BHAGYANAGAR GAS LIMITED
(A JOINT VENTURE OF HPCL & GAIL)

BID DOCUMENT FOR

TENDER FOR GASIFICATION WORKS OF LMC (LAST MILE CONNECTIVITY)-COMPLETED CUSTOMERS AND REMOVAL OF LMC (LAST MILE CONNECTIVITY)-FOR NON-INTERESTED CUSTOMERS IN HYDERABAD GA

UNDER OPEN DOMESTIC COMPETITIVE BIDDING

e- tender

Bid Document No.: BGL/698/2025-26

VOLUME-II of II

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TENDER DOCUMENT FOR HIRING OF LMC CONTRACTS FOR HYDERABAD GA

[VOLUME – II OF II]

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TECHNICAL SPECIFICATIONS, SCOPE OF WORK [SOW], DRAWINGS

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TECHNICAL SPECIFICATIONS

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C O N T E N T S

LIST OF SPECIFICATION/ STANDARDS
TECHNICAL SPECIFICATION

1) LAYING OF UNDERGROUND PE MAIN PIPELINE

2) INSTALLATION OF ABOVEGROUND GI/Cu PIPING FOR DOMESTIC, COMMERCIAL AND INDUSTRIAL CONSUMERS

3) HDPE PIPES

4) PE FITTINGS AND ELECTRO-FUSION

5) POLYETHYLENE PIPES

6) PE ISOLATION VALVES

7) GI PIPE

8) CU TUBES

9) GI FITTING FOR NATURAL GAS

10) COPPER FITTING

11) BRASS FITTING

12) ISOLATION AND APPLIANCE VALVE

13) WARNING MAT

14) FLEXIBLE METAL HOSE (ANACONDA)

15) FLUX

16) STEEL RE-INFORCED RUBBER HOSE

17) QUALITY ASSURANCE

18) HEALTH SAFETY AND ENVIROMENT

19) DRAWINGS

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TECHNICAL SPECIFICATION

FOR

LAYING OF PE MAIN PIPELINES AND

SERVICE PIPELINES

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TECHNICAL SPECIFICATION

1.0 GENERAL INFORMATION

1.1 INTRODUCTION

1.2

BGLhas been set up to provide CNG (Compressed Natural Gas) as fuel to commercial & private vehicles through filling stations and PNG (Piped Natural Gas) to Industrial, household and commercial sector in 03 GAs across India.

1.2 Nature of Contract & brief scope of work:

The contractor shall be paid on a Schedule of Rates basis. He shall execute the work and perform his obligations under the contract, and Owner shall pay the contractor for measured quantity of each item of work actually carried out under the contract. Payment shall be at the rate for the work set out in the agreed Schedule of Rates.

<u>Important:</u> It is to be noted that the total work front may be offered to the bidder at different locations (which may not be near to each other) in staggered basis (in suraram , shapur surrounding area) across the GA. Bidder to understand to execute the required work at various locations and be prepared as per the allotted fronts at scattered locations across the GA. BGL-EIC will allocate the location/ area to contractor.
The Contractor shall be responsible for maintenance of the gasified customers under this contract for a period of four (04) months, which shall include generation and collection of customer bills covering two (02) billing cycles, as well as onboarding of customers onto BGL's billing software/platform.
Any dues arising from gas consumption by the customers during the said four-month period shall be recoverable from the Contractor's running bills and/or final bill.

Note: The Contractor shall proactively coordinate with BGL for timely generation of bills, ensure that the bills are duly delivered to the customers, and ensure collection of payments without fail.

The Bidder shall obtain prior approval from BGL before laying MDPE and/or GI pipelines to each customer premises. Any MDPE/GI pipeline laid without the prior written consent of BGL shall not be considered for measurement or billing under the contract.

The Contractor shall closely coordinate on a day-to-day basis with the

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BGL Engineer-in-Charge (EIC) / authorized BGL representative for execution of works.

Further, the Contractor shall obtain written and/or photographic (visual) confirmation from the customer prior to removal of any laid Last Mile Connectivity (LMC) and/or meters, and maintain proper records for verification and audit purposes. Failing which payment for the same shall not be processed.

BGL shall provide the Contractor with the list of customers where LMCs and/or meters have been installed. The Contractor / Bidder shall be responsible for contacting and coordinating with the customers, assessing site readiness, and undertaking onboarding for gasification of the customer or removal of meters, strictly as per the customer's willingness and interest. Also, contractor is liable to collect the customer bills covering two (02) billing cycles, as well as onboarding of customers onto BGL's billing software/platform.

As per the directions of the BGL Engineer-in-Charge (EIC), the area(s) for execution of works shall be allotted by BGL, and the Bidder shall deploy adequate and competent teams to execute the tendered works within the stipulated timelines and as per the contract conditions. It shall be the sole responsibility of the Bidder to handle and resolve all customer-related matters required for execution of the works under this contract, without any additional liability or involvement on the part of BGL.

Payment for procured/bought-out materials shall be restricted to the quantities actually used at site and duly certified by BGL.

It shall be the sole responsibility of the Bidder to obtain prior quality approvals from BGL, including but not limited to Inspection and Test Plans (ITP), Quality Assurance Plans (QAP), and relevant material approvals, before procurement and utilization of such materials at site. All materials supplied and used under this contract shall strictly comply with PNGRB regulations and all other applicable statutory codes, standards, and specifications relevant to City Gas Distribution (CGD) applications, as amended from time to time.

The scope of work shall include removal of previously installed Last Mile Connectivity (LMC) infrastructure in cases where customers are not interested, gasification is not viable for near-future commissioning, or network extension is technically or commercially not feasible.

The scope further includes identification of feasible households, completion of pending LMC works, and commissioning of Domestic Piped Natural Gas (DPNG) connections using the existing LMC infrastructure (including meters, GI piping, fittings, etc.), wherever available and suitable.

Additionally, the Contractor shall undertake gasification of new customers in the allotted area, which shall include customer registration, onboarding onto BGL's billing platform, meter installation, commissioning, bill generation and collection, recovery of dues, security deposit collection, and all other activities necessary for successful commissioning and operation, as per BGL procedures and applicable

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regulations.

The scope of work shall also include obtaining all required permissions, approvals, and clearances, as well as coordination and liasoning with the respective permission-issuing authorities and execution agencies during the course of work. All such activities shall be entirely within the Bidder's scope, and no separate payment shall be admissible on this account.

The Bidder shall be deemed to have fully understood the complete scope of work, including all associated responsibilities, risks, and statutory requirements, and shall have considered the same while submitting the bid/quote. No claims on account of misunderstanding, omission, or underestimation of the scope shall be entertained at a later stage.

2.0 SCOPE OF WORK

Generally the following shall constitute the Contractor's scope of work :

2.1 Plan and prepare a schedule for execution and work implementation as per QA/QC plans to be issued by Owner/ PMC. Contractor has to submit the Construction/ Execution procedures before commencement of work.

2.2 Assist in obtaining permissions from land owing agencies for road cutting for laying of pipelines. Liaisoning with concerned authorities during execution of the job.

2.3 Prior to start of Construction activities , Contractor shall carry out area and crossings survey and prepare drawings for proposed gas pipe line laying and submit to Owner/ PMC for approval.

2.4 Receipt of free issue items from clients designated stores, loading, transportation, unloading at Contractor's stores near project sites.

2.5 Proper storing, stacking, identification, providing security, and insurance, during storage, laying and upto handing over of pipelines.

2.6 Making trial pits to determine the underground utilities /services such as existing pipelines, Cables (Electrical/Communication), Conduits, U/G drainage, Sewers, tunnels, Subways foundations etc, and deciding optimum routes and depths for laying the pipelines based on the route plans provided in the tender.

2.7 Obtaining the approval for optimum route and ROU from the concerned authority and EIC. Grading the ROU as per requirement for proper movement of workmen, equipment and QA/QC personnel.

2.8 Wherever required the grass/ turfing, pavement, linings, drains roads and other such 'pucca' area shall be locally removed to facilitate trenching and pipe laying

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works. The same is to be reinstated as original.

2.9 Supply & Installation of Safety/ Warning Signs, barricading of the entire route to be trenched. Pits to be similarly barricaded along the warning sign.

2.10 To make trenches with stable slopes but restricting minimum disturbance to above ground/underground services/ installation as per specifications and approved route plans; keep the trenches free from water and soil till placement of pipes;

2.11 Uncoiling/ stringing the PE pipes of required sizes (i.e. 20, 32, 63, 90, 125) pipes into trenches as per specification.

2.12 Joining the pipe ends with fittings and valves by approved electro fusion techniques as per specification.

2.13 Installation of pipe fittings/installation like elbow, tee, reducers, tapping saddles, joints, connectors, transition fittings, valves, sleeves etc. including construction of supports, valves pits, inspection chambers etc. as per specification.

2.14 Laying pipeline using trench less technology methods with or without casing pipes as per specification and as directed by EIC.

2.15 Supply & Laying of HDPE duct as casing pipe wherever applicable, along with PE Pipe.

2.16 Supply of good quality GI sleeves, MS enamel coated sleeves, concrete casing pipes, sand and other material, fittings to be supplied by the Contractor as per provisions of tender.

2.17 Back filling and compaction by jumping jack compactor using approved 'good' soil or using excavated earth or borrow earth as per requirement and specification and replacement of tiles, slabs removed during the excavation. Cleaning all unserviceable material, debris, excess earth near trenches etc to designated disposal area.

2.18 Carrying out pneumatic testing and purging as per specifications and approved procedures; providing all tools, tackles, instruments, manpower and other related accessories for carrying out the testing of pipes.

2.19 Nitrogen purging (including supply), commissioning & gas charging of tested pipeline as per approved procedure.

2.20 Restoration of existing ground features such as grass/ turfing, paving, roads, drains, concrete, floral beds, fencing, titles, flooring masonry etc. to original condition and to match with adjoining conditions-functionally and aesthetically upto the entire satisfaction of Client/PMC any other third party agency designated by Client and local authorities, failing which, it will be done at the risk and cost of the contractor. Obtaining satisfactory completion certificates for the

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restoration work done from the concerned authorities.

2.21 Installing of permanent site markers, warning signs, valve chamber etc.

2.22 Returning surplus material to Clients stores, reconciliation of free issue material/ consumables if supplied by Client and obtaining 'no objection certificates' from Client/ PMC.

2.23 Handing over the completed works to Client for their operation / use purposes.

2.24 Maintaining the completed pipelines/installation for any defect, failures during defect liability period.

2.25 Preparation and submission of As–built drawings, details of crossings, utility graphs, measurement sheets and deviation statements on completion / commissioning of work by way of drawing, sketches and tables.

2.26 Any other activity not mentioned/ covered explicitly above, but otherwise required for satisfactory completion/ operation/ safety/ statutory/ maintenance of the works shall also be covered under the Scope of work and has to be completed by the Contractor within specified schedule at no extra cost to Client.

3.0 MATERIAL, LABOUR, PLANT AND EQUIPMENT

3.1 Owner's Scope of Supply (Free Issue Item)

Owner's scope of supply shall be as per PJS clause no 4.1.

In order to speed up the project Free Issue Materials shall be issued to the Contractor from the designated store(s) of Client. Contractor shall be responsible for lifting the free issue materials from Owner's storage point(s) and transporting the same to work site(s) at his own cost.

3.2 Supplied by the Contractor

Contractor will supply all size HDPE casing pipe, GI pipes (as per SOR), fittings and PE fittings other materials as per SOR & scope of supply necessary to complete the laying of gas main pipelines and service pipelines.

The contractor is to procure all bought out items from approved vendors and accordingly keep Client / PMC informed. The inspection of bought out items would be carried out by Client / PMC / Third Party Inspection or as instruction by EIC.

In general PE pipe shall be of the following lengths indicated.

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20mm/32mm	100 to 300 Mtrs. coils
63 mm	100 Mtrs. Coils
90 mm	50 Mtrs Coils
125 mm	50 Mtrs. Coils
180 mm	12 Mtrs. Coils

The Contractor shall provide the skilled labour, tools, material and equipment necessary for the proper execution of the Work. This will include but not be limited to list of specialized items included in the enclosure furnished herewith.

3.2.1 **Equipment & Machinery**

All vehicular type machinery shall be in good working order 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.

In addition to above, the contractor must have dedicated bar coded electro-fusion (Automatically readable) machine with power generator (at any point of time minimum 2 nos.), Pipe Cutters (like circular guillotine), End Scrapers, Pipe Straightened, approved Top loading clamp for fusing saddle tapping tee, clamps of all sizes for Electro-fusion fittings, re-rounding tools and test ends

etc. for pipes of following diameters 125mm, 90mm, 63mm, 32mm & 20mm for this project. Contractor has to arrange his own all equipments for trenchless crossings such as HDD, Moling & rock cutting equipment, HDPE fusion equipment at the site whenever required.

Contractor must also have to arrange his own equipment for restoration work like water tanker and jumping jack compactor for compaction of backfilled trenches and roller and other required equipment/ machinery for asphalting/ road works.

In case there is non availability of approved equipments, tools and tackles during the work at site, suitable penalties, as per special terms and condition of the contract, will be levied and deducted from the running bills.

3.2.2 **Imported Backfill and Material**

The Contractor shall be responsible to arrange the supply of approved soft soil / Coarse Sand free from any impurities like clay, mica and soft flaky pieces as per the instruction of EIC/Owner.

For supply of sand in trench for rocky terrain ,no separate charges are payable and is included in SOR item for excavation of hard rock/ Morrum.
Also supply of sand in valve chambers ,Normal chambers & Built up surface ,if required ,as per the instruction of EIC, is not separately payable.

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In case specified trench depths are not achieved & if directed by Engineer-in- charge Contractor to provide concrete casing pipes/ slabs or cement concrete, without any cost implication to Owner.

3.2.3 **Other Materials**

The Contractor shall supply the following items where required.

- All materials required for form work, trench support, temporary trench crossings.
- All sign boards, barricades, tin sheets, lights and protective equipment.
- Permanent markers as shown in the drawings enclosed in the tender.
- Material required for installation of valve chambers.
- GI ,Half Round concrete sleeves
- All minor items not expressly mentioned in the Contract but which are necessary for the satisfactory completion and performance of the Work under this Contract.

3.2.4 Manpower

The contractor shall provide the skilled labour, tools, materials, and equipment necessary for the proper execution.

3.2.5 Acquisition, Receipt, & Storage Of Materials

In case of material supplied by owner than the contractor shall collect all materials from Client store between working hours following all documentation procedures laid down and as directed by EIC. The contractor shall at the time of receipt of material physically examine all materials and notify the EIC immediately of any damage . Any damage not recorded at the time of inspection done by contractor will be deemed not to have existed at the time of receipt of material. Cost of repair, rectification, replacement will be borne by the contractor. Any defective material found during the time of installation will noted and forwarded to stores for replacement immediately with P.O reference and only wit written approval of EIC. The contractor shall ensure that no defective material shall be returned to store at the time of closure of contract. The contractor shall maintain permanent locked store preferably near site in so that all the material are stored in such a manner so as to prevent and damage to the materials

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from scratching , gouging , indentation , excessive heat or by contact with any sharp objects and chemicals.

The contractor shall maintain log book at their respective stores stating issue and availability of free issue material as a given day. Further the contractor is required to undertake and submit an inventory of materials every month to Owners/Owners Representative (mandatory) .

4.0 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 daily progress reports, weekly progress reports, graphs with utilities, testing reports, material consumption and inventory reports, deviation statements etc.

5.0 APPROVALS

Contractor has to assist in getting permissions, obtain statutory approval/ clearances for laying of pipelines. However, Client will pay the departmental charges and Bank Guarantees for getting the clearances. It is the contractor's responsibility to inform and co-ordinate the concerned local authorities and also other utility agencies before commencement of work at site. To ensure smooth execution of the work on a day to day basis, the contractor has to liaison with respective authorities and obtains necessary approvals.

6.0 REFERENCE SPECIFICATION, CODES AND STANDARDS

The contractor shall carry out the work in accordance with the requirement of latest relevant applicable standards, this specification, Client's Engineering Standards; relevant Oil India Safety Directorate (OISD) norms,

Latest PNGRB Guidelines, ASME B31.8 – Gas Transmission and Distribution Piping Systems; Australian Standard 3723 – Installation and Maintenance of Plastics Pipe Systems for Gas; and the American Gas Association Document – Purging Principles and Practice. ISO: 4437/ IS:14885 for underground polyethylene pipes and Client's approved procedures

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.

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7.0 SAFETY

The Contractor shall conform to the requirements outlined elsewhere in the tender document. 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 vicinity when these materials are being used.

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 trenches/ pits shall not be kept open in night times. However in case the same is essential the same shall be properly barricaded with proper lighting arrangements & manned.

The Contractor shall provide all safety equipments like helmets, books, etc. to the labour which are necessary for safe working practice.

Any accident causing injury to any person or damage to property or equipment shall be reported to the EIC.

Where the EIC determines that the work is being performed by the Contractor in an unsafe manner, he may suspend the Work until corrective action is taken by the Contractor.

For further details refer Attached HSE technical specification.

8.0 ROUTE SURVEY

8.1 Plans detailing the size, operating pressure and approximate location of the proposed mains, connections and associated regulator installations will be issued to the contractor at the start of the works.

8.2 The final alignment of mains will be worked out at site in consultations with the site engineers after route survey and trial pits, at his cost, have been carried out. Any change in routing from the issued drawings due to site constraint will be notified to EIC & his specific written approval shall be obtained before carrying out the job.

8.3 **Service Lines**

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8.3.1 A survey will be conducted jointly by PMC/ third party inspection and the contractor at each premises or housing colony to be supplied. The survey record will note customer details, the potential gas supply points and proposed regulator positions and estimates of material quantities. The contractor's representatives will make as sketch of the agreed pipe routes if necessary.

8.3.2 The contractor will be responsible for contacting the customer and making the necessary arrangements for access, and appointments to carry out the work. Contractor shall maintain job card and complaint books at site. Client will not be responsible for any time lost due to broken appointments or disputes with customers.

9.0 ORGANIZATION OF WORK

9.1 All construction work will be carried out as per direction of EIC, and this will be the primary point of contact between the contractor and Client on site. All work will be issued and sanctioned through the EIC and site control exercised by Site Engineer Client/PMC. The contractor shall ensure that technical quality standards are maintained, that construction is carried out cost effectively and that a good customer and public image of Client is maintained.

9.2 Contractor shall designate RCM who will be the single point coordinator to interact with EIC/Consultant/TPIA and authorized to attend review meetings, receive materials, authorized to sign documents, claims and receive payments etc. . Contractor shall submit the organization chart stating that in charge of projects, store, QA/QC and take approval from the owner.

9.3 The contractor will appoint his own supervisors of minimum number instructed by EIC. These personnel will be responsible to the SE for monitoring construction standards and for ensuring that all detailed technical requirements are met on each and every job which is undertaken. The contractor's supervisor(s) will have day to day liaison with the SE, and will provide the SE with technical reports and audits, and other management information as is required on work progress and construction quality standards.

9.4 The contractor's supervisor shall have mobile telephones or pagers to ensure that they can be contacted at all times. The contractor will also nominate one person who can be contacted if necessary out of hours, for the duration of the works. The contractor's supervisor will have access to transport at all times to allow them to visit sites and attend meetings with PMC/ Client as is required. The normal day to day issue of work instructions, communication between PMC/Client and the contractor's supervisor and the SE. No deviation from the approved technical specification / issued construction drawings shall be undertaken without written approval of EIC.

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9.5 Contractor shall maintain a Project site office, Material store with following facilities:

- Telephone, Mobile phones, Fax machine, printers/Scanning/Xerox machines, Computer with e-mail facility
- 1 No . four wheeler with driver for suit survey , meetings etc, with Owner/Owners representative. Also it shall be well equipped with tools and tackles for attending any emergency complaints and ongoing execution work.

On award of the contract , The contractor shall establish and submit documentary evidence for above Which will be verified by owner before of the work order .Any delay and non-compliance of above may result into the termination of contract

10.0 STRUCTURES, SERVICES AND OTHER PROPERTY

10.1 Location of Underground Utilities

The contractor shall locate all buried utility pipes, underground cables, water mains and other obstructions intersecting or adjacent to the Works, and shall make available the necessary labour to expose and record the depth of cover over all obstructions in advance of excavation. This shall be done far enough in advance of excavation to facilitate gradual change in grade or position found necessary to clear any obstructions.

In addition, the contractor shall excavate trial pits as necessary to determine the pipe route. The number of trial pits will be agreed with the EIC in advance of any excavation. In any event, trial pits shall be made at intervals of a maximum of
30 meters. Restoration of the abandoned trial pits and trenches shall be the contractor's responsibility. No payments shall be made for such type of jobs. It is contractor's responsibility to interact with other utility agencies regarding their existing utilities and finalize the route along with these agencies and Owner/ Owner's representative.
There will be no additional payments in respect of abandoned trenches incurred because of insufficient or inadequate trial pits, or any associated lost time or delays.

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10.2 **Protection of Structures and Utilities**

The Contractor shall at his own cost, support and protect 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, unless so protected, 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 operations or kind of work. Special care shall be taken while laying Pipelines near the trees.

10.3 **Interference with Traffic, Street Drainage and General Public**

The Work shall be executed in such a manner as to cause a minimum of inconvenience to persons requiring to use public or private roads, lanes, thoroughfares, walkways, rights-of use or passages through which the Works are to be executed. The trench shall be back filled, compacted, leveled and extra earth 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, in any circumstance, use a private driveway, access track or entrance without the prior approval of the EIC.

The Contractor shall provide suitable access where 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 deviate them where necessary and use all proper measures to provide for the free passage of water.

The Contractor shall deliver the completed works after proper cleaning of the site.

The contractor shall conduct his operations at all times, with a view to minimizing

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as far as practicable noise from plant and other objectionable nuisance (e.g. oil leakage).

11.0 TRENCHING

The schematic diagram with the detail of trench is enclosed as Annexure.

The Contractor shall perform the excavation works so as to enable the pipe to be laid in conformity with the levels, depths, slopes, curves, dimensions and instructions shown on the Drawings, Specifications or as otherwise directed by the EIC.

Contractor shall excavate and maintain the pipeline trench on staked centerline as per approved alignment sheets taking into account the horizontal curves of the pipelines.

While trenching care shall be taken to ensure that all underground structures and utilities are disturbed to the minimum. Suitable crossing shall be provided and maintained over the ROU wherever necessary to permit general public, property owners or his tenants to cross or move stock or equipment from side of the trench or another.

Trenching shall be made with sufficient slopes on sides in order to minimize collapsing of the trench. On slopes wherever there is danger of landslides, the pipeline trench shall be maintained open only for the time strictly necessary. Client may require excavation by hand tools, local rerouting and limiting the period of executing of the works. Before trench cuts through water table, proper drainage shall be ensured, both near the ditch and ROU in order to guarantee the soil stability.

The Contractor shall ensure that trench bottom is maintained in the square form as far as possible, with equipment, so as to avoid/ minimize the hand grading at the bottom of the trench. The Contractor shall do all such handwork in the trench as required to free the bottom of trench from loose rock, pebbles and to trim protruding roots from the bottom and sidewalls of the trench.

11.1 Depth of Trench

The minimum depth of cover shall be measured from top of pipe to the top of undisturbed surface of the soil or top of the graded working strip or top of road or top of rail, whichever is lower.

The depth of the trench will be such as to provided minimum cover as stipulated below :

* Refer PJS clause No. 17.0 SPECIAL POINTS PERTAINING TO SPECIFICATION.

The minimum depth as mentioned above may be greater than as may be required

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by Government/ Public authorities under jurisdictions. The Contractor shall perform such work without extra compensation, according to the requirement of concerned authorities.

In cases of Drain/ Culvert crossing through open cut where excavation cut is more than
1.5m, the extra excavation shall be paid in quantity basis. The rate shall include backfilling as specified. No separate payment is chargeable for extra excavation and includes backfilling as well.

In case the depth could not be achieved due to practical problems and the same is demonstrated, EIC after examining thoroughly and considering the codes and standards may allow the contractor to provide suitable protection by way of concrete casing pipes or slabs without extra cost to Client.

11.2 **Width of Trench**

The width of the trench shall be wide enough to provide bedding around the pipe and to prevent damage to the pipe inside the trench. Unless otherwise directed by the EIC and where ground conditions permit, the minimum distance from the inside edge of the trench wall to the outside of the pipe shall be as per drawing enclosed herewith.

11.3 **Trench Base**

The trench bottom shall be cut or trimmed to provide a uniform bedding for the pipe, and shall be free of stones, metal, wood, vegetation, clods of earth or other debris before placement of the pipe.

Hard rock is defined as trench material with a single piece dimension exceeding 1.5 m in length which cannot be removed other than by the use of pneumatic chisel/drill or sledge hammer and chisel.

Excavation through soil mixed with boulders that have been used for a road base will not be considered as hard rock for the purposes of payment.

11.4 **Clearances**

Unless otherwise approved, the following clearances shall be maintained between the external wall of the gas pipe and the external surface of other underground assets in the vicinity of the Works.

- 150-300 mm where the gas pipe crosses other assets, other than electric cables, whereupon the clearance shall be 300 mm.
- 300mm where the gas pipe is on a similar alignment to the other assets.

Where the above clearances cannot be achieved, or in other special circumstances, the EIC may approve/specify protection with

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concrete/MS
coated pipe, etc. The protective material shall be supplied and installed by the
Contractor at his cost.

11.5 **Under Ground Interferences**

The Contractor shall locate and expose manually all underground facilities if any during trenching. Safety barriers, if required shall be erected to prevent any damages or accident. On locations where pipeline is laid under the existing facilities and near the approaches to the crossing, the trench shall be gradually deepened to avoid sharp bends.

All sewers, drains, ditches and other natural waterways encountered while trenching shall be maintained open and functional by providing proper temporary installations if required. Suitable dewatering pumps shall be deployed to dewater, if required.

Whenever it is permitted by Authorities and/ or Client to open cut paved road crossing, or where line is routed within the road pavement, the Contractor shall remove the paving in accordance with the restrictions and requirements of the authorities having jurisdiction thereof as directed by Client. After laying the pipeline, backfilling shall be immediately performed and all the areas connected with the works shall be temporarily restored.

In case of damage to any of above referred structures/ utilities the contractor shall be responsible for repairs/ replacement at his own cost, which shall be carried out to satisfaction of concerned authorities, resident and PMC/ Client.

11.6 **Others**

Throughout the period of execution of such work, the 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 Client.

For all roads, paths, walkways etc. that are open-cut, the Contractor shall provided temporary diversions properly constructed to allow the passage of normal traffic with the minimum of inconvenience and interruptions.

The paving shall be restored to its original condition after the pipeline is installed.

The Contractor shall excavate to additional depth at all the points where the contour of the earth may require extra depth, or where as deep trench is required at the approaches to crossings of roadways, railroads, rivers, streams, drainage ditches without any extra cost implication to Client.

The Contractor shall excavate all such aforesaid depths as may be required at no

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extra cost of Client.

The trench shall be cut to a grade that will provide a firm, uniform and continuous support for the pipe.

The Contractor shall take conducive measures to ensure the protection of underground utilities as per the instructions of Client or relevant authorities.

Where the pipeline crosses underground utilities/ structures, Contractor shall first manually excavate to a depth and in a such a manner that the utilities/ structures are located, then proceed with the conventional methods.

The locations, where the pipeline has to be laid more or less parallel to an existing pipeline cable and/ or other utilities in the Right-of-way the Contractor shall maintain proper distances and perform the work to the satisfaction of Client and other utility agencies. In such locations, the Contractor shall perform work in such a way that even under the worst weather and flooding conditions, the existing pipeline/ utilities remain stable and shall neither become undermined nor have the tendency to slide towards the trench.

11.7 **Bedding**

The contractor shall ensure that the pipe when placed in the trench is supported and surrounded by a bed of screened excavated soil, which shall be stone free and have a maximum grit size of 5mm in order to ensure no damage occurs to the pipe.

However in case of rocky soil, the bedding shall be done with approved/ good

quality packing sand, subject to the approval of the EIC, the size distribution of the sand/ shall be the same as per soil. The packing sand shall be placed to a minimum thickness of 150mm around the pipe in case of rocky terrain.

Unless directed by the EIC the quantity of bedding & surrounding sand shall confirm to specifications. There shall be no void space in packing sand around the pipe.

12.0 LAYING

Laying of PE pipelines shall commence only after ensuring proper dimensions and
clean surface of the trench. The trench bottom shall be free from the presence of cuts, stones, roots, debris, stakes, rock projections upto 150mm below underside of pipe and any other material which could lead of perforation/ tearing of the pipe wall. After ensuring above the PE pipe coil shall be uncoiled smoothly through proper equipment's/
care inside the trench ensuring no damage to pipe coil during laying. The Contractor must ensure that pipe caps are provided before lowering of pipeline. The trench after this can be released for back filling leaving adequate lengths open at the ends, for

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jointing.

Where given specific approval by the EIC a pipe may pass through an open drain or nallah. Where this is permitted the pipe shall be installed inside a concrete or steel sleeve for protection. The sleeve material shall be procured and laid by the Contractor. In general the GI Sleeve and MS sleeves material specification shall be confirming to IS 1239 (Heavy Duty) specification of reputed make. The payment for the length of pipe in the sleeve will be made as per SOR. All other work necessary to break through the walls of the obstruction, and to seal the annulus between the pipe and the sleeve and the sleeve and the wall, shall be deemed to be included in the rates.

Open ends of pipe placed in the trench shall be securely capped or plugged to prevent the ingress of water or other matter. The Contractor is to ensure that

nothing enters the inside of the pipe during the laying process as this could cause a future blockage or regulator malfunction due to dust, etc.

Service lines shall be installed in accordance with the drawing enclosed. Note that the service pipe rises out of the ground at the customer's premises within a GI sleeve pipe. The vertical portion of the sleeve shall be fixed to the wall of the premises in a secure manner. A bending tool shall be used to bend the GI sleeve pipe so that it has the appropriate curvature and is free of kinks. The bending of the sleeve, its fitting and clamping, and the installation of the transition fitting excluding service-isolating valve, is all included in the service connection rate**.** A rate is included in the SOR for the provision of sleeves for PE laying. Any installation without inspection and approval may lead to penalties as Special condition of contract

A bending tool shall be used to bend the GI sleeve pipe so that it has the appropriate curvature and is free of Kinks. The installation of the GI sleeve for service lines shall be done by sealing the annulus, firm fixing of the GI sleeves with concrete mix, breaking through any obstructions & their subsequent restoration to the satisfaction of the EIC.

The contractor shall supply the GI sleeves (Heavy duty OF IS:1239 reputed make) respectively for domestic & commercial / Industrial installation. The vertical portion of the sleeves shall be fixed to the wall of the premises in a secure manner. The service line shall be installed in accordance with drawing enclosed. The material test certificates
/ inspection reports shall be inspected by TPIA/PMC before installation.

Valves shall be installed at locations shown on the Design Plan or as directed by the EIC and joined with PE pipes by electro-fusion techniques. The valves shall be supported on a bed of fine fill of grit size not greater than 5mm to achieve equivalent support as the incoming and outgoing pipe work.

Laying graphs with details of depth, length, offsets from fixed references, other utility crossings, fittings, size of casing pipe used for the pipeline shall be prepared

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on daily basis and submitted to Site Engineers of the Owner for approval. These details will be further incorporated into As-Built Drawings.

14.0 JOINTING OF POLYETHYLENE PIPE

The procedure for jointing of PE pipe and fittings is enclosed. Only Bar coded electro- fusion machine (Automatically Readable) that can read the bar code of the fittings automatically shall be used for jointing of PE pipe / fittings.
Manual feeding electro-fusion machines are not acceptable for jointing purpose.
The Contractor has to submit the certificate of calibration of Fusion machine at the time of start of work and at fixed intervals as per the instruction of owner.
Contractor shall ensure that the machine are always available at site, no stoppage of work due to the non availability of machines.

The contractor shall flush the Pipeline with air to remove dust, water, mud etc. before fusing the joints.

Before jointing, the Contractor shall place packing sand under the pipes on both sides of the joint to keep the pipes in line and at the correct alignment during the jointing process. Alignment clamps with the correct size shells should be used to align the pipe during the electro-fusion cycle.

The Contractor shall ensure that polyethylene pipe is only cut with an approved PE pipe cutting tool. Before fusion is attempted he shall remove the oxidized surface of the pipe to be inserted into the electro-fusion coupling. The tool must remove a layer of
0.1 mm to 0.4 mm from the outer surface of the polyethylene pipe. **It may also be noted that no fusion will be allowed without clamping device and only the approved cutting tools (Hack Saw shall not be allowed for cutting the Pipe) shall be used**.

The contractor has to supply all the consumables required for carrying fusion of the joints (like cloth/ paper napkin, acetone etc.).

If, upon inspection, the EIC determines a joint is defective, Contractor shall remove the joint by an approved method. The cost of this work shall be borne by the Contractor.

For electro-fusion jointing, the contractor must bring own tools, tackles and equipments. Contractor shall arrange generator for power supply for fusion machine. Taking power connection from electric poles ,connections without written permission from concerned authorities or residential premises is strictly not permitted.

Only, Approved Jointers shall carry out fusion of all joints. Contractors shall provide the list of jointers to be used on the job and make arrangements for qualification Testing of the jointers in presence of Owner / Owner's representative . All approved Jointers shall bear Identity cards signed by Owner/Owner's representative..

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Taking power connection from electric poles , connection without written permission from the concerned authorities or residential premises is strictly prohibited

15.0 BACKFILLING

Backfilling shall be done after ensuring that appurtenance have been properly fitted and the pipe is following the ditch 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. Dewatering shall be carried out prior to backfilling. No backfilling shall be allowed if the trench is not completely dewatered. Prior to backfilling it should be ensured that the post padding where required of compacted thickness 150mm is put over and around the pipe immediately after lowering.

Backfilling shall be carried out immediately after the post padding where required has been completed in the trench, inspected and approved by Client/ PMC, so as to provide a natural anchorage for the pipe, avoiding,

sliding down of trench sides and pipe moment in the trench. If immediate backfilling is not possible, a padding of at least 200mm of earth, free of rock and hard lumps shall be placed over and around the pipe and coating.

The backfill material shall contain no extraneous material and/ or hard lumps of soil, which could damage the pipe and/ or coating or leave voids in the backfilled trench. In case, it is required and directed by EIC, screening of the backfill material shall be carried out with specified equipment before backfilling the trench.

The surplus material shall be neatly crowned directly over the trench and the adjacent excavated areas on both sides of the trench to such a height which will, in Client/ PMC opinion of provide adequately for future settlement of the trench backfill during the maintenance period and thereafter. The down shall be high enough to prevent the formation of the depression in the soil when backfill has settled into its permanent position should depression occur after backfill, 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 land owner or authority having jurisdiction at no extra cost to Client.

Where small pieces of rock, gravel, lumps of hard soil or like materials are encountered at the time of trench excavation, sufficient earth or select backfill materials shall be placed around and over the pipe to form a protective cushion extending at least to a height of 150mm above the top of the pipe. Select backfill materials for padding that are acceptable shall be screened soil, containing no gravel. All these works shall be carried out by Contractor at no extra cost to Client. Loose rock may be returned to the trench after the required selected backfill material has been placed, provided the rock placed in the ditch will not interfere with the use of the land by landowner, or tenant.

In case where hard rock is encountered or as desired by EIC sand padding is to be provided upto height of 150mm around the pipe.
When the trench has been dug through drive ways or roads, all backfilling shall

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be executed with suitable material in layers as approved by PMC/ Client and shall be thoroughly compacted. Special compaction methods as specified may be adopted. All costs incurred there upon shall be borne by the Contractor.

Trenches excavated in dikes which are the properties of railways or which are parts of main roads shall be graded and backfilled in their original profile and condition. If necessary, new and/ or special backfill materials shall be supplied and worked-upto PE Warning Grid/Mat 1mm thick and 300mm wide will be placed on distribution main and on service lines inside premises, after backfill of the trench upto a height of 300mm on the top of the carrier pipes. The warning grid is to be unrolled centrally over the pipe section and thereafter further backfilling will commence.

Backfilling activity shall include proper compaction by jumping jack compactor and watering in layers of 150mm above the warning mat. Proper crowning of not more than 150mm shall be done. All the excavated material required to be used during the Restoration process shall be stacked and kept separately and properly. Wherever Road cutting/ Tiles removal/ PCC cutting has been done during excavation for laying, the area shall be back filled and compacted immediately so that no inconvenience is caused to the general public.

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 joint in completed.

Debris and other surplus material shall be removed immediately after the back filling.

The contractor shall not be entitled for 30% payment on laying & backfilling till the above activities are completed.

16.0 MOLING:

The Moling shall be carried out as per the requirement specified by Client/ PMC, and approved procedures. The contractor has to carry out thorough survey of the underground utilities before going for the Moling, to avoid the damage to the other utilities.

No extra payment will be made for any trial/ abandoned pits made during the survey. The supply of all equipment, power required for carrying out moling work, is in contractor's scope. The type of moling to be carried out i.e., Manual/ Machine with or without casing shall be at the discretion of PMC/ Client. A prior approval is to be taken before starting the Moling.

For manual Moling the contractor shall ensure that the size of the hole shall not be more than 20% of the size of the casing / carrier pipe whichever is applicable. After completion of Manual Moling the hole shall be properly compacted / filled with soil by watering and by approved procedures, the

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pits shall be backfilled, compacted & restored . The rate for such crossing work by using casing pipe & carrier pipe or only carrier pipe shall be payable as per Schedule of Rates. **No separate payment shall be made for pulling the carrier pipe.**

The rates for Moling, as indicated in SOR, are payable as per the size of the casing/ carrier pipe and are inclusive of excavation of pits, backfilling, compaction, restoration, jointing and insertion of carrier pie.

Any damages occurred to other utilities during the Moling operation shall be immediately notified and rectified by the contractor without any cost implication to Client.

The length of the Hole (excluding the sizes of the pits on both ends) shall be considered for the measurement of Moling length. However, intermediate pits will consider in the moling length.

17.0 BORING/RAMMING/DIRECTIONAL DRILLING

One of the above techniques is required to be carried out by the Contractor where conventional trenching/Moling is not possible viz. railways, major waterways, highways, roads etc. Details of such crossings shall be obtained by the Contractor, and construction drawings shall be prepared by the Contractor in consultation with PMC/ C l i e n t. Execution of the work shall be based on the PMC/ Clients approved drawings. The contractor has do the thorough survey of the underg round utilities before commencement of BORING/ RAMMING/ DIRECTIONAL DRILLING to avoid the damage to the other utilities. No extra payment will be made for any trail/ abandoned pits made during the survey. The supply of all equipments is in Contractors scope. Work to be carried out in accordance with API - 1102.

Once the work is allotted, **Any delay in mobilizing / non – availability of HDD machines as per site requirement and conditions shall result in levying of penalties on daily basis as per SCC.**

The type of HDD to be carried out i.e. conventional (with or without casing) shall be at the discretion of Client/ PMC. And prior approval is to be taken before starting the HDD.

The rates for HDD, as indicated in SOR, are payable as per the size of the carrier pipe and are inclusive of excavation of pits, backfilling, compaction, jointing and insertion of carrier pipe and restoration of pits. For HDD with casing pipe no separate payment shall be made for pulling of the carrier pipe, the rate quoted by the Contractor shall be inclusive of pulling carrier pipe.

Any damages occurred to other utilities during the HDD operation shall be immediately notified and rectified by the Contractor without any cost implications to Client.

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The length of the HOLE (excluding the sizes of the pits on both ends) shall be considered of HDD length.

18.0 CASING PIPE

The tentative sizes of the HDPE casing pipe for Moling/ HDD shall be as follows:-

Size of PE pipe	Size of HDPE pipe
20 mm	75mm
32 mm	75mm
63 mm	125mm
90mm	180mm
125 mm	250mm

19.0 RESTORATION

Wherever the restoration is required, the roads, footpaths (including roads and footpaths inside colonies) shall be restored to original condition, and the same shall be done as per concerned local authorities norms and to the satisfaction of the concerned local Authority. To retard curing of the installed concrete, wet sack cloth is to be placed on the finished surface and kept damp for a period of 36 hours.

Where slabs and blocks are to be restored, the level of the compacted sub- base is to be adjusted according to the slab/block thickness. The slabs or blocks should be laid on moist bedding material, which should be graded sand, mortar or mortar mix. The slabs or blocks should be tapped into position to ensure they do not rock after laying.

The restored slabs or blocks should match the surrounding surface levels. Joint widths should match the existing conditions, and be filled with a dry or wet mix of mortar.

The sketch for restoration of Road, Footpath, Channel is enclosed herewith and is indicative. However, the restoration shall be done in accordance with the norms of concerned land owning agencies.

Turf shall be replaced in highly developed grassed area. In lesser-developed grassed areas topsoil should be replaced during the restoration process.

Where permanent surface restorations cannot be completed immediately, the Contractor shall provide and maintain a suitable temporary running surface for vehicular traffic and pedestrians. The Contractor will be responsible for the maintenance of all restoration carried out, for the duration of the Contract guarantee period.

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The Contractor is to ensure the restoration work is properly supervised, and that the material used is suitable for the purpose and properly compacted. Where the required standards are not achieved the Contractor will be required to replace the defective restoration work.

Note that Payment for pipe laying will only be authorized on initial-satisfactory restoration, and where the sites has been cleared of all surplus materials, etc.

Contractor has to obtain the clearance certificate from the concerned local authorities after completion of the restoration work. The restoration specification specified in the tender is only a typical specification and the contractor has to carry out restoration as per latest version of the (PWD/ IRC) specification to its original condition and also to the entire satisfaction of land owner (Private/Public).

The expenditure incurred towards testing of the material used for restoration as per applicable standards, shall be borne by the contractor.

20.0 TESTING

Pressure testing will be carried out with compressed air. Compressed air will be provided by Contractor for testing purposes and is to be included in the rates.

For main pipelines work the Contractor shall perform progressive pressure testing to avoid having to find leaks in long lengths of pipe. The test pressure shall be 6.0 bar(g), and there shall be no unaccountable pressure loss during the test period.

Test procedure with sketches showing the pipeline to be tested, vent points, gauge location, and inlet pressure print is to prepared & got approved by EIC.

For main line the test duration shall be 24 hrs . With these tests the pressure should be allowed to stabilize for a period of 30 minutes after pressurization. The holding period may then commence and continue for 24 hours. Measuring instruments shall have been calibrated and their accuracy and sensitivity confirmed. For testing of Network, calibrated pressure gauges of suitable range shall be supplied by the contractor. The pressure gauges shall be calibrated from time to time as desired by Engineer-in-Charge. 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.

For service lines in some cases testing will be carried out independently of the testing of the mains for which the test duration may be reduced to 4 hrs. The service testing in this case will be performed after the service installation is complete but before the service tee has been tapped. Also in some cases the tapping of the service tee will be delayed pending the completion and purging of the main pipelines.

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21.0 PURGING

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

Nitrogen required for purging will also be provided by the Contractor. Nitrogen shall be supplied in labeled, tested and certified cylinders, and completed with all necessary regulators, hoses and connections, which will be in good condition and working order.

In addition the Contractor shall submit and get approved a Purging Plan before commencing any purging work. The Plan shall include, but not be limited to, the provision of the following materials and equipment: Personal safety equipment, Fire extinguisher, Purging adapter, Purge stack with flame trap and gas sampling point, Gas sampling equipment (may be gas leak detector), squash-off tool, Polyethylene connecting pipe work.

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

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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.

22.0 VALVE PIT

The valve pit shall be constructed in accordance with enclosed drawing & payment shall be as per relevant SOR item.

The construction of valve chambers shall be taken up immediately after installation of valve pit. Drawing No. : GGL/23N0/05/25/M/000/016 – 20

22.1 **Workmanship**

The excavation work shall be done at a location given by Engineer–in-Charge. All care shall be taken not to damage existing facilities and surface of construction shall be restored to its original state.

Sandbags to be placed below pipeline without disturbing the laid pipe. Gunny bags and Sand should be of approved quality.

Precast RC slab shall be placed as indicated in the drawing issued to the contractor. PCC to be placed below the pipe as indicated. Once PCC is set sand is to be filled and properly rammed so that pipe and precast concrete blocks are firmly placed.

Valve will be supplied without the operating stem. Contractor has to supply the operating stem with a handle for the valves of the different sizes. The Contractor has to take prior approval for design and material specification of the stem for installation. Approved quality sand is to be placed in between area.

Surrounding area to be properly cleared and PCC to be placed around the location where precast slab with CI Manhole cover is placed. The RC precast slab to be laid in level and finished smooth.

23.0 PERMANENT MARKERS

23.1 Permanent Marker (As per typical Drawings Placed at Tender) shall be installed on the ROU at regular intervals as per the instructions of the EIC immediately after laying of the pipeline. The installation of the type of the Permanent Marker shall be decided by the EIC depending on the site condition. The Markers shall be painted before installation as per the approved procedure. The supply of the paint and painting as per the specification is in contractor's scope. Separate payment for installation of the markers shall be paid to the Contractor as per the respective Item in SOR .

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23.2 The artwork shown in the drawing is typical for all the markers. The contractor must take prior approval for the artwork from EIC before installation of Markers. The artwork must have Client's logo and specify the location of the pipeline from the marker.

Guidelines :

- The installation of these markers shall be such that in between two pole markers two RCC markers are installed with spacing of 50 Mtrs on either side. However , Pole markers shall be installed at all the tapping / Branching points in the mainline.
- Interval between any two RCC markers for mainline (125mm to 63mm) shall not be more than 50 m .
- Pole marker or RCC marker shall be installed near to valve chambers on mainline & inside the pockets respectively for indication.
- Pole marker with foundation shall be installed after two RCC marker as per drawings.
- The entry and exit pits for laying of pipeline by HDD/ Moiling for road crossings shall be marked by pole markers or RCC markers depending upon the site condition .
- In addition to the above , pole markers with foundation (As per drawings) shall be installed outside societies / Areas as per the instruction of the site in charge.
- For the distribution network 32 mm & 20 mm pipe , plate markers shall be installed as per the site condition and direction of the site in charge.

24.0 ASSISTANCE IN COMMISSIONING

Contractor shall provide the required personnel, Vehicles, labour, supervision, tools, equipment, instruments and technical assistance for performance tests and commissioning activities as per requirement of Owner/ PMC.

25.0 STANDARD OF WORK

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

25.2 The manpower deployed on the respective work shall be adequately trained & shall have necessary skills to executive / supervise the work. However, the assessment on the qualification of the personal shall be at the discretion of

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EIC.

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25.3 Fusion operators and other skilled personnel shall be approved by Client/ PMC and identification cards duly signed by EIC shall be issued to them. Only those personnel who are approved by EIC shall be allowed to execute the critical activities like joining of PE Pipes.

26.0 RECORDING (AS-BUILT DRAWINGS)

The Contractor will be required to submit computerized as-built drawings duly certified by EIC in A0/ A1 sheet form at 1:200 scale with six sets of prints plus soft copy. The as-built drawing shall be submitted on area wise as specified. The bill of materials used for the particular area shall be specified on the drawings. The Contractor shall use the area and crossing survey drawings prepared by them as reference. On-site sketches, picking up key reference points, shall be made during the installation of services. The lengths, depths of installed pipe work, changes in direction, major fittings, etc, shall be recorded together with appropriate references to other services crossed and in the proximity of the gas pipe .

Distance of pipeline from permanent property /structure should be provided at least every 20 meters. If there is any chance in alignment/orientation and offset distance etc. of the pipeline in between the above said 20 meters, the same shall be dearly mentioned in the as laid. Gas objects (off valve, tees, elbows, couplers , T.F, etc shall be shown as block objects (which from a single node to connect) with respect owners symbol and legend. The as laid drawing shall be as per the legends provided by EIC. Details & offset distances from other utilities present should be given in as laid drawing. If there is any change in the depth of pipeline, the same shall be clearly marked with details in the as laid drawings. The details of additional protection provided must be mentioned.

Details of the PE stop off valve and other fittings used should be shown with adequate information and orientation. Technical deviation (if any) should be provided with reference to the buildings and permanent structure around, and the same should be cited clearly with all relevant details.

Complete details of nallah crossings should be shown in a separate sketch.

Name of roads , major landmarks and buildings should be mentioned appropriately for reference.

Proper Chainage shall be mentioned on all the drawings to be referred with continuation reference.

Direction of gas flow should be indicated in each drawing.

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Land based features shown on the drawing shall match the exact distance as they were on real ground with respect to scale ratio (1:200)

The details shall be prepared in standard format using Map Info/AUTOCAD Map and submitted in CD ROM. Contractor shall also make the item wise material consumption report for the respective areas in a soft copy and to be submitted along with the as- built drawings.

27.0 Civil Works

The contractor has to supply the adequate materials and skilled manpower for the completion of all the civil works . The contractors shall also insure that the work carried out as per the detail mentioned in the schedule of rates .

Special care should be taken at the time of labours working in depths/lifting of the skids by hydras/ cranes considering all the safety guidelines.

The contractors has to ensure that sample of all the material shall be inspected and approved by EIC before carrying out installation or erection work. The contractor has to submit the test certificates for all the materials to be used at the site . the construction shall be carried out strictly as per the drawings provided by the Client. The party shall ensure extra / Surplus / malba shall be immediately removed from the site after completion of the job. Separate payment shall be made as per the SOR.

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TECHNICAL SPECIFICATION

FOR

INSTALLATION OF ABOVE GROUND GI /CU PIPING FOR DOMESTIC, COMMERCIAL AND INDUSTRIAL CONSUMERS

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1.0 GENERAL INFORMATION

1.1 INTRODUCTION

The main intent of the specification is Supply and installation of above ground GI pipes, fittings, valves, meters and regulators, from the outlet of 'PE/GI transition fitting' up to the DOMESTIC consumers 'Appliance / stove/ oven valve' as per the Distribution Schedule.

The scope for commercial consumer includes installation of above ground GI pipes and associated fittings, valves, regulator up to and including meter. However, the piping may have to be carried out up to appliance valve, in case of some commercial customers.

In case of large commercials and industries completely assembled metering skids would be supplied to the contractor who would be required to install and provide inlet & outlet connection.

This technical specification defines the basic guidelines to develop an acceptable design and suitable construction methodology for carrying out different activities listed out in the schedule of rates of this tender.

Compliance with these specifications and / or approval of any of the Contractor's documents shall in no case relieve the Contractor of his contractual obligations.

2.0 SCOPE OF WORK

Generally the following shall constitute the contractor's scope of work:

2.1 Plan and prepare a detailed execution schedule and procedure for implementation based on QA / QC formats plans issued by Client / PMC.

2.2 Contractor has to submit the Construction/Execution procedures before commencement of work to owner / owner's representative for approval.

2.3 Selection of route and marking on walls / floors between 'transition fitting' to 'cooking oven / stove / appliance' making openings and making provisions for fixing clamps. Making temporary but stable platforms / scaffolding / rope ladder etc., required for installation of pipes /fittings at all heights /multi storied flats and locations. Providing safety equipment to workers / plumbers.

2.4 Receipt of regulators, domestic meters, as a free issue items from Owner's Stores, loading, transportation, unloading at project site. Proper storing, stacking, identification, providing security and insurance during and before installation and

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commissioning of pipelines. Obtaining the approvals for optimum route and permission for work from the concerned authority and EIC.

2.5 Contractor shall procure all material, except free issue material from the outlet of PE/GI transition fitting up to the Domestic/Commercial customers "Appliance/Stove/Oven valve for satisfactory completion to the owner/Owner's representative.

2.6 Installation of GI pipes of ½", ¾", 1" dia. between transition fittings (installed by PE contractor) and customer's kitchen which would include NPT threading of pipes, and jointing of fittings such as elbows, tees, connectors, regulators, meters, isolation valves etc., as per laid procedures and specification including supply of GI fittings & Teflon tapes for sealing of joints. Painting of GI Pipes & fittings as per specification.

2.7 Installation of Copper pipes of ½" (12 mm) OD from the downstream of Meter up to the isolation valve prior to the customers appliance, including the installation of isolation valves, brass fitting at the downstream of meters and at the entry of isolation valves with application of lacquer paint etc. to the satisfaction of EIC.

2.8 Supply & Installation of clamps for fixing pipes, isolation valve, appliance valve, box for regulator, Sleeves wherever required, painting of steel pipes & fittings. Providing consumables grout material, repair / restoration of walls / floors / holes including the materials required for conversions along with tools and tackles etc., complete as per specification.

2.9 Conversion of all types of LPG kitchen appliances to NG based appliances inclusive of supply of nozzles. Signing of Joint Meter Records (JMRs).

2.10 To demonstrate to the customer regarding use, safety and maintenance related aspects of NG based appliances and installations.

2.11 Testing & Commissioning of installations including p urging as per specification an d handling over the installation of Client / customer to the entire satisfaction of Client / PMC.

2.12 Dismantling of scaffolding / temporary structures and cleaning of site.

2.13 Restoration of walls, flooring and other damages while executing the above ground installation

2.14 Preparation and submission of above ground installation card for each house / commercial establishment indicating the list of materials used, reasons of not providing connections, testing pressure and date etc.. Deviation statements, if any, on completion / commissioning of work.

2.15 Any other activity not mentioned / covered explicitly above, but otherwise required for satisfactory completion / operation / safety / statutory/ maintenance of the works shall al so be covered under the Scope of work and has to be completed by the Contractor within specified schedule at no extra cost to Client.

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2.16 Following activities are also in contractor scope

- Receive customer's request and complaints logged
- Carry out joint technical feasibility survey for request received.
- Attend and resolve customer complaint

Important: It is to be noted that the total work front may be offered to the bidder at different locations (which may not be near to each other) in staggered basis across the GA. Bidder to understand to execute the required work at various locations and be prepared as per the allotted fronts at scattered locations across the GA.

3.0 MATERIAL, LABOUR, PLANT AND EQUIPMENT

3.1 Owner's Scope of Supply (Free Issue Item)

In order to speed up the project Free Issue Materials shall be issued to the Contractor from the designated store(s) of Client. Contractor shall be responsible for lifting the free issue materials from Owner's storage point(s) and transporting the same to work site(s) at his own cost.

3.2 Supplied by the Contractor

The contractor has to supply all GI pipes, GI Fittings, flexible hose, suraksha hose, Valves, Fittings, Clamps, Cu pipes, GI Pipes, Appliance Valves ½" and isolation Valves ½" , ¾", sleeves, etc. and other materials required for said works.

The contractor shall provide the labour, tools (such as Hammer Drill, Piston Drill, Pipe cutters, Dies for threading, Pipe wrenches, spanners, all types of clamps, Plant and equipment necessary for the proper execution of the work. This will include but not be limited to list of specialized tools & tackles enclosed herewith. Contractor shall submit the specification of all the material to be supplied by him to EIC for approval and get the material checked & approved by him before commencement of execution.

The contractor is to be procure all bought out items from approved vendors and accordingly keep Client. / PMC informed. The inspection of bought out items would be carried out by Client / PMC / Third Party Inspection or as instruction by EIC.

3.2.1 Plant and Equipment

All vehicular type machinery shall be in good working order 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.

3.2.2 Sealant, grout

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The contractor shall be responsible to arrange the supply of any consumable sealant or ready mix grout material required for execution of work. The sealant / grout supplied by the contractor shall be compatible with the area to be restored / rectified. No separate payment for the supply of sealant and grout shall be made to the contractor.

3.2.3 Clamps, Rawal Plugs, Screws, Nozzles etc.

The Clamps, Rawal Plugs, Screws, Nozzles, etc shall be approved lot wise by EIC prior to installation. Re-drilling of existing appliance nozzles is strictly not permitted.

The indicative sketch of the Brackets for Meter and GI Pipe Clamps is enclosed herewith.

3.2.4 Consumable Items

Special consumables such as Teflon Tapes, Solder wire, Flux, lacquer, thinner, shall be supplied by the contractor and are included for within the rates.

These consumables shall be of reputed companies and required grades / class and duly approved by EIC.

3.2.5. Other Materials

The contractor shall supply the following items where required. All materials required for formwork, NPT threading, testing etc. All signs, barricades, lights and protective equipment.
All material required for working at higher floor levels (i.e., scaffolding, Ladder, safety belts etc.).
Special consumable uch as grease fo r maintenance o f domestic appliances an d al l paints or painting o f G.I pipes, clamps, sleeves, brackets for meters, consumables such as Teflon Tapes, Petrol, diesel, fuels and oils required are to be supplied by the contractor and are included for within the rates.
All minor items not expressly mentioned in the contract b ut which are necessary for the satisfactory completion and performance of the work under this contract.

4. Acquisition, Receipt, & Storage Of Materials

In case of materials supplied by owner, than the contractor shall collect all materials from Client store between working hours following all documentation procedures laid down and as directed by EIC. The contractor shall at the time of receipt of material physically examine all materials and notify the EIC immediately of any damage . Any damage not recorded at the time of inspection done by contractor will be deemed not to have existed at the time of receipt of material . Cost of repair , rectification , replacement will be borne by the contractor. Any defective material found during the time of installation will noted and forwarded to stores for replacement immediately with P.O reference and only wit written approval of EIC. The contractor s hall ensure that no

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defective material s hall be returned t o s tore a t the time of closure of contract .

The contractor shall maintain permanent locked store preferably near site in so that all the material are stored in such a manner so as to prevent and damage to t he materials from scratching , gouging , indentation , excessive heat or by contact with any sharp objects and chemicals.

The contractor shall maintain log book at their respective stores stating issue and availability of free issue material as a given day. Further the contractor is required to undertake and submit an inventory of materials every month to Owners/Owners Representative (mandatory) .

5.0 ISSUE OF WORK INSTRUCTIONS

5.1 The contractor will be required to carry out GI installation in the areas where PE laying is under progress. However, testing of GI installation shall be done in con- junction with laying of PE Service Lines to respective premises. A general scheme of distribution to domestic consumer is indicated in the sketch enclosed herewith, for reference. It may vary in case of individual and multistoried flats. A general scheme of distribution to small commercials consumers is indicated in the sketch enclosed herewith for reference.

5.2 All skilled personnel like plumbers, conversion technicians shall be approved and certified by EIC. Those who are certified and possess the identify cards duly signed by EIC shall only be authorized to take up respective jobs. The contractor has to arrange the identify cards. **In case it is found that contractor personnel other than authorized are carrying out these works, applicable penalty will be levied to the contractor as per contract**.

5.3 The rates to be quoted by contractor shall be inclusive of all preparatory / bye works, platforms, materials, labour, skills , supervision, tools , taxes, duties, levies, salaries, wages, overheads, profits, escalations, fluctuations in exchange rates and no change in the rates shall be admissible during tenancy of the contract.

5.4 The schedule of items of SOR have been described in brief and shall be held to be complete in all respect including safety requirements as per clause 9.0, tests, inspection, QA/ QC works, enabling and sundry works. The payment shall be made against completed and measured works only. No extra works whatsoever shall be considered in execution of these items.

5.5 A general scheme of distribution to domestic consumer is indicated in enclosed drawing. It may vary in case of individual and multistoried flats

6.0 PROGRESS OF WORK

6.1

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6.2 The contractor shall proceed with the work under the contract with due expedition and without delay.

6.3 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.

6.4 Weekly progress reports shall be submitted in the formats approved by Owner/ PMC , indicating broadly the laying, testing, RFC, conversions and extra piping.

Material consumption statement to be submitted at least once a month.

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7.0 WORK SHEETS

7.1 The quantities and other details will be checked by Owner/ PMC's site engineer and the same shall be incorporated in measurement cards, signed & dated as certified on site.
The cards will the be approved by the EIC.

7.2 Measurement sheets shall be prepared based on the measurement cards and checked and certified by the site engineers for billing purpose.

7.3 If measurement sheets submitted are illegible, incomplete or incorrectly booked, they will be returned to the contractor.

7.0 PERMISSIONS / APPROVALS

Contractor shall be responsible for obtaining approval from authorities like ADA / LDA and any other concerned authority, if required for completion of the work. Contractor must take the prior appointment from the resident for carrying out the work.

8.0 REFERENCE SPECIFICATION, CODES AND STANDARDS

The contractor shall carry out the work in accordance with this specification, Client's Engineering Standards: ASME B31.8 - Gas Transmission and distribution piping systems; Australian standard 3723 - Installation and Maintenance of Plastics Pipe Systems for Gas; Oil India Safety Directorate Norms (OISD), Latest PNGRB guidelines and the American Gas Association Document -Purging Principles and Practice.

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.

9.0 SAFETY

The contractor shall take care of all safety norms applicable for such works at site. Contractor shall provide all safety appliances e.g., safety helmets, gloves, safety belts, ladders, staging, shoes, goggles etc.

All necessary care shall be taken while working at heights and workmen with proper skills and work permits only shall be deployed. Proper barricading and warning signs shall be installed. Adequate care shall be taken while taking supports from balconies, chajjas / protection parapets and like structures to be sure of strength and adequacy of the same.

No night working shall be permitted, without proper lighting and prior approval of EIC.

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10.0 RIGHT-OF-USE SURVEY AND MARKING

The route of the pipeline to be installed shall be decided with consent of the consumer and SE
/ EIC. Contractor must ensure that the persons/ workers/ supervisors/workers at site shall have proper identity cards prior to entering the premises of the consumer.

No temporary or permanent deposit of any kind of material resulting from the work shall be permitted in the approach and any other position which might hinder the passage and / or natural water drainage or any area where there is objection from consumer

The contractor shall obtain necessary permissions from landowners and tenants and shall be responsible for all damages caused by the construction and use of such approaches, pavements, gardens, rooms, walls, roof etc., at no extra cost to Client.

A survey will be conducted jointly by Owner/ PMC and the contractor at each premises or housing colony to be supplied. The survey record will note customer details, the potential gas supply points and proposed meter positions and estimates of material quantities. The contractor's representatives will make as sketch of the agreed pipe routes, if necessary.

The contractor will be responsible for contacting the customer and making the necessary arrangements for access, and appointments to carry out the work. Client will not be responsible for any time lost due to broken appointments or disputes with customers.

The contractor shall confine its operations within limits of the Right-in-use. The contractor shall restore any damage to property outside ROU, attributable to him.

The contractor shall also carryout all necessary preparatory work if needed to permit the passage of men and equipment. Lights, curbs, signs shall be provided wherever and / or required by the PMC/ Client necessary to protect the public.

11.0 PROTECTION OF STRUCTURES AND UTILITIES

The contractor shall at his own cost, support and protect all buildings, walls, fences or other structures and all utilities and property which may, unless so protected, 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 operations or kind of work.

While painting contractor must take care of the consumer p remises while carrying out the job/ such as spillage on floor, walls, ceilings, sun shades etc. if the same does

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occur, the contractor is to immediately make good to original.

12.0 G.I ABOVE GROUND SERVICE PIPE

The GI service pipe installation work includes all work necessary to connect from the PE / GI transition fitting on the down-stream of the PE service, to the customers appliance, including the installation of appliance valve and isolation valves, except, Suraksha hose, Meters, Regulator for which separate rate shall be paid as per SOR Item of this document**.** The contractor shall be required to provide all equipment, tools and materials necessary to execute the work in an efficient and effective manner. Amongst other things he will be required to provide ladders, scaffolding pipe, dies, tripods, vices, fittings and teflon tape, drills for concrete and other masonry, drills for timber and laminated surfaces inside customers property, bending tools, clamps, sleeves to facilitate the pipe passing through floors and walls, paint for pipe marking etc. GI pipes, fittings, valves and regulator shall be provided by Client.

All GI risers on the outside of buildings shall be fully supported to carry the weight of piping. Risers shall be supported by a flanged foot, or similar device, capable of supporting the total weight of the riser. The riser shall rise in a vertical line from its point of support to its highest point with a minimum of changes in direction. The threading of GI pipe shall be NPT and conforming to ASME / ANSI B1. 20.1.

Contractor has to supply different types / sizes of approved clamps (Mild Steel) for fixing G I pipes suiting to the site conditions and the same shall be painted before fixing, as

per the painting specifications. Every fresh lot of the clamps, brackets, regulators boxes and other consumables shall be approved by the EIC prior to start of installation. All riser and lateral pipe shall be clamped to the building at intervals not exceeding two meters.

All riser and lateral pipe shall be clamped to the building at intervals not exceeding 1.5 meter. Maximum distance between clamps shall be 1.0-1.5m when pipe goes to the straight ,if any tee or fittings lies in between the pipe then clamp shall be placed

150 mm far away from center line of fittings at every sides. However, the same may be changed as per site conditions/as directed by E IC. Minimum gap between pipe and wall shall be 25 mm. The joints/fittings of the GI installations shall be painted only after carrying out testing of the installation. Where pipe passes through a balcony floor, the floor surface shall be made slightly elevated around the service pipe or its surrounding sleeve to prevent the accumulation of water at that point. Where a short piece of sleeve is used around the gas pipe, the sleeve should be embedded in the concrete with a mix o f mortar and the void between the pipe and sleeve filled with a suitable sealant. The sealant should be beveled such as to prevent an accumulation of water. Supply of clamps for al l sizes o f t he G I pipes are in contractor's s cope. Contractor has to take prior approval for design of clamps, paintings etc.

Pipe shall preferably enter a building aboveground and remain in a ventilated location. The location for entry shall be such that it can be routed to the usage points by the shortest practicable route.

The rates are to be paid in bands as shown in SOR e.g., the ground floor to 2nd floor

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band c overs pipe work laid from the ground floor level to ceiling level on the 2 nd floor. Payment will be in incremental stages. e.g., if a pipe is laid from the ground floor to the 9th floor of a building, the length of pipe laid up to the 2 nd floor will be paid in the first band, The length of pipe laid between 3rd and 5th floor will be paid in second band and the length of pipe from the 6th floor and above will be paid for in the third b and. However, it may be noted that all the piping done inside the premises shall be considered as ground floor piping, the payment for such work shall be as per first band.
The Pipe installation includes all fittings, Flexible hoses, clamps, Regulators etc.
The contractor shall ensure that gas supply shall not be provided to the customer in any concealed piping.

13.0 COPPER ABOVE GROUND SERVICES PIPE

The Copper service pipe installation work includes all work necessary to connect from the downstream of Meter upto the isolation valve and flexible hose prior to the customers appliance, including the installation of valves, including application of lacquer paint etc. The contractor shall be required to provide all equipment, tools

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and material necessary to execute the work in an efficient and effective manner. Amongst other things he will be required to provide ladders, scaffolding pipe, drills for concrete and other masonry, drills for timber and laminated surfaces inside customers property, bending tools, clamps, sleeves to facilitate the pipe passing through floors and walls, etc. Copper pipes, fittings, valves and regulator shall be provided by Client.

During installation the COPPER pipe is to be cut to proper length with a tube cutter, the burrs removed with a file, cleaning of outside surface of pipe & inside surface of fitting, applying flux to the tube and fitting around the outer / inner ends, inserting the tube in to t he fitting, applying heat to the assembled joints using conventional Blow torch to melt Solder wire and lacquering.

Lacquer is to be applied to the copper tubes by mixing lacquer with thinner in approved proportions and applied by dipping method or with brush. It should be applied only once at a time and drying time of minimum one hr. is to be given.

Contractor has to supply different types / sizes of approved clamps for fixing COPPER pipes suiting to the site conditions and the same shall be painted, if required, before fixing, as per the painting specifications.

Contractor has to take prior approval of EIC for quality of the clamps, solder, flux, lacquer, thinner etc. The approval shall be taken for every fresh lot of clamps from EIC before installation at site.

All riser and lateral pipe shall be clamped to the building at intervals not exceeding one meter.

Where pipe passes through a balcony floor, the floor surface shall be made slightly elevated around the service pipe or its surrounding sleeve to prevent the accumulation of water at that point. W here a short piece of sleeve i s used around the gas pipe, the sleeve should be embedded in the concrete with a mix of mortar and the void between the pipe and sleeve filled with a suitable sealant. The sealant should be beveled such as to prevent an accumulation of water. Supply of clamps for all sizes of the CPPER pipes is in contractor's s cope. Contractor h as to take prior approval for design of clamps, painting etc.

Pipe shall preferably enter a building aboveground and remain in a ventilated location. The location for entry shall be such that it can be routed to the usage points by the shortest practicable route.

The rates, mentioned in SOR are applicable from ground floor to 2nd floor. However, it may be noted that all the piping done inside the premises shall be considered as ground floor piping, the payment for such work shall be as per the SOR.

After installation of the entire piping system, final painting shall be done to the satisfaction of EIC.

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All copper piping shall be clamped to the building at intervals not exceeding 500mm. These solder wire shall be of reputed company , lead free as per BS 29453: 1994 (Soft solder alloys) and supplied in coils. The details specification attached in tender. Solder for use with Cu tube & fittings generally melt within the temperature range of 1800C to 2500C. The contractor has to furnish the certificate of confirmation of standards before start of work.

14.0 TESTING OF GI INSTALLATION

14.1 The installation from PE/ GI transition fitting up to regulator shall be tested at the [pressure of 6.0 bar (g)].

14.2 The testing of GI riser pipe up to regulator shall be done with the isolation valve in open condition and open end plugged.

14.3 The GI pipe shall be painted with one coat prior to installation in riser, however the ends / joints shall be painted only after carrying out testing of the installation.

14.4 The G I installation from regulator outlet to appliance valve (except meter) shall b e tested at a pressure of 2.0 bar (g) for a hold period of 4 hours and all the joints shall be checked with soap solution.

14.5 The meter shall be removed while carrying out the testing and joints of the meter shall be tested on line with soap solution after completion of the work. Proper test ends shall be made along with gauges and got approved by EIC. For the installation to be tested by manometer or diaphragm gauge the meter shall not be dismantled/removed and testing shall be carried out at
100 m bar with holding period of 15 min with no pressure drop.

14.6 The calibrated pressure gauges of suitable range shall be supplied by the contractor for testing.

14.7 The pressure gauges shall be calibrated from time-to-time as desired by Engineer In-charge but positively once in every six months.

14.8 Valves supplied by Clients, shall not be used for testing purpose

14.9 The details of testing shall be properly recorded in the measurement cards

15.0 INSPECTION

Any defect noticed during the various stages of inspection shall be rectified b y t he contractor to the entire satisfaction of Engineer-in-Charge before proceeding further. Irrespective of the inspection, repair and approval at intermediate stages of work, contractors hall be responsible for making good any defects found during final inspection/ guarantee period/ defect liability period as defined in general condition of contract.

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16.0 PURGING & COMMISSIONING

Payment for the tapping of live mains and GI piping prior to the actual purge is included in normal laying & testing. The connection may involve the fitting of a temporary bypass, disconnection etc.
Purging shall be carried in accordance with the principles defined in the American Gas Association Publication "Purging Principles and Practice".

In addition the contractor shall submit and have approved Purging Plan before commencing any purging work. The plan shall include, but not be limited to the provision of the following materials and equipment: personal safety equipment, fire extinguisher, Purging adapter, Purge stack with flame trap and gas sampling point, Gas sampling equipment (may be gas leak detector), s quash-off tool, Polyethylene connecting pipe work etc.

The plan shall also include the purging process along with detail on the sequence of events. The process is to also specially/mention the need to lay a wet cloth over the GI pipe and in contact with the ground, to disperse static electricity during the purging work.

A purging 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.

The purging work should be performed as follows,

- Ensure the method of purging is such that no pockets of air are left in any part of the customer's piping.
- Ensure that all appliance connections are gas tight, all appliance gas valves are turned off and there are no open ends.
- Where possible, select an appliance with an open burner at which to commence the purge i.e., a hotplate burner.
- Ensure the area is well ventilated, and free from ignition sources.
- Ensure branches that do not have an appliance connected are fitted with a plug or cap.
- Turn on one burner control valve until the presence of gas is detected. A change in the audible tone and smell is a good indication that gas is at the burner. Let the gas flow for a few seconds longer, then turn off and allow sufficient time for any accumulated gas to disperse.
- Turn on one gas control valve again and keep a continuous flame at the burner until the gas is alight and the flame is stable.

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- Continue to purge until gas is available at other appliances.

17.0 **INSTALLATION OF METERS**

The work in this section includes :

17.1 Installation of domestic and non-domestic /small commercial meters with associated inlet and outlet connections (GI/Brass fitting), on the wall with approved meter brackets and angles.

17.2 Supply of approved meter brackets and angle brackets, properly painted with one coat of Zinc primer and two coats of synthetic enamel paint of approved make. A sketch of the brackets is enclosed herewith. It is required that one sample of each type of bracket is got approved beforehand.

17.3 Firmly securing the meters on the wall with good quality supply of proper rowel plugs, screws etc. In case the rowel plugs are not holding than wooden blocks or other fixing arrangements like cement etc. to be used for proper grouting.

17.4 The same rates of respective SOR Item will apply irrespective of whether the meter is situated inside or outside the property. Where a bank of meters is constructed the rate shall be for each complete meter installed.

17.5 The above activities along with restoration of the area to original shall be carried out to the complete satisfaction of consumer and EIC.

17.6 The meter installation will be preferred in open/ventilated space so as to prevent Gas accumulation and easy dispensation of Gas to atmosphere in case of any smell/ leakage of Gas. The meter installation will not be provided in any fixed enclosures, cabinets (below or above the slab)or confined space in the customer premises.

17.7 The contractor shall ensure that GI installation and rubber hose shall not be exposed to direct heat of Gas burners. The installation should have minimum clearance of about 1m from electric [point mains and switches. Minimum distance between appliance valve and Gas Burners shall be 0.3 meters. The isolation valve shall be installed after entering the customer premises /kitchen but before the meter installation.

18.0 PAINTING OF GI PIPES

The entire length of the pipeline along with fittings and clamps are to be painted after proper surface preparation and painting as follows.

- One coat of Primer application (Appropriate Zinc based primer)
- Two coats of synthetic enamel paint – canary yellow of minimum of 30 microns per coat of reputed make like Asian, Berger, Nerolac.

All painting materials including primers and thinners brought to site by contractor for application shall be procured directly from manufacturers/ dealers as per specifications and shall be accompanied by manufacturer's test certificates. Paint formulations without

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certificates are not acceptable.

Engineer-in-Charge at his discretion, may call for tests for paint formulations. Contractor s hall arrange to have such tests performed including batch wise test of wet paints for physical & chemical analysis. All costs there shall be borne by the contractor.

The painting work shall be subject to inspection and certification by Engineer-in- Charge at all times.

After installation of the entire piping system, final touching shall be done to the satisfaction of EIC.

19.0 BOX FOR REGULATOR

Boxes will be supplied and installed outside for regulators after due approval of the sample. The boxes will be installed as per requirement and as per instructions of Client.

The box brackets are to tightly secured to the wall with good quality proper Rowel plugs, screws etc. Wooden blocks to be used in case rowel plugs, do not hold properly.

All the boxes shall be thoroughly cleaned, painted with approved colour code.

As the boxes are installed outside it is to be ensured that they are painted properly to avoid rusting / weathering.

A sketch of regulator box is enclosed herewith.

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20.0 CONVERSION OF DOMESTIC APPLIANCES

The work in this section includes,

a. The changing of nozzles and associated controls in accordance with manufactures instructions for both domestic and imported burners/ ovens/grills/hotplate.
b. The changing of old appliance connection hoses and nozzles and re-greasing taps as necessary.
c. The contractor has to supply all types of nozzles / jets required for all types of appliances including imported burners, Grills, Ovens, Cleaning and performing minor maintenance of appliances
d. Testing for gas escapes and the soundness and performance of the appliance.
e. Instructing the customer in the safe use of natural gas and for fixing of safety and conversion labels.
f. Contractor must attend the complaints regarding appliances till the total area is handed over to Client's operation and maintenance.
g. All consumables (Nozzles, greases etc.) are in contractor's scope. Changing or repairing of any items damaged during conversion.

It may be noted that the rates will apply to all appliance found in both domestic and commercial premises. The contractor will be required under the Rates to provide both Pin gauges and standard sized nozzles.

21.0 RESTORATION

Contractor has to restore the area where ever he has carried out drilling, clamping etc. to its original condition to the satisfaction of the consumer and to ensure no passage to the premises and seepage. If the work was carried out in Govt. Flats (PWD), contractor has to restore the area according to CPWD specifications. For government flats the contractor has to obtain a clearance certificate from the concerned authorities maintaining the flats, after completion of the work.

Where slabs and brick work are to be reinstated, the level of the compacted sub- base is to be adjusted according to the slab / block thickness. The slabs or brick work should be laid on moist bedding material, which should be graded sand, mortar or mortar mix. The slabs or brick work should be tapped into position.

The restored slabs or brick work should match the surrounding surface levels. Joint widths should match the existing conditions, and be filled with a dry or wet mix of mortar.

Wherever any items of the consumer is damaged / broken during working, the same will be made good or replaced to the total satisfaction of the consumer.

The contractor will be responsible for the maintenance of all restoration carried out, for

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the duration of the contract guarantee period.

The contractor is to ensure the restoration work is properly supervised, and that the material used is suitable for the purpose and proper. Where the required standards are not achieved the contractor will be required to replace the defective reinstatement work.

Note that Payment for GI /Copper piping will only be authorized on satisfactory restoration, and where the sites has been cleared of all surplus materials etc.,

22.0 SUBMISSION OF FINAL RECORDS

Contractor shall submit the following documents in three sets each:

a) Total list of houses & commercial establishments in the area allotted to him giving details of connections provided & reasons where connection could not be given / completed.
b) The details recorded in measurement cards of every domestic house.
c) Details of houses where extra piping done along with materials used.
d) Total material consumption report.
e) Material reconciliation with respect to the materials issued.
f) Test reports & test certificates of gauges etc.
g) Any other documents / records required.

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TECHNICAL SPECIFICATION

FOR HDPE

PIPES

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Date: 2026.01.08 19:30:02 IST

Contents

Sl. No.	Description
1.0	INTENT OF SPECIFICATION
2.0	SCOPE OF WORK
3.0	INSTRUCTION TO THE TENDERER

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1.0 **INTENT OF SPECIFICATION**

The intent of this specification is to establish minimum requirements to manufacture and supply of HDPE Pipes used for casing purpose of carrier pipe, supplying natural gas.

2.0 **SCOPE OF WORK**

2.1 The scope of the tenderer will include manufacture/ supply, inspection/ testing/ marking/ packaging/ handling and dispatch of HDPE Pipes of ratings and grades as indicated in the Material Requisition & Schedule of Rates, as per IS:4984 (Specification for HDPE Pipes for water supply).

2.2 All codes and standards for manufacture, testing, inspection etc. shall be of latest edition.

2.3 Purchaser reserves the right to delete or order additional quantities during execution of order, based on unit rates and other terms & conditions in the original order.

3.0 **INSTRUCTION OF TENDERER**

3.1 Length of the Pipes and their supply will be as per following :-

- DN 50 – In each coils of 100 mtrs. Length
- DN 75 – Each pipe of 12 mtrs. length minimum
- DN 90 – Each pipe of 12 mtrs. length minimum
- DN 110 – Each pipe of 12 mtrs. length minimum
- DN 250 – Each pipe of 12 mtrs. length minimum
- DN 315 – Each pipe of 12 mtrs. length minimum

3.2 Protection

i) The ends shall be protected by proper end caps to prevent from shocks and ingress of the foreign body.

ii) Coils shall be covered by black PVC/ PE Film to prevent exposure to direct sun light.

3.3 The successful bidder shall submit following for approval of Purchaser/ Consultant after placement of order

a) The Quality Assurance Plan (QAP & Sampling Plan)

b) Material test report as per clause 5 of IS:4984.

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c) Performance Requirements (clause 8 of IS:4984)

d) Type Test (clause 9.1 of IS:4984).

3.4 The bidder shall submit following documents at the time of bidding, a) BIS Certification

b) List of current orders in hand for similar items with full details such as specification, name of purchaser etc.

c) Details of the largest supply executed

d) Name and address of proposed test laboratories along with their credentials/ past records for carrying out all required tests.

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TECHNICAL SPECIFICATION
FOR

MEDIUM DENSITY POLYETHYLENE FITTINGS AND ELECTRO-FUSION

FOR

NATURAL GAS DISTRIBUTION

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C O N T E N T S

Sl. No.	Description
1.0	SCOPE AND FIELD OF APPLICATION
2.0	EQUIPMENT
3.0	SYMBOLS & DEFINITIONS
4.0	DESIGNATION
5.0	DESIGN
6.0	ELECTRICAL CHARACTERISTICS
7.0	DIMENSIONAL
8.0	PERFORMANCE REQUIREMENTS
9.0	MARKING
10.0	PACKAGING

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1.0 SCOPE AND FIELD OF APPLICATION

This specification elaborates the requirements for Electrofusion fittings in

the nominal size range 16 to 125 mm made from PE compound used with PE pipes for supply of natural gas and to be used at operating temperature not more than 40°C.

The material grades to be used are PE 100. The fittings shall be yellow or black in colour.

Electro Fusion Fitting Jointing

1.1 For Electro Fusion fitting jointing an electrical resistance element is

incorporated in the socket of fitting which when connected to an appropriate power supply, melts and fuses the materials of the pipe and fitting together.

1.2 The effectiveness of this technique depends on attention to the preparation of the jointing surfaces, in particular the removal of the

oxidized surface of the pipe over the socket depth and ensuring the jointing surface are clean. If ovality causes gap between concentrically located pipe and the fitting to exceed 1% of the pipe OD after re-rounding to ensure correct welding. If the gap still exceeds 1% of the pipe OD after re- rounding then a check should be made of the pipe OD dimensions to determine if it meets specification.

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1.3 The maximum gap between eccentrically located pipe and fitting i.e. pipe touching fitting at one point must not exceed 2% of the pipe OD.

1.4 Sometimes coiled pipes may be too oval to fit into couplers, or the end of the pipe may make the alignment of the ends impossible. In such circumstances the use of a mechanical pipe straightener or rounding tool is necessary.

2.0 EQUIPMENT

2.1 The control box 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 box are to include safety devices to prevent excessive voltages being present at the control box output. The safety devices 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 to trench.

A mechanical pipe surface preparation tool is to be used before fusion is attempted. The tool is capable of removing the oxidized surface of the pipe in excess of the insertion depth. The tool is to remove a layer of surface material 0.2-0.4 mm thick form outer surface of the pipe preferably in a continuous strip of swarf over that length and round of the pipe.
Pipe clamps for rest raining, aligning and re-rounding the pipes in the fusion process are to be used.

