BHAGYANAGAR GAS LIMITED

(A JOINT VENTURE OF HPCL & GAIL)

BID DOCUMENT FOR

Supply of MDPE Pipes for Hyderabad, Vijayawada and Kakinada CGD Projects

UNDER OPEN DOMESTIC COMPETITIVE BIDDING

Bid Document No.: BGL/377/2017-18

VOLUME II OF II

C O N T E N T

SECTION – 8

MATERIAL REQUISITION

Material Requisition

Project : Procurement of MDPE Pipes for City Gas Distribution project at Hyderabad, Vijayawada and Kakinada

Client : M/s Bhagyanagar Gas Limited

Items : MDPE PIPES

Tender No. : **BGL/377/2017-18**

Material Requistion						
S.No	Dia of Pipe Line	UOM	Total Qty	Hyd	Vjy	Kkd
2	90 mm dia MDPE SDR 17.6	Km	15	15	0	0
3	63 mm dia MDPE SDR 11	Km	115	35	40	40
4	32 mm dia MDPE SDR 11	Km	392.50	172.50	110	110
5	20 mm dia MDPE SDR 11	Km	55	15	20	20
Total Qty			577.50	237.50	170	170

SECTION – 9

SPECIAL CONDITIONS OF CONTRACT (SCC)

SPECIAL CONDITIONS OF CONTRACT (SCC)

GENERAL

1.1 Special Conditions of Contract shall be read in Conjunction with the General Conditions of Contract, Specification of work, Drawing and any other documents forming part of this Contract wherever the context so requires.

1.2 Notwithstanding the sub-division of the documents into these separate sections and volumes ever part of each shall be deemed to be supplementary to and complementary of every other part and shall be read with in the Contract so far as it may be practicable to do so.

1.3 Where any portion of the General Conditions of Contract is repugnant to or at variance with any provisions of the Special Conditions of Contract, unless a different intention appears, the provisions of the Special Conditions of Contract of Contract shall be deemed to over-ride the provisions of the General Conditions of Contract and shall be the extent of such repugnancy, or variations, prevail.

1.4 Wherever it is mentioned in the specification 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.

1.5 The materials, design, and workmanship shall satisfy the relevant Indian Standard, the Job Specifications contained herein and Codes referred to where the job specification stipulate requirements in addition to those contained in the standard codes and specifications, these additional requirements shall also be satisfied.

1.6 In case of an irreconcilable conflict between Indian or other applicable standards, General Conditions of Contract, Special Conditions of Contract, Specification, Drawings or Schedule of Rates, the following shall prevail to the extent of such irreconcilable conflict in order of precedence:

i) Letter of Acceptance/ FOI alongwith Statement of Agreed Variations.
ii) Schedule of Rates as enclosures to Letter of Acceptance
iii) Special Conditions of Contract
iv) Drawings
v) Technical/ Material Specifications
vi) Instruction to Bidder
vii) General Conditions of Contract
viii) Indian Standards
ix) Other applicable standards

1.7 It will be the 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.

1.8 In the absence of any Specifications covering any material, design of work(s) the same shall be performed/ supplies/ executed in accordance with Standard Engineering Practice as per the instructions/ directions of the Engineer-in-charge, which will be binding on the Contractor.

2.0 SCOPE OF SUPPLY

The Scope of SUPPLY shall be as set out at Material Requisition, Data Sheets and Technical Specifications given in Volume-II of tender document and supplemented by all stipulation in the total tender document.

Seller's scope shall include (a) Design, detail engineering, manufacturing of items as per Material Requisition technical specifications, (b) preparation of Quality Assurance / Quality control programme; (c)obtaining Owner's approval; (d) arranging Inspection and Testing certification; (e) Inspection by Purchaser's/Agency Designated by Purchaser, as applicable as per bid document and obtaining Inspection Release Note; (f) obtaining dispatch clearance; (g) Packing; (h) Loading on truck/trailer and Unloading of MDPE Pipes at Project site; (i) providing all related services as detailed in the technical specification.

3.0 CONTRACT PRICE

The contract price shall be deemed to be firm and valid for the entire duration of the contract till the completion of work, and shall not be subject to any adjustment due to increase in price of materials, utilities, or any .other input for performance of work and the contract except for increase/decrease in taxes and duties on account of subsequent legislation.

4.0 DIVISION OF ORDER

BGL reserves the right to divide the quantity among more than one bidder at its sole discretion and as mentioned in Evaluation & Ordering criteria in BEC of Vol I of II.

5.0 QUALITY ASSURANCE/QUALITY CONTROL:

5.1. The Contractor shall "prepare a detailed quality assurance plan for the execution of Contract for various facilities, which will be mutually discussed and agreed to.

5.2. The Contractor shall establish document and maintain an effective quality assurance system outlined in recognized codes.

5.3. The Purchaser while agreeing to a quality assurance plan shall mark the stages where they would like to witness the tests; review any or all stages of work at shop/site as deemed necessary for quality assurance.

6.0 QUANTITY VARIATION

The tendered quantity may vary depending upon the project requirement. BGL reserves the right to decrease/ increase the quantity depending upon its requirement.

7.0 DISPATCH INSTRUCTIONS

7.1 Seller shall obtain dispatch clearance from the Purchaser prior to each dispatch.

7.2. Copy of Inspection Release Certificate, Dispatch Clearance and statement showing the name of the Vessel/Trailers description and weight of material and shipping marks etc. to be submitted along with the documents.

8.0 INSPECTION

M/s. Bhagyanagar Gas Limited (BGL), reserves the right to engage their own personnel and or BGL's Inspection agency (TPIA). All the charges towards all kinds of tests shall be included in the quoted rates. No additional payment to this effect will be made. Vendor shall inform the readiness of the materials well in advance.
Vendor/ Bidder shall Propose 2-3 TPIA's approved by PNGRB(Petroleum & Natural Gas Regulatory Board), out of which BGL shall select one on random basis. For each lot the TPIA may not be same agency.The detailed procedure of manufacturing sequence and production plans to be submitted to BGL.

9.0 REJECTION

9..1. Any materials/goods covered under scope of supply, which during the process of inspection by appointed third party, at any stage of manufacture/fabrication, and subsequent stages, prior to dispatch is found not conforming to the requirements/specifications of the Purchase Requisition /Order, shall be liable for immediate rejection.

