



A Joint Venture of Andhra Pradesh Gas Distribution Corporation Ltd. and Hindustan Petroleum Corporation Ltd

**VOLUME I OF II**

**OPEN DOMESTIC COMPETITIVE BIDDING**

**BID DOCUMENT**

FOR

**COMPOSITE WORKS IN VARIOUS CNG STATIONS AT  
EAST & WEST GODAVARI DISTRICTS OF ANDHRA  
PRADESH**

**(TENDER NO: GGPL/KKD/C&P/CW/2545/VS)**

**BID DOCUMENT FEE : NOT APPLICABLE**

**DUE DATE & TIME FOR  
BID SUBMISSION : 26.10.2018 at 1400 Hrs. (IST)**

**DUE DATE & TIME FOR BID OPENING: 26.10.2018 at 1500 Hrs. (IST)**

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E-mail- [vsrinivasulu@gail.co.in](mailto:vsrinivasulu@gail.co.in)

Website: [www.godavarigas.in](http://www.godavarigas.in)

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**SECTION-I**  
**INVITATION FOR BID**  
**(IFB)**

**SECTION-I**

**TENDER NO: GGPL/KKD/C&P/CW/2545/VS**

**"INVITATION FOR BID (IFB)"**

**Ref No: GGPL/KKD/C&P/CW/2545/VS**

**Date: 03.10.2018**

To,

***PROSPECTIVE BIDDERS***

**SUB: TENDER DOCUMENT FOR COMPOSITE WORKS IN VARIOUS CNG STATIONS AT EAST & WEST GODAVARI DISTRICTS OF ANDHRA PRADESH.**

**Dear Sir/Madam,**

- 1.0 Godavari Gas Private Limited hereinafter called GGPL invites bids from eligible bidders for the subject job/works, in complete accordance with the following details and enclosed tender documents.
- 2.0 The brief details of the tender are as under:

	NAME OF WORK / BRIEF SCOPE OF WORK/JOB	COMPOSITE WORKS IN VARIOUS CNG STATIONS AT EAST & WEST GODAVARI DISTRICTS OF ANDHRA PRADESH.
A	TENDER NO. & DATE	<b>GGPL/KKD/C&amp;P/CW/2545/VS</b> <b>Date : 03.10.2018</b>
B	TYPE OF BIDDING SYSTEM	TWO BID SYSTEM
C	TYPE OF TENDER	OPEN DOMESTIC TENDER
D	CONTRACT PERIOD	<b>2 Years (ANNEXURE-3 TO SPECIAL CONDITIONS OF CONTRACT)</b>
E	BID SECURITY / EARNEST MONEY DEPOSIT (EMD) (Refer clause no.16 of ITB)	APPLICABLE Amount: INR 10,00,000
F	AVAILABILITY OF TENDER DOCUMENT ON WEBSITE(S)	<b>From 03.10.2018 (17.00 Hrs, IST)</b> <b>to 26.10.2018 (13.30 Hrs, IST)</b> <b>on following websites:</b> GGPLs Tender Website <a href="http://www.godavariqas.in">http://www.godavariqas.in</a>
G	PRE-BID MEETING	<b>10.10.2018 (15.00 Hrs, IST)</b>
H	UN-PRICED BID OPENING	<b>Date &amp; time: 26.10.2018/15:00 Hrs</b>
J	CONTACT DETAILS	Name : V. Srinivasulu, Designation: Dy. General Manager (C&P) Phone No. & Extn : 9756603608 e-mail : <a href="mailto:vsrinivasulu@gail.co.in">vsrinivasulu@gail.co.in</a>

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**In case of the days specified above happens to be a holiday in GGPL, the next working day shall be implied.**

3.0 Bids must be submitted strictly in accordance with Clause No. 11 of ITB depending upon Type of Tender as mentioned at Clause no. 2.0 ( C )of IFB. The IFB is an integral and inseparable part of the bidding document.

~~4.0 In case of e-tendering, the following documents in addition to uploading in the bid on GAIL's e-tendering website shall also be submitted in Original (in physical form) within 7 (seven) days from the bid due date provided the scanned copies of the same have been uploaded in e-tender by the bidder along with e-bid within the due date and time to the address mentioned in Bid Data Sheet(BDS):-~~

- ~~i) Demand Draft towards Tender fee (if applicable)~~
- ~~ii) EMD/Bid Security (if applicable)~~
- ~~iii) Power of Attorney~~
- ~~iv) Integrity Pact (if applicable)~~

5.0 In case of Manual Bids, bids complete in all respect should reach at the address specified in Bid Data Sheet on or before the due date & time. Bids received after the due date and time is liable to be rejected.

6.0 Bidder(s) are advised to quote strictly as per terms and conditions of the tender documents and not to stipulate any deviations/exceptions.

7.0 Any bidder, who meets the Bid Evaluation Criteria (BEC) and wishes to quote against this Tender Document, may download the complete Tender Document along with its amendment(s) if any from websites as mentioned at **2.0 (F) of IFB and submit their Bid complete** in all respect as per terms & conditions of Tender Document on or before the Due Date & Time of Bid Submission.

8.0 Bid(s) received from bidders to whom tender/information regarding this Tender Document has been issued as well as offers received from the bidder(s) by downloading Tender Document from above mentioned website(s) shall be taken into consideration for evaluation & award provided that the Bidder is found responsive subject to provisions contained in Clause No. 2 of ITB.

The Tender Document calls for offers on single point "Sole Bidder" responsibility basis (except where JV/Consortium bid is allowed pursuant to clause no. 3.0 of ITB) and in total compliance of Scope of Works as specified in Tender Document.

9.0 Clarification(s)/Corrigendum(s) if any shall also be available on above referred websites. Any revision, clarification, addendum, corrigendum, time extension, etc. to the this Tender Document will be hosted on the above mentioned website(s) only. Bidders are requested to visit the website regularly to keep themselves updated.

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- 10.0 All the bidders including those who are not willing to submit their bid are required to submit F-11 (Acknowledgement cum Consent letter) duly filled within 7 days from receipt of tender information.
- ~~11.0 SAP generated Request for Quotation (RFQ), if any shall also form an integral part of the Tender Document.~~
- 12.0 GGPL reserves the right to reject any or all the bids received at its discretion without assigning any reason whatsoever.

This is not an Order.

For & on behalf of  
Godavari Gas Private Limited



(Authorized Signatory)  
Name : V SRINIVASULU  
Designation : Dy. General Manager (C&P).  
E-mail ID : [vsrinivasulu@gail.co.in](mailto:vsrinivasulu@gail.co.in)  
Contact No. : 9756603608



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**DO NOT OPEN - THIS IS A QUOTATION**

***Bid Document No.*** : .....

***Description*** : .....

***Due Date & Time*** : .....

***From:***

***To:***

..... .....	..... .....
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***(To be pasted on the envelope containing Bid (in case of Manual Tendering)/  
Physical documents (in case of e-Tendering) )***

## **SECTION-II**

**BID EVALUATION**

**CRITERIA &**

**EVALUATION**

**METHODOLOGY**



**SECTION-II**

**BID EVALUATION CRITERIA & EVALUATION METHODOLOGY**

**1.0 TECHNICAL BEC:**

The bidder must have executed a contract of retail outlet(s) for dispensing of CNG (Compressed Natural Gas) / Motor Spirit / Diesel / Auto LPG involving civil, mechanical and electrical works (including supply of various materials, equipments, tools and tackle etc.) or a construction work contract of commercial / residential building involving civil, structural, electrical works (such as Transformer or lighting etc.) and mechanical works (such as air-conditioning or HVAC or lift etc.) in at least one single work order of minimum value of Rs. 95 Lakhs in previous 7 years reckoned from last date for submission of un-priced Bid.

In case the bidder is executing a contract of above nature which is still running and the works executed till one day prior to the due date of submission is equal to or more than the minimum requirement as mentioned above such experience will also be taken into consideration provided that the bidder has submitted work execution certificate to this effect issued by the end user / owner.

A job executed by a bidder for its own plant / projects cannot be considered as experience for the purpose of meeting the requirement of BEC of this tender. However, jobs executed for Subsidiary/ Fellow subsidiary / Holding company will be considered as experience for the purpose of meeting BEC subject to submission of tax paid invoice(s) duly certified by Statutory Auditor / Chartered Accountant of the bidder towards payments of statutory tax in support of the job executed for Subsidiary / Fellow subsidiary / Holding company. Such bidders to submit these documents in addition to the documents specified in the bidding documents to meet BEC. The experience acquired as sub-contractor shall not be considered.

**2.0 FINANCIAL CRITERIA**

**2.1 Annual Turnover:**

The minimum annual turnover achieved by the bidder as per their audited financial results in any one of the last three preceding financial years i.e. 2015-16, 2016-17 and 2017-18 shall be Rs. 317.50 Lakhs.

**2.2 Net worth:**

Net worth of the bidder should be positive as per the audited financial results of immediate preceding financial year (i.e. FY 2017-18).

### **2.3 Working Capital:**

The minimum Working Capital of the bidder as per the audited financial results of immediate preceding financial year (i.e. FY 2017-18) shall be Rs. 63.5 Lakhs.

Note:

- i. If the bidder's working capital is inadequate, the bidder should supplement this with a letter from the bidder's Bank (as per stipulated Format), having net worth not less than Rs.100 Crores, confirming the availability of line of credit for at least working capital requirement as stated above.
- ii. Annual Turnover- In case the tenders having the bid closing date up to 30th September of the relevant financial year, and audited financial results of the immediate three preceding financial years are not available, the bidder has an option to submit the audited financial results of the three years immediately prior to that. Wherever the closing date of the bid is after 30th Sept. of the relevant financial year, bidder has to compulsorily submit the audited financial results for the immediate three preceding financial years.
- iii. Net worth and Working Capital: In case the tenders having the bid closing date up to 30th September of the relevant financial year, and audited financial results of the immediate preceding financial year is not available, in such case the audited financial results of the year immediately prior to that year will be considered as last financial year for Net worth/ Working Capital calculation. Wherever the closing date of the bid is after 30th Sept. of the relevant financial year, bidder has to compulsorily submit the audited financial results for the immediate preceding financial years.

### **3.0 DOCUMENTS REQUIRED:**

The documents required to be submitted by the bidder to substantiate

their qualification under Bid Evaluation Criteria shall be as follows:

- 3.1 For authentication of document(s) submitted in support of above mentioned Technical Criteria of Bid Evaluation Criteria (BEC):

All the documents mentioned above towards substantiating Bid Evaluation Criteria – Technical, must be duly certified/attested by Chartered Engineer and Notary Public with legible stamp failing which the bid shall be liable for rejection.

- 3.2 For authentication of document(s) submitted in support of Financial Criteria of Bid Evaluation Criteria (BEC):

The bidder shall submit “Details of Financial Capability of Bidder” in prescribed format as enclosed duly signed and stamped by Chartered accountant.

Further, copy of audited annual financial statements submitted in bid shall be duly certified /attested by notary public with legible stamp.

**4.0 EVALUATION AND AWARD DISTRIBUTION:**

- 4.1 **Evaluation:** Evaluation shall be done on the overall quoted price for the entire scope of work under the complete SOR. Bidder has to quote for complete scope of work or else their bid will be summarily rejected.

- 4.2 **Award Distribution:** To have flexibility and to ensure simultaneous working in multiple areas, contract shall be distributed to L1 & L2 Bidders (subject to matching with L1 Price) in 60:40 ratio.

5.0

	<b>CNG-Mother stations</b>
Total	08
L1 Bidder (~60%)	05
L2, L3.... Bidder subject to matching with L1 Price (~40%)	03

For this distribution purpose, L2, bidder shall be asked to match L1 Price. In the event of L2 bidder not agreeing to match L1 Price, then L3, L4.....

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and so on bidder shall be asked to match L1 Price, so as to select two bidders as prescribed above for award of contracts. In the event of none of the bidder(s) matching L1 price, then the 40% Work will be retendered.

In a tie situation where two or more bidders become L1 or L2..... the bidder whose turnover is more for the immediate preceding audited financial year i.e. 2017 – 18 will be decided as L1 or L2 .....

# **SECTION-III**

# **INSTRUCTION TO** **BIDDERS**

**(TO BE READ IN CONJUNCTION WITH**  
**BIDDING DATA SHEET (BDS)**

**SECTION-III**

**INSTRUCTION TO BIDDERS**

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**INSTRUCTIONS TO BIDDERS [ITB]**

**(TO BE READ IN CONJUNCTION WITH BIDDING DATA SHEET (BDS))**

**[A] – GENERAL**

**1 SCOPE OF BID**

- 1.1 The Employer as defined in the "General Conditions of Contract [GCC]", wishes to receive Bids as described in the Bidding Document/Tender document issued by Employer. Employer/Owner/GGPL occurring herein under shall be considered synonymous.
- 1.2 **SCOPE OF BID:** The scope of work/ Services shall be as defined in the Bidding documents.
- 1.3 The successful bidder will be expected to complete the scope of Bid within the period stated in Special Conditions of Contract.
- 1.4 Throughout the Bidding Documents, the terms 'Bid', 'Tender' & 'Offer' and their derivatives [Bidder/Tenderer, Bid/Tender/Offer etc.] are synonymous. Further, 'Day' means 'Calendar Day' and 'Singular' also means 'Plural'.

**2 ELIGIBLE BIDDERS**

- 2.1 The Bidder shall not be under a declaration of ineligibility by Employer for Corrupt/ Fraudulent/ Collusive/ Coercive practices, as defined in "Instructions to Bidders [ITB], Clause No. 39" (Action in case Corrupt/ Fraudulent/ Collusive/ Coercive Practices).
- 2.2 The Bidder is not put on 'Holiday' by GAIL or Public Sector Project Management Consultant (like EIL, PMC only due to "poor performance" or "corrupt and fraudulent practices") or banned/blacklisted by Government department/ Public Sector on due date of submission of bid. Further, neither bidder nor their allied agency/(ies) (as defined in the Procedure for Action in case of Corrupt/ Fraudulent/ Collusive/ Coercive Practices) are on banning list of GAIL or the Ministry of Petroleum and Natural Gas.

If the bidding documents were issued inadvertently/ downloaded from website, offers submitted by such bidders shall not be considered for opening/ evaluation/Award and will be returned immediately to such bidders.

In case there is any change in status of the declaration prior to award of contract, the same has to be promptly informed to GGPL by the bidder.

It shall be the sole responsibility of the bidder to inform GGPL in case the bidder is put on 'Holiday' by GAIL or Public Sector Project Management Consultant (like EIL, PMC. only due to "poor performance" or "corrupt and fraudulent practices") or banned/blacklisted by Government department/



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Public Sector on due date of submission of bid and during the course of finalization of the tender. Concealment of the facts shall tantamount to misrepresentation of facts and shall lead to action against such Bidders as per clause 39 of ITB.

- 2.3 The Bidder should not be under any liquidation court receivership or similar proceedings on due date of submission of bid.

In case there is any change in status of the declaration prior to award of contract, the same has to be promptly informed to GGPL by the bidder.

It shall be the sole responsibility of the bidder to inform GGPL in case the bidder is under any liquidation court receivership or similar proceedings on due date of submission of bid and during the course of finalization of the tender. Concealment of the facts shall tantamount to misrepresentation of facts and shall lead to action against such Bidders as per clause no.39 of ITB.

- 2.4 Bidder shall not be affiliated with a firm or entity:

- (i) that has provided consulting services related to the work to the Employer during the preparatory stages of the work or of the project of which the works/services forms a part of or
- (ii) that has been hired (proposed to be hired) by the Employer as an Engineer/ Consultant for the contract.

- 2.5 Neither the firm/entity appointed as the Project Management Consultant (PMC) for a contract nor its affiliates/ JV'S/ Subsidiaries shall be allowed to participate in the tendering process unless it is the sole Licensor/Licensor nominated agent/ vendor.

- 2.6 Pursuant to qualification criteria set forth in the bidding document, the Bidder shall furnish all necessary supporting documentary evidence to establish Bidder's claim of meeting qualification criteria.

- 2.7 Power of Attorney:

In case of a Single Bidder, Power of Attorney issued by the Board of Directors/ CEO / MD / Company Secretary of the Bidder/ all partners in case of Partnership firm/Proprietor in favour of the authorised employee(s) of the Bidder, in respect of the particular tender for signing the Bid and all subsequent communications, agreements, documents etc. pertaining to the tender and to act and take any and all decision on behalf of the Bidder, is to be submitted.

In case of a Consortium/JV, Power of Attorney issued by Board of Directors/ CEO / MD / Company Secretary of the Consortium Leader as well as Consortium Member(s) of the Consortium/ partners of JV, in favour of the authorised employee(s) of the Consortium Leader/Lead member of JV, for

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signing the documents on behalf of the Bidder, in respect of this particular tender, to sign the Bid and all subsequent communications, agreements, documents etc. pertaining to the tender and act and take any and all decision on behalf of the Consortium/JV, are to be submitted.

The authorized employee(s) of the Bidder shall be signing the Bid and any consequence resulting due to such signing shall be binding on the Bidder.

**3 BIDS FROM "JOINT VENTURE"/"CONSORTIUM" (FOR APPLICABILITY OF THIS CLAUSE REFER BIDDING DATA SHEET (BDS)) : Not applicable**

~~3.1 Bids from consortium/ JV of two or more members (maximum three including leader) are acceptable provided that they fulfill the qualification criteria and requirements stated in the Bidding Documents. Participating Consortium/ JV shall submit the Agreement as per the format F-17 clearly defining the scope and responsibility of each member. Members of consortium/ JV shall assume responsibility jointly & severally. The EMD shall be submitted by the Bidder (Consortium/ JV).~~

~~3.2 The Consortium/ JV Agreement must clearly define the leader/ lead partner, who shall be responsible for timely completion of work/ services and shall receive/ send instructions for and on behalf of the consortium during the period the bid is under evaluation as well as during the execution of contract.~~

~~3.3 All the members shall authorize the representative from the lead partner by submitting a Power of attorney (on a non-judicial stamp paper of appropriate value) signed by legally authorized signatories of all the member(s). Such authorization must be accompanied with the bid. The authorized signatory shall sign all the documents relating to the tender/ contract. However, in case of award, payment shall be made to the consortium.~~

~~3.4 A consortium/JV once established at the time of submitting the Bid shall not be allowed to be altered with respect to constituting members of the JV/ Consortium or their respective roles/ scope of work, except if and when required in writing by owner. If during the evaluation of bids, a consortium/JV proposes any alteration/ changes in the orientation of consortium/JV or replacements or inclusions or exclusions of any partner(s)/ member(s) which had originally submitted the bid, bid from such a consortium/JV shall be liable for rejection.~~

~~3.5 Any member of the consortium/ JV shall not be eligible either in an individual capacity or be a part of any other consortium/JV to participate in this tender. Further, no member of the consortium/ JV shall be on 'Holiday' by GAIL or Public Sector Project Management Consultant (like EIL, PMC) only due to~~

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~~“poor performance” or “corrupt and fraudulent practices”) or banned/blacklisted by Government department/ Public Sector on due date of submission of bid. Offer submitted by such consortium/ JV shall not be considered for opening/ evaluation/Award.~~

**4 ONE BID PER BIDDER**

4.1 A Firm/Bidder shall submit only 'one [01] Bid' in the same Bidding Process. A Bidder who submits or participates in more than 'one [01] Bid' will cause all the proposals in which the Bidder has participated to be disqualified.

4.2 Alternative Bids shall not be considered.

**5 COST OF BIDDING & TENDER FEE**

**5.1 COST OF BIDDING**

The Bidder shall bear all costs associated with the preparation and submission of the Bid including but not limited to Bank charges all courier charges including taxes & duties etc. incurred thereof. Further, GGPL will in no case, be responsible or liable for these costs, regardless of the outcome of the bidding process.

**5.2 TENDER FEE: NOT APPLICABLE**

~~5.2.1 Tender Fee, if applicable, will be acceptable in the form of ‘crossed payee accounts only’ Bank Drafts/Banker’s Cheque[in favor of Godavari Gas Private Limited payable at place mentioned in BDS]. The Tender Fee is to be submitted as per Clause No. 2.0 (F) & 4.0 of IFB. A Bid without requisite Tender Fee will be ignored straightaway.~~

~~5.3 SMEs (Small & Micro Enterprises) are exempted from submission of Tender Fee in accordance with the provisions of Public Procurement Policy for MSE-2012 and Clause 40 of ITB. The Government Departments/PSUs are also exempted from the payment of tender fee.~~

~~5.4 In the event of a particular tender being cancelled, the tender fee (excluding GST, if any) will be refunded to the concerned bidders without any interest charges. No plea on interest charges in this regard shall be entertained by the Owner.~~

**6 SITE VISIT**

6.1 The Bidder is advised to visit and examine the site of works and its surroundings and obtain for itself on its own responsibility all information that

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may be necessary for preparing the Bid and entering into a Contract for the required job. The costs of visiting the site shall be borne by the Bidder.

- 6.2 The Bidder or any of its personnel or agents shall be granted permission by the Employer to enter upon its premises and land for the purpose of such visits, but only upon the express conditions that the Bidder, its personnel and agents will release and indemnify the Employer and its personnel, agents from and against all liabilities in respect thereof, and will be responsible for death or injury, loss or damage to property, and any other loss, damage, costs, and expenses incurred as a result of inspection.
- 6.3 The Bidder shall not be entitled to hold any claim against GGPL for non-compliance due to lack of any kind of pre-requisite information as it is the sole responsibility of the Bidder to obtain all the necessary information with regard to site, surrounding, working conditions, weather etc. on its own before submission of the bid.
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**[B] – BIDDING DOCUMENTS**

**7 CONTENTS OF BIDDING DOCUMENTS**

- 7.1 The contents of Bidding Documents / Tender Documents are those stated below, and should be read in conjunction with any 'Addendum / Corrigendum' issued in accordance with "ITB: Clause-9":
- Section-I : Invitation for Bid [IFB]
  - Section-II : BID EVALUATION CRITERIA [BEC] & Evaluation methodology
  - Section-III : Instructions to Bidders [ITB]  
Annexure  
Forms & Format
  - Section-IV : General Conditions of Contract [GCC]
  - Section-V : Special Conditions of Contract [SCC]
  - Section-VI : Specifications, Scope of Work and Drawing
  - Section-VII : Schedule of Rates

\*Request for Quotation', wherever applicable, shall also form part of the Bidding Document.

- 7.2 The Bidder is expected to examine all instructions, forms, terms & conditions in the Bidding Documents. The "Request for Quotation [RFQ] & Invitation for Bid (IFB)" together with all its attachments thereto, shall be considered to be read, understood and accepted by the Bidders. Failure to furnish all information required by the Bidding Documents or submission of a Bid not

substantially responsive to the Bidding Documents in every respect will be at Bidder's risk and may result in the rejection of his Bid.

## **8 CLARIFICATION OF BIDDING DOCUMENTS**

- 8.1 A prospective Bidder requiring any clarification(s) of the Bidding Documents may notify GGPL in writing or by fax or email at GGPL's mailing address indicated in the BDS no later than 02 (two) days prior to pre-bid meeting (in cases where pre-bid meeting is scheduled) or 05 (five) days prior to the due date of submission of bid in cases where pre-bid meeting is not held. GGPL reserves the right to ignore the bidders request for clarification if received after the aforesaid period. GGPL may respond in writing to the request for clarification. GGPL's response including an explanation of the query, but without identifying the source of the query will be uploaded on GGPL's tendering web site <http://www.godavarigas.in> communicated to prospective bidders by e-mail/ fax.
- 8.2 Any clarification or information required by the Bidder but same not received by the Employer at clause 8.1 (refer BDS for address) above is liable to be considered as "no clarification / information required".

## **9 AMENDMENT OF BIDDING DOCUMENTS**

- 9.1 At any time prior to the 'Bid Due Date', Owner may, for any reason, whether at its own initiative or in response to a clarification requested by a prospective Bidder, modify the Bidding Documents by addenda/ corrigendum.
- 9.2 Any addendum/ corrigendum thus issued shall be integral part of the Tender Document and shall be hosted on the websites as provided at clause no. 2.0 (H) of IFB /communicated to prospective bidders by e-mail/ fax. Bidders have to take into account all such addendum/ corrigendum before submitting their Bid.
- 9.3 The Employer, if consider necessary, may extend the date of submissions of Bid in order to allow the Bidders a reasonable time to furnish their most competitive bid taking into account the amendment issued thereof.

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## **[C] – PREPARATION OF BIDS**

### **10 LANGUAGE OF BID:**

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The bid prepared by the Bidder and all correspondence, drawing(s), document(s), certificate(s) etc. relating to the Bid exchanged by Bidder and GGPL shall be written in English language only. In case a document, certificate, printed literature etc. furnished by the Bidder in a language other than English, the same should be accompanied by an English translation duly authenticated by the Chamber of Commerce of Bidders Country, in which case, for the purpose of interpretation of the Bid, the English translation shall govern.

**11. DOCUMENTS COMPRISING THE BID**

11.1 In case the Bids are invited under the Manual two Bid system. The Bid prepared by the Bidder shall comprise the following components sealed in 2 different envelopes:

11.1.1 **ENVELOPE-I: "TECHNO-COMMERCIAL / UN-PRICED BID"** shall contain the following:

- (a) 'Covering Letter' on Bidder's 'Letterhead' clearly specifying the enclosed contents.
- (b) 'Bidder's General Information', as per 'Form F-1'.
- (c) 'Bid Form', as per 'Form F-2'
- (d) Copies of documents, as required in 'Form F-3'
- (e) As a confirmation that the prices are quoted in requisite format complying with the requirements copy of Schedule of Rate (SOR) with prices blanked out mentioning quoted / not quoted (as applicable) written against each item.
- (f) 'Letter of Authority' on the Letter Head, as per 'Form F-5'
- (g) 'No Deviation Confirmation', as per 'Form F-6'
- (h) 'Bidder's Declaration regarding Bankruptcy', in 'Form F-7'
- (i) 'Certificate for Non-Involvement of Government of India ' from Bidder, as per 'Form F-8'
- (j) 'Agreed Terms and Conditions', as per 'Form F-10'
- (k) 'ACKNOWLEDGEMENT CUM CONSENT LETTER', as per 'Form F-11'
- (l) Duly attested documents in accordance with the "BID EVALUATION CRITERIA [BEC]" establishing the qualification.
- (m) Undertaking on the Letter head, as per the Form F-12.
- (n) Power of Attorney /copy of Board Resolution, in favour of the authorized signatory of the Bid, as per clause no.2.7 of ITB
- (o) Any other information/details required as per Bidding Document
- (p) EMD in original as per Clause 16 of ITB
- (q) All forms and Formats including Annexures.
- (r) Original Tender Fee (if applicable)
- (s) List of consortium/ JV member (s), if any, and Consortium Agreement (as per format ) clearly defining their involvement & responsibility in

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this work, wherever applicable as specified elsewhere in the IFB/RFQ/BEC.

- (t) 'Integrity Pact' as per 'Form F-20'
- (u) 'Indemnity Bond' as per 'Form F-21'
- (v) Tender Document duly signed/ digitally signed by the Authorized Signatory.
- (w) Additional document specified in Bidding Data Sheet (BDS).

**Note: All the pages of the Bid must be signed by the "Authorized Signatory" of the Bidder.**

**11.1.2 ENVELOPE-II: Price Bid**

- i) The Prices are to be submitted strictly as per the Schedule of Rate of the bidding documents. GGPL shall not be responsible for any failure on the part of the bidder to follow the instructions.
- ii) Bidders are advised NOT to mention Rebate/Discount separately, either in the SOR format or anywhere else in the offer. In case Bidder(s) intend to offer any Rebate/Discount, they should include the same in the item rate(s) itself under the "Schedule of Rates (SOR)" and indicate the discounted unit rate(s) only.
- iii) If any unconditional rebate has been offered in the quoted rate the same shall be considered in arriving at evaluated price. However no cognizance shall be taken for any conditional discount for the purpose of evaluation of the bids.
- iv) In case, it is observed that any of the bidder(s) has/have offered suo-moto Discount/Rebate after opening of un-priced bid but before opening of price bids such discount /rebate(s) shall not be considered for evaluation. However, in the event of the bidder emerging as the lowest evaluated bidder without considering the discount/rebate(s), then such discount/rebate(s) offered by the bidder shall be considered for Award of Work and the same will be conclusive and binding on the bidder.
- v) In the event as a result of techno-commercial discussions or pursuant to seeking clarifications / confirmations from bidders, while evaluating the un-priced part of the bid, any of the bidders submits a sealed envelope stating that it contains revised prices; such bidder(s) will be requested to withdraw the revised prices failing which the bid will not be considered for further evaluation.
- vi) In case any bidder does not quote for any item(s) of "Schedule of Rates" and the estimated price impact is more than 10% of the quoted price, then the bid will be rejected. If such price impact of unquoted items is 10% or less of his quoted price, then the unquoted item(s) shall be loaded highest of the price quoted by the other bidders . If such bidder

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happens to be lowest evaluated bidder, price of unquoted items shall be considered as included in the quoted bid price.

~~11.2 In case the bids are invited under e tendering system, bidders are requested to refer instructions for participating in E Tendering enclosed herewith as Annexure III and the ready reckoner for bidders available in <https://etender.gail.co.in>. Bids submitted manually shall be rejected, the bids must be submitted on GAIL's E tendering website as follows :-~~

~~11.2.1 **PART-I: "TECHNO-COMMERCIAL/UN-PRICED BID"** comprising all the above documents mentioned at 11.1.1 along with copy of EMD/Bid Bond, Tender fee (wherever applicable), copy of Power of Attorney and copy of integrity pact should be uploaded in the private area earmarked (Tender Document) in the GGPL's e tendering portal.~~

~~Further, Bidders must submit the original " EMD & Tender Fee (wherever applicable), Power of Attorney, Integrity Pact (wherever applicable) and any other documents specified in the Tender Document to the address mentioned in IFB, in a sealed envelope, super scribing the details of Tender Document (i.e. tender number & tender for) within 7 days from the date of un priced bid opening.~~

~~Bidders are required to submit the EMD in original by Due Date and Time of Bid Submission or upload a scanned copy of the same in the Part I of the Bid. If the Bidder is unable to submit EMD in original by Due Date and Time of Bid Submission, the Bidder is required to upload a scanned copy of the EMD in Part I of Bid, provided the original EMD, copy of which has been uploaded, is received within 7 days from the Due Date of Bid Opening, failing which the Bid will be rejected irrespective of their status/ranking in tendering process and notwithstanding the fact that a copy of EMD was earlier uploaded by the Bidder.~~

~~11.2.2 **PART-II: PRICE BID**~~

~~The Prices are to be filled strictly in the Schedule of Rate of the bidding documents and provision mentioned at para 11.1.2 hereinabove and to uploaded in SOR attachment/Conditions of E tendering portal.~~

~~*[In case of online bidding, necessary modifications w.r.t. SOR attachment and provisions for online filling the rate and its attachment, should be mentioned]*~~

~~11.3 In case of bids invited under *single bid system*, a single envelope containing all documents specified at Clause 11.1.1 & 11.1.2 of ITB above form the BID. All corresponding conditions specified at Clause 11.1.1 & 11.1.2 of ITB shall become applicable in such a case.~~

**12 SCHEDULE OF RATES / BID PRICES**



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- 12.1 Unless stated otherwise in the Bidding Documents, the Contract shall be for the whole works as described in Bidding Documents, based on the rates and prices submitted by the Bidder and accepted by the Employer. The prices quoted by the Bidders will be inclusive of all taxes except GST ((**CGST & SGST/UTGST or IGST**)).
- 12.2 Prices must be filled in format for "Schedule of Rates [SOR]" enclosed as part of Tender document. If quoted in separate typed sheets and any variation in item description, unit or quantity is noticed; the Bid is liable to be rejected.
- 12.3 **Bidder shall quote for all the items of "SOR" after careful analysis of cost involved for the performance of the completed item considering all parts of the Bidding Document.** In case any activity though specifically not covered in description of item under "SOR" but is required to complete the works as per Specifications, Scope of Work / Service, Standards, General Conditions of Contract ("GCC"), Special Conditions of Contract ("SCC") or any other part of Bidding Document, the prices quoted shall deemed to be inclusive of cost incurred for such activity.
- 12.4 All duties, taxes and other levies [if any] payable by the Contractor under the Contract, or for any other cause except final **GST (CGST & SGST/UTGST or IGST)** shall be included in the rates / prices and the total bid-price submitted by the Bidder. Applicable rate of **GST (CGST & SGST/ UTGST or IGST)** on the contract value shall be indicated in Agreed Terms & Conditions (Format-F10) and SOR
- 12.5 Prices quoted by the Bidder, shall remain firm and fixed and valid until completion of the Contract and will not be subject to variation on any account. Any new taxes & Duties, if imposed by the State/ Govt. of India after due date of bid submission but before the Contractual Delivery Date, shall be reimbursed to the contractor on submission of documentary evidence for proof of payment to State/ Govt. Authorities and after ascertaining it's applicability with respect to the contract.
- 12.6 The Bidder shall quote the prices in 'figures' & words. There should not be any discrepancy between the prices indicated in figures and the price indicated in words. In case of any discrepancy, the same shall be dealt as per clause no. 30 of ITB.
- 12.7 Further, Bidder shall also mention the **Service Accounting Codes (SAC) / Harmonized System of Nomenclature (HSN)** at the designated place in SOR.
- 13 **GST (CGST & SGST/UTGST or IGST)**
- 13.1 Bidders are required to submit copy of the GST Registration Certificate while submitting the bids wherever **GST (CGST & SGST/UTGST or IGST)** is applicable.

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- 13.2 Quoted prices should be inclusive of all taxes and duties, except **GST (CGST & SGST or IGST or UTGST)**. Please note that the responsibility of payment of **GST (CGST & SGST or IGST or UTGST)** lies with the Supplier of Goods / Services only. Supplier of Goods / Services (Service Provider) providing taxable service shall issue an Invoice/ Bill, as the case may be as per rules/ regulation of GST. Further, returns and details required to be filled under GST laws & rules should be timely filed by Supplier of Goods / Services (Service Provider) with requisite details.

Payments to Service Provider for claiming **GST (CGST & SGST/UTGST or IGST)** amount will be made provided the above formalities are fulfilled. Further, GGPL may seek copies of challan and certificate from Chartered Accountant for deposit of **GST (CGST & SGST/UTGST or IGST)** collected from Owner.

- 13.3 In case CBEC (Central Board of Excise and Customs)/ any equivalent Central Government agency/State Government agency brings to the notice of GGPL that the Supplier of Goods / Services (Service Provider) has not remitted the amount towards **GST (CGST & SGST/UTGST or IGST)** collected from GGPL to the government exchequer, then, that Supplier of Goods / Services (Service Provider) shall be put under Holiday list of GGPL for period of six months as mentioned in Procedure for Evaluation of Performance of Vendors/ Suppliers/Contractors/ Consultants.

- 13.4 In case of statutory variation in **GST (CGST & SGST/UTGST or IGST)**, other than due to change in turnover, payable on the contract value during contract period, the Supplier of Goods / Services (Service Provider) shall submit a copy of the 'Government Notification' to evidence the rate as applicable on the Bid due date and on the date of revision.

Beyond the contract period, in case GGPL is not entitled for input tax credit of **GST (CGST & SGST/UTGST or IGST)**, then any increase in the rate of **GST (CGST & SGST/UTGST or IGST)** beyond the contractual delivery period shall be to Service Provider's account whereas any decrease in the rate **GST (CGST & SGST/UTGST or IGST)** shall be passed on to the Owner.

Beyond the contract period, in case GGPL is entitled for input tax credit of **GST (CGST & SGST/UTGST or IGST)**, then statutory variation in applicable **GST (CGST & SGST/UTGST or IGST)** on supply and on incidental services, shall be to GGPL's account.

Claim for payment of **GST (CGST & SGST/UTGST or IGST)**/ Statutory variation, should be raised within two [02] months from the date of issue of 'Government Notification' for payment of differential (in %) **GST (CGST &**

**SGST/UTGST or IGST**), otherwise claim in respect of above shall not be entertained for payment of arrears.

The base date for the purpose of applying statutory variation shall be the Bid Due Date.

13.5 Where the GGPL is entitled to avail the input tax credit of **GST (CGST & SGST/UTGST or IGST)**:-

13.5.1 Owner/GGPL will reimburse the **GST (CGST & SGST/UTGST or IGST)** to the Supplier of Goods / Services(Service Provider) at actuals against submission of Invoices as per format specified in rules/ regulation of GST to enable Owner/GGPL to claim input tax credit of **GST (CGST & SGST/UTGST or IGST)** paid. In case of any variation in the executed quantities, the amount on which the **GST (CGST & SGST/UTGST or IGST)** is applicable shall be modified in same proportion. Returns and details required to be filled under GST laws & rules should be timely filed by supplier with requisite details.

13.5.2 The input tax credit of **GST (CGST & SGST/UTGST or IGST)**quoted shall be considered for evaluation of bids, as per evaluation criteria of tender document.

13.6 Where the GGPL is not entitled to avail/take the full input tax credit of **GST (CGST & SGST/UTGST or IGST)**:-

13.6.1 Owner/GGPL will reimburse **GST (CGST & SGST/UTGST or IGST)**to the Supplier of Goods / Services (Service Provider) at actuals against submission of Invoices as per format specified in rules/ regulation of GST subject to the ceiling amount of **GST (CGST & SGST/UTGST or IGST)**as quoted by the bidder, subject to any statutory variations, except variations arising due to change in turnover. In case of any variation in the executed quantities (If directed and/or certified by the Engineer-In-Charge) the ceiling amount on which **GST (CGST & SGST/UTGST or IGST)**is applicable will be modified on pro-rata basis.

13.6.2 The bids will be evaluated based on total price including applicable **GST (CGST & SGST/UTGST or IGST)**.

13.7 GGPL will prefer to deal with registered supplier of goods/ services under GST. Therefore, bidders are requested to get themselves registered under GST, it not registered yet.

However, in case any unregistered bidder is submitting their bid, their prices will be loaded with applicable **GST (CGST & SGST/UTGST or IGST)**while evaluation of bid. Where GGPL is entitled for input credit of **GST (CGST & SGST/UTGST or IGST)**, the same will be considered for evaluation of bid as per evaluation methodology of tender document.

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- 13.8 In case GGPL is required to pay entire/certain portion of applicable **GST (CGST & SGST/UTGST or IGST)** and remaining portion, if any, is to be deposited by Bidder directly as per **GST (CGST & SGST/UTGST or IGST)** laws, entire applicable rate/amount of **GST (CGST & SGST/UTGST or IGST)** to be indicated by bidder in the SOR.

Where GGPL has the obligation to discharge **GST (CGST & SGST/UTGST or IGST)** liability under reverse charge mechanism and GGPL has paid or is /liable to pay **GST (CGST & SGST/UTGST or IGST)** to the Government on which interest or penalties becomes payable as per GST laws for any reason which is not attributable to GGPL or ITC with respect to such payments is not available to GGPL for any reason which is not attributable to GGPL, then GGPL shall be entitled to deduct/ setoff / recover such amounts against any amounts paid or payable by GGPL to Contractor / Supplier.

- 13.9 Contractor shall ensure timely submission of invoice(s) as per rules/ regulations of GST with all required supporting document(s) within a period specified in Contracts/ LOA to enable GGPL to avail input tax credit. Further, returns and details required to be filled under GST laws & rules should be timely filed by supplier with requisite details.

If input tax credit with respect to **GST (CGST & SGST/UTGST or IGST)** is not available to GGPL for any reason which is not attributable to GGPL, then GGPL shall not be obligated or liable to pay or reimburse **GST (CGST & SGST/UTGST or IGST)** charged in the invoice(s) and shall be entitled to / deduct/ setoff /recover the such **GST (CGST & SGST/UTGST or IGST UTGST)** thereupon together with all penalties and interest if any, against any amounts paid or payable by GGPL to Supplier of Goods / Services.

**13.10 Anti-profiteering clause**

As per Clause 171 of GST Act it is mandatory to pass on the benefit due to reduction in rate of tax or from input tax credit to the consumer by way of commensurate reduction in prices. The Supplier of Goods / Services may note the above and quote their prices accordingly.

- 13.11 In case the GST rating of vendor on the GST portal / Govt. official website is negative / black listed, then the bids may be rejected by GGPL. Further, in case rating of bidder is negative / black listed after award of work for supply of goods / services, then GGPL shall not be obligated or liable to pay or reimburse GST to such vendor and shall also be entitled to deduct / recover such GST along with all penalties / interest, if any, incurred by GGPL.

13.12 **GST (CGST & SGST/UTGST or IGST) is implemented w.e.f. 01.07.2017 which subsumed various indirect taxes and duties applicable before 01.07.2017. Accordingly, the provisions of General Condition of Contract relating to taxes and duties which are subsumed in GST are modified to aforesaid provisions mentioned in clause no. 12 and 13 of ITB.**

**14 BID CURRENCIES:**

Bidders must submit bid in Indian Rupees only.

**15 BID VALIDITY**

15.1 Bids shall be kept valid for period specified in BDS from the final Due date of submission of bid'. A Bid valid for a shorter period may be rejected by GGPL as 'non-responsive'.

15.2 In exceptional circumstances, prior to expiry of the original 'Bid Validity Period', the Employer may request the Bidders to extend the 'Period of Bid Validity' for a specified additional period. The request and the responses thereto shall be made in writing or by fax/email. A Bidder may refuse the request without forfeiture of his EMD. A Bidder agreeing to the request will not be required or permitted to modify his Bid, but will be required to extend the validity of its EMD for the period of the extension and in accordance with "ITB: Clause-16" in all respects.

**16 EARNEST MONEY DEPOSIT**

16.1 Bid must be accompanied with earnest money (i.e **Earnest Money Deposit (EMD)** also known as **Bid Security**) in the form of '**Demand Draft**' / '**Banker's Cheque**' [in favour of **Godavari Gas Private Limited** payable at place mentioned in **BDS**] or '**Bank Guarantee**' or '**Letter of Credit**' strictly as per the format given in form F 4/ F- 4A (as the case may be) of the **Tender Document**. Bidder shall ensure that EMD submitted in the form of '**Bank Guarantee**' or '**Letter of Credit**' should have a validity of at least 'two [02] months' beyond the validity of the Bid. EMD submitted in the form of '**Demand Draft**' or '**Banker's Cheque**' should be valid for three months

Bid not accompanied with EMD, or EMD not in requisite format shall be liable for rejection. The EMD shall be submitted in Indian Rupees only.

16.2 The EMD is required to protect GGPL against the risk of Bidder's conduct, which would warrant the forfeiture of EMD, pursuant to clause-16.7 of ITB.

16.3 GGPL shall not be liable to pay any documentation charges, Bank charges, commission, interest etc. on the amount of EMD. In case EMD is in the form of a 'Bank Guarantee', the same shall be from any Indian scheduled Bank or a

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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 Banks, the Bank must be commercial Bank having net worth in excess of Rs. 100 Crores [Rupees One Hundred Crores] and a declaration to this effect should be made by such commercial Bank either in the ‘Bank Guarantee’ itself or separately on its letterhead.

- 16.4 Any Bid not secured in accordance with “ITB: Clause-16.1 & Clause-16.3” may be rejected by GGPL as non-responsive.
- 16.5 Unsuccessful Bidder’s EMD will be discharged/ returned as promptly as possible, but not later than ‘thirty [30] days’ after finalization of tendering process.
- 16.6 The successful Bidder’s EMD will be discharged upon the Bidder’s acknowledging the ‘Award’ and signing the ‘Agreement’ (if applicable) and furnishing the ‘Contract Performance Security (CPS)/ Security Deposit’ pursuant to clause no. 38 of ITB.
- 16.7 Notwithstanding anything contained herein, the EMD may also be forfeited in any of the following cases:
- (a) If a Bidder withdraws his Bid during the ‘Period of Bid Validity’
  - (b) If a Bidder has indulged in corrupt/fraudulent /collusive/coercive practice
  - (c) If the Bidder modifies Bid during the period of bid validity (after Due Date and Time for Bid Submission).
  - (d) Violates any other condition, mentioned elsewhere in the Tender Document, which may lead to forfeiture of EMD.
  - (e) In the case of a successful Bidder, if the Bidder fails to:
    - (i) to acknowledge receipt of the “Notification of Award” / Fax of Acceptance[FOA]”,
    - (ii) to furnish “Contract Performance Security / Security Deposit”, in accordance with “ITB: Clause-38”
    - (iii) to accept ‘arithmetical corrections’ as per provision of the clause 30 of ITB.
- 16.8 In case EMD is in the form of ‘Bank Guarantee’ or ‘Letter of Credit’, the same must indicate the Tender Document No. and the name of Tender Document for which the Bidder is quoting. This is essential to have proper correlation at a later date.
- 16.9 MSEs (Micro & Small Enterprises) are exempted from submission of EMD in accordance with the provisions of PPP-2012 and Clause 40 of ITB. The Government Departments/PSUs are also exempted from the payment of EMD.

However, Traders/Dealers/ Distributors /Stockiest /Wholesaler are not entitled for exemption of EMD.

**17 PRE-BID MEETING (IF APPLICABLE)**

- 17.1 The Bidder(s) or his designated representative are invited to attend a "Pre-Bid Meeting" which will be held at address specified in IFB. It is expected that a bidder shall not depute more than 02 representatives for the meeting.
- 17.2 Purpose of the meeting will be to clarify issues and to answer questions on any matter that may be raised at that stage and give hands-on e-tendering.
- 17.3 Text of the questions raised and the responses given, together with any responses prepared after the meeting, will be uploaded on GGPL e-tendering website against the Tender. Any modification of the Contents of Bidding Documents listed in "ITB: Clause-7.1", that may become necessary as a result of the Pre-Bid Meeting shall be made by the Employer exclusively through the issue of an Addendum / Corrigendum pursuant to "ITB: Clause-9", and not through the minutes of the Pre-Bid Meeting.
- 17.4 Non-attendance of the Pre-Bid Meeting will not be a cause for disqualification of Bidder.

**18 FORMAT AND SIGNING OF BID**

- 18.1 The original and all copies of the Bid shall be typed or written in indelible ink [in the case of copies, photocopies are also acceptable] and shall be signed by a person or persons duly authorized to sign on behalf of the Bidder (as per POA). The name and position held by each person signing, must be typed or printed below the signature. All pages of the Bid except for un-amended printed literature where entry(s) or amendment(s) have been made shall be initialed by the person or persons signing the Bid.
- 18.2 The Bid shall contain no alterations, omissions, or additions, unless such corrections are initialed by the person or persons signing the Bid.
- 18.3 In case of e-tendering, digitally signed documents to be uploaded as detailed in addendum to ITB.

**19 ZERO DEVIATION AND REJECTION CRITERIA**

- 19.1 **ZERO DEVIATION:** Deviation to terms and conditions of "Bidding Documents" may lead to rejection of bid. GGPL will accept bids based on terms & conditions of "Bidding Documents" only. Bidder may note GGPL will determine the substantial responsiveness of each bid to the Bidding Documents pursuant to provision contained in clause 29 of ITB. For purpose of this, a substantially responsive bid is one which conforms to all terms and conditions of the Bidding Documents without deviations or reservations. GGPL's

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determination of a bid's responsiveness is based on the content of the bid itself without recourse to extrinsic evidence. GGPL reserves the right to raise technical and/or commercial query(s), if required, may be raised on the bidder(s). The response(s) to the same shall be in writing, and no change in the price(s) or substance of the bids shall be sought, offered or permitted. The substance of the bid includes but not limited to prices, completion, scope, technical specifications, etc. Bidders are requested to not to take any deviation/exception to the terms and conditions laid down in this "Tender Documents", and submit all requisite documents as mentioned in this "Tender Documents", failing which their offer will be liable for rejection. If a bidder does not reply to the queries in the permitted time frame then its bid shall be evaluated based on the documents available in the bid.