Pipe cutters with saw and saw guide

Protection against adverse weather conditions.

2.2 Electro Fusion Jointing Method / Procedure Preparation

- Ensure there is sufficient space permit access to the jointing area . In a trench a minimum clearance of 150 mm is required.
- Check that the pipe ends to be jointed are cut square to the axis of the pipe and any burrs removed.
- Wipe pipe ends clean lint free material to remove traces of dirt or mud
- Mark the area over which the oxidized pipe surface is to be removed I.e. by placing the socket of the bagged fitting along side 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 similar.

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Note that the fitting should not be removed from the packaging at this stage.

- Connect the electro fusion control box input leads to the generator
- Check that the reset stop button, if fitted on the control box is in the correct mode.

- Check that reset stop button if fitted on the control box is in the correct mode
- Using the pipe end preparation tool, remove the entire surface of the pipe uniformly, preferably in continuous swarf over the area identified. i.e. in excess of insertion depth.

- 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.

Note that the prepared pipe surface should not be touched by hand.

- Remove the fitting from its packing and clean the scrapped area of the pipe surface and the bore of the fitting with a disposable wipe impregnated with Iso-propanol / Acetone. Ensure the prepared surfaces are completely dry before proceeding.

Note that while Iso-propanol is a suitable cleaner , its use is subject to local health and safety regulation.

Check that the pipe clamps are of the correct size for the pipes to be jointed .
Insert the pipe ends into the fitting so that they are in contact with centre stop
Using the pipe clamps, secure the pipes so that they cannot move during the fusion cycle.
Check that the pipes ends and the fitting are correctly aligned.

Connect the control box and check that they have been fully inserted.
If required by the control box enter the fusion jointing time into the control box timer. The join ting time is indicated on the fitting. Check the correct time as shown on the control box display.

Note 1: Automatic control box are available which obviate the need to enter the fusion time
Note 2: Gloves and goggles should be worn during the fusion process
Note 3: 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.

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2.3 **Records**: Records of appropriate servicing and calibration shall be kept.

2.4 **Training**: It is necessary that operators , inspection and supervisory personnel acquire the skills o f Electro-fusion fitting .The necessary training should be carried out by 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 joints from pipes and fittings of different sizes
- Inspect for and identify joints of acceptable

Note that some form of assessment and certification should be associated with the training . The certificate should detail the pipe and fitting size range and the equipment used. A register of successful participants should be kept.

2.5 Electro-Fusion Saddle Jointing

For Electro Fusion fitting jointing an electrical resistance element is incorporated in the socket of fitting which when connected to a n appropriate power supply, melts and fuses the materials of the pipe and fitting together.

The effectiveness of this technique depends on attention to the preparation of the jointing surfaces, in particular the removal of the oxidized surface of the pipe over the socket depth and ensuring the jointing surface are clean.

Method of holding the tapping tee saddle during the fusion cycle are used namely top loading and under clamping space around the pipe. In a trench a minimum clearance of 150 mm is required.

2.6 Electro-Fusion Saddle Jointing Method / Procedure.

Preparation

Expose the pipe onto which the taping tee is to be assembled , ensuring there is sufficient clear s pace around the pipe . In a trench a minimum clearance of 150mm is required.

Clean the pipe over the general area on which the saddle is to be assembled using clean , disposable lint free material .

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Without removing the fitting from its packaging , place over the required position on the main . Mark the pipe surface all around and clear of the saddle base area using a felt tip pen or similar.

Remove the surface of the pipe to a depth of 0.2 to 0.4mm over the full area marked using a suitable tool, remove the swarf.

Connect the electro fusion control box input leads to the generator .
Check that the reset stop button, if fitted on the control box is in the correct mode.

Check that reset stop button if fitted on the control box is in the correct mode. Remove the fitting

from its packing and clean the scrapped area of the pipe
surface and the bore of the fitting with a disposable wipe impregnated with Iso-propanol / Acetone. Ensure the prepared surfaces are completely dry before proceeding

Note that while Iso-propanol is a suitable cleaner , its use is subject to local health and safety regulation.

Position the fitting base onto the prepared pipes surface , and bring the lower saddle into position then gradually and evenly tighten the nuts until the upper saddle makes firm contact with scrapped pipe.

Check that there is sufficient fuel for the generator to complete the joint . Start the generator and check that it is functioning correctly

Switch on the control box if applicable

Connect the control box output leads to the fitting terminals and check that have they have been fully inserted.
If required by the control box enter the fusion jointing time into the control box timer. The jointing time is indicated on the fitting . Check the correct time as shown on the control box display.

Note 1 : Automatic control box are available which obviate the ne ed to enter the fusion time
Note 2 : Gloves and goggles should be worn during the fusion process

Press the start button on the control box and check that the heating cycle is proceedings as indicated on the display.

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On completion of the heating cycle , the melt indicators where incorporated should have risen . If there is no apparent move in the melt indicators a new saddle joint should be made. Cut the tee of the faulty joints from its base.

If a satisfactory joint has been made , the joint is to be left in the clamps for the cooling time specified on the fitting label or any the automatic control box

Note 3 : 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

The connection of the service pipe to the fitting outlet should be carried out in accordance with the procedure of the appropriate section of this item

Do Not attempt to tap the main with the integral cutter for at least 10 minutes after the completion of cooling cycle .

Records

Records of appropriate and calibration of electro fusion machines and joint shall be kept.

Trainings

AS PER 2.4

Note that some form of assessment and certification should be associated with the training. The certificate should detail the pipe and fitting size range and the equipment used. A register of successful participants should be kept.

2.7 STOPPING THE GAS FLOW

In the operation of a distribution system there is a periodic need to stop the gas flow for either routine or emergency maintenance. The flow may be s topped through the use of installed fitting such as valves. Where installed fittings are not available or the use of such would cause significant supply disruption, then one of the following methods may be employed.

2.8 SQUEEZE - OFF

a. To control the gas flow a special tool may be us ed to squeeze the pipe walls together. Hydraulic jacks are used to supply the nece ssary force to compress the pipe walls for sizes 90 mm and above.

b. As will be seen the squeeze-off equipment comprises two bars to apply pressure to outside of the pipe. The bars are 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.

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c. The hydraulic machines should have a spring return for the jack and 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.

d. 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 reduction in some pressure bearing properties.

e. A complete stop may not always be obtainable because of wrinkling of the inside of the pipe. If a complete stop is required than a second squeeze can be used, with an intermediate vent to remove the gas which passes the first squeeze from say the trench of three pipe diameters area. A second squeeze – off procedure should be a minimum of three pipe diameters and right angles to the squeeze.

f. 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 squeezing operation.

2.9 BENDING – BACK

Bending back of the pipe may be performed where the pipe has been served damaged and stopping they gas flow is imperative. Its application is of a temporary nature and will provide a relief until a permanent repair can be affected. The section of pipe, which has been bent back, will to be replaced because of the damage caused by the severeness of the band back operation. The need of any bend back operation is most likely to occur as a consequence of damage caused to a PE service pipe.

While it is not the prime function of a saddle tee , controlling the flow in the service may be achieved by opening upon an installed saddle tee and winding down the internal tapping tool to shut off the flow to the service pipe.

3. SYMBOLS & DEFINITIONS

3.1 Symbols for Electro fusion Fittings

3.1.1 Symbol for Electro Fusion Socket Fittings

The dimensions and main symbols used in this part of ISO 8085 are shown in figure 1, where

D1 is the mean inside diameter in the fusion zone comprising the mean inside diameter measured in a plane parallel to the plane of the mouth at a distance of L3 + 0.5 L2 from the plane at the mouth.

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D2 is the minimum bore comprising the minimum diameter of the flow channel through the body of the fitting.

L1 is the depth of penetration of the pipe or of the male end of a spigot fittings.

L2 is the nominal length of the fusion zone corresponding to the heated length.

L3 is the nominal unheated entrance length of the fitting comprising the distance between the mouth of the fittings and the near end of the fusion zone.

3.1.2. Symbol for Electro Fusion Tapping Tees

The main symbols used for tapping tees are shown in Figure 2, where. **h** is the height of the service pipe and comprising the distance between the axis of the main pipe and the axis of the service pipe.

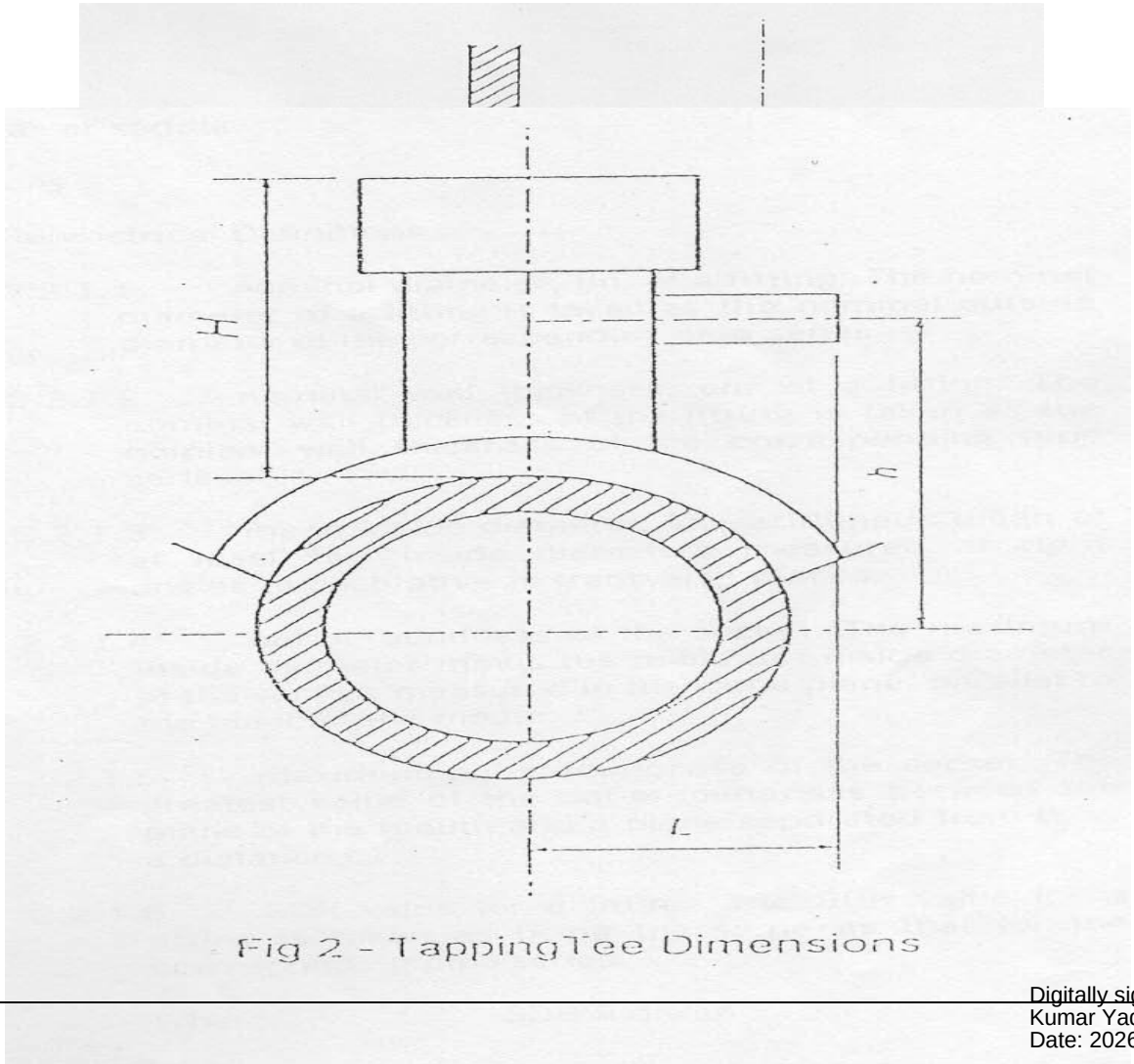


Fig 2 - Tapping Tee Dimensions

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L is the width of the tapping tee and comprising the distance between the axis of the main pipe and the plane of the mouth of the service pipe.

H is the height of the saddle which comprises the distance from the top of the main to the top of the tapping tee or saddle.

3.2 **Definitions**

3.2.1. Geometrical Definitions

3.2.1.1 Nominal diameter , DN, of a fitting:

The nominal diameter of a fitting is taken as the nominal outside diameter of the corresponding pipe series

3.2.1.2 Nominal wall thickness.en of a fitting:

The nominal wall thickness of the fittings is taken as the nominal wall thickness of the corresponding pipe series.

3.2.1.3 Meaninside diameter

The arithmetic mean of at least two inside diameter measured at right angles to each other in transverse planes.

3.2.1.4 Out of roundness of the socket

The maximum inside diameter minus the minimum inside diameter of the socket, measured in the same plane, parallel to the plane of the mouth.

3.2.1.5 Maximumout of roundness of the socket:

The greatest value of the out of roundness between the plane of the mouth and a plane separated from it by a distance L1.

3.2.1.6 SDRvalve for a fitting:

The SDR value for a fittings is taken as being the same as that for the corresponding pipe series.

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Where, SDR = dn/en

3.2.1.7 Wall thickness, E of a fitting:

The wall thickness of a fittings at any point of the body of the fitting which could be submitted to a stress inducted by the pressure of the gas in the piping system.

3.2.2 Material Definition

3.2.2.1 Virgin Material:

Materials in form such as granules or powder that has not been subjected to use or processing other than that required for its manufacturer and to which no re-processable or recyclable materials have been added.

3.2.2.2 Own Reprocessable Material

Material prepared from rejected unused pipes, fittings or valves, including trimmings from the production of pipes, fittings or valve, that will be reprocessed in a manufacturer's plant after having been previously processed by the same manufacturer by a process such as injection moulding or extrusion.

3.2.2.3 Compound:

A homogenous mix of base polymer (PE) and additives, i.e. antioxidants, pigments, UV-stabilisers and others, at a dosage level necessary for the processing and of components of this standards. The additives shall not have a negative influence on the performance with respect to feasibility. All additives shall be uniformly dispersed.

3.2.3 Definitionrelated to material characteristics

3.2.3.1 Lower Confidence Limit (LCL):

A quantity with the unit in mega Pascals (MPs), which can be considered as a property of the material representing the 97.5% lower confidence limit of the predicted long-term hydrostatic strength at a temperature 20° C for 50 years in water.

3.2.3.2 Overall Service (Design) Coefficient (C):

An overall coefficient with a value larger than 1.0 which takes into consideration service conditions as well properties of the components of a piping system other than those represented in lcl. For gas applications, C can have any value equal to or greater than 2.0.

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3.2.3.3 MinimumRequired Strength (MRS):

The value of the lcl rounded down to the next lower value of the R 10 series when the lcl is less than 10 Mpa, or t o the next lower value of the R 2 0 series when the lcl is greater than or equal to 10 Mpa.

Note: R10 and R 20 series are the Renard number series according the ISO 3 and ISO 497

3.2.3.4 Melt Mass Flow Rate:

A value relating to the viscosity of the molten material at a specified temperature and rate of shear.

3.2.4 Definitions Related To Service Conditions:

3.2.4.1 GaseousFuel:

Any fuel which is in the gaseous state at a temperature of + 15° C and a pressure of 1 bar.

3.2.4.2 MaximumOperating Pressure (MOP)

The maximum effective pressure of the gas in the piping system, expressed in bar, which is allowed in continuous use. It takes into account the physical and the mechanic characteristics of the components of a piping system.

Note : It is given by the equation : $MOP = \frac{20 * MRS}{C*(SDR-1)}$

3.2.5 Definition on Design of Electrofusion Fittings:

3.2.5.1 ElectroFusion Socket Fittings:

A polyethylene (PE) fittings which contains one or more integral heating elements, that are capable of transforming electrical energy into head to realize a fusion joint with a spigot – end or a pipe.

3.2.5.2 Electro Fusion Saddle Fittings:

A polyethylene (PE) fitting (top loading or wrap around) which contains one or more integral heating elements, that are capable of transforming electrical energy into head to

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realize a fusion joint onto a pipe.

3.2.5.3 Tapping Tee:

An Electrofusion saddle fitting which contains an integral cutter, to cut through the pipe wall. The cutter remains in the body of the saddle after installation.

3.2.5.4 BranchSaddle:

An Electrofusion saddle fitting which requires an ancillary cutting tool for drilling a hole in the adjoining main pipe.

3.2.5.5 U Regulation:

Control of the energy supplied during the fusion process of an Electrofusion fitting, by means of the voltage parameter.

3.2.5.6 I Regulation:

Control of the energy supplied, during the fusion process of an electrofusion fitting by means of the current parameter.

4. DESIGNATION

4.1 Fittings shall be designed according to the grade of material, nominal diameter and Standard Dimension Ratio (SDR).

4.2 **Grade of Material:**

4.2.1. Fittings shall be classified according to the grade of material as given in following table:

Table–1

Material	M.R.S. Mpa	1 cl (20° C, 50 Yrs 97.5%) Mpa	Maximum Allowable Operating Pressure
PE 80	8.0	8.00 ≤ 1 cl ≤ 9.99	5.5 Bar
PE 100	10.0	10.00 ≤ 1 cl ≤ 11.19	7.0 Bar

4.3 **Nominal Diameter**

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The Nominal Diameter for fittings covered in this standard are 16, 20, 25, 32, 40, 63, 75, 90, 110, 125 mm.

4.4 **Material**

4.4.1 Polyethylene Compound:

The Polyethylene compound used in the manufacture of fitting shall be a cadmium free compound. It shall be free from visible water, shall comply with the requirements as specified in Table – 2.

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Table-2 : Characteristics of PE Compound

Characteristics	Units	Requirements	Test Parameters	Test Method
Conventional Density	Kg/m^3	≥ 930 (base polymer)	23 °C	ISO 1183 - ISO 1872/1
Melt Mass-flow Rate	g/10 min	± 20% of value nominated by compound producer	190 °C condition 18	ISO 1133
Thermal Stability	Minutes	> 20	200 °C (2)	ISO TR 10837
Volatile Content at Extrusion	mg/kg	≤ 350		ISO 4437 Annex. A
Water Content (3)	mg/kg	≤ 300		ASTM D 4019
Carbon Black Content	% (m/m)	2,0 ≤.....≤ 2,5		ISO 6964
Carbon Black Dispersion (4)	Grade	≤ 3		ISO DIS 11420
Pigment Dispersion (5)	Grade	≤ 3		ISO DIS 13949
Resistance to Gas Constituents	h	≥ 20	80 °C 2 Mpa	ISO 4437 Annex. B
Resistance to rapid crack propagation (RCP) (6) Full Scale (FS) test : d ≥ 250mm	Mpa	The critical pressure in the FS test shall be greater than or equal to the value of the MOP of the system multiplied by 1:5	0°C	ISO DIS 13478
Or S4 Test : in principle according to all diameters (7)	Mpa	The critical pressure in the S4 test shall be equal to or greater than the value of the MOP of the system divided by 2,4 (8)	0°C	ISO DIS 13477
Resistance to slow crack growth en > 5mm	h	165	80 °C, 8,0 bar (f) (9) 80 °C, 9,2 bar (f) (10)	ISO DIS 13479

1) Non black compound shall conform to the weathering requirements to ISO 4437

2) Test may be carried out at 210°C providing that there is a clear correlation to the results at 200°C, in case of dispute the reference temperature shall be 200°C

3) Only applicable if the compound does not conform to the requirement for volatile content. In case of dispute the requirements for water content shall apply

4) Carbon black dispersion for black compounds only.

5) Pigment dispersion method for non-black compounds only.

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6) Only applicable for fittings which incorporate extruded pipe elements.

7) Shall be performed on pipe with a wall thickness of ≥15 mm.

8) This factor 2.4 is still under study and may be subject to change. If the requirement is not met, then retesting by using the Full Scale (FS) test shall be performed

9) Test parameter for PE 80.

10) Test parameter for PE 100.

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5.0 DESIGN

- Fittings shall be designed for system operation at the pressures given in Table – I
- Fittings shall be free from cracks, voids, blisters, distortion, dent or other defects.
- Fittings shall be capable of being fusion jointed to pipes using control boxes. The fittings shall exhibit the strengths and fusion compatibility with, pipes of respective sizes.
- Each fitting shall be bar coated and shall have a permanent fusion indicator.
- Heating coil design shall be such that it should not be damaged during assembly leading to short circuit of heating coil.

5.1 Electrofusion Socket Fittings

Electrofusion Socket Fittings shall incorporate a method of controlling pipe penetration within each socket. The inner cold zone of each socket shall not be less than (0.1 d + 5) mm for sizes upto 125 mm & 0.1 d for sizes greater than 125 mm.

5.2 Tapping Tees

Tapping tees shall be capable of installation by a force between 1 kN and 1.5 kN applied from above and on the centre line of the tapping tees stack. The tapping tees shall provide a means of cutting through the pressurised main pipe and allowing the gas flow into the outlet pipe.

5.3 Transition Pieces

To make connection between steel pipe and PE pipe specially fabricated transition pieces consisting of steel and PE pipes should conform to the requirements mentioned herein.

5.3.1 PE Pipe:

The PE pipe with one end plain should conform to the specification (IS:14885/ SDR 11)

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5.3.2 Steel Pipe

Black ERW steel pipe should conform to the specifications as laid in API STD 5L (latest revision)

5.3.2.1 **Pipe END**

One end of the pipe should be bevelled for welding angle of bevel should be 30° + 5°.

5.3.3 Jointing between steel and PE pipes:

Steel and PE pipes should be so jointed in the factory so as to have a monolithic joint which is leak free and should be mechanically as strong or stronger than the PE Pipe.

5.4 **Transition Fittings (PE Pipes to threaded G.I. Fitting):**

Transition fitting for jointing of PE Pipes confirming to specification IS:14855/ SDR 11 to threaded G.I. tubing confirming to specification. The PE end of the transition fitting shall be jointed with PE Pipe with the electrofusion method.

6.0 ELECTRICAL CHARACTERISTICS

For each size and type of fitting, the manufacturer shall declare the nominal resistance of the heating element and specify the production tolerances.

The manufacturer s hall demonstrate that satisfactory joint can be made using the extremes of these tolerances.
All fittings shall have mechanically shrouded maloelectrical terminals. The fittings terminals connections shall be suitable for use with voltage less than or equal to 48 volts. Considerations should be given to the design of the shroud with respect to impact damage. When hollow terminal pins are used, the hole at the top of the pin shall be less than 1 mm diameter. The terminal pin material shall be corrosion resistant and the surface finish shall be N7.

Fittings incorporation two electrofusion sockets shall have both sockets fused in a single operation.

The heating elements shall be suitable designed to prevent short circuiting or local overheating/ under heating during the fusion operation. Protective coating applied to the heating element shall not have a detrimental effect on the joint.

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The heating element wire shall not be disturbed during assembly.

7.0 DIMENSIONS

7.1 Measuring Temperature

Fittings shall not be measured within 24 hrs. of manufacturer to allow for normalization. The fittings shall be measured at an ambient temperature of
23 ± 2°C, after a conditioning period of 5 Hrs.

Methods of measurements shall provide the appropriate degree of accuracy, and the reference conditions specified in this clause 6 apply in case of disputes in dimensional measurement.

7.2 Dimensional Stability

7.2.1 Couplers(Including all form of socket fittings):

All coupler dimensions shall conform to their specified value when the fitting has been stored for a period of 12 months at a temperature of 30 ± 2°C.

7.2.2 Tapping Tees and Branch Saddles:

All tapping tee and branch saddle dimensions shall conform to their specified agreed values when the fitting has been stored for a period of 12 month at a temperature of 30 ± 2°C.

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TABLE 3: SOCKET DIMENSIONS

Pipe Size d mm	Limits for average diameter d on each fitting measured over apparent fusion length L mm		Apparent fusion length L mm	Penetration depth L mm
	Maximum	Minimum	Minimum	Maximum
16	16.6	16.4	15	41
20	20.6	20.4	16	41
25	25.6	25.4	18	41
32	32.9	32.5	18	41
40	41.0	40.6	18	49
50	51.1	50.7	20	55
55	56.1	55.7	21	63
63	64.1	63.7	23	63
75	76.3	75.9	25	70
90	91.5	91.1	28	79
110	111.3	111.1	32	82
125	126.7	126.2	35	87
140	141.7	141.2	38	92
160	162.1	161.4	42	98
180	182.1	181.5	46	105

Notes:

1. The apparent fusion length, L, is the length of the integral heating elements, from the first regular section of the element to the end of the regular section, on one side of the fitting. This dimension to be measured from outside edge to outside edge of wire.

2. Any protrusions into the bore of the fitting (e.g. centralization ribs) shall not prevent easy assembly in the field.

3. The overall length of a straight coupler is equal to twice the quoted maximum penetration depth L.

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TABLE 4: OVERALL LENGTH OF REDUCERS

Major Diameter mm	Maximum Length mm
25	90
32	90
63	120
90	180
125	215
180	280
200	245
225	260
250	280
280	300
315	320

TABLE 5: BRANCH SADDLE ASSEMBLY OUTLET LENGTH

Off-take Size mm	Shut-off method	Dimension from flange face to crown of main		Dimension from pipe end to crown of main	
		Class B fitting mm	Class B fitting mm	Class B fitting mm	Class B fitting mm
63	Valve	-	-	-	-
63	Squeeze	-	260*	-	-
90	Valve	-	-	400	-
90	Squeeze	400	180**	-	-
125	Valve	-	-	550	-
125	Squeeze	360	180***	-	-
180	Valve	-	-	750	-
180	Squeeze	360	180+	-	-
250	Valve	-	-	-	-
250	Squeeze	360	180++	-	-

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* Flange size DN 50
** Flange size DN 100
*** Flange size DN 150
\+ Flange size DN 250
++ Flange size DN 250

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8 PERFORMANCE REQUIREMENTS

8.1 Mechanical Characteristics

Fittings shall be tested using pipes, which conform to ISO 4437, T est samples shall be assembled in accordance with ISO DIS 11413, following the technical instruction of the manufacturer and using fusion equipment conforming ISO DIS 12176.2.

When tested in accordance with the test methods as specified in table – 6 using the indicated parameters, the fittings have mechanical characteristics confirming to the requirements given in Table 6.

TABLE 6: MECHANICAL PROPERTIES

Characteristics	Units	Requirements I	Test	Parameters	Test Method
Hydrostatic strength at 20°C	H	Failure time ≥ 100	End caps orientation conditioning time. Type of test circumferential (hoop) stress pipe PE 80, PE 100, Test temperature.	Type a) free 1 h 9 Mpa, 12.4 Mpa, 20°C	ISO DIS 9356
Hydrostatic strength at 80°C	H	Failure time ≥ 165	End caps orientation conditioning time. Type of test circumferential (hoop) stress pipe PE 80, PE 100, Test temperature.	Type a) free 12 h water-in-water 4.6 Mpa 5.5 Mpa 80°C	ISO DIS 9356
Hydrostatic strength at 80°C	H	Failure time ≥ 1000	End caps orientation conditioning time. Type of test circumferential (hoop) stress pipe PE 80, PE 100, Test temperature.	Type a) free 12 h water-in-water 4 Mpa, 5 Mpa, 80°C	ISO DIS 9356
Cohesive resistance	mm	Length of initiation of brittle fracture L/3	Test temperature choice of method	23°C	ISO 13954 (A) ISO 13955 (A) ISO 13956 (B)
Impact strength (B)		No failure No leakage	Test temperature Falling height Mass of the striker	20°C 23°C 5m 5kg	ISO DIS 13957

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Characteristics	Units	Requirements I	Test	Parameters	Test Method
Pressure drop (B)	M^3/h	0.5 mbar : dn ≤ 63 0.1 mbar : dn^2 > 63	Air flow rate Test medium Test pressure	Indicated by the manufacturer Air source 25 mbar	PrEN 12117

(A) Electrofusion Socket Fittings
(B) Tapping Tees

For hydrostatic strength test at 80°C only brittle failure shall be taken into account. If ductile failure occurs before the re quired time, a lower st ress shall be selected and the minimum test time will be obtained from the line through the stress/ time points given in Table – 7.

TABLE 7
Hydrostatic strength (80°C) – Stress/ Minimum Failure Time Correlation

PE-80		PE-100	
Stress Mpa	Minimum Failure Time h	Stress Mpa	Minimum Failures Time h
4.6	165	5.5	165
4.5	219	5.4	233
4.4	293	5.3	332
4.3	394	5.2	476
4.2	533	5.1	688
4.1	727	5.0	1000
4.0	100	-	-

8.2 **Physical Characteristics**

When tested in accordance with the test methods as s pecified in Table 8 using the indicated parameters, the fittings shall have physical characteristics conforming to the requirements given in Table 8.

TABLE 8 : Physical Characteristics of Fittings

Property	Units	Requirements	Test Parameters	Test Method

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Thermal Stability	Minutes	> 20	200 °C (1)	ISO TR 10837

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Property	Units	Requirements	Test Parameters	Test Method
Melt Mass-flow Rate (MFR)	g/10 min	0.2 ≤ MFR ≤ 1.4 and after processing maximum deviation of ± 20% of the value measured on the batch compound	Condition 18	ISO 4440.1

(1) Test may be carried out at 210 °C providing that there is a clear correlation to the results at 200 °C, in case of dispute the reference temperature shall be 200 °C.

8.3 **Technical File**

The manufacturer of the fittings shall make availability of a technical file (generally confidential) with all relevant data to prove the conformity of the fittings to this specification. It shall include all results of the type testing and shall conform to the specification relevant technical brochure (e.g. ISO
12093 for electro fusion fittings).

The technical description of the manufacturer shall include the following information:

1. Field of appliance (pipe and fitting temperature limits SDR's and out of roundness):
2. Assembly instructions:
3. Fusion instruction (fusion parameters with limits)
4. For saddles and tapping tee:

   - The means of attachment (tools and/ or under clamp).
   - The need to maintain the under clamp in position in order to ensure the performances of the assembly.

For electrofusion fitting, the format of the technical brochure shall conform to ISO DIS 12093.

In the event of modification of the fusion parameters, the manufacturer shall ensure that the joint conforms to this standard.

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9. MARKING

Following information shall be embossed upto height of 0.15 mm onto the fitting and also in the form of bar code:

a) The manufacturer's identity
b) The size of the fitting in mm
c) Material and Designation
d) The date of manufacturer (code may be used)
e) Fusion time in seconds
f) Cooling time in minutes
g) Fusion parameters in BAR code
h) Lot Number.

The information may be printed on a label associated with the fitting.

10 . PACKING

The fittings shall be packaged in bulk or individually protected where necessary in order to prevent deterioration. Whenever possible, they shall be placed in airtight plastic bags in card board boxes or cartons.

The cartons and/or individual bags shall bear at least one label with the manufacturer's name, date of manufacturer, type and dimensions of the part, number of units in the box, and any special storage conditions and storage time limits.

Note:

All the fittings required shall be bar coded electrofusion fitting type. In case bidder is quoting for spigot fittings, the necessary electrofusion coupler for all non-electrofusion ends shall be included in the complete package

The transition fittings shall also be bar coded electrofusion type for PE connection, NPT Female threading confirming to ANSI B 20.1 for G.I connection & butt welded for carbon steel end.

The carbon steel material of transition fittings shall be confirming to APL 5L x 42 and thickness shall be of 4.8 mm.

All the fittings shall be used for the network operating at 4.0 Bar(g) Pressure.

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TECHNICAL SPECIFICATION

FOR POLYETHYLENE

PIPES

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C O N T E N T S

Sl.No.	Description
1.0	INTENT OF SPECIFICATION
2.0	INSTRUCTION TO THE TENDERER

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1.0 **INTENT OF SPECIFICATION**

The intent of this specification is to establish minimum requirements to manufacture and supply of Polyethylene Pipes used for supply of natural gas.

2.0 **INSTRUCTION TO THE TENDERER**

2.1 The PE pipes are to be supplied as per IS:14885.

2.2 The length of the Pipes and their supply will be as per following :-

- 20mm OD – In each Coils of 100 mtrs. length
- 32mm OD – In each Coils of 100 mtrs. length
- 63mm OD – In each Coils of 100 mtrs. Length
- 90mm OD – In each Coils of 50 mtrs, Length
- 125mm OD – In each Coils of 12 mtrs. length

2.3 **PROTECTION**

i) The ends shall be protected by proper end caps to prevent from shocks and ingress of the foreign body.

ii) Coils shall be covered by black PVC/ PE Film to prevent exposure to direct sun light.

2.4 The successful bidder shall submit following for approval of Purchaser/ Consultant after placement of order

a) The Quality Assurance Plan (QAP & Sampling Plan)

b) Certified test result of PE Compound (clause 5 of IS:14885)

c) Performance Requirements (clause 8 of IS:14885)

d) Type Test (clause 9.1.2 of IS:14885).

2.5 The bidder shall submit following documents at the time of bidding,

a) BIS/ ISO Certification if obtained already, or documentary evidence of applying

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for the same

b) List of current orders in hand for similar items with full details such as specification, name of purchaser etc.

c) Details of the largest supply executed

d) Name and address of proposed test laboratories alongwith their credentials/ past records for carrying out all required tests.

e) The names of standards/ codes being followed in manufacture and supply

f) Any accreditation certificates obtained or applied for.

2.6 **MARKING**

The pipe shall be marked in continues length in addition to the requirement of the applicable code.

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TECHNICAL SPECIFICATION

FOR

ISOLATION VALVES

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Item	:	PE BALL VALVE
Application	:	Natural Gas Distribution Services
Code	:	ASME B16.40 **/** EN 1555-4
Rating	:	PE100 SDR 11
Operating Pressure	:	6 bar (g)
Operating Temperature	:	0°C to 60°C
End Connection	:	PE materials (Spigot Type)
Stem Extension	:	Not Required
Valve Design	:	Full Bore
Ball position Indicator	**:**	Open/Close Limits required

INSPECTION / DOCUMENT

i) Inspection shall be carried out as per client/consultant's approved Inspection Plan / QAP.

ii) Third party inspection agency appointed by vendor on prior approval of owner shall carry out stage wise inspection during manufacturing / final inspection.

iii) Vendor shall furnish all the material test certificates, proof of approval /license from specified authority as per specified standard, if relevant, internal test / inspection reports as per owner Technical Specification and specified code for 100% material, at the time of final inspection of each supply lot of material.

PACKING

Packing size to be mentioned to ensure uniformity in delivery condition of the material being procured. Bidder shall submit the packaging details during QAP and also compiled with at the time delivery.

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TECHNICAL SPECIFICATION

FOR

GI PIPES

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TECHNICAL SPECIFICATION FOR GI PIPES

Service	:	Natural Gas
Working Pressure	:	4 bar (g)
Hydrostatic Test Pressure	:	6 bar (g)
Working Temperature	:	0°C to 50°C
Material Description	:	IS:1239 (Part-I) Heavy Duty, Continuous Welded
Min. Tensile Strength	:	30 kgf/sq.mm
Min. Elongation	:	6%
Tolerance	:	+ Not limited, - 10%
Protective Coating	:	Galvanised uniformly to protect from corrosion as per IS:4736/ ASTM A53 or by Electro Galvanising
Ends of Pipes	:	Plain End
Inspection	:	Inspection shall be carried out as per applicable code & approved QAP and 100% Pressure Testing shall be carried out at factory.

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1.0 **GENERAL NOTES**

1.1 All pipes and their dimensions, tolerance, chemical composition, physical properties, heat treatment, hydrotest and other testing and marking shall conform to the codes and standards.

1.2 Material test certificates (physical property chemical composition & heat treatment report) shall also be furnished for the pipes supplied.

1.3 All pipes shall be supplied with length between 5 to 7 mtr but average length of pipes supplied shall not be less than 6 meter. Overall length tolerance shall be (–) zero and (+) one length to complete the ordered quantity.

1.3 Pipes shall be galvanised uniformly to protect from corrosion as per IS:4736 / ASTM A53 or by electro galvanising.

2.0 **MARKING AND DESPATCH**

2.1 All pipes shall be marked in accordance with the IS 1239 codes, standards and specifications.

2.2 Paint or ink for marking shall not contain any harmful metal or metallic salts, such as zinc lead or copper which causes corrosive attack in heat.

2.3 Pipes shall be dry, clean and free from moisture, dirt and loose foreign materials of any kind.

2.4 Pipes shall be protected from rust, corrosion and mechanical damage during transportation, shipment and storage.

2.5 Both ends of the pipe shall be protected with the following material.

Plain End	:	Plastic Cap
Bevel End	:	Wood, Metal or Plastic Cover
Threaded End	:	Metal or Plastic Threaded Cap

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TECHNICAL SPECIFICATION

FOR

COPPER TUBES

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STANDARD TECHNICAL SPECIFICATION FOR SEAMLESS ROUND COPPER TUBES

SPECIFICATION NO.: 020

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AMENDMENT STATUS

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1.0 SCOPE

This specification covers the requirements for Seamless Round Copper Tubes. Specific requirement of Copper Tubes shall be 12 mm OD X 0.6 mm WT, Half Hard, with Physical properties to ensure wrinkle free bend-ability. Unless modified by this specification, requirement of BS EN 1057:2006 shall prevail.

2.0 MATERIAL

The material used for the manufacturer of Copper tube shall conform to BS EN 1057:2006, Grade Cu – DHP or CW024A or ASTM C 12200.

Each lot of copper tubes shall be tested in accordance with BS EN: 1057 to ensure the following properties.

a. Mechanical Properties:

i. Ultimate Tensile Strength – 250 N/ sq.mm (min)

ii. Elongation – 30% (min)

iii. Hardness - 75 to 100 on HV scale.

b. Chemical Properties:

Copper Percentage including silver (Cu+Ag): Min 99.9%

Phosphorus Percentage (P): 0.015 to 0.040%

3.0 DIMENSIONAL TOLERANCES:

The me an Outside Diameter of the tube shall not vary from the specified outside diameter of 12 mm by more than ±0.0 9 mm. And also wall thickness of the tube shall not vary by more than ±0.06 mm of specified wall thickness of 0.6 mm.

Copper Tubes shall be supplied in cut lengths of 3.0m

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4.0 PROCESS OF MANUFACTURE:

The tubes shall be so lid drawn by the process of melting, extrusion and thereafter Bright annealing. The ends shall be cut clean & square with the axis of the tube in no case shall tubes be redrawn from old or used tubes.

5.0 INSPECTION AND TESTING:

Inspection shall be carried out as per design codes/standards, Technical Specification and Inspection Plan/ Vendor's detailed QAP duly approved by owner/owner's representative.

Even after third party inspection, Client reserves the right to select a sample of tube randomly from each manufacturing batch and have these independently tested. If the results of these tests fall outside the limits specified in Technical specification, then client reserves the rights to reject all production supplied from the batch.

a. FREEDOM FROM DEFECT TEST

The tubes shall be free from internal & external fins, flaws, skin defects, blow holes etc. or other irregularities which might restrict the free flow of fluid and shall be so designed that resistance to the flow of fluid through the tubes is minimized.

All the tubes shall be subject to one the following tests:

i) **Eddy Current Test:** Tubes shall be Eddy Current tested as per Annex. C of BS EN 1057 an d ASTM E243. Eddy Current testing is a computer aided test, wherein the tube passes through a probe & an electro- magnetic field is created around the peripheral of the tube to detect any flaw or blow hole which may not be visible to the naked eye. The manufacturer must have in-house Eddy Current testing facilities to supply to IGL . IGL reserve s th e right to witness the Eddy Current facility at the manufacturer's factory premises

ii) **Hydrostatic Test:** Hydrostatic test shall be carried out minimum 35 bar pressure for a period of 10 second as per BS EN 1057.

iii) **Pneumatic Test:** The tube under test shall be connected to pressurized air. Air pressure of 4 bar shall be maintained in the tube. The tube shall be completely immersed in water for a minimum period of 10 sec. and inspected for the issue of bubbles from the tube. Tube shall be rejected in case of occurrence of bubble, otherwise accepted.

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b. CARBON CONTENT TEST

Copper tubes to be tested for carbon con tent test to ensure a car bon level to avoid the formation of carbon film during installation. Max. Carbon level shall be permitted a s per Table-6 of BS EN 1057. Test shall be carried out as per reference method described in EN 723.

Sampling frequency shall be at least one sample per 5 Km of tube length. However, for small order quantities/ each batch of production, at least one sample shall be drawn.

c. CARBON FILM TEST

The detection and assessment of carbon film shall be carried out as per Annex. B of BS EN 1057. Sampling for this test shall be same as that for 5.0 (b) of this specification.

6.0 RETEST:

In case a sample fails to meet the test requirements of this specification, the whole batch of production represented by the sample shall be kept aside for further test.

Four times the number of samples as sampling criteria defined in 5. 0 (b) shall be taken from that batch for the specific test, for which the earlier sample failed, for further testing. If any of these samples fail to meet the test requirements, whole batch shall be rejected. And if, all the samples pass the test, that batch of production shall be accepted.

7.0 MARKING:

Each tube shall be permanently marked every meter with Client's Logo, manufactures name, size (ODXWT) and specification (BS EN 1057) of the tube.

Each packing containing tubes shall carry the following, stamped or writ ten in indelible ink.

a) Manufacturers name or trade mark ,
b) Designation of tubes (OD x wall thk)
c) Lot number.
d) No. of the standard (EN 1057)

8.0 PACKAGING:

Packing size shall be ensure d for uniformity in de livery conditions of the material being procured. Packing size shall be approved by owner / owner's representative before packing the material. The vendor shall submit the packaging details during QAP and also complied with at the time of delivery.

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9.0 DOCUMENTATION:

(i) Vendor shall furnish all the material test certificates, proof of approval/ license from specified authority as per specified standard, if relevant, internal test/ inspection reports as per Technical Specification, at the time of final inspection of each supply lot of material.

(ii) Vendor shall prepare and submit the detail drawings of required Copper Tubes and QAP for approval by Client/ consultant before starting production.

(iii) For any control test or examination required under the supervision of TPIA/owner/owner's representative, latter shall be informed in writing one (1) week in advance by vender about inspection date & place along with production schedule.

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			QAP Copper Tubes			QAP NO. S020/QAP Sheet 1			
						INSPECTION			
Sr. No.	INSPECTION AND TESTING	QUANTUM OF CHECK	PROCEDURE	ACCEPTANCE CRITERIA AND CERTIFICATE	FORMAT OF RECORD	Vendor	TPIA	PMC/ Owner	REMARKS
1	Metallic materials (Chemical & Physical Requirements- Composition, Tensile & Hardness)	As per Sampling Plan in TS	As per BS EN 1057:2007	Clause 2.0 (a) & (b) of Technical Specification	Material Test certificate type 3.1	P	W	R	
2	Freedom From Defects Test One of the following three tests shall be performed :								
2.1	Eddy Current Test	100%	As per BS EN 1057:2007 and Technical Specification	As per BS EN 1057:2007 and Technical Specification	INSPECTION TEST REPORT	P	W	R	
2.2	Hydrostatic Test	100%	As per BS EN 1057:2007 and Technical Specification	As per BS EN 1057:2007 and Technical Specification	INSPECTION TEST REPORT	P	W	R	
2.3	Pneumatic Test	100%	As per BS EN 1057:2007 and Technical Specification	As per BS EN 1057:2007 and Technical Specification	INSPECTION TEST REPORT	P	W	R	
3	Surface Quality Test One of the following two tests shall be performed :								
3.1	Carbon Content Test	As per Sampling Plan in TS	As per BS EN 1057:2007 and Technical Specification	As per BS EN 1057:2007 and Technical Specification	INSPECTION TEST REPORT	P	W	R	
3.2	Carbon Film Test	As per Sampling Plan in TS	As per BS EN 1057:2007 and Technical Specification	As per BS EN 1057:2007 and Technical Specification	INSPECTION TEST REPORT	P	W	R	
4	Visual	1%	--	As per BS EN 1057:2007 and Technical Specification	--	P	W	R	
5	Dimensional	1%	--	As per BS EN 1057:2007 and Technical Specification	--	P	W	R	
6	Marking	100%	As per Technical Specification		INSPECTION TEST REPORT	P	W	R	
7	Packaging		As per Technical Specification		INSPECTION TEST REPORT	P	R	R	
8	Final Documentation		Document pertaining to all tests specified in this QAP	Document pertaining to all tests specified in this QAP	EN 10204 3.1 Certificate	P	H	H	

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LEGENDS: R - REVIEW, W - Witness, H-Hold, P - Perform, TPIA -
Third Party Agency (Owner / Owner's Representative)

Note:-

1. The Above Testing and acceptance criteria are minimum requirements, however, manufacturer shall ensure that the product shall also comply to the additional requirements as per TS and Design Standard.
2. The supplier shall submit their own details ITP prepared on the basis of above/ Technical specification for approval of Owner/Owner's representative.
3. Owner/Owner representative shall review/approve all the documents related to ITP/Quality manuals/Drawings etc. submitted by supplier.
4. Contractor shall in coordination with Supplier/Sub vendor issue detailed Production and Inspection schedule indicating the dates and the location to facilitate Owner/Owner's representative and TPIA to organize Inspection.
6. Owner / Owner's representative including TPIA will have to right to inspect any activity of manufacturing at any time
7. All reference Codes/ Standards, Documents. P.O. Copies shall be arranged by vendor / Supplier for reference of TPIA/PMC/OWNER at the time of Inspection
8. At the time of delivery of material in stores, vendor will submit copy of all related document of inspection along with release note & MTC.

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TECHNICAL SPECIFICATION

FOR

GI FITTINGS

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Date: 2026.01.08 19:30:02 IST

STANDARD TECHNICAL SPECIFICATION FOR GI FITTINGS

SPECIFICATION NO.: 045

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1.0 SCOPE

This specification covers the requirements for Malleable Cast Iron Fittings. Unless modified by this specification, requirements of IS 1879 – latest edition shall be valid.

2.0 MATERIAL

The material used for the manufacturing of GI fittings shall conform to IS 14329 –
1995 with latest amendments Grade BM 300. Relevant test certificates conforming to all the test agreements of IS 14329 shall be provided with fittings.

3.0 DIMENSIONS AND DIMENSIONAL TOLERANCES

1. Dimensions of various types of fittings shall be as specified in sections 2 to 10 of IS 1879 – 1987 with latest amendments, as applicable.

2. Wall thickness of fittings and tolerances on them shall be as given in Table 1.2 of IS 1879 – 1987 with latest amendments,

3. In case of reducing fittings, the dimensions at each outlet shall be those appropriate to the nominal size of the outlet.

4. All GI fittings shall be of reinforced type. Reinforcement shall be provided as per Table 1.2 of IS: 1879.

4.0 WEIGHT

Weights of various types of fittings shall be as specified in sections 2 to 10 of IS 1879 – 1987 with latest amendments, as applicable.

5.0 THREADS

1. Threads shall be NPT type and conforming to ASME B1.20.1.

2. Outlets of fittings shall be threaded to dimensions & the tolerances as specified in ASME B1.20.1.

3. All internal & external threads shall be tapered.

4. For checking conformity of threads gauging practice in accordance with ASME B1.20.1 shall be followed.

5. Chamfering: The outlet of fittings shall have chamfer.

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6.0 FREEDOM FROM DEFECTS

On visual examination, the outside & inside surfaces of fittings shall be smooth & free from any defects such as cracks, injurious flaws, fine sand depth etc.

7.0 GALVANIZING

i. Fittings shall be galvanized to meet the requirement of IS: 4759 with latest amendments.

ii. Zinc conforming to any grade specified in IS: 13229-1991 with latest amendments shall be used for the purpose of galvanizing.

iii. Galvanizing bath: The molten metal in the galvanizing bath shall contain not less than 98.5% by mass of zinc.

iv. Coating requirements: Mass of coating shall be 610 - 700 g/m2.

v. Freedom from defect: The zinc coating shall be uniform adhered, reasonably smooth & free from such imperfections as flux, ash bare patches, black spots, pimples, lumpiness runs, rust stains, bulky white deposits & blisters.

vi. **Sampling plan and testing for Galvanization**:

a. All materials of the same type in coating bath having uniform coating characteristics shall be grouped together to continue a lot. Each lot shall be tested separately for the various requirements of the specification. The number of units to be selected from each lot for this purpose shall be given in Table 2 of IS 4759 – latest edition.

b. The sample selected according to Column 1 & 2 of Table 2, IS: 4759 – latest edition shall be tested for visual requirements as per Clause 6.2 of IS:4759 – latest edition

c. The sample found conforming to above requirements shall then be tested for mass of zinc coating in accordance with Clause 9.2 of IS: 4759 – latest edition.

vii. Criteria for conformity: As per Clause 8.3 of IS: 4759-latest edition.

viii. Test procedure shall be as per Clause 9 of IS: 4759-latest edition.

8.0 PRESSURE TEST

Vendor shall carry out pneumatic pressure test as per Clause 12.1b of IS:1879

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1987 with latest amendments on each & every fittings. Vendor has to submit the
Internal Quality control certificate for the same.

9.0 COMPRESSION TEST

This test shall be conducted to judge the malleability of the pipe fittings & shall be carried out as per Clause 13 of IS:1879 – 1987 with latest amendments.

10.0 SAMPLING

Owner Representative of Third Party Inspection Agency appointed by Owner shall witness the tests as per Appendix-B of IS 1879 – 1987 with latest amendments. However, vendor to perform 100% inspection of visual, dimensional & pressure test. Vendor shall furnish Internal test certificates at the time of final inspection to the Owner.

11.0 MARKING

1. Each fitting shall be embossed with Client's logo, manufacturer's name or trademark and the size designation to the extent possible depending upon available space. Detailed marking arrangement shall be submitted by vendor for approval.

2. Each packing containing fittings shall carry the following embossed, stamped or written by indelible ink.

3. Manufacturer's name or trade mark.

4. Designation of fittings.

5. Lot number.

6. Each fitting conforming to this standard shall also be marked with BIS standard mark.

12.0 PACKAGING

Packing size is to be mentioned to ensure uniformity in delivery conditions of the material being procured. Packing size shall be approved by owner / owner's representative before packing the material. The vendor shall submit the packaging details during QAP and also complied with at the time of delivery.

13.0 INSPECTION / DOCUMENTS

1. Inspection shall be carried out as per Owner Technical Specification/ referred

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codes.

2. Owner Representative/ Consultant or Third Party Inspection Agency appointed by Owner shall carry out inspection during manufacturing / final inspection.
3. Vendor shall furnish all the material test certificates, proof of approval / licence from specified authority as per specified standard, if relevant, internal test / Inspection reports as per Technical Specification & specified code for 100% material, at the time of final inspection of each supply lot of material.

4. Even after third party inspection, Owner reserves the rights to select a sample of fittings randomly from each manufacturing batch & have these independently tested. Should the results of these tests fall outside the limits specified in Owner technical specification, then Owner reserves the rights to reject all production supplied from the batch.

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			QAP GI FITTINGS			QAP NO. 45/QAP Sheet 1			
Sr. No.	INSPECTION AND TESTING	QUANTUM OF CHECK	PROCEDURE	ACCEPTANCE CRITERIA AND CERTIFICATE	FORMAT OF RECORD	INSPECTION			
						Vendor	TPIA	PMC	REMARKS
1	Materials (Chemical Properties)	IS:14329	IS:14329	IS:14329	Material Test	P	R	R	
2	Materials (Mechanical Properties)	IS:14329	IS:14329	IS:14329	Material Test	P	R	R	
3	Galvanizing								
3a	Visual inspection (Free from defects)	As per IS 4759-1996	As per IS 4759-1996	As per IS 4759-1996	INSPECTION TEST REPORT	P	W	R	
3b	Mass of Zinc Coating	As per IS 4759-1996	As per IS 4759-1996	As per IS 4759-1996	INSPECTION TEST REPORT	P	W	R	
4	Pneumatic Pressure Test	As per TS	As per IS 1879-1987	As per IS 1879-1987	INSPECTION TEST REPORT	P	W	R	
5	Compression Test	As per TS	As per IS 1879-1987	As per IS 1879-1987	INSPECTION TEST REPORT	P	W	R	
6	Weight of the Fittings	As per TS	As per IS 1879-1987	As per IS 1879-1987	INSPECTION TEST REPORT	P	W	R	
7	Dimension tolerances (Min. length of engagement. OD. Wall thk.)	1%	As per IS 1879-1987	As per IS 1879-1987	INSPECTION TEST REPORT	P	W	R	
8	Marking	1%	As per IS 1879-1987	As per IS 1879-1987	INSPECTION TEST REPORT	P	W	R	
9	Final Documentation		Document pertaining to all tests specified in this QAP	Document pertaining to all tests specified in this QAP		P	H	R	

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LEGENDS: R - REVIEW, W - Witness, H-Hold, P - Perform, TPIA - Third Party Agency
(Owner / Owner's Representative) Note:

1. The Above Testing and acceptance criteria are minimum requirements, however, manufacturer shall ensure that the product shall also comply to the additional requirements as per TS.
2. The supplier shall submit their own details ITP prepared on the basis of above/ Technical specification for approval of Owner/Owner's representative.
3. Owner/Owner representative shall review/approve all the documents related to ITP/Quality manuals/Drawings etc. submitted by supplier.
4. Owner / Owner's representative including TPIA will have to right to inspect any activity of manufacturing at any time
5. All reference Codes/ Standards, Documents. P.O. Copies shall be arranged by vendor / Supplier for reference of TPIA/PMC/Client at the time of Inspection
6. At the time of delivery of material in stores, vendor will submit copy of all related document of inspection along with release note & MTC.

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TECHNICAL SPECIFICATION

FOR COPPER

FITTINGS

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4.0 CARBON IN BORE

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7.0 PRESSURE TEST

8.0 MARKING

9.0 INSPECTION / DOCUMENTS

10.0 DRAWINGS

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1.0 SCOPE

This specification covers the requirements for Copper Capillary fittings (End feed). Unless modified by this specification requirement European EN 1254 Part-I shall be valid.

2.0 MATERIAL

i) The material used for the manufacturer of Copper Capillary Fittings shall confirm to BS EN 1254 - 1: latest Half hard

ii) Material used for the solder should conform to BS 219 & BS EN 29453 or equivalent and should be lead free.

3.0 DIMENSIONAL TOLERANCES

Dimensions tolerances of various types of copper capillary fittings (End feed) shall be as per BS 864 Part-2 (latest) & EN 1254 (Open tolerances on dimensions shall be +/-0.1 mm).

The tolerances as specified in EN 1254 in nominal diameter are as follows (Ref Table 2).

Nominal Diameter	Tolerance on the mean diameter with respect to the nominal diameter		Resulting Difference	Diametrical
D	Outside Dia of male end (mm)	Inside Dia of Socket (mm)	Max. (mm)	Min. (mm)
12 mm	+ .0.04 – .0.05	+ 0.15 – 0.06	0.20	0.02

The minimum wall thickness of a fitting shall be in accordance as given below (Ref. Table 5 of EN 1254).

Nominal Dia mm D	Minimum wall thickness (mm) Wrought Coppers
12	0.6

End connection of the Fitting must be capable of end feeding. Internal solder ring type fitting is not acceptable

4.0 CARBON IN BORE

The internal surface of copper capillary fittings for soldering or brazing shall not contain any detrimental film nor present a carbon level high enough to allow the formation of such a film during installation. The maximum total carbon level on internal surfaces shall

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not exceed 1.0 mg/dm2 when tested in accordance with the specification.

5.0 CHEMICAL PROPERTIES

Each heat no. of the copper fitting will be tested for chemical properties to conform to non-arsenical copper DHP grade C 106 as per BS EN 1057 & BS 2871 to have the following chemical composition :

Copper Percentage : Min 99.9%

Phosphorus Percentage : 0.015 to 0.040%

6.0 FREEDOM FROM DEFECTS

The fittings shall be free from internal fins, blow holes, skin defects etc. or other irregularities which might restrict the free flow of fluid, and shall be designed that resistance to the flow of fluid through the fittings is minimized.

7.0 PRESSURE TEST

All fittings shall be leak tested at the option of BGL at a pressure of 1 bar (g) for a period of 2 minutes and no leakage is permitted during this period Manufacturer's Test Certificate is necessary with supply.

STRESS CORROESION RESISTANCE TEST

A Stress Corrosion Resistance is to be carried out as per method defined in ISO 6957 using test solution of pH 9.5 but without pickling

8.0 MARKING

Each tube shall be embossed with manufacturers name or trade mark BS 864 or EN 1254. Each packing containing fittings shall carry the following stamped or written in indelible ink.

a) Manufacturers name or trade mark

b) Designation of tubes

c) BS Symbol mentioning as 864 or EN 1254 to be used.

9.0 INSPECTION / DOCUMENTS

i) Inspect shall be carried out as per Client's Technical Specification and Inspection Plan / QAP.

ii) Client representative or third party inspection agency appointed by Client shall carry out stage wise inspection during manufacturing / final inspection.

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iii) Vendor shall furnish all the material test certificates, proof of approval / license from specified authority as per specified standard, if relevant, internal test / inspection reports as per Client.
Technical Specification and specified code for 100% material, at the time of final inspection of each supply lot of material.

iv) Even after third party inspection, Client reserves the right to Select a sample of tube randomly from each manufacturing batch and have these independently tested. Should the results of these tests fall outside the limits specified in Client Technical specification, then Client reserves the rights to reject all production supplied from the batch.

v) Vendor shall prepare and submit the detail drawing of required copper fittings for approval by Client Before starting production

vi) For any control test the date and place of inspection shall be provided by the vendor in writing to the Owner /Owner representative along with Production Schedule.

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STANDARD SPECIFICATION

FOR

BRASS FITTINGS

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STANDARD TECHNICAL SPECIFICATION FOR BRASS FITTINGS

SPECIFICATION NO.: 023

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AMENDMENT STATUS

Sl. No.	Clause / Paragraph / Annexure / Exhibit / Drawing Amended	Page No.	Rev.	Date	BY		Verified	
					Name	Sig.	Name	Sig.

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1.0 SCOPE

This specification covers the requirements f or Brass Capillary fittings (End feed fittings). Unless modified by this specification, requirement of EN 1254 Part 1 shall be valid.

2.0 MATERIAL

i) The material used f or the manufacturer of Brass Capillary Fittings shall conform to IS 319 Grade-2 or CW 602N as per EN12164.

ii) Material used f or the solder should conform to B S EN 2 9453 and should be lead free. S older material shall be generally melting within the temperature range 180 ° C to 250 ° C.

iii) Threading on the Brass fittings shall be done as per NPT (ASME 1.20.1).

3.0 DIMENSIONS

I. Dimensions tolerances of various ty pes of brass capillary fittings (End feed fittings). shall be as per EN 1254 Part 1 .The tolerances at the end shall be as per EN 1254 Part I in nominal diameter which are as follows (Ref. table 2)

Diameter	Tolerance on the mean diameter with respect to the nominal diameter		Resulting Diametrical difference	
D	Outside Dia of male end (mm)	Inside Dia of socket (mm)	Max (mm)	Min (mm)
12 mm	+.0.04 -.0.05	+ 0.15 +0.06	0.20 0.0	

The minimum wall thickness of a fitting shall be in accordance as given below (Ref table 5 of EN 1254 Part 1)

Nominal Dia mm, D	Minimum wall thickness (mm) Brass
12	1.1

II. Minimum length of engagement shall be as per table-3 of BS EN 1254-1.

III. Minimum bore area of fittings shall b e corresponding to minimum bore a s per table-4 of BS EN 1254-1

IV. Tube abutment shall be shown in the drawing submitted for approval a s per guidelines of BS EN 1254- 1.

4.0 END CONNECTION

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End connection of the fitting must be cap able of end feeding to the NP T x 12 mm. Integral solder ring type fitting is not acceptable.

5.0 CHEMICAL PROPERTIES

Chemical composition & mechanical properties of Brass shall be as mentioned in IS:319 Grade-2/ CuZn36Pb2As or CW602N as per EN12164. The material shall be Dezincification-resistant.

6.0 CARBON IN BORE

The internal surface of brass capillary fittings for soldering or brazing shall not contain any detrimental film nor present a carbon level high enough to allow the formation of such a film during installation. The maximum to talcarbon level on internal surfaces shall not exceed 1.0 mg/dm2. The test shall be carried out as per clause no. 5.4 an d Annexure- A of EN 1254 -1.

7.0 RESISTANCE TO DEZINCIFICATION

The fittings shall be manufactured from alloys containing more than 10% Zinc. Accordingly resistance to dezincification test shall be carried out as per Cl. 5.5 of E N 1254 -1. The acceptance criteria shall be as per Clause 4.5.3.

8.0 STRESS CORROSION RESISTANCE TEST

A stress corrosion resistance is to be carried out on fittings as per method defined in ISO 6957 using test solution of pH 9.5 but without pickling.

9.0 FREEDOM FROM DEFECT

The fittings shall be free from internal fins, blow holes, skin defects etc. or other irregularities which might restrict the free flow of fluid, and shall be designed that resistance to the flow of fluid through the fittings is minimized.

10.0 HYDROSTATIC PRESSURE TEST

All fittings shall be leak tightness tested at 1.5x25 bars for a period of 15 minutes and no leakage is permitted. This test shall be performed on each size of the fittings.

11.0 PNEUMATIC PRESSURE TEST

All fittings shall be leak tested at 6 bars for a period of 10 seconds and no leakage is permitted.

12.0 MARKING

Each fittings shall be embossed with client's logo, manufacturers name and trade mark EN 1 254 Part – I and designation of fittings. Each packing containing fittings shall carry

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the following stamped or written in indelible ink.

a) Manufacturer's name or trade mark.

b) Designation of fittings.

c) Month and year of manufacturing

13.0 PACKAGING

Packing size to be mentioned to the ensure uniformity in delivery conditions of the material being procured. Bidder shall submit the packaging details during QAP and also complied with at the time of delivery.

14.0 INSPECTION / DOCUMENTS

(i) Inspection shall be carried out as per design codes/standards, Technical Specification and manufacturing/ final inspection.

(ii) Vendor shall furnish all the material test certificates, proof of approval/ license from specified authority as per specified standard, if relevant, internal test/ inspection reports as per Technical Specification, at the time of final inspection of each supply lot of material.

(iii) Even after third party inspection, Client reserves the right to select a sample o f tube randomly from each manufacturing batch and have these independently tested. If the results of these tests fall outside the limits specified in Technical specification, then client reserves the rights to reject all production supplied from the batch.

(iv) Vendor shall prepare and submit the detail drawings of required brass fittings and QAP for approval by Client/ consultant before starting production.

(v) For any control test or examination required under the supervision of TPIA/owner/owner's representative, latter shall be in formed in writing one (1) week in advance by vender about inspection date & place along with production schedule.

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			QAP BRASS FITTINGS			QAP NO. S023/QAP S			
						INSPECTION			
Sr. No.	**INSPECTION AND TESTING**	**QUANTUM OF CHECK**	**PROCEDURE**	**ACCEPTANCE CRITERIA AND CERTIFICATE**	**FORMAT OF RECORD**	**Vendor**	**TPIA**	**PMC/ Owner**	**REMARKS**
1	Raw Material Testing:								
1.1	Metallic materials (Chemical / Physical Requirement)	One sample in each heat	As per EN12164 for Gr. CW602N/ IS:319 Gr. 2)	As per EN12164 for Gr. CW602N/ IS:319 Gr.2)	Material Test certificate type 3.1	P	R	R	
2	Leak tightness under Internal Hydrostatic Pressure Test	1%	BS EN 1254-1	BS EN 1254-1	INSPECTION TEST REPORT	P	W	R	
3	Gas Tightness Test (Pneumatic test)	1%	BS EN 1254-1	BS EN 1254-1	INSPECTION TEST REPORT	P	W	R	
4	Carbon in Bore	1%	BS EN 1254-1	BS EN 1254-1	INSPECTION TEST REPORT	P	W	R	
5	Dezincification Resistance Test	1%	BS EN 1254-1	BS EN 1254-1	INSPECTION TEST REPORT	P	W	R	
6	Stress Corrosion Resistance Test	1%	BS EN 1254-1	BS EN 1254-1	INSPECTION TEST REPORT	P	W	R	
8	Visual inspection (Free from defects)	10%	BS EN 1254-1	BS EN 1254-1	INSPECTION TEST REPORT	P	W	R	
9	Dimension tolerances (Min. length of engagement. OD. Wall thk.)	10%	As per Approved Drawing/ BS EN 1254-1	As per Approved Drawing/ BS EN 1254-1	INSPECTION TEST REPORT	P	W	R	
10	Marking	10%	BS EN 1254-1	B	INSPECTION TEST	P	W	R	
11	Final Documentation		Document pertaining to all tests specified in this QAP	Document pertaining to all tests specified in this QAP	EN 10204 3.1 CERTIFICATES	P	H	H	

LEGENDS: R - REVIEW, W - Witness, H-Hold, P - Perform, TPIA - Third Party Agency (Owner / Owner's Representative)

Note:-

1 The Above Testing and acceptance criteria are minimum requirements, however, manufacturer shall ensure that the product shall also comply to the additional requirements as per TS.

2 The supplier shall submit their own details ITP prepared on the basis of above/ Technical specification for approval of Owner/Owner's representative.

3 Owner/Owner representative shall review/approve all the documents related to ITP/Quality manuals/Drawings etc. submitted by supplier.

4 Contractor shall in coordination with Supplier/Sub vendor issue detailed Production and Inspection schedule indicating the dates and the location to facilitate Owner/Owner's representative and TPIA to organize Inspection.

6 Owner / Owner's representative including TPIA will have to right to inspect any activity of manufacturing at any time

7 All reference Codes/ Standards, Documents. P.O. Copies shall be arranged by vendor / Supplier for reference of TPIA/PMC/OWNER at the time of Inspection

8 At the time of delivery of material in stores, vendor will submit copy of all related document of inspection along with release note & MTC.

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TECHNICAL SPECIFICATION

FOR

ISOLATION & APPLIANCE BALL VALVES

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Contents

Sl. No.	Description
1.0	INTENT OF SPECIFICATION
2.0	SCOPE OF WORK
3.0	MATERIAL SPECIFICATION
4.0	DESIGN AND CONSTRUCTION
5.0	INSPECTION AND TESTING
6.0	PACKING AND MARKING

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1.0 **INTENT OF SPECIFICATION**

The intent of this specification is to establish minimum requirements to manufacture and supply of Isolation & Appliance Ball Valves used for supply of natural gas.

2.0 **SCOPE OF WORK**

2.1 The scope of the tenderer will include manufacture/ supply, inspection/ testing/ marking/ packaging/ handling and despatch of Isolation & Appliance Ball Valves, as indicated in the Material Requisition & Schedule of Rates, meeting all the requirements as laid down in ASME B16.33 and should be approved by any certified agency for Gas application.

2.2 All codes and standards for manufacture, testing, inspection etc. shall be of latest edition.

3.0 **MATERIAL SPECIFICATION**

3.1 Metallic parts of Valves shall be manufactured as per material specified in respective datasheets.

3.2 Lubricants and Sealants. Lubricants and/or sealants shall be resistant to the action of fuel gases such as natural, manufactured, and LP gases. The valve manufacturer is responsible for the selection of lubricants and sealants, and for the determination of their suitability for the service conditions specified in the scope of this Standard.

3.3 Seating and Stem Seal Materials. The valve manufacturer is responsible for selection of seating and stem seal materials and for determination of their suitability for the service conditions specified in the scope of this Standard.

3.4 Air Aging Tests. Elastomer parts that are exposed to fuel gas shall be made from materials that, following 70-hr air aging in accordance with ASTM D573 at 212°F (100°C), meet elongation, tensile, and hardness property requirements as per ASME B16.33.

3.5 Elastomeric components' material shall qualify swell test and compression set tests as per requirement of ASME B16.33.

4.0 **DESIGN AND CONSTRUCTION**

4.1 DESIGN QUALIFIACTION: Manufacturer shall qualify the design of the valves as per clauses mentioned below. Relevant documents for establishment of design qualification shall be submitted along with bid.

4.1.1 Each basic valve design shall be qualified and demonstrated as suitable for the service by testing randomly selected production valves of each size, type, and pressure shell material.

4.1.2 Following tests shall be carried out for design qualification as per ASME B 16.33
a) Gas tightness
b) Temperature resistance

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c) Structural tests viz. Strength test, Twist test, Bend Test, Tensile Test, Turning Torque test
d) Flow Capacity

4.2 Production Testing
Each Valve shall be tested to a test pressure of 1.5 times the pressure rating of the valve according to test method of gas tightness. No leakage is permitted during production testing.

4.3 Valve ends shall be as specified in respective datasheets.

5.0 **Inspection and Testing**

5.1 Each valve shall be tested for leakage as specified in cl. 4.2 above. Test certificate shall be provided for production testing.

5.2 Test certificates for physical and chemical properties of all the components of valves shall be provided as per agreed QA/QC requirements.

5.3 Test certificates of all the tests conducted for design qualification as per ASME B16.33 shall be submitted for review.

5.4 Type of inspection documents as per EN 10204 shall be as defined in respective QAP/ Datasheet.

6.0 **Packing and Marking**

6.1 Valves shall be marked as mentioned below.

6.1.1 The manufacturer's name or trademark and, where space permits, the designation"B16.33." The B16.33 mark is the manufacturer's acknowledgement that the valve was manufactured i n conformance with ASME B16.33.

6.1.2 Pressure Rating.

6.1.3. Open and close indication. when a 1/4 turn valve is in the open or closed position (if flat hed, longitudinal axis of the head shall be perpendicular to the longitudinal axis of the valve when valve is in the closed position)

6.2 Each Valve shall be packed in individual card board boxes so as to avoid wear and tear during transport.

6.3 For threaded end valves, end caps shall be provided.

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Data Sheet - Isolation Ball Valve		
S.NO	**Description**	**Details**
	Process Data	
1.01	Fluid	Natural Gas
	Operating Condition	
2.01	Pressure	4 Bar (g)
2.02	Temperature (°C)	0-48
	Design Condition	
3.01	Pressure	-
3.02	Temperature (°C)	-29 to 65
	Valve Data	
4.01	Size	1/2" and 3/4"
4.02	Type	Isolation Ball Valve of Full Bore with NPT Female (Confirming to ANSI B1.20.1) as an inlet with operating Knob and locking arrangement with provision for sealing wire and lead seal (without Key).metallic operating Knob for full open/close at 90° position.
4.03	Rating	125#
4.04	End Connections	NPT Female (Confirming to ANSI B1.20.1)
4.05	Body Material	Total Body Including the Nozzle shall be of forged Brass (ASTM B 283, Alloy UNSC37700) with Nickel/ Chrome plated.
4.06	Ball Material	Hard Chrome/ Nickel Plated, ASTM B 283
4.07	Stem	ASTM B283
4.08	Seat	Teflon
4.12	Extension Stem	Not required
4.13	Operator	Butterfly Arrangement
	Painting	
5.01	Surface Preparation	Not Required
5.02	primer	Not Required
5.03	finish	Not Required
5.04	insulation	Not Required
	Test	
	Production Test	-
6.01	Production Test Pressure	1.5 times of design class pressure
6.02	Test Medium	As per ASME B16.33
6.05	Tes duration	15 seconds
Note	1. Lever type handle not acceptable.	
	2. Minimum Nickel/ Chrome Plated on the ball & body of Isolation ball valve shall be 25 micron	
	3. The above specified tests in TS/ Data sheet are minimum however, the other remaining/ specified test shall be done as per ASME B.16.33	

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Data Sheet - Appliance Ball Valve		
S.NO	**Description**	**Details**
	Process Data	
1.01	Fluid	Natural Gas
	Operating Condition	
2.01	Pressure	4 Bar (g)
2.02	Temperature (°C)	0-48
	Design Condition	
3.01	Pressure	-
3.02	Temperature (°C)	-29 to 65
	Valve Data	
4.01	Size	1/2"
4.02	Type	Appliance Ball Valve of Full Bore with ½" NPT (Confirming to ANSI B1.20.1) Female as an inlet and the outlet shall be having Ni/ Cr plated brass or steel a nozzle (Serrated to suit ¼" rubber tubing/ hose connection) and the material is required for Domestic Natural Gas Service with a metallic operating Knob for full open/close at 90 degree position.
4.03	Rating	125#
4.04	End Connections	Female as an inlet and the outlet shall be having Ni/ Cr plated brass or steel as nozzle
4.05	Body Material	Total Body Including the Nozzle shall be of forged Brass (ASTM B 283, Alloy UNSC37700) with Nickel/ Chrome plated.
4.06	Ball Material	Hard Chrome/ Nickel Plated, ASTM B 283
4.07	Stem	ASTM B283
4.08	Seat	Teflon
4.12	Extension Stem	Not required
4.13	Operator	Knob Arrangement.
	Painting	
5.01	Surface Preparation	Not Required
5.02	primer	Not Required
5.03	finish	Not Required
5.04	insulation	Not Required
	Test	
	Production Test	-
6.01	Production Test Pressure	1.5 times of design class pressure
6.02	Test Medium	As per ASME B16.33
6.05	Test duration	15 seconds
Note	1. Minimum Nickel/ Chrome Plated on the ball & body of Isolation ball valve shall be 25 micron	
	2. The above specified tests in TS/ Data sheet are minimum however, the other remaining/ specified test shall be done as per ASME B.16.33	

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			QAP ISOLATION AND APPLIANCE BALL VALVES			QAP: 038 Sheet 1		
						INSPECTION		
Sr. No.	INSPECTION AND TESTING	QUANTUM OF CHECK	PROCEDURE	ACCEPTANCE CRITERIA AND CERTIFICATE	FORMAT OF RECORD	Vendor	TPIA	REMARKS
1	Raw Material Testing:							
1.1	Matallic materials (Chemical / Physical Requirement)	One in each heat	As per ASTM B 283 (ALLOY UNS C37700)	As per ASTM B 283 (ALLOY UNS C37700)	Material Test certificate	P	R	EN10204-3.1 certificate
1.2	Seat & Stem Seal Material	One in each heat	As per TS/ B16.33	As per TS/ B16.33	Material Test certificate	P	R	EN10204-3.1 certificate
2	Final Product:							
2.1	Gas Tightness Test	1%	ASME B 16.33	ASME B 16.33	INSPECTION TEST REPORT	P	W	
	Twist (Torque) Test	1%	ASME B 16.33	ASME B 16.33	INSPECTION TEST REPORT	P	W	
	Bending Test	1%	ASME B 16.33	ASME B 16.33	INSPECTION TEST REPORT	P	W	
	Tensile Test	One in each heat	ASME B 16.33	ASME B 16.33	INSPECTION TEST REPORT	P	W	
	Turning Torque Test	1%	ASME B 16.33	ASME B 16.33	INSPECTION TEST REPORT	P	W	
2.2	Temperature Resistance test	1%	ASME B 16.33	ASME B 16.33	INSPECTION TEST REPORT	P	W	
2.3	Flow Capacity Test	1%	ASME B 16.33	ASME B 16.33	INSPECTION TEST REPORT	P	W	
2.4	Production pressure test	100%	ASME B 16.33	ASME B 16.33	INSPECTION TEST REPORT	P	RW	
2.5	Visual inspection (Free from defects)	100%	ASME B 16.33	ASME B 16.33	INSPECTION TEST REPORT	P	RW	
2.6	Dimension tolerances (Min. length of engagement. OD. Wall thk.)	100%	As per Approved Drawing	As per Approved Drawing	INSPECTION TEST REPORT	P	RW	
2.7	Marking	100%	ASME B 16.33	ASME B 16.33	INSPECTION TEST REPORT	P	RW	
3	Final Documentation		Document pertaining to all tests specified in this QAP	Document pertaining to all tests specified in this QAP	EN 10204 3.1 CERTIFICATES for raw material	P	H	

LEGENDS: R - REVIEW, W - Witness, RW - Random Witness (Minimum 0.5% of lot size) H-Hold, P - Perform, TPIA - Third Party Agency, CA- Control Authority (Owner / Owner's Representative)

Note:-

1 The Above Testing and acceptance criteria are minimum requirements, however, manufacturer shall ensure that the product shall also comply to the additional requirements as per TS.

2 The supplier shall submit their own details ITP prepared on the basis of above/ Technical specification for approval of Owner/Owner's representative.

3 Owner/Owner representative shall review/approve all the documents related to ITP/Quality manuals/Drawings etc. submitted by supplier.

4 Contractor shall in coordination with Supplier/Sub vendor issue detailed Production and Inspection schedule indicating the dates and the location to facilitate Owner/Owner's representative and TPIA to organize Inspection.

5 Special manufacturing procedures have to the specially approved or only previously approved procedures have to be used.

6 Owner / Owner's representative including TPIA will have to right to inspect any activity of manufacturing at any time

7 All reference Codes/ Standards, Documents. P.O. Copies shall be arranged by vendor / Supplier for reference of TPIA/PMC/GGL at the time of Inspection

8 At the time of delivery of material in stores, vendor will submit copy of all related document of inspection along with release note & MTC.

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TECHNICAL SPECIFICATION
FOR
WARNING MATS

SPECIFICATION NO. : 042

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SPECIFICATION FOR PE ANTI RODENT WARNING MATS FOR PIPELINE

Purpose	:	For using as a warning sign for Underground Pipeline
Width	:	D + 300 mm, D – Dia of Line Pipe
Thickness	:	1.0 mm thick
Material of the mat	:	The material shall be of high density Polyethylene of virgin quality and non Biodegradable type. It shall have Non Hazardous, Non Toxic and Anti – Rodent properties.
Colour of the mat	:	Golden Yellow with letters printed in RED of non-deletable type with high abrasion resistant.
Art Work	:	A sample piece of 30mm wide and 200mm long of every batch shall be checked by immersing in 20% solution of Ammonium Sulphide for period of 2 weeks at a temperature of 15°C for colour intactness of the strip. Copy of Art work is enclosed at Page 4. **The art work shall be printed in English and local language alternatively at every 1 meter distance.**
Mechanical Properties of HDPE		
Tensile Strength	:	Minimum 200 kg/cm^2
Elongation at Break	:	Minimum 175%
Bundle Length	:	1.0 mm thick warning mat shall be supplied as 100 mtrs length in each bundle packed in PE Woven sack material.
Tests	:	Minimum following test has to be done with each batch of warning mat ¾ Tensile Strength test ¾ Elongation test ¾ Impact Strength test ¾ Color fastness test ¾ Heat Stability test ¾ Print Stability test

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- ¾ Oxidation Induction test
- ¾ ESCR test
- ¾ Melt Flow Rate test
- ¾ Anti-Rodent Test.
- ¾ UV Stabilizer Test
- ¾ DSC Scan Test of Raw Material & Finish Goods.

Test Certificates : Vendor has to submit the all test certificates to Purchaser

Inspection : The manufacturer has to submit the QAP before commencement of production. Inspection of the material will be done at vendor's works by Client / PMC Representative. Vendor has to submit all test reports before inspection call. Any test failed during the inspection for the offered lot, the total lot will be rejected.

Documentation : Vendor shall submit all test reports including document regarding Toxicology data & ROHS compliance, documentary evidence regarding Non-biocide product, value of Lethal Dosage (LD), value of % dermal toxicity, details of active ingredient in the product and final inspection reports along with the supply of materials.

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HIGH PRESSURE GAS PIPELINE BELOW

CLIENT NAME

COMPANY NAME`

IN EMERGENCY PLEASE CONTACT

PHONE NOS. …….

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	CONTRACTOR	**QUALITY ASSURANCE PLAN FOR WARNING MAT**	PROJECT:
	ORDER NO. & DATE		PACKAGE NO.
	SUB-CONTRACTOR		PACKAGE NAME :
	ORDER NO. & DATE		ITEM : PE Anti-Rodent Warning Mat

Main Client		
Consultants		M/S
Contractor		
Supplier Name & Address		
Supplier P.O. No.		
Job No.:		
Name of Project		
Item Description		PE Anti-Rodent Warning Mat.
Specification No.		GGL/TS/05/62/042, Rev 1
Manufacturing Process		Extrusion of HOPE Film/ Sheet.
Size Color		D+300 MM Width for steel Pipelines, 300mm width for PE Pipelines, thickness 1 mm Golden Yellow Color with Red Text Legend.
TPI Agency		Hired and deployed by Package Contractor as per Tender/ PO guidelines

QAP No.: 042

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	ORDER NO. & DATE SUB-CONTRACTOR ORDER NO. & DATE	**QUALITY ASSURANCE PLAN FOR WARNING MAT**	PROJECT : PACKAGE NO. PACKAGE NAME : ITEM : PE Anti-Rodent Warning Mat

Sr No	Name of Test Ref. to Test standards	Type of check / Method	Sampling model for manufacturer	Inspection by Mfr/ Lab.	Acceptance Norms / As per PTS (GGL/TS/05/62/042, Rev 1)	Agency				Format of Record	Remarks (If any)
						Mfr.	TPIA	CONTR	Owner/ PMC		
	I Test on Warning Mat :										
1	Dimension & Tolerance: Width & Thickness	Measure ment	Three samples from each lot / batch/Batch	At Mfr's Works	Width : As per PO Thk. : Min. 1mm	p	w	R	R	Test Report	
2	Material Identification by chemical method.	Measure ment	One sample to be tested from each lot / batch.	Performed at any independent Lab.	Test sample shall be tested & to be confirmed HDPE by lab.	w	w	R	R	Test report of independent lab	
3	Color of Mat	Visual	Three sample to be tested from each lot / batch.	At Mfr's Works	Golden yellow color.	w	w	R	R	Test Report	
4	Text legend Printing on Mat	Visual	Three samples from each lot / batch.	At Mfr's Works	Red color. Non deletable and high abrasion resistant (Lamination over printing)	w	w	R	R	Test Report	
5	Tensile strength at break	Measure ment	Three samples to be tested from each lot / batch.	At Mfr's Works	Min 200 kg/cm2	p	w	R	R	Test Report	

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6	Elongation at break	Measure ment	Three sample to be tested from each lot / batch.	At Mfr's Works	Min 175%	p	w	R	R	Test Report	

Sr No	Name of Test Ref.to Test standards	Type of check / Method	Sampling modelfor manufacturer	Inspection by Mfr/ Lab	Acceptance Norms / As per PTS (GGL/TS/05/62/042, Rev 1)	Agency				Format of Record	Remarks (If any
						Mfr.	TPIA	CONTR	Owner/ PMC		
7	Impact Strength (500 gm Stricker weight at 1.2 Mtr. Height)	Measureme nt nt	Three sample to be tested from each lot / batch	At Mfr's Works	All test samples shall pass. If one fails out of the lot / batch,three more samples to be tested and no failure should occur.	p	w	R	R	Test Report	
8	Color fastness Test: After 15 days at 15°C in 20% Ammonium sulphite solution. (Type Test)	Review of TC	Refer Notes below	Testing at NABL accredited LAB	Satisfactory,while comparing the test specimen with production specimen of that batch in cool light with white background.	p	W*	R	R	Test report	
9	Performance of printing stability	Visual	Three samples from each lot / batch.	At Mfr's Works	Pass. Marking shall be easily legible Non Deletable.	p	w	R	R	Test Report	
10	Oxidation Induction Test (Type Test)	Review of TC	Refer Notes below	Testing at NABL accredited LAB	Pass .Oxidation Induction test.	R	W*	R	R	Test certifica te	
11	ESCR Test (Type Test)	Review of TC	Refer Notes below	Testing at NABL accredited LAB	Pass. No crack found after test.	R	W*	R	R	Test certifica te	

QAP No.: 042

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Sr No	Name of Test Ref.to Test standards	Type of check / Method	Sampling model for manufacturer	Inspection by Mfr/ Lab	Acceptance Norms / As per PTS (GGL/TS/05/62/042, Rev 1)	Agency				Format of Record	Rem arks (If any
						Mfr.	TPIA	CONTR	Owner/ PMC		
12	Melt flow Rate {190 degree C,2.16 kg load) (Type Test)	Measurement	Each lot / batch	Testing at NABL accredited LAB	0.2 - 2.5 Gms / 10 min	p	W*	R	R	Test certificate	
13	Heat Stability (at 80 degree celcius for 15 min.)	Measurement	Three samples from each lot / batch.	Testing at NABL accredited LAB	All test samples shall pass. There should be no visual or dimensional changes	p	W*	R	R	Test certificate	
14	Anti-Rodent Test - Non Toxic, Non Hazardous, Non Bio degradable (Type Test)	Review of TC	One sample from each lot / batch.	Testing at NABL accredited LAB	Pass. Anti-Rodent Test. Protection against rodent attack. Document/Certificate issued by supplier for Anti Rodent Master Batch as per PTS - Toxicology data, ROHS Compliance & Non- biocidal	p	W*	R	R	Test certificate	
15	UV stabilizer Test {Type Test)	Review of TC	One sample from each lot / batch.	Testing at NABL accredited Lab	UV content present	p	W*	R	R	Test certificate	
16	DSC Scan with Melting Temperature Tm (Type Test)	Review of TC	One sample from each lot / batch.	Testing at NABL accredited LAB	Tm of Raw Material & corresponding finished product based on DSC Scan image results will have to	p	W*	R	R	T.C.	

