, Portable Fire Extinguishers, etc. and carrying out erection / fabrication / Mechanical Works for Daughter/ Daughter booster CNG Stations at OMC'S Retail Outlet or Franchise Station/ LCNG Station/ Decompression stations located in various Cities / Towns / Locations of Gujarat State / Union Territories as per the advice from GGL including testing & commissioning of the construction of assets.

The Detailed scope of work is specified as under;

2. BIDDER'S SCOPE OF WORK / SUPPLY

2.1 APPLICABLE CODES & STANDARDS

The Bidder shall supply, install and commission the material as per design and engineering of which is confirming to the following code & standards but not limited to:

- All rigid piping, tubing, fittings and other piping components shall conform to the recommendations of ANSI B 31.3. "Petroleum Refinery Piping". All the elements of piping shall be designed for the full range of Pressure, Temperature and loading to which they may be subjected with a factor of safety of at least 4 (four) based on the minimum specified tensile strength at 20° C.
- NFPA Code,
- OISD Norms,
- ASTM A-269,
- ASME 31.8,
- Gas Cylinder Rules,
- CCoE / PESO Guidelines,
- NZS 5425,
- PNGRB T4S

shall be applicable for the proposed job.

2.2 MATERIAL SPECIFICATION

The material specification of piping involved in package units shall strictly conform to the relevant services indicated in the enclosed specifications.

A. Brief Specifications for Seamless Tubing

Specification : SA-213 Gr. TP-316

Make / Vendor : As per vendor list

Material	: SS 316 (ASTM A-269)
Size	: 1/2" (Thickness 0.083" & 0.065"), 3/4" (Thickness 0.095")
Tolerance	: ± 0.005"
Hardness	: Rb80
Finish	: Fully annealed
Pressure Rating	: Shall be suitable for more than 275 bar-g (working pressure.)

Tubing shall be suitable for bending, Flaring and cold finish. Finishing shall be scratch free and bright polished. Necessary marking for batch / make / traceability should be placed on every tube and test certificate shall be made available before installation.

B. Brief Specifications for Fittings

- i. All fittings shall be designed for 6000 PSIG working pressure.
- ii. The fittings shall be flare less design and consist of four primary components, i.e. Body, Nut, Front Ferrule and Back Ferrule. All the Parts should be interchangeable for only of same make Ferrules.
- iii. All fittings shall be suitable for the tubes as per ASTM A-269. Tolerances and hardness of Tubes will be Rb 80.
- iv. The basic material for the fittings shall be SS 316, bar stock as per ASME S A-479 and forging shall be as per ASME A-182.
- v. Fittings shall be suitable to operate at high temperature and pressure combinations.
- vi. NPT thread shall be as per ANSI B1.20.1 standard. Especially male threads are to be made by Cold rolling method and shall be protected by plastic caps.
- vii. Heat Code Traceability numbers will be roll marked on the Body and Nut, Ferrules.
- viii. The Nut shall be silver plated from inside to reduce torque and prevent galling.
- ix. Fitting body, Nut and Ferrules shall be Electro polished.
- x. Front Ferrule which is wetted part shall not be hardened by Heat treatment.
- xi. Rear Ferrule, which grips the tubing and not typically wetted part shall be significantly hardened than the tubing up to RC 60 hardness.
- xii. Rear ferrule shall not be hardened by Heat Treatment.
- xiii. For hardening of back ferrule multiple processes shall not be used.
- xiv. The sealing cone of body where front ferrule seats shall be burnished to remove tool marks and to give extra smooth surface for proper sealing.
- xv. Fittings shall be designed for minimum 50 - 60 remakes.
- xvi. Fittings shall be gauge able. Gauges shall be provided.

- C. 6 Nos. 20 gauge GI, Red coloured buckets filled with fine sand. The buckets shall be provided with MS bucket hanging on the dedicated Epoxy Powder coated (0.03 mm to 0.05 mm thick epoxy) MS stand with weather proof roof duly painted with red colour.