9.2. Supplier shall be responsible and liable for immediate replacement of such material with acceptable material at no extra cost or impact on the delivery schedule to EMPLOYER

10.0 TERMS OF PAYMENTS

The Payment shall be made in the following manner subject to completion of all contractual requirements as per tender document.

The following shall be read in conjunction with Clauses of GCC (Goods)

i) SUPPLY:

- 100% payment of the supplied portion along with all taxes, duties and freight will be paid on receipt & acceptance of goods at FOT site after adjustment of PRS,

against submission of invoice in triplicate and following documents:

i) Inspection release note by Purchaser/Purchaser's authorized representative.
ii) Original LR/GR
iii) Documents as specified in Vendor Data Requirement in MR.
iv) Packing List
v) Insurance cover note covering transit insurance
vi) Document related Input Tax Credit (ITC) credit to be claimed by Owner, if applicable.

ii. MODE OF PAYMENT

All payments payable in Indian rupees against the contract shall be released by Owner through account payee cheque payable at par.

iii. DEDUCTION AT SOURCE

Purchaser will release the payment to the Seller after effecting deductions as per applicable law in force.
Purchaser will release payments by F&A Dept, BGL to the Contractor after offsetting all dues to the Purchaser payable by the Contractor under the Contract.

11.0 COMPENSATION FOR DELAY (PRICE REDUCTION /LIQUIDATED DAMAGES)

In case of delay in delivery of materials beyond contractually agreed delivery schedule, price reduction schedule will be applicable @0.5% of material value for the unsupplied portion per week of delay or part thereof, subject to ceiling of 5% (FIVE PERCENT) of the total order value. For details, please refer relevant clause of GCC-Goods.

The value referred in PRS clause is excluding taxes & duties.

12.0 PERFORMANCE BANK GUARANTEE SECURITY DEPOSIT:

Bidder will provide Performance Guarantee @10% of order value within 30 days of receipt of FOA/ WO from the Owner. The contract performance bank guarantee shall be valid 03(three) months beyond the expiry of Warrantee/Guarantee period. The Performance Guarantee shall be in form of either Demand Draft or Banker's Cheque or irrevocable Bank Guarantee and shall be in the currency of Contract (issued by any Indian Scheduled bank or a branch of an International Bank situated in India and registered with Reserve Bank of India as Scheduled Foreign Bank).

However, in case of Bank Guarantee from banks other than the Nationalized Indian bank, the bank must be a commercial bank having net worth in excess of Rs. 100 Crores or equivalent US Dollars and **a declaration to** this effect should be made by such commercial bank either in the bank guarantee itself or separately on its letterhead.

Performance Guarantee for 10% of order value shall be excluding taxes & duties.

BGL shall not be liable to pay any bank charges, commission or interest on the same.

Failure of the successful bidder to comply with the requirement of this clause shall constitute a breach of contract, cause for annulment of the award, forfeiture of the bid security and any such remedy the Owner may take under the Contract pursuant to GCC-Goods.

There is no exemption to MSEs including SSI units from submission of Security Deposit/ Contract Performance Bank Guarantee (CPBG).

13.0 REPEAT ORDER

BGL reserves the right to place a repeat order within Six (06) months from date of purchase order for upto 50% of order quantities on same rate, terms and conditions.

14.0 DELIVERY

The delivery of the items location wise is as per the Material Requisition.
The Vendor to arrange transportation of these materials from the vendor shop to designated location of BGL yard in the above cities. No extra payment shall be made for the transportation and deemed to be included in the quoted price.

Bidder to deliver the materials at all locations as per the quantity estimated.

15.0 DELIVERY SCHEDULE

Delivery of the total order quantity will be completed as given below from date of Fax of Acceptance (FOA)/Purchase Order (PO) as mentioned in Section 10 (Time Schedule) of Bid Document:

Item Description	Completion period
Manufacture, Inspection, Testing, Supply (on FOT Site basis) including packaging forwarding, transportation, etc.	Progressively within six (06) months from the date of FOA/PO on FOT site basis. As per the delivery schedule.

16.0 PACKING, MARKING AND SHIPMENT

The Seller, wherever applicable shall after proper painting, pack and crate all goods for sea/air/road/rail transportation in a manner suitable to tropical humid climatic region in accordance with the internationally accepted practices and in such a manner so as to protect it from damage and deterioration, in transit by sea or air or road or rail and during storage at the storehouse. The Seller shall be held responsible for all damages due to improper packing. The Seller shall ensure sizing or packing of all oversized consignments in such a way that availability of carrier and/or road/rail route is properly taken into consideration.

For MARKING & PACKAGING of the MDPE Pipes shall be as Section-IV of Vol I of I.

Seller shall comply with the Packing, Marking and Shipping Instructions and Special Packaging Requirement of this Bidding Document.

17.0 INDEPENDENT SELLER

It is expressly understood and agreed that Seller is an independent party and that neither the Seller/ its personnel are servants, agents or employees of Purchaser nor the Seller has any kind of interest in other sellers.

18.0 LIEN

Seller shall ensure that the Scope of Supply supplied under the Agreement shall be free from any claims of title/liens from any third party. In the event of such claims by any party, Seller shall at his own cost defend, indemnify and hold harmless Purchaser or its authorised representative from such disputes of title/liens, costs, consequences etc.

19.0 LIMITATION OF LIABILITY

Notwithstanding anything contrary contained herein, the aggregate total liability of Supplier under the Contract or otherwise shall be limited to 100% of contract value. However, neither party shall be liable to the other party for any indirect and consequential damages, loss of profits or loss of production.

20.0 GOVERNING LAW

Laws of India will govern the Agreement and Hyderabad courts will have exclusive jurisdiction on all matters related to Agreement.

21.0 OWNER'S RIGHTS AND REMEDIES

Without prejudice to Owner's right and remedies under Agreement, if SUPPLIER fails to commence delivery as per agreed schedule and/or in reasonable opinion of the OWNER, CONTRACTOR is not in a position to makeup the delay to meet the intended purpose, the OWNER may terminate the AGREEMENT in full or part at SUPPLIER's default and may get supplies from other sources at SUPPLIER's risk and cost.

22.0 Clause no. 16.0 of GCC shall be appended with the following :

Bidder shall arrange Transit Insurance and the cost of which shall be borne by bidder. Quoted price shall be inclusive of the same.