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17	Identification, Marking Art Work & Packing	Visual	Three sample from each lot / batch.	At Mfr's Works	Client Logo-followed by Client Name, Warning symbols with safety message and Telephone symbol with contact nos in English & local language at defined interval. Lot / batch no. to be printed at minimum 1mtr interval for identification purpose. Printing shall be done as per approved layout. Roll length IOOm minimum.	p	W	R	R	Test Report	

Abbrevations: P= Perform; W=Mandatory Witness; R=Review; T.C.=Test Certificate W*= First time witness and subsequent review for type tests.

Type Testing procedure: Manufacturer shall declare a given lot of Raw Material mix (PE compound, colorant, UV and Anti rodent) weight by assigning a specific lot Number. Manufacturer shall submit the documentation containing weight of individual components to prepare such mix. Manufacturer shall conduct the type testing once for such mix in a NABL lab for all type tests and get the same witnessed by TPIA. If lab does not allow TPI testing as a matter of their policy then such declaration from lab along with type testing results need to be submitted. Manufacturer shall maintain a log book of material consumption of such declared lot and need not carry out type testing until all the material in such lot is consumed. With every inspection waiver request, manufacturer shall provide the updated log book to use the same type test certificates. The updated log book shall be certified by TPIA at the time of final inspection. TPIA has to honor the previously certified log book by different TPI agency.

QAP No.: 042

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TECHNICAL SPECIFICATION

FOR

FLEXIBLE HOSE PIPE
(Anaconda)

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Date: 2026.01.08 19:30:02 IST

AMENDMENT STATUS

Sl. No.	Clause / Paragraph / Annexure / Exhibit / Drawing Amended	Page No.	Rev.	Date	BY		Verified	
					Name	Sig.	Name	Sig.

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2.0	SCOPE OF WORKS
3.0	TECHNICAL SPECIFICATIONS
4.0	TESTING, CLEANING & PACKAGING
5.0	MARKING
6.0	PACKAGING
7.0	INSPECTION / DOCUMENTS

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1.0 INTENT OF SPECIFICATION

The intent of this specification is to establish minimum requirements to manufacture and supply of corrugated flexible metal hose used for supply of domestic natural gas.

2.0 SCOPE OF WORKS

The scope of the tender will include manufacture/ supply, inspection, testing, marking, packaging handling and dispatch of corrugated flexible metal hose assembly, as indicated in the Material Requisition & Schedule of Rates, meeting all the requirements as laid down in manufacturing standard BS: 6501 Part 1(latest)/ ISO 10380.

All codes and standard for manufacture, testing, inspection etc. shall be of latest edition.

Owner/ Owner's Representative reserves the right to delete or order additional quantities during execution of order, based on unit rates and other terms & conditions in the original order.

3.0 TECHNICAL SPECIFICATIONS

Item	:	Corrugated Flexible metal Hose (Type-A flexibility) for Natural Gas Service
Applicable Code	:	BS: 6501 Part-I: (latest)/ ISO 10380 Specification for Corrugated Hose Assemblies
Nominal Size	:	DN 12
Total Length of Hose Assembly	:	350mm end to end
Movement Required	:	Static
Medium Flowing through Hose assembly	:	Natural gas (PNG)
Nominal Pressure/Design Pressure	:	0.25 bar (g) at 20°C
Temperature Range	:	0–65°C

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			QAP FLEXIBLE HOSES (ANACONDA)			QAP NO. S045A Sheet 1			
						INSPECTION			
Sr. No.	INSPECTION AND TESTING	QUANTUM OF CHECK	PROCEDURE	ACCEPTANCE CRITERIA AND CERTIFICATE	FORMAT OF RECORD	Vendor	TPIA	PMC	REMARKS
1	Materials (Chemical Properties)	One sample each heat	Material code	Material code	Material Test certificate	P	R	R	
2	Materials (Mechanical Properties)	One sample each heat	Material code	Material code	Material Test certificate	P	R	R	
3	TIG welding (End fitting to hose)	100%	Approved WPS	ASME Section IX	Welding report	P	R	R	
4	Cyclic Test (Type test)	One sample each lot	As per ISO 10380	As per ISO 10380	INSPECTION TEST REPORT	P	W	R	
5	Pliable Test (Type Test)	One sample each lot	As per ISO 10380	As per ISO 10380	INSPECTION TEST REPORT	P	W	R	
6	Pneumatic test (Production test)	100%	As per Technical specification	As per Technical specification	INSPECTION TEST REPORT	P	W	R	
7	Leakage Test	1%	As per ISO:10380	As per ISO:10380	INSPECTION TEST REPORT	P	W	R	
8	Dimensional Check	1%	-	As per approved Drawing	INSPECTION TEST REPORT	P	W	R	
9	Marking	1%	As per TS	As per TS	INSPECTION TEST REPORT	P	W	R	
10	Final Documentation		Document pertaining to all tests specified in this QAP	Document pertaining to all tests specified in this QAP		P	H	R	

LEGENDS: R - REVIEW, W - Witness, H-Hold, P - Perform, TPIA - Third Party Agency
(Owner / Owner's Representative) Note:-

1 The Above Testing and acceptance criteria are minimum requirements, however, manufacturer shall ensure that the product shall also comply to the additional requirements as per TS.

2 The supplier shall submit their own details ITP prepared on the basis of above/ Technical specification for approval of Owner/Owner's representative.

3 Owner/Owner representative shall review/approve all the documents related to ITP/Quality manuals/Drawings etc. submitted by supplier.

4 Owner / Owner's representative including TPIA will have to right to inspect any activity of manufacturing at any time

5 All reference Codes/ Standards, Documents. P.O. Copies shall be arranged by vendor / Supplier for reference of TPIA/PMC/Owner at the time of Inspection

6 At the time of delivery of material in stores, vendor will submit copy of all related document of inspection along with release note & MTC.

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TECHNICAL SPECIFICATION

FOR

FLUX

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TECHNICAL SPECIFICATION FOR FLUX

I) Flux should be Non-Acidic, Lead Free as per ANSI / NSF 6 or equivalent to be approved by EIC.

II) The Flux should be supplied in paste form packed in small tin container of 500 gms. & should have compatibility to use with solder wire (Lead free & as per BS 219 or equivalent).

III) Certificate of confirmation with the specified standard & relevant material test certificate should be furnished by vendor.

IV) Vendor should supply branded material.

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SPECIFICATION FOR

QUALITY ASSURANCE SYSTEMS REQUIREMENTS

SPECIFICATION NO. 66

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Date: 2026.01.08 19:30:02 IST

STANDARD SPECIFICATION			
TITLE	QUALITY ASSURANCE SYSTEMS REQUIREMENTS	SPECIFICATION NO.	66

1.0 INTRODUCTION

This specification establishes the Quality Assurance Requirements to be met by the sub-contractors (including turnkey Contractors) and their sub-vendors.

In case of any conflict between this specification and other provisions of the contract/ purchase order, the same shall be brought to the notice of Owner, at the stage of bidding and shall be resolved with Owner, prior to the placement of order.

2.0 DEFINITION

Bidder

For the purpose of this specification, the word "Bidder" means the person(s), firm, company or organization who is under the process of being contracted by Owner/ PMC for delivery of some products (including service). The word is considered synonymous to supplier, contractor or vendor.

Correction

Action taken to eliminate the detected non-conformity.

Refers to repair, rework or adjustment and relates to the dis position of an existing non-conformity.

Corrective Action

Action taken to eliminate the causes of an existing non-conformity, defect or other undesirable situation in order to prevent recurrence.

Preventive Action

Action taken to eliminate the causes of a potential non-conformity, defect or other undesirable situation in order to prevent its recurrence.

Process

Set of inter-related resources and activities which transform inputs into outputs.

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STANDARD SPECIFICATION			
TITLE	QUALITY ASSURANCE SYSTEMS REQUIREMENTS	SPECIFICATION NO.	66

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Special Process

Processes requiring pre-qualification of their process capability.

3.0 **CONTRACTORS SCOPE OF WORK**

3.1 **Prior to award of contract**

The bidder shall understand scope of work, drawings, specifications and standards etc., attached to the tender/ enquiry document, before he makes an offer.

The bidder shall submit milestone charts hawing the time required for each milestone activity and linkages between different milestone activities along with overall time period required to complete the entire scope of work.

The bidder shall develop and submit manpower and resource deployment chart.

The bidder shall submit, along with the bid, a manual or equivalent document describing/ indicating/ addressing various control/ check points for the purpose of quality assurance and the responsibilities of various functions responsible for quality assurance.

3.2 **After the award of contract**

The bidder shall submit the schedule for submission of following documents in the kick-off meeting or within two weeks of the placement of order, whichever is earlier.

- Detailed Bar Chart
- Quality plan for all activities, required to be do ne by the bidder, to accomplish offered scope of work.
- Inspection and test plans, covering various control aspects.
- Job procedures as required by Owner/ PMC.
- Procurement schedule for items to be supplied by contractor covering inspection of the same.

Various documents submitted by the bidder shall be finalized in consultation with Owner/ PMC. Here it shall be presumed that once a bidder has made an offer, he has understood the requirements given in this specification and agrees to

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STANDARD SPECIFICATION			
TITLE	QUALI1Y ASSURANCE SYSTEMS REQUIREMENTS	SPECIFICATION NO.	66

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comply with them in totality unless otherwise categorically so indicated during pre-award stage through agreed deviation/ exception request. All Quality Assurance Plan (QAP) documents shall be reviewed by PMC and the bidder shall be required to incorporate all comments within the framework of this specification at this stage of the contract. It is also obligatory on the part of the bidder that obtains approval on every Quality Assurance Plan (QAP) documents, before he starts using a particular document for delivery of contracted scope of work. Participation of PMC/ Owner in review/ approvaI of quality plan/ QAP documents does not absolve the contractor of his contractual obligations towards specified and intended use of the product (or service) provided/ to be provided by him under the contract.

3.3 **During job execution**

During job execution, the bidder shall fully comply with all quality document submitted and finalized/ agreed against the requirements of this specification. Approval of PMC/ Client on all these documents shall be sought before start of work.

Bidder shaII produce sufficient quality records on controlled/agreed forms such that requirements given in this specification are objectively/ demonstrable.

Bidder shall facilitate Owner/ PMC during quality/ technical audits at his works/ sites.

Bidder shall discharge all responsibilities towards enforcement of this specification on all his sub-contractors for any part of the scope which is sub-contracted.

4.0 **QUALITY ASSURANCE SYSTEM REQUIREMENTS**

4.1 The bidder shall nominate an overall incharge of the contract titled as "Project Manager" for the scope of work of agreed contract. The name of this person shall be duly intimated to PMC/ Client including all subsequent changes, if any. Owner/ PMC shall correspond only with the project manager of the bidder on all matters of the project. The project manager of the bidder shall be responsible for co-ordination and management of activities with bidder's organisation and all sub-vendors appointed by the bidder.

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STANDARD SPECIFICATION			
TITLE	QUALI1Y ASSURANCE SYSTEMS REQUIREMENTS	SPECIFICATION NO.	66

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After award of work, the bidder may review augmentation of manpower and resources deployment chart (submitted earlier), detail it out, if so consented by PMC/ Owner and resubmit the same as "issued for effective implementation of the project".

4.2 The bidder shall plan the contract scope of work on quality plan format such that no major variation is expected during delivery of contract scope of work. These quality plan shall be made on enclosed format complete in all respect. The quality plan shaII be assumed to be detailing bidder's understanding and planning for the contract/ offered scope of work. The bidder shall plan the type of resources including various work methodology which he agrees to utilize for delivery of contract scope of work.

4.3 The bidder is required to review the contract at all appropriate stages to evaluate his capabilities with respect to timely and quality completion of all activities pertaining to contracted scope of work and shall report for constraints, if any to PMC/ Owner.

4.4 The design activities, if any performed during delivery of contract scope of work shall be so controlled that the outputs is reliable enough. It is expected that during development of design, the bidder shall take recourse to detailed checking, inter departmental reviews and documented verification methods.

4.5 For all documents which the bidder is likely to utilize for delivery of contract scope of work, a system must exist which assures that latest/ required version(s) of the document(s) is available at all location/ point of use.

4.6 In case the bidder decides to sub-contract any part/ full of the contract scope of work (without prejudice to main Contractual condition), the bidder shall:

- Evaluate the technical and financial capabilities and past performance of the sub-contractor(s) and their products and/ or services before awarding them with the sub-contracted scope of work. Selection of a sub-contractor should meet PMC/ Client's approval in documented form.

- Requirement of this specification shall be enforced on sub-contracted agency also. The bidder shall choose sub-contractor based on their capability to meet requirements of this specification also.

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STANDARD SPECIFICATION			
TITLE	QUALI1Y ASSURANCE SYSTEMS REQUIREMENTS	SPECIFICATION NO.	66

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Note: It may so happen that, in a given situation, a sub-contractor may not have a system meeting the requirements of this specification. In all such eventualities, bidder may lend his system to sub-contractor for the contract such that sub-contractor effectively meets the requirements of this specification. In all such cases PMC/ Client shall be duly informed.

4.7 Bidder shaII establish adequate methodology such that the materials supplied by the Owner/ PMC shall be adequately preserved, handled and made use of for the purpose for which they are provided.

4.8 All output delivered against contract scope of work shall be suitably identified in such a manner that either through identification or some other means, sufficient traceability is maintained which permits effective resolution of any problem reported in the outputs.

4.9 Critical activities shall be identified and the bidder is required to have documented methodologies which he is going to utilize for carrying out such activities under the contract scope of work. Wherever it is difficult to fully inspect or verify the output (special process), bidder shall pre-qualify, the performers and methodologies.

4.10 All inspections carried out by the bidder's surveillance/ inspection staff shall be conformity to quality plans and/ or inspection and test plans. All inspection results shall be duly documented on controlled/ agreed forms such that results can be co-related to specific product, that was inspected/ tested.

4.11 All inspection, measuring & test equipments (IMTEs) shall be duly calibrated as per National/ International standards/ codes and only calibrated and certified IMTEs shall be utilized for delivery of contract scope of work.

4.12 All out puts/ products delivered against contract scope of work shall be duly marked such that their inspection status is clearly evident during all stages/ period of the contract.

4.13 All non-conformities (NCs) found by the contractor's inspection/ surveillance staff shall be duly recorded, including their disposal action. The deficiencies observed during stage of the product, shall be recorded and resolved suitably. Effective corrective and preventive action shall be implemented by the bidder for all repetitive NCs, including deficiencies.

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STANDARD SPECIFICATION			
TITLE	QUALI1Y ASSURANCE SYSTEMS REQUIREMENTS	SPECIFICATION NO.	66

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4.14 All deficiencies noticed by PMC/ Owner representative(s) shall be recorded on a controlled form (Format No. 00002). Such deficiencies shall be analysed by the bidder and effective and appropriate correction, corrective and preventive actions shall be implemented. Bidder shall intimate PMC/ Owner of all such corrective and preventive action implemented by him.

4.15 Bidder shall establish appropriate methodologies for safe and effective handling, storage, preservation of various materials/ inputs encountered during delivery of contract scope of work.

4.16 Bidder shall prepare sufficient records for various processes carried out by him for delivery of contract scope of work such that requirements of this specification are objectively demonstrable. In case PMC/ Owner finds that enough objective evidence/ recording is not available for any particular process, bidder shall be obliged to make additional records so as to provide sufficient objective evidence. The decision of PMC/ Owner shall be final and binding on such issues.

4.17 The bidder shall arrange internal quality audits at quarterly intervals, to independently assess the conformance by various performers to the requirements of this specification. The findings of such assessment shall be duly recorded and a copy shall be sent to PMC/ Owner for review.

4.18 For all special processes, bidder shall deploy only qualified performers. Wherever PMC/ 0wner observes any deficiency, the bidder shall arrange the adequate training to the performer(s) before any further delivery of work.

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STANDARD SPECIFICATION			
TITLE	QUALI1Y ASSURANCE SYSTEMS REQUIREMENTS	SPECIFICATION NO.	66

OBSERVATION OF QUALITY ASPECTS

FORMAT - 00002

Job No. and Description No. Issued to : M/s	Date:	
Location of Work : Item of Work :		
Details of Observation(Deficiency)	Recommended Course of Action Time Allowed for Correction :	
Issued by : _____ Name of Signature of RCM, PMC Site		
Corrective Action taken report by Contractor/ Vendor : Date:		Name and Signature

Distribution (before resolution) :

Project Manager Owner	Chief Business Executive PMC/ Client	PMC/ Owner Inspection New Delhi	Resident Construction Manager, PMC Site

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Verification of Resolution by PMC/ Client : Date:		Name of Signature
Distribution (before resolution) :		

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Project Manager Owner	Chief Business Executive PMC	PMC Inspection New Delhi	Resident Construction Manager, PMC Site

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FORMAT – 00001

Bidder's Quality Plan		Project Name :				PO/ Contract Ref:				
General			Performing Functions			Inspection Functions			Audit Function	
Activity Description	Procedure Number	Code of Conformance	Performer	Checker	Reviewer/ Approver	Sampling Plan	Testing and Inspection Code	Type of (Approval) Surveillance	Audit Scope	Owner's/ PMC Review/ Audit Requirement

Note: 1) The bidder ensures that the filled up format conforms to minimum requirements on Quality Plan/ Quality Assurance, specified by PMC/ Client on drawings/ standards/ specifications/ write-up.

2) The bidder confirms that document is issued for information/ approval of Owner/ PMC for the project implementation

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TECHNICAL SPECIFICATION OF STEEL REINFORCED RUBBER HOSE

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AMENDMENT STATUS

Sl. No.	Clause / Paragraph / Annexure / Exhibit / Drawing Amended	Page No.	Rev.	Date	BY		Verified	
					Name	Sig.	Name	Sig.

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1.0	SCOPE
2.0	MATERIAL
3.0	DIMENSIONS & TOLERANCES
4.0	FEATURES
5.0	MARKING
6.0	PACKAGING
7.0	INSPECTION / DOCUMENTS

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1.0 SCOPE

This present document covers the technical specification for the procurement of steel reinforced rubber hose, Type 4 used in distribution systems. It describes the general requirements, controls, tests, QA/QC examination and final acceptance criteria which need to be fulfilled.

This specification covers the requirements for steel reinforced rubber hose unless modified by this specification, requirements of IS: 9573 shall be valid.

2.0 MATERIAL

i. Lining: - It shall be nitrile – butadiene rubber (NBR) or chloroprene rubber (CR) compound. It shall be smooth in bore, uniform in thickness and free from air blisters, porosity and splits.

ii Reinforcement material :- It shall have wire reinforcement in braided form in between the lining & cover.

iii Cover :- It shall be manufactured out of synthetic rubber compound resistant to abrasion, weather and natural gas. The cover color shall be orange.

iv. The whole shall be consolidated by wrapping or any other suitable method and uniformly vulcanized to give good adhesion between reinforcement plies and the rubber lining of the cover.

3.0 DIMENSIONS & TOLERANCES

i. Bore size

Nominal size (mm)	Minimum base diameter (mm)	Minimum bend radius (mm)
8 mm	7.9	95

The Nominal bore size of the hose shall be accordance to table # 1 of IS 9573 : 1998 shall be as given above table. It shall be tested/ checked as method defined in IS 4143

ii. The Minimum thickness of lining & cover shall be 2 mm & 1 mm respectively.
iii. Length of hose shall be as defined in M.R. & the tolerances on length shall be permitted ± 1%.

4.0 FEATURES

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			QAP STEEL REINFORCED RUBBER HOSES			QAP NO. S045B Sheet 1			
						INSPECTION			
Sr. No.	INSPECTION AND TESTING	QUANTUM OF CHECK	PROCEDURE	ACCEPTANCE CRITERIA AND CERTIFICATE	FORMAT OF RECORD	Vendor	TPIA	PMC	REMARKS
1	Materials (Chemical Properties)	IS :9573	Manufacturer Std	IS :9573	Material Test certificate	P	R	R	
2	Dimensional check	IS : 9573	-	IS :9573	INSPECTION TEST REPORT	P	W	R	
3	Physical Properties (Tensile Strength and Elongation	IS : 9573	IS : 9573	IS : 9573	INSPECTION TEST REPORT	P	W	R	
4	Accelerated aging test	IS : 9573	IS : 9573	IS : 9573	INSPECTION TEST REPORT	P	W	R	
5	Resistance of lining to N-Pentane	IS : 9573	IS : 9573	IS : 9573	INSPECTION TEST REPORT	P	W	R	
6	Adhesion	IS : 9573	IS : 9573	IS : 9573	INSPECTION TEST REPORT	P	W	R	
7	Low Temperature Flexibility	IS : 9573	IS : 9573	IS : 9573	INSPECTION TEST REPORT	P	W	R	
8	Flexibility	IS : 9573	IS : 9573	IS : 9573	INSPECTION TEST REPORT	P	W	R	
9	Ozone Resistance	IS : 9573	IS : 9573	IS : 9573	INSPECTION TEST REPORT	P	W	R	
10	Hydrostatic Test	IS : 9573	IS : 9573	IS : 9573	INSPECTION TEST REPORT	P	W	R	
11	Bursting Pressure Test	IS : 9573	IS : 9573	IS : 9573	INSPECTION TEST REPORT	P	W	R	
12	Grip Strength Test	IS : 9573	IS : 9573	IS : 9573	INSPECTION TEST REPORT	P	W	R	
13	Burning Behavior test	IS : 9573	IS : 9573	IS : 9573	INSPECTION TEST REPORT	P	W	R	
14	Marking	IS : 9573	IS : 9573	IS : 9573	INSPECTION TEST REPORT	P	W	R	
15	Final Documentation		Document pertaining to all tests specified in this QAP	Document pertaining to all tests specified in this QAP		P	H	R	

LEGENDS: R - REVIEW, W - Witness, H-Hold, P - Perform, TPIA - Third Party Agency
(Owner / Owner's Representative) Note:-

1 The Above Testing and acceptance criteria are minimum requirements, however, manufacturer shall ensure that the product shall also comply to the additional requirements as per TS.

2 The supplier shall submit their own details ITP prepared on the basis of above/ Technical specification for approval of Owner/Owner's representative.

3 Owner/Owner representative shall review/approve all the documents related to ITP/Quality manuals/Drawings etc. submitted by supplier.

4 Owner / Owner's representative including TPIA will have to right to inspect any activity of manufacturing at any time

5 All reference Codes/ Standards, Documents. P.O. Copies shall be arranged by vendor / Supplier for reference of TPIA/PMC/Client at the time of Inspection

6 At the time of delivery of material in stores, vendor will submit copy of all related document of inspection along with release note & MTC.

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TECHNICAL SPECIFICATION AND STANDARDS FOR LMC WORKS

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TECHNICAL SPECIFICATION AND STANDARDS
FOR LMC WORKS

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AMENDMENT STATUS

Sl. No.	Clause / Paragraph / Annexure / Exhibit / Drawing Amended	Page No.	Revision	Date	By (Name)	Verified (Name)

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TECHNICAL SPECIFICATION AND STANDARDS FOR LMC WORKS

S. No.	Violation or HSE norms	Penalty Amount
3.	Unsafe electrical practices (not installing ELCB, using poor joints of cables, using naked wire without top plug into socket, laying wire / cables on the roads, electrical jobs by incompetent person, etc.)	Rs.3,000/- per item per day.
4.	Working at height without full body harness, using non-standard/ rejected scaffolding and not arranging fall protection arrangement as required like Safety Nets.	Rs.1,000/ per case per day.
5.	Unsafe handling of compressed gas cylinders (No trolley, jubilee clips double gauge regulator, improper storage / handling).	Rs. 100/- per item per day
6.	Use of domestic LPG for cutting purpose.	Rs.1,000/- per occasion
7.	No fencing / barricading of excavated areas.	Rs.1,000/- per occasion
8.	Not providing shoring / strutting / proper slope and not keeping the excavated earth at least 1.5 M away from excavated area.	Rs.5,000/- per occasion
9.	Non display of caution boards, list of hospitals, emergency services available at work locations.	Rs.500/- per occasion
10.	Traffic rules violations like over speeding of vehicles, rash driving, wrong parking, not using seat belts, vehicles not fitted with reverse warning alarms.	Rs.1,000/- per occasion
11.	Absence of Contractor's top most executive at site in the safety meetings whenever called by PMC / Owner	Rs.1,000/- per occasion

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12.	Failure to maintain safety records by Contractor Safety personnel.	Rs.1,000/- per month.
13.	Failure to conduct daily safety site inspection, HSE meeting and HSE audit at predefined frequencies.	Rs.1,000/- per occasion
14.	Failure to submit the monthly HSE report by 5th of subsequent month to Engineer-in-Charge.	Rs. 1,000/- per occasion and Rs. 100/- per day for further delay.

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15.	Poor House Keeping	Rs.1,000/- per occasion
16.	Failure to report & follow up accident (including Near Miss) reporting system.	Rs. 10,000/- per occasion

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SL. NO	DESCRIPTION	*QUANTITY*
1.	Small size Roller Bandages, 1 inch wide (Finger Dressing small)	6 Pcs.
2.	Medium size Roller Bandages, 2 inch wide (Hand and Foot Dressing)	6 Pcs.
3.	Large size Roller Bandages, 4 inch wide (Body Dressing Large)	6 Pcs.
4.	Large size Burn Dressing (Burn Dressing Large)	4 Pkts.
5.	Cotton wool (20 gms packing)	4 Pkts.
6.	Antiseptic Solution Dettol (100 ml.) or Savlon	1 Bottle
7.	Mercurochrome Solution (100 ml.) 2% in water	1 Bottle
8.	Ammonia Solution (20 ml.)	1 Bottle
9.	A Pair of Scissors	1 Piece
10.	Adhesive Plaster (1.25 cm x 5 m)	1Spool
11.	Eye pads in Separate Sealed Packet	4 Pcs.
12.	Tourniqut	1 No.
13.	Safety Pins	1 Dozen
14.	Tinc. Iodine / Betadine (100 ml.)	1 Bottles
15.	Ointment for burns (Burnol 20 gms.)	1 Bottle
16.	Polythene Wash cup for washing eyes	1 No.
17.	Potassium Permanganate (20 gms.)	1 Pkt.
18.	Tinc. Benzoine (100 ml.)	1 Bottle
19.	Triangular Bandages	2 Nos.
20.	Band Aid Dressing	5 Pcs.
21.	Iodex / Moov (25 gms.)	1 Bottle
22.	Tongue Depressor	1 No.
23.	Boric Acid Powder (20 gms.)	2 Pkt.
24.	Sodium Bicarbonate (20 gms.)	1 Pkt.
25.	Dressing Powder (Nebasulf) (10 gms.)	1 Bottle
26.	Medicinal Glass	1 No.
27.	Duster	1 No.
28.	Booklet (English & Local Language)	1 No. each
29.	Soap	1 No.
30.	Toothache Solution	1 No.
31.	Eye Ointment	1 Bottle
32.	Vicks (22 gms.)	1 Bottle
33.	Forceps	1 No.
34.	Cotton Buds (5 nos.)	1 Pkt.
35.	Note Book	1 No.
36.	Splints	4 Nos.
37.	Lock	1 Piece
38.	Life Saving/Emergency/Over-the Counter Drugs	As decided at site
	Box size : 14” x 12” x 4”	

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TECHNICAL SPECIFICATION AND STANDARDS FOR LMC WORKS

ANNEXURE – E

CONSTRUCTION HAZARDS, THEIR EFFECTS & PREVENTIVE MEASURES

ACTIVITY	*TYPE OF HAZARD*	EFFECT OF HAZARD	PREVENTIVE MEASURES
(A) EXCAVATION Pit Excavation up to 3.0m	§ Falling into pit	§ Personal injury	§ Provide guard rails/barricade with warning signal. § Provide at least two entries/exits. § Provide escape ladders.
	§ Earth Collapse	§ Suffocation / Breathlessness Buried	§ Provide suitable size of shoring and strutting, if required. § Keep soil heaps away from the edge equivalent to 1.5m or depth of pit whichever is more. § Don't allow vehicles to operate too close to excavated areas. Maintain at least 2m distance from edge of cut. § Maintain sufficient angle of repose. § Provide slope not less than 1:1 and suitable bench of 0.5m width at every 1.5m depth of excavation in all soils except hard rock. § Battering/benching the sides.

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	§ Contact with buried electric cables Gas/ Oil Pipelines	§ Electrocution Explosion	§ Obtain permission from competent authorities, prior to excavation, if required. § Locate the position of buried utilities by referring to plant drawings. § Start digging manually to locate the exact position of buried utilities and thereafter use

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ACTIVITY	*TYPE OF HAZARD*	EFFECT OF HAZARD	PREVENTIVE MEASURES
			mechanical means.
Pit Excavation beyond 3.0m	§ Same as above plus § Flooding due to excessive rain/ underground water	§ Can cause drowning situation	§ Prevent ingress of water § Provide ring buoys Identify and provide suitable size dewatering pump or well point system
	§ Digging in the vicinity of existing Building/ Structure	§ Building/ Structure may collapse § Loss of health & wealth	§ Obtain prior approval of excavation method from local authorities § Use under-pining method § Construct retaining wall side by side
	§ Movement of vehicles / equipments close to the edge of cut.	§ May cause cave-in or slides § Persons may get buried	§ Barricade the excavated area with proper lighting arrangements § Maintain at least 2m distance from edge of cut and use stop block to prevent over-run. § Strengthen shoring and strutting
Narrow deep excavations for pipelines, etc.	§ Same as above plus Frequent cave-in or slides	§ May cause severe injuries or prove fatal	§ Battering/benching of sides § Provide escape ladders
	§ Flooding due to Hydrostatic testing	§ May arise drowning situation	§ Same as above plus Bail out accumulated water § Maintain adequate ventilation

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Rock excavation by blasting	§ Improper handling of explosives	§ May prove fatal	§ Ensure proper storage, handling & carrying of explosives by trained personnel. § Comply with the applicable explosive acts & rules.
	§ Uncontrolled explosion	§ May cause severe injuries or prove fatal	§ Allow only authorized persons to perform blasting operations. § Smoking and open

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ACTIVITY	*TYPE OF HAZARD*	EFFECT OF HAZARD	PREVENTIVE MEASURES
			flames are to be strictly prohibited.
	§ Scattering of stone pieces in atmosphere	§ Can hurt people	§ Use PPE like goggles, face mask, helmets etc.
Rock excavating by blasting (Contd)	§ Entrapping of persons/ animals.	§ May cause severe injuries or prove fatal	§ Barricade the area with red flags and blow siren before blasting.
	§ Misfire	§ May explode suddenly	§ Do not return to site for at least 20 minutes or unless announced safe by designated person.
Piling Work	§ Failure of pile-driving equipment	§ Can hurt people	§ Inspect Piling rigs and pulley blocks before the beginning of each shift.
	§ Noise pollution	§ Can cause deafness and psychological imbalance	§ Use personal protective equipments like ear plugs, muffs, etc.
	§ Extruding rods / casing	§ Can hurt people	§ Barricade the area an install sign boards Provide first-aid
	§ Working in the vicinity of 'Live-Electricity'	§ Can cause electrocution / asphyxiation	§ Keep sufficient distance from Live-Electricity as per IS code. § Shut off the supply, if possible § Provide artificial/rescue breathing to he injured.
(B) CONCRETING	§ Air pollution by cement	May affect Respiratory System	§ Wear respirators or cover mouth and nose with wet cloth.
	§ Handling of ingredients	§ Hand s may get injured	§ Use gloves and other PPE.
	§ Protruding reinforcement	§ Feet may get injured	§ Use Safety shoes. § Provide platform

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	rods.		above reinforcement for movement of workers.
	§ Earthing of electrical mixers,	§ Can cause electrocution / asphyxiation	§ Ensure earthing of equipments and proper functioning of

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ACTIVITY	*TYPE OF HAZARD*	EFFECT OF HAZARD	PREVENTIVE MEASURES
	vibrators, etc. not done		electrical circuit before commencement of work.
	§ Falling of materials from height	§ Persons may get injured	§ Use hard hats § Remove surplus material immediately from work place § Ensure lighting arrangements during night hours.
	§ Continuous pouring by same gang	§ Cause tiredness of workers and may lead to accident.	§ Insist on shift pattern § Provide adequate rest to workers between subsequent pours.
	§ Revolving or concrete mixer/ vibrators	§ Parts of body or clothes may get entrapped.	§ Allow only mixers with hopper § Provide safety cages around moving motors § Ensure proper mechanical locking of vibrator
Super-structure	§ Same as above plus § Deflection in props or shuttering material	§ Shuttering / props may collapse and prove fatal	§ Avoid excessive stacking on shuttering material § Check the design and strength of shuttering material before commencement of work § Rectify immediately the deflection noted during concreting
	§ Passage to work place	§ Improperly tied and designed props / planks may collapse	§ Ensure the stability and strength of passage before commencement of work § Do not overload and under the passage.

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(C) REINFORCEMENT	§ Curtailment and binding of rods	§ Persons may get injured	§ Use PPE like gloves, shoes, helmets, etc. § Avoid usage of shift tools
	§ Carrying of rods for short distance/ at	§ Workers may injure their hands and shoulders	§ Provide suitable pads on shoulders and use safety

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ACTIVITY	*TYPE OF HAZARD*	EFFECT OF HAZARD	PREVENTIVE MEASURES
	heights		gloves. § Tie up rods in easily liftable bundles § Ensure proper staging.
	§ Checking of clear distance/ cover with hands	§ Rods may cut or injure the finger	§ Use measuring devices tape, measuring rods, etc.
	§ Hitting projected rods and standing on cantilever rods	§ Persons may get injured and fall down	§ Use safety shoes and avoid standing unnecessarily on cantilever rods § Avoid wearing loose clothes
	§ Falling of material from height	§ May prove fatal	§ Use helmets § Provide safety nets
	§ Transportation of rods by trucks / trailers	§ Protruded rods may hit the persons	§ Use red flags/lights at the ends § Do not protrude the rods in front of or by the side of driver's cabin. § Do not extend the rods 1/3rd of deck length or 1.5 m which is less
(D) WELDING AND GAS CUTTING	§ Welding radiates invisible ultraviolet and infrared says	§ Radiation can damage eyes and skin.	§ Use specified shielding devices and other PPE of correct specifications § Avoid throated tungsten electrodes for GTAW.
	§ Improper placement of oxygen and acetylene cylinders	§ Explosion may occur	§ Move out any leaking cylinder § Keep cylinder in vertical position § Use trolley for transportation of cylinders and chain them

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			§ Use flash back arrestors
	§ Leakage / cuts in hoses	§ May cause fire	§ Purge regulators immediately and then turn off § Never use grease or

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ACTIVITY	*TYPE OF HAZARD*	EFFECT OF HAZARD	PREVENTIVE MEASURES
			oil on oxygen line connections and copper fittings on acetylene lines § Inspect regularly gas carrying hoses § Always use red hose for acetylene & other fuel gases and black for oxygen.
	§ Opening-up of cylinder	§ Cylinder may burst	§ Always stand back from the regulator while opening the cylinder § Turn valve slowly to avoid bursting § Cover the lug terminals to prevent short circuiting.
	§ Welding of tanks, container or pipes storing flammable liquids	§ Explosion may occur	§ Empty & purge them before welding § Never attach the ground cable to tanks, container or pipe storing flammable liquids § Never use LPG for gas cutting
(E) RADIOGRAPHY	§ Ionizing Radiation	§ Radiations may react with the skin and can cause cancer, skin irritation, dermatitis, etc.	§ Ensure safety regulations as per BARC/AERB before commencement of job. § Cordon off the area and install Radiation warning symbols § Restrict the entry of unauthorized persons § Wear appropriate PPE and film badges issued by BARC/AERB

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	§ Transportation and Storage of Radiography source	§ Same as above	§ Never touch or handle radiography source with hands § Store radiography source inside a pit in an exclusive isolated

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ACTIVITY	*TYPE OF HAZARD*	EFFECT OF HAZARD	PREVENTIVE MEASURES
			storage room with lock and key arrangement. The pit should be approved by BARC/AERB § Radiography source should never be carried either in passenger bus or in a passenger compartment of trains. § BARC/AERB have to be informed before source movement. § Permission from Director General of Civil Aviation is required for booking radio isotopes with airlines.
	§ Loss of Radio isotope	§ Same as above	§ Try to locate with the help of Survey Meter. § Inform BARC/AERB(*) (*) Atomic Energy Regulatory Board (AERB), Bhabha Atomic Research Centre (BARC) Anushaktinagar, Mumbai – 400 094
(F) ELECTRICAL INSTALLATION AND USAGE	§ Short circuiting	§ Can cause Electrocution or Fire	§ Use rubberized hand gloves and other PPE § Don't lay wires under carpets, mats or doorways. § Allow only licensed electricians to

			§ perform on electrical facilities § Use one socket for one appliance § Ensure usage of only fully insulated wires or cables § Don't place bare wire ends in a socket

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ACTIVITY	*TYPE OF HAZARD*	EFFECT OF HAZARD	PREVENTIVE MEASURES
			§ Ensure earthing of machineries and equipments § Do not use damaged cords and avoid temporary connections § Use spark-proof/flame proof type field distribution boxes. § Do not allow open/bare connections § Provide all connections through ELCB § Protect electrical cables / equipment's from water and naked flames § Check all connections before energizing.
	§ Overloading of Electrical System	§ Bursting of system can occur which leads to fire	§ Display voltage and current ratings prominently with 'Danger' signs. § Ensure approved cable size, voltage grade and type. § Switch off the electrical utilities when not in use. § Do not allow unauthorized connections. § Ensure proper grid wise distribution of Power.

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	§ Improper laying of overhead and underground transmission lines / cables	§ Can cause electrocution and prove fatal	§ Do not lay unarmored cable directly on ground, wall, roof of trees § Maintain at least 3m distance from HT cables § All temporary cables should be laid at least 750 mm below ground on 100 mm

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ACTIVITY	*TYPE OF HAZARD*	EFFECT OF HAZARD	PREVENTIVE MEASURES
			fine sand overlying by brick soling § Provide proper sleeves at crossings/ intersections § Provide cable route markers indicating the type and depth of cables at intervals not exceeding 30m and at the diversions / termination.

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(G) FIRE PREVENTION AND PROTECTION	§ Small fires can become big ones and may spread to the surrounding areas	§ Cause burn injuries and may prove fatal.	§ In case a fire breaks out, press fire alarm system and shout "Fire, Fire" § Keep buckets full of sand & water/fire extinguishing equipment near hazardous locations § Confine smoking to 'Smoking Zones' only § Train people for using specific type of fire equipments under different classes of fire § Keep fire doors/ shutters, passages and exit doors unobstructed § Maintain good house keeping and first-aid boxes (for detail refer Annex-2) § Don't obstruct assess to Fire extinguishers § Do not use elevators for evacuation during fire § Maintain lightening arrestors for elevated structures § Stop all electrical motors with internal combustion. § Move the vehicles from dangerous

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ACTIVITY	*TYPE OF HAZARD*	EFFECT OF HAZARD	PREVENTIVE MEASURES
			locations. § Remove the load hanging from the crane booms. § Remain out of the danger areas.
	§ Improper selection of Fire Extinguisher	§ It may not extinguish the fire	§ Ensure usage of correct fire extinguisher meant for the specified fire (for details refer Appendix-C) § Do not attempt to extinguish Oil and electric fires with water. Use foam cylinders/CO_2/sand or earth.

	§ Improper storage of highly inflammable substances	§ Same as above	§ Maintain safe distance of flammable substances from source of ignition § Restrict the distribution of flammable materials to only min. necessary amount § Construct specifically designed fuel storage facilities § Keep chemicals in cool and dry place away from hat. Ensure adequate ventilation § Before welding operation, remove or shield the flammable material properly § Store flammable materials in stable racks, correctly labeled preferably with catchments trays. § Wipe off the spills immediately

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TECHNICAL SPECIFICATION AND STANDARDS FOR LMC WORKS

ACTIVITY	*TYPE OF HAZARD*	EFFECT OF HAZARD	PREVENTIVE MEASURES
	§ Short circuiting of electrical system	§ Same as above § Can cause Electrocution	§ Don't lay wires under carpets, mats or door ways § Use one socket for one appliance § Use only fully insulated wires or cables § Do not allow open/bare connections § Provide all connections through ELCB § Ensure earthing of machineries and equipments
(H) VEHICULAR MOVEMENT	§ Crossing the Speed Limits (Rash driving)	§ Personal injury	§ Obey speed limits and traffic rules strictly § Always expect the unexpected and be a defensive drive § Use sat belts/helmets § Blow horn at intersections and during overtaking operations. § Maintain the vehicle in good condition § Do not overtake on curves, bridges and slopes

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	§ Adverse weather condition	§ Same as above	§ Read the road ahead and ride to the left § Keep the wind screen and lights clean § Do not turn at speed § Recognize the hazard, understand the defense and act correctly in time.
	§ Consuming alcohol before and during he	§ Same as above	§ Alcohol and driving do not mix well. Either choose

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ACTIVITY	*TYPE OF HAZARD*	EFFECT OF HAZARD	PREVENTIVE MEASURES
	driving operation		alcohol or driving. § If you have a choice between hitting a fixed object or an oncoming vehicle, hit the fixed object § Quit the steering at once and become a passenger. Otherwise take sufficient rest and then drive. § Do not force the driver to drive fast and round the clock § Do not day dram while driving
	§ Falling objects / Mechanical failure	§ May prove fatal	§ Ensure effective braking system, adequate visibility for the drives, reverse warning alarm. § Proper maintenance of the vehicle as per manufacturer instructions

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(I) PROOF TESTING (HYDROSTATIC/ PNEUMATIC TESTING	§ Bursting of piping § Collapse of tanks § Tanks flying off	§ May cause injury and prove fatal	§ Prepare test procedure & obtain CONSULTANT/ Owner's approval § Provide separate gauge for pressurizing pump and piping/equipment § Check the calibration status of all pressure gauges, dead weight testers and temperature recorders § Take dial readings at suitable defined intervals and ensure most of them fall between 40-60% of the gauge scale range § Provide safety relief valve (set at

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ACTIVITY	*TYPE OF HAZARD*	EFFECT OF HAZARD	PREVENTIVE MEASURES

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			pressure slightly higher than test pressure) while testing with air/nitrogen § Ensure necessary precautions, stepwise increase in pressure, tightening of bolts/ nuts, grouting, etc. before and during testing § Keep the vents open before opening any valve while draining out of water used for hydro testing of tanks § Pneumatic testing involves the hazard of released energy shored in compressed gas. Specific care must therefore be taken to minimize the chance of brittle failure during a pneumatic leak test. Test temperature is important in this regard and must be considered when the designer chooses the material of construction § A pressure relief device shall be provided, having a set pressure not higher than the test pressure plus the lesser of 345 KPa (50 psi) or 10% of he test pressure. The gas used as test fluid, if not air, shall be nonflammable and nontoxic.
(J) WORKING AT HEIGHTS	§ Person can fall down	§ May sustain severe injuries or	§ Provide guard rails/barricade at the

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ACTIVITY	*TYPE OF HAZARD*	EFFECT OF HAZARD	PREVENTIVE MEASURES
		prove fatal	work place § Use PPE like safety belts, full body harness, life line, helmets, safety shoes, etc. § Obtain a permit before starting the work at height above 3 meters § Fall arrest systems like safety nets, etc. must be installed § Provide adequate working space (min. 0.6 m) § Tie/weld working platform with fixed support § Use roof top walk ladder while working on a slopping roofs § Avoid movement on beams
		§ May hit the scrap / material stacked at the ground or in between	§ Keep the work place neat and clean § Remove the scrap immediately
	§ Material can fall down	§ May hit the workers working at lower levels and prove fatal.	§ Same as above plus § Do not throw or drop material or equipment from height § All tools to be carried in a toolkit bags or on working uniform § Remove scrap from the planks § Ensure wearing of helmet by the workers at low level

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(K) CONFINED SPACES	§ Suffocation / drowning	§ Unconsciousness, death	§ Use respiratory devices, if required § Avoid over crowding inside a confined space § Provide Exhaust Fans for ventilation § Do not wear loose clothes, neck ties,

ACTIVITY	*TYPE OF HAZARD*	EFFECT OF HAZARD	PREVENTIVE MEASURES
			etc. § Fulfill conditions of the permit. § Check for presence of hydrocarbons, O_2 level § Obtain work permit before entering a confined space § Ensure that the connected piping of the equipment which is to be opened is pressure free, fluid has been drained, vents are open and piping is positively isolated by a blind flange
	§ Presence of foul smell and toxic substances	§ Inhalation can pose threat to life.	§ Same as above plus § Check for hydrocarbon and Aromatic compounds before entering a confined space § Depute one person outside the confined space for continuous monitoring and for extending help in case of an emergency

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	§ Ignition / flame can cause fire	§ Person may sustain burn injuries or explosion may occur	§ Keep fire extinguishers at a hand distance § Remove surplus material and scrap immediately § Do not smoke inside a confined space § Do not allow gas cylinders inside a confined space § Use low voltage (24V) lamps for lighting § Use tools with air motors or electric tools with max.

ACTIVITY	*TYPE OF HAZARD*	EFFECT OF HAZARD	PREVENTIVE MEASURES
			voltage of 24V § Remove all equipments at the end of the day

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(L) HANDLING AND LIFTING EQUPMENTS	§ Failure of load lifting and moving equipments	§ Can cause accident and prove fatal	§ Avoid standing under the lifted load and within the operating radius of cranes § Check periodically oil, brakes, gears, horns and tyre pressure of all moving machinery § Check quality, size and condition of all chain pulley blocks, slings, U-clamps, D-shackles, wire ropes, etc. § Allow crane to move only on hard, firm and leveled ground § Allow lifting slings as short as possible and check gunny packings at the friction points § Do not allow crane to tilt its boom while moving § Install Safe Load Indicator § Ensure certification by applicable authority.
	§ Overloading of lifting equipments	§ Can cause electrocution and fire	§ Safe lifting capacity of derricks and winches written on them shall be got verified. § The max safe working load shall be marked on all lifting equipments § Check the weight of columns and other heavy items painted on them and accordingly decide about the crane

ACTIVITY	***TYPE OF HAZARD***	**EFFECT OF HAZARD**	**PREVENTIVE MEASURES**

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			§ capacity, boom and angle of erection § Allow only trained operators and riggers during crane operation
	§ Overhead electrical wires	§ Can cause electrocution and fire	§ Do not allow boom or other parts of crane to come within 3 m reach of overhead HT cables § Hook and load being lifted shall preferably remain in full visibility of crane operator.
(M) SCAFFOLDING, FORMWORK AND LADDERS	§ Person can fall down	§ Person may sustain severe injuries and prove fatal	§ Provide guard rails for working at height § Face ladder while climbing and use both hands § Ladders shall extend about 1m above landing for easy access and tying up purpose § Do not place ladders against movable objects and maintain base at ¼ unit of the working length of the ladder § Suspended scaffolds shall not be less than 500 mm wide and tied properly with ropes § No loose planks shall be allowed § Use PPE, like helmets, safety shoes, etc.
	§ Failure of scaffolding material	§ Same as above	§ Inspect visually all scaffolding materials for stability and anchoring with permanent structures. § Design scaffolding

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ACTIVITY	*TYPE OF HAZARD*	EFFECT OF HAZARD	PREVENTIVE MEASURES
			for max. load carrying capacity § Scaffolding planks shall not be less than 50x250 mm full thickness lumber or equivalent. These shall be cleared or secured and must extend over the end supports by at least 150mm and not more that 300 mm § Don't overload the scaffolds § Do not splice short ladders to make a longer one. Vertical ladders shall not exceed 6m.
	§ Material can fall down	§ Persons working at lower level gets injured.	§ Remove excess material and scrap immediately § Carry the tools in a tool-kit bag only § Provide safety nets
(N) STRUCTURAL WORKS	§ Personal negligence and danger of fall	§ Can cause injury or casualty	§ Do not take rest inside rooms built for welding machines or electrical distribution system § Avoid walking on beams at height § Wear helmet with chin strap and safety belts when working at height § Use hand gloves and goggles during grinding operations § Cover or mark the sharp and projected edges § Do not stand within the operating radius of cranes

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	§ Lifting / slipping of	§ Same as above	§ Do not stand under the lifted load

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ACTIVITY	*TYPE OF HAZARD*	EFFECT OF HAZARD	PREVENTIVE MEASURES
	material		§ Stack properly all the materials. Avoid slippage during handling § Control longer pieces lifted up by cranes from both ends § Remove loose materials from height § Ensure tightening of all nuts and bolts
(O) PIPELINE WORKS	§ Erection / lowering failure	§ Can cause injury	§ Do not stand under the lifted Load § Do not allow any person to come within the radii of the side boom handling pipes § Check the load carrying capacity of the lifting tools and tackles § Use safe Load Indicators § Use appropriate PPEs
	§ Other	§ Same as above	§ Wear gum boots in marshy areas § Allow only one person to perform signaling operations while lowering of pipes § Provide night caps on pipes § Provide end covers on pipes for stoppage of pigs while testing/cleaning operations.

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FORMAT NO. : HSE-1, REV. 0

HSE CHECKLIST CUM COMPLIANCE REPORT (1/6)

Project: _____ Date:
Inspection By:_____

Frequency : Fortnightly

Contractor :_____
Owner :_____
Report No. :_____
Job No :_____

Note: write 'NA' wherever the item is not applicable

SL. NO.	ITEM	YES	NO	REMARKS	ACTION
1	**HOUSEKEEPING**				
a)	Waste containers provided and used				
b)	Sanitary facilities adequate and clean				
c)	Passageways and Walkways clear				
d)	General neatness of working areas				
e)	Others				
2	**PERSONNEL PROTECTIVE EQUIPMENT**				
a)	Goggles; Shields				
b)	Face protection				
c)	Hearing protection				
d)	Safety shoes				
e)	Hand protection				
f)	Respiratory Masks etc.				
g)	Safety Belts				
h)	Safety Helmet/Hard Hat				
I)	Others				
3	**EXCAVATIONS/OPENINGS**				
a)	Openings properly covered or barricaded				
b)	Excavations shored				
c)	Excavations barricaded				
d)	Overnight lighting provided				
e)	Others				
4	**WELDING & GAS CUTTING**				
a)	Gas cylinders chained upright				
b)	Cables and hoses not obstructing				
c)	Screens or shields used				
d)	Flammable materials protected				
e)	Fire extinguisher(s) accessible				
f)	Others				
5	**SCAFFOLDING**				

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a)	Fully decked platforms				
b)	Guard and intermediate rails in place				

SL. NO.	ITEM	YES	NO	REMARKS	ACTION
c)	Toe boards in place				
d)	Adequate shoring				
e)	Adequate access				
f)	Others				
6	**LADDERS**				
a)	Extension side rails 1m above				
b)	Top of landing				
c)	Properly secured				
d)	Angle + 70 from horizontal				
e)	Others				
7	**HOISTS, CRANES AND DERRICKS**				
a)	Condition of cables and sheaves OK				
b)	Condition of slings, chains, hooks and eyes OK				
c)	Inspection and maintenance logs maintained				
d)	Outriggers used				
e)	Signs/barricades provided				
f)	Signals observed and understood				
g)	Qualified operators				
h)	Others				
8	**MACHINERY, TOOLS AND EQUIPMENT**				
a)	Proper instruction				
b)	Safety devices				
c)	Proper cords				
d)	Inspection and maintenance				
e)	Others				
9	**VEHICLE AND TRAFFIC**				
a)	Rules and regulations observed				
b)	Inspection and maintenance				
c)	Licensed drivers				
d)	Others				
10	**TEMPORARY FACILITIES**				
a)	Emergency instructions posted				
b)	Fire extinguishers provided				
c)	Fire-aid equipment available				
d)	Secured against storm damage				
e)	General neatness				
f)	In accordance with electrical requirements				
g)	Others				

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11	**FIRE PREVENTION**				
a)	Personnel instructed				
b)	Fire extinguishers checked				
c)	No smoking in Prohibited Areas				
d)	Hydrants Clear				

SL. NO.	ITEM	YES	NO	REMARKS	ACTION
e)	Others				
12	**ELECTRICAL**				
a)	Use of 3-core armored cables				
b)	Usage of 'All insulated' or 'double insulated' electrical tools				
c)	All electrical connection are routed through ELCB				
d)	Natural Earthing at the source of power (main DB)				
e)	Continuity and tightness of earth conductor				
f)	Covering of junction boxes, panels and other energized wiring places				
g)	Ground fault circuit interrupters provided				
h)	Prevention of tripping hazards				
i)	Others				
13	**HANDLING AND STORAGE OF MATERIALS**				
a)	Properly stored or stacked				
b)	Passageways clear				
c)	Others				
14	**FLAMMABLE GASES AND LIQUIDS**				
a)	Containers clearly identified				
b)	Proper storage				
c)	Fire extinguishers nearby				
d)	Others				
15	**WORKING AT HEIGHT**				
a)	Erection plan and work permit obtained				
b)	Safety nets				
c)	Full body harness and lanyards; chute lines				
d)	Health Check record available for workers going up?				
e)	Others				
16	**CONFINED SPACE**				
a)	Work permit obtained				
b)	Test for toxic gas and sufficient availability of oxygen conducted				
c)	At least one person outside the confined space for monitoring deputed				
d)	Availability of sufficient means of entry, exit and ventilation				

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e)	Fire extinguishers and first-aid facility ensured				
f)	Lighting provision made by using 24V lamps				
g)	Proper usage of PPEs ensured				
17	**RADIOGRAPHY**				
a)	Proper storage and handling of source as per BARC / AREB guidelines				
b)	Working permit obtained				
c)	Cordoning of the area done				

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TECHNICAL SPECIFICATION AND STANDARDS FOR LMC WORKS

SL. NO.	ITEM	YES	NO	REMARKS	ACTION
d)	Use of appropriate PPE's ensured				
e)	Proper training to workers/supervisors imparted				
f)	Minimum occupancy of workplace ensured				
18	**HEALTH CHECKS**				
a)	Workers medically examined and found to fit for working : i) At heights ii) In confined space.				
b)	Availability of First-aid facilities				
c)	Proper sanitation at site, office and labor camps				
d)	Arrangement of medical facilities				
e)	Measures for dealing with illness				
f)	Availability of Portable drinking water for workmen & staff				
g)	Provision of crèches for children				
h)	Stand by vehicle available for evacuation of injured.				
19	**ENVIRONMENT**				
a)	Chemical and other effluents properly disposed				
b)	Cleaning liquid of pipes disposed off properly				
c)	Seawater used for hydro-testing disposed off as per agreed procedure				
d)	Lubricant Waste/Engine oils properly disposed				
e)	Waste from Canteen, offices, sanitation etc. disposed properly				
f)	Disposal of surplus earth, stripping materials, oily rags and combustible materials done properly				
g)	Green belt protection				

Signature of Resident Engineer with Seal

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ITEM			UPTO PREVIOUS MONTH	THIS MONTH	CUMU-LATIVE
a)	Average number of Staff & Workmen (average daily headcount, not man days)				
b)	Manhours Worked				
c)	Number of HSE meeting organized at site				
d)	Number of HSE awareness programmes conducted at site				
e)	Number of Lost Time Accidents (LTA)	Fatal			
		Other LTA			
f)	Number of Loss time Injuries (LTI)	Fatalities			
		Other LTI			
g)	Number of Loss Time Accidents				
h)	Number of First Aid Cases				
i)	Number of Near Miss Incidents				
j)	Man-days lost due to accidents				
k)	LTA Free Manhours i.e. Number of LTA free manhours from the Lst LTA				
l)	Compensation cases raised with Insurance				
m)	Compensation case resolved and paid to workmen				
n)	Whether workmen compensation policy taken		Y/N		
o)	Whether workmen compensation policy valid		Y/N		
p)	Whether workmen registered under ESI Act		Y/N		
Remark					

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C. Permit shall be issued for maximum one week only (Monday to Sunday).

D. This permit shall be applicable in non-operational areas.

E. After completion of the work, used permits shall be preserved for record purposes.

F. Additional precautions, if any …….

Permission is granted to work (See overleaf) = Yes/No

Name of Contractor's Supervisor (Initiator)

Name of Contractor's Safety Officer (Issuing Authority)

GRANT OF PERMIT AND EXTENSIONS

Sl. No.	Validity Period From …… To ……	Work time From …..Hrs. To.....Hrs.	Initiator (Supervisor of Contractor)	Issuing Authority (Safety Officer) of Contractor	Verification by CONSULTANT with date

Additional safety instructions, if any.

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FORMAT NO. : HSE-7, REV. 0

CONFINED SPACE ENTRY PERMIT

Project Site : ..... Sr. No.: .....
Name of the work: ..... Date: .....
Name of Contractor : ..... Nature of Work : .....
Exact location of work : .....

Safety Requirements : POSITIVE ISOLATION OF THE VESSEL IS MANDATORY

(A) Has the equipment been ?					
Y	**NR**		**Y**	**NR**		**Y**	**NR**	
		isolated from power / steam / air			water flushed &/or steamed			radiation sources removed
		isolated from liquid or gases			Manways open & ventilated			Proper lighting provided
		depressurized &/or drained			cont. inset gas flow arranged			
		blanked / blinded / disconnected			adequately cooled			

(B) Expected Residual Hazards								
Y	**NR**		**Y**	**NR**		**Y**	**NR**	
		lack of O_2			combustible gas / liquid			H_2S / toxic gases
		corrosive chemicals			pyrophoric iron / scales			electricity / static
		Heat / stream / frost			high humidity			ionizing radiation

(C) Protective Measures								
Y	**NR**		**Y**	**NR**		**Y**	**NR**	
		gloves			ear plug / muff			goggles / face shield
		protective clothing			dust / gas / airline mask			personal gas alarm
		Grounded air educator / blower / AC			attendant with SCBA / air mask			rescue equipment / team
		Firefighting arrangements			safety harness & lifeline			communication equipment

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FORMAT NO. : HSE-8, REV. 0

RADIATION WORK PERMIT

Project : Sr. No.:

Name of the work : Date:

Name of Contractor : Job No. :

Location of work :

Source Strength :

Cordoned distance (m) :

Name of Radiographing agency : Approved by Owner / PMC ☐

The following items have been checked & compliance shall be ensured during currency of the permit :

S. No.	Item Description	Done
1.	Safety regulations as per BARC/AERB ensured while source in use/ in transit & during storage.	☐
2.	Area cordoned off.	
3.	Lighting arrangements for working during nights ensured.	
4.	Warning signs / flash lights installed.	
5.	Cold work permit taken (if applicable)	
6.	PPEs like film badges, dosimeters used.	

Additional precautions, if any _____

(Radiography Agency's BARC / AREB authorized Supervisor) (Contractor's Safety Officer)

Permission is granted.

Permit is valid from _____AM/PM _____Date to _____AM/PM _____ Date

(Signature of permit issuing authority)

Name : Designation : Date :

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Permit renewal :

Permit extended upto		Additional precautions required, if any.	Sign of issuing authority with date
Date	**Time**		

Work completed / stopped / area cleared at _____Hrs. of Date _____

(Sign of permit issuing authority)
Name :

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FORMAT NO. : HSE-9, REV. 0

RADIATION WORK PERMIT

Project : Sr. No.:

Name of the work : Date:

Name of Contractor : Job No. :

Name of Contractor :

Line No. / Equipment No. /Structure to be dismantled :

Location details of dismantling / demolition with sketch : (Clearly indicate the area)

The following items have been checked & compliance shall be ensured during currency of the permit :

S. No.	Item Description	Done	Not Applicable
1.	Services like power, gas supply, water, etc. disconnected.	☐	☐
2.	Dismantling / Demolishing method reviewed & approved.	☐	☐
3.	Usage of appropriate PPEs ensured.	☐	☐
4.	Precautions taken for neighboring structures		
5.	First-Aid arrangements made		
6.	Firefighting arrangements ensured	☐	☐
7.	Precautions taken for blasting	☐	☐

(Contractor's Supervisor) (Contractor's Safety Officer)

Permission is granted.

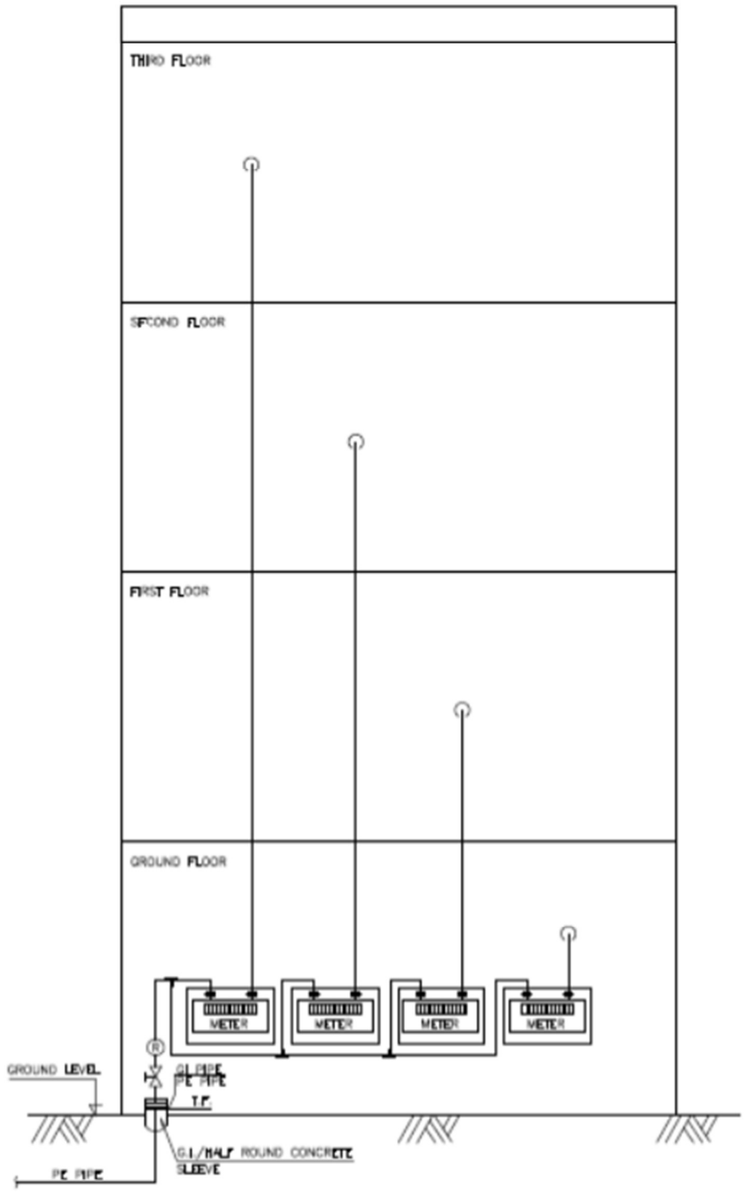
(Permit issuing authority)
Name :
Date :

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DRAWINGS

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Date: 2026.01.08 19:30:02 IST

GGL/23OH/05/25/M000/001



INDICATIVE RISER ARRANGEMENT IN BUILDING, IF METER IS INSTALLED AT GROUND FLOOR

NOTES:-

1. ALL DIMENSIONS ARE IN MM. UNLESS NOTED OTHERWISE.
2. THE SIZES SHOWN IN THE DRAWING ARE TENTATIVE. IT SHALL BE DECIDED DURING DETAILS ENGINEERING.
3. PIPING DOWN STREAM METER SHALL BE OF COPPER IN CASE METER IS INSTALLED WITHIN THE KITCHEN.
4. RISER LENGTH (FROM OUTLET OF TRANSITION FITTING TO INLET OF ISOLATION VALVE) SHALL BE 1.5m. HOWEVER IT SHALL BE TAKEN APPROVAL FROM OWNER BEFORE STARTING THE EXECUTION.
5. IT SHALL BE DECIDED BY OWNER/OWNER'S REPRESENTATIVE AS PER SITE CONDITIONS.
6. IF COPPER PIPE GOES TO THE APPLIANCE VALVE THAN BRASS FITTING SHALL BE USED AT THE OUTLET OF METER OR GI PIPE GOES TO THE APPLIANCE VALVE THAN GIFITTING SHALL BE USED AT THE OUTLET THE METER.
7. TAPPING SHALL BE LEFT NEAR THE OUTSIDE KITCHEN AS DIRECTED BY OWNER/OWNER'S REPRESENTATIVE.
8. MAXIMUM DISTANCE BETWEEN CLAMPS SHALL BE 1.5M PIPE GOES IN THE STRAIGHT LENGTH, IF ANY TEE OR ANY FITTING USE IN BETWEEN THE PIPE THAN CLAMP SHALL BE PLACED 150MM FAR AWAY FROM CENTER LINE OF FITTINGS AT EVERY SIDE. HOW EVER THE SAME MAY BE CHANGES AS PER SITE CONDITIONS/AS DIRECTED BY EIC.
9. FROM THE TRANSITION FITTING TO THE ISOLATION VALVE SHALL BE CONSIDERED IN THE OUTSIDE KITCHEN PIPING.
10. AT THE TIME OF MEASURING LENGTH OG GI/COPPER PIPE, GI/CU FITTINGS SHALL BE COUNTED IN THE PIPE LENGTH.

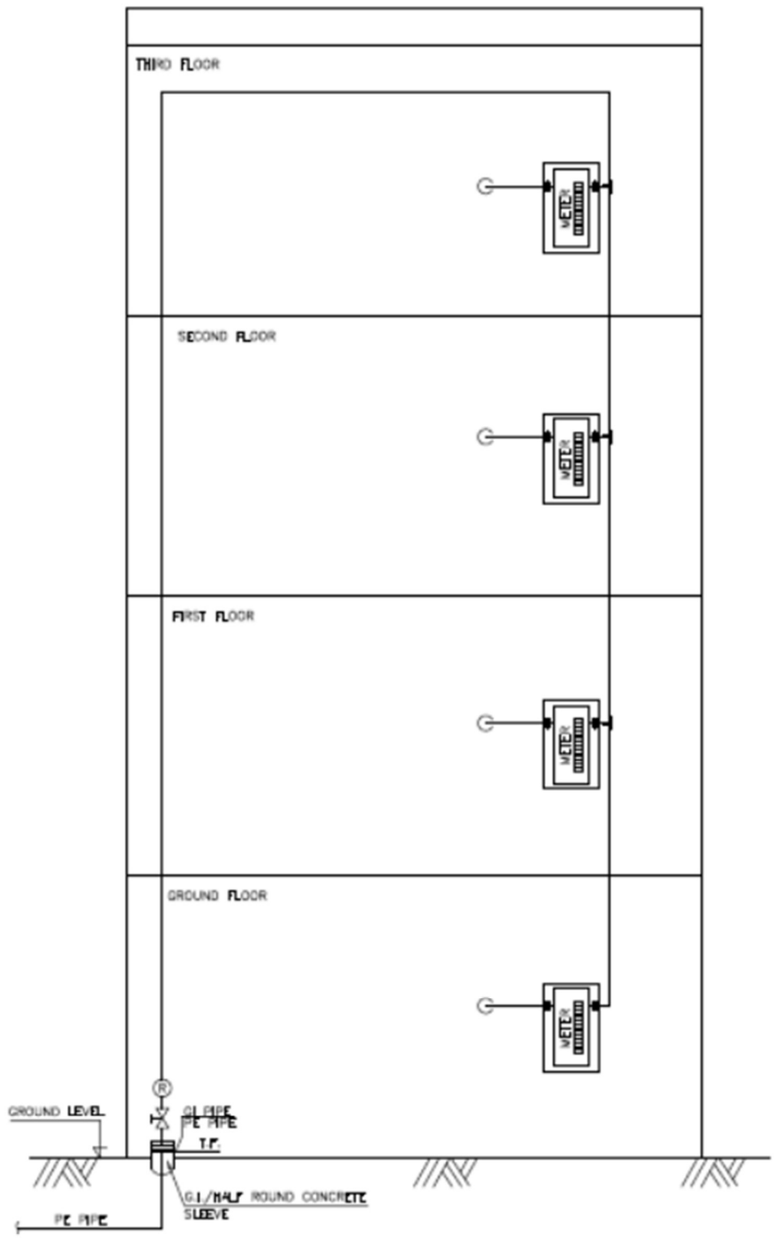
FOR TENDER PURPOSE ONLY

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GGL/23QOH/05/25/M/000/001



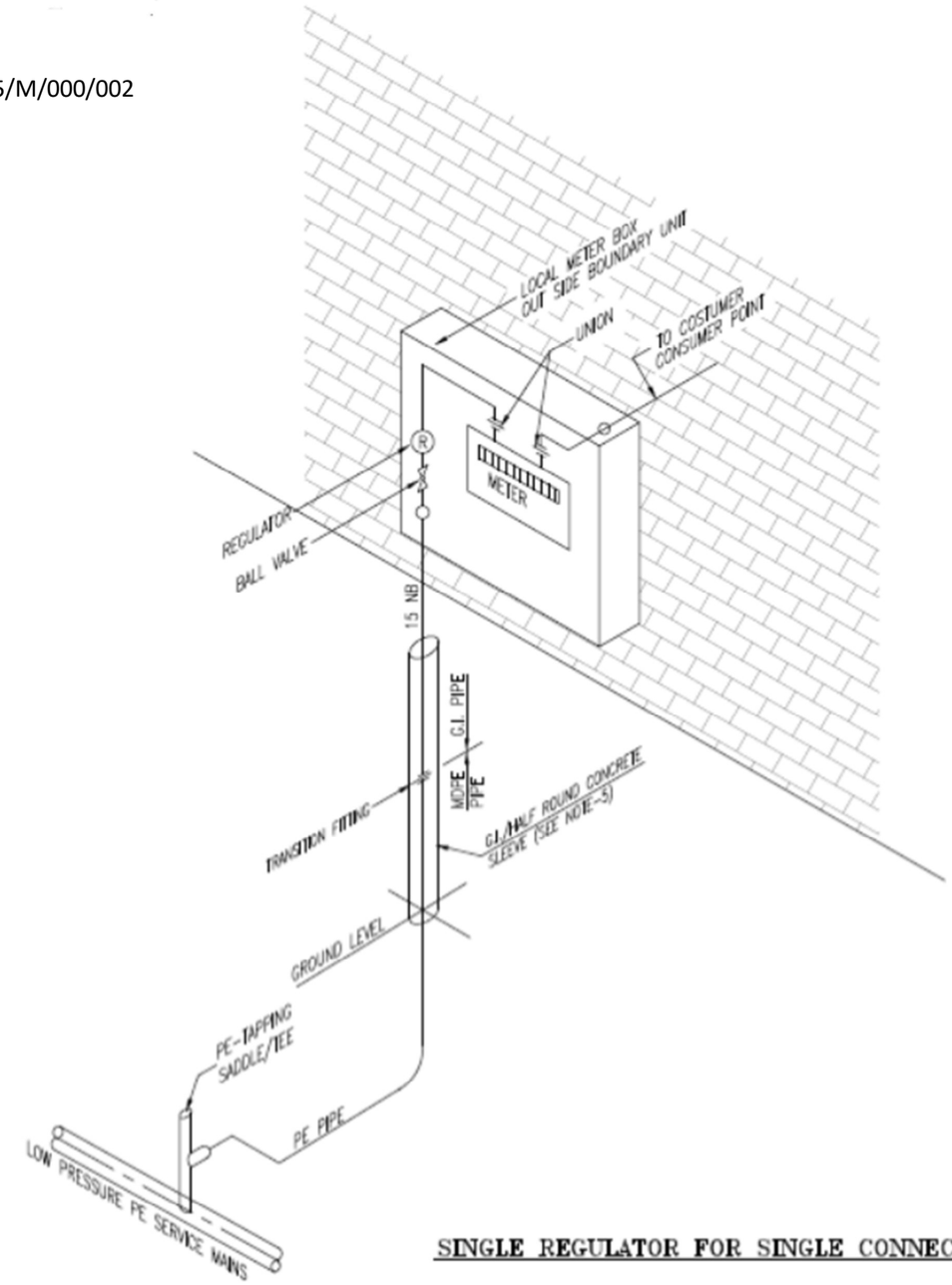
NOTES:-

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3. PIPING DOWN STREAM METER SHALL BE OF COPPER IN CASE METER IS INSTALLED WITHIN THE KITCHEN.
4. RISER LENGTH (FROM OUTLET OF TRANSITION FITTING TO INLET OF ISOLATION VALVE) SHALL BE 1.5m. HOWEVER IT SHALL BE TAKEN APPROVAL FROM OWNER BEFORE STARTING THE EXECUTION.
5. IT SHALL BE DECIDED BY OWNER/OWNER'S REPRESENTATIVE AS PER SITE CONDITIONS.
6. IF COPPER PIPE GOES TO THE APPLIANCE VALVE THAN BRASS FITTING SHALL BE USED AT THE OUTLET OF METER OR GI PIPE GOES TO THE APPLIANCE VALVE THAN GIFITTING SHALL BE USED AT THE OUTLET THE METER.
7. TAPPING SHALL BE LEFT NEAR THE OUTSIDE KITCHEN AS DIRECTED BY OWNER/OWNER'S REPRESENTATIVE.
8. MAXIMUM DISTANCE BETWEEN CLAMPS SHALL BE 1.5M PIPE GOES IN THE STRAIGHT LENGTH, IF ANY TEE OR ANY FITTING USE IN BETWEEN THE PIPE THAN CLAMP SHALL BE PLACED 150MM FAR AWAY FROM CENTER LINE OF FITTINGS AT EVERY SIDE. HOW EVER THE SAME MAY BE CHANGES AS PER SITE CONDITIONS/AS DIRECTED BY EIC.
9. FROM THE TRANSITION FITTING TO THE ISOLATION VALVE SHALL BE CONSIDERED IN THE OUTSIDE KITCHEN PIPING.
10. AT THE TIME OF MEASURING LENGTH OG GI/COPPER PIPE, GI/CU FITTINGS SHALL BE COUNTED IN THE PIPE LENGTH.