2.3 FABRICATION, INSTALLATION / INSPECTION & TESTING FOR TUBING AND FITTINGS

- A. Following type test for fittings shall be applicable for the entire job in various stages but not limited to the following and shall be executed as per the best engineering practice and type test certificate mentioning below parameter has to be submitted as a part of test certificate along with the first invoice;

- i. Visual Examination
- ii. Pneumatic Pressure Test
- iii. Vibration Test
- iv. Burst Test (Hydraulic)
- v. Tensile Pull Test
- vi. Generic test certificates from NABL accredited test labs shall be submitted.

B. Following test for tubes shall be applicable for all tubes and test certificate mentioning below parameter has to be submitted as a part of test certificate along with the invoice;

- a. Hydrostatic test
- b. Eddy Current Test

Material Composition Test Certificate for all fitting and tubes shall be submitted as per best engineering practice.

C. Fabrication Specifications - Stainless Steel & Fittings

Cutting, Fit-up and Laying out

- i. Template shall be used for laying out headers, laterals and other irregular details to ensure accurate cutting and proper fit up.
- ii. The pipes / tubes shall be aligned correctly within the existing tolerance on the diameter, wall thickness and out of roundness.
- iii. Rigid supports & clamps / brackets shall be provided at minimum distances, i.e. 1 meter and near all joints as per the standard engineering practice.
- iv. For fit-up, maximum recommended torque shall be given for tightening it.

Bending

- i. Completed bends / elbows shall have a smooth surface and free of flat spots and corrugations.
- ii. Hot bending is not permitted.
- iii. The bends shall be free of buckles, cracks, wrinkles, bulges and other visible defects.
- iv. The tolerances on bending shall be maintained.
- v. Cold bends to a radius of three (3) times the nominal pipe diameter or greater may be made without subsequent stress relieving. For good quality bends three (3) times the nominal pipe diameter bends shall be made subject to the approval of Engineer-In-Charge or its representative.
- vi. The flattening at any cross section shall not exceed 8% and 3% of nominal outside diameter for internal and external pressure respectively. Similarly, reduction in wall thickness as measured by the difference between nominal thickness and minimum thickness shall not exceed 10% of nominal pipe thickness.

Tools & Accessories

Tube benders, tube cutters, tube de-burring tools, threaded gauges, cap gauges, vices, applicable personnel protective equipment, 6-inch ruler, scribe (for making fittings) or equivalent (Indelible pen or felt tip marker - low chloride) and open end wrenches in two sets each shall be procured and provided by Bidder / Bidder.

D. Installation, Inspection, Testing & Commissioning, Reports / Documentations

- i. All equipments shall be installed conforming to good engineering practice in general and particularly conforming to NFPA Code, OISD Norms, ASTM A-269, ASME 31.8, Gas Cylinder Rules, CCoE / PESO Guidelines, NZS 5425.
- ii. The Bidder shall arrange all the necessary erection tools, tackles, testing and measuring equipments

for testing and commissioning of job.

- iii. Test certificates for routine tests carried out on individual items or equipment as a whole shall be provided. Tests shall be as those listed in the relevant specifications, and as a minimum shall be those listed in the relevant Indian Standard specifications.
- iv. The Bidder shall submit all relevant test certificates to Gujarat Gas Ltd or its representative and the necessary witness shall be made by them at the site for mechanical works as per standard practice.
- v. Gujarat Gas Ltd or its representative shall carry out the inspection of the erection and witness the testing and commissioning of the equipment at site and approve the test certificate. Their certification shall be attached with invoice for the payments.
- vi. Bidder shall do necessary painting & marking as per IS Rules wherever required. Station wise As-built Drawing for the entire installation work shall be provided by Bidder before commissioning or along with invoice or as per the EIC instructions.
- vii. Bidder has to provide necessary tag marking on tubing as Low, Medium & High Bank at both end of high pressure tubing installation. Further, painting of "Emergency valve" and "Low", "Medium" and "High" on MS Plate located at isolation valve of dispenser so that outsider can visualize in case of emergency.
- viii. Bidder shall provide wire mesh screen in SS tubing trench at bottom side of dispenser base frame for protection against rat bite on cables & other accessories of dispenser. Specification of Wire Mesh Screen:- Material - SS304, Diameter of Wire – 1mm, Mesh/Inch – 1, Type – Square Mesh.
- ix. If any inspected or tested services / Goods fail to confirm to the specifications, Gujarat Gas Ltd may reject them and the Bidder shall either replace the rejected Goods or make all alterations necessary to meet Specifications' requirements, free of cost to GUJARAT GAS LTD.
- x. Final measurements shall be taken jointly by Gujarat Gas Ltd EIC, Bidder or its representatives at site to be certified by both of them for its correctness for billing and payments.
- xi. Material inspection shall be carried out by Gujarat Gas Ltd or its representatives.
- xii. Bidder shall carry out necessary hook-up & interconnecting tubing with CNG Dispenser (to be supplied by Gujarat Gas Ltd as free issue material) and further successful commissioning including supply of material, fabrication, erection / installation, testing etc.
- xiii. Bidder shall carry out necessary hook-up & interconnecting tubing with Air Compressor for pneumatic air supply (to be supplied by Gujarat Gas Ltd or OMC as free issue material) and further successful commissioning including supply of material, fabrication, erection / installation, etc.
- xiv. Material reconciliation shall be done jointly after completion of work at each of the station.
- xv. Bidder shall furnish the reports, such as, Inspection & Testing Report, Material Test Certificates, Final As-built drawing in Soft & Hard copies duly certified as per EIC instruction.
- xvi. Bidder shall make arrangement of displaying hard copy (in the form of hard board) of mechanical layout of CNG station duly approved & authorized by EIC of GUJARAT GAS LTD.
- xvii. Bidder shall provide header arrangement including tubing piece, ball valve & required fittings in storage cascade to facilitate / enable CNG filling or unloading. However, this is an optional case and it may be performed with prior concern from EIC of GUJARAT GAS LTD.

E. WARRANTY / GUARANTEE / DEFECT LIABILITY

- i. Bidder shall replace the material against defect & workmanship, etc...if any,
- ii. The defect liability of material, workmanship shall be one year from the date of completion of entire job of each station and acceptance by Gujarat Gas Ltd. Necessary deduction shall be made from final bill or recovered from CPBG, if any non-conformance is found.

2.4 SCOPE OF WORK & SUPPLY - GUJARAT GAS LTD

- a. Gujarat Gas Ltd EIC shall arrange the required work permit or site clearance for the job.
- b. Gujarat Gas Ltd or its representative shall inspect & witness the entire job.
- c. Gujarat Gas Ltd or its representative shall approve the sample quality of material and colour, make, etc...before dispatching at site.
- d. Gujarat Gas Ltd shall arrange the approval of authority, if required. Necessary marking for the same shall be made jointly, if any.
- e. Gujarat Gas Ltd shall provide Electrical LT power supply at station if needed.
- f. Gujarat Gas Ltd shall provide & arrange installation of CNG Dispenser, including assistance to OEM (vendor) in configuration, testing & commissioning.
- g. Gujarat Gas Ltd shall provide & arrange installation of Air Compressor (if required), including assistance in configuration, testing & commissioning through the OEM vendor. However, Bidder shall provide the connectivity from Dispensers to Air Compressor.
- h. Gujarat Gas Ltd shall arrange all the required permissions / approvals related to the CNG station.
- i. GUJARAT GAS LTD shall provide necessary sample layout (sketch) of CNG Daughter station, Tubing arrangement, cascade header arrangement, LCV fill post layout.
- j. Gujarat Gas Ltd EIC shall approve the site wise layout of installation for the mechanical works to be proposed by Bidder.

2.5 HEALTH, SAFETY, ENVIRONMENT & SECURITY

a) Work Permit

Bidder shall take necessary work permits from the concerned while working at site. Bidder shall educate / instruct his laborers for strictly obeying of "No Smoking" at site.

b) Personnel Protective Equipments

Bidder shall ensure usage of all suitable Personal Protective Equipments for all the personnel during performing the entire job. Since, the job has to be performed at height, adequate & suitable safety belts, fall arrester, etc...to be provided to the technicians.

c) Environment

Bidder shall ensure all prevailing norms for preserving the environmental aspects especially no throwing of oil, grease, paints, edge sharp material & other chemicals. Also, Bidder shall ensure the cleaning the site everyday after completion of job.

d) Security

Bidder shall ensure that the existing installations are not damaged during the job, including security aspects at site for assets, material, personnel, information, etc...

2.6 OTHER TERMS & CONDITIONS / STIPULATIONS

- a) The Bidder shall provide first aid box at the place of work for minor injuries to his staff. It is pertinent to state that the Gujarat Gas Ltd as referred above shall be no way responsible for any kind of medical claims / re-imbursement / premium of any kind of medical or pertaining insurances to the staff of Bidder.
- b) The Bidder shall be responsible for his employees observing all security and safety rules set by Gujarat Gas Ltd & may issue regulations and instruction from time to time. In case the Gujarat Gas Ltd suffers any losses, etc..., of whatsoever in nature on account of the Bidder's employees not following the security / safety norms, the Bidder shall be liable to make good all such losses as may be determined

by the Gujarat Gas Ltd, and the Gujarat Gas Ltd shall have the right to recover all such losses, etc..., from the dues payable to the Bidder. The Bidder shall provide details of each person engaged at site and have to fill in a prescribed Performa of all the employees for records. Any staff shall be engaged after the approval of the Gujarat Gas Ltd only.

- c) The Bidder shall ensure disciplined behavior amongst his staff / workers at the place of working. If any one Bidder employee found violating the norms of discipline and good conduct, the Bidder shall be liable to take disciplinary actions for the same.
- d) The Bidder shall mobilize at site within the stipulated time as indicated in the Letter of Intent / work order unless otherwise specified elsewhere in the work order to mobilize early on exigencies of the requirement of Gujarat Gas Ltd.
- e) The work shall be performed during day hours only; if required to be carried out in the night hours, necessary permission shall be obtained from Gujarat Gas Ltd in advance. If necessary, adequate illumination has to be provided by Bidder at their cost.
- f) Bidder will carry out the additional work, if asked by Gujarat Gas Ltd. Such work will be charged extra on mutually agreement, on written order issued by Gujarat Gas Ltd.

2.7 PENALTY

- 2.7.1 In case of any complaint regarding non fulfillment of any obligation under the contract, Gujarat Gas Ltd reserves the right to withhold payment of the Bidder, and out of such amount and including the security deposit held, make such payment to another agency for getting the jobs at the Bidder's risk & cost, as it may consider necessary for smooth and unhanded working of the system
- 2.7.2 The completion period of the entire scope of work shall be deemed to be the essence of the contract. In case of delay in completion of job beyond the stipulated time, penalty would be levied as mentioned in table
- 2.7.3 Incase of delay of over 10 weeks in completion of the work beyond the stipulated completion date, Gujarat Gas Ltd., reserves the right to terminate the contract and get all the jobs completed through another agency of its choice. Any extra expenditure that Gujarat Gas Ltd will have to incur for completion of the balance jobs through another agency on account of higher rates quoted by the agency will be recovered from the Bidder's pending bills or by revoking the performance bank guarantee.
- 2.7.4 The following critical parameter describes the system performance and service level expectations and requirements during the Implementation phase of contract. The service level includes target performance measures, unacceptable measures and the related penalties for not meeting required service levels.

As the mechanical hook-up works shall be carried out in line with the civil works completion & equipments installation i.e. in staggered manners, The Completion Schedule / Period for Supply, Erection / Installation, Testing and Commissioning of HP tubing for GGL shall be considered from the Date of intimation from Engineer-In-Charge (EIC).

The execution schedule for mechanical hook-up works shall be prepared jointly with GGL EIC considering Civil work plan, Equipment installation plan etc. during commencement of job. Each Project activities shall be carried out in line with finalized schedule jointly and intimation of EIC/SIC. Any practical reason of delay in execution of job shall be verified by engineer-in-charge and shall be recorded.

No penalty shall be applicable in case of;

- A. Force majeure,

B. When GGL has instructed not to carry out the work, for which only written evidence shall be considered / granted.

C. Reasons attributable to GGL.

Sr.	Parameter	Service Level Agreement	Penalty
1	Delay in supply and installation of Tubing, Fittings, hoses, etc.	<u>Supply at Site</u> within 20 Days from approval from GGL EIC	INR 200/- per delayed day per site shall be deducted from contractor's bill
2	Delay in supply and installation of Tubing, Fittings & hoses	<u>Installation & testing at Site</u> within 10 Days from intimation from GGL EIC	INR 200/- per delayed day per site shall be deducted from contractor's bill
3	Delay in Supply, installation, Erection/Installation of Mass flow meter for LCV post	<u>Installation & testing at Site</u> within 45 Days from intimation from GGL EIC	INR 200/- per delayed day per site shall be deducted from contractor's bill
4	Delay in supply of Fire Extinguishers.	<u>Supply at Site</u> within 20 Days from intimation from GGL EIC	INR 100/- per delayed day per site shall be deducted from contractor's bill
5	Delay in submission of test report/documents /drawings/ certificate/ manuals etc.	Within 10 days from work completion/instruction from GGL EIC	INR 200/ per each delayed day for each site
6	HSE Compliance	Noncompliance to GGL HSE requirements	INR 500/- per instance* during the execution of job.
7	Child labour	Non-employment of child labour less than 18 years.	INR 10,000/- per occasion
8	Compliance	Noncompliance to GGL Life savers	INR 1000/- per each instance* during the execution of job.

* Instance will be restricted to one per day for the same contractor for the same site.

The cumulative penalties arising out of Service Level Agreements detailed above shall not exceed 10% of the overall contract value. The Penalty will be recoverable from contractor's invoice.

Note: Any noncompliance to applicable statutory and legal requirements may lead to termination of services or contract subject to discretion of GGL.

SPECIAL CONDITIONS OF CONTRACT

- 1.0 The Bidder is required to carry out all services as mentioned in their Scope of work and Schedule of Rates on all the 365 days including Sundays and all Holidays.
- 2.0 The Bidder shall allow weekly offs to his workmen and daily working hours will be fixed as per the relevant Act/ Law and Rule made there under. However, no work shall be left incomplete/ unattended on any holiday/ weekly rest. The Bidder or his authorized representative shall interact with Engineer-in-charge daily for smooth services.
- 3.0 Bidder has to ensure & insure the safety of man and machine all the time. The Bidder shall remain at all times liable to Gujarat Gas Ltd for any loss or damage caused to any building, plant, equipments, instruments, accessories, fittings, fixtures, machinery of Gujarat Gas Ltd due to careless, negligent, inexperienced act or default of the Bidder, his / their agents, representative or employees. Gujarat Gas Ltd shall be the sole judge as regards the quantum of loss or damage and it shall be entitled to deduct from the amounts payable hereunder to the Bidder, the cost of repairs or the amount of loss or damages.
- 4.0 Bidder will be liable for any loss or injury to Gujarat Gas Ltd employees/ agents due to careless, negligent, inexperienced act or default of the Bidder, his/ her agents, representatives or employees.
- 5.0 The decision taken by the Engineer-in-Charge regarding work completion, will be treated as final and binding.
- 6.0 The Bidder shall make his own arrangements to provide all facilities like office accommodation and transport etc. to his workmen. Gujarat Gas Ltd does not make any commitment to provide the Bidder or his employees with facilities such as office accommodation, food, canteen, tea, toilet, telephone etc.
- 7.0 Bidder or their personnel shall not share or disclose any information to any one pertaining to the contract for any reason.
- 8.0 The Bidder will strictly adhere to all the safety rules and regulations prevailing and applicable from time to time at the installations as directed by Gujarat Gas Ltd.
- 9.0 The rates quoted by the bidder must be inclusive of all the taxes, duties, and any other statutory levies on the vehicles, Bidder's share of P.F., insurance charges, Licenses, permits, works contract tax and any other expenditures, etc.
- 10.0 It will be the responsibility of the Bidder to pay as per the minimum wages of the appropriate government rules applicable under the prevailing Minimum Wage Act. Gujarat Gas Ltd may depute its representative to ensure compliance of the clause.
- 11.0 All arrangements for communication shall be the responsibility of the Bidder.
- 12.0 The Bidder shall indemnify the company from any claim of the contract labour.
- 13.0 If the Bidders fail to furnish any proof in respect of separate PF Code/ No. of the concerned RPF Commissioner/ Authority, their bids shall be liable for rejection.
- 14.0 All the jobs mentioned under scope of services shall be carried out as per sound engineering practices, work procedure documentation, and as per the guidelines/ direction of Engineer-In-Charge or his authorized representatives.
- 15.0 GGL will intimate the station requirement vide email, Bidder has to deliver the material for the Station within 4 weeks after the receipt of the written intimation.