23.0 Clause no. 30.4 of GCC shall be appended with the following :

SETTLEMENT OF COMMERCIAL DISPUTES BETWEEN PUBLIC SECTOR ENTERPRISE(S) INTER-SE AND PUBLIC SECTOR ENTERPRISE(S) AND GOVERNMENT DEPARTMENT(S) THROUGH PERMANENT MACHINERY OF ARBITRATION (PMA) IN THE DEPARTMENT OF PUBLIC ENTERPRISES

In the event of any dispute or difference relating to the interpretation and application of the provisions of the contracts, such dispute or difference shall be referred by either party for Arbitration to the sole Arbitrator in the Department of Public Enterprises to be nominated by the Secretary to the Government of India in-charge of the Department of Public Enterprises. The Arbitration and Conciliation Act, 1996 shall not be applicable to arbitrator under this clause. The award of the Arbitrator shall be binding upon the parties to the dispute, provided, however, any party aggrieved by such award may make a further reference for setting aside or revision of the award to the Law Secretary, Department of Legal Affairs, Ministry of Law & Justice, Government of India. Upon such reference the dispute shall be decided by the Law Secretary or the Special Secretary / Additional Secretary. When so authorized by the Law Secretary, whose decision shall bind the Parties finally and conclusively. The parties to the dispute will share equally the cost of arbitration as intimated by the Arbitrator.

24.0 FAILURE & TERMINATION CLAUSE

Time and date of delivery shall be the essence of the contract. If the vendor/contractor fails to deliver the entire quantity of materials ordered/ complete the work or a part thereof within the contractual delivery/ completion period agreed to for such part or total quantity as per the delivery / time schedule or at any time repudiates the contract before the expiry of such period, BGL may without prejudice to any other right or remedy available to it recover damages for breach of the contract in any manner stipulated hereunder:-

(a) Recover from the vendor/ contractor an agreed amount towards Price Reduction Schedule and not by way of penalty a sum equivalent to 1/2% (half per cent) of the contract price of the whole unit per week for such delay or part thereof (this is a genuine pre-estimate of damages duly agreed by the parties) which the vendor/ contractor has failed to deliver within the period fixed for delivery in the schedule, where delivery thereof is accepted after expiry of the aforesaid period.

It may be noted that such recovery of PRS may be up to 5% of the contract price / of the total quantity of items of materials / equipment which the contractor has failed to deliver within the period fixed for delivery; or

(b) Purchase or authorise the purchase elsewhere on the account and at the risk of the contractor, of the materials not so delivered or others of a similar description, by serving prior notice to the contractor / supplier without canceling the contract in respect of the installment not yet due for delivery;
or

(c) Cancel the contract or a portion thereof by serving prior notice to the contractor and if so desired, purchase or authorise the purchase of the materials not so delivered or others of a similar description (where such materials exactly complying with particulars are not, in the opinion of the purchaser, which shall be final, readily procurable) at the risk and cost of the contractor. If the contractor had defaulted in

the performance of the original contract, the purchaser shall have the right to ignore his tender for risk purchases even through the lowest. Where the contract is terminated at the risk and cost of the firm under the provisions of this clause, if shall be solely upto the purchaser to exercise his discretion to collect or not, the security deposit from the firm, on whom the contract is placed, at the risk and expense of the defaulting firm.

(d) Where action is taken under sub-clause (b) or sub-clause(c) above, the contractor shall be liable for any loss which the purchaser may sustain on that account, provided the purchase or if there is an agreement to purchase, such agreement is made, in case of failure to deliver the materials within six months from the date of such failure and in case repudiation of the contract within six months from the date of cancellation of contract. The contractor shall not be entitled to any gain on such purchase and the manner and method of such purchase shall be at the entire discretion of the purchaser. It shall be necessary for the purchaser to give a notice of such purchase on the contractor.

(e) It may further be noted that clause (a) above provides for recovery of PRS on the cost of contact price of delayed supplies (whole unit) at the rate of 1/2% (half per cent) of the contract price of the whole unit per week for such delay or part thereof upto a ceiling of 5% of the contract price of delayed supplies thus accrued will be recovered by the paying authorities of the purchaser specified in the supply order, from the bill for payment of the cost of the material submitted by the vendor/ contractor in accordance with terms of supply order, or otherwise.

(f) Notwithstanding any thing stated above equipment and materials will be deemed to have been delivered only when all its components, parts are also delivered. If certain components are not delivered in time the equipment and material will be considered as delayed until such time all the missing parts are also delivered.

25.0 General Conditions

(i) When the materials are dispatched to the consignee intimation must also be given to this effect. Reference to the supply order should invariably be given in all the relevant correspondence.

(ii) The tender is liable to be rejected in case the tender does not comply with tender stipulations or the goods, works and services offered do not conform to the required specifications indicated there in.

(iii) Any other terms and conditions offered by the firm and not included in the order/contract, are not acceptable to BGL.

SECTION – 10

TIME SCHEDULE

TIME SCHEDULE

Item Description	Completion period
Manufacture, Inspection, Testing, Supply (on FOT Site basis) including packaging forwarding, transportation, etc.	Progressively within Six (06) months from the date of FOA/PO on FOT site basis. As per the delivery schedule.

Delivery Schedule:-

PART-A:

Entire quantity in SOR shall be delivered in 2 months as a single lot form date of FOA/PO.

PART-B:

1st Lot within 2 months from date of award of FOA/ PO -- 50 % of quantity ordered.

2nd Lot 2 months from date of intimation by the Engineer-IN –Charge (EIC) – 30% of quantity ordered.

3rd Lot 2 months from date of intimation by the Engineer-IN –Charge (EIC) – 20% of quantity ordered.

PART-C:

1st Lot within 2 months from date of award of FOA/ PO -- 50 % of quantity ordered.

2nd Lot 2 months from date of intimation by the Engineer-IN –Charge (EIC) – 50% of quantity ordered.

The basis of delivery will be FOT site, Hyderabad, Vijayawada and Kakinada basis.

Note: Price Reduction Schedule (PRS) will be based on contract value for the items covered under this schedule.

SECTION – 11

TECHNICAL SPECIFICATIONS

Part - A : General Requirements

TABLE OF CONTENTS

1.0 SCOPE

This specification defines the requirements which must be met by polyethylene (PE) pipes used to construct underground networks for natural gas distribution.

Testing of the pipes is carried out in accordance with the procedures described in document Part - C: "**Polyethylene pipes for underground networks for natural gas distribution - Quality control of pipes**".

2.0 Reference Standards & Specifications:

ISO 760: 1978	Determination of water - Karl Fisher method (General method) Buried polyethylene (PE) pipes for the supply of gaseous fuels- Metric series-Specifications.
ISO6259-3: 1997	Plastic pipes- Measurement of dimensions.
EN728:1997	Plastics piping and ducting systems - Plastics pipes and fillings - Method for exposure to direct (natural) weathering.
prEN 1555-1: 2001	Plastics piping systems for the supply of gaseous fuels- Polyethylene (PE)-Part 1: General.
prEN 1555-2: 2001	Plastics piping systems for the supply of gaseous fuels - Polyethylene (PE) - Part 2: Pipes.
ISO 4440-1: 1994	Thermoplastics pipes and fittings - Determination of melt mass-flow rate - Part 1: Test method.
ISO 4437 -1997	Buried Polyethylene (PE) Pipes for supply of gaseous fuels specifications.
IS 14885	Specifications for Polyethylene Pipes for Supply of Gaseous Fuels.
Part - D	Acceptance procedure for MDPE Pipes

DEFINITIONS:

3.1 BATCH OF COMPOUND

By batch of compound is meant a homogeneous quantity of PE compound of the same origin and of a particular brand.

The batch must be registered under a single identification number (batch number) which leaves no doubt as to the origin, identity and date of manufacture of the compound.

3.2 BATCH OF PIPES

By batch of pipes is meant a homogenous lot of pipes with identical dimensions, made in a continuous process by the same extrusion machine and from the same batch of compound.

3.3. MINIMUM REQUIRED STRENGTH (MRS 10)

Standardized class of compounds for which the Lower Confidence Limit (LCL) is equal to10.

Nominal out Side Diameter (dn) –

The Specified nominal outside diameter of Pipe.

Mean Outside Diameter (do) –

Average Value corresponding to the circumference of any pipe divided by (∏ = 3.1416) for the number of measurements rounded up to the next greater 0.1mm.

Out of Rounded (Ovality) –

The Roundness is the difference between the measured maximum outside diameter and measured minimum diameter in the same cross- section of pipe.

Nominal wall thickness (en) –

The numerical designated wall thickness of the pipe which is convenient round number approximately equal to the manufacturing dimension in mm.

Minimum walls Thickness (emin) –

The minimum value of the mean wall thickness as specified for a given nominal wall thickness.

Mean Wall thickness (em) -

The arithmetic mean of a number of measurements regularly spaced around the circumference of the pipe in the same cross section of pipe, including the absolute measured minimum and measured maximum value of the wall thickness.

3.10 PE 100

Standard designation for PE compounds in class MRS 10.

For such PE compounds, the long-term hydrostatic strength — calculated and classified according to the standardized method (ISO 9080 and ISO 12162) for a temperature of 20°C, a period of 50 years and a reliability of 97.5 % — must be at least 10 MPa.

Lower Confidence Limit (LCL)

A quantity with the dimensions of stress, in Megapascal, which can be considered as a property of the material under consideration and represents the 97.5% lower confidence limit of the predicted long-term hydrostatic strength at a temperature of 20°C for 50 years with internal water pressure.

Standard Dimensions Ratio (SDR)

SDR is the quotient of the nominal outside diameter and the nominal wall thickness (expressed rounded to one decimal).

SDR = de/en

de = nominal diameter of pipe

en= nominal thickness of pipe in mm

Overall Service (Design) Co-efficient (C)

C is an overall co-efficient with a value greater than 1 which takes into consideration service condition as well as properties of the components of a piping system other than those represented in the lower confidence limit. For this specification the minimum of C is 2.0.

Maximum Allowable Operating Pressure (MAOP)

The highest effective pressure of the gas in the pipeline system expressed in bar, which is allowed in Continuous use. It takes into account the physical and the mechanical characteristics of the components of the piping system.'

It is given by the equation: **MAOP = (20 X MRS) /(C X (SDR – 1))**

MATERIAL SPECIFICATION

The PE compounds that are acceptable shall conform to the requirements for PE 100 described in prENl555-1.

The polyethylene compound used in the manufacturing of pipes shall be cadmium free pigmented compound. It shall be free from visible water compound.

In order to be approved, materials shall conform with the MECON technical specification Part - D: "Polyethylene compounds for manufacture of pipes and fittings for underground networks for natural gas distribution - Acceptance procedure."

Approved materials are listed in Appendix 1. Characteristics of PE Compound are given in Appendix 2. Following are forbidden:

a. use of recycled materials;
b. mixture of different materials;
c. addition of complementary materials by the pipe manufacturer.

5.0 CHARACTERISTICS

RAW MATERIAL

All the characteristics of the PE Compound are in accordance with the provisions of prEN 1555-1 or IS 14885 for PE 100 materials and for the limit values listed in the table in Appendix 2.

PIPES

Physical characteristics

Appearance of pipes

The pipes must be square cut with smooth trimmed ends.

The internal and external surfaces of the pipes, examined visually without magnification, are uniform and smooth.

The pipes are free of scratches, pits, voids, blisters, occlusions or cracks.

Colour

MDPE pipes shall be of PE-100 grade only (of Orange) Color.

Density

Density is measured in Kg/m3 as per ISO -1183. The measured value must correspond to the data listed in the table in Appendix 2, allowing for possible differences caused by measuring on the pipe instead of granulate. (IS 7328)

Melt mass-flow rate (MFR)

The melt mass-flow rate MFR (190°C - 5 kg), measured on a sample taken from the pipe in accordance with ISO 4440-1 or IS 14885., is within the limits stated in the table in Appendix 2: characteristics of PE Compound.

In addition, the discrepancy in absolute value between the MFR measured on a pipe sample and that measured on a sample of raw material may not exceed 20% of the latter.

MFR rate (requirement) shall be read as + / - 20% value nominated by compound producer.

Volatile content

The volatile content, measured on a pipe sample in accordance with ISO 4437 or IS 14885., may not exceed 350 mg/kg.

Water content

The water content may be estimated by measuring the volatile content.

If the volatile content, measured in accordance with ISO 4437., is more than 250 mg/kg, the water content must be ascertained.

The water content, measured in accordance with ISO -760, must be 250 mg/kg or less.

Thermal stability (OIT)

Thermal stability is measured in accordance with D of IS 14885 on samples taken from the wall at random.

The minimum oxidation induction time at 210°C is 20 minutes. The maximum admissible decrease in the oxidation induction time measured on a pipe sample compared to that measured on the raw material, may not exceed 20% of the latter.

Resistance to atmospheric influence

Resistance to atmospheric influence is tested in accordance with EN 1056. The exposure dose corresponds to a total energy of at least 3.5 GJ/m^2.

Mechanical characteristics -

Internal stresses

Internal stresses are measured in accordance with ISO 2505. The variation in length between the reference points must be 3% or less. The test temp. is 110^{o}C.

Resistance to internal hydraulic pressure

The tests are carried out in accordance with IS 1167. The test specimens taken from a batch of pipes show no leakage in the conditions of temperature, wall stress and test length stated in the tables in Appendix 2: resistance to internal hydraulic pressure.

If, for a given material, during the test at 80°C - 165 hrs with the highest wall stress σ, fracture occurs before the specified time and is ductile in nature, the tests are repeated with a minimum time of 1,000 hrs and the corresponding wall stress level as specified in Appendix 2.

The test pressure is calculated using the following formula based on the nominal diameter and thickness.

P = 10.< (2.en)/de-en)

Where,

< = Pipe Wall stress in MPa. de= nominal diameter of pipe. en= nominal thickness of pipe. P= test pressure in bar.

The test must be repeated if the pressure and /or temperature fall below the lower limit.

Resistance to slow cracking (Notch test)

The test is carried out on pipes with a nominal diameter >= 90 using the test method stated in EN ISO 13479. No fracture will occur on the samples for test periods of less than 500 hrs at 80^{0}C on a notched pipe with wall stress at 4.6MPa.

Resistance to growth of cleavage fractures

Pipes with a diameter >= 90 are tested in accordance with the test described at ISO 13477. The critical pressure at 0^{0}C is at least 3 bar and knife speed will be 20m/s.

Stress at yield point and elongation to fracture

The test is carried out in accordance with ISO 6529-3 for thickness of less than 12mm, the test specimen shall be cut using a hollow punch. The traction speed should not be more than 100mm/min.

The minimum stress at the yield point is defined in the table "Characteristics of PE Compound" (Appendix 2).

Dimensional characteristics

All dimensions except for length are measured at 23^0c using method stated In ISO 3126.

Series

Nominal Diameter (de)	Thickness (mm)
	SDR 11
20	3
32	3
63	5.8
90	8.2
125	11.4
	SDR17.6
90	

The pipes belong to the series of SDR 11 and SDR 17.6 as per standard dimensions as in IS14885.

Length

The length of the pipes is specified in the order. The preferred lengths are defined in Part - B.

The tolerances for straight pipes are: - 0 / + 0.05 m The tolerances for rolled pipes are: - 0 / + 0.50 m

Mean external diameter Dm

The extreme mean external diameters are stated in ISO 4437.

External diameter D - ovalisation

The maximum deviation permitted in relation to nominal diameter de is given ISO4437.

In the event of dispute regarding the dimensions of rolled pipes, the dimensions shall be reviewed 24 hours after the pipe has been unrolled.

Thickness

The thicknesses are given in table A and have been taken from ISO 4437.

Reversion Test

When tested as stated in IS 14885, the value of longitudinal reversion shall not be greater than 3%.

Tensile Test

When tested in accordance with IS 14885 at 23+/-1^{0}C at a speed of 100 mm/min +/- 10% for specimen thickness below 5 mm and at a speed of 25 mm/min for thickness above 5mm, the value obtained shall be as follows:

Tensile yield strength	15 MPa,
Min Elongation at Break	350 %,Min

Squeeze off

On all sizes of pipe up to and including 400 mm diameter, strength after squeeze-off and subsequent re rounding, must be demonstrated by testing as per IS 14885.

Pigment Dispersion

MARKING

The marking is repeated at least once per metre. This marking is done on two diametrically opposite generating lines. The empty space between two technical data is filled by alternate repetition of the word "GAS".

Marking must be indelible and visible in colour.

The stamping must not affect the quality of the pipe. The minimum height of the characters must be:

- 3 mm for nominal diameters <= 63
- 5 mm for nominal diameters >= 110.

The depth of the marking must be <= 0.1 mm in the case of pipes with a nominal diameter <= 110 and <= 0.2 mm in the case of pipes with larger diameters.

Marking of the pipes shall include, in the following order, on each generating line:

- The word "GAS";
- Nominal diameter and the thickness of the wall;
- SDR series;
- Date of manufacture (year, month, day);
- Manufacturer's identity;
- The words BHAGYANAGAR GAS LIMITED;
- The alphanumeric coding PE 100
- The name or style of the manufacturer.

Any other marking, either in terms of the application technique or the data specified, must be submitted to the Company for approval in advance.

7.0 PACKAGING AND STORAGE

GENERAL

The manufacturer shall take all necessary action to prevent the pipes from deteriorating during storage, loading and transport.

The pipes may be supplied in straight lengths or in rolls. Straight lengths are normally placed in crates.

The pipes are fitted with sealing devices at both ends, of a model approved by the Company.

LENGTHS

The preferred pipe lengths are given in table C below.

TABLE C

Nominal diameter,de	Preferred Length in meters	
	Reels	Straight pipes
20	100	-
32	100	-
63	100	-
90	50	
125	50	

The lengths to be supplied are specified in the order.

7.3.1. Packaging of straight pipes

The wooden framework is banded using galvanized steel hoops. The tension of the hoops is such that the pieces of wood forming the framework are in contact with one another and the overlap of the crosspieces on the uprights is 2/3 the thickness of the latter.

7.3.2 Packaging of rolled pipes

Each roll includes an adequate number of hoops made from cords or bands of synthetic material, evenly distributed around the whole circumference of the bundle. In each case there must be a hoop less than 0.3 m from each end of the pipes.

The packaging must on no account adulterate the pipe.

HANDLING AND STORAGE

Immediately after production, pipes shall be handled with great care from the production line to the storage place, in order to avoid any damage such as scratches, notches, superficial wear and tear, holes, dented walls or similar.

If handled by fork lift or similar equipment, the metallic forks shall be covered with a soft material in order to avoid any damage to the pipes.

The extremities of the pipes shall not be in contact with the floor while handling.

Indoor storage is preferred.

Outdoor storage is permitted at the following conditions:

- Storage periods are not exceeding one month
- Pipes are protected from direct sunlight by a suitable shelter
- Pipes are stored on a hard storage surface clean from excessive dust,
- Pipes are not in contact with the soil, but are supported by soft material such a wood etc.

SEALS:

Prior to execution of the order, the manufacturer must submit to the Company the seals which it intends to use for all the types of pipes ordered.

The seals shall preferably be made of PE or a material which does not adulterate polyethylene. Metal and PVC seals are not permitted. The seals must be able to withstand storage times as guaranteed in § 8.6. of this specification, and also to withstand handling during installation.

They must not be brittle or sharp and the materials, shapes and dimensions thereof must be such that they cannot fully penetrate inside the pipes.

They are of the internal plug type for all pipes supplied in straight lengths, and for pipes rolled in coils or on reels, the seals may be PE end caps.

All seals are fitted with a valve to prevent pressurization or depressurizations of the pipes, depending on climatologically temperature cycles.

In theory, they are placed on the pipes immediately after completion of the manufacturing tests, but before storage of the pipes. In the event of acceptance, the pipe plugs are removed and replaced by the supplier.

The seals cannot be recycled after the pipes have been installed. Their removal on site should not require the use of special tools.

STORAGE WARRANTY

It must be possible to store the pipes in the open air, protected from direct sunlight, without taking any other special precautions for at least two years from the date of manufacture stated on the pipe.

The storage warranty covers continued conformity of the dimensions, characteristics and performances laid down in this specification.

PRODUCT TYPE-APPROVAL

For the purpose of type-approval of the product, the manufacturer is obliged to supply a technical file as defined in PART -D.

Type-approval of the products is carried out in accordance with the aforementioned procedure

Any change to the type-approved product, process or manufacturing equipment must be notified to the Company in writing.

Any failure in this respect shall incur withdrawal of type-approval until termination of the contract.

ANNEXURE - 1

Approved materials

As per the BGL standard PART-A the following will be the basic requirement of PE basic material.

1. The base material from which the pipe is produced shall be medium density polyethylene and shall be made by adding only antioxdiants, UV stabilisers and pigments which are necessary for the manufacture of pipes and to the end user of pipes.
2. The polyethylene should be mixed with ultraviolet stabiliser and suitable antioxidants to protect the pipe from photo degradations.
3. 100% virgin raw material shall be used for pipe production.
4. The raw material used for pipe manufacturing shall comply the requirement as stated in Annexure 2.
5. The raw material when classified in accordance with ISO 4437-1997 shall be PE 100 with MRS(Minimum Required Strength) of 10MPa.
6. The technical details of the pipe manufacturing and Raw material shall be made available in advance and subsequently get approved by BGL/ PMC/TPI Agency.

ANNEXURE – 2

Characteristics of MDPE material

Sr No	Characteristics	Units	Requirement	Test Parameters	Test Method
1	Conventional Density	Kg/m3	>930	$23^{o}c$	IS 7328
2	Melt Flow rate	g/10min	0.68 – 1.0	$190^{o}c$	IS 2530
3	Volatile Content	Mg/Kg	<350	$105^{o}c$	IS 4437
4	Thermal Stability	Minute	>20	$200^{o}c$	IS 14885
5	Water Content	Mg/kg	<300	$105^{o}c$	
6	Resistant to Gas Constituents	H	>=20	$80^{o}c$	

Part - B: Polyethylene Pipes Technical Data Sheet

TABLE OF CONTENTS

1.0 REFERENCE

PART - A : Polyethylene pipes for underground networks for Natural Gas Distribution - General requirements.

PART - C : Polyethylene pipes for underground networks for natural gas distribution -Quality control of pipes.

PART - D : Supplementary procedure for type-approval of polyethylene pipes for underground networks for natural gas distribution.

IS 14885 : Polyethylene Pipes for the Supply of Gaseous Fuels-Specification

Working Condition

a. Maximum Operating Pressure : 7 bar for SDR 11
b. Working Medium : Dry Natural gas
c. Maximum Working temperature (Inside Gas Pipe for point C.) : $47^{o}c$

Weldability:

The pipes are used for assembly by electro fusion fitting or butt welding and so should possess good weldiability.

The manufacturer has to prove weldiability of the pipes to BGL/PMC/TPIA's representative and indicate specific electro fusion conditions to be complied with for such components.

Fusion of two network components having been made from different compounds may lead to difficulties and hence the manufacturer has to ensure that the properties of each batch of raw material are identical.

Production of pipe:

1. Entire production of pipe shall be carried out in presence of BGL/PMC/TPIA's representative.
2. The bags of raw material should be certified/approved by BGL/PMC/TPIA's representative.
3. The tolerance of length of coil shall be + / -100mm.
4. The pipes shall be supplied in coils/straight length as per the table:

Sampling

Sr No	Outside Diameter in Mm	Length of pipe in Coil in meters	Length of pipe in Straight length in mtrs	Minimum inner diameter of coil
1	20	100	----------	0.5
2	32	100	----------	0.8
3	63	100	----------	1.6
4	90	50	----------	2.3
5	125	50	----------	2.7

All the in a single consignment , of the same size , same length and manufactured essentially from same batch of raw material and under similar condition of manufacture shall be considered as a lot.

The scale of sampling for raw material shall be as per table,

Characteristics	No of sample from lot
Conventional Density	1
Melt flow rate	1
Thermal stability	1
Volatile / Moisture Content	2

Scale of sampling for finished pipe is as per table,

Characteristics	No of sample from lot
L.T.H.S.Test	2 to5
I.B.T.Test	2 to 5
Squeeze Test	1 to 3
Notch test	1 to 3
Tensile Test	1 to 3
Weldiability	1 to 3
Conventional Density	1 to 3
Melt Flow rate	1 to 3

The quantity of sampling may vary at the time of inspection, depending up on the quantity and duration of product.

Inspection and Testing:

Inspection shall be carried out by BGL representative or Third Party inspection agency nominated by BGL.

Manufacturer shall submit the copies of test report of following test along with lot.

a. All test report for Raw material and Finished Product.

b. Certificate from raw material producer, for each batch of raw material procured for manufacture of Pipes.

BGL/PMC/TPIA's representative shall have right of free entry, at all the times at manufactures workshop/factory.

PART -C: Quality Control of Pipes

1.0 GENERAL PRINCIPLES

MANUFACTURER'S RESPONSIBILITY

The manufacturer is totally responsible for the quality of the pipes which he manufactures. Acceptance Test procedures do not absolve him from this responsibility.

In order to ensure that the pipes comply with the specification in every case, tie pipes are tested by the factory control department, which is separate from its production department.

The pipes supplied are guaranteed for one year after commissioning or three years maximum after the date of manufacture.

QUALITY ASSURANCE

The manufacturer must have a quality assurance system in place as described in standard EN 29001 or EN 29002. The quality manual must be supplied to the Owner/ owner representative Quality Control Department.

The quality assurance system shall be certified by an accredited body.

2.0 SPECIMEN SAMPLE OF GRANULATE

The manufacturer shall supply the Owner/ owner representative Quality Control Department with a kilo of granulate from each batch of material used to manufacture the pipes.

The specimen sample is taken in the presence of the Owner/ owner representative Quality Control Department official if testing takes place during manufacture. A suitable container shall be supplied to the manufacturer by Owner.

All necessary precautions shall be taken to prevent contamination and deterioration of the granulate during sampling and during subsequent handling of the sample.

3.0TESTS

TESTS CARRIED OUT BY THE MANUFACTURER

General

It is essential to comply with the provisions in the following sections to ensure that the pipes conform to the specification in every case.

All the pipes are individually numbered. This marking is done using an inert product which will not adulterate the quality of the pipes (e.g. lithographic chalk). The pipe number consists of a maximum of three digits. In the case of pipes with a diameter of 90 mm or more, the number is marked on the inside. For rolled pipes and pipes on drums, it is applied on an adjoining label and the marking must not be subject to deterioration. All the test carried out by the manufacturer are as per the BGL standards.

Dimensions

The thickness and average diameter, measured in the conditions defined in the specification, are entered in an inspection document which includes the dates of manufacture and the production team, extruder number, code of the material used, pipe number and, if a pipe is declared invalid, the reason for the rejection.

When the manufacturer carries out continuous measurement of the thickness, the record of the values measured shall include all the details necessary for marking of the pipes.

The, inspection documents and any records shall be supplied to the Owner/ owner representative official.

FACTORY ACCEPTANCE

General

Acceptance tests are carried out in the presence of an official from the Owner/ owner representative Quality Control Department. All checks and tests are carried out in the conditions laid down in technical specification PART-A.

The results must be in accordance with the provisions specified therein and with the individual specifications of the order.Whenever so requested by the Owner/Owner's representative, the manufacturer must be able to provide him with recent test and calibration reports for the measuring instruments and test installations.

ACCEPTANCE AND REJECTION

Appearance, dimensions and marking

Any failure means that the batch is rejected. It may however be presented again after sorting, with the agreement of the Owner.

3.3.2 Checking of characteristics

Any result which is not in accordance with the provisions of the specification and the individual specifications of the order shall give rise to a repeat test on at least double

the number of samples. If the unfavorable result is confirmed, the batch is definitively rejected. If the unfavorable result is invalidated, the batch is accepted. By way of additional investigation, other analyses or examinations may be carried out by mutual agreement, at the manufacturer's expense.

DISPATCH PREPARATION

1. The Pipe ends shall be cleanly cut, square with axis of pipe and protected against shocks and ingress of foreign bodies by welding appropriate end caps.
2. Each coil shall be properly secured with PVC strap/Self Adhesive Tape at regular intervals to avoid unwinding of the coil during transport or storage.
3. Each coil shall be wrapped properly first wrap of white PE sheet having thickness more than 30 microns and outer wrap of good quality Hessian cloth so as to prevent the pipe from exposure to sunlight.
4. The pipes shall be transported in trucks, the coils being covered properly so as to avoid damage to pipes as per K-5.2 of IS 14885(latest editions).

4.0 DOCUMENTS

The Bidder shall submit all the Test Certificates of the Raw material, Factory Approval certificate approved by reputed (PNGRB approved) Inspection agency for BGL/PMC's approval.

The Bidder shall submit the Quality Assurance Plan approved by Inspection agency along with the test certificates for manufacture of MDPE pipes.

Following completion of the type approval tests, the Supplier shall compile a data folder which shall include details of all test results and all critical information, i.e., dimensions, materials, source of materials, manufacturing site and manufacturing techniques.

All test results shall be signed by the Supplier and countersigned by Bhagyanagar Gas Ltd (BGL)/PMC's representative.

5.0 DESIGN CHANGES

Any proposed changes in design, materials, and source of materials, manufacturing site or manufacturing techniques to approved pipes shall be proposed by the supplier for consideration as variant by BGL/PMC.

The Supplier shall submit details of the changes with a copy of the original signed data and a copy of the new data appropriately signed. BGL/PMC shall require the relevant approval tests to be repeated if performance is considered to be affected. On approval of the variant, the new data shall be countersigned and returned to the Supplier to replace the superseded data in the data folder.

PART -D: Supplementary Procedure for MDPE Pipes

1 PREAMBLE

The internal and external surfaces of the tubes are examined visually with the naked eye, without magnification and under adequate lighting.

2. DESCRIPTION OF MAIN APPEARANCE DEFECTS

DEFECTS CAUSED BY HANDLING OR STORAGE

Incrustation with foreign matter: Pebbles, sand, glass, filings, wood splinters, etc.

Scratches Narrow continuous lesions.

Notches Incisions made by a sharp instrument.

Superficial wear and tear Surface deterioration resulting from friction against foreign matter.

Holes: Holes in the wall caused by forceful insertion of a generally pointed object (e.g.: nails, probes, screws, etc.).

Dented walls Permanent distortion of the wall accidentally caused during handling.

MANUFACTURING DEFECTS

Continuous longitudinal internal lines

Longitudinal marks evenly distributed around the inner circumference of the pipe, caused by fusion of material faces on exit from the extrusion tool. These marks are caused by an incorrect choice of transformation parameters.

Continuous longitudinal lines inside and outside these do not exceed 0.2 mm in depth

- They may be caused by the defective condition of the calibrators or the sealing device for the calibration system, in which case they are isolated instances.
- They may be caused by friction of residual deposits attached to parts of the extrusion tool, the calibrators or the sealing plug of the calibration system. In this case, they are generally randomly These deposits may consist of waxes, oxidized polyethylene or other products which are released during transformation of the material in the extruder or which are present in the cooling water.

Incrustation with residual matter generated during extrusion

The deposits defined in 2.2.2. work loose and are crushed in the external wall of the pipes while passing into the calibrator, or adhere to the internal wall of the pipes.

Presence of foreign matter in the polyethylene resulting from contamination of the raw material.

This contamination may be caused by all sorts of liquid or solid products (oil, paper. cardboard, plastics, glass, sand, dust, etc.).

Excessive water and volatile contents

2.2.5.1Porosity

Defects generally caused by volatile matter which occur specifically when the water and volatile contents are too high.

The term extrusion defect covers all defects resulting from the complete pipe manufacturing process.

2.2.5.2Craters (surface spalling)

Shallow or deep conical cavities the cause of which is difficult to establish, generally the result of water and volatile contents being too high.

Pitting

Defects in the shape of aligned dots, either in clusters or dispersed, which are often connected with carbon black anomalies.

Unfused parts

Molecular polyethylene elements which are totally or partially unfused and located both on the surface and right inside the thickness of the pipe wall.

Cavities

Superficial denting of the external wall, sometimes replicated on the internal wall.

This is the result of distortion caused by a drop of water between the pipe and the calibrator at the intake. The water comes from the calibrator cooling system and is a common phenomenon if the pressure of the calibrator cooling water is too high.

DEFECTS CAUSED BY MARKING

Marking too deep

This is caused by incorrect setting of the stamps or the stamp design.

Dentations caused by the tool holding the marking stamps. These are the result of incorrect settings or wear and tear.

3. ASSESSMENT CRITERIA

CRITICAL DEFECTS

The following defects are critical:

- Continuous longitudinal internal lines
- Presence of foreign matter in the polyethylene
- resulting from contamination of the raw material
- Porosity

OTHER DEFECTS

Defects caused by handling or storage

Pipes presenting one of the following defects are classified as defective:

- Incrustation with foreign matter
- Scratches the depth of which is more than 10% of the thickness, with a limit of 0.5 mm.
- Superficial wear and tear where the depth of the marks is more than 10% of the thickness, with a limit of 0.5 mm.
- Notches the depth of which is more than 10% of the thickness, with a limit of 0.50 mm.
- Holes, the depth of which is more than 10% of the thickness, with a limit of

0.50 mm

- Dents in the pipe wall

Manufacturing defects

Incrustation with residual matter generated during extrusion, craters, pits, unfused elements sample may present several of the above defects.

- Let p be the depth of the defect and e the nominal thickness of the pipe.

 Case 1 : p>0.1.e

- Any pipe which includes one of the above defects where the depth is more than 10% of the nominal thickness of the pipe is always considered to be defective.

 Case 2 : p <= 0.1.e

- For a pipe which contains isolated defects[2],the depth of which is 10% of the nominal thickness or less, each defect is allocated a grade g depending on its largest dimension a, excluding the depth. The value of g in terms of a is defined in Table 1.

Table I

Largest Dimension of defects in mm	Grade
1.0<=a<2.0	5
2.0<=a <3.0	10
3.0<=a<4.0	25
4.0<=a<5.0	50
5.0<=a<6.0	51

Defects, the largest dimension of which is less than 1mm are not taken into account.

A pipe is considered to be defective when it presents a defect, the largest dimension of which is 6.0 mm or more.

A pipe is considered to be defective when the sum of the products of the grades g multiplied by the number of defects n detected along a length of 100 cm exceeds the value L defined in table 2 in terms of the diameter of the pipe.

Table 2

Nominal diameter de	L=∑(n.g)
20	20
32	20
62	40
125	40
180	60

Continuous longitudinal marks inside and outside, cavities, marking too deep and indentations caused by marking tool.

Pipes presenting the following defects are classified as defective:

- Continuous longitudinal marks on the inside and outside which are 0.20 mm deep or more
- Cavities
- Marking too deep where the depth is more than 0.20 mm.
- Indentations caused by the marking tool where the depth is more than 0.20 mm.

SECTION 12

SCHEDULE OF RATES (SOR)

Sl. No.	Description of Items	Location / CITY	Qty	Unit price					
				Unit basic Rate	Freight charges including Transit Insurance and taxes and duties except GST up to FOT site including unloading and stacking at site	Goods & Services Tax (Applicable extra on Col. 4 & 5)		Unit FOT-delivered at site, price per unit including Packing & forwarding, GST & any other levy	TOTAL FOT-delivered at site, price per unit including,TPI Charges, Packing & forwarding, freight& Transit Insurance, Inspection ,loading & Iunloading, stacking charges , GST & any other levy.
			UoM->Mtrs	(INR/Mtr.)	Amount (INR)	%	Amount (INR)	Amount (INR/Mtr.)	Amount (INR)
1	2		3	4	5	6.a	6.b	7 = (4+5+6b)	8 = (3 x7)
	Supply of Polyethylene Pipe, conforming to Technical Specification in bId document for Polyethylene Pipe of following sizes, grades & specifications as indicated below :								
Sl. No.1- SOR PART –A									
1.1.	**Size (OD) mm-90,** Grade of Material-PE-100,Standard Dimensions Ratio **(SDR)-17.6**	Hyderabad	15,000						
	Grand TOTAL FOT-delivered at site, price per unit including TPI charges Packing & forwarding, Transit insurance, freight, unloading, stacking, GST & any other levy (Rs) for PART-A: (in Words)								

Sl. No.2- SOR PART –B									
2.a.1.	**Size (OD) mm-63,** Grade of Material-PE-100, Standard Dimensions Ratio **(SDR)-11**	Hyderabad	35,000						
2.a.2		Vijayawada	40,000						
2.a.3		Kakinada	40,000						
2.a	**Total Price of 63(OD) mm, SDR 11**								
2.b.1.	**Size (OD) mm-32,** Grade of Material-PE-100, Standard Dimensions Ratio **(SDR)-11**	Hyderabad	1,72,500						
2.b.2		Vijayawada	1,10,000						
2.b.3		Kakinada	1,10,000						
2.b	**Total Price of 32(OD) mm, SDR 11**								
	Grand TOTAL FOT-delivered at site, price per unit including TPI charges Packing & forwarding, Transit insurance, freight, unloading, stacking, GST & any other levy (Rs) for PART-B(2.a+2.b): (in Words)								
Sl. No. -3 :SOR PART –C									
3.1	**Size (OD) mm-20,** Grade of Material-PE-100, Standard Dimensions Ratio **(SDR)-11**	Hyderabad	15,000						
3.2		Vijayawada	20,000						

3.3		Kakinada	20,000						
	Grand TOTAL FOT-delivered at site, price per unit including TPI charges, Packing & forwarding, Transit insurance, freight, unloading, stacking, GST & any other levy (Rs) for PART-C: (in Words)								

Name of the Bidder :
Signature & Seal of the Bidder :