19.2 **REJECTION CRITERIA:** Notwithstanding the above, deviation to the following clauses of Tender document shall lead to summarily rejection of Bid:

- (a) Firm Price
- (b) Earnest Money Deposit / Bid Security
- (c) Specifications & Scope of Work
- (d) Schedule of Rates / Price Schedule / Price Basis
- (e) Duration / Period of Contract/ Completion schedule
- (f) Period of Validity of Bid
- (g) Price Reduction Schedule
- (h) Contract Performance Security
- (i) Guarantee / Defect Liability Period
- (j) Arbitration / Resolution of Dispute/Jurisdiction of Court
- (k) Force Majeure & Applicable Laws
- (l) Integrity Pact, if Applicable
- (m) Any other condition specifically mentioned in the tender document elsewhere that non-compliance of the clause lead to rejection of bid

Note: Further, it is once again reminded not to mention any condition in the Bid which is contradictory to the terms and conditions of Tender document.

**20 E-PAYMENT**

Godavari Gas Private Limited has initiated payments to Suppliers and Contractors electronically, and to facilitate the payments electronically through 'e-banking'. The successful bidder should give the details of his bank account as per the bank mandate form.

**[D] – SUBMISSION OF BIDS**

**21 SUBMISSION, SEALING AND MARKING OF BIDS**



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- 21.1 In case of e-tendering, bids shall be submitted through e-tender mode in the manner specified elsewhere in tender document. No Manual/ Hard Copy (Original) offer shall be acceptable.
- 21.2 In case of manual tendering bid must be submitted in sealed envelope. If the envelope is not sealed & marked as per Clause No. 11 of ITB, the employer will assume no responsibility for misplacement or pre-mature opening of the bid.
- 21.3 All the bids shall be addressed to the owner at address specified in IFB.
- 21.4 Bids submitted under the name of AGENT/CONSULTANT /REPRESENTATIVE/RETAINER/ASSOCIATE etc. on behalf of a bidder/affiliate shall not be accepted.

**22 DEADLINE FOR SUBMISSION OF BIDS**

- 22.1 In case of e-bidding, the bids must be submitted through e-tender mode not later than the date and time specified in the tender documents/BDS.
- 22.2 In case of manual tendering EMD along with bid must be submitted within the due date & time.
- 22.3 GGPL may, in exceptional circumstances and at its discretion, extend the deadline for submission of Bids (clause 9 of ITB refers). In which case all rights and obligations of GGPL and the Bidders, previously subject to the original deadline will thereafter be subject to the deadline as extended. Notice for extension of due date of submission of bid will be uploaded on GGPL's website/ communicated to the bidders.

**23 LATE BIDS**

- 23.1 Any bids received after the notified date and time of closing of tenders will be treated as late bids.
- 23.2 ~~In case of e tendering, e tendering system of GGPL shall close immediately after the due date for submission of bid and no bids can be submitted thereafter.~~

In case of manual tendering, bids received by GGPL after the due date for submission of bids shall not be considered. Such late bids shall be returned to the bidder within "10 days" in 'unopened conditions'. The EMD of such bidders shall be returned along with the un-opened bid. In case of e-tendering, where the bid bond/physical documents has been received but the bid is not submitted by the bidder in the e-tendering portal, such bid bond/ physical documents shall be returned immediately.

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23.3 Unsolicited Bids or Bids received to address other than one specifically stipulated in the tender document will not be considered for evaluation/opening/award if not received to the specified destination within stipulated date & time.

**24 MODIFICATION AND WITHDRAWAL OF BIDS**

24.1 Modification and withdrawal of bids shall be as follows:-

**24.1.1 IN CASE OF E-TENDERING**

~~— The bidder may withdraw or modify its bid after bid submission but before the due date and time for submission as per tender document.~~

**24.1.2 IN CASE OF MANUAL BIDDING**

The bidder may withdraw or modify its bid after bid submission but before the due date for submission as per tender document provided that the written notice of the modification/ substitution/ withdrawal in received by GGPL prior to the deadline for submission of bid.

24.2 The modification shall also be prepared, sealed, marked and dispatched in accordance with the provisions of the clause 11 & 22 of ITB with relevant ‘Cut-Out Slip’ duly pasted and mentioning on top of the envelope as “MODIFICATION”. In case of withdrawal of bid, the Envelope containing withdrawal letter duly super scribing the envelope as “WITHDRAWAL” and “Tender Document number :....”/ communication regarding withdrawal of bid with “Tender Document number :....”/ must reach concerned dealing official of GGPL within Due date & Time of submission of Bid. No bid shall be modified/ withdrawn after the Due Date & Time for Bid submission.

24.3 Any withdrawal/ modification/substitution of Bid in the interval between the Due Date & Time for Bid submission and the expiration of the period of bid validity specified by the Bidder in their Bid shall result in the Bidder’s forfeiture of EMD pursuant to clause 16 of ITB and rejection of Bid.

24.4 The latest Bid submitted by the Bidder shall be considered for evaluation and all other Bid(s) shall be considered to be unconditionally withdrawn.

24.5 In case after price bid opening the lowest evaluated bidder (L1) is not awarded the job for any mistake committed by him in bidding or withdrawal of bid or modification of bid or varying any term in regard thereof leading to re-tendering, GGPL shall forfeit EMD paid by the bidder and such bidders shall be debarred from participation in re-tendering of the same job(s)/item(s). Further, such bidder will be put on holiday for a period of six months after following the due procedure.

**25 EMPLOYER'S RIGHT TO ACCEPT ANY BID AND TO REJECT ANY OR ALL BIDS**

GGPL reserves the right to accept or reject any Bid, and to annul the Bidding process and reject all Bids, at any time prior to award of Contract, without

thereby incurring any liability to the affected Bidder or Bidders or any obligations to inform the affected Bidder or Bidders of the ground for GGPL's action. However, Bidder if so desire may seek the reason (in writing) for rejection of their Bid to which GGPL shall respond quickly.

**[E] – BID OPENING AND EVALUATION**

**26 BID OPENING**

**26.1 *Unpriced Bid Opening :***

GGPL will open bids, in the presence of bidders' designated representatives who choose to attend, at date, time and location stipulated in the BDS. The bidders' representatives, who are present shall sign a bid opening register evidencing their attendance.

**26.2 *Priced Bid Opening:***

26.2.1 GGPL will open the price bids of those bidders who meet the qualification requirement and whose bids is determined to be technically and commercially responsive. Bidders selected for opening of their price bids shall be informed about the date of price bid opening. Bidders may depute their authorized representative to attend the bid opening. The bidders' representatives, who are present shall sign a register evidencing their attendance and may be required to be present on a short notice.

26.2.2 The price bids of those Bidders who were not found to be techno-commercially responsive shall not be opened in both manual tendering and e-tendering. In case of Manual Tender, the envelope containing Price Bid shall be returned unopened after opening of the price bids of techno-commercially responsive Bidders.

26.3 In case of bids invited under the single bid system, bid shall be opened on the specified due date & time.

**27 CONFIDENTIALITY**

Information relating to the examination, clarification, evaluation and comparison of Bids, and recommendations for the award of a Contract, shall not be disclosed to Bidder(s) or any other persons not officially concerned with such process.

**28 CONTACTING THE EMPLOYER**

28.1 From the time of Bid opening to the time of award of Contract, if any Bidder wishes to contact the Employer on any matter related to the Bid, it should do so in writing. Information relating to the examination, clarification, evaluation & recommendation for award shall not be disclosed.

28.2 Any effort by the Bidder to influence the Employer in the Employer's 'Bid Evaluation', 'Bid Comparison', or 'Contract Award' decisions may result in the rejection of the Bidder's Bid and action shall be initiated as per procedure in this regard.

**29 EXAMINATION OF BIDS AND DETERMINATION OF RESPONSIVENESS**

29.1 The owner's determination of a bid's responsiveness is based on the content of the bid only. Prior to the detailed evaluation of Bids, the Employer will determine whether each Bid:-

- (a) Meets the "Bid Evaluation Criteria" of the Bidding Documents;
- (b) Has been properly signed;
- (c) Is accompanied by the required 'Earnest Money / Bid Security';
- (d) Is substantially responsive to the requirements of the Bidding Documents; and
- (e) Provides any clarification and/or substantiation that the Employer may require to determine responsiveness pursuant to "ITB: Clause-29.2"

29.2 A substantially responsive Bid is one which conforms to all the terms, conditions and specifications of the Bidding Documents without material deviations or reservations or omissions for this purpose employer defines the foregoing terms below:-

- a) "Deviation" is departure from the requirement specified in the tender documents.
- b) "Reservation" is the setting of limiting conditions or withholding from complete acceptance of the requirement in the tender documents.
- c) "Omission" is the failure to submit part or all of the information or documentation required in the tender document.

29.3 A material deviation, reservation or omission is one that,

- a) If accepted would,
  - i) Affect in any substantial way the scope, quality, or performance of the job as specified in tender documents.
  - ii) Limit, in any substantial way, inconsistent with the Tender Document, the Employer's rights or the tenderer's obligations under the proposed Contract.
- b) If rectified, would unfairly affect the competitive position of other bidders presenting substantially responsive bids.

29.4 The employer shall examine all aspects of the bid to confirm that all requirements have been met without any material deviation, reservation or omission.

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29.5 If a Bid is not substantially responsive, it may be rejected by the Employer and may not subsequently be made responsive by correction or withdrawal of the of material deviation, reservation or omission.

**30 CORRECTION OF ERRORS**

30.1 Bids determined to be substantially responsive will be checked by the Employer for any arithmetic errors. Errors will be corrected by the Employer as follows:

- (i) When there is a difference between the rates in figures and words, the rate which corresponds to the amount worked out by the Bidder (by multiplying the quantity and rate) shall be taken as correct.
- (ii) When the rate quoted by the Bidder in figures and words tallies but the amount is incorrect, the rate quoted by the contractor shall be taken as correct and not the amount and the amount shall be re-calculated/ corrected accordingly.
- (iii) When it is not possible to ascertain the correct rate, in the manner prescribed above, the rate as quoted in words shall be adopted and the amount worked out, for comparison purposes

30.2 The amount stated in the bid will be adjusted by the Employer in accordance with the above procedure for the correction of errors. If the bidder does not accept the corrected amount of bid, its bid will be rejected, and the bid security shall be forfeited.

**31 CONVERSION TO SINGLE CURRENCY FOR COMPARISON OF BIDS**

Not Applicable. All bids submitted must be in the currency specified at clause 14 of ITB.

**32 EVALUATION AND COMPARISON OF BIDS**

Bid shall be evaluated as per evaluation criteria mentioned in Section-II of bidding documents.

**33 COMPENSATION FOR EXTENDED STAY (FOR APPLICABILITY OF THIS CLAUSE REFER BDS):-**

33.1 In the event of the time of completions of work getting delayed beyond the time schedule indicated in the bidding document plus a grace period equivalent to 1/5<sup>th</sup> of the time schedule or 2 months whichever is more, due to reasons solely attributable to Employer, the Contractor shall be paid compensation for extended stay (ESC) to maintain necessary organizational set up and construction tools, tackles, equipment etc. at site of work.

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- 33.2 The bidder is required to specify the rate for ESC on per month basis in the “PRICE PART” of his bid, which shall be considered for loading on total quoted price during price bid evaluation. The loading shall be done of a period of 1/5<sup>th</sup> of the time schedule or 1 month whichever is less. In case bidder does not indicate the rate for ESC in price part of his bid, it will be presumed that no ESC is required by the bidder and evaluation shall be carried out accordingly.

**34 PURCHASE PREFERENCE**

Purchase preference to Central government public sector Undertaking and Micro and Small Enterprises (MSEs) shall be allowed as per Government instructions in vogue.

**[F] – AWARD OF CONTRACT**

**35 AWARD**

Subject to "ITB: Clause-29", GGPL will award the Contract to the successful Bidder whose Bid has been determined to be substantially responsive and has been determined as the lowest provided that bidder, is determined to be qualified to satisfactorily perform the Contract.

**36 NOTIFICATION OF AWARD / FAX OF ACCEPTANCE**

- 36.1 Prior to the expiry of ‘Period of Bid Validity’, Notification of Award for acceptance of the Bid will be intimated to the successful Bidder by GGPL either by Fax / E - mail /Letter or like means defined as the “Fax of Acceptance (FOA)”. The Contract shall enter into force on the date of FOA and the same shall be binding on GGPL and successful Bidder (i.e. Contractor/Service Provider). The Notification of Award/FOA will constitute the formation of a Contract. The detailed Letter of Acceptance shall be issued thereafter incorporating terms & conditions of Tender Document, Corrigendum, Clarification(s), Bid and agreed variation(s)/acceptable deviation(s), if any. GGPL may choose to issue Notification of Award in form of detailed Letter of Acceptance without issuing FOA and in such case the Contract shall enter into force on the date of detailed Letter of Acceptance only.

- 36.2 Contract period shall commence from the date of "Notification of Award" or as mentioned in the Notification of Award. The "Notification of Award" will constitute the formation of a Contract, until the Contract has been effected pursuant to signing of Contract as per "ITB: Clause-37".

Upon the successful Bidder's / Contractor's furnishing of 'Contract Performance Security / Security Deposit', pursuant to "ITB: Clause-38", GGPL will promptly discharge his 'Earnest Money / Bid Security', pursuant to "ITB: Clause-16"

**37 SIGNING OF AGREEMENT**

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- 37.1 GGPL will award the Contract to the successful Bidder, who, within 'fifteen [15] days' of receipt of the same, shall sign and return the acknowledged copy to GGPL.
- 37.2 The successful Bidder/Contractor shall be required to execute an 'Agreement' in the proforma given in this Bidding Document on a 'non-judicial stamp paper' of appropriate value [cost of the 'stamp-paper' shall be borne by the successful Bidder/Contractor] and of 'state' specified in Bidding Data Sheet (BDS) only, within 'fifteen [15] days' of receipt of the "Fax of Acceptance [FOA]" of the Tender by the successful Bidder/Contractor failure on the part of the successful Bidder/Contractor to sign the 'Agreement' within the above stipulated period, shall constitute sufficient grounds for forfeiture of EMD/Security Deposit.

**38 CONTRACT PERFORMANCE SECURITY / SECURITY DEPOSIT**

- 38.1 Within 30 days of the receipt of the notification of award/ Fax of Acceptance from GGPL, the successful bidder shall furnish the Contract Performance Security (CPS) in accordance with of General Conditions of the Contract. The CPS shall be in the form of either Banker's Cheque or Demand Draft or Bank Guarantee or Letter of Credit and shall be in the currency of the Contract. However, CPS shall not be applicable in cases where in the order value as specified in Notification of Award is less than INR 5 Lakh (exclusive of taxes & duties).
- 38.2 The contract performance security shall be for an amount equal to specified in Bidding Data Sheet (BDS) towards faithful performance of the contractual obligations and performance of equipment. For the purpose of CPS, Contract/order value shall be exclusive of **GST (CGST & SGST/UTGST or IGST)** to be reimbursed by the Owner.
- Bank Guarantee towards CPS shall be 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, in case of bank guarantees from banks other than the Nationalized Indian banks, the bank must be a commercial bank having net worth in excess of Rs 100 crores and a declaration to this effect should be made by such commercial bank either in the Bank Guarantee itself or separately on its letterhead. This bank guarantee shall be valid for a period as three months beyond the DLP specified in Bid Data Sheet.
- 38.3 Failure of the successful bidder to comply with the requirements of this article shall constitute sufficient grounds for the annulment of the award and forfeiture of the EMD.
- 38.4 The CPS has to cover the entire contract value including extra works/services also. As long as the CPS submitted at the time of award take cares the extra works/ services executed and total executed value are within the awarded

contract price, there is no need for additional CPS. As soon as the total executed value is likely to burst the ceiling of awarded contract price, the contractor should furnish additional CPS.

**39 PROCEDURE FOR ACTION IN CASE CORRUPT/ FRAUDULENT/COLLUSIVE/ COERCIVE PRACTICES**

39.1 Procedure for action in case Corrupt/ Fraudulent/Collusive/Coercive Practices is enclosed at Annexure-I.

39.2 The Fraud Prevention Policy document is available on GAIL's website ([www.gailonline.com](http://www.gailonline.com))

**39.3 NON-APPLICABILITY OF ARBITRATION CLAUSE IN CASE OF BANNING OF VENDORS/ SUPPLIERS / CONTRACTORS/BIDDERS/ CONSULTANTS INDULGED IN FRAUDULENT/ COERCIVE PRACTICES**

Notwithstanding anything contained contrary in GCC and other "CONTRACT DOCUMENTS", in case it is found that the Vendors/ Suppliers / Contractors/Bidders/ Consultants indulged in fraudulent/ coercive practices at the time of bidding, during execution of the contract etc., and/or on other grounds as mentioned in GAIL's "Procedure for action in case Corrupt/Fraudulent/Collusive/Coercive Practices" (Annexure-I), the contractor/bidder shall be banned (in terms of aforesaid procedure) from the date of issuance of such order by GAIL (India) Ltd., to such Vendors/ Suppliers / Contractors/Bidders/ Consultants.

The Vendor/ Supplier / Contractor/ Bidder/Consultant understands and agrees that in such cases where Vendor/ Supplier / Contractor/ Bidder/Consultant has been banned (in terms of aforesaid procedure) from the date of issuance of such order by GAIL (India) Limited, such decision of GAIL (India) Limited shall be final and binding on such Vendor/ Supplier / Contractor/ Bidder/Consultant and the 'Arbitration clause' in the GCC and other "CONTRACT DOCUMENTS" shall not be applicable for any consequential issue /dispute arising in the matter.

**40 PUBLIC PROCUREMENT POLICY FOR MICRO AND SMALL ENTERPRISES**

**NOT APPLICABLE FOR THE INSTANT TENDER**

**41 AHR ITEMS**

In item rate contract where the quoted rates for the items exceed 50% of the estimate rates, such items will be considered as Abnormally High Rates (AHR) items and payment of AHR items beyond the SOR stipulated quantities shall be made at the lowest amongst the following rates:



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- I) Rates as per SOR, quoted by the Contractor/Bidder.
- 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.

**42 VENDOR PERFORMANCE EVALUATION**

Shall be as stipulated Annexure II to ITB herewith.

**43 INCOME TAX & CORPORATE TAX**

- 43.1 Income tax deduction shall be made from all payments made to the contractor as per the rules and regulations in force and in accordance with the Income Tax Act prevailing from time to time.
- 43.2 Corporate Tax liability, if any, shall be to the contractor's account.
- 43.3 Work Contract tax/ GST as may be applicable shall be deducted as per trade tax.
- 43.4 TDS, wherever applicable, shall be deducted as per applicable act/law/rule.

**43.4 MENTIONING OF PAN NO. IN INVOICE/BILL**

As per CBDT Notification No. 95/2015 dated 30.12.2015, mentioning of PAN no. is mandatory for procurement of goods / services/works/consultancy services exceeding Rs. 2 Lacs per transaction.

Accordingly, supplier/ contractor/ service provider/ consultant should mention their PAN no. in their invoice/ bill for any transaction exceeding Rs. 2 lakhs. As provided in the notification, in case supplier/ contractor/ service provider/ consultant do not have PAN no., they have to submit declaration in Form 60 along with invoice/ bill for each transaction.

Payment of supplier/ contractor / service provider/ consultant shall be processed only after fulfillment of above requirement

**44. SETTLEMENT OF DISPUTES BETWEEN GOVERNMENT DEPARTMENT AND ANOTHER AND ONE GOVERNMENT DEPARTMENT AND PUBLIC ENTERPRISE AND ONE PUBLIC ENTERPRISE AND ANOTHER**

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.

**45 DISPUTE RESOLUTION (ADDENDUM TO PROVISION REGARDING APPLICABLE LAWS AND SETTLEMENT OF DISPUTES OF GCC)**

- 45.1 GAIL (India) Limited has framed the Conciliation Rules 2010 in conformity with supplementary to Part – III of the Indian Arbitration and Conciliation Act 1996 for speedier, cost effective and amicable settlement of disputes through conciliation. A copy of the said rules made available on GAIL’s web site [www.gailonline.com](http://www.gailonline.com) for reference. Unless otherwise specified, the matters where decision of the Engineer-in-Charge is deemed to be final and binding as provided in the Agreement and the issues/disputes which cannot be mutually resolved within a reasonable time, all disputes shall be settled in accordance with the Conciliation Rules 2010.
- 45.2 Any dispute(s)/difference(s)/issue(s) of any kind whatsoever between/amongst the Parties arising under/out of/in connection with this contract shall be settled in accordance with the aforesaid rules.
- 45.3 In case of any dispute(s)/difference(s)/issue(s), a Party shall notify the other Party (ies) in writing about such a dispute(s) / difference(s) / issue(s) between / amongst the Parties and that such a Party wishes to refer the dispute(s)/difference(s)/issue(s) to Conciliation. Such Invitation for Conciliation shall contain sufficient information as to the dispute(s)/difference(s)/issue(s) to enable the other Party (ies) to be fully informed as to the nature of the dispute(s)/difference(s)/issue(s), the amount of monetary claim, if any, and apparent cause(s) of action.
- 45.4 Conciliation proceedings commence when the other Party(ies) accept(s) the invitation to conciliate and confirmed in writing. If the other Party (ies) reject(s) the invitation, there will be no conciliation proceedings.
- 45.5 If the Party initiating conciliation does not receive a reply within thirty days from the date on which he/she sends the invitation, or within such other period of time as specified in the invitation, he/she may elect to treat this as a rejection of the invitation to conciliate. If he/she so elects, he/she shall inform the other Party(ies) accordingly.
- 45.6 Where Invitation for Conciliation has been furnished, the Parties shall attempt to settle such dispute(s) amicably under Part-III of the Indian Arbitration and

Conciliation Act, 1996 and GAIL (India) Limited Conciliation Rules, 2010. It would be only after exhausting the option of Conciliation as an Alternate Dispute Resolution Mechanism that the Parties hereto shall go for Arbitration. For the purpose of this clause, the option of ‘Conciliation’ shall be deemed to have been exhausted, even in case of rejection of ‘Conciliation’ by any of the Parties.

45.7 The cost of Conciliation proceedings including but not limited to fees for Conciliator(s), Airfare, Local Transport, Accommodation, cost towards conference facility etc. shall be borne by the Parties equally.

45.8 The Parties shall freeze claim(s) of interest, if any, and shall not claim the same during the pendency of Conciliation proceedings. The Settlement Agreement, as and when reached/agreed upon, shall be signed between the Parties and Conciliation proceedings shall stand terminated on the date of the Settlement Agreement.

46.0 **INAM-PRO (PLATFORM FOR INFRASTRUCTURE AND MATERIALS PROVIDERS)**

INAM-Pro (Platform for infrastructure and materials providers) is a web based platform for infrastructure provides and materials suppliers and was developed by Ministry of Road Transport and Highways (MoRT&H) with a view to reduce project execution delays on account of supply shortages and inspire greater confidence in contractors to procure cement to start with directly from the manufacturers. Presently, numerous cement companies are registered in the portal and offering cement for sale on the portal with a commitment period of 3 years. These companies have bound themselves by ceiling rates for the entire commitment period, wherein they are allowed to reduce or increase their cement rates any number of times within the ceiling rate, but are not permitted to exceed the said ceiling rate.

MoRT&H is expanding the reach of this web-portal by increasing both the product width as well as the product depth. They are working on incorporating 60 plus product categories. The product range will span from large machineries like Earth Movers and Concrete Mixers, to even the smallest items like road studs. MoRT&H intend to turn it into a portal which services every infrastructure development related need of a modern contractor.

GGPL’s contractors may use this innovative platform, wherever applicable. The usage of web – Portal is a completely voluntary exercise. The platform, however, can serve as a benchmark for comparison of offered prices and products.

47 **PROMOTION OF PAYMENT THROUGH CARDS AND DIGITAL MEANS**

To promote cashless transactions, the onward payments by Contractors to their employees, service providers, sub-contractors and suppliers may be made through Cards and Digital means to the extent possible

48. **CONTRACTOR TO ENGAGE CONTRACT MANPOWER BELONGING TO SCHEDULED CASTES AND WEAKER SECTIONS OF THE SOCIETY**

While engaging the contractual manpower, Contractors are required to make efforts to provide opportunity of employment to the people belonging to Scheduled Castes and weaker sections of the society also in order to have a fair representation of these sections.

49. **QUARTERLY CLOSURE OF THE CONTRACT (FOR APPLICABILITY OF THIS CLAUSE REFER BDS):-**

During execution of contracts/orders, various issues may arise. In order to timely detect and to address the contractual issue (s) during the execution of contracts, GGPL has introduced a mechanism of quarterly closure of the contract, under which all the issues related to the contract execution will be monitored on quarterly basis for resolution.

Vendors/Contractors are required to co-operate with EIC for proper implementation of this mechanism for smooth execution of the contract.”

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**Annexure-I**

**PROCEDURE FOR ACTION IN CASE  
CORRUPT/FRAUDULENT/COLLUSIVE/COERCIVE PRACTICES**

**A Definitions:**

A.1 “Corrupt Practice” means the offering, giving, receiving or soliciting, directly or indirectly, anything of value to improperly influence the actions in selection process or in contract execution.

“Corrupt Practice” also includes any omission for misrepresentation that may mislead or attempt to mislead so that financial or other benefit may be obtained or an obligation avoided.

A.2 “Fraudulent Practice” means and include any act or omission committed by a agency or with his connivance or by his agent by misrepresenting/ submitting false documents and/ or false information or concealment of facts or to deceive in order to influence a selection process or during execution of contract/ order.

A.3 “Collusive Practice amongst bidders (prior to or after bid submission)” means a scheme or arrangement designed to establish bid prices at artificial non-competitive levels and to deprive the Employer of the benefits of free and open competition.

A.4 “Coercive practice” means impairing or harming or threatening to impair or harm directly or indirectly, any agency or its property to influence the improperly actions of an agency, obstruction of any investigation or auditing of a procurement process.

A.5 “Vendor/Supplier/Contractor/Consultant/Bidder” is herein after referred as “Agency”

A.6 ”Appellate Authority” shall mean Committee of Directors consisting of Director (Finance) and Director (BD) for works centers under Director (Projects). For all other cases committee of Directors shall consist of Director (Finance) & Director (Projects).

A.7 “Competent Authority” shall mean the authority, who is competent to take final decision for Suspension of business dealing with an Agency/ (ies) and Banning of business dealings with Agency/ (ies) and shall be the “Director” concerned.

A.8 “Allied Agency” shall mean all the concerns within the sphere of effective influence of banned/ suspended agencies. In determining this, the following factors may be taken into consideration:

- (a) Whether the management is common;
- (b) Majority interest in the management is held by the partners or directors of banned/ suspended firm.
- (c) substantial or majority shares are owned by banned/ suspended agency and by virtue of this it has a controlling voice.

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A.9 “Investigating Agency” shall mean any department or unit of GAIL investigating into the conduct of Agency/ party and shall include the Vigilance Department of the GAIL, Central Bureau of Investigation, State Police or any other agency set up by the Central or state government having power to investigate.

**B Actions against bidder(s) indulging in corrupt /fraudulent/ collusive/ coercive practice**

**B.1 Irregularities noticed during the evaluation of the bids :**

If it is observed during bidding process/ bids evaluation stage that a bidder has indulged in corrupt/fraudulent /collusive/coercive practice, the bid of such Bidder (s) shall be rejected and its Earnest Money Deposit (EMD) shall be forfeited.

Further, such agency shall be banned for future business with GGPL for a period specified in para B 2.2 below from the date of issue of banning order.

**B.2 Irregularities noticed after award of contract**

**(i) During execution of contract:**

If an agency, is found to have indulged in corrupt/fraudulent/ collusive/coercive practices, during execution of contract, the agency shall be banned for future business with GGPL for a period specified in para B 2.2 below from the date of issue of banning order.

The concerned order (s)/ contract(s) where corrupt/fraudulent/collusive practices is observed, shall be suspended with immediate effect by Engineer-in-Charge (EIC)/ Employer whereby the supply/ work/ service and payment etc. will be suspended. The action shall be initiated for putting the agency on banning.

After conclusion of process, the order (s)/ contract (s) where it is concluded that such irregularities have been committed shall be terminated and Contract cum Performance Bank Guarantee (CPBG)/ Contract Performance Security(CPS) submitted by agency against such order (s)/ contract (s) shall also be forfeited. The amount that may have become due to the contractor on account of work already executed by him shall be payable to the contractor and this amount shall be subject to adjustment against any amounts due from the contractor under the terms of the contract.

No risk and cost provision will be enforced in such cases.

**(ii) After execution of contract and during Defect liability period (DLP)/ Warranty/Guarantee Period:**

If an agency is found to have indulged in corrupt/fraudulent/collusive/coercive practices, after execution of contract and during DLP/Warranty/Guarantee Period, the agency shall be banned for future business with GAIL for a period specified in para B 2.2 below from the date of issue of banning order.

Further, the Contract cum Performance Bank Guarantee (CPBG)/Contract Performance Security (CPS) submitted by agency against such order (s)/ contract (s) shall be forfeited.

**(iii) After expiry of Defect liability period (DLP)/ Warranty/Guarantee Period**

If an agency is found to have indulged in corrupt/fraudulent/collusive/coercive practices, after expiry of Defect liability period (DLP)/ Warranty/Guarantee Period, the agency shall be banned for future business with GGPL for a period specified in para B 2.2 below from the date of issue of banning order.

**B.2.2 Period of Banning**

Banning period shall be reckoned from the date of banning order and shall be 3 years.

In exceptional cases where the act of vendor/ contractor is a threat to the National Security, the banning shall be for indefinite period.

**C Effect of banning on other ongoing contracts/ tenders**

C.1 If an agency is put on Banning, such agency should not be considered in ongoing tenders/future tenders.

C.2 However, if such an agency is already executing other order (s)/ contract (s) where no corrupt/fraudulent/ collusive/coercive practice is found, the agency should be allowed to continue till its completion without any further increase in scope except those incidental to original scope mentioned in the contract.

C.3 If an agency is put on the Banning List during tendering and no irregularity is found in the case under process:

C.3.1 after issue of the enquiry /bid/tender but before opening of Technical bid, the bid submitted by the agency shall be ignored.

C.3.2 after opening Technical bid but before opening the Price bid, the Price bid of the agency shall not be opened and BG/EMD submitted by the agency shall be returned to the agency.

C.3.3 after opening of price, BG/EMD made by the agency shall be returned; the offer of the agency shall be ignored & will not be further evaluated. If the

agency is put on banning list for fraud/ mis-appropriation of facts committed in the same tender/other tender where errant agency emerges as the lowest (L1), then such tender shall also be cancelled and re-invited.

## **D. Procedure for Suspension of Bidder**

### **D.1 Initiation of Suspension**

Action for suspension business dealing with any agency/(ies) shall be initiated by Corporate C&P Department when

- (i) Corporate Vigilance Department based on the fact of the case gathered during investigation by them recommend for specific immediate action against the agency.
- (ii) Corporate Vigilance Department based on the input from Investigating agency, forward for specific immediate action against the agency.
- (iii) Non performance of Vendor/Supplier/Contractor/Consultant leading to termination of Contract/ Order.

### **D.2 Suspension Procedure:**

- D.2.1 The order of suspension would operate initially for a period not more than six months and is to be communicated to the agency and also to Corporate Vigilance Department. Period of suspension can be extended with the approval of the Competent Authority by one month at a time with a ceiling of six months pending a conclusive decision to put the agency on banning list.
- D.2.2 During the period of suspension, no new business dealing may be held with the agency.
- D.2.3 Period of suspension shall be accounted for in the final order passed for banning of business with the agency.
- D.2.4 The decision regarding suspension of business dealings should also be communicated to the agency.
- D.2.5 If a prima-facie, case is made out that the agency is guilty on the grounds which can result in banning of business dealings, proposal for issuance of suspension order and show cause notice shall be put up to the Competent Authority. The suspension order and show cause notice must include that (i) the agency is put on suspension list and (ii) why action should not be taken for banning the agency for future business from GAIL.

The competent authority to approve the suspension will be same as that for according approval for banning.



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**D 3 Effect of Suspension of business:**

Effect of suspension on other on-going/future tenders will be as under:

- D.3.1 No enquiry/bid/tender shall be entertained from an agency as long as the name of agency appears in the Suspension List.
- D.3.2 If an agency is put on the Suspension List during tendering:
- D.3.2.1 after issue of the enquiry /bid/tender but before opening of Technical bid, the bid submitted by the agency shall be ignored.
- D.3.2.2 after opening Technical bid but before opening the Price bid, the Price bid of the agency shall not be opened and BG/EMD submitted by the agency shall be returned to the agency.
- D.3.2.3 after opening of price, BG/EMD made by the agency shall be returned; the offer of the agency shall be ignored & will not be further evaluated. If the agency is put on Suspension list for fraud/ mis-appropriation of facts conducted in the same tender/other tender where errant agency emerges as the lowest (L1), then such tender shall also be cancelled and re-invited.
- D.3.3 The existing contract (s)/ order (s) under execution shall continue.
- D.3.4 Tenders invited for procurement of goods, works and services shall have provision that the bidder shall submit a undertaking to the effect that (i) neither the bidder themselves nor their allied agency/(ies) are on banning list of GAIL or the Ministry of Petroleum and Natural Gas and (ii) bidder is not banned by any Government department/ Public Sector.

**F. Appeal against the Decision of the Competent Authority:**

- F.1 The agency may file an appeal against the order of the Competent Authority for putting the agency on banning list. The appeal shall be filed to Appellate Authority. Such an appeal shall be preferred within one month from the of receipt of banning order.
- F.2 Appellate Authority would consider the appeal and pass appropriate order which shall be communicated to the party as well as the Competent Authority.
- F.3 Appeal process may be completed within 45 days of filing of appeal with the Appellate Authority.
- G. Wherever there is contradiction with respect to terms of 'Integrity pact' , GCC and 'Procedure for action in case of Corrupt/Fraudulent/ Collusive/Coercive Practice', the provisions of 'Procedure for action in case of Corrupt/Fraudulent/ Collusive/Coercive Practice' shall prevail.

**Annexure-II**

**PROCEDURE FOR EVALUATION OF PERFORMANCE OF VENDORS/  
SUPPLIERS/ CONTRACTORS/ CONSULTANTS**

**1.0 OBJECTIVE**

The objective of Evaluation of Performance aims to recognize, and develop reliable Vendors/ Suppliers/Contractors/ Consultants so that they consistently meet or exceed expectations and requirements.

The purpose of this procedure is to put in place a system to monitor performance of Vendors/ Suppliers/Contractors/ Consultants associated with GAIL in Projects and in O&M so as to ensure timely completion of various projects, timely receipt of supplies including completion of works & services for operation and maintenance of operating plants and quality standards in all respects.

**2.0 METHODOLOGY**

i) Preparation of Performance Rating Data Sheet

Performance rating data Sheet for each and every Vendor/ Supplier/Contractor/ Consultant for all orders/Contracts with a value of Rs. 7 Lakhs and above is recommended to be drawn up. These data sheets are to be separately prepared for orders/ contracts related to Projects and O&M. Format, Parameters, Process, responsibility for preparation of Performance Rating Data Sheet are separately mentioned.

ii) Measurement of Performance

Based on the parameters defined in Data Sheet, Performance of concerned Vendor/ Supplier/Contractor/ Consultant would be computed and graded accordingly. The measurement of the performance of the Party would be its ability to achieve the minimum scoring of 60% points in the given parameters.

iii) Initiation of Measures:

Depending upon the Grading of Performance, corrective measures would be initiated by taking up the matter with concerned Vendor/ Supplier/Contractor/ Consultant. Response of Vendor/ Supplier/Contractor/ Consultant would be considered before deciding further course of action.

iv) Implementation of Corrective Measures:

Based on the response of Vendor/ Supplier/Contractor/ Consultant, concerned Engineer-in-Charge for the Projects and/or OIC in case of O&M would recommend for continuation or discontinuation of such party from the business of GGPL.

v) Orders/contracts placed on Proprietary/OEM basis for O&M will be evaluated and, if required, corrective action will be taken for improvement in future.

### 3.0 PROCESS OF EVALUATION OF PERFORMANCE OF VENDORS/ SUPPLIERS/ CONTRACTORS/ CONSULTANTS

#### 3.1 FOR PROJECTS

- i) Evaluation of performance of Vendors/ Suppliers/Contractors/ Consultants in case of PROJECTS shall be done immediately with commissioning of any Project.
- ii) On commissioning of any Project, EIC (Engineer-in-charge)/ Project-in-charge shall prepare a Performance Rating Data Sheet (Format at Annexure-1) for all Orders and Contracts.
- iii) Depending upon the Performance Rating, following action need to be initiated by Engineer-in-charge/Project-in-charge:

Sl.No.	Performance Rating	Action
1	POOR	Seek explanation for Poor performance
2	FAIR	Seek explanation for Fair performance
3	GOOD	Letter to the concerned for improving performance in future
4	VERY GOOD	No further action

- iv) Reply from concerned Vendor/ Supplier/Contractor/ Consultant shall be examined. In case of satisfactory reply, Performance Rating data Sheet to be closed with a letter to the concerned for improving performance in future.
- v) When no reply is received or reasons indicated are unsatisfactory, the following actions need to be taken:
  - A) Where Performance rating is “POOR”:

Recommend such defaulting Vendor/ Supplier/Contractor/ Consultant for putting on Holiday for a period from one to three years as given below:

- (i) Poor Performance due to reasons other than Quality : **One Year**
- (ii) Poor Performance on account of Quality (if any mark obtained against Quality parameter is less than 30): **Two Years**
- (iii) Poor Performance leading to termination of contract or Offloading of contract due to poor performance solely attributable to Vendor/ Supplier/Contractor/ Consultant or Repeated Offence: **Three Years**

Non performance of a Vendor/Supplier/Contractor/Consultant leading to termination of Contract/ Order, such Vendor/ Supplier/ Contractor/Consultant are also to be considered for Suspension.

In all such cases, concerned site will put up recommendation for issuance of SCN and putting the party on suspension list as per process defined for suspension in “Procedure for Action in case of Corrupt/ Fraudulent/ Collusive/ Coercive Practices”

(B) Where Performance rating is “FAIR”:

Recommend for issuance of warning to such defaulting Vendor/ Supplier/Contractor/ Consultant to improve their performance.

### 3.2 FOR CONSULTANCY JOBS

Monitoring and Evaluation of consultancy jobs will be carried out in the same way as described in para 3.1 for Projects.

### 3.3 FOR OPERATION & MAINTENANCE

- i) Evaluation of performance of Vendors/ Suppliers/Contractors/ Consultants in case of Operation and Maintenance shall be done immediately after execution of order/ contract.
- ii) After execution of orders a Performance Rating Data Sheet (Format at Annexure-2) shall be prepared for Orders by Site C&P and for Contracts/Services by respective Engineer-In-Charge.
- iii) Depending upon Performance Rating, following action need to be initiated by Site C&P:

Sl. No.	Performance Rating	Action
1	<b>POOR</b>	Seek explanation for Poor performance
2.	<b>FAIR</b>	Seek explanation for Fair performance
3	<b>GOOD</b>	Letter to the concerned for improving performance in future.
4	<b>VERY GOOD</b>	No further action

- iv) Reply from concerned Vendor/ Supplier/Contractor/ Consultant shall be examined. In case of satisfactory reply, Performance Rating data Sheet to be closed with a letter to the concerned for improving performance in future.
- v) When no reply is received or reasons indicated are unsatisfactory, the following actions need to be taken:
  - A) Where performance rating is “POOR”

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Recommend such defaulting Vendor/Supplier/Contractor/ Consultant for putting on Holiday for a period from one to three years as given below:

- (i) Poor Performance due to reasons other than Quality : **One Year**
- (ii) Poor Performance on account of Quality (if any mark obtained against Quality parameter is less than 30): **Two Years**
- (iv) Poor Performance leading to termination of contract or Offloading of contract due to poor performance solely attributable to Vendor/Supplier/Contractor/Consultant or Repeated Offence: **Three Years**

Non-performance of a Vendor/Supplier/Contractor/Consultant leading to termination of Contract/ Order such Vendor/ Supplier/ Contractor/Consultant are also to be considered for Suspension.

In all such cases, concerned site will put up recommendation for issuance of SCN and putting the party on suspension list as per process defined for suspension in “Procedure for Action in case of Corrupt/ Fraudulent/ Collusive/ Coercive Practices”

(B) Where Performance rating is “FAIR”

Recommend for issuance of warning to such defaulting Vendors/Contractors/Consultants to improve their performance.

**4.0 EXCLUSIONS:**

The following would be excluded from the scope of evaluation of performance of Vendors/ Suppliers/Contractors/ Consultants:

- i) Orders/Contracts below the value of Rs. 7 Lakhs.
- ii) One time Vendor/ Supplier/Contractor/ Consultant.
- iii) Orders for Misc./Administrative items/ Non stock Non valued items.

However, concerned Engineer-in-Charge /OICs will continue to monitor such cases so as to minimize the impact on Projects/O&M plants due to non performance of Vendors/ Suppliers/Contractors/ Consultants in all such cases.

**5.0 REVIEW & RESTORATION OF PARITES PUT ON HOLIDAY**

- 5.1 An order for Holiday passed for a certain specified period shall deemed to have been automatically revoked on the expiry of that specified period and it will not be necessary to issue a specific formal order of revocation.

Further, in case Vendor/ Supplier/Contractor/ Consultant is put on holiday due to quality, and new order is placed on bidder after restoration of Vendor/ Supplier/Contractor/ Consultant, such order will be properly monitored during execution stage by the concerned site.

## **6.0 EFFECT OF HOLIDAY**

- 6.1 If a Vendor/ Supplier/Contractor/ Consultant is put on Holiday, such Vendor/ Supplier/Contractor/ Consultant should not be considered in ongoing tenders/future tenders.
- 6.2 However, if such Vendor/ Supplier/Contractor/ Consultant is already executing any other order/ contract and their performance is satisfactory in terms of the relevant contract, should be allowed to continue till its completion without any further increase in scope except those incidental to original scope mentioned in the contract. In such a case CPBG will not be forfeited and payment will be made as per provisions of concerned contract. However, this would be without prejudice to other terms and conditions of the contract.
- 6.3. Effect on other ongoing tendering:
- 6.3.1 After issue of the enquiry /bid/tender but before opening of Technical bid, the bid submitted by the party shall be ignored.
- 6.3.2 after opening Technical bid but before opening the Price bid, the Price bid of the party shall not be opened and BG/EMD submitted by the party shall be returned to the party.
- 6.3.3 after opening of price, BG/EMD made by the party shall be returned; the offer of the party shall be ignored & will not be further evaluated. If errant party emerges as the lowest (L1), then such tender shall also be cancelled and re-invited.
- 7.0 While putting the Vendor/ Supplier/Contractor/ Consultant on holiday as per the procedure, the holding company, subsidiary, joint venture, sister concerns, group division of the errant Vendor/ Supplier/Contractor/ Consultant shall not be considered for putting on holiday list.

Any bidder, put on holiday, will not be allowed to bid through consortium route also in new tender during the period of holiday.

- 8.0 If an unsuccessful bidder makes any vexatious, frivolous or malicious complaint against the tender process with the intention of delaying or defeating any procurement or causing loss to GAIL or any other bidder, such bidder will be put on holiday for a period of six months, if such complaint is proved to be vexatious, frivolous or malicious, after following the due procedure.

**9. APPEAL AGAINST THE DECISION OF THE COMPETENT AUTHORITY:**

- (a) The party may file an appeal against the order of the Competent Authority for putting the party on Holiday list. The appeal shall be filed to Appellate Authority. Such an appeal shall be preferred within one month from the of receipt of Holiday order.
- (b) Appellate Authority would consider the appeal and pass appropriate order which shall be communicated to the party as well as the Competent Authority.
- (c) Appeal process may be completed within 45 days of filing of appeal with the Appellate Authority.
- (d) “Appellate Authority” shall mean Committee of Directors consisting of Director (Finance) and Director (BD) for works centers under Director (Projects). For all other cases committee of Directors shall consist of Director (Finance) & Director (Projects).

**10. ERRANT BIDDER**

In case after price bid opening the lowest evaluated bidder (L1) is not awarded the job for any mistake committed by him in bidding or withdrawal of bid or modification of bid or varying any term in regard thereof leading to re-tendering, GAIL shall forfeit EMD paid by the bidder and such bidders shall be debarred from participation in re-tendering of the same job(s)/item(s).

Further, such bidder will be put on holiday for a period of six months after following the due procedure.

- 11. In case GST department brings to the notice of GGPL that a Party has not paid to the credit of the Government the GST collected from GGPL, then party will be put on holiday for a period of six months after following the due procedure.

Annexure-1

**GGPL  
PERFORMANCE RATING DATA SHEET  
(FOR PROJECTS/ CONSULTANCY JOBS)**

- i) Project/Work Centre :
- ii) Order/ Contract No. & date :

**TENDER NO: GGPL/KKD/C&P/CW/2545/VS**

- iii) Brief description of Items :  
Works/Assignment
- iv) Order/Contract value (Rs.) :
- v) Name of Vendor/Supplier/ :  
Contractor/ Consultant
- vi) Contracted delivery/ :  
Completion Schedule
- vii) Actual delivery/ :  
Completion date

Performance Parameter	Delivery/ Completion Performance	Quality Performance	Reliability Performance#	Total
Maximum Marks	40	40	20	100
Marks Allotted				

Note:

Remarks (if any)

**PERFORMANCE RATING (\*\*)**

Note :

(#) Vendor/Supplier/Contractor/Consultant who seek repeated financial assistance or deviation beyond contract payment term or seeking direct payment to the sub-vendor/sub-contractor due to financial constraints, then '0' marks should be allotted against Reliability Performance.