FOR TENDER PURPOSE ONLY

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GGL/23HQ/05/25/M/000/002



SINGLE REGULATOR FOR SINGLE CONNECTION

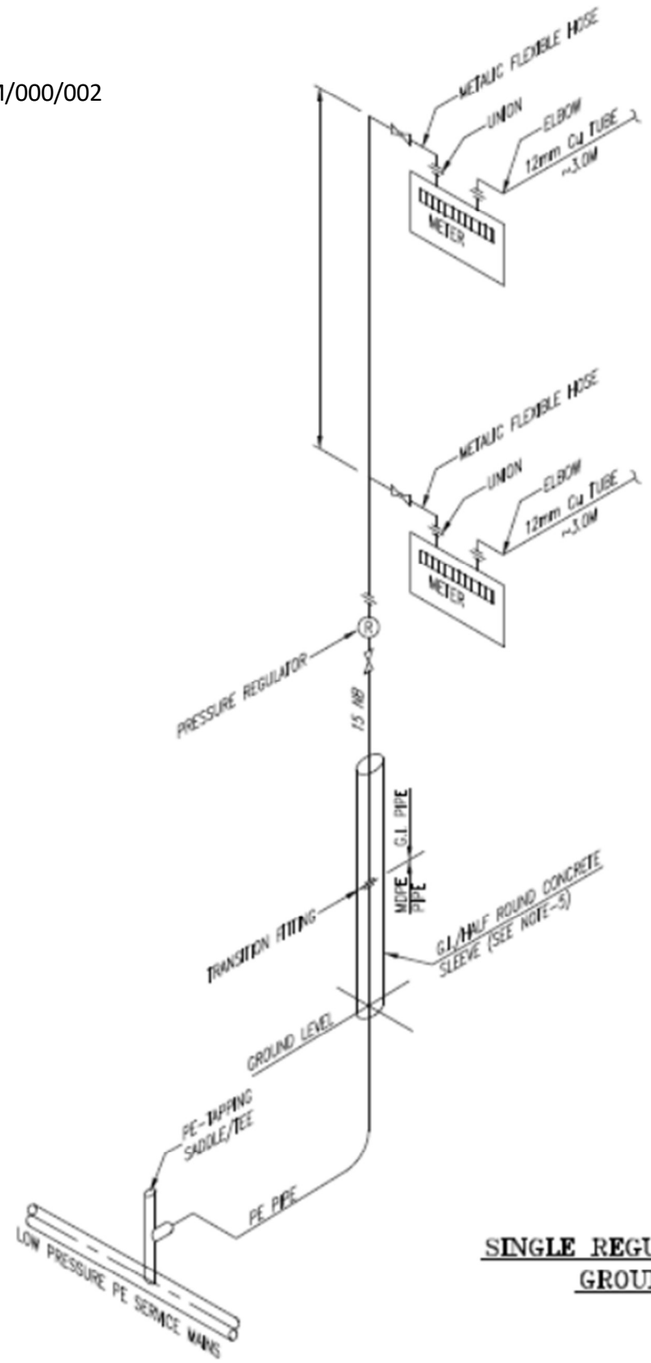
NOTES:-

1. ALL DIMENSIONS ARE IN MM. UNLESS NOTED OTHERWISE.
2. THE SIZES SHOWN IN THE DRAWING ARE TENTATIVE. IT SHALL BE DECIDED DURING DETAILS ENGINEERING.
3. PIPING DOWN STREAM METER SHALL BE OF COPPER IN CASE METER IS INSTALLED WITHIN THE KITCHEN.
4. TENTATIVE RISER LENGTH (FROM OUTLET OF TRANSITION FITTING TO INLET OF ISOLATION VALVE) SHALL BE 1.5m. ANY CHANGES IN RISER LENGTH SHALL BE AFTER APPROVED FROM EIC.
5. G.I. INSTALLATION/METER INSTALLATION SHALL BE DECIDED BY OWNER/ OWNER'S REPRESENTATIVE AS PER SITE CONDITIONS.
6. IF COPPER PIPE GOES TO THE APPLIANCE VALVE THAN BRASS FITTING SHALL BE USED AT THE OUTLET OF METER OR GI PIPE GOES TO THE APPLIANCE VALVE THAN GIFITTING SHALL BE USED AT THE OUTLET THE METER.
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SINGLE REGULATOR & SINGLE CONNECTION ON GROUND FLOOR & FIRST FLOOR

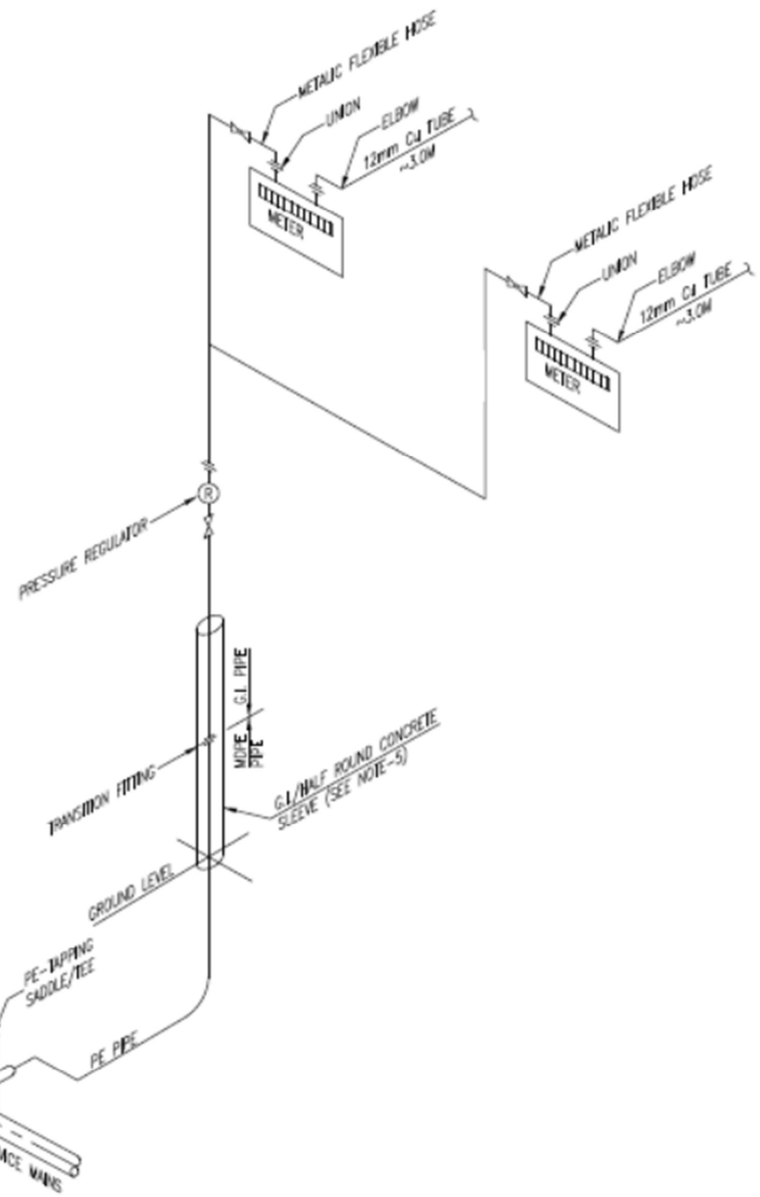
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FOR TENDER PURPOSE ONLY

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SINGLE REGULATOR & DOUBLE CONNECTION ON GROUND FLOOR

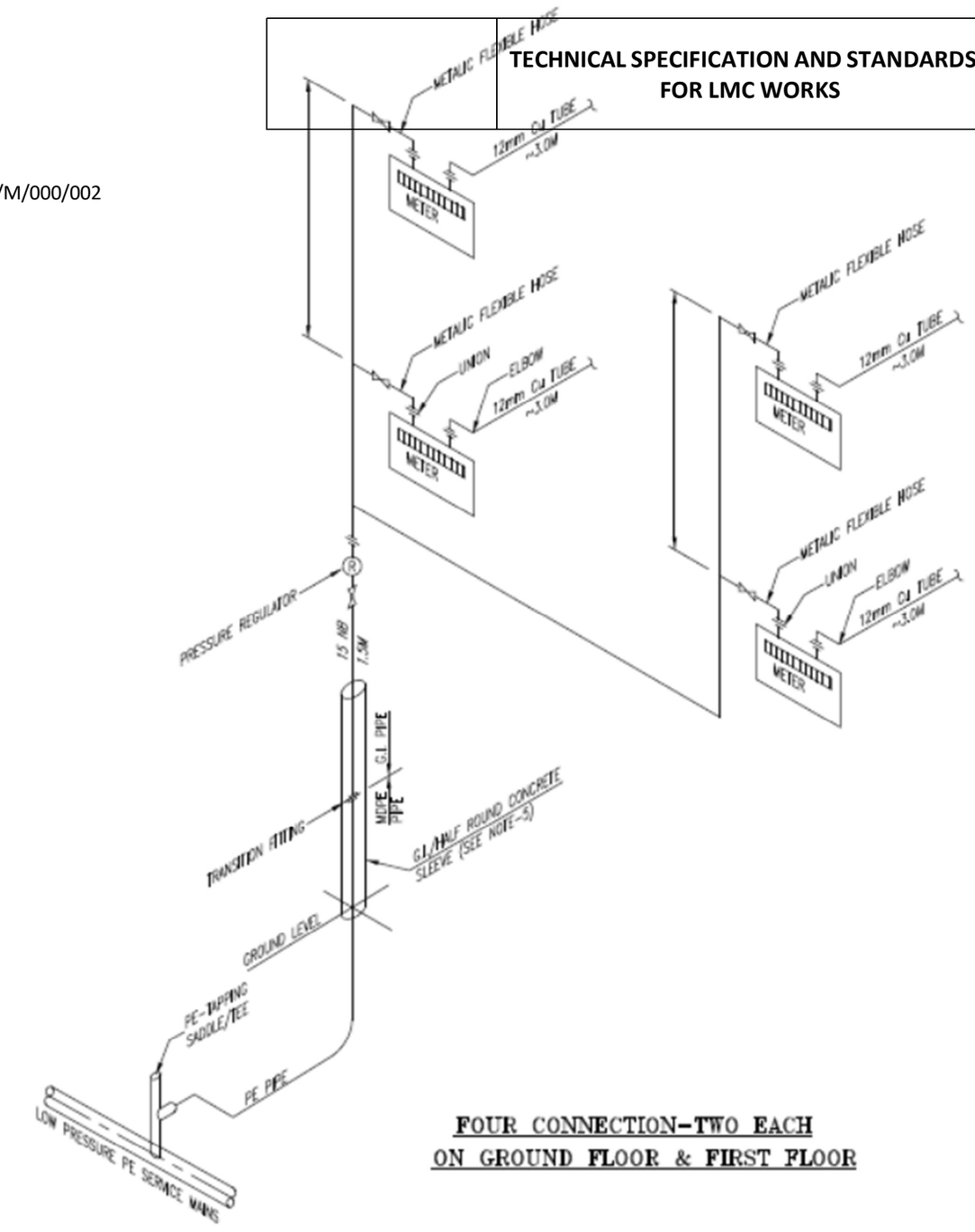
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FOUR CONNECTION-TWO EACH ON GROUND FLOOR & FIRST FLOOR

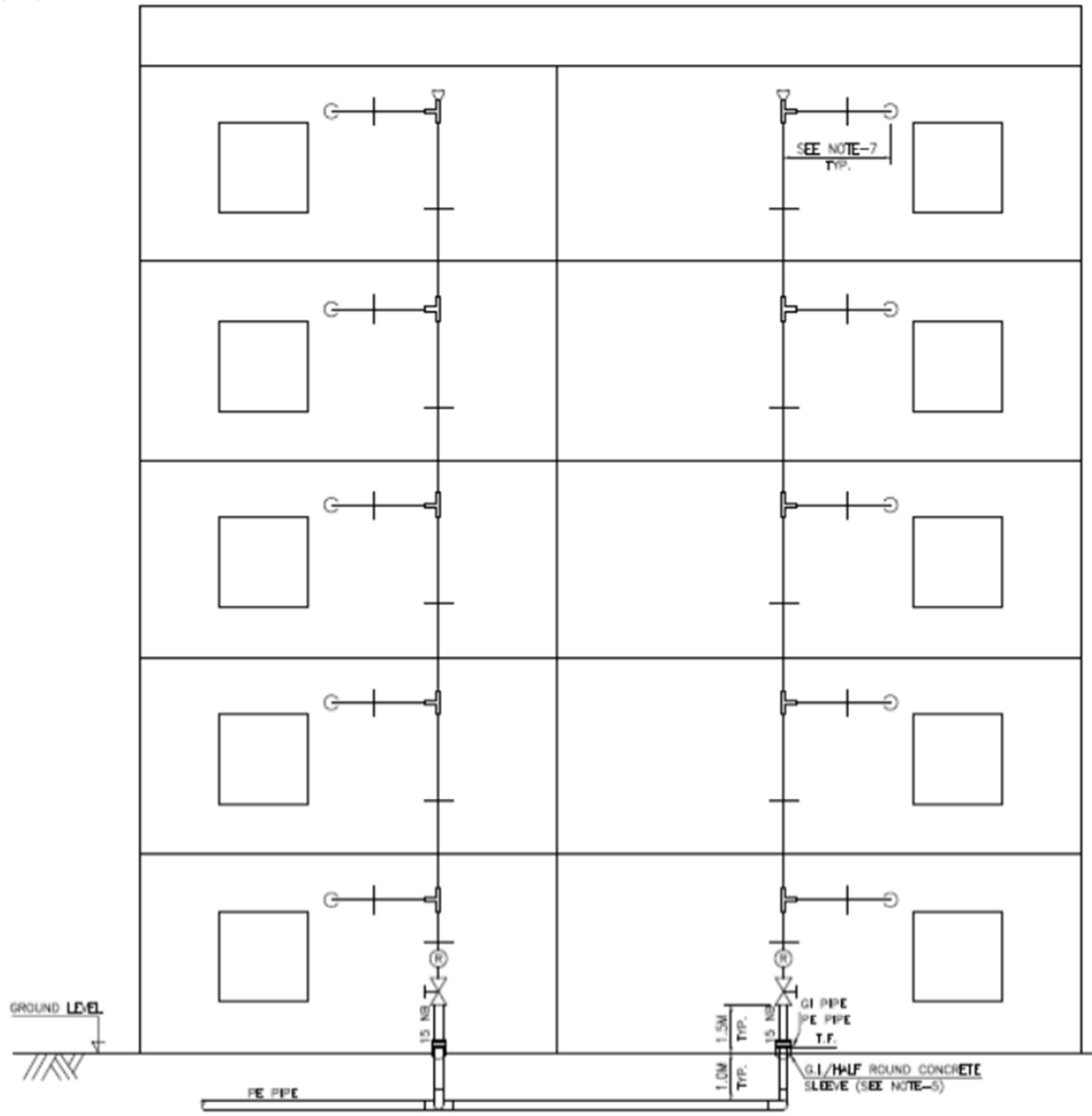
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INDICATIVE RISER ARRANGEMENT IN GR+4 BUILDING (METER INSTALLED INSIDE THE KITCHEN)

NOTES:-

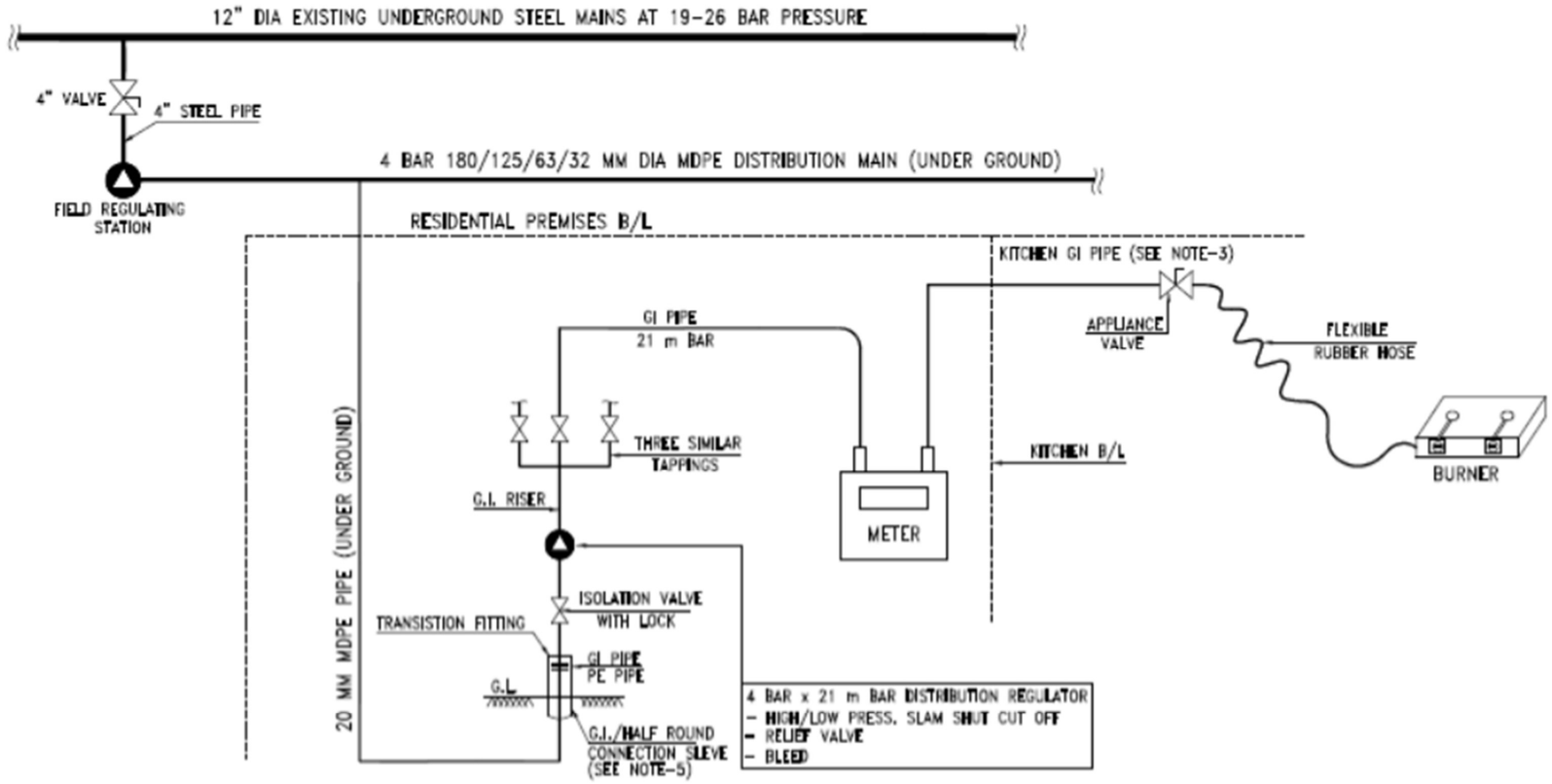
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8. TAPPING SHALL BE LEFT NEAR THE OUTSIDE KITCHEN AS DIRECTED BY OWNER/OWNER'S REPRESENTATIVE.

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SCHEMATIC DRAWING FOR DOMESTIC CONNECTION



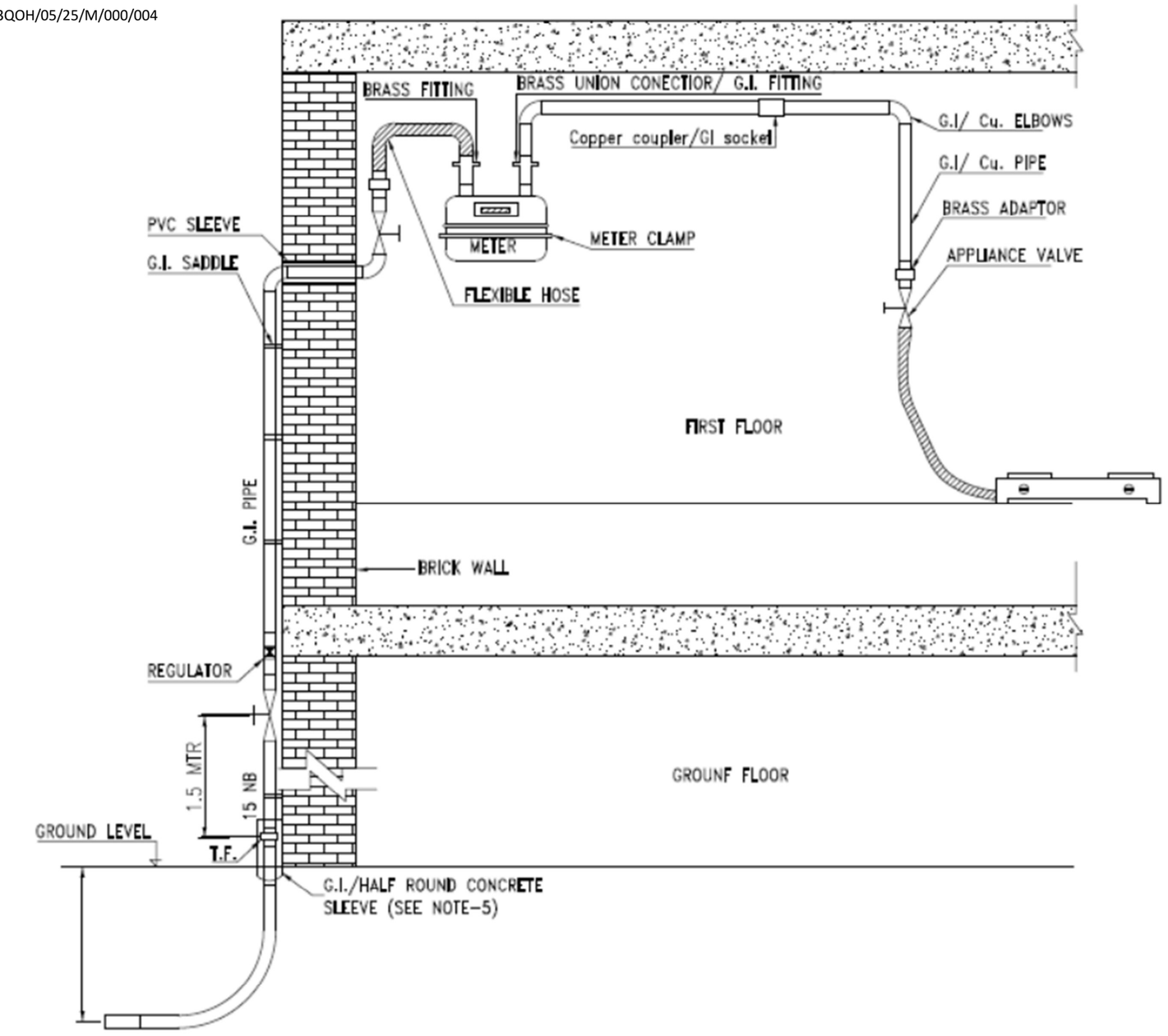
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FOR TENDER PURPOSE ONLY

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GGL/23QOH/05/25/M/000/004



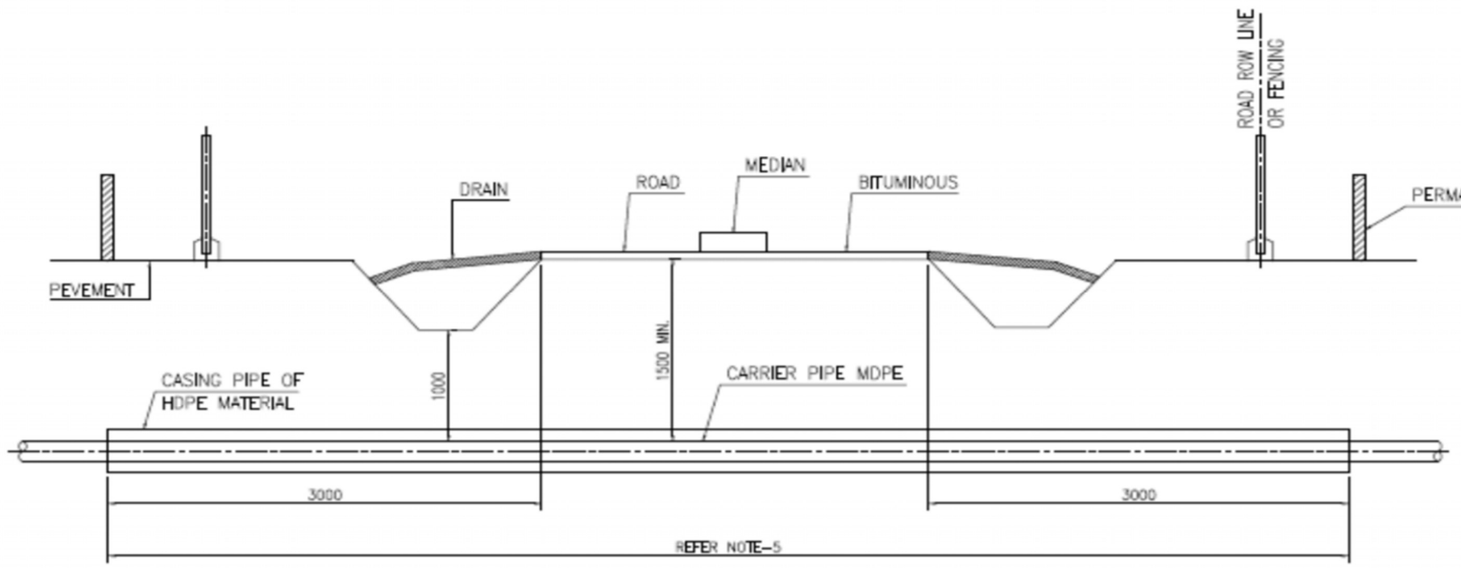
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8. METER CLAMP SHALL BE APPROVED FROM OWNER/OWNER'S REPRESENTATIVE

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GGL/23QOH/05/25/M/000/005



TYPICAL SECTION

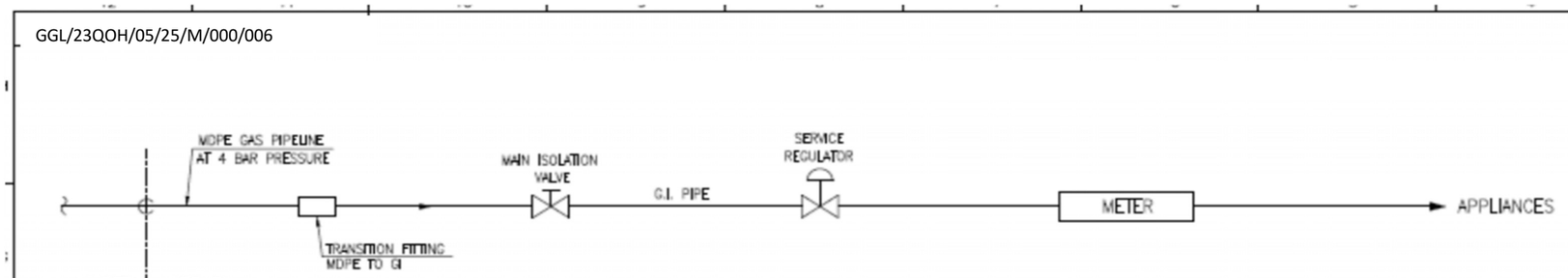
NOTES:-

1. ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE SPECIFIED.
2. ROAD HIGHWAY CROSSING SHALL BE RESTORED TO ORIGINAL CONDITION TO THE ENTIRE SATISFACTION OF OWNER AND CONCERNED AUTHORITIES HAVING CORISDICTION.
3. REFER API RP 1102 FOR OTHER DESIGN AND INSTALLATION REQUIREMENTS.
4. ANGLE OF INTERSECTION BETWEEN PIPELINE AND THE ROAD/ HIGHWAY SHALL BE AS CLOSED TO 90° AS POSSIBLE BUT IN NO CASE LESS THAN 30°.
5. CONTRACTOR SHALL VERIFY THE ACTUAL DIMENSIONS WITH RESPECT TO SURVEY DETAILS OF EACH ROAD/HIGHWAY CROSSING AND PREPARE DETAILED DRAWINGS FOR INDIVIDUAL CROSSING TAKE ENGINEER-IN-CHARGE AND CLIENTS APPROVAL BEFORE COMMERNCEMENT OF CONSTRUCTION.
6. THE CASING PIPE SHALL BE OF SIZE MAINTAINED AT CLAUSE NO.19 OF TECHNICAL SPECIFICATION FOR PE LAYING.

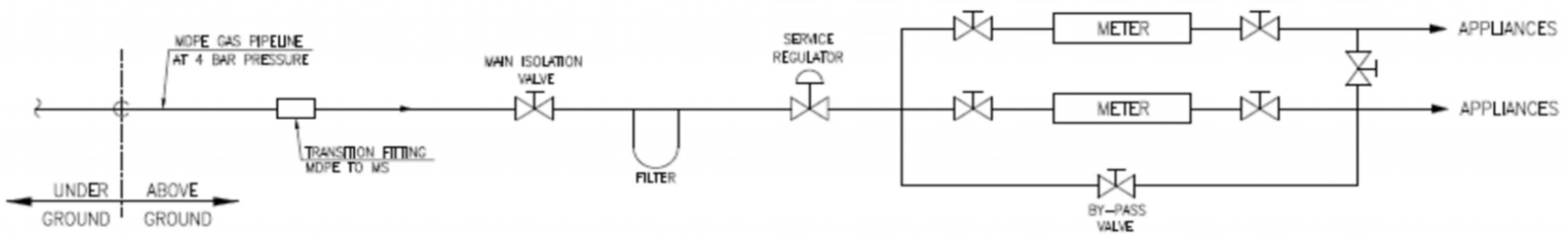
FOR TENDER PURPOSE ONLY

Digitally signed by Pradeep Kumar Yadav
Date: 2026.01.08 19:30:02 IST

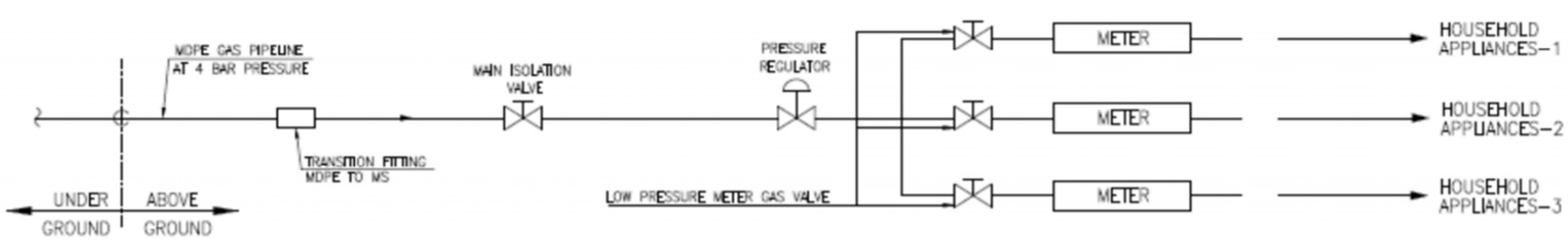
GGL/23QOH/05/25/M/000/006



SCHEME OF NATURAL GAS SUPPLY TO SMALL COMMERCIAL CONSUMERS



SCHEME OF NATURAL GAS SUPPLY TO LARGE COMMERCIAL CONSUMERS



SCHEME OF NATURAL GAS SUPPLY TO DOMESTIC CONSUMERS

NOTES:-

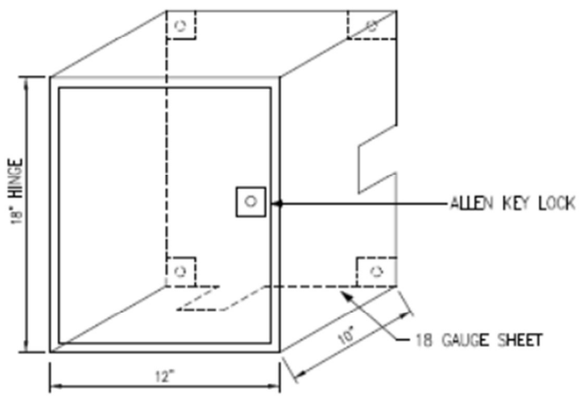
1. ALL DIMENSIONS ARE IN MM. UNLESS NOTED OTHERWISE.
2. SIZE OF LINE, VALVE ETC. SHALL BE DECIDED AT THE TIME OF EXECUTION AS PER THE INSTRUCTIONS OF OWNER/OWNER'S REPRESENTATIVE.

FOR TENDER PURPOSE ONLY

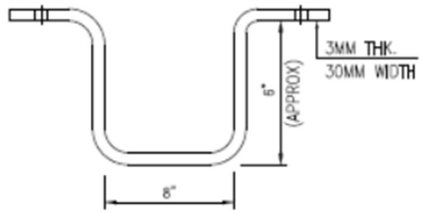
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Date: 2026.01.08 19:30:02 IST

SKETCH FOR REGULATOR BOX, BRACKETS & CLAMPS

GGL/23QOH/05/25/M/000/007



REGULATOR BOX



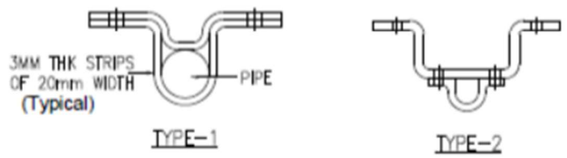
BRACKET FOR METERS (DOMESTIC)



PE/PVC CLAMPS FOR COPPER PIPE



ANGLE BRACKETS 50x50mm FOR NON DOMESTIC METERS



MS CLAMPS FOR GI PIPE

NOTES:-

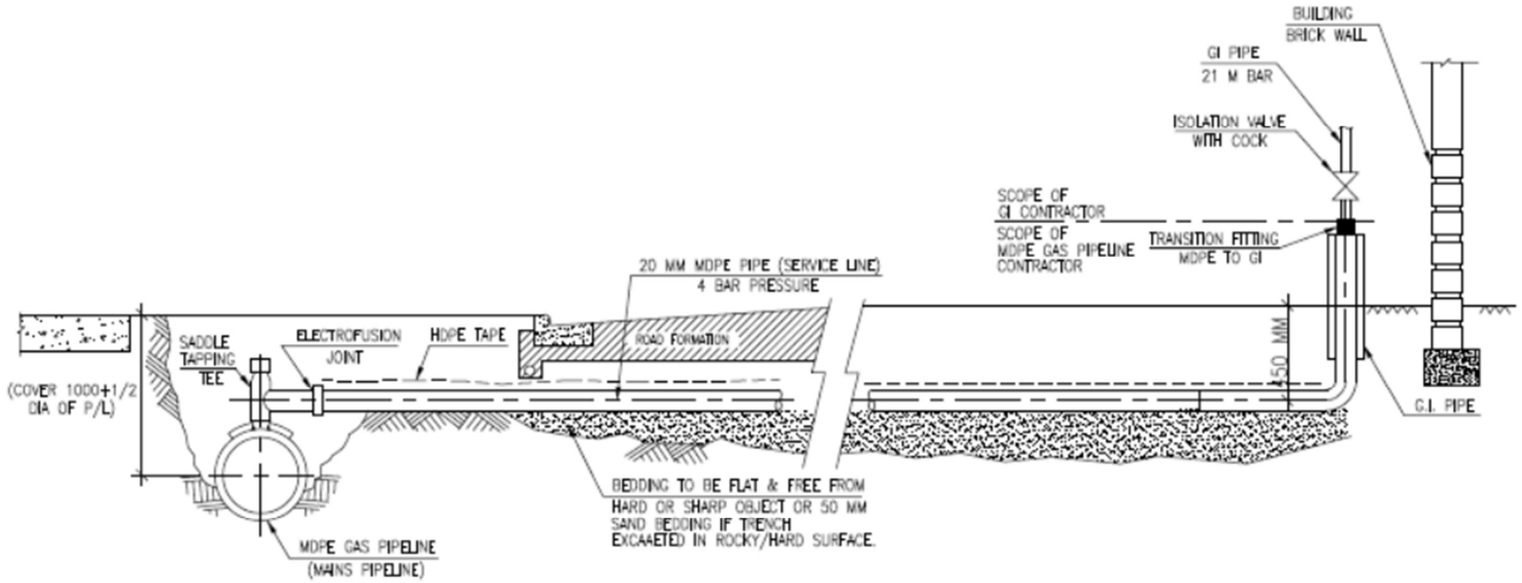
1. ALL DIMENSIONS ARE IN MM UNLESS NOTED OTHERWISE.
2. CLAMP, REGULATOR BOX AND METER BRACKET ARE TO BE MADE AS PER DIRECTION AND APPROVAL OF EIC.
3. CLAMPS/BOXES BRACKETS TO BE TIGHTLY SECURED TO THE WALL WITH PROPER ROWEL PLUGS, SCREWS ETC. WOODEN BLOCK TO BE USED IN CASE ROWEL PLUGS DO NOT HOLD. PROPER TINE AREA.
4. PAINTING WITH ONE COAT OF ZINC PRIMER AND THREE COATS OF SYNTHETIC ENAMEL PAINT OF REPUTED MAKE (ASIAN PAINT, BERGER, NEROLAC) TO BE USED.
5. CLAMPS ON PIPES TO BE FIXED AT MAXIMUM DISTANCE OF 1.5 mtrs AND AT BENDS.

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SCHEME OF HIGH PRESSURE SERVICE INSTALLATION

GGL/23QOH/05/25/M/000/008



GENERAL NOTES

1. FOR CLAMPING TO BRICK WALL USE SUITABLE WALL BRACKETS.
2. TRENCH BACK FILL TO BE FREE FROM STONES OR SHARP OBJECTS. CARE TO BE EXERCISED WHEN CONSOLIDATING BACK FILL TO AVOID DAMAGING PLASTIC PIPE.
3. THIS SKETCH IS INDICATIVE AND FINAL LAYING WILL BE DECIDED BY ENGINEER-IN-CHARGE.

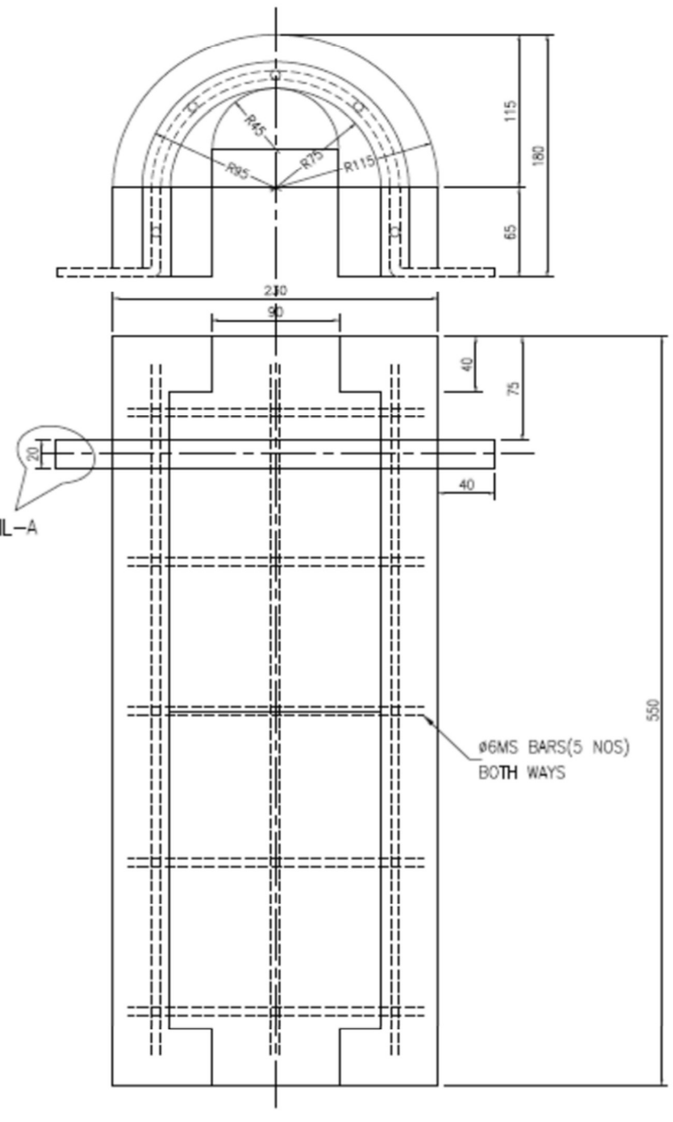
FOR TENDER PURPOSE ONLY

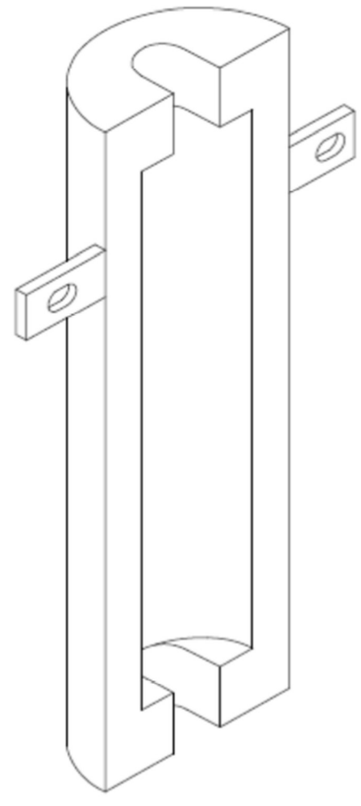
Digitally signed by Pradeep Kumar Yadav
Date: 2026.01.08 19:30:02 IST

DRG.NO. MEC/23QH/05/25/M/000/009

GGL/23QOH/05/25/M/000/009

HALF ROUND CONCRETE SLEEVE





ISOMETRIC VIEW

NOTES:-

1. ALL DIMENSIONS ARE IN MM UNLESS NOTED OTHERWISE.
2. IT SHALL BE TAKEN APPROVAL FROM OWNER/OWNER'S REPRESENTATIVE. BEFORE STARTING THE PROCUREMENT.
3. SIZES ARE SHOWN AS A TENTATIVE ONLY.

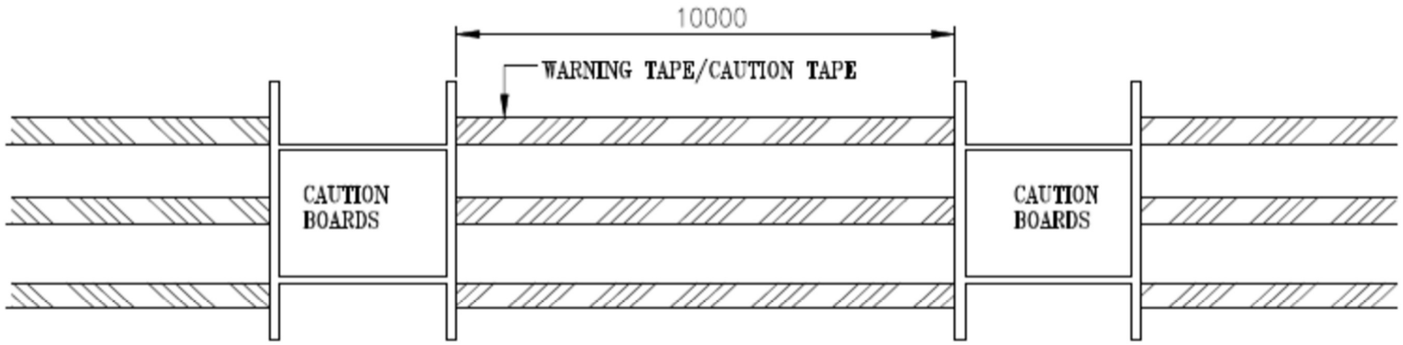
FOR TENDER PURPOSE ONLY

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DRG.NO. MEC/23QH/05/25/M/000/010

GGL/23QOH/05/25/M/000/010

NOTES:-
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2. TO THE CAUTION BOARDS REFER DRAWING NO. MEC/TYP/05/28/STD/1002



SCHEMATIC LAYOUT OF CAUTION BOARDS AND BARRICADDING

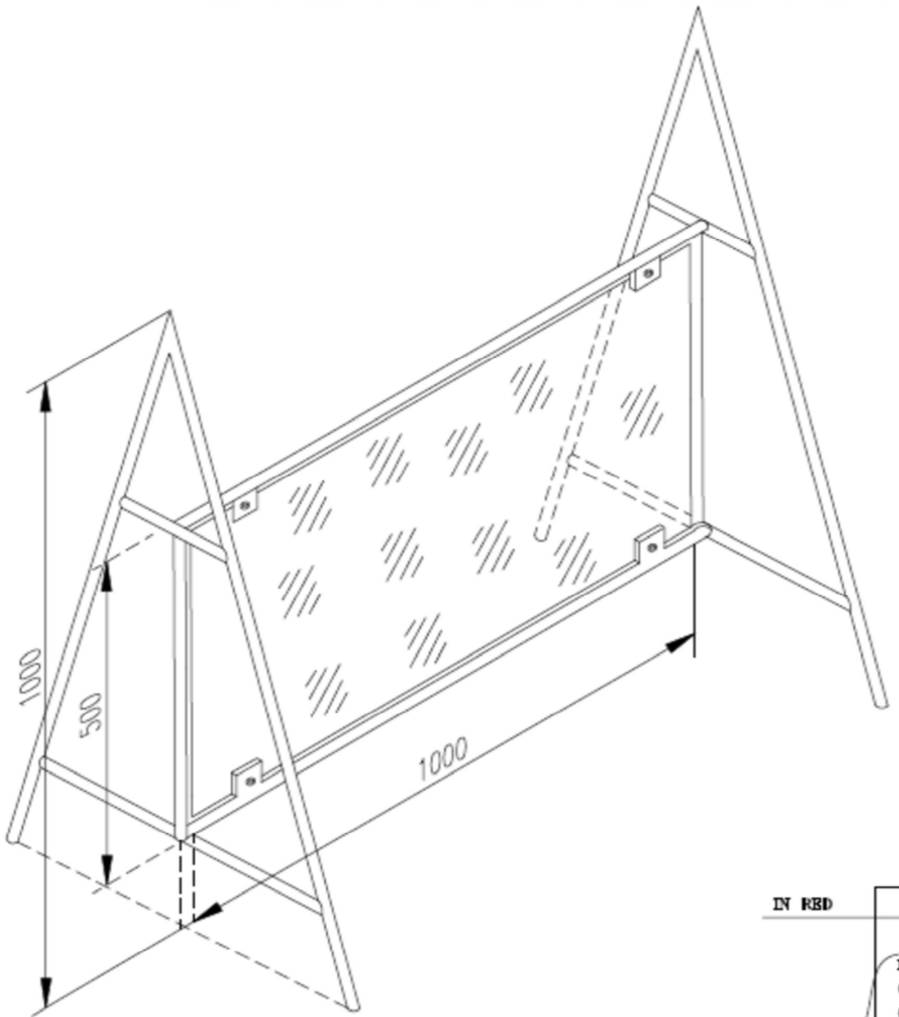
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Date: 2026.01.08 19:30:02 IST

CAUTION BOARD

DRG.NO. MEC/23QH/05/25/M/000/011

GGL/23QOH/05/25/M/000/011



IN RED → C A U T I O N ← CLIENT'S LOGO

WORK IN PROGRESS

IN BLACK
LAYING OF NATURAL GAS PIPELINE
CLIENT : OWNER'S NAME
CONTRACTOR NAME :
DATE OF COMMENCEMENT :
DATE OF COMPLETION :
EMERGENCY PHONE NOS:

NOTES:-
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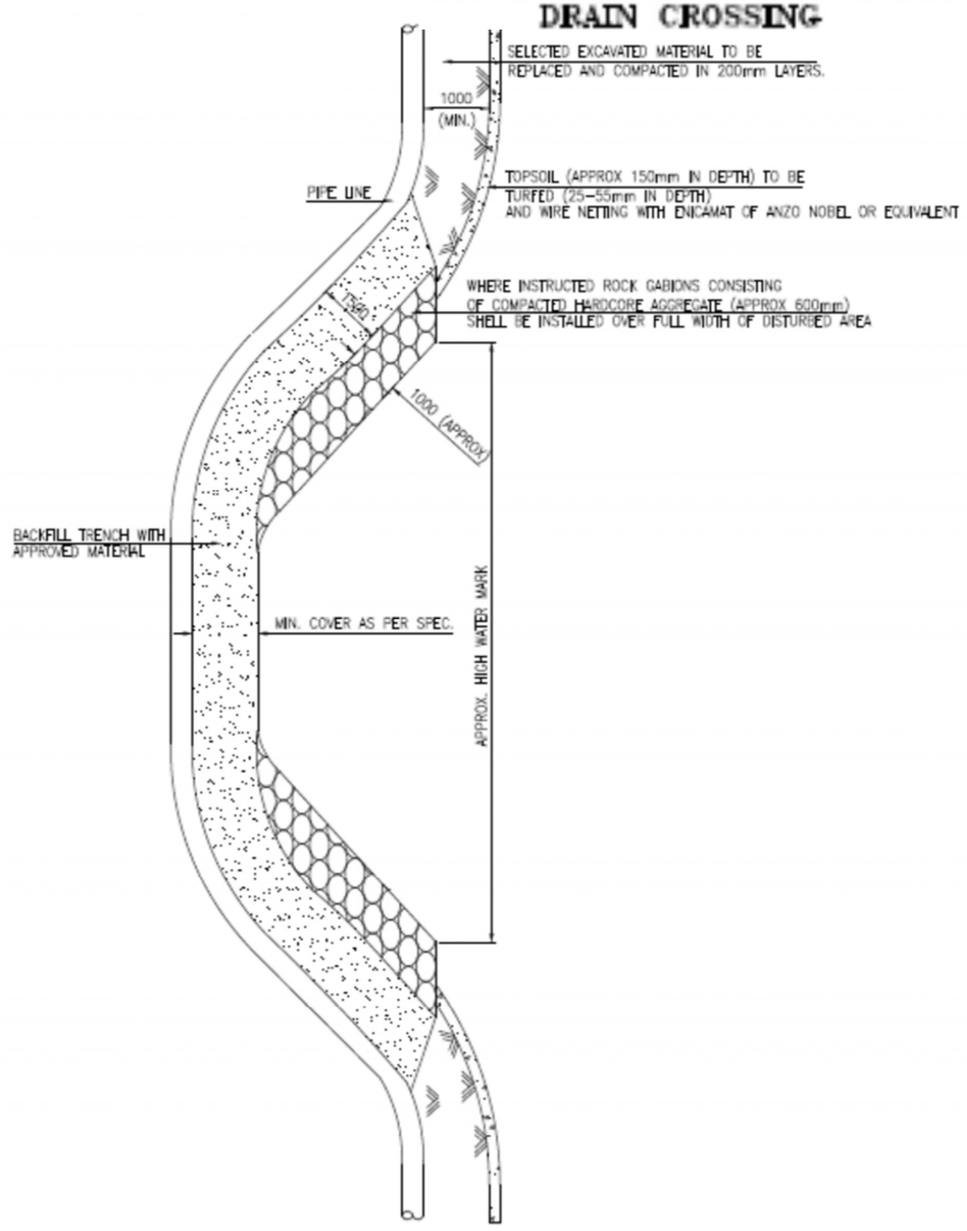
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DRG.NO. MEC/23QH/05/25/M/000/012

GGL/23QOH/05/25/M/000/012

STD. DETAIL OF BACKFILL FOR DRAIN CROSSING



NOTES:-

1. BACKFILLING OF THE DISTURBED BANK ARRA SHALL BE FINISHED A MINIMUM OF 100mm ABOVE THE ADJACENT UNDISTURBED BANK LEVELS.
2. BACKFILLING SHALL BE FINISHED FLUSH WITH INVERT AND BANK SLOPES EXCEPT THE REINSTATED SLOPE WHICH SHALL NOT EXCEED 40° IN WHICH CASE THE SLOPE SHALL BE EQUAL TO ADJACENT UNDISTURBED BANKS.
3. MIN. COVER 1.5M BELOW SCAMING DEPTH.

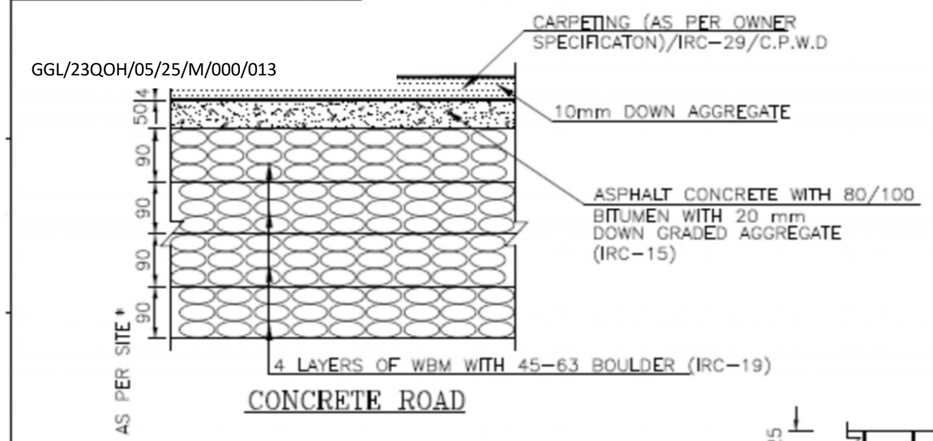
FOR TENDER PURPOSE ONLY

Digitally signed by Pradeep Kumar Yadav
Date: 2026.01.08 19:30:02 IST

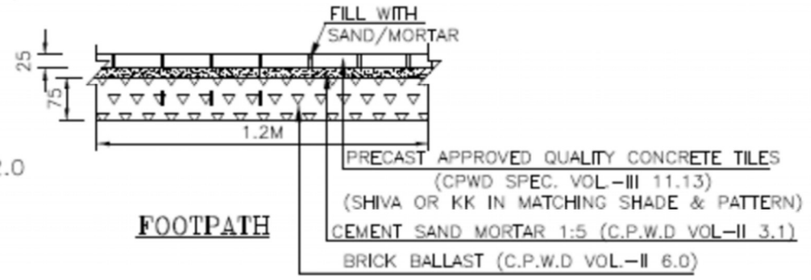
DRG.NO. MEC/23QH/05/25/M/000/013

RESTORATION OF ROADS, FOOTPATH & CHANNEL

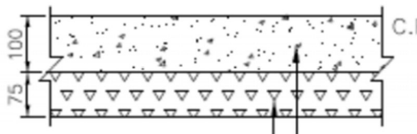
GGL/23QOH/05/25/M/000/013



CONCRETE ROAD

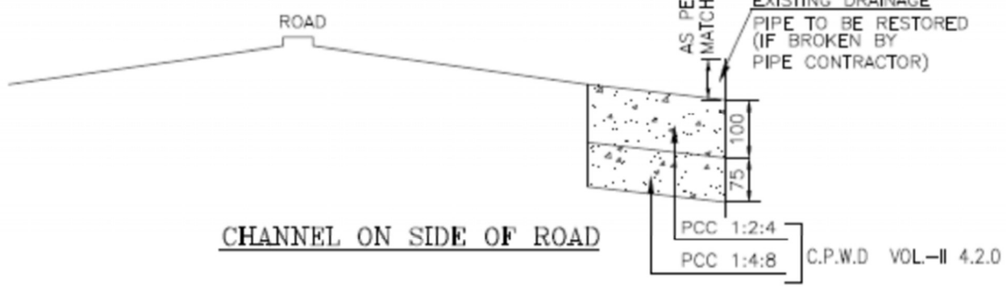


FOOTPATH





FOOTPATH



CHANNEL ON SIDE OF ROAD

NOTES:-

1. ALL DIMENSIONS ARE IN mm & LEVELS ARE IN METRE.
2. ONLY FIGURED DIMENSIONS ARE TO BE FOLLOWED.
3. THESE ARE INDICATIVE SCHEME ONLY. ACTUAL WORK TO FOLLOW AS PER CPWD/PWD CONCERNED AUTHORITIES REQUIREMENTS IN RESPECTIVE AREA.

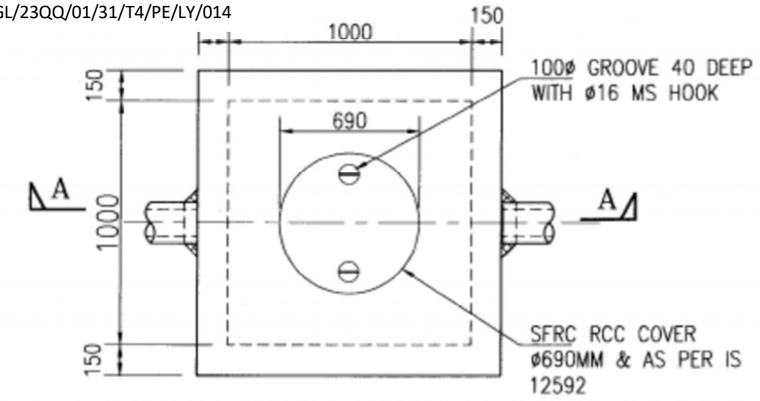
FOR TENDER PURPOSE ONLY

Digitally signed by Pradeep Kumar Yadav
Date: 2026.01.08 19:30:02 IST

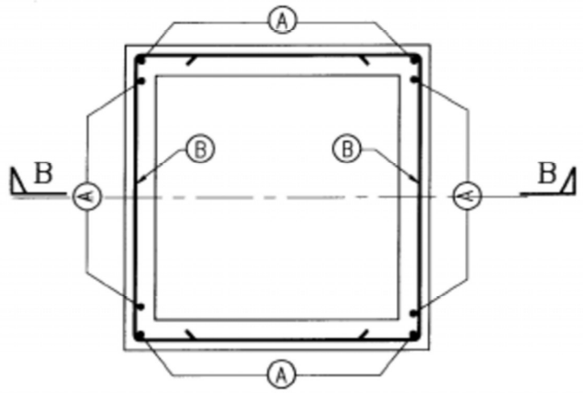
DRG.NO. MEC/2300/01/31/14/PE/LY/014

DETAILS OF VALVE PIT TYPE-I

GGL/23QQ/01/31/T4/PE/LY/014

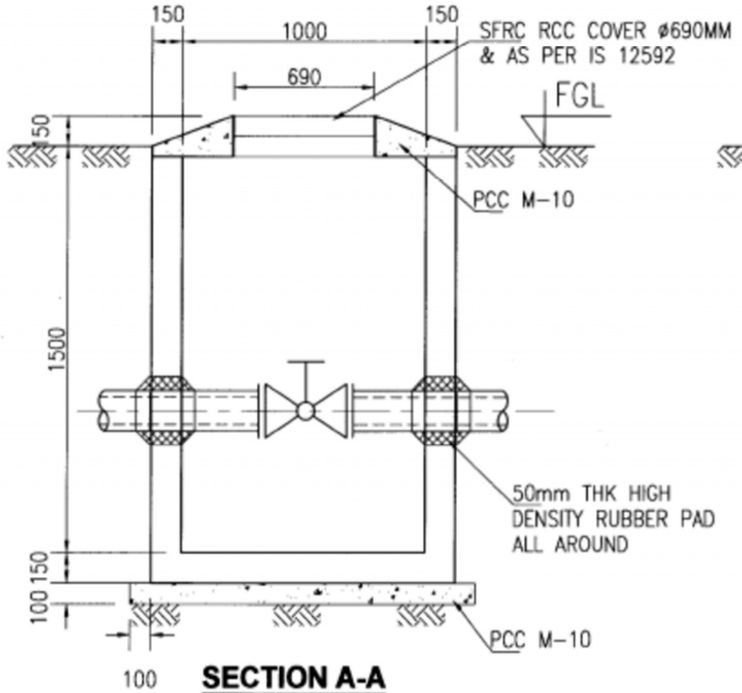


PLAN OF VALVE PIT VP-1

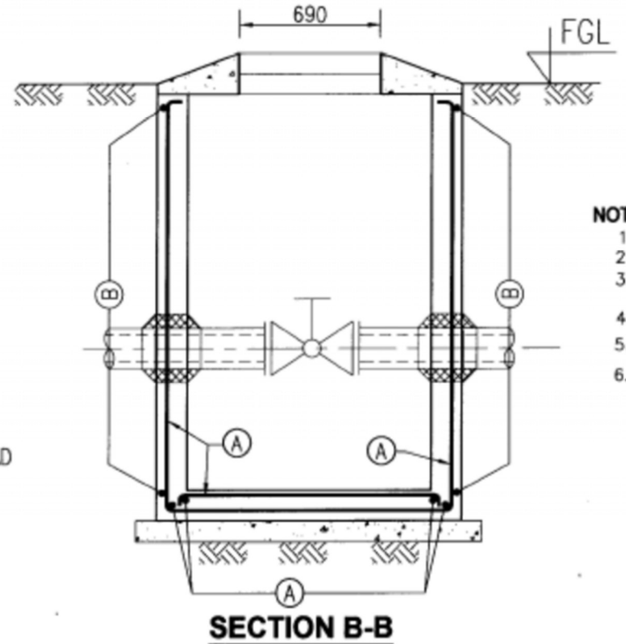


REINF. DETAIL OF VALVE PIT

REINF.	
A	B
12ϕ@150c/c	12ϕ@150c/c



SECTION A-A



SECTION B-B

NOTES:-

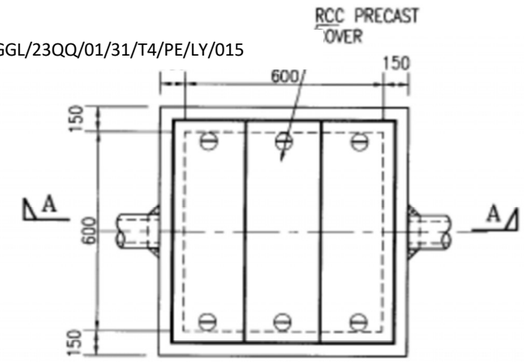
1. ALL DIMENSIONS ARE IN mm.
2. ONLY FIGURED DIMENSIONS ARE TO BE FOLLOWED.
3. ALL R.C.C. USED SHALL BE OF GRADE M25 AS PER IS:456-2000. UNLESS OTHERWISE SPECFIED.
4. ALL R/F STEEL SHALL BE HYSD (Fe 415) CONFORMING TO IS: 1786.
5. CLEAR COVER TO MAIN R/F SHALL BE 40mm.
6. FOR EXACT LOCATION & ORIENTATION OF VALVE PIT REFER LAYOUT DRAWING.

Digitally signed by Pradeep Kumar Yadav
Date: 2026.01.08 19:30:02 IST

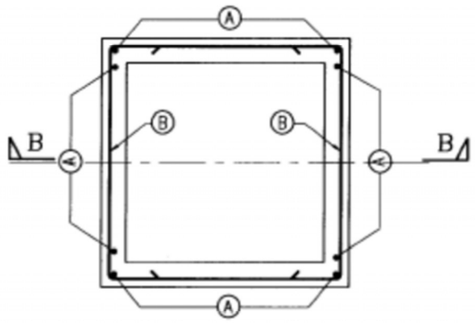
DRG.NO. MEC/23QQ/01/31/T4/PE/LY/015

GGL/23QQ/01/31/T4/PE/LY/015

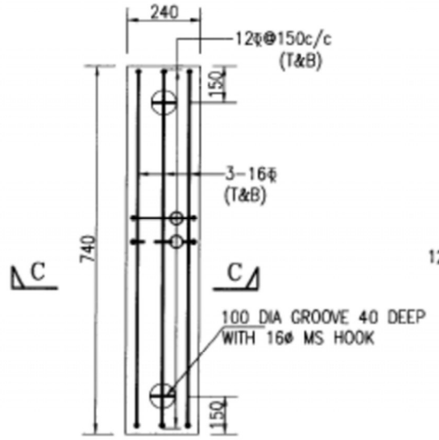
DETAILS OF VALVE PIT TYPE-II



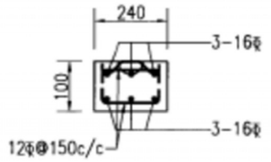
PLAN OF VALVE PIT



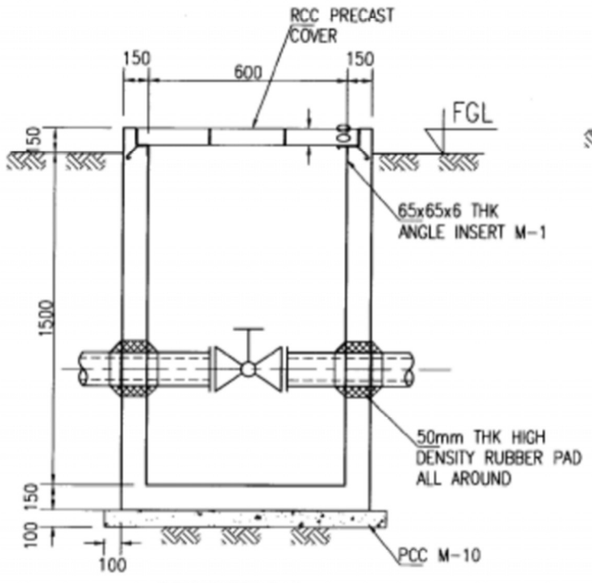
REINF. DETAIL OF VALVE PIT



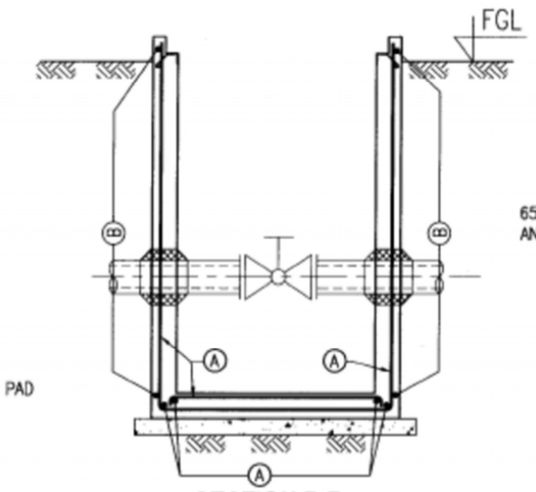
RCC DETAIL OF PRECAST SLAB



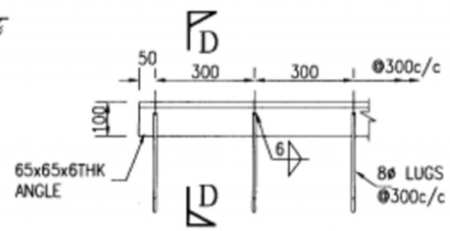
SECTION C-C



SECTION A-A



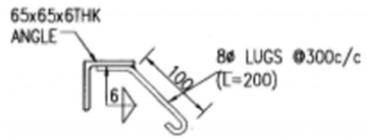
SECTION B-B



DETAIL OF INSERT IN-1



DETAIL OF 16Ø MS LIFTING HOOK



SECTION D-D

REINF.	
A	B
12ϕ@150c/c	12ϕ@150c/c

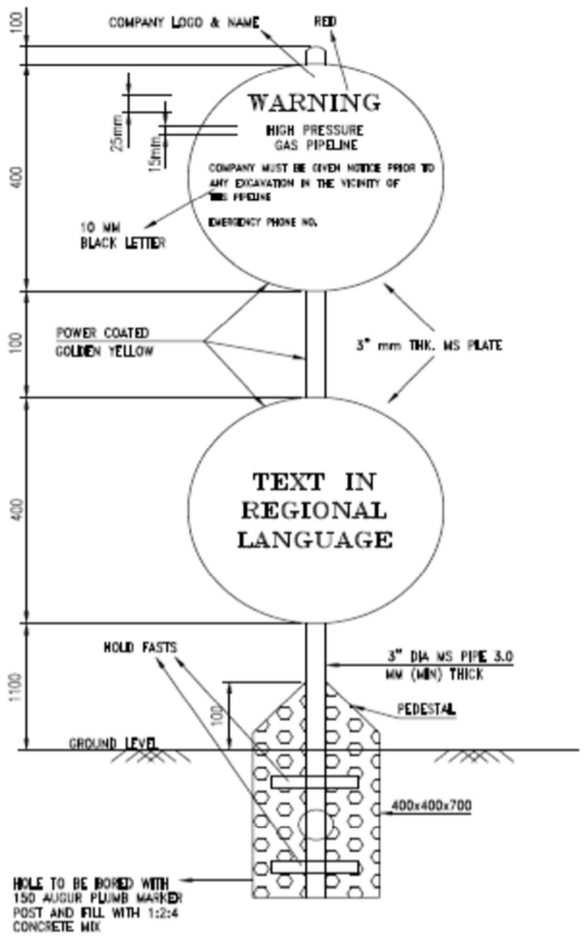
NOTES:-

1. ALL DIMENSIONS ARE IN mm.
2. ONLY FIGURED DIMENSIONS ARE TO BE FOLLOWED.
3. ALL R.C.C. USED SHALL BE OF GRADE M25 AS PER IS:456-2000. UNLESS OTHERWISE SPECFIED.
4. ALL R/F STEEL SHALL BE HYSD (Fe 415) CONFORMING TO IS: 1786.
5. CLEAR COVER TO MAIN R/F SHALL BE 40mm.
6. FOR EXACT LOCATION & ORIENTATION OF VALVE PIT REFER LAYOUT DRAWING.

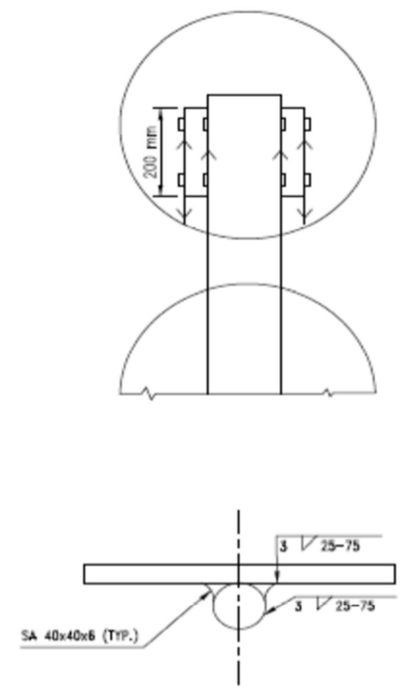
Digitally signed by Pradeep Kumar Yadav
Date: 2026.01.08 19:30:02 IST

POLE MARKER WITH FOUNDATION

GGL/23HQ/05/25/M/000/018



FIXING DETAILS



NOTES:-

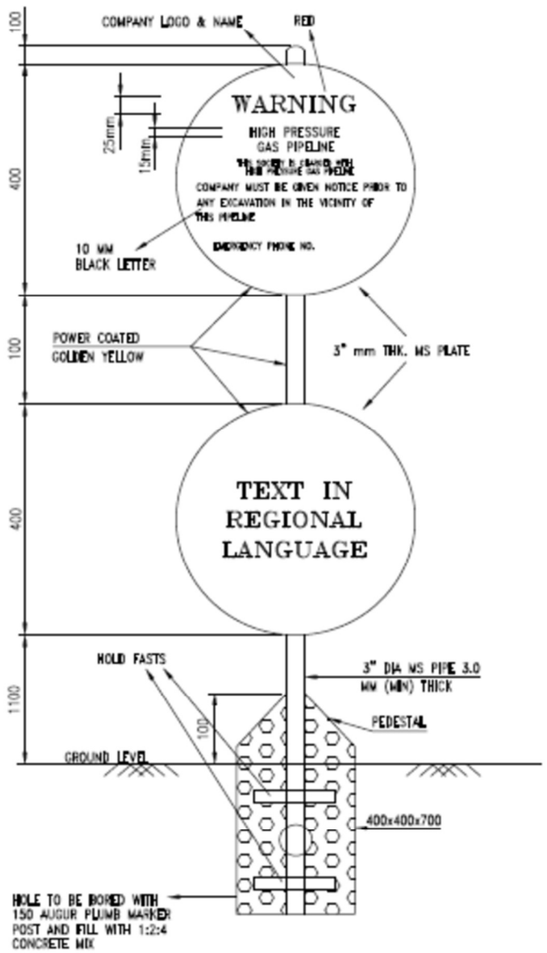
1. ALL DIMENSIONS ARE IN MM. UNLESS NOTED OTHERWISE.
2. THE FULL WORKING AND SIZES ARE ONLY INDICATIVE AND ARE SUBJECT TO THE APPROVAL BY OWNER/OWNER'S REPRESENTATIVE BEFORE FABRICATION.
3. SCHEME FOR POWDER COATING AND COLOURING
   ONE COAT OF PRIMER & TWO COATS OF SPECIFIED PANTS
   ALL LETTERS EXCEPT "WARNING" TO BE PAINTED BLACK.
4. APPROVAL OF WARNING MARKER DESIGN SHALL BE OBTAINED BEFORE THE COMMENCEMENT OF WORK.

FOR TENDER PURPOSE ONLY

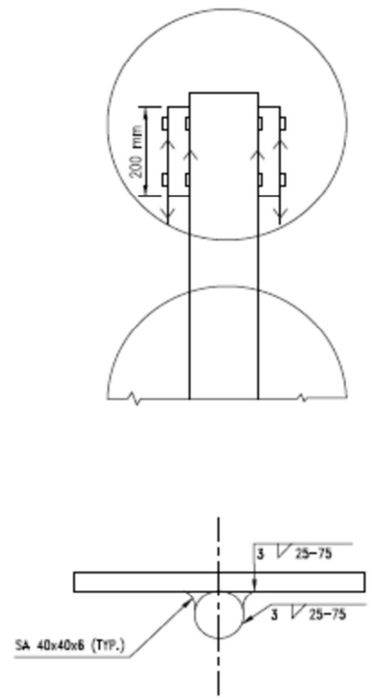
Digitally signed by Pradeep Kumar Yadav
Date: 2026.01.08 19:30:02 IST

POLE MARKER WITH FOUNDATION
(INDIVIDUAL SOCIETIES/AREAS)

GGL/23HQ/05/25/M/000/019



FIXING DETAILS



NOTES:-

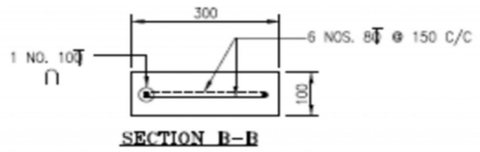
1. ALL DIMENSIONS ARE IN MM. UNLESS NOTED OTHERWISE.
2. THE FULL WORKING AND SIZES ARE ONLY INDICATIVE AND ARE SUBJECT TO THE APPROVAL BY OWNER/OWNER'S REPRESENTATIVE BEFORE FABRICATION.
3. SCHEME FOR POWDER COATING AND COLOURING
   ONE COAT OF PRIMER & TWO COATS OF SPECIFIED PANTS
   ALL LETTERS EXCEPT "WARNING" TO BE PAINTED BLACK.
4. APPROVAL OF WARNING MARKER DESIGN SHALL BE OBTAINED BEFORE THE COMMENCEMENT OF WORK.

FOR TENDER PURPOSE ONLY

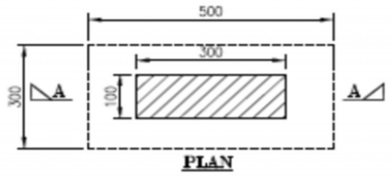
Digitally signed by Pradeep Kumar Yadav
Date: 2026.01.08 19:30:02 IST

SKETCH FOR RCC ROUTE MARKER

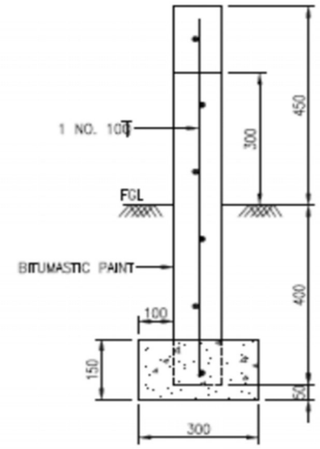
GGL/23HQ/05/25/M/000/020



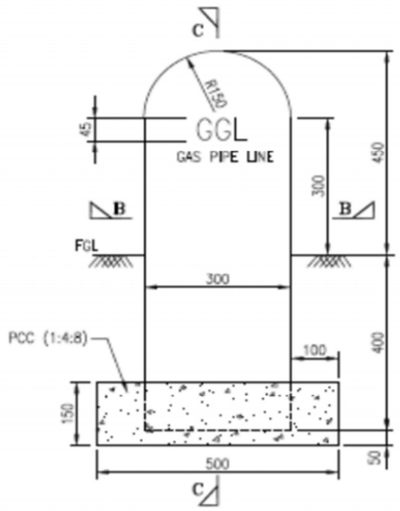
SECTION B–B



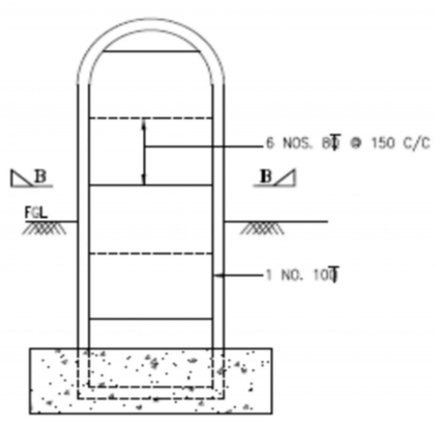
PLAN



SECTION C–C



SECTION A–A
(FOR DIMENSION)



SECTION A–A
(FOR REINFORCEMENT)

NOTES:–

1. DRAWING IS NOT TO SCALE.
2. ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE SPECIFIED.
3. MARKERS SHALL BE INSTALLED IN EVERY 50M INTERVAL AS PER INSTRUCTION OF ENGINEER–IN–CHARGE.
4. ALL BOUNDARY MARKERS SHALL BE PRECAST AND INSCRIPTIONS SHALL BE ENGRAVED 5mm DEEP IN THE MOULD ON BOTH FACE.
5. CONCRETE FOR BOUNDARY MARKER SHALL BE M20.

FOR TENDER PURPOSE ONLY

Digitally signed by Pradeep Kumar Yadav
Date: 2026.01.08 19:30:02 IST

PLATE MARKER

GGL/23HQ/05/25/M/000/021



NOTES:-

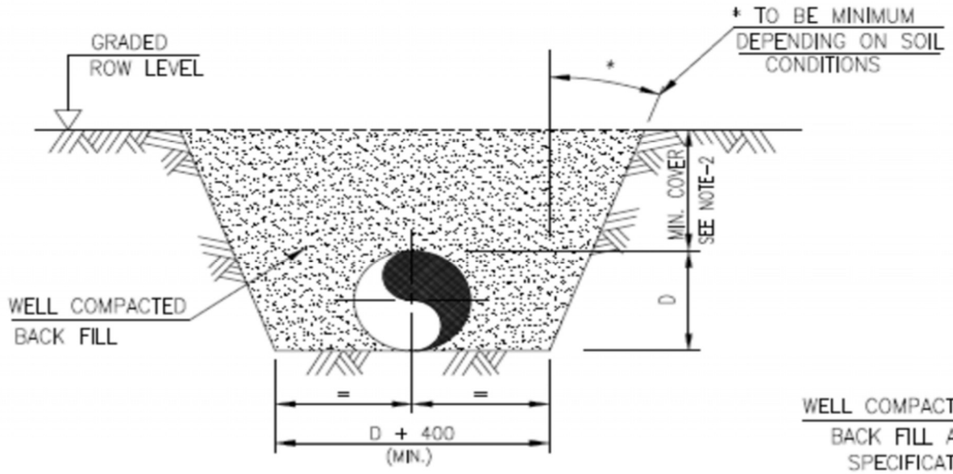
1. ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE SPECIFIED.
2. FOLLOW WRITEN DIMENSION ONLY. DO NOT SCALE.

FOR TENDER PURPOSE ONLY

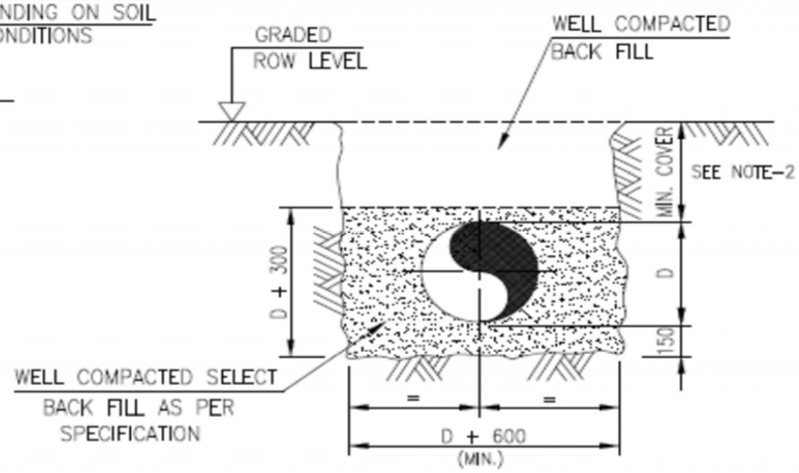
Digitally signed by Pradeep Kumar Yadav
Date: 2026.01.08 19:30:02 IST

TYPICAL TRENCH DIMENSIONS FOR PIPE LINE

GGL/23HQ/05/25/M/000/022



TRENCH IN NORMAL SOIL
TYPICAL SECTION



TRENCH IN CONSOLIDATED ROCK
TYPICAL SECTION

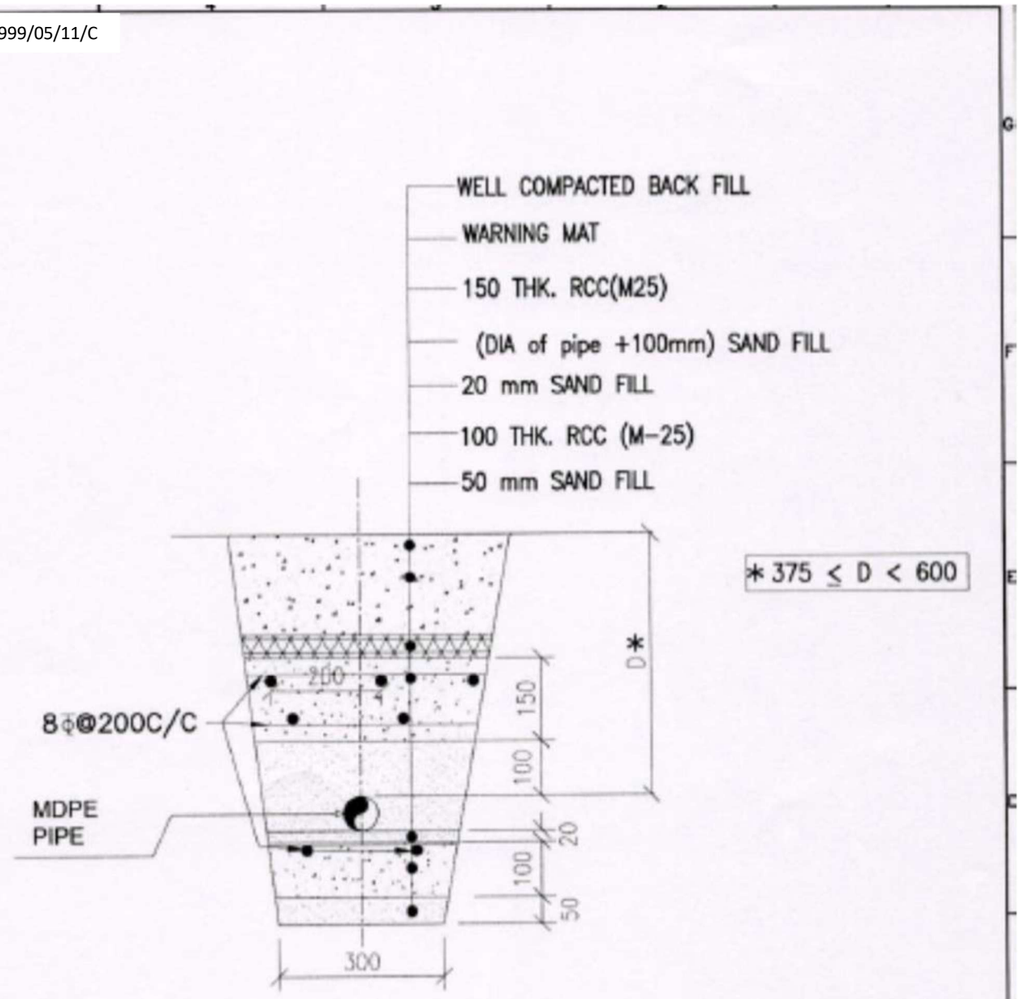
NOTES:-

1. ALL DIMENSIONS ARE IN MM. UNLESS SPECIFIED OTHERWISE.
2. FOR ALL PIPELINES TO BE CONSTRUCTED IN THE LAND UNDER JURISDITION OF GOVT. OF INDIA THE MINIMUM COVER TO BE ADOPTED SHALL BE 1000 MM. IN ACCORDANCE WITH GOVT. OF INDIA PETROLEUM PIPELINES (AQUISITION OF RIGHT OF USER IN LAND) ACT NO. 50,1962 AND AMENDMENT ACT NO. 13,1977. ANY EXTRA REQUIRMENT SHALL BE IN ACCORDANCE WITH SPECIFICATIONS.
3. MINIMUM COVER REQUIREMENT SHALL BE SUBJECTED TO APPROVAL OF CONCERNED AUTHORITIES WHEREVER REQUIRED.
4. EXTRA COVER REQUIRMENT SHALL BE ESTABLISEMED AT ALL COVER BENDS, SAG BENDS AND HORIZONTAL BENDS WHEREVER REQUIRED.
5. FOR MINIMUM COVER REQUIRMENT AT PIPELINES CROSSING ROADS, RAILWAY TRACKS, RIVERS, MARSHY AREASETC, REFER RELEVENT STANDARDS.

FOR TENDER PURPOSE ONLY

Digitally signed by Pradeep Kumar Yadav
Date: 2026.01.08 19:30:02 IST

GGL/U999/05/11/C



SECTIONAL VIEW OF MITIGATION

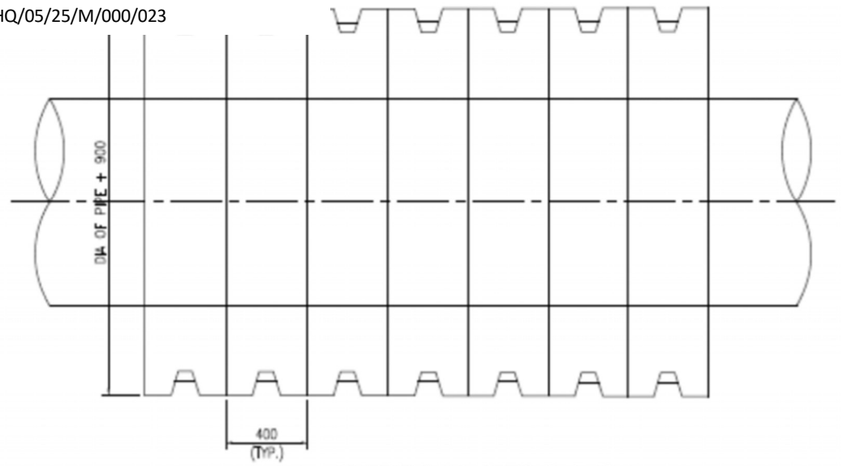
NOTE:-
1. ALL DIMENSIONS ARE IN mm & LEVELS ARE IN M.

Digitally signed by Pradeep Kumar Yadav
Date: 2026.01.08 19:30:02 IST

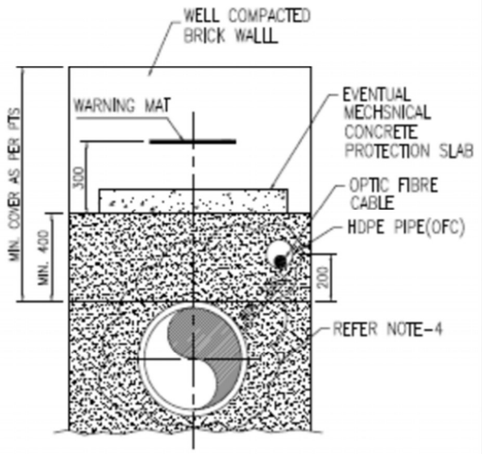
TYPICAL MECHANICAL PROTECTION CONCRETE SLAB DETAILS
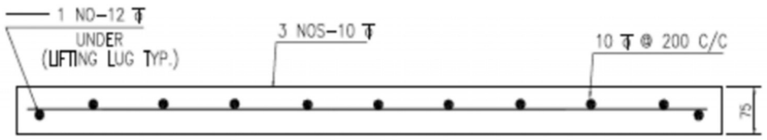
ORG.NO. MEC/23GH/05/25/M/000/023

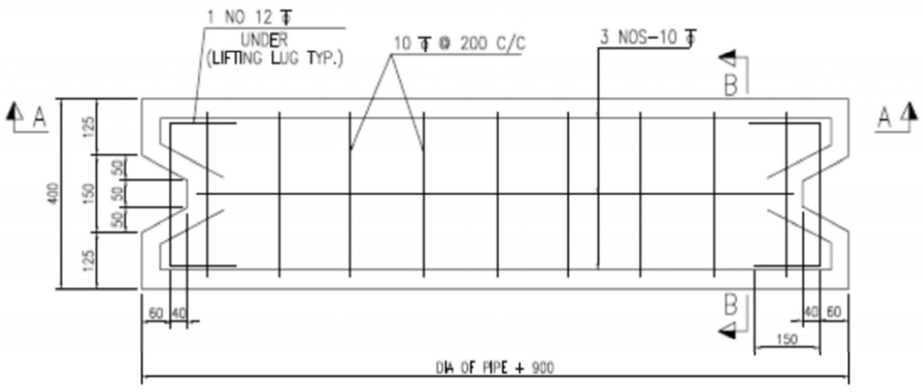
GGL/23HQ/05/25/M/000/023



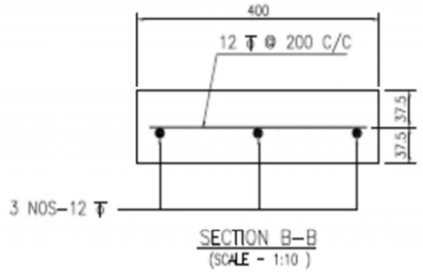
PROTECTIVE CONCRETE SLAB PLAN







REINF. DETAIL PROTECTIVE CONCRETE SLAB



SECTION B-B
(SCALE - 1:10)

NOTES:-

1. ALL DIMENSIONS ARE IN MM UNLESS NOTED OTHERWISE.
2. MINIMUM COVER OVER LINE PIPE SHALL BE AS PER SPECIFICATION AND REQUIRMENT OF CONCERNED AUTHORITIES.
3. THIS SKETCH IS INDICATIVE ONLY.
4. TYPE OF TRENCHING SHALL BE AS PER PTS AND APPROVED PROCEDURE.
5. CONCRETE MIX M20 SHALL BE USED.

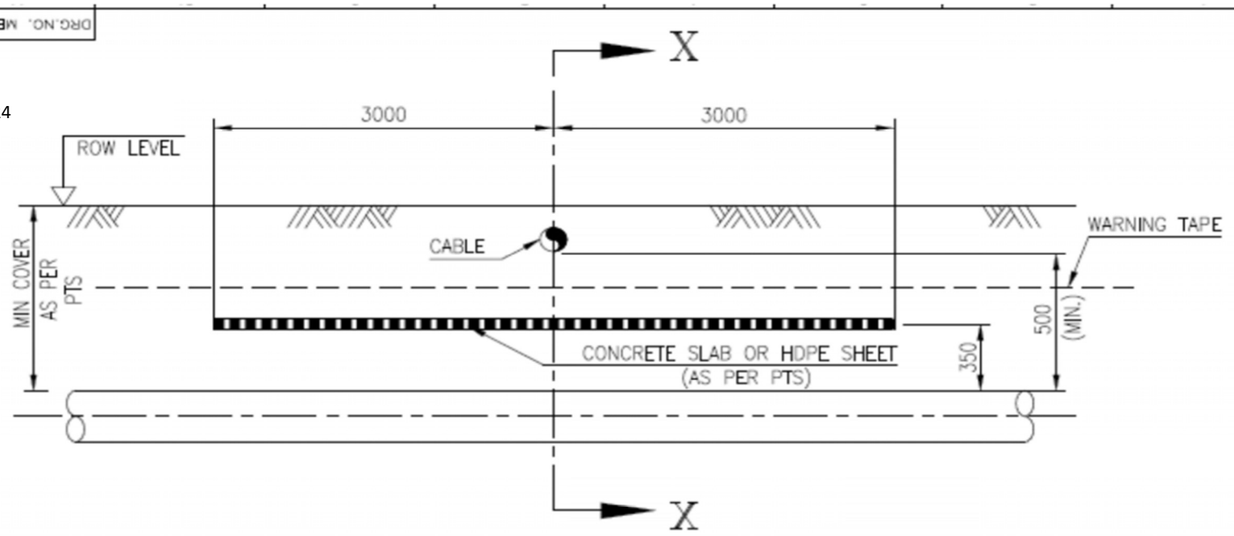
FOR TENDER PURPOSE ONLY

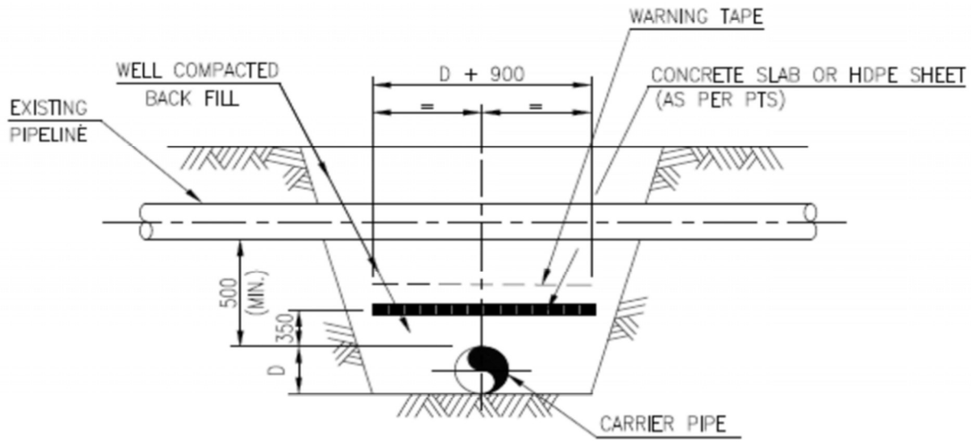
Digitally signed by Pradeep Kumar Yadav
Date: 2026.01.08 19:30:02 IST

TYPICAL UNDERGROUND CABLE CROSSING DETAILS

ORG.NO. MEC/23GH/05/25/M/000/024

GGL/23HQ/05/25/M/000/024





SECTION X-X

NOTES:-

1. ALL DIMENSIONS ARE IN MM. UNLESS SPECIFIED OTHERWISE.
2. A MODIFIED PIPELINE WARNING SIGN SHALL BE INSTALLED CLOSE TO THE CROSSING.
3. IN CASE OF ARMOUREWD OFC CABLE, CP BONDING IS NOT BE PROVIDED BETWEEN PIPELINE AN CABLE ARMOUR IN CASE OF UNARMOURED CABLE ARRANGEMENT FOR SHIELDIND (BY PROVIDING CASING ON EITHE SIDE OF THE PIPELINE OR CABLE) SHALL BE CONSIDERED.
4. FOR APPROVAL OF XING SHALL BE OBTAINED FROM CONCERNED AUTHORITIES.
5. FOR CONCRETE SLAB SHALL BE REFER STD. DRG. NO. MEC/TYP/05/28/STD/0007

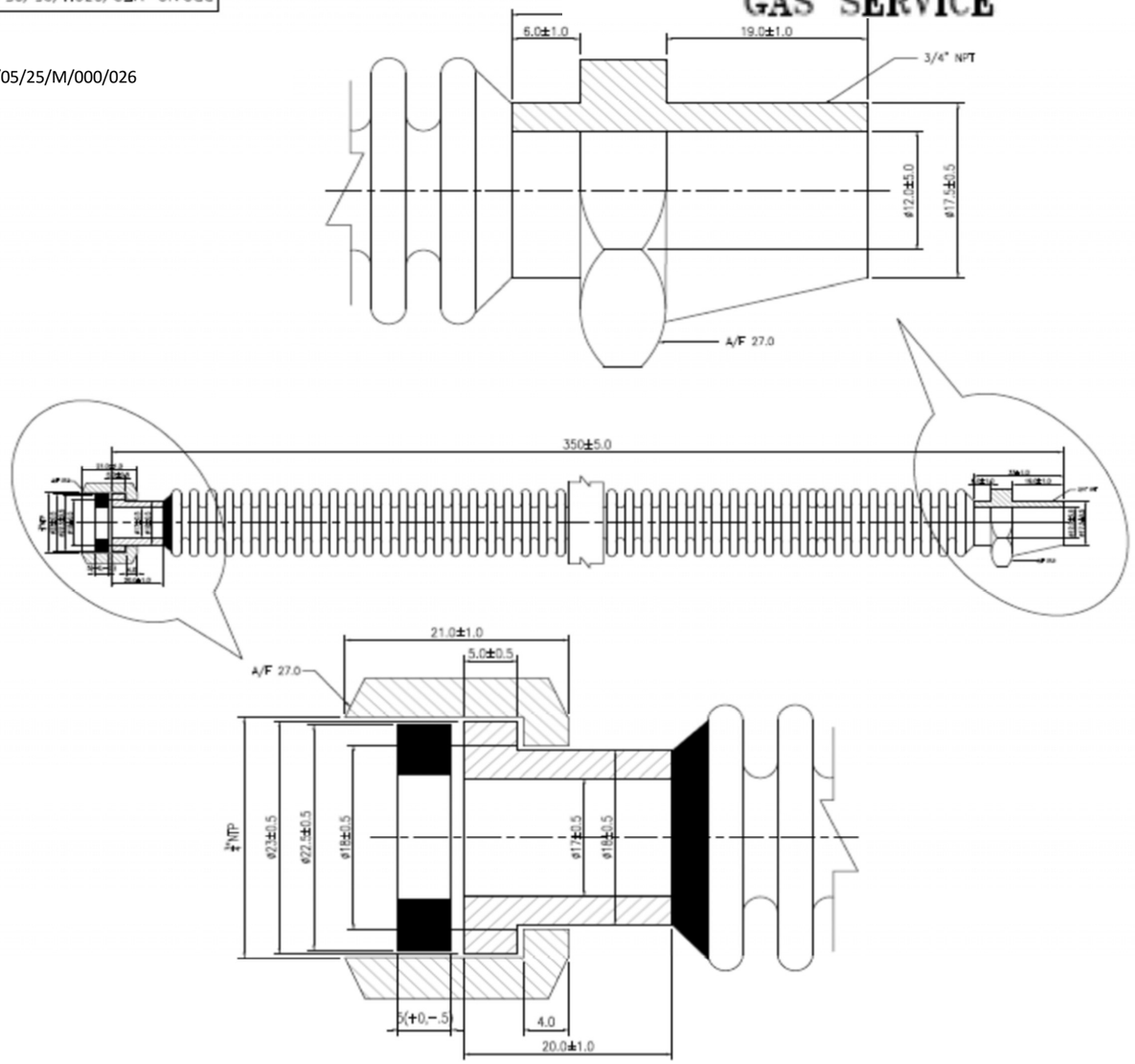
FOR TENDER PURPOSE ONLY

Digitally signed by Pradeep Kumar Yadav
Date: 2026.01.08 19:30:02 IST

HOSE ASSEMBLY FOR NATURAL GAS SERVICE

DRG.NO. MEC/23HQ/05/25/M/000/026

GGL/23HQ/05/25/M/000/026



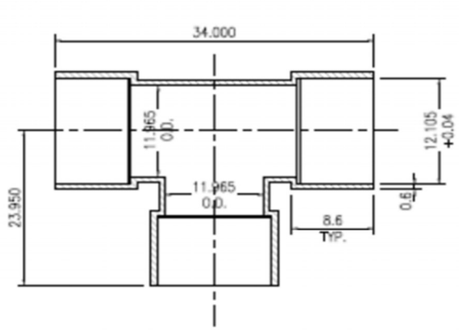
NOTES:-
1. ALL DIMENSIONS ARE IN MM.
2. FOLLOW WRITTEN DIMENSIONS ONLY. DO NOT SCALE.

FOR TENDER PURPOSE ONLY

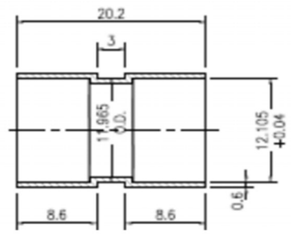
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Date: 2026.01.08 19:30:02 IST

COPPER FITTING FOR NATURAL GAS SERVICE

GGL/23HQ/05/25/M/000/027

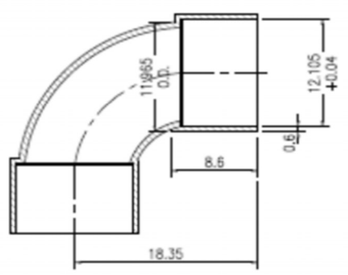


TEE



COUPLER

FITTING AS PER EN 1254 PART-1



90° ELBOW

FITTING AS PER EN 1254 PART-1

NOTES:-

1. ALL DIMENSIONS ARE IN MM.
2. FOLLOW WRITTEN DIMENSIONS ONLY. DO NOT SCALE.
3. OPEN TOLRENCES ON DIMENSIONS SHALL BE AS PER EN 1254.
4. FOR DETAIL REFER SPEC NO.
5. THESE DRAWINGS ARE INDICATIVE ONLY. DETAIL DRAWING TO BE PREPARED BY THE VENDOR AS PER DESIGN CODE/MANUFACTURING STANDARD.

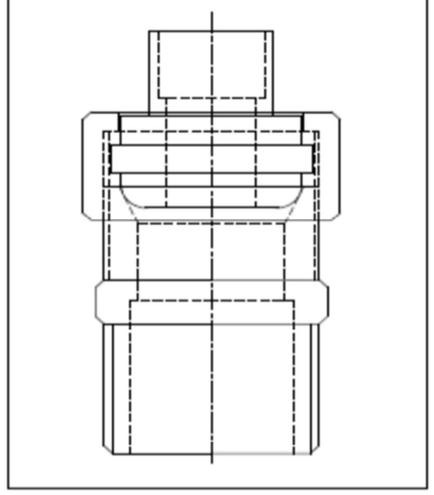
FOR TENDER PURPOSE ONLY

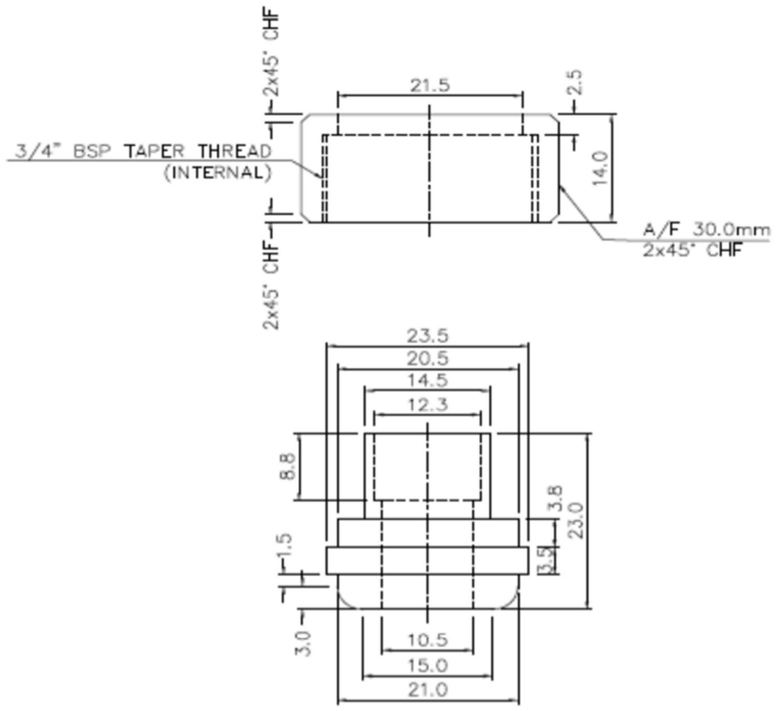
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Date: 2026.01.08 19:30:02 IST

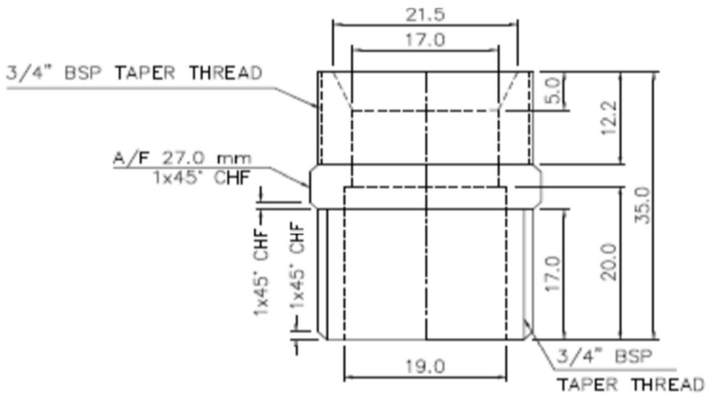
BRASS DISCONNECTING UNION
3/4" BSPT x 12mm (STRAIGHT)

GGL/23HQ/05/25/M/000/028

TYPICAL ASSEMBLY DRAWING







NOTES:-
1. MATERIAL SHALL CONFORM TO 319 : FREE CUTTING EXTRUDED BRASS ROD.
2. DIMENSIONS TOLERENCES SHALL BE AS PER BS 864 AND BS 21.
3. OPEN TOLERENCES ON DIMENSIONS SHALL BE +/- 0.1 mm.
4. THREADIND SHALL BE DONE AS PER BS 21.
5. ALL UNIONS BE LEAK TESTED AT 1 BAR.
6. ALL DIMENSIONS ARE IN MM.

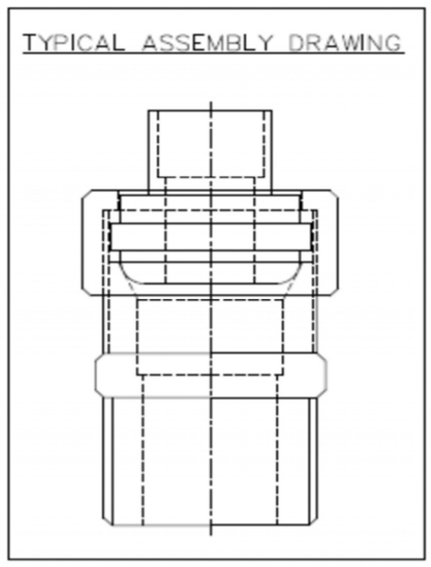
FOR TENDER PURPOSE ONLY

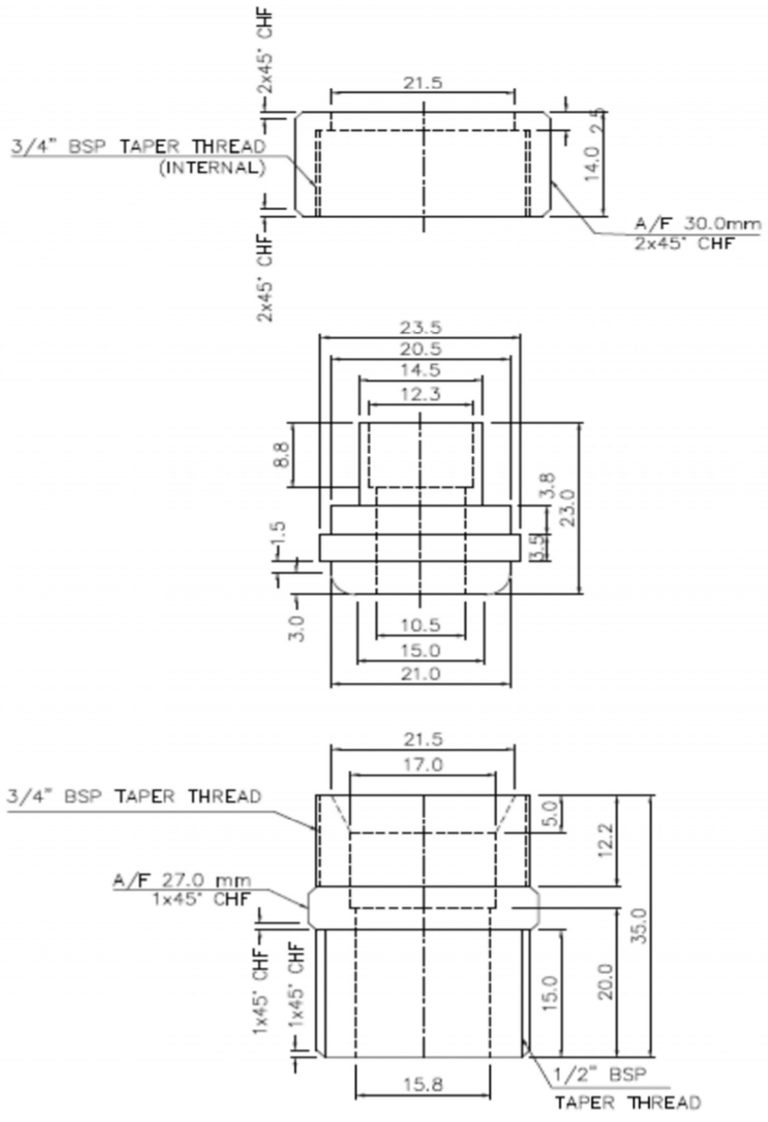
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BRASS DISCONNECTING UNION
1/2" BSPT x 12mm (STRAIGHT)

GGL/23HQ/05/25/M/000/029

TYPICAL ASSEMBLY DRAWING





NOTES:-

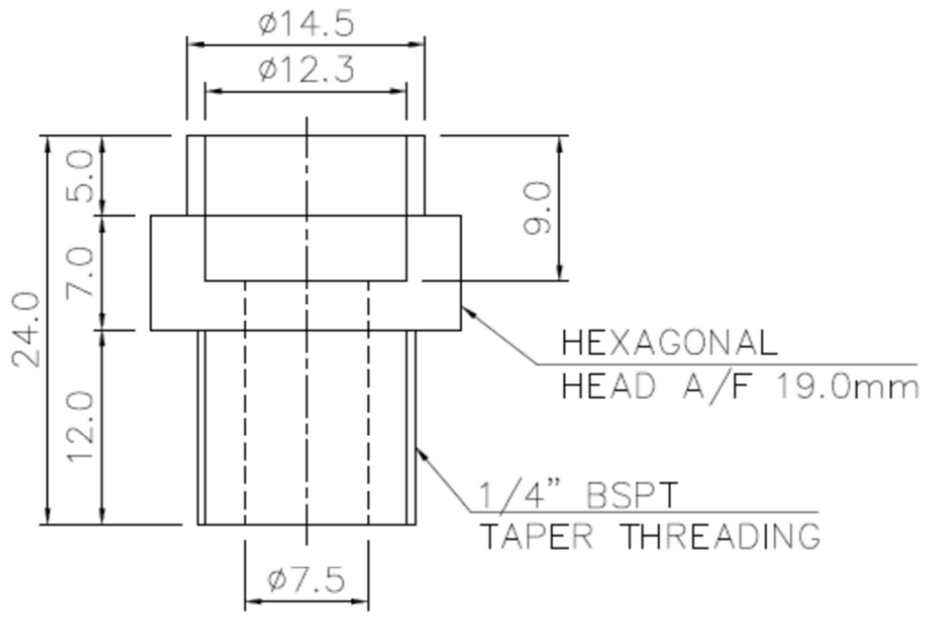
1. MATERIAL SHALL CONFORM TO 319 : FREE CUTTING EXTRUDED BRASS ROD.
2. DIMENSIONS TOLERENCES SHALL BE AS PER BS 864 AND BS 21.
3. OPEN TOLERENCES ON DIMENSIONS SHALL BE +/- 0.1 mm.
4. THREADIND SHALL BE DONE AS PER BS 21.
5. ALL UNIONS BE LEAK TESTED AT 1 BAR.
6. ALL DIMENSIONS ARE IN MM.

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BRASS ADOPTER
1/4" BSPT x 12mm (STRAIGHT).

GGL/23HQ/05/25/M/000/030



NOTES:-

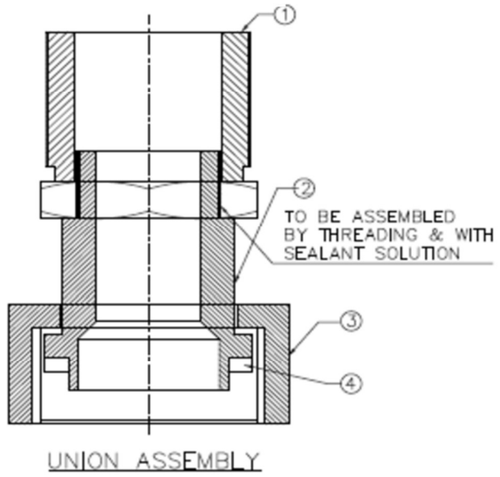
1. MATERIAL SHALL CONFORM TO IS : 319 FREE CUTTING EXTRUDED BRASS RODS.
2. DIMENSIONS TOLERENCES SHALL BE AS PER BS 864 AND BS 21.
3. OPEN TOLERENCES ON DIMENSIONS SHALL BE +/- 0.1 mm.
4. THREADIND SHALL BE DONE AS PER BS 21.
5. ALL UNIONS BE LEAK TESTED AT 1 BAR.
6. ALL DIMENSIONS ARE IN MM.

FOR TENDER PURPOSE ONLY

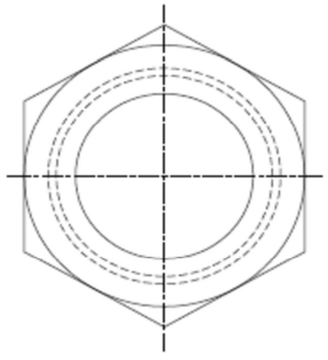
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Date: 2026.01.08 19:30:02 IST

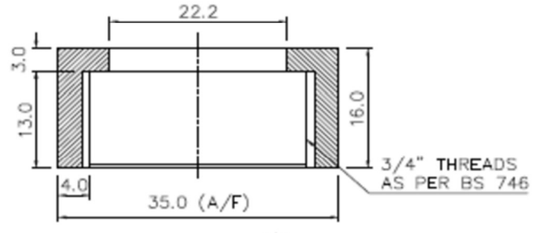
METER INLET UNION
3/4" x 3/4"

GGL/23HQ/05/25/M/000/031

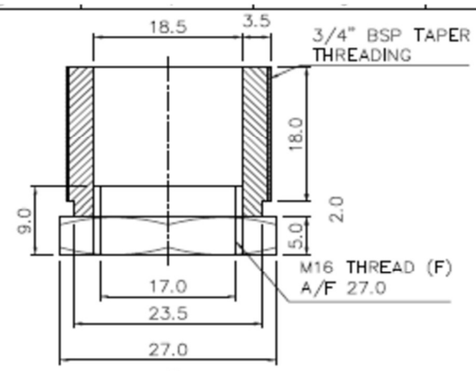


UNION ASSEMBLY

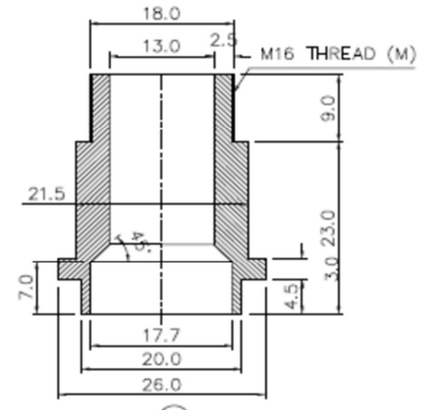




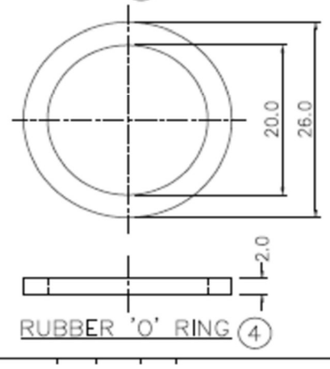
HEX. NUT (3)



(1)



(2)



RUBBER 'O' RING (4)

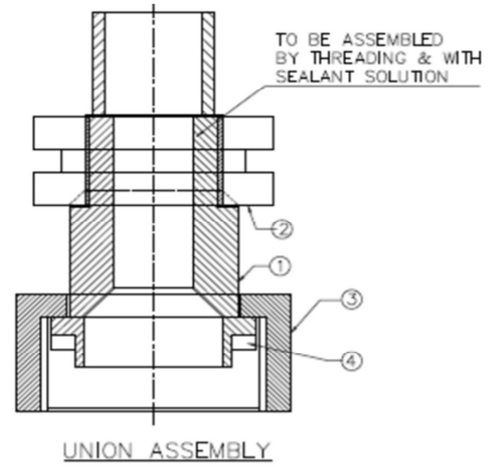
NOTES:-
1. ALL DIMENSIONS ARE IN MM.
2. MATERIAL SHALL BE EXTRUDED FREE CUTTING BRASS ROD AS PER IS 319/BS EQUIVALENT.
3. RUBBER O RING MATERIAL WILL BE NITRAIL.
4. FOR DETAILS REFER TECHNICAL SPECIFICATION NO. MEC/TS/05/62/020B
5. O RING MATERIAL &SEALANT SOLUTION SHOULD BE SUITABLE FOR NATURAL GAS SERVICE.

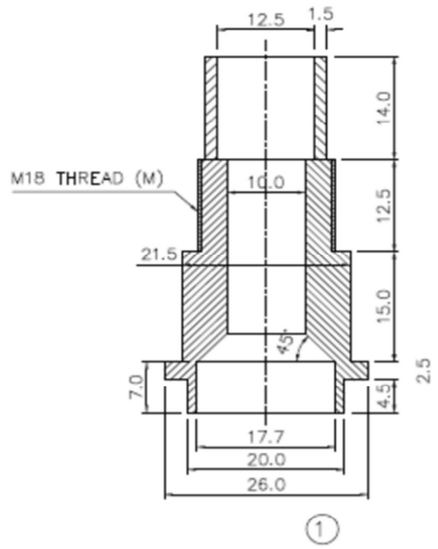
FOR TENDER PURPOSE ONLY

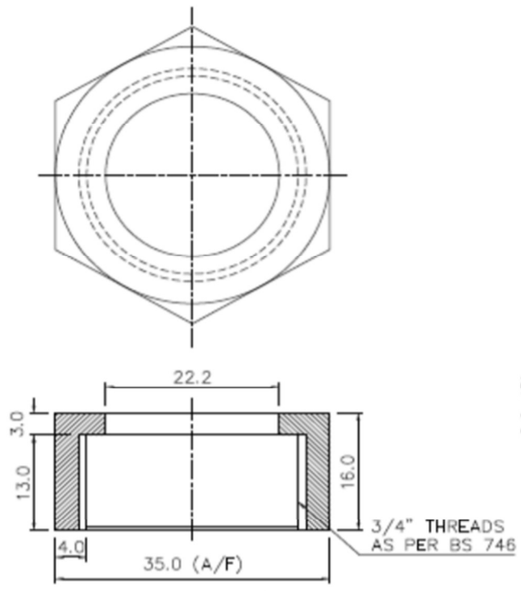
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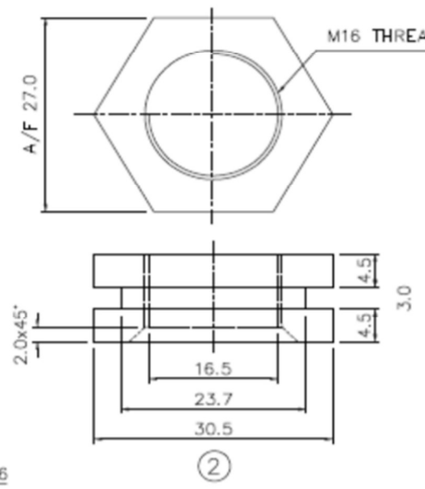
METER OUTLET UNION
3/4" x 12 mm (STRAIGHT)

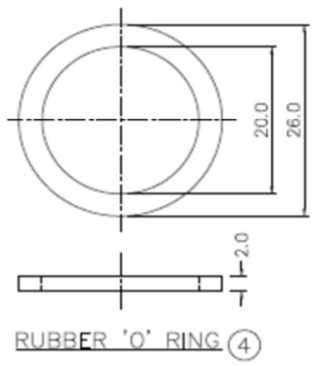
GGL/23HQ/05/25/M/000/032











NOTES:-

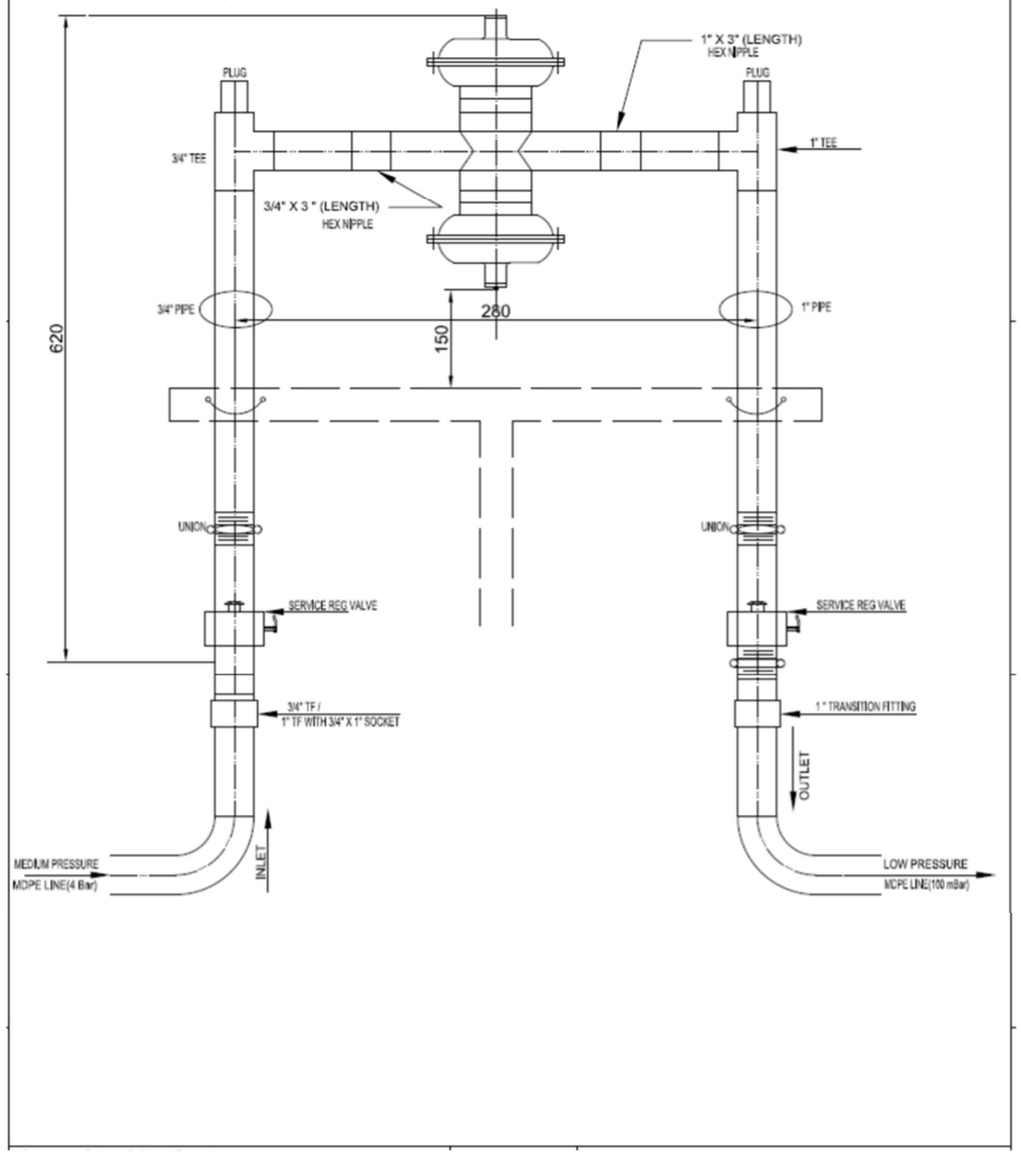
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FOR TENDER PURPOSE ONLY

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SCHEMATIC DIAGRAM FOR SINGLE STREAM SERVICE REGULATOR

GGL/23HQ/05/25/M/000/034

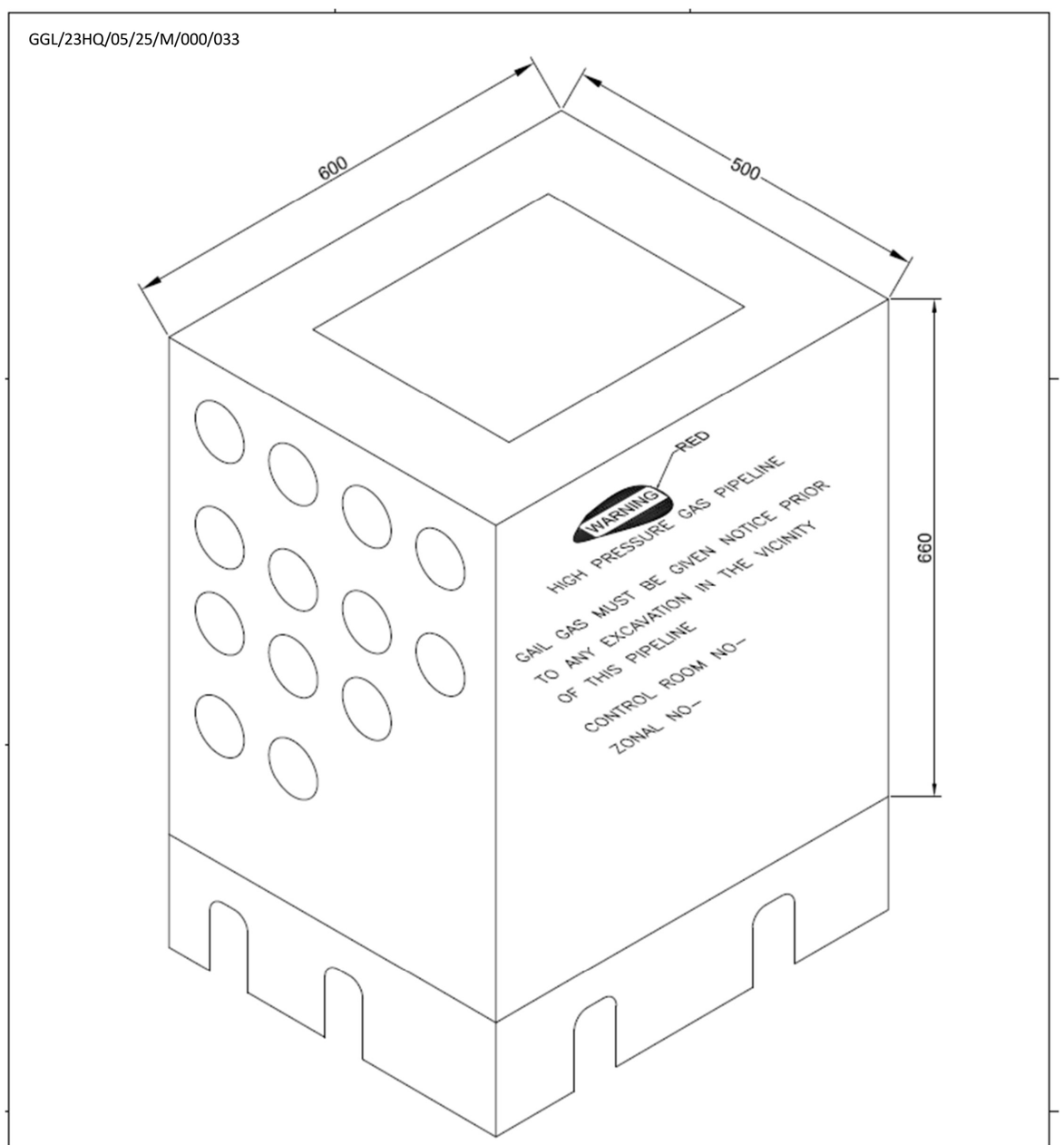


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SCHEMATIC DIAGRAM OF HOUSING

FOR SINGLE SERVICE REGULATOR

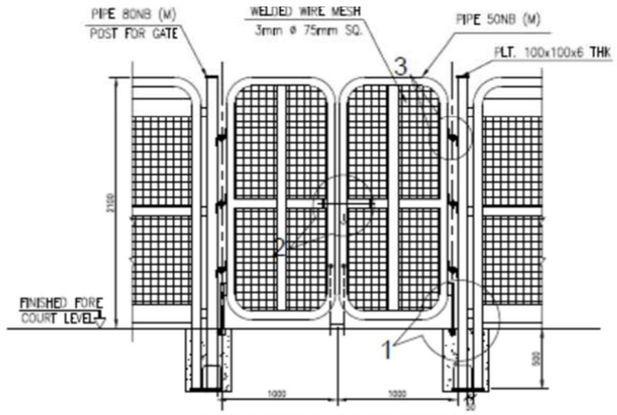
GGL/23HQ/05/25/M/000/033



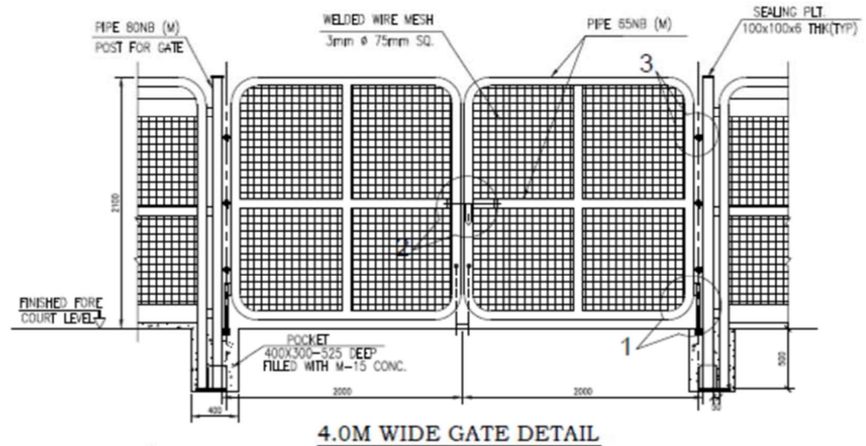
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Date: 2026.01.08 19:30:02 IST

TYPICAL DETAIL OF GATE & FENCING (2100 MM HIGH)

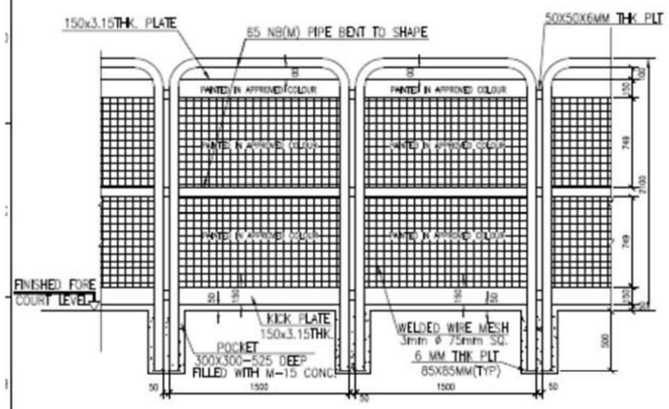
GGL/U999/05/12/S/062



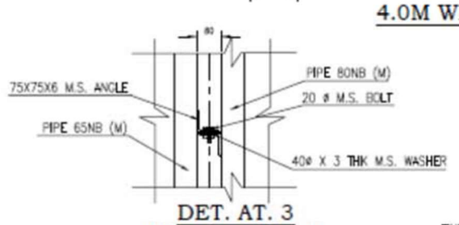
2.0M WIDE GATE DETAIL



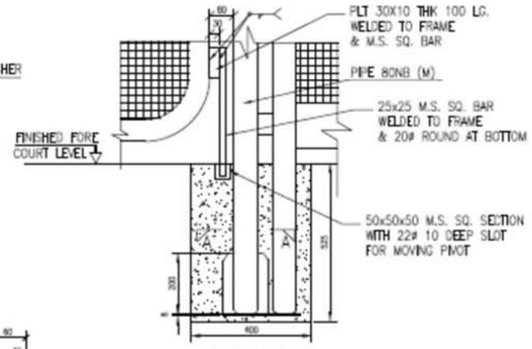
4.0M WIDE GATE DETAIL



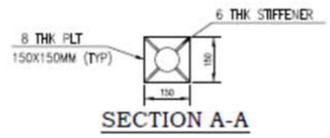
TYPICAL FENCING DETAIL



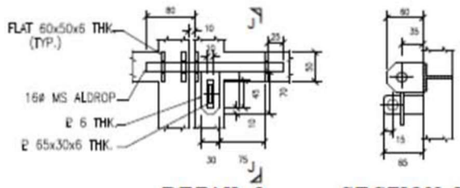
DET. AT. 3
(Detail of Hinge)



DETAIL 1



SECTION A-A



DETAIL-2

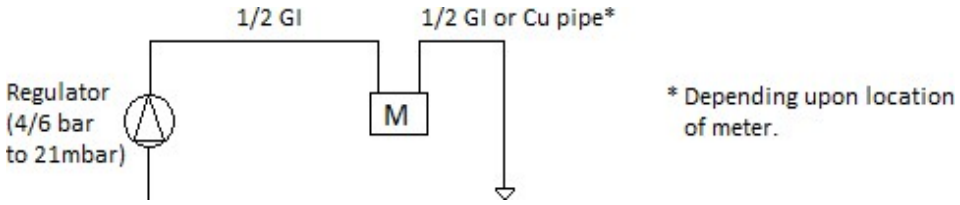
SECTION J-J

FOR TENDER PURPOSE ONLY

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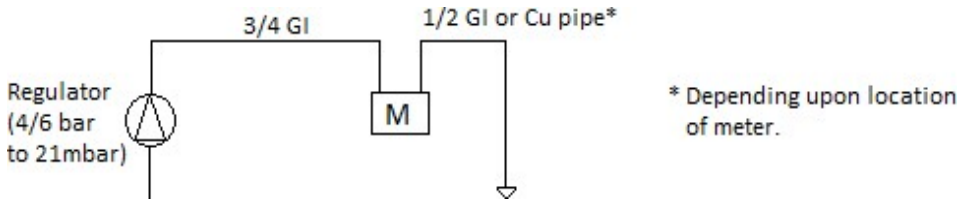
Schemes for GI Piping for Domestic Consumers

Scheme 1- For Independent house upto G+2:



- Regulator shall be of range **from 4/6 bar to 21mbar**.
- Pipe from outlet of regulator to inlet of meter shall be **1/2" GI pipe**.
- From outlet of meter, **1/2" GI pipe or Copper pipe** shall be used depending upon the location of installation of domestic meter.

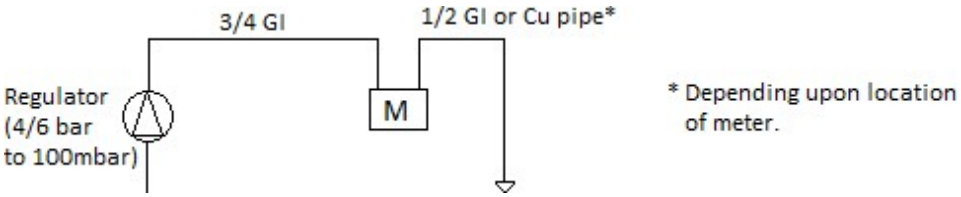
Scheme 2- For High-Riser society from G+3 to G+7:



- Regulator shall be of range **from 4/6 bar to 21mbar**.
- Pipe from outlet of regulator to inlet of meter shall be **3/4" GI pipe**.
- From outlet of meter, **1/2" GI pipe or Copper pipe** shall be used depending upon the location of installation of domestic meter.

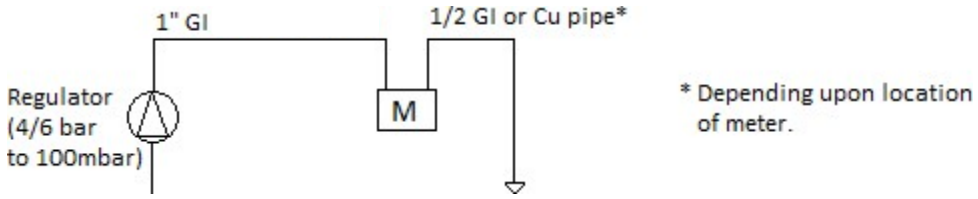
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Scheme 3- For High-Riser society from G+8 to G+12:



- Regulator shall be of range **from 4/6 bar to 100mbar**.
- Pipe from outlet of regulator to inlet of meter shall be **3/4" GI pipe**.
- From outlet of meter, **1/2" GI pipe or Copper pipe** shall be used depending upon the location of installation of domestic meter.

Scheme 4- For High-Riser society from G+13 to G+20:



- Regulator shall be of range **from 4/6 bar to 100mbar**.
- Pipe from outlet of regulator to inlet of meter shall be **1" GI pipe**.
- From outlet of meter, **1/2" GI pipe or Copper pipe** shall be used depending upon the location of installation of domestic meter.

Note:- 3/4 inch GI pipe (from Regulator outlet to Meter inlet) may be used instead of 1/2 inch GI pipe as per site condition, material availability & utilization of resources considering site urgency and same is applicable for

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Scheme 1- For Independent house up to G+2 only.

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CHECK – LIST For Domestic Connection

Society's Name: _____ Contractor's Name: _____

Area: _____ Date: _____

		Status As on dated	If No, then target Date	Completion Date
1.	Availability of As-build drawings (Hard & Soft copy):	YES ☐ NO ☐		
2.	Restoration properly done & NOC Obtained from society:	YES ☐ NO ☐		
3.	Sleeve Restoration properly done:	YES ☐ NO ☐		
4.	Sand filled inside the Sleeve up to the top level:	YES ☐ NO ☐		
5.	2 No's of Clamps fitted in the GI pipe below Regulator:	YES ☐ NO ☐		
6.	All Regulator joints & Isolation Valves are Leak proof:	YES ☐ NO ☐		
7.	Proper Painting, Clamping of GI Pipes and Hole Cementing done:	YES ☐ NO ☐		
8.	Valve Chamber is properly made with proper Cover on it:	YES ☐ NO ☐		
9.	Extra Earth/ Material removed from the Society premises:	YES ☐ NO ☐		
10.	RFC & Conversion data (Handover Data) submitted:	YES ☐ NO ☐		
11.	House Consent forms forwarded to Marketing:	YES ☐ NO ☐		
12.	Pole/ RCC/ Plate Markers properly installed:	YES ☐ NO ☐		

13. Other Check Points (if any): _____

_____

_____

_____

_____

_____

GGL (Signature of O&M Personal) (Signature of Projects Contractor)

(Signature of O&M In-charge) (Signature of Projects In-charge)

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Standard Work Procedure (SWP) G I & Meter Installation

1. Route Survey

1	Initial survey to finalise route of GI Piping to be done by Contractor & EIC/PMC to confirm feasibility and acceptance of custom
2	Hand sketch of route to be signed by Customer,Contractor & EIC/PMC.
3	Route to be finalized ensuring proper ventilation.
4	conceled piping is strictly not allowed

2. GI Installation

1	All the machinery & adequete manpower should be availiable at site (by contractor) before commencement of work.
2	Test Report of all the bought out items to be submitted by contractor
3	All pipes should be vertically plumbed.
4	clamping must be provided on either sides of each fitting with maximum of 150 mm gap.
5	Minimum 2 Clamps must be provided in to support 1.5 m 1/2" dia GI pipe below regulator
6	One clamp must be provided above regulator with maximum gap of 150 mm.
7	At each service tee there should be provision of isolation valve (3/4").
8	Minimum offset distance from riser and hole piece should be 150mm.
9	Hole piece must pass through PVC pipe.
10	In case of approach riser, all droppings must have individual valves.
11	All pipings must be visible and installed in ventilated area.
12	kitchen should have sufficient ventilation.
13	One coat Zinc based primer
14	Two coats paint of synthetic enamel caneery yellow (Asian,Nerolack, Burger or as per Tech Spec.) per coat 30 micron must be applied prior to installation of pipes and same is not applicable in case of powder coated GI pipe and fitting.
15	All fittings must be painted after testing of instllation.
16	Minimum distance between Electral items like points/wiring/cable etc. and installation of GI pipe shall be 300-500 mm or if distance is not adequete then GI pipe shall be covered with PVC sleeve.
17	GI installation shall not be done below kitchen platform .
18	GI routing on wooden /False ceiling is not permitted.

3. GI Testing

1	At the time of riser testing all isolation valves must be in opened and plugged condition.
2	Riser testing should be done at 2.2Kg/cm^2 pressure and it should be witnessed for two to four hours.
3	Pressure gauge used for testing must be (0-4) Kg/Cm^2 and it must be within calibration period.
4	Calibration certificates of pressure gauge must be approved by EIC or PMC and signed seal must be sticked on the gauge.
5	After testing of riser it must be socket plugged which indicates that riser has been tested.
6	Riser measurement must be done prior to testing and measurement sheet report is to be signed by EIC/PMC.
7	Customer must be informed about extra piping if applicable and extra piping consent is to be signed by customer.
8	Plate marker at TF point is to be ensure before final gas charging.
9	After testing final touch up of painting is to be done as per requirement.

4. Meter Installation

1	Meter must be installed in ventilated location.
2	Flexible hose pipe should be used in 3 patterns as shown in figure below.
3	Isolation Valve inside kitchen must be on maximum height of 2.0 m from ground level.
4	All pipings inside kitchen must be minimum 300-500 mm away from electric wires.
5	Gas piping should not cross over any electric line.
6	Distance from appliance valve and gas burner must be minimum of 1000 mm.
7	Piping must not run over gas burner.

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8	PVC clamp must be on either side of each bend in copper piping.
9	One supporting PVC clamp must be provided just before Appliance Valve.
10	GI installation shall not be done below kitchen platform .
11	Selection of GI/Cu, From Meter Outlet to Appliance valve will be decided by customer.

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5. Online Tapping

1	All work to carried out in the presence of PMC/EIC only.
2	Tapping in front of all probable houses(domestic consumer) is to be done.
3	Shut down form to be filled and signed by connected consumers.
4	Isolation Valve to be installed in balance tap offs and it must be plugged.
5	Inform connected consumers that gas is available and take there initials.
6	Internal testing from the "Isolation valve of service tee" upto the "Appliance Valve" with meter to be done at not more than 400 millibar with manometer or diaphragm gauge with MCV in open condition.
7	At the time of commissioning ensure that there is no leakage from the Isolation Valve with soap solution.
8	Presence of fire extinguisher must at the time of online tapping.

6. Meter testing/Ready for conversion (RFC) Checklist

1	GI Sleeves shall be properly sand filled.
2	Ensure proper clamping & painting of the installation.
3	Ensure riser testing is done. Also make sure that socket is plugged.
4	Holes for filled with cement mortar.
5	Make sure that all other Isolation Valves are closed except of those whose RFC's are to be done.
	type regulator is to be ensure.
7	Ensure that Copper Pipe Clamping has been properly done alongwith leaqure coating
8	Internal Testing (from Meter inlet to Appliance valve) is to done at 100 mbar for a duration of 3 minutes.
9	Socket Plugged after RFC.
10	Safety Manual Chart to be provided to the customer.
11	Obtain feed back form duly signed by the customer.
12	Emergency Phone No. stickers to be stuck over the meter bearing the initial of TPI with date.

7. Conversion Checklist

1	Make Sure that socket is plugged and is RFC done before NG conversion.
2	Nozzles should be changed.
3	New Hose Pipe to be provided & C clamped on both ends.
4	Old nozzles should be handed over to the customer.
5	Soap solution test to be carried out.
6	Portable Fire Extinguisher should be carried at the time of conversion.
7	After NG JMR is to be filled and duly signed by Customer, Contactor & EIC/PMC
Note:	

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1 This Procedure is to be read along with PNGRB and T4S Guidelines.

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Ref. No.:		Project: CITY GAS DISTRIBUTION PROJECT, ----------

PNG CONNECTION JOB

CUSTOMER DETAIL		TECHNICAL	
APPLICATION NO: CUSTOMER NAME: HOUSE NO.LANDMARK CITY	SERVICE ORDER NO. STREET AREA CONTACT NO.	METER NO. IMR Outside Kitchen INSTALLATION DATE TESTING	METER LOCATION Inside/

ILL OF MATERIAL

S.No.	Material Description	SIZE	Unit	Quantity	S.No.	Material Description	SIZE	Unit	Quantity
1	GI PIPE	1/2"	Mtr.		7	BURNER	-----	Nos.	
2	GI PIPE	3/4"	Mtr.		8	PEDESTRAL	-----	Nos	
3	COPPER PIPE	12 mm	Mtr		9	WARNING PLATE	-----	Nos.	
4	APPLIANCE VALVE	1/2"	Nos.		10				
5	ISOLATION VALVE	1/2"	Nos		11				
6	ISOLATION VALVE	3/4"	Nos.		12				

I hereby confirm that Meter Installation and routing of GI and Copper Pipes were carried out by GGL in my house has been done to the best of my satisfaction.	Contractor name:- SIGN DATE	Owner/ PMC SIGN DATE

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Contractor's Logo

PNEUMATIC TESTING REPORT GI installation from regulator outlet to appliance valve (except meter) *& meter testing*

Ref. No.: Project: CITY GAS DISTRIBUTION PROJECT , ----------

Project: City Gas Distribution at ----------			
Client: M/s			
Consultant: M/s			
Contractor:		**Location:**	
Address of Quarter:		**Service Order No./PO no.:**	
Details :-			
1	Sizes of GI : ½" ,¾" ,1"	**6**	Start Time :_____DATE :____/_____/_____
2	Total Length of the pipe: _____ mtr.	**7**	Holding Time: 04 Hrs.
3	Whether Meter removed: Y / N	**8**	Pressure Gauge Make & No.:_____
4	Testing Medium: Compressed air (oil free)	**9**	Gauge calibration valid up to: ____/____/_____
5	Testing Pressure: 02 bar	**10**	Whether Leakage observed by applying soap solution: Y / N

Observation Chart *from regulator outlet to appliance valve (except Meter)*:

S.No.	Time	Reading (Kg.f/cm²)	S.No.	Time	Reading (Kg.f/cm²)
1.			5.		
2.			6.		
3.			7.		
4.			8.		

Observation in separate Meter Testing:

1	Test pressure for separate Meter testing: 100mbar
2	Holding Time for separate Meter testing: 15 minutes
3	Whether Pressure drop observed:

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STANDARD WORK PROCEDURE FOR PE LAYING AND GI WORKS

Project: City Gas Distribution Projects

Client: M/s

Consultant: M/s

Contractor:

Standard Work Procedure (SWP) For G I & Meter Installation

1. Route Survey

1	Initial survey to finalize route of GI Piping to be done by Contractor & EIC/PMC to confirm feasibility and acceptance of customer.
2	Hand sketch of route to be signed by Customer, Contractor & EIC/PMC.
3	Route to be finalized ensuring proper ventilation.
4	Concealed piping is strictly not allowed

2. GI Installation

1	All the machinery & adequate manpower should be available at site (by contractor) before commencement of work.
2	Test Report of all the bought out items to be submitted by contractor
3	All pipes should be vertically plumbed.
4	Clamping must be provided on either sides of each fitting with maximum of 150 mm gap.
5	Minimum 2 Clamps must be provided in to support 1.5 m 1/2" dia. GI pipe below regulator
6	One clamp must be provided above regulator with maximum gap of 150 mm.
7	At each service tee there should be provision of isolation valve (3/4").
8	Minimum offset distance from riser and hole piece should be 150mm.
9	Drill holes must pass through PVC pipe.
10	In case of approach riser, all droppings must have individual valves.
11	All piping must be visible and installed in well-ventilated area.
12	Kitchen room shall have sufficient ventilation.
13	One coat Zinc based primer
14	Two coats of synthetic enamel canary yellow paint (Asian, Nerolac, Berger or as per Tech Spec.) per coat 30 micron must be applied prior to installation of pipes and same is not applicable in case of powder coated GI pipe and fitting.
15	All fittings must be painted after testing of installation.

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16	Minimum distance between Electrical items like points/wiring/cable etc. and installation of GI pipe shall be 300-500 mm or if distance is not adequate then GI pipe shall be covered with PVC sleeve.
17	GI installation shall not be done below kitchen platform.
18	GI routing on wooden /false ceiling is not permitted.

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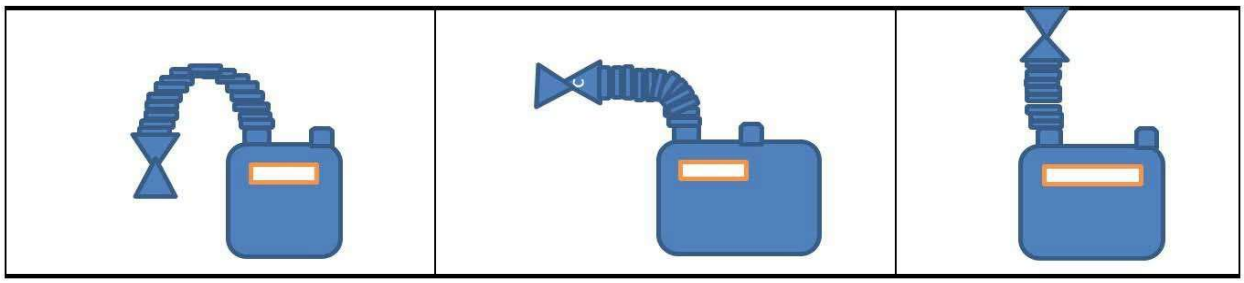
STANDARD WORK PROCEDURE FOR PE LAYING AND GI WORKS

3. GI Testing

1	At the time of riser testing all isolation valves must be in opened and plugged condition.
2	Riser testing should be done at 2.2Kg/cm^2 pressure and it should be witnessed for two to four hours.
3	Pressure gauge used for testing must be (0-4) Kg/Cm^2 and it must be within calibration period.
4	Calibration certificates of pressure gauge must be approved by EIC or PMC and signed seal must be pasted on the gauge.
5	After testing of riser it must be socket plugged which indicates that riser has been tested.
6	Riser measurement must be done prior to testing and measurement sheet report is to be signed by EIC/PMC.
7	Customer must be informed about extra piping if applicable and extra piping consent is to be signed by customer.
8	Plate marker at TF point is to be ensured before final gas charging.
9	After testing final touch up of painting is to be done as per requirement.

4. Meter Installation

1	Meter must be installed in ventilated location.
2	Flexible hose pipe should be used in 3 patterns as shown in figure below.
3	Isolation Valve inside kitchen must be on maximum height of 2.0 m from ground level.
4	All GI piping inside kitchen must be minimum 300-500 mm away from electric wires.
5	Gas piping should not cross over any electric line.
6	Distance from appliance valve and gas burner must be minimum of 1000 mm.
7	Piping must not run over gas burner.
8	PVC clamp must be on either side of each bend in copper piping.
9	One supporting PVC clamp must be provided just before Appliance Valve.
10	GI installation shall not be done below kitchen platform.
11	Selection of GI/Cu, From Meter outlet to Appliance valve will be decided by customer.
12	GI pipe clamping and routing through wooden surface must be avoided.



5. Online Tapping

1	All work to carried out in the presence of PMC/EIC only.
2	Tapping in front of all probable houses (domestic consumer) is to be done.
3	Shut down form to be filled and signed by connected consumers.
4	Isolation Valve to be installed in balance tap offs and it must be plugged.
5	Inform connected consumers that gas is available and take their initials.

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6	Internal testing from the "Isolation valve of service tee" up to the "appliance Valve" with meter to be done at not more than 400 mbar with manometer or diaphragm gauge with MCV in open condition.

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STANDARD WORK PROCEDURE FOR PE LAYING AND GI WORKS	
7	At the time of commissioning ensure that there is no leakage from the Isolation Valve with soap solution.
8	Presence of fire extinguisher must at the time of online tapping.

6. Meter testing/Ready for conversion (RFC) Checklist

1	GI Sleeves shall be properly sand filled.
2	Ensure proper clamping & painting of the installation.
3	Ensure riser testing is done. Also make sure that socket is plugged.
4	Holes for filled with cement mortar.
5	Make sure that all other Isolation Valves are closed except of those whose RFC's are to be done.
6	Ensure no leakage in Regulator assembly by soap solution test.
7	Ensure that Copper Pipe Clamping has been properly done along with lacquer coating.
8	Internal Testing (from Meter inlet to Appliance valve) is to done at 100 mbar for a period of 3 minutes.
9	Socket Plugged after RFC.
10	Safety Manual Chart to be provided to the customer.
11	Obtain feedback forms duly signed by the customer.
12	Emergency Phone No. stickers to be stuck over the meter bearing the initial of TPI with date.

7. Conversion Checklist

1	Make Sure that socket is plugged and is RFC done before NG conversion.
2	Nozzles should be changed.
3	Suraksha Rubber Hose Pipe to be provided & C clamped on both ends.
4	Old nozzles should be handed over to the customer.
5	Soap solution test to be carried out.
6	Portable Fire Extinguisher should be carried at the time of conversion.
7	After NG JMR is to be filled and duly signed by Customer, Contactor & EIC/PMC

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Note:-

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CHARGING PLAN/PROCEDURE

Project: City Gas Distribution Projects

Client:

Consultant:

Contractor:

Date of charging: -

S. No.	Description	Details				
1	**N_2 Purging Detail**	**Purging Date: -**				
		Number of nitrogen cylinder consumed: -				
2	**Length of PE P/L Pneumatically Tested and flushed as well as cleaned (m)**	**Date of Pneumatic testing: -**				
		Type/size	**ø125**	**ø63**	**ø32**	**ø20**
		Revived PE line				
		New PE line				
		Total (meter)				
3	**No of PE Isolation Valve Chamber (in Nos.): -**					
4.	**Check List: -**					
a)	**Isolation valve plugged**	Yes / No /NA				
b)	**Any Exposed Pipe**	Yes / No				
c)	**RCC/Plate/Pole Markers installation**	Yes / No				
d)	**Charging Tools available**	Yes / No				
e)	**As-built Drawing**	Yes / No				
f)	**Certificates confirming nitrogen available**	Yes / No				
g)	**Fire Extinguisher / Gas Detector**	Yes / No				
h)	**Sleeves / half round filled with sand**	Yes / No/NA				

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i)	**Valve Chamber construction done**	Yes / No/NA
j)	**Safety equipment /First Aid available**	Yes / No
k)	**Emergency Nos.provided to the society**	Yes / No / NA

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ACTIVITY/PROCEDURE FOR CHARGING

Sr. No.	Steps to be followed	Activity Description
1.	**Integration of PE network to be charged**	Ensure that 125mm primary/main line is integrated with 63mm secondary line and further integrated with 32mm/20mm service line. If step-1 is ensured then proceed to step-2.
2	**Pneumatic testing**	Final pneumatic testing at 6.2kg/cm2 of all PE network to be charged and the same pressure will be held up for at least 4-6 hrs. Ensure no leak is observed throughout the network to be charged. If step-2 is ensured then proceed to step-3.
3	**Purging procedure**	Purging will be done with the help of Nitrogen medium of99.96% purity. Proper vent to be provided at specified safe location. If step-3 is ensured then proceed to step-4.
4	**Gas charging**	1. Ensure all the PE valve on the network to be charged is in closed position. 2. DRS outlet valve to be open and pressure point to be set at 2kg/cm2. 3. Valve of 125 mm main line will be plugged in / open position. Now the pressure will be checked at the tail end of the main pipeline with the help of pressure gauge and reducing arrangement made at the tail end. 4. If all is ok then valve of 63mm secondary line will be plugged in/open position and ensured that there is no any pressure drop on the gauge of the main line. 5. If all is ok then valve of 32mm tertiary/service line will be plugged in/open position and ensured that there is no any pressure drop on the gauge of the main line and gauge of the tertiary line at different locations.

CHARGING PHILOSOPHY IN DETAIL

1. Intent

It is intended to apply this guideline for the purpose of safe purging, commissioning and de-commissioning of City or Local Natural Gas Distribution Network, which has been constructed and tested confirming to specifications laid down in the PNGRB Technical Standards for CGD Networks (T4S).

2. Pre-Commissioning checks

Prior to commissioning, the entire pipeline system shall be checked with respect to the "as built drawings" and other design specifications.

The pre-commissioning checks should include, but not limited to, following, namely:-

(a) Tightness test- The tightness test (pneumatic) should be completed at a pressure of at least 2 bar(g) with air after completion of all mechanical activities including pneumatic test, cleaning and flushing process. For low pressure network tightness test should be done at least at operating / working pressure. Once the pipeline is connected with live line for purging/ gas-in, it should be

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commissioned immediately and completed as a continuous process.

(b) Function-test of field equipment and system- The supports, route markers, valves, instruments, controls, interlocks etc. are adequately installed and physically checked along the pipeline. All the valves / equipments are checked for intended applications by simulating the operation condition before the gas is introduced to ensure that each valve is operating correctly.

6. Commissioning Process-

As a part of procedure, the entity should ensure specific checklist prior to pipeline commissioning based on type of purging method adopted by them i.e. complete displacement as discussed here-in. However, illustrative check lists are annexed to this guideline for reference.

(a) Valves are checked for respective opening / closing positions.
(b) Check Line Pressure.
(c) Nitrogen flow rate shall be controlled by opening / closing the inlet purging valve.
(d) Record the line pressure at every 30 minutes interval.
(e) Ensure Positive Pressure (not less than 2 kg/cm2) for Nitrogen Purging in the entire Pipeline.
(f) After ensuring the nitrogen purging, close purging valve.
(g) Remove the Nitrogen Purging Connection and install a Blind / Plug and Close the Valve.
(h) Gas-in to be started after confirmation of readiness at all valve stations with closed valves in closed position.
(i) Gas Inlet valve to be opened for 50 angle (crack open) and simultaneously nitrogen shall be vented. With further valve opening, Pipeline shall be pressurized up to 4 kg/cm2. Gas availability shall be ensured at this point by LEL / Methane detector and shall be communicated back to DRS station.
(j) Subsequently, each section of Pipeline shall be pressurized so that entire ML network is free from Nitrogen and is pressurized with Natural Gas at a pressure of 2 kg/cm2 up to end of the pipeline.
(k) Hold the pressure of 4 kg/cm2 for a minimum of 04 hour and check the entire ML network for No Leakage.
(l) If any leakage is observed, it shall be recorded and arrested properly.

7. Commissioning Records-

The commissioning records should as a minimum include, but not limited to, following, namely: -

a) Pneumatic test report.
b) Functional-testing of pipeline.
c) Completed pre-start checklist.
d) Purging report.
e) Commissioning report.
f) As-built Drawings.

Remarks If any:	

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SIG: NAME: **CONTRACTOR**	SIG: NAME: **PMC**	SIG: NAME: **OWNER**

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Date: 2026.01.08 19:30:02 IST

Contractor's Logo

COMMISSIONING REPORT

(P.E. LINE)

Format No. 71127 / Z / 62 /0011R-3

Client	M/S	**Area Name:**	
Consultant Name	M/s	**Locality Name**	
CONTRACTOR			

Details :

1	Length of the Pipe :		5	Date of commissioning :	
2	Size of Pipe:		6	Number of nitrogen cylinders consumed:	
3	Purging Medium:	Nitrogen	7	Line Pr. after gas charging:	
4	Date of Pneumatic testing :				

Check List:

1	Isolation valve plugged	Yes / No /NA	7	Fire Extinguisher / Gas Detector	Yes / No
2	Any Exposed Pipe	Yes / No	8	Sleeves / half round filled with sand	Yes / No/NA
			10	Safety equipment /First Aid available	Yes / No
3	RCC/Plate/Pole Markers installation	Yes / No	9	Valve Chamber construction done	Yes / No/NA
			11	Emergency Nos. provided to the society	Yes / No / NA
4	Charging Tools available	Yes / No			
5	As-built Drawing	Yes / No			
6	Certificates confirming nitrogen available	Yes / No			

Contractor **PMC** **Owner**

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Fusion welding Checklist

Ref. No.:

Project: CITY GAS DISTRIBUTION PROJECT

Dia. Of Pipe_____Loop No. _____Joint no._____
Coupler Type_____

Project : CITY GAS DISTRIBUTION

Client : M/s

PMC : M/s

Contractor :

Location :

Joining Details:

Sr. No.	Description	Requirement	Remarks
1	Fusion Machine	Bar coded electro-fusion machine (Automatically Readable)	
2	Whether Fusion Machine verification format available		
3	Coupler Type		
4	Whether material inspection report available		
5	Whether Pipeline is free from dust, water, mud etc.		
6	Whether Alignment Clamp available		
7	Whether approved pipe cutting tool available		
8	Availability of DG set		
9	Whether Jointer is having ID card signed by Owner/ PMC		

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10	Whether Removal of oxidized surface (0.1 to 0.4 mm from outer surface of PE pipe)		
11	Whether Pipes Securely fasten		

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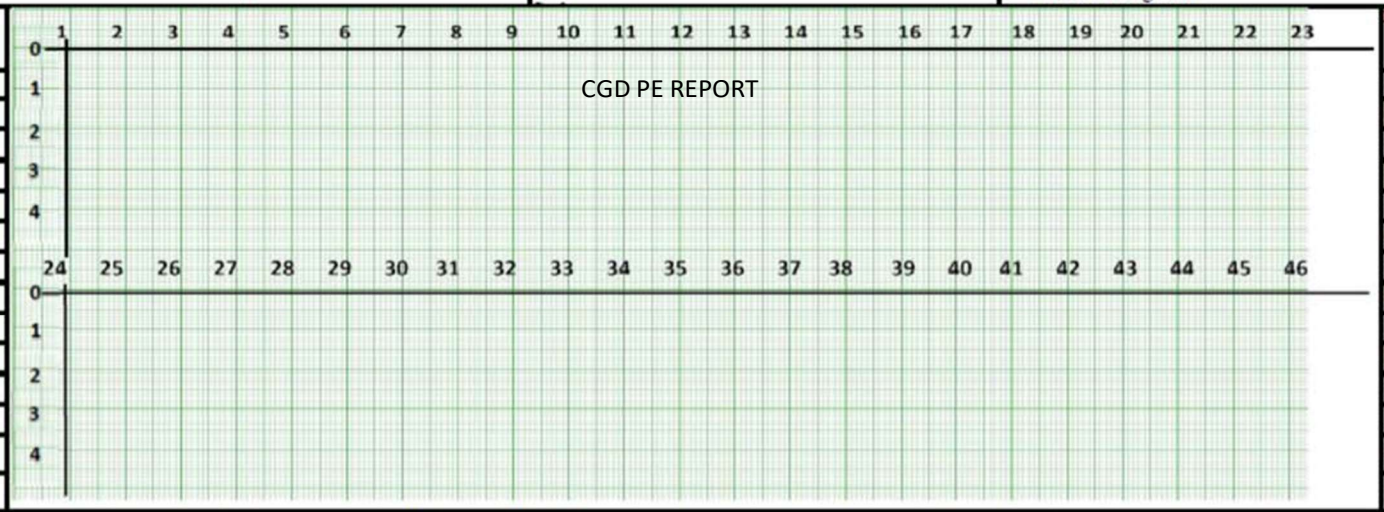
12	Whether Pipes Faces are parallel & aligned through proper alignment clamp		
13	Whether bar code reading done		
14	Fusion completed as per required time through automatic bar code reading		
15	Joint hold immobile under fusion force for 5 minutes		
16	Avoided of any activity near or on joint for 30 minutes		
17	GPS coordinates for joint/joint no. with location		

Contractor	PMC/Owner

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Vendor Name			LOA NO : ------- Dated : --------	Date
MachineNo/Name		Shot Length (M)	LinkName:	Report No.------
No.ofDuct		DuctLength (M)		
EntryPitGPS Cord.		Latitude/Longitude	ExitPitGPS	Latitude/Longitude

Rod	Pitch	Depth
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		
21		
22		
23		
24		
25		



Rod Length (M) =3 M SCALE : X axis = 1CM = 3M SCALE : Y axis = 1CM = 1M

OFFSETDRAWING

Rod	Pitch	Depth
26		
27		
28		
29		
30		
31		
32		
33		
34		
35		
36		
37		
38		
39		
40		
41		
42		
43		
44		
45		
46		
47		
48		
49		

	Contractor	Mecon Ltd	GGL
Signature			
Date			

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Standard Work Procedure (SWP) PE Laying

Specification of PE Pipes

1	PE Pipes as per IS code- 14885
2	Grade: PE 100 SDR 11

3 **ROUTE SURVEY**

1	PE Route for assigned area shall be finalized by PMC/EIC and accordingly sketch will be prepared by contractor.
2	Sketch prepared by contractor to be approved by PMC/ EIC and same shall be used for laying of PE network.
3	Sketch shall have following information/data:-
a.	Total route length
b.	Type of Method for laying like Open cut, HDD or Moling
c.	sizing detail
d.	Break-up of Katcha and Pakka Road

TRENCHING

DEPTH OF TRENCH

1	Minor water body crossing/Canal	2.5 meter
2	Uncased/Cased Road Crossing	1.5 meter
3	Rail/Road Cased Crossing	1.5 meter
4	Normal Areas	1.5 meter

Minimum depths may change depending on requirement of approving authority.

CLEARANCES

1	**150 mm** Where the gas pipe Crosses other assets/utilities
2	**300 mm** Where the gas pipe Crosses (or along) Electical Cable
3	**300 mm** Where the gas pipe is laid along other assets /utilities

TF PROTECTION

1	GI sleeve IS 1239 (Heavy Duty) L 300 mm x Dia. 2.5 inch (3-inch dia. in case of commercial connections)
2	Making of Pedestal (PCC pedestal of grade (1:2:4) and size (300mm(L)X200mm(W) X Height (H)), (H>=300mm & will be as per site condition)))
3	Half round concrete sleeve (min size 250 x 250 x 150 mm)
4	Material **M-20 1:2:4**
5	T F

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PE WARNING MAT

1 Specification of Warning mat shall be as per Approved QAP.

2 Warning Mat is to be placed after padding of about **300 mm** on the top of carrier pipes.

PE Laying

1 Before starting of PE laying written permission (From concerned Authorities) should be provided by Owner/EIC/PMC to contractor

2 All the machinery & adequate manpower should be available at site (by contractor) before commencing of the job. Extent of mobilization is to be finalized by EIC as per availability of work front.

3 Safety measure like Sign board, barricading ,PPE is to be taken up as specified in Technical Specification during PE laying.

4 After PE laying, jointing & before backfilling ,top cover of PE pipe is to witnessed by EIC/PMC.

Flushing

1 Flushing of PE network is to be done by Air from 4-6 kg/cm^2 pressure.

2 Proper flushing is to be ensured before testing.

Testing

1 PE network is to be tested by Air at 6.2 Kg/cm^2 pressure.

2 Pressure is to be hold for the duration as given below:-

a. PE Length <=500 M ,4 hours.

b. PE Length >=500 M ,24 hours.

Purging

1 Purging is to be done using Nitrogen at 2 kg/cm^2 pressure.

2 Pressure Holding is to be ensured by contractor till gas charging.

Commissioning

1 Before Gas charging in PE network following points are to be complied:

a. Completeness of valve chamber along with valves.

b. installation of Pole, and RCC marker.

c. As built drawing

d. Also refer Annexure-1

VALVE SIZE

	Dia	Length	Valve Chamber Size
1	180 mm	650 mm	As per tender
2	125 mm	600 mm	
3	63 mm	450 mm	
4	32 mm	300 mm	

Note:-

1 This Procedure is to be read along with PNGRB and T4S Guidelines.

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Contractor's Logo

PNEUMATIC TESTING REPORT PE Line

Ref. No.: Project: CITY GAS DISTRIBUTION PROJECT

Project: City Gas Distribution
Client: M/s
Consultant: M/s
Contractor: **Location:**

Details :-

1	Size of PE Pipe :	6	Holding Time:
2	Total Length of the pipe:	7	Pressure Gauge Make & No.:
3	Testing Medium: Compressed air (oil free):	8	Gauge calibration valid upto:
4	Testing Pressure:	9	Result:
5	Start Date:	10	Line Pr. after release :

Observation Chart:

S.No.	Time	Reading (Kg.f/cm²)	S.No.	Time	Reading (Kg.f/cm²)
1.			13.		
2.			14.		
3.			15.		
4.			16.		
5.			17.		
6.			18.		
7.			19.		
8.			20.		
9.			21.		
10.			22.		
11.			23.		
12.			24.		

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Contractor's Logo

PNEUMATIC TESTING REPORT PE Line

Ref. No.: Project: CITY GAS DISTRIBUTION PROJECT

Check List :-

Flushing
Pipe cleared from water & debris: - Yes/ No

Witnessed by :

1. GI Sleeves/ Half round concrete sleeve properly installed : - Yes/ No
2. Isolation Valve plugged: - Yes/ No
3. Regulator piece properly clamped: - Yes/ No
4. Sand filling in GI/ Half round concrete sleeve and non exposure of PE pipe/ Transition fitting – Yes/ No
5. Isolation Valve in open condition with open end plugged- Yes/ No

Contractor **PMC** **Owner**

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STANDARD WORK PROCEDURE FOR PE LAYING AND GI WORKS

Project: City Gas Distribution Projects

Client: M/s

Consultant: M/s

Contractor:

Date: -

Standard Work Procedure (SWP) For PE Laying

Specification of PE Pipes

1 PE Pipes as per IS Code 14885

2 Grade: PE 100 SDR 11

3

PE Carrier Pipe Size (mm)	Thickness (mm)	Length m	HDPE Casing Pipes Min. Dia (mm)	HDPE Casing Pipes Max. Dia (mm)
20	3	200	50	50
32	3	150	50	90
63	5.8	100	110	160
125	11.4	50	200	250
180	16.4	12	250	315

1	PE Route for assigned area shall be finalized by PMC/EIC and accordingly sketch will be prepared by contractor.
2	Sketch prepared by contractor to be approved by PMC/ EIC and same shall be used for laying of PE network.
3	Sketch shall have following information/data:-
a.	Total route length
b.	Type of Method for PE laying like Open cut, HDD or Moling.
c.	Sizing detail
d.	Break-up of Katcha and Pakka Road

TRENCHING

DEPTH OF TRENCH

1	Minor water body crossing/Canal	2.5 meter
2	Uncased/Cased Road Crossing	1.5 meter
3	Rail/Road Cased Crossing	1.5 meter
4	Normal Areas	1.5 meter

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STANDARD WORK PROCEDURE FOR PE LAYING AND GI WORKS

2 Pressure Holding is to be ensured by contractor till gas charging.

Commissioning

1 Before Gas charging in PE network following points are to be complied:

a. Completeness of valve chamber along with valves.

b. Installation of Pole, and RCC marker.

c. As built drawing

d. Also refer Annexure-1

VALVE SIZE

	Dia	Length	Valve Chamber Size
1	180 mm	650 mm	1000 (L)X1000 (W)
2	125 mm	600 mm	1000 (L)X1000 (W)
3	90 mm		1000 (L)X1000 (W)
4	63 mm	450 mm	600 (L)X600 (W)
5	32 mm	300 mm	600 (L)X600 (W)

Note:-

1 This Procedure is to be read along with PNGRB and T4S Guidelines.

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Contractor's Logo

VALVE CHAMBER CONSTRUCTION CHECKLIST /POUR CARD

Ref. No.:

Project: CITY GAS DISTRIBUTION PROJECT,_____

Report no:

Project	:	**CITY GAS DISTRIBUTION,_____**	
Client :		**M/s**	
PMC	:	**M/s**	
Contractor	:	**----------**	
Location	:	**----------**	
Dia of Pipe	:	**----------**	**Dia of Valve:**
Type of Valve chamber	:	**----------**	**Size of Valve chamber:**
Date:-	:		

Valve Chamber Details

Sr. No.	Description	Requirement	Witnessed by
1.	Excavation of Pit	As per Drawing/tender requirement	
2.	Inspection of contractor supplied materials	Sand, Corse Sand, Cement, Steel Bar, Concrete	
3.	Concrete Grade		
a)	Aggregate Size	20 MM & Down	
b)	Sand	Coarse sand of approved quality	
c)	Cement	Reputed manufacturer	
4.	Reinforcement Rods	As per Drawing/tender requirement	
5.	Manhole cover	As per tender drawing	
6.	Laying of PCC for foundation (Casting of 100 mm thick PCC for foundation, M10 Grade)	As per Drawing/tender requirement	

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7.	Curing of base PCC	At proper interval	
8.	Inspection of Shuttering, Spacing and Dimension of walls	As per Drawing/tender requirement	

9.	Laying of RCC on top of PCC (Casting of 150mm thick RCC on top of PCC (M-25))	As per Drawing/tender requirement	
10.	Concrete casting of pedestal to support of Valve	As per Drawing/tender requirement	
11.	Fabrication of reinforcement along with angle insert as per drawing for wall	As per Drawing/tender requirement	
12.	Spacing of reinforcement between shuttering	Proper in between and as per Drawing/tender requirement	
13.	Casting of 150mm thick RCC for walls (M-25)	RCC M-25	
14.	Curing of casting (walls) along with base PCC/RCC	At proper interval	
15.	Fabrication of reinforcement as per drawing for top cover	Not Require	
16.	Centering, Shuttering, Spacing and Dimension of top Cover	Not Require	
17.	Casting of top RCC	As per Drawing/tender requirement	
18.	Curing of top cover RCC	As per standard	
19.	Plastering of wall with Cement Mortal with water Proofing (16 mm thk)	As per Drawing/tender requirement	
20.	Coping and sealing of entry and exit of pipe in the chamber	As per drawing	
21.	Sand filling	Coarse sand of approved quality	
22.	Supply and placement of Manhole cover	Heavy duty (with lifting hook) and proper placement	

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Bhagyanagar Gas Limited	**TENDER FOR GASIFICATION WORKS OF LMC (LAST MILE CONNECTIVITY)-COMPLETED CUSTOMERS AND REMOVAL OF LMC (LAST MILE CONNECTIVITY)-FOR NON-INTERESTED CUSTOMERS IN HYDERABAD GA** **Bid Document No: BGL/696/2025-26**	Volume II of II

Contractor	PMC/Owner

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PARTICULAR JOB SPECIFICATION

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19.0 Addendum/Modification/Corrigendum/Change made in the Clauses/ Statement/ Descriptions, etc. of technical specification enclosed in Volume II of II

20.0 General Addendum/Modification/Corrigendum/Change made in the Clauses/ Statement/ Descriptions, etc. in Volume I & II of the Tender document.

21.0 Augmentation/Modification in HEALTH, SAFETY AND ENVIRONMENT (HSE) management.

22.0 List of Manufacturer / Supplier for Bought Out Items

Appendix-I

Appendix-II

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Appendix-III

1.0 PROJECT DESCRIPTION & SCOPE OF WORK

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1.1 **Project Description**

Bhagyanagar gas Limited, A JV company of M/s GAIL (India) Limited & HPCL, is engaged in development of CNG & City Gas Distribution Networks (CGDN) at different Geographical Areas in the country for distribution of CNG and PNG to various consumer segments.

Presently, BGLis operating CNG & City Gas Distribution Networks (CGDN) at 3 GAs across India to supply Natural Gas to Domestic, Commercial, Industrial and Automobile Consumers in these Geographical Areas (GAs).

- BGLintends to award the work of laying of Last Mile Connectivity (LMC) work to domestic consumers (i.e., domestic PNG connections) to more than one bidder

- BGLinvites bids through e-tendering on Open Domestic Competitive Bidding basis for Last Mile Connectivity (LMC) work to domestic consumers (i.e., domestic PNG connections) at Specified GA under single stage two e - envelopes system from bidders meeting the Bid Evaluation Criteria as detailed herein.

1.2 **Scope of Work**

The scope of work involves Last Mile Connectivity (LMC) to domestic consumers (i.e., domestic PNG Connections) for City Gas Distribution project, as per SOR. The LMC work shall include supply, installation and testing of GI pipes including associated fittings, Copper service Pipes, Isolation and Appliance valve etc. along with laying, testing and commissioning of underground Polyethylene (PE) service pipelines of size of 20 & 32 mm from existing PE network.

The work also includes installation and supply of Steel reinforced Flexible Hose as per IS 9573 (with Type as per latest PNGRB guidelines) (Gas tube from end of Isolation Valve up to burner/stove) and conversion of all the burners of the LPG stove (one per household) including supply of all types of burner nozzles/jets and associated controls etc.

The Scope of Work includes following:

Laying, testing and commissioning of underground Polyethylene (PE) service pipelines of size of 20 & 32 &63 mm from existing PE network along with last mile connectivity to households consumers (for 5000 nos. of connection).

This work shall include installation and testing of GI pipes including supply, installation of associated fittings, Copper service Pipes, Isolation and Appliance valve etc. along with laying, testing and commissioning of underground Polyethylene (PE) pipelines of size of 20, 32 mm from existing PE network in specified GA under BGLCGD Project.

All other material except PE pipe, GI pipe, Meter and Regulators (which shall be Free Issue Items) shall be procured by the contractor as indicated in SOR and elsewhere.

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The works covered under the scope of work is spread over the entire Geographical Areas (As mentioned above) which will be notified for execution to the successful bidder from time to time.

Further the scope of work also includes preparation of pipeline connectivity drawings suiting to site condition for each connection with details of existing permanent structures, buildings, roads, pavements / by-lanes, nallahs, culverts, drains, utility lines, electric poles, type of ground surface and marking on drawings along with location of all houses by their names and house/society/apartment/block/commercial establishment no. The drawing so prepared shall also indicate the pipeline sizes for laying along with method of laying and the same shall be submitted to GGL/PMC for approval. Execution will be done as per approved drawing.

The broad scope of this tender comprised of but not limited to the following:

- Laying, testing & commissioning of PE service line (of size 20mm to 32mm) along with fittings and valves from the nearest existing branch line of various sizes to the housing complex / society / individual houses etc including PE/GI transition pipe. Supply of fittings & valves are in the Bidders scope.
- 20mm PE laying for service line will be primarily laid by LMC contractor; all the drain/ Nalla crossing jobs / RCC slab etc. as required for the same shall be in the scope of the LMC contractor. Further, job of service line may be laid through PE laying contractor (as per relevant SOR) in case of site urgency/exigency. The decision of EIC in this regard shall be final and binding to the contractor.

  Further; wherever service line job requires drain/Nalla crossing/ RCC slab job etc, service line job of such nature is in the scope of LMC contractor only.
- Laying, testing of pipeline on all types of surfaces, floors, roads, including Road /Drain Crossing for making the PE to GI installation connectivity complete in all respects.
- Supply and installation of tapping saddle on existing PE pipe of various sizes of existing network.
- Installation of Domestic / Commercial / Service / Field Regulators, Domestic & Commercial Meters & other associated fittings (including supply of fittings).
- Supply and above ground GI installation including riser kit (PE to GI transition fittings) from regulator at consumer end.
- Supply of copper tube, isolation valves & appliance valves.
- Supply & installation of GI Pipe connection within Kitchen of Domestic consumers including installation of meters (free issue), regulators (free issue), anaconda, appliance / isolation valve, brass fittings, copper tube etc. complete in all respect.
- Conversion of Domestic appliances (like burner, hotplate etc) for application / use of PNG.

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- Supply, fabrication and installation of RCC marker, Plate marker with foundation and Plate marker.
- Making of PCC pedestal (Details as given in the tender).
- Supply and Installation of TF along with GI Sleeve, pedestals, sand filling& sealing etc.

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- Supply and installation of valves and end caps.
- Registration of Domestic PNG Connections.
- Liasoning with concerned authorities/house owners for executing the work and obtaining NOC from them after restoration
- Reconciliation of material received from store each time before submission of RA bills.

Other than PE & GI pipes and regulators, all other materials like PE fittings, PE to GI transition fittings for PE to GI connectivity, GI pipes, fittings, isolation valves shall be procured by the contractor as indicated in Schedule of Rates (SOR).

Supply and installation of Transition fittings (TF) at low pressure (100mbar/330mbar/500mbar) GI to MDPE transition or MDPE to GI transition.

Making trial pits to determine the underground utilities/services such as existing pipelines, Cables (Electrical/Communication), Conduits, U/G drainage, Sewers, tunnels, Subways foundations etc, and deciding optimum routes and depths for laying the pipelines based on the actual site condition / approved pipeline route by EIC/authorities.

Note:

1. The left-over jobs, which may be in parts, is also to be carried out with same terms & conditions of contract by the bidders as per the requirement & direction of EIC. The decision of EIC in this regard shall be final and binding to the contractor. Hence bidder is requested to make the site visit for the left-over jobs in the entire GA and familiarize with them before formulating their bid.

2. The bidder may also need to carry out the works including part works for the left-over job with the same terms & conditions of contract for above mentioned GA as per above scope of works and their details mentioned elsewhere in the tender documents and as per the requirement & direction of EIC. The decision of EIC in this regard shall be final and binding to the contractor. Hence bidder is requested to make the site visit of Cuttack GA also and familiarize with them before formulating their bid.

2. GENERAL TERMS AND CONDITION

i. Special Condition of Contract shall be read in Conjunction with the General Conditions of Contract, SOR, PJS of work, specifications, Drawings and any other documents forming part of this contract wherever the context so requires.

ii. Notwithstanding the sub-division of the documents into these separate sections and volumes every part of each shall be deemed to be supplementary to and complementary of every other part and shall

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be read with and into the contract so far as it may be practicable to do so.

iii. Where any portion of the General Condition of Contract is repugnant, to or at variance with any provisions of the Special Conditions of Contract, unless a different intention appears, the provisions

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of the Special Conditions of Contract shall be deemed to over-ride the provisions of the General Condition of Contract and shall to the extent of such repugnancy, or variations, prevail.

iv. The materials, design and workmanship shall satisfy the relevant INDIAN STANDARDS, the TECHNICAL SPECIFICATIONS contained herein and CODES referred to. Where the technical specification stipulate requirements in addition to those contained in the standard codes and specifications, these additional requirements shall also be satisfied.

v. Wherever it is mentioned in the specifications that the CONTRACTOR shall perform certain work or provide certain facilities, it is understood that the CONTRACTOR shall do so at his cost and the VALUE OF CONTRACT shall be deemed to have included cost of such performance and provisions, so mentioned.

vi. It will be Contractor's responsibility to bring to the notice of Engineer-in-charge any irreconcilable conflict in the contract documents before starting the work(s) or making the supply with reference which the conflict exists.

vii. In the absence of any specifications covering any material, design of work(s) the same shall be performed/ supplied/ executed in accordance with Standard Engineering Practice as per the instructions/ directions of the Engineer-in-charge, which will be binding on the Contractor.

3. PROCUREMENT

3.1.1 CONTRACTOR shall procure and supply all the materials other than OWNER supplied materials, required for permanent installation of pipeline and aboveground GI Installation in sequence and at appropriate time. All equipment, materials, components etc. shall be suitable for the intended service. Approved vendor list has been indicated in the bid package for various items. For items which are not covered in the vendor list, CONTRACTOR shall obtain Owner's prior approval for the vendor based on PTR document.

3.1.2 CONTRACTOR shall procure all materials, components, equipment, consumable etc. required for successful completion of the pipeline system. CONTRACTOR shall also procure and supply spares required for pre-commissioning and commissioning/ start up as recommended for all items supplied by him as per specifications provided in the bid package. Where no specification is available in the contract, the same shall be prepared by the CONTRACTOR based on the piping material specification and shall be subject to Owner's approval.

3.1.3 Material take-off with complete description of size, rating, material, thickness and specifications to be prepared by contractor.

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3.1.4 Only single offer shall be provided by the bidder fully complying to specifications/ drawings/ requirements for Owner's review and approval. CONTRACTOR shall provide for inspection of the items at vendor's works by the OWNER/ Owner's REPRESENTATIVE or by a reputed inspection agency and shall submit inspection reports for Owner's clearance.

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3.1.5 Stores management including receipt, warehousing, preserving the material in good condition, issue of material to construction site, reconciling/ handing over surplus material to OWNER for OWNER supplied items.

3.1.6 Carryout proper documentation of inspection and quality assurance programmes for all equipment and bulk materials duly approved by OWNER. CONTRACTOR shall maintain an accurate and traceable listing of procurement records for the location, quality and character of all permanent materials in the Project.

3.1.7 CONTRACTOR shall immediately report to the OWNER of all changes which will affect material quality, and recommend any necessary corrective actions to be taken.

3.1.8 Submit periodic progress reports highlighting hold ups and slippages, if any, to OWNER and take remedial measures.

3.1.9 Interact with authorities such as Sales Tax, Octroi, Excise, Customs etc. as necessary and arrange for transportation of the materials under his scope of supply to site.

3.1.10 All purchase requisitions including purchase orders shall be approved by Owner/ Owner's Representative.

3.1.11 Compliance with vendor's and supplier's instructions and recommendations for transportation, handling, installation & commissioning.

3.2 **Construction**

3.2.1 **General**

3.2.1.1 All construction works shall be carried out as per "Approved for Construction" drawings, procedures, specification and applicable codes and standards. Any changes at site shall also need prior approval from the OWNER and revision of drawings. Construction drawings will be submitted by the Contractor in a phased manner for Owner's approval in accordance with the procurement and construction plan prepared and furnished by contractor & agreed by Owner.

Owner will take minimum 7 working days from the date of submission of the documents / drawings submitted by the contractor for Owner's comments / approval.

3.2.1.2 **Statutory Approvals**

The Owner shall provide to the Contractor the basic / in principal approval for laying the pipeline. However, the Contractor at his own initiative shall obtain all permissions, permits and licenses necessary for the performance of the work**. If any such permission, permit or license required for the performance of the work** by the contractor can only be granted at the request or recommendation of the Owner, the Owner shall at the request of the Contractor, provide recommendatory letters to the contractor to obtain or procure the same. The contractor shall not, however be entitled to any additional compensation over and above contracted

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rates of services for any hardship or increased cost caused by any idleness, suspension or disruption of work or any other account whatsoever as a result of the inability of the contractor to obtain the permission(s), permit(s), license(s) aforesaid to match with the progress of the work nor shall the same constitute a ground for extension of time.

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a) The approval from any authority required as per statutory rules and regulations of Central/ State Government agencies etc. shall be the contractor's responsibility unless otherwise specified in the tender document. The application on behalf of the Owner for submission to relevant authorities along with copies of required certificates complete in all respects shall be prepared and submitted by the Contractor well ahead of time so that the actual construction/ commissioning of the work is not delayed for want of the approval/ inspection by concerned authorities. The Contractor shall arrange the inspection of the works by the authorities and necessary coordination and liaison work in this respect shall be the responsibility of the Contractor. However statutory fees paid, if any, for all inspections and approvals by such authorities shall be reimbursed at actual by the Owner to the Contractor on production of documentary evidence.

b) The defective work resulting from poor workmanship and/ or material supplied by contractor, as pointed out by any statutory authority shall be rectified by the contractor at no extra cost to the Owner. Any change/ addition required to be made to meet the requirements of the statutory authorities; the same shall be carried out by the contractor free of charge. The inspection and acceptance of the work by statutory authorities shall, however, not absolve the contractor from any of his responsibilities under this contract.

3.2.1.3 The Contractor shall comply with all the conditions and requirements issued by Authorities having jurisdiction in the area where the work is to be performed.

It shall be the Contractor's sole responsibility to make arrangements for land for setting up of its string fabrication yards, all storage areas for line pipe and other materials, wherever required, and all other work areas.

The Contractor shall make all arrangements for access to his work site at his own cost and responsibility. If no public road exists Contractor shall arrange on his own for access to his work area at no extra cost to the COMPANY.

The CONTRACTOR shall be responsible for claims if any arising out of damage/ obstruction to public utilities like lines of DOT etc. where the claims will cover the restoration costs as well as loss of revenue due to down time.

The contractor shall strictly follow without any deviations the conditions laid by the authorities stipulated in their permission letter. At the days end of work, all open trenches and pits shall be closed and backfilled. Till the time, the entire work is not completed, suitable barricade and caution tapes shall be provided in the area of work. The pipeline laying shall be planned by the contractor in such a fashion that the pits and trenches are not left open than stipulated in the permission. In case it is essential for the excavated areas to be left open for work completion, the contractor from concerned agencies including GGL and PMC shall obtain prior approval.

The excess soil, area cleaning including restoration shall be carried out sequentially and under no circumstances gap between pipeline laying length and restoration including excess soil /debris removal length

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shall exceeds 2Km. No excess soil shall be left or pipe coil, protruding pipe shall be left on the roads leading to inconvenience to public.

3.2.1.4 Providing schedules, progress reporting, organization chart at construction site, quality assurance plan and developing quality control procedures, as per requirements indicated elsewhere in the bid package.

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3.2.1.5 Coordination and supervising the work of sub-contractors.

3.2.1.6 Transportation of appropriate materials and taking delivery of Company supply materials, store, worksite, intermediate storage points, maintaining and operating an adequate material control procedure at worksite.

3.2.1.7 Fabrication of all GI piping, structural components as per approved drawings.

3.2.1.8 All civil/ structural works, electrical and instrumentation, laying and commissioning works shall be performed in accordance with relevant specifications and requirements enclosed elsewhere in the bid package.

3.2.1.9 CONTRACTOR shall provide complete details of manpower, equipment etc. to be deployed. Mobilizing and providing all equipments, manpower (skilled and unskilled), consumable and other resources etc. for each spread as required for the execution of the complete job defined herein and thereafter demobilizing the same upon completion of work.

3.2.1.10 Provide, maintain and operate all temporary facilities required for the construction related works and remove after completion of work. Providing barricading at trench in city area as per instruction of engineer in charge for safety.

3.2.1.11 Hook up / tie-in of pipeline and piping system with other facilities etc.

3.2.1.12 All works related to cleaning, testing, dewatering, swabbing, drying, pre-commissioning and commissioning of the work tendered.

3.2.1.13 Idle time preservation of pipeline, if required.

3.2.1.14 All incidental and associated works and any other works not specifically listed therein but are required to be carried out to complete entire work related to pipelines and terminals.

3.2.2 **Branch / service Pipeline**

3.2.2.1 **Familiarization of Pipeline Route**

Bidders are advised to make site visits to familiarize themselves with all the salient features of available infrastructure along the proposed pipeline in concerned GA area (cities). Contractor shall be deemed to have considered all constraints and eventualities on account of site conditions while formulating his bid. Contractor shall not be eligible for any compensation in terms of cost and / or time, on account of site conditions varying to any extent from whatever described in the Bid Package.

3.2.2.2 The city condition field / other fields may have lots of PVC, PE & utility pipelines or other pipelines & cables being used for city utility / other utilities purposes. CONTRACTOR shall ensure that these

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lines shall not be damaged/ cut affecting the water / power / communication / other supply to concerned Users / Owners / Authorities. Wherever required, temporary necessary precautions have to be maintained for uninterrupted supply.

3.2.2.3 Supply, loading, unloading, handling, stacking, storing and transportation to workshop/ work site of all

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materials that may be used for the construction of pipeline system at their designated stack yard/ dump site/ store and/ or by CONTRACTOR as the case may be.

3.2.2.4 Stacking, clearing, grading as required, trenching to all depths in all types of soil including soft & hard rock by chiseling or otherwise cutting etc. to a width to accommodate the PE pipeline as per relevant standards, drawings, specification etc. transportation of PE pipes along the route, stringing, aligning, bending, jointing including testing, inspection, field jointing including supply of all materials as per specifications, laying and lowering of the pipeline, back filling, Supply and installation of pipeline as shown in approved drawings and as directed by OWNER, installation of supports wherever required, supply of select backfill material as required, clean-up, flushing, pneumatic testing, nitrogen purging / pre-commissioning and commissioning of complete pipeline system, including all associated works as per relevant specifications, standards and approved drawings.

3.2.2.5 Sand / soft soil padding around pipe wherever required in areas where trenching has been done in hard soil area / rocky area including supply of sand/ soft soil. The thickness of sand/ soft soil padding at the top of pipe shall be minimum 150 mm and bottom of pipe shall be minimum 150 mm or as per drawing enclosed whichever is more.

3.2.2.6 Installation of all inline / online instruments / valves / fittings / transition fittings / appurtenances etc. as per requirements of approved drawings.

3.2.2.7 **Testing & Purging**

A) Testing

Pressure testing will be carried out with compressed air. Compressed air will be provided by Contractor for testing purposes and is to be included in the rates.

Measuring instruments shall have been calibrated and their accuracy and sensitivity confirmed. For testing of Network, calibrated pressure gauges of suitable range shall be supplied by the contractor. The pressure gauges shall be calibrated from time to time as desired by Engineer-in-Charge. 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.

For service lines in some cases testing will be carried out for the test duration of 4 hrs. The service testing in this case will be performed after the service installation is complete but before the service tee has been tapped. Also in some cases the tapping of the service tee will be delayed pending the completion and purging of the main pipelines.

B) Purging

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

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Nitrogen required for purging will also be provided by the Contractor. Nitrogen shall be supplied in labeled, tested and certified cylinders, and completed with all necessary regulators, hoses and connections, which will be in good condition and working order.

In addition, the Contractor shall submit and get approved a Purging Plan before commencing any purging

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work. The Plan shall include, but not be 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), squash-off tool, Polyethylene connecting pipe work.

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.

3.2.2.8 **Markers**

Installation of all types of markers including all associated civil works. Any other work not specifically mentioned above but required for making the entire pipeline system ready for operation.

3.2.2.9 **Priorities**

The Contractor shall start the execution work as per approved execution methodology / plan / procedure to complete the scope of work and shall deploy adequate manpower, machinery, tool & tackles etc. accordingly.

However, Owner may, at its sole option, assign priority of construction to any part/ segment of the work. Contractor shall comply with such priority of execution and their deployment without any time and cost implication to the Owner.

3.2.2.10 **Pre-commissioning and Commissioning Assistance**

- Pre-commissioning including supply of all materials, consumables and manpower of the complete pipeline system
- Making the entire system ready for commissioning and providing assistance during the complete duration of commissioning operations.
- Completion of all pipeline activities as detailed in SOR.

3.2.2.11 **Civil Works**

Civil works shall be carried out as per scope mentioned at SOR and as per Indian Standard norms.

Any other work not specifically listed herein but required for the completion of the work.

3.2.2.12 **Installation of welded Riser and Lateral Pipes in High Rise Building for PNG connection**

- Erection, Fabrication, Socket Welding of GI Pipes (heavy duty, as per IS-1239 Part-I duly Zinc coated in

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accordance with IS 4736) & wrought steel fittings (forged fittings, conforming to IS-1239 Part-II). The threading of GI pipe shall be NPT and conforming to ANSI B120.1

- Erection, Fabrication, Socket Welding, Testing & Installation of welded GI Pipes & Fittings etc., including NPT threading as per technical specification and sketch attached.

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- Preparation and approval of sketches, schedules, execution procedures & WPS as per technical specification. All consumables e.g. electrodes, flux etc. for welding pipes and fittings are under contractor's scope.

- Supply & fixing of MS angle clamps, Ceiling clamps & dowel plugs with screws, grout material, suitable thread sealant i.e. Teflon Tape / lock tight, Supply and fixing of studs & bolts of various sizes ranging from 1/2" to 2" and 3/4" to 2", Jointing of transition fittings to above ground GI pipes, purging, testing and commissioning of the complete installation.

- Welding of Riser is to be carried out in line with duly approved PQR / WPS.

- Galvanized (Zinc) coating shall be removed by light duty grinder or by any other suitable tool at both ends of riser pipe at about 25mm in length where welding is to be performed.

- The entire riser assembly shall be fabricated with socket welds both for threaded riser assembly and plain ended pipes. Threaded joints are permitted after first isolation valve on laterals where riser is not approachable from balcony and in case if riser is in approach of balcony within 300 mm gap from balcony laterals may be threaded with tee of welded riser on account of workability and future maintenance considerations

- Pipe and required fittings shall be first coupled with threaded (NPT) joints. The threaded joints to be made using male tapered thread and female parallel thread fittings.

- Teflon/PTFE Tape or any other joining compound shall not be used in threaded joints for welded riser. Alternatively plain ended pipes and fitting can also be used for welding in welded riser.

- Risers and laterals must be designed to run through the optimal possible route, taking into consideration potential meter positions, design regulations and access for future maintenance. A riser must not be constructed so that the laterals face directly into the wall from the riser.

- Risers and laterals must be laid a minimum of 300 mm from any electrical equipment or installations. On occasions where the pipe has to cross over a cable, this has to be done at right angles and a minimum gap of 25 mm must be maintained between the pipe and cable. Consideration may be given to wrapping the pipe with electrical insulation tape for protection against electrical short circuiting.

- The riser shall be installed in a vertical line from its point of support to its highest point with a minimum of changes in direction. All riser and lateral pipe shall be clamped to the building at intervals not exceeding 1.5 mtrs. Maximum distance between clamps shall be 1.0 - 1.5 m when pipe goes to the straight, if any tee or fittings lies in between the pipe then clamp shall be placed 150 mm far away from centre line of fittings at every sides. However, the same may be changed as per site conditions/as directed by EIC. Minimum gap between pipe & wall shall be 25 mm.

- Only pretested riser shall be erected using pulley. Pretesting shall be done with compressed air @ 2 bar (g) for minimum duration of 30 minutes.

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- Supply and Installation of lateral GI pipes of 1/2" to 2" dia. from welded riser tapping TEE (Isolation Valve) to customer's kitchen appliances including NPT threading of GI pipes, supply of proper seal outs for threads to join fittings such as elbows, tees, connectors, regulators (free issue), meters (free issue), appliance & isolation valves etc., as per approved procedures and specification including clamping and sealing etc.

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- The lateral extending from the riser at right- angles must extend a minimum of 400 mm from the riser before passing through a wall. Where the 400 mm length cannot be achieved, a flexible fitting such as stainless steel hose (anaconda) shall be fitted.

- **For the laterals beyond eighth floor, flexible Anaconda shall be used in compliance to the material specification of SS316, fittings shall be used with brass connections conforming to IS 319, in order to account for the temperature induced stresses.**

- Where pipe passes through the balcony and the surface is slightly elevated around the service pipe or its surrounding, sleeves to be provided to prevent the accumulation of water at that point.

- Pipe shall preferably be entered into building above ground and remain in a ventilated location. The location for entry shall be such that it can be easily routed to the usage points by the shortest practicable route.

- Risers and laterals shall be Leak tested with compressed air @ 2 bar (g) for minimum 2 hrs after vertical installation.

- The joints/ fittings of the GI installation shall be painted only after carrying out testing of the installation

- Making temporary but stable platforms/scaffolding/rope ladder etc., required for installation of pipes/fittings at all heights/multi storied flats and locations.

- Any other material & activities not mentioned/covered above, but otherwise required for satisfactory completion/safety of work as defined in tender has to be supplied / done by contractor within specified schedule at no extra cost to Owner.

4.0 SCOPE OF SUPPLY

4.1 Owner's Scope of Supply (Free Issue Item)

Owner's scope of supply includes all MDPE pipe, Meters & Regulators only as required.

In addition to above, In order to speed up the project other Materials if available with Owner shall be issued on replacement basis to the Contractor from the designated store(s) of BGL. Contractor shall be responsible for lifting the free issue materials from Owner's storage point(s) and transporting the same to work site(s) at his own cost.

Material to be supplied by Contractor

The procurement and supply, in sequence and at the appropriate time, of all materials and consumables required for completion of the work as defined in this Bid document except the materials specifically listed above, shall be entirely the CONTRACTOR'S responsibility and item rates quoted for the execution of the

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CONTRACT shall be inclusive of supply of all these materials. The material to be supplied by the Contractor shall be as per specification and preferred make as indicated in Appendix-I or duly approved / recommended for use by BGL / PMC. The materials will be, but not by way of limitations, as follows:

All materials except what is under Owner's scope of supply as mentioned in Clause No. 4.1 above, and

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required for successful completion of works in all respects shall be supplied by the Contractor and the cost of such supply shall be deemed to have been included in the quoted price without any additional liability on the part of Owner.

The following materials to be supplied by the contractor **as required** for completing the work. However other additional/ Supplementary materials required for execution of the project is to be supplied by the contractor.

Material under Contractor's Scope of Supply

A) **HDPE Casing Pipes PE 63/80, PN 6**

i) HDPE Ducting Pipes of various sizes

B) **Coupler / bends / elbows as required**

i) For 20 to 32 mm (PE)

C) **End Caps**

i) For 20 to 32 mm (PE)

D) **Equal Tee**

i) For 20 to 32 mm (PE)

E) **Saddle Tapping Tee**

i) Saddle Tapping Tee 32x20 (PE)
ii) Saddle Tapping Tee 63x20 (PE)
iii) Saddle tapping Tee 63x32 (PE)
iv) Saddle tapping Tee 90x20 (PE)
v) Saddle Tapping Tee 90x32 (PE)
vi) Saddle Tapping Tee 125x63 (PE)
vii) Saddle Tapping Tee 180x125 (PE)
viii) Saddle Tapping Tee 125x90 (PE)
ix) Saddle Tapping Tee 125x63 (PE)

F) **Reducer**

i) Reducers 32x20 (PE)
ii) Reducers 63x32(PE)
iii) Reducers 90x63 (PE)
iv) Reducers 125x63 (PE)
v) Reducers 125x90 (PE)
vi) Reducers 180x125 (PE)

G) **Transition Fitting**

i) PE to G.I. (20 mm to 1/2")-01(Imp)
ii) PE to G.I. (32 mm to 1")

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H) **Warning mat**

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Warning Mat 300mm Wide-1mm Thick

I) **GI Fittings**

i) Elbows F End (½") (GI)
ii) Elbows F End (¾") (GI)
iii) Elbows F End (1") (GI)
iv) Elbows F End (1½") (GI)

v) M & F Elbows End (½") (GI)
vi) M & F Elbows End (¾") (GI)
vii) M & F Elbows End (1") (GI)
viii) M & F Elbows End (1½") (GI)

ix) Equal Tee (½") (GI)
x) Equal Tee (¾") (GI)
xi) Equal Tee (1") (GI)
xii) Equal Tee (1½") (GI)

xiii) Union (½") (GI)
xiv) Union (¾") (GI)
xv) Union (1") (GI)
xvi) Union (1½") (GI)

xvii) Sockets (½") (GI)
xviii) Sockets (¾") (GI)
xix) Sockets (1") (GI)
xx) Sockets (1½") (GI)

xxi) Reduced Elbows (¾" x ½") (GI)
xxii) Reduced Elbows (1" x ¾") (GI)
xxiii) Reduced Elbows (1½" x ¾") (GI)
xxiv) Reduced Elbows (1½" x 1") (GI)
xxv) Reduced Elbows (2" x 1½") (GI)

xxvi) Hex Nipple Size (½" x 2") Long (GI)
xxvii) Hex Nipple Size (½" x 3") Long (GI)
xxviii) Hex Nipple Size (¾" x 2") Long (GI)
xxix) Hex Nipple Size (1" x 2") Long (GI)
xxx) Hex Nipple Size (1½" x 2") long (GI)

xxxi) Reduced Sockets (¾" x ½") long (GI)
xxxii) Reduced Sockets (1" x ¾") (GI)

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xxxiii) Reduced Sockets (1½" x ¾") (GI)
xxxiv) Reduced Sockets (1½" x 1") (GI)
xxxv) Reduced sockets (2" x 1½") (GI)
xxxvi) GI Plugs ¾", 1”

J) **GI PIPEs**

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i) ½" all floor (including connectivity from TF to regulator)
ii) ¾" all floor (including installation of riser)
iii) 1" dia all floor (for riser installation)
iv) 11/2" dia pipe

K) **COPPER TUBES**

i) 12.0 OD X 0.6 mm wall thickness

L) **ISOLATION VALVES**

i) ½"
ii) ¾"
iii) 1"
iv) 11/2"

M) **APPLIANCE VALVES**
i) ½"

GI pipes/ Anaconda (flexible hoses) before meter if

required. Steel reinforced rubber hose (before burner)

if required

Any other fittings not specified above but required for GI, Cu and PE lines is to be provided by the contractor.

Notes:-

i. All the supply items shall be procured from the vendors / manufacturers listed in tender documents.

ii. For any other item(s) for which the vendor list is not provided, bidders can supply those item(s) from vendors/ suppliers who have earlier supplied same item(s) for the intended services in earlier projects and the item(s) offered is in their regular manufacturing/ supply range. The bidder is required to submit documentary evidences (PO copies, Inspection Certificate etc.) before procurement / Placement of Order for approval to Owner / PMC.

iii. For supply items the contractor has to **submit only Material test certificate** and other relevant documents from the approved / listed manufacturer for review of Owner / PMC.

iv. In case, Contractor proposes a vendor other than those as per the suggested vendor list, Contractor is required to submit documentary evidences such as PO copies, Inspection Certificate and any other information etc (such as reasons for proposing the change of vendor) before procurement / Placement of

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order for approval to Owner / PMC.

v. Owner / PMC reserve the right to accept material on MTC basis from listed / approved vendors for procurement of supply items by the contractor.

5.0 **DOCUMENTS, SPECIFICATIONS, STANDARDS & DRAWINGS**

5.1 Owner shall furnish tender purpose drawings as listed in content of Volume-II of II of the tender document and other typical standard drawings attached with respective technical specifications enclosed with Volume-II of II of the tender document. Contractor shall prepare detail engineering drawing, bill of materials and all construction drawings and submit to Consultant for approval prior to start of the job / any procurement.

5.2 Contractor shall prepare isometric drawings, any specific detail drawings (if required by Engineer-in-charge) & bill of materials and submit the same for Owner/ Consultant's approval / record.

Contractor shall prepare drawing for utilities line as required or as per SOR and submit the same for Owner/ Consultant's approval/ record.

5.3 No construction small or big shall be carried out without proper construction / standard drawings duly approved by Owner's Engineers at Delhi or site office or Owner's representative duly authorized to do so.

5.4 After Completion of construction & commissioning of pipeline system, Contractor shall incorporate all the correction in drawings, prepare and issue the drawings "as built drawings" as listed below to Owner as final submission of drawings. For pipeline alignment sheet, all block valves location & details, pipe book etc. and for tap-off point & consumers premises, piping GAD, Isometric and all civil drawings including hook-up arrangement with Meter Regulator. For final submission only 4 sets of documents shall be handed over by Contractor. Any construction done by Contractor without duly approved drawings shall be wholly at his risk and cost. Contractor shall also submit soft copy of pipe book in excel alongwith hard copy. Soft copy of all as-built drawings shall be also submitted in AutoCAD.

5.5 **Specifications**

The work shall be carried out by CONTRACTOR strictly in accordance with the following specifications enclosed in Volume-II o II of this document: -

1) Laying of Underground PE Pipeline
2) Installation of Aboveground GI Piping for Domestic Consumers
3) PE Pipes
4) GI Pipe
5) GI Fittings
6) HDPE Pipes
7) Cu pipe
8) Cu fitting

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9) Warning mats
10) MDPE Fittings and Electro-fusion
11) Brass Fitting
12) Flexible Hose (anaconda)
13) Flux
14) Isolation valve & Appliance Valve
15) Health safety and environment
16) Quality Assurance
17) Steel reinforced rubber hose

5.6 **Drawings**

The drawings to the extent available are included in Vol.-II of the bid package for BIDDER's reference purpose only; Bidders are advised to go through these drawings and also visit the site before submitting their bids. The Contractor shall develop all drawings including for all crossings, along with the all connection drawings required for construction works as detailed in respective SCC, SOW & SOR etc.

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6.0 RESOURCES / FACILITIES

6.1 Recruitment of Personnel by Contractor

The Contractor shall not recruit personnel of any category from among those who are already employed by the other agencies working at the sites but shall make maximum use of local labour available.

6.2 Construction Water and Power Supply

No water and power will be provided by the Owner. It should be the responsibilities of the contractor to arrange water and power at his own cost.

6.3 Land for Residential Accommodation

Owner shall not provide any land for residential accommodation of contractor's staff and labour.

7.0 PROJECT SCHEDULING & MONITORING

The following schedules/documents/reports shall be prepared and submitted by the Bidder/Contractor for review/approval at various stages of the contract.

7.1 Along with Bid

a) Time Schedule

The Completion Time Schedule for the work (including mobilization period) as per SCC Annexure-3 **of Tender in all respect, from the date of issue of telex/telegram/letter/Fax of Intent.**

The Bidder is required to submit a Project Time Schedule in Bar Chart Form, alongwith the Bid. The Schedule shall cover all aspects like sub-ordering, manufacturing and delivery, indicated in the Bid Document. The Owner interface activities shall be clearly identified with their latest required dates. Owner reserves the right to disqualify the Bidder if the above Schedule submitted by the Bidder is not in line with the over all Project requirement.

b) Scheduling & Monitoring System

The Bidders should describe their system of Project Scheduling and monitoring, the extent of computerization, level of detailing, tracing methodology etc. with the name of computer package and sample outputs.

7.2 After the Award of Contract

a) Overall Project Schedule

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The Contractor shall submit within 1 week of Fax of Intent, a sufficiently detailed over all Project Schedule in the activity network form, clearly indicating the major milestones, interrelationship/ interdependence between various activities together with analysis of critical path and floats.

The network will be reviewed and approved by Engineer- in-Charge and the comments if any shall

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be incorporated in the network before issuing the same for implementation. The network thus finalized shall form part of the contract document and the same shall not be revised without the prior permission from Engineer-in- Charge during the entire period of contract.

b) Progress Measurement Methodology

The contractor is required to submit within 1 week of award of WORK, the methodology of progress measurement of sub-ordering, manufacturing/ delivery, sub- contracting construction and commissioning works and the basis of computation of overall services/physical progress informed. Owner reserves the right to modify the methodology in part or in full.

c) Functional Schedules

The contractor should prepare detailed functional schedules in line with network for functional monitoring and control and submit scheduled progress covers for each function viz. ordering, delivery and construction.

7.3 **Project Review Meetings**

The Contractor shall present the programme and status at various review meetings as required.

a) Weekly Review Meeting

Level of Participation	:	Contractor's / Consultant's RCM/ Site In charge & Job Engineers.
Agenda	:	a) Weekly programme v/s actual achieved in the past week & programme for next week. b) Remedial Actions and hold up analysis. c) Client query/ approval.
Venue	:	Site Office

b) Monthly Review Meeting

Level of Participation	:	Senior Officers of BGL / PMC and Contractors.
Agenda	:	a) Progress Status/ Statistics b) Completion Outlook c) Major holdups /slippages

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d) Assistance required
e) Critical issues
f) Client query / approval

Venue : BGL / PMC Office/ Site at the discretion of Owner/ PMC

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7.4 **Progress Reporting Performa**

A) Monthly Progress Report

This report shall be submitted on a monthly basis within 10 (ten) calendar days from cut-off date, as agreed upon covering overall scenarios of the work. The report shall include, but not limited to the following:

a) Brief Introduction of the work.
b) Activities executed / achievements during the month.
c) Schedule versus actual percentage progress and progress curves for Detail Engg. Sub-ordering, Manufacturing / Delivery, Sub-contracting, Construction, Commissioning and Overall and quantum wise status & purchase orders against schedule.
d) Area of concern/ problem/ hold-ups, impacts and action plans.
e) Resources deployment status.
f) Annexures giving status summary for drawings, MRs, deliveries, sub-contracting and construction.
g) Procurement status for items to be supplied by Contractor.

B) Weekly Reports

The report will be prepared and submitted by the Contractor on weekly basis and will cover following items:

a) Activities programmed and completed during the week.
b) Resource deployed men and machines.
c) Quantities achieved against target in construction
d) Record of Man-days lost.
e) Construction percentage progress schedule and actual.

C) Daily Repots

a) Activity programme for the day
b) Progress of the previous day and commutative progress.
c) Manpower & machinery deployed.

7.5 **Progress Reports**

7.5.1 CONTRACTOR shall make every effort to keep the OWNER adequately informed as to the progress of the WORK throughout the CONTRACT period.

CONTRACTOR shall keep the OWNER informed well in advance of the construction schedule so as to permit

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the OWNER to arrange for requisite inspection to be carried out in such a manner as to minimize interference with progress of WORK. It is imperative that close coordination be maintained with the OWNER during all phases of WORK.

7.5.2 By the 10th (tenth) of each month, CONTRACTOR shall furnish the OWNER a detailed report covering the

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progress as of the last day of the previous month. These reports will indicate actual and scheduled percentage of completion of construction as well as general comments of interest or the progress of various phases of the WORK. The frequency of progress reporting by the CONTRACTOR shall be weekly.

7.5.3 Once a week, CONTRACTOR shall submit a summary of the WORK accomplished during the preceding week in form of percentage completion of the various phases of the WORK, to the OWNER.

7.5.4 Progress reports shall be supplied by CONTRACTOR with documents such as chart, networks, photographs, test certificate etc. Such progress reports shall be in the form and size as may be required by the OWNER and shall be submitted in at least 3 (three) copies.

7.5.5 Contractor shall prepare daily progress report (DPR) in the desired format and submit it to Engineer-in-charge alongwith schedule of next day to Engineer-in-charge.

8.0 CONSTRUCTION

OWNER reserves the right to inspect all phases of CONTRACTOR's operations to ensure conformity to the SPECIFICATIONS. Owner will have Engineers, Inspectors or other duly authorized representatives, made known to the CONTRCTOR present during progress of the WORK and such representatives shall have free access to the WORK at all times. The presence or absence of a OWNER's representative does not relieve the CONTRACTOR of the responsibility for quality control in all phases of the WORK. In the event that any of the WORK being done by the CONTRACTOR or any SUB-CONTRACTOR is found by OWNER's representatives to be unsatisfactory or not in accordance with the DRAWINGS, procedures and SPECIFICATIONS, the CONTRACTOR shall, upon verbal notice of such, revise the work in a manner to conform to the relevant DRAWINGS, procedures and SPECIFICATIONS.

8.1 Rules & Regulations

CONTRACTOR shall observe in addition to Codes specified in respective specification, all National and Local Laws, Ordinances, Rules and Regulations and requirements pertaining to the WORK and shall be responsible for extra costs arising from violations of the same.

8.2 Procedures

Various procedures and method statements to be adopted by CONTRACTOR during the construction as required in the respective specifications shall be submitted to OWNER in due time for APPROVAL. No such construction activity shall commence unless approved by OWNER in writing.

8.3 Field Inspection

CONTRACTOR shall have at all times during the performance of the WORK, a Competent Superintendent on the premises. Any instruction given to such superintendent shall be construed as having been given to the

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CONTRACTOR.

8.4 **Erection and Installation**

The CONTRACTOR shall carry out required supervision and inspection as per quality Assurance plan

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and furnish all assistance required by the OWNER in carrying out inspection work during this phase. The OWNER will have engineers, inspectors or other authorized representatives present who are to have free access to the WORK at all times. If an OWNER's representative notifies the CONTRACTOR's authorized representative not lower than a Foreman of any deficiency, or recommends action regarding compliance with the SPECIFICATIONS, the CONTRACTOR shall make every effort to carry out such instructions to complete the WORK conforming to the SPECIFICATIONS and approved DRAWINGS in the fullest degree consistent with best industry practice.

8.5 **Construction Aids, Equipment, Tools & Tackles**

CONTRACTOR shall be solely responsible for making available for executing the work, all requisite Construction Equipments, Special Aids and Tools, Tackles and testing Equipments and appliances. Such construction equipment etc. shall be subject to examination by Owner and approval for the same being in first class operating condition. Any discrepancies pointed out by OWNER shall be immediately got rectified, repaired or the equipment replaced altogether, by CONTRACTOR. OWNER shall not in any way be responsible for providing any such equipment, machinery, tools and tackles.

The OWNER reserves the right to rearrange such deployment depending upon the progress and priority of work in various sections.

Tie-end between main line and starting point of terminal is included in the scope of contract, as and when main line section is available for Tie-ins.

9.0 **DOCUMENTATION**

9.1 **"As Built" Drawings**

The Contractor will be required to submit computerized as-built drawings duly certified by EIC in **A1/ A2** sheet form at 1:200 scale with one set for BGLsite office in original hard copy and one set hard copy for BGL, Hyderabad plus soft copy. The as-built drawing shall be submitted on area wise as specified. The bill of materials used for the particular area shall be specified on the drawings

9.2 **Completion Document – PE & GI**

The following documents shall be submitted in hard binder by the BIDDER in one set for BGLsite office in original and one set for BGL, Hyderabad, as a part of completion documents:

a) Copies of the Inspection reports, Laying Graphs, HDD Profiles (if required) and valve pit drawings (if required).
b) Pre testing, final Hydrostatic / pneumatic and other Test results and reports.
c) Consumption statements of PE / GI certified by Owner's Site Engineer.
d) Material Reconciliation, stores issue & return statements

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e) All other requirements as specified in the respective specifications.
f) Completion Certificate issued by Owner's Site Engineer.
g) No claim certificate by the BIDDER.
h) Completion certificate for embedded and covered up works wherever applicable.
i) Recovery statement, if any.
j) Deviation statement.

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k) Statement for reconciliation of all the payments and recoveries made in the progress bills.
l) Copies of deviation statement and order of extension of time, if granted.
m) Any other contractual documents required on completion.
n) Total list of houses in the area allotted to him giving details of connections provided & reasons where connection could not be given / completed.
o) The details recorded in measurement cards of every domestic house.
p) Details of houses where extra piping done along with materials used.
q) Total material consumption report.
r) Material reconciliation with respect to the materials issued.
s) Test reports & test certificates of gauges etc.
t) Any other documents / records required.

10.0 SURVEY AND LEVEL / SETTING OUT WORK

10.1 Before the WORK or any part thereof are begun, the CONTRACTOR's agent and the Engineer-in-Charge's representative shall together survey and take levels of the SITE and decide all particulars on which the survey is to be made, and on which measurements of the WORK are to be based. Such particulars shall be plotted by the CONTRACTOR and after agreement the drawings shall be signed by the Engineer-in-Charge.

10.2 The CONTRACTOR shall be entirely responsible for the horizontal and vertical alignment, the level and correctness of every part of the WORK and shall rectify any errors or imperfections therein. Such rectifications shall be carried out by the CONTRACTOR at his own cost, when instructions are issued to this effect by the Engineer-in-Charge or his representative.

10.3 The Engineer-in-Charge shall furnish the relevant existing grid point with Bench Mark on the land. It shall be CONTRACTOR's responsibility to set out the necessary control points in and to set out the alignment of the various works. The CONTRACTOR shall have to employ efficient survey team for this purpose and the accuracy of such setting out work shall be CONTRACTOR's responsibility.

10.4 The CONTRACTOR shall give the Engineer-in-Charge not less than 24 (twenty four) hours notice in writing of his intention to set out or give levels for any part of the WORK so that arrangements may be made checking the same.

10.5 WORK shall be suspended for such times as necessary for checking lines and levels on any part of the WORK.

10.6 The CONTRACTOR shall at his own expense provide all assistance, which the Engineer-in-Charge may require for checking the setting out of WORKS.

10.7 Before commencement of any activity, contractor's quality control set up duly approved by company must be available at site.

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11.0 **ORDER OF WORKS / PERMISSIONS / RIGHT OF ENTRY / CARE OF EXISTING SERVICES**

11.1 The order in which the WORK shall be carried out shall be subject to the approval of the Engineer-in-charge and shall be so as to suit the detailed method of construction adopted by the CONTRACTOR, as well as the

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agreed joint programme. The WORK shall be carried out in a manner so as to enable the other contractors, if any, to work concurrently.

OWNER reserves right to fix up priorities which will be conveyed by Engineer-in-Charge and the CONTRACTOR shall plan and execute work accordingly.

11.2 **Existing Service**

11.2.1 Drains, pipes, cables, overhead wires and similar services encountered in course of the works shall be guarded from injury by the CONTRACTOR at his own cost, so that they may continue in full and uninterrupted use to the satisfaction of the Owners thereof, or otherwise occupy any part of the SITE in a manner likely to hinder the operation of such services.

11.2.2 Should any damage be done by the CONTRACTOR to any mains, pipes, cables or lines (whether above or below ground etc.), whether or not shown on the drawings the CONTRACTOR must make good or bear the cost of making good the same without delay to the satisfaction of the Engineer-in-Charge.

12.0 **MAKE OF MATERIAL / BOUGHT OUT ITEMS**

Approved vendors for various major items are enclosed as Appendix-I to Particular Job Specification with this tender document. The bidder shall consider such names only as indicated in the aforesaid list and clearly indicate in the bid the name(s) as selected against these items. For any other item not covered in the list enclosed with this tender document, prior approval shall be obtained by the contractor for its make/ supplier's name.

13.0 **INSPECTION OF SUPPLY ITEMS**

All inspections and tests shall be made as required by the specifications forming part of this contract. Contractor shall advise Owner/ Consultant in writing at least 10 days in advance of the date of final inspection/tests. Manufactures inspection or testing certificates for equipment and materials supplied, may be considered for acceptance at the discretion of Owner/ Consultant. All costs towards testing etc. shall be borne by the contractor within their quoted rates. All inspection of various items shall be carried out based on Quality Assurance Plan, which will be submitted by the Contractor and duly approved by Owner/ Consultant.

14.0 **ESCALATION**

The Unit Rates quoted shall be kept firm till completion of work and no price Escalation shall be paid.

15.0 **DOCUMENTS TO BE SUBMITTED / PRODUCED ALONGWITH R.A. BILLS**

Refer 'the checklist– F-21' for details of the documents to be submitted. Checklist duly signed will become part of RA bill.

16.0 **INSURANCE FOR FREE ISSUE MATERIAL**

Insurance for Free Issue Material

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Contractor shall at his own expense arrange, secure and maintain insurance cover for Owner's supplied free issue materials as defined in Tender Document of adequate value as intimated by Owner / consultant. Contractor's quoted price shall be inclusive of all costs on account of insurance liabilities covered under the Contract. Contractor to note that the beneficiary of insurance cover shall be BGL. The

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approximate cost of free issue material for overall scope is: -

- Rs. 5.25 Crore (100% scope).

The contractor may take the insurance as per the following schedule:

a) Up to 3 months: 30%
b) Up to 6 months: 60%
c) Beyond 9 months: 100%

16.2. **Insurances in India**

16.2.1 Contractor shall at his own expense arrange, secure and maintain insurance with Indian insurance companies to the satisfaction of the Owner as may be necessary and to its full value for all such amounts to protect the works in progress from time to time and the interest of Owner against all risks as detailed herein. The form and the limit of such insurance as defined herein together with the under writer works thereof in each case should be as acceptable to the Owner. However, irrespective of work acceptance the responsibility to maintain adequate insurance coverage at all times during the period of Contract shall be that of Contractor alone. Contractor's failure in this regard shall not relieve him of any of this responsibilities and obligations under Contractor.

16.2.2 Any loss of damage to the equipment during inland transportation, storage, erection and commissioning till such time the Work is taken over by Owner shall be to the account of Contractor. Contractor shall be responsible for preferring of all claims and make good for the damage or loss by way of repairs and/ or replacement of the parts of the Work damaged or lost. Contractor shall provide the Owner with a copy of all insurance policies and documents shall be submitted to the Owner immediately upon the Contractor having taken such insurance coverage. Contractor shall also inform the Owner regarding the expiry cancellation and/ or changes in any of such documents and ensure revalidation/ renewal etc., as may be necessary well in time.

16.2.3 The risks that are to be covered under the insurance shall include, but not be limited to the loss or damage in handling, transit, theft, pilferage, riot, civil commotion, weather conditions, accidents of all kinds, fire, war risk etc. The scope of such insurance shall cover the entire value of supplies of equipments, plants and materials.

16.2.4 All cost on account of insurance liabilities covered under this Contract will be to Contractor's account and will be included in Contract Price. However, the Owner may from time to time, during the currency of the Contract, ask the Contractor in writing to limit the insurance coverage risk and in such a case, the parties to the Contract will agree for a mutual settlement, for reduction in Value of Contract to the extent of

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reduced premium amounts.

Contractor as far as possible shall cover insurance with Indian Insurance Companies.

17.0 **SPECIAL POINTS PERTAINING TO SPECIFICATION**

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The technical specification & safety standards as prescribed in PNGRB is to be followed further

The minimum pipeline cover shall be kept as follows:

Pipeline Burial Requirement

The entire pipeline shall be buried and provided with a minimum cover as given in Table below:

Pipeline Burial Requirements	
Location	**Min. Cover (m)**
a) minor water crossing (below firm bed level)	1.5
b) Cased/ Uncased Road/ cart track crossings	1.2
c) Drainage, ditches at roads crossings	1.0
d) Residential and other locations including rocky areas	1.0

Note:

i) The depth of cover shall be measured from the top of the pipe to the top of the undisturbed surface of soil or the top of graded working strip, whichever is lower. The fill material in the working strip shall not be considered in the depth of cover.

ii) The cover shall be measured from the top of road or top of rail, as the case may be.

iii) For water courses that are prone to scour and erosion, adequate safe cover as mentioned above or as advised by concerned authorities (whichever is stringent) shall be provided below the predicted scour profile expected during the life time of the pipeline.

iv) When scour level is not known, an additional cover of at least 1 m or as advised by concerned authorities shall be provided from the existing firm bed of the river / water course except in case or rocky river bed;

v) Minimum cover mentioned above against Sl. no. a), b), c), d) & e) category may be increased based on the statutory requirements from concerned authorities and requirement shall be final and binding to the contractor.

vi) Soft soil / sand padding of minimum 150 mm thickness or as mentioned in standard drawing

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(whichever is stringent) to be provided around the pipeline where gravel / hard soil or rocky area **if** encountered.

- Piping at consumer ends, connection at existing tap-off location and for future connections alongwith bill of materials.

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Contractor shall develop General Arrangement Drawings (GADs) good for construction for size 32 / 20mm and locations based on typical sketches/ drawings alongwith bill of materials and submit to Owner for reviews/ approval. Construction work shall be carried out based on construction drawings duly approved by Owner/ Consultant.

- The detailed engineering for above ground installation shall include detail engineering pertaining to all disciplines (if required) along with bill of materials.

- All the documents/ drawings prepared by the Contractor shall be submitted to Owner/ Engineer-in-charge for review and approval. All works shall be executed based on the approved drawings/ documents only.

- Contractor shall obtain all clearance from Government authorities (if required). However bank guarantee/ required fee or charges shall be submitted by Owner.

17a. If any ambiguity arises between SCC (Tech.) & Particular Job Specification in that case later shall govern. However in some cases, decision of Engineer-in-charge shall be final and binding to the contractor.

17b **Following points shall be taken care by the contractor before during execution works.**

i) Contractor shall be responsible for taking necessary precautions regarding traffic (installation of notice / warning boards).
ii) Contractor shall be totally responsible for the occurrence of any accident during excavation of road and shall be liable for damages / expenses due to the same.
iii) Concerned authority / Owner shall not be responsible for any loss / damage.
iv) One copy of the permission shall be made available with contractor's responsible workman (if required) at the place where excavation is undertaken.
v) While executing the subject work, excavation shall be done in consultation with the concerned authority engineer of that area.
vi) Necessary safety measures shall be taken for the gas pipeline, since high tension lines and other services carriers are running alongwith in gas pipeline route in the area.

17c **Additional Clause**

17c.1 Contractor to note that the minimum requirements of inspection and testing of the bought-out items shall be governed by attached QAP with the tender document. However, contractor shall submit their QAP in line with the requirement specified in attached QAP for Owner's/ PMC's approval.

17c.2 Contractor to note that all the documents/drawings submitted by them as a part of bid shall be considered only to assess Bidder's technical capability and shall in no way absolve them from complying with all the requirements of the Tender.

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All works to be performed by the Bidder shall be strictly in accordance with tender conditions.

17c.3 Contractor shall submit duly signed & stamped hard copies of all required documents/ drawings/ data sheets etc to PMC for their review & approval as per terms & condition of tender documents. The date of receipt of these documents/ drawings/ data sheets etc at PMC shall be deemed as the date of submission. If any documents/ drawings/ data sheets

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etc require re-submission due to any error/ deficiency noticed during review/ approval stage, in that event the additional time required by the contractor to get the revised document/ drawing reviewed/approved by PMC shall be solely to contractor's account and in no case contractor shall be entitled for any time or cost benefit.

17c.4 The drawings/documents/ data sheets etc shall be reviewed, checked, approved and duly signed/stamped by successful contractor before submission. Revision number shall be changed and revisions shall be highlighted by clouds during submission of revised documents/drawings/data sheets by the successful contractor. Whenever the successful contractor requires any sub-supplier drawings to be reviewed/approved by PMC, the same shall be submitted by the contractor after review/ approval and stamped by the Contractor. Direct submission of the sub-supplier's drawings/documents/data sheets etc without contractor's approval shall not be entertained.

17c.5 Review/Approval of the contractor's submitted drawings/ documents/ data sheets etc by PMC would be only to review the compatibility with basic design and concepts including construction work procedure and in no way absolve the successful contractor of his responsibility/contractual obligation to comply with tender requirements, applicable codes, specifications and statutory rules/regulations. Any error/deficiency noticed during any stage of manufacturing/execution/installation shall be promptly corrected by the contractor without any extra cost or time, whether or not comments on the same were received from PMC during the drawing review stage.

Inspection/ Site supervision as per QA/QC of the contractor's carried out works and their supplied material etc at site by PMC would be only to inspect / supervise the activities/works randomly to check the compatibility with the requirement of technical specification of the Contract document and in no way absolve the successful contractor of his responsibility/contractual obligation to comply with contract document requirements, applicable codes, specifications and statutory rules/regulations. Any error/deficiency noticed during any stage of manufacturing/execution/installation shall be promptly corrected by the contractor without any extra cost or time, whether or not observation/comments on the same were received from PMC either in inspection report / work procedure during the construction works to commissioning stage.

17c.6 Contractor shall make & maintain their own suitable sized Storage yard/ area (covered as well as open space) to store Free Issue Materials (FIM) in proper manner. Contractor shall also maintain the FIM in good condition during entire storage period by using all type of servicing/overhauling such as cleaning, greasing, protecting from rusting/ pitting etc.

17c.7 Storage Yard/ Area shall have proper motarable approach, adequate indoor & outdoor area lighting, potable & service water, proper rack & wooden sleeper etc. for staking/ storing the material, availability of material handling equipment of adequate capacity etc.

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Owner/PMC's Site In-charge shall visit & inspect the Contractor's Storage yard/ Area and upon his concurrence only, the FIM shall be stored by the Contractor at the particular Storage Yard/ Area.

Delay in issuance of FIM due to non acceptance of Contractor's Storage Yard/ Area (i.e. mainly because of non

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compliance of the minimum condition as Mentioned Above for Storage Yard/ Area) shall not be attributable to Owner / PMC.

17c.8 During construction, Owner / PMC, on their discretion, have reserve right to take samples for any bought-out item received at site and test the same in a NABL approved or equivalent laboratory even if the lot has already been Inspected and cleared by PMC / Owner for use in construction. The cost for such testing shall be borne by the Contractor. In case of failure of the samples, the lot shall be rejected and the same shall be replaced by the Contractor without any additional cost to Owner.

17c.9 Wherever the pipeline network is being augmented/ extended from existing laid network, the work required to be done for extension (such as T-joint, excavation of pit for carrying out the job etc.) shall be in the scope of the agency/ contractor laying or laid the pipeline of lower diameter. In case, the pipeline diameter of the already laid pipeline and the extension pipeline to be laid are the same, then the scope of work for extension work (i.e., T-joint, excavation of pit etc.) shall be in the scope of the agency/ contractor which has laid or laying the pipeline in the downstream w.r.t. the flow direction. For 20 mm MDPE pipe laying, all the scope of supply and services for extension from existing MDPE network shall be in the scope of LMC contractor.

18.0 SPECIAL NOTES PERTAINING TO SCHEDULE OF RATES (SOR)

i) All SOR item shall be quoted by the bidder in the price part of the bid, other-wise bid will be rejected.

ii) The quantities given above against individual items are indicative and shall not be considered to be binding. The quantities may be increased, decreased or deleted at site at the time of actual execution and as per discretion of Owner/ Engineer-in-charge. The unit rate shall be operated to work out the final payment due to Contractor.

iii) The payment will be made as per actual certified measurement at site.

iv) The scope as mentioned in the SOR is of indicative nature only and shall include all activities as detailed in the relevant clauses of the respective Particular Job Specifications, Technical Specifications, Data Sheets & drawings, etc.

v) Installation of PE Pipes of size 20 -125 mm is to be laid underground considering for domestic consumers as required in respective city.

vi) Restoration works of pipeline trench made by open cut method are included in Contractor's scope as indicate in SOR. Owner's / Engineer-in-Charge's decision in this regard shall be final and binding to the contractor.

vii) 20 mm PE laying for service line is primarily in the scope of the LMC Contract (under this tender) and all

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drain crossings/ nallah crossings etc. required for 20 mm service lines shall be done by the LMC contractor. Any scope of 20 mm PE laying with dedicated PE Laying contract shall only be used in case of exigency/ urgency. The decision of EIC in this regard shall be final and binding on the contractors.

19.0 Addendum/ Modification/ Corrigendum/ Change made in the Clauses/ Statement/ Descriptions, etc. of

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technical specification enclosed in Volume II of II

19.1 Refer clause no. 9.5 of TECHNICAL SPECIFICATION FOR LAYING OF PE MAIN PIPELINES AND SERVICE PIPELINES Shall be read as-

Contractor shall maintain a Project site office, Material store with following facilities:

- Telephone/ Mobile phones, Printers/Scanning/Xerox machines, Computer with internet facility
- 1 No. air-conditioned four-wheeler reasonably in good condition with valid license holder driver for site survey, meetings at site, etc. to be kept for Owner/Owners representative. Also, it shall be well equipped with tools and tackles for attending any emergency complaints and ongoing execution work.

On award of the contract, the contractor shall establish the Project site office, Material store with required facilities as mentioned above and shall submit the documentary evidence, which will be verified by Owner/Owners representative before start of the works. Delay in non-compliance of above may result into the termination of contract.

19.2 Refer clause no. 18.0 (i.e CASING PIPE) of TECHNICAL SPECIFICATION FOR LAYING OF PE MAIN PIPELINES AND SERVICE PIPELINES Shall be read as-

The tentative sizes of the HDPE casing pipe for Moling/ HDD shall be as follows: -

Size of PE pipe	HDPE Casing Pipes Min. Dia (mm)	HDPE Casing Pipes Max. Dia (mm)
20 mm	50	50
32 mm	50	90
63 mm	110	160
90mm	200	250
125mm	250	315

19.3 Refer clause no. 2.6 of TECHNICAL SPECIFICATION FOR INSTALLATION OF ABOVE GROUND GI /CU PIPING FOR DOMESTIC, COMMERCIAL AND INDUSTRIAL CONSUMERS Shall be read as-

Installation of GI pipes of ½", ¾", 1" dia. between transition fittings (installed by PE contractor) and customer's kitchen which would include NPT threading of pipes, and jointing of fittings such as elbows, tees, connectors, regulators, meters, isolation valves etc., as per laid procedures and specification including supply of GI fittings & Teflon tapes for sealing of joints. Painting of GI Pipes & fittings as per specification.

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Installation of CS pipes of 1½" & 2" dia. complete along with all associated works between transition fittings (installed by PE contractor) and battery limit of Commercial & Industrial Consumer's premises shall be carried out as per separate TS [i.e SPECIFICATION FOR PIPING FABRICATION AND ERECTION SPECIFICATION NO.: 06]. Painting of CS Piping system along with fittings, flanges, valves & equipments as per specification.

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20.0 VOID

21.0 AUGMENTATION/MODIFICATION in HEALTH, SAFETY AND ENVIRONMENT (HSE) MANAGEMENT.

The following modification or augmentation has been proposed as per BGLSafety Procedure & shall be considered for Health, Safety and Environment (HSE) MANAGEMENT & in case of contradiction between **SPECIFICATION FOR HEALTH, SAFETY AND ENVIRONMENT (HSE) MANAGEMENT (SPECIFICATION NO.: 65, VOL-II)** or these guidelines, these guidelines shall prevail:

Sl. no.	**Clause as per SPECIFICATION FOR HEALTH, SAFETY AND ENVIRONMENT(HSE) MANAGEMENT (SPECIFICATION NO.: 65, VOL-II)**		**Augmentation/Modification as per BGLSafety Procedure**
1.	**3.1 Management Responsibility**		**3.1 Management Responsibility & duties & responsibilities of contractor**
2.	**clause 3.1 Management Responsibilities**		**In the clause 3.1 Management Responsibilities following guidelines shall be considered as per BGLsafety procedure: -** **Safety Supervisor:** A dedicated Safety Supervisor having recognized degree in science or diploma in engineering with one-year experience of working as a safety supervisor in
	No. Of workers deployed Up to 250	Designate one safety supervisor who will guide the workers from time to time, as well as impart training basic guidelines at least weekly once.	

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	Above 250 & up to 500	Deploy one qualified and experienced safety Engineer/ Officer who will guide the workers from time to time as well as impart basic guideline & training at least weekly once. He / She shall possess a recognized Degree in any branch of engineering or technology or architecture and had a post qualification construction experience of minimum two years or possess a recognized Diploma in any branch of engineering or technology or Graduate in Science stream and had a post qualification construction experience of minimum five years.	any oil & gas industry /chemical/construction industry shall be deployed up to 50 workers. Subsequently for every 50 workers, CONTRACTOR shall deploy one dedicated Safety Supervisor. **Safety Officer:** A full time /dedicated qualified Safety Engineer/Officer shall be assigned for every 250 workers are employed at site/GA. The Safety Engineer/Officer shall possess requisite qualification and experience in line the Central/State Regulations.
	Above 500 (for every 500 or less)	One additional safety engineer/ Officer One additional safety engineer/Officer	

	CLAUSE NO. 3.1.10, PENALTY ON VIOLATION OF HSE NORMS, sl. no. 20: - Any violation not covered above.	Following penalties shall also be included along with penalties as given in **CLAUSE NO. 3.1.10, PENALTY ON VIOLATION OF HSE NORMS** in technical specification.

Sl. no.	VIOLATION OF HSE NORMS	PENALTY AMOUNT
1.	Non-deployment of safety supervisor / supervisor responsible for safety at work site	**Rs. 3300 per day.**

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		2.	Non deployment of the licensed electricians for electrical job.	**To be decided by PMC/Owner**
		3.	Deployment of child or adolescent labour.	**Penalty applicable as per Government Laws/ Norms**
		4.	Violation of Safety Permit conditions like Firefighting equipment etc.	**To be decided by PMC/ Owner.**
		5.	Non using of PPEs while carrying out Holiday of pipeline	
	CLAUSE NO. 3.2 House Keeping	Following text shall also be included in CLAUSE NO. 3.2 House Keeping in technical specification. **DUTIES AND RESPONSIBILITIES OF CONTRACTOR'S SAFETY SUPERVISOR/**		

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		SAFETY OFFICER a) To ensure that all the preventive measures for identified hazards through Job Safety Analysis are in place and communicated to workers. b) To ensure strict compliance with work permit system by carrying out work only and after ensuring that all safety precautions/ conditions in the permit are complied with and closing the same after job. c) To ensure that the workers likely to be exposed to hazardous chemicals/ materials have access to appropriate Material Safety Data Sheets (MSDS), and provide necessary mitigation measures. d) To ensure that required guards and standard Personal Protective Equipment (PPE) are provided, used and properly maintained including Emergency Requirement. e) To ensure inspection, testing, certification and maintenance of all tools and ensure removal of defective tools. f) To plan the workload and assign workers to jobs in commensuration with their qualification, experience and state of health. g) To take immediate corrective action against the violation of safety rules observed or reported. h) To ensure that appropriate warning signboards or tags are displayed. i) To ensure that all workers have proper training for their job assignments, including use of appropriate PPE, first aid and firefighting equipment. j) To ensure that only medically fit person shall be engaged in work and also ensure that sick/ or injured workers during course of work should revive timely and appropriate first aid and/ or medical attention. k) To report each incident and/or injury in accordance with established procedures and

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		assist in investigation. Maintain Daily HSE Observations and action

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		taken report at site Conduct Tool Box talks along with Site Engineers/ supervisors before commencement of any job. Records of Safety Talks shall be recorded. **DUTIES AND RESPONSIBILITIES OF CONTRACT WORKERS** a) To understand the risk associated with the job and their mitigation measures. b) To perform work safely as per the job requirement and instructions. c) To inform all concerned regarding unsafe conditions/ and unsafe acts. d) To wear PPE as stipulated and necessary for the job. e) To inform promptly to their supervisor regarding all work-related incidents resulting in personal injury, illness and/ or property damage. f) To take all necessary and appropriate safety precautions to protect themselves, other personnel and the environment. **PROJECT/CONSTRUCTION MANAGEMENT CONSULTANT** a) The activities and responsibilities covered under the scope of the OWNER may be delegated to the consultant in those cases as applicable, based on the respective contract conditions. b) The primary responsibility of CONSULTANT is to ensure compliance on agreed HSE plan for the contract by the CONTRACTOR. c) The CONSULTANT shall observe and abide by all HSE Rules & Regulation of the OWNER. d) The CONSULTANT should have the responsibility for submission of latest HSE plans for work under his and CONTACTOR's purview and implementing the same till job completion.

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		e) The CONSULTANT shall designate adequate number of Safety Officer (s) with necessary skills required for the work to be performed.

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		f) The CONSULTANT shall review the documents submitted by the contractor and advise OWNER on acceptance as well as advise suitably and number of Contractor's safety officers/ supervisors.
	CLAUSE NO. 3.3 Healthy, Safety and Environment	Following text shall also be included in CLAUSE NO. 3.3 Healthy, Safety and Environment. Work Permit System shall be followed in accordance with OWNER's HSE Management System and OISD Standard 105.
	CLAUSE NO. 3.3 Healthy, Safety and Environment-Training	Training clause to be replaced as below: **SAFETY AWARENESS AND TRAINING** 1) No person should be employed in any work at a workplace unless that person has received the necessary information, instruction and training so as to be able to do work competently and safety. 2) The CONTRACTOR shall ensure that all his personnel possess appropriate and job specific training on potential hazards to which they may be exposed at workplace and measures for prevention & mitigation, emergency plan etc. to carry out the assigned job safely. a) The information, instruction and training should be given in a language understood by the worker and written, oral, visual and participative approaches should be used to ensure that the worker has assimilated the information. b) Workers should be adequately and suitably: 3) Informed of potential safety and health hazards to which they may be exposed to at their workplace;

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		4) Instructed and trained in the measures available for the prevention, control and protection against those hazards. a) Training Schedule duly approved shall be submitted to ENGINNER IN-CHARGE. Records of such training shall be kept and submitted to Owner, as and when required. **b)** Safety Talks shall be given to workers prior to commencement of any job/activity and during the work, periodically. Records of such Safety Talks shall be maintained**.**
	CLAUSE NO. 3.3 Healthy, Safety and Environment-INSPECTION	Following text to be added: - INSPECTION / AUDIT: Inspection / Audit is a tool to evaluate compliance of all safety requirements. Most of the information could be gathered through site inspection using ready-made check lists to ensure that contractors / agencies abide by the safety rules and norms while working at operating / construction sites. a) A mobilization audit shall be conducted by ENGINEER IN-CHARGE to verify the HSE System and healthiness of equipment & appliances are in place, in accordance with agreed by OWNER and CONTRACTOR during Post Award Meeting. b) A checklist, while carrying out different type of jobs, should be developed based on hazards associated with the job being performed and requirements as per OISD-GDN- 192 on "Safety Practices during Construction".

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		c) Before starting the work and at regular intervals thereafter at least once in three months, CONTRACTOR's SUPERVISOR/SAFETY OFFICER, CONSULTANT SAFETY OFFICER and OWNER'S REPRESENTATIVE / ENGINEER-IN CHARGE/ SAFETY OFFICER should inspect as per the checklist so prepared to ensure that contractor has prepared to start the work with all safety precaution required for safe execution of job.
	CLAUSE NO. 3.3 Healthy, Safety and Environment-HSE PROMOTION	Following text to be added: - **SAFETY COMMITTEE MEETINGS** a) The Safety Committee should be included representatives of Owner, consultant, CONTRACTOR, headed by EIC/CONSULTANT shall be held at least once in a quarter. b) Apart from above, the CONTRACTOR Safety Committee comprising of contract workers' representative, consultant and CONTRACTOR shall be formed and meeting held, at least monthly, to discuss various HSE Aspects. c) Record of such Safety Committee Meetings along with action taken report shall be maintained and submitted to EIC. **OCCUPATIONAL HEALTH:**

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		a) The CONTRACTOR shall arrange medical health examination by registered medical practitioner of all his employees before commencement of work and after illness or injury. The medical health examination report shall be submitted to EIC. Further regular periodic medical health examination shall be carried out by CONTRACTOR, at periodicity stipulated under Factory Act/Building & Construction Workers Regulation etc. Owner/EIC has right to conduct medical health examination of any contract worker (s), if found necessary in addition with medical health examination conducted by CONTRACTOR.
		b) The CONTRACTOR shall ensure at a construction/maintenance site an occupational health center mobile or static is provided and maintained in good order. Services and facilities as per the scale lay down under Factory Act & Rules/Building & Construction Workers Regulations etc.

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		c) The CONTRACTOR shall ensure Material Safety Data Sheet (MSDS) of each chemical which is used/handled at site. Preventive measures shall also be taken for exposure to chemical (s) to worker(s). d) The CONTRACTOR shall ensure adequate Occupational Health measures for worker(s) during epidemic/ pandemic if any, in accordance with guidelines of Government of India and Owner. e) CONTRACTOR shall maintain and ensure of First Aid Boxes and First Aid trained attendant and other facilities as per requirement of Factory Act & Rules/Building and Construction Workers Regulations & other applicable regulations for its employees and those of its SUB-CONTRACTOR. Periodical inspection of First Aid Boxed shall be carried out to ensure availability of medicines with expiry date. f) CONTRACTOR shall make outside arrangements for ambulance service and for the treatment of industrial injuries. Names of those providing these services shall be furnished to EMPLOYER prior to start of construction and their telephone numbers shall be prominently posted in CONTRACTOR's field office.

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22.0 APPENDIX-I TO PARTICULAR JOB SPECIFICATION

LIST OF PREFERRED/ APPROVED SUPPLIERS FOR BOUGHT OUT ITEMS

Please refer Appendix-I, II, III

Notes:

1) For procuring the above listed bought out item(s) from the vendor/ supplier, whose name is not appearing in the above preferred make list, bidders can supply those item(s) from such vendors/suppliers who have earlier supplied same item(s) for the intended services and the offered item(s) is in their regular manufacturing/ supply range and the same may be accepted subject to following:-

   a) The Vendor/ Supplier of bought out item(s) is a Manufacturer/ Supplier of the said item(s) for intended services and the same are in their regular manufacturing/ supply range.

   b) The vendor/supplier should not be in the Holiday list of Client/ PMC / Other PSU.

   c) For items to be purchased with measurement unit either in length or in weight: - Should have supplied for intended services at least 15% of SOR quantity of same size, thickness, schedule, pressure & temperature ratings, SDR, etc. or higher (as applicable) as per technical details mentioned in SOR & Tender specification and the same should have been supplied within last seven (07) year from the date of approval request made by the contractor.

   d) For items to be purchased with measurement unit in number: - Should have supplied for intended services at least 15% of SOR quantity of same size, thickness, schedule, pressure & temperature ratings, SDR, etc. or higher (as applicable) as per technical details mentioned in SOR & Tender specification and the same should have been supplied within last seven (07) year from the date of approval request made by the contractor.

2) For procuring any other item(s) {i.e. not listed above} for which the vendor/ supplier name is not appearing in above preferred make list, bidders can supply those item(s) from such vendors/suppliers who have earlier supplied same item(s) for the intended services and the offered item(s) is in their regular manufacturing/ supply range and the same may be accepted subject to following:-

   a) The Vendor/ Supplier of bought out item(s) is a Manufacturer/ Supplier of said item(s) for intended services and the same are in their regular manufacturing/ supply range.
   b) The vendor/supplier should not be in the Holiday list of Client/ PMC / Other PSU.
   c) For items to be purchased with measurement unit either in length or in weight:- Should

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have supplied for intended services at least 15% of SOR quantity of same size, thickness, schedule, pressure & temperature ratings, SDR, etc. or higher (as applicable) as per technical details mentioned in SOR & Tender specification and the same should have been supplied within last seven (07) year from the date of approval request made by the contractor.

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d) For items to be purchased with measurement unit in number:- Should have supplied for intended services at least One (01) number of same size, thickness, schedule, pressure & temperature ratings, SDR, etc. or higher (as applicable) as per technical details mentioned in SOR & Tender specification and the same should have been supplied within last seven (07) year from the date of approval request made by the contractor.

Remarks for Note 1 & 2:

i. To meet the criterion mentioned above, the successful bidder/ contractor is required to submit documentary evidences such as copy of FOA/ Purchase Order (PO)/ sub-purchase order and their supply record like Inspection certificates/report, Inspection release note, Tax paid invoice, performance certificates (if available), etc. from which it can be established that vendor have executed supplied the order. These documents shall require to be submitted by them within 30 days from date of Placement of Order for approval to CLIENT / PMC.

ii. The details of vendors indicated in this list are based on the informationavailable with CLIENT, Contractor shall verify the capabilities of each vendor for producing the required quantity and the items are in their regular manufacturing range. CLIENT/ PMC does not take any guarantee / responsibility on the performance of the vendor. It is the contractor's responsibility to verify the correct status of vendor and their quality control before proposing to CLIENT / PMC for approval of vendor name. It is also the responsibility of contractor to expedite the material in time.

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Appendix-I

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APPENDIX-I

LIST OF PREFERRED MANUFACTURER/SUPPLIER FOR BOUGHT OUT ITEMS

PE FITTINGS & PE VALVES

1) M/s Friatech AG, Germany (represented by M/s Sherman Sales in India)
2) M/s Jain Irrigation Systems Ltd. Jalgaon (Fusion, UK)
3) M/s George Fisher
4) M/s Plasson Ltd.
5) M/s Agru, Australia
6) M/s Kimplas, Nasik (PE Fittings only)
7) M/s Innogaz & M/s Frialen of M/s Aliaxis Utilities & Industry Pvt. Ltd. (formerly Glynwed pipe systems)

HDPE PIPES & HDPE DUCT

1) M/s Climax Synthetics (P) Ltd., Vadodra
2) M/s Indian Poly Pipes, Calcutta
3) M/s Jain Irrigation Systems Ltd., Jalgaon
4) M/s Kirti Industries (India) Ltd., Indore
5) M/s Ori Plast Limited, Calcutta
6) M/s Phoel Industries Limited, Delhi
7) M/s Sangir Plastics (P) Ltd., Mumbai
8) M/s Veekay Plast, Jaipur
9) M/s Kisan Irrigation
10) M/s Dutron Polymers Ltd.
11) M/s Manikya Plastichem (P) Ltd
12) M/s Mangalam Pipes Pvt. Ltd., Bengaluru
13) M/s Shand Pipe industry Pvt. Ltd., Bengaluru
14) M/s Varun Pipes Pvt. Ltd., Bengaluru
15) M/s EPP Composite Pvt. Ltd., Rajkot
16) M/s DM Engineering Co. , Mumbai

GI PIPES

1) M/s Goodluck Steel Tubes Ltd, Ghaziabad
2) M/s Indus Tubes Ltd , New Delhi
3) M/s Jindal Pipes Ltd , New Delhi
4) M/s Jyotindra Steel & Tubes Ltd, Firozabad
5) M/s Rama Steel Tubes Ltd, New Delhi
6) M/s Surya Roshni Ltd, Bhadurgarh
7) M/s Vishal Pipes Ltd.
8) M/s Advance Steel Ltd.
9) M/s Swastik Pipe Ltd.
10) M/s Fortune Pipe Ltd.
11) M/s Indian Seamless Metal Tubes Ltd., Pune

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12) M/s Appolo Tubes, Bengaluru
13) M/s Nezone Tubes Ltd., Kolkata
14) M/s Topworth Pipes & Tubes Pvt. Ltd., Navi Mumbai

WARNING MAT

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1) M/s Sparco Multiplast Pvt. Ltd., Ahmedabad
2) M/s Singhal Industries, Ahmedabad
3) M/s Raychem RPG Ltd.
4) M/s Puja Packings, Mumbai
5) M/s Bina Enterprises, Mumbai
6) M/s Shree Vijay Wire & Cables Industries, Jaipur

GI FITTINGS

1) M/s Jainsons Industries, Jalandhar
2) M/s Jupiter Metal Industries Ltd.
3) M/s Rajnesh Malleables Ltd., Delhi
4) M/s Industrial Valves & Components, Delhi
5) M/s Sarin Industries, Delhi
6) M/s Excel Metal & Engineering Industries, Mumbai
7) M/s Modern Stores & Engineering Concern, Kolkata
8) M/s Jinan Meide Casting Co. Ltd., China
9) M/s Mehta Brother & Co., Mumbai- (Make: M/s Jinan Meide Casting Co. Ltd., Japan) confirming to IS 1879:2010 latest standard
10) M/s Chokhawala Distributors

MULTILAYER COMPOSITE (MLC) PIPES

1) M/s JINDAL PE-X TUBES PRIVATE LIMITED
2) M/s UNIPRO PIPING SYSTEMS PRIVATE LIMITED (AUTHORISED DEALER OF M/s ZHEJIANG MINGSHI XINGXIN HVAC TECHNOLOGY CO. LTD.)
3) M/s KITEC INDUSTRIES (INDIA) PVT. LTD.,

COPPER TUBES AND COPPER FITTINGS

1) M/s Paras Industries Ltd.
2) M/s Rajco Metal
3) M/s Chandan Enterprises
4) M/s Mehta Tubes
5) M/s Cofit Industries, Bengaluru
6) M/s Mandev Tubes
7) M/s Sagardeep Alloys
8) M/s Pallavi Copper Pipes

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BRASS FITTINGS

1) M/s Chandan Enterprises
2) M/s Paras Industries Ltd.
3) M/s Umesh Enterprises
4) M/s Om brass Enterprises
5) M/s KPC Flexi Tubes
6) M/s Mehta Bros, Mumbai

FLEXIBLE HOSE (ANACONDA)

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1) M/s KPC Flex Tubes
2) M/s Vestas Hose Division
3) M/s Alfa Flexitubes
4) M/s Bengal Industries Pvt. Ltd.
5) M/s Vikram & co.

6) M/s Gaytri Industrial Corporation, Thane (W)

PE PIPES

1) M/s Jain Irrigation System Ltd., New Delhi
2) M/s Pennwalt Agru Plastics Ltd., Navi Mumbai
3) M/s Pioneer Polyfeb Ltd. Ghaziabad
4) M/s Kriti Industries (i) Ltd., Indore
5) M/s Ori Plast Ltd., Kolkata
6) M/s.Purma Plast Pvt Ltd, Rajasthan

METERS AND REGULATORS

1) M/s Actaris Metering System, New Delhi
2) M/s Elster Messtechnik Gmbh, Lampertheim
3) M/s Emerson Process Management (India) Pvt. Limited, Mumbai
4) M/s Equimeter Inc., USA
5) M/s Gorter Controls B.V., Netherlands
6) M/s Instromet International, Belgium
7) M/s Invensys Metering Systems India Ltd., Pune
8) M/s Mesura SA, France
9) M/s Pietro Fiorentini S.p.A, Italy
10) M/s RMG Regal – Messtechnik Gmbh, Germany
11) M/s Raychem RPG Limited, Kolkata
12) M/s Rockwin Flowmeter India Pvt. Ltd., New Delhi
13) M/s Itron India Pvt. Limited, Noida
14) M/s. Daniel Solutions Pvt. Ltd. Gurgaon

STEEL REINFORCED RUBBER HOSE

1) M/s Suraksha Products Pvt. Ltd.
2) M/s Vansh Industries
3) M/s T &L Gases
4) M/s Vikram & Co.
5) M/s Gayatri
6) M/s Luxmi Rubtech

ISOLATION VALVES AND APPLIANCE VALVES

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1) M/s Universal Srl
2) M/s Tiemme Raccorderie Sede
3) M/s Jainson Industries
4) M/s Enolgas Bonimu s.a.s.
5) M/s Fratelli Fortis s.r.l

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6) M/s Giacomo Climbrio
7) M/s Parker Hannifin S.P.A.
8) M/s Singapore Valve & Amp; Fittings Pte Limited, Singapore
9) M/S Rubinetterie Utensilerie Bonomi (RUB)
10) M/s Zhegiang Valogin Technology Co. Ltd. , China
11) M/s Ningbo Huaping Metalwork Co. Ltd., China
12) M/s Mehta Brothers, Mumbai.
13) M/s Chokhawala Distributors

PAINT

Notes:

1. M/s Asian Paints
2. M/s Berger Paints
3. M/s Kansai Nerolac Paints.
4. Durolac paints

Notes:

1) For procuring the above listed bought out item(s) from the vendor/ supplier, whose name is not appearing in the above preferred make list, bidders can supply those item(s) from such vendors/suppliers who have earlier supplied same item(s) for the intended services and the offered item(s) is in their regular manufacturing/ supply range and the same may be accepted subject to following:-

a) The Vendor/ Supplier of bought out item(s) is a Manufacturer/ Supplier of the said item(s) for intended services and the same are in their regular manufacturing/ supply range.

b) The vendor/supplier should not be in the Holiday list of Client/ PMC/ Other PSU.

c) For items to be purchased with measurement unit either in length or in weight:- Should have supplied for intended services at least 15% of SOR quantity of same size, thickness, schedule, pressure & temperature ratings, SDR, etc. or higher (as applicable) as per technical details mentioned in SOR & Tender specification and the same should have been supplied within last seven (07) year from the date of approval request made by the contractor.

d) For items to be purchased with measurement unit in number:- Should have supplied for intended services at least 15% of SOR quantity of same size, thickness, schedule, pressure & temperature ratings, SDR, etc. or higher (as applicable) as per technical details mentioned in SOR & Tender specification and the same should have been supplied within last seven (07) year from the date of approval request made by the contractor.

2) For procuring any other item(s) {i.e. not listed above} for which the vendor/

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supplier name is not appearing in above preferred make list, bidders can supply those item(s) from such vendors/suppliers who have earlier supplied same item(s) for the intended services and the offered item(s) is in their regular manufacturing/ supply range and the same may be accepted subject to following:-

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a) The Vendor/ Supplier of bought out item(s) is a Manufacturer/ Supplier of said item(s) for intended services and the same are in their regular manufacturing/ supply range.

b) The vendor/supplier should not be in the Holiday list of Client/ PMC / Other PSU.

c) For items to be purchased with measurement unit either in length or in weight:- Should have supplied for intended services at least 15% of SOR quantity of same size, thickness, schedule, pressure & temperature ratings, SDR, etc. or higher (as applicable) as per technical details mentioned in SOR & Tender specification and the same should have been supplied within last seven (07) year from the date of approval request made by the contractor.

d) For items to be purchased with measurement unit in number:- Should have supplied for intended services at least One (01) number of same size, thickness, schedule, pressure & temperature ratings, SDR, etc. or higher (as applicable) as per technical details mentioned in SOR & Tender specification and the same should have been supplied within last seven (07) year from the date of approval request made by the contractor.

Remarks for Note 1 & 2:

i. To meet the criterion mentioned above, the successful bidder/ contractor is required to submit documentary evidences such as copy of FOA/ Purchase Order (PO)/ sub-purchase order and their supply record like Inspection certificates/report, Inspection release note, Tax paid invoice, performance certificates (if available), etc. from which it can be established that vendor have executed supplied the order. These documents shall require to be submitted by them within 30days from date of Placement of Order for approval to OWNER / PMC.

ii. The details of vendors indicated in this list are based on the information available with PMC, Contractor shall verify the capabilities of each vendor for producing the required quantity and the items are in their regular manufacturing range. PMC/ OWNER does not take any guarantee / responsibility on the performance of the vendor. It is the contractor's responsibility to verify the correct status of vendor and their quality control before proposing to OWNER / PMC for approval of vendor name. It is also the responsibility of contractor to expedite the material in time.

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Appendix-II

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APPENDIX-II

LIST OF REGISTERED MANUFACTURER/SUPPLIER FOR BOUGHT OUT ITEMS (As per CVDC)

PE FITTINGS & PE VALVES

1) AL-AZIZ PLASTICS PVT LTD MUMBAI-A273

HDPE PIPES & DUCT

1) EONNPLAST INDIA PVT LTD Noida-E192.
2) EPP COMPOSITE PVT. LTD. Rajkot-E148.
3) SANGIR PLASTICS PVT LTD Mumbai-S432

GI PIPES

1) P.S STEEL TUBES LIMITED Bhilai-P138.
2) RIDDHI STEEL AND TUBE LIMITED Ahmedabad-R188.
3) APL APOLLO TUBES LIMITED Noida-A299.

WARNING MAT / GRID

1) M/s Sparco Multiplast Pvt. Ltd., Ahmedabad

GI FITTINGS

1) SHAKTI FORGE INDUSTRIES PVT. LTD. RAJKOT-S512.

FLEXIBLE HOSE (ANACONDA)

1) AEROFLEX INDUSTRIES LTD Navi Mumbai-A131

2) FLEXATHERM EXPANLLOW PVT LTD VADODARA-F1

3) ALFA FLEXITUBES PVT LTD BAHADURGARH-A252

Notes:

1. For procuring the above listed bought out item(s) from the vendor/ supplier, whose name is not appearing in the above preferred make list, bidders can supply those item(s) from such vendors/suppliers who have earlier supplied same item(s) for the intended services and the offered item(s) is in their regular manufacturing/ supply range and the same may be accepted subject to following:-

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a) The Vendor/ Supplier of bought out item(s) is a Manufacturer/ Supplier of the said item(s) for intended services and the same are in their regular manufacturing/ supply range.

b) The vendor/supplier should not be in the Holiday list of Owner/ PMC/ Other PSU.

c) For items to be purchased with measurement unit either in length or in weight:- Should have supplied for intended services at least 15% of SOR quantity of same size, thickness, schedule, pressure & temperature ratings, SDR, etc. or higher (as applicable) as per technical details mentioned in SOR & Tender specification and the same should have been supplied within last seven (07) year from the date of approval request made by the contractor.

d) For items to be purchased with measurement unit in number:- Should have supplied for intended services at least 15% of SOR quantity of same size, thickness, schedule, pressure & temperature ratings, SDR, etc. or higher (as applicable) as per technical details mentioned in SOR & Tender specification and the same should have been supplied within last seven (07) year from the date of approval request made by the contractor.

2) For procuring any other item(s) {i.e. not listed above} for which the vendor/ supplier name is not appearing in above preferred make list, bidders can supply those item(s) from such vendors/suppliers who have earlier supplied same item(s) for the intended services and the offered item(s) is in their regular manufacturing/ supply range and the same may be accepted subject to following:-

a) The Vendor/ Supplier of bought out item(s) is a Manufacturer/ Supplier of said item(s) for intended services and the same are in their regular manufacturing/ supply range.

b) The vendor/supplier should not be in the Holiday list of Owner/ PMC/ Other PSU.

c) For items to be purchased with measurement unit either in length or in weight:- Should have supplied for intended services at least 15% of SOR quantity of same size, thickness, schedule, pressure & temperature ratings, SDR, etc. or higher (as applicable) as per technical details mentioned in SOR & Tender specification and the same should have been supplied within last seven (07) year from the date of approval request made by the contractor.

d) For items to be purchased with measurement unit in number:- Should have supplied for intended services at least One (01) number of same size, thickness, schedule, pressure & temperature ratings, SDR, etc. or higher (as applicable) as per technical details mentioned in SOR & Tender specification and the same should have been supplied

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within last seven (07) year from the date of approval request made by the contractor.

Remarks for Note 1 & 2:

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i. To meet the criterion mentioned above, the successful bidder/ contractor is required to submit documentary evidences such as copy of FOA/ Purchase Order (PO)/ sub-purchase order and their supply record like Inspection certificates/report, Inspection release note, Tax paid invoice, performance certificates (if available), etc. from which it can be established that vendor have executed supplied the order. These documents shall require to be submitted by them within 30 days from date of Placement of Order for approval to OWNER/ PMC.

ii. The details of vendors indicated in this list are based on the information available with OWNER/ PMC, Contractor shall verify the capabilities of each vendor for producing the required quantity and the items are in their regular manufacturing range. OWNER/ PMC does not take any guarantee / responsibility on the performance of the vendor. It is the contractor's responsibility to verify the correct status of vendor and their quality control before proposing to OWNER/ PMC for approval of vendor name. It is also the responsibility of contractor to expedite the material in time

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Appendix-III

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APPENDIX-III

I. List of preferred manufacturer/supplier for bought out items "LAST MILE CONNECTIVITY" works

PE FITTINGS & PE VALVES

1) M/s Friatech AG, Germany (represented by M/s Sherman Sales in India)
2) M/s Jain Irrigation Systems Ltd. Jalgaon (Fusion, UK)
3) M/s George Fisher
4) M/s Plasson Ltd.
5) M/s Agru, Australia
6) M/s Kimplas, Nasik (PE Fittings only)
7) M/s Innogaz & M/s Frialen of M/s Aliaxis Utilities & Industry Pvt. Ltd. (formerly Glynwed pipe systems)

GI PIPES

1) M/s Goodluck steel tubes ltd, Ghaziabad
2) M/s Indus tubes ltd, New Delhi
3) M/s Jindal pipes ltd, New Delhi / Bengaluru
4) M/s Jyotindra steel & tubes ltd, Firozabad
5) M/s Rama Steel tubes ltd, New Delhi
6) M/s Surya Roshni ltd, Bhadurgarh
7) M/s Vishal Pipes Ltd. New Delhi
8) M/s Advance Steel Ltd. New Delhi
9) M/s Swastik Pipe Ltd, New Delhi / Bengaluru
10) M/s Indian seamless metal tubes ltd., Pune
11) M/s Appolo tubes., Bengaluru
12) M/s Fortune Pipes Ltd
13) M/s Nezone Tubes Ltd., Kolkata

GI FITTINGS

1 M/s Jainsons Industries, Jalandhar
2 M/s Jupiter Metal Industries Ltd., Jalandhar
3 M/s Excel metal & Engineering Industries, Mumbai
4 M/s Modern Stores & Engineering Concern, Kolkata
5 M/s Jinan Meide Casting Co. Ltd, China
6 M/s Green Manufacturing Co. Limited, Jalandhar, Punjab (For ½" Elbow, ½" Male female Elbow, ¾" Elbow, ½" Equal Tee, ½" Socket only)

COPPER TUBES AND FITTINGS

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1. M/s Paras Industries Ltd., Jamnagar
2. M/s Rajco Metal, Mumbai
3. M/s Mehta Tubes, Mumbai
4. M/s Janya Extrusions Pvt Ltd, Mumbai
5. M/s Pallavi Copper pipes
6. M/s Mandev Tubes
7. M/s Sagardeep Alloys

BRASS FITTING

1. M/s Chandan Enterprises, Mumbai
2. M/s Paras Industries Ltd., Jamnagar
3. M/s Mehta Tubes, Mumbai
4. OM Brass Industries, Jamnagar
5. M/s KPC Flexi Tubes

FLEXIBLE HOSE

1. M/s KPC Flex Tubes, Faridabad
2. M/s Vestas Hose Division, New Delhi
3. M/s Alfa Flexi Tubes, Bahadurgarh
4. M/s Bengal Industries Pvt.Ltd
5. M/s Gaytri Industrial Corporation, Thane (W)
6. M/s Vikram & Co

ISOLATION VALVES AND APPLIANCE VALVES

1. M/s Universal Srl, Italy
2. M/s TiemmeRaccorderieSede, Italy
3. M/s Jainson Industries, Jalandhar
4. M/s Enolgas Bonimu s.a.s., Italy
5. M/s Fratelli Fortis s.r.l, Italy
6. M/s Giacomo Climbrio, Italy
7. M/s Parker Hannifin S.P.A., USA
8. M/s Singapore Valve & Amp; Fittings Pte Limited, Singapore /Bengaluru
9. M/S Rubinetterie Utensilerie Bonomi (RUB), Italy
10. M/s Zhegiang Valogin Technology Co. Ltd., China
11. M/s Ningbo Huaping Metalwork Co. Ltd., China
12. M/s Zhejiang DunAn valve Co.Ltd, China

PAINT

1. M/s Asian Paints
2. M/s Berger Paints
3. M/s Kansai Nerolac Paints

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II. List of approved supplier for bought out items for "PE Pipeline laying " works

A) PE FITTINGS

1) M/s Jain Irrigation systems Ltd. Jalgaon

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2) M/s George Fisher
3) M/s Kimplas Piping Systems ltd., Nashik
4) M/s Aliaxis Utilities & Industry Pvt. Ltd (Formerly Glynwed pipesystems)
5) M/s Friatech AG, Germany
6) M/s Agru, Austria

B) ISOLATION (PE) VALVES

1) M/s Friatech AG, Germany
2) M/s George Fisher, Germany
3) M/s Plasson Ltd., Israel
4) M/s Agru, Austria
5) M/s Aliaxis Utilities & Industry Pvt. Ltd (Formerly Glynwed pipesystems)

C) HDPE PIPES & DUCT

1) M/s Mangalam Pipes Pvt. Ltd., Bengaluru
2) M/s Shand pipe Industry Pvt. Ltd., Bengaluru
3) M/s Varuna pipes Pvt. Ltd., Bengaluru
4) M/s Manikya Plastichem (P) Ltd., Mysore
5) M/s Jain Irrigation systems Ltd. Jalgaon
6) Godavari Polymers Pvt. Ltd. Secunderabad.

E) WARNING MAT

1) M/s Sparco Multiplast Pvt. Ltd., Ahmedabad
2) M/s Singhal Industries ,Ahemdabad
3) M/s Pooja Packing, Mumbai
4) M/s Bina Enterprises, Mumbai

Note:

1) For procuring the above listed bought out item(s) from the vendor/ supplier, whose name is not appearing in the above preferred make list, bidders can supply those item(s) from such vendors/suppliers who have earlier supplied same item(s) for the intended services and the offered item(s) is in their regular manufacturing/ supply range and the same may be accepted subject to following:-

a) The Vendor/ Supplier of bought out item(s) is a Manufacturer/ Supplier of the said

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item(s) for intended services and the same are in their regular manufacturing/ supply range.

b) The vendor/supplier should not be in the Holiday list of OWNER/ PMC / Other PSU.

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c) For items to be purchased with measurement unit either in length or in weight:- Should have supplied for intended services at least 15% of SOR quantity of same size, thickness, schedule, pressure & temperature ratings, SDR, etc. or higher (as applicable) as per technical details mentioned in SOR & Tender specification and the same should have been supplied within last seven (07) year from the date of approval request made by the contractor.

d) For items to be purchased with measurement unit in number:- Should have supplied for intended services at least 15% of SOR quantity of same size, thickness, schedule, pressure & temperature ratings, SDR, etc. or higher (as applicable) as per technical details mentioned in SOR & Tender specification and the same should have been supplied within last seven (07) year from the date of approval request made by the contractor.

2) For procuring any other item(s) {i.e. not listed above} for which the vendor/ supplier name is not appearing in above preferred make list, bidders can supply those item(s) from such vendors/suppliers who have earlier supplied same item(s) for the intended services and the offered item(s) is in their regular manufacturing/ supply range and the same may be accepted subject to following:-

a) The Vendor/ Supplier of bought out item(s) is a Manufacturer/ Supplier of said item(s) for intended services and the same are in their regular manufacturing/ supply range.
b) The vendor/supplier should not be in the Holiday list of OWNER/ PMC / Other PSU.
c) For items to be purchased with measurement unit either in length or in weight:- Should have supplied for intended services at least 15% of SOR quantity of same size, thickness, schedule, pressure & temperature ratings, SDR, etc. or higher (as applicable) as per technical details mentioned in SOR & Tender specification and the same should have been supplied within last seven (07) year from the date of approval request made by the contractor.

d) For items to be purchased with measurement unit in number:- Should have supplied for intended services at least One (01) number of same size, thickness, schedule, pressure & temperature ratings, SDR, etc. or higher (as applicable) as per technical details mentioned in SOR & Tender specification and the same should have been supplied within last seven (07) year from the date of approval request made by the contractor.

Remarks for Note 1 & 2:

i. To meet the criterion mentioned above, the successful bidder/ contractor is required to submit documentary evidences such as copy of FOA/ Purchase Order (PO)/ sub-purchase order and their supply record like Inspection certificates/report, Inspection release note, Tax paid invoice, performance certificates (if available), etc. from which it can be established

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that vendor have executed supplied the order. These documents shall require to be submitted by them within 30days from date of Placement of Order for approval to OWNER/ PMC.

ii. The details of vendors indicated in this list are based on the information available with OWNER/ PMC, Contractor shall verify the capabilities of each vendor for producing the

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required quantity and the items are in their regular manufacturing range. OWNER/ PMC does not take any guarantee / responsibility on the performance of the vendor. It is the contractor's responsibility to verify the correct status of vendor and their quality control before proposing to OWNER/ PMC for approval of vendor name. It is also the responsibility of contractor to expedite the material in time.

28.0 Removal of Already Installed LMC Infrastructure:

This scope applies to locations where commissioning is not possible in the near future and involves the safe removal, inventory, and return of assets. BGL to provide the area wise data available to contractor.

1. **Identification and Survey:** The Contractor shall carry out a joint survey with the Engineer-in-Charge (EIC)/ BGL representative to identify and document existing LMC infrastructure (meters, regulators, GI piping) deemed non-commissionable.

   Areas proposed: Shapur Nagar, HAL Colony, Gajularamaram, Bowenpally, Sikh Basti, Alwal, Kukatpally, Borabanda, Motinagar, Premanagar, other nearby localities as per BGL EIC instructions.

2. **Disconnection and Removal of Assets:**

a. **Removal of Meters:** Safely disconnect and remove already installed DPNG meters. This includes handling the meters, which are assumed to be Free Issue Items, for subsequent return to BGL's designated stores.

b. **Removal of GI Pipe:** Remove all installed GI piping, including piping before and after the DPNG meter (up to and including the transition fitting (TF) installed by BGL, if applicable).

c. **Material Handling and Logistics:** Proper packing, loading, transportation, and unloading of all recovered equipment/materials (meters, pipes, etc.) to BGL's designated storage locations. The Contractor is responsible for inventory management and security of these items until official handover.

d. **Restoration:** Restoration of walls, floors, or any other area damaged or disturbed during the removal process, restoring the area to its original condition to the satisfaction of the concerned authorities/ customer and the EIC.

Documentation: Preparation and submission of records detailing the infrastructure removed, including location, type, quantity, and proof of return to BGL stores.

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SPECIAL CONDITIONS OF CONTRACT (SCC)+ANNEXURES

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SPECIAL CONDITIONS OF CONTRACT

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1.0 GENERAL

1.1 Special conditions of contract (SCC) shall be read in conjunction with the General Conditions of Contract (GCC). Schedule of rates, specifications of work, drawings and any other document forming part of this contract wherever the context so requires.

1.2 Notwithstanding the sub-division of the document into these separate sections and volumes, every part of each with and into the contract so far as it may be practicable to do so.

1.3 Where any portion of the GCC is repugnant to or at variance with any provisions of the special conditions of contract, then unless a different intention appears, the provision(s) of the special conditions of contract shall be deemed to override the provision(s) of GCC only to the extent that such repugnance's of variations in the special conditions of contract are not possible of being reconciled with the provisions of GCC.

1.4 Wherever it is stated in this Bidding Document that such and such a supply is to be effected or such and such a work is to be carried out, it shall be understood that the same shall be effected/carried out by the contractor at his own cost, unless a different intention is specifically and expressly stated herein or otherwise explicit from the context. Contract value (also referred to as Contract price) shall be deemed to have included such cost.

1.5 The materials, design and workmanship shall satisfy the applicable relevant Indian Standards, the job specifications stipulate requirements in addition to those contained in the standard codes and specifications, these additional requirements shall also be satisfied. In the absence of any Standard/ Specifications/codes of practice for detailed specifications covering any part of the work covered in this Bidding on the contractor.

1.6 In partial modification to Clause No.21.0 of GCC the following shall apply:
In case of contradiction between Indian or other applicable Standards, General Conditions of Contract, Special Conditions of Contract, Specifications, drawings, Schedule of Rates, the following shall prevail in order of precedence:

i) Contract Agreement
ii) Detailed Letter of acceptance alongwith statement of Agreed variations.
iii) Fax / Letter of Intent / Fax of Acceptance
iv) Schedule of Rates as enclosures to letter of acceptance
v) Job / Particular Specifications
vi) Drawings
vii) Technical / Material Specifications
viii) Special Conditions of Contract
ix) Instructions to Bidders (ITB)
x) General Conditions of Contract

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xi) Indian Standards
xii) Other Applicable Standards

1.7 It will be contractor's responsibility to bring to the notice of Engineer-in-charge any irreconcilable conflict in the contract documents before starting the work(s) of making the supply with reference which the conflict exists.

In the absence of any specifications covering any material, design of work(s) in the same shall be performed
/ supplies / executed in accordance with Standards Engineering Practice as per the instructions / directions of the Engineer-in-charge, which will be binding on the Contractor.

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1.8 The requirements of any statutory body and authority like Indian boiler regulation, Tariff Advisory Committee, Chief controller of Explosives, etc, shall govern where these are more stringent than the requirements specified above.

1.9 Owner's representative means authorized representative of Owner (i.e. M/s BGL) and / or Consultant.

2.0 THE WORK

2.1 Scope of work

BGL shall provide the Contractor with the list of customers where LMCs and/or meters have been installed. The Contractor / Bidder shall be responsible for contacting and coordinating with the customers, assessing site readiness, and undertaking onboarding for gasification or removal of meters, strictly as per the customer's willingness and interest.

The scope of work covered in this Contract will be as described in **Annexure-1** to SCC at Particular job specifications, Standard Specifications, Schedule of Rates etc.

2.2 Scope of Supply

The scope of supply covered in this Contract will be as described in **Annexure-2** to SCC Particular Job Specifications, Standard Specifications, and Schedule of Rates etc.

2.3 Time schedule

2.3.1 The work shall be executed strictly as per time schedule given in **Annexure-3** to SCC. The period of completion given includes the time required for mobilization as well as testing, rectifications, if any, retesting, demobilization and completion in all respects to the satisfaction of the Engineer-in-Charge.

2.3.2 A joint program of execution of work will be prepared by the Engineer-in-Charge and Contractor. This program will take into account the time of completion mentioned in 2.3.1 above.

2.3.3 Monthly/Weekly execution program will be drawn up by the Engineer-in-Charge jointly with the Contractor based on availability of materials, work fronts and the joint program of execution as referred to above. The contractor shall scrupulously adhere to the Targets/Programs by deploying adequate personnel, Construction Equipment, Tools and Tackles and also by timely supply of required materials coming within his scope of supply as per Contract. In all matters concerning

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the extent of target set out in the weekly/monthly program and the degree of achievement, the decision of the Engineer-in-Charge will be final and binding on the Contractor.

2.3.4 Contractor shall give every day category-wise labour and equipment deployment report alongwith the progress of work done on previous day in the proforma prescribed by the Engineer-in-Charge.

2.4 **Measurement of Works**

In addition to the provisions of Clause 88.1 of the General Conditions of Contract and associated provisions thereof, the provisions of **Annexure – 4** to SCC shall apply.

2.5 **Terms of Payment**

Terms of Payment will be as specified in **Annexure – 5** to SCC.

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2.6 **Temporary Works**

All temporary works, ancillary works, enabling works, including dewatering of surface and subsoil water, temporary drains at the work site, preparing approaches to working areas, wherever required, for execution of the work, shall be the responsibility of Contractor.

2.7 **Temporary Fencing**

The Contractor shall, at his own costs and expenses, erect and maintain in good condition temporary fences and gates along the boundaries of the site assigned to him wherever required as per instruction of Engineer-in-charge. Wherever trenching is being done specially at crossing site near habitation and public movement. The contractor shall provide barricading as per sketch enclosed and provide proper night light as per requirement and to the satisfaction of EIC. The Contractor shall, except when authorized by the Engineer-in-Charge, confine his men, materials and plant etc. within the site of which he is given possession. The Contractor shall not use any part of the site for purpose not connected with the works unless prior written permission or consent of the Owner/Engineer-in-Charge has been obtained. Access to site shall be made only through the approved gateways. The Contractor shall maintain sufficient watchmen at site to the satisfaction of the Owner/Engineer-in-Charge.

2.8 **Contractor's Temporary Structure**

The Contractor may, at his own costs and expenses and subject to the approval of the Engineer-in-Charge and statutory authorities, construct offices, stores, workshop and remove the same as per the orders of the Engineer-in-Charge on completion of the contract. Whenever required the Contractor shall furnish such details of his temporary works as may be called for by the Owner/Engineer-in-Charge as to their safety and efficiency. The Owner/Engineer-in-Charge may direct those temporary works which he considers unsafe or, inefficient be removed and replaced in a satisfactory manner. The Contractor shall immediately follow Owner/Engineer-in-Charge's direction/instruction, on maintenance of all the equipments and he shall ensure that they are suitable for the work and is maintained in such a manner as to ensure their efficient working. The Owner/Engineer-in-Charge, may if they deem fit, direct the Contractor to remove from site any equipment which are not efficient and/or prejudicial to the quality of work to be replaced by equipment to their satisfaction. The Contractor shall immediately follow Owner/Engineer-in-Charge's direction/instruction.

2.9 **Statutory Approvals**

2.9.1 All associated activities required for obtaining necessary clearances, permissions, approvals, all licenses from all concerned authorities in respect of pipeline crossing & all related works shall be the responsibility of the Contractor and the cost of the same shall be deemed to have been

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included in the quoted prices.

The approval from any authority required as per statutory rules and regulations of Central / State Government shall be the Contractor's responsibility unless otherwise specified in the Bidding Document. The application on behalf of the Owner for submission to relevant authorities along with copies of required certificate complete in all respects shall be prepared and submitted by the Contractor well ahead of time so that the actual construction of the work is into delayed for want of the approval/inspection by concerned authorities. The inspection of the works by the authorities shall be arranged by the Contractor and necessary coordination and liaison work in this respect shall be the responsibility of the Contractor. However statutory fees paid, if any, for all inspections and approvals by such authorities shall be reimbursed at actual by the Owner to the Contractor on production of documentary evidence.

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Any change/addition required to be made to meet the requirements of the statutory authorities shall be carried out by the Contractor free of charge. The inspection and acceptance of the work by statutory authorities shall however, not absolve the Contract from any of his responsibilities under this Contract.

2.10 **Quality Assurance**

2.10.1 Bidder shall include in his offer the quality assurance programme containing the overall quality management and procedures, which is required to be adhered to during the execution of contract. After the award of contract detailed quality assurance program shall be prepared by the contractor for the execution of Contract for various works, which will be mutually discussed and agreed to.

2.10.2 The Contractor shall establish document and maintain an effective quality assurance system as outlined in recognized codes.

2.10.3 Quality Assurance System plans/procedures of the Contractor shall be furnished in the in the form of QA manual. This document should cover details of the personnel responsible for the quality assurance, plans or procedures to be followed for quality control in respect of Design, Engineering, Procurement, Supply, Installation, Testing and Commissioning.

The quality assurance system should indicate organizational approach for quality control and quality assurance of the construction activities, at all stages of work at site as well as at manufacturer's works and dispatch of materials.

2.10.4 The Employer/ consultant / Consultant or their representative shall reserve the right to inspect / witness, review any or all stages of work at shop/site as deemed necessary for quality assurance.

2.10.5 The Contractor has to ensure the deployment of quality Assurance and Quality Control Engineer(s) depending upon the quantum of work. This QA /QC group shall be fully responsible to carry out the work as per standards and all code requirements. In case Engineer-in-charge feels that contractor's QA/QC Engineer
(s) are incompetent or insufficient, contractor has to deploy other experienced Engineer(s) as per site requirement and to the full satisfaction of engineer-in- charge.

2.10.6 In case contractor fails to follow the instructions of Engineer –in-charge with respect to above clauses, next payment due to him shall not be released unless until he complies with the instructions to the full satisfaction of Engineer –in –charge.

2.10.7 The contractor shall adhere to the quality assurance system as per specification enclosed in the bidding document as Annexure-6.

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2.11 **Notice and Licenses**

The Contractor shall at his costs and expenses give to the Municipal or Panchayat, Police and other authorities all notices etc., that may be required in law to be given and obtain all necessary permissions and licenses etc., for temporary obstructions, enclosures and pay all fees, taxes charges etc. which may be leviable by such authorities for that purpose. The Contractor shall make good any damage to the adjoining property whether public or private.

2.12 **Working Hours**

Depending upon the requirements, time schedule/ drawn up programs and the target set to complete the job in time the works may have to continue beyond normal working hours to the extent of round the clock and on holidays also for which no extra claim shall be entertained.

2.13 **Responsibility of Contractor**

Preparing approaches and working area for the movement and operation or the cranes, levelling the area for assembly and erection shall also be the responsibility of the Contractor. The Contractor shall acquaint himself with access availability, facilities such as railway siding, local labour etc.

The procurement and supply in sequence and at the appropriate time of all materials and consumables covered under Contractor's scope of supply shall be entirely the Contractor's responsibility. Contractor shall not use any of the equipment or materials issued to him by Owner for temporary works, manufacturing erection aids etc. Misuse of materials will be seriously viewed and deduction at penal rates will be made from the Contractors bill for such quantities that are misused.

Contract Price is deemed to be inclusive of all expenses towards above responsibilities.

2.14 **Additional Works/Extra Works**

Owner reserve their right to execute any additional works/ extra works, during the execution of Work, either by themselves or by appointing any other agency, even though such works are incidental to and necessary for the completion of works awarded to the Contractor. In the event of such decisions taken by Owner, Contractor is required to extend necessary cooperation and act as per the instructions of Engineer-in-Charge.

2.15 **Compensation for Idle Time**

The owner shall make every reasonable effort to have the materials and working front available so as not to delay laying activities. No idle time claim shall be entertained under any circumstances.

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2.16 **Power and Water Connection**

The Purchaser / Consultant will not provide any power and water during construction period. Contractor shall apply and obtain necessary power and water during connection from relevant authority and will pay its usage charge or arrange the same from the other sources.

2.17 **Penalties**

2.17.1 In case of proper barricading is not provided, along the trench and pits, as per technical specification for laying of PE Pipeline, the work shall be immediately suspended till such time proper barricading as per the technical specification is provided and Rs. 1000.00 per case / location per day shall be levied as penalty till such time the barricading is provided. In case the contractor fails to provide the barricading for long time, at the discretion of Owner, the work shall be offloaded to some other agency at the risk and cost of the contractor.

2.17.2 Installation/ Works to be carried out by the contractor as per the latest industry recommended practices/ latest relevant standards/ latest relevant code/ technical specification/ SOR. Incise of any conflict among above, most stringent requirement shall be adopted. If installation/ works carried out by the contractor is not as per the latest industry recommended practices/ latest relevant standards/ latest relevant code/ technical specification/ SOR, and rectification of the same is not completed within the stipulated time, a penalty of Rs.

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2000.00 per connection shall be levied on the contractor.

2.17.3 In case it is noticed and confirmed by the consultant / Third Party Agencies / Owner's Site-In Charge that any fusion jointing and conversion is being carried out by personnel other than approved / qualified technicians as per the technical specifications for laying of PE pipelines and technical specifications for installation of GI/Copper Pipes, Rs. 1000.00 per joint or conversion shall be levied and the person supervising the work shall be suspended from Client's/Owner's/PMC's Site.

2.17.4 Material reconciliation statement must be provided with each running bills.

2.17.5 Contractor is expected to complete 375 to 400 no. of house hold connection monthly who has been awarded with 750 nos. DPNG connections Release order.

Contractor is expected to complete 375 to 400 no. of house hold connection monthly who has been awarded with 1500 nos. DPNG connections Release order.

Contractor is expected to complete 15KM of PE laying monthly who has been awarded with 30KM PE laying Release order.

Further, if awarded DPNG connections/PE laying to the contractors are varies from stipulated DPNG connections/PE laying as mentioned above or varies as per site condition as decided by EIC, in that case Contractor is expected to complete no. of house hold connection/PE laying monthly on pro-rata basis as decided by EIC.

The grace period of one (01) week is applicable on the above monthly target. In case there is delay (attribute to Contractor) in achieving monthly target after a grace period of one (01) week, a penalty shall be levied @ Rs. 1000 per connection of delayed quantity and the same shall be deducted from their running advance (RA) bill.

Penalty for said works shall be dealt as per Release order wise.

2.17.6 In case Fusion machine with GPS facility is not available at site, a penalty shall be levied @ Rs. 500 per joint per machine.

2.17.7 Contractor shall submit Route map with GPS Coordinates of PE pipeline laid every month (with maximum fifteen (15) days backlog allowed), failing which 5% of the respective RA bill amount shall be put under retention.

2.17.8 Proper inspection of bought out items at site by PMC/BGL is to be ensured by contractor within 1 week from the date of arrival of material at site failing which no amount will be certified against supply as well installation in the respective RA bill

2.17.9 Quarterly Closure Statement/ Report must be provided after every quarter, failing which a

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penalty of Rs. 5000.00 per week of delay will be deducted from Contractor's RA Bills. Format of Quarterly Closure Report will be provided by EIC.

2.17.10 Contractor to deploy safety officer/safety supervisor at site (as per the guidelines given in Annexure-9 of SCC to Annexure), failing which penalty of Rs 3300 per day will be deducted from Contractor's RA Bills.

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Depending upon site conditions, EIC can modify the various penalties and decision of EIC in this regard shall be final and acceptable.

3.0 CONSTRUCTION

OWNER reserves the right to inspect all phases of Contractor's operations to ensure conformity to the SPECIFICATIONS. Owner will have Engineers, Inspectors or other duly authorized representatives, made known to the Contractor present during progress of the WORK and such representatives shall have free access to the WORK at all times. The presence or absence of an Owner's representative does not relieve the Contractor of the responsibility for quality control in all phases of the WORK. In the event that any of the WORK being done by the Contractor or any Sub-Contractor is found by Owner's representatives to be unsatisfactory or not in accordance with the DRAWINGS, procedures and SPECIFICATIONS, the Contractor shall, upon verbal notice of such, revise the work in a manner to conform to the relevant DRAWINGS, procedures and SPECIFICATIONS.

3.1 Rules and Regulations

Contractor shall observe in addition to Codes specified in respective specification, all national and local laws, ordinances, rules and regulations and requirements pertaining to the work and shall be responsible for extra costs arising from violations of the same.

3.2 Procedures

Various procedures and method statements to be adopted by Contractor during the construction as required in the respective specifications shall be submitted to Engineer-in-Charge in due time for approval. No construction activity shall commence unless approved by Engineer-in-Charge in writing.

3.3 Security

The work being in protected area, entry into the work area shall be restricted and governed by issue of photo gate passes by the Security/CISF. The Contractor shall arrange to obtain through the Engineer-in-Charge, well in advance, all necessary entry permits/gate pass for his staff and labour and entry and exit of his men and materials shall be subject to vigorous check by the security staff. The Contractor shall not be eligible for any claim or extension of time whatsoever on this account.

3.4 Drawings and Documents

3.4.1 The drawings accompanying the bid document (if any) are of indicative nature and issued for

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bidding purpose only. Purpose of these drawing is to enable the bidder to make an offer in line with the requirements of the Employer/Consultant. However, no extra claim whatsoever, shall be entertained for variation in the "Approved for Construction" and "Bid document drawings" regarding any changes/units. Construction shall be as per drawings/specifications issued/approved by the Engineer-in-Charge during the course of execution of work. Detailed construction drawings (wherever required) on the basis of which actual execution of work is to proceed will be prepared by the contractor.

3.4.2 The drawings and documents to be submitted by the Contractor to Employer/Consultant after award of the work as per the requirements enlisted in the bidding document shall be for Employer/Consultant's review, information and record. The Contractor shall ensure that drawings and documents submitted to Employer/Consultant are accompanied by relevant calculations, data as required and essential for review of the document/ drawings. Owner/PMC shall review the drawings/ documents within two weeks from the date

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of submission provided the same are accompanied by relevant calculations, data as required and essential for review.

3.4.3 All documents and drawings including those of Contractor's sub-vendors manufacturers etc. shall be submitted to Employer/Consultant after fully vetted in detail, approved and co-opted by the Contractor & shall bear Contractor seal/ certifications to this effect. All documents/drawings & submissions made to Employer/Consultant without compliance to this requirement will not be acceptable and the delay & liability owing to this shall be to the Contractor's account.

3.4.4 The review of documents and drawings by Employer/Consultant shall not absolve Contractor from his responsibility to meet the requirements of specifications, drawings etc. and liabilities for mistakes and deviations. Upon receiving the comments on the drawing/documents reviewed by Employer/Consultant, Contractor shall incorporate the comments as required and ensure their compliance.

3.4.5 Copies of all detailed working drawing relating to the works shall be kept at the contractors' office at the site and shall be made available to the Engineer-in-charge/ Employer/Consultant at any time during execution of the contract. However, no extra claim what so ever shall be entertained for any variation in the "approved/issued for construction drawings" and "tender drawings" regarding any changes/units unless otherwise agreed.

3.4.6 The Contractor shall rectify any inaccuracies, errors and non-compliance to contractual requirements. Any delay occurring on this shall not construed a reason for delay/ extension.

3.5 Excavation by blasting

Excavation by blasting is not permitted wherever required in hard strata other mechanical tools shall be used.

3.6 Construction Equipment & Mechanization of Construction Activities

Contractor shall, without prejudice to his overall responsibility to execute and complete the Work as per specifications and time schedule, adopt as far as practicable, mechanized construction techniques for major site activities. However, Contractor agrees that he will deploy the required numbers and types of the part & machinery applicable for different activities in consultation with the Engineer-In-Charge during execution of works.

The Contractor shall mechanize the construction activities to the maximum extent by deploying all necessary construction equipment/machinery in adequate numbers and capacities.

Wherever Structural/Piping works are included in the scope, the Contractor's responsibilities shall

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include establishing and maintaining of a proper fabrication workshop with transportation facilities to site to carryout fabrication of steel structures, piping specials etc., preparing approaches working areas for the movement/operation of cranes and levelling the areas for assembly/erection to ensure effective mechanization on the works. The Contractor shall acquaint himself with availability of access, facilities such as railway siding, local labour etc. and the Contractor may have to build temporary access roads to aid his work and the quoted and agreed rates shall be deemed to include the same. It may be noted that all fabrication work shall be carried out in fully mechanized workshops to reduce site fabrication to minimum.

For speedy execution of work, Contractor shall also ensure use of computer software for at least the following:

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(i) Billing
(ii) Planning & Scheduling
(iii) Progress Reporting
(iv) Material Control & Warehousing
(v) Safety Records
(vi) Resource Deployment
(vii) Communication

Contractor further agrees that Contract price is inclusive of all the associated costs) which he may incur for actual mobilization, required in respect of use of mechanized construction techniques and that the Owner/Consultant in this regard shall entertain no claim whatsoever.

3.7 Site Organization

The Contractor shall provide all necessary superintendence during the design and execution of the Works and as long thereafter as the Engineer-in-Charge may consider necessary for the proper fulfilling of the Contractor's obligations under the Contract. Such superintendence shall be given by sufficient persons having adequate knowledge of the operations to be carried out including the methods and techniques required the hazards likely to be encountered and methods of preventing accident for the satisfactory and safe execution of the Work. The workmen deployed, by the Contractor should also possess the necessary license etc., if required under any law, rules and regulations.

Subject to the provisions in the Contract Document and without prejudice to Contractor's liabilities and responsibilities to provide adequate qualified and skilled personnel on the Work, Contractor shall augment the same as decided by the Engineer-in-Charge depending on the exigencies of Work.

3.7.1 SUPERVISION

All construction work will be carried out as per direction of EIC, and this will be the primary point of contact between the Contractor and BGL. on site. All work will be issued and sanctioned through the EIC and site control exercised by site engineers. The Contractor shall ensure that technical quality standards are maintained, that construction is carried out cost effectively and that a good customer and public image is maintained for BGL.

The Contractor will appoint his own supervisors of minimum number instructed by EIC. These personnel will be responsible to the SE for monitoring construction standards and for ensuring that all detailed technical requirements are met on each and every job which is undertaken. The Contractor's supervisor(s) will have day to day liaison with the SE, and will provide the SE with technical reports and audits, and other management information as is required on work progress

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and construction quality standards.

The Contractor's supervisor shall have smart mobile phones with internet facility to ensure that they can be contacted & communicated at all times. The Contractor will also nominate one person who can be contacted, if necessary, out of hours, for the duration of the works. The Contractor's supervisor will have access to transport at all times to allow them to visit sites and attend meetings with client/ owner as and when are required. The normal day to day issue of work instructions, communication between BGL. and the Contractor's supervisor and the SE. No deviation from the approved technical specification / issued construction drawings shall be undertaken without written approval of EIC.

The successful bidder / contractor will as far as possible engage local workers/manpower in the activities to be undertaken / executed by them for BGL.

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3.8 Health Safety and Environment (HSE) Management

After the award of the contract, detailed Health, Safety and Environment (HSE) program to be followed for execution of contract under various divisions of works will be mutually discussed and agreed between Contractor, Client & PMC.

The Contractor shall establish document and maintain an effective Health, Safety and Environment (HSE) management system. In case contractor fails to follow the instructions of Engineer-in-charge with respect to above clauses, next payment due to him shall not be released unless until he complies with the instructions to the full satisfaction of Engineer-in-charge.

The Contractor shall adhere to the Health, Safety and Environment (HSE) management system as per BGL. Specification and General Conditions of Contract.

It will be the Contractor's responsibility to acquaint his site staff and operatives of all current safety legislation, statutory requirements and BGL's safety standards/**Safety Management system**. In addition, and before any work takes place all the Contractor's operatives shall be given training in site safety by the trained person under supervision of BGL. If the Contractor wishes to start any new operatives on site, he must first inform the SE, who will arrange for such training to be arranged.

3.9 General Guidelines During and Before Erection

3.9.1 The Contractor shall be responsible for organizing the lifting of the structural element, equipment in the proper sequence, that orderly progress of the work is ensured and access routes for erecting the other structures/ equipments are kept open.

3.9.2 During the performance of the work the Contractor at his own cost, shall keep structures, materials and equipment adequately braced by guys, struts or otherwise approved means which shall be Supplied and installed by the Contractor as required till the installation work is satisfactorily completed.

Such guys, shoring, bracing, strutting, planking supports etc. shall not interfere with the work of other agencies and shall not damage or cause distortion to other works executed by him or other agencies.

3.9.3 Manufacturer's recommendations and detailed specifications for the installation of the various equipment and machines shall be fulfilled by the Contractor.

3.9.4 Various tolerances required as marked on the drawings and as per specifications and instructions of the Engineer-in-Charge, shall be maintained.

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Verticality shall be maintained. Verticality shall be verified with the Theodolite/advanced instruments.

3.10 Construction Photographs

The Owner desires to have two sets of monthly progress reports with photographs showing the progress of construction. Before utilizing any photograph for publicity, the Contractor shall obtain prior approval of the Owner.

3.11 Schedule of Labour Rates

Schedule of Labour Rates attached as **Annexure-10** to SCC shall be used for analysing rates for extra items.

Schedule of equipment rates attached as **Annexure-11** to SCC shall be used for analysing rates for extra items.

3.11.1. Construction Equipment

Minimum construction equipment to be deployed is enclosed as **Annexure-8** to SCC. However, any other equipment required for completion of pipeline laying work but not specifically mentioned here, shall be deployed by contractor without any additional cost. The list of equipments mentioned in **Annexure-8** is the minimum to be deployed by contractor and contractor shall ensure the availability at site of listed equipments in good working condition.

3.12 Specific Requirements

Specific requirements spelt out in various technical parts of the Bidding Document shall be followed by Contractor.

3.13 SITE CLEANING

3.13.1 The BIDDER shall take care for cleaning the working site from time to time for easy access to work site and also from safety point of view.

3.13.2 Working site should be always kept cleaned up to the entire satisfactions of the Engineer-in-charge.

Before handing over and work to owner, the BIDDER in addition to other formalities to be observed as detailed in the document shall clear the site to the entire satisfaction of Engineer-in-charge.

3.14 SURVEY OF WORK

Before the WORK or any part thereof are begun, the Contractor's agent and the Engineer-in-Charge's representative shall together survey the SITE and decide the tentative route considering all

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obstructions on which the pipeline is to be laid and on which measurements of the WORK are to be based. Such particulars shall be plotted by the BIDDER and trial pits started thereon.

The Contractor shall be entirely responsible for the correctness of every part of the WORK and shall rectify any errors or imperfections therein. Such rectifications shall be carried out by the Contractor at his own cost, when instructions are issued to this effect by the Engineer-in-Charge or his representative.

WORK shall be suspended for such times as necessary for checking lines and levels on any part of the WORK.

The Contractor shall at his own expense provide all assistance, which the Engineer-in-Charge may require for checking the setting out to WORKS.

Before commencement of any activity, Contractor's quality control set up duly approved by company must be available at site.

3.15 MANPOWER DEPLOYMENT

3.15.1 Bidder shall meet the requirement regarding deployment of minimum skilled manpower as specified in the bidding document at Annexure-9.

3.15.2 Schedule of Labour & Equipment Rates

Hiring / Recovery Rate for Deployment of Manpower attached as Annexure- 10 to SCC shall be used for analysing rates for extra items and recovery for non- deployment of manpower.

3.15.3 Equipment Hiring / Recovery Rates attached as Annexure-11 to SCC shall be used for analysing rates for extra items and recovery for non-deployment of equipment.

3.16 PRICE ADJUSTMENT DUE TO DELAYED MOBILIZATION OR SHORTFALL IN MOBILISATION OF MINIMUM EQUIPMENT AND MANPOWER

3.16.1 In case during execution, adequate front is not available at site, contractor may request for delayed mobilization of certain equipments / manpower and submit for approval of Engineer-in-charge.

3.16.2 Contractor shall maintain record of actual mobilization of each equipment and key personnel and offer the same to EIC on monthly basis.

3.16.3 In case of delay in mobilization or shortfall in mobilization of equipment and key personnel w.r.t approved deployment of equipments and manpower, recovery shall be effected from contractor's running bills as certified by ENGINEER INCHARGE. The recovery shall be based on the hiring / recovery rates specified elsewhere in the bidding document.

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3.16.4 If found necessary, BGL / PMC may deploy any equipment / manpower and recover the amount for such deployment as per rates provided at Annexure-10 & 11 to SCC respectively.

3.16.5 In case of early mobilization or additional mobilization of equipment as compared to required equipments to meet the schedule requirement. Contractor shall not be entitled for any extra claim.

3.16.6 Equipment and key personnel may be demobilized by the contractor on completion works at site after written clearance of Engineer-in-charge. Unilateral withdrawal of any equipment / key manpower by the contractor will attract recovery as per the hiring / recovery rates specified in Annexure-10 & 11 to SCC.

3.16.7 Deduction under this clause is in addition to PRS applicable pursuant to GCC clause 27.0 and SCC Clause. The provision of GCC clause no. 27.0 shall have no bearing on this clause. The Contractor's maximum liability towards deduction for non-deployment of requisite minimum equipment & manpower shall be limited to 2.5% of contract price.

3.16.8 In case PRS is not applicable to the contractor, then amount deducted on account of non-deployment of equipments and manpower will be refunded to the contractor.

3.16.9 In case of final bill, contractor shall be required to submit NOC from subcontractor about receipt of full payment from the contractor.

3.16.10 Contractor shall maintain record of actual mobilization of each equipment and key personnel. Joint record of equipment mobilization will be maintained month-wise. Further a copy of hindrance register for the specified period (RA bill period) duly signed by contractor/ PMC / BGL shall be maintained and submitted along with each RA bill.

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4.0 TESTS, INSPECTION AND COMPLETION

4.1 Tests and Inspection of Material under Contractor's Scope

Inspection and test prior to shipment of material and at final acceptance shall be as specified in Technical Specification. However, without prejudice to the provision of Technical Specification following shall hold good.

The Owner/Consultant or its representative shall have the right to inspect ad or to test the material to conform their conformity to the specification.

If any inspected or tested material fail to conform the specification, the Owner/Consultant may reject them and the contractor shall either replace the rejected materials or make all the alteration necessary to meet the specification, free of cost to the purchaser/consultant.

The Purchaser / Consultant's right to inspect, test and where ever necessary reject the material after the material's arrival in the purchaser / consultant site shall in no way be limited to or waived by reason of the material having previously been inspected, tested and passed by the purchaser/ Consultant or their representative prior to the material shipment from the material supplier.

4.2 Tests and Inspection during execution

The Contractor shall carry out the various tests as enumerated in the technical specifications of this Bidding Document and technical documents that will be furnished to him during the performance of the work at no extra cost to the Owner.

All the tests either on the field or at outside laboratories concerning the execution of the work and supply of materials by the Contractor shall be carried out by Contractor at his own cost.

The work is subject to inspection at all times by the Engineer-in-Charge. The Contractor shall follow all instructions given during inspection and shall ensure that the work is being carried out according to the technical specifications of this Bidding Document, the technical documents that will be furnished to him during performance of work and the relevant codes of practice.

The Contractor shall provide for purposes of inspection access ladders, lighting equipment for testing, necessary instruments etc. at his own cost, low voltage lighting equipment for tray fixing and inspection work.

Compressed air for carrying out works shall be arranged by the Contractor at his own cost.

For material supplied by Owner, Contractor shall carry out the tests, if required by the Engineer-

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in-Charge, and the cost of such tests shall be reimbursed by the Owner at actual to the Contractor on production of documentary evidence.

Contractor shall inspect carefully all equipment before receiving them from Owner for installation purposes. Any damage or defect noticed shall be brought to the notice of Engineer-in- Charge immediately.

All results of inspection and tests will be recorded in the inspection reports, proforma of which will be approved by the Engineer-in-Charge. These reports shall form part of the completion documents. Any work

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not conforming to execution drawings, specifications or codes shall be rejected and the Contractor shall carryout the rectifications at his own cost.

Inspection and acceptance of the work shall not relieve the Contractor from any of his responsibilities under this Contract.

4.3 Final Inspection during execution

After completion of all tests as per specification the whole work will be subject to a final inspection to ensure that job has been completed as per requirement. If any defect is noticed, the Contractor will be notified by the Engineer-in-Charge and he shall make good the defects at his own cost and risk with utmost speed. If, however, the Contractor fails to attend to these defects within a reasonable time (time period shall be fixed by the Engineer-in-Charge) then Engineer-in-Charge may have defects rectified at Contractor's cost.

When these works are carried out at the risk and cost of the Contractor, the Engineer-in-charge would recover the actual cost incurred towards labour, supervisions and material, consumables or otherwise, plus 100% towards overheads from any pending bill of the Contractor or the security deposit.

4.3 Documentation

4.3.1 As- Built Drawings

Notwithstanding the provisions contained in standard specifications, upon completion of commissioning, the BIDDER shall complete all of the related approved drawings along with bill of materials to the "AS BUILT" stage provide to a **scale of 1:200** and submit to BGL., the following:

a) One complete set in reduced size (279 mm x 432 mm).
b) One complete set of Soft Copy in CD of all original drawings.
c) Four complete sets of approved prints in A2 / A3 sizes.

4.3.2 Completion Document

The following documents shall be submitted in hard binder by the BIDDER in FOUR sets, as a part of completion documents: -

a) Copies of the Inspection reports, Laying Graphs, HDD Profiles (IF ANY) and valve pit drawings (IF ANY).

b) Pre testing, final Hydrostatic / pneumatic and other Test results and reports.

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c) Consumption statements of PE / GI certified by Owner's Site Engineer.

d) Final Material Reconciliation, stores issue & return statements

e) All other requirements as specified in the respective specifications.

f) Completion Certificate issued by Owner's Site Engineer.

g) No claim certificate by the BIDDER.

h) Completion certificate for embedded and covered up works wherever applicable.

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i) Recovery statement, if any.

j) Deviation statement.

k) Statement for reconciliation of all the payments and recoveries made in the progress bills.

l) Copies of deviation statement and order of extension of time, if granted.

m) Any other contractual documents required on completion.

n) Total list of houses in the area allotted to him giving details of connections provided & reasons where connection could not be given / completed.

o) The details recorded in measurement cards of every domestic house.

p) Details of houses where extra piping done along with materials used.

q) Total material consumption report.

r) Material reconciliation with respect to the materials issued.

s) Test reports & test certificates of gauges etc.

t) Any other documents / records required.

4.4 Statement of Final Bills-Issue of No Demand Certificate

The final bill of Contractor shall be accompanied by no-demand certificate from the following departments of the Owner:

i) Administration & Personnel Department regarding vacation of land, housing accommodation, recovery of tents etc.

ii) Fire and Safety Officer and CISF. (IF REQUIRED)

The Contractor shall obtain such no-demand certificates from the concerned authorities and furnish the same to the Engineer-in-Charge.

4.5 Issue and Reconciliation of Material

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Refer **Annexure-7** to SCC for details.

4.6 GOVERNMENT OF INDIA NOT LIABLE

It is expressly understood and agreed by and between the Contractor and the Employer that the Employer is entering into this agreement solely on its own behalf and not on behalf of any other person or entity. In particular, it is expressly understood and agreed that the Government of India is not a party to this agreement and has no liabilities, obligations or rights there under. It is expressly understood and agreed that the Employer is an independent legal entity with power and authority to enter into contract, solely in its own

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behalf under the applicable laws of India and general principal of Contract Law. The Contractor expressly agrees, acknowledges and understands that the Employer is not an agent, representative or delegate of Govt. of India. It is further understood and agreed that the Govt. of India is not and shall not be liable for any acts, omissions, commissions, breaches or other wrongs arising out of the contract. Accordingly, contractor hereby expressly waives, releases and foregoes any and all actions or claims, including cross claims, impleader claims or counter claims against the Govt. of India arising out of this contract and covenants not to sue to Govt. of India as to any manner, claim, cause of action or thing whatsoever arising of or under this agreement.

5.0 VOID

6.0 LIMITATION OF LIABILITY

"Clause no. 80.3 of GCC-Works is modified to the following extent:

Following shall stand appended to clause no. 80.3 of GCC-Works:
The final payment by the Employer in pursuance of the Contract terms shall not mean release of the Contractor from all of his liabilities under the Contract. The Contractor shall be liable and committed under this contract to fulfil all his liabilities and responsibilities, till the time of release of contract performance guarantee by the Employer.

7.0 Void

8.0 CONTRACT PERFORMANCE GUARANTEE

Please refer clause no. 38 of ITB (Vol. I) & clause no. 24.0 of GCC (General Condition of Contract)

& BDS. In addition to above, following will also apply: -

a) In the event completion of works is delayed beyond the Scheduled Completion Date for any reasons whatsoever, the Contractor shall have the validity of the guarantee suitably extended to cover the period mentioned above.

b) The Employer/Consultant shall have an unqualified option under this guarantee to invoke the Banker's Guarantee and claim the amount there under in the event of Contractor failing to honour any of the commitments entered into under this Contract and/or in respect of any amount due from the Contractor to the Employer/Consultant. In case Contractor fails to furnish the requisite Bank Guarantee as stipulated above, then the Employer/Consultant shall have the option to terminate the Notification of Award of Work and forfeit the Bid Security/Earnest Money amount and no compensation for the works performed shall be payable upon such termination.

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c) Upon completion of the Works as per Completion Schedule stipulated in Contract, the above said guarantee shall be considered to constitute the Contractor's warranty/guarantee for the work done by him or for the Works supplied and performance as per the specifications and any other conditions against this Contract. The warranty/guarantee shall remain in force for 12 months from the date of issuance of certificate of Completion and Acceptance against this Contract as per GCC. Contractor shall also arrange for the Performance Guarantee to remain valid until expiration of the guarantee period for entire works covered under the contract.

d) In the event of Completion of Project being delayed beyond the Scheduled Completion Date, the Employer/Consultant may without prejudice to any other right or remedy available to the Employer/Consultant, operate the Bank Guarantee to recover the Compensation for delay leviable as per

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Clause 27 of GCC. The Bank Guarantee amount shall thereupon be increased to the original amount, or the Contractor may alternatively submit a fresh Bank Guarantee for the equivalent amount of compensation for delay recovered.

9.0 TAXES, DUTIES AND LEVIES IN INDIA

9.1 The Contractor agrees to and does hereby accept full and exclusive liability for the payment of any and all taxes, duties, including GST, custom duty, etc. now in force and hereafter increased, imposed or modified from time to time in respect of works and materials and all contributions and taxes for unemployment compensation, insurance and old age pensions or annuities now or hereafter imposed by any Central or State Government authorities which are imposed with respect to or covered by the wages, salaries, or other compensations paid to the persons employed by the Contractor and the Contractor shall be responsible for the compliance with all obligations and restrictions imposed by the Labour Law or any other law affecting employer-employee relationship and the Contractor further agrees to comply, and to secure the compliance of all subcontractors with all applicable Central, State, Municipal and local law and regulation, and requirement of any central, State or Local Government agency or authority. Contractor further agrees to defend, indemnify and hold Employer/Consultant harmless from any liability or penalty which may be imposed by the Central, State or Local authorities by reason of any violation by Contractor or Subcontractor of such laws, regulations or requirements and also from all claims, suits or proceedings that may be brought against the Employer/Consultant arising under, growing out of, or by reason of the work provided for by this Contract, by third parties, or by Central or State Government authority or any administrative sub-division thereof. The prices shall also be inclusive of all taxes/ Trade tax/ turnover tax as applicable.

9.2 Employer shall make from Contractors bills such tax deductions as are required as per rules and regulations in force from time to time.

9.3 If GST is applicable during site fabrication, the same must be assessed and deemed to be included by the bidder in the quoted prices. The bidder in this regard shall arrange all required formalities.

9.4 Bidder shall take care of all applicable taxes & duties while submitting their prices.

9.5 Any errors of interpretation of applicability of taxes/ duties by Bidders shall be to their account.

10.0 SUBSEQUENT LEGISLATION

10.1 All duties, taxes (including trade tax/ turnover tax/GST as applicable), fees, charges, expenses, etc. (except where otherwise expressly provided in the Contract) as may be levied/ imposed in consequence of execution of the works or in relation thereto or in connection therewith as per

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the Acts, Laws, Rules, Regulations in force shall be to Contractor's account. However, any new taxes /duties imposed after the date of submission of last price bid & up to Contractual Completion date shall be to the BGL.'s account but such Taxes /duties imposed beyond Contractual Completion date shall be to the Contractor's account. However if such new taxes etc. is in substitute of existing taxes, same will be considered on merit of each case.

11.0 STATUTORY VARIATION IN TAXES & DUTIES

Refer ITB.

12.0 INCOME TAX & CORPORATE TAX

Refer ITB.

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13.0 VOID

14.0 CUSTOMS DUTY ON CONSTRUCTION EQUIPMENTS

14.1 Contractor is liable to pay custom duty on the equipments brought into India for executing the project. The Contractor shall be fully liable for observing all the formalities in this regard as well as to pay the custom duty chargeable on the equipments, including any deposit payable for such purposes. No adjustment in contracted rates shall be permissible for any change in duty drawback applicable in respect of equipment & machinery brought in India for the use of the project and for re-export of equipment and machinery, on completion of the project.

14.2 If the Custom Authorities require the Contractor to furnish a bond to secure payment of any custom duty in respect of any import and that such Bond shall be furnished by the Employer, the Employer may at the request of the Contractor furnish the said Bond against the Contractor furnishing a Bank Guarantee to the Employer, of the like amount in the form and from a Bank in India approved by the Employer.

14.3 If for any reason the Employer is required by the Customs Authorities during pendency of Contract to pay any customs duty due to the importation or retention by the Contractor of any imports, the Contractor shall forthwith on demand by the Employer pay the same to the Employer, with the right in the Employer/Consultant (without prejudice to any other mode of recovery or right of the Employer/Consultant) to deduct the same from the on account and other payments due and/or becoming due or payable to the Contractor from time to time. The payments under such a case shall be subject to submission of Bank Guarantee from a Bank approved by Employer, by the Contractor in favour of the Employer for an amount equivalent to amount of custom duty.

14.4 The obligations undertaken and/or any bond or facility provided by the Employer to the Contractor shall be based on the clear understanding that the said equipment shall be utilized by the Contractor only for the performance of the work covered under this contract and that the Employer/Consultant shall be discharged forthwith from all said obligations and shall be entitled forthwith to discontinue and recall any bond or other facility to the Contractor if the Contractor shall utilize or permit to be utilized the said equipment(s) or any of them for the performance of any work other than the work covered by the Contract in which event any amount due from Contractor in this connection shall also carry interest @22% (Twenty two percent) per annum from the date of relative payment by Employer up to the date of recovery in full.

15.0 ISSUE OF CERTIFICATE- PERTAINING TO IMPORT

BGL. shall not provide any kind of certificate in this regard.

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16.0 IMPORT LICENCE

16.1 Contractor shall arrange import of all materials required for permanent incorporation in the works as well as construction equipment as per the guidelines laid down by the Government of India. Employer shall not provide import license.

17.0 WITHHOLDING, ACCOUNTING AND TAX REQUIREMENTS

17.1 Contractor agrees for withholding from wages and salaries of its agents, servants or employees all sums, required to be withheld by the laws of the Republic of India or any other agency having jurisdiction over the area where Contractor is conducting operations, and to pay the same promptly and directly when due to the

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proper authority. Contractor further agrees to comply with all accounting and reporting requirements of any Nation having jurisdiction over the subject matter hereof and to conform to such laws and regulations and to pay the cost of such compliance. If requested, Contractor will furnish the evidence of payment of applicable taxes, in the country (ies) of the Contractor's and his sub-contractor(s) and expatriate employees.

18.0 INTELLECTUAL PROPERTY

18.1 Neither Employer nor Contractor nor their personnel, agents nor any sub-contractor shall divulge to any one (other than persons designated by the party disclosing the information) any information designated in writing as confidential and obtained from the disclosing party during the course of execution of the works so long as and to the extent that the information has not become part of the public domain. This obligation does not apply to information furnished or made known to the recipient of the information without restriction as to its use by third parties or which was in recipient's possession at the time of disclosure by the disclosing party. Upon completion of the works or in the event of termination pursuant to the provisions of the contract, Contractor shall immediately return to Employer/Consultant all drawings, plans, specifications and other documents supplied to the Contractor by or on behalf of Employer/Consultant or prepared by the Contractor solely for the purpose of the performance of the works, including all copies made thereof by the Contractor.

19.0 FIRM PRICE

19.1 The quoted prices shall be firm and shall not subject to price escalation till the work is completed in all respects.

20.0 WORKS CONTRACT

20.1 The work covered under this contract shall be treated as "Works Contract".

21.0 PROVIDENT FUND ACT

21.1 The Contractor shall strictly comply with the provisions of Employees Provident Fund Act and register themselves with RPFC before commencing work. The Contractor shall deposit Employees and Employers contributions to the RPFC every month. The Contractor shall furnish along with each running bill, the challan/ receipt for the payment made to the RPFC for the preceding months.

22.0 MOBILIZATION ADVANCE

Not Applicable for this tender

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23.0 TERMS OF PAYMENT

23.1 Basis and terms of payment for making "On Account Payment" shall be as set out in Annexure-5 to SCC.

24.0 DELETED

25.0 COORDINATION WITH OTHER AGENCIES

25.1 Work shall be carried out in such a manner that the work of other agencies operating at the site is not hampered due to any action of the Contractor. Proper coordination with other agencies will be Contractor's responsibility. In case of any dispute, the decision of Engineer-in-Charge shall be final and binding on the Contractor.

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26.0 SINGLE POINT RESPONSIBILITY

The entire work as per scope of work covered under this contract (to be awarded to any bidder as per evaluation methodology) shall be awarded on single point responsibility basis.

27.0 ROYALTY

27.1 Contractor's quoted rate should include the royalty on different applicable items as per the prevailing Government rates. In case, Employer is able to obtain the exemption of Royalty from the State Government, the contractor shall pass on the same to Employer for all the items involving Royalty.

28.0 THE FACILITIES FOR WORKMEN

28.1 Following facilities are to be ensured at all work places where workmen are deployed/ engaged by Contractor & any other, as required by law at the time of execution.

- Arrangement of first aid
- Arrangement for clean drinking water.
- Toilets
- Canteen where tea & snacks are available
- A crèche where 10 or more women workmen are having children below the age of 6 years.

29.0 ARBITRATION

Refer ITB

30.0 PROJECT PLANNING, SCHEDULING AND MONITORING SYSTEM

30.1 The Contractor shall follow the specifications with respect to Project Planning, Scheduling and Monitoring system as giving in Bidding Document.

31.0 CHECKING OF LEVELS

31.1 The Contractor shall be responsible for checking levels, orientation plan of all foundations, foundation bolts, etc., well in advance of taking up the actual erection work and bring to the notice of Engineer-in-Charge discrepancies, if any. In case of minor variations in levels etc. the Contractor shall carry out the necessary rectifications to the foundations within his quoted price.

31.2 The Contractor shall also be responsible for checking with templates, wherever necessary, the

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disposition of foundation bolts with the corresponding bases of structure and shall effect rectifications, as directed, within his quoted rate.

32.0 STORAGE FACILITIES

32.1 The Contractor shall maintain wherever required an air-conditioned room for the storage of the instruments as well as for calibration and testing of the instruments at his own cost. The contractor shall provide these facilities within the quoted price.

33.0 ABNORMALLY HIGH RATED ITEMS (AHR ITEMS)

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Refer ITB.

34.0 VOID

35.0 BUILDING AND OTHER CONSTRUCTION WORKER'S ACT

In order to govern welfare and working conditions of labourers engaged in construction activities, the Building and other Construction Workers' (Regulation of Employment and Conditions of Service "RE &CS") Act, 1996 came into force. RE&CS Act'1996 is applicable in respect of building and other construction work. Wherever applicable, The CONTRACTOR shall strictly comply with the following provisions pertaining to RE &CS Act'1996.

a. The CONTRACTOR must be registered with the concerned authorities under the Building and Other Construction Workers' (RE&CS) Act, 1996 or in case of non-registration; the CONTRACTOR should obtain registration within one month of the award of contract.

b. The CONTRACTOR shall be responsible to comply with all provisions of the Building and Other Construction Workers' (RE&CS) Act, 1996, the Building and Other Construction Workers' Welfare Cess Act, 1996, the Building and other Construction Workers' (RE&CS) Rules, 1998 and the Building and Other Construction Workers Welfare Cess Rules, 1998.

c. Cess as per the prevailing rate, shall be deducted at source from bills of the CONTRACTOR by the engineer-in-Charge of the contract and remitted to the "Secretary, Building and Other Construction Workers Welfare Board" of the concerned State. The CONTRACTOR shall be responsible to submit final assessment return of the cess amount to the assessing officer after adjusting the cess deducted at source.

36.0 COMPUTERIZED CONTRACTORS BILLING SYSTEM

36.1 Without prejudice to stipulation in General Conditions of Contract, Contractor should follow following billing system.

36.2 The bills will be prepared by the contractors on their own PCs as per the standard formats and codification scheme proposed by BGL / PMC. The contractors will be provided with data entry software to capture the relevant billing data for subsequent processing. Contractors will submit these data to BGL / PMC in an electronic media along with the hard copy of the bill, necessary enclosures and documents. The contractor will also ensure the correctness and consistency of data so entered with the hard copy of the bill submitted for payment.

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36.3 Employer/Consultant will utilize these data for processing and verification of the Contractor's bill and payment."

37.0 ORDER PLACEMENT OF BOUGHT OUT ITEMS

The contractor is required to place firm order for all bought out items of adequate quantity (including 1st lot in those cases where items are required to be procured in more than one lot, if so stated in SOR/ SCC) within 30 days from the date of placement of order, failing which owner reserves the right to procure the same at the risk & cost of the contractor. However, the contractor shall always take prior approval of owner and consultant for items required to be procured.

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Further lots (for those cases where items are required to be procured in more than one lot, if so, stated in SOR/ SCC) shall be procured after suitable period so as to ensure adequate availability of material at site throughout the execution period).

38.0 REQUIREMENTS FOR CONTRACTOR AT SITE

38.1 Contractor shall establish site office in the respective areas with adequate facilities like tables, chairs, telephone, and computer with mailing facility etc. for effective communication and documentation.

38.2 Contractor shall provide as and when required a wagon(s) suitable for soil removal, for the delivery or reinstatement materials and for the transport of pipe to and from site.

38.3 Contractor shall supply transport for their technical staff and operatives to move from site to site, and to move tools and equipment from site to site, this vehicle will also be fitted with a tow bar suitable for the towing of a mobile air compressor or pipe trailer.

38.4 Contractor shall make appropriate arrangements to ensure that their supervisor(s) are adequately mobile and can attend sites or meeting with BGL/ PMC & other authorities or customers as required, without any undue delay.

38.5 Contractors shall provide cell phones to their supervisors for day-to-day communication with BGL/ PMC and site representatives of BGL/ PMC.

38.6 The RCM/ site in-charge must be a permanent employee of the contractor having desired qualification and work experience, any change in key persons working at site shall be informed to the Owner promptly.

38.7 Owner will not allow switching/ swapping of key personnel of any contractor working at site from one contractor to another during the continuity of the contract.

39.0 COMPLIANCE WITH LAWS

39.1 The Contractor shall abide by all applicable rules, regulations, statutes, laws governing the performance of works in India, including but not limited to the following:

i) Contract Labour (Regulation & Abolition) Act 1970 & the centre rules, 1971 framed there under.
ii) Payment of Wages Act.
iii) Minimum Wages Act.
iv) Employer's Liability Act.

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v) Factory Act.
vi) Apprentices Act.
vii) Workman's Compensation Act.
viii) Industrial Dispute Act.
ix) Environment Protection Act.
x) Wild life Act.
xi) Maritime Act.
xii) Any other Statute, Act, Law as may be applicable.
xiii) PNGRB Act.

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40. NOTES TO SCHEDULE OF RATES (SOR)

i) The SOR items would be operatable as per job requirement.

ii) The quantities stated in SOR are tentative and may vary considerably on ± side depending upon site condition, methodology adopted as per site requirement. The payment will be made as per actual certified Measurement at site and as instructed by EIC.

iii) The scope as mentioned in the SOR is of **indicative nature only** and shall include all activities as detailed in the relevant clauses of the specifications attached and other relevant documents enclosed with tender.

iv) Any other materials & activities not mentioned/covered in SOR, but otherwise required for satisfactory completion/safety of work as defined in tender has to be supplied /done by contractor with in the specified schedule at no extra cost to owner.

v) Contractor shall be required to deploy adequate no. of plumbing teams to ensure domestic conversions expeditiously. In this regard, no. of independent teams shall be decided by Engineer-in-charge.

vi) **Important: It is to be noted that the total work front may be offered to the bidder at different locations (which may not be near to each other) in staggered basis across the GA. Bidder to understand to execute the required work at as per the allotted fronts at scattered locations across the GA.**

41.0 Insurance

All kind of Insurances including transit Insurance shall be borne & arranged by the bidder in line with clause no. 101 of GCC-Works. Price quoted in SOR shall be inclusive of this cost.

42.0 PRICE REDUCTION SCHEDULE (PRS)

The Price reduction schedule shall be applicable at the rate mentioned as per clause no. 27 of GCC-Works as per following:

In case of delay in completion of work, Price Reduction Schedule shall be applicable at the rate of ½ % of the contract price, per week of delay or part thereof. The maximum PRS shall be 5% of contract Price.

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For PRS purpose, Contract value shall be excluding of GST.

The price reduction schedule shall be applicable against individual release order with specific completion period and not on the total ARC value.

The compensation on account of any liability (lies) including penalties other than above shall be as per provisions of bidding documents and shall be applicable in addition to PRS.

43.0 DIRECT PAYMENTS TO SUB-VENDORS/ SUPPORTING AGENCIES OF MAIN CONTRACTOR

Normally, the payment is to be made to vendor/ contractor only as per provision of contract. During execution, in case of financial constraints, BGL may make direct payment to their sub-vendor/ supporting agencies as an exception from the amounts due to the vendors/ contractors from any of their bills under process upon certification by EIC subject to receipt of such request from the vendor/ contractor.

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Further, the request for direct payments to the sub-vendor/ sub-contractor shall be considered in performance evaluation of such vendor/ contractor.

44.0 SUB-LETTING OF WORKS

Pursuant to Clause No. 37 of GCC-Works:

The contractor shall not, save with previous consent in writing of the Engineer-in-charge, sublet, transfer or assign the contract or any part thereof or interest therein or benefit or advantage thereof in any manner whatsoever.

Provided, nevertheless, that any such consent shall not relieve the contractor from any obligation, duty or responsibility under the contract.

However, subletting of WHOLE WORKS is prohibited. Vendor/ Contractor shall submit undertaking to this effect along with each invoice/ bill.

45.0 BONUS FOR EARLY COMPLETION

The Clause 27.3 of GCC-Works for Bonus for early completion shall not be applicable in this Contract.

46.0 JOINTS MEASUREMENT OF WORK EXECUTED, BILLING, INVOICE AND PAYMENTS.

Measurement shall be recorded as per the methods of measurement spelt out in Specification/Contract Documents/ Procedure of BGL.

47.0 WAY BILL / ROAD PERMIT: Shall be issued by Owner only for transportation of free issue material from one state to another.

48.0 LOCAL EMPLOYMENT

In order to encourage local employment, contractor shall endeavor to deploy personnel pass-out from local institutes including execution of non-critical activities through local agencies. However, preference should be given to engage more unskilled manpower resources locally to boost local employment.

49.0 ANNUAL RATE CONTRACT CONDITIONS:

i) The ARC contract shall be valid for 1 Year from the date of issuance of Fax of Acceptance (FOA).

ii) OWNER can award to contractor as per Schedule of Rates (SOR) in bid document as & when required during the validity of Rate Contract.

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iii) Contract Performance Bank Guarantee (CPBG) :

SD/CPBG @ 10% OF TOTAL ORDER/Contract Value within 30 days of FOA/notification of award.

OR

Initial Security Deposit (ISD) @ 5% of Total contract value within 30 days of FOA/ notification of award and deduction @ 10% of the RA bill subsequently from RA bills till the total amount of security deposit (including ISD and deducted amount) reaches 10% of Total contract value.

iv) Separate release order (s)/ Letter of Intimation(s) will be placed for required work during the validity of Rate Contract. Price Reduction Schedule for delay in completion, Defect Liability Period and contract value for Limitation of Liability will be applicable for each order (i.e. Release order/ Letter of Intimation) separately. Completion period will be counted from date of release of order / letter of intimation

v) Owner envisages that there can be more than one front / section for performance of work (like Welding, Lowering of Pipes, installation of pipe/ fittings, etc) at a time, accordingly contractor shall be required to work for the all front / sections simultaneously and each front / section shall be dealt exclusively separate so that project(s) schedule can be adhered to and completed on or before the date of completion.

Quantity in SOR is estimated and payment will be made on actual work done basis based on release order (s) / Letter of Intimation (s) issued.

50.0 COMPLETION CERTIFICATE-AS PER ITB & GCC.

51.0 PRADHAN MANTRI SURAKSHA BIMA YOJANA (PMSBY) AND PRADHAN MANTRI JEEVAN JYOTI BIMA YOJANA (PMJJBY)

Contractor shall ensure that all its personnel deployed under this contract have obtained additional insurance coverage under the Pradhan Mantri Suraksha Bima Yojana (PMSBY) and Pradhan Mantri Jeevan Jyoti Bima Yojana (PMJJBY) through the participating banks and submit the proof of such insurance coverage to the satisfaction of BGL. The cost of the insurance premium amount for both the above schemes shall be borne by the contractor giving evidence/proof to BGL in this respect and the Contractor shall suitably consider the same in their bid.
Both the schemes are to be regulated continuously on yearly basis and the same should be renewed on each successive relevant date in subsequent years.

52.0 PLANNING AND DESIGNING IN PURVIEW OF VULNERABILITY ATLAS OF INDIA

The following provision shall be considered as a part of General Conditions of Contract-Works:

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Vulnerability Atlas of India (VAI) is a comprehensive document which provides existing hazard scenario for the entire country and presents the digitized State/UT- wise hazard, maps with respect to earthquakes, winds and floods for district-wise identification of vulnerable areas. It also includes additional digitized maps for thunderstorms, cyclones and landslides. The main purpose of this Atlas is its use for disaster preparedness and mitigation at policy planning and project formulation stage.

This atlas is one of its kind single point source for the various stakeholders including policy makers, administrators, municipal commissioners, urban managers, engineers, architects, planners, public etc. to ascertain proneness of any city/location/site to multi-hazard which includes earthquakes, winds, floods thunderstorms, cyclones and landslides. While project formulation, approvals and implementation of various urban housing, buildings and infrastructures schemes, this Atlas provides necessary information for risk analysis and hazard assessment.

The Vulnerability Atlas of India has been prepared by Building Materials and Technology Promotion Council under Ministry of Housing and Urban Affairs, Government of India and available at their website www.bmtpc.org.It is mandatory for the bidders to refer Vulnerability Atlas of India for multi- hazard risk assessment and include the relevant hazard proneness specific to project location while planning and designing the project in terms of.

i) Seismic zone (II to V) for earthquakes,
ii) Wind velocity (Basic Wind Velocity:55,50,47,44,39&33m/s)
iii) A reliable to floods and Probable max, surge height
iv) Thunder storms history

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v) Number of cyclonic storms/ severe cyclonic storms and max sustained wind specific to coastal region
vi) Landslides incidences with Annual rainfall normal
vii) District wise Probable Max. Precipitation.

53.0 TERMINATION / OFFLOADING:

The contractor fully understands that timely completion of the work as per the schedule is of paramount necessity as otherwise it would lead to adversely affecting the schedules of other works/project with resultant financial and other losses to the owner. In view of this, the contractor unconditionally agrees and binds himself to be liable for all the consequences for non-completion of the work within the stipulated time.

In case a situation is brought about by the contractor warranting termination/off-loading of the whole or any part of the work for any reason whatsoever, the owner shall have the liberty and right to entrust/engage/award the work So terminated/off loaded at the risk and cost of the contractor to any other agency/contractor by adopting any mode of inviting tenders, i.e. open/limited/single party etc or awarding to the other contractors working in that GA for similar work on rate analysis basis etc. in order to ensure completion of the work as per the schedule or at the quickest possible time.

54.0 PLANT, MACHINERY AND SHUTTERING MATERIAL ADVANCE:

An interest-bearing advance of five per cent of the contract price, depending on nature of job can be provided against the new key construction equipment purchased for the work and brought to the site, if so requested by the contractor. The advance should normally not be more than 50 (fifty) percent of the depreciated cost of such plants and machinery and should be hypothecated to BGL, before the payment of advance is released. This advance shall be subject to the following conditions: (i) the contractor shall produce satisfactory proof of payment; (ii) such equipment is considered necessary for the works; (iii) the equipment has been verified to have been brought to site; (iv) the contractor gives an undertaking on stamp paper that the equipment will work only on that job and will not be removed from the site without obtaining written approval of EIC; and (v) the contractor furnishes a BG to cover the advance. No advance shall be admissible on equipment purchased under a hire purchase scheme/ financing arrangement or on hired equipment.

The rate of interest shall be interest rate (medium term) at Marginal Cost of Fund based Lending Rate (MCLR) for one year charged by SBI (applicable on the date of disbursement of mobilization advance) plus 2% p.a. on reducing balance basis.

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The repayment of advances shall be done through proportionate percentage deductions from running bill. The time of commencement of repayment, rate of deductions from interim payments, and time by which the advance should be fully repaid will be as specified below:

Recoveries will be effected from each Running Account Bill at the rate of 10% of the gross bill value, till the entire Advance (together with interest accrued thereon) is fully recovered. In any case, advance shall be fully recovered before release of payment due towards Mechanical completion / pre final bill.

Interest will be charged on delayed recoveries either due to the late submission of bill by the contractor or any other reason besides the reason giving rise to the encashment of Bank Guarantee.
Bank Guarantee against advance shall be released after recovery of Interest and Principal Amount.

All advances shall be used by the contractor exclusively for mobilisation expenditure, including the acquisition of construction-related plant and equipment. Should the contractor misappropriate any portion of the advance, it shall become due and payable immediately, and no further advance will be made to the

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contractor thereafter. In such cases, the contractor shall also be liable for action under the contract.

55.0 SECURED ADVANCE AGAINST MATERIAL BROUGHT AT SITE:

Advance is not applicable.

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ANNEXURES TO SCC

C O N T E N T S

Annexure-1 : Scope of Work

Annexure-2 : Scope of Supply

Annexure-3 : Time Schedule

Annexure-4 : Measurement of

Work Annexure-5 : Terms of Payment

Annexure-6 : Quality Assurance

Annexure-7 : Conditions for issue & reconciliation of

material Annexure-8 : Construction equipment to be deployed

Annexure-9 : Minimum no. of skilled manpower to be

deployed Annexure-10 : Schedule of Labour Rate

Annexure-11 : Schedule of Equipment Hourly Rental Rate

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SCOPE OF WORK

(ANNEXURE-1 TO SPECIAL CONDITIONS OF CONTRACT)

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ANNEXURE-1 TO SCC

1.0 SCOPE OF WORK

Scope of work shall be as detailed in Particular Job Specification, Technical Specifications, Schedule of Rates & various other parts of this Bidding Document.

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SCOPE OF SUPPLY

(ANNEXURE-2 TO SPECIAL CONDITIONS OF CONTRACT)

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ANNEXURE-2 TO SCC

1.0 SCOPE OF SUPPLY

1.1 Owner's Scope of Supply (Free Issue Item)

Owner's scope of supply shall be as specified in Particular Job Specification, Technical Specifications, Schedule of Rates & various other parts of the Bidding Document. GI pipe is not a free issue material.

In order to speed up the project Free Issue Materials on replacement basis shall be issued to the Contractor from the designated store(s) of BGL. Contractor shall be responsible for lifting the free issue materials from Owner's storage point(s) and transporting the same to work site(s) at his own cost.

Conditions for Issue and Reconciliation of Materials shall be as per Document enclosed as **Annexure-7** to Special Conditions of Contract.

1.2 Contractor's Scope of Supply

All materials except what is under Owner's scope of supply as mentioned in Clause No. 1.1 above, and required for successful completion of works in all respects shall be supplied by the Contractor and the cost of such supply shall be deemed to have been included in the quoted price without any additional liability on the part of Owner.

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TIME SCHEDULE

(ANNEXURE-3 TO SPECIAL CONDITIONS OF CONTRACT)

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ANNEXURE-3 TO SCC

TIME SCHEDULE

Validity of the ARC contract under the present tender shall be for a period of 12 (Twelve) months from the date of FOA. Time schedule for individual release order shall be as under.

Name of Work	Scope of work	Time of Completion
LMC and associated works for City Gas Distribution.	2000 nos. of connection-Onboarding of DPNG connections & 2000 nos. of LMC removal	To be completed within 12 weeks from the date issuance of release order/written information.
	2000 nos. of connection-Onboarding of DPNG connections & 2000 nos. of LMC removal	To be completed within 12 weeks from the date issuance of release order/written information.
	1000 nos. of connection-Onboarding of DPNG connections & 1000 nos. of LMC removal	To be completed within 08 weeks from the date issuance of release order/written information.

Note: Mobilization period is 07 days from the date FOA/ EIC intimation.

1) The above time schedule is inclusive of mobilization period.
2) The time indicated is for completing all the works in all respects as per specifications, codes, drawings and instructions of Engineer-in-charge.

3) It is to be noted that the completion period of complete scope of works mentioned above and/or in tender document includes preparation of drawings (if required), procurement and supply of materials including their inspection & testing, mobilization at site, construction, laying/ installation, fabrication, erection, testing, inspection, testing, rectification (if any), pre-commissioning, commissioning and demobilization works etc. complete in all respects to the entire satisfaction of Owner/ Engineer-in-charge.

4) Successive lot will be awarded only after nearing completion of the earlier lot and back log. EIC will have the liberty to take the decision and decide further course of action. If found to be non-committal / failing to achieve the quantity (Target), scope of the individual contractor will be offered to other contractor and decision of the EIC will be binding on the contractor.

(**STAMP & SIGNATURE OF BIDDER**)

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MEASUREMENT OF WORK

(ANNEXURE-4 TO SPECIAL CONDITIONS OF CONTRACT – TECHNICAL)

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ANNEXURE-4 TO SCC

MEASUREMENT OF WORK

1.0 **GENERAL**

1.1 The mode of measurement shall be as mentioned in relevant standard specification incorporated in the Bidding Document. Any other mode of measurements not covered in above specifications shall be followed in accordance with relevant BIS codes/ Schedule of Rates/ Specifications etc. and/ or as decided by Engineer-in-charge.

1.2 Payment will be made on the basis of joint measurements taken by Contractor and certified by PMC Engineer. Measurement shall be based on "Approved for Construction" drawings, to be the extent that the work conforms to the drawings and details are adequate. 3-5% checking of measurement work shall be by BGL engineer.

1.3 Wherever work is executed based on instructions of Engineer-in-charge or details are not adequate in the drawings, physical measurements shall be taken by Contractor in the presence of Engineer-in-charge.

1.4 Measurements of weights shall be in metric tonnes corrected to the nearest Kilogram. Linear measurements shall be in meters corrected to the nearest centimetres.

1.5 The weights mentioned in the drawing or shipping list shall be the basis for payment. If mountings for panels etc. are packed separately, their erection weights shall include all mountings.

1.6 Welds, bolts, nuts, washers etc. shall not be measured. Rates for structural steel work shall be deemed to include the same.

1.7 No other payment either for temporary works connected with this Contractor for any other item such as weld, shims, packing plates etc. shall be made. Such items shall be deemed to have been included for in the rates quoted.

1.8 Measurement will be made for various items under schedule of rates on the following basis as indicated in the unit column.

i) Weight : MT or Kg
ii) Length : M (Meter)

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iii) Number : No.
iv) Volume : Cu.M
v) Area : Sq.M

2.0 **PIPING**

2.1 Length of pipes shall be measured along the curvilinear centre of the pipelines laid/ installed and shall include all types of fittings, bends etc. but excluding all types of valves. Length of valves shall be excluded from piping measurement and shall be considered on number basis.

3.0 **FOR PIPELINE CROSSINGS BY HDD (if required) / BORING / MOLING METHOD**

Payment shall be made as specified in SOR, PJS and Technical Specification.

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TERMS OF PAYMENT

(ANNEXURE-5 TO SPECIAL CONDITIONS OF CONTRACT)

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ANNEXURE-5 TO SCC

1.0 TERMS OF PAYMENT

Pending completion of the whole works, provisional progressive payments for the part of work executed by the contractor shall be made by Owner on the basis of said work completed and certified by the Owner's representative as per the agreed milestone payment schedule and the percentage break-ups given below.

Contractor shall submit his invoices to the Owner's representative in the manner as instructed by Owner. Each invoice will be supported by documentation acceptable to Owner and certified by the Owner's representative. Payments made by owner to the contractor for any part of the work shall not deem that the Owner has accepted the work. Owner will release payment through e- payments only as detailed in the bidding document.

The Contractor has to raise the RA bill on monthly basis and payment shall be made as per the following terms

For SOR item 1.1:

40%	In continuous stretches of minimum 100 Mtrs. including trench less laying or total scope whichever is less after completion of trenching, lowering, electro-fusion jointing of pipeline, backfilling and compaction for the complete stretch as per the scope of work.
20%	Testing of network, Pre-Commissioning of the system, installation of Permanent Markers & Valve chambers.
20%	Commissioning or gas charging of the PE pipeline (case decided by EIC) and material re-conciliation
20%	Submission of all documents, submission of NOC, Submission of As-built drawings. Closure of contract, Submission of final bill.

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- **For SOR item 1.2:**

50%	After Complete area wise restoration as per the standards (bidder may note that restoration work shall be carried out after successful testing and commissioning / gas charging in respective area).
30%	After obtaining NOC from respective local authorities / Third party agencies designated by land owning agencies
20%	After Completion of all works and closure of contract.

- **For SOR item 1.3: -**

50%	Installation of casing & carrier pipe or only carrier pipe, electrofusion joining with main pipeline
30%	After testing, backfilling of moling pits, restoration of pits, commissioning / gas charging of pipeline.
20%	After submission of documents, submission of As – Built drawing, completion of all works and closure of contract.

- **For SOR item 1.4 &1.5: -**

90%	Upon supply and Complete installation of item's and all its associated work.
10%	After submission of documents and closure of contract.

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- **For SOR item 2.1 &2.2: -**

50%	Completion of installation of pipes including all fittings, valves, etc
20%	Testing of installations & painting.
20%	Commissioning including all related activities.
10%	After submission of documents and closure of contract

- **For SOR item 2.3,2.4 & 2.5 : -**

50%	Upon Complete installation of Items and its associated work
35%	Testing of installations and commissioning.
15%	After submission of documents and closure of contract

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- **For SOR item 2.6,2.7& 2.8 : -**

50%	Upon Complete installation of Items and its associated work
35%	Testing of installations and commissioning.
15%	After submission of documents and closure of contract

- **For SOR item,3 : -**

80%	After completion of the work in all respects and onboarding of customer in BGL platform and generation of 1st bill.
20%	After submission of documents and closure of contract.

- **For SOR item, 4: -**

80%	After completion of the work in all respects and handing over of removed material at BGL designated store.
20%	After submission of documents and closure of contract

1. Any other work (Not mentioned above)

a) Completion of individual work as per SOR including supply (wherever applicable): 90%

b) Completion of all activities and their acceptance submission of final documents, final bill and acceptance of these by owner thereafter for successful closure of work order: 10 %

Note: Any further breakup of each activity for the payment purpose can be done depending upon the site situation / requirement and recommendation by EIC and approval of construction in-charge.

2.0 Payment Methodology

1. The contractor shall raise invoices and shall enclose all documents as per check list issued by PMC/ Owner during kick off meeting. All the RA bills are to be submitted to EIC (PMC/ BGL)

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2. Employer will release payment through e-payments only as detailed in the Bidding Document.

3. Further break-up of Lumpsum Prices, if deemed necessary for any progressive payment of individual item may be mutually arrived at between Engineer-in-Charge and the Contractor.

4. All payments against running bills are advance against the work and shall not be taken as final acceptance of work / measurement carried out till the final bill.

5. *The contractor shall submit monthly RA bills in prescribed format. Following documents are to be provided along with Measurement Book & Abstract of Measurement*
   - *Measurement sheets duly verified and certified by EIC, in support of the works executed as per SOR for the billing period.*

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- *Copy of PF remittance challan.*
- *Copy of ESIC remittance.*
- *Copy of Wage register.*
- *Two sets of Construction Photographs*

In the absence of the requisite documents, the Measurement Book / Abstract of Measurement shall be returned to the contractor.

6. Successful bidder(s) to submit material reconciliation certificate along with each bill.

7. Bills shall be raised by contractor in line with check list attached in Tender document.

8. *As per CBDT Notification No. 95/2015 dated 30.12.2015, mentioning of PAN no. is mandatory for procurement of goods / services/works/consultancy services exceeding Rs. 2 Lacs per transaction.*

Accordingly, supplier/ contractor/ service provider/ consultant should mention their PAN no. in their invoice/ bill for any transaction exceeding Rs. 2 lakhs. As provided in the notification, in case supplier/ contractor/ service provider/ consultant do not have PAN no., they have to submit declaration in Form 60 along with invoice/ bill for each transaction.

Payment of supplier/ contractor / service provider/ consultant shall be processed only after fulfilment of above requirement.

BGL's PAN No. is …. (check with BGL before proceeding further)

9. **E Payment**

i) BGL has initiated payments to Contractors electronically, and to facilitate the payments electronically through 'e-banking'.

ii) void

iii) Supplier/ Contractor/Service Provide/ Consultant is required to submit digital invoice

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QUALITY ASSURANCE

(ANNEXURE-6 TO SPECIAL CONDITIONS OF CONTRACT)

(For details- Refer Technical Specification No. 66 of the same is enclosed in Scope of Work of tender document.)

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CONDITIONS FOR ISSUE AND RECONCILIATION OF MATERIAL (ANNEXURE-7 TO SPECIAL CONDITIONS OF CONTRACT)

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ANNEXURE-7 TO SCC

1.0 **CONDITIONS FOR ISSUE OF MATERIALS**

Whenever any material is issued by Owner, following conditions for issue of material in addition to other conditions specified in the contract shall be applicable.

1.1 Necessary indents will have to be raised by the Contractor as per procedure laid down by the Engineer-in-charge from time to time, when he requires the above material for incorporation in permanent works.

1.2 Materials will be issued only for permanent works and not for temporary works, enabling works etc. unless specifically approved by the Engineer-in-charge and the same shall not be taken into account for the purpose of materials reconciliation.

1.2.1 The contractor shall beer all other cost including lifting, carting from issue points to work site/ contractor's store, custody and handling etc. and return of surplus/ serviceable scrap materials to Owner's storage points to be designated by the Engineer-in-charge etc. No separate payment for such expenditure will be made.

1.3 No material shall be allowed to be taken outside the plant without a gate pass.

1.4 The contractor shall be responsible for proper storage, preservation and watch & ward of the materials.

1.6 Reconciliation of Owner supplied materials

1.6.1 Every month, the contractor shall submit an account for all materials issued by Owner in the proforma prescribed by the Engineer-in-charge. On completion of the work the contractor shall submit "Material Appropriation Statement" for all materials issued by the Owner in the proforma prescribed by the Engineer-in-charge.

Waste materials like part lengths of pipes and other partly used items are the property of BGL. and must be returned to the store with the appreciate documentation so that they can be considered as part of the material reconciliation (applicable free issue of material).

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Item	Unaccountable	Scrap
Regulators & Meters	0%	0%
PE Pipes	2%	2% (less than 2.0 mtrs.)
GI Pipes*	2%	2% (less than 0.5 mtrs.)
Consumables	Discretionary	

* In case supplied by Owner

Unaccountable wastage / scrap shall be at actual as per site assessment subject to maximum as stated above.

The percentage allowance shall be accounted on the basis of final measurement book.

1.6.2 All unused, scrap materials and salvageable materials shall be the property of the Owner and shall be returned by the Contractor category-wise at his cost to the Owner's designated store yard(s). In case the Contractor fails to do so/ or exceeds the limits of allowances specified above for scrap/ serviceable materials, then recovery for such quantities not returned as well as returned in excess of permitted limit by the Contractor will be done at the time of final bill/ closing of contract by Engineer-in-charge shall be effected from the Contractor's bill(s) or from any other dues of the Contractor to the Owner in the following manner:

i) At a penal rate of 125% of landed cost for all other items except DPNG meters.
ii) At a penal rate of 10 times of landed cost for DPNG meters only.

Contractor shall be responsible for the adjustment/ weighment/ measurement of the surplus materials to be returned to the store. Contractor shall also be responsible for suitable segregation of returned materials into separate stacks of serviceable and scrap materials.

1.6.3 Wherever certain material is covered under Contractor's scope of supply whether part or in full for any item of work covered under SOR, no allowance towards wastage / scrap etc. shall be accounted for during execution stage.

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CONSTRUCTION EQUIPMENT TO BE DEPLOYED

(ANNEXURE-8 TO SPECIAL CONDITIONS OF

CONTRACT)

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ANNEXURE-8 CONSTRUCTION EQUIPMENT TO BE DEPLOYED

Sl. No.	Description of Item	Qty. to be Deployed* per requirement
i.	Electro-fusion machine with **Bar Code, GPS antenna, Memory to store up to 2048 weld data, USB interface and control box with leads**	2
ii.	Moling Equipment	As and when required
iii.	PE Squeeze Tools for 20mm / 32mm Pipes	2
iv.	Universal pipe scrapper 20mm, 32mm / hand scrappers	2
v.	Tapping tools for PE service tees	2 sets of all size
vi.	PE pipe cutter / Guillotine	2
vii.	Gas detection equipment, wherever required	As and when required
viii.	Cable and pipe locator	As and when required
ix.	PE closure plugs / test ends for 20mm / 32mm pipes	As and when required
x.	Towing heads	As required
xi.	Pipe alignment clamps, jointing of elbow, tee, top loading clamps for top tee	2
xii.	Pipe straighteners, re-rounding tools of all pipe sizes	2
xiii.	Jumping Jack compactor	As and when required
xiv.	Roller for asphalting	As and when required

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xv.	Water tanker	As and when required
xvi.	Hammer Drill	2
xvii.	Power Generator a) 5.5 kVA, b) 2.5kVA	1 2
xviii.	Piston Drill	As and when required
xix.	Conversion Kit	As and when required
xx.	Pneumatic Test Pumps	2
xxi.	Die sets for thread preparation	2
xxii.	Soldier Torch	4
xxiii.	Cleaning pads	4
xxiv.	Cleaning Brush	4
xxv.	Voltage Stabilizer	2
xxvi.	Calibrated Pressure Gauge (0-6 Bar)	4
xvii.	Acetone/ H2O2 (pipe cleaner)	As and when required

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xviii.	Harness belts & clamps	As and when required

*** Number of equipment indicated herein above, may be revised by Engineer In-charge for various sites depending on quantum of work and work front made available to the contractor. Any additional equipment requirement, whenever asked for by the Engineer In-charge, shall be deployed by the contractor at site without any additional cost to Owner.**

Notes:

1. Any other equipment required for completion of pipeline laying work but not specifically mentioned herein above, shall be deployed by contractor without any additional cost to Owner. Contractor shall deploy above mentioned equipments in good working condition & properly calibrated.
2. Mobilization shall be considered complete only after equipments having quantity specifically mentioned hereinabove / quantity decided by engineer-in-charge on case to case basis at site are made available at site in good wood working condition as verified by EIC.

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MINIMUM NO. OF SKILLED MANPOWER TO BE DEPLOYED (ANNEXURE-9 TO SPECIAL CONDITIONS OF CONTRACT)

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ANNEXURE-9

MINIMUM NO. OF SKILLED MANPOWER TO BE DEPLOYED

S.No	Description	Requirement per contractor
1	Resident Construction Manager /Section Incharge	1
2	Engineer (QA/QC)	1
3	Safety Officer/Safety supervisor ***	1
4	Foreman/Supervisor	2
5	Document Controller	1
6	Store Keeper/ Store in-charge	1
7	Fusion Operation/ Jointer	2
8	Skilled Workers (GI Plumber)	10
9	Plumber's Helper	10
10	NG Conversion Team	4
11	Skilled Workers (Moling Team)	As and when required
12	Unskilled Workers (Labour)	As and when required

The above proposed list of skilled manpower is the minimum to be deployed by Contractor.

***Note: -

Safety Supervisor: A dedicated Safety Supervisor having recognized degree in science or diploma in engineering with one-year experience of working as a safety supervisor in any oil & gas industry /chemical/construction industry shall be deployed up to 50 workers. Subsequently for every 50 workers, CONTRACTOR shall deploy one dedicated Safety Supervisor.

Safety Officer: A full time /dedicated qualified Safety Engineer/Officer shall be assigned for every 250 workers are employed at site/GA. The Safety Engineer/Officer shall possess requisite qualification and experience in line the Central/State Regulations.

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NOTES:-

1. RCM/Section Incharge should be posted at Site.

2. The details of minimum manpower required to be mobilized by the execution contractor to complete the work within schedule is given above and is not exhaustive. Contractor is required to augment the above list with additional numbers/categories of workmen as required and directed by Engineer-In charge to complete the work within the completion time schedule and quoted price.

3. The Manpower as identified above should have required qualification and adequate relevant experience.

4. The minimum no. of. skilled manpower to be deployed may however vary (increase/decrease) depending on availability of work front. The decision of EIC in this regard shall be final.

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SCHEDULE OF LABOUR RATES

(ANNEXURE-10 TO SPECIAL CONDITIONS OF CONTRACT)

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Date: 2026.01.08 19:30:02 IST

ANNEXURE –10 to SCC

SCHEDULE OF LABOUR RATES (FOR EXTRA WORKS)

1. The Labour rates are "all inclusive". These rates include but are not limited to all payroll costs and allowances, payroll taxes, fringe benefits, protective and/or special clothing, construction supplies required for work of a nature included in this contract, overhead, profit, insurance, transportation and travel time

2. The rates are inclusive of providing hand tools and consumables such as electrodes, filler wire, gases, grinding wheels where the concerned category of labour is expected to use in execution of the job but exclusive of all major equipment and machineries.

3. The normal time labour rates shall apply for all hours worked upto eight (8) hours in a day and overtime rates shall apply for all hours worked in excess of eight (8) hours in one working day, Sunday and Public Holidays. The payment for part of the day shall be made on prorata basis.

SR NO.	CLASSIFICATION PERSONNEL	RATE PER DAY OF NORMAL HOURS	RATE PER HOUR FOR OVER TIME, SUNDAY & HOLIDAY
		IN RS.	IN RS.
1	FOREMAN	2475	540
2	SURVEYOR	1750	385
3	SUPERVISOR	2750	600
4	ENGINEER	3500	775
5	SAFETY OFFICER	2750	600
6	GAS CUTTER	1155	250

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7	GRINDER	1155	250
8	BRICK MASON	860	175
9	STONE MASON	860	175
10	STRUCTURAL WELDER	1650	360
11	QUALIFIED ARC WELDER-AUTOMATIC	2250	490
12	QUALIFIED ARC WELDER-MANUAL	1750	385
13	WATCHMAN/HELPER	650	140
14	CIVIL LABOUR (UNSKILLED LABOUR)	650	140
15	PIPELINE FITTER	1000	220
16	STRUCTURAL FITTER	860	185
17	COATER	860	185
18	MECHANIC	860	185
19	SITE EQUIPMENT/MACHINE OPERATOR	860	185
20	HEAVY MACHINE OPERATOR	1000	220

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21	HEAVY DUTY DRIVER	1000	220
22	ELECTRICIAN	1000	220
23	FABRICATOR	1000	220
24	CARPENTER	860	175
25	PLUMBER	860	175
26	PAINTER	860	175
27	CABLE JOINTER	860	175
28	FUSION OPERATION/JOINTER	860	185
29	INSTRUMENTATION TECHNICIAN	860	185
30	INSULATOR	750	150
31	RIGGER	750	165
32	BHISTI (WATER MAN)	650	145
33	DOCUMENT CONTROLLER	1000	220
34	ACCOUNT OFFICER	1500	330
35	STORE KEEPER/INCHARGE	1000	220

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(SIGNATURE OF BIDDER)

NOTES:-

1. Rates are final and Tenderer is to sign only without deviation.
2. In case of foreign bidder, conversion rate applicable on one day prior to price bid opening date published by the State Bank of India will be considered.
3. The recovery rates shall be the rates provided above plus 20% (twenty percent).

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EQUIPMENT HOURLY RENTAL RATES FOR EXTRA WORKS

(ANNEXURE-11 TO SPECIAL CONDITIONS OF CONTRACT)

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Date: 2026.01.08 19:30:02 IST

Sl. No.	Equipment	HIRING / RECOVERY RATES (IN INR) (Per Day): 8 Hrs INCLUDING CONSUMABLES & FUEL
1.	Excavator / Back Hoe-Ex 280 / 300 & Above or Equivalent	10,000
2.	Excavator / Back Hoe-Ex 200 & Above or Equivalent	8,000
3.	Pipe Layer/Side Boom – 70 T & Above Capacity	10,000
4.	Pipe Layer/Side Boom – 60 T & Above Capacity	9,500
5.	Pipe Layer/Side Boom – 40 T & Above Capacity	8,500
6.	Pipe Bending Machine	7,500
7.	Dozer with Ripper – D7/D6 or Equivalent	6,500
8.	DG Welding Machines	1,800
9.	Semi Auto Welding Machines	2,500
10.	Dozer with Ripper – D8 or Equivalent	10,000
11.	Hydra (upto 10 MT)	4,000
12.	Hydra (above 10 MT - upto 25 MT)	5,000
13.	Hydra (above 25 MT)	5,800
14.	Horizontal Auger Boring Machine with Rock breaking tool	4,500
15.	Pipe Clamp (Pneumatic/Hydraulic) – Internal	1,500
16.	Tyre Mounted Cranes (above 10 and upto 30 MT)	7,500
17.	Tyre Mounted Cranes (above 30 and upto 75 MT)	15,000
18.	Tyre Mounted Cranes (above 75 MT)	25,000
19.	X-Ray M/C – Internal Crawler	2,500
20.	X-Ray M/C – External	2,500
21.	Gamma Source	750
22.	Water Lifting Pump (400 m3/hr. & above)	900
23.	Filling Pumps (400 TO 1000 M3/HR)	950
24.	Pressurization Pump – Motorized	3,500
25.	Induction/Resistance Heating Equipment or LPG Multi Torch.	4,000
26.	Air Compressor – (300CFM)	4,000
27.	Air Compressor – (450/600/800 CFM)	4,200
28.	Air Compressor – (1000-1500 CFM)	4,500
29.	D.G. Sets : 62.5 KVA to 200 KVA (inclusive of generators)	5,000

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30.	Blast Cleaning Machine	500
31.	Pipe Trailers (FB / Semi Low Bed)	7,000
32.	Mono drill crawler mounted	3,500
33.	Hand drill(pneumatic)for rock blasting	2,500

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34.	Rock breaker attachment	4,000
35.	Dozing Pump	500
36.	Bevel Cutting Machine –Manual	750
37.	UT Machine with operator	1,500
38.	Dewatering Pump	1,500
39.	Holiday Detector Unit	500
40.	Dead WT Tester	500
41.	Dumper / Tippers	4,000
42.	Pipe locator	500
43.	Pipe Clamp – External	600
44.	Pipe Trailer for Coated Line Pipe	7,500
45.	Rock Breaking Machine with Excavator	10,000
46.	Grinding machine	250
47.	Gas cutting set with cylinders	750
48.	Trucks (upto 9 T) with driver	5,000
49.	Car/Jeep with driver (5 Seater)	2,000
50.	Car/Jeep with driver (7 Seater)	2,500
51.	Tractor with trolley	2,000
52.	Tripod with 5 Tons Chain Pulley Block	400
53.	Pneumatic Drill (Tractor mounted for blasting) with Compressor	5,000
54.	JCB Excavator	8,000
55.	JCB Excavator with rock breaking tool	12,000
56.	Moling machine (Manual)	3,000
57.	Moling machine (Machine)	5,000
58.	Fusion jointing Machine	5,000
59.	Concrete mixer 0.25 to 0.40 Cum with hopper or as required.	1,000
HDD equipments		
60.	HDD Rig with all Equipments & Accessories (Cap upto 50 T) (Soft Strata)	20,000
61.	HDD Rig with all Equipments & Accessories (Cap upto 50 T) (Rock Strata)	25,000

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62.	HDD Rig with all Equipments & Accessories (Cap above 50 T and upto 100 T) (Soft Strata)	30,000
63.	HDD Rig with all Equipments & Accessories (Cap above 50 T and upto 100 T) (Rock Strata)	40,000
64.	HDD Rig with all Equipments & Accessories (Cap above 100 T and upto 200 T) (Soft Strata)	80,000
65.	HDD Rig with all Equipments & Accessories (Cap above 100 T and upto 200 T (Rock Strata)	100,000

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66.	HDD Rig with all Equipments & Accessories (Cap above 200 T and upto 350T) (Soft Strata)	115,000
67.	HDD Rig with all Equipments & Accessories (Cap above 200 T and upto 350T (Rock Strata)	140,000
68.	HDD Rig with all Equipments & Accessories (Cap above 350 T) (Soft Strata)	150,000
69.	HDD Rig with all Equipments & Accessories (Cap above 350 T) (Rock Strata)	180,000

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ANNEXURE-11 TO SCC

EQUIPMENT HOURLY RENTAL RATES FOR EXTRA WORKS

NOTES: -

1. Rates are inclusive of operators / drivers / Fuel /POL and consumables.
2. Rates are inclusive of contractor's overheads & profit.
3. In case of foreign bidder, conversion rate applicable on one day prior to price bid opening date published by the State Bank of India will be considered.
4. The recovery rates shall be the rates provided above plus 20% (twenty percent).
5. Hiring rates of above equipments are for one shift (i.e. 8 Hrs). Hiring rates for two shifts i.e. 16 hrs are 1.25 times of above rates & hiring rates for three shifts i.e. 24 hrs are 1.5 times of above Rates.
6. Notes for HDD equipment: -

a. Rates are inclusive of operators / drivers / Fuel /POL and consumables.

b. Rates are inclusive of contractor's overheads & profit.

c. In case of foreign bidder, conversion rate applicable on one day prior to price bid. opening date published by the State Bank of India will be considered.

d. The recovery rates shall be the rates provided above plus 20% (twenty percent).

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STANDARD CONDITIONS OF SCC: PART II

Compliances under various Labour Laws

The contractor has to fully comply with all applicable labour laws and regulations passed, modified and notified from time-to-time by the central, state and local government agencies/authorities. Specific attention of the contractor is drawn to the following obligations amongst other:

1. ***The Minimum Wages Act 1948, Payment of Wages Act, 1936 and Payment of Bonus Act 1965 or The Code on Wages, 2019 (after it comes into force)***

1.1 **Minimum Wages:**

a. During the tenure of the contract, the Contractor must ensure the payment of minimum wages, as notified by the Central Government or State Government whichever is higher, as per the provisions of the Minimum Wages Act, 1948 / Code on Wages, 2019 (after it comes into force).

b. **Wage period and monthly wages**: Wage period shall be monthly and wages for a month shall be calculated by multiplying daily rate of Minimum Wages by 26. The monthly wages include the wages of the weekly days of rest as applicable to the office/establishment of BGL.

Deduction in case of any days of absence other than weekly days of rest shall be calculated using the following formula:

Deduction for absence = days of absence x applicable wage rate

1.2 **Payment of Wages:**

The Contractor shall disburse monthly wages **through e-banking / digital mode through cashless transaction only**, and avoid illegitimate deductions and maintain records /returns as prescribed. The Contractor shall be solely responsible for the payment of wages and other dues to the resources, if any, deployed by him latest by 7th day of the subsequent month as per the provisions of the Payment of Wages Act, 1936 / as applicable under Code on Wages,2019 (after it comes into force) in the presence of Engineer In-charge (EIC) or authorized

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representative of BGL. After disbursement of wages, the representative of the Contractor and EIC/ authorised representative of BGL. have to certify the payment of wages to the resources and sign the Wage Register - Form B (under The Ease of Compliance to Maintain Registers under various Labour Laws Rules, 2017) / FORM-I of Code on Wages, 2019 (after it comes into force) with specific seal detailing name/designation/Company.

1.3 Payment of Wages :

Contractor shall ensure payment of bonus as per the provisions of the Payment of Bonus Act,

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1965 / Code on Wages, 2019 (after it comes into force). Present minimum rate of payment of Bonus as per the Payment of Bonus Act, 1965 is 8.33% of minimum wages per month or 8.33% of Rs.7, 000/- per month whichever is higher. The rate shall be subject to amendments made from time to time to the legislation.

Payment of Bonus / ex-gratia shall be made preferably before Deepawali festival falling after the end of relevant financial year(s) and the balance payment at the time of closure of contract.

For service contracts, the payment towards the bonus/ex-gratia **(made on yearly basis)** shall be released / reimbursed to the contractor, after submission of proof of payment. No reimbursement shall however be applicable in works contract.

2. Leaves/ Leave with wages/ Holiday:

The Contractor shall comply with all the applicable leave Rules including leave with wages in terms of applicable labour legislations i.e. Factories Act, 1948 / Shops & Establishment Act/ *Industrial Establishment* (*national* & *festival holidays*, *casual* & *sick leave*) *Act*, 1965.

The Contractor shall extend the leave with wages and maintain the Register of Leave pertaining to the resource deployed. The payment towards un-availed leave, as per the Factories Act, 1948 / Shops & Establishment Act, shall be settled with the resource at the time of closure of the contract or separation of resource from the contract by the contractor.

i. As per the **Factories Act, 1948 (if applicable)**:-Annual Leave with Wages @ 01 day for every 20 days of work performed by him in the previous calendar year becomes due.
ii. As per the **Shops & Establishment Act(if applicable)** : Privilege Leave not less than 15 days and Sickness/Casual Leave not less than 12 days (this provision may vary from state to state).
iii. *As per the Industrial Establishment* **(***national* **&** *festival holidays***,** *casual* **&** *sick leave***)** *Act***, 1965 /Negotiable Instrument Act 1881/ shops & Establishment Act (as applicable)**: (a) three national holidays of one whole day each on the 26th January, 15th August and 2nd October

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(b) five other holidays on any of the festivals specified in the - Schedule appended to this Act. (c) Every worker shall in each calendar year, be allowed by the employer 07 casual leave and 14 sick leave in such manner and on such conditions as may be prescribed (This provision may vary from state to state).

3. The Employees' Provident Fund & Miscellaneous Provisions Act 1952

a) The Contractor shall have independent PF code no. with the RPFC as required under the Employees' PF & Misc. Provisions Act, 1952.

b) The Contractor has to ensure compliance (as per prevailing rates) and extend benefits under the Employees' Provident Fund Scheme 1952, the Employees' Pension Scheme 1995 & the Employees' Deposit Linked Insurance Scheme, 1976 to the resources deployed by him.

c) The Contractor is required to submit copies of ***separate e-Challans / ECR alongwith proof of payment/receipt*** in respect of resources engaged through this contract only, on monthly basis. **Common challans would not be acceptable in BGL.**The Contractor should submit copies of previous months EPF e-Challans / ECR alongwith current month's bill. The TRRN. No. of the ECR would be verified online from EPFO portal by the Engineer- in-charge to confirm the status of payment and names of the resources deployed.

d) **PF is mandatory irrespective of the number of resources deployed** by the Contractor under this contract. PF membership and deposit of PF contribution is also mandatory even if the wage payment to the resource is exceeding the prescribed monthly wage ceiling (i.e. Rs.15,000/-) under the Employees' PF & Misc . Provisions Act, 1952 and in such case the liability of the Contractor towards PF contribution shall be limited to the prescribed monthly wage ceiling notified from time to time (i.e. Rs. 15,000/- currently).

e) In case, the Contractor deploys any "**International Worker**", the Contractor should also make compliance under para 83 of EPF Scheme, 1952 i.r.o the "International Workers" and must register on the ***International Worker Portal of EPFO***.

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4. The Employees' State Insurance Act, 1948 (If applicable and as per prevailing rates)

a) The Contractor shall have his own ESI code No. allotted by Employees' State Insurance Corporation (ESIC) as required under the Employees' State Insurance Act, 1948.

b) The Contractor has to arrange **Smart Cards (i.e. ESI Identity Card) /e-Penchan Card** for the resource(s) engaged by him from the Corporation.

5. The Employees' Compensation Act 1923 (wherever applicable)

In case, the work place is out of the notified coverage area under ESIC i.e. ESIC is not implemented in the area **or** in case of excluded employees under ESIC, the Contractor is required to take Employee Compensation / Workmen Compensation Policy from IRDAI approved Insurance Company taking into consideration the **maximum compensation liability** as per provisions of Employees' Compensation Act, 1923. It must be ensured that the contractor/contracting firm should extend coverage to the contract workers through Employee Compensation Policy, to meet the **Compensation Liability** under **Employee's Compensation Act, 1923** along with **Medi-claim Floater Policy with a coverage of Rs. 3 Lakhs per resource covering his/her spouse and two children.**

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6. Group Personal Accident Insurance Policy

The Contractor is required to take a Group Personal Accident Insurance Policy with coverage of **Rs. 5 Lakhs (**covering death, permanent disability + partial disability**)** per resource for the entire period of contract covering all resources deployed under the contract.

7. **The Payment of Death Gratuity Act, 1972**

In case of Death or permanent disablement of a resource during execution of work under the contract, the Contractor has to pay the Gratuity as per the provision under the Payment of Gratuity Act, 1972 to the nominee(s) of the resource as per the details maintained in the duly signed Nomination Form maintained by the Contractor. The proof of disbursement may be submitted to the EIC .

8. **The Contract Labour (R&A) Act, 1970**

a) The Contractor is required to obtain Labour license under the provisions of the Contract Labour (R&A) Act, 1970 from the office of Licensing Officer, Central Labour Authority, Ministry of Labour and Employment, Govt. of India having jurisdiction of the Region.

b) The Contractor shall discharge obligations as provided under the Contract Labour (R&A) Act, 1970 rules and regulations framed under the same and enforced from time to time.

c) The Contractor shall ensure regular and effective supervision and control over the resources deployed for which a supervisor / representative of the Contractor should be available at all the times for giving suitable direction for undertaking the Contractual Obligations.

d) The Contractor is solely responsible for payment of wages to each resource deployed by him and such wages shall be paid before the expiry of such period as may be prescribed.

e) It shall be the duty of the Contractor to ensure the disbursement of wages to resource(s) through e-banking/digital mode. In case the resource does not have a bank account, the disbursement of wages may be made in cash in the

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presence of the Engineer-in-charge / authorized representative of Bhagyanagar Gas Ltd. initially and Contractor shall simultaneously arrange for opening the bank account of each contract labour deployed by him.

f) In case, the Contractor fails to make payment of wages and deposit of PF contribution within the prescribed period or makes short payment of wages / short deposit of PF contribution, **it shall be treated as FAILURE and action as per the provisions of General Conditions of Contract shall be taken. Further,** Bhagyanagar Gas Ltd., as Principal Employer, will make payment of wages in full or the unpaid balance due, as the case may be, to the resource(s) deployed by the Contractor and deposit the PF contribution

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with PF authorities. Such amounts will be recovered from the Contractor either by deduction from any amount payable to the Contractor under any contract or as a debt payable by the Contractor.

9. The contractor is required to comply with all applicable labour laws and regulations including, but not limited to the following:

a) The Factories Act, 1948 / The Shops & Establishment Act, 1948 (which ever applicable)
b) The Maternity Benefit Act, 1961
c) The Building and Other Construction Workers (Regulation of Employment and Conditions of Service) Act 1979 & Building and Other Construction Workers Welfare Cess Act, 1996
d) The Inter State Migrant Workmen (RECS) Act 1979 (if applicable)
e) Contract Labour (R&A) Act-1970
f) Employees' Provident Fund & Misc. Provisions Act- 1952
g) Employees' State Insurance Act-1948
h) Employees' Compensation Act, 1923
i) Payment of Gratuity Act,1972
j) Minimum of ages Act, 1948
k) The Payment of Wages Act, 1936
l) The Payment of Bonus Act, 1965

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STANDARD CONDITIONS OF SCC : PART III

Responsibilities of the Contractor

1. The Contractor shall be solely responsible and indemnify Bhagyanagar Gas Ltd. against all charges, dues, claim etc. arising out of the disputes relating to the dues and employment of resources, if any, deployed by him.

2. The Contractor shall indemnify BGL against all losses or damages, if any, caused to it on account of acts of the resource(s) deployed by him.

3. The Contractor shall indemnify BGL from all claims, demands, actions, cost and charges etc. brought by any court, competent authority / statutory authorities against BGL.

4. The Contractor shall also indemnify BGL for any action brought against him for violation, non-compliance of any act, rules & regulation of centre / state / local statutory authorities.

5. All resources deployed by the Contractor are deemed to be on the rolls of the Contractor.

6. **Age:** No resource below the age of **18** years shall be deployed by the contractor for the execution of the contract. However, maximum age of resources deployed under the contract would be 60 years. (In case of Security and Fire & Safety Services, no resource below the age of 18 years shall be deployed by the contractor for the execution of the contract. However, in view of nature of business operation and nature of duty, for efficacy & efficiency purpose, resources will be deployed up to the age of 58 years. However, the age limit can be relaxed for a further period of two (02) years up to the age of 60 years if the contract worker is competent, efficient and medically fit i.e. physically fit with good health, good eye sight without any disease. The contractor has to produce Medical Fitness Certificate, to this effect, against such contract workers if deployed beyond 58 years.)

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7. **Appointment/Nomination of supervisor:**
   As a part of the contract, the Contractor is required to appoint/nominate a supervisor (s) who will supervise, control and give directions to the resource(s) for discharging the contractual obligations. Accordingly, the Contractor has to give in writing the name and contact details of the supervisor (s) to the EIC. A copy of the same is also to be sent to HR In-charge and Security In-charge for records.

8. A copy of the Letter of Acceptance (LOA) should be submitted to the Security Department by the Contractor / his representative or supervisor for facilitating the movement of resource(s) including machine & materials involved in the contract.

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9. The resources to be deputed/ deployed by the Contractor shall observe all security, fire and safety rules of BGL while at the site/work. All existing and amended safety / fire rules of BGL are to be followed at the work site by the Contractor and his deployed resource(s).

10 **Personal Protective Equipment / Safety Kit and Liveries** adequate supply of personal protective equipment / Safety Kit and Liveries as mentioned in the Scope of Work to all such resources deployed.

11. In case of accident, injury or death caused to the resource(s) while executing the Work under the contract, the Contractor shall be solely responsible for payment of adequate compensation, insurance money etc. to the next kith & kin of injured / diseased. Contractor shall indemnify BGL from such liabilities.

12. The Contractor shall not deploy any resource suffering from any contagious or infectious disease. The Contractor shall get the deployed resource(s) examined from a civil Govt. Doctor.

13. No resource(s) or representatives of Contractor (including Contractor) are allowed to consume alcoholic drinks or any narcotics within the premises of BGL (including Plant, Office and Residential etc.). If found under the influence of above, the Contractor shall immediately replace that resource(s) with intimation to the EIC.

14. While engaging / deploying the resources, the Contractor is required to make efforts to provide opportunity of employment to all resources belonging to all classes in order to have a fair representation of these sections of the society.

15. While engaging the resources, the Contractor is required to make efforts to provide an **opportunity to** candidates with experience of **apprentice training in BGL /BGL.** under the provisions of the Apprentices Act, 1961.

16. The Contractor is required to maintain all Registers and other records in an **office** within the premises of BGL. or at a place **within a radius of three kilometres**.

17. Contractor shall provide proper **Employment cards (FORM XII)** for the resource to be deployed by him, duly signed by the Contractor or authorized person on behalf of Contractor.

18. **Gate/ Entry Pass or Authorization:**

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Entry to the premises of Bhagyanagar Gas Ltd. is restricted and is subject to appropriate entry authorization in the prescribed format of a Gate Pass or any other entry authorization w.r.t police verification as per instruction of Security department from time to time. Similarly, entry for material/ equipment's/ tools/ tackles etc. is restricted & subject to entry authorization by security department.

19. The Contractor shall issue **Identity cards** in his firm's name to the resource deployed.

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20. Discipline of the resource(s) during discharge of duties must be regulated by the Contractor himself or by his representative.

21. **Police verification**

a) The Contractor (including his sub-Contractors/Petty Contractors etc, if allowed) will undertake police verification in respect of the resource(s) engaged by him in BGL's premises. Such verification will have to be carried out from concerned police station of their permanent place of residence/present place of residence.

b) Further, the Contractor is advised not to deploy any resource having past criminal record in the establishment/premises of BGL. under this contract awarded to him.

c) In the event of violation of above clauses at (a) and (b), the Contractor will be solely responsible for the same.

d) If any such resource(s) having criminal record is deployed by the Contractor in the premises of BGL. and has come to the notice of BGL. at any point of time, the Contractor shall immediately replace that resource(s), failing which that particular resource(s) of the Contractor will not be allowed to enter into the premises of BGL.

22. While confirming to any of these conditions, the Contractor must ensure that all applicable Laws of State regarding labour, their welfare, conduct etc. are complied.

23. The contractor shall ensure the KYC of contract workers in EPFO portal at all time during the period of contract and submit a proof of the same to the Engineer-in-charge.

24. The contractor shall ensure that the nomination of contract workers deployed by him under the said contract is duly updated in the EPFO Portal

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STANDARD CONDITIONS OF SCC: PART-IV

Compliance of Government of India Directives

1. **Pradhan Mantri Suraksha BimaYojna (PMSBY) and Pradhan Mantri Jeevan Jyoti BimaYojna (PMJJBY)**

   Contractor shall, ensure that all its resources deployed under this contract have obtained additional insurance coverage under the Pradhan Mantri Suraksha Bima Yojana (PMSBY) and Pradhan Mantri Jeevan Jyoti Bima Yojana (PMJJBY) through the participating banks and submit the proof of such insurance coverage to the satisfaction of BGL. The Contractor shall submit evidence / proof to BGL. in this respect. Both the schemes are to be regulated continuously on yearly basis and the same should be renewed on each successive relevant date in subsequent years during the period of the contract.

2. **Labour Identification Number (i.e. LIN) Registration (Mandatory)**

   The Unified Shram Suvidha Portal, developed by Government of India, facilitates reporting of Inspections & submission of Returns and has also been envisaged as a single point of contact between employer, resources and enforcement agencies bringing in transparency in their day-to-day interactions. For integration of data among various enforcement Agencies, the Contractor, as an inspectable unit, is required to register and obtain Labour Identification Number (i.e. LIN) from Shram Suvidha Portal and submit the same in BGL.

3. **Pradhan Mantri Rojgar Protsahan Yojna (PMRPY) Aatmanirbhar Bharat Rozgar Yojana (ABRY)/ Pradhan Mantri Garib Kalyan Yojana- – if applicable**

   In order to support the Govt. of India's Initiative on Employment Generation, the Contractor must register for Pradhan Mantri RojgarProtsahanYojna (PMRPY) Scheme Scheme / Aatmanirbhar Bharat Rozgar Yojana (ABRY) /Pradhan Mantri Garib Kalyan Yojana (as applicable). In service contracts,the Contractor shall inform BGL/Engineer in Charge about the benefit availed, if any, against the scheme for adjustment against the invoice(s) / bill(s).

Records and Registers

1. **Maintenance of records and registers**

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The Contractor is required to maintain statutory records and registers for applicable labour laws as prescribed under the following rules:

a) Ease of Compliance to Maintain Registers under the various Labour Laws, 2017
b) Rationalization of Forms and Reports under Certain Labour Laws Rules, 2017
c) Labour Codes (after they are made effective by Government of India)

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2. The Contractor has to maintain the following (but not limited to) Registers/ Forms/ Reports / Returns at all times:

a) Employee Register in FORM A (to be replaced by FORM – IV of Code on Wages-2019 after it comes into force)
b) Wage Register in FORM B (to be replaced by Register of Wages, Overtime, Fine, Deduction for damage and Loss in FORM – I of Code on Wages-2019 after it comes into force)
c) Register of Loan / Recoveries in FORM C
d) Attendance Register in FORM D
e) Register of rest/leave/leave wages in FORM E
f) Copies of Wage Slips in FORM XIX (to be replaced by FORM – V of Code on Wages-2019, after it comes into force)
g) Copies of Employment Card in FORM XII

3. Documents to be submitted by the Contractor to EIC at various stages during the currency of the contract

a) <u>Immediately after issuance/receiving of Letter of Acceptance (LOA)</u>

i. Details as required for issuance of **FORM - VII (Notice of Commencement of Work)**
ii. Application for issuance of **FORM –III** (**Form of Certificate by Principal Employer)** for obtaining Labour License from Licensing Authority for engaging 20 or more resources.
iii. Copy of **FORM - VI** (**License**) before commencement of work if 20 or more resources are engaged.
iv. Copy of **Provident Fund Registration Certificate** issued by concerned Regional Provident Fund Commissioner.
v. Copy of **ESI Registration Certificate** issued by concerned ESIC. vi.Copies **Insurance Policy(ies)** as mentioned at ***Annexure-iv***
vii. Copy of **Labour Identification Number (i.e. LIN)** Registration done in **Shram Suvidha Portal** of Govt. of India.
viii. Copy of registration under the Building and Other Construction Workers (RE&CS) Act,1996 in case he employs ten or more building workers in any building or other construction work.

b) <u>At the time of submission of monthly bills</u>

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i. Copy of **Employee Register in FORM – A** under The Ease of Compliance to Maintain Registers under various Labour Laws Rules, 2017 (to be replaced by FORM **– IV** (of Code on Wages-2019, after it comes into force).

ii. Copy of **Wage Register in FORM – B** under The Ease of Compliance to Maintain Registers under various Labour Laws Rules, 2017 (to be replaced by Register of Wages, Overtime, Fine, Deduction for damage and Loss in FORM – I of Code on Wages-2019, after it comes into force) duly certified by **authorized representative** of the Contractor and **authorised person** in BGL certifying as "***Certified that the amount shown***

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in the column No. ---- has been paid to the workman concerned in my presence on-----
-(date) at -------(place)" along with **copy of bank statement** duly certified by bank as proof of **Cashless Transaction / Payment of wages through e-banking/digital mode**.

iii. As a part of compliance and proof of depositing Provident Fund, EDLI and ESI contributions the Contractor shall submit copies of the ***Separate E-Challans / ECR,*** bank receipts/bank statement in respect of resources deployed in BGL in the previous month in this contract. The documents should also contain details of resources, PF account No., ESI No., contributions of resources and employer etc.

iv. Dully filled in details as per ***Annexure- i.***

v. Copy of Wage Slips in FORM XIX

vi. *Proof of deposit of Cess under The Building and Other Construction Workers ' Welfare Cess Act, 1996, (if applicable)*

c) ***At the time of closure of contract***

i. **Indemnity Bond** of Rs. 100/- duly notarized from Notary indemnifying BGL from all liabilities w.r.t. the resource engaged by the Contractor regarding payment of wages, Provident Fund/ESI contributions, Insurance and other statutory payments. Format for Indemnity Bond is enclosed at ***Annexure- ii.***

ii. Copy of the **Wage Register** in **FORM – B** (to be replaced by FORM-I of Code on Wages-2019 after it comes into force) for the last month.

iii. Copies of **Service Certificates** issue to resource in **FORM VIII**

iv. Copy of the ECR related to EPF and ESIC Compliance in respect of Resource.

v. Details as required for issuance of **FORM - VII (Notice of Completion of Work)**

vi. Copies of FORM-C & FORM –D under the Payment of Bonus Act 1965 as proof of payment towards Bonus.

vii. Copy of proof towards release of Leave Encashment

viii. Copies of No Dues Certificate from contract workers stating they have received all statutory payments and social benefits.

ix. Proof towards PF KYC compliance of contract workers

x. Proof of deposit of total Cess under The Building and Other Construction Workers ' Welfare Cess Act, 1996, (if applicable) with final assessment from respective Cess Collector (s).

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4. **Verifications of bills and documents submitted by the Contractor**

   Before certifying/verifying the running/ final bill/invoice of the Contractor, the designated EIC of the respective contract of BGL, shall verify from the ECRs of PF/ESI, through respective web portals, the detail/status of the payment made by the Contractor. In case the information furnished by the Contractor is found to be incorrect, BGL shall take appropriate action against the Contractor under relevant conditions as available in the tender document.

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Annexure-i

Details in support of RA Bill for the Month of _____, 20__

(1) Name of the Firm/Agency/Contractor _____
(2) Nature of Contract: Job/ Service _____
(3) Period of Contract: From _____to _____
  (a) Extension Period of Contract, if any from _____to _____
  (b) Place where contract workmen are working _____
(4) Postal address of the Contractor: _____
(5) Phone No. of the Contractor: _____
(6) Fax No. and Email of the Contractor: _____
(7) Name and Address of PF office from where EPF Code No. has been allotted: _____
(8) EPF Code No. allotted by PF office: _____
(9) Name and Address of ESIC office from where ESI Code No. has been allotted: _____
(10) ESI Code No. allotted by ESIC office: _____
(11) Labour License No. _____dated _____
(12) Validity period of Labour License from _____to _____
(13) Detail of Resource engaged by the Contractor:

Category	No. of Resources		Prevailing Minimum Wages
	Male	Female	
Unskilled			
Semi-skilled			
Skilled			
Highly skilled			
Total			

(14) Copy of Wage Register in FORM – B (to be replaced by FORM-I as per Code on Wages-2019, after it comes into force)
(15) Details of deposit of contribution towards EPF:
  a) EPF Challan No. Amount Date
  _____ _____ _____
(16) Details of Deposition of contribution towards ESI
  a) ESI Challan No. Amount Date
  _____ _____ _____
(17) Whether any arrangement / agreement has been entered with any resource for extending benefits under Inter-state Migrant Workmen (RE&CS) Act, 1979: _____(Yes / No)
If Yes, No. of such Inter-state Migrant Workers: _____

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SIGNATURE OF CONTRACTOR/AUTHORIZED REPRESENTATIVE

Place :

Date:

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Annexure-ii

INDEMNITY BOND

WHEREAS Bhagyanagar Gas Limited (hereinafter referred to as BGL) which expression shall, unless repugnant to the context include their legal representatives, successors and assigns, having their Registered Office at …., Hyderabad has entered into a CONTRACT with <***name of the Contractor***> Incorporated (hereinafter referred to as the ('CONTRACTOR') which expression shall unless repugnant to the context include their legal representatives, successors and assigns, having their Registered Office ----------

- for Rs. ----------for <***NAME OF THE CONTRACT***> **---- for a period of----------**" and

on the terms and conditions as set out, inter-alia in the Letter of Acceptance No. ----------

----------and various documents forming part thereof hereinafter collectively referred to as the 'CONTRACT' which expression shall include all amendments, modifications and / or variations thereto.

BGL has also requested the CONTRACTOR to execute an Indemnity Bond in favour of BGL indemnifying it from all consequences which may arise out of any Case filed by any Resources/ vendors/ sub- Contractors /partner etc. who may have been engaged by the CONTRACTOR directly or indirectly with or without consent of BGL for above works , which may be pending before any court of Law including Quasi-Judicial Authority , Competent Authority, Labour Court , Arbitrator , Tribunal etc. and the Contractor has readily agreed for the same.

NOW, THEREFORE, in consideration of the promises aforesaid; the CONTRACTOR hereby irrevocably and unconditionally undertakes to indemnify and keep indemnified BGL from any loss, which may arise out of any such contract/Case. The CONTRACTOR undertakes to compensate BGL forthwith, on demand, without protest the loss suffered by BGL together direct / indirect expenses.

AND THE CONTRACTOR hereby agrees with BGL that:

(i) This Indemnity Bond shall remain valid and irrevocable for all claims of BGL arising from any such contract/case for which BGL has been made party until now or here-in- after.

(ii) This Indemnity Bond shall not be discharged / revoked by any change / modification / amendment / deletion in the constitution of the firm / Contractor or any conditions thereof including insolvency etc. of the CONTRACTOR but shall be in all respects and for all purposes binding and operative until any claims for

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payment are settled by the Contractor.

The undersigned has full power to execute this Indemnity Bond on behalf of the CONTRACTOR and the same stands valid.

SIGNATURE OF CONTRACTOR/AUTHORIZED REPRESENTATIVE
Place
:
Date:

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Annexure- iii

UNDERTAKING

(To be submitted along with un-priced bid)

I/We hereby undertake that I/We have completely understood the statutory & non-statutory components, minimum resources required to be deployed and the cost involved thereof in deployment of resources as per the tender conditions.

I/We further undertake to ensure all compliances of the tender conditions. Any non-compliance may be construed as deficiency in the performance of the contract. If such non-compliance is noticed Bhagyanagar Gas Limited/owner is at liberty to take action in line with the tender conditions including termination of the contract.

Signature of Bidder…….
Name of Bidder……

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Annexure IV

Summary of Insurance Policies

Contractor is required to cover all resources deployed by him with the following insurances / schemes:

Sl. No.	SCHEME	APPLICABILITY	PREMIUM/ CONTRIBUTION	SUM ASSURED/ BENEFITS	REMARKS
1	The Employees' State Insurance Act, 1948	Applicable to all resources of the Contractor (within ESI wage limit) working in notified area.	3.25% of wages by employer 0.75% of wages by employees	Benefits under the Employees' State Insurance Act, 1948.	
2	The Employees' Compensation Act, 1923 (in lieu of ESI – mentioned at Sl. 1)	Applicable to excluded employees under ESI and those who are working in non-notified area to extend similar benefits as available under ESI Act, 1948	Premium to be calculated considering wage limit under EC Act, 1923 (i.e. Rs. 15,000/- p.m currently)	Maximum **Compensation Liability** under Employee's Compensation Act, 1923 along with **a Mediclaim floater policy with a coverage of Rs. 3 Lakhs per resource covering his/her spouse and two children.**	Provides compensation and medical facility to resources.
3	Group personal Accident Insurance	Applicable to all resources of the Contractor	Based on the coverage	Insured value: **Rs. 5 Lakh** to cover expenses associated with any accident.	Death, permanent disablement, temporary total disability or any other medical expenses

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				related to
4	Pradhan Matri Suraksha Bima Yojana (PMSBY)	Eligibility – age group 18 to 70 years	Rs. 12/- per annum	**Accidental** death and permanent disability: (i) Permanent total disability – Rs. 2 lakhs. (ii) Permanent partial disability – Rs. 1 Lakh.
5	Pradhan Mantri Jeevan Jyoti Bima Yojana(PMJJB)	Eligibility – age group 18 to 50 years. (can continue upto 55 years)	Rs. 330/- per annum.	Risk coverage – Rs. 2 Lakhs- in case of **death due to any reason**

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Annexure IV

Summary of Insurance Policies

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Sl. N	SCHEME	APPLICABILITY	PREMIUM/ CONTRIBUTI ON	SUM ASSURED/ BENEFITS	REMARKS
1	The Employees' State Insurance Act, 1948	Applicable to all resources of the Contractor (within ESI wage limit)working in notified area.	3.25% of wages by employer 0.75% of wages by employees	Benefits under the Employees' State Insurance Act, 1948.	
2	The Employees' Compensation Act, 1923 (in lieu of ESI – mentioned at Sl. 1)	Applicable to excluded employees under ESI and those who are working in non-notified area to extend similar benefits as available under ESI Act, 1948	Premium to be calculated considering wage limit under EC Act, 1923 (i.e. Rs. 15,000/- p.m currently)	Maximum **Compensation Liability** under Employee's Compensation Act, 1923 along with **a Mediclaim floater policy with a coverage of Rs. 3 Lakhs per resource covering his/her spouse and two children.**	Provides compensation and medical facility to resources.
3	Group personal Accident Insurance	Applicable to all resources of the Contractor	Based on the coverage	Insured value: **Rs. 5 Lakh** to cover expenses associated with any accident.	Death, permanent disablemen, temporary total disability or any other medical expenses related to accident.
4	Pradhan Matri Suraksha Bima Yojana (PMSBY)	Eligibility – age group 18 to 70 years	Rs. 12/- per annum	**Accidental** death and permanent disability: (i) Permanent total disability – Rs. 2 lakhs. (ii) Permanent partial disability – Rs. 1 Lakh.	
5	Pradhan Mantri Jeevan Jyoti Bima	Eligibility – age group 18 to 50 years. (can continue upto 55 years)	Rs. 330/- per annum.	Risk coverage – Rs. 2 Lakhs- in case of **death due to any reason**	

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	Yojana(PMJJB)			

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Section 8: Schedule of Rates

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PART A

SCHEDULE OF RATES

SUB: TENDER FOR GASIFICATION WORKS OF LMC (LAST MILE CONNECTIVITY)-COMPLETED CUSTOMERS AND REMOVAL OF LMC (LAST MILE CONNECTIVITY)-FOR NON-INTERESTED CUSTOMERS IN HYDERABAD GA

BID DOCUMENT NO: BGL/696/2025-26

Item No.	Activity	UOM	Qty	Unit Rate inclusive of all applicable taxes, duties & other levies [if any] payable by the Contractor under the Contract, or for any other cause except final GST in Rs.	Total Amount inclusive of all applicable taxes & duties & other levies [if any] payable by the Contractor under the Contract, or for any other cause except final GST in Rs.
1.0	**PE PIPELINE**				
1.1	**Pipe Laying in any unprepared surface (Katcha surface) / Normal Surface / Hard surface using Open Cut / Moling (without Casing) methodology.**				

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	Receipt, Loading, unloading, storing, reloading, tranportation, unloading, stringing and laying of PE100, SDR11/17.6/17 line pipes of all sizes including, proper stacking, identification,and supply of accessories of all sizes & thickness like PE Bends, Couplers, Endcaps, Tee, Reducer, CS / GI to PE Fittings (i.e. Transition Fittings of sizes 20 mm to 63 mm), Warning Mat etc. Handling, Stringing / uncoiling, aligning of the PE line pipe on the pipeline Right-of-Use / route ,laying / installation of PE line pipe alongwith required accessories as mentioned above as per specification wherever required depending on site condition including execution of all works; Storage of material in contractor's store, fabrication, access for construction procurement and supply of all materials, consumables,equipments, labour and other inputs , including the laisoning charges for obtaining the ROU , NOC, etc., if any. In the case of free issue items, the scope also includes, receiving and loading from Owner's designated store,transportation, unloading and stacking of free issue items at Contractor's store, etc. excavator/ Machine moiling technique for PE pipesizes as per specifications.				
	Carrying out all temporary, ancillary, auxiliary works required to make the PE pipeline ready for commissioning as per drawings.				
	Specifications, scope of work indicated in PJS and other provisions of Contract document and instructions of Engineer-in-charge, including but not limited to carrying out the following works:				
	Surveying of route and detours required at the time of execution including marking the same in topographical sheet, preparation of construction drawings showing survey details, and submit same to Owner for review / approval.				

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	Carrying out preliminary activities such as preperation of drawings wherever required for crossing etc.				
	Preparation and getting approval of schedules, execution procedures, drawings/ sketches/ wherever required, making trial pits to determine the underground utilities/ services etc., restoration of the abandoned trial pits to original condition.				
	Stacking and installation of construction markers, clearing, fencing, grubbing, cutting of trees, full filling all the requirements of various statutory/ environment authorities to the entire satisfaction of concerned authorities, grading of work area.				
	Barricading the work area as per local authorities norms & to the satisfaction of Owner/ Eingineer -in- charge,installation of safety signs.				
	Barricading the pipeline construction area prior to execution of the works as per drawing no. as per enclosed with tender document and to the entire satisfaction of owner / engineer- in - charge.				

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	Laying using open trench without casing includes survey of under ground utilities (through trial pits), execution of work as per specification including Trenching to all depths by excavation in all types of soils including soft/ rocky strata and different type of pavement / footpath / roads etc. including rock breaking, chiselling or otherwise cutting etc. as required and storing excavated soil, reusable materials at designated area as directed by Engineer in charge and to a width to accommodate the pipeline as per the relevant standard/ specification etc. [The minimum depth of the top of pipeline shall be 1.0 m measured from top of pipeline to the top of undisturbed surface of the soil or as per Specification/ OISD - 226 & PNGRB latest guidelines whichever is higher]. Dewatering of trenches / pits if required as per site condition.Repairing of all damaged utilities if any, and payment of any compensation (if claimed by owner / other utility agencies).				
	Uncoiling / stringing & aligning of PE pipes, clamping, jointing of the pipe ends / fittings / valves by qualified personnel using approved electro-fusion techniques as per specification.				

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	Installation / lowering the pipeline in trench to required depth as per PJS, Technical Specification & drawings, supply & placement of HDPE Yellow colour warning mat (refer PJS item no.- 4.2J) over the pipeline along the complete route as per standard drawings, data sheets & technical specifications, padding around pipeline including supply of suitable padding material duly approved by EIC , backfilling to its original condition with excavated earth / borrowed select soil/sand duly approved by EIC & its compaction & crowning. At certain specific area of ROU, trench shall be backfilled & compacted and shall be made ready for motorable.All tiles/slabs/curb stones etc removed during excavation shall be placed properly and no seperate payment shall be admissible against this activity. Restoration shall be carried as per separate SOR item mentioned elsewhere in the SOR or to be done by Owner / concerned authorities.				
	The scope of work against this item also include Electro-fusion jointing of valves, fittings wherever required and as directed by Engineer-in-charge.				
	The scope of work against laying of 20 mm/ 32 mm pipe also includes works like making of PCC pedastal of grade (1:2:4) and size (8"X6"X4"), supply and installation of GI Sleeve (Heavy (C-Class) as per IS-1239), filling of sand and installation of TF (along with supply).				
	Pneumatic testing, purging with nitrogen and commissioning as per specification and approved procedures providing all tools and tackles, nitrogen, instruments, manpower and other related accessories and as per the instructions of the Engineer-in-charge.				

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	Final clean-up of right-of-use or area disturbed by contractor during their construction activities for laying of pipeline works and disposal of debris and surplus material to designated disposal areas and backfilling of trench and compaction of the same as per satisfaction of Owner and / or as directed by Engineer–in–charge.				
	Maintaining the completed pipelines and installation for any defect or failures during defect liability period (i.e. 12 months from date of completion of work) .				
	Handing over the completed works to Owner for their operation/ use, reconciliation of material area wise and obtaining "no objection certificate" from Owner/ PMC.				
	Preparation and submission of Daily progress report, Laying Graphs / PE line cards on daily basis.				
	On completion of gas charging of pipelines. Preparation and submission of As-built drawings, crossings details, termination, utility graphs and deviation statements.				
	In case, the minimum required depth is not possible due to site condition, necessary mitigation measures shall be required to be taken by contractor in consultation with EIC as per PNGRB Guidelines. No additional payment shall be admissible against the same.				
	Submission of all documents required for contract closure in numbers as mentioned in contract.				

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	Any other activities not mentioned / covered explicitly above, but otherwise required for satisfactory completion / operation / safety / statutory / maintenance of the works shall also be covered under the scope of work and has to be completed by the Contractor within specified schedule at no extra cost to Owner. All the work shall be executed in accordance with the provision of contract. Reconciliation of materials, handing over the completed Pipeline Network to BGL for their operation & maintenance team and submisssion of As-built Drgs and other related documents as per contract.				
a)	20mm / 32 mmPE 100 pipe Service line laying upto 5 M length (Ground connection)	Nos	1000	3313.60	3313600.00
b)	20 mm PE 100 pipe quantity required beyond 5 meters, the rate per meter will be payble for full executed qty	Meter	7500	354.35	2657625.00
c)	32 mm PE 100 pipe quantity required beyond 5 meters, the rate per meter will be payble for full executed qty	Meter	4000	382.85	1531400.00
d)	63 mm PE 100 pipe	Meter	1500	397.10	595650.00
	Note:				
i)	The lengths of pipelines are tentative.				
ii)	For restoration of asphalt / concrete roads, the item for construction of asphalt top / concrete top / red stone / paver shall be paid separately as per the rates quoted for the same elsewhere in the SOR.				
iii)	The measurement will be made from tapping saddle on existing PE pipe of various sizes of existing network to Transition Fitting (PE to GI). The tapping saddle, Transition Fittings and other fittings shall be included in the measurement.				
iv)	The measurement will be made from tapping saddle on existing PE pipe of various sizes of existing network to Transition Fitting (PE to GI). The tapping saddle, Transition Fittings and other fittings shall be				

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	included in the measurement.				
v)	In case quantity increases beyond 5 meter (against SOR item no 1.1.a) payment towards additional length shall be paid as per SOR item no. 1.1.b & 1.1.c				
1.2	**Restoration**				
	Restoration of the roads, pavements, channels, footpaths, tiles, stones etc. to original condition including supply of the approved quality material required, as per local authorities norms, obtaining NOC from land owners/ third party inspection agencies/Consultant designated by BGL Gas and to the satisfaction of Engineer-in-charge.				
a)	Asphalting	Meters	500	764.75	382375.00
b)	Cement Concrete/RCC/PCC	Meters	600	735.30	441180.00
c)	Tiles/ Paver/ Blocks/ Curb Stones, Red sand stone	Meters	600	605.15	363090.00
d)	Brick Soling/ Stone Soling, etc.	Meters	400	292.00	116800.00
1.3	**Pipe laying using manual Moling technique (with out casing) for PE pipe sizes of :**				
	Laying of all PE pipe (PE 100 SDR11), Including supply of Couplers, End caps etc. (As per Particular job specification.)				

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	Survey of under ground utilities, execution of the work as per specification, including excavation of pits Moling with the hole size not exceeding 20% of the pipe dia, jointing and insertion of carrier pipe, testing & commissioning and restoration of the pits to original condition, submission of As-Built Graph as per specifications and the instruction of Engineer-in-charge.				
a)	20 mm PE 100 pipe	Meters	500	483.55	241775.00
b)	32 mm PE 100 pipe	Meters	500	552.30	276150.00
c)	63 mm PE 100 pipe	Meters	200	641.25	128250.00
1.4	**Supply of GI/ Concrete Sleeves (wherever required as a Special Case as per instructions of the Engineer-in-charge)**				
	Supply, installation of sleeve, insertion of pipe, sealing the annuals, firm fixing of Sleeves with concrete mix. Breaking through any obstructions and their subsequent restoration, as per specifications and instructions of the Engineer-in-charge.				
a)	**GI Sleeves /Concrete Sleeves**				
i)	2 $^{1}/_{2}$" NB,	Meters	100	612.75	61275.00
ii)	4" NB,	Meters	100	912.00	91200.00
	The decision regarding use of type of sleeves to be used at various locations shall be made by Engineer In -Charge / Owner				
1.5	**Fabrication & Installation of Markers**				
iii)	**Warning Plate Markers**				
	Supply, fabrication and installation of plate markers, including application of approved colour and quality of primer and paint, stencil letter cutting of lettering, numbers, direction, etc. as per the attached	Nos.	1000	552.90	552900.00

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	drawings to be installed near regulator.				
2.0	**PNG Connection to Domestic Consumers**				
2.1	**Installation of GI Service Pipe**				
	Supply, loading, storing, unloading and laying of GI pipes, including supply of GI fittings/accessories including meter adopter, Fittings of all sizes & thickness like Elbows, Tees, unions, sockets, reducers, GI plugs, Sleeves etc., installation of GI line (along with installation of required accessories as mentioned above) of following sizes, including fabrication with supply of all materials , consumables, labour and other incidental works. The scope of work also includes installation of Regulators (4/6 bar to 21 m bar) / any other capacity meter regulators which shall be provided as free issue item. Carrying out all temporary, ancillary, auxiliary works required to make the GI line ready for commissioning as per drawings specifications.				
	Scope of work indicated in PJS and other provisions of Contract document and instructions of Engineer-in- charge, including but not limited to carrying out the following works: Preparation and approval of schedules, execution procedures, sketches.				
	Finalisation of optimum route with consent of customer, from transition fitting to cooking oven/ appliance.				

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	Making temporary but stable platforms/ scaffolding/ rope ladders and all other safety measures including safety belts wherever required.				
	Installation of GI Pipes ,Fittings, including NPT threading, painting as specified .				
	Drillings of holes through walls (Brick, RCC) , Granite, Marble, Glass Cutting with proper heavy duty hammer drill machine tools and tackeles, using proper sealent /grout materialed colors to match the original replacement of damages during drillling, restoring the area to original condition.				
	Supply & Fixing of approved clamps, Dowell Plugs with screws, grout material, suitable thread sealant i.e. Teflon Tape/ lock tight, drilling of holes through tiles/ wood/ marble/ Granite etc. jointing of PE to above Ground service GI pipes, testing, purging with Nitrogen and commissioning of the complete installation as per specification.				
	Painting of entire length of pipe along with fittings after proper surface finish by one coat of approved primer paint and two coats of approved synthetic enamel paint complete as per specification & direction of EIC. Restoring the wall surface to original conditions				
	All above activities to be carried out as per specification to the complete satisfaction of consumer & as desired by Engineer-in-charge.				
	Handing over the completed works to BGL Gas for operation/ use, reconciliation of material area wise and obtaining "no objection certificate" from BGL Gas / PMC.				

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	Any other activity not mentioned/ covered, explicitly above, but otherwise required for satisfactory completion/ safety/ statutory/ maintenance of works shall also be covered under scope of work and has to be completed by contractor within specified schedule time.				
a)	½" All floors (Including connectivity from TF to regulator.)- with supply of GI Pipes by Contractor	Meter	12500	354.13	4426625.00
b)	¾" All Floors (Including Installation of Risers) including supply of GI Pipes by Contractor	Meter	6225	421.12	2621472.00
C)	1" Dia All Floors ((for Riser Installations & For Commercial Connections) including **supply of GI Pipes by Contractor**	Meter	5000	536.65	2683250.00
d)	1 1/2" Dia All Floors ((for Riser Installations & For Commercial Connections) including **supply of GI Pipes by contractor**	Meter	3750	647.87	2429512.50
	Note:-				
i)	Refer Particular Job Specification for supply items.				
ii)	The quantity measurement shall be from the outlet of the Transition Fitting (TF) upto the Meter. All intermediate GI fittings (excluding Flexible Hose / Anaconda, valves and regulator) shall be considered while measuring length of GI Pipes.				
iii)	Supply and installation of isolation Ball Valves shall be paid as a separate SOR Item.				

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2.2	**Supply, Installation, Testing & Commissioning of Copper Service Pipes**				
	Supply and installation of copper tubing as per PMC TS and associated fittings including brass fittings at the outlet of the meter and at the entry of appliance valve as per satisfaction of EIC. The copper tube and fittings shall be procured from approved vendors who have supplied these items for similar application earlier and with prior approved of Client / Consultant.				
	Copper tube shall be installed from the downstream of meter up to the isolation valve before the customers' appliance as per requirement and to the satisfaction of EIC. The Contractor to provide all equipment, tools and material necessary to execute the work in an efficient manner by cutting, cleaning, flux application, soldering and lacquering. The work includes supply of all tools, tackles and consumables including clamps for fixing the tubes.				
	12.0 mm OD x 0.6 mm wall thickness	Meter	4000	477.00	1908000.00
Note:					
i)	Supply and installation Appliance Ball Valves shall be paid as a separate SOR Item.				
2.3	**Installation of Meter, Flexible Hose & Conversion of Domestic Appliance:**				
a.	**Installation & fixing of meters** with associated inlet and outlet connections/ fittings, meter adopter, valves, regulators (100 mbar to 21 mbar), approved meter brackets and other supports by proper scaffolding/ grouting, Restoring the area to original complete as per specification. (Meter and Regulator will be issued as free issue Item).	Nos.	2500	694.00	1735000.00

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b.	**Conversion of Domestic Appliance** The work also includes installation and supply of Steel reinforced Flexible Hose as per IS 9573 (with Type as per latest PNGRB guidelines) (Gas tube from end of Isolation Valve up to burner/stove) and conversion of all the burners of the LPG stove (one stove per household) including supply of all types of burner nozzles/jets and associated controls etc. including the onboarding in BGL's software platform and maintain the gasifier customer for the period of 04 months including the handing over and collection of bills (i.e. 02 billing cycles). Any dues from the customer shall be recovered from the contractor.	Nos.	5000	290.00	1450000.00
	Cleaning and performing minor maintenance, greasing etc. of appliance, testing/ showing performance to the customer, signing of Joint Meter Records (JMR) entries in BGL's software and instructing customer on use & safety norms, complete as per specifications & to satisfaction of customer.				
2.4.	**Isolation Ball Valve And Appliance Valve**				
	Supply and installation of Isolation & Appliance Ball Valves as per Technical Specification and as directed by EIC				
a)	Isolation Ball Valve 1/2 " max. 6 bar (g)	Nos.	3750	277.00	1038750.00
b)	Isolation Ball Valve 3/4 " max. 6 bar (g)	Nos.	500	443.00	221500.00
c)	Isolation Ball Valve 1 " max. 6 bar (g)	Nos.	200	551.00	110200.00
d)	Isolation Ball Valve 1 1/2 " max. 6 bar (g)	Nos.	50	700.00	35000.00
e)	Appliance Ball Valve 1/2 " max. 35 mili Bar (g)	Nos.	3000	238.00	714000.00
2.5	**void**				
2.6	**Installation of Service Regulator / Field Regulator:** Installation & Fixing of regulator with associated inlet and outlet including required civil works				
a)	Service / Field Regulator installation as per sketch attached- (1/6 bar to	Nos	30	2561.44	76843.20

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	100 mbar)				
2.7	**Regulator Boxes:** Supply & Installation including painting of approved make regulator boxes and installing them firmly by grouting using approved bracket /clamps as per drawing enclosed & as per specifications and cleaning the area complete to the satisfaction of EIC.	Nos	30	1058.00	31740.00
2.8	Retesting, if required, commissioning of the GI piping network of various size from 1/2" to 2" NB having riser, headers as well as laterals . Item include checking of the network by air pressure, repair if any leakage observed and to make network ready for GAS-IN by providing manpower tools & tackles, gasket etc. purging with nitrogen and taking the gas inside the network. The total length of the network being tested shall be consider for payment.	Meters	10000	32.30	323000.00
3.0	**Registration of Domestic PNG Connections**				

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	Assistance in carrying out the work of Domestic PNG registration as per directions/instructions of the Marketing In charge of BGL Gas / Authorized representative including but not limited to following: 1) Enrolment & Registration of Domestic PNG Customers as per the given target. 2) Collection of filled up form along with Cheque/Demand Draft of Security Deposit amount and documents All other activities as may be required to complete the work in all respect is defined in the Scope of work to be read along with the Special Conditions of Contract and as per instructions of MIC. Carrying out the marketing activities for Domestic PNG connection as detailed in Scope of work, complete in all respects, as per directions/instructions of the Marketing In Charge including but not limited to the following: Distribution of leaflets & FAQ, Installation of banners, to be provided by client, at prime location, Awareness cum Registration Camp, Audio / Visual Presentations, Organizing Road Shows, etc. 3) Updation of reports on daily/ weekly/ monthly basis as per BGL instructions	Nos.	1000	132.00	132000.00

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4.0	Providing services for safe disconnection, isolation, de-pressurization (if applicable), dismantling and removal of installed DPNG meter, regulator, including removal of existing GI pipeline installed before and after the meter up to Transition fitting(TF)/isolation valve, along with all associated fittings, valves, supports, clamps and accessories. Scope includes collection, segregation, tagging, proper packing, loading, transportation and delivery of recovered LMC materials to BGL designated store and handing over to BGL. Item also includes reinstatement/restoration of all civil works affected during dismantling such as masonry cutting, plastering, grouting, flooring and painting to match existing finish. The bidder shall collect the final meter reading and obtain a joint report duly signed by the customer/owner and the bidder. The bidder shall also capture clear photographs of the existing infrastructure before and after removal. All such documents, including photographs and the joint inspection report, shall be submitted along with the Inspection Report at the time of submission of the RA bill. All activities shall be executed with due safety precautions, and in compliance with PNGRB norms, statutory regulations and BGL technical specifications, complete in all respects.	Nos	5000	450.00	2250000.00
	Total Amount inclusive of all applicable taxes & duties & other levies [if any] payable by the Contractor under the Contract, or for any other cause except final GST for complete scope of work (sub total)-A				**3,29,40,163**
	GST@18%				**59,29,229**

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	Total Amount inclusive of all applicable taxes & duties & other levies [if any] payable by the Contractor under the Contract, or for any other cause inclusing GST for complete scope of work		**3,88,69,392**

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PART B

SUMMARY OF SCHEDULE OF RATES

Bid Document No: BGL/696/2025-26

		Bidder's Name:			
Sl.no	**Description**	**Total Estimated Cost (inclusive of all applicable taxes & duties & other levies [if any] payable by the Contractor under the Contract, or for any other cause except final GST) in Rupees**	**Quoted Variation**		
			"INCREASE" OR "DECREASE" (Refer note no 1 below)	**Percentage In Figures (upto two decimal places)**	**Percentage In Words (upto two decimal places)**
(1)	(2)	(3)	(4 a)	(4 b)	(4 c)
1	**Refer Detailed SOR sheet attached herewith**	**3,29,40,163**			
2	Applicable GST (CGST&SGST/UTGST or IGST) rate on Total price (in %)				
3	Service Accounting Codes (SAC) as per GST act [To be filled by bidder]				

Notes:

1	**Under Column '4a', the bidder has to indicate clearly either "INCREASE" or "DECREASE" as applicable. In case the column is left blank, it will be considered as "DECREASE" in terms of percentage**

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