



Bhagyanagar Gas Ltd.

# **BHAGYANAGAR GAS LIMITED**

(A JOINT VENTURE OF HPCL & GAIL)

## **BID DOCUMENT FOR**

**Tender for Supply & Installation of One No of permanent  
SHALLOW Anode Bed at Shamirpet, Hyderabad.**

## **UNDER LIMITED DOMESTIC COMPETITIVE BIDDING**

**Bid Document No.: BGL/512/2020-21**

**VOLUME-II of II**

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**SECTION – 8**

**SCOPE OF WORK**

### **SCOPE OF WORK/SERVICES**

**“The intent of this document is to install and commission one number of Shallow anode bed with associated civil work, cabling work etc.”**

The latest version of the following codes and standards will be considered as a minimum requirement:-

NACE Publications.

#### **I) CATHODIC PROTECTION SYSTEM- Introduction**

Pipeline network is in 01 Cities Hyderabad, as per following:

A) Hyderabad -16" inch pipeline-	30 KM
B) Hyderabad - 12" inch pipeline	10 KM
C) Hyderabad -6" inch pipeline-	2.9 KM
D) Hyderabad -4" inch pipeline-	2.6 KM

The said underground natural gas pipelines are passing through city and urban areas and are provided with Impressed Current Cathodic Protection (ICCP) System to protect from external corrosion as a supplementary system in addition to external coating of the pipelines of different diameters and length. The power source for ICCP system, in case of isolated pipelines is using Transformer Rectifier units with conventional type ground beds with backup power with battery banks are provided to maintain required corrosion protection level.

Test Stations have been installed at an interval of around 1 Km approx. in case of isolated pipeline networks and Gas Pipeline networks in order to monitor the health of the pipeline and performance of the CP systems.

#### **SITE INFORMATION:**

It is understood that before quoting the rates, the bidder has to visit the work site at own cost and has acquainted himself fully with nature and quantum of the job to be carried out by him in case of award of contract. Ignorance of this will not be considered after the award of contract. Contractor will be responsible to complete the job in all respect, including any other work necessary to complete the job satisfactorily, though specifically not covered in the “scope of work & Technical”.

#### **The system is to be maintained so as to achieve the following protection criteria:-**

- The Pipe to soil potential measurements of steel structures in soil will be between (-Ve) 0.85 and (-Ve) 1.50 Volts in case of isolated pipelines and (-ve) 0.95 and (-ve) 1.50 volts in case of Gas Pipeline networks with respect of Copper/Copper Sulphate reference electrode.
- The pipeline will be considered protected when minimum (-Ve) 300 Millivolt potential shift has been achieved from the initial-native potential to the "ON" potential.
- A minimum polarization shift of (-Ve) 100 Millivolt will indicate adequate level of Cathodic Protection of the pipeline.

**II) SPECIFICATIONS FOR MATERIAL AND SCOPE OF WORK IN EXECUTION OF INSTALLATION OF NEW anode Bed:**

**1) SPECIFICATION FOR CATHODIC PROTECTION OF ANODE BED**

This specification covers the requirement of design, manufacture, inspection, testing and supply and installation of Cathodic Protection anode bed to be used as source for impressed current

C.P System for underground pipelines. Reliability of equipment and ease of maintenances of utmost importance. The workmanship shall be of highest grade and entire design and construction in accordance with the best modern practice. The CP-Anode bed shall be capable of continuous trouble free operation at full load rating specified. The protection devices and control components shall be of standard design and carefully chosen to meet the requirements of the specifications. Special care shall be exercised in the design and manufacture for aging effects Resistance conditions during operation.

Apart from the de-ratings for site conditions an additional de-ratings of 20% shall be considered for the specific use as per International Standards. The components of the units shall be designed for maximum operating efficiency. The CP anode bed shall be provided with all the necessary protections required as detailed:

**SYSTEM OVERVIEW**

**Design life: 40 years**

**Pipeline Dia: 16"**

**Protective Current Density: 200 $\mu$ A/m<sup>2</sup> for normal soil (considered)**

**No. of CP stations: 1Nos, AC-DC (CPTR-Unit)**

**Anode Junction box: 01 Nos**

**Cathode Junction Box: 01 Nos**

**Permanent Reference cell : 2 Nos**

**CORROSION SURVEY**

Soil resistivity measurement will take at purposed anode bed locations. At least two plot were selected at one anode bed locations and soil resistivity will take that locations. Deep well anode bed: 1.5, 2.5, 5, 10, 30.....75 mtrs. Depending on anode bed depth.

The locations of anode ground plot will be selected based on the land availability to avoid problems during construction & keeping maintenance in view. However, from the resistance calculation, the type of anode bed can be decided.

**INSTALLATION**

- a) During installation, the shallow permanent anode bed shall be subjected to inspection by BGL's Engineer. The supplier shall furnish all information and facilities to enter into the work spot.
- b) All tests shall be carried out at the supplier works under his care and Expenses.
- c) spot tests shall be witnessed by inspecting authority of BGL's representative.

- i) As a part of general inspection visual checks shall also be carried out. This shall cover measurement of overall dimensions, locations, numbering on leads and terminal markings, MMO coating, etc.
- ii) Operation check for the controls as per specifications.
- iii) Resistance test shall be witnessed by inspecting authority of BGL's representative.

**SHALLOW ANODE BED:**

**A. PRUPOSE:**

To describe a procedure for installation of ICCP Anode ground bed and provide adequate quality assurance/control of workmanship and inspection at site.

**B. SCOPE**

This procedure covers installation of shallow ground bed, as per standard drawing & design document.

**C. Material Required:**

SR No	MATERIAL/ TOOL	MAKE	APPLICATION/ PURPOSE
1	Crimping Tool	Standard	For Clamping cable with lug
2	Excavation tools & Augers	Standard	For Excavation
3	Measuring Tape	Standard	Measurement
4	Petroleum coke breeze	GOA Carbons	Back filling Material
5	Canister	Standard	Sheet Steed for backfilling
6	MMO Anode	De Nora	Anodes for Anode Bed
7	Cu Sleeves/ Cable lug / D clamps / Ferrules, PVC pipe & Warning Mat etc..	Standard	
8	Holiday Detector	Caltech	For cable check
9	Electrical Tool Box	Standard	
10	Soil Resistivity meter	Nilsson/ MC Miller	Measurement of resistance
11	Casing Pipe for deep anode bed	Standard	Casing pipe for deep anode bed
14	Anode Tail Cable	Netco/ Torrent/KEI/ Finolex	Connection to pipe

**D. Procedure for Shallow bed:**

- Before starting the work, check material certificates & Inspection release note.
- Mark the boundary of the land acquired for installation of anode bed. This shall be in line with approved CP equipment layout for each CP station. Also mark location for each deep anode bed.
- Prior to proceeding to site, the MMO anode dimension shall be checked against the data sheet to ensure conformity.
- Identify the location of anode ground bed at remote distance from the pipeline for installation of MMO anode as per the construction drawings.
- Mark the locations of anode bed installation.

- Excavate the trench at 3 to 5 meter & 50-100 meter long as per design.
- Minimum 10 Nos. of anode shall be installed at distance of 4 meter( center to center) in between. Lower the Anode at depth of 3-5 meter from the ground in horizontal position.
- Fill coke breeze inside the trench in slurry from as per construction drawing.
- The leads of the anodes shall be brought up to the anode junction box and shall be terminated.
- Measure and record anode individual resistance and total anode ground bed resistance using soil resistivity meter.
- If the total anode bed resistance is more then 05 ohm, necessary action shall be taken to bring the anode groundbed resistance less than 05 ohm.
- Total ground bed area shall be covered with fencing as per attached drawing.
- After completion of anode ground bed, install the marker on each Anode installation.
- The inspection will be recorded on inspection / installation format as shown below.
- Clamp/ tie the anode tail cables and lay up to anode junction box.
- All the tail cables and Header cable shall be laid and terminated in anode junction box.
- Prepare Anode pit and cover as per approved drawing.
- The effective boundary of anode ground bed shall be secured with chain link fencing as per approved design.
- Measure and record anode individual resistance & total circuit resistance. Total circuit resistance shall be less that 1 ohm. If it is more than 1 ohm necessary action shall be taken to bring total circuit resistance less than 1 ohm.