(\*) Allocation of marks should be as per enclosed instructions

(\*\*) Performance rating shall be classified as under :

Sl. No.	Range (Marks)	Rating
1	60 & below	POOR
2	61-75	FAIR
3	76-90	GOOD
4	More than 90	VERY GOOD

Signature of Authorised Signatory:

Name:

Designation:

**Instructions for allocation of marks**

1. Marks are to be allocated as under :

**1.1 DELIVERY/ COMPLETION PERFORMANCE 40 Marks**

Delivery Period/ Completion Schedule	Delay in Weeks	Marks
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a) Upto 3 months	Before CDD	40
	Delay upto 4 weeks	35
	” 8 weeks	30
	” 10 weeks	25
	” 12 weeks	20
	” 16 weeks	15
	More than 16 weeks	0
b) Above 3 months	Before CDD	40
	Delay upto 4 weeks	35
	” 8 weeks	30
	” 10 weeks	25
	” 16 weeks	20
	” 20 weeks	15
	” 24 weeks	10
	More than 24 weeks	0

**1.2 QUALITY PERFORMANCE**

**40 Marks**

For Normal Cases : No Defects/ No Deviation/ No failure: 40 marks

i) Rejection/Defects	Marks to be allocated on	10 marks
	Pro-rata basis for acceptable	
	Quantity as compared to total	
	Quantity for normal cases	
ii) When quality failure endanger system integration and safety of the system	Failure of severe nature	0 marks
	- Moderate nature	5 marks
	- low severe nature	10-25 marks
iii) Number of deviations	1. No deviation	5 marks
	2. No. of deviations $\leq 2$	2 marks
	3. No. of deviations $> 2$	0 marks

**1.3 RELIABILITY PERFORMANCE**

**20 Marks**

<b>A.</b>	<b>FOR WORKS/CONTRACTS</b>	
i)	Submission of order acceptance, agreement, PBG, Drawings and other documents within time	4 marks

ii)	Mobilization of resources as per Contract and in time	4 marks
iii)	Liquidation of Check-list points	4 marks
iv)	Compliance to statutory and HS&E requirements  or  Reliability of Estimates/Design/Drawing etc. in case of Consultancy jobs	4 marks
v)	Timely submission of estimates and other documents for Extra, Substituted & AHR items	4 marks
<b>B.</b>	<b>FOR SUPPLIES</b>	
i)	Submission of order acceptance, PBG, Drawings and other documents within time	5 marks
ii)	Attending complaints and requests for after sales service/ warranty repairs and/ or query/ advice (upto the evaluation period).	5 marks
iii)	Response to various correspondence and conformance to standards like ISO	5 marks
iv)	Submission of all required documents including Test Certificates at the time of supply	5 marks

Annexure-2

**GGPL  
PERFORMANCE RATING DATA SHEET  
(FOR O&M)**

- i) Location :
- ii) Order/ Contract No. & date :
- iii) Brief description of Items :  
Works/Assignment

**TENDER NO: GGPL/KKD/C&P/CW/2545/VS**

- iv) Order / Contract value (Rs.) :
- v) Name of Vendor/Supplier/ Contractor/ Consultant :
- vi) Contract delivery/ Completion Schedule :
- vii) Actual delivery/ Completion date :

Performance Parameter	Delivery Performance	Quality Performance	Reliability Performance#	Total
Maximum Marks	40	40	20	100
Marks Allocated (*)				

Remarks (if any)

**PERFORMANCE RATING (\*\*)**

Note :

- (#) Vendor/Supplier/Contractor/Consultant who seek repeated financial assistance or deviation beyond contract payment term or seeking direct payment to the sub-vendor/sub-contractor due to financial constraints, then '0' marks should be allotted against Reliability Performance
- (\*) Allocation of marks should be as per enclosed instructions
- (\*\*) Performance rating shall be classified as under :

Sl. No.	Range (Marks)	Rating
1	60 & below	POOR
2	61-75	FAIR
3	76-90	GOOD
4	More than 90	VERY GOOD

Signature of  
Authorised Signatory:

Name:

Designation:

**Instructions for allocation of marks (For O&M)**

1. Marks are to be allocated as under :

**1.1 DELIVERY/ COMPLETION PERFORMANCE 40 Marks**

Delivery Period/ Completion Schedule	Delay in Weeks	Marks
a) Upto 3 months	Before CDD	40

Delay upto 4 weeks	35
” 8 weeks	30
” 10 weeks	25
” 12 weeks	20
” 16 weeks	15
More than 16 weeks	0

b) Above 3 months	Before CDD	40
	Delay upto 4 weeks	35
	” 8 weeks	30
	” 10 weeks	25
	” 16 weeks	20
	” 20 weeks	15
	” 24 weeks	10
	More than 24 weeks	0

**1.2 QUALITY PERFORMANCE 40 Marks**

For Normal Cases : No Defects/ No Deviation/ No failure: 40 marks

i) Rejection/Defects	Marks to be allocated on prorata basis for acceptable quantity as compared to total quantity for normal cases	10 marks
ii) When quality failure endanger system integration and safety of the system	Failure of severe nature - Moderate nature - low severe nature	0 marks 5 marks 10-25 marks
iii) Number of deviations	1. No deviation 2. No. of deviations $\leq 2$ 3. No. of deviations $> 2$	5 marks 2 marks 0 marks

**1.3 RELIABILITY PERFORMANCE 20 Marks**

<b>A.</b>	<b>FOR WORKS/CONTRACTS</b>	
i)	Submission of order acceptance, agreement, PBG, Drawings and other documents within time	4 marks
ii)	Mobilization of resources as per Contract and	4 marks

	in time	
iii)	Liquidation of Check-list points	4 marks
iv)	Compliance to statutory and HS&E requirements  or  Reliability of Estimates/Design/Drawing etc. in case of Consultancy jobs	4 marks
v)	Timely submission of estimates and other documents for Extra, Substituted & AHR items	4 marks
<b>B.</b>	<b>FOR SUPPLIES</b>	
i)	Submission of order acceptance, PBG, Drawings and other documents within time	5 marks
ii)	Attending complaints and requests for after sales service/ warranty repairs and/ or query/ advice (upto the evaluation period).	5 marks
iii)	Response to various correspondence and conformance to standards like ISO	5 marks
iv)	Submission of all required documents including Test Certificates at the time of supply	5 marks

**ANNEXURE-IV**
**BIDDING DATA SHEET (BDS)**
**ITB TO BE READ IN CONJUNCTION WITH THE FOLLOWING:**

<b>A. GENERAL</b>	
<b>ITB clause</b>	<b>Description</b>
<b>1.2</b>	The Invitation for Bids/ Tender no is : <b>GGPL/KKD/C&amp;P/CW/2545/VS</b>

**TENDER NO: GGPL/KKD/C&P/CW/2545/VS**

<b>1.1</b>	The Employer/Owner is: <b>Godavari Gas Private Limited,</b>				
<b>2.1</b>	The name of the Works/Services to be performed is: COMPOSITE WORKS IN VARIOUS CNG STATIONS AT EAST & WEST GODAVARI DISTRICTS OF ANDHRA PRADESH.				
<b>3</b>	BIDS FROM CONSORTIUM/JOINT VENTURE : <b>NOT APPLICABLE</b>				
<b>5.2.1</b>	Demand Draft/ Banker's Cheque towards Tender fee (if applicable) shall be in favour of <b>Godavari Gas Private Limited</b> payable at Rajamahendravaram, E.G Dist Andhra Pradesh				
<b>B. BIDDING DOCUMENT</b>					
<b>ITB clause</b>	<b>Description</b>				
<b>8.1</b>	For <b>clarification purposes</b> only, the communication address is: Attention: V. Srinivasulu, DGM (C&P) Street Address: Door No. 70-14-5/1, Floor/Room number: Siddarth Nagar, Near RTO office, City: Kakinada- 533001, East Godavari Dist., Andhra Pradesh, Country: India Email: <a href="mailto:v.srinivasulu@gail.co.in">v.srinivasulu@gail.co.in</a>				
<b>C. PREPARATION OF BIDS</b>					
<b>ITB clause</b>	<b>Description</b>				
<b>11.1.1 (u)</b>	The Bidder shall submit with its Techno-commercial/ Un priced bid the following additional documents (SCC Refers): Indemnity Bond _____				
<b>12</b>	Additional Provision for Schedule of Rate/ Bid Price are as under: NIL				
<b>12. &amp; 13</b>	Whether GGPL will be able to avail input tax credit in the instant tender: Currently no. <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td style="text-align: center;">YES</td> <td style="text-align: center;"><input type="checkbox"/></td> </tr> <tr> <td style="text-align: center;">NO</td> <td style="text-align: center;"><input type="checkbox"/></td> </tr> </table>	YES	<input type="checkbox"/>	NO	<input type="checkbox"/>
YES	<input type="checkbox"/>				
NO	<input type="checkbox"/>				

14	The currency of the Bid shall be INR	
15	The bid validity period shall be 3 Months from final 'Bid Due Date'.	
16.1	In case ' <b>Earnest Money / Bid Security</b> ' is in the form of ' <b>Demand Draft</b> ' or ' <b>Banker's Cheque</b> ', the same should be favor of <b>Godavari Gas Private Limited</b> payable at Rajamahendravaram, E.G Dist Andhra Pradesh. Details of GGPL's Bank is Canara Bank,	
<b>D. SUBMISSION AND OPENING OF BIDS</b>		
<b>ITB clause</b>	<b>Description</b>	
18	In addition to the original of the Bid, the number of copies required is one.	
22	The E-Tender No. of this bidding process is: <b><u>Not applicable</u></b>	
<b>22.3 and 4.0 of IFB</b>	For <b><u>bid submission purposes</u></b> only (Manual) or the submission of physical document as per clause no. 4.0 of IFB, the Owner's address is : Attention: V. Srinivasulu, DGM (C&P) Street Address: Door No. 70-14-5/1, Floor/Room number: Siddarth Nagar, Near RTO office, City: Kakinada- 533001, East Godavari Dist., Andhra Pradesh, Country: India Email: <a href="mailto:v.srinivasulu@gail.co.in">v.srinivasulu@gail.co.in</a>	
26	<b>The bid opening shall take place at:</b> <b>Godavari Gas Private Limited</b> Attention: V. Srinivasulu, DGM (C&P) Street Address: Door No. 70-14-5/1, Floor/Room number: Siddarth Nagar, Near RTO office, City: Kakinada- 533001, East Godavari Dist.,	

**TENDER NO: GGPL/KKD/C&P/CW/2545/VS**

	Andhra Pradesh, Country: India Email: <a href="mailto:v.srinivasulu@gail.co.in">v.srinivasulu@gail.co.in</a> <b>Date: 26.10.2018 / Time: 15:00 Hrs</b>
<b>E. EVALUATION, AND COMPARISON OF BIDS</b>	
<b>ITB clause</b>	<b>Description</b>
<b>32</b>	Evaluation Methodology is mentioned in Section-II.
<b>33</b>	Compensation for Extended Stay: <b>NOT APPLICABLE</b>
<b>F. AWARD OF CONTRACT</b>	
<b>ITB clause</b>	<b>Description</b>
<b>37</b>	State of which stamp paper is required for Contract Agreement: <b>Andhra Pradesh</b>
<b>38</b>	Contract Performance Security/ Security Deposit : <b>Applicable</b> If applicable: <b>10 % of contract value.</b>
<b>40</b>	Whether tendered item is non-split able or not-divisible : <b>NO</b>
<b>41</b>	Provision of AHR Item : <b>Applicable</b>



# **FORMS & FORMAT**

**LIST OF FORMS & FORMAT**

<b>Form No.</b>	<b>Description</b>
F-1	BIDDER'S GENERAL INFORMATION
F-2	BID FORM
F-3	LIST OF ENCLOSURES
F-4	PROFORMA OF "BANK GUARANTEE" FOR "EARNEST MONEY / BID SECURITY"
F-4A	PROFORMA OF "LETTER OF CREDIT" FOR "EARNEST MONEY / BID SECURITY"
F-5	LETTER OF AUTHORITY
F-6	NO DEVIATION CONFIRMATION
F-7	DECLARATION REGARDING HOLIDAY/BANNING AND LIQUIDATION, COURT RECEIVERSHIP ETC.
F-8	CERTIFICATE FOR NON-INVOLVMENT OF GOVT. OF INDIA
F-9	PROFORMA OF "BANK GUARANTEE" FOR "CONTRACT PERFORMANCE SECURITY / SECURITY DEPOSIT"
F-10	AGREED TERMS & CONDITIONS
F-11	ACKNOWLEDGEMENT CUM CONSENT LETTER
F-12	UNDERTAKING ON LETTERHEAD
F-13	BIDDER'S EXPERIENCE
F-14	CHECK LIST
F-15	FORMAT FOR CERTIFICATE FROM BANK IF BIDDER'S WORKING CAPITAL IS INADEQUATE
F-16	FORMAT FOR CHARTERED ACCOUNTANT CERTIFICATE FOR FINANCIAL CAPABILITY OF THE BIDDER
F-17	FORMAT FOR CONSORTIUM/JV AGREEMENT
F-18	BIDDER'S QUERIES FOR PRE BID MEETING
F-19	E-BANKING FORMAT
F-20	INTEGRITY PACT
F-21	INDEMNITY BOND

**TENDER NO: GGPL/KKD/C&P/CW/2545/VS**

**F-1**

**BIDDER'S GENERAL INFORMATION**

To,  
M/s GGPL  
Rajahmahendravaram

TENDER NO:

1	Bidder Name	
2	Status of Firm	Proprietorship Firm/Partnership firm/ Limited/Others If Others Specify: _____ [Enclose certificate of Registration]
3	Name of Proprietor/Partners/Directors of the firm/company	
4	Number of Years in Operation	
5	Address of Registered Office: *In case of Partnership firm, enclose letter mentioning current address of the firm and the full names and current addresses of all the partners of the firm.	City: District: State: PIN/ZIP:
6	Operation Address (if different from above)	City: District: State: PIN/ZIP:
8	Telephone Number	_____ (Country Code) (Area Code) (Telephone No.)
9	E-mail address	
10	Website	
11	Fax Number:	_____ (Country Code) (Area Code) (Telephone No.)

**TENDER NO: GGPL/KKD/C&P/CW/2545/VS**

12	ISO Certification, if any	{If yes, please furnish details}
13	Bid Currency	
14	Banker's Name	
15	Branch	
17	Bank account number	
18	PAN No.	[Enclose copy of PAN Card]
19	GST no.	[Enclose copy of GST Registration Certificate]
20	EPF Registration No.	[Enclose copy of EPF Registration Certificate]
21	ESI code No.	[Enclose copy of relevant document]
22	We (Bidder) are cover under the definition of section 2 (n) of the MSMED Act	Yes / No <i>(If the response to the above is 'Yes', Bidder to provide Purchaser a copy of the Entrepreneurs Memorandum (EM) filled with the authority specified by the respective State Government.)</i>
23	Whether Micro/Small/Medium Enterprise	(Bidder to submit documents as specified it ITB)
24	Type of Entity	Corporate/ Non-Corporate (As per Service tax Act). (In case of Non-Corporate Entity, bidder will submit documentary evidence for same).

Place:

Date:

[Signature of Authorized Signatory of Bidder]

Name:

Designation:

Seal:



**TENDER NO: GGPL/KKD/C&P/CW/2545/VS**

**F-2**  
**BID FORM**

To,

M/s Godavari Gas Private Limited  
Rajahmahendram

SUB:  
TENDER NO:

Dear Sir,

After examining / reviewing the Bidding Documents for the tender of  
“\_\_\_\_\_” including  
"Specifications & Scope of Work", "General Conditions of Contract [GCC]", "Special  
Conditions of Contract [SCC]" and "Schedule of Rates [SOR]", etc. the receipt of which is  
hereby duly acknowledged, we, the undersigned, are pleased to offer to execute the whole  
part of the job and in conformity with the said Bid Documents, including Addenda /  
Corrigenda Nos. \_\_\_\_\_.

We confirm that this Bid is valid for a period as specified in BDS from the date of opening of  
"Techno-Commercial / Un-priced Bid", and it shall remain binding upon us and may be  
accepted by any time before the expiry of that period.

If our Bid is accepted, we will provide the "Contract Performance Security / Security  
Deposit" equal to "\_\_\_\_\_ of the Contract Price" or as mentioned in Tender Document  
for the due performance within "thirty [30] days" of such Award.

Until a final Agreement/Letter of Award is prepared and executed, the tender document  
(including addenda/ corrigenda) together with the "Notification of Award" shall constitute a  
binding Agreement between us.

We understand that Bidding Document is not exhaustive and any action and activity not  
mentioned in Bidding Documents but may be inferred to be included to meet the intend of the  
Bidding Documents shall be deemed to be mentioned in Bidding Documents unless otherwise  
specifically excluded and we confirm to perform for fulfillment of Agreement and  
completeness of the Work in all respects within the time frame and agreed price.

We understand that you are not bound to accept the lowest priced or any Bid that you may  
receive.

Place: [Signature of Authorized Signatory of Bidder]  
Date: Name:  
Designation:  
Seal:

TENDER NO: GGPL/KKD/C&P/CW/2545/VS

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**F-3**  
**LIST OF ENCLOSURES**

To,

M/s Godavari Gas Private Limited  
Rajahmahendram

SUB:

TENDER NO:

**Dear Sir,**

We are enclosing the following documents as part of the bid:

1. Power of Attorney of the signatory to the Bidding Document.
2. Document showing annual turnover for the last three years such as annual reports, profit and loss account, net worth etc. along with information as sought in enclosed format F-16
3. Document showing Financial Situation Information as sought in enclosed format F-16
4. Copy of Bidding Documents along with addendum/corrigendum duly signed and sealed on each page, in token of confirmation that Bid Documents are considered in full while preparing the bid and in case of award, work will be executed in accordance with the provisions detailed in Bid Documents.
5. Documentary Evidences showing the Bidder's claim of meeting Technical Criteria as mentioned in Clause 4 of ITB.
6. Bid Security/EMD\*
7. Tender Fee\*
8. Integrity Pact\*
9. Power of Attorney\*
10. Duly certified document from chartered engineer and or chartered accountant.

Note:

\* In case of e-bidding the bidder has the option to submit specified documents in physical form on/before the bid due date or within seven days from the bid opening date. However, scanned copy of these (same) documents must be submitted on-line as part of e-bid before the bid due date/time.

Place:

[Signature of Authorized Signatory of Bidder]

Date:

Name:

Designation:

Seal:



TENDER NO: GGPL/KKD/C&P/CW/2545/VS

**FORMAT F-4**

**PROFORMA OF "BANK GUARANTEE"**  
**FOR "EARNEST MONEY / BID SECURITY"**

(To be stamped in accordance with the Stamp Act)

Ref.....

Bank Guarantee No.....

Date.....

To,

M/s Godavari Gas Private Limited  
D. No.: 85-06-23/2,2nd Floor, Above Happy Home Furniture Shop,  
40th Ward, Morumpudi Junction,  
Rajamahendravaram – 533103  
East Godavari Dist, Andhra Prades

SUB:

TENDER NO:

Dear Sir(s),

In accordance with Letter Inviting Tender under your reference No \_\_\_\_\_ M/s. \_\_\_\_\_ having their Registered / Head Office at \_\_\_\_\_ (hereinafter called the Tenderer), wish to participate in the said tender for \_\_\_\_\_

As an irrevocable Bank Guarantee against Earnest Money for the amount of \_\_\_\_\_ is required to be submitted by the Tenderer as a condition precedent for participation in the said tender which amount is liable to be forfeited on the happening of any contingencies mentioned in the Tender Document.

We, the \_\_\_\_\_ Bank at \_\_\_\_\_ having our Head Office \_\_\_\_\_ (Local Address) guarantee and undertake to pay immediately on demand without any recourse to the tenderers by Godavari Gas Private Limited, the amount \_\_\_\_\_ without any reservation, protest, demur and recourse. Any such demand made by GAIL, shall be conclusive and binding on us irrespective of any dispute or difference raised by the Tenderer.

This guarantee shall be irrevocable and shall remain valid up to \_\_\_\_\_ [this date should be two (02) months beyond the validity of the bid]. If any further extension of this guarantee is required, the same shall be extended to such required period on receiving instructions from M/s. \_\_\_\_\_ whose behalf this guarantee is issued.

In witness whereof the Bank, through its authorized officer, has set its hand and stamp on this \_\_\_\_\_ day of \_\_\_\_\_ 20\_\_ at \_\_\_\_\_.

WITNESS:

(SIGNATURE)  
(NAME)

(SIGNATURE)  
(NAME)

Designation with Bank Stamp

TENDER NO: GGPL/KKD/C&P/CW/2545/VS

(OFFICIAL ADDRESS)

Attorney as per  
Power of Attorney No. \_\_\_\_\_  
Date: \_\_\_\_\_

**INSTRUCTIONS FOR FURNISHING "BID SECURITY / EARNEST MONEY" BY "BANK GUARANTEE"**

1. The Bank Guarantee by Bidders will be given on non-judicial stamp paper as per "Stamp Duty" applicable. The non-judicial stamp paper should be in the name of the issuing Bank. In case of foreign Bank, the said Bank's Guarantee to be issued by its correspondent Bank in India on requisite non-judicial stamp paper
2. The expiry date should be arrived at in accordance with "ITB: Clause-15.1".
3. The Bank Guarantee by bidders will be given from Bank as specified in "ITB".
4. A letter from the issuing Bank of the requisite Bank Guarantee confirming that said Bank Guarantee / all future communication relating to the Bank Guarantee shall be forwarded to the Employer at its address as mentioned at "ITB".
5. Bidders must indicate the full postal address of the Bank along with the Bank's E-mail / Fax / Phone from where the Earnest Money Bond has been issued.
6. If a Bank Guarantee is issued by a commercial Bank, then a letter to Employer confirming its net worth is more than Rs. 1,000,000,000.00 [Rupees One Hundred Crores] or equivalent along with documentary evidence.



TENDER NO: GGPL/KKD/C&P/CW/2545/VS

**F-4A**  
**PROFORMA OF "LETTER OF CREDIT"**  
**FOR "EARNEST MONEY / BID SECURITY"**

To,

M/s Godavari Gas Private Limited  
D. No.: 85-06-23/2, 2nd Floor,  
Above Happy Home Furniture Shop,  
40th Ward, Morumpudi Junction,  
Rajamahendravaram – 533103  
East Godavari Dist, Andhra Pradesh

SUB:

TENDER NO:

**Irrevocable and confirmed Letter of Credit No. .... Amount: Rs.**

**Validity of this Irrevocable:** ..... (in India)  
Letter of Credit (2 months beyond validity of Offer)

**Dear Sir,**

1. You are hereby authorized to draw on ..... (Name of Applicant/Bidder with full address) for a sum not exceeding ..... available by your demand letter (draft) on them at sight drawn for Rs. .... accompanied by a certificate by **Godavari Gas Private Limited**, with the Tender No. duly incorporated therein, that one or more of the following conditions has/have occurred, specifying the occurred condition(s):
  - (i) The Bidder withdraws its Bid during the period of Bid validity or any extension thereof duly agreed by the Bidder.
  - (ii) The Bidder varies or modifies its Bid in a manner not acceptable to **Godavari Gas Private Limited** during the period of bid validity or any extension thereof duly agreed by the Bidder.
  - (iii) The Bidder, having been notified of the acceptance of its Bids,
    - (a) Fails or refuses to execute the Supply Order/Contract
    - (b) Fails or refuses to furnish the Contract Performance Security within 30 days before expiry of Bid Security.
    - (c) Fails to accept arithmetic corrections as per tender conditions.
  - (iv) The Bidder defaults w.r.t. any terms & conditions of Tender Document which call for forfeiture of Earnest Money Deposit (EMD).



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2. This Irrevocable Letter of Credit has been established towards EMD/Bid Security against Tender No ..... for ..... (Name of Tender Document)
3. We hereby guarantee to protect the Drawers, Endorsers and bonafide holders from any consequences, which may arise in the event of the non-acceptance or non-payment of Demand Letter (draft) in accordance with the terms of this credit.
4. This Credit is issued subject to the Uniform Customs and Practices for Documentary Credits (1993 Revised) International Chamber of Commerce brochure No. 500.
5. Please obtain reimbursement as under: .....
6. All foreign as well as Indian bank charges will be on the account of M/s. .... (Applicant/Bidder)

FOR .....

**Authorized Signature**  
(Original Bank)

**Counter Signature**

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**F-5**  
**LETTER OF AUTHORITY**

[Pro forma for Letter of Authority for Attending Subsequent 'Negotiations' / 'Pre-Bid Meetings' / 'Un-priced Bid Opening' / 'Price Bid Opening']

Ref:

Date:

To,

M/s Godavari Gas Private Limited  
Rajahmahendram

SUB:

TENDER NO:

**Dear Sir,**

I/We, \_\_\_\_\_ hereby authorize the following representative(s) for attending any 'Negotiations' / 'Meetings [Pre-Bid Meeting]', 'Un-priced Bid Opening', 'Price Bid Opening' and for any subsequent correspondence / communication against the above Bidding Documents:

[1] Name & Designation \_\_\_\_\_ Signature \_\_\_\_\_

Phone/Cell:

Fax:

E-mail: ..... @ .....

[2] Name & Designation \_\_\_\_\_ Signature \_\_\_\_\_

Phone/Cell:

Fax:

E-mail: ..... @ .....

We confirm that we shall be bound by all commitments made by aforementioned authorised representative(s).

Place:

[Signature of Authorized Signatory of Bidder]

Date:

Name:

Designation:

Seal:

Note: This "Letter of Authority" should be on the "**letterhead**" of the Firm / Bidder and should be signed by a person competent and having the 'Power of Attorney' to bind the Bidder. Not more than 'two [02] persons per Bidder' are permitted to attend "Techno-commercial / Un-priced" & "Price Bid" Openings. Bidders authorized representative is required to carry a copy of this authority letter while attending the un-priced and priced bid opening, the same shall be submitted to **Godavari Gas Private Limited**.

**TENDER NO: GGPL/KKD/C&P/CW/2545/VS**

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**F-6**  
**"NO DEVIATION" CONFIRMATION**

To,

M/s Godavari Gas Private Limited  
Rajahmahendram

SUB:

TENDER NO:

**Dear Sir,**

We understand that any 'deviation / exception' in any form may result in rejection of Bid. We, therefore, certify that we have not taken any 'exception / deviation' anywhere in the Bid and we agree that if any 'deviation / exception' is mentioned or noticed, our Bid may be rejected.

Place:

Date:

[Signature of Authorized Signatory of Bidder]

Name:

Designation:

Seal:

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**F-7**  
**DECLARATION REGARDING HOLIDAY/BANNING AND LIQUIDATION,**  
**COURT RECEIVERSHIP**

To,

M/s Godavari Gas Private Limited  
Rajahmahendram

SUB:

TENDER NO:

**Dear Sir,**

We hereby confirm that we are not on 'Holiday' by GAIL or Public Sector Project Management Consultant (like EIL, PMC only due to "poor performance" or "corrupt and fraudulent practices") or banned by Government department/ Public Sector on due date of submission of bid.

Further, we confirm that neither we nor our allied agency/(ies) (as defined in the Procedure for Action in case of Corrupt/ Fraudulent/ Collusive/ Coercive Practices) are on banning list of GAIL or the Ministry of Petroleum and Natural Gas.

We also confirm that we are not under any liquidation, court receivership or similar proceedings or 'bankruptcy'.

In case it comes to the notice of GAIL that the bidder has given wrong declaration in this regard, the same shall be dealt as 'fraudulent practices' and action shall be initiated as per the Procedure for action in case of Corrupt/Fraudulent/Collusive/Coercive Practices.

Further, we also confirm that in case there is any change in status of the declaration prior to award of contract, the same will be promptly informed to GAIL by us.

Place:

[Signature of Authorized Signatory of Bidder]

Date:

Name:

Designation:

Seal:



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**F-8**  
**CERTIFICATE FOR NON-INVOLVMENT OF GOVT. OF INDIA**

To,

M/s Godavari Gas Private Limited  
Rajahmahendram

SUB:

TENDER NO:

**Dear Sir,**

If we become a successful Bidder and pursuant to the provisions of the Bidding Documents, award is given to us for the tender for“ \_\_\_\_\_”,the following Certificate shall be automatically enforceable:

"We agree and acknowledge that the Employer is entering into the Agreement solely on its own behalf and not on behalf of any other person or entity. In particular, it is expressly understood & agreed that the Government of India is not a party to the Agreement and has no liabilities, obligations or rights thereunder. It is expressly understood and agreed that the Employer is authorized to enter into Agreement, solely on its own behalf under the applicable laws of India. We expressly agree, acknowledge and understand that the Employer is not an agent, representative or delegate of the Government of India. It is further understood and agreed that the Government of India is not and shall not be liable for any acts, omissions, commissions, breaches or other wrongs arising out of the Agreement. Accordingly, we hereby expressly waive, release and forego any and all actions or claims, including cross claims, VIP claims or counter claims against the Government of India arising out of the Agreement and covenants not to sue to Government of India as to any manner, claim, cause of action or things whatsoever arising of or under the Agreement."

Place:

[Signature of Authorized Signatory of Bidder]

Date:

Name:

Designation:

Seal:

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**F-9**  
**PROFORMA OF "BANK GUARANTEE" FOR "CONTRACT**  
**PERFORMANCE SECURITY / SECURITY DEPOSIT"**  
**(ON NON-JUDICIAL STAMP PAPER OF APPROPRIATE VALUE)**

To,  
M/s Godavari Gas Private Limited  
Rajahmahendram

**Dear Sir(s),**

M/s. \_\_\_\_\_ having registered office at \_\_\_\_\_ (herein after called the "contractor/supplier" which expression shall wherever the context so require include its successors and assignees) have been placed/ awarded the job/work of \_\_\_\_\_ vide PO/LOA /FOA No. \_\_\_\_\_ dated \_\_\_\_\_ for **Godavari Gas Private Limited** having registered office at .....(herein after called the "GGPL" which expression shall wherever the context so require include its successors and assignees).

The Contract conditions provide that the SUPPLIER/CONTRACTOR shall pay a sum of Rs. \_\_\_\_\_ (Rupees \_\_\_\_\_) as full Contract Performance Guarantee in the form therein mentioned. The form of payment of Contract Performance Guarantee includes guarantee executed by Nationalized Bank/Scheduled Commercial Bank, undertaking full responsibility to indemnify **Godavari Gas Private Limited**, in case of default.

The said M/s. \_\_\_\_\_ has approached us and at their request and in consideration of the premises we having our office at \_\_\_\_\_ have agreed to give such guarantee as hereinafter mentioned.

1. We \_\_\_\_\_ hereby undertake to give the irrevocable & unconditional guarantee to you that if default shall be made by M/s. \_\_\_\_\_ in performing any of the terms and conditions of the tender/order/contract or in payment of any money payable to **Godavari Gas Private Limited** we shall on first demand pay without demur, contest, protest and/ or without any recourse to the contractor to GGPL in such manner as GGPL may direct the said amount of Rupees \_\_\_\_\_ only or such portion thereof not exceeding the said sum as you may require from time to time.
2. You will have the full liberty without reference to us and without affecting this guarantee, postpone for any time or from time to time the exercise of any of the powers and rights conferred on you under the order/contract with the said M/s. \_\_\_\_\_ and to enforce or to forbear from endorsing any powers or rights or by reason of time being given to the said

**TENDER NO: GGPL/KKD/C&P/CW/2545/VS**

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M/s. \_\_\_\_\_ and such postponement forbearance would not have the effect of releasing the bank from its obligation under this debt.

3. Your right to recover the said sum of Rs. \_\_\_\_\_ (Rupees \_\_\_\_\_) from us in manner aforesaid is absolute & unequivocal and will not be affected or suspended by reason of the fact that any dispute or disputes have been raised by the said M/s. \_\_\_\_\_ and/or that any dispute or disputes are pending before any officer, tribunal or court or arbitrator or any other authority/forum and any demand made by you in the bank shall be conclusive and binding. The bank shall not be released of its obligations under these presents by any exercise by you of its liberty with reference to matter aforesaid or any of their or by reason or any other act of omission or commission on your part or any other indulgence shown by you or by any other matter or changed what so ever which under law would, but for this provision, have the effect of releasing the bank.
4. The guarantee herein contained shall not be determined or affected by the liquidation or winding up dissolution or changes of constitution or insolvency of the said supplier/contractor but shall in all respects and for all purposes be binding and operative until payment of all money due to you in respect of such liabilities is paid.
5. This guarantee shall be irrevocable and shall remain valid upto \_\_\_\_\_ (this date should be 90 days after the expiry of defect liability period/ Guarantee period) \_\_\_\_\_. The bank undertakes not to revoke this guarantee during its currency without your previous consent and further agrees that the guarantee shall continue to be enforceable until it is discharged by GGPL in writing. However, if for any reason, the supplier/contractor is unable to complete the supply/work within the period stipulated in the order/contract and in case of extension of the date of delivery/completion resulting extension of defect liability period/guarantee period of the supplier/contractor fails to perform the supply/work fully, the bank hereby agrees to further extend this guarantee at the instance of the supplier/contractor till such time as may be determined by GGPL. If any further extension of this guarantee is required, the same shall be extended to such required period on receiving instruction from M/s. \_\_\_\_\_ (contractor) on whose behalf this guarantee is issued.
6. Bank also agrees that GGPL at its option shall be entitled to enforce this Guarantee against the bank (as principal debtor) in the first instant, without proceeding against the supplier/contractor and notwithstanding any security or other guarantee that GGPL may have in relation to the supplier's/contractor's liabilities.



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7. The amount under the Bank Guarantee is payable forthwith without any delay by Bank upon the written demand raised by GGPL. Any dispute arising out of or in relation to the said Bank Guarantee shall be subject to the exclusive jurisdiction of courts at New Delhi.
7. Therefore, we hereby affirm that we are guarantors and responsible to you on behalf of the Supplier/Contractor up to a total amount of \_\_\_\_\_ (amount of guarantees in words and figures) and we undertake to pay you, upon your first written demand declaring the Supplier/Contractor to be in default under the order/contract and without caveat or argument, any sum or sums within the limits of (amounts of guarantee) as aforesaid, without your needing to prove or show grounds or reasons for your demand or the sum specified therein.
8. We have power to issue this guarantee in your favor under Memorandum and Articles of Association and the undersigned has full power to do under the Power of Attorney, dated \_\_\_\_\_ granted to him by the Bank.

Yours faithfully,

\_\_\_\_\_  
Bank by its Constituted Attorney

Signature of a person duly  
Authorized to sign on behalf of  
the Bank

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**INSTRUCTIONS FOR FURNISHING**  
**"CONTRACT PERFORMANCE SECURITY / SECURITY DEPOSIT" BY "BANK**  
**GUARANTEE"**

1. The Bank Guarantee by successful Bidder(s) will be given on non-judicial stamp paper as per 'stamp duty' applicable. The non-judicial stamp paper should be in name of the issuing bank. In case of foreign bank, the said Bank Guarantee to be issued by its correspondent bank in India on requisite non-judicial stamp paper and place of Bid to be considered as Delhi.
2. The Bank Guarantee by Bidders will be given from bank as specified in Tender.
3. A letter from the issuing bank of the requisite Bank Guarantee confirming that said Bank Guarantee and all future communication relating to the Bank Guarantee shall be forwarded to Employer.
4. If a Bank Guarantee is issued by a commercial bank, then a letter to Employer and copy to Consultant (if applicable) confirming its net worth is more than Rs. 100,00,00,000.00 [Rupees One Hundred Crores] or its equivalent in foreign currency alongwith documentary evidence.

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**F-10**  
**AGREED TERMS & CONDITIONS**

To,

M/s Godavari Gas Private Limited  
Rajahmahendram

SUB:

TENDER NO:

This Questionnaire duly filled in, signed & stamped must form part of Bidder's Bid and should be returned along with Un-priced Bid. Clauses confirmed hereunder need not be repeated in the Bid.

Sl.	DESCRIPTION	BIDDER'S CONFIRMATION
1	Bidder's name and address	
2.	Please confirm the currency of quoted prices is in Indian Rupees.	
3.	Confirm quoted prices will remain firm and fixed till complete execution of the order.	
4	Rate of applicable GST	CGST:.....% SGST:.....% IGST:.....% Total : .....%
4.1	Whether in the instant tender GST is covered in reverse charge rule of Goods and service tax	Yes/ No  In case of Yes, please specify GST) payable by: GGPL:.....% Bidder:.....%
5.	i) Confirm acceptance of relevant Terms of Payment specified in the Bid Document. ii) In case of delay, the bills shall be submitted after deducting the price reduction due to delay.	
6.	Confirm that Contract Performance Security will be furnished as per Bid Document.	
7.	Confirm that Contract Performance Security shall be 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. However, in case of bank guarantees from banks other than the Nationalised Indian banks, the bank must be a commercial bank having net worth in excess of Rs 100 crores and a declaration to this effect shall be made by such commercial bank either in the Bank Guarantee itself or separately on its letterhead.	

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<b>Sl.</b>	<b>DESCRIPTION</b>	<b>BIDDER'S CONFIRMATION</b>
8.	Confirm compliance to Completion Schedule as specified in Bid document. Confirm contract period shall be reckoned from the date of Fax of Acceptance.	
9.	Confirm acceptance of Price Reduction Schedule for delay in completion schedule specified in Bid document.	
10.	a) Confirm acceptance of all terms and conditions of Bid Document (all sections). b) Confirm that printed terms and conditions of bidder are not applicable.	
11.	Confirm your offer is valid for period specified in BDS from Final/Extended due date of opening of Techno-commercial Bids.	
12.	Please furnish EMD/Bid Security details : a) EMD/ Bid Security No. & date b) Value c) Validity	
13.	Confirm acceptance to all provisions of ITB read in conjunction with Bid Data Sheet (BDS).	
14.	Confirm that Annual Reports for the last three financial years are furnished along with the Un-priced Bid.	
15.	Confirm that, in case of contradiction between the confirmations provided in this format and terms & conditions mentioned elsewhere in the offer, the confirmations given in this format shall prevail.	
16.	Confirm the none of Directors of bidder is a relative of any Director of Owner or the bidder is a firm in which any Director of Owner/ GGPL or his relative is a partner.	
17.	All correspondence must be in ENGLISH language only.	
18.	Owner reserves the right to make any change in the terms & conditions of the TENDER/BIDDING DOCUMENT and to reject any or all bids.	
19.	Confirm that all Bank charges associated with Bidder's Bank shall be borne by Bidder.	

Place:

[Signature of Authorized Signatory of Bidder]

Date:

Name:

Designation:

Seal:

**TENDER NO: GGPL/KKD/C&P/CW/2545/VS**

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**F-11**  
**ACKNOWLEDGEMENT CUM CONSENT LETTER**

**(On receipt of tender document/information regarding the tender, Bidder shall acknowledge the receipt and confirm his intention to bid or reason for non-participation against the enquiry /tender through e-mail/fax to concerned executive in GGPL issued the tender, by filling up the Format)**

To,

M/s Godavari Gas Private Limited  
Rajahmahendram

SUB:

TENDER NO:

Dear Sir,

We hereby acknowledge receipt of a complete set of bidding document along with enclosures for subject item/job and/or the information regarding the subject tender.

- We intend to bid as requested for the subject item/job and furnish following details with respect to our quoting office:

Postal Address with Pin Code : .....

Telephone Number : .....

Fax Number : .....

Contact Person : .....

E-mail Address : .....

Mobile No. : .....

Date : .....

Seal/Stamp : .....

- We are unable to bid for the reason given below:

Reasons for non-submission of bid:

---

Agency's Name : .....

Signature : .....

Name : .....

Designation : .....

Date : .....

Seal/Stamp : .....



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**F-12**  
**UNDERTAKING ON LETTERHEAD**

To,

M/s Godavari Gas Private Limited  
Rajahmahendram

SUB:

TENDER NO:

Dear Sir

We hereby confirm that “The contents of this Tender Document No. \_\_\_\_\_ have not been modified or altered by M/s. ....(Name of the bidder with complete address). In case, it is found that the tender document has been modified / altered by the bidder, the bid submitted by M/s.....(Name of the bidder) shall be liable for rejection”.

Place:

Date:

[Signature of Authorized Signatory of Bidder]

Name:

Designation:

Seal:

**TENDER NO: GGPL/KKD/C&P/CW/2545/VS**

**F-13**  
**BIDDER'S EXPERIENCE**

To,

M/s Godavari Gas Private Limited  
Rajahmahendram

SUB:

TENDER NO:

Sl. No	Description of the Services	LOA /WO No. and date	Full Address & phone nos. of Client. <i>Name, designation and address of Engineer/ Officer-in-Charge (for cases other than purchase)</i>	Postal & phone nos.	Value of Contract /Order ( <i>Specify Currency Amount</i> )	Date of Commencement of Services	Scheduled Completion Time (Months)	Date of Actual Completion	Reasons for delay in execution, if any
(1)	(2)	(3)	(5)	(6)	(7)	(8)	(9)	(10)	

Place:

Date:

[Signature of Authorized Signatory of Bidder]

Name:

Designation:

Seal:



**TENDER NO: GGPL/KKD/C&P/CW/2545/VS**

3.0	Confirm that all forms duly filled in are enclosed with the bid duly signed by authorised person(s)		
4.0	Confirm that the price part as per Price Schedule format submitted with Bidding Document/ uploaded in case of e-bid.		X
7.0	Confirm that annual reports for last three financial years & duly filled in Form 16 are enclosed in the offer for financial assessment (where financial criteria of BEC is applicable).		

Place:

[Signature of Authorized Signatory of Bidder]

Date:

Name:

Designation:

Seal:





TENDER NO: GGPL/KKD/C&P/CW/2545/VS

**F-15**  
**FORMAT FOR CERTIFICATE FROM BANK**  
**IF BIDDER’S WORKING CAPITAL IS INADEQUATE/NEGATIVE**  
(To be provided on Bank’s letter head)

Date:

To,  
M/s. Godavari Gas Private Limited

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Dear Sir,

This is to certify that M/s ..... (name of the bidder with address) (hereinafter referred to as Customer) is an existing customer of our Bank.

The Customer has informed that they wish to bid for GGPL’s RFQ/Tender no. .... dated ..... for .....(Name of the supply/work/services/consultancy) and as per the terms of the said RFQ/Tender they have to furnish a certificate from their Bank confirming the availability of line of credit.

Accordingly M/s ..... (name of the Bank with address) confirms availability of line of credit to M/s ..... (name of the bidder) for at least an amount of Rs. \_\_\_\_\_

It is also confirmed that the net worth of the Bank is more than Rs. 100 Crores (or Equivalent USD) and the undersigned is authorized to issue this certificate.

Yours truly

for ..... (Name & address of Bank)

(Authorized signatory)

Name of the signatory :

Designation :

Stamp

**TENDER NO: GGPL/KKD/C&P/CW/2545/VS**

**F-16**  
**FORMAT FOR CHARTERED ACCOUNTANT CERTIFICATE/ CERTIFIED PUBLIC**  
**ACCOUNTANT (CPA) FOR FINANCIAL CAPABILITY OF THE BIDDER**

We have verified the Audited Financial Statements and other relevant records of M/s..... (Name of the bidder) and certify the following:

**A. AUDITED ANNUAL TURNOVER\* OF LAST 3 YEARS:**

Year	Amount (Currency)
Year 1:	
Year 2:	
Year 3:	

**B. NETWORTH\* AS PER LAST AUDITED FINANCIAL STATEMENT:**

Description	Year _____
	Amount (Currency)
1. Net Worth	

**C. WORKING CAPITAL\* AS PER LAST AUDITED FINANCIAL STATEMENT :**

Description	Year _____
	Amount (Currency)
1. Current Assets	
2. Current Liabilities	
3. Working Capital (Current Assets-Current liabilities)	

***\*Refer Instructions***

**Note: It is further certified that the above mentioned applicable figures are matching with the returns filed with Registrar of Companies (ROC) [Applicable only in case of Indian Companies]**

**TENDER NO: GGPL/KKD/C&P/CW/2545/VS**

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Name of Audit Firm: [Signature of Authorized Signatory]  
Chartered Accountant/CPA Name:  
Date: Designation:  
Seal:  
Membership No.:

**Instructions:**

1. The Separate Pro-forma shall be used for each member in case of JV/ Consortium.
2. The financial year would be the same as one normally followed by the bidder for its Annual Report.
3. The bidder shall provide the audited annual financial statements as required for this Tender document. Failure to do so would result in the Proposal being considered as non- responsive.
4. For the purpose of this Tender document:
  - (i) **Annual Turnover** shall be “Sale Value/ Operating Income”
  - (ii) **Working Capital** shall be “Current Assets less Current liabilities” and
  - (iii) **Net Worth** shall be Paid up share capital plus Free Reserves & Surplus less accumulated losses, deferred expenditure and miscellaneous expenditure not written off, if any.
5. **Above figures shall be calculated after considering the qualification, if any, made by the statutory auditor on the audited financial statements of the bidder including quantified financial implication.**
6. This certificate is to be submitted on the letter head of Chartered Accountant/CPA.

TENDER NO: GGPL/KKD/C&P/CW/2545/VS

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F-17

~~(TO BE INCLUDED ONLY WHERE CONSORTIUM/JV ARE  
ALLOWED)~~

~~FORMAT FOR CONSORTIUM/JV AGREEMENT  
(ON NON JUDICIAL STAMP PAPER OF APPROPRIATE VALUE)~~

CONSORTIUM/JV AGREEMENT



**TENDER NO: GGPL/KKD/C&P/CW/2545/VS**

**F-18**

**BIDDER'S QUERIES FOR PRE BID MEETING**

To,

M/s Godavari Gas Private Limited  
Rajahmahendram

Sub :

Tender No :

SL. NO.	REFERENCE OF BIDDING DOCUMENT				BIDDER'S QUERY	GGPL'S REPLY
	SEC. NO.	Page No.	Clause No.	Subject		

**NOTE: The Pre-Bid Queries may be sent by fax and also by e-mail before due date for receipt of Bidder's queries.**

**SIGNATURE OF BIDDER:** \_\_\_\_\_

**NAME OF BIDDER :** \_\_\_\_\_

TENDER NO: GGPL/KKD/C&P/CW/2545/VS

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**F-19**

**E-Banking Mandate Form**

(To be issued on vendors letter head)

1. Vendor/customer Name :
2. Vendor/customer Code:
3. Vendor /customer Address:
4. Vendor/customer e-mail id:
5. Particulars of bank account
  - a) Name of Bank
  - b) Name of branch
  - c) Branch code:
  - d) Address:
  - e) Telephone number:
  - f) Type of account (current/saving etc.)
  - g) Account Number:
  - h) RTGS IFSC code of the bank branch
  - i) NEFT IFSC code of the bank branch
  - j) 9 digit MICR code

I/We hereby authorize Godavari Gas Private Limited to release any amount due to me/us in the bank account as mentioned above. I/We hereby declare that the particulars given above are correct and complete. If the transaction is delayed or lost because of incomplete or incorrect information, we would not hold the GAIL (India) Limited responsible.

(Signature of vendor/customer)

**BANK CERTIFICATE**

We certify that ----- has an Account no. -----  
with us and we confirm that the details given above are correct as per our records.

Bank stamp

Date  
bank)

(Signature of authorized officer of

**TENDER NO: GGPL/KKD/C&P/CW/2545/VS**

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**F-20**  
**INTEGRITY PACT**

**NOT APPLICABLE**

**F-21**  
**INDEMNITY BOND**

WHERE AS Godavari Gas Private Limited. (hereinafter referred to as “**GGPL**”) which expression shall, unless repugnant to the context include its successors and assigns, having its registered office at D. No.: 85-06-23/2,2nd Floor, Above Happy Home Furniture Shop, 40th Ward, Morumpudi Junction, Rajamahendravaram – 533103]has entered into a contract with M/s\*..... (hereinafter referred to as the “**Contractor**”) which expression shall unless repugnant to the context include its representatives, successors and assigns, having its registered office at \*..... and on the terms and conditions as set out, inter-alia in the [ *mention the work order/LOA/Tender No.*]and various documents forming part thereof, hereinafter collectively referred to as the ‘**CONTRACT**’ which expression shall include all amendments, modifications and / or variations thereto.

GGPL has also advised the Contractor to execute an Indemnity Bond in general in favour of GGPL indemnifying GGPL and its employees and Directors including Independent Directors from all consequences which may arise out of any prospective litigation or proceedings filed or may be initiated by any third party, including any Banker / financial institution / worker(s) / vendor(s)/ subcontractor(s) etc. who may have been associated or engaged by the Contractor directly or indirectly with or without consent of GGPL for above works.

