



TECHNICAL SCOPE OF WORK FOR ALTERATION / MODIFICATION WORK OF DOMESTIC AND COMMERCIAL CONNECTIONS

DOC. NO - GEL/TS/PE-PNG/SERVICE/ALTERATION/SOW

01	2, Ann 4	• Clarifications in GI pipe instalaltion scope • Detailed - Scope of work : PE laying • Incoporation of Island kitchen installation methodology • Specificaiton(Seperate Annexure) added for Coverall specification	22.06.2026
00	-	Original Document	17.04.2023
Rev. No	Clause No.	Description of Change	Date of Issue

TABLE OF CONTENT

PART-1: INTRODUCTION	4
INTRODUCTION	4
DEFINITIONS	4
PART- 2 CONTRACTOR'S SCOPE OF WORK	7
1 CONTRACTOR GENERAL SCOPE OF WORK	7
2 SCOPE OF ALTERATION/MODIFICATION OF EXISTING PNG INSTALLATION	7
2.1. GENERAL GUIDELINE FOR ALTERATION / MODIFICATION WORK	7
2.2. GI PIPE / ABOVE GROUND INSTALLATION WORK	8
2.3. SCOPE OF WORK FOR PE LAYING	16
PART-3 COMMON TERMS OF CONTRACT	29
1 GENERAL	29
1.1. COMPETENCY & TRAINING	30
1.2. Equipment, Machinery & Tools	30
1.3. PROGRESS OF WORK	30
1.4. QUALITY OF WORK	31
2 COMPLIANCE OF LAWS	31
3 IMPLEMENTATION OF DIGITIZATION INITIATIVES	32
4 ISSUE OF GEL SUPPLIED FREE ISSUE MATERIAL	32
4.1. Material to be Supplied by Owner as Free Issue	33
4.2. Material to be Supplied by Contractor	34
5 SAFETY	35
5.1. HANDLING OF PIPES AND COMPONENTS BEFORE AND DURING LAYING	36
6 STATUTORY COMPLIANCE	37
7 REPORTING	38
8 QUALITY CONTROL / INSPECTION	39
8.1. General	39
8.2. Inspection	39
9 GUARANTEES AND WARRANTIES	40
10 SITE FACILITIES	41
11 Waste management	43
12 Interpretation of Tender Terms	43
ANNEXURE 1 - MINIMUM TOOLS, EQUIPMENTS & TO BE PROVIDED BY THE CONTRACTOR	44
ANNEXURE 2 - PE/GI CONSUMABLE MATERIALS/ ITEMS	47
ANNEXURE 3 - FORMAT OF REPORTS	50
ANNEXURE 4 - MINIMUM REQUIRED SPECIFICATION OF FIRE-RETARDANT COVERALL	53

PART-1: INTRODUCTION

INTRODUCTION

GUJARAT ENERGY LIMITED (erstwhile Gujarat Gas LTD) is involved in Piped Natural Gas Distribution to industrial, commercial, transportation, residential segments of major cities / towns of Gujarat state and outside of Gujarat as per authorization received by PNGRB. GUJARAT ENERGY is rapidly developing a multi-dimensional operational framework that fulfils the India's energy needs by exploring, developing and harnessing newer energy services.

PNG is a mixture of hydrocarbon gases and vapors consisting of principally methane in gaseous form. The PNG network consist of receiving natural gas from suppliers at city gate station (CGS), steel mains, pressure regulating installations (PRI), poly ethylene (PE) mains and supply system to end users. Natural Gas (NG) is today increasingly gaining popularity over as alternate auto fuel primarily because it is environment friendly, economical and more efficient as compared to other conventional auto & kitchen fuels. Emission of harmful oxide and other polluting particulates is minimal in case of NG.

GUJARAT ENERGY intends to appoint contractor for the comprehensive activity based "Operation & Maintenance" of City Gas Distribution Network, PNG Installations, Equipments and associated facilities in the region to provide uninterrupted supply with due compliance of all the PNGRB standards, GEL technical specifications, prevailing statutory & HSE norms keeping in view of the customer satisfaction.

DEFINITIONS

City Gate Station or CGS	"City Gate Station" means the point where the custody transfer of natural gas from natural gas pipeline to the CGD network takes place.
Transmission / Sub transmission Line	Carrying high pressure gas at above 49 bars it is under scope of Transporter.
Primary Network	"Primary network" means a part of CGD network that operates at pressure above 100 psig (7 bar) and below 711 psig (49 bar) and pipelines forming part of this network called Gas Main or Distribution Main or Ring Main shall be designed to ensure uninterrupted supply of gas from one or more City Gate Stations to supply gas to the secondary gas distribution network or service lines to bulk customers through service lines. Can also be defined as steel pipeline network.
Secondary Network	"Secondary network" means a part of CGD network that operates at a pressure below 100 psig (7 bar) and above 1.5 psig (100 mbar) and pipelines forming part of this network shall be called low-Pressure Distribution Mains which shall be designed to ensure uninterrupted supply to tertiary network or to industrial consumers through service lines. It can be defined as PE (MP) distribution network
Tertiary Network	"Tertiary network" means a part of the CGD Network that operates pressure less than 1.5 psig (100 mbar) and pipelines forming a part of this network to service pressure distribution mains shall be designed to ensure uninterrupted Gas supply to service lines. It can be defined as PE (LP) distribution network.
SDR	Standard Dimension Ratio it is the ratio of nominal OD to nominal wall thickness of PE pipe as define in IS-14885, with latest edition
Trench less	Such method of construction that does not need an open trench.

Consumer meter		A meter that measures gas delivered to a consumer at the consumer's premises
Creep relief valve		A relief valve installed to relieve over pressure caused by creep in the downstream system that discharge maximum 1% of the equipment flow capacity. A joint made in thermo plastic piping by passing the current through the electrical coil provided in the fitting and heating the parts sufficiently to permit adequate flow and fusion of the materials between the two surfaces put in contact.
Bidder		"BIDDER" shall mean the "person or firm" with whom Purchase Order/ Contract is placed/ entered into by OWNER for supply of equipment, materials and services
CPRS, DRS, DPRC		It receives gas from steel distribution line and carries out filtration, pressure reduction of 1.5- 4 barg and dispatches to PE distribution network.
Domestic Connection	Customer	Consist of regulator, meter, GI / copper pipeline and wire braided rubber tube. Gas flow downstream of regulator at 21-24 mbar and consumed at hot plate.
Commercial Connection	Customer	Consist of regulator, meter, GI / copper pipeline and wire braided rubber tube. Gas flow downstream of regulator at 75-100 mbar and consumed at hot plate.
Industrial Connection	Customer	Consist of filter, regulator, meter, PE / CS pipeline and consumed at Gas equipment like boiler, furnace, etc.
Transition Box / Service Regulator		Receive 0.5 to 5 bar pressure gas through PE network and supply 110 mbar pressure gas to downstream PE network after pressure reduction.
Odorizing Unit / Facility		Adequate odor / smell is imparted to piped natural gas by continuous dozing-controlled quantity of odorant chemical, in the flowing gas supply.
Office / Control Room		For carrying out round the clock for 24 hours and 365 days operational activities of CGD.
IMS		Integrity Management System comprising of ISO 9001:2015, ISO 14001:2015 and ISO 18001:2007
Portable Gas Detectors		For detecting / measuring gas presence during leaks / escape / maintenance jobs
Office Facilities		Office Equipment, Furniture, UHF Wireless Communication, Emergency Vehicle, Condensate Pits, Fire Protection / Fighting & Leak Detection Equipment, Telephone connection, etc.....as per enclosure.
Emergency Vehicle(ERV)	Response	A vehicle for attending regular and emergency activities/ maintenance
Computer System / Printer / log Books		For record / reports and logging daily information's and parameters / customer complaints handling and status per shift including attendance.
Public Announcement System	Announcement	For making public announcement to customer during gas supply stoppage, resumption, disaster, earthquake, fire hazards etc.
Signage / Caution / Information Boards		For display of information / caution, quick and effective transmission of information, even when away from control room.
Fire Extinguishers		For extinguishing fire accident during routine job
Personal Protection Equipments (PPE)	Protection	For personal protection during normal and critical jobs.

Tools / Tackles	For repair / maintenance of leaking / damaged PE pipes / fittings on PE network, on line functional testing of PE valves and service regulators and customer connection.
PNG	Natural Gas produced from Gas wells, Gas condensate wells or Oil wells and the residue Gas remaining after conditioning being metered, regulated / controlled, odorized & distributed through pipelines for various applications, i.e. for industrial, commercial, domestic, etc. as a Fuel.
Equipment	Gas Transmission Pipelines (Steel), Distribution mains (PE), City Gate Station, DRS / CPRS, Transition Box / service regulator, GI Installations, Meter / Regulators, Safety / Regulating / Control valves & associated facilities includes Flow Meter, Filters, Odorizer and accessories owned by OWNER for PNG distribution.
Safety Procedures	The Procedures, Direction, Guidelines and Measures as communicated from time to time by OWNER to the CONTRACTOR for safe / reliable handling, distribution & usage of PNG.
Vehicle	A Light Motor Vehicle (Cars & Three Wheelers) and Heavy Motor Vehicle (Bus) as defined under the Motor Vehicle Act, 1988.
MIS	Management Information System
AOMP	Annual Operation & Maintenance Plan
HSE	Health, Safety, Environment
PPE	Personal Protective Equipment
SRV	Safety Relief Valve
SSV	Safety Shut-off Valve
PRV	Pressure Reducing Valve
LDT	Leak Detection Test
LPT	Lock Pressure Test
TR Unit	Transformer Rectifier Unit
MDPE	Medium Density Polyethylene
MS	Mild Steel
BA Set	Breathing Apparatus Set
CP	Cathodic Protection
IJ	Insulating Joint
AJB	Anode Junction Box
TLP	Test Lead Point
CJB	Cathode Junction Box
MP	Medium Pressure
QAP	Quality Assurance Plan
SOP	Standard Operating Procedure

PART- 2 CONTRACTOR'S SCOPE OF WORK

1 CONTRACTOR GENERAL SCOPE OF WORK

This contract is for Alteration / Modification of existing Domestic / Commercial connections including ground connection / tapping from the main network or Riser/Header but not limited to following work.

1. Addition of new point for Kitchen or Geyser
2. Alteration / Modification of GI Pipe installation
3. Dismantling and Refitting of Domestic / Commercial / Non-Commercial / NDEC installation
4. Shifting of Domestic and Commercial connection - Contractor will do the dismantling of installation and Shifting of GI Pipe, Meter, Regulator and all materials (it is in customer scope)
5. Extension or modification of GI Riser / GI Header
6. Modification / extension in ground connection from tapping point to RCC guard as well as PE Pipeline modification inside apartment area as required on case to case basis
7. Alteration / Modification activity to be performed under this tender is for planned Alteration / Modification work. Job Order will be issued by Gujarat energy Limited for the said activity and it is to be performed as per SLA. Any Emergency Maintenance / Alteration work like leakage repairing, repairing of pipeline installation damage, dismantling of installation for house renovation and any other post commissioning services are to be performed by PE-PNG O&M Contractor.
8. CONTRACTOR shall implement digital initiatives for above activities as instructed by GEL(without any additional cost) and all manpower shall have compatible smartphones to avoid any deviation to GEL implemented initiatives.
9. Contractor to follow GEL approved guideline/procedures for alteration related works

2 SCOPE OF ALTERATION/MODIFICATION OF EXISTING PNG INSTALLATION

Scope of the work for Alteration / Modification of existing PNG Connections are described below. However, contractor to follow the updated GEL SOP/ Guidelines time to time with no extra cost to GEL (wherever not specified)

2.1. GENERAL GUIDELINE FOR ALTERATION / MODIFICATION WORK

- Upon receipt of Job Order from GEL EIC, Contractor shall complete the alteration work in accordance with the specified SLA.
- If the alteration/modification request execution is technically not feasible due to any reasons including safety/technical concern, and regulatory non-conformity, Contractor to escalate such cases to GEL EIC. Site visit report shall be filled with reason/observation & customer concurrence.
- For any type of alteration or modification works, drilling of holes in RCC wall or any type of stones like granite, marble etc. is under contractor's scope, contractor to claim relevant SOR line item for the same.
- Contractor shall take utmost care while performing drilling activity.
- After carrying out GI installation proper restoration/cementing of holes shall be done, Contractor shall be responsible for any damages while carrying out drilling activity.
- In case of any damages, contractor shall bear the cost of repair and GEL will not be responsible for such damages
- After carrying out GI installation proper restoration/cementing of holes shall be done, Contractor shall be responsible for any damages while carrying out drilling activity.
- Underground connection shall be done from the nearest PE Service Line only
- Carry out site specific risk assessment; identify risk control measures and emergency arrangement requirement.

- Whenever permit to work is required as per PtW matrix, take the work permit and make it available at site
- Carry out tool box talk & SSRA before starting of the work and document the same.
- Plumbers shall have trained in line with STC training procedure
- Ensure availability and use of PETZL make / GEL approved safety harness by competent person while working at height and wearing required PPE's –As per PPE Matrix
- Apply for authority permission if needed
- No work shall be carried out without issuance of valid Job order from GEL EIC.
- Any activity which requires permission from local municipal corporation / municipality shall be completed only after receiving necessary permission/s.
- Contractor must adhere to the GEL-approved Alteration SOP while carrying out the work.

2.2. GI PIPE / ABOVE GROUND INSTALLATION WORK

2.2.1. ROUTE SELECTION FOR DOMESTIC PIPELINE INSTALLATION

While selecting the route of Domestic pipeline installation at site following points shall be considered;

- Location and numbers of risers to be in-line with the approved plan of designated authority.
- Route is planned for shortest possible length by considering quality and safety parameters with ease of maintenance
- Route is finalized considering minimum no. of thread
- Route is finalized considering minimum length of high-pressure line entering in to customer's premises
- Don't install GI Pipe on un-plastered wall, house under construction or on wooden structure
- Don't install GI Pipe in an unventilated void space, where chances of gas accumulation in case of gas leakage
- Avoid GI pipe installation on terrace parapet wall. If required, all possible risks and feasibility shall be evaluated through joint risk assessment by GA Technical & HSE team duly approved by GA Head.
- Install GI Pipe away from other utilities have potential hazards to PNG installation
- Don't install GI Pipes in ducts and areas where it is not convenient to operate and difficult to approach for maintenance
- Don't install outside lateral line at a height where maintenance is difficult
- Provide connection in multi-storied buildings from common GI Vertical Riser from nearest available riser tapping. In case of row house connection, connection can be provided either individual GC method or from common horizontal header method based on site situation. However, preference shall be given to individual connection with GC in such cases.
- Consider risk of vehicular movement and strike of compound gate during installation in parking area
- Install isolation valve at a convenient height of 5' to 6' so it is easy to operate from ground / floor level
- Install gas tap/appliance valve on platform in such a way that rubber hose can be fitted easily, easily traceable, easy for movement of gas burner and convenient to operate in case of emergency
- Install gas meter at a readable height at 6.5' to 7.0' (index height) to provide ease of meter reading. However in case any customer wants Gas Meter at height below this, for any reason, joint risk assessment should be done for the same in consultation with GA HSE personnel with due approval of GA head

- Install regulator at the convenient height for ease of maintenance and considering minimum high-pressure line entering at customer premises
- Don't conceal G I Pipe inside /outside the premises and ensure always to be exposed open to atmosphere
- Install appliance valve for Gas based water heater / Geyser on outside wall of the bathroom or in fully ventilated space like terrace / balcony / passageways / Open veranda with adequately protection from the weather
- Don't install any portion of pipe hanging without any support.
- For glass cook-top (stoves with rubber hose connectivity at the bottom) gas tap may be provided above the platform. In such cases, rubber hose may be connected below the platform. In such cases it is advisable to have proper ventilation in the wooden cabinet below the platform.
- Compound gate or doors and windows inside the house shall not hit the Gas pipeline, if no alternative route found installs proper pipe protection guard.
- Maintain adequate distance of GI installations from the electrical installations
- For riser installation tapping tee shall be provided at sufficient height to avoid exposure of WAH for on line tapping
- No of points in each connection is to provide as per prevailing C&M policy / Guidelines.
- For two points in the single kitchen and two points for geyser purpose, G 1.6 Meter is to be installed. In case of demand for more geyser points and also extra kitchen points required in extended kitchen for grill / re-heating purpose etc. G 2.5 Meter is to be installed. (Please refer Gujarat energy /C&M-HO/2023-24 dated 27/03/2024, Guidelines for providing Extra Points i.e. Kitchen and Geyser Points Offering to D-PNG customers in GEL Operating Areas
- Commissioning of unauthorized / tampered connections shall not be done under any circumstances
- Ensure that there is no damage while passing pipes through holes in decorative tiles, Marble / Stone, RCC structure etc.
- In case of farm house / bungalow connection (requiring underground PE pipeline laying inside customer's premises greater than 30-meter length as defined in SOP COM-P-08), install meter at entry of premises/gate on compound wall and then lay underground PE pipeline in customer's premises till kitchen wall and then install GI pipeline till appliance. Ensure to provide separate isolation valves at meter as well as near kitchen wall in such cases. In case at the entry of the premises where permanent structure not available, install PD meter & regulator skid with cabinet on civil platform.
- Island kitchen installation is to be carried out as per process mentioned in this document.

2.2.2. INSTALLATION OF G. I. PIPE AND FITTINGS

- Length of pipes is cut accurately as per dimension
- The condition of die and vice shall be periodically checked for threading.
- GI Pipe threading machine with proper safety arrangement is preferred in place of manual threading. To achieve clean and precise threads, maintain a steady speed and pressure while threading with the machine. Regularly inspect the threads during the process and use cutting oil generously. Avoid tilting of the pipes being threaded and ensure it is positioned as close to center as possible
- The thread form shall be tapered as per IS 554
- Cutting fluids (Oils) shall be used at the end of each pipe and die
- The threads shall be cleaned properly with a soft lather brush / Cotton
- The threaded pipes shall be kept on stands only
- The edges should be straight to avoid knife-edge and burrs shall be removed from the edges through proper tool.

- The threads shall be wrapped with Teflon tape with minimum three overlaps
- Testing tee should not be provided in connection.
- Avoid Union fitting in the connection but however in some cases Union fitting may be provided after review in view of site requirement.
- The pipes are supported by mean of "U" / "C" clamps as per GEL specified so as to avoid failure of threaded joints
- The distance between two clamps shall not be more than one meter in case of joint less installation and 200mm away of each side at any fittings.
- The number of clamps shall be adequate. The pipeline portion containing the Regulator and Meter, either horizontal or vertical, shall have clamps on both side of the regulator and meter. Clamps shall be fitted in such a way that they do not create misalignment of pipes.
- The clamps shall be provided in such a way that they do not create misalignment of pipes
- Clamps shall be provided on both sides of thread joints
- Plastic end caps shall be used to close incomplete connection to prevent entry of unwanted elements
- Pipe protection clamp shall be installed to protect it from house door hitting or any obstruction of pipe line
- For wall crossing, drill the hole with the help of electrical drilling machine in such a way that plaster and tiles shall not be damaged. It shall be ensured that there is no concealed wiring or any other fitting on the opposite side of the wall for a particular location of drilling
- Self-adhesive anti-corrosive tape shall be wrapped on the pipe with 50% overlap.
- Casing sleeve shall be installed in wall for wall crossing.
- All pipes shall run on wall and overhanging should be avoided.
- Concealed piping shall not be done.
- Wherever the powder coating is peeled off during the installation, touch up shall be done by golden yellow paint only after complete installation and successful testing.
- G I pipe bending is not allowed.
- Prior to installation all pipes and fittings shall be checked internally to ensure that they are free from any obstruction.
- PE to GI (transition fitting) threaded joint shall be provided above ground. PE pipe length should be 1.5 mtr. of transition fitting.
- For idle point/future point only ½" GI Hollow Hex Plug shall be provided properly. Rubber Cap are not allowed.

2.2.3. WORKING AT HEIGHT

- Ensure that valid PTW is available at site.
- Working at height job is performed in presence of GEL Engineer representative as per PtW matrix.
- All requisite equipment for working at height is available at site including PETZL harness.
- All Equipment, tools, tackles and safety devices are checked before use to ensure fit for purpose and ensure that required certificates are available.
- Safe method is selected as per approved procedure or permit for work at height e.g. rope access system or ladder or use of safety harness.
- All tools & equipment are secured while working at height
- Proper place is identified to hang / tie the tool bag
- Sign board displayed and ensure the area is cordoned below the workplace (potential dropped object area)

- Avoid working in vicinity of live overhead power line. Ensure overhead power line if any is at safe distance from work at height location

2.2.4. GROUND CONNECTION

- Availability of sufficient clearance as per technical and safety standard between existing underground utilities and gas pipelines.
- PE service shall not be provided through casing / ducting etc.
- PE service line shall not install / passing through drainage chamber.
- PE service line shall not be provided near sock pit
- Before starting the excavation work, the availability of utility is checked through customer as well as nearby public is also contacted to know the exact location of the utility.
- On confirmation of utility, necessary precautionary measures shall be taken to avoid damage.
- Tapping from charged network must be done in presence of either GEL representative or Third-Party Engineers appointed by GEL.
- Work permit must be received as per PtW Matrix
- The depth of trench shall be 1 meter. Transition fitting shall be connected with the G.I. pipe by using suitable length of G.I. pipe so that PE pipe comes above ground and transition fitting remains at least 100-150mm above ground (but not exceed length of RCC Guard)
- Where it is impractical to provide 1.0 m cover due to physical constraints, additional protective measures such as concrete slabs shall be installed at least 300 mm above the service line. In no case the depth of cover shall be less than 600mm
- Ground connection will be done only after completion of above ground GI installation.
- Due to unavoidable circumstances, If Ground connection is to be done before above ground GI plumbing installation (advance Ground Connection) installation shall be done up to isolation valve plugged with ½" G I Hollow Hex Plug. Advance ground connection up to TF / RCC Guard is not allowed. Such advance GC are allowed in registered connections only.
- The PE service pipeline to be checked visually on entire surface for damages if any may be occurred during handling / transportation. Also TPI / Site Engineer to ensure signature & name of TPI on either end of the pipe, coil number to confirm pre-tested coil.
- Ensure the PE pipeline welding joint is performed by qualified PE welder.
- Connect transition fitting and PE pipe with 20mm EF coupler by means of Electro fusion welding process
- Clean the pipe area and remove upper oxidized layer by proper scraping and cleaning through isopropyl alcohol
- Fix the saddle properly on pipe with help of Top loaded clamp.
- If Ground Connection tapping to be done through 20mm PE pipeline, 20mm dia. EF Eq. Tee shall be provided
- Follow all safety and electro fusion guideline of using electro fusion machine and Electro fusion fittings.
- Pneumatic testing of 20mm pipes (Ground connection) shall be done after fusing tapping tee (saddle) and transition fitting fixing at 3.5 kg/cm² with holding period of 30 minutes Or
- By pressurizing through appliance valve (Gas tap) after installation of meter and regulator spool piece i.e. pneumatic testing of combined PE and GI installation from tapping tee (Saddle) to appliance valve (Gas tap) before saddle drilling from appliance valve.
- Tapping tee (saddle) drilling to be done after successful testing of Ground connection
- All joints shall be checked with soap solution after saddle drilling.

- After Ground Connection is completed ensure all the valves Main isolation valves & Appliance valves are kept in close position
- Do not throw plastic bags of electro-fusion fittings at site

2.2.5. ONLINE TAPPING FROM RISER / HORIZONTAL COMMON HEADER GI PIPELINE

Following check list is followed during on line tapping from commissioned GI Riser or Horizontal Common header.

- Required Work permit is obtained as per PtW matrix.
- Online tapping from riser can be done in presence of GEL authorized TPI. Ensure all required tools and tackles and consumables are available at site.
- Intimation to all affected customers prior to isolation of Riser supply and isolate their main isolation valve.
- Ensure complete isolation of main control valve and proper tag out is done at Riser Isolation valve.
- Keep one person near Riser isolation valve to ensure no one will operate the valve during on line tapping work.
- Proper PPE & safety harness shall be used for on-line tapping.
- End plug from where taping shall be done to be removed slowly after consumption of line pack gas from any connected customer from the same riser
- After complete consumption of Natural Gas from Riser pipeline, check with soap solution to ensure no passing of Natural Gas from Main isolation valve. In case passing of Isolation valve is observed, same to be replaced by O&M team prior to continue further work.
- Ensure complete fitting of GI pipe up to individual main isolation valve. If further GI installation up to meter and appliance valve is not planned on same day then fix hollow hex plug. Ensure no leakage/valve passing before starting balance work of the connection.
- Inform all affected customer about supply resumption prior to opening of isolation valve and resuming gas supply.
- Open main isolation valve and carry out leak check with soap solution of newly fitted GI pipeline.
- After ensuring no leakage, open individual main isolation valve and ensure proper gas supply.
- Ensure no open end is left before leaving the site.
- Installation of 03 nos. RCC guard are allowed as per site condition.

2.2.6. TESTING OF INSTALLED CONNECTION

General guideline for Pneumatic testing of Dom / Com / NDEC connections (PPT):

- Before carrying out the pneumatic test of the whole installation; testing assembly, air foot pump with pressure gauge / manometer shall be checked its calibration and proper functioning.
- Before pneumatic testing of the installed connection spacing between two clamps, tightening of the clamps thread joints, alignments of the whole piping shall be checked. Valve shall be kept in open position and the appliance valve shall be kept in close position.
- Ensure Meter and Regulator is not installed during PPT. Proper Meter spool piece to be installed during PPT (No flexible hose to be allowed).
- Calibrated pressure gauge shall be used having the range of 0 – 4 Kg/Cm²
- Position of the pointer of the pressure gauge shall not be marked with the marker pen on the glass. It should be recorded in the test records.
- After pressurization of the whole piping section shall be checked for the leakage with the help of soap solution.

- During the testing, air should reach up to complete connection. After completion of testing, pressurized air shall be released from appliance valve only.
- Type of testing, test pressure and test duration as per the below.

Sr. No.	Type of Testing	Test Pressure	Test Duration
1	PPT of above ground Plumbing	3.5 Kg/Cm ²	30 Minutes
2	PPT of Ground Connection	3.5 Kg/Cm ²	30 Minutes
3	MMT	Gas Pressure	15 Minutes
4	Riser PPT	3.5 Kg/Cm ²	1.0 Hrs.

- Steps for Testing of Domestic connection
 - ✓ Remove meter and regulator & install spool piece (Meter spool) for testing of installation
 - ✓ Ensure main isolation valve shall be in closed position.
 - ✓ Apply pressure from Gas tap/Appliance valve.
 - ✓ The test pressure shall be 3.5 Kg/Cm². The pressure shall be maintained for minimum 30 minutes for individual connections
 - ✓ Result of the same to be filled in Pressure Test Certificate
- Steps for testing of Vertical & Horizontal Riser
 - ✓ Remove regulator & install spool piece for testing of riser where riser to be connected through MP Network.
 - ✓ The gauge pressure shall be between 3.4 bar to 3.6 Kg/Cm² (max), which will be ensured by TPI engineer or GEL representative
 - ✓ The pressure shall be maintained for 60 minutes for riser testing
 - ✓ Result of the same to be filled in Pneumatic Pressure Test Certificate
- Manometer testing (MMT) and commissioning of connection
- Following quality & safety check by TPI engineer / GEL representative, Before commissioning of connection
 - ✓ Route selection & Installation is done as per installation guideline
 - ✓ Alignment of complete connection including meter.
 - ✓ Installation of pipe clamps and protection clamp if require as per guidelines.
 - ✓ Installation of protective tap & sleeves in wall crossing and ensure cementing of hole
 - ✓ Proper installation of RCC guard and back filling of excavated trench
 - ✓ Check the Dom installation with manometer on gas pressure for 15 minutes to ensure leak proof installation prior to starting gas stove conversion
 - ✓ Ensure all geyser points is outside the bathroom & capped with ½" GI Hex plug if geyser is not available during commissioning of connection
 - ✓ Close isolation valve.

2.2.7. CONVERSION OF HOT PLATE

Following procedure to be followed for conversion of Hot Plate. All gas taps shall be in closed position.

- The Isolation valve should be opened
- Conversion technician shall check the Dom installation with manometer on gas pressure (25 mbar to 35 mbar) to ensure mechanical integrity of the installation
- Check all joints, parts of the stove with soap solution for any leakage in presence of customer Before start of conversion activity conversion technician to confirm that all parts of the stoves are fit for purpose / non-leaking before conversion to NG.
- Open the burner knob and remove the plug from hot plate
- Clean the grease from plug with cotton cloth and clean the simmer hole
- Make the simmer hole of 0.6 mm with the help of simmer drill and ensure that it should not be inclined

- Remove the dust from plug
- While greasing uniformly on plug, ensure that simmer hole should not be covered by grease
- After greasing, plug and knob should be properly positioned at their original place
- Remove the burner from hot plate and clean the burner with the needle
- Clean the mixing tube with brush and open the old jet (LPG) using Allen key
- As per standard burner size, 125, 110 & 65 no. jet size is used for conversion of burner.
- Place the burner on its original position on hot plate
- If nozzle diameter is more than 5 mm, it should be changed
- Nozzle outer end should be nearest to gas tap. If its position is opposite to gas tap position, it should be changed and placed nearest to the gas tap
- A new Suraksha hose for each point shall be fixed
- Connect gas tap to nozzle of hot plate using Suraksha hose with hose clamping at both sides.
- Check all joint with soap solution in presence of the customer
- Ensure the flame color, it should be blue
- The flame should not come out above the vessel
- If back firing is occurring, set the air fuel ratio of burner with the help of S. S. Strip/clamp
- Take meter reading in closed position of all the gas taps
- In case customer is not ready for actual conversion, force NG letter will be sent to customer for their non-readiness of commissioning
- Conversion of platform mounted stove, electrically started stove, any advance stove should be in customer scope through OEM.

2.2.8. INSTALLATION OF RUBBER HOSE

- A new Rubber Hose with valid expiry date for each point shall be fixed
- Connect gas tap to nozzle of hot plate using Rubber hose with hose clamping at both sides.
- It is preferred to use 1.00-meter length Rubber Hose during installation, however based on small platform size, 0.7-meter length can be utilized after approval from GEL engineer. Such rare instances to be cross verified by GEL engineer and shorter length to be used only when sufficient distance (to maintain 95 mm minimum bending radius) between Gas tap & stove cannot be maintained by any means.
- Do not use any oily material to install Rubber Hose
- Rubber Hose shall not be cut through knife, hacksaw, cutter or any other sharp tools.
- Rubber Hose shall be installed such a way that minimum bend radius of Rubber Hose shall be more than 95 mm. Customer is to be educated for the same.

2.2.9. INSTALLATION AT ISLAND KITCHEN

(New Island Kitchen Installation or Modification/Alteration of Existing Island Kitchen)

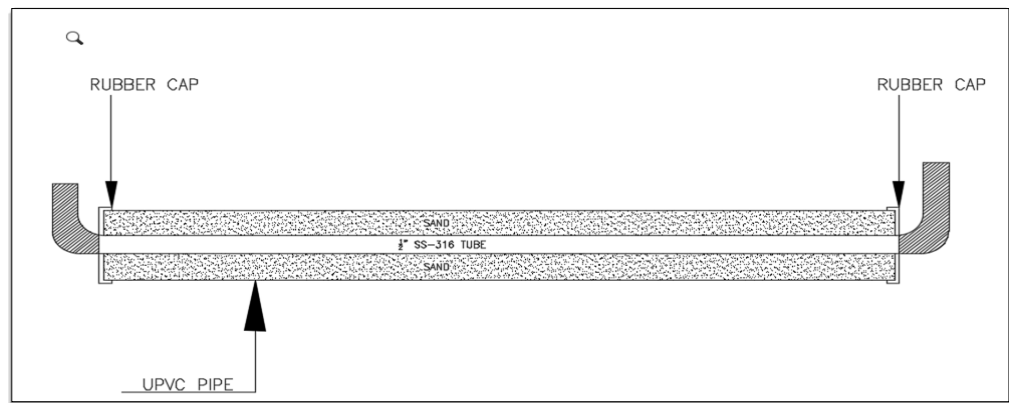
Advancement in infrastructure and aesthetic design creating hurdles in many cases where installation of GI gas pipeline as per conventional way is not possible. In some of the residences, kitchen platform is located in center of the kitchen room and GI pipeline mounted on one of the kitchen walls requires to be extended up to the appliance. Under such circumstances, pipe can be laid in flooring with adequate protection. Same shall be termed as “Kitchen with island platform”. To overcome this challenge and fulfil customer’s requirement, Gujarat energy Limited has proposed installation of SS tubing housed in UPVC conduit pipe, which will be installed in the groove underneath the floor tiles.

- **Contractor Scope of Work**

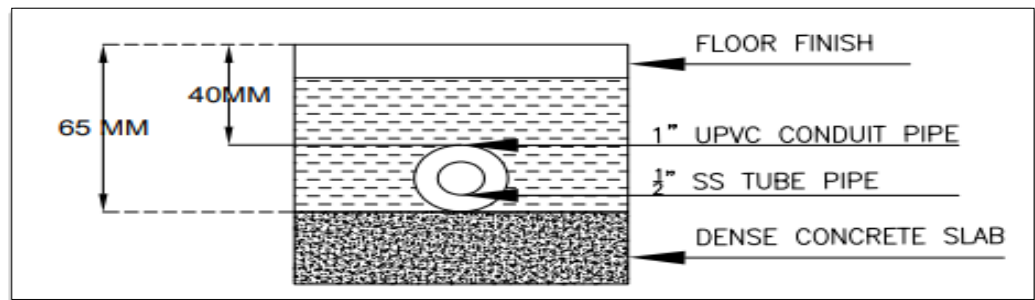
- Contractor shall deploy Skilled manpower for SS tube installation work, comprising minimum one experienced technician along with helper.
- Contractor manpower shall have necessary tools & tackles like SS bender, spanners & other associated items/consumables required for SS tube installation.
- **Contractor Procured Material used for Island Kitchen**
Below mentioned material will be supplied and installed by contractor as per site requirement.
 - SS-316 Grade tube "Supply of 1/2" OD Tube, MOC: SS316, Hardness: Rb80, Finish: Full Annealed, Wall Thickness: 0.065", Tolerance in OD: +0.005"
 - SS-316 Grade -1/2" Ferrule*1/2" BSPT MALE connector (Compression fitting)
 - SS-316 Grade - 1/2" Ferrule*1/2" BSPT FEMALE Connector (Compression fitting)
 - UPVC pipe 1"
 - Hollow End cap (MOC- Rubber/UPVC)
 - PVC Clamp 1/2"
 - Anti-Corrosive tape
- **Guidelines for Installation at Island Kitchen is as follow:**
 - A groove is required below the floor tiles / on the concrete slab as shown in the drawing (Refer Drawing No.1). Groove shall be prepared by the customer.
 - SS tube (1/2") to be inserted in UPVC pipe (1") and space between ss tube and UPVC Pipe shall be filled with sand. Cap (hollow) to be fixed on both end of UPVC pipe.
 - SS tube to be bent with SS tube bender to bring the tube vertically up at both ends inside the kitchen.
 - GI pipe installation on the kitchen wall to be connected with SS tube with connector. (1/2" Ferrule*1/2" BSPT Female at minimum height of 6" from floor.
 - Self-adhesive anti-corrosive tape shall be wrapped on the Connector joint and Pipe (300 mm above and 300 mm below) with 50% overlap. It is required to serve the purpose of prevention of galvanic corrosion due to bi-metal contact of GI and SS materials.
 - Appliance Valve to be connected with SS tube inside the kitchen with Connector (1/2" ferrule*1/2" BSPT Male). Appliance Valve on island kitchen outside wall shall be installed at height where it is easy to operate. Appliance Valve and SS Tubing can be installed inside wall of the Island kitchen only when area below platform is not closed / properly ventilated and Appliance valve is easily accessible.
 - This prefabricated assembly to be fixed in the floor groove. (Refer Drawing.1)
 - Pipe work laid in flooring shall be protected against various factors leading to corrosion and also against failure caused by movement.
 - Groove / screed depth shall be 65 mm minimum on the top of the concrete slab which will provide an approximate cover of 40 mm over a 25 mm UPVC conduit pipe.
 - The conduit pipe should be fixed in the groove properly.
 - Entire DPNG installation shall be tested including SS tubing as per existing practice (PPT of above ground Plumbing at 3.5 Kg/Cm² for 30 Minute)
 - Customer can fill the groove as per his requirement / can fix floor tiles after testing of the installation work.
 - Following precautions to be taken during SS Tube Installation.

- ✓ Do not conceal above ground GI pipe and above ground SS Tubing including Connector joints and ensure always to be exposed to the atmosphere
- ✓ No joints are allowed in SS tubing inside conduit pipe under the floor.
- ✓ Unions are allowed in SS tubing only while installation of plumbing on wall.
- ✓ Safe and shortest possible route shall be selected. Bends and deviations shall be avoided
- ✓ Any interference with other utilities shall be avoided. In case there is such interference, a minimum distance of 300mm should be maintained.

• **Typical Installation for Island Kitchen**



CROSS SECTION: SS TUBE IN FLOORING



2.3. SCOPE OF WORK FOR PE LAYING

2.3.1. PE SERVICE LINE INSTALLATION CRITERIA

- Availability of sufficient clearance as per technical and safety standard between existing underground utilities and hydrocarbon pipelines.
- Availability of sufficient clearance from overhead electrical lines as per Electricity Act.
- Availability of adequate width of road (minimum of 3 meters) for ease of maintenance and emergency handling.
- The route has stable soil conditions and free from erosion.
- Route free from recent soil infill which causes significant change to natural ground levels. Route free from sand gravel, flood risk, land-slip and ground likely to subsidence.
- Route free from any effluent drain in to soil which causes corrosion to pipeline.
- Route shall be free from old large trees and intense forest with minimum impact on wildlife / habitats.
- Route shall be free from issue of sensitive inhabitanancies and vandalism.

2.3.2. MODIFICATION IN SERVICE PIPELINE

- Ensure availability of sufficient clearance as per technical and safety standard between existing underground utilities and PE pipelines.
- Ensure sufficient clearance from overhead electrical lines as per Electricity Act.
- Following Checks to be done while selecting service line route
 - The route has stable soil conditions and free from erosion.
 - Route free from recent soil infill which causes significant change to natural ground levels.
 - Route free from sand gravel, flood risk, land-slip and ground likely to subsidence.
 - Route free from any effluent drain in to soil which causes corrosion to pipeline.
 - Route shall be free from old large trees and intense forest with minimum impact on wildlife / habitats.
 - Route shall be free from issue of sensitive inhabitanicies and vandalism.
 - PE service shall not be provided through casing / ducting etc.
 - Route shall be selected to avoid Rat hole / Rat route

2.3.3. PE LINE LAYING EXECUTION METHODOLOGY

CONTRACTOR shall intimate well in advance before laying of pipe to TPI/ EIC. Laying of PE pipelines shall be commenced only after ensuring proper dimensions and clean surface of the trench and after clearance from TPIA/EIC. The trench bottom shall be free from the presence of cuts, stones, roots, debris, stakes, rock and any other material, which could lead of deep, scratches/tearing of the pipe wall. After ensuring above and sand bedding of trench bottom, the PE pipe coil shall be uncoiled smoothly through proper equipment's/care inside the trench ensuring no damage to pipe coil during laying. Special care shall be taken to ensure that the uncoiling is properly controlled and cannot hit persons nearby the work area. Also, the area, where the pipe is to be uncoiled, shall be made free of sharp objects.

CONTRACTOR shall examine Pipe bore/ inside of pipe for cleanliness prior to lining up and all extraneous matter shall be removed and the extreme end shall be capped before laying.

Contractors shall ensure open ends of pipe placed in the trench shall be securely capped or plugged to prevent the ingress of water or any foreign material as this could cause a future blockage of pipe or regulator malfunction due to dust, etc.

In case trench is flooded with water due to damage of utilities or due to rain, dewatering shall be carried out prior to laying of pipe. No laying shall be allowed if the trench is not completely de watered.

Direction change, turning of PE piping shall be made by welding PE EF fittings. However, use of elbows for change in direction shall be minimized and natural bending of PE pipes shall be used wherever possible and as per instruction given by TPIA/EIC.

Minimum radius of curvature shall be maintained as given below-

SDR	Without joint	With joint
11	15D	25D
17.6	15D	45D

All drains/ culverts/ nala should be crossed below the bed level and PE pipe to be laid through RCC/PCC/ Hume pipe, provided by contractor, unless and until specific approval is obtained from Site Engineer in writing.

PE pipes shall be laid at a centre of trench with a minimum clearance of 150 mm from both the wall of trench unless otherwise agreed with the Site Engineer for proper padding of soft soil/sand etc. as per requirement.

Contractors shall ensure adequate cleared spacing at PE insertion point to avoid difficulty in PE insertion/

laying, in case of open cuts and moling, where two pipes are to be laid parallel in same trench or same pits.

Valves shall be installed at locations directed by the EIC and joined with PE pipes by electro fusion techniques. After installation of PE Valve, valve chamber to be constructed as per the approved specification and drawing of GEL.

Rough sketches of AS-Built Drawings with details of depth, length, offsets from fixed references, other utility crossings, fittings, sizes of the casing pipe used for the pipeline shall be prepared on daily basis and to be submitted to EIC.

Activities partially completed during tenure of current contract will be paid as per the prevailing SOR applicable for achieved milestone. Balance work executed against new contract attended by same contractor or other contractor will be paid as per the respective line item new contract.

2.3.3.1. JOINTING OF PE PIPE BY ELETROFUSION FITTINGS

The procedure for jointing of PE pipes and fittings as mentioned below.

Only bar-coded electro-fusion machine (Automatically Readable) of GEL approved manufacturer that can read the bar code of the fittings automatically shall be used for joining of the PE pipes/fittings. Manual feeding Electro-fusion machines are not acceptable for jointing purpose. The contractor has to submit the calibration certificate of Electro Fusion machine with bar coded control unit at the time of start of work and at fixed intervals as per the instructions of Owner. Contractor shall ensure that the machines are always available at site.

- a. Taking power connection form electric poles, connections without written permission from the concerned authorities or residential premises is strictly prohibited. Only electro fusion fitting of approved manufacturer shall be used for PE jointing.
- b. CONTRACTOR shall arrange all the tools required for Electro-fusion welding, as specified below:
 - Cutting : Pipe Cutter for Pipe Cutting
 - Marking: Permanent type Marker
 - Scrapping : Scraper with sharp edge blade
 - Degreasing/ Cleaning : Isopropyl Alcohol and Lint Free Tissue Paper
 - Clamping : Pipe Alignment clamp/Top load clamp
 - Welding : Electro-fusion Machine with all accessories
- c. The Contractor shall ensure that polyethylene pipe is only cut with proper plastic pipe- cutting tool. Before fusion is attempted, the contractor shall remove the oxidized surface of the pipe using Scraper before inserting into the electro-fusion coupler. No fusion shall be allowed without clamping device and the proper cutting tools.
- d. The contractor has to supply all the consumables required for carrying fusion of the joints (like tissue paper, napkin, isopropyl alcohol etc.).
- e. After fusion is completed, Pipe alignment clamp used for coupler & top load clamp used for saddle shall be kept in position till the cooling time mentioned on the fitting is over.
- f. Contractor site supervisor shall prepare welding joint report as per the approved format. Welding joint report shall be submitted to EIC for verification before pneumatic testing of the particular site. Joint numbers shall be written on each joint with the help of permanent marker pen after cooling of the joint

If, upon inspection, the EIC determines a joint is defective, Contractor shall remove the joint by an approved method. The cost of replacing joint shall be borne by the Contractor including the cost of pipe and fittings removed.

Jointing of PE pipes shall be as per Owners technical specification. Jointing shall be carried out by electro fusion method only.

- g. Electro fusion unit input supply is to be from a nominal 240V generator, which is normally of approximately 5kVA capacity. The nominal output of the generator is to be 240V + 15%, - 10% between no load and full load. Control boxes are to include safety devices to prevent excessive voltages being present at the control box output. The safety device shall operate in less than 0.5 s.

Note that extension leads are not to be used on the control box outlet connections.

WARNING: Control boxes are not intrinsically safe and must therefore not be taken into the trench.

- h. The contractor has to submit the calibration certificate of Electro Fusion machine with bar coded control unit at the time of start of work and at fixed intervals as per the instructions of Owner. Contractor shall ensure that the machines are always available at site. No stoppage of work due to the non-availability of machines shall be allowed.
- i. For electro-fusion jointing, the contractor shall bring own tools, tackles and equipments including DIESEL GENERATOR SET with/ RCCB having an adequate capacity of power required for electro fusion machine.
- j. Contractor shall also arrange double insulated cables, Industrial power board with 3- pin plug, proper earthing of equipment etc. Contractor shall ensure that bare cable without proper plug shall never be used
- k. Only registered, qualified and certified welder shall be allowed to make joints on the PE pipeline. Welder shall carry ID card issued by the approved welder training agency on site. Welder shall not be allowed to make a joint in case if he is not carrying the ID card on site. Any new welder shall be registered first with GEL and shall get training with GEL approved training program at contractor's expense.

2.3.3.2. ELECTRO FUSION JOINTING METHOD/ PROCEDURE

- a. Ensure there is sufficient space to permit access to the jointing area in the pit/trench.
- b. Check that the pipe ends to be jointed are cut at right angle or square to the axis of the pipe by using proper pipe cutters and any burrs removed. PE pipe cutting with Hacksaw blade will not be allowed in any case.
- c. Check visually that the pipe/fitting surface is free of defects such as cuts, abrasion etc. and wipe pipe ends using clean lint-free material to remove traces of dirt or mud or grease etc. up to at least 100 mm length. Avoid using excessive ovalized pipes. Ovality of the pipes to be removed by using Re-round tool.
- d. Mark the area over which the oxidized pipe surface is to be removed, i.e. In excess of the insertion depth, on each pipe to be joined by placing the EF fitting of the bagged fitting alongside the pipe end. Trace a line round the circumference at the appropriate distance from the end of the pipe using a felt tip pen or an indelible marker pen or similar. The scraping area must be 10mm larger than the insertion depth of the fittings.
- e. Remove the oxidized surface from the pipe by scraping.
- f. AVOID ABSOLUTELY other scraping equipment such as abrasive paper, rasp, emery wheels, saw blades etc. other than Mechanical/Manual scrapper.
- g. A mechanical scraper could be used however; there is a considerable risk that the end preparation will

not be adequate with the use of such a tool, so extra care shall be taken during scrapping with mechanical scrapper.

- h. Before inserting the PE pipe into the PE fitting, clean the scraped surface using isopropyl alcohol to remove the dust.
- i. Remove the fitting from its packing and clean the scraped area of the pipe surface and the bore of the fitting with a disposable or tissues wipe impregnated with isopropyl alcohol. Ensure the prepared surfaces are completely dry before proceeding.
- j. Note that the prepared pipe surface should not be touched by hand.
- k. The aligning clamp must be used for all types and sizes of EF fittings to be joined which protects, during the electro fusion and the subsequent cooling, mechanical stresses on the jointing.
- l. Top loading clamp shall be used for holding the tapping tee saddle during the fusion cycle. In some cases, if the manufacturer's procedure for holding the fitting is provided, then the same should be followed during the fusion cycle.
- m. In case of EF coupler jointing, sign a mark using an indelible pen on the two ends to be welded corresponding to the depth of insertion, in general equal to half length of the coupler.
- n. Insert the coupler on both pipes up to marking and fasten the pipe into the aligning clamp.
- o. Connect the electro fusion control box input leads to the generator.
- p. Check that the reset stop button, if fitted on the control box, is in the correct mode.
- q. Check that there is sufficient fuel for the generator to finish the joint. Start the generator and check that it is functioning correctly.
- r. Switch on the control box, Connect the control box output leads to the fitting terminals and check that they have been fully inserted and proceed with the set-up of the jointing parameters, strictly following the instructions of the fusion unit.
- s. Press the start button on the control box and check that the heating cycle is proceeding as indicated on the display.
- t. When the fusion cycle is completed, verify the fusion indicators coming out. The fusion indicators are located near the terminal connection of the fitting. If there is no apparent move in the melt indicators, the joint should be cut out and a fresh joint made (See note below).
- u. If a satisfactory joint has been made, the joint is to be left in the clamps for the cooling time specified on the fitting or the automatic control box. Cooling, in order to avoid possible stresses on the jointing, strictly respect the cooling time indicated on the bar-code and do not remove aligning clamp of the fittings. In no case artificial cooling by placing wet cloth or sprinkling of water be allowed.

Note 1: Bar coded EF units are available which obviate the need to enter the fusion time. Manually feeding of fusion time in EF unit shall not be allowed.

Note 2: Gloves and goGEles should be worn during the Fusion process.

Note 3: If there is an accidental interruption during the joining cycle, operation can only be repeated after the Electro fusion joint has totally cooled (min. 1 hour). This operation can be done only once.

Note 4: If the fusion cycle terminates before completion of the countdown, check for faults as indicated by the control box warning lights and check that there is adequate fuel in the generator. DO NOT attempt a second fusion cycle within one hour/ cooling of joint at Ambient Temperature of the first attempt.

RECORDS

Records of appropriate servicing and calibration certificate of Electro fusion unit shall be kept at site along with traceability of the master instrument.

2.3.3.3. TRAINING FOR ELECTROFUSION WELDING

It is necessary that operators, inspection and supervisory personnel acquire the skills of electro fusion fitting fusion. Necessary training should be carried out by a qualified instructor with the objective of enabling participants to;

- Understand the principles of electro fusion fitting jointing
- Identify pipe and appropriate fitting markings
- Carry out pre-jointing machine and equipment checks
- Make satisfactory electro fusion fitting joints from pipes and fittings of different sizes
- Inspect for and identify joints of acceptable quality

Note that only registered, qualified and certified welder of GEL shall be allowed to make joints on the PE pipeline. Welder shall carry ID card issued by the approved welder training agency on site and allowed to perform welding joints up to pipe dia. certified by training agency. Welder shall not be allowed to make a joint in case if he is not carrying the ID card on site. Any new welder shall be registered first with GEL and shall get training with GEL approved training program at contractor's expense.

Top loading clamp shall be used for holding the tapping tee saddle during the fusion cycle. In some cases, if the manufacturer's procedure for holding the fitting is provided, then the same should be followed during the fusion cycle.

2.3.3.4. SQUEEZE-OFF

- To control the gas flow a special tool may be used to squeeze the pipe walls together. Hydraulic squeezing tools are used to supply necessary force to compress the pipe walls for sizes 125 or 90 mm and above. Manual squeezing tools can be used for squeezing 90mm or below PE pipes.
- As will be seen the squeeze-off equipment comprises two bars to apply pressure to the outside of the pipe. The bars are brought together, either manually or hydraulically, squeezing the pipe material together until a seal is formed where the upper and lower walls meet.
- The hydraulic squeeze off tool should have a locking to prevent accidental release of pressure during operation. All squeeze-off machines should be fitted with check plate or stops to avoid over compression of the pipe.
- Where the pipe walls are compressed the polyethylene pipe will be severely deformed in the regions of maximum compression. The pipe will eventually regain its original shape after squeezing but there will be some reduction in the pressure bearing properties.
- A complete stop may not always be obtainable because of wrinkling of the inside of the pipe. If a complete stop is required, then a second squeeze can be used. A second squeeze-off distance should be a minimum of three pipe diameters and right angles to the initial squeeze.
- While not essential it would be good practice to fit a reinforcing stainless-steel band/ do not squeeze again adhesive tape around the pipe upon the completion of a squeezing operation.
- Special squeeze-off sticker should be wrapped on pipe after completion of operation prior to backfilling. Placement of such tape/ mat will facilitate to avoid another squeezing at the same place in future.

2.3.3.5. BACKFILLING

- a. Trenches excavated during the day shall be backfilled by evening before workmen leave the site unless, otherwise as approved by the Owner Engineer In charge.
- b. Backfilling shall be done after ensuring that appurtenance have been properly fitted and the pipe is following the trench profile at the required depth that will provide the required cover and has a bed which is free of extraneous material and which allows the pipe to rest smoothly and evenly. The Contractor shall supply all necessary pumping equipment and power sources to de-water trenches and excavations as required by Owner at no extra cost.
- c. Prior to backfilling it should be ensured that the trench is filled with fine sand around the pipe as per the specification given in this document and soft graded soil layer up to 500 mm to be backfilled above layer of sand immediately after lowering where required.
- d. The surplus material shall be neatly crowned directly over trench and adjacent excavated areas on both sides of the trench to such a height which will provide adequately for future settlement of the trench. Contractor shall be responsible for remedial work at no extra cost to Company. Surplus material, including rock left from this operation shall be disposed off to the satisfaction of landowner or authority having jurisdiction at no extra cost to Owner.
- e. When the trench has been dug through driveways or roads, all backfilling shall be executed with sand/suitable material in layers as approved by Owner's representative and shall be thoroughly compacted. Special compaction methods as specified may be adopted. All costs incurred there upon shall be borne by the Contractor.
- f. The Contractor shall ensure laying of PE Warning Mat 250 mm wide and 300 Micron thick, approved marking and color of Owner, shall be placed on PE pipeline in the trench after backfill of the trench up to a height of 500 mm on the top of the PE Pipes. The warning mat is to be unrolled centrally over the pipe section and thereafter further backfilling will commence.
- g. Backfilling activity shall include watering and proper compaction of backfilled soil by jumping jack compactor, wherever required as per instruction of EIC; Proper crowning of not more than 150mm shall be done
- h. Electro-fusion of joints is to be undertaken immediately after lowering and the activity shall not be kept pending for lack of Electro-fusion jointing. The backfilling shall be considered complete only after the jointing of pipes.
- i. All the excavated material that could be used during the Restoration process shall be stacked and kept separately and properly
- j. Contractor has to ensure the backfill, watering, compaction and carryout a temporary reinstatement of all premises of statutory authorities work such as Road, Railway etc. immediately after completion of PE Laying and jointing work.
- k. During random inspections if back filling is not found to be as per the specifications, the Contractor will have to re-open the trench and rectify the back filling as per the Owner specification without any additional charge.
- l. Debris and other surplus material shall be removed immediately after the back filling.

2.3.3.6. MANUAL BORING

- The Manual boring shall be carried out as per the requirement specified by Owner's representative and

approved procedures

- The contractor has to arrange sets of manual boring tools as per the approved specification/drawing of GEL. No boring tools other than the approved one shall be allowed at site.
- Contractor shall plan manual boring work well in advance with detailed drawing to be prepared and submitted to EIC for approval. Contractor shall carry out assessment of risk involved at particular site and also submit mitigation plan to EIC for approval prior to manual boring.
- The contractor has to carry out survey of the underground utilities before going for the Molling to avoid any damage to other utilities
- Contractor shall submit check list along with rough sketch showing location for proposed boring pit, boring route and other utilities, if any within the boring route with details of each utility listed in consultation with society officials/ individual house owner in case of a ground connection to EIC for approval.
- Contractor shall co-ordinate with Local municipal authorities, electricity departments & other underground utility operators and intimate them with detail drawing of proposed boring site. If possible, a joint site visit along with the concern officials may be arranged so as to avoid damage/accidents.
- Contractor shall obtain Work permit before manual boring/ HDD activity from EIC.
- Final depth of the boring shall be arrived based upon location of all other underground utilities enrooting the boring path and maintaining safe distance of Minimum 500 mm from the deepest existing utility.
- In case of electrical cable on the route of boring path, electrical supply, if possible, shall be cut off during boring operation in coordination with local electrical utility company
- Maximum length of boring at one stretch shall not exceed 5 Meters to the extent possible. In case boring length is more than 5-meter Contractor shall follow GEL procedure/ guidelines instructed by GEL EIC.
- Contractor shall ensure proper tools & tackles, PPE's listed below to be provided to labour at site. Fire extinguisher & all other safety precaution shall be provided by the contractor at site prior to starting of the work.
 - ✓ Hand gloves rated at min 33 KVA and to be tested annually.
 - ✓ Gum boots
 - ✓ Helmet
 - ✓ Boring tool must be electrical shock proof
- Contractor shall ensure that only one man at a time shall excavate in a confined space. A second man shall to watch & be alert for any emergency handling. Contractor shall ensure that execution of manual boring work is under continues supervision by their experience supervisor till completion of work.
- Contractor shall ensure that boring pit shall be properly cordoned at all times till completion of work
- Availability of First Aid box shall be ensured at all boring sites.
- Contractor shall ensure that after completion of Molling/boring the hole and boring pit shall be properly compacted/ filled with soil by watering as approved procedure and the boring pits and others work shall be restored immediately after completion of work to the satisfaction of EIC.
- Contractor shall ensure that boring pit is large enough to work in comfort till completion of work.
- If there is water seepage into the bore of pipe manholes, Manual boring shall not be done on that location
- If the ground is unstable, Contractor shall provide timber to support the boring pit for saving it from collapse. If the excavation is 1.5 meter deep or greater, the boring pit must be timbered irrespective of depth. In

either case of alternative to timbering is to better the sides of the excavation. Contractor shall ensure that labours performing boring are well trained in the use of tools, use of PPE's. Safety & boring procedure shall be informed/ conveyed by contractor in presence of GEL EIC and records of such training of boring work shall be available with the contractor for auditing by GEL officials, as and when required.

- Contractor shall ensure that, Manual boring must be executed only during day light. Boring work in the night is strictly prohibited.
- PE pipe may be laid by manual boring technique by prior approval of Site Engineer. Provision of manual boring tool shall be in the scope of contractor and the same shall be as per approved drawing/ specification of Owner.
- Manual boring rate will not applicable for intermediate open cut excavation.
- In case of depth of excavation is more than 1.5 meter, additional compliance to be ensured as per GEL Lifesaver/ procedures

2.3.3.7. TESTING

- Pressure testing shall be carried out either with compressed air (free from oil and greases) or nitrogen and no other test medium shall be used. Compressed air or Nitrogen gas shall be provided by Contractor for testing purposes and is to be included in the laying rates. Nitrogen shall be supplied in labelled, tested and certified cylinders and complete with all necessary regulators, hoses and connections which shall be in good order and working condition. No extra payment will be made for any delays incurred, or repair or rectification work found necessary as a result of test failures, where this is the result of faulty workmanship or negligence on the part of the Contractor.
- For both main & service pipeline laying, the Contractor shall perform progressive pressure testing & pneumatic testing to ensure no leaks in long lengths of pipe.
- Schematic drawing of PE network to be tested shall be prepared with clearly marked pressurization point, venting point, PE Valves Location.
- Prior to pressure testing of PE network, proper flushing shall be done with Compressed air or Nitrogen for the entire PE network to the satisfaction of EIC by the contractor and get approval from Owner representative
- The pneumatic test pressure shall be 100 Psig (7 bar-g), and there shall be no unaccountable pressure loss during the test period. The holding period of test section is as below.
- For PE pipeline network of length greater than 1 KM at least 24 hrs. after pressure stabilization period of 30 minutes.
- For PE pipeline network of length shorter than 1 KM at least 6 hrs. after pressure stabilization period of 30 minutes.
- There shall be no pressure drop and measure of pressure unchanged during the test in pressure gauge.
- After successful completion of the pneumatic test, pipeline sections are depressurized. De-pressure rate is regulated to ensure a moderate and constant pressure drop.
- If NG commissioning is not planned immediately after testing, pipeline sections are depressurized and pressure shall be reduced to 1 bar-g and kept under hold.
- In case permission authority requires to carry-out road re-instatement immediately after completion of PE pipeline laying and NG commissioning is not possible / not planned immediately after testing is completed,

in such cases, off-line ground connection (Ground connection of PNG installation prior to commissioning of PE Pipeline network) is also to be carried out prior to NG Commissioning of PE Pipeline network. In such unavoidable circumstances, further process is to be taken as follows:

- If above ground GI installation is not done: Carry out GI installation up to Isolation valve with end plug. No further GI installation to be done prior to PE Pipeline commissioning and Isolation valve of the PNG Connection shall be kept in closed position
- If above ground GI installation is already completed: Network positive/hold pressure (air pressure) shall be reduced from 1 bar-g to 110 mbar-g and shall be kept under hold till NG Commissioning of PE Pipeline Network and Isolation valve of the PNG Connection shall be kept in closed position.
- Positive air pressure (1 barg /110 mbar-g) kept in pipeline network to be mandatory witnessed by TPI or GEL site In-charge and the same is recorded in PE pipeline “Cleaning, Flushing & Pneumatic Testing Report” (CON-F-13)
- Prior to commissioning of PE Network, positive air pressure in pipeline network is to be verified by TPI /GEL site in charge with reference to original positive air pressure recorded in CON-F-13, for any pressure drop to ensure integrity of network before commissioning. Pressure drop observed to be recorded in commissioning report.
- If re-testing is required, in case where positive air pressure / hold pressure after network testing is kept 110 mbar-g and offline GC are also carried-out, GI end plug shall be installed after Isolation valve or shall remove Pressure Regulator & Gas Meter prior to pressure testing. This is to be documented and ensured by TPI / CS and GEL EIC.
- Retesting of PE network to be done in case of further activity is carried out by new contractor (Re-Testing rates are applicable over and above PE Laying, Testing & Commissioning rates. For same contractor retesting rate will be applicable after 6 months from first testing date). Contractor shall ensure following before starting of pneumatic testing.
 - Tested hoses at required pressure and clamps to be used.
 - Area of testing to be away from populated area or sand bags to be kept around so that in case of accident it acts as barriers.
 - If compressed air is being used for pneumatic testing contractor, shall ensure that compressor of appropriate capacity is being used.
 - If Nitrogen is being used for pneumatic testing, Contractor shall ensure industrial nitrogen purity by checking oxygen % in the cylinder as per GEL guidelines.
 - Contractor shall ensure that testing section of PE pipeline is completely isolated positively.
 - Measuring instruments shall have been calibrated and their accuracy and sensitivity confirmed before the start of testing, where in calibrated pressure gauges of suitable range shall be supplied & used for testing by the contractor.
 - The range of pressure gauge is minimum 1.5 times of test pressure and least count of gauge should be 0.1 Kg/cm².
 - The pressure gauges shall be calibrated from time to time as desired by EIC.
 - All testing shall be witnessed and approved by the EIC or his delegated representative. Tie-in joints may be tested at working pressure following commissioning.

The testing shall include, but not limited to the provision of consumable and Non-consumable materials, tools, tackles and equipments, Personal Safety Equipment, Fire Extinguisher, Adaptor, Polyethylene connecting pipe etc.

2.3.3.8. PURGING

Purging shall be carried out in accordance with the principles defined in the American Gas Association publication "Purging Principles and Practice".

The Contractor shall also provide nitrogen required for purging as per the direction of EIC. Nitrogen shall be supplied in labelled, tested and certified cylinders and completed with all necessary regulators, hoses and connections, which shall be in good and working condition. No separate payment shall be paid for supplying Nitrogen cylinders for purging and is included in the laying rates.

Prior to use of nitrogen cylinder, Contractor shall ensure industrial nitrogen purity by checking oxygen % in the cylinder as per GEL guidelines

In addition, the Contractor shall submit purging plan and get approval from Owner/ Owner representative before commencing any purging work. The Plan shall include, but not limited to the provision of the following materials and equipment: Personal Safety Equipment, Fire Extinguisher, Purging Adaptor, Purge stack with flame trap and gas sampling point, Gas sampling equipment (may be gas leak detector), squeeze - off tool, etc.

The Plan shall also include the purging process along with detail on the sequence of events. The process is to also specifically mention the need to lay a wet cloth over the PE main and in contact with the ground, to disperse static electricity during the purging work.

A purge stack with flame trap shall be used when purging services. Care shall be taken to ensure that the purge outlet is so located that vent gas cannot drift into buildings.

2.3.3.9. INSTALLATION OF PD METER AND REGULATOR MODULE (FARM HOUSE/ BUNGALOW)

Location for Installation of PD meter and regulator skid shall be decided by EIC. Skid with PD meter and regulator to be installed at farm house/ independent houses or bungalows where the distance from the entry gate of the premises to kitchen is greater than 30 meters

Contractor shall ensure that the skid is installed and supported on a bed of firmly compacted soil as per the drawing provided in this document.

The scope of work and technical requirements associated with the Installation of skid of inlet pressure 100 mbar-g to 5.0 bar-g and Outlet pressure 21 mbar-g supplied by Owner are as follows:

- The skid shall be a complete pre-fabricated unit, including all valves, fittings, test points and ancillary fittings.
- The skid supplied by Owner shall be pre-tested and ready for installation by Owner and frame mounted with housing or canopy.
- Contractor shall carry out all the necessary excavation/ breaking of surface (Tar/ RCC) etc. For Installation of Skid as per the foundation drawing/specification attached with tender document.
- Installation of skid should be in such a position that Flow direction of Regulator and gas flow in pipeline is in the same direction while connecting upstream and downstream of PE network.
- Contractor shall ensure that usage of 90-degree EF elbow, Coupler for hook-up of the skid for 63mm and above size pipeline.

- Contractor shall apply Golden yellow color on foundation of Skid
- Contractor shall connect inlet and outlet of skid by appropriate EF fitting with transition fitting of Skid.
- Contractor shall carry out functional testing of Skid and carry out leak test prior to commissioning of Skid as per instruction of EIC
- Contractor shall carry out leak test of all the joints of Skid with soap solution during commissioning as per the instruction of EIC.

SELECTION OF LOCATION FOR INSTALLATION OF SKID:

Location selection for Skid is very significant activity for safe and uninterrupted gas supply to Domestic customer. EIC will decide and intimate the installation location of Skid to Contractor. However, the guidelines for selection of location for installation of Skid is as per the below.

Wherever possible, Location is to be selected inside the premises immediately after entering into premises i.e. farm house, bungalow etc. To select the location for installation of Skid, following criteria needs to be considered.

LOCATION TO BE AVOIDED:

- Water logged area
- In front of Entry/ Exit of Farm house/ bungalow etc.
- Garbage collection centre/point

INSTALLATION & TESTING OF MODULE

- Pre-commissioning testing for performance of safety devices i.e. UPSO, OPSO, and Relief valve, which is integral part of Regulator shall be done.
- All electro fusion joints (Skid Hook up joints) shall be checked with soap solution before commissioning.

COMMISSIONING OF SKID

- Ensure all installation and pre-commissioning activities as mentioned above are completed.
- Inlet and Outlet valves shall be kept in closed position.
- Gas in up to inlet valve of Regulator by opening of Valve/squeeze tool.
- Leak test shall be carried out up to upstream of inlet valve.
- If no leakages found, open inlet valve of Skid and ensure no leakages up to outlet isolation valve.
- Monitor Outlet pressure of Skid up to 5.0 minutes before opening outlet valve.
- Ensure positive lock-up pressure (to confirm no leakages or open-end during commissioning) in downstream network before opening outlet valve
- Ensure that not a single domestic connection has been connected through downstream of the network which is to be commissioned.
- Release lock up pressure before opening outlet valve of Skid and by keeping inlet valve closed.
- Slowly open inlet valve first and subsequently outlet valve of regulator to allow Gas – in the downstream network

PART-3 COMMON TERMS OF CONTRACT

1 GENERAL

- GEL shall share Procedure for CPAR to the contractor during kick off meeting and each parameter shall be discussed with contractor.
- In case of any revision / amendment in procedure, GEL shall share the revised CPAR Procedure to contractor and shall be implemented new procedure accordingly.
- CONTRACTOR shall ensure that all tools, tackles, equipment, machineries & instruments are adequately deployed and are 'Fit for Purpose'. Pre-mobilization checks/ inspection shall be carried out by GEL team for the same before the start of work.
- CONTRACTOR to deploy separate manpower and resources exclusively for Alteration / Modification work
- GEL emphasizes on the importance of the Health and Fitness of all staff/ work force deployed at GEL work sites. Contractor/ Service provider shall adhere to medical check-up as per the GEL Health check-up matrix (as applicable)
- A proper HSE orientation and training will be organized by GEL for the CONTRACTOR workforce before the start of work; under no circumstances should the CONTRACTOR commence the work unless they have undergone the HSE training (as applicable)
- CONTRACTOR shall ensure that all their staff/ work force is provided required Personal Protective Equipment (PPEs) as per GEL PPE matrix (as applicable)
- CONTRACTOR shall ensure all required emergency arrangements like Medical treatment, FIRST AID box and Firefighting equipment (as applicable)
- CONTRACTOR shall be required to mobilize the resources as per Service Level Agreement written intimation given by GEL Engineer In charge. In case where CONTRACTOR is already mobilized on site and a fresh/ renewal/ call out order contract is issued just to ensure continuity of the work then there is no separate Mobilization required and all associated clause/ terms related to initial/ first mobilization shall not be applicable.
- GEL will be conducting regular performance reviews through system of Contractor Performance Assessment Review (CPAR) throughout the tenure of the contract, under which, CPAR score for the month will be determined and signed off jointly by GEL and CONTRACTOR. Ensure below mentioned communication with contractor in regards to CPAR process:
- Work allotment by GEL & invitation for CPAR meeting to be formally communicated to contractor every month.
- Signed and scanned copy of CPAR form to be formally communicated to contractor owner on monthly basis.
- In case contractor does not attend CPAR meeting even after follow-up, the same to internally signed off, scanned and formally communicated to contractor Owner every month and the case is also escalated to Zonal Head.
- It will be mandatory for the CONTRACTOR or its authorized representative to attend all the CPAR meetings and sign off the Minutes of Meeting with CPAR score.
- Pending Work of non-performing contractor will be allotted to all the contractors in line with the mutually agreed capacity of the contractor (Based on written declaration by contractor on the capacity) and also got greater than 60% CPAR in all the previous 3 months.
- GEL reserves the right for continuous review & change in Contractor Performance Assessment and Review (CPAR) procedure and same shall be applicable on bidder.
- GEL to share change of CPAR procedure / new procedure / new contractor performance evaluation process to contractor, applicable actions shall be taken by GEL in case of less CPAR score as per current procedure.

- The Contractor shall provide skilled manpower necessary for the proper execution of the Work and site management as defined in tender document.

1.1. COMPETENCY & TRAINING

- Competency training needs for resources are identified and provided as per Gujarat energy requirements. Charges for Training which will be provided by GEL through outsourced agencies shall be debited to contractor.
- Training frequency and training shall be as per prevailing GEL matrix

1.2. Equipment, Machinery & Tools

- All vehicular type machinery shall be in good working order, with all required legal documents including insurance and shall not cause spillage of oil or grease. To avoid damage to paved surfaces, the Contractor will provide pads of timber or thick rubber under the hydraulic feet or outriggers of machinery.
- Contractor must also have to arrange his own equipment for restoration work like water tanker for proper compaction of backfilled trenches
- Throughout the period of execution of such works, contractor shall provide and use warning signs, traffic lights or lanterns, barricades, fencing, watchman, etc. as required by the local authorities having jurisdiction and/or GEL.
- Trench shall be restored as per the GEL requirement after the pipeline is installed. Excess soil (up to 4" above the road level or as suggested by GEL Engineer) on the trench after backfilling, shall be removed by Contractor at his own cost and, shall be unloaded on the location shown by authority/ GEL representatives.

1.3. PROGRESS OF WORK

The contractor shall proceed with the work under the contract with due expedition and without delay. The EIC may direct in what order and at what time, the various stages or parts of the work under the Contract shall be performed.

Contractor has to regularly submit at his own cost the following reports in agreed formats and frequency by owner.

- Daily Activity Report (Daily progress/ planning shall be submitted to EIC daily in morning)
- Testing reports.
- Equipment and Manpower deployment status report (Monthly).
- Material Consumption & Inventory report. (Monthly).
- Material Reconciliation reports (As per GEL approved SOP).
- Approved Deviation statements (as and when required).
- Waste collection and disposal report on monthly basis

OWNER will conduct review of contractor performance in respect to quantitative and qualitative at regular interval (as per CPAR Procedure) as per GEL standard practice.

The contractor shall carry out the work in accordance with the requirement of latest relevant applicable standards, Tender specifications, Owner's Engineering Standards; relevant Oil Indian Safety Directorate (OISD) norms, PNGRB Regulations(T4S), ASME B31.8-Gas Transmission and Distribution Piping Systems and Gujarat energy procedures/ Guidelines/ SOPs being released time to time.

Should the contractor find any discrepancy, ambiguity or conflict in or between any of the Standards and the contract documents, then this should be promptly referred to the Engineer-in-Charge (EIC) for his decision, which shall be considered binding on the contractor.

1.4. QUALITY OF WORK

All works carried out under this contract shall confirm to applicable standards, codes of practice, construction procedures and other technical requirements as defined in the technical specifications.

The manpower deployed on the respective activities shall be adequately trained & shall have necessary skills to execute/ supervise the work as defined by GEL. However, the assessment on the qualification of the personnel shall match the qualification given in guidelines for qualification be at the discretion of EIC.

PE welders shall be registered with GEL and shall be trained by GEL approved agency and other skilled personnel shall be approved by Owner's representative and identification cards shall be issued to them. Only personnel who matches the qualification and are approved by GEL shall be allowed to execute the critical activities like Electro fusion jointing of PE Pipes & Fittings and plumbing work of GI pipes.

2 COMPLIANCE OF LAWS

- The contractor deploying contract labor shall obtain license from appropriate licensing authority as per prevailing rules & regulation and as modified from time to time during contract period.
- The contractor (which shall include the contracting firm / company) shall be solely liable to obtain and to abide by all necessary licenses from the concerned authorities as provided under the various Labor Laws / legislations including labor license from the competent authority under the Contract Labor ("Regulation & Abolition") Act 1970 and Acts made thereafter.
- The Contractor shall also be bound to discharge obligations as provided under various statutory enactments including the Employees Provident Fund and Miscellaneous Provisions Act 1952, ESI Act 1948, Contract Labor ("Regulation & Abolition") Act 1970, Minimum Wages Act 1948, payment of wages Act 1936, Workmen's Compensation Act 1923 and other relevant Acts, Rules & Regulations in force from time to time.
- The Contractor shall be responsible for necessary contributions towards PF, Family Pension, ESIC or any other statutory payments to Government Agencies as applicable under the laws in respect of the contract and of personnel deployed by the contractor for rendering services to OWNER and shall deposit the required amount with the concerned statutory authorities on or before due dates. The contractor shall obtain a separate PF number from the concerned Regional Provident Fund Commissioner and submit necessary proof of having deposited the employees as well as the OWNER's contribution to the Provident Fund. The contractor shall also be responsible for payment of any administration / inspection charges thereof, wherever applicable, in respect of personnel deployed by him relating to the work of OWNER.
- The Contractor shall not engage / deploy any person of less than 18 years under this contract, and the person(s) to be deployed should be physically and mentally fit.
- The installations where job is to be carried out are live and have hydrocarbon environment. Contractor shall comply with all safety and security rules and regulations and other rules laid down by OWNER for its operation. Contractor shall follow best Engineering practice and relevant international safety standards. It shall be duty / responsibility of the Contractor to ensure the compliance of fire safety, security and other operational rules and regulations by his personnel. Disregard to these rules by the Contractor's personnel will lead to the termination of the Contract in all respects and shall face penal / legal consequences.
- The Contractor shall arrange for life insurance for all his personnel deployed on the job as per the relevant Acts, rules and regulations, etc. In case by virtue of provisions of Workers Compensation Act, 1923 or any other law in force, OWNER has to pay compensation for a workman employed by the Contractor due to any cause whatsoever, the amount so paid shall be recovered from the dues payable to the Contractor and/or security deposit with OWNER.

3 IMPLEMENTATION OF DIGITIZATION INITIATIVES

- OWNER has implemented and will implement various initiatives towards automation and digitization of the activities and processes with an aim of having high efficiency work, to reduce manual efforts, to improve communication and collaboration. Accordingly, CONTRACTOR shall implement the same including but not limited to digital attendance reporting, online documentation and transaction monitoring, online document review and approval, online data uploading and updating, online material management etc. with no additional cost to OWNER. Time to time, CONTRACTOR shall ensure the required resources like smart phones, computers, internet connectivity etc. to implement the app based/web-based process including training of the manpower for the same.
- OWNER has initiated QR code based online Pay-Attendance-Leave Management (PALM) System in order to capture attendance of man power hired by Contractors, where applicable. The online attendance data will be integrated with the pay and leave module to get manpower billing and pay-remuneration process done without any manual intervention. CONTRACTOR shall be responsible to ensure compliance to any such attendance, pay & leave system.
- OWNER has initiated implementation of GPS (Global Positioning System) based Vehicle Tracking Operations and Payment (V-TOP) system on IT platform provided by the OWNER. The System will analyze GPS data of COMPANY used vehicles to ascertain various details of vehicle operations in terms of mileage, geo-locations, route deviations, operational hours, unscheduled stops, delays, breakdowns, fuel use, operational efficiency etc. V-TOP system will provide alerts and notifications in order to guide and to ensure the vehicle operations as per standard operating procedures. V-TOP system will be integrated with PALM system to capture attendance of drivers and manpower deployed with the vehicles. Further, V-TOP system will automatically process the GPS and attendance data for billing and payment of fuel use, manpower use and services of the vehicle provider without any manual intervention. CONTRACTOR shall be responsible to ensure compliance to any such vehicle tracking system, where applicable.
- OWNER has implemented Vendor Invoice Submission Application (VISA) for office automation, digitization and transparency in processing of vendor invoices. CONTRACTOR shall upload the invoices and other specified supporting documents on VISA before submitting physical set of Invoice & documents along with covering letter generated from application to respective GEL Offices. Additional reports/documents (not specified on VISA portal), may be directly submitted to concerned GEL- Contract Owner / EIC as per requirements. The onus of selecting relevant name of GEL Contract Owner & GEL GA/Office (where physical invoice is to be submitted by vendor) is on the CONTRACTOR for timely processing of invoices and for further certification / payment.

4 ISSUE OF GEL SUPPLIED FREE ISSUE MATERIAL

- It's in Bidders scope to get the material issued from GEL stores / Material management system established by GEL. All resources required for getting delivery & transportation of material from GEL Stores shall be in Bidders scope.
- In case of material issue from Owner's store, locations of the stores are as follows. GEL may update the list of ware house as per business requirement time to time and contractor has to follow the same for material issue, if required.

SN	GA Name	State	GEL Store from where this GA material shall be issued
1	Gandhinagar GA	Gujarat	Sanand Store
2	Rajkot GA	Gujarat	Dhrol Store
3	Morbi GA	Gujarat	Morbi Store

4	Surendranagar GA	Gujarat	Baldana Store
5	Jamnagar GA	Gujarat	Dhrol Store
6	Bhavnagar GA	Gujarat	Bhavnagar Store
7	Amreli GA	Gujarat	Bhavnagar Store
8	Kutchh (W) GA	Gujarat	Morbi Store
9	Nadiad GA & Anand Rural GA	Gujarat	Baniyara Store
10	Panchmahal GA	Gujarat	Baniyara Store
11	Dahod GA	Gujarat	Baniyara Store
12	Ahmedabad Rural GA	Gujarat	Sanand Store
13	Thane GA	Maharashtra	Virar store
14	Valsad GA	Gujarat	Vapi Store
15	Navsari GA	Gujarat	Vapi/Surat Store
16	Surat & Hazira GA	Gujarat	Surat Store
17	Narmada GA	Gujarat	Ankleshwar Store
18	Bharuch/Ank GA	Gujarat	Ankleshwar Store
19	Dahej GA	Gujarat	Ankleshwar Store
20	DNH GA	DNH	Silvassa Store
21	Amritsar, Gurdaspur and Hoshiarpur	Punjab/Harayana	Amritsar Store
22	Bathinda, Mansa and Faridkot	Punjab/Harayana	Bathinda Store
23	Jhalore, Banswara, Sirohi, Dungarpur	Rajasthan	Sirohi Store
24	Ratlam and Indore	MP	Ratlam Store

4.1. Material to be Supplied by Owner as Free Issue

Unless otherwise specified, Owner will supply following materials for PE Pipeline Laying work through the owner established material management system. All materials other than mentioned below shall be supplied by contractor at his own cost as per attached technical specification to complete the laying of gas main pipelines and service pipelines.

- PE 100 Pipes.
 - ✓ 160mm Dia., SDR 17 12 M (Straight)
 - ✓ 125mm Dia., SDR 17, 50 M (Coil)
 - ✓ 90mm Dia., SDR 17, 100 M (Coil)
 - ✓ 63mm Dia., SDR 11, 200 M (Coil)
 - ✓ 32mm Dia., SDR 11, 200 M (Coil)
- PE Ball Valves :160mm, 125mm, 90mm and 63mm
- DRS / DPRC / IPRS / SRM (Service Regulators Module) / IMS (Industrial Metering Skid) /Wall Mounted 1 Bar MRS Skid with RPD Meter
- Domestic/ Commercial - Meter
- Domestic/ Commercial - Gas Pressure Regulator
- Rubber hose

4.1.1. Acquisition, Receipt & Storage of Materials

- The Contractor shall collect all materials from GEL stores during working hours by complying with all documentation procedures laid down and as directed by the EIC. The Contractor shall carry pipe in such a manner as to preclude damage during transportation and handling.
- The Contractor shall at the time of receipt of material physically examine all materials and notify the EIC immediately of any damage or defect noticed by the Contractor. The EIC shall duly note any damage or defect in a site instruction book and both parties shall countersign the entry. Any damage not so recorded will be deemed not to have existed at the time of receipt of material by

the Contractor and the cost of repair or replacement or rectification shall be borne by the Contractor.

- Any material once issued from GEL store, if found in non-working condition at site shall be brought to the notice of EIC with Goods Issue Note reference in writing and after subsequent approval shall return defective material in GEL stores as instructed by EIC.
- Contractor shall ensure the consumption of free issue material on first in first out (FIFO) basis considering the warranty of free issued material. If contractor starts using second lot of material before completely consuming the first lot of free issue material lying in contractor store, then GEL will debit cost of material for those defective material returned after warranty period.
- Contractor should return the unused or defective material to GEL store within specified time else the material will not be reconciled and amount of the same will be deducted from bills. The contractor shall ensure that no defective material shall be returned to store at the time of closure of contract. The format for defective materials returning to stores will be made available by EIC.
- The Contractor shall maintain log book at their respective stores stating issue and availability of free issue material at any given day. Further, it is mandatory for the contractor to submit inventory details of free issue and purchased materials on monthly basis to Owner's representative as per the approved format of the owner. The inventory details shall be in correlation with the Daily progress chart and material reconciliation sheet.

4.2. Material to be Supplied by Contractor

Following materials shall be supplied by the contractor but not limited to:

All other materials except above listed materials in GEL scope are in contractor's scope.

- PE-100 Electro fusion Fittings (All type/sizes)
- Precast RCC Chamber for PE valve installation
- FRP Cover with frame for PE valve chamber
- RCC Hume Pipe with collar/ Half Round
- Warning Mats
- Various type Markers and Caution board as per GEL specification and drawing
- 20 mm OD PE -100 Pipe, SDR – 9
- Powder coated ½" NB or 1" NB GI pipes
- Powder coated ½" NB or 1" NB GI fittings, Hollow Hex plug & Nipple
- Inlet/outlet brass adaptor for Meter/ Regulator with NRV
- Brass Isolation Valve (1/2", 1", 1.5")
- Isolation Valve- 1.5" (ASTM 105) and 2" (flange end)
- Brass Appliance Valve (Gas Tap)
- Corrugated flexible SS Metal hose assembly (Anaconda)
- Clamp required for fixing of Rubber Hose
- Powder coated MS Pipe Clamp with Screw and Nuts
- RCC Guard
- PE to GI Butt-weld Transition fittings (PE coated is preferred in Basement)
- PVC Hole sleeves
- Nozzle for Burner conversion
- Required all consumables like PTFE tape, roul plugs, etc.
- Blind adaptors (For Disconnection-Red plug)
- Anti-corrosive Tape
- All Materials for Island Kitchen

Notes

- ✓ Material reconciliation statement of free issue material duly certified by Owner's representative shall be submitted to Owner on monthly basis along with RA bill.

- ✓ The free issue material shall not be procured from any other source by contractor.
- ✓ Contractor should ensure that any material which are procured by them to be inspected prior to dispatch from contractor store to site for installation by Owner representative/ TPI as per the test certificate of materials provided by manufacturer.
- ✓ Contractor has to submit required samples from their supplied materials to GEL EIC/representative for destructive (laboratory) testing as per GEL procedure.
- ✓ The Contractor shall procure material from GEL approved vendors only. Final inspection at Contractors stores shall be carried out by Owner representative/ TPI duly appointed by Owner.

5 SAFETY

- The Contractor shall conform to the safety requirements outlined in Technical scope in the tender document, GEL Permit to work system and other HSE guidelines/ procedures being released time to time. In addition, the Contractor shall observe safe working practices in the storage and handling of cleaning fluids, flammable fluids, etc, and ensure smoking or naked flames are not permitted in the site.
- Trench walls shall be battered with sufficient slope in order to minimize a trench collapse. Where there is a danger of an earth slide or collapse, the trench shall remain open for the minimum time possible with proper barricading. The Contractor is to ensure that no person enters a trench, which is of a depth of 1.5 meters or greater, unless the trench has adequate shoring or the sides are battered to such an extent as to prevent a trench collapse.
- The Contractor shall also protect all work sites with warning signs, barricades and night lighting. The Contractor shall inspect all fenced excavations daily, and maintain them in good order.
- The Contractor shall provide PPE's like helmets, safety shoes, etc. to the labour as mentioned in tender document which are necessary for safe working practice and is approved by HSE officer on site.
- Any accident causing injury to any person or damage to property or equipment shall be reported to the EIC and the cost of repair/ replacement of the damage equipment shall be borne by the contractor. Where the EIC determines that the work is being performed by Contractor in an unsafe manner, he may suspend the Work until corrective action is taken by the Contractor.
- Manual boring has to be executed with fully insulated boring tool and electrical gloves, as per the GEL specifications and job should be executed on receipt of work permit in line with the GEL guidelines.
- The Contractor shall at his own cost ensure supports and protections of all buildings, walls, fences or other structures and all utilities e.g. Electrical cables, Telephone Cables, Water pipelines, Sewer pipelines etc., and property which may be damaged as a result of the execution of the works. He shall also comply with the requirements in the specification relating to protective measures applicable to particular type of operations or work. Special care shall be taken while laying of pipelines near the trees/ street light poles.
- The CONTRACTOR shall remain at all times liable to OWNER for any loss or damage caused to any building plant, machine, installations of OWNER/ Consumers due to carelessness, negligence, inexperienced act of default of the CONTRACTOR, his agents, representative or employees. OWNER shall be the sole judge as regards the quantum of loss or damage caused to any utility, building plant, machine, installations, Gas loss due damage on pipeline and the said amount shall be deducted from the amount payable hereunder to the CONTRACTOR the cost of repairs or the amount of loss or damages.
- Interference with Traffic, Street Drainage and General Public
 - The Work shall be executed in such a manner so as to cause a minimum inconvenience to public at large, usage of public or private roads, lanes, thoroughfares, walkways, rights-of use or passages through which the Works are to be executed. The trench shall be backfilled, compacted, levelled and extra soil shall be removed immediately after laying

of pipeline to avoid public inconvenience. Closure of roads etc. shall not be permitted without the approval of the EIC.

- The Contractor shall comply with all local Authorities requirements to traffic and keep roads open to traffic and maintain access to and within any private property.
- Wherever the pipe route crosses driveways, access tracks or entrances to private properties the Contractor shall give the owner, occupier or relevant authority at least 24 hours prior notice of intended commencement of excavation and shall be restricted to pass through.
- The Contractor shall not use a private driveway, access track or entrance without the prior approval of the EIC in any circumstance.
- The Contractor shall provide suitable access wherever necessary in the form of temporary bridges, culverts, flumes, etc. of a size and type approved by the EIC.
- The Contractor shall comply with all relevant road Laws. Where limits and/or speed limits have been placed in the vicinity of the Works, the Contractor shall provide for the necessary movement of plant and equipment in accordance with the requirements of the relevant authority.
- The Contractor shall not obstruct any drainage pipes or channels in any road but shall divert them wherever necessary and use all proper measures to provide for the free passage of water.
- The contractor shall conduct his operation at all times, with a view to minimize noise and other objectionable nuisances (e.g. oil leakage) as far as practicable.
- The Contractor shall handover the completed works after proper cleaning of the site.

5.1. HANDLING OF PIPES AND COMPONENTS BEFORE AND DURING LAYING

HANDLING OF PIPES OR PIPELINES

It is compulsory:

- a) To take the necessary precautions to prevent damage during the loading, transportation, unloading and various other operations involving the handling of pipes and fittings;
- b) To stack the pipes on a flat surface and to support and clamp them sufficiently during transport;
- c) To organize the movement of the pipes so that the pipe or the ends of it do not drag across the ground.

It is prohibited:

- a) To roll pipes across the ground or the road surface;
- b) To lift up or move pipes or pipelines with cables, chains or other hard or squeezing ropes;
- c) To bring the pipes into contact with a naked flame, oil or bituminous products.

Any pipe which is temporarily left alongside the trench shall always be protected against water ingress and the introduction of impurities by means of temporary cap. Particular attention shall be made to this temporary cap while the pipe is laid in the trench. The temporary cap shall be designed in such a way that they can be easily mounted and removed.

The ends of pipes temporarily left behind in the trench shall be temporarily capped so as to prevent water or mud to penetrate even if the trench is completely filled with water. To do this, appropriate caps may be used.

The presence of water or impurities in the pipe shall be considered as a serious fault by the contractor and the contractor shall flush/ pigging to clean the pipeline, at his own expenses, until the water, dirt or any other impurity has been removed to satisfaction of EIC.

6 STATUTORY COMPLIANCE

- Contractor shall comply with and adhere to all the provisions of applicable Labour Codes enforced by Govt. (effective November 2025) and shall also abide by any amendments / modifications / Notifications/Circular/change in any Central or State rules, etc. implemented from time to time. Contractor shall mandatorily issue appointment letters to all the persons engaged under the Contract as per the Labour Codes.
- Contractor shall strictly adhere and abide by the provisions of the Code on Social Security, 2020 (effective November 2025) which includes Payment of Gratuity Act, Employees State Insurance Act, Employees Compensation Act, EPF & Misc. Provisions Act, Bonus act etc.
- CONTRACTOR shall be responsible for Insurance coverage of the complete manpower engaged for O&M jobs under the workmen's compensation Act / Group personal accident policy for the number of persons engaged by him at any point of time. He shall produce necessary documentation for the same to OWNER. He shall not engage any person less than 18 years of age.
- If time taken by the team for performing any breakdown or shutdown maintenance activity on charged network is beyond 8 hours, then contractor has to make overtime payment to the team and the same need to be recorded in Overtime register in line with the minimum wages act.
- CONTRACTOR shall indemnify and keep indemnified the OWNER and its representative / servants and agents from and against all third party claims whatsoever including but not limited to property loss and damage, personnel accident injury or death, etc.
- CONTRACTOR shall at his own expenses comply with all labor laws and keep the OWNER indemnified in respect thereof. The OWNER shall be entitled to deduct directly from the bills to be paid to the CONTRACTOR any sum, fines / penalty payable by the CONTRACTOR and which sum / sums the company is required to pay as the principal employer on account of the CONTRACTOR's default in respect of all liabilities referred to in above clause.
- CONTRACTOR shall be responsible for the payment of contribution under Employee State Insurance Act, Provident fund and other statutory payment to be made under any law or statutory rules and regulations for the time being applicable to the personnel deployed by the CONTRACTOR for the work at the OWNER's premises / sites.
- CONTRACTOR shall be responsible to comply with all the liabilities and accordingly, CONTRACTOR shall maintain all record and registers and produce before the competent Authorities under the Act or the OWNER as and when demanded.
- By way of illustration of various Acts as stated in the contract, the CONTRACTOR thereof shall comply with the following Acts prevailing from time-to-time or any amendments therein;

1	The Employee's Provident Fund Act, 1952
2	The Employee's State Insurance Act, 1948
3	The Contract Labor (regulation and abolition) act, 1970
4	The Minimum Wages Act, 1948
5	The Payment of Wages Act, 1936
6	The Workmen's Compensation Act, 1923
7	The Payment of Bonus Act, 1965 & The Gratuity Act
8	The Factories Act, 1948

- Any other statutory requirements of Local / State Government / Government of India shall be complied by the CONTRACTOR and the same shall be included in his scope of work.
- All the statutory approval / consent & Liaisoning required for entire scope of work shall in the scope of OWNER.
- CONTRACTOR shall comply with all Health, Safety & Environmental aspects including legal related requirement applicable to excavation / pipeline laying / equipment /, vehicles, transportations and other operations & maintenance for entire scope of work.
- The O&M of CGD Network should comply with the following codes / standards;
 - ✓ Relevant Factory Act / Rules, Relevant HSE norms.
 - ✓ ANSI/ ASME B 31.8
 - ✓ Australian standard – AS 3723 -1989 Installation & Maintenance of plastic pipe system for gas.
 - ✓ ISO- 4437 Buried PE pipes for the supply of gaseous fuels.
 - ✓ American Gas Association Vol.III
 - ✓ Gas Cylinder Rules 2004, Indian Explosive Act / Rules, Indian Electricity Act.
 - ✓ Gas Act 1992 and Gas Regulation 1993.
 - ✓ OISD Norms, ASME B 31.8, IGE/SR/16, IGE/TD/1, 3, 4, 9, 10, NEMA, ASTM, ANSI, NFPA-52; 1992, NFPA-37, API-11P.
- CONTRACTOR shall not discuss / disclose / inform to the statutory, local authorities during Audit / Inspection in verbal / writing without prior consent of OWNER pertaining to the operations.
- CONTRACTOR shall obtain all statutory approvals of concerned authorities for providing various services such as provision of utilities, personnel, etc. for the scope of work.

7 REPORTING

- CONTRACTOR shall be responsible for reporting as per OWNER's "Management Information System" (MIS). OWNER shall provide the copy of MIS to the successful CONTRACTOR, according to which CONTRACTOR has to submit the same for perusal & approval of the OWNER. Typically the CONTRACTOR shall prepare the following reports but not limited to:
- For evaluating the performance against the activities based on SLAs, contractor has to maintain time of commencement of activity and completion of activity separately and submit the same to EIC.
- While handling Emergencies contractor has to maintain separate records for;
 - ✓ Time taken for making site Safe i.e. time at which the information is received at control room to the Time at which site is declared safe for commencement of next activity like Repair, start of alternate supply, alteration / modification can be initiated etc. Time taken for making site Safe i.e. time at which the information is received at control room to the Time at which site is declared safe for commencement of next activity like Repair, start of alternate supply, alteration / modification can be initiated etc.
 - ✓ For any job performed on Gas network after making the site safe, time taken for SLA has to be recorded from the time of commencement of the job to the time gas is charged in the network
- CONTRACTOR shall prepare General Reports regarding the CGD operations in Daily, Weekly or Monthly frequency and submit the same to OWNER, Soft as well as Hard copy in the format provided to the CONTRACTOR. The general activity report mainly comprising of Daily Progress Report, PE & PNG Updates, Periodic / Preventive / Breakdown / Shutdown job (if any), Flow meter readings, CGS, TB, parameters readings, patrolling reports, Customer service call, Emergency vehicle records, Gas Purchase Report, Bank Statement, Expenditures, Gas Reconciliation Report, Asset Update, ERDMP update, First-Aid up Keeping, Stores and Inventory.
- CONTRACTOR shall submit the plan based on the AOMP (Annual Operation & Maintenance Plan), duly approved by OWNER. The copy of AOMP will have to be maintained at all times at site by

CONTRACTOR for reference. The access of the same will be restricted to authorized personnel only.

- The successful CONTRACTOR shall prepare & submit the Quality Assurance Plan, Work Instruction, Standard Operating Procedures, Reporting Formats, etc. & get it approved by OWNER for implementation in addition to Statutory / Manpower documents, List of Tools & Tackles, Equipments, etc.
- CONTRACTOR shall submit O&M activity / highlight report with reference to the AOMP. Monthly Shift Schedule will also be a part of reporting.
- CONTRACTOR shall upkeep the daily status for the Material In-Out, Odorant inventory, dosing, etc. to the OWNER.
- CONTRACTOR shall ensure that all Near Misses occurred during execution of the work are reported from time to time to OWNER. Any Hazard spotted while on job shall be reported to OWNER for further mitigation. Any incident / Accident shall be reported to OWNER as per guidelines.
- CONTRACTOR's operator shall maintain logbook / record of the entire operations & maintenance as well and calibration & testing of equipment and instruments, if any.
- CONTRACTOR shall make correspondence in writing with the OWNER.
- CONTRACTOR shall prepare the detailed inspection and health check-up report for each equipment / installation and submit the OWNER for the perusal.
- CONTRACTOR shall strictly adhere to the work permit system as per OWNER's specification.
- Before taking any shutdown or planned / breakdown maintenance or overhauling, CONTRACTOR shall inform to the OWNER and obtain the approval for the same.
- CONTRACTOR shall maintain the data for Dis-connection, Re-connection, New installation, Conversion, etc. & update in the Billing software.
- CONTRACTOR shall prepare the analysis reports related to various activities to enable OWNER to carry out the predictive actions therein.
- CONTRACTOR shall assist OWNER to prepare statutory or other reports as & when required related to CGD operations.
- CONTRACTOR shall monitor & analyze the Cathodic Protection (TR / TLP readings / PSP) to assess the health of the system.
- Contractor shall provide all Call notes / O&M Formats and its copies as required by GA team timely.
- Office Assistant deployed as per SOR line item, shall report to GEL EIC and work for GEL only. Contractor to recruit his own manpower for the invoice and data management related for his contract activities.

8 QUALITY CONTROL / INSPECTION

8.1. General

The Quality Control / Inspection indicate the requirement for various activities pertaining to the scope of work. This is significant requirements to ensure "Safe, Reliable & Uninterrupted" supply of natural gas by delighting customer with due compliance of ISO 2001:2015, ISO 14001 and ISO 18001. CONTRACTOR shall prepare and submit the Quality Assurance / Control Plan based on the activity to be performed throughout the tenure and get it approved by OWNER along with AOMP.

8.2. Inspection

- All components such as flow meters, safety relief / shut-off valves, fire protection / fighting systems, PPEs', gas detectors, sensors / switches, pressure / temperature gauges, pressure vessels / cylinders, tubing / piping, valves, etc.... should be periodically inspected for, calibrated and tested as per the norms laid down by the statutory authorities or by OWNER.

- To ensure periodic safety check, test schedule, parameters, such as, inlet / outlet pressures on skid, gas compositions / characteristics, all type of vales, to their serviceability, installation for obvious gas leaks, safe working condition, etc. Also, ensure for visibility and in place of safety / other signs / instructions, gas odorization, display of inspection certificate, tagging, etc.
- Testing, calibration, refilling of equipments, components, installations, etc. shall be carried out by OWNER or its representative up on receipt of advance requisition from CONTRACTOR. However, CONTRACTOR shall assist OWNER for the said activity to be carried out as and when required, and also to ensure smooth functioning of the same during their operations.
- Contractor shall ensure that all equipment, instruments and materials used are fit for use. OWNER have the right to carry out the Quality Assurance, periodic safety check and test schedule of all the equipments and instruments mobilized by contractors includes inspection of spares, material at factory / site / stores, if required.
- On completion of the inspection of the installation of equipment being found to comply with codes & standard (National & International), the competent Quality Control Organization shall issue the inspection / test certificate for records, wherever mandatory & required.
- OWNER, from time to time shall carry out the performance evaluation of the CONTRACTOR for the entire operations and take appropriate action in this regard.
- CONTRACTOR shall ensure the uninterrupted supply of gas to various applications & extended consumer services at all the time. However, major / breakdown maintenance should be carried out in non-peak hours / timings with due coordination with customers / end users / Owner.
- CONTRACTOR shall provide the material Invoices, Challan, Test Certificates, process / witness / inspection documents & other references for the spares, material, etc. procured for the scope of work.
- Contractor shall inform GEL for material inspection before using at site for material procured directly from GEL approved vendor. OWNER / it's representative shall inspect the material and approved the same for using at site.
- OWNER / its representative shall inspect / witness the activities performed by the CONTRACTOR including Laying, Electro fusion, Preventive / Breakdown maintenance, LDT, LPT, etc.
- OWNER shall conduct necessary qualification process for the PE welder to be deployed by OWNER before commencement of work & renewal of the same from time to time. No welder shall be allowed without such qualification / certifications.
- CONTRACTOR shall carry out all the job with due care & attitude towards HSE norms, best engineering practice, code of conduct, OWNER norms / specifications, Particular Technical Specifications, OEM guidelines, complying National & International standards, etc. prevails from time to time.
- CONTRACTOR shall provide all the equipment, tools & tackles, measuring devices, etc. duly calibrated, tested for performing any scope of work.
- In case any inspection, test fails, re-inspection / tests shall be carried out after necessary rectification / replacement by the CONTRACTOR at his risk / cost.

9 GUARANTEES AND WARRANTIES

- **Performance Guarantee of the Work-** CONTRACTOR shall guarantee the work executed by him against poor workmanship, defective equipment and material, etc. for certain period as decided by OWNER. If any defects are found during the guarantee period, CONTRACTOR shall rectify the same with short notice as informed by OWNER. Otherwise OWNER may get the same rectified through other agencies and recover the cost, so incurred from the CONTRACTOR deposit against performance guarantee or amount due to the CONTRACTOR.
- If after delivery, acceptance and installation and within the guarantee period, the operation or use of material or equipment supplied and installed by the CONTRACTOR, prove to be unsatisfactory to the OWNER's representative, he shall have the right to continue to operate / use such material or equipment until rectification of defects, errors or omissions, or by practical

replacement made thereof, without interfering with the operation of the network / installation. This may even require replacement of defective material / components / equipment by new ones whenever found essential.

- **Equipment and Material / Spares Warranty**
 - ✓ All the equipments and materials, if supplied by CONTRACTOR shall be warranted for trouble free operation for a certain period as decided by OWNER / OEM.
 - ✓ In case of bought out items, CONTRACTOR shall obtain such warranty from the sub-vendor in favor of OWNER without prejudice to his liability for the performance of whole system including bought out items. CONTRACTOR shall intimate to OWNER for any defect found in the material supplied by the OWNER promptly.
 - ✓ In case of any problem arising during guarantee period, CONTRACTOR has to carryout necessary rectification at no extra cost to the OWNER.

10 SITE FACILITIES

- **Power Supply:** Contractor shall arrange at his own cost power supply distribution for the site. All works by the Contractor will be done as per Indian Electricity Act & Rules framed there under and passed by the Engineer-in-Charge. The temporary lines will be removed forthwith, after completion of the work or if there is any hindrance caused to other work due to the alignment of these lines, the Contractor will re-route or remove the temporary lines at his own cost. The Contract Price shall be deemed to include all costs towards all above.
- **Site Camp Facilities:** Besides providing site facilities as per law of land, site camps with all related amenities shall be provided in line with the requirements of all Regulations/Acts and the Statutory Authorities along with the following facilities at all work places where workmen are deployed/ engaged by contractor:
 - a. Arrangement for First Aid.
 - b. Arrangement of Drinking water
 - c. Arrangement for Clean & Potable Drinking Water & Tea, etc.
 - d. A Crèche where 10 or more women workers are having children below the age of 6 years.
 - e. Any other facility/ utility as may be required under the Contract as per the existing legislation.
 - f. Rest Rooms/ Toilets for Site Staff/ Labor.
 - g. Proper Rest Facility
- **House Keeping :** CONTRACTOR shall be responsible for the house keeping of Odorant Storage Facilities, CGSS', DRS / CPRS / DPRC/ IMS, SRs, TR unit, Valve chambers, Equipment / Accessories, drain pit, canopy, surrounding premises and all under his scope / battery limit at his risk and cost. CONTRACTOR shall provide housekeeping materials at site at his own cost, but not limited to; Detergent, Water, Phenyl, Hand Soap, Sanitary Items, Bucket, Cotton Waste, Broom, etc. needed for executing of job defined on this tender document. Disposal of waste material / effluent should be carried out as per the environmental norms. Records of disposal to be maintained for further review.
- **Communication:** CONTRACTOR shall provide mobile telephone set (suitable for the region) to their work force and its tariff charges / maintenance cost shall be managed on their own. CONTRACTOR shall ensure the proper & minimum usage of this facility and up keep in reasonable condition. In case of OWNER provided UHF wireless communication Base Station with all accessories where ever possible, tariff charges shall be borne by the OWNER, including maintenance of the radio.
- **Availability of IT facility:** All the gadgets provided by CONTRACTOR like laptop/Computer/Tablets/mobile phones etc. shall be compatible with GEL's IT facilities / software like ASMS, GIS etc. Smart mobiles with internet facility shall be provided to all O&M manpower teams as directed by EIC on his own cost. The necessary maintenance of the instruments shall be taken care by Contractor. CONTRACTOR shall ensure the security of the Data

(information & electronic). All O&M activities are to be digitized to reduce paper work and data security.

- ✓ CONTRACTOR shall provide IT related materials at site at his own cost, but not limited to; CDs, Computer Stationery, Printer Cartridge, etc.
- ✓ CONTRACTOR shall up keep all the data pertaining to O&M including billing and submit the data backup in Soft copies (preferably on CDs or as instructed by GEL EIC if required), as per MIS.
- ✓ CONTRACTOR to provide Internet connection facility at his own cost for day-to-day reporting.
- ✓ The minimum requirement of tablet and Accessories is mentioned as under
 - Screen Size of the tablet should be minimum 7.”
 - Tablet should be provided with Back Cover.
 - Tablet should be provided with Screen Guard.
 - It should be operated on Android or IOS Platform.
 - It Should support Apple iOS versions 10.x, 11.x & up to latest versions and Android versions (Tablet) 6.x, 7.x” & up to latest versions
 - It should be compatible for minimum 4G or higher type of service options.
- CONTRACTOR shall maintain and upkeep of the facility as per the prescribed OWNER's requirement and ensure that the site / ROU is at all times kept free from any encroachment. & keep records of the same for further communication to GEL EIC
- CONTRACTOR shall not make any modifications within the facility / premises or layout of the CGD without prior approval of OWNER.
- CONTRACTOR shall at his own cost, provide & maintain the additional facilities to consumers, if any with prior approval of OWNER.
- CONTRACTOR must maintain Id cards, Dress Codes and Personal Protective Equipment to all workers. No worker shall be allowed to work without proper uniform and PPE's.
- CONTRACTOR shall be responsible for the security at storage under his scope, Installations / Equipment, worksite, etc.
- CONTRACTOR shall ensure proper upkeep of utility system / services, such as, Emergency Vehicle, OWNER's supplied Tools / Tackles and other accessories.
- CONTRACTOR shall co-ordinate & assists for the services related to the Operations, e.g. electricity, telephone, water supply, IT, billing, testing & calibration, statutory issues, etc. and visit from time-to-time.
- CONTRACTOR shall ensure and manage the traffic especially vehicular at worksite during the work & in case of emergency as well.
- No overtime, fuel & conveyance, food, commission, incentive, etc. shall be paid by OWNER other than the mentioned in SOR.
- CONTRACTOR shall intimate to the OWNER for any statutory problem, supply stoppage / interruption, break down / emergency shut-down, etc. for better planning & functioning of the facility.
- Since, the entire Premises, Installations, Facility of CGD is a restricted zone; CONTRACTOR shall ensure that no through fare will be entertained without OWNER's written permission that including Plant visit, Photography, Video Shooting or any Interview.
- CONTRACTOR shall facilitate new enquiries pertaining to PNG, Consumer services from time-to-time. However, he should not provide any specific information to such enquiry and not accept any payments or whatsoever on behalf of OWNER or its representatives. OWNER reserves the right to take necessary actions in this regard, if found.
- CONTRACTOR shall provide printing & stationary materials at site at his own cost, but not limited to; Log Book, Registers, Files, Note Book / Pad, Eraser / Ink, Sketch Pens, Tag / Stickers, Hole Guard, Stamp Pad, Envelope, Rubber Band, Staples, Punch, Pen, Pencil, Refill, Highlighters, Photocopy / Xerox, etc.

- CONTRACTOR shall provide adequate First-Aid, Equipment / Tools & Tackles such as, Electrical Extension Board with accessories, Instrument for measuring earthing resistance, Multi-meter, Emergency Light, etc. from time-to-time. Also, consumables like Araldite, M-Seal, Grease, Emery Papers, Cutting / Cleaning Fluid.
- CONTRACTOR shall ensure the availability of sufficient water (Potable / Drinking purpose) at site at his cost.

11 Waste management

- BIDDER shall coordinate & carry out the disposal of any waste (Hazardous or otherwise) produced or occurring as a consequence of its operations pursuant to the contract, all such disposals shall be in accordance with all legislation, OWNER's norms and best practices, whether that shall be for hazardous waste or non-hazardous waste. BIDDER shall ensure that all necessary approvals or licenses are obtained and that any subcontractors utilized for this purpose fully comply with such requirements. BIDDER shall record & provide OWNER with a copy of each waste transfer / disposal report / note.
- For meeting the environmental requirements as per ISO 14000, BIDDER has to,
 - Return all PE cut pieces to GEL stores/material management system established by GEL and maintain certified records of the same
 - Return all GI pipes and fittings, suraksha rubber tubes dismantled from customer's premises to GEL stores and maintain certified records of the same
 - Plastic packing materials, GI thread cutting burrs, used oil / diesel, cotton waste contaminated with used oil, other consumables and other hazardous waste has to be disposed of by BIDDER through agency authorized to handle such waste with supporting documents and submit the supporting documents to GEL for records
 - Bentonite if used for HDD shall ensure proper disposal as per vendor specification. . Bentonite slurry and returns from the drilled hole shall be disposed of in the mud pit to be excavated at site. Bentonite to be used does not contain any constituents hazardous to the environment
 - Non-hazardous waste generated out of free issue materials has to be returned to GEL stores/material management system established by the Owner and other non-hazardous waste has to be disposed of to authorized scrap dealers. Supporting documents to be submitted to GEL

12 Interpretation of Tender Terms

- In case of any inconsistency, ambiguity, or dispute concerning the interpretation or scope of the tender terms, the clarification or interpretation issued by the Client shall be deemed authoritative and shall be final and binding on all parties

ANNEXURE 1 - MINIMUM TOOLS, EQUIPMENTS & TO BE PROVIDED BY THE CONTRACTOR

SN	Name of Material	UOM	Make
1	Drill Machine-24"	Nos	Bosch
2	Drill Machine-10"	Nos	Bosch
3	Drill Bit 5"	Set	Bosch
4	Wire Brush	Nos	Any standard make
5	Hack Saw/ Blade	Nos	Bipco
6	Small Hacksaw	Nos	Bipco
7	Safety Helmet	Nos	Any standard make
8	Cotton Hand Gloves	Nos	Any standard make
9	Gum Boot	Pairs	Any standard make
10	Ear Muff	Nos	Any standard make
11	Ear Plug	Nos	Any standard make
12	Reflective Jacket	Nos	Any standard make
13	Simple Rubber Gloves	Set	Any standard make
14	Rubber Hand Gloves	Set	Any standard make
15	GoGEles	Pairs	Any standard make
16	Fire Blanket	Nos.	Any standard make
17	Fire Retardant Suit	Nos	Any standard make
18	Flame Proof Torch - min. 25 lumens	Nos	Any standard make
19	Normal Torch. - min. 25 lumens	Nos	Any standard make
20	Screw Jack with Tommy Bar	Nos	Any standard make
21	Safety Harness - for Working at Height	Nos	PeTzl
22	Traffic cones / Barricades with fluorescent paint	Nos.	Any standard make
23	Fusion Machine	Nos	Approved vender
24	Generator - min. 5 kVA	Nos	Any standard make
25	De-watering Pump - 3.5 HP	Nos.	Any standard make
26	Extension Board with 40 meter cable & RCCB / ELCB	Nos.	Any standard make
27	Conversion Kit	Kit	Any standard make
28	PE Pipe Cutter 20-32 mm	Set	Any standard make
29	PE Pipe Cutter 63 -160 mm	Set	Any standard make
30	PE Pipe Scraper	Nos	Any standard make
31	Permanent Marker Pen	Nos	Any standard make
32	Re-rounding tools 63mm	Nos	Any standard make
33	Re-rounding tools 90mm	Nos	Any standard make
34	Re-rounding tools 110mm	Nos	Any standard make
35	Re-rounding tools 125mm	Nos	Any standard make
36	Re-rounding tools 160mm	Nos	Any standard make
37	Squeeze Tool 20mm - 32 mm with earthing rod	Nos	Any standard make
38	Squeeze Tool 63mm with earthing rod	Nos	Any standard make
39	Squeeze Tool 125 & 90mm with earthing rod	Nos	Any standard make
40	Hydraulic Squeeze Tool with earthing rod	Set	Any standard make
41	Alignment Clamp 160 mm	Nos	Any standard make
42	Alignment Clamp 125 mm	Nos	Any standard make
43	Alignment Clamp 90 mm	Nos	Any standard make
44	Alignment Clamp 63 mm	Nos	Any standard make
45	Alignment Clamp 32 mm	Nos	Any standard make
46	Alignment Clamp 20 mm	Nos	Any standard make
47	PE Saddle Clamp	Nos	Any standard make

48	Allen Key	Set	Taparia
49	Iso-propyl Alcohol (500ml in each vehicle)	Bottle	Any standard make
50	Tissue Paper	Roll	Any standard make
51	Vice For Pipe along with BSPT Die	Nos	Jainson
52	Tool Box	Set	Taparia
53	Pipe Wrench	Nos	Taparia
54	Side Wrench	Nos	Taparia
55	Screw Driver	Set	Taparia
56	Fix Spanner	Set	Taparia
57	8x9	Nos	Taparia
58	12x13	Nos	Taparia
59	16x17	Nos	Taparia
60	18x19	Nos	Taparia
61	21x23	Nos	Taparia
62	20x22	Nos	Taparia
63	24x27	Nos	Taparia
64	Ring Spanner	Nos	Taparia
65	18x17	Nos	Taparia
66	18x19	Nos	Taparia
67	Box Spanner Set	Set	Taparia
68	Hammer	Nos	Taparia
69	Plastic / Rubber Hammer	Nos	Any standard make
70	Measure Tape - 10.0 mtr.	Nos	Any standard make
71	Fire Extinguisher 5kg/9kg	Nos	Any standard make
72	Safety Shoes/Gum boot	Pairs	Any standard make
73	Emergency light (Flam proof Halogen light arrangement for work carried out during night)	Nos	Any standard make
74	Pressure Gauge (0-10.bar & 0 - 4 bar)	Nos	Any standard make
75	Digital Pressure Gauge for LP line 0-5000 mmwc	Nos.	Any standard make
76	Digital Manometer 0-1999.9 mmwc	Nos	Any standard make
77	3 Mtrs height venting arrangement for venting of NG during Emergency with earthing facility	Mtr	Any standard make
78	Spray Bottle	Nos	Any standard make
79	Trikam	Nos	Any standard make
80	Pawda	Nos	Any standard make
81	Tagara	Nos	Any standard make
82	Water Bucket	Nos	Any standard make
83	Sign Board	Nos	Any standard make
84	Torch/Battery	Nos	Any standard make
85	Chisel	Nos	Any standard make
86	File	Nos	Any standard make
87	First Aid Box	Nos	GEL Recommended
88	2 1/2" Pipe Wrench	Nos	Any standard make
89	Valve Chamber Opener or hooks (PE/Steel)	Nos	Any standard make
90	PE Valve Chamber Key	Nos	Any standard make
91	Cordoning Tape	Mtr	Any standard make
92	Non Sparkling Tool Set	Set	Any standard make
93	Hard barricading	Nos.	As per GEL drawing
94	Site Umbrella (Summer)- Extra large	No	Any standard make
95	Garden Umbrella (Monsoon)- 49" or large	No	Any standard make

96	Teflon insulated crow bar	No	Any standard make
97	Aluminium ladder- rated load 150 kgs,3 mtr Length	No	Any standard make
98	Grass Hook (Hand Sickle)	Nos.	Any standard make
99	Digital pressure Gauge (0-10 bar) for MP LPT with least count 0.001 Bar	Nos.	Any standard make
100	Rubber mat	No	GEL recommended
101	Tablet for Dom/Comm. AMC & O&M activity with Internet Facility	No	GEL recommended
102	Valve keys for valve operation - all sizes & types (For Third party site supervisors also)	Nos.	Any standard make
103	Electrical Supply Tester (Upto 500V)	Nos	Any standard make
104	Pack - III for Odorant monitoring	Nos	Any standard make
105	Grease Gun	Nos	Any standard make
106	SS tube bender for island kitchen work	Nos	Any Standard make
107	Portable Public Announcement (PA) System (For ERV & Third-party site supervisors)	Nos	Any Standard make

Notes:

- All pressure gauges shall be calibrated at every one year
- Above list of tools and tackles are considering complete range of pe network of PNG installations across GEL location. Ga will prepare and issue a list of require tools and tackles during kick-off meeting after issuance of wo to O&M contractor for their inventory management. All instruments / equipments are calibrated and / or tested as per GEL approved procedure

ANNEXURE 2 - PE/GI CONSUMABLE MATERIALS/ ITEMS

SN	NAME OF MATERIAL	UOM	MAKE
A	ELECTRO FUSION FITTINGS		
1	PE Coupler 160 mm, As per Network	Nos.	Approved vendor
2	PE Coupler 125 mm	Nos.	Approved vendor
3	PE Coupler 110 mm, As per Network	Nos.	Approved vendor
4	PE Coupler 90 mm	Nos.	Approved vendor
5	PE Coupler 63 mm	Nos.	Approved vendor
6	PE Coupler 32 mm	Nos.	Approved vendor
7	PE Coupler 20 mm	Nos.	Approved vendor
8	PE Elbow (90°) 160 mm , As per Network	Nos.	Approved vendor
9	PE Elbow (90°) 125 mm	Nos.	Approved vendor
10	PE Elbow (90°) 110 mm , As per Network	Nos.	Approved vendor
11	PE Elbow (90°) 90 mm	Nos.	Approved vendor
12	PE Elbow (90°) 63 mm	Nos.	Approved vendor
13	PE Elbow (90°) 32 mm	Nos.	Approved vendor
14	PE Equal Tee 160mm, As per Network	Nos.	Approved vendor
15	PE Equal Tee 125mm	Nos.	Approved vendor
16	PE Equal Tee 110mm, As per Network	Nos.	Approved vendor
17	PE Equal Tee 90mm	Nos.	Approved vendor
18	PE Equal Tee 63mm	Nos.	Approved vendor
19	PE Equal Tee 32mm	Nos.	Approved vendor
20	PE Equal Tee 20mm	Nos.	Approved vendor
21	PE Reducer 125 x 110mm, As per Network	Nos.	Approved vendor
22	PE Reducer 110 x 90 mm, As per Network	Nos.	Approved vendor
23	PE Reducer 160 x 125 mm, As per Network	Nos.	Approved vendor
24	PE Reducer 160 x 90 mm, As per Network	Nos.	Approved vendor
25	PE Reducer 125 x 90 mm	Nos.	Approved vendor
26	PE Reducer 125 x 63 mm	Nos.	Approved vendor
27	PE Reducer 90 X 63 mm	Nos.	Approved vendor
28	PE Reducer 63 X 32 mm	Nos.	Approved vendor
29	PE Reducer 32 X 20 mm	Nos.	Approved vendor
30	PE Saddle 160 x 32 mm, As per Network	Nos.	Approved vendor
31	PE Saddle 125 x 63 mm	Nos.	Approved vendor
32	PE Saddle 125 x 32 mm	Nos.	Approved vendor
33	PE Saddle 90 x 63 mm	Nos.	Approved vendor
34	PE Saddle 90 x 32 mm	Nos.	Approved vendor
35	PE Saddle 90 x 20 mm	Nos.	Approved vendor
36	PE Saddle 63 x 32 mm	Nos.	Approved vendor
37	PE Saddle 32 x 20 mm	Nos.	Approved vendor
38	PE Saddle 63 X 20 mm	Nos.	Approved vendor
39	PE End Cap 160mm, As per Network	Nos.	Approved vendor
40	PE End Cap 125mm	Nos.	Approved vendor
41	PE End Cap 110mm, As per Network	Nos.	Approved vendor
42	PE End Cap 90mm	Nos.	Approved vendor
43	PE End Cap 63mm	Nos.	Approved vendor
44	PE End Cap 32mm	Nos.	Approved vendor
45	PE End Cap 20mm	Nos.	Approved vendor
46	Transition Fitting 1/2"x 20mm	Nos.	Approved vendor

47	Transaction Fitting 1"x 32mm	Nos.	Approved vendor
48	Transaction Fitting- MS,GI,BW,32MM PEX1"	Nos.	Approved vendor
49	Transaction Fitting- MS,GI,BW,63MM PEX2"	Nos.	Approved vendor
50	Transaction Fitting- MS,GI,BW,90MM PEX3"	Nos.	Approved vendor
51	Transaction Fitting- MS,GI,BW,125MM PEX4"	Nos.	Approved vendor
52	Transaction Fitting- MS,GI,BW,160MM PEX6"	Nos.	Approved vendor

B	G.I. / CU. CONSUMABLE MATERIAL LIST		
48	GI 1/2" Pipe	Mtr	Approved vendor
49	GI 1" Pipe	Mtr	Approved vendor
50	GI 1" Coupler	Nos.	Approved vendor
51	GI 1" Union	Nos.	Approved vendor
52	GI 1" Elbow	Nos.	Approved vendor
53	GI 1" Plug	Nos.	Approved vendor
54	GI 1" Tee	Nos.	Approved vendor
55	GI 1" Clamp	Nos.	Approved vendor
56	GI 1" Hex Nipple	Nos.	Approved vendor
57	GI 1" Nipple 1"x2	Nos.	Approved vendor
58	GI 1" Nipple 1"x3	Nos.	Approved vendor
59	GI 1" Nipple 1"x4	Nos.	Approved vendor
60	GI 1" Nipple 1"x6	Nos.	Approved vendor
61	GI 1/2" Coupler	Nos.	Approved vendor
62	GI 1/2" Union	Nos.	Approved vendor
63	GI 1/2" Elbow	Nos.	Approved vendor
64	GI 1/2" Plug, Cap	Nos.	Approved vendor
65	GI 1/2" Tee	Nos.	Approved vendor
66	GI 1/2" Clamp	Nos.	Approved vendor
67	GI 1/2" Hex Nipple	Nos.	Approved vendor
68	GI 1/2" Nipple 1/2"x2	Nos.	Approved vendor
69	GI 1/2" Nipple 1/2"x3	Nos.	Approved vendor
70	GI 1/2" Nipple 1/2"x4	Nos.	Approved vendor
71	GI 1/2" Nipple 1/2"x6	Nos.	Approved vendor
72	TUBE,CU,12MM OD	Mtr	Approved vendor
73	COUPLING,COPPER,12MM OD	Nos.	Approved vendor
74	TEE,CU,12MM OD	Nos.	Approved vendor
75	ELBOW,COPPER,12MM OD	Nos.	Approved vendor
76	CLAMP,PVC,12MM OD	Nos.	Approved vendor
77	UNION,BRASS,1/2"ODX12MM OD	Nos.	Approved vendor
78	ADAPT,12MM OD X 1/2"BSPT,BRASS	Nos.	Approved vendor
79	SCREW,WOOD,6X32MM	Nos.	Approved vendor
80	Regulator Bush	Nos.	Approved vendor
81	Teflon Tape	Nos.	Approved vendor
82	O-rings For Meter Adaptor, Union, Plug Valve	Nos.	Approved vendor
83	O-rings For Regulator Adaptor	Nos.	Approved vendor
84	Domestic Meter adaptor	Nos.	Approved vendor
85	Commercial meter adaptor (All size)	SET	Approved vendor

86	Commercial Regulator bush	Nos.	Approved vendor
87	Adaptor Up/Down	Nos.	Approved vendor
88	Warning Tape	Mtr	Approved vendor
89	Soap Solution Bottle	Nos.	Approved vendor
90	Fittings For Pr. Gauge	Set	Approved vendor
91	Revel Plug	Nos.	Approved vendor
92	Screw	Nos.	Approved vendor
93	Simmering Tool	Nos.	Approved vendor
94	Waste Cloth	Roll	Approved vendor
95	Burner Jet 110 & 125	Nos.	Approved vendor
96	Grease stick - A,B,C type or MP grease cartridge	PKT	Approved vendor
97	GI 1 " x 1/2" Reducer	Nos.	Approved vendor
98	GI 1 " x 1/2" Tee	Nos.	Approved vendor
99	Blind apator-MS (Red Plug)	Nos.	Approved vendor

Notes:

- Above list of consumables are indicative list considering complete range of PE network of PNG installations across GEL location. GA will prepare and issue a list of required consumables during Kick-off meeting after issuance of WO to O&M contractor for their inventory management.

C	ADDITIONAL PROCUREMENT OF MATERIAL LIST ADDED IN CONTRACTOR SCOPE		
100	ANACONDA	Nos.	Approved vendor
101	SLEEPER WITH FRAME,FRP,600X600MM	Nos.	Approved vendor
102	SLEEPER WITH FRAME,FRP,1000X1000MM	Nos.	Approved vendor
103	SLEEPER WITHOUT FRAME,FRP,1000X500MM	Nos.	Approved vendor
104	VLV,APPLIANCE,BALL,BRASS,6MMX1/2"BSPT	Nos.	Approved vendor
105	VLV,BALL,BRASS,BSPT,1/2"	Nos.	Approved vendor
106	VLV,BALL,BRASS,BSPT,1"	Nos.	Approved vendor
107	VLV,BALL,BRASS,BSPT,1.5"	Nos.	Approved vendor

b) Debit Note Charges for Domestic Alteration/Modification Work

NOTIFICATION NO:				INSTALLATION DATE:-		
CUSTOMER NAME:						
SR.NO	Code	Type	MATERIAL DISCRIPTION	UNIT	SOR Rs./Unit	Actual Quanti
1	600000011	Service	DISMENTLING OF 1/2" GI	MTR		
2	600000015	Service	REINSTALALTION OF 1/2" GI	MTR		
3	100008122	Material	1/2" GI PIPE, C-CLASS, HEAVY	MTR		
4	100004868- for PE 80. Code not available for PE 100	Material	20 MM PIPE	MTR		
5	600000077	Service	Excavation and Laying of 20mm-32MM PE pipe	MTR		
6	-	Service	BORING	MTR		
7	600000065	Service	Replacement of Ball Valve, MCV/IV-1/2"	NOS		
8	100004182	Material	1/2"NB BRASS BALL VALVE	NOS		
9	100004903	Material	1/2" GI ELBOW	NOS		
10	100004905	Material	1/2" HEX NIPPLE	NOS		
11	100010677	Material	1/2" NIPPLE 2" LENGTH	NOS		
12	100004845	Material	1/2" NIPPLE 3" LENGTH	NOS		
13	100004846	Material	1/2" NIPPLE 4" LENGTH	NOS		
14	100004847	Material	1/2" NIPPLE 6" LENGTH	NOS		
15	100010527	Material	METER "O" RING	NOS		
16	100004901	Material	1/2" GI COUPLING	NOS		
17	100004896	Material	1/2" GI EQUAL TEE	NOS		
18	100004842	Material	1/2"GI POWDER COATED CLAMP WITH SCREW	NOS		
19	100004184	Material	1/2" NB BRASS APPLIANCE VALVE (Gas tap-6 mm)	NOS		
20	600000064	Service	Replacement of Gas Tap (1/2"-6 mm)	NOS		
21	100004181	Material	WIRE BRAIDED SURAKSHA RUBBER HOSE – 7.9mm x 1.0 MTR. LONG	NOS		
22	600000067	Service	Replacement/Installation of Rubber tube / Suraksha hose with Clamp fittings	NOS		
23	600000018	Service	Drilling of Hole in Brick / plastering	NOS		
24	600000019	Service	Drilling of Hole in RCC	NOS		
25	600000020	Service	Drilling of Hole in Others (Marble, Granite etc.)	NOS		
26	100010972	Material	G1.6 DOM. METER INLET ADAPTOR-BRASS	NOS		
27	100010973	Material	G1.6 DOM. METER OUTLET ADAPTOR WITH NRV, BRASS.	NOS		
28	600000061	Service	Replacement of Meter adaptor for Domestic Meter including O ring	NOS		
29	600000062	Service	Replacement of Domestic Meter including O ring	NOS		
30	100000140	Material	LOW PRESSURE DOMESTIC REGULATOR, INLET PRESSURE 50-110MBAR AND OUTLET PRESSURE 22 MBAR.	NOS		
31	600000063	Service	Replacement of Domestic Regulator (HP or LP)	NOS		
32	100004808	Material	SADDLE,TAPPING,EF,PE,PE100,40V,32X20MM	NOS		
33	-	Material	SADDLE 63x20	NOS		
34	100004804	Material	RED,EF,PE,PE100,40V,32X20MM	NOS		
35	-	Material	REDUCER 63x20	NOS		
36	100004786	Material	COUPLER,EF,PE,PE100,40V,20MM & 32MM	NOS		
37	100004814	Material	CAP,END,EF,PE100,40V,20MM	NOS		
38	100004798	Material	TEE,EF,PE,PE100,40V,20MM	NOS		
39	100008235	Material	RCC GUARD WITH CLAMP – 20mm PE pipe	NOS		
40	600000079	Service	INSTALLATION,RCC GUARD,20MM	NOS		
41	100004815	Material	1/2" X 20MM - GI TO PE TRANSITION FITTING	NOS		
42	600000030	Service	Installation of Transition fitting and welding E.F. coupler /s (E F welding charges)	NOS		
43	100011199	Service	Installation of PVC Sleeve on GI Pipe with Insulation at wall crossing.	MTR		
44	100008310	Material	Domestic Suraksha Hose CLAMP – 8 mm	NOS		
45	-	Material	1/2" HOLLOW HEX PLUG	NOS		
46	600000075	Service	Installation of hex plug	NOS		
47	100004899	Material	1/2" GI UNION	NOS		
Plumber Name				Customer Name		
Signature				Signature		
Contractor				Authorised Signature (Site		
TPI						

- c) Preventive Maintenance Report of PE/Steel Network Valve & Valve Chamber
 d) Customer Service Call Note

 GUJARAT GAS	Customer Service Call note DOM / COM / NCOM / YHS / IND	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td>DOC No.</td> <td>MAI-F-115</td> </tr> <tr> <td>REV No.</td> <td>1</td> </tr> <tr> <td>EFF.DATE</td> <td>01.08.2019</td> </tr> </table>	DOC No.	MAI-F-115	REV No.	1	EFF.DATE	01.08.2019
DOC No.	MAI-F-115							
REV No.	1							
EFF.DATE	01.08.2019							
Customer Details								
	City:							
	Customer Segment:-							
	Business Partner No.:							
	Contract Account No.:							
	Notification No.:							
	Order Number and Type :							
	Complaint Received by:							
	Response Details							
	Nature of Complaint :							
		Date	Time					
Received :								
Reached at Site :								
Completion:								
Complaint Details								
Details of Complaints:								
Nature/Observation:								
Reason/Cause:								
Action Taken:								
Material Details:								
Sr.	Bill of Material (Used)	Quantity	Unit	Chargeable/Non Chargeable				
Sr.	Bill of Material (Returned)	Quantity	Unit	Condition (Usable /Not Usable)				
Meter/Rubber Tube Details								
Condition :-		New Number:	Mfg Year:-	New Reading:				
Rubber Tube Expiry:		Old Number:	Mfg Year:-	Old Reading:				
Comments / Feedback /Suggestions by Customer								
I hereby certify that, my above mentioned gas installation has been checked/repaired/inspected with manometer and soap solution (to check leakages if any), in my presence & found in safe working condition. Information related to Safety & Service is given to me at the time of completion								
Attended By			Name & sign Of Customer					
Name:			Name:					
Sign:			Sign:					
Contact Number:-			Contact Number:-					

ANNEXURE 4 - MINIMUM REQUIRED SPECIFICATION OF FIRE-RETARDANT COVERALL

- **Fabric Composition:** The coverall shall be made from fire-retardant Aramid fabrics, specifically a blend of Meta-aramid and Para-aramid fibres and shall possess antistatic properties. As mentioned below:
 - 93% Meta-Aramid
 - 5% Para-Aramid
 - 2% Antistatic fiber
- **Conforming Standards:** Fire Retardant Coverall with fabric conforming to standard ISO 11612:2015, EN 1149-5:2018 and NFPA 2112
- **Fabric Weight:** The fabric weight shall be 170 GSM (grams per square meter) and GSM value must be clearly printed on the garment tag.
- Garment Labelling shall contain Fabric composition, GSM, Washing instructions, FR conformity standards, Manufacturer/Batch details and Size
- **Design & Features**
 - Collar: Stand-up collar design
 - Zipper: Two-way heavy-duty FR zipper with metal snap closure at top
 - Inside Flap: Internal flap made of the same FR fabric to cover the zipper
 - Cuffs: Elastic in sleeve cuffs
 - Waistband: Elasticized waistband at the back
 - Stitching: Double-stitched seams using FR thread; all stress points reinforced with bar tacks
 - All front and rear pockets must have Velcro closures.
 - Thread: Heavy-duty, color-fast, fire-resistant stitching thread
- **Reflective Tape**
 - Reflective Strip Width: 2 inches
 - Colour: White
 - Make: 3M
 - Placement: As per shown in Annexures 1 & 2 (total of 6 locations)
 - Certification: 3M certification required
 - Certified for minimum 25 wash cycles
- **Fire-Resistant Accessories:** All accessories used in the coverall must meet FR standards, including FR Zippers, FR Reflective Tapes and FR Thread for stitching