**E. Precautions**

- Lower anode carefully to avoid damage to tail cable, anode should never be handled by cables, but rope to be used for the same.
- After lowering clamp/ Tie the cable to avoid further slide.
- Tail cables and PVC conduits shall be of sufficient length so as to reach anode junction box without any joint and providing sufficient slack for future maintenance purpose.
- Whenever the underground cable rises above ground, suitable mechanical protection to prevent damage to the cable must be provided.
- Keep tail cable lengths sufficient slack for future maintenance purposes.
- All cables are to be appropriately tagged before lowering cables in to trench/well.
- Provide cable core ferrules at end before final termination.

**F. Health, Safety & Environment:**

Hazard Identification and risk assessment will be carried out and Operational Control measures shall be adopted for Anode installation activities.

1. Necessary PPE to be utilized
2. Trained Personnel are to be deployed for this activity.

**DRAWINGS**

- a) A single line diagram printed on non-corrosive metallic sheet shall be affixed on the outside of the door of Anode premises. The diagram shall clearly indicate the terminal numbers, markings, values of the all components etc.

 <p>BHAGYANAGAR GAS LIMITED</p>	<p><b>Supply &amp; Installation of One No of permanent SHALLOW Anode Bed at Shamirpet, Hyderabad</b></p> <p><b>Bid Document No. BGL/512/2020-21</b></p>	<p>VOLUME II OF II</p>
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- b) A detailed installation diagram of the shallow bed Unit offered together with the technical specifications of the various components shall also be supplied along with the tender.
- c) Complete design of anode to be used in Shallow bed . Units should also be submitted with all related document.

**GUARANTEE**

The shallow anode bed shall be guaranteed for trouble free operation for a period of 12 months from the date of commissioning of the unit at site or 18 months from the date of delivery whichever is earlier. Any defects discovered during this period shall be rectified by the supplier at BGL’s site / premises at suppliers cost.

**MAINTENANCE MANUAL**

The tenderer shall supply 1 set of maintenance manual of the shallow bed.

- 1) CABLE TO PIPE JOINT (if required)
  - In the making of the joint(s) particular care shall be taken to avoid any loose or imperfect joint(s) because it is on the continuity of these joints that the reliability and performance of the whole system depends.
  - (a) The pipe to cable connection can be made by Pin brazing
  - (b) The pipe to cable connection can also be made by using Pin brazing or Thermit weld.
- 2) SPECIFICATIONS OF MATERIALS FOR CIVIL WORK
  - All materials for civil works shall be of standard quality, manufactured by renowned concerns conforming to Indian Standards or equivalent. The CONTRACTOR shall get all materials approved by Engineer-In-Charge prior to procurement & use. If required, the CONTRACTOR shall furnish manufacturer's certificates for the materials supplied by him or get the materials tested from an approved test laboratory at the direction of Engineer-In- Charge. The cost for all tests & test certificates shall be borne by the CONTRACTOR. Any material brought to site & not conforming to specifications & satisfaction of Engineer-In- Charge shall be rejected & the CONTRACTOR shall have to remove the same immediately from the site at his own expense & shall not have any claim for compensation due to such rejection.
  - 2.1 WATER
    - Water used for cement concrete, mortar, plaster, grout, curing or washing of coarse aggregates shall be clear & free from injurious contents of oil, acids, alkali, organic matters or other harmful substances in such amounts that may impair the strength or durability of the structure. Potable water shall generally be considered satisfactory for mixing & curing of concrete. The Engineer-In-Charge may require the CONTRACTOR to get the water tested from an approved laboratory at the latters expense & in case the water contains any sugar or an excess of acid, alkali or any injurious amounts of salts etc., the Engineer-In-Charge may refuse to permit its use.
  - 2.2 AGGREGATE
    - Coarse & fine aggregates for concrete shall conform in a respect to IS:383 specifications for coarse & line aggregates from natural sources for concrete & to IS: 515 specifications for natural & manufactured aggregates for use a mass concrete, as the case may be. Aggregates shall consist of naturally occurring sand and gravel or stone,



crushed/uncrushed or a combination thereof & shall not contain any harmful material such as iron pyrites, coal, mica, shale, clay, organic impurities etc. in such quantities as to affect the strength or durability of the concrete and in addition to the above, fore enforced concrete any material which might cause corrosion of the re-enforcement. The sum of percentages of all deleterious materials shall not exceed 5% by weight & 8% by volume, which includes materials passing 75 micron IS: Sieve.

#### 2.2.1 COARSE AGGREGATE

Coarse aggregate is aggregate most of which is retained on 4.75 mm IS: Sieve & shall have a specific gravity of not less than 2.6. These may be obtained from crushed or uncrushed gravel or stone.

#### 2.2.2 FINE AGGREGATE

Fine aggregate is aggregate most of which passes through 4.75 mm IS: Sieve but not more than 10% passes through 150 micron IS: Sieve. Fine aggregates shall consist of natural sand resulting from natural disintegration of rock & which has been deposited by streams or glacial agencies or crushed stone sand or gravel sand.

#### 3.0 SAND FOR FILLING

Sand for filling shall be medium hard, strong, free from any organic & deleterious materials. Any sand (FINE/COARSE) proposed, shall be used only after it is approved by the Engineer-In-Charge.

#### 4.0 CEMENT

The cement used shall be ordinary Portland cement conforming to IS: 269 or as approved by the Engineer-In-Charge.

The cement shall be stored in a suitable weather tight store in such a manner as to permit easy access for proper inspection. The cement shall be stored in such a manner as to prevent deterioration due to moisture & to minimize ware-house deterioration.

At the discretion of the Engineer-In-Charge, cement can be subjected to any or all of the tests & analysis required by the relevant Indian Standard Specifications. The CONTRACTOR shall bear the cost of all such tests. The Engineer-In-Charge may reject any cement as a result of any tests thereof. He may also reject cement which has deteriorated owing to inadequate protection from moisture or due to intrusion of foreign matter or other causes. Any cement which is considered defective by the Engineer-In-Charge shall not be used, & shall be promptly removed from the site by the CONTRACTOR at his own expense.

#### 5.0 STEEL REINFORCEMENT

Mild steel reinforcement shall conform to IS: 422 Part-1. Structural steel shall conform to IS: 226 / IS: 2062.

#### 6.0 BRICK

6.1 These shall be sound, hard, tough, rectangular in shape & size, well burnt (not over burnt) of uniform deep red colour & shall conform to IS: 1077 first class bricks (50 A class)

6.2 The brick shall be free from cracks, chips, flaws or humps of any kind and shall not show signs of efflorescence. The bricks shall be of fine, compact homogeneous structure &

emit a clear ringing sound on being struck & shall have minimum compressive strength of 50 Kg / cm<sup>2</sup> & shall not absorb water more than 20% of its dry weight when soaked in cold water for 24 hours. The tolerance limit shall be 3% for absorption.

6.3 All other materials not fully specified herein & which may be used in the work shall be of quality approved by the Engineer-In-Charge & he shall have the right to determine whether all or any of the materials supplied by the CONTRACTOR for use in the work are suitable for the purpose.

#### **7.0 CHEQUERED PLATES & STRUCTURAL STEEL WORKS**

Chequered plates shall be 6mm (7mm moreover chequered & shall conform to IS: 3502). Steel for chequered plate shall conform to IS: 226 shall be clearly rolled & shall be free from harmful surface defects such as crack surface flaws etc. The plate shall be cut to shape & fixed to the bearing members as shown in relevant drawings & directed by Engineer-In-Charge. The edges shall be made smooth, no burrs or gaged ends shall be left. The plates may be spliced with prior consent of the Engineer-in-Charge. But in that case care should be taken so that there is continuity in the pattern of the plates between the portions.

#### **8.0 CHAIN LINK FENCING:**

Fixing of chain link fencing of GI Wire (3mm thick) of mesh size (50mm x 50mm) fixed angle iron of size 50mm x 50mm x 6mm grouted in PCC 1:3:6 in foundation & painted with aluminium paint including brick work in cement mortar 1:6 along the length under the chain link fencing with PCC 1:2:4 (50mm thick) on the brick work to hold the fencing at the bottom, the height of chain link fencing should be 2.5 mtrs above the floor.

Arrangement of all consumables items viz. insulation tape, MS-Brass nuts & bolts, washers, cable lugs, Bakelite-plates & terminals, warning tapes / mats, lubricants, grease, waste cotton, cold soldering materials like eutectics 157-Sealing / capsulation materials like M-seal and the necessary tools and tackles, instruments, equipment's (tri port, chain pulley etc.) to carry out tendered job is in the scope of contractor without any extra cost. Contractor shall have to furnish all details regarding availability of tools and tackles, instruments, equipment's before commencement of work.

For executing any item if contractors outsource/hire the expertise from outside agency the cost of the same would be admissible as per SOR defined only. In such cases prior permission of EIC is to be obtained.