NOW, THEREFORE, in consideration of the promises aforesaid, the Contractor hereby irrevocably and unconditionally undertakes to indemnify and keep indemnified GGPL and all its employees, Directors, including Independent Directors, from and against all/any claim(s), damages, loss, which may arise out of any litigations/ liabilities that may be raised by the Contractor or any third party against GGPL under or in relation to this contract. The Contractor undertakes to compensate and pay to GGPL and/or any of its employees, Directors including Independent Directors, forth with on demand without any protest the amount claimed by GGPL for itself and for and on behalf of its employees, Directors including Independent Directors together with direct/indirect expenses including all legal expenses incurred by them or any of them on account of such litigation or proceedings.

AND THE CONTRACTOR hereby further agrees with GGPLthat:

- (i) This Indemnity shall remain valid and irrevocable for all claims of GGPL and/or any of its employees and Directors including Independent Directors arising out of said contract with respect to any such litigation / court case for which GGPL and/or its employees and Directors including Independent Directors has been made party until now or here-in-after.
- (ii) This Indemnity shall not be discharged/revoked by any change/ modification/amendment/assignment of the contract or any merger of the Contractor with other entity or any change in the constitution/structure of the



**TENDER NO: GGPL/KKD/C&P/CW/2545/VS**

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Contractor's firm/Company or any conditions thereof including insolvency etc. of the Contractor, but shall be in all respects and for all purposes binding and operative until any/all claims for payment of GGPL are settled by the Contractor and/or GGPL discharges the Contractor in writing from this Indemnity.

The undersigned has full power to execute this Indemnity Bond for and on behalf of the Contractor and the same stands valid.

SIGNED BY :

For [ Contractor ]

*Authorised Representative*

Place:

Dated:

Witnesses:

- 1.
- 2.

# **SECTION – IV**

## **SPECIAL CONDITIONS OF CONTRACT**

## **Special Conditions of Contract**

### **1. PROJECT DETAILS**

Godavari Gas Private Ltd (GGPL), a Joint Venture Company of M/s APGDC and M/s HPCL, is engaged in development of CNG & City Gas Distribution Networks (CGDN) at two Geographical Areas of East & West Godavari districts for distribution of CNG and PNG to various consumer segments. Presently, GGPL is planning to implement CNG & City Gas Distribution Network (CGDN) to supply Natural Gas to domestic, commercial, industrial and automobile Consumers in the Geographical Areas (GAs) of East & West Godavari districts of Andhra Pradesh.

GGPL invites bids for the item(s) in complete accordance with the Bid Documents / Attachments for above stated Project under single stage two e-envelopes system from competent suppliers meeting the Bid Evaluation Criteria as detailed herein.

### **2. BRIEF SCOPE OF WORK**

The brief scope of work includes the following:

GGPL intend to construct Eight CNG Mother Stations in the Geographical Area of East and West Godavari districts. The tentative locations where CNG mother stations to be installed are as given below

1. Bommuru
2. RC Puram/Draksharamam
3. Amalapuram
4. Mandapeta
5. Bhimadole
6. Tetali (Tanuku)
7. Nidadavole
8. Palacollu
9. Bhaimavaram

The scope of work includes supply, construction, erection / installation, painting, testing and commissioning of Civil, Architectural, Structural, Mechanical Electrical and Instrumentation Works for 8 (Eight) nos. of CNG Mother station in East & West Godavari districts areas. The locations will be intimated to the successful bidder.

Note: The work shall be awarded to TWO bidders as per the methodology for distribution indicated in methodology for distribution.

**3.0 TIME SCHEDULE**

The contract shall be valid for a period two years from the date of issuance of Fax of Acceptance (FOA) with a provision of one year extension with same rates and terms & conditions.

4.0 **Evaluation Methodology and Award of Work:** Refer to Section II BEC & Evaluation Methodology

**5.0 DISTRIBUTION METHODOLOGY:**

5.1 **Award Distribution:** To have flexibility and to ensure simultaneous working in multiple areas, it is proposed to distribute award of Work to L1 & L2 Bidders (subject to matching with L1 Price) as mentioned below:

	<b>CNG-Mother stations</b>
Total	08
L1 Bidder (~60%)	05
L2, L3.... Bidder subject to matching with L1 Price (~40%)	03

For this distribution purpose, L2, bidder shall be asked to match L1 Price. In the event of L2 bidder not agreeing to match L1 Price, then L3, L4..... and so on bidder shall be asked to match L1 Price, so as to select two bidders as prescribed above for award of contracts. In the event of none of the bidder(s) matching L1 price, then balance qty. will be retendered.

In a tie situation where two or more bidders become L1 or L2..... the bidder whose turnover is more for the immediate preceding audited financial year i.e. 2017 – 18 will be decided as L1 or L2 .....

**6.0 EVALUATION AND COMPARISON OF BIDS:** Refer to Section II BEC & Evaluation Methodology

**7. CONDITIONS OF CONTRACT**

**Annexure-1 : Scope of Work**

**Annexure-2 : Scope of Supply**

**Annexure-3 : Time Schedule**

**Annexure-4 : Measurement Work**

**Annexure-5 : Terms of Payment**

**Annexure-6 : Specification for Quality Assurance System requirements from Bidders**

**Annexure-7 : Specification for Health, Safety and Environment (HSE) Management**

**Annexure-8 : Conditions for issue & reconciliation of material**

**Annexure-9 : Hiring/Recovery rate for Deployment of manpower**

**Annexure-10 : Equipment Hiring / Recovery Rates**

## **SCOPE OF WORK**

**(ANNEXURE-1 TO SPECIAL CONDITIONS OF  
CONTRACT)**



**TENDER NO: GGPL/KKD/C&P/CW/2545/VS**

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ANNEXURE-1 TO SCC

1. SCOPE OFWORK

The scope of work includes supply, construction, erection / installation, painting, testing and commissioning of Civil, Architectural, Structural, Mechanical Electrical and Instrumentation Works for **8 (eight)** nos. of CNG Mother station in East & West Godavari districts Geographical area. The locations will be intimated to the successful bidder. Construction is to be done as per the technical specifications given in the tender.

## **SCOPE OF SUPPLY**

**(ANNEXURE-2 TO SPECIAL CONDITIONS OF  
CONTRACT)**



ANNEXURE-2 TO SCC

**1. SCOPE OF SUPPLY**

**1.1. Owner's Scope of Supply**

Owner's scope of supply shall be as specified in Particular Job Specification, Technical Specifications, Schedule of Rates & various other parts of the Bidding Document.

Free Issue Materials shall be issued to the Contractor from the designated store(s) of Owner. Contractor shall be responsible for lifting the free issue materials from Owner's storage point(s) and transporting the same to work site(s) at his own cost from anywhere in the districts of East & West Godavari districts.

GGPL designated store for this project shall be located in anywhere in the GA areas of East & West Godavari districts.

Conditions for Issue and Reconciliation of Materials shall be as per Document enclosed as Annexure-8 to Special Conditions of Contract.

**1.2. Contractor's Scope of Supply**

All materials except what is under Owner's scope of supply as mentioned in Clause No. 1.1 above, and required for successful completion of works in all respects shall be supplied by the Contractor and the cost of such supply shall be deemed to have been included in the quoted price without any additional liability on the part of Owner.

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## **TIME SCHEDULE**

**(ANNEXURE-3 TO SPECIAL CONDITIONS OF  
CONTRACT)**

**TENDER NO: GGPL/KKD/C&P/CW/2545/VS**

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ANNEXURE-3 TO SCC

The contract validity period shall be **24 months** from the date of Fax of Acceptance (FOA) and shall be extendable for one year under the same rates and conditions & contract. Separate intimation will be provided to the contractor for execution of jobs with the following completion schedules.

Sl. No.	Part	Completion schedule
1.	Works for construction of CNG Mother stations	10 months from the date of intimation for individual CNG station

Note:

- 1) The time indicated is for completing all the works in all respects as per specifications, codes, drawings and instructions of Engineer-in-charge.

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(STAMP & SIGNATURE OF BIDDER)

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**MEASUREMENT OF WORK  
(ANNEXURE- 4 TO SPECIAL CONDITIONS OF  
CONTRACT)**

ANNEXURE-4 TO SCC

**MEASUREMENT OF WORK**

**1.0 GENERAL**

- 1.1** The mode of measurement shall be as mentioned in relevant standard specification incorporated in the Bidding Document. Any other mode of measurements not covered in above specifications shall be followed in accordance with relevant BIS codes/ Schedule of Rates/ Specifications etc. and/ or as decided by Engineer-in-charge.
- 1.2** Payment will be made on the basis of joint measurements taken by Contractor and certified by Engineer-in-charge. Measurement shall be based on "Approved for Construction" drawings, to be the extent that the work conforms to the drawings and details are adequate.
- 1.3** Wherever work is executed based on instructions of Engineer-in-charge or details are not adequate in the drawings, physical measurements shall be taken by Contractor in the presence of Engineer-in-charge.
- 1.4** Measurements of weights shall be in metric tons corrected to the nearest Kilogram. Linear measurements shall be in meters corrected to the nearest Centimeters.
- 1.5** The weights mentioned in the drawing or shipping list shall be the basis for payment. If mountings for panels etc. are packed separately, their erection weights shall include all mountings.
- 1.6** Welds, bolts, nuts, washers etc. shall not be measured. Rates for structural steel work shall be deemed to include the same.
- 1.7** No other payment either for temporary works connected with this Contractor or any other item such as weld, shims, packing plates etc. shall be made. Such items shall be deemed to have been included for in the rates quoted.
- 1.8** Unless otherwise specified in SOR, Measurement will be made for various items under schedule of rates on the following basis as indicated in the unit column.

- i. Weight : MT orKg
- ii. Length : M (Metre)
- iii. Number : No.
- iv. Volume : Cu.M
- v. Area : Sq.M

- 1.9** All measurements shall be in metric system. All the works in progress will be jointly measured by the representative of the Engineer-in-charge and the contractor's authorised agent progressively. Such measurements will be either recorded/typed by the contractor in the numbered measurementsheetstobesuppliedbyEngineer-in-Charge/Owneror computerized by Contractor themselves. The measurements shall be signed in token of acceptance by the contractor or his authorized representative. The contractor shall submit the bill in the approved Performa in triplicate to the Engineer-in-Charge of the work

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**2.0 PIPING**

**2.1** Length of pipes /tubes shall be measured along the curvilinear centre of the pipelines laid/ installed and shall include all types of specials, fittings, mitre bends etc. but excluding all types of valves. Length of valves shall be excluded from piping measurement and shall be considered on number basis.

**2.2** All fittings & hot/cold bends, reducers etc. for all sizes shall be fabricated and erected as per requirements by the contractor at no additional cost and his rates for piping shall be inclusive of this work.

**2.3** Vents and drains shall be measured from O.D. of pipe lines and shall be paid for at the corresponding unit rates for similar sizes of pipe. Other piping attachment such as couplings, earthing lugs etc. shall be supplied & erected by the contractor within his quoted rates for piping.

**2.4** Fabrication of spool pieces for temporary use to aid Contractor's work such as fabrication, erection, flushing and testing of piping etc. shall be done by Contractor as part of piping work and no separate payment shall be made for this.

**2.5** In case of branch piping, the measurement shall be made from outer surface of the main line except in case of equal size branches, in which case measurement shall be made from centre line of the branching header.

**2.6 Erection of Valves**

Erection of all types of valves such as gate/ globe / check / plug / needle/ ball / control/ safety valves etc. will be paid on number basis at the rates included in supply rates as given in the Schedule of Rates. Any dismantling and re-erection of the valves required for the purpose of testing, calibration etc. will be carried out by the contractor within his quoted rates.

**2.7 Fabrication of Supports**

- Fabrication of all types of pipe supports, provided as per drawings & instructions of the Engineer-in-Charge, will be paid on weight basis. Bolts, nuts and washers including U- bolt will be supplied by contractor. Weight of bolts, nuts and clamps etc. shall not be added to the weight of pipe support for payment purpose.
- Erection of all types of supports, spring supports and turn buckles, including grouting of supports, if required, shall be carried out by the Contractor as part of piping work and no separate payment will be made for it.
- While fabricating the supporting elements, the contractor will ensure that the dimensions shown in the drawings match with site conditions. No payment shall be made for rectification arising out of discrepancies in dimensions of the fabricated items of supporting elements due to site conditions.
- Additional supports as necessary with the site condition shall be fabricated and erected in accordance with the standard engineering practices and instructions of Engineer-in- charge.

**3.0 RADIOGRAPHY/DYE-PENETRANT EXAMINATIONS/MAGNETIC PARTICLE TEST(MPT)**

Payment for radiography shall be made on the basis of circumferential joints for different pipe dia. Repeat radiography due to defective films or on repaired joint due to Contractor's fault or for additional radiography necessitated due to poor performance of Contractor's welder will be done at Contractor's cost.

## **TERMS OF PAYMENT**

### **(ANNEXURE-5 TO SPECIAL CONDITIONS OF CONTRACT)**

ANNEXURE-5 TO SCC

**A. TERMS OF PAYMENT**

Pending completion of the whole works, provisional progressive payments for the part of work executed by the contractor shall be made by Owner on the basis of said work completed and certified by the Owner's representative as per the agreed milestone payment schedule and the percentage break-ups given below.

Contractor shall submit his invoices to the Owner's representative fortnightly in the manner as instructed by Owner. Each invoice will be supported by documentation acceptable to Owner and certified by the Owner's representative. Payments made by owner to the contractor for any part of the work shall not deem that the Owner has accepted the work. 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. Owner will release payment through e-payments only as detailed in the bidding document.

**1.0 CNG STATION WORKS**

**1.1 Tubing Works**

- a. 45% on fabrication complete with visual inspection of tubing.
- b. 30% on erection, alignment, swaging etc. complete to achieve mechanical completion.
- c. 15% on flushing, testing, draining, drying etc.
- d. 10% on completion of all activities and their acceptance. Submission of final documents, final bill and acceptance of these by owner thereafter for successful closure of work order.

**1.2 Civil and Architectural works**

- a. 90% on completion of work including all supply on pro-rata basis as certified in running bills.
- b. 10% on completion of all activities and their acceptance. Submission of final documents, final bill and acceptance of these by owner thereafter for successful closure of work order.

**1.3 Structural works**

- a. 45% on supply and acceptance of material at site.
- b. 45% on fabrication, erection, alignment, welding, painting, etc.



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- c. 10% on completion of all activities and their acceptance. Submission of final documents, final bill and acceptance of these by owner thereafter for successful closure of work order.
  - d. 10% on completion of all activities and their acceptance. Submission of final documents, final bill and acceptance of these by owner thereafter for successful closure of work order.
- 1.4 Items including supply of finished goods (Mechanical, Electrical-Instrumentation)
- a. 5% on placement of order and sub-vendor.
  - b. 65% on receipt of material at site and acceptance thereof. In case the bidder intends to do the job themselves, 5%asperitema) shall also be paid at this stage.
  - c. 15% on erection, alignment,welding,grouting,painting,installation,jointing,terminationetc,.
  - d. 5% on testing.
  - e. 10% on completion of all activities and their acceptance. Submission of final documents, final bill and acceptance of these by owner thereafter for successful closure of work order.
- 1.5 Equipment Erection works
- a. 45% on transportation and installation in position.
  - b. 30% after initial alignment, levelling and grouting.
  - c. 15% after final alignment and making ready for commissioning.
  - d. 10% on completion of all activities and their acceptance. Submission of final documents, final bill and acceptance of these by owner thereafter for successful closure of work order.
- 1.6 Electrical –Instrumentation works
- a. 80% on completion of installation.
  - b. 10% on testing.
  - c. 10% on completion of all activities and their acceptance. Submission of final documents, final bill and acceptance of these by owner thereafter for successful closure of work order.
- 1.7 For Lump sum items
- For all lump sum items included in schedule of rates, contractor shall furnish price break-up for quoted lump sum prices for the approval of Engineer-in-charge. Payment for such item shall be made accordingly. In this regard decision of Engineer-in-charge shall be final and binding to the bidder.

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1.8 Supply of Materials and all other works (Not specifically covered under above items)

- a. Completion of individual item of work : 90% progressively.
- b. Completion of all activities and their acceptance: 10%

Submission of final documents, final bill and acceptance of these by owner thereafter for successful closure of work order.

Note: Any further break-up of each activity for the payment purpose can be done depending upon the site situation / requirement and recommendation by Engineer-In charge and approval of Construction In charge.

**2.0 PAYMENT METHODOLOGY**

2.1 The contractor shall raise invoices on fortnightly/monthly basis. Bidder shall enclose all documents as per check list issued by PMC/ GGPL during kick off meeting.

2.2 Deleted.

2.3 Employer will release payment through e-payments only as detailed in the Bidding Document.

2.4 Further break-up of Lump-sum Prices, if deemed necessary for any progressive payment of individual item may be mutually arrived at between Engineer-in-Charge and the Contractor.

2.5 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.

2.6 The contractor shall submit fortnightly RA bills in prescribed pro-forma in triplicate along with the following documents:-

1. Measurement sheets duly verified and certified by EIC, in support of the works executed as per SOR for the billing period.
  2. Copy of PF remittance Challan.
  3. Copy of ESIC remittance.
  4. Copy of Wage register.
  5. Two sets of Construction Photographs
- In the absence of the requisite documents, the bill shall be returned to the contractor.

3.0 Payment shall be made by Finance within 30 days from the date of submission of the bill to GGPL., through e-banking. Further payment shall also be released through RTGS / NEFT provided the bidder should submit the dully filled format specified by GGPL

**QUALITY ASSURANCE**  
**(ANNEXURE-6 TO SPECIAL CONDITIONS OF**  
**CONTRACT)**

(For details- Refer our Technical Specification enclosed in Vol.-II of tender document.)

TENDER NO: GGPL/KKD/C&P/CW/2545/VS

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## **HEALTH SAFETY AND ENVIRONMENTAL (HSE) MANAGEMENT AT CONSTRUCTION SITE**

### **(ANNEXURE-7 TO SPECIAL CONDITIONS OF CONTRACT)**

(For details- Refer our Technical Specification enclosed in Vol.-II of tender document.)

**CONDITIONS FOR ISSUE AND  
RECONCILIATION OF MATERIAL**

**(ANNEXURE - 8 to SCC)**

ANNEXURE 8 TO SCC

**1. CONDITIONS FOR ISSUE & RECONCILLATION OF MATERIALS**

Whenever any material is issued by Owner, following conditions for issue of material in addition to other conditions specified in the contract shall be applicable:

- 1.1. Necessary indents will have to be raised by the Contractor as per procedure laid down by the Engineer-in-Charge from time to time, when he requires the above material for incorporation in permanent works.
- 1.2. Materials will be issued only for permanent works and not for temporary works, enabling works etc. unless specifically approved by the Engineer-in-Charge and the same shall not be taken into account for the purpose of materials reconciliation.
- 1.3. The Contractor shall bear all other cost including lifting, carting from issue points to work site/Contractor's store, custody and handling etc. and return of surplus/serviceable scrap materials to Owner's storage points to be designated by the Engineer-in-Charge etc. No separate payment for such expenditure will be made.
- 1.4. No material shall be allowed to be taken outside the work area without permission from EIC.
- 1.5. The Contractor shall be responsible for proper storage, preservation and watch & ward of the materials.

**1.6. RETURN OF UNUSED MATERIAL**

- 1.6.1. All unused/scrap materials shall be the property of the Owner and shall be returned in good and acceptable condition size wise, category wise by the Contractor at his own cost to Owner's Store(s).
- 1.6.2. No credit will be given to the Contractor for return of scrap. The Contractor should quote the rates accordingly.
- 1.6.3. In case the Contractor fails to return unused/scrap materials, then recovery for such quantity of materials, not returned by the Contractor shall be affected at following penal rates from the Contractor's bills or from any other dues of the Contractor to the Owner. Contractor shall make his own arrangements for weighing the off cuts to be returned to Owner's stores.

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1.6.4. Penal Rates for non-return of material

Sl.No.	Material	Penal rates
a)	Penal rate for non return of accountable scrap	Issue Rate + 25% or Landed Rate + 25% (in case issue rate are not indicated in the contract)
b)	Penal rates for non return of Unused material/excess scrap	Twice the Issue Rates or Twice the
		Landed Rates (in case issue rate are not indicated in the contract)

Notes:

1. Landed Rate shall be arrived from the latest Purchase Order of respective material received at site by Owner/PMC.
2. In case different penal rates have been indicated in the Contract (based on Project requirement), the same will supersede the above rates.

**2. PIPING MATERIALS**

- 2.1. All pipes shall be issued in available lengths/shapes and no claims for extra payments on account of issue of non-standard length & shape will be entertained. Pipes shall be issued on linear measurement basis. All valves, flanges, fittings etc. shall be issued on number(s) basis. Contractor shall store the materials in such a way so as to avoid mixing of different types of material and shall maintain complete identification and traceability at all times.
- 2.2. The scrap allowance for pipes issued by the Owner shall be 3% (2½% accountable + ½% non-accountable) of the actual consumption as incorporated in the works.
- 2.3. All pipes in length of 2 meters and above shall be considered as serviceable material provided the material is in good and acceptable condition and has clear identification and traceability (Manufacturer's name, heat number/batch number and test certificates). Pipes in lengths less than 2M shall be treated as scrap.
- 2.4. For the non account of pipes drawn by the Contractor over and above the actual consumption as determined by the Engineer-in-Charge, plus 3% (2½% accountable + ½% non accountable) thereof to cover the scrap allowance, recovery at penal rate shall be effected from the Contractor's bill(s) or from any other dues of the Contractor to the Owner.
- 2.5. All unused/scrap pipes, valves, flanges, forged fitting like elbows, reducers tees shall be returned by the Contractor category wise duly cleaned, greased and spec. marked at his own cost to Owner's stores. In case the Contractor fails to do so then recovery for such quantity of pipes not returned by the Contractor at the penal rates shall be affected from the Contractor's bill(s) or from any other dues of the Contractor to the Owner.
- 2.6. **EQUIPMENTS**
- 2.7. Various equipment/materials intended for the installation will be received by Owner in unpacked, skid mounted, crated, packed or loose condition and will be stored in the warehouses and open yards. In general, materials will be issued to the Contractor in 'as received' condition. It will be the Contractor's responsibility to draw, load and transport all materials from Owner's designated places of issue to the point of installation and return all packing materials like steel frames, wooden boxes/scrap etc. to Owner's stores.

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All materials supplied by the Owner shall be duly protected by the Contractor at his own cost with appropriate preservative like primer, lacquer coating, grease etc. as required.

**3. CABLES**

3.1. Appropriation of cables shall be done as follows:

3.1.1. All the surplus and serviceable cables out of the cables quantity(ies) issued by the Owner to the Contractor shall be returned by the Contractor to the Owner's store in good condition and as directed by the Engineer-in-Charge.

3.1.2. The Contractor shall be allowed a cutting/wastage allowance of 1.5% for power cables and 3% for the control cables. This cutting/wastage allowance shall be computed on the length of cables actually laid, measured and accepted.

3.1.3. All cables being returned to store should carry Aluminium sheet tags indicating the size & type of cable. Cables of less than 15 meters length will be termed as scrap. Cables of lengths 15M and above shall be termed as serviceable material & shall be returned size wise and category wise to the Owner's store in wooden drums. Cables of serviceable length being returned to stores in drum(s) shall be accepted only after Megger value continuity test and physical measurement is carried out by the Contractor to the satisfaction of Engineer-in-Charge. Empty cable drums and major packing material (as decided by Engineer-in-charge) shall be Owner's property and shall be returned to Owner's Store/designated place without any additional cost.

3.1.4. While carrying out material appropriation with the Contractor, the above points will be taken into account. All serviceable materials returned by the Contractor (size wise & category wise) shall be deducted from the quantity(ies) issued to the Contractor or the respective sizes. Scrap generated for power cable and control cable shall also be returned to Owner's store on Lot basis.

3.1.5. Material appropriation shall be done & allowable scrap quantity calculated. The wastage generated by the Contractor in excess of the allowable percentage shall be charged at the penal rates.

**4. LINE PIPES**

4.1. All bare line pipes as per Line Pipe specifications shall be issued on linear measurement basis.

The line pipes shall be issued in available lengths and shapes and no claim for extra payment on account of issue of non-standard length and shape will be entertained. Contractor shall store and maintain the line pipes in proper manner to avoid mixing of different classes of pipes. Contractor shall maintain complete identification and traceability at all times. All cut pieces when returned to Owner's storage points after bevelling, shall be considered as serviceable material provided:

4.1.1. Corrosion Protection Coating is intact.



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4.1.2. Pipe pieces have pipe specifications, manufacturer's logo/name and heat number duly authenticated with hard stamp of the authorised inspector as per approved procedure. All cut pieces of pipes measuring less than 2 M will be treated as wastage/scrap.

4.2. For the purpose of accounting of line pipes, following allowances shall be permitted:

- |  |       |
|--|-------|
| a. Unaccountable wastage                                       | 0.1%  |
| b. Scrap (All cut pieces of pipes measuring<2m)                | 0.25% |
| c. Serviceable materials (All cut pieces of pipe measuring>2m) | 0.5%  |

Scrap shall be accounted at actual as per site assessment subject to maximum limits as stated above.

The percentage allowance shall be accounted on the basis of pipe book chainage for main pipeline.

4.2.1. Material appropriation shall be done & allowable scrap quantity calculated. The wastage generated by the Contractor in excess of the allowable percentage shall be charged at the penal rates as given in the contract.

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**HIRING/RECOVERY RATE FOR  
DEPLOYMENT OF MANPOWER  
(Annexure- 9 of Special Condition of Contract)**

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**HIRING / RECOVERY RATE FOR DEPLOYMENT OF MANPOWER**

1. The Labour rates are “all inclusive”. These rates include but are not limited to all payroll costs and allowances, payroll taxes, fringe benefits, protective and/or special clothing, construction supplies required for work of a nature included in this contract, overhead & profit, service tax, insurance, transportation and travel time.
2. The rates are inclusive of providing hand tools and consumables such as electrodes, filler wire, gases, grinding wheels where the concerned category of labour is expected to use in execution of the job but exclusive of all major equipment and machineries.
3. The normal time labour rates shall apply for all hours worked upto eight (8) hours in a day. The payment for part of the day shall be made on pro-rata basis.

<b>Sl. No</b>	<b>Classification Personnel</b>	<b>Rate per day of normal hours (8 hrs )</b>
1	Foreman	1160
2	Supervisor	760
3	Engineer	1360
4	Gas-cutter	680
5	Grinder	580
6	Brick Mason / Stone Mason	690
8	Structural Welder	780
9	Qualified ARC welder – Manual /S. Automatic	1350
11	Welder Helper	460
12	Pipe Fitter/Bender	960
13	Structural Fitter	690
14	Pipeline/ SS Tube Fitter	1150
15	Coater	690
16	Mechanic	770

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17	Site Equipment /Machine Operator	850
18	Electrician	770
19	Fabricator	1150
20	Carpenter	690
21	Plumber	690
22	Painter	770
23	Cable Jointer	575
24	Instrumentation Technician	770
25	Insulator	575
26	Rigger	575
27	Bhisti (water man)	460
28	Heavy Duty Driver	770
29	Civil Surveyor	960
30	Document Controller	960
31	Account Officer	770
32	Store Keeper/Incharge	770
33	AUT Interpreter	690
34	Liasioning personnel	770
35	Light Duty Driver	690
36	Sand Blaster	620
37	Qualified Surveyor	960
38	Unskilled Worker	460
39	Construction Manager	3060



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40	QA/QC/Safety/Planning/ NDT Engineer	1340
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*(SIGNATURE OF BIDDER)*

**NOTES:-**

1. Rates are final and Tenderer is to sign only without deviation.
2. In case of foreign bidder, conversion rate applicable on one day prior to price bid opening date published by the State Bank of India will be considered.
3. The recovery rates shall be the rates provided above plus 20% (twenty percent).

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## **EQUIPMENT HIRING/RECOVERY RATES**

**(Annexure - 10 of Special Condition of Contract)**

**EQUIPMENT HIRING/RECOVERY RATES**

<b>SL. NO.</b>	<b>DESCRIPTION OF EQUIPMENT</b>	<b>HIRING/RECOVERY RATES(IN INR) PER DAY(MINIMUM 8 HOURS) INCLUDING CONSUMABLES &amp;FUEL</b>
1.	Back Hoe-Ex 280 / 300 & Above or Equivalent	Rs. 16000
2.	JCB Excavator	Rs. 6000
3.	DG along with Welding Machines	Rs. 4000
4.	Hydra (8 – 10 MT)	Rs. 6000
5.	Bevel Cutting Machine –Manual	Rs. 600
6.	Tyre Mounted Cranes (10 MT & above)	Rs. 15000
7.	HDD Rig with All Equipments& Accessories (Cap. 25 T and above)	Rs. 40000
8.	X-Ray M/C – External	Rs. 5000
9.	Gamma Source	Rs. 4000
10.	Water Lifting Pump	Rs. 1200
11.	Filling Pumps	Rs. 1500
12.	Pressurization Pump – Motorized	Rs. 3000
13.	Induction/Resistance Heating Equipment or LPG Multi Torch.	Rs. 3000
14.	Air Compressor – (300CFM)	Rs. 2000
15.	Air Compressor –(above 300 CFM)	Rs.15000
16.	D.G. Sets : 62.5 KVA to 200 KVA (inclusive of generators)	Rs. 7000

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<b>SL. NO.</b>	<b>DESCRIPTION OF EQUIPMENT</b>	<b>HIRING/RECOVERY RATES(IN INR) PER DAY(MINIMUM 8 HOURS) INCLUDING CONSUMABLES &amp;FUEL</b>
17.	Blast Cleaning Machine	Rs. 1000
18.	Pipe Trailers (FB / Semi Low Bed)	Rs. 10000
19.	Mono drill crawler mounted	Rs. 3000
20.	Hand drill (pneumatic) for rock breaking/JCB breaker	Rs. 4000
21.	Rock breaker attachment	Rs. 3000
22.	Dosing Pump	Rs. 1000
23.	UT Machine with operator	Rs. 1000
24.	Dewatering Pump	Rs. 1000
25.	Holiday Detector Unit	Rs. 1000
26.	Dead WT Tester	Rs. 1000
27.	Dumper / Tippers	Rs. 11000
28.	Pipe locator	Rs. 2000
29.	Pipe Clamp – External	Rs. 500
30.	Pipe Trailer for Coated Line Pipe	Rs. 12000
31.	Rock Breaking Machine with Excavator	Rs. 25000/-
32.	Grinding machine	Rs. 1000/-
33.	Gas cutting set with cylinders	Rs.1500/-
34.	Trucks	Rs.4000/-
35.	Car/Jeep	Rs.2000/-



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SL. NO.	DESCRIPTION OF EQUIPMENT	HIRING/RECOVERY RATES(IN INR) PER DAY(MINIMUM 8 HOURS) INCLUDING CONSUMABLES &FUEL
36.	Tractor with trolley	Rs.4000/-
37.	Tripod with 5 Tons Chain Pulley Block	Rs.700/-
38.	Concrete mixer	Rs.800/-

*(SIGNATURE OF BIDDER)*

**NOTES:-**

1. Rates are final and Tenderer is to sign only without deviation.
2. Rates are inclusive of operators / drivers as applicable.
3. Rates are all inclusive of all taxes and duties, including service taxes etc., contractor's overheads & profit.
4. The recovery rates shall be the rates provided above plus 20% (twenty percent).

**SCHEDULE OF RATES**  
**(SEPARATELY ATTACHED)**

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**SECTION – V**

**GENERAL CONDITIONS OF**

**CONTRACT (GCC)**



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- 16.0 Policy for Tenders under consideration
  - 17.0 Award of Contract
  - 18.0 Clarification of Tender Document
  - 19.0 Local Conditions
  - 20.0 Abnormal Rates

**SECTION – IV (GENERAL OBLIGATIONS)**

- 21.0 Interpretation of Contract Documents
  - 21.1 General
  - 21.2 Headings & Marginal Notes
  - 21.3 Singular and Plural
- 22.0 Special Conditions of Contract
- 23.0 Contractor to obtain his own information
- 24.0 Security Deposit
- 25.0 Time of Performance
  - 25.1 Time for Mobilization
  - 25.2 Times Schedule of Construction
- 26.0 Force Majeure
  - 26.1 Conditions for Force Majeure
  - 26.2 Outbreak of War
- 27.0 Compensation for Delay (Liquidated Damages)
- 28.0 Rights of Owner to forfeit Security Deposit
- 29.0 Failure by the Contractor to comply with the provisions of the Contract.
- 30.0 Contractor remains liable to pay compensation if action not taken under Clause 29.
- 31.0 Change in Constitution
- 32.0 Termination of Contract for Death
- 33.0 Members of the Owner not individually liable
- 34.0 Owner not bound by personal representations
- 35.0 Contractor's office at site
- 36.0 Contractor's subordinate staff and their conduct
- 37.0 Sub letting of works
  - (i) Sub Contracts for Temporary works etc.
  - (ii) List of Sub-contractors to be supplied
  - (iii) Contractor's Liability not limited by contractors
  - (iv) Owner may terminate sub contracts
  - (v) No remedy for action taken under this clause
- 38.0 Power of Entry
- 39.0 Contractor's responsibility with Mechanical, Electrical, Intercommunication System, Air Conditioning Contractors and other Agencies
- 40.0 Other agencies at site
- 41.0 Notices

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- 41.1 To the Contractor
  - 41.2 To the Owner
  - 42.0 Rights of Various Interests
  - 43.0 Patents and Royalties
  - 44.0 Liens
  - 45.0 Delays by Owner & his authorized agents
  - 46.0 Payments if Contract is terminated
  - 47.0 No waiver of Rights
  - 48.0 Certificate not to affect Right of Owner and Liability of contractor
  - 49.0 Languages & Measures
  - 50.0 Transfer of Title
  - 51.0 Release of Information
  - 52.0 Brand Names
  - 53.0 Completion of Contract
  - 54.0 Spares

**SECTION – V (PERFORMANCE OF WORK)**

- 55.0 Execution of work
- 56.0 Co-ordination and Inspection of work
- 57.0 Work in Monsoon & dewatering
- 58.0 Work on Sundays & Holidays
- 59.0 General Conditions for construction & Erection Work
- 60.0 Alternations in specified, Design & Extra work
- 61.0 Drawings to be supplied by the Owner
- 62.0 Drawings to be supplied by the Contractor
- 63.0 Setting out works
- 64.0 Responsibility for Levels and Alignment
- 65.0 Materials to be supplied by Contractor
- 66.0 Stores supplied by Owner
- 67.0 Condition for issue of material
- 68.0 Materials Procured with assistance of Owner/Return of surplus
- 69.0 Materials obtained from Dismantling
- 70.0 Articles of Value found
- 71.0 Discrepancies between instructions
- 72.0 Action where no specification is issued
- 73.0 Inspection of Works
- 74.0 Tests for Quality of Works
- 75.0 Samples for approval
- 76.0 Action and Compensation in case of bad work
- 77.0 Suspension of Work
- 78.0 Owner may do part of work
- 79.0 Possession prior to completion

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- 80.0 Twelve months period of liability from the date of issue of completion certificate
- 81.0 Care of Works
  - 81.1 Defects prior to taking over
  - 81.2 Defects after taking over
- 82.0 Guarantee/Transfer of Guarantee
- 83.0 Training of Owner's personnel
- 84.0 Replacement of Defective parts & materials
- 85.0 Defense of Suits
- 86.0 Construction Aids, Equipments, Tools & Tackles

**SECTION – VI (CERTIFICATES AND PAYMENTS)**

- 87.0 Schedule of Rates and Payments
  - (i) Contractor's Remuneration
  - (ii) Schedule of Rates to be inclusive
  - (iii) Schedule of rates to cover construction equipment, materials, labour etc.
  - (iv) Schedule of Rates to cover Royalties; Rents and claims
  - (v) Schedule of Rates to cover taxes & duties
  - (vi) Schedule of Rates to cover risks of delay
  - (vii) Schedule of Rates cannot be altered
- 88.0 Procedure for Measurement and billing of works in progress
  - 88.1 Billing Procedure
  - 88.2 Secured Advance on materials
  - 88.3 Dispute in mode of measurement
  - 88.4 Rounding of Amounts
- 89.0 Lumpsum in tender
- 90.0 Running Account Payments to be regarded as advances
- 91.0 Notices of Claims for Additional Payments
- 92.0 Payment of contractor's bills
- 93.0 Receipt for Payment
- 94.0 Completion Certificate
  - 94.1 Application for Completion Certificate
  - 94.2 Completion Certificate
  - 94.3 Completion Certificate documents
- 95.0 Final Decision & Final Certificate
- 96.0 Certificate and Payments on evidence of completion
- 97.0 Deduction from Contract Price

**SECTION – VII (TAXES AND INSURANCE)**

- 98.0 Taxes, Duties, Octroi etc.
- 99.0 GST
- 100.0 101.0 Insurance

101.1 General

- (i) Employees State Insurance Act
- (ii) Workmen Compensation and Employee's Liability Insurance
- (iii) Any other insurance required under law or regulations or by Owner
- (iv) Accident or injury to workmen
- (v) Transit Insurance

102.0 Damage to property or to any person or any third party

**SECTION – VIII (LABOUR LAWS & ARBITRATION)**

103.0 Labour Laws

104.0 Implementation of Apprentices act 1961

105.0 Contractor to indemnify the Owner

106.0 Health and Sanitary agreement for Worker

107.0 Dispute Resolution & Arbitration

108.0 Jurisdiction

**SECTION – X (SAFETY CODES)**

109.0 General

110.0 Safety Regulations

111.0 First-aid and Industrial Injuries

112.0 General Rules

113.0 Contractor's barricades

114.0 Scaffolding

115.0 Excavation and Trenching

116.0 Demolition/General Safety

117.0 Care in Handling Inflammable Gas

118.0 Temporary Combustible structures

119.0 Precautions against Fire

120.0 Explosives

121.0 Mines Act

122.0 Preservation of Places

123.0 Outbreak of Infectious diseases

124.0 Use of intoxicants

**ANNEXURES**

1. Proforma for Indemnity Bond
2. Proforma for Contract Agreement

**GENERAL CONDITIONS OF CONTRACT**

**SECTION- I DEFINITIONS**

1. Definition of Terms:



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1.1 In this **CONTRACT** (as here-in-after defined) the following words and expressions shall have the meanings hereby assigned to them except where the context otherwise required.

1.1.1. The **EMPLOYER/COMPANY/GGPL** means GGPL (INDIA) LTD., a public limited company, incorporated under the Company's act 1956 and having its Registered office at D. No. 85-06-23/2, 2<sup>nd</sup> floor, 40<sup>th</sup> Ward, Morampudi Junction, Rajahmendravararam-533 103, East Godavari Dist, A.P. and includes its successors and assigns.

1.1.2. The "**CONTRACTOR**" means the person or the persons, firm or Company or corporation whose tender has been accepted by the EMPLOYER and includes the CONTRACTOR's legal Representatives his successors and permitted assigns.

1.1.3. The **ENGINEER/ENGINEER-IN-CHARGE**" shall mean the person designated from time to time by the GGPL and shall include those who are expressly authorized by him to act for and on his behalf for operation of this CONTRACT.

1.1.4. The "**WORK**" shall mean and include all items and things to be supplied/ done and services and activities to be performed by the CONTRACTOR in pursuant to and in accordance with CONTRACT or part thereof as the case may be and shall include all extra, additional, altered or substituted works as required for purpose of the CONTRACT.

1.1.5. The "**PERMANENTWORK**" means and includes works which will be incorporated in and form a part of the work to be handed over to the EMPLOYER by the CONTRACTOR on completion of the CONTRACT.

1.1.6. "**CONSTRUCTIONEQUIPMENT**" means all appliances/equipment and things whatsoever nature for the use in or for the execution, completion, operation, or maintenance of the work or temporary works (as hereinafter defined) but does not include materials or other things intended to form or to be incorporated into the WORK, or camping facilities.

1.1.7. "**CONTRACTDOCUMENTS**" means collectively the Tender Documents, Designs, Drawings, Specification, Schedule of Quantities and Rates, Letter of Acceptance and agreed variations if any, and such other documents constituting the tender and acceptance thereof.

1.1.8. **CONSULTANT**: means ----- who are the consulting engineer to the Employer for this project and having registered office at -----

1.1.9. The "**SUB-CONTRACTOR**" means any person or firm or Company (other than the CONTRACTOR) to whom any part of the work has been entrusted by the CONTRACTOR, with the written consent of the ENGINEER-IN-CHARGE, and the legal representatives, successors and permitted assigns of such person, firm or company.

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1.1.10. The "**CONTRACT**" shall mean the Agreement between the EMPLOYER and the CONTRACTOR for the execution of the works including therein all contract documents.

1.1.11. The "**SPECIFICATION**" shall mean all directions the various technical specifications, provisions attached and referred to the Tender Documents which pertain to the method and manner of performing the work or works to the quantities and qualities of the work or works and the materials to be furnished under the CONTRACT for the work or works, as may be amplified or modified by the GGPL or ENGINEER-IN-CHARGE during the performance of CONTRACT in order to provide the unforeseen conditions or in the best interests of the work or works. It shall also include the latest edition of relevant Standard Specifications including all addenda/corrigenda published before entering into CONTRACT.

1.1.12. The "**DRAWINGS**" shall include maps, plans and tracings or prints or sketches thereof with any modifications approved in writing by the ENGINEER- IN-CHARGE and such other drawing as may, from time to time, be furnished or approved in writing by the ENGINEER-IN-CHARGE.

1.1.13. The "**TENDER**" means the proposal along with supporting documents submitted by the CONTRACTOR for consideration by the EMPLOYER.

1.1.14. The "**CHANGEORDER**" means an order given in writing by the ENGINEER-IN-CHARGE to effect additions to or deletion from and alteration in the works.

1.1.15. The "**COMPLETIONCERTIFICATE**" shall mean the certificate to be issued by the ENGINEER-IN-CHARGE when the works have been completed entirely in accordance with CONTRACT DOCUMENT to his satisfaction.

1.1.16. The "**FINALCERTIFICATE**" in relation to a work means the certificate regarding the satisfactory compliance of various provision of the CONTRACT by the CONTRACTOR issued by the ENGINEER-IN- CHARGE/EMPLOYER after the period of liability is over.

1.1.17. "**DEFECTLIABILITYPERIOD**" in relation to a work means the specified period from the date of COMPLETION CERTIFICATE upto the date of issue of FINAL CERTIFICATE during which the CONTRACTOR stands responsible for rectifying all defects that may appear in the works executed by the CONTRACTOR in pursuance of the CONTRACT and includes warranties against Manufacturing/Fabrication/ Erection/Construction defects covering all materials plants, equipment, components, and the like supplied by the CONTRACTOR, works executed against workmanship defects.

1.1.18. The "**APPOINTINGAUTHORITY**" for the purpose of arbitration shall be the CHAIRMAN and MANAGING DIRECTOR or any other person so designated by the EMPLOYER.

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1.1.19. "**TEMPORARYWORKS**" shall mean all temporary works of every kind required in or about the execution, completion or maintenance of works.

1.1.20. "**PLANS**" shall mean all maps, sketches and layouts as are incorporated in the CONTRACT in order to define broadly the scope and specifications of the work or works, and all reproductions thereof.

1.1.21. "**SITE**" shall mean the lands and other places on, under, in or through which the permanent works are to be carried out and any other lands or places provided by the EMPLOYER for the purpose of the CONTRACT.

1.1.22. "**NOTICEINWRITINGORWRITTENNOTICE**" shall mean a notice in written, typed or printed characters sent (unless delivered personally or otherwise proved to have been received by the addressee) by registered post to the latest known private or business address or registered office of the addressee and shall be deemed to have been received in the ordinary course of post it would have been delivered.

1.1.23. "**APPROVED**" shall mean approved in writing including subsequent written confirmation of previous verbal approval and "APPROVAL" means approval in writing including as aforesaid.

1.1.24. "**LETTEROFINTENT/FAXOFINTENT**" shall mean intimation by a Fax/Letter to Tenderer(s) that the tender has been accepted in accordance with the provisions contained in the letter.

1.1.25. "**DAY**" means a day of 24 hours from midnight to midnight irrespective of the number of hours worked in that day.

1.1.26. "**WORKINGDAY**" means any day which is not declared to be holiday or rest day by the EMPLOYER.

1.1.27. "**WEEK**" means a period of any consecutive seven days.

1.1.28. "**METRICSYSTEM**" - All technical documents regarding the construction of works are given in the metric system and all work in the project should be carried out according to the metric system. All documents concerning the work shall also be maintained in the metric system.

1.1.29. "**VALUEOFCONTRACT**" or "**TOTALCONTRACTPRICE**" shall mean the sum accepted or the sum calculated in accordance with the prices accepted in tender and/or the CONTRACT rates as payable to the CONTRACTOR for the entire execution and full completion of the work, including change order.

1.1.30. "**LANGUAGEFORDRAWINGSANDINSTRUCTION**" All the drawings, titles, notes, instruction, dimensions, etc. shall be in English Language.

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1.1.31. "**MOBILIZATION**" shall mean establishment of sufficiently adequate infrastructure by the CONTRACTOR at "SITE" comprising of construction equipments, aids, tools tackles including setting of site offices with facilities such as power, water, communication etc. establishing manpower organization comprising of Resident Engineers, Supervising personnel and an adequate strength of skilled, semi-skilled and un-skilled workers, who with the so established infrastructure shall be in a position to commence execution of work at site(s), in accordance with the agreed Time Schedule of Completion of Work. "MOBILISATION" shall be considered to have been achieved, if the CONTRACTOR is able to establish infrastructure as per Time Schedule, where so warranted in accordance with agreed schedule of work implementation to the satisfaction of ENGINEER-IN-CHARGE/EMPLOYER.

1.1.32. "**COMMISSIONING**" shall mean pressing into service of the system including the plant(s), equipment(s), vessel(s), pipeline, machinery(ies), or any other section or sub-section of installation(s) pertaining to the work of the CONTRACTOR after successful testing and trial runs of the same. "COMMISSIONING" can be either for a completed system or a part of system of a combination of systems or sub-systems and can be performed in any sequence as desired by EMPLOYER and in a manner established to be made suited according to availability of pre-requisites. Any such readjustments made by EMPLOYER in performance of "COMMISSIONING" activity will not be construed to be violating CONTRACT provisions and CONTRACTOR shall be deemed to have provided for the same.

## **SECTION-II GENERAL INFORMATION**

### **2. General Information**

2.1 a) **Location of Site:** The proposed location of Project site is defined in the Special Conditions of Contract.

b) **Access by Road:** CONTRACTOR, if necessary, shall build other temporary access roads to the actual site of construction for his own work at his own cost. The CONTRACTOR shall be required to permit the use of the roads so constructed by him for vehicles of any other parties who may be engaged on the project site. The CONTRACTOR shall also facilitate the construction of the permanent roads should the construction there of start while he is engaged on this work. He shall make allowance in his tender for any inconvenience he anticipates on such account. Non-availability of access roads, railway siding and railway wagons for the use of the CONTRACTOR shall in no case condone any delay in the execution of WORK nor be the cause for any claim for compensation against the EMPLOYER.

2.2 **Scope of Work:** The scope of WORK is defined in the Technical Part of the tender document. The CONTRACTOR shall provide all necessary materials, equipment, labour etc. for the execution and maintenance of the WORK till completion unless otherwise mentioned in the Tender Document.

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**2.3 Water Supply:** Contractor will have to make his own arrangements for supply of water to his labour camps and for works. All pumping installations, pipe net work and distribution system will have to be carried out by the Contractor at his own risk and cost. Alternatively the Employer at his discretion may endeavour to provide water to the Contractor at the Employer's source of supply provided the Contractor makes his own arrangement for the water meter which shall be in custody of the Employer and other pipe net works from source of supply and such distribution pipe network shall have prior approval of the Engineer-in-Charge so as not to interfere with the layout and progress of the other construction works. In such case, the rate for water shall be deducted from the running account bills. However, the Employer does not guarantee the supply of water and this does not relieve the Contractor of his responsibility in making his own arrangement and for the timely completion of the various works as stipulated.

**2.4 Power Supply:**

**2.4.1** Subject to availability, EMPLOYER will supply power at 400/440 V at only one point at the nearest sub-station, from where the CONTRACTOR will make his own arrangement for temporary distribution. The point of supply will not be more than 500 m away from the CONTRACTOR'S premises. All the works will be done as per the applicable regulations and passed by the ENGINEER-IN-CHARGE. The temporary line will be removed forthwith after the completion of work or if there is any hindrance caused to the other works due to the alignment of these lines, the CONTRACTOR will re-route or remove the temporary lines at his own cost. The CONTRACTOR at his cost will also provide suitable electric meters, fuses, switches, etc. for purposes of payment to the EMPLOYER which should be in the custody and control of the EMPLOYER. The cost of power supply shall be payable to the EMPLOYER every month for Construction Works power which would be deducted from the running account bills. The EMPLOYER shall not, however, guarantee the supply of electricity nor have any liability in respect thereof. No claim for compensation for any failure or short supply of electricity will be admissible.

**2.4.2** It shall be the responsibility of the CONTRACTOR to provide and maintain the complete installation on the load side of the supply with due regard to safety requirement at site. All cabling, equipment, installations etc. shall comply in all respects with the latest statutory requirements and safety provisions i.e., as per the Central/State Electricity Acts and Rules etc. The CONTRACTOR will ensure that his equipment and Electrical Wiring etc., are installed, modified, maintained by a licensed Electrician/Supervisor. A test certificate is to be produced to the ENGINEER-IN-CHARGE for his approval, before power is made available.

**2.4.3** At all times, IEA regulations shall be followed failing which the EMPLOYER has a right to disconnect the power supply without any reference to the CONTRACTOR. No claim shall be entertained for such disconnection by the ENGINEER-IN-CHARGE. Power supply will be reconnected only after production of fresh certificate from authorized electrical supervisors.

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2.4.4 The EMPLOYER is not liable for any loss or damage to the CONTRACTOR's equipment as a result of variation in voltage or frequency or interruption in power supply or other loss to the CONTRACTOR arising therefrom.

2.4.5 The CONTRACTOR shall ensure that the Electrical equipment installed by him are such that average power factors does not fall below 0.90 at his premises. In case power factor falls below 0.90 in any month, he will reimburse to the EMPLOYER at the penal rate determined by the EMPLOYER for all units consumed during the month.

2.4.6 The power supply required for CONTRACTOR's colony near the plant site will be determined by the EMPLOYER and shall be as per State Electricity Board's Rules and other statutory provisions applicable for such installations from time to time. In case of power supply to CONTRACTOR's colony, the power will be made available at a single point and the CONTRACTOR shall make his own arrangement at his own cost for distribution to the occupants of the colony as per Electricity Rules and Acts. The site and colony shall be sufficiently illuminated to avoid accidents.

2.4.7 The CONTRACTOR will have to provide and install his own lights and power meters which will be governed as per Central/State Government Electricity Rules. The metres shall be sealed by the EMPLOYER.

2.4.8 In case of damage of any of the EMPLOYER's equipment on account of fault, intentional or unintentional on the part of the CONTRACTOR, the EMPLOYER reserves the right to recover the cost of such damage from the CONTRACTOR's bill. Cost of HRC Fuses replaced at the EMPLOYER's terminals due to any fault in the CONTRACTOR's installation shall be to CONTRACTOR's account at the rates decided by the ENGINEER-IN-CHARGE.

2.4.9 Only motors upto 3 HP will be allowed to be started direct on line. For motors above 3 HP and upto 100 HP a suitable Starting device approved by the ENGINEER- IN-CHARGE shall be provided by the CONTRACTOR For motors above 100 HP slipring induction motors with suitable starting devices as approved by the ENGINEER- IN-CHARGE shall be provided by the CONTRACTOR

2.4.10 The CONTRACTOR shall ensure at his cost that all electrical lines and equipment and all installations are approved by the State Electricity Inspector before power can be supplied to the EMPLOYER.

2.4.11 The total requirement of power shall be indicated by the tenderer alongwith his tender.

2.5 Land for Contractor's Field Office, Godown and Workshop: The EMPLOYER will, at his own discretion and convenience and for the duration of the execution of the work make available near the site, land for construction of CONTRACTOR's Temporary Field Office, godowns workshops and assembly yard required for the execution of the CONTRACT. The

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CONTRACTOR shall at his own cost construct all these temporary buildings and provide suitable water supply and sanitary arrangement and get the same approved by the ENGINEER-IN-CHARGE. On completion of the works undertaken by the CONTRACTOR, he shall remove all temporary works erected by him and have the SITE cleaned as directed by ENGINEER-IN-CHARGE. If the CONTRACTOR shall fail to comply with these requirements, the ENGINEER-IN-CHARGE may at he expenses of the CONTRACTOR remove such surplus, and rubbish materials and dispose off the same as he deems fit and get the site cleared as aforesaid; and CONTRACTOR shall forthwith pay the amount of all expenses so incurred and shall have no claim in respect of any such surplus materials disposed off as aforesaid. But the EMPLOYER reserves the right to ask the CONTRACTOR any time during the pendency of the CONTRACT to vacate the land by giving 7 days notice on security reasons or on national interest or otherwise. Rent may be charged for the land so occupied from contractor by the Employer. The CONTRACTOR shall put up temporary structures as required by them for their office, fabrication shop and construction stores only in the area allocated to them on the project site by the EMPLOYER or his authorised representative. No tea stalls/canteens should be put up or allowed to be put up by any CONTRACTOR in the allotted land or complex area without written permission of the EMPLOYER. No unauthorised buildings, constructions or structures should be put up by the CONTRACTOR anywhere on the project site. For uninterrupted fabrication work, the CONTRACTOR shall put up temporary covered structures at his cost within Area in the location allocated to them in the project site by the EMPLOYER or his authorised representative. No person except for authorised watchman shall be allowed to stay in the plant area/CONTRACTOR's area after completion of the day's job without prior written permission from ENGINEER-IN-CHARGE.

2.6 Land for Residential Accommodation:-:No Land shall be made available for residential accommodation for staff and labour of CONTRACTOR.

### **SECTION-III GENERAL INSTRUCTIONS TO TENDERERS**

#### **3. Submission of Tender:**

3.1 TENDER must be submitted without making any additions, alterations, and as per details given in other clauses hereunder. The requisite details shall be filled in by the TENDERER at space provided under "Submission of Tender at the beginning of GCC of Tender Document. The rate shall be filled only in the schedule given in this Tender Document.

3.2 Addenda/Corrigenda to this Tender Document, if issued, must be signed, submitted alongwith the Tender Document. the tenderer should write clearly the revised quantities in Schedule of Rates of Tender Document and should price the WORK based on revised quantities when amendments of quantities are issued in addenda.

3.3 Covering letter alongwith its enclosures accompanying the Tender Document and all further correspondence shall be submitted in duplicate.

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3.4 Tenderers are advised to submit quotations based strictly on the terms and conditions and specifications contained in the Tender Documents and not to stipulate any deviations.

3.5 Tenders should always be placed in double sealed covers, superscribing ["QUOTATION DO NOT OPEN" Tender for \_\_\_\_\_ Project of GODAVARI GAS (P) LTD due for opening on \_\_\_\_\_]. The Full Name, Address and Telegraphic Address, Fax No. of the Tenderers shall be written on the bottom left hand corner of the sealed cover.

#### **4. Documents:**

4.1 General: The tenders as submitted, will consist of the following:

- (i) Complete set of Tender Documents (Original) as sold duly filled in and signed by the tenderer as prescribed in different clauses of the Tender Documents.
- (ii) Earnest money in the manner specified in Clause 6 hereof.
- (iii) Power of Attorney or a true copy thereof duly attested by a Gazetted Officer in case an authorised representative has signed the tender, as required by Clause 14 hereof.
- (iv) Information regarding tenderers in the proforma enclosed.
- (v) Details of work of similar type and magnitude carried out by the Tenderer in the proforma provided in the tender document.
- (vi) Organisation chart giving details of field management at site, the tenderer proposes to have for this job.
- (vii) Details of construction plant and equipments available with the tenderer for using in this work.
- (viii) Solvency Certificate from Scheduled Bank to prove the financial ability to carry out the work tendered for.
- (ix) Latest Balance Sheet and Profit & Loss Account duly audited.
- (x) Details of present commitment as per proforma enclosed to tender.
- (xi) Data required regarding SUB-CONTRACTOR(s)/ Supplier/ Manufacturers and other technical informations the tenderer wish to furnish.
- (xii) Provident fund registration certificate
- (xiii) List showing all enclosures to tender.



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4.2 All pages are to be Initiated: All signatures in Tender Documents shall be dated, as well as, all the pages of all sections of Tender Documents shall be initialed at the lower right hand corner and signed wherever required in the tender papers by the TENDERER or by a person holding power of attorney authorising him to sign on behalf of the tenderer before submission of tender.

4.3 Rates to be in Figures and Words: The tender should quote in English both in figures as well as in words the rates and amounts tendered by him in the Schedule of Rates of Tender submitted by the CONTRACTOR for each item and in such a way that interpolation is not possible. The amount for each item should be worked out and entered and requisite total given of all items, both in figures and in words. The tendered amount for the work shall be entered in the tender and duly signed by the Tenderer. If some discrepancies are found between the RATES in FIGURES and WORDS or the AMOUNT shown in the tender, the following procedure shall be followed:

- a) When there is difference between the rates in figures and words, the rate which corresponds to the amount worked out by the tenderer shall be taken as correct.
- b) When the rate quoted by the tenderer in figures and words tally but the amount is incorrect the rate quoted by the tenderer shall be taken as correct.
- c) When it is not possible to ascertain the correct rate by either of above methods, the rate quoted in words shall be taken as correct.

4.4 Corrections and Erasures: All correction(s) and alteration(s) in the entries of tender paper shall be signed in full by the TENDERER with date. No erasure or over writing is permissible.

**4.5 Signature of Tenderer:**

4.5.1 The TENDERER shall contain the name, residence and place of business of person or persons making the tender and shall be signed by the TENDERER with his usual signature. Partnership firms shall furnish the full names of all partners in the tender. It should be signed in the partnership's name by all the partners or by duly authorised representatives followed by the name and designation of the person signing. Tender by a corporation shall be signed by an authorised representative, and a Power of Attorney in that behalf shall accompany the tender. A copy of the constitution of the firm with names of all partners shall be furnished.

4.5.2 When a tenderer signs a tender in a language other than English, the total amount tendered should, in addition, be written in the same language. The signature should be attested by at least one witness.

4.6 **Witness:** Witness and sureties shall be persons of status and property and their names, occupation and address shall be stated below their signature.

4.7 **Details of Experience:** The tenderer should furnish, alongwith his tender, details of previous experience in having successfully completed in the recent past works of this

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nature, together with the names of Employers, location of sites and value of contract, date of commencement and completion of work, delays if any, reasons of delay and other details alongwith documentary evidence(s).

**4.8 Liability of Government of India:** It is expressly understood and agreed by and between Bidder or/Contractor and M/s GODAVARI GAS (P) LTD, and that M/s GGPL (India) Ltd., is entering into this agreement solely on its own behalf and not on behalf of any other person or entity. In particular, it is expressly understood and agreed that the Government of India is not a party to this agreement and has no liabilities, obligations or rights hereunder. It is expressly understood and agreed that M/s GGPL (India) Ltd. is an independent legal entity with power and authority to enter into contracts solely on its own behalf under the applicable Laws of India and general principles of Contract Law. The Bidder/Contractor expressly agrees, acknowledges and understands that M/s GGPL (India) Ltd. is not an agent, representative or delegate of the Government of India. It is further understood and agreed that the Government of India is not and shall not be liable for any acts, omissions, commissions, breaches or other wrongs arising out of the contract. Accordingly, Bidder/Contractor hereby expressly waives, releases and foregoes any and all actions or claims, including cross claims, impleader claims or counter claims against the Government of India arising out of this contract and covenants not to sue to Government of India as to any manner, claim, cause of action or thing whatsoever arising of or under this agreement.

**5. Transfer of Tender Documents:**

5.1 Transfer of Tender Documents purchased by one intending tenderer to another is not permissible.

**6. Earnest Money:**

6.1 The bidder must pay Earnest Money as given in the letter /notice inviting tenders and attach the official receipt with the tender failing which the tender is liable to be rejected and representatives of such tenderers will not be allowed to attend the tender opening. Earnest Money can be paid in Demand Drafts or Bank Guarantee or Banker's Cheque or Letter of Credit 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. However, other than the Nationalised Indian Banks, the banks whose BGs are furnished, must be commercial banks having net worth in excess of Rs. 100 crores 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. The bid guarantee shall be submitted in the prescribed format .

Note: The Bank Guarantee so furnished by the tenderer shall be in the proforma prescribed by the EMPLOYER. No interest shall be paid by the EMPLOYER on the Earnest Money deposited by the tenderer. The Bank Guarantee furnished in lieu of Earnest Money shall be kept valid for a period of "SIX MONTHS" from the date of opening of tender.(TWO MONTHS beyond the bid validity). The Earnest Money deposited by successful tenderer shall be forfeited if the Contractor fails to furnish the requisite Contract Performance

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Security as per clause 24 hereof and /or fails to start work within a period of 15 days or fails to execute the AGREEMENT within 15 days of the receipt by him of the Notification of Acceptance of Tender.

Note: The Earnest Money of the unsuccessful bidder will be returned by EMPLOYER/CONSULTANT, directly to the tenderer (s), within a reasonable period of time but not later than 30 days after the expiration of the period of bid validity prescribed by EMPLOYER.

## **7 Validity:**

7.1 Tender submitted by tenderers shall remain valid for acceptance for a period of "4 MONTHS" from the date of opening of the tender. The tenderers shall not be entitled during the said period of 4 months, without the consent in writing of the EMPLOYER, to revoke or cancel his tender or to vary the tender given or any term thereof. In case of tender revoking or canceling his tender or varying any term in regard thereof without the consent of EMPLOYER in writing, the EMPLOYER shall forfeit Earnest Money paid by him alongwith tender.

## **8 Addenda/Corrigenda**

8.1 Addenda/ Corrigenda to the Tender Documents will be issued in duplicate prior to the date of opening of the tenders to clarify documents or to reflect modification in design or CONTRACT terms.

8.2 Each addenda/ corrigendum issued will be issued in duplicate to each person or organisation to whom set of Tender Documents has been issued. Recipient will retain tenderer's copy of each Addendum/Corrigendum and attach original copy duly signed along with his offer. All Addenda/Corrigenda issued shall become part of Tender Documents.

## **9 Right of Employer to Accept or Reject Tender:**

9.1 The right to accept the tender will rest with the EMPLOYER. The EMPLOYER, however, does not bind himself to accept the lowest

tender, and reserves to itself the authority to reject any or all the tenders received without assigning any reason whatsoever. At the option of the Employer, the work for which the tender had been invited, may be awarded to one Contractor or split between more than one bidders, in which case the award will be made for only that part of the work, in respect of which the bid has been accepted. The quoted rates should hold good for such eventualities. Tenders in which any of the particulars and prescribed information are missing or are incomplete in any respect and/or the prescribed conditions are not fulfilled are liable to be rejected. The Tender containing uncalled for remarks or any additional conditions are liable to be rejected. Canvassing in connection with tenders is strictly

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prohibited and tenders submitted by the Tenderers who resort to canvassing will be liable to rejection.

## **10 Time Schedule**

10.1 The WORK shall be executed strictly as per the TIME SCHEDULE specified in TENDER/CONTRACT Document. The period of construction given in Time Schedule includes the time required for mobilisation as well as testing, rectifications if any, retesting and completion in all respects to the entire satisfaction of the ENGINEER-IN-CHARGE.

10.2 A joint programme of execution of the WORK will be prepared by the ENGINEER-IN-CHARGE and CONTRACTOR based on priority requirement of this project. This programme will take into account the time of completion mentioned in 10.1 above and the time allowed for the priority works by the ENGINEER-IN-CHARGE.

10.3 Monthly/Weekly construction programme will; be drawn up by the ENGINEER-IN-CHARGE jointly with the CONTRACTOR, based on availability of work fronts and the joint construction programme as per 10.2 above. The CONTRACTOR shall scrupulously adhere to these targets /programmes by deploying adequate personnel, construction tools and tackles and he shall also supply himself all materials of his scope of supply in good time to achieve the targets/programmes. In all matters concerning the extent of targets set out in the weekly and monthly programmes and the degree of achievements the decision of the ENGINEER-IN-CHARGE will be final and binding on the CONTRACTOR.

## **11 Tenderer's Responsibility**

11.1 The intending tenderers shall be deemed to have visited the SITE and familiarised submitting the tender. Non-familiarity with the site conditions will not be considered a reason either for extra claims or for not carrying out the works in strict conformity with the DRAWINGS and SPECIFICATIONS or for any delay in performance.

## **12 Retired Government or Company Officers**

12.1 No Engineer of Gazetted rank or other Gazetted Officer employed in Engineering or Administrative duties in an Engineering Department of the States/ Central Government or of the EMPLOYER is allowed to work as a CONTRACTOR for a period of two years after his retirement from Government Service, or from the employment of the EMPLOYER without the previous permission of the EMPLOYER. The CONTRACT, if awarded, is liable to be cancelled if either the CONTRACTOR or any of his employees is found at any time to be such a person, who has not obtained the permission of the State/Central Government or of the EMPLOYER as aforesaid before submission of tender, or engagement in the CONTRACTOR'S service as the case may be.

## **13 Signing of the Contract:**

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13.1 The successful tenderer shall be required to execute an AGREEMENT in the proforma attached with TENDER DOCUMENT within 15 days of the receipt by him of the Notification of Acceptance of Tender. In the event of failure on the part of the successful tenderer to sign the AGREEMENT within the above stipulated period, the Earnest Money or his initial deposit will be forfeited and the acceptance of the tender shall be considered as cancelled.

**14 Field Management & Controlling/Coordinating Authority:**

14.1 The field management will be the responsibility of the ENGINEER-IN-CHARGE, who will be nominated by the EMPLOYER. The ENGINEER-IN-CHARGE may also authorize his representatives to assist in performing his duties and functions.

14.2 The ENGINEER-IN-CHARGE shall coordinate the works of various agencies engaged at site to ensure minimum disruption of work carried out by different agencies. It shall be the responsibility of the CONTRACTOR to plan and execute the work strictly in accordance with site instructions to avoid hindrance to the work being executed by other agencies.

**15 Note to Schedule of Rates:**

15.1 The Schedule of Rates should be read in conjunction with all the other sections of the tender.

15.2 The tenderer shall be deemed to have studied the DRAWINGS, SPECIFICATIONS and details of work to be done within TIME SCHEDULE and to have acquainted himself of the condition prevailing at site.

15.3 Rates must be filled in the Schedule of Rates of original Tender Documents. If quoted in separate typed sheets no variation in item description or specification shall be accepted. Any exceptions taken by the tenderer to the Schedule of Rates shall be brought out in the terms and conditions of the offer.

15.4 The quantities shown against the various items are only approximate. Any increase or decrease in the quantities shall not form the basis of alteration of the rates quoted and accepted.

15.5 The EMPLOYER reserves the right to interpolate the rates for such items of work falling between similar items of lower and higher magnitude.

**16 Policy for Tenders Under Consideration:**

16.1 Only Those Tenders which are complete in all respects and are strictly in accordance with the Terms and Conditions and Technical Specifications of Tender Document, shall be considered for evaluation. Such Tenders shall be deemed to be under consideration immediately after opening of Tender and until such time an official intimation of acceptance /rejection of Tender is made by GGPL to the Bidder.

16.2 **Zero Deviation:** Bidders to note that this is a ZERO DEVIATION TENDER. GGPL will appreciate submission of offer based on the terms and conditions in the enclosed General

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Conditions of Contract (GCC), Special Conditions of Contract (SCC), Instructions to Bidders (ITB), Scope of Work, technical specifications etc. to avoid wastage of time and money in seeking clarifications on technical/ commercial aspects of the offer. Bidder may note that no technical and commercial clarifications will be sought for after the receipt of the bids. In case of any deviation/nonconformity observed in the bid, it will be liable for rejection.

**17 Award of Contract:**

17.1 The Acceptance of Tender will be intimated to the successful Tenderer by GGPL either by Telex/ Telegram/ Fax or by Letter or like means-defined as LETTER OF ACCEPTANCE OF TENDER.

17.2 GGPL will be the sole judge in the matter of award of CONTRACT and the decision of GGPL shall be final and binding.

**18 Clarification of Tender Document:**

18.1 The Tender is required to carefully examine the Technical Specifications, Conditions of Contract, Drawings and other details relating to WORK and given in Tender Document and fully inform himself as to all conditions and matters which may in any way affect the WORK or the cost thereof. In case the Tenderer is in doubt about the completeness or correctness of any of the contents of the Tender Documents he should request in writing for an interpretation/clarification to GGPL in triplicate. GGPL will then issue interpretation/clarification to Tenderer in writing. Such clarifications and or interpretations shall form part of the Specifications and Documents and shall accompany the tender which shall be submitted by tenderer within time and date as specified in invitations to tender.

18.2 Verbal clarification and information given by GGPL or its employee(s) or its representatives shall not in any way be binding on GGPL.

**19 Local Conditions:**

19.1 It will be imperative on each tenderer to inform himself of all local conditions and factors which may have any effect on the execution of WORK covered under the Tender Document. In their own interest, the tenderer are requested to familiarise themselves with the Indian Income Tax Act 1961, Indian Companies Act 1956, Indian Customs Act 1962 and other related Acts and Laws and Regulations of India with their latest amendments, as applicable GGPL shall not entertain any requests for clarifications from the tenderer regarding such local conditions.

19.2 It must be understood and agreed that such factors have properly been investigated and considered while submitting the tender. No claim for financial or any other adjustments to VALUE OF CONTRACT, on lack of clarity of such factors shall be entertained.

**20 Abnormal Rates:**

20.1 The tenderer is expected to quote rate for each item after careful analysis of cost involved for the performance of the completed item considering all specifications and Conditions of Contract. This will avoid loss of profit or gain in case of curtailment or change of specification for any item. In case it is noticed that the rates quoted by the tenderer for

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any item are unusually high or unusually low, it will be sufficient cause for the rejection of the tender unless the EMPLOYER is convinced about the reasonableness after scrutiny of the analysis for such rate(s) to be furnished by the tenderer (on demand).

#### **SECTION-IV GENERAL OBLIGATIONS**

##### **21 Priority of Contract Documents**

21.1 Except if and the extent otherwise provided by the Contract, the provisions of the General Conditions of Contract and Special Conditions shall prevail over those of any other documents forming part of the CONTRACT. Several documents forming the CONTRACT are to be taken as mutually explanatory of one another, but in case of ambiguities or discrepancies the same shall be explained and adjusted by the ENGINEER-IN-CHARGE who shall thereupon issue to the Contractor instructions thereon and in such event, unless otherwise provided in the Contract, the priority of the documents forming the Contract shall be as follows :

- (i) The Contract Agreement ;
- (ii) The Letter of Acceptance;
- (iii) The (Instructions to Bidders)ITB;
- (iv) Special Conditions of Contract (SCC);
- (v) General Conditions of Contract (GCC)
- (vi) Any other document forming part of the Contract. Works shown in the DRAWING but not mentioned in the SPECIFICATIONS OR described in the SPECIFICATIONS without being shown in the DRAWINGS shall nevertheless be deemed to be included in the same manner as if they had been specifically shown upon the DRAWINGS and described in the SPECIFICATIONS.

21.2 **Headings and Marginal Notes:** All headings and marginal notes to the clauses of these General Conditions of Contract or to the SPECIFICATIONS or to any other Tender Document are solely for the purpose of giving a concise indication and not a summary of the contents thereof, and they shall never be deemed to be part thereof or be used in the interpretation or construction thereof the CONTRACT.

21.3 **Singular and Plural:** In CONTRACT DOCUMENTS unless otherwise stated specifically, the singular shall include the plural and vice versa wherever the context so requires.

21.4 **Interpretation:** Words implying 'Persons' shall include relevant 'Corporate Companies / Registered Associations/ Body of Individuals/ Firm of Partnership' as the case may be.

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**22 Special Conditions of Contract:**

22.1 Special Conditions of Contract shall be read in conjunction with the General Conditions of Contract, specification of Work, Drawings and any other documents forming part of this CONTRACT wherever the context so requires.

22.2 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 with and into the CONTRACT so far as it may be practicable to do so.

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

22.4 Wherever it is mentioned in the specifications that the CONTRACTOR shall perform certain WORK or provide certain facilities, it is understood that the CONTRACTOR shall do so at his cost and the VALUE OF CONTRACT shall be deemed to have included cost of such performance and provisions, so mentioned.

22.5 The materials, design and workmanship shall satisfy the relevant INDIAN STANDARDS, 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.

**23 Contractor to obtain his own Information:**

23.1 The CONTRACTOR in fixing his rate shall for all purpose whatsoever reason may be, deemed to have himself independently obtained all necessary information for the purpose of preparing his tender and his tender as accepted shall be deemed to have taken into account all contingencies as may arise due to such information or lack of same. The correctness of the details, given in the Tender Document to help the CONTRACTOR to make up the tender is not guaranteed. The CONTRACTOR shall be deemed to have examined the CONTRACT DOCUMENTS, to have generally obtained his own information in all matters whatsoever that might affect the carrying out of the works at the schedules rates and to have satisfied himself to the sufficiency of his tender. Any error in description of quantity or omission there from shall not vitiate the CONTRACT or release the CONTRACTOR from executing the work comprised in the CONTRACT according to DRAWINGS and SPECIFICATIONS at the scheduled rates. He is deemed to have known the scope, nature and magnitude of the WORKS and the requirements of materials and labour involved etc., and as to what all works he has to complete in accordance with the CONTRACT documents



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whatever be the defects, omissions or errors that may be found in the DOCUMENTS. The CONTRACTOR shall be deemed to have visited surroundings, to have satisfied himself to the nature of all existing structures, if any, and also as to the nature and the conditions of the Railways, Roads, Bridges and Culverts, means of transport and communication, whether by land, water or air, and as to possible interruptions thereto and the access and egress from the site, to have made enquiries, examined and satisfied himself as to the sites for obtaining sand, stones, bricks and other materials, the sites for disposal of surplus materials, the available accommodation as to whatever required, depots and such other buildings as may be necessary for executing and completing the works, to have made local independent enquiries as to the sub-soil, subsoil water and variations thereof, storms, prevailing winds, climatic conditions and all other similar matters effecting these works. He is deemed to have acquainted himself as to his liability of payment of Government Taxes, Customs duty and other charges, levies etc. Any neglect or omission or failure on the part of the CONTRACTOR in obtaining necessary and reliable information upon the foregoing or any other matters affecting the CONTRACT shall not relieve him from any risks or liabilities or the entire responsibility from completion of the works at the scheduled rates and times in strict accordance with the CONTRACT. It is, therefore, expected that should the CONTRACTOR have any doubt as to the meaning of any portion of the CONTRACT DOCUMENT he shall set forth the particulars thereof in writing to EMPLOYER in duplicate, before submission of tender. The EMPLOYER may provide such clarification as may be necessary in writing to CONTRACT, such clarifications as provided by EMPLOYER shall form part of CONTRACT DOCUMENTS. No verbal agreement or inference from conversation with any effect or employee of the EMPLOYER either before, during or after the execution of the CONTRACT agreement shall in any way affect or modify and of the terms or obligations herein contained. Any change in layout due to site conditions or technological requirement shall be binding on the CONTRACTOR and no extra claim on this account shall be entertained.

**24 Contract Performance Security:**

24.1 The CONTRACTOR shall furnish to the EMPLOYER, within 15 days from the date of notification of award, a security in the sum of 10% of the accepted value of the tender or the actual value of work to be done whichever is applicable due to any additional work or any other reasons, in the form of a Bank draft/Banker's cheque or Bank Guarantee or irrevocable Letter of credit (as per proforma enclosed) as Contract Performance Security with the EMPLOYER which will be refunded after the expiry of DEFECTS LIABILITY PERIOD. However where the contract is for two years or more, in this case, contractor has to deposit security deposit 7.5% of annualized contract value and where the contract value is up to 25 lacs, initially SD is to be deposited 2.5% and remaining 5% to be recovered from RA Bills. Contract/Order value as mentioned above shall be exclusive of taxes and duties. The SD will

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be valid for the period of contract + 90 days beyond the contract period/duration and applicable Warranty/Guarantee/Defect Liability Period (if any).

24.2 CONTRACTOR can furnish the Contract Performance Security in the form of Demand Draft or through a Bank Guarantee or through an irrevocable Letter of Credit 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. However, other than the Nationalised Indian Banks, the banks whose BGs are furnished, must be commercial banks having net worth in excess of Rs. 100 crores 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. The bank guarantee or the Letter of Credit shall be submitted in the prescribed format.

24.3 If the CONTRACTOR/SUB-CONTRACTOR or their employees or the CONTRACTOR's agents and representatives shall damage, break, deface or destroy any property belonging to the EMPLOYER or others during the execution of the CONTRACT, the same shall be made good by the CONTRACTOR at his own expenses and in default thereof, the ENGINEER-IN-CHARGE may cause the same to be made good by other agencies and recover expenses from the CONTRACTOR (for which the certificate of the ENGINEER- IN-CHARGE shall be final).

24.4 All compensation or other sums of money payable by the CONTRACTOR to the EMPLOYER under terms of this CONTRACT may be deducted from or paid by the encashment or sale of a sufficient part of his Contract Performance Security or from any sums which may be due or may become due to the CONTRACTOR by the EMPLOYER of any account whatsoever and in the event of his Contract Performance Security being reduced by reasons of any such deductions or sale of aforesaid, the CONTRACTOR shall within ten days thereafter make good in cash, bank drafts as aforesaid any sum or sums which may have been deducted from or realised by sale of his Contract Performance Security, or any part thereof. No interest shall be payable by the EMPLOYER for sum deposited as Contract Performance Security.

24.5 Failure of the successful bidder to comply with the requirements of this Clause shall constitute sufficient grounds for the annulment of the award and the forfeiture of bid security.

## 25 **Time of Performance:**

25.1 **Time for Mobilization:** The work covered by this CONTRACT shall be commenced within fifteen (15) days, the date of letter/Fax of Intent and be completed in stages on or before the dates as mentioned in the TIME SCHEDULE OF COMPLETION OF WORK. The CONTRACTOR should bear in mind that time is the essence of this agreement. Request for revision of construction time after tenders are opened will not receive consideration. The

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above period of fifteen (15) days is included within the overall COMPLETION SCHEDULE, not over and above the completion time to any additional work or any other reasons.

## 25.2 Time Schedule of Construction:

25.2.1 The general Time Schedule of construction is given in the TENDER DOCUMENT. CONTRACTOR should prepare a detailed monthly or weekly construction program jointly with the ENGINEER-IN-CHARGE within 15 days of receipt of LETTER/FAX OF INTENT or ACCEPTANCE OF TENDER. The WORK shall be executed strictly as per the Time Schedule given in the CONTRACT DOCUMENT. The period of construction given includes the time required for mobilisation testing, rectifications, if any, retesting and completion in all respects in accordance with CONTRACT DOCUMENT to the entire satisfaction of the ENGINEER-IN-CHARGE.

25.2.2 The CONTRACTOR shall submit a detailed PERT network within the time frame agreed above consisting of adequate number of activities covering various key phases of the WORK such as design, procurement, manufacturing, shipment and field erection activities within fifteen (15) days from the date of LETTER/FAX OF INTENT. This network shall also indicate the interface facilities to be provided by the EMPLOYER and the dates by which such facilities are needed.

25.2.3 CONTRACTOR shall discuss the network so submitted with the EMPLOYER and the agreed network which may be in the form as submitted with the EMPLOYER or in revised form in line with the outcome of discussions shall form part of the CONTRACT, to be signed within fifteen (15) days from the date of LETTER OF ACCEPTANCE OF TENDER. During the performance of the CONTRACT, if in the opinion of the EMPLOYER proper progress is not maintained suitable changes shall be made in the CONTRACTOR's operation to ensure proper progress. The above PERT network shall be reviewed periodically and reports shall be submitted by the CONTRACTOR as directed by EMPLOYER.

## 26 Force Majeure:

26.1 CONDITIONS FOR FORCE MAJEURE: In the event of either party being rendered unable by Force Majeure to perform any obligations required to be performed by them under the CONTRACT the relative obligation of the party affected by such Force Majeures shall upon notification to the other party be suspended for the period during which Force Majeures event lasts. The cost and loss sustained by the either party shall be borne by the respective parties. The term "Force Majeures" as employed herein shall mean acts of God, earthquake, war (declared or undeclared), revolts, riots, fires, floods, rebellions, explosions, hurricane, sabotage, civil commotions and acts and regulations of respective Government of the two parties, namely the EMPLOYER and the CONTRACTOR Upon the occurrence of such

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cause(s) and upon its termination, the party alleging that it has been rendered unable as aforesaid thereby, shall notify the other party in writing immediately but not later than 72 (Seventy-two) hours of the alleged beginning and ending thereof giving full particulars and satisfactory evidence in support of its claim. Time for performance of the relative obligation suspended by the Force Majeures shall then stand extended by the period for which such cause lasts. If deliveries of bought out items and/or works to be executed by the CONTRACTOR are suspended by Force Majeure conditions lasting for more than 2 (two) months the EMPLOYER shall have the option to terminate the CONTRACT or re-negotiate the contract provisions.

## **26.2 OUTBREAK OF WAR**

26.2.1 If during the currency of the CONTRACT there shall be an out-break of war whether declared or not, in that part of the World which whether financially or otherwise materially affect the execution of the WORK the CONTRACTOR shall unless and until the CONTRACT is terminated under the provisions in this clause continue to use his best endeavour to complete the execution of the WORK, provided always that the EMPLOYER shall be entitled, at any time after such out-break of war to terminate or re-negotiate the CONTRACT by giving notice in writing to the CONTRACTOR and upon such notice being given the CONTRACT shall, save as to the rights of the parties under this clause and to the operation of the clauses entitled settlement of Disputes and Arbitration hereof, be terminated but without prejudice to the right of either party in respect of any antecedent breach thereof.

26.2.2 If the CONTRACT shall be terminated under the provisions of the above clause, the CONTRACTOR shall with all reasonable diligence remove from the SITE all the CONTRACTOR's equipment and shall give similar facilities to his SUB-CONTRACTORS to do so.

## **27 Price reduction schedule:**

27.1 Time is the essence of the CONTRACT. In case the CONTRACTOR fails to complete the WORK within the stipulated period, then, unless such failure is due to Force Majeure as defined in Clause 26 here above or due to EMPLOYER's defaults, the Total Contract price shall be reduced by ½ % of the total Contract Price per complete week of delay or part thereof subject to a maximum of 5 % of the Total Contract Price, by way of reduction in price for delay and not as penalty. The said amount will be recovered from amount due to the Contractor/ Contractor's Contract Performance Security payable on demand. The decision of the ENGINEER-IN-CHARGE in regard to applicability of Price Reduction Schedule shall be final and binding on the CONTRACTOR.

27.2 All sums payable under this clause is the reduction in price due to delay in completion period at the above agreed rate.

## **27.3 Bonus For Early Completion (\*)**

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BONUS FOR EARLY COMPLETION If the Contractor achieves completion of Works in all respect prior to the time schedule stipulated in the SCC, the Employer shall pay to the Contractor the relevant sum, if mentioned specifically in SCC, as bonus for early completion. The bonus for early completion, if provided specifically in SCC, shall be payable to the maximum ceiling of 2 ½ % of the total contract price.

(\*) Partial earlier completion may not always produce net benefits to the Employer, for example where utilization of the completed Works requires (a) the fulfillment of all parts of the Contract (e.g. the training of personnel); or (b) the completion of all Sections (e.g. in pipeline laying, where early completion of the laying of pipeline would not be useful if the compressor is still under installation); or (c) certain seasonal effects to take place (e.g. onset of the rainy season, for impounding a reservoir); or (d) other circumstances. Also a more rapid drawdown of budgeted funds may be required. All such factors should be considered prior to the inclusion of a bonus clause in the Contract.

**28 Rights of the employer to forfeit contract performance security:**

28.1 Whenever any claim against the CONTRACTOR for the payment of a sum of money arises out or under the CONTRACT, the EMPLOYER shall be entitled to recover such sum by appropriating in part or whole the Contract Performance Security of the CONTRACTOR. In the event of the security being insufficient or if no security has been taken from the CONTRACTOR, then the balance or the total sum recoverable, as the case may be shall be deducted from any sum then due or which at any time thereafter may become due to the CONTRACTOR. The CONTRACTOR shall pay to the EMPLOYER on demand any balance remaining due.

**29 Failure by the contractor to comply with the provisions of the contract:**

29.1 If the CONTRACTOR refuses or fails to execute the WORK or any separate part thereof with such diligence as will ensure its completion within the time specified in the CONTRACT or extension thereof or fails to perform any of his obligation under the CONTRACT or in any manner commits a breach of any of the provisions of the CONTRACT it shall be open to the EMPLOYER at its option by written notice to the CONTRACTOR:

a) TO DETERMINE THE CONTRACT in which event the CONTRACT shall stand terminated and shall cease to be in force and effect on and from the date appointed by the EMPLOYER on that behalf, whereupon the CONTRACTOR shall stop forthwith any of the CONTRACTOR's work then in progress, except such WORK as the EMPLOYER may, in writing, require to be done to safeguard any property or WORK, or installations from damage, and the EMPLOYER, for its part, may take over the work remaining unfinished by the CONTRACTOR and complete the same through a fresh contractor or by other means, at the risk and cost of the CONTRACTOR, and any of his sureties if any, shall be liable to the EMPLOYER for any excess cost occasioned by such work having to be so taken over and completed by the EMPLOYER over and above the cost at the rates specified in the schedule of quantities and rate/prices.

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b) WITHOUT DETERMINING THE CONTRACT to take over the work of the CONTRACTOR or any part thereof and complete the same through a fresh contractor or by other means at the risk and cost of the CONTRACTOR. The CONTRACTOR and any of his sureties are liable to the EMPLOYER for any excess cost over and above the cost at the rates specified in the Schedule of Quantities/ rates, occasioned by such works having been taken over and completed by the EMPLOYER.

29.2 In such events of Clause 29.1(a) or (b) above.

a) The whole or part of the Contract Performance Security furnished by the CONTRACTOR is liable to be forfeited without prejudice to the right of the EMPLOYER to recover from the CONTRACTOR the excess cost referred to in the sub-clause aforesaid, the EMPLOYER shall also have the right of taking possession and utilising in completing the works or any part thereof, such as materials equipment and plants available at work site belonging to the CONTRACTOR as may be necessary and the CONTRACTOR shall not be entitled for any compensation for use or damage to such materials, equipment and plant.

b) The amount that may have become due to the CONTRACTOR on account of work already executed by him shall not be payable to him until after the expiry of Six (6) calendar months reckoned from the date of termination of CONTRACT or from the taking over of the WORK or part thereof by the EMPLOYER as the case may be, during which period the responsibility for faulty materials or workmanship in respect of such work shall, under the CONTRACT, rest exclusively with the CONTRACTOR. This amount shall be subject to deduction of any amounts due from the CONTRACT to the EMPLOYER under the terms of the CONTRACT authorised or required to be reserved or retained by the EMPLOYER.

29.3 Before determining the CONTRACT as per Clause 29.1(a) or (b) provided in the judgement of the EMPLOYER, the default or defaults committed by the CONTRACTOR is/are curable and can be cured by the CONTRACTOR if an opportunity given to him, then the EMPLOYER may issue Notice in writing calling the CONTRACTOR to cure the default within such time specified in the Notice.

29.4 The EMPLOYER shall also have the right to proceed or take action as per 29.1(a) or (b) above, in the event that the CONTRACTOR becomes bankrupt, insolvent, compounds with his creditors, assigns the CONTRACT in favour of his creditors or any other person or persons, or being a company or a corporation goes into voluntary liquidation, provided that in the said events it shall not be necessary for the EMPLOYER to give any prior notice to the CONTRACTOR

29.5 Termination of the CONTRACT as provided in sub-clause 29.1(a) above shall not prejudice or affect their rights of the EMPLOYER which may have accrued upto the date of such termination.

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**30 Contractor remains liable to pay compensation if**

30.1 In any case in which any of the powers conferred upon the EMPLOYER BY CLAUSE 29.0 thereof shall have become action not taken under clause 29: exercisable and the same had not been exercised, the non-exercise thereof shall not constitute a waiver of any of the conditions hereof and such powers shall notwithstanding be exercisable in .the event of any further case of default by the CONTRACTOR for which by any clause or clauses hereof he is declared liable to pay compensation amounting to the whole of his Contract Performance Security, and the liability of the CONTRACTOR for past and future compensation shall remain unaffected. In the event of the EMPLOYER putting in force the power under above sub-clause (a), (b) or (c) vested in him under the preceding clause he may, if he so desired, take possession of all or any tools, and plants, materials and stores in or upon the works or the site thereof belonging to the CONTRACTOR or procured by him and intended to be used for the execution of the WORK or any part thereof paying or allowing for the same in account at the CONTRACT rates or in case of these not being applicable at current market rates to be certified by the ENGINEER-IN-CHARGE whose certificate thereof shall be final, otherwise the ENGINEER-IN-CHARGE may give notice in writing to the CONTRACTOR or his clerk of the works, foreman or other authorised agent, requiring him to remove such tools, plant, materials or stores from the premises (within a time to be specified in such notice), and in the event of the CONTRACTOR failing to comply with any such requisition, the ENGINEER-IN-CHARGE may remove them at the CONTRACTOR's expense or sell them by auction or private sale on account of the CONTRACTOR and at his risk in all respects without any further notice as to the date, time or place of sale and the certificate of the ENGINEER-IN-CHARGE as to the expenses of any such removal and the amount of the proceeds and expenses of any such sale shall be final and conclusive against the CONTRACTOR.

**31 Change in constitution:**

31.1 Where the CONTRACTOR is a partnership firm, the prior approval of the EMPLOYER shall be obtained in writing, before any change is made in the constitution of the firm. Where the CONTRACTOR is an individual or a Hindu undivided family business concern, such approval as aforesaid shall, likewise be obtained before such CONTRACTOR enters into any agreement with other parties, where under, the reconstituted firm would have the right to carry out the work hereby undertaken by the CONTRACTOR In either case if prior approval as aforesaid is not obtained, the CONTRACT shall be deemed to have been allotted in contravention of clause 37 hereof and the same action may be taken and the same consequence shall ensure as provided in the said clause.

**32 Termination of contract**

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**32.1 TERMINATION OF CONTRACT FOR DEATH:** If the CONTRACTOR is an individual or a proprietary concern and the individual or the proprietor dies or if the CONTRACTOR is a partnership concern and one of the partner dies then unless, the EMPLOYER is satisfied that the legal representative of the individual or the proprietary concern or the surviving partners are capable of carrying out and completing CONTRACT, he (the EMPLOYER) is entitled to cancel the CONTRACT for the uncompleted part without being in any way liable for any compensation payment to the estate of the deceased CONTRACTOR and/or to the surviving partners of the CONTRACTOR'S firm on account of the cancellation of CONTRACT. The decision of the EMPLOYER in such assessment shall be final and binding on the parties. In the event of such cancellation, the EMPLOYER shall not hold the estate of the deceased CONTRACTOR and/or the surviving partners of the CONTRACTOR'S firm liable for any damages for non-completion of CONTRACT.

**32.2 TERMINATION OF CONTRACT IN CASE OF LIQUIDATION / BANKRUPTCY ETC.** If the Contractor shall dissolve or become bankrupt or insolvent or cause or suffer any receiver to be appointed of his business of any assets thereof compound with his Creditors, or being a corporation commence to be wound up, not being a member's voluntary winding up for the purpose of amalgamation or reconstruction, or carry on its business under a Receiver for the benefits of its Creditors any of them, EMPLOYER shall be at liberty :- To terminate the contract forthwith upon coming to know of the happening of any such event as aforesaid by notice in writing to the Contractor or to give the Receiver or liquidator or other person, the option of carrying out the contract subject to his providing a guarantee upto an amount to be agreed upon by EMPLOYER for due and faithful performance of the contract.

**32.3 TERMINATION OF CONTRACT FOR NON-PERFORMANCE AND SUBSEQUENTLY PUTTING THE CONTRACTOR ON HOLIDAY:**

In case of termination of CONTRACT herein set forth (under clause 29.0) except under conditions of Force Majeure and termination after expiry of contract, the CONTRACTOR shall be put under holiday [i.e. neither any enquiry will be issued to the party by GGPL (India) Ltd. against any type of tender nor their offer will be considered by GGPL against any ongoing tender (s) where contract between GGPL and that particular CONTRACTOR (as a bidder) has not been finalized] for three years from the date of termination by GGPL (India) Ltd. to such CONTRACTOR.

**33 Members of the employer not individually liable :**

**33.1** No Director, or official or employee of the EMPLOYER/ CONSULTANT shall in any way be personally bound or liable for the acts or obligations of the EMPLOYER under the



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CONTRACT or answerable for any default or omission in the observance or performance of any of the acts, matters or things which are herein contained.

**34 Employer not bound by personal representations:**

34.1 The CONTRACTOR shall not be entitled to any increase on the scheduled rates or any other right or claim whatsoever by reason of any representation, explanation statement or alleged representation, promise or guarantees given or alleged to have been given to him by any person.

**35 Contractor's office at site:**

35.1 The CONTRACTOR shall provide and maintain an office at the site for the accommodation of his agent and staff and such office shall be open at all reasonable hours to receive instructions, notice or other communications. The CONTRACTOR at all time shall maintain a site instruction book and compliance of these shall be communicated to the ENGINEER-IN CHARGE from time to time and the whole document to be preserved and handed over after completion of works.

**36 Contractor's subordinate staff and their conduct**

36.1 The CONTRACTOR, on or after award of the WORK shall name and depute a qualified engineer having sufficient experience in carrying out work of similar nature, to whom the equipments, materials, if any, shall be issued and instructions for works given. The CONTRACTOR shall also provide to the satisfaction of the ENGINEER-IN- CHARGE sufficient and qualified staff to superintend the execution of the WORK, competent sub-agents, foremen and leading hands including those specially qualified by previous experience to supervise the types of works comprised in the CONTRACT in such manner as will ensure work of the best quality, expeditious working. Whenever in the opinion of the ENGINEER-IN- CHARGE additional properly qualified supervisory staff is considered necessary, they shall be employed by the CONTRACTOR without additional charge on accounts thereof. The CONTRACTOR shall ensure to the satisfaction of the ENGINEER-IN-CHARGE that SUB- CONTRACTORS, if any, shall provide competent and efficient supervision, over the work entrusted to them.

36.2 If and whenever any of the CONTRACTOR's or SUB- CONTRACTOR'S agents, sub-agents, assistants, foremen, or other employees shall in the opinion of ENGINEER-IN-CHARGE be guilty of any misconduct or be incompetent or insufficiently qualified or negligent in the performance of their duties of that in the opinion of the EMPLOYER or the ENGINEER-IN-CHARGE, it is undesirable for administrative or any other reason for such person or persons to be employed in the works, the CONTRACTOR, is so directed by the ENGINEER-IN-CHARGE, shall at once remove such person or persons from employment thereon. Any person or persons so removed from the works shall not again be employed in connection with the WORKS without the written permission of the ENGINEER-IN- CHARGE.