All arrangements / payments (if any) necessary for carrying out maintenance SOR mentioned jobs, ROU opening, excavation job, crop compensation and negotiations / discussions with landowner, farmer or any other public / private agency, liaison with authorities for non receipt of the energy bills, correction in reading etc. & power restoration of TR CP unit in case of any fault, shall be the contractor's responsibility without any extra cost to BGL as a part of monitoring activity.

#### **9.0 COKE BREEZE:-**

##### **DATA SHEET:**

CHEMICAL COMPOSITION :

Moisture, Volatile ( On Dry Basis), Ash

**Seal & Sign of Bidder**

and Sulphur	: 1% ( % By Mass )
Fixed Carbon	: 99% Minimum
BULK DENSITY	: 800 – 1200 Kgs / M3
REAL DENSITY	: 2.03 gm / cc
POROSITY	: 40%
RESISTIVITY	: 0.1 Ohm Cm at 150 PSI
Particle Size	: (-) 1.0 mm Max Dust Free

#### **10.0 ANODE LEAD JUNCTION BOX:-**

(a) Anode lead junction box is having facility for individual anode connection and suitable for pillar mounting. Appropriate cable glands provided in bottom side of box. A hinged lockable lid is provided as front door for access to the box. Box includes min 6-10 No. single anode circuits and main positive feed cables of maximum 25 Sq. mm cross section lugged copper conductor.

(b) Bus bar -- NiCd plated Copper bus bar of 25mm x 3mm mounted on two number epoxy supports, with brass studs/nuts/washers and antivibration washer to accommodate lugged cable connection of up to 2 x 25 sq. mm. main anode cable and tap off interconnection for 18 nos. individual anode circuits.

All terminals should be of SS-304 material and size M-8 (08mm) nut, bolts, spring washer. The termination boards should be Fabric reinforced Bakelite of minimum 08 mm thickness.

(c) Anode Circuit --- Each anode circuit is provided with following:

1. Removable link (Copper)
2. Measurement shunt: 10Amp, 100mV rating.
3. Variable Resistor: Slides wire type 5 Ohm 5 amps rating.
4. Individual anode terminals will comprise of studs/nuts/washers and anti-vibration washers to terminate 10 Sq. mm lugged cables.

(d) Enclosure: The fabrication details as per following -  
Material - MS Sheet 2.5 mm thick, weight - 30 Kg (approximate),

- Painting : Surface Preparation SA 2 ½  
Hot Dipped Galvanised – 80um  
One Coat of Zinc Primer  
Two Coat of Epoxy Paint IS631 Shade

#### **11.0 SHALLOW ANODE GROUND BED SPECIFICATIONS & DATA SHEET SCOPE:**

This specification covers the minimum technical requirements for the design, manufacture, performance, inspection, testing and supply of Mixed Metal Oxide coated Titanium Tubular Anode Strip for shallow Anode Ground beds for ICCP System.

The MMO Anode strip should be a standard product of a manufacturer regularly engaged in production of MMO Anodes. The Anodes shall be supplied in accordance with the following specifications and data sheets.

#### **CODES AND STANDARDS**

The design, manufacturing, testing of MMO lida Anode String for Deep Anode Ground bed shall be in accordance with the latest revisions of the following Indian standards, wherever applicable. Where appropriate Indian standards are not available, the relevant IEC standards shall apply.

- a) Indian Standards institution (ISI)
- b) International Electro technical commission (IEC)
- c) American Standards Institution (ANSI)
- d) British Standards Institution (BS)

**ANODE DATA SHEET:**

Anode Base Material	: Titanium substrate (ASTM B 861 Grade I) Coated with mixed metal oxide (MMO) of noble metals of group VIII.
Anode Type	: LIDA (Linear Distributed Anodes)- Mixed Metal Oxide (MMO) coated Titanium Anodes
Application	: Shallow – Horizontal ground bed in neutral soil/fresh soil with carbonaceous backfill
Shape & Size	Strip Anode 750 to 700 mmm+/-5mm ( Strip Anode) 25.4mm O.D +0.40/-0.79mm 1mm+/-0.1 mm Thick
Weight	0.285kg+/-0.021 Kg
Design Life	40 years
Anode Current Output	: 5 Amperes per Anode
Number of Anodes	: 10 Nos as defined in respective SOR items
Total Anode Current Output	: 48 Amperes or 24 Amp
Anode Design Life at Maximum Output	: 40 years
Maximum Operating Current Density with carbonaceous backfill	100 Amp/M <sup>2</sup>
Coating resistivity	: 6 x 10 <sup>-5</sup> Ohm - cm
Anode to cable connection	LIDA anode to cable patented crimp connection at centre and end sealing.
Anode quantity on string	As per current requirement
Contactresistance/Electrical continuity	1 milli Ohm (max.)
Coating Consumption rate	1 mg per ampere -year
Mixed metal Oxide (MMO) coating	More than 9 gm /M <sup>2</sup>
Weight	
Coating deposition Method	Thermal decomposition

**Carbon Backfill**

High quality calcined petroleum coke is to be used for all deep anode installations. Granular carbon sinks readily in fresh water and is normally poured directly from the bag into the well. Fluid coke is comprised of fine carbon particles that compact tightly around anodes.

**MMO ANODE:**

The Anode base metal shall be titanium substrate confirming the ASTM Grade – I / II material specifications. The Titanium substrate shall be coated with refractory & precious mixed metal oxides augmented by the Plasma Spray Processed Catalytic Coating Method. The coating density, mixture ratio, type of precious & refractory metal oxides and the dielectric material used for insulation shall be suitable for operations in different electrolytes and environment.

The Plasma Spray Coating process gives an Enhanced Mixed Metal Oxide Coating that should give three distinct advantages.

a. Abrasion Resistance:

The EMMO Coating on the Anode should be abrasion resistant to sharp rock or sharp metal edges.

b. Coating Mechanical Stability:

The EMMO Coating on the Anode should be mechanically stable and resistant to rupture due to electrolysis-generated gas in the coating porosity.

c. Coating Thickness:

The EMMO Catalytic Coating mean thickness on the Anode should be ~900 microns.

**ANODE GROUNDBED BACKFILL:**

Calcined Petroleum Coke Breeze with chemical composition of minimum 98% Carbon and (-)1mm mesh size. The consumption rate of coke breeze should be 1.1Kg / Amp – Yr and the Anode Ground bed Design life should not be less than 35 years at an operating load current of 50 Amperes.

**DOCUMENTS AND DRAWINGS:**

The Anode Manufacturer shall have a proved track record in manufacturing of EMMO Anodes for 10 years and Performance Certificates should be produced for Approval from Owner. The Anode Manufacturer should provide fabrication drawings and data Sheet for approval from Owner before placement of Purchase order.

The Anode Manufacturer should provide fabrication drawings and data Sheet for approval from Owner before proceeding with manufacturing. After approval of Fabrication drawing and proto type test is cleared the anode strings should be finally manufactured.

**12.0 WARRANTY:**

The EMMO Anode Strings should be warranted for minimum 05 years from the date of installation. The New EMMO Anode String should be provided by its manufacturer if it stops functioning within 05 years when installed and operated per manufacturer's guidelines.



**13.0 PROCEDURE FOR CP CABLE TRENCH BED & BACKFILLING:-**

- (i) 1 Mtr. Depth laying
- (ii) layer of sand
- (iii) Approved class brick layer of 3" thick
- (iv) Red color poly thin of 0.25 mm thick
- (v) Back filling with soil
- (vi) Watering (As & when required )
- (vii) Making normal surface
- (viii) As per the approved drawing

**14.0 EARTHING SYSTEM / EARTHING PIT :-**

The earthing system of TR Unit / Solar CP Station and P/L or at Gas terminal comprises of Earth pits, Earthing grid etc. Monitoring, Maintenance/Repair is to be carried out as per IS 3043 (pipe).

**INSPECTION & TEST PLAN FOR SHALLOW ANODE BED**

Sl. no	Activity Description	Procedure	Frequency of inspection		Record to be submitted by
			Contractor	PMC/Client	
1	Check location	Procedure	W	R	Procedure
2	Checking of Distance, depth & length/Dia of anode bed		P	W	
3	Check alignment & lowering of Anode for deepwell		P	W	
4	Individual anode		P	W	
5	Check Encapsulation		P	W	
6	Check continuity of cable to pipe		P	W	
7	Check holiday at 15 KV (For encapsulation)		P	W	
8	Check restoration		P	W	
9	Holiday testing equipment Calibration Certificate Test		P	W	

**Inspection Codes:**

W – Witness. Prior notification

required P - perform

R – Review

00		For Review and Approval		
Rev.	Date	Description	Prepared by	Approved by

<u>PROCEDURE- CABLE LAYING</u> 3	Sandpadding & brick laying		P	W	
4	Warning mat		P	W	
5	Tagging and restoration of earth work		P	W	

**Inspection Codes:**

W – Witness. Prior notification

required P - preform

R – Review

00		For Review and Approval		
Rev.	Date	Description	Prepared by	Approved by

**PROCEDURE FOR ANODE JUNCTION BOX INSTALLATION**

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*Inspection and Test Plan*

*Inspection Report*



## **1.0 PURPOSE**

To describe the procedure for installation of anode junction box provides adequate quality assurance/control of workmanship and inspection at site.

## **2.0 SCOPE**

The procedure covers installation of anode junction box should be as per site condition left /right side towards direction of flow.

## **3.0 MATERIALS AND REFERENCES**

3.1 Equipments: Calibrated portable multimeter, Portable Reference Cu/CuSO<sub>4</sub> electrode.

3.2 Materials: Shuttering, concrete, Cable lugs, ferrules, etc.

## **4.0 PROCEDURE**

4.1 Make a pit of dimension 1 m x 1 m x 0.5 m. The pit should be made at proper distance from pipeline on the wider side of the ROW.

4.2 Foundation should be cast either in site or at a convenient storage yard. Keeping the M.S. pipe vertically aligned. Take care so that the top of the foundation and the top of the enclosure the overall dimensions of foundations shall be 900 mm x 900 mm x 600 mm.

4.3 Take care about the mainline pipe and its insulation to ensure that no damage is caused to them during excavation on the pipeline for cable to pipe connections. A reference should be made to approve anode Junction box Schedule for the type of connection scheme designed for the respective anode Junction box. Make required number of cable to pipe connections of appropriate cable size and length.

4.4 Insert cable carefully on the rim of the M.S. pipe protruding out of the foundation block. This is to avoid damage to cable insulation while pulling the cables into the enclosure.

4.5 Pull the cables up to the top of foundation and then harness them through the support pipe into the enclosure.

4.6 The M.S. support pipe along with enclosure should be erected on top of foundation block by matching the base plate holes and fastening the bolts grouted in the foundation secured by the matching nuts.

4.7 Take care so that the top of the foundation and the top of the enclosure remain in the horizontal plane.

4.8 The orientation of the enclosure (box) should be such that its door faces the pipeline.

4.9 Mount the necessary hardware within the enclosure and terminate the cable onto the respective terminals.

4.10 Measure pipe to soil potential with portable multimeter and Cu/CuSO<sub>4</sub> reference electrode at all cables terminals inside the box.

## **5.0 PRECAUTIONS**

5.1 Cables used shall be of sufficient length so as to reach termination point without any joint and providing sufficient slack for future maintenance purposes.

5.2 Tag all cables appropriately.

- 5.3 Check all the connections for proper tightening
- 5.4 Provide cable core ferrules at both ends before final termination.
- 5.5 Keep one set of drawing / documents by site supervisor at work place.
- 5.6 Neatly dress the cable inside the trench and terminated inside junction box.
- 5.7 Installed test stations are in the cultivated land / open field at the boundary of two plots and not in the middle of these plots.

## 6.0 TEST REPORT

Record and document all inspection result obtained in the Inspection report format

Inspection and Test Plan

Inspection Report

*Inspection Test Plan: Anode Junction Box Installation*

Sr. No	Activity Description	Reference document	Frequency of Inspection		Record to be submitted by
			CONTR.	Client	
1	Check Pit dimensions and location as per drawing	procedure	W	R	procedure
2	Concrete foundation, size and grade including curing time		P	W	
3	AJB top mounting on foundation		P	W	
4	Check foundation level		P	W	
5	Checking height above ground level		P	W	

### Inspection Codes:

W – Witness. Prior notification

required P - preform

R – Review

00		For Review and Approval		
Rev.	Date	Description	Prepared by	Approved by

**INSPECTION & TEST PLAN  
FOR CONSTRUCTION OF SHALLOW ANODE GROUND BED**

**Owner :**

**CP Contractor :**

**Project :**

**P/L Description :**

**Jurisdiction :**

**Report No. :**

**DOC No. : Procedure/ Drawing**

**Date :**

Sl No	Activity Description	Controlling Specification / Acceptance Criteria	Verifying Document	cp	client	Remarks
1	Location check & Checking of Distance, Depth and Length/dia of Anode Bed	Design document & Drawing	Inspection report	P	W	
2	Individual anode tail cable connection & conduit sealing	Drawing	Inspection report	P	RI	
3	Check alignment, & installation of Anode for shallow well	Drawing	Inspection report	P	RI	
4	Filling of Coke Breeze for deep anode bed	procedure	Inspection report	P	RI	
5	Check the Cable Laying up to AJB and Backfilling of Soil	Drawing	Inspection report	P	RI	
6	Cable termination	Drawing	Inspection report	P	RI	

LEGEND : RI - RANDOM INSPECTION      W - WITNESS ALL      AP - APPROVAL/ACCEPTANCE

P - PERFORM

I - INPECTION

H - HOLD

R- REVIEW

**For**

**For**

Name:

Name:

Sign:

Sign:

Date:

Date:

**INSPECTION REPORT SHALLOW ANODE BED INSTALLATION**

<b>Owner :</b>					
<b>CP Contractor:</b>					
<b>Project :</b>					
<b>P/L Description :</b>				<b>Jurisdiction :</b>	
<b>Report No. :</b>			<b>DATE :</b>		
<b>Reference doc.</b>	<b>Procedure</b>		<b>Reference drawing No.</b>		
<b>CP station No. &amp; Location</b>				<b>Chainage (Km)</b>	
<b>Dimension of anode</b>				<b>Spacing between Anode</b>	
<b>Tail cable size</b>				<b>Backfill material</b>	
<b>Casing pipe</b>	<b>Dia</b>		<b>Thickness</b>		<b>Anodebed depth (m)</b>
<b>Vent pipe</b>	<b>Dia</b>		<b>length</b>		<b>Anode bed Chamber</b> OK/NOT OK
<b>End Weight</b>	<b>Kg.</b>				<b>Coke breeze filling</b>
			<b>Connection</b>		<b>Cable Laying</b>



BHAGYANAGAR GAS  
LIMITED

**Supply & Installation of One No of permanent  
SHALLOW Anode Bed at Shamirpet, Hyderabad**

**Bid Document No. BGL/512/2020-21**

VOLUME II  
OF II

Anode No	Cable length (m)	Depth & Length of anode (m)	Anode centralizer	Cable tag Number	Remarks
A1					
A2					
A3					
A4					
A5					
A6					
A7					
A8					
<b>For</b>			<b>For</b>		
Name:			Name:		
Sign:			Sign:		
Date			Date:		

**HEALTH, SAFETY**

**ENVIRONMENT [HSE] SPECIFICATIONS**

**HEALTH, SAFETY AND ENVIRONMENT [HSE] SPECIFICATIONS**

**1.0 SCOPE**

These specifications establish the 'Health, Safety and Environment [HSE] Management' requirement to be complied with by the Contractors during executing their Job. Requirements stipulated in these specifications shall supplement the requirements of 'HSE Management' given in relevant act(s) / legislation(s).

**2.0 REQUIREMENTS OF 'HEALTH, SAFETY AND ENVIRONMENT [HSE] MANAGEMENT SYSTEM' TO BE COMPLIED BY BIDDERS**

- 2.1 Preferably, the Contract should have a documented 'HSE Policy' to cover commitment of their organization to ensure health, safety and environment aspects in their line of operations.
- 2.2 The Contractor shall ensure that the BGL's 'Health, Safety and Environment [HSE]' requirements are clearly understood and faithfully implemented at all level, at sites.
- 2.3 Contractor shall promote & develop consciousness for health, safety & environment among all personnel working for the Contractor. Regular work-site meetings shall be arranged on 'HSE' activities to cover hazards involved in various operations during executing their jobs, location of First Aid Box, trained personnel to give First Aid, Assembly Points, standby Ambulance or vehicle and fire protection measures such as fire hydrant, water and fire extinguishers, etc.
- 2.4 Non-conformance of 'HSE' by Contractor [including his sub-Contractors] as brought out during review/audit by BGL / external agency authorized by BGL, shall be complied by Contractor and its report to be submitted to BGL.
- 2.5 Contractor shall adhere consistently to all provisions of 'HSE' requirements. In case of non-compliance of continuous failure in implementation of any of the 'HSE' provisions, BGL may impose stoppage of work and a suitable penalty for non-compliance. The decision of imposing work-stoppage, its extent & monetary penalty shall rest with BGL.
- 2.6 All fatal accidents and other personnel accidents shall be investigated for root cause by BGL and Contractor shall extend all necessary help and cooperation in this regard. Recommend corrective and preventive actions of findings will be communicated to Contractor for taking suitable actions should be taken by the Contractors to avoid recurrence of such incidences.
- 2.7 Contractor shall ensure that all their staffs and workers, including their sub- Contractor(s), shall wear 'Personal Protective Equipment's [PPEs]' such as safety
- 2.8 helmets, safety shoes, safety belts, protective goggles, gloves, etc., as per job requirements. All these gadgets shall conform to relevant IS specifications or equivalent.
- 2.9 Contractor shall assign competent & qualified personnel for carrying out various tasks/jobs as per requirement.
- 2.10 All equipments should be tested and certified for its capacity before use.
- 2.11 Contractor shall ensure storage and utilization methodology of materials that are not detrimental to the environment. Where required, Contractor shall ensure that only the environment-friendly materials are used.
- 2.12 All persons deployed at site shall be knowledgeable of and comply with the environmental laws, rules and regulations relating to the hazardous material substances and waste. Contractor shall not dump release or otherwise discharge of dispose off any such materials without the express authorization of BGL.
- 2.13 Contractor should obtain all work permits before start of activities [as applicable] like hot work, confined space, work at heights, storage of chemicals/explosive materials and its use & implement all precautions mentioned therein.
- 2.14 Contractor should display at site office and work locations caution boards, provide posters, banners for safe working to promote safety consciousness, etc.

2.15 Contractor should carryout audits/inspections/supervisions at the sub-Contractor's works and submits the reports for review by BGL.

**3.0 RELEVANT CODES FOR 'PERSONAL PROTECTION EQUIPMENTS**

IS: 2925 - 1984	Industrial Safety Helmets
IS: 47701 - 1968	Rubber Gloves for Electrical Purpose
IS: 6994 - 1973 [Part-I]	Industrial Safety Gloves [Leather & Cotton Gloves]
IS: 1989 - 1986 [Part-II]	Leather Safety Boots & Shoes
IS: 5557 - 1969	Industrial & Safety Rubber Knee Boots
IS: 6519 - 1971	Code of Practice for Selections, Care & Repair of Safety Footwear
IS: 11226 - 1985	Leather Safety Footwear Having Direct Molding Sole
IS: 5983 - 1978	Eye Protectors
IS: 9167 - 1979	Ear Protectors
IS: 3521 - 1983	Industrial Safety Belts & Harnesses

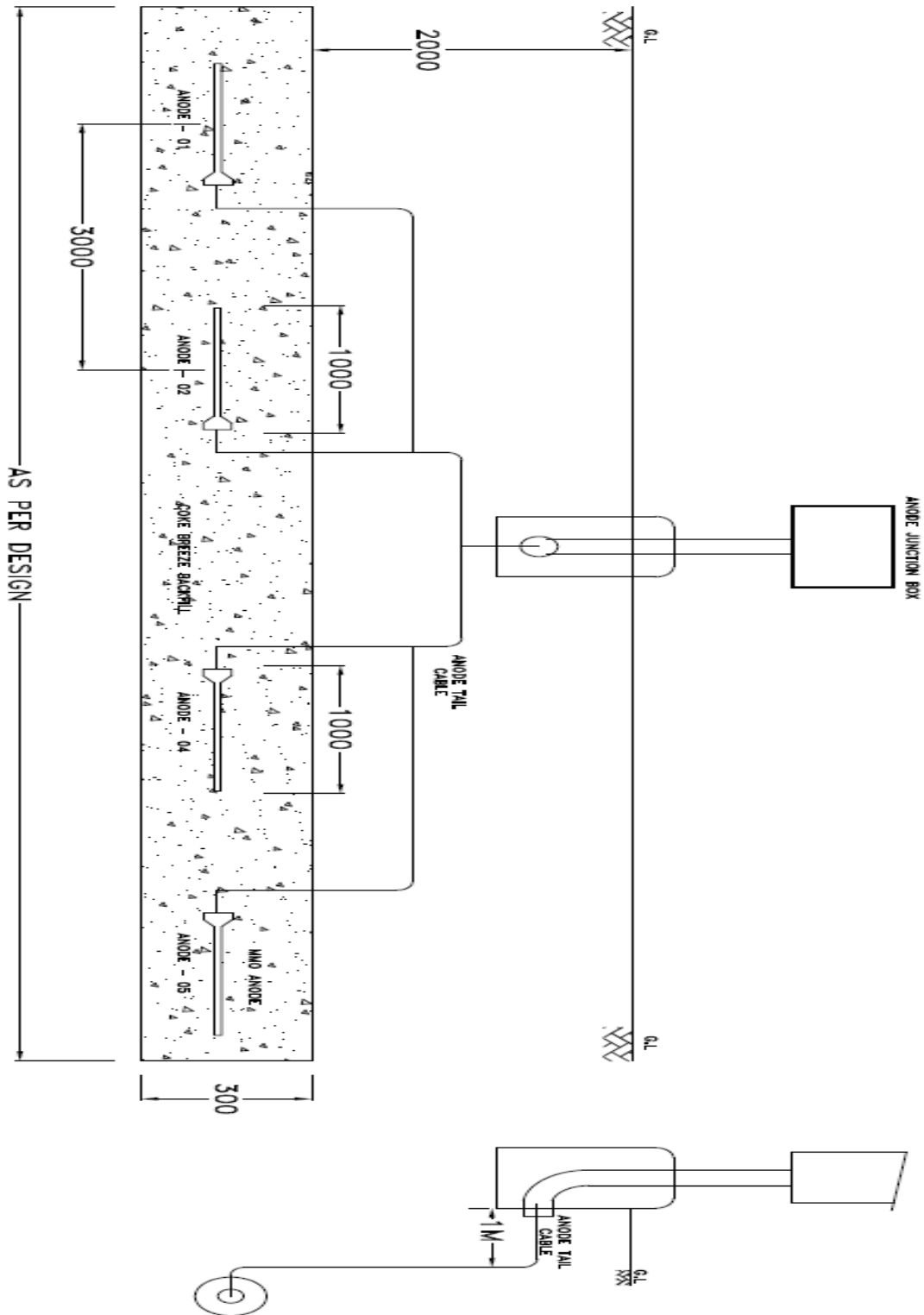


BHAGYANAGAR GAS LIMITED

# Supply & Installation of One No of permanent SHALLOW Anode Bed at Shamirpet, Hyderabad

Bid Document No. BGL/512/2020-21

VOLUME II OF II



**SHALLOW ANODE BED INSTALLATION – for reference only.**





BHAGYANAGAR GAS  
LIMITED

**Supply & Installation of One No of permanent  
SHALLOW Anode Bed at Shamirpet, Hyderabad**

**Bid Document No. BGL/512/2020-21**

VOLUME II  
OF II

**SECTION – 9**

**SPECIAL CONDITIONS OF  
CONTRACT (SCC)**

**SPECIAL CONDITIONS OF CONTRACT (SCC)**

**1.0 GENERAL**

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.

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 be read within the Contract so far as it may be practicable to do so.

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 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.

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 include cost of such performance and provisions, so mentioned.

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.

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/ LOI along with 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

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.

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.

### 1.0 SCOPE OF WORK & SCOPE OF SUPPLY

The detailed scope of work shall be as specified in Technical Volume II of II & tender / addendum / corrigendum document. It is however, explicitly understood that scope described is not limiting, in far as the responsibilities of the contractor are concerned and shall include, interalia, carrying out any and all works and providing any and all facilities as are required to complete the works in all respect.

### 2.0 TIME SCHEDULE

The completion schedule for work shall be as follows:

NAME OF WORK	TIME OF COMPLETION
Tender for installation of shallow permanent anode bed at Shameerpet, MS hyderabad.	Total 03 months from the date of issuance of Fax of Acceptance (FOA) The above period includes all post commissioning and AC & DC Interference detection and Mitigation.

### 3.0 DRAWINGS AND DOCUMENTS

- 3.1 The drawings accompanying the bid document (if any) are of indicative nature and issued for 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.
- 3.2 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. MECON shall review the drawings/ documents within two weeks from the date of submission provided the same are accompanied by relevant calculations, data as required and essential for review.
- 3.3 All documents and drawings including those of Contractors sub-vendor's manufacturer's etc. shall be submitted to Employer/Consultant after having been 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 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.

- 3.5 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.
- 3.6 The Contractor shall rectify any inaccuracies, errors and non-compliance to contractual requirements. Any delay occurring on this shall not construe a reason for delay/ extension.

#### **4.0 LIMITATION OF LIABILITY**

- 4.1 The final payment by the Owner/ Consultant 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 fulfill all his liabilities and responsibilities, till the time of release of contract performance guarantee by the Owner/ Consultant.
- 4.2 Notwithstanding anything contrary contained herein, the aggregate total liability of Contractor 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 profit or loss of production.

#### **5.0 CONTRACT PERFORMANCE GUARANTEE**

- 5.1 As a Contract Security, the Contractor to whom the work is awarded, within 30 (Thirty)days of such award of contract shall furnish a Contract Performance Guarantee in favour of the Employer/Consultant in the form of an irrevocable and unconditional Bank Guarantee as per Pro-forma approved by Employer/Consultant. This Bank Guarantee shall be issued by any Indian Nationalised /Scheduled Bank or reputed International Bank.

**The Guarantee amount shall be 10% (Ten Percent) of the 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 @5% of invoice subsequently from invoices till the total amount of security deposit (including ISD and deducted amount) reaches 10% of Total Contract value".**

- 5.2 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.
- 5.3 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 compensation for the works performed shall be payable upon such termination.

- 5.4 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.
- 5.5 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 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.

#### **6.0 SUBSEQUENT LEGISLATION**

- 6.1 All duties, taxes (including sales tax on works contract/ trade tax / turnover tax/ service tax 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 the Act, laws, Rules, Regulations in force shall be to Contractors account. However, any new taxes / duties imposed after the date of submission of price bid & up to Contractual Completion date shall be to the GAIL's account but such Taxes / duties imposed beyond Contractual Completion date shall be to the Contractor's account.

#### **7.0 ISSUE OF ESSENTIALITY CERTIFICATE**

- 7.1 BGL shall not provide any kind of certificate

#### **8.0 IMPORT LICENCE**

- 8.1 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/Consultant shall not provide import licence.

#### **9.0 WITHHOLDING, ACCOUNTING AND TAX REQUIREMENT**

- 9.1 Contractor agrees for withholding from wages and salaries of its agents servants or employees all sums required to be withheld by the laws of 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 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.

## **10.0 INTELLECTUAL PROPERTY**

10.1 Neither Employer/Consultant nor Contractor nor their personnel, agents nor any subcontractor 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.

## **11.0 FIRM PRICE**

11.1 The quoted prices shall be firm and shall not be subject to price escalation till the work is completed in all respects.

## **12.0 PROVIDENT FUND ACT**

12.1 The Contractor shall strictly comply with the provisions of Employees Provident Fund Act and register them 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 RPFC for the preceding months.

## **13.0 CHANGE ORDERS /EXTRA WORKS/ DEVIATIONS**

13.1 A change order will be initiated in case:

- i) The Owner/Consultant directs the Contractor to include any addition to the scope of work not covered under this Contract or delete any Work included in the scope of work under the contract.
- ii) Contractor requests to delete any part of the work which will not adversely affect the operational capabilities of the project and if agreed by the Owner / Consultant and for which cost and time benefits shall be passed on to the Owner.

13.2 Any changes required by the Owner / Consultant before giving their approval to detailed procedure or any other document relating to material procurement, layout plans etc. for complying with the requirements of bidding document shall not be construed to be a change in the scope of work under the contract.

13.3 Any change order as above comprising an alteration which involves a change in the cost of works (which sort of alteration is hereinafter called a "Variation") shall have impact on the contract value that shall be dealt towards end of contract. All change orders shall be approved by the Engineer-In-Charge.

13.4 If the Contract provides applicable rates for the valuation of the variation in question the contract price shall be increased or decreased in accordance with those rates. If the parties

agree that the contract does not contain applicable rates then the parties shall negotiate a revision of the contract price which shall represent the change in cost of the works caused by the variations. Any change order must be duly approved by the Owner consultant in writing.

- 13.5 If there is a difference in opinion between the Contractor and the Owner / Consultant whether a particular work constitutes a change order or not, the matter shall be handled in accordance with the procedures set forth in.
- 13.6 Within 10 (Ten) working days of receiving the comments from the Owner / Consultant on the documents submitted by the Contractor for approval, the Contractors response in writing stating which item(s) is are potential change(s), if applicable, will be submitted to the Owner/Consultant.
- 13.7 Procedure
- 13.8 During execution of work if the Contractor observes that any new requirements which is not specific or intended in the bidding document has been indicated by Owner / Consultant, they shall discuss the matter with Owner / Consultants representatives.
- 13.9 In case such requirement arises from the side of the Contractor they would also discuss the matter with Owner / Consultants Representative.
- 13.10 In either of the two cases above, the representatives of both the parties shall discuss the project requirement and mutually decide whether the project requirement constitutes a change order.
- 13.11 If it is mutually agreed that the project requirement inquiry constitutes a "Change Order" then a joint memorandum will be prepared to confirm a "Change Order" and basic ideas of necessary agreed modifications.
- 13.12 Contractor will study the work required in accordance with the Joint memorandum and assess subsequent schedule and cost effect if any.
- 13.13 The results of this study would be discussed mutually to enable Owner / Consultant to give a final decision whether Contractor should proceed with the Change Order or not, in the best interest of the Project.
- 13.14 If Owner/Consultants representative accepts the change order in writing then Contractor shall proceed the work stipulated in the Change order. Time worked by all workmen employed and a statement showing the description and quantity of all materials and plant utilized for extra work shall be submitted to Owner / Consultant. The Owner / Consultant's representative shall sign and return to the Contactor the statement, as agreed. At the end of each month the Contractor shall deliver to the Owner / Consultants representative a priced statement of the labour, materials and plant used. Whenever any dispute arises as to cost allocation between the Contractor and the Owner / Consultant, the voucher shall nevertheless be signed by the Owner / Consultant as a record of time worked and materials used. List and vouchers so signed will be subject of negotiations between the Owner / Consultant and the Contractor regarding their cost allocation.
- 13.15 In case, mutual agreement as above that is whether Project Requirement constitutes a change order or not, reached, then Contractor, in the interest of the project, shall take up the implementation of the work, if advised in writing to do so by Owner / Consultants

representative pending settlement between the two parties to the effect whether the Project Requirement constitutes a change order or not as per the terms and conditions of Contract Documents.

- 13.16 The time and cost effect in such a case shall be mutually verified for the purpose of record. Should it be established that the said work constitutes a Change Order, the same shall be compensated taking into account the records kept and in accordance with the contract.
- 13.17 Should the amount of Extra Work / Change Order, if any, which the Contractor may be required to perform by the Owner / Consultant, fairly entitles the Contractor to extensions of time beyond the scheduled completion date for completion of either the whole of the work or for such Extra Work only the Owner/ Consultant and the Contractor shall mutually discuss and decide the extension of time, if any to be granted to the Contractor.

#### **14.0 CONSTRUCTION EQUIPMENT AND ORGANIZATION**

- 14.1 The Contractor shall without prejudice to his overall responsibility to execute and complete the work as per specifications and time schedule, progressively deploy construction equipments and tools & tackles and shall augment the same as decided by the

Engineer-in- Charge depending on the exigencies of the work so as to complete all works within the contracted time schedule and without any additional cost to Employer. No construction equipment shall be supplied by the Employer.

- 14.2 The Employer/Consultant shall supply no Construction Equipment.

#### **14.3 SITE ORGANIZATION**

- 14.4 Subject to the provisions in the contract document and without prejudice to Contractor's liabilities and responsibilities to provide adequate qualified skilled, semi skilled and unskilled personnel on the work, contractor shall deploy supervisory personnel as specified in this SCC and augment the same as decided by the Engineer-in-Charge depending upon the site requirement & the exigencies of work so as to complete all works within the contracted time schedule and without any additional cost to Employer.

- 14.5 Qualification and experience of Key Supervisory Personnel to be deployed for this work as given in bid document. Contractor shall submit bio-data of Key Supervisory Personnel meeting the requirement as given in bid document will be reviewed and approved by Engineer-in charge.

#### **15.0 MEASUREMENT OF WORKS**

- 15.1 Shall be as per the provisions of relevant clause of GCC and as defined in the bid document.

#### **16.0 TERMS OF PAYMENT**

- 16.1 Basis and Terms of Payment shall be as set out in Annexure-I to SCC.

#### **17.0 STATUTORY APPROVALS**

- 17.1 Owner shall obtain general in-principle permissions from concerned authorities, if any having jurisdiction over the site area as necessary for construction activities. However, for some of the permissions, if not available, Contractor shall do the follow up with the concerned authorities to get the permissions to execute the job in time. However, all the



statutory payment required for such permissions shall be reimbursed by Employer at actuals.

- 17.2 The Contractor shall arrange the inspection of the works by the authorities and necessary co-ordination 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 Employer/Consultant to the contractor on production of documentary evidence.
- 17.3 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 contractor from any of his responsibilities under this contract.
- 17.4 Notice and Licenses: The Contractor shall at his costs and expenses give to the Municipal or Panchayat, Police and any other private or public 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.

#### **18.0 TESTS AND INSPECTION**

- 18.1 The Contractor shall carry out the various tests as enumerated in the technical specifications of this bid document and the technical documents that will be furnished to him during the performance of the work.
- 18.2 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.
- 18.3 The work is subject to inspection at all times by the Engineer-in-Charge. The contractor shall carry out all instructions given during inspection and shall ensure that the work is being carried out according to the technical specifications of this bid document, the technical documents and the relevant codes of practice will be furnished to him during the performance of the work.
- 18.4 The Contractor shall provide for purposes of inspection access ladders, lighting and necessary instruments at his own cost.
- 18.5 Any work not conforming to execution drawings, specifications or codes and approved methodology / scheme shall be rejected forthwith and the Contractor shall carryout the rectifications at his own cost.
- 18.6 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.
- 18.7 For materials supplied by Employer/Consultant, Contractor shall carryout the tests, if required by the Engineer-in-Charge, and the Employer/Consultant shall reimburse the cost of such tests at actual to the Contractor on production of documentary evidence.
- 18.8 Statutory fees paid to IBR authorities and for repeat tests and inspection due to failures, repairs etc. such reasons attributable to the Contractor shall be borne by the Contractor.
- 18.9 Inspection and acceptance of work shall not relieve the Contractor from any of his responsibilities under this Contract.

**19.0 INSPECTION OF SUPPLY ITEMS**

- 19.1 All inspection and tests on bought out items shall be made as per the specifications forming part of this contract. Various stages of inspection and testing shall be identified after receipt of Quality Assurance Programme from the Contractor/ Manufacturer.
- 19.2 Inspection calls shall be given for associations of Owner/Consultant's representative as per mutually agreed programme in prescribed proforma with 15 days margin, giving details of equipment and attaching relevant test certificates and internal inspection report of the Contractor. All drawings, General Arrangement and other contract drawings, specifications, catalogues etc. pertaining to equipment offered for inspection shall be got approved from Owner /Consultant and copies shall be made available to Owner /Consultant beforehand for undertaking inspection.
- 19.3 The contractor shall ensure full and free access to the inspection Engineer of Owner /Consultant at the Contractor's or their sub-contractor's premises at any time during contract period to facilitate him to carry out inspection and testing assignments.
- 19.4 The contractor/ sub-contractor shall provide all instruments, tools, necessary testing and other inspection facilities to inspection engineer of Owner /Consultant free of cost for carrying out inspection.
- 19.5 Where facilities for testing do not exist in the Contractor's/ sub-contractor's laboratories, samples and test pieces shall be drawn by the Contractor/ SubContractor in presence of Inspection Engineer of a Owner /Consultant and duly sealed by the later and sent for testing in Government approved Test House or any other testing laboratories approved by the Inspection Engineer at the Contractor's cost.

**20.0 FINAL INSPECTION**

- 20.1 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 defects noticed in the work attributable to Contractor, the Contractor at his own cost shall attend these, as and when the Owner /Consultant brings them to his notice. The Owner /Consultant shall have the right to have these defects rectified at the risk and cost of the contractor if he fails to attend to these defects immediately.

**21.0 COMPENSATION FOR EXTENDED STAY**

- 21.1 The clause of GCC is modified to the following extent: Bidder to note that extended stay compensation is NOT APPLICABLE.

**22.0 COMPUTERIZED CONTRACTORS BILLING SYSTEM**

- 22.1 Without prejudice to stipulation in General Conditions of Contract, Contractor should follow following billing system.
- 22.2 The bills will be prepared by the contractors on their own PCs as per the standard formats and codification scheme proposed by BGL. 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 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
- 22.3 Employer/Consultant will utilize these data for processing and verification of the Contractor's bill and payment."

**23.0 SITE CLEANING**

- 23.1 The Contractor shall clean and keep clean the work site from time to time to the satisfaction of the Engineer-in-Charge for easy access to work site and to ensure safe passage, movement and working.
- 23.2 If the work involves dismantling of any existing structure in whole or part, care shall be taken to limit the dismantling up to the exact point and/or lines as directed by the Engineer-in-Charge and any damage caused to the existing structure beyond the said line or point shall be repaired and restored to the original condition at the Contractor's cost and risks to the satisfaction of the Engineer-in-Charge, whose decision shall be final and binding upon the Contractor.
- 23.3 The Contractor shall be the custodian of the dismantled materials till the Engineer-in-Charge takes charge thereof.
- 23.4 The Contractor shall dispose off the unserviceable materials, debris etc. to any areas decided by the Engineer-in-Charge.
- 23.5 The Contractor shall sort out, clear and stack the serviceable materials obtained from the dismantling/renewal at places as directed by the Engineer-in-Charge.
- 23.6 No extra payment shall be paid on this account.

**24.0 COMPLETION DOCUMENTS**

- 24.1 Contract shall provide completion documents as defined in bid documents.

**25.0 TEST CERTIFICATES**

- 25.1 Bidder shall be required to submit recent test certificates for the material being used in works room the recognised laboratories. These certificates should indicate all properties of the materials as required in relevant IS Standards or International Standards.
- 25.2 Contractor shall also submit the test certificate with every batch of material supplied which will be approved by Engineer-in-Charge. No secured advance will be given for the materials not having test certificate. In case any test is to be carried out, the same shall be got done in the approved laboratory at the cost of contractor.

**26.0 ADDITIONAL WORKS/ EXTRA WORKS**

- 26.1 Employer/Consultant reserves 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 Employer/Consultant Contractor is required to extend necessary cooperation, and act as per the instructions of Engineer-in-Charge.

**27.0 COMPENSATION FOR DELAY (L.D) / PRICE REDUCTION SCHEDULE FOR ANY DELAY**

- 27.1 Clause of GCC, pertaining to Compensation for Delay (Liquidated Damages) stands modified to the following extent
- 27.2 The contractual completion period is 12 months as given in the SCC.
- 27.3 In case of delay in works in any of the parts against any of the activities stated in SOR, L.D / PRS shall be applicable @ ½% of the contract value of respective section(s). The maximum L.D / PRS shall be limited to 5% of contract value. The contract value for L.D /

PRS purpose shall be excluding service tax.

**28.0 ABNORMALLY HIGH RATED ITEMS (AHR ITEMS)**

28.1 Clause of GCC is modified to the following extent:

28.2 "In items rate contract where the quoted rates for the items exceed 50% of the owners/ estimated rates, such items will be considered as Abnormally High Rates Items (AHR) and payment of AHR items beyond the SOR stipulated quantities shall be made at the least of the following rates:

- i) Rates as per SOR, quoted by the Contractor.
- ii) Rate of the item, which shall be derived as follows:
  - a) Based on rates of machine and labour as available from the contract (which includes contractor's supervision, profit, overheads and other expenses).
  - b) In case rates are not available in the contract, rates will be calculated based on prevailing market rates of machine, material and labour plus 15% to cover contractor's supervision profit, overhead & other expenses.

**29.0 BANK GUARANTEES**

The provision relating to submission of Bank Guarantee from any Nationalized Bank wherever appearing in above documents stand replaced by the following:

- i) Bank guarantees towards Bid Security from 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 in case of Indian bidder and from any reputed International Bank or Indian scheduled bank in case of foreign bidder, may be accepted. However, other than the Nationalized Indian Banks, the banks whose BGs are furnished, must be commercial banks having net worth in excess of Rs.1000 Million and a declaration to this effect should be made by such commercial bank either in the bank guarantee itself or separately on a letter head.
- ii) Similarly, bank guarantees towards Performance and Advance Payments may be accepted from 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 in case of Indian bidder as well as foreign bidder. However, other than the Nationalised Indian Banks, the banks whose BGs are furnished, must be commercial banks having net worth in excess of Rs.1000 Million and a declaration to his effect should be made by such commercial bank either in the bank guarantee itself or separately on a letter head.
- iii) Guarantee towards Bid Security/Contract and Equipment Performance/Advance payment may also be acceptable from All India Level Public Financial Institution on case to case basis meeting the following criteria:
  - a) The Institution is All India Level Public Financial Institution.
  - b) It should be rated AAA by any rating agency like CRISIL.
  - c) The Institution should be authorised by way of Law/its memorandum to issue such guarantee.

**30.0 INSURANCES IN INDIA**

30.1 In addition to the insurance covers specified in the General Conditions of Contract to be obtained and maintained by the Contractor, Contractor shall at his own expense arrange, secure and maintain insurance with reputable insurance companies to the satisfaction of the Employer/Consultant 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 Employer/Consultant 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 Employer/Consultant. 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 his responsibilities and obligations under Contractor.

- 30.2 Any loss or damage to the equipment during ocean transportation, port/custom clearance, inland and port handling, inland transportation, storage, erection and commissioning till such time the Work is taken over by Employer/Consultant, 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 Employer/Consultant with a copy of all insurance policies and documents taken out by him in pursuance of the Contract. Such copies of documents shall be submitted to the Employer/Consultant immediately upon the Contractor having taken such insurance coverage. Contractor shall also inform the Employer/Consultant at least 60 (Sixty) days in advance regarding the expiry cancellation and/or changes in any of such documents and ensure revalidation/renewal etc., as may be necessary well in time.
- 30.3 Statutory clearances, if any, in respect of foreign supply required for the purpose of replacement of equipment lost in transit and/or during erection, shall be made available by the Employer/Consultant. Contractor shall, however, be responsible for obtaining requisite licenses, port clearances and other formalities relating to such import. 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 (during ocean transportation only) etc. The scope of such insurance shall cover the entire value of supplies of equipment's, plants and materials to be imported from time to time.
- 30.4 All costs on account of insurance liabilities covered under this Contract will be to Contractor's account and will be included in Contract Price. However, the Employer/Consultant 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 reduced premium amounts.
- 30.5 Contractor as far as possible shall cover insurance with Indian Insurance Companies, including marine Insurance during ocean transportation.

**31.0 DOCUMENTS TO BE SUBMITTED/ PRODUCED ALONGWITH R.A. BILLS**

- i) Computerized R.A. Bill/ Manual Bill, with IT No./ ST No./ Labour License No. Printed thereon.
- ii) ESI/ EPF clearance certificates for the last month along with R.A. Bills.
- iii) Insurance Policy as per relevant clauses of Contract Agreement.
- iv) Attendance Register and Salary Records.
- v) Photocopy of the measurement book to be attached with R.A. Bills.
- vi) Any other document required for the purpose of processing the bills.
- vii) Registration Certificate with Sales tax authorities of state concerned.

## **ANNEXURE : I TO PAYMENT TERMS**

### **PAYMENT TERMS & MODE OF PAYMENT**

#### **1.0 PAYMENT TERMS**

#### **1.1 Supplies & Installation**

1.1.1 75 % Pro-rata for supply portion as per approved Billing Schedule on submission of Invoice in triplicate with following document:

- i) On complete acceptance & certification of the EIC.
- ii) Vendor/Supplier Accepted copies of PO's along with Cenvatbale invoice.
- iii) Original LR / GR as applicable.
- iv) Packing List.
- v) Inspection release note issued by Owner / Consultant
- vi) Material receipt issued by Bidder & verified by Owner/Consultant at storage.

1.1.2 15% on Installation, site acceptance, testing and commissioning of individual item on submission of invoice in triplicate with following document:

- a) Certificate from Owner / Consultant for successful testing, commissioning & acceptance of CP system.
- b) Validity of performance bank guarantee as per tender requirement.

1.1.3 10% of total supply portion on completion, Post commissioning survey and on handing over the CP system on submission of invoice in triplicate with following document:

- a) Certificate from Owner/ Consultant for taking over of completed interference free CP system.
- b) Certificate from Owner / Consultant for receipt of all requisite documents such as
  - (i) Warranty certificate;
  - (ii) as built drawings;
  - (iii) test reports;
  - (iv) reconciliation statement etc.

c) Validity of performance bank guarantee as per tender requirement.

#### **1.2 For Work Portion (Erection, Installation & Commissioning Only)**

1.2.1 90% progressive monthly payment on submission of invoice in triplicate with following documents:

- a. Invoice covering PRS, if applicable
- b. Certificate from Owner / Consultant for completion of work as per approved Billing Schedule.
- c. Validity of performance bank guarantee as per tender requirement.

- 1.2.2 10% of total work portion on completion of works in all respect and on handing over the CP system shall be paid along with last 10% payment of Supply as detailed in para 1.1.3 above on submission of invoice covering PRS, if applicable in triplicate with following documents:
- a) Certificate from Owner/ Consultant for successful completion of CP system.
  - b) Certificate from Owner/ Consultant for taking over of completed interference free CP system.
  - c) Certificate from Owner / Consultant for receipt of all requisite documents such as
    - (i) warranty certificate;
    - (ii) Delay Analysis, if any
    - (ii) As built drawings;
    - (iii) Test reports;
    - (v) Reconciliation statement etc.
    - (vi) Survey reports & Recommendation etc.
  - d) Validity of performance bank guarantee as per tender requirement.

## **2.0 PAYMENT METHODOLOGY**

- 2.1 The contractor may raise invoices on monthly basis. Bidder shall enclose all documents as per check list issued by BGL. However, EIC may authorize payments for bills more frequently i.e. periodicity of less than fortnight, depending on site requirements.
- 2.2 The payments to the Contractor will be released within a period of 15 days from the date of receipt of the complete invoice as per the terms and conditions of the Contract.
- 2.3 Further break-up of Lumpsum Prices, if applicable & deemed necessary for any progressive payment of individual item may be permitted after request by Contractor showing relevance of further breakup & recommendation by EIC.
- 2.4 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.

## **3.0 MODE OF PAYMENT**

- 3.1 All payments payable against the contract shall be released by Owner through account payee cheque / RTGS / NEFT payable at par within 15 days of receipt of required documents and accepted by EIC.

## **4.0 DEDUCTION AT SOURCE**

- 4.1 Purchaser will release the payment to the Seller after effecting deductions as per applicable law in force.
- 4.2 Purchaser will release payments to the Contractor after offsetting all dues to the Purchaser payable by the Contractor under the Contract.



BHAGYANAGAR GAS  
LIMITED

**Supply & Installation of One No of permanent  
SHALLOW Anode Bed at Shamirpet, Hyderabad**

**Bid Document No. BGL/512/2020-21**

VOLUME II  
OF II

## **SECTION – 10**

### **SCHEDULE OF RATES (SOR)**





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VOLUME II  
OF II

Sr. No.	Description	UOM	Qty (1)	Unit rate inclusive of all taxes, duties, Levies, Freight, Insurance including Transit Insurance of free issue materials but excluding GST as defined in bid document.(2)		Total Price inclusive of all taxes, duties, Levies, Freight, Insurance including Transit Insurance of free issue materials but excluding GST (3)=((1) * (2))	
				figures (INR)	words(INR)	figures (INR)	words(INR)
1	Survey, Design, Detail Engineering, Supply, installation, testing and commissioning, Post commissioning surveys, interference mitigation of the cathodic protection system of the pipeline. All work shall be carried out conforming to the scope of work, design basis, data sheets, specifications, standards, drawings, etc as per the provisions						
1.1	Supply and installation strip type MMO canister Anode rated at 5Amps. Along with 10sqmm Copper cable XLPE/PVC of length 10mtrs.	Sets	10				

Seal & Sign of Bidder

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1.2	Supply and Installation of calcined Petroleum Coke Breeze	kgs	1000				
1.3	Supply and installation cable lugs, glands and ferules (At actuals)	LS	1				
1.4	Supply and Installation of cables - 25 Sqmm Copper S/C Armoured	mtrs	300				
1.5	Supply and installation of anode Junction Box supplied along with bend pipe and mounting post and with one shunt and one removable link of tinned copper - Brass terminals - weather Proof	Nos.	1				
1.6	Testing and commissioning	Nos.	1				
<b>Total Amount incl alltaxes &amp; duties excl. GST (INR) (a)</b>							
<b>GST @ .....% (b)</b>							
<b>Grand Total amount including all taxes and duties &amp; GST (c)=(a) +(b)</b>							

Seal & Sign of Bidder

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