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Any person so removed from the WORK shall be immediately re-placed at the expense of the CONTRACTOR by a qualified and competent substitute. Should the CONTRACTOR be requested to repatriate any person removed from the works he shall do so and shall bear all costs in connection herewith.

36.3 The CONTRACTOR shall be responsible for the proper behaviour of all the staff, foremen, workmen, and others, and shall exercise a proper degree of control over them and in particular and without prejudice to the said generality, the CONTRACTOR shall be bound to prohibit and prevent any employees from trespassing or acting in any way detrimental or prejudicial to the interest of the community or of the properties or occupiers of land and properties in the neighborhood and in the event of such employee so trespassing, the CONTRACTOR shall be responsible therefore and relieve the EMPLOYER of all consequent claims or actions for damages or injury or any other grounds whatsoever. The decision of the ENGINEER-IN-CHARGE upon any matter arising under this clause shall be final. The CONTRACTOR shall be liable for any liability to EMPLOYER on account of deployment of CONTRACTOR's staff etc. or incidental or arising out of the execution of CONTRACT. The CONTRACTOR shall be liable for all acts or omissions on the part of his staff, Foremen and Workmen and others in his employment, including misfeasance or negligence of whatever kind in the course of their work or during their employment, which are connected directly or indirectly with the CONTRACT.

36.4 If and when required by the EMPLOYER and CONTRACTOR's personnel entering upon the EMPLOYER's premises shall be properly identified by badges of a type acceptable to the EMPLOYER which must be worn at all times on EMPLOYER's premises. CONTRACTOR may be required to obtain daily entry passes for his staff/employees from EMPLOYER to work within operating areas. These being safety requirements, no relaxations on this account shall be given to CONTRACTOR

### **37 Sub-letting of works:**

37.1 No part of the CONTRACT nor any share or interest therein shall in any manner or degree be transferred, assigned or sublet by the CONTRACTOR directly or indirectly to any person, firm or corporation whatsoever without the consent in writing, of the ENGINEER/EMPLOYER except as provided for in the succeeding sub-clause.

i) **SUB-CONTRACTS FOR TEMPORARY WORKS ETC.:** The EMPLOYER may give written consent to Sub- contract for the execution of any part of the WORK at the site, being entered in to by CONTRACTOR provided each individual Sub- contract is submitted to the ENGINEER-IN-CHARGE before being entered into and is approved by him.

ii) **LIST OF SUB-CONTRACTORS TO BE SUPPLIED:** At the commencement of every month the CONTRACTOR shall furnish to the ENGINEER-IN- CHARGE list of all SUB-CONTRACTORS or other persons or firms engaged by the CONTRACTOR and working at the SITE during the previous month with particulars of the general nature of the Subcontract or works done by them.

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iii) **CONTRACTOR'S LIABILITY NOT LIMITED BY SUB- CONTRACTORS:** Notwithstanding any sub-letting with such approval as aforesaid and notwithstanding that the ENGINEER-IN-CHARGE shall have received copies of any Subcontracts, the contractor shall be and shall remain solely responsible for the quality, proper and expeditious execution of the Contract in all respects as if such sub-letting or Subcontracting had not taken place, and as if such work had been done directly by the CONTRACTOR. The CONTRACTOR shall bear all responsibility for any act or omission on the part of sub-contractors in regard to work to be performed under the CONTRACT.

iv) **EMPLOYER MAY TERMINATE SUB-CONTRACTS:** If any SUB-CONTRACTOR engaged upon the works at the site executes any works which in the opinion of the ENGINEER-IN-CHARGE is not in accordance with the CONTRACT documents, the EMPLOYER may by written notice to the CONTRACTOR request him to terminate such subcontract and the CONTRACTOR upon the receipt of such notice shall terminate such Subcontract and dismiss the SUB-CONTRACTOR(S) and the later shall forthwith leave the works, failing which the EMPLOYER shall have the right to remove such SUB- CONTRACTOR(S) from the site.

v) **NO REMEDY FOR ACTION TAKEN UNDER THIS CLAUSE:** No action taken by the EMPLOYER under the clause shall relieve the CONTRACTOR of any of his liabilities under the CONTRACT or give rise to any right or compensation, extension of time or otherwise failing which the EMPLOYER shall have the right to remove such SUB-CONTRACTOR(S) from the site.

**38 Power of entry:**

38.1 If the CONTRACTOR shall not commence the WORK in the manner previously described in the CONTRACT documents or if he shall at any time in the opinion of the ENGINEER-IN-CHARGE.

i) fail to carry out the WORK in conformity with the CONTRACT documents, or  
ii) fail to carry out the WORK in accordance with the Time Schedule, or  
iii) substantially suspend work or the WORK for a period of fourteen days without authority from the ENGINEER

IN-CHARGE, or

iv) fail to carry out and execute the WORK to the satisfaction of the ENGINEER-IN-CHARGE, or

v) fail to supply sufficient or suitable construction plant, temporary works, labour, materials or things, or vi) Commit, suffer, or permit any other breach of any of the provisions of the CONTRACT on his part to be performed or observed or persist in any of the above mentioned breaches of the CONTRACT for fourteen days, after notice in writing shall have been given to the CONTRACTOR by the ENGINEER-IN-CHARGE requiring such breach to be remedied, or

vi) if the CONTRACTOR shall abandon the WORK , or

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vii) If the CONTRACTOR during the continuance of the CONTRACT shall become bankrupt, make any arrangement or composition with his creditors, or permit any execution to be levied or go into liquidation whether compulsory or voluntary not being merely a voluntary liquidation for the purpose of amalgamation or reconstruction then in any such case, the EMPLOYER shall have the power to enter upon the WORK and take possession thereof and of the materials, temporary WORK, construction plant, and stock thereon, and to revoke the CONTRACTOR's license to use the same, and to complete the WORK by his agents, other CONTRACTORS or workmen or to relate the same upon any terms and to such other person, firm or corporation as the EMPLOYER in his absolute discretion may think proper to employ and for the purpose aforesaid to use or authorise the use of any materials, temporary work, CONSTRUCTION PLANT, and stock as aforesaid, without making payment or allowance to the CONTRACTOR for the said materials other than such as may be certified in writing by the ENGINEER-IN-CHARGE to be reasonable, and without making any payment or allowance to the CONTRACTOR for the use of the temporary said works, construction plant and stock or being liable for any loss or damage thereto, and if the EMPLOYER shall by reason of his taking possession of the WORK or of the WORK being completed by other CONTRACTOR (due account being taken of any such extra work or works which may or be omitted) then the amount of such excess as certified by the ENGINEER-IN-CHARGE shall be deducted from any money which may be due for work done by the CONTRACTOR under the CONTRACT and not paid for. Any deficiency shall forthwith be made good and paid to the EMPLOYER by the CONTRACTOR and the EMPLOYER shall have power to sell in such manner and for such price as he may think fit all or any of the construction plant, materials etc. constructed by or belonging to and to recoup and retain the said deficiency or any part thereof out of proceeds of the sale.

**39 Contractor's responsibility with the mechanical, electrical, intercommunication system, air conditioning contractors and other agencies:**

39.1 Without repugnance of any other condition, it shall be the responsibility of the CONTRACTOR executing the work of civil construction, to work in close cooperation and coordinate the WORK with the Mechanical, Electrical, Air-conditioning and Intercommunication Contractor's and other agencies or their authorized representatives, in providing the necessary grooves, recesses, cuts and opening etc., in wall, slabs beams and columns etc. and making good the same to the desired finish as per specification, for the placement of electrical, intercommunication cables, conduits, air-conditioning inlets and outlets grills and other equipments etc. where required. For the above said requirements in the false ceiling and other partitions, the CONTRACTOR before starting-up the work shall in consultation with the Electrical, Mechanical, Intercommunication, Air-conditioning contractor and other agencies prepare and put-up a joint scheme, showing the necessary openings, grooves, recesses, cuts, the methods of fixing required for the WORK of the aforesaid, and the finishes therein, to the ENGINEER-IN-CHARGE and get the approval. The

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CONTRACTOR before finally submitting the scheme to the ENGINEER-IN-CHARGE, shall have the written agreement of the other agencies. The ENGINEER- IN-CHARGE, before communicating his approval to the scheme, with any required modification, shall get the final agreement of all the agencies, which shall be binding. No claim shall be entertained on account of the above. The CONTRACTOR shall confirm in all respects with provision of any statutory regulations, ordinances or byelaws of any local or duly constituted authorities or public bodies which may be applicable from time to time to the WORK or any temporary works. The CONTRACTOR shall keep the EMPLOYER indemnified against all penalties and liabilities of every kind, arising out of non- adherence to such stains, ordinances, laws, rules, regulations, etc.

**40 Other agencies at site:**

40.1 The CONTRACTOR shall have to execute the WORK in such place and conditions where other agencies will also be engaged for other works such as site grading, filling, and leveling, electrical and mechanical engineering works, etc. No claim shall be entertained due to WORK being executed in the above circumstances.

**41 Notice:**

41.1 TO THE CONTRACTOR: Any notice hereunder may be served on the CONTRACTOR or his duly authorized representative at the job site or may be served by registered mail direct to the address furnished by the CONTRACTOR Proof of issue of any such notice could be conclusive of the CONTRACTOR having been duly informed of all contents therein.

41.2 TO THE EMPLOYER: Any notice to be given to the EMPLOYER under the terms of the CONTRACTOR shall be served by sending the same by Registered mail to or delivering the same at the respective site offices of M/S. GGPL (INDIA) LTD. addressed to the HEAD/SITE-IN-CHARGE.

**42 Right of various interests:**

42.1 The EMPLOYER reserves the right to distribute the work between more than one agency(ies). The CONTRACTOR shall cooperate and afford other agency(ies) reasonable opportunity for access to the WORK for the carriage and storage of materials and execution of their works.

42.2 Wherever the work being done by any department of the EMPLOYER or by other agency(ies) employed by the EMPLOYER is contingent upon WORK covered by this CONTRACT, the respective rights of the various interests involved shall be determined by the ENGINEER-IN-CHARGE to secure the completion of the various portions of the work in general harmony.

**43 Patents and royalties:**

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43.1 The CONTRACTOR, if licensed under any patent covering equipment, machinery, materials or compositions of matter to be used or supplied or methods and process to be practiced or employed in the performance of this CONTRACT, agrees to pay all royalties and license fees which may be due with respect thereto. If any equipment, machinery, materials, composition of matters, be used or supplied or methods and processes to be practiced or employed in the performance of this CONTRACT, is covered by a patent under which the CONTRACTOR is not licensed then the CONTRACTOR before supplying or using the equipment, machinery materials, composition method or processes shall obtain such licenses and pay such royalties and license fees as may be necessary for performance of this CONTRACT. In the event the CONTRACTOR fails to pay any such royalty or obtain any such license, any suit for infringement of such patents which is brought against the CONTRACTOR or the EMPLOYER as a result such failure will be defended by the CONTRACTOR at his own expense and the CONTRACTOR will pay any damages and costs awarded in such suit. The CONTRACTOR shall promptly notify the EMPLOYER if the CONTRACTOR has acquired the knowledge of any plant under which a suit for infringement could be reasonably brought because of the use by the EMPLOYER of any equipment, machinery, materials, process, methods to be supplied hereunder. The CONTRACTOR agrees to and does hereby grant to EMPLOYER, together with the right to extend the same to any of the subsidiaries of the EMPLOYER as irrevocable, royalty free license to use in any country, any invention made by the CONTRACTOR or his employee in or as result of the performance of the WORK under the CONTRACT.

43.2 All charges on account of royalty. toilage, rent, octroi terminal or GST and/or other duties or any other levy on materials obtained for the work or temporary work or part thereof (excluding materials provided by the EMPLOYER) shall be borne by the CONTRACTOR.

43.3 The CONTRACTOR shall not sell or otherwise dispose of or remove except for the purpose of this CONTRACT, the sand, stone, clay, ballast, earth, rock or other substances, or materials obtained from any excavation made for the purpose of the WORK or any building or produce upon the site at the time of delivery of the possession thereof, but all such substances, materials, buildings and produce shall be the property of the EMPLOYER provided that the CONTRACTOR may with the permission of the ENGINEER-IN-CHARGE, use the same for the purpose of the work by payment of cost of the same at such a rate as may be determined by the ENGINEER-IN- CHARGE.

43.4 The EMPLOYER shall indemnify and save harmless the CONTRACTOR from any loss on account of claims against CONTRACTOR for the contributory infringement of patent rights arising out and based upon the claim that the use of the EMPLOYER of the process included in the design prepared by the EMPLOYER and used in the operation of the plant infringes on any patent right. With respect to any subcontract entered into by CONTRACTOR pursuant to the provisions of the relevant clause hereof, the CONTRACTOR shall obtain from

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the SUB-CONTRACTOR an undertaking to provide the EMPLOYER with the same patent protection that CONTRACTOR is required to provide under the provisions of this clause.

**44 Liens:**

44.1 If, at any time there should be evidence or any lien or claim for which the EMPLOYER might have become liable and which is chargeable to the CONTRACTOR, the EMPLOYER shall have the right to retain out of any payment then due or thereafter to become due an amount sufficient to completely indemnify the EMPLOYER against such lien or claim and if such lien or claim be valid, the EMPLOYER may pay and discharge the same and deduct the amount so paid from any money which may be or may become due and payable to the CONTRACTOR. If any lien or claim remain unsettled after all payments are made, the CONTRACTOR shall refund or pay to the EMPLOYER all money that the latter may be compelled to pay in discharging such lien or claim including all costs and reasonable expenses. EMPLOYER reserves the right to do the same.

44.2 The EMPLOYER shall have lien on all materials, equipments including those brought by the CONTRACTOR for the purpose of erection, testing and commissioning of the WORK.

44.3 The final payment shall not become due until the CONTRACTOR delivers to the ENGINEER-IN-CHARGE a complete release or waiver of all liens arising or which may arise out of his agreement or receipt in full or certification by the CONTRACTOR in a form approved by ENGINEER-IN-CHARGE that all invoices for labour, materials, services have been paid in lien thereof and if required by the ENGINEER-IN-CHARGE in any case an affidavit that so far as the CONTRACTOR has knowledge or information the releases and receipts include all the labour and material for which a lien could be filled.

44.4 CONTRACTOR will indemnify and hold the EMPLOYER harmless, for a period of two years after the issue of FINAL CERTIFICATE, from all liens and other encumbrances against the EMPLOYER on account of debts or claims alleged to be due from the CONTRACTOR or his SUB-CONTRACTOR to any person including SUB- CONTRACTOR and on behalf of EMPLOYER will defend at his own expense, any claim or litigation brought against the EMPLOYER or the CONTRACTOR in connection therewith. CONTRACTOR shall defend or contest at his own expense any fresh claim or litigation by any person including his SUB-CONTRACTOR, till its satisfactory settlement even after the expiry of two years from the date of issue of FINAL CERTIFICATE.

**45 Delays by employer or his authorized agents:**

45.1 In case the CONTRACTOR's performance is delayed due to any act or omission on the part of the EMPLOYER or his authorized agents, then the CONTRACTOR shall be given due extension of time for the completion of the WORK, to the extent such omission on the part of the EMPLOYER has caused delay in the CONTRACTOR's performance of his WORK.

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45.2 No adjustment in CONTRACT PRICE shall be allowed for reasons of such delays and extensions granted except as provided in TENDER DOCUMENT, where the EMPLOYER reserves the right to seek indulgence of CONTRACTOR to maintain the agreed Time Schedule of Completion. In such an event the CONTRACTOR shall be obliged for working by CONTRACTOR's personnel for additional time beyond stipulated working hours as also Sundays and Holidays and achieve the completion date/interim targets.

**46 Payment if the contract is terminated:**

46.1 If the CONTRACT shall be terminated as per Tender pursuant to Clause no. 29 of GCC, the CONTRACTOR shall be paid by the EMPLOYER in so far as such amounts or items shall not have already been covered by payments of amounts made to the CONTRACTOR for the WORK executed and accepted by ENGINEER-IN-CHARGE prior to the date of termination at the rates and prices provided for in the CONTRACT and in addition to the following:

- i) The amount payable in respect of any preliminary items, so far as the Work or service comprised therein has been carried out or performed and an appropriate portion as certified by ENGINEER-IN-CHARGE of any such items or service comprised in which has been partially carried out or performed.
- ii) Any other expenses which the CONTRACTOR has expended for performing the WORK under the CONTRACT subject to being duly recommended by ENGINEER-IN-CHARGE and approved by EMPLOYER for payment, based on documentary evidence of his having incurred such expenses.

46.2 The CONTRACTOR will be further required to transfer the title and provide the following in the manner and as directed by the EMPLOYER.

- a) Any and all completed works.
- b) Such partially completed WORK including drawings, information and CONTRACT rights as the CONTRACTOR has specially performed, produced or acquired for the performance of the CONTRACTOR.

**47 No waiver of rights:**

47.1 Neither the inspection by the EMPLOYER or any of their officials, employees, or agents nor any order by the EMPLOYER for payment of money or any payment for or acceptance of the whole or any part of the Work by the EMPLOYER nor any extension of time, nor any possession taken by EMPLOYER shall operate as a waiver of any provision of the CONTRACT, or of any power herein reserved to the EMPLOYER, or any right to damages herein provided, nor shall any waiver of any breach in the CONTRACT be held to be a waiver of any other subsequent breach.

**48 Certificate not to affect right of employer and liability of contractor:**

48.1 No interim payment certificate(s) issued by the Engineer-in- Charge of the EMPLOYER, nor any sum paid on account by the EMPLOYER, nor any extension of time for execution of the work granted by EMPLOYER shall affect or prejudice the rights of the



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Employer against the CONTRACTOR or relieve the CONTRACTOR of his obligations for the due performance of the CONTRACT, or be interpreted as approval of the WORK done or of the equipment supplied and no certificate shall create liability for the EMPLOYER to pay for alterations, amendments, variations or additional works not ordered, in writing, by EMPLOYER or discharge the liability of the CONTRACTOR for the payment of damages whether due, ascertained, or certified or not or any sum against the payment of which he is bound to indemnify the EMPLOYER.

**49 Language and measures:**

49.1 All documents pertaining to the CONTRACT including Specifications, Schedules, Notices, Correspondence, operating and maintenance Instructions, DRAWINGS, or any other writing shall be written in English language. The Metric System of measurement shall be used in the CONTRACT unless otherwise specified.

**50 Transfer of title:**

50.1 The title of Ownership of supplies furnished by the CONTRACTOR shall not pass on to the EMPLOYER for all Supplies till the same are finally accepted by the EMPLOYER after the successful completion of PERFORMANCE TEST and GUARANTEE TEST and issue of FINAL CERTIFICATE.

50.2 However, the EMPLOYER shall have the lien on all such works performed as soon as any advance or progressive payment is made by the EMPLOYER to the CONTRACTOR and the CONTRACTOR shall not subject these works for use other than those intended under this CONTRACT.

**51 Release of information:**

51.1 The CONTRACTOR shall not communicate or use in advertising, publicity, sales releases or in any other medium, photographs, or other reproduction of the Work under this CONTRACT or description of the site dimensions, quantity, quality or other information, concerning the Work unless prior written permission has been obtained from the EMPLOYER.

**52 Brand names:**

52.1 The specific reference in the SPECIFICATIONS and documents to any material by trade name, make or catalogue number shall be construed as establishing standard or quality and performance and not as limited competition. However, TENDERER may offer other similar equipments provided it meets the specified standard design and performance requirements.

**53 Completion of contract:**

53.1 Unless otherwise terminated under the provisions of any other relevant clause, this CONTRACT shall be deemed to have been completed at the expiration of the PERIOD OF LIABILITY as provided for under the CONTRACT.

**54 Spares:**

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54.1 The CONTRACTOR shall furnish to the EMPLOYER all spares required for COMMISSIONING of the plants, recommendatory and/or mandatory spares, which are required essential by the manufacturer/supplier. The same shall be delivered at SITE, 3(Three) months before COMMISSIONING. Also the CONTRACTOR should furnish the manufacturing drawings for fast wearing spares.

54.2 The CONTRACTOR guarantees the EMPLOYER that before the manufacturers of the equipments, plants and machineries go out of production of spare parts for the equipment furnished and erected by him, he shall give at least twelve (12) months' advance notice to the EMPLOYER, so that the latter may order his requirement of spares in one lot, if he so desires.

### **SECTION-V PERFORMANCE OF WORK**

#### **55 Execution of work:**

55.1 All the Works shall be executed in strict conformity with the provisions of the CONTRACT Documents and with such explanatory detailed drawings, specification and instructions as may be furnished from time to time to the CONTRACTOR by the ENGINEER-IN-CHARGE whether mentioned in the CONTRACT or not. The CONTRACTOR shall be responsible for ensuring that works throughout are executed in the most substantial, proper and workmanlike manner with the quality of material and workmanship in strict accordance with the SPECIFICATIONS and to the entire satisfaction of the ENGINEER-IN-CHARGE. The CONTRACTOR shall provide all necessary materials equipment labour etc. for execution and maintenance of WORK till completion unless otherwise mentioned in the CONTRACT.

#### **56 Co-ordination and inspection of work:**

56.1 The coordination and inspection of the day-to-day work under the CONTRACT shall be the responsibility of the ENGINEER-IN-CHARGE. The written instruction regarding any particular job will normally be passed by the ENGINEER-IN-CHARGE or his authorized representative. A work order book will be maintained by the CONTRACTOR for each sector in which the aforesaid written instructions will be entered. These will be signed by the CONTRACTOR or his authorized representative by way of acknowledgement within 12 hours.

#### **57 Work in monsoon and dewatering:**

57.1 Unless otherwise specified elsewhere in the tender, the execution of the WORK may entail working in the monsoon also. The CONTRACTOR must maintain a minimum labour force as may be required for the job and plan and execute the construction and erection according to the prescribed schedule. No extra rate will be considered for such work in monsoon.

57.2 During monsoon and other period, it shall be the responsibility of the CONTRACTOR to keep the construction work site free from water at his own cost.

#### **58 Work on Sundays and Holidays:**

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58.1 For carrying out Work on Sundays, and Holidays, the CONTRACTOR will approach the ENGINEER-IN-CHARGE or his representative at least two days in advance and obtain permission in writing. The CONTRACTOR shall observe all labour laws and other statutory rules and regulations in force. In case of any violations of such laws, rules and regulations, consequence if any, including the cost thereto shall be exclusively borne by the CONTRACTOR and the EMPLOYER shall have no liability whatsoever on this account.

**59 General conditions for construction and erection work:**

59.1 The working time at the site of work is 48 hours per week. Overtime work is permitted in cases of need and the EMPLOYER will not compensate the same. Shift working at 2 or 3 shifts per day will become necessary and the CONTRACTOR should take this aspect into consideration for formulating his rates for quotation. No extra claims will be entertained by the EMPLOYER on this account. For carrying out work beyond working hours the CONTRACTOR will approach the ENGINEER-IN-CHARGE or his authorized representative and obtain his prior written permission.

59.2 The CONTRACTOR must arrange for the placement of workers in such a way that the delayed completion of the WORK or any part thereof for any reason whatsoever will not affect their proper employment. The EMPLOYER will not entertain any claim for idle time payment whatsoever.

59.3 The CONTRACTOR shall submit to the EMPLOYER/ENGINEER-IN-CHARGE reports at regular intervals regarding the state and progress of WORK. The details and Proforma of the report will mutually be agreed after the award of CONTRACT. The CONTRACTOR shall provide display boards showing progress and labour strengths at worksite, as directed by the ENGINEER-IN-CHARGE.

**60 Alterations in specifications, design and extra works:**

60.1 The WORK covered under this CONTRACT having to be executed by the CONTRACTOR on a lumpsum firm price/item rate quoted by him, the EMPLOYER will not accept any proposals for changes in VALUE OF CONTRACT or extension in time on account of any such changes which may arise to the CONTRACTOR's scope of WORK as a result of detailed Engineering and thereafter during the execution of WORK. The only exception to this will be a case where the EMPLOYER requests in writing to the CONTRACTOR to upgrade the SPECIFICATIONS or the size of any major pieces of equipments, plant or machinery beyond what is normally required to meet the scope of WORK as defined in the CONTRACT DOCUMENT. In such cases, a change order will be initiated by the CONTRACTOR at the appropriate time for the EMPLOYER's prior approval giving the full back-up data for their review and for final settlement of any impact on price within 30 (thirty) days thereafter.

60.2 The ENGINEER-IN-CHARGE shall have to make any alterations in, omission from, additions to or substitutions for, the Schedule of Rates, the original specifications, drawings,

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designs and instructions that may appear to him to be necessary or advisable during the progress of the WORK and the CONTRACTOR shall be bound to carry out the such altered/ extra/ new items of WORK in accordance with any instructions which may be given to him in writing signed by the ENGINEER-IN- CHARGE, and such alterations, omissions, additions or substitutions shall not invalidate the CONTRACT and any altered, additional or substituted work which the CONTRACTOR may be directed to do in the manner above specified as part of the WORK shall be carried out by the CONTRACTOR on the same conditions in all respects on which he agreed to do the main WORK. The time of completion of WORK may be extended for the part of the particular job at the discretion of the ENGINEER-IN- CHARGE, for only such alterations, additions or substitutions of the WORK, as he may consider as just and reasonable. The rates for such additional, altered or substituted WORK under this clause shall be worked out in accordance with the following provisions:-

I. For Item Rate Contract

a) If the rates for the additional, altered or substituted WORK are specified in the CONTRACT for the WORK, the CONTRACTOR is bound to carry on the additional, altered or substituted WORK at the same rates as are specified in the CONTRACT.

b) If the rates for the additional, altered or substituted WORK are not specifically provided in the CONTRACT for the WORK, the rates will be derived from the rates for similar class of WORK as are specified in the CONTRACT for the WORK. The opinion of the ENGINEER-IN- CHARGE, as to whether or not the rates can be reasonably so derived from the items in this CONTRACT will be final and binding on the CONTRACTOR

c) If the rates for the altered, additional or substituted WORK cannot be determined in the manner specified in sub-clause(s) and (b) above, then the CONTRACTOR shall, within 7 days of the date of receipt of order to carry out the WORK, inform the ENGINEER-IN-CHARGE of the rates which it is his intention to charge for such class of WORK, supported by analysis of the rate or rates claimed, and the ENGINEER-IN-CHARGE shall determine the rate or rates on the basis of the prevailing market rates, labour cost at schedule of labour rates plus 10% to cover contractor's supervision, overheads and profit and pay the CONTRACTOR accordingly. The opinion of the ENGINEER- IN-CHARGE as to current market rates of materials and the quantum of labour involved per unit of measurement will be final and binding on the CONTRACTOR

d) Where the item of work will be executed through nominated specialist agency as approved by the ENGINEER-IN-CHARGE, then the actual amount paid to such nominated agency supported by documentary evidence and as certified by ENGINEER-IN-CHARGE shall be considered plus 10% (ten percent) to cover all contingencies, overhead, profits to arrive at the rates.

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e) Provisions contained in the Sub-clause (a) & (d) above shall, however, not apply for the following:- Where the value of additions of new items together with the value of alterations, additions/deletions or substitutions does not exceed by or is not less than plus/minus (+)25% of the VALUE OF CONTRACT. The item rates in the Schedule of Rates shall hold good for all such variations between the above mentioned limits, irrespective of any increase/decrease of quantities in the individual items of Schedule of Rates. Where the value of addition of new items together with the value of alterations, additions/deletions or substitutions reduces more than 25% of the contract value but is within the following limits the tenderer shall be paid compensation for decrease in the value of work, as follows: S.No. Range of Variation Percentage compensation for decrease in the value of work in the respective range. a) Beyond (+) 25% No increase and/or upto & inclusive of decrease shall be (+) 50% applicable for the Schedule of Rates (The rates quoted for this increase shall be valid). b) Beyond (-) 25% upto & For reduction beyond inclusive of (-) 50% 25% contractor shall be compensated by an amount equivalent to 10% of the reduction in value of the contract as awarded. For example if the actual contract value is 70% of awarded value then compensation shall be 10% of (75-70) i.e. 0.5% of awarded contract value.

II. For Lump sum Contracts: CONTRACTOR shall, within 7 days of the date of receipt of order to carry out the WORK, inform the ENGINEER-IN- CHARGE of the rates which it is his intention to charge for such class of WORK, supported by analysis of the rate or rates claimed, and the ENGINEER-IN-CHARGE shall determine the rate or rates on the basis of the prevailing market rates, labour cost at schedule of labour rates plus 10% to cover contractor's supervision, overheads and profit and pay the CONTRACTOR accordingly. The opinion of the ENGINEER- IN-CHARGE as to current market rates of materials and the quantum of labour involved per unit of measurement will be final and binding on the CONTRACTOR.

**61 Drawings to be supplied by the employer**

61.1 The drawings attached with tender are only for the general guidance to the CONTRACTOR to enable him to visualize the type of work contemplated and scope of work involved. The CONTRACTOR will be deemed to have studied the DRAWINGS and formed an idea about the WORK involved.

61.2 Detailed working drawings on the basis of which actual execution of the WORK is to proceed, will be furnished from time to time during the progress of the work. The CONTRACTOR shall be deemed to have gone through the DRAWINGS supplied to him thoroughly and carefully and in conjunction with all other connected drawings and bring to the notice of the ENGINEER-IN-CHARGE discrepancies, if any, therein before actually carrying out the Work.

61.3 Copies of all detailed working drawings relating to the WORK shall be kept at the CONTRACTOR's office on the site and shall be made available to the ENGINEER-IN- CHARGE

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at any time during the CONTRACT. The drawings and other documents issued by the EMPLOYER shall be returned to the EMPLOYER on completion of the WORK.

**62 Drawings to be supplied by the contractor:**

62.1 The drawings/date which are to be furnished by the CONTRACTOR are enumerated in the special conditions of contract, and shall be furnished within the specified time.

62.2 Where approval/review of drawings before manufacture/ construction/fabrication has been specified, it shall be CONTRACTOR's responsibility to have these drawings prepared as per the directions of ENGINEER-IN-CHARGE and got approved before proceeding with manufacture/construction/fabrication as the case may be. Any change that may have become necessary in these drawings during the execution of the work shall have to be carried out by the CONTRACTOR to the satisfaction of ENGINEER-IN-CHARGE at no extra cost. All final drawings shall bear the certification stamp as indicated below duly signed by both the CONTRACTOR and ENGINEER-IN-CHARGE. "Certified true for

\_\_\_\_\_ (Name of Work) Agreement  
No. \_\_\_\_\_ Signed: \_\_\_\_\_ (CONTRACTOR) (ENGINEER-  
IN-CHARGE)

62.3 The DRAWINGS submitted by the CONTRACTOR shall be reviewed by the ENGINEER-IN-CHARGE as far as practicable within 3 (Three) weeks and shall be modified by the CONTRACTOR, if any modifications and/or corrections are required by the ENGINEER-IN-CHARGE. The CONTRACTOR shall incorporate such modifications and/or corrections and submit the final drawings for approval. Any delays arising out of failure by the CONTRACTOR to rectify the drawing in good time shall not alter the Contract Completion Time.

62.4 As built drawings showing all corrections, adjustments etc. shall be furnished by the CONTRACTOR in six copies and one transparent for record purposed to the EMPLOYER.

**63 Setting out works:**

63.1 The ENGINEER-IN-CHARGE shall furnish the CONTRACTOR with only the four corners of the Works site and a level bench mark and the CONTRACTOR shall set out the Works and shall provide an efficient staff for the purpose and shall be solely responsible for the accuracy of such setting out.

63.2 The CONTRACTOR shall provide, fix and be responsible for the maintenance of all stakes, templates, level marks, profiles and other similar things and shall take all necessary precautions to prevent their removal or disturbance and shall be responsible for the consequence of such removal or disturbance should the same take place and for their efficient and timely reinstatement. The CONTRACTOR shall also be responsible for the maintenance of all existing survey marks, boundary marks, distance marks and center line marks, either existing or supplied and fixed by the CONTRACTOR The work shall be set out to the satisfaction of the ENGINEER-IN-CHARGE. The approval there of joining with the CONTRACTOR by the ENGINEER- IN-CHARGE in setting out the work, shall not relieve the CONTRACTOR of any of his responsibility.

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63.3 Before beginning the Works, the CONTRACTOR shall at his own cost, provide all necessary reference and level posts, pegs, bamboos, flags, ranging rods, strings and other materials for proper layout of the works in accordance with the schemes for bearing marks acceptable to the ENGINEER-IN-CHARGE. The center, longitudinal or face lines and cross lines shall be marked by means of small masonry pillars. Each pillar shall have distinct mark at the centre to enable theodolite to be set over it. No work shall be started until all these points are checked and approved by the ENGINEER-IN-CHARGE in writing but such approval shall not relieve the CONTRACTOR of any of his responsibilities. The CONTRACTOR shall also provide all labour, material and other facilities, as necessary, for the proper checking of layout and inspection of the points during construction.

63.4 Pillars bearing geodetic marks located at the sites of units of WORKS under construction should be protected and fenced by the CONTRACTOR

63.5 On completion of WORK, the CONTRACTOR must submit the geodetic documents according to which the WORK was carried out.

**64 Responsibility for level and alignment:**

64.1 The CONTRACTOR shall be entirely and exclusively responsible for the horizontal and vertical alignment, the levels and correctness of every part of the WORK and shall rectify effectively any errors or imperfections therein, such rectifications shall be carried out by the CONTRACTOR, at his own cost, when instructions are issued to that effect by the ENGINEER- IN-CHARGE.

**65 Materials to be supplied by contractor:**

65.1 The CONTRACTOR shall procure and provide within the VALUE OF CONTRACT the whole of the materials required for the construction including steels, cement and other building materials, tools, tackles, construction plant and equipment for the completion and maintenance of the WORK except the materials which will be issued by the EMPLOYER and shall make his own arrangement for procuring such materials and for the transport thereof. The EMPLOYER may give necessary recommendation to the respective authority if so desired by the CONTRACTOR but assumes no further responsibility of any nature. The EMPLOYER will insist on the procurement of materials which bear ISI stamp and/or which are supplied by reputed suppliers.

65.2 The CONTRACTOR shall properly store all materials either issued to him or brought by him to the SITE to prevent damages due to rain, wind, direct exposure to sun, etc. as also from theft, pilferage, etc. for proper and speedy execution of his works. The CONTRACTOR shall maintain sufficient stocks of all materials required by him.

65.3 No material shall be dispatched from the CONTRACTOR's stores before obtaining the approval in writing of the ENGINEER-IN-CHARGE.

66 **Stores supplied by the employer:**

66.1 If the SPECIFICATION of the WORK provides for the use of any material of special description to be supplied from the EMPLOYER's stores or it is required that the CONTRACTOR shall use certain stores to be provided by the ENGINEER-IN-CHARGE, such materials and stores, and price to be charged there for as hereinafter mentioned being so far as practicable for the convenience of the CONTRACTOR, but not so as in any way to control the meaning or effect of the CONTRACT, the CONTRACTOR shall be bound to purchase and shall be supplied such materials and stores as are from time to time required to be used by him for the purpose of the CONTRACT only. The sums due from the CONTRACTOR for the value of materials supplied by the EMPLOYER will be recovered from the running account bill on the basis of the actual consumption of materials in the works covered and for which the running account bill has been prepared. After the completion of the WORK, however, the CONTRACTOR has to account for the full quantity of materials supplied to him as per relevant clauses in this document.

66.2 The value of the stores/materials as may be supplied to the CONTRACTOR by the EMPLOYER will be debited to the CONTRACTOR's account at the rates shown in the schedule of materials and if they are not entered in the schedule, they will be debited at cost price, which for the purpose of the CONTRACT shall include the cost of carriage and all other expenses whatsoever such as normal storage supervision charges which shall have been incurred in obtaining the same at the EMPLOYER's stores. All materials so supplied to the CONTRACTOR shall remain the absolute property of the EMPLOYER and shall not be removed on any account from the SITE of the WORK, and shall be at all times open for inspection to the ENGINEER-IN-CHARGE. Any such materials remaining unused at the time of the completion or termination of the CONTRACT shall be returned to the EMPLOYER's stores or at a place as directed by the ENGINEER-IN-CHARGE in perfectly good condition at CONTRACTOR's cost.

67 **Conditions for issue of materials:**

67.1 Materials specified as to be issued by the EMPLOYER will be supplied to the CONTRACTOR by the EMPLOYER from his stores. It shall be responsibility of the CONTRACTOR to take delivery of the materials and arrange for its loading, transport and unloading at the SITE of WORK at his own cost. The materials shall be issued between the working hours and as per the rules of the EMPLOYER as framed from time to time.

67.2 The CONTRACTOR shall bear all incidental charges for the storage and safe custody of materials at site after these have been issued to him.

67.3 Materials specified as to be issued by the EMPLOYER shall be issued in standard sizes as obtained from the manufacturers.



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67.4 The CONTRACTOR shall construct suitable Godowns at the SITE of WORK for storing the materials safe against damage by rain, dampness, fire, theft etc. He shall also employ necessary watch and ward establishment for the purpose.

67.5 It shall be duty of the CONTRACTOR to inspect the materials supplied to him at the time of taking delivery and satisfy himself that they are in good condition. After the materials have been delivered by the EMPLOYER, it shall be the responsibility of the CONTRACTOR to keep them in good condition and if the materials are damaged or lost, at any time, they shall be repaired and/or replaced by him at his own cost according to the instructions of the ENGINEER-IN-CHARGE.

67.6 The EMPLOYER shall not be liable for delay in supply or non-supply of any materials which the EMPLOYER has undertaken to supply where such failure or delay is due to natural calamities, act of enemies, transport and procurement difficulties and any circumstances beyond the control of the EMPLOYER. In no case, the CONTRACTOR shall be entitled to claim any compensation or loss suffered by him on this account.

67.7 It shall be responsibility of the CONTRACTOR to arrange in time all materials required for the WORK other than those to be supplied by the EMPLOYER. If, however, in the opinion of the ENGINEER-IN-CHARGE the execution of the WORK is likely to be delayed due to the CONTRACTOR's inability to make arrangements for supply of materials which normally he has to arrange for, the ENGINEER-IN-CHARGE shall have the right at his own discretion to issue such materials, if available with the EMPLOYER or procure the materials from the market or as elsewhere and the CONTRACTOR will be bound to take such materials at the rates decided by the ENGINEER-IN-CHARGE. This, however, does not in any way absolve the CONTRACTOR from responsibility of making arrangements for the supply of such materials in part or in full, should such a situation occur nor shall this constitute a reason for the delay in the execution of the WORK.

67.8 None of the materials supplied to the CONTRACTOR will be utilized by the CONTRACTOR for manufacturing item which can be obtained as supplied from standard manufacturer in finished form.

67.9 The CONTRACTOR shall, if desired by the ENGINEER- IN-CHARGE, be required to execute an Indemnity Bond in the prescribed form for safe custody and accounting of all materials issued by the EMPLOYER.

67.10 The CONTRACTOR shall furnish to the ENGINEER-IN- CHARGE sufficiently in advance a statement showing his requirement of the quantities of the materials to be supplied by the EMPLOYER and the time when the same will be required by him for the works, so as to enable the ENGINEER-IN-CHARGE to make necessary arrangements for procurement and supply of the material.

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67.11 Account of the materials issued by the EMPLOYER shall be maintained by CONTRACTOR indicating the daily receipt, consumption and balance in hand. This account shall be maintained in a manner prescribed by the ENGINEER-IN-CHARGE along with all connected papers viz. requisitions, issues, etc., and shall be always available for inspection in the CONTRACTOR's office at SITE.

67.12 The CONTRACTOR should see that only the required quantities of materials are got issued. The CONTRACTOR shall not be entitled to cartage and incidental charges for returning the surplus materials, if any, to the stores wherefrom they were issued or to the place as directed by the ENGINEER-IN-CHARGE.

67.13 Materials/Equipment(s) supplied by EMPLOYER shall not be utilized for any purpose(s) than issued for.

**68 Material procured with assistance of employer/return of surplus:**

68.1 Notwithstanding anything contained to the contrary in any or all the clauses of this CONTRACT where any materials for the execution of the CONTRACT are procured with the assistance of the EMPLOYER either by issue from EMPLOYER's stock or purchases made under order or permits or licenses issued by Government, the CONTRACTOR shall hold the said materials as trustee for the EMPLOYER and use such materials economically and solely for the purpose of the CONTRACT and not dispose them off without the permission of the EMPLOYER and return, if required by the ENGINEER-IN-CHARGE, shall determine having due regard to the condition of the materials. The price allowed to the CONTRACTOR, however, shall not exceed the amount charged to him excluding the storage charges, if any. The decision of the ENGINEER-IN-CHARGE shall be final and conclusive in such matters. In the event of breach of the aforesaid condition, the CONTRACTOR shall, in terms of the licenses or permits and/or criminal breach of trust, be liable to compensate the EMPLOYER at double rate or any higher rate, in the event of those materials at that time having higher rate or not being available in the market, then any other rate to be determined by the ENGINEER-IN-CHARGE and his decision shall be final and conclusive.

**69 Materials obtained from dismantling:**

69.1 If the CONTRACTOR in the course of execution of the WORK is called upon to dismantle any part for reasons other than those stipulated in Clauses 74 and 77 hereunder, the materials obtained in the WORK of dismantling etc., will be considered as the EMPLOYER's property and will be disposed off to the best advantage of the EMPLOYER.

**70 Articles of value found:**

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70.1 All gold, silver and other minerals of any description and all precious stones, coins, treasure relics, antiquities and other similar things which shall be found in, under or upon the SITE, shall be the property of the EMPLOYER and the CONTRACTOR shall duly preserve the same to the satisfaction of the ENGINEER-IN-CHARGE and shall from time to time deliver the same to such person or persons indicated by the EMPLOYER.

**71 Discrepancies between instructions:**

71.1 Should any discrepancy occur between the various instructions furnished to the CONTRACTOR, his agent or staff or any doubt arises as to the meaning of any such instructions or should there be any misunderstanding between the CONTRACTOR's staff and the ENGINEER-IN-CHARGE's staff, the CONTRACTOR shall refer the matter immediately in writing to the ENGINEER-IN-CHARGE whose decision thereon shall be final and conclusive and no claim for losses alleged to have been caused by such discrepancies between instructions, doubts, or misunderstanding shall in any event be admissible.

**72 Action where no specification is issued:**

72.1 In case of any class of WORK for which there is no SPECIFICATION supplied by the EMPLOYER as mentioned in the Tender Documents such WORK shall be carried out in accordance with Indian Standard Specifications and if the Indian Standard Specifications do not cover the same, the WORK should be carried out as per standard Engineering Practice subject to the approval of the ENGINEER-IN-CHARGE.

**73 Inspection of works:**

73.1 The ENGINEER-IN-CHARGE will have full power and authority to inspect the WORK at any time wherever in progress either on the SITE or at the CONTRACTOR's premises/workshops wherever situated, premises/ workshops of any person, firm or corporation where WORK in connection with the CONTRACT may be in hand or where materials are being or are to be supplied, and the CONTRACTOR shall afford or procure for the ENGINEER-IN-CHARGE every facility and assistance to carry out such inspection. The CONTRACTOR shall, at all time during the usual working hours and at all other time at which reasonable notice of the intention of the ENGINEER-IN-CHARGE or his representative to visit the WORK shall have been given to the CONTRACTOR, either himself be present or receive orders and instructions, or have a responsible agent duly accredited in writing, present for the purpose. Orders given to the CONTRACTOR's agent shall be considered to have the same force as if they had been given to the CONTRACTOR himself. The CONTRACTOR shall give not less than seven days notice in writing to the ENGINEER-IN-CHARGE before covering up or otherwise placing beyond reach of inspection and measurement of any work in order that the same may be inspected and measured. In the event of breach of above the same shall be uncovered at CONTRACTOR's expense for carrying out such measurement or inspection.

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73.2 No material shall be dispatched from the CONTRACTOR's stores before obtaining the approval in writing of the Engineer-in-Charge. The CONTRACTOR is to provide at all time during the progress of the WORK and the maintenance period, proper means of access with ladders, gangways etc. and the necessary attendance to move and adopt as directed for inspection or measurements of the WORK by the ENGINEER- IN-CHARGE.

73.3 The CONTRACTOR shall make available to the ENGINEER-IN- CHARGE free of cost all necessary instruments and assistance in checking or setting out of WORK and in the checking of any WORK made by the CONTRACTOR for the purpose of setting out and taking measurements of WORK.

**74 Tests for quality of work:**

74.1 All workmanship shall be of the respective kinds described in the CONTRACT DOCUMENTS and in accordance with the instructions of the ENGINEER-IN-CHARGE and shall be subjected from time to time to such test at CONTRACTOR's cost as the ENGINEER-IN-CHARGE may direct at the place of manufacture or fabrication or on the site or at all or any such places. The CONTRACTOR shall provide assistance, instruments, labour and materials as are normally required for examining, measuring and testing any workmanship as may be selected and required by the ENGINEER-IN-CHARGE.

74.2 All the tests that will be necessary in connection with the execution of the WORK as decided by the ENGINEER- IN-CHARGE shall be carried out at the field testing laboratory of the EMPLOYER by paying the charges as decided by the EMPLOYER from time to time. In case of non- availability of testing facility with the EMPLOYER, the required test shall be carried out at the cost of CONTRACTOR at Government or any other testing laboratory as directed by ENGINEER-IN-CHARGE.

74.3 If any tests are required to be carried out in conjunction with the WORK or materials or workmanship not supplied by the CONTRACTOR, such tests shall be carried out by the CONTRACTOR as per instructions of ENGINEER-IN-CHARGE and cost of such tests shall be reimbursed by the EMPLOYER.

**75 Samples for approval:**

75.1 The CONTRACTOR shall furnish to the ENGINEER-IN-CHARGE for approval, when requested or if required by the specifications, adequate samples of all materials and finished to be used in the WORK. Such samples shall be submitted before the WORK is commenced and in ample time to permit tests and examinations thereof. All materials furnished and finishes applied in actual WORK shall be fully equal to the approved samples.

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**76 Action and compensation in case of bad work:**

76.1 If it shall appear to the ENGINEER-IN-CHARGE that any work has been executed with unsound, imperfect or unskilled workmanship, or with materials of any inferior description, or that any materials or articles provided by the CONTRACTOR for the execution of the WORK are unsound, or of a quality inferior to that contracted for, or otherwise not in accordance with the CONTRACT, the CONTRACTOR shall on demand in writing from the ENGINEER-IN-CHARGE or his authorized representative specifying the WORK, materials or articles complained of notwithstanding that the same may have been inadvertently passed, certified and paid for, forthwith rectify or remove and reconstruct the WORK so specified and provide other proper and suitable materials or articles at his own cost and in the event of failure to do so within the period specified by the ENGINEER-IN-CHARGE in his demand aforesaid, the CONTRACTOR shall be liable to pay compensation at the rate of 1 % (One percent) of the estimated cost of the whole WORK, for every week limited to a maximum of 10% (ten percent) of the value of the whole WORK, while his failure to do so shall continue and in the case of any such failure the ENGINEER-IN-CHARGE may on expiry of notice period rectify or remove and re-execute the WORK or remove and replaced with others, the materials or articles complained of to as the case may be at the risk and expense in all respects of the CONTRACTOR The decision of the Engineering-in-charge as to any question arising under this clause shall be final and conclusive.

**77 Suspension of works:**

77.1 Subject to the provisions of sub-para (ii) of this clause, the CONTRACTOR shall, if ordered in writing by the ENGINEER-IN-CHARGE, or his representative, temporarily suspend the WORKS or any part thereof for such written order, proceed with the WORK therein ordered to be suspended until, he shall have received a written order to proceed therewith. The CONTRACTOR shall not be entitled to claim compensation for any loss or damage sustained by him by reason of temporary suspension of the WORKS aforesaid. An extension of time for completion, corresponding with the delay caused by any such suspension of the WORKS as aforesaid will be granted to the ONTRACTOR should he apply for the same provided that the suspension was not consequent to any default or failure on the part of the CONTRACTOR.

77.2 In case of suspensions of entire WORK, ordered in writing by ENGINEER-IN-CHARGE, for a period of more than two months, the CONTRACTOR shall have the option to terminate the CONTRACT.

**78 Employer may do part of work:**

78.1 Upon failure of the CONTRACTOR to comply with any instructions given in accordance with the provisions of this CONTRACT the EMPLOYER has the alternative right, instead of assuming charge of entire WORK, to place additional labour force, tools, equipments and materials on such parts of the WORK, as the EMPLOYER may designate or also engage another CONTRACTOR to carry out the WORK. In such cases, the EMPLOYER

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shall deduct from the amount which otherwise might become due to the CONTRACTOR, the cost of such work and material with ten percent (10%) added to cover all departmental charges and should the total amount thereof exceed the amount due to the CONTRACTOR, the CONTRACTOR shall pay the difference to the EMPLOYER.

**79 Possession prior to completion:**

79.1 The ENGINEER-IN-CHARGE shall have the right to take possession of or use any completed or partially completed WORK or part of the WORK. Such possession or use shall not be deemed to be an acceptance of any work completed in accordance with the CONTRACT agreement. If such prior possession or use by the ENGINEER-IN-CHARGE delays the progress of WORK, equitable adjustment in the time of completion will be made and the CONTRACT agreement shall be deemed to be modified accordingly.

**80 Defects Liability Period (Twelve months period of liability from the date of issue of completion certificate):**

80.1 The CONTRACTOR shall guarantee the installation/WORK for a period of 12 months from the date of completion of WORK as certified by the ENGINEER-IN-CHARGE which is indicated in the Completion Certificate. Any damage or defect that may arise or lie undiscovered at the time of issue of Completion Certificate, connected in any way with the equipment or materials supplied by him or in the workmanship, shall be rectified or replaced by the CONTRACTOR at his own expense as deemed necessary by the ENGINEER-IN-CHARGE or in default, the ENGINEER-IN-CHARGE may carry out such works by other work and deduct actual cost incurred towards labour, supervision and materials consumables or otherwise plus 100% towards overheads (of which the certificate of ENGINEER-IN-CHARGE shall be final) from any sums that may then be or at any time thereafter, become due to the CONTRACTOR or from his Contract Performance Security, or the proceeds of sale thereof or a sufficient part on thereof.

80.2 If the CONTRACTOR feels that any variation in WORK or in quality of materials or proportions would be beneficial or necessary to fulfill the guarantees called for, he shall bring this to the notice of the ENGINEER-IN-CHARGE in writing. If during the period of liability any portion of the WORK/equipment, is found defective and is rectified/ replaced, the period of liability for such equipment/ portion of WORK shall be operative from the date such rectification/ replacement are carried out and Contract Performance Guarantee shall be furnished separately for the extended period of liability for that portion of WORK/ equipment only. Notwithstanding the above provisions the supplier's, guarantees/warrantees for the replaced equipment shall also be passed on to the EMPLOYER.

80.3 LIMITATION OF LIABILITY Notwithstanding anything contrary contained herein, the aggregate total liability of CONTRACTOR under the Agreement or otherwise shall be limited

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to 100% of Agreement / 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.

**81 Care of works:**

81.1 From the commencement to completion of the WORK, the CONTRACTOR shall take full responsibility for the care for all works including all temporary works and in case any damages, loss or injury shall happen to the WORK or to any part thereof or to any temporary works from any cause whatsoever, shall at his own cost repair and make good the same so that at completion the WORK shall be in good order and in conformity in every respects with the requirement of the CONTRACT and the ENGINEER-IN- CHARGE's instructions.

81.2 **DEFECTS PRIOR TO TAKING OVER:** If at any time, before the WORK is taken over, the ENGINEER-IN-CHARGE shall: a) Decide that any works done or materials used by the CONTRACTOR or by any SUB-CONTRACTOR is defective or not in accordance with the CONTRACT, or that the works or any portion thereof are defective, or do not fulfill the requirements of CONTRACT (all such matters being hereinafter, called 'Defects' in this clause), and b) As soon as reasonably practicable, gives to the CONTRACTOR notice in writing of the said decision, specifying particulars of the defects alleged to exist or to have occurred, then the CONTRACTOR shall at his own expenses and with all speed make good the defects so specified. In case CONTRACTOR shall fail to do so, the EMPLOYER may take, at the cost of the CONTRACTOR, such steps as may in all circumstances, be reasonable to make good such defects. The expenditure so incurred by the EMPLOYER will be recovered from the amount due to the CONTRACTOR. The decision of the ENGINEER-IN-CHARGE with regard to the amount to be recovered from the CONTRACTOR will be final and binding on the CONTRACTORAs soon as the WORK has been completed in accordance with the CONTRACT (except in minor respects that do not affect their use for the purpose for which they are intended and except for maintenance there of provided in clause 80.1 of General Conditions of Contract) and have passed the tests on completion, the ENGINEER-IN-CHARGE shall issue a certificate (hereinafter called Completion Certificate) in which he shall certify the date on which the WORK have been so completed and have passed the said tests and the EMPLOYER shall be deemed to have taken over the WORK on the date so certified. If the WORK has been divided into various groups in the CONTRACT, the EMPLOYER shall be entitled to take over any group or groups before the other or others and there upon the ENGINEER-IN-CHARGE shall issue a Completion Certificate which will, however, be for such group or groups so taken over only. In such an event if the group /section/ part so taken over is related, to the integrated system of the work, notwithstanding date of grant of Completion Certificate for group/ section/ part. The period of liability in respect of such group/ section/ part shall extend 12 (twelve) months from the date of completion of WORK.

81.3 **DEFECTS AFTER TAKING OVER:** In order that the CONTRACTOR could obtain a COMPLETION CERTIFICATE he shall make good, with all possible speed, any defect arising

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from the defective materials supplied by the CONTRACTOR or workmanship or any act or omission of the CONTRACT or that may have been noticed or developed, after the works or groups of the works has been taken over, the period allowed for carrying out such WORK will be normally one month. If any defect be not remedied within a reasonable time, the EMPLOYER may proceed to do the WORK at CONTRACTOR's risk and expense and deduct from the final bill such amount as may be decided by the EMPLOYER. If by reason of any default on the part of the CONTRACTOR a COMPLETION CERTIFICATE has not been issued in respect of any portion of the WORK within one month after the date fixed by the CONTRACT for the completion of the WORK, the EMPLOYER shall be at liberty to use the WORK or any portion thereof in respect of which a completion certificate has not been issued, provided that the WORK or the portion thereof so used as aforesaid shall be afforded reasonable opportunity for completing these works for the issue of Completion Certificate.

**82 Guarantee/transfer of guarantee:**

82.1 For works like water-proofing, acid and alkali resisting materials, pre-construction soil treatment against termite or any other specialized works etc. the CONTRACTOR shall invariably engage SUB-CONTRACTORS who are specialists in the field and firms of repute and such a SUB-CONTRACTOR shall furnish guarantees for their workmanship to the EMPLOYER, through the CONTRACTOR. In case such a SUB-CONTRACTOR/ firm is not prepared to furnish a guarantee to the EMPLOYER, the CONTRACTOR shall give that guarantee to the EMPLOYER directly.

**83 Training of employer's personnel:**

83.1 The CONTRACTOR undertakes to provide training to Engineering personnel selected and sent by the EMPLOYER at the works of the CONTRACTOR without any cost to the EMPLOYER. The period and the nature of training for the individual personnel shall be agreed upon mutually between the CONTRACTOR and the EMPLOYER. These engineering personnel shall be given special training at the shops, where the equipment will be manufactured and/ or in their collaborator's works and where possible, in any other plant where equipment manufactured by the CONTRACTOR or his collaborators is under installation or test to enable those personnel to become familiar with the equipment being furnished by the CONTRACTOR. EMPLOYER shall bear only the to and fro fare of the said engineering personnel.

**84 Replacement of defective parts and materials:**

84.1 If during the progress of the WORK, EMPLOYER shall decide and inform in writing to the CONTRACTOR, that the CONTRACTOR has manufactured any plant or part of the plant unsound or imperfect or has furnished plant inferior to the quality specified, the CONTRACTOR on receiving details of such defects or deficiencies shall at his own expenses within 7 (seven) days of his receiving the notice, or otherwise within such time as may be reasonably necessary for making it good, proceed to alter, re-construct or remove such work and furnish fresh equipments upto the standards of the specifications. In case the



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CONTRACTOR fails to do so, EMPLOYER may on giving the CONTRACTOR 7 (seven) day's notice in writing of his intentions to do so, proceed to remove the portion of the WORK so complained of and at the cost of CONTRACTOR's, perform all such works or furnish all such equipments provided that nothing in the clause shall be deemed to deprive the EMPLOYER of or affect any rights under the CONTRACT, the EMPLOYER may otherwise have in respect of such defects and deficiencies.

84.2 The CONTRACTOR's full and extreme liability under this clause shall be satisfied by the payments to the EMPLOYER of the extra cost, of such replacements procured including erection/installation as provided for in the CONTRACT; such extra cost being the ascertained difference between the price paid by the EMPLOYER for such replacements and the CONTRACT price portion for such defective plants and repayments of any sum paid by the EMPLOYER to the CONTRACTOR in respect of such defective plant. Should the EMPLOYER not so replace the defective plant the CONTRACTOR's extreme liability under this clause shall be limited to the repayment of all such sums paid by the EMPLOYER under the CONTRACT for such defective plant.

**85 Indemnity**

85.1 If any action is brought before a Court, Tribunal or any other Authority against the Employer or an officer or agent of the EMPLOYER, for the failure, omission or neglect on the part of the CONTRACTOR to perform any acts, matters, covenants or things under the CONTRACT, or damage or injury caused by the alleged omission or negligence on the part of the CONTRACTOR, his agents, representatives or his SUB- CONTRACTOR's, or in connection with any claim based on lawful demands of SUB-CONTRACTOR's workmen suppliers or employees, the CONTRACTOR, shall in such cases indemnify and keep the EMPLOYER and/or their representatives harmless from all losses, damages, expenses or decrees arising out of such action.

**86 Construction aids, equipments, tools & tackles:**

86.1 CONTRACTOR shall be solely responsible for making available for executing the WORK, all requisite CONSTRUCTION EQUIPMENTS, Special Aids, Barges, Cranes and the like, all Tools, Tackles and Testing Equipment and Appliances, including imports of such equipment etc. as required. In case of import of the same the rates applicable for levying of Custom Duty on such Equipment, Tools, & Tackles and the duty drawback applicable thereon shall be ascertained by the CONTRACTOR from the concerned authorities of Government of India. It shall be clearly understood that EMPLOYER shall not in any way be responsible for arranging to obtain Custom Clearance and/or payment of any duties and/or duty draw backs etc. for such equipments so imported by the CONTRACTOR and the CONTRACTOR shall be fully responsible for all taxes, duties and documentation with regard to the same. Tenderer in his own interest may contact, for any clarifications in the matter, concerned agencies/Dept./Ministries of Govt. of India. All clarifications so obtained and interpretations thereof shall be solely the responsibility of the CONTRACTOR

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**SECTION-VI CERTIFICATES AND PAYMENTS**

**87 Schedule of rates and payments:**

**87.1 CONTRACTOR'S REMUNERATION:** The price to be paid by the EMPLOYER to CONTRACTOR for the whole of the WORK to be done and for the performance of all the obligations undertaken by the CONTRACTOR under the CONTRACT DOCUMENTS shall be ascertained by the application of the respective Schedule of Rates (the inclusive nature of which is more particularly defined by way of application but not of limitation, with the succeeding sub-clause of this clause) and payment to be made accordingly for the WORK actually executed and approved by the ENGINEER-IN-CHARGE. The sum so ascertained shall (excepting only as and to the extent expressly provided herein) constitute the sole and inclusive remuneration of the CONTRACTOR under the CONTRACT and no further or other payment whatsoever shall be or become due or payable to the CONTRACTOR under the CONTRACT.

**87.2 SCHEDULE OF RATES TO BE INCLUSIVE:** The prices/rates quoted by the CONTRACTOR shall remain firm till the issue of FINAL CERTIFICATE and shall not be subject to escalation. Schedule of Rates shall be deemed to include and cover all costs, expenses and liabilities of every description and all risks of every kind to be taken in executing, completing and handing over the WORK to the EMPLOYER by the CONTRACTOR. The CONTRACTOR shall be deemed to have known the nature, scope, magnitude and the extent of the WORK and materials required though the CONTRACT DOCUMENT may not fully and precisely furnish them. Tenderer's shall make such provision in the Schedule of Rates as he may consider necessary to cover the cost of such items of WORK and materials as may be reasonable and necessary to complete the WORK. The opinion of the ENGINEER-IN-CHARGE as to the items of WORK which are necessary and reasonable for COMPLETION OF WORK shall be final and binding on the CONTRACTOR, although the same may not be shown on or described specifically in CONTRACT DOCUMENTS. Generality of this present provision shall not be deemed to cut down or limit in any way because in certain cases it may and in other cases it may not be expressly stated that the CONTRACTOR shall do or perform a work or supply articles or perform services at his own cost or without addition of payment or without extra charge or words to the same effect or that it may be stated or not stated that the same are included in and covered by the Schedule of Rates.

**87.3 SCHEDULE OF RATES TO COVER CONSTRUCTION EQUIPMENTS, MATERIALS, LABOUR ETC.:** Without in any way limiting the provisions of the preceding sub-clause the Schedule of Rates shall be deemed to include and cover the cost of all construction equipment, temporary WORK (except as provided for herein), pumps, materials, labour, insurance, fuel, consumables, stores and appliances to be supplied by the CONTRACTOR and all other matters in connection with each item in the Schedule of Rates and the execution of the WORK or any portion thereof finished, complete in every respect and maintained as

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shown or described in the CONTRACT DOCUMENTS or as may be ordered in writing during the continuance of the CONTRACT.

**87.4 SCHEDULE OF RATES TO COVER ROYALTIES, RENTS AND CLAIMS:** The Schedule of Rates (i.e., VALUE OF CONTRACT) shall be deemed to include and cover the cost of all royalties and fees for the articles and processes, protected by letters, patent or otherwise incorporated in or used in connection with the WORK, also all royalties, rents and other payments in connection with obtaining materials of whatsoever kind for the WORK and shall include an indemnity to the EMPLOYER which the CONTRACTOR hereby gives against all actions, proceedings, claims, damages, costs and expenses arising from the incorporation in or use on the WORK of any such articles, processes or materials, octroi or other municipal or local Board Charges, if levied on materials, equipment or machineries to be brought to site for use on WORK shall be borne by the CONTRACTOR

**87.5 SCHEDULE OF RATES TO COVER TAXES AND DUTIES:** No exemption or reduction of Customs Duties, GST , GST on works Contract quay or any port dues, transport charges, stamp duties or Central or State Government or local Body or Municipal Taxes or duties, taxes or charges (from or of any other body), whatsoever, will be granted or obtained, all of which expenses shall be deemed to be included in and covered by the Schedule or Rates. The CONTRACTOR shall also obtain and pay for all permits or other privileges necessary to complete the WORK.

**87.6 SCHEDULE OF RATES TO COVER RISKS OF DELAY:** The Schedule of Rates shall be deemed to include and cover the risk of all possibilities of delay and interference with the CONTRACTOR's conduct of WORK which occur from any causes including orders of the EMPLOYER in the exercise of his power and on account of extension of time granted due to various reasons and for all other possible or probable causes of delay.

**87.7 SCHEDULE OF RATES CANNOT BE ALTERED:** For WORK under unit rate basis, no alteration will be allowed in the Schedule of Rates by reason of works or any part of them being modified, altered, extended, diminished or committed. The Schedule of Rates are fully inclusive of rates which have been fixed by the CONTRACTOR and agreed to by the EMPLOYER and cannot be altered. For lumpsum CONTRACTS, the payment will be made according to the WORK actually carried out, for which purpose an item wise, or work wise Schedule of Rates shall be furnished, suitable for evaluating the value of WORK done and preparing running account bill. Payment for any additional work which is not covered in the Schedule of Rates, shall only be released on issuance of change order.

**88 Procedure for measurement and billing of work in progress:**

**88.1 BILLING PROCEDURE:** Following procedures shall be adopted for billing of works executed by the CONTRACTOR.

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88.1.1 All measurements shall be recorded in sextuplicate on standard measurement sheets supplied by EMPLOYER and submitted to EMPLOYER/CONSULTANT for scrutiny and passing.

88.1.2 EMPLOYER/CONSULTANT shall scrutinize and check the measurements recorded on the sheets and shall certify correctness of the same on the measurement sheets.

88.1.3 ENGINEER-IN-CHARGE shall pass the bills after carrying out the comprehensive checks in accordance with the terms and conditions of the CONTRACTS, within 7 days of submission of the bills, complete in all respects and send the same to the Employer to effect payment to the CONTRACTOR

88.1.4 GGPL shall make all endeavor to make payments of undisputed amount of the bills submitted based on the joint measurements within 15 (Fifteen) days from the date of certification by the Engineer-in-Charge.

88.1.5 Measurements shall be recorded as per the methods of measurement spelt out in EMPLOYER/CONSULTANT SPECIFICATIONS / CONTRACT DOCUMENT. EMPLOYER/CONSULTANT shall be fully responsible for checking the measurements quantitatively and qualitatively as recorded in the Measurement Books/ Bills.

88.1.6 While preparing the final bills overall measurements will not be taken again. Only volume of work executed since the last measured bill alongwith summary of final measurements will be considered for the final bill. However, a detailed check shall be made as to missing measurements and in case there are any missing items or measurements the same shall be recorded.

88.1.7 **COMPUTERISED BILLING SYSTEM:** GODAVARI GAS (P) LTD has introduced Computerised Billing System whereby when the Bills are submitted in GGPL by a Contractor, a receipt number is generated. The Contractor can know the status of the Bill through GGPL's website.

88.2 **SECURED ADVANCE ON MATERIAL:** Unless otherwise provided elsewhere in the tender, no 'Secured Advance' on security of materials brought to site for execution of contracted items(s) shall be paid to the Contractor whatsoever.

88.3 **DISPUTE IN MODE OF MEASUREMENT:** In case of any dispute as to the mode of measurement not covered by the CONTRACT to be adopted for any item of WORK, mode of measurement as per latest Indian Standard Specifications shall be followed.

88.4 **ROUNDING-OFF OF AMOUNTS:** In calculating the amount of each item due to the CONTRACTOR in every certificate prepared for payment, sum of less than 50 paise shall be omitted and the total amount on each certificate shall be rounded off to the nearest rupees, i.e., sum of less than 50 paise shall be omitted and sums of 50 paise and more upto one rupee shall be reckoned as one rupee.

89 **Lumpsum in tender:**

89.1 The payment against any Lumpsum item shall be made only on completion of that item as per the provision of the CONTRACT after certification by ENGINEER-IN-CHARGE.

90 **Running account payments to be regarded as advance:**

90.1 All running account payments shall be regarded as payment by way of advance against the final payment only and not as payments for WORK actually done and completed and shall not preclude the requiring of bad, unsound and imperfect or unskilled work to be removed and taken away and reconstructed or re-erected or be considered as an admission of the due performance of the CONTRACT, or any part thereof, in this respect, or of the accruing of any claim by the CONTRACTOR, nor shall it conclude, determine or affect in any way the powers of the EMPLOYER under these conditions or any of them as to the final settlement and adjustment of the accounts or otherwise, or in any other way vary or affect the CONTRACT. The final bill shall be submitted by the CONTRACTOR within one month of the date of physical completion of the WORK, otherwise, the ENGINEER-IN-CHARGE's certificate of the measurement and of total amount payable for the WORK accordingly shall be final and binding on all parties

91 **Notice of claims for additional payments:**

91.1 Should the CONTRACTOR consider that he is entitled to any extra payment for any extra/additional WORKS or MATERIAL change in original SPECIFICATIONS carried out by him in respect of WORK he shall forthwith give notice in writing to the ENGINEER-IN-CHARGE that he claims extra payment. Such notice shall be given to the ENGINEER-IN-CHARGE upon which CONTRACTOR bases such claims and such notice shall contain full particulars of the nature of such claim with full details of amount claimed. Irrespective of any provision in the CONTRACT to the contrary, the CONTRACTOR must intimate his intention to lodge claim on the EMPLOYER within 10 (ten) days of the commencement of happening of the event and quantify the claim within 30 (thirty) days, failing which the CONTRACTOR will lose his right to claim any compensation/reimbursement/damages etc. or refer the matter to arbitration. Failure on the part of CONTRACTOR to put forward any claim without the necessary particulars as above within the time above specified shall be an absolute waiver thereof. No omission by EMPLOYER to reject any such claim and no delay in dealing therewith shall be waiver by EMPLOYER of any of this rights in respect thereof.

91.2 **ENGINEER-IN-CHARGE** shall review such claims within a reasonable period of time and cause to discharge these in a manner considered appropriate after due deliberations thereon. However, CONTRACTOR shall be obliged to carry on with the WORK during the period in which his claims are under consideration by the EMPLOYER, irrespective of the

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outcome of such claims, where additional payments for WORKS considered extra are justifiable in accordance with the CONTRACT provisions, EMPLOYER shall arrange to release the same in the same manner as for normal WORK payments. Such of the extra works so admitted by EMPLOYER shall be governed by all the terms, conditions, stipulations and specifications as are applicable for the CONTRACT. The rates for extra works shall generally be the unit rates provided for in the CONTRACT. In the event unit rates for extra works so executed are not available as per CONTRACT, payments may either be released on day work basis for which daily/hourly rates for workmen and hourly rates for equipment rental shall apply, or on the unit rate for WORK executed shall be derived by interpolation/extrapolation of unit rates already existing in the CONTRACT. In all the matters pertaining to applicability of rate and admittance of otherwise of an extra work claim of CONTRACTOR the decision of ENGINEER-IN-CHARGE shall be final and binding.

**92 Payment of contractor's bill:**

92.1 No payment shall be made for works estimated to cost less than Rs.10,000/- till the whole of the work shall have been completed and a certificate of completion given. But in case of works estimated to cost more than Rs.10,000/-, that CONTRACTOR on submitting the bill thereof be entitled to receive a monthly payment proportionate to the part thereof approved and passed by the ENGINEER-IN-CHARGE, whose certificate of such approval and passing of the sum so payable shall be final and conclusive against the CONTRACTOR This payment will be made after making necessary corrections/deductions as stipulated elsewhere in the CONTRACT DOCUMENT for materials, Contract Performance Security, taxes etc.

92.2 Payment due to the CONTRACTOR shall be made by the EMPLOYER by Account Payee cheque forwarding the same to registered office or the notified office of the CONTRACTOR In no case will EMPLOYER be responsible if the cheque is mislaid or misappropriated by unauthorized person/persons. In all cases, the CONTRACTOR shall present his bill duly pre-receipted on proper revenue stamp payment shall be made in Indian Currency.

92.3 In general payment of final bill shall be made to CONTRACTOR within 60 days of the submission of bill on joint measurements, after completion of all the obligations under the CONTRACT.

**93 Receipt for payment:**

93.1 Receipt for payment made on account of work when executed by a firm, must be signed by a person holding due power of attorney in this respect on behalf of the CONTRACTOR, except when the CONTRACTOR's are described in their tender as a limited company in which case the receipts must be signed in the name of the company by one of its principal officers or by some other person having authority to give effectual receipt for the company.

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**94 Completion certificate:**

**94.1 APPLICATION FOR COMPLETION CERTIFICATE:** When the CONTRACTOR fulfils his obligation under Clause 81.1 he shall be eligible to apply for COMPLETION CERTIFICATE. The ENGINEER-IN-CHARGE shall normally issue to the CONTRACTOR the COMPLETION CERTIFICATE within one month after receiving any application therefore from the CONTRACTOR after verifying from the completion documents and satisfying himself that the WORK has been completed in accordance with and as set out in the construction and erection drawings, and the CONTRACT DOCUMENTS. The CONTRACTOR, after obtaining the COMPLETION CERTIFICATE, is eligible to present the final bill for the WORK executed by him under the terms of CONTRACT.

**94.2 COMPLETION CERTIFICATE:** Within one month of the completion of the WORK in all respects, the CONTRACTOR shall be furnished with a certificate by the ENGINEER-IN-CHARGE of such completion, but no certificate shall be given nor shall the WORK be deemed to have been executed until all scaffolding, surplus materials and rubbish is cleared off the SITE completely nor until the WORK shall have been measured by the ENGINEER-IN-CHARGE whose measurement shall be binding and conclusive. The WORKS will not be considered as complete and taken over by the EMPLOYER, until all the temporary works, labour and staff colonies are cleared to the satisfaction of the ENGINEER-IN-CHARGE. If the CONTRACTOR fails to comply with the requirements of this clause on or before the date fixed for the completion of the WORK, the ENGINEER-IN-CHARGE may at the expense of the CONTRACTOR remove such scaffolding, surplus materials and rubbish and dispose off the same as he thinks fit and clean off such dirt as aforesaid, and the CONTRACTOR shall forthwith pay the amount of all expenses so incurred and shall have no claim in respect of any such scaffolding or surplus materials as aforesaid except for any sum actually realised by the sale thereof.

**94.3 COMPLETION CERTIFICATE DOCUMENTS:** For the purpose of Clause 94.0 the following documents will be deemed to form the completion documents:

- (i) The technical documents according to which the WORK was carried out. Six (6) sets of construction drawings showing therein the modification and correction made during the course of execution and signed by the ENGINEER-IN-CHARGE.
- (ii) COMPLETION CERTIFICATE for 'embedded' and 'covered' up work.
- (iii) Certificates of final levels as set out for various works.
- (iv) Certificates of tests performed for various WORKS.
- (v) Material appropriation, Statement for the materials issued by the EMPLOYER for the WORK and list of surplus materials returned to the EMPLOYER's store duly supported by necessary documents.

**95 Final decision and final certificate:**

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95.1 Upon expiry of the period of liability and subject to the ENGINEER-IN-CHARGE being satisfied that the WORKS have been duly maintained by the CONTRACTOR during monsoon or such period as hereinbefore provided in Clause 80 & 81 and that the CONTRACTOR has in all respect duly made-up any subsidence and performed all his obligations under the CONTRACT, the ENGINEER-IN- CHARGE shall (without prejudice to the rights of the EMPLOYER to retain the provisions of relevant Clause hereof) otherwise give a certificate herein referred to as the FINAL CERTIFICATE to that effect and the CONTRACTOR shall not be considered to have fulfilled the whole of his obligations under CONTRACT until FINAL CERTIFICATE shall have been given by the ENGINEER-IN- CHARGE notwithstanding any previous entry upon the WORK and taking possession, working or using of the same or any part thereof by the EMPLOYER.

**96 Certificate and payments on evidence of completion:**

96.1 Except the FINAL CERTIFICATE, no other certificates or payments against a certificate or on general account shall be taken to be an admission by the EMPLOYER of the due performance of the CONTRACT or any part thereof or of occupancy or validity of any claim by the CONTRACTOR

**97 Deductions from the contract price:**

97.1 All costs, damages or expenses which EMPLOYER may have paid or incurred, which under the provisions of the CONTRACT, the CONTRACTOR is liable/will be liable, will be claimed by the EMPLOYER. All such claims shall be billed by the EMPLOYER to the CONTRACTOR regularly as and when they fall due. Such claims shall be paid by the CONTRACTOR within 15 (fifteen) days of the receipt of the corresponding bills and if not paid by the CONTRACTOR within the said period, the EMPLOYER may, then, deduct the amount from any moneys due i.e., Contract Performance Security or becoming due to the CONTRACTOR under the CONTRACT or may be recovered by actions of law or otherwise, if the CONTRACTOR fails to satisfy the EMPLOYER of such claims.

**SECTION-VII TAXES AND INSURANCE**

**98 Taxes, Duties, Octroi etc:**

98.1 The CONTRACTOR agrees to and does hereby accept full and exclusive liability for the payment of any and all Taxes, Duties, including Excise duty, octroi etc. now or hereafter imposed, increased, modified, all the GST, duties, octrois etc. now in force and hereafter increased, imposed or modified, from time to time in respect of WORKS and materials and all contributions and taxes for unemployment compensation, insurance and old age pensions or annuities now or hereafter imposed by any Central or State Government authorities which are imposed with respect to or covered by the wages, salaries, or other compensations paid to the persons employed by the CONTRACTOR and the CONTRACTOR



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shall be responsible for the compliance of all SUB-CONTRACTORS, with all applicable Central, State, Municipal and local law and regulation and requirement of any Central, State or local Government agency or authority. CONTRACTOR further agrees to defend, indemnify and hold EMPLOYER harmless from any liability or penalty which may be imposed by the Central, State or Local authorities by reason or any violation by CONTRACTOR or SUB-CONTRACTOR of such laws, suits or proceedings that may be brought against the EMPLOYER arising under, growing out of, or by reason of the work provided for by this CONTRACT, by third parties, or by Central or State Government authority or any administrative sub-division thereof. Tax deductions will be made as per the rules and regulations in force in accordance with acts prevailing from time to time.

**99 GST/ Composite scheme under GST :**

99.1 Tenderer should quote all inclusive prices including the liability of GST/ Composite scheme under GST whether on the works contract as a whole or in respect of bought out components used by the CONTRACTOR in execution of the CONTRACT. GGPL shall not be responsible for any such liability of the CONTRACTOR in respect of this CONTRACT.

**100 Statutory variations**

100.1 Tenderer should quote prices inclusive of GST applicable on finished product. Any statutory variations in GST on finished product during the contractual completion period, shall be to the GGPL account for which the Contractor will furnish documentary evidence(s) in support of their claims to GGPL. However, any increase in the rate of these taxes and duties (GST beyond the contractual completion period shall be to Contractor's account and any decrease shall be passed on to GGPL.

**101 Insurance:**

101.1 GENERAL CONTRACTOR shall at his own expense arrange secure and maintain insurance with reputable insurance companies to the satisfaction of the EMPLOYER as follows: CONTRACTOR at his cost shall arrange, secure and maintain insurance 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 against all risks as detailed herein. The form and the limit of such insurance, as defined here in together with the under works thereof in each case should be as acceptable to the EMPLOYER. 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 CONTRACT. 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, 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

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way of repairs and/or replacement of the parts of the Work damaged or lost. CONTRACTOR shall provide the EMPLOYER with a copy of all insurance policies and documents taken out by him in pursuance of the CONTRACT. Such copies of document shall be submitted to the EMPLOYER immediately upon the CONTRACTOR having taken such insurance coverage. CONTRACTOR shall also inform the EMPLOYER 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. 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. CONTRACTOR shall, however, be responsible for obtaining requisite licences, 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 equipments, plants and materials to be imported from time to time. All costs on account of insurance liabilities covered under CONTRACT will be to CONTRACTOR's account and will be included in VALUE OF CONTRACT. However, the EMPLOYER 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 CONTRACTOR as far as possible shall cover insurance with Indian Insurance Companies, including marine Insurance during ocean transportation.

**101.1.1 EMPLOYEES STATE INSURANCE ACT:** The CONTRACTOR agrees to and does hereby accept full and exclusive liability for the compliance with all obligations imposed by the Employee State Insurance Act 1948 and the CONTRACTOR further agrees to defend, indemnify and hold EMPLOYER harmless for any liability or penalty which may be imposed by the Central, State or Local authority by reason of any asserted violation by CONTRACTOR or SUB-CONTRACTOR of the Employees' State Insurance Act, 1948, and also from all claims, suits or proceeding that may be brought against the EMPLOYER arising under, growing out of or by reasons of the work provided for by this CONTRACTOR, by third parties or by Central or State Government authority or any political sub- division thereof. The CONTRACTOR agrees to fill in with the Employee's State Insurance Corporation, the Declaration Forms, and all forms which may be required in respect of the CONTRACTOR's or SUB- CONTRACTOR's employees, who are employed in the WORK provided for or those covered by ESI from time to time under the Agreement. The CONTRACTOR shall deduct and secure the agreement of the SUB- CONTRACTOR to deduct the employee's contribution as per the first schedule of the Employee's State Insurance Act from wages and affix the Employees Contribution Card at wages payment intervals. The CONTRACTOR shall remit and secure the agreement of SUB-CONTRACTOR to remit to the State Bank of India, Employee's State Insurance Corporation Account, the Employee's contribution as required by the Act.

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The CONTRACTOR agrees to maintain all cards and Records as required under the Act in respect of employees and payments and the CONTRACTOR shall secure the agreement of the SUB- CONTRACTOR to maintain such records. Any expenses incurred for the contributions, making contributions or maintaining records shall be to the CONTRACTOR's or SUB-CONTRACTOR's account. The EMPLOYER shall retain such sum as may be necessary from the total VALUE OF CONTRACT until the CONTRACTOR shall furnish satisfactory proof that all contributions as required by the Employees State Insurance Act, 1948, have been paid. This will be pending on the CONTRACTOR when the ESI Act is extended to the place of work.

**101.1.2 WORKMEN COMPENSATION AND EMPLOYER'S LIABILITY INSURANCE:** Insurance shall be effected for all the CONTRACTOR's employees engaged in the performance of this CONTRACT. If any of the work is sublet, the CONTRACTOR shall require the SUB-CONTRACTOR to provide workman's Compensation and employer's liability insurance for the later's employees if such employees are not covered under the CONTRACTOR's Insurance.

**101.1.3 ACCIDENT OR INJURY TO WORKMEN:** The EMPLOYER shall not be liable for or in respect of any damages or compensation payable at law in respect or in consequence of any accident or injury to any workman or other person in the Employment of the CONTRACTOR or any SUB-CONTRACTOR save and except an accident or injury resulting from any act or default of the EMPLOYER, his agents or servants and the CONTRACTOR shall indemnify and keep indemnified the EMPLOYER against all such damages and compensation (save and except and aforesaid) and against all claims, demands, proceeding, costs, charges and expenses, whatsoever in respect or in relation thereto.

**101.1.4 TRANSIT INSURANCE** In respect of all items to be transported by the CONTRACTOR to the SITE of WORK, the cost of transit insurance should be borne by the CONTRACTOR and the quoted price shall be inclusive of this cost.

**101.1.5 COMPREHENSIVE AUTOMOBILE INSURANCE** This insurance shall be in such a form as to protect the Contractor against all claims for injuries, disability, disease and death to members of public including EMPLOYER's men and damage to the property of others arising from the use of motor vehicles during on or off the `site' operations, irrespective of the Employership of such vehicles.

**101.1.6 COMPREHENSIVE GENERAL LIABILITY INSURANCE:**

a) This insurance shall protect the Contractor against all claims arising from injuries, disabilities, disease or death of member of public or damage to property of others due to any act or omission on the part of the Contractor, his agents, his employees, his representatives and Sub- Contractor's or from riots, strikes and civil commotion.

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b) Contractor shall take suitable Group Personal Accident Insurance Cover for taking care of injury, damage or any other risks in respect of his Engineers and other Supervisory staff who are not covered under Employees State Insurance Act.

c) The policy shall cover third party liability. The third party (liability shall cover the loss/ disablement of human life (person not belonging to the Contractor) and also cover the risk of damage to others materials/ equipment/ properties during construction, erection and commissioning at site. The value of third party liability for compensation for loss of human life or partial/full disablement shall be of required statutory value but not less than Rs. 2 lakhs per death, Rs. 1.5 lakhs per full disablement and Rs. 1 lakh per partial disablement and shall nevertheless cover such compensation as may be awarded by Court by Law in India and cover for damage to others equipment/ property as approved by the Purchaser. However, third party risk shall be maximum to Rs. 10(ten) lakhs to death.

d) The Contractor shall also arrange suitable insurance to cover damage, loss, accidents, risks etc., in respect of all his plant, equipments and machinery, erection tools & tackles and all other temporary attachments brought by him at site to execute the work.

e) The Contractor shall take out insurance policy in the joint name of EMPLOYER and Contractor from one or more nationalized insurance company from any branch office at Project site.

f) Any such insurance requirements as are hereby established as the minimum policies and coverages which Contractor must secure and keep in force must be complied with, Contractor shall at all times be free to obtain additional or increased coverages at Contractor's sole expenses.

101.1.7 ANY OTHER INSURANCE REQUIRED UNDER LAW OR REGULATIONS OR BY EMPLOYER: CONTRACTOR shall also carry and maintain any and all other insurance(s) which he may be required under any law or regulation from time to time without any extra cost to EMPLOYER. He shall also carry and maintain any other insurance which may be required by the EMPLOYER.

#### **102 Damage to Property or to any Person or any Third Party**

102.1 CONTRACTOR shall be responsible for making good to the satisfaction of the EMPLOYER any loss or any damage to structures and properties belonging to the EMPLOYER or being executed or procured or being procured by the EMPLOYER or of other agencies within in the premises of all the work of the EMPLOYER, if such loss or damage is due to fault and/or the negligence or willful acts or omission of the CONTRACTOR, his employees, agents, representatives or SUB-CONTRACTORS.

102.2 The CONTRACTOR shall take sufficient care in moving his plants, equipments and materials from one place to another so that they do not cause any damage to any person or to the property of the EMPLOYER or any third party including overhead and underground

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cables and in the event of any damage resulting to the property of the EMPLOYER or of a third party during the movement of the aforesaid plant, equipment or materials the cost of such damages including eventual loss of production, operation or services in any plant or establishment as estimated by the EMPLOYER or ascertained or demanded by the third party shall be borne by the CONTRACTOR Third party liability risk shall be Rupees One lakh for single accident and limited to Rupees Ten lakhs.

102.3 The CONTRACTOR shall indemnify and keep the EMPLOYER harmless of all claims for damages to property other than EMPLOYER's property arising under or by reason of this agreement, if such claims result from the fault and/or negligence or willful acts or omission of the CONTRACTOR, his employees, agents, representative of SUB-CONTRACTOR.

### **SECTION-VIII LABOUR LAWS**

#### **103 Labour laws:**

103.1 No labour below the age of 18 (eighteen) years shall be employed on the WORK.

103.2 The CONTRACTOR shall not pay less than what is provided under law to laborers engaged by him on the WORK.

103.3 The CONTRACTOR shall at his expense comply with all labour laws and keep the EMPLOYER indemnified in respect thereof.

103.4 The CONTRACTOR shall pay equal wages for men and women in accordance with applicable labour laws.

103.5 If the CONTRACTOR is covered under the Contract labour (Regulation and Abolition) Act, he shall obtain a license from licensing authority (i.e. office of the labour commissioner) by payment of necessary prescribed fee and the deposit, if any, before starting the WORK under the CONTRACT. Such fee/deposit shall be borne by the CONTRACTOR

103.6 The CONTRACTOR shall employ labour in sufficient numbers either directly or through SUB- CONTRACTOR's to maintain the required rate of progress and of quality to ensure workmanship of the degree specified in the CONTRACT and to the satisfaction of the ENGINEER-IN-CHARGE.

103.7 The CONTRACTOR shall furnish to the ENGINEER-IN- CHARGE the distribution return of the number and description, by trades of the work people employed on the works. The CONTRACTOR shall also submit on the 4th and 19th of every month to the ENGINEER-IN-CHARGE a true statement showing in respect of the second half of the preceding month and the first half of the current month (1) the accidents that occurred during the said fortnight showing the circumstances under which they happened and the extent of damage and injury caused by them and (2) the number of female workers who have been allowed Maternity Benefit as provided in the Maternity Benefit Act 1961 on Rules made thereunder and the amount paid to them.

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103.8 The CONTRACTOR shall comply with the provisions of the payment of Wage Act 1936, Employee Provident Fund Act 1952, Minimum Wages Act 1948. Employers Liability Act 1938. Workmen's Compensation Act 1923, Industrial Disputes Act 1947, the Maternity Benefit Act 1961 and Contract Labour Regulation and Abolition Act 1970, Employment of Children Act 1938 or any modifications thereof or any other law relating thereto and rules made thereunder from time to time.

103.9 The ENGINEER-IN-CHARGE shall on a report having been made by an Inspecting Officer as defined in Contract Labour (Regulation and Abolition) Act 1970 have the power to deduct from the money due to the CONTRACTOR any sum required or estimated to be required for making good the loss suffered by a worker or workers by reason of non-fulfillment of the Conditions of the Contract for the benefit of workers, non-payment of wages or of deductions made from his or their wages which are not justified by the terms of the Contract or non-observance of the said regulations.

103.10 The CONTRACTOR shall indemnify the EMPLOYER against any payments to be made under and for the observance of the provisions of the aforesaid Acts without prejudice to his right to obtain indemnity from his SUB-CONTRACTOR's. In the event of the CONTRACTOR committing a default or breach of any of the provisions of the aforesaid Acts as amended from time to time, of furnishing any information or submitting or filling and Form/ Register/ Slip under the provisions of these Acts which is materially incorrect then on the report of the inspecting Officers, the CONTRACTOR shall without prejudice to any other liability pay to the EMPLOYER a sum not exceeding Rs.50.00 as Liquidated Damages for every default, breach or furnishing, making, submitting, filling materially incorrect statement as may be fixed by the ENGINEER-IN- CHARGE and in the event of the CONTRACTOR's default continuing in this respect, the Liquidated Damages may be enhanced to Rs.50.00 per day for each day of default subject to a maximum of one percent of the estimated cost of the WORK put to tender. The ENGINEER-IN-CHARGE shall deduct such amount from bills or Contract Performance Security of the CONTRACTOR and credit the same to the Welfare Fund constitute under these acts. The decision of the ENGINEER-IN-CHARGE in this respect shall be final and binding.

#### **104 Implementation of Apprentices Act, 1961:**

104.1 The CONTRACTOR shall comply with the provisions of the Apprentices Act, 1961 and the Rules and Orders issued thereunder from time to time. If he fails to do so, his failure will be a breach of the CONTRACT and the ENGINEER-IN-CHARGE may, at his discretion, cancel the CONTRACT. The CONTRACTOR shall also be liable for any pecuniary liability arising on account of any violation by him of the provisions, of the Act.

#### **105 Contractor to indemnify the Employer:**

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105.1 The CONTRACTOR shall indemnify the EMPLOYER and every member, office and employee of the EMPLOYER, also the ENGINEER-IN-CHARGE and his staff against all actions, proceedings, claims, demands, costs and expenses whatsoever arising out of or in connection with the matters referred to in Clause 102.0 and elsewhere and all actions, proceedings, claims, demands, costs and expenses which may be made against the EMPLOYER for or in respect of or arising out of any failure by the CONTRACTOR in the performance of his obligations under the CONTRACT DOCUMENT. The EMPLOYER shall not be liable for or in respect of or arising out of any failure by the CONTRACTOR in the performance of his obligations under the CONTRACT DOCUMENT. The EMPLOYER shall not be liable for or in respect of any demand or compensation payable by law in respect or in consequence of any accident or injury to any workmen or other person. In the employment of the CONTRACTOR or his SUB-CONTRACTOR the CONTRACTOR shall indemnify and keep indemnified the EMPLOYER against all such damages and compensations and against all claims, damages, proceedings, costs, charges and expenses whatsoever in respect thereof or in relation thereto.

105.2 PAYMENT OF CLAIMS AND DAMAGES: Should the EMPLOYER have to pay any money in respect of such claims or demands as aforesaid the amount so paid and the costs incurred by the EMPLOYER shall be charged to and paid by the CONTRACTOR and the CONTRACTOR shall not be at liberty to dispute or question the right of the EMPLOYER to make such payments notwithstanding the same, may have been made without the consent or authority or in law or otherwise to the contrary.

105.3 In every case in which by virtue of the provisions of Section 12, Sub-section (i) of workmen's compensation Act, 1923 or other applicable provision of Workmen Compensation Act or any other Act, the EMPLOYER is obliged to pay compensation to a workman employed by the CONTRACTOR in execution of the WORK, the EMPLOYER will recover from the CONTRACTOR the amount of the compensation so paid, and without prejudice to the rights of EMPLOYER under Section 12, Sub-section (2) of the said act, EMPLOYER shall be at liberty to recover such amount or any part thereof by deducting it from the Contract Performance Security or from any sum due to the CONTRACTOR whether under this CONTRACT or otherwise. The EMPLOYER shall not be bound to contest any claim made under Section 12, Sub-section (i) of the said act, except on the written request of the CONTRACTOR and upon his giving to the EMPLOYER full security for all costs for which the EMPLOYER might become liable in consequence of contesting such claim.

**106 Health and sanitary arrangements for workers:**

106.1 In respect of all labour directly or indirectly employed in the WORKS for the performance of the CONTRACTOR's part of this agreement, the CONTRACTOR shall comply with or cause to be complied with all the rules and regulations of the local sanitary and other authorities or as framed by the EMPLOYER from time to time for the protection of health and sanitary arrangements for all workers.

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106.2 The CONTRACTOR shall provide in the labour colony all amenities such as electricity, water and other sanitary and health arrangements. The CONTRACTOR shall also provide necessary surface transportation to the place of work and back to the colony for their personnel accommodated in the labour colony.

### **SECTION-IX APPLICABLE LAWS AND SETTLEMENT OF DISPUTES**

#### **107 Dispute Resolution & Arbitration:**

Unless otherwise specified, the matters where decision of the Engineer-in-Charge is deemed to be final and binding as provided in the Agreement and the issues/disputes which cannot be mutually resolved within a reasonable time, all disputes shall be dealt as per Conciliation Rule 2010 and Arbitration, as under.

107.1 GGPL (INDIA) LTD has framed the condition Rules 2010 in conformity with supplementary to part- III of the Indian Arbitration and conciliation Act 1996 for speedier, cost effective and amicable settlement of disputes through conciliation. A copy of the said rules made available on GGPL's web site [www.GGPLonline.com](http://www.GGPLonline.com) for reference. Unless others specified, the matters where decision of the Engineer-in-charge is deemed to be final and binding as provided in the Agreement and the issue/disputes which cannot be mutually resolved within a reasonable time, all disputes shall be settled in accordance with the conciliation Rules 2010 .

107.2 Any dispute (s)/difference(s)/issue(s) of any kind whatsoever between/amongst the parties arising under /out/of/in connection with this contract shall be settled in accordance with the afore said rules.

107.3 In case of any dispute (s)/difference(s)/issue(s), a party shall notify the other party (ies) in writing about such a disputes (s)/difference(s)/ issue(s) between/amongst the parties and that such a party wishes to refer the disputes(s)/difference(s)/issues(s) to conciliation. Such Invitation for conciliation shall contain sufficient information as to the dispute(s)/difference(s) /issue(s) to enable the other party (ies) to be fully informed as to the nature of the dispute(s)/difference(s) issue(s) , the amount of monetary claim, if any, and apparent causes(s) of action.

107.4 Conciliation proceedings commence when the other party(ies) accept (s) the invitation to conciliate and confirmed in writing. If the other party (ies) reject(s) the invitation, there will be no conciliation proceedings.

107.5 If the party initiating conciliation does not receive a reply within thirty days from the date on which he/she sends the invitation, or within such other period of times as specified



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in the invitation, he/she may elect to treat this as a rejection of the invitation to conciliate. If he/she so elect he/she shall inform the other party(ies) accordingly.

107.6 Where Invitation for conciliation has been furnished, the parties shall attempt to settle such dispute (s) amicably under part-III of the Indian Arbitration and Conciliation Act,1996 and GGPL (INDIA) LTD Conciliation Rules,2010. It would be only after exhausting the option of conciliation as an Alternate Dispute Resolution Mechanism that the parties here to shall go for Arbitration. For the purpose of this clause, the option of 'Conciliation' shall be deemed to have been exhausted, even in case of rejection of Conciliation by any of the parties.

107.7 The cost of Conciliation proceeding including but not limited to fees for Conciliator(s), Airfare, Local Transport, Accommodation, cost towards conference facility etc. shall be borne by the parties equality.

107.8 The parties shall freeze claims(s) of interest, if any and shall not claim the same during the pendency of Conciliation proceedings. The Settlement Agreement, as and when reached/agreed upon, shall be signed between the parties and Conciliation proceedings shall stand terminated on the date of the Settlement Agreement.

**17.9 Arbitration:**

The Employer [GGPL ] shall suggest a panel of three independent and distinguished persons to the bidder/contractor/supplier/buyer (as the case may be) to select any one among them to act as the Sole Arbitrator. In the event of failure of the other parties to select the Sole Arbitrator within 30 days from the receipt of the communication suggesting the panel of arbitrators, the right of selection of the sole arbitrator by the other party shall stand forfeited and the EMPLOYER (GGPL) shall have discretion to proceed with the appointment of the Sole Arbitrator. The decision of Employer on the appointment of the sole arbitrator shall be final and binding on the parties. The award of sole arbitrator shall be final and binding on the parties and unless directed/awarded otherwise by the sole arbitrator, the cost of arbitration proceedings shall be shared equally by the parties. The Arbitration proceedings shall be in English language and venue shall be Rajahmundry, India. Subject to the above, the provisions of (Indian) Arbitration & Conciliation ACT 1996 and the Rules framed there under shall be applicable. All matter relating to this contract are subject to the exclusive jurisdiction of the court situated in the state of Rajahmundry, East Godavari Dist, A.P. Bidders/suppliers/contractors may please note that the Arbitration & Conciliation Act 1996 was enacted by the Indian Parliament and is based on United Nations Commission on International Trade Law (UNCITRAL model law), which were prepared after extensive consultation with Arbitral Institutions and centers of International Commercial Arbitration. The United Nations General Assembly vide resolution 31/98 adopted the UNCITRAL Arbitration rules on 15 December 1976.

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**107.2 FOR THE SETTLEMENT OF DISPUTES BETWEEN GOVERNMENT DEPARTMENT AND ANOTHER AND ONE GOVERNMENT DEPARTMENT AND PUBLIC ENTERPRISE AND ONE PUBLIC ENTERPRISE AND ANOTHER THE ARBITRATION SHALL BE AS FOLLOWS:**

"In the event of any dispute or difference between the parties hereto, such dispute or difference shall be resolved amicably by mutual consultation or through the good offices of empowered agencies of the Government. If such resolution is not possible, then, the unresolved dispute or difference shall be referred to arbitration of an arbitrator to be nominated by Secretary, Department of Legal Affairs ("Law Secretary") in terms of the Office Memorandum No.55/3/1/75 CF, dated the 19th December 1975 issued by the Cabinet Secretariat (Department of Cabinet Affairs), as modified from time to time. The Arbitration Act 1940 (10 of 1940) shall not be applicable to the arbitration under this clause. The award of the Arbitrator shall be binding upon 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 Law Secretary whose decision shall bind the parties finally and conclusively.

**108 Jurisdiction:**

108.1 The CONTRACT shall be governed by and constructed according to the laws in force in INDIA. The CONTRACTOR hereby submits to the jurisdiction of the Courts situated at RAJAHMUNDRY, EAST GODAVARI DIST, A.P for the purposes of disputes, actions and proceedings arising out of the CONTRACT, the courts at RAJAHMUNDRY, EAST GODAVARI DIST, A.P only will have the jurisdiction to hear and decide such disputed, actions and proceedings.

**SECTION-X SAFETY CODES****109 General:**

109.1 CONTRACTOR shall adhere to safe construction practice and guard against hazardous, and unsafe working conditions and shall comply with EMPLOYER's safety rules as set forth herein. Prior to start of construction, CONTRACTOR will be furnished copies of EMPLOYER's "Safety Code" for information and guidance, if it has been prepared.

**110 Safety regulations:**

110.1 In respect of all labour, directly employed in the WORK for the performance of CONTRACTOR's part of this agreement, the CONTRACTOR shall at his own expense arrange for all the safety provisions as per safety codes of C.P.W.D., Indian Standards Institution. The Electricity Act, The Mines Act and such other acts as applicable.

110.2 The CONTRACTOR shall observe and abide by all fire and safety regulations of the EMPLOYER. Before starting construction work CONTRACTOR shall consult with EMPLOYER's safety Engineers or ENGINEER- IN-CHARGE and must make good to the satisfaction of the EMPLOYER any loss or damage due to fire to any portion of the work done or to be done under this agreement or to any of the EMPLOYER's existing property.

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**111 First aid and industrial injuries:**

111.1 CONTRACTOR shall maintain first aid facilities for its employees and those of its SUB-CONTRACTOR

111.2 CONTRACTOR shall make outside arrangements for ambulance service and for the treatment of industrial injuries. Names of those providing these services shall be furnished to EMPLOYER prior to start of construction and their telephone numbers shall be prominently posted in CONTRACTOR's field office.

111.3 All critical industrial injuries shall be reported promptly to EMPLOYER, and a copy of CONTRACTOR's report covering each personal injury requiring the attention of a physician shall be furnished to the EMPLOYER.

**112 General rules:**

112.1 Smoking within the battery area, tank farm or dock limits is strictly prohibited. Violators of the no smoking rules shall be discharged immediately.

**113 Contractor's barricades:**

113.1 CONTRACTOR shall erect and maintain barricades required in connection with his operation to guard or protect:-

- a) Excavations
- b) Hoisting Areas.
- c) Areas adjudged hazardous by CONTRACTOR's or EMPLOYER's inspectors.
- d) EMPLOYER's existing property subject to damage by CONTRACTOR's Operations.
- e) Rail Road unloading spots.

113.2 CONTRACTOR's employees and those of his SUB- CONTRACTOR's shall become acquainted with EMPLOYER's barricading practice and shall respect the provisions thereof.

113.3 Barricades and hazardous areas adjacent to, but not located in normal routes of travel shall be marked by red flasher lanterns at nights.

**114 Scaffolding:**

114.1 Suitable scaffolding should be provided for workmen for all works that cannot safely be done from the ground or from solid construction except such short period work as can be done safely from ladders. When a ladder is used an extra Mazdoor shall be engaged for holding the ladder and if the ladder is used for carrying material as well, suitable footholds and handholds shall be provided on the ladder and the ladder shall be given an inclination not steeper than 1 in 4 (1 horizontal and 4 vertical).

114.2 Scaffolding or staging more than 4 metres above the ground or floor, swing suspended from an overhead support or erected with stationary support shall have a guard rail properly attached, bolted, braced and otherwise retarded at least one metre high above

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the floor or platform of such scaffolding or staging and extending along the entire length of the outside and ends thereof with only such openings as may be necessary for the delivery of materials. Such scaffolding or staging shall be so fastened as to prevent it from swaying from the building or structure.

114.3 Working platform, gangway and stairway should be so constructed that they should not sag unduly or unequally and if the height of platform of the gangway or the stairway is more than 4 metres above the ground level or floor level, they should be closely boarded, should have adequate width and should be suitably fastened as in ii) above.

114.4 Every opening in the floor of a building or in a working platform shall be provided with suitable means to prevent the fall of persons or materials by providing suitable fencing or railing whose minimum heights shall be 1 metre.

114.5 Safe-means of access shall be provided to all working platforms and other working places, every ladder shall be securely fixed. No portable single ladder shall be over 9 metres in length while the width between side rails in rung ladder shall in no case be less than 30 cms for ladder upto and including 3 metres in length. For longer ladder this width should be increased 5mm for each additional foot of length. Uniform steps spacing shall not exceed 30 cms. Adequate precautions shall be taken to prevent danger from electrical equipment. No materials on any of the sites or work shall be so stacked or placed to cause danger or inconvenience to any person or public. The CONTRACTOR shall also provide all necessary fencing and lights to protect the workers and staff from accidents, and shall be bound to bear the expenses of defense of every suit, action or other proceeding of law that may be brought by any person for injury sustained owing to neglect of the above precautions and pay any damages and costs which may be awarded in any such suit or action or proceeding to any such person or which may with the consent of the CONTRACTOR be paid to compromise any claim by any such person.

**115 Excavation and trenching:**

115.1 All trenches 1.2 metres or more in depth, shall at all times be supplied with at least one ladder for each 50 metres length or fraction thereof. Ladder shall be extended from bottom of the trenches to at least 1 metre above the surface of the ground. The sides of the trenches which are 1.5M in depth shall be stepped back to give suitable slope or securely held by timber bracing, so as to avoid the danger of sides to collapse. The excavated materials shall not be placed within 1.5 metres of the edge of the trench or half of the trench width whichever is more. Cutting shall be done from top to bottom. Under no circumstances undermining or under-cutting shall be done.

**116 Demolition/general safety:**

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116.1 Before any demolition work is commenced and also during the progress of the demolition work

- a) All roads and open areas adjacent to the work site shall either be closed or suitably protected.
- b) No electric cable or apparatus which is liable to be a source of danger shall remain electrically charged.
- c) All practical steps shall be taken to prevent danger to persons employed from risk of fire or explosion or flooding. No floor, roof or other part of the building shall be so overloaded with debris or materials as to render it unsafe.

116.2 All necessary personal safety equipment as considered adequate by the ENGINEER-IN-CHARGE should be kept available for the use of the persons employed on the SITE and maintained in condition suitable for immediate use, and the CONTRACTOR shall take adequate steps to ensure proper use of equipment by those concerned.

- a) Workers employed on mixing asphaltic materials, cement and lime mortars shall be provided with protective footwear and protective gloves.
- b) Those engaged in white washing and mixing or stacking or cement bags or any material which are injurious to the eyes be provided with protective goggles.
- c) Those engaged in welding and cutting works shall be provided with protective face & eye shield, hand gloves, etc.
- d) Stone breakers shall be provided with protective goggles and protective clothing and seated at sufficiently safe intervals.
- e) When workers are employed in sewers and manholes, which are in use, the CONTRACTOR shall ensure that the manhole covers are opened and are ventilated atleast for an hour before the workers are allowed to get into the manholes, and the manholes so opened shall be cordoned off with suitable railing and provided with warning signals or
- f) Board to prevent accident to the public.
- g) The CONTRACTOR shall not employ men below the age of 18 years and women on the work of painting with products containing lead in any form. Wherever men above the age of 18 years are employed on the work of lead painting, the following precautions should be taken.
  - 1) No paint containing lead or lead product shall be used except in the form of paste or readymade paint.
  - 2) Suitable face masks should be supplied for use by the workers when paint is applied in the form of spray or a surface having lead paint dry rubbed and scrapped.
  - 3) Overalls shall be supplied by the CONTRACTOR to the workmen and adequate facilities shall be provided to enable the working painters to wash them during and on cessation of work.

116.3 When the work is done near any place where there is risk of drowning, all necessary safety equipment should be provided and kept ready for use and all necessary steps taken

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for prompt rescue of any person in danger and adequate provision should be made for prompt first aid treatment of all injuries likely to be sustained during the course of the work.

116.4 Use of hoisting machines and tackles including their attachments, anchorage and supports shall conform to the following standards or conditions:

- a. These shall be of good mechanical construction, sound materials and adequate strength and free from patent defect and shall be kept in good working order.
- b. Every rope used in hoisting or lowering materials or as means of suspension shall be of durable quality and adequate strength and free from patent defects.
- b) Every crane driver or hoisting appliance operator shall be properly qualified and no person under the age of 21 years should be in charge of any hoisting machine including any scaffolding, winch or give signals to the operator.
- c) In case of every hoisting machine and of every chain ring hook, shackle, swivel, and pulley block used in hoisting or lowering or as means of suspension, the safe working load shall be ascertained by adequate means. Every hoisting machine and all gears referred to above shall be plainly marked with the safe working load of the conditions under which it is applicable and the same shall be clearly indicated. No part of any machine or any gear referred to above in this paragraph shall be loaded beyond safe working load except for the purpose of testing.
- d) In case of departmental machine, the safe working load shall be notified by the ENGINEER-IN-CHARGE. As regards CONTRACTOR's machines, the CONTRACTOR shall notify the safe working load of the machine to the ENGINEER-IN-CHARGE whenever he brings any machinery to SITE of WORK and get it verified by the Engineer concerned.
- e) Motors, gears, transmission lines, electric wiring and other dangerous parts of hoisting appliances should be provided with efficient safeguards. Hoisting appliances should be provided with such means as to reduce to minimum the accidental descent of the load, adequate precautions should be taken to reduce the minimum risk of any part or parts of a suspended load becoming accidentally displaced. When workers are employed on electrical installations which are already energized, insulating mats, wearing apparel, such as gloves, sleeves, and boots as may be necessary should be provided. The workers shall not wear any rings, watches and carry keys or other materials which are good conductors of electricity.

116.5 All scaffolds, ladders and other safety devices mentioned or described herein shall be maintained in safe conditions and no scaffolds, ladder or equipment shall be altered or removed while it is in use. Adequate washing facilities should be provided at or near places of work.

116.6 These safety provisions should be brought to the notice of all concerned by displaying on a notice board at a prominent place at the work-spot. The person responsible for compliance of the safety code shall be named therein by the CONTRACTOR

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116.7 To ensure effective enforcement of the rules and regulations relating to safety precautions, the arrangements made by the CONTRACTOR shall be open to inspection by the Welfare Officer, ENGINEER-IN- CHARGE or safety Engineer of the Administration or their representatives.

116.8 Notwithstanding the above clauses there is nothing in these to exempt the CONTRACTOR for the operations of any other Act or rules in force in the Republic of India. The work throughout including any temporary works shall be carried out in such a manner as not to interfere in any way whatsoever with the traffic on any roads or footpath at the site or in the vicinity thereto or any existing works whether the property of the Administration or of a third party. In addition to the above, the CONTRACTOR shall abide by the safety code provision as per C.P.W.D. Safety code and Indian Standard Safety Code from time to time.

**117 Care in handling inflammable gas:**

117.1 The CONTRACTOR has to ensure all precautionary measures and exercise utmost care in handling the inflammable gas cylinder/inflammable liquids/paints etc. as required under the law and/or as advised by the fire Authorities of the EMPLOYER.

**118 Temporary combustibile structures:**

118.1 Temporary combustibile structures will not be built near or around work site.

**119 Precautions against fire:**

119.1 The CONTRACTOR will have to provide Fire Extinguishers, Fire Buckets and drums at worksite as recommended by ENGINEER-IN-CHARGE. They will have to ensure all precautionary measures and exercise utmost care in handling the inflammable gas cylinders/ inflammable liquid/ paints etc. as advised by ENGINEER-IN-CHARGE. Temporary combustibile structures will not be built near or around the work-site.

**120 Explosives:**

120.1 Explosives shall not be stored or used on the WORK or on the SITE by the CONTRACTOR without the permission of the ENGINEER-IN-CHARGE in writing and then only in the manner and to the extent to which such permission is given. When explosives are required for the WORK they will be stored in a special magazine to be provided at the cost of the CONTRACTOR in accordance with the Explosives Rules. The CONTRACTOR shall obtain the necessary license for the storage and the use of explosives and all operations in which or for which explosives are employed shall be at sole risk and responsibility of the CONTRACTOR and the CONTRACTOR shall indemnify the EMPLOYER against any loss or damage resulting directly or indirectly there from.

**121 Mines act:**

121.1 **SAFETY CODE:** The CONTRACTOR shall at his own expense arrange for the safety provisions as required by the ENGINEER-IN-CHARGE in respect of all labour directly

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employed for performance of the WORKS and shall provide all facilities in connection therewith. In case the CONTRACTOR fails to make arrangements and provides necessary facilities as aforesaid, the ENGINEER-IN- CHARGE shall be entitled to do so and recover the costs thereof from the CONTRACTOR

121.2 Failure to comply with Safety Code or the provisions relating to report on accidents and to grant of maternity benefits to female workers shall make the CONTRACTOR liable to pay Company Liquidated Damages an amount not exceeding Rs.50/- for each default or materially incorrect statement. The decision of the ENGINEER-IN-CHARGE in such matters based on reports from the Inspecting Officer or from representatives of ENGINEER-IN-CHARGE shall be final and binding and deductions for recovery of such Liquidated Damages may be made from any amount payable to the CONTRACTOR from all the provisions of the Mines Act, 1952 or any statutory modifications or re-enactment thereof the time being in force and any Rules and Regulations made there under in respect of all the persons employed by him under this CONTRACT and shall indemnify the EMPLOYER from and against any claim under the Mines Act or the rules and regulations framed there under by or on behalf of any persons employed by him or otherwise.

**122 Preservation of place:**

122.1 The CONTRACTOR shall take requisite precautions and use his best endeavors to prevent any riotous or unlawful behavior by or amongst his worker and others employed or the works and for the preservation of peace and protection of the inhabitants and security of property in the neighborhood of the WORK. In the event of the EMPLOYER requiring the maintenance of a Special Police Force at or in the vicinity of the site during the tenure of works, the expenses thereof shall be borne by the CONTRACTOR and if paid by the EMPLOYER shall be recoverable from the CONTRACTOR.

**123 Outbreak of infectious diseases:**

123.1 The CONTRACTOR shall remove from his camp such labour and their facilities who refuse protective inoculation and vaccination when called upon to do so by the ENGINEER-IN-CHARGE's representative. Should Cholera, Plague or other infectious diseases break out the CONTRACTOR shall burn the huts, beddings, clothes and other belongings or used by the infected parties and promptly erect new huts on healthy sites as required by the ENGINEER-IN-CHARGE failing which within the time specified in the Engineer's requisition, the work may be done by the EMPLOYER and the cost thereof recovered from the CONTRACTOR.

**124 Use of intoxicants:**

124.1 The unauthorized sale of spirits or other intoxicants, beverages upon the work in any of the buildings, encampments or tenements owned, occupied by or within the control of the CONTRACTOR or any of his employee is forbidden and the CONTRACTOR shall exercise his influence and authority to the utmost extent to secure strict compliance with this condition. In addition to the above, the CONTRACTOR shall abide by the safety code provision as per C.P.W.D. safety code and Indian Standard Code framed from time to time.

**PROFORMA OF INDEMNITY BOND**



**TENDER NO: GGPL/KKD/C&P/CW/2545/VS**

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(To be executed on non-judicial stamped paper of appropriate value)

WHEREAS GODAVARI GAS PVT. LTD (here in after referred to as GGPL) which expression shall, unless repugnant to the context include their legal representatives, successors and assigns, having their Registered Office at D. No. 85-06-23/2, 2<sup>nd</sup> floor, 40<sup>th</sup> Ward, Morampudi Junction, Rajamahendravaram-533 103, East Godavari Dist, A.P. has entered into a CONTRACT with M/s. \_\_\_\_\_

Incorporated (hereinafter referred to as the ('CONTRACTOR') which expressions shall unless repugnant to the context include their legal representatives, successors and assigns, having their Registered office \_\_\_\_\_ for Rs. \_\_\_\_\_ for \_\_\_\_\_ for a period of \_\_\_\_\_ and on the terms and conditions as set out, inter-alia in the Work Order No. \_\_\_\_\_ and various documents forming part there of here in after collectively referred to as the CONTRACT' which expression shall include all amendments, modifications and/or variations thereto.

GGPL has also advised the CONTRACTOR to execute an Indemnity Bond in favour of GGPL indemnifying it from all consequences which may arise out of any Case filed by any workers / Labourers / vendors / sub-contractors/partner etc. Who may have been engaged by the CONTRACTOR directly or indirectly with or without consent of GGPL for above works, which may be pending before any court of Law including Quasi-Judicial Authority, Competent Authority, Labour Court, Arbitrator, Tribunal etc.

NOW, THEREFORE, in consideration of the promises aforesaid; the CONTRACTOR hereby irrevocably and unconditionally undertakes to indemnify and keep indemnified GGPL from any loss, which may arise out of any such contract/Case. The CONTRACTOR undertake to compensate to GGPL forthwith, on demand, without protest the loss suffered by GGPL to get her direct/indirect expenses.

AND THE CONTRACTOR hereby agrees with GGPL that:

- (i) This Indemnity Bond shall remain invalid and irrevocable for all claims of GGPL arising from any such contract/case for which GGPL has been made party until nowhere- in-after.
- (ii) This Indemnity Bond shall not be discharged / revoked by any change/ modification/ amendment/ deletion in the constitution of the firm / contractor or any conditions thereof including insolvency etc. of the CONTRACTOR but shall be in all respects and for all purposes binding and operative until any claims for payment are settled by the contractor.

The under signed has full power to execute this Indemnity Bond on behalf of the CONTRACTOR and the same stands valid.

SIGNATURE OF AUTHORIZED REPRESENTATIVE

Place:

Date:

Seal:

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**PROFORMA FOR CONTRACT AGREEMENT**

LOA No. GGPL /

dated -----

**GGPL's PAN No. AAACG1209J**

Contract Agreement for the work of ----- of GGPL (INDIA) Ltd. made on ----- between (Name and Address)-----, hereinafter called the "CONTRACTOR" (which term shall unless excluded by or repugnant to the subject or context include its successors and permitted assignees) of the one part and GODAVARI GAS (P) LTD hereinafter called the "EMPLOYER" (which term shall, unless excluded by or repugnant to the subject or context include its successors and assignees) of the other part.

WHEREAS

- A. The EMPLOYER being desirous of having provided and executed certain work mentioned, enumerated or referred to in the Tender Documents including Letter Inviting Tender, General Tender Notice, General Conditions of Contract, Special Conditions of Contract, Specifications, Drawings, Plans, Time Schedule of completion of jobs, Schedule of Rates, Agreed Variations, other documents has called for Tender.
- B. The CONTRACTOR has inspected the SITE and surroundings of WORK specified in the Tender Documents and has satisfied himself by careful examination before submitting his tender as to the nature of the surface, strata, soil, sub-soil and ground, the form and nature of site and local conditions, the quantities, nature and magnitude of the work, the availability of labour and materials necessary for the execution of work, the means of access to SITE, the supply of power and water thereto and the accommodation he may require and has made local and independent enquiries and obtained complete information as to the matters and thing referred to, or implied in the tender documents or having any connection therewith and has considered the nature and extent of all probable and possible situations, delays, hindrances or interferences to or with the execution and completion of the work to be carried out under the CONTRACT, and has examined and considered all other matters, conditions and things and probable and possible contingencies, and generally all matters incidental thereto and ancillary thereof affecting the execution and completion of the WORK and which might have influenced him in making his tender.
- C. The Tender Documents including the Notice Letter Inviting Tender, General Conditions of Contract, Special Conditions of Contract, Schedule of Rates, General Obligations, SPECIFICATIONS, DRAWINGS, PLANS, Time Schedule for completion of Jobs, Letter of Acceptance of Tender and any statement of agreed variations with its enclosures copies of which are hereto annexed form part of this CONTRACT though separately set out herein and are included in the expression "CONTRACT" wherever herein used.

AND WHEREAS

**TENDER NO: GGPL/KKD/C&P/CW/2545/VS**  
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The EMPLOYER accepted the Tender of the CONTRACTOR for the provision and the execution of the said WORK at the rates stated in the schedule of quantities of the work and finally approved by EMPLOYER (hereinafter called the "Schedule of Rates") upon the terms and subject to the conditions of CONTRACT.

NOW THIS AGREEMENT WITNESSETH AND IT IS HEREBY AGREED AND DECLARED AS FOLLOWS:-

1. In consideration of the payment to be made to the CONTRACTOR for the WORK to be executed by him, the CONTRACTOR hereby covenants with EMPLOYER that the CONTRACTOR shall and will duly provide, execute and complete the said work and shall do and perform all other acts and things in the CONTRACT mentioned or described or which are to be implied there from or may be reasonably necessary for the completion of the said WORK and at the said times and in the manner and subject to the terms and conditions or stipulations mentioned in the contract.
2. In consideration of the due provision execution and completion of the said WORK, EMPLOYER does hereby agree with the CONTRACTOR that the EMPLOYER will pay to the CONTRACTOR the respective amounts for the WORK actually done by him and approved by the EMPLOYER at the Schedule of Rates and such other sum payable to the CONTRACTOR under provision of CONTRACT, such payment to be made at such time in such manner as provided for in the CONTRACT.

A N D

3. In consideration of the due provision, execution and completion of the said WORK the CONTRACTOR does hereby agree to pay such sums as may be due to the EMPLOYER for the services rendered by the EMPLOYER to the CONTRACTOR, such as power supply, water supply and others as set for in the said CONTRACT and such other sums as may become payable to the EMPLOYER towards the controlled items of consumable materials or towards loss, damage to the EMPLOYER'S equipment, materials construction plant and machinery, such payments to be made at such time and in such manner as is provided in the CONTRACT.

It is specifically and distinctly understood and agreed between the EMPLOYER and the CONTRACTOR that the CONTRACTOR shall have no right, title or interest in the SITE made available by the EMPLOYER for execution of the works or in the building, structures or work executed on the said SITE by the CONTRACTOR or in the goods, articles, materials etc., brought on the said SITE (unless the same specifically belongs to the CONTRACTOR) and the CONTRACTOR shall not have or deemed to have any lien whatsoever charge for unpaid bills will not be entitled to assume or retain possession or control of the SITE or structures and the EMPLOYER shall have an absolute and unfettered right to take full possession of SITE and to remove the CONTRACTOR, their servants, agents and materials belonging to the CONTRACTOR

**TENDER NO: GGPL/KKD/C&P/CW/2545/VS**

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and lying on the SITE.

The CONTRACTOR shall be allowed to enter upon the SITE for execution of the WORK only as a licensee simpliciter and shall not have any claim, right, title or interest in the SITE or the structures erected thereon and the EMPLOYER shall be entitled to terminate such license at any time without assigning any reason.

The materials including sand, gravel, stone, loose, earth, rock etc., dug up or excavated from the said SITE shall, unless otherwise expressly agreed under this CONTRACT, exclusively belong to the EMPLOYER and the CONTRACTOR shall have no right to claim over the same and such excavation and materials should be disposed off on account of the EMPLOYER according to the instruction in writing issued from time to time by the ENGINEER-IN-CHARGE.

In Witness whereof the parties have executed these presents in the day and the year first above written.

Signed and Delivered for and on

on behalf of EMPLOYER.

GODAVARI GAS (P) LTD.  
CONTRACTOR)

\_\_\_\_\_  
\_\_\_\_\_

Date : \_\_\_\_\_

Place: \_\_\_\_\_

**IN PRESENCE OF TWO WITNESSES**

1. \_\_\_\_\_

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\_\_\_\_\_

2. \_\_\_\_\_

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\_\_\_\_\_  
\_\_\_\_\_

Signed and Delivered for and

on behalf of the CONTRACTORS.

(NAME OF THE

\_\_\_\_\_  
\_\_\_\_\_

Date : \_\_\_\_\_

Place: \_\_\_\_\_

1. \_\_\_\_\_

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2. \_\_\_\_\_

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# **SECTION – VI**

## **PRICE SCHEDULE**

**PL REFER TO SEPARATE ATTACHMENT**



A Joint Venture of Andhra Pradesh Gas Distribution Corporation Ltd. and  
Hindustan Petroleum Corporation Ltd

**VOLUME II OF II**

**OPEN DOMESTIC COMPETITIVE BIDDING**

**BID DOCUMENT**

FOR

**COMPOSITE WORKS IN VARIOUS CNG STATIONS AT  
EAST & WEST GODAVARI DISTRICTS OF ANDHRA PRADESH**

**(TENDER NO: GGPL/KKD/C&P/CW/2545/VS)**

**TENDER NO: GGPL/KKD/C&P/CW/2545/VS**

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**VOLUME – II OF II**

**TECHNICAL SPECIFICATIONS**



**CONTENTS**

**LIST OF SPECIFICATION/STANDARDS**

- PART-I : Civil, Structural and Architectural Work**
- PART-II : Electrical and illumination Work**
- PART-III : Mechanical Work**
- PART-IV : Instrumentation Work**
- PART- V : Typical CNG station/De-compression unit layout Drawings**

**TENDER NO: GGPL/KKD/C&P/CW/2545/VS**

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**PART-I**

**TECHNICAL SPECIFICATION  
FOR CIVIL, STRUCTURAL AND  
ARCHITECTURAL WORK**

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## **1. CIVIL, STRUCTURAL AND ARCHITECTURAL WORKS**

### **1.1. GENERAL**

The scope of work to be performed under this contract shall include complete civil, architectural and steel structural works as per plans, equipment layout, drawings & technical specifications for the 'CNG Stations & De-compression unit installations.

### **1.2. SCOPE OF SUPPLY**

Contractor shall procure & supply to site all the materials including cement, reinforcing steel, steel sections, plates, pipes, MS Y Angle Posts, Concertina coil, RBT fencing wire, Chain link fencing, chequered plate, Colour coated steel sheets, False ceiling, mesh and other accessories, other masonry materials, bitumen/asphalt, admixtures & bonding agents, sealants, kerb stones, paver block, sand, boulder, etc., and any other construction material / item required to complete the civil & structural works.

All costs towards testing/inspection of materials/goods shall be borne by the Contractor.

### **1.3. SITE WORK**

Complete construction work including supply of labour, construction materials, construction equipment, survey, tools & tackles, dismantling & modification / strengthening, supervision, testing etc. required to complete all the structures, foundations, roads, drains, pavements, finishes, supply, fabrication, erection of steel structures, Canopy, hoarding, Loading unloading platform, LCV Platform, cat ladder, welded wire mesh fencing and gates etc, painting, including site grading/earthwork in cutting & filling etc. as specified and required to complete the civil & road works in all respect.

All enabling works e.g. construction water tank, casting/fabrication yard, electricity, site stores & office, safety and security measures, coordination with other contractors working at site etc. shall be Contractor's responsibility.

### **1.4. SCOPE OF WORK**

The scope of work shall be broadly, but not limited to, the following:

- a. Site grading of the plot by removing 150 mm top soil, , stacking it properly and reusing it for planting purpose, including plot development by filling good quality earth as required.
- b. Earth filling in embankments for external roads wherever required with providing of RCC Culverts/ Pipe Culvert.
- c. Clearing the site, removal of bushes and trees etc as per site requirement.
- d. Construction of a 3 m high boundary wall with brick masonry, PCC Coping, MS Y Angle Posts and Concertina coil with RBT fencing etc as per drawing.

- 
- e. RCC cable trenches: complete civil works for cable trench including providing inserts, conduits (GI, PVC or HDPE etc.) and PVC coated MS Chequered cover plate / Pre cast concrete covers as per requirement.
  - f. Construction of single and double S.S.tube trench as per drawing.
  - g. Construction of compressor foundation as per drawing.
  - h. Construction of Green belt etc as per drawing.
  - i. Construction of Dispenser foundation, canopy foundation etc. as per relevant drawings.
  - j. Construction of fore court, approach roads etc. as per drawing.
  - k. Construction of cable pit, drain pits etc as per requirement.
  - l. Construction of Septic Tank along with Soak Pit and connections.
  - m. Storm water drainage system in RCC/brick drains with complete civil works as per requirement.
  - n. Laying of Hume pipes for drainage as per drawing and requirement of site.
  - o. Construction of Utility/Office building - Control room, Office room, Store Room, UPS and Battery Room, Electrical Room etc as per relevant architectural drawings.
  - p. Construction of Bore well as per supplier specification and direction of Engineer in charge.
  - q. 80 mm thick PCC paver block over sand cushion over ground/on a PCC base (Grade M-10) at locations as specified.
  - r. Laying PCC kerb stones 125mm x 300 mm over 75 thk PCC base (Grade M- 10) as specified.
  - s. Grouting of all base plates/frames of equipment foundations and structural bases.
  - t. Providing of all inserts, conduits, pre-cast covers, fixing of free issue items into permanent works etc.
  - u. Providing of approved quality sand for back filling as per requirement.
  - v. Clearing all construction debris and handing over completed work site.
  - w. Any other work not specifically mentioned but required to make the station functional.
  - x. Making as-built details/drawings on one set of construction drawings and return to owner.

## 2. PREAMBLE TO SCHEDULE OF RATES

The Preamble to Schedule of Items is an integral part of the schedule of quantities and rates and this is to be considered incorporated into the description of items themselves. The Contractor's rate for any item of work in the schedule of item shall, unless stated otherwise be held to include the cost of all materials including wastage, conveyance and delivery, unloading, storing, fabrication, all consumable materials, like MS bolts, washer, electrodes, putty, gases, splices paints, tools and plants, power fuel, consumables, all taxes, royalties, other revenue expenses, temporary facilities like roads etc.

The item shall include all the safety provisions listed below:

- 
- The site should be cordoned off on all sides by way of 3 Mt. High corrugated GI sheet fixed on metal pipes/angles, leaving space for only a Gate. This fencing should be fixed such that it is not possible for anyone to enter the site from any other location other than the Gate.
  - The gate should be made in metal with metal sheet cladding. A guard restricting entry of all unauthorized person/material on site should man the gate. The guard shall also maintain a register of all persons visiting site.
  - All persons including all labor, supervisors, visitors etc. on site must wear hand gloves, helmet and safety shoes. The responsibility of this shall rest with the main contractor.
  - All workmen while working on height shall wear safety helmets.
  - All workmen such as welders/ fitters etc. shall wear protective gloves, protective glasses etc. and as per the requirement and demands of the trade.
  - All excavated pits/holes shall be cordoned off with red tape with warning notice.
  - All inflammable material shall be kept in non-inflammable containers that are fixed with screwed on caps at all times. The containers should be marked with danger sign and the name of the material shall be marked on the outside. There should be at least one person who should be responsible for the safe custody of these materials.
  - All areas of work shall have appropriate safety signage depending on the nature of work, prominently displayed to prevent any mishap, particularly signs in fluorescent paint for night vision. These signs should be visible from a reasonable distance for a vehicular traffic at designated speed limits for a given road/ location. All necessary city traffic rules and signage specifications shall be observed with strict adherence.
  - All gadgets must have required safety devices in working conditions as per the manufacturers' recommendations and the law of the country.
  - All the persons on site must be insured against injury and death due to accidents.

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- The contractor shall not use the site for any activity other than what it is authorised for.
  - Children below the age of 16 shall not be allowed to work on site. The contractor shall prepare a secured crèche adjacent to the site, for the children of labor working on site and there shall be at least one person dedicated to look after the safety and other needs of these children at all time.
  - All persons working at site shall be physically and mentally fit. The contractor shall ensure that no illegal activity takes place on site and that no person with doubtful past shall be engaged on site.
  - The contractor shall be responsible for the safety of all persons at site.
  - Consumption of liquor and smoking shall not be permitted on the site.
  - The site shall be illuminated at night when there is work in progress.
  - The contractor shall maintain a First-aid box at site to take care of any minor injury.
  - The storing of all inflammable/explosive material shall be done as per the laws of the country and best common practice.
  - All temporary electrical connections shall be done with the help of insulated connectors to prevent any sparking etc.
  - Contractor shall keep the Owner and Consultant completely indemnified by ensuring a completely safe working, keeping a third party insurance cover on site.

## **2.1. SITE CLEARANCE**

Complete works for the site clearing so that the site is suitable for construction activity. Brief description of major items shall be as follows:

- a. Dismantling of all existing structures in brick masonry/stone masonry/ RCC /PCC, road, fence, sheds, cladding, sheets etc. so that the site becomes suitable for construction activity.
- b. Disposal of all material to be cleared from the site to any authorised disposal site/ storage yard.

- c. Removal of trees up to and above 30cm girth as per respective SOR items.
- d. Provide all assistance/co-ordination/liaison between any and all government/ semi government agencies connected with the scope mentioned and also with the body owning/maintaining the access road to the site.

Note:

1. Site Clearance including removal of vegetation shall be measured in  $m^2$ .
2. Demolition of RCC/PCC/Brick Masonry and road will be paid in  $M^3$ .
3. Trees shall be counted in numbers for more than 30 cm girth.

## 2.2. EARTHWORK IN SITE GRADING, EXCAVATION & BACKFILLING FOR PLOT DEVELOPMENT, ETC.

Brief description of major items shall be as follows:

- a. Taking pre-work and finished levels.
- b. Stripping and grubbing the top soil of 150 mm and preparation of sub-grade.
- c. Excavating excess soil and soft rock if any to develop the plot.
- d. Dewatering of excessive water.
- e. Backfilling with serviceable earth in layers of 150 mm thickness in controlled way.
- f. Watering and compaction up to '95% or as per direction of Engineer in charge of its MDD with PM Chanical means.
- g. Disposal of unserviceable and surplus earth/rock to a suitable dumping ground to any lead.
- h. Actual work shall be carried out as per certified construction drawings to be issued to successful tenderer.

Note:

- i. For all these items only net excavated quantity in CuM shall be measured for payment.
- ii. No separate payment for excavation for foundation / sewerage forecourt or Road work/other items where earthwork is included (since cost of earthwork is included in respective items).
- iii. Measurement for rock breaking shall be done by stacking. 35% of stack measurement shall be deducted as voids.

Earthwork shall be done as per approved detailed construction drawings to be issued to the successful tenderer. Offer to be prepared by the tenderer based on the enclosed drawings and on lump sum unit rate (per  $M^3$ ).

## 2.3. EARTH WORK IN FILLING

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Complete earthwork in filling with borrowed earth is included in the scope. Brief description of major items shall be as follows:

- a. Taking pre-work and finished levels.
- b. De-watering of excessive water.
- c. Strutting and shoring to retain the earth.
- d. Borrowing of approved quality good earth from any lead.
- e. Filling in layers of 150 mm.
- f. Watering and compaction up to '95% or as per direction of Engineer in charge' of its MDD with Mechanical means.

**Note:**

Payment for item earthwork in filling shall be paid for compacted net volume of filling after deductions of foundations, culverts, etc

#### **2.4. SAND FILLING AND STONE SOLING**

Complete works in filling is included in the scope. Brief description of major items shall be as follows:

- a. Taking pre-work and finished levels
- b. Borrowing of approved quality sand/stone from any lead.
- c. Filling in layers of 150 mm.
- d. Providing and laying stone ballast 40-63 mm size in layers of 150 mm with spreading blinding material like murum, bajri, stone grit and compaction with road roller etc. complete the surface as per specifications including cost of material.
- e. Watering and compaction by 10 T rollers.

**Note:**

- i. Payments to be done on completed work profiles by considering the plan dimensions only. Sand filling and Stone soling shall be done as per approved detailed construction drawings to be issued to the successful tenderer. Offer to be prepared by the tenderer based on the enclosed drawings and on lump sum unit rate (per M<sup>3</sup>).

#### **2.5. PCC WORK**

Providing and laying PCC M 7.5 (1:4:8) / M 10 (1:3:6) / M15 (1:2:4) in all positions, in foundations, substructure, superstructure and under floor, etc. (at locations where the same is not included in respective SOR items, eg RCC in Substructure, Brick work, Concrete pavement etc.) complete in all respects as per scope of work, detailed construction drawings, technical



specifications and direction of Engineer-in-charge.

Following works shall be inclusive in the rate of PCC item:

- a. Earth Work in excavation including back filling (including disposal of surplus earth).
- b. Preparation of bed including cleaning, levelling, compacting/tamping of surface and providing support from bottom and sides.
- c. Providing shuttering and strutting of all types (If necessary).
- d. Providing inserts, pockets, recesses, holdfast etc.
- e. Curing, rendering, finishes to match with adjoining surfaces etc.

Note:

- i. For all these items only net PCC concrete quantity in  $M^3$  shall be measured for payment. PCC below brick work and RCC works is included in the respective item.

The construction of PCC work shall be done as per approved detailed construction drawings to be issued to the successful tenderer. Offer to be prepared by the tenderer based on the enclosed typical drawings and on lump sum unit rate (per  $M^3$ ) of PCC work done.

## 2.6. REINFORCED CEMENT CONCRETE - SUB STRUCTURE

Brief description of major items shall be as follows:

- a. Earth Work in excavation including back filling using serviceable surplus/ borrow material, disposal of surplus earth (wherever required), including bailing out water (where ever required), shoring / strutting etc.
- b. 100 mm thk. PCC M-10 in mud mat.
- c. Providing shuttering and strutting of all types.
- d. RCC M25 as per drg. & specification including supply of cement, coarse aggregate, fine aggregate and placement of concrete at all levels and depths, all inclusive & testing of concrete and other materials.
- e. Providing and fixing of all anchor bolt and nuts into permanent works etc.
- f. Providing and fixing of all inserts, conduits, precast covers into permanent works etc.
- g. Provision of chequered plates, gratings into permanent works as per SOR item of Structural works.
- h. Grouting of all base plates/frames of equipment foundations as per requirement.
- i. Application of two coats of hot bitumen on surfaces in contact with soil.

Note:

- i. For all these items only net RCC quantity in  $M^3$  shall be measured for payment.
- ii. Earth work with borrowed earth shall be paid vide respective SOR item.
- iii. Anchor bolts and nuts shall be paid vide respective SOR item.

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- iv. Grouting with non shrinkable compound shall be paid vide respective SOR item

## **2.7. REINFORCED CEMENT CONCRETE - SUPER STRUCTURE**

Brief description of major items shall be as follows:

- a. Providing shuttering and strutting of all types
- b. RCC M25 as per drg. & specification including supply of cement, coarse aggregate, fine aggregate and placement of concrete at all levels, all inclusive & testing of concrete and other materials.
- c. Grouting of all base plates/frames of equipment foundations and structural bases as per requirement.
- d. Providing and fixing of all anchor bolt and nuts into permanent works etc.
- e. Providing and fixing of all inserts, conduits, precast covers into permanent works etc.
- f. Provision of chequered plates, gratings into permanent works as per SOR item of Structural works.

Note:

- i. For all these items only net RCC quantity in M<sup>3</sup> shall be measured for payment. The RCC quantity of building superstructure is included in the Building Works item.
- ii. Anchor bolts and nuts shall be paid vide respective SOR item.
- iii. Grouting with non shrinkable compound shall be paid vide respective SOR item.

## **2.8. REINFORCEMENT STEEL**

- a. Supplying , fabricating and fixing in position HYSD steel reinforcements / TMT grade Fe-415/Fe- 500 confirming to IS 1786-1985 at all levels and positions.
- b. Straightening, cutting, bending, cranking, binding, welding, provision of necessary chairs and spacers for reinforcement bars as per drawing and construction requirements.
- c. Preparation of bar bending schedule drawings and getting the same approved by site engineers as directed by EIC.

Note:

- i. Rate to include cost of all labour, tools, tackles, equipment, hire charges, supply of all materials such as steel reinforcement, binding wire and other minor construction materials, testing etc. all by works and sundry works complete in all respects.
- ii. Chairs, laps, spacers, wastage etc. shall be to contractor's account.
- iii. Only net reinforcement bars as per approved BBS / as laid at site shall be considered for payment.

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## 2.9. BRICK WORK IN SUB STRUCTURE / CC BLOCKS (200mm thick)

Complete works in brick masonry sub structure is included in the scope. Brief description of major civil items shall be as follows:

- a. Earthwork in excavation including back filling using serviceable surplus material or approved borrow material and transportation of excess earth beyond plot limits. Preparation of sub-base including de-watering and compaction.
- b. CC block work for sub structure and super structure with not less than M7.5 grade, minimum compressive strength 75 kg/sqcm in 1:4 cement sand mortar (in coarse sand.)
- c. Brick work for SS tubing trench with not less than M-5 grade bricks/ minimum comp. Strength of 50 kg/cm<sup>2</sup> in 1:6 cement sand mortar (in coarse sand).
- d. 150 mm thk. PCC (M-10) in levelling course.
- e. DPC 50 mm with cement concrete M-15 (1:2:4) as per requirement with water proofing compound and application of bituminous paint
- f. 15 mm thk. plastering in CM (1:4) (in coarse sand) on exposed brick surfaces.
- g. Application of two coats of hot bitumen on surfaces in contact with soil.
- h. Applying Lime wash / Cement based paint / Weather proof paint on plastered faces in sub structure as specified in drawings.
- i. Making weep holes of 150 mm x 150 mm with stone filter pack at 1.0 m intervals in both the directions.

Note:

- i. Only net brick masonry quantity excluding plaster thickness shall be measured in M<sup>3</sup> for payment purpose.
- ii. Earth work in backfilling with borrowed earth shall be paid vide respective SOR item. The construction of brick work shall be done as per detailed construction drawings to be issued to the successful tenderer. Offer to be prepared by the tenderer based on work described above.

## 2.10. BRICK WORK IN SUPER STRUCTURE /CC BLOCKS

Complete works in brick masonry super structure is included in the scope. Brief description of major civil items shall be as follows:

- a. CC block work for sub structure and superstructure with not less than M7.5 grade , minimum compressive strength 75 kg/scm in 1:4 cement sand mortar (in coarse sand).
- b. Brick work for ss tubing trench with not less than M-5 grade bricks/minimum comp. strength of 50 kg/scm in 1:6 cement sand mortar (in coarse sand).
- c. 15 mm thk plastering in CM (1:4) (in course sand) on exposed brick surfaces.

- d. All niches, offsets, pockets etc shall be considered part of the work.
- e. Providing shuttering / supports etc. as per requirement.
- f. Applying Lime wash / Cement based paint / Weather proof paint / oil bound distemper /Acrylic paint on plastered faces in super structure as specified in drawings.

Note:

- i. Only net brick masonry quantity excluding plaster thickness shall be measured for payment purpose.

The construction of brick work shall be done as per detailed construction drawings to be issued to the successful tenderer. Offer to be prepared by the tenderer based on work described above and payment will be made on rate (per M<sup>3</sup>) of brickwork done.

## **2.11. BRICK MASONRY/CC BLOCKS(200mm thick) BOUNDARY WALL IN SUPER STRUCTURE**

Complete works of brick masonry wall in superstructure including RCC, PCC, DPC, Coping with MS Y Angle Posts and Concertina coil with RBT fencing etc as per drawing. Brief description of major civil items shall be as follows:

- a. CC block work for sub structure and superstructure with not less than M7.5 grad, minimum compressive strength 75 kg/scm in 1:4 cement sand mortar (in coarse sand).
- b. RCC M-25 Including steel reinforcement for coping.
- c. Drip course 25 mm wide over coping.
- d. 15 mm thk plastering in CM (1:4) (in coarse sand) on exposed brick surfaces.
- e. Painting of exposed wall surface with three coats of Acrylic emulsion paint as approved by Engineer-in-charge.
- f. Expansion joints shall be provided as per drawing.
- g. Approx 600 mm High MS Y angle Posts including painting as per specification with 9 straight lengths of RBT fence with 2.6 mm dia spring core wire and short barbs of 11 mm width and circular Concertina coil of 600 mm dia with 50 turns per coil expandable between 6-8m and approx. weight of 8 Kg per coil.

Note:

Only net Boundary wall length including Pillars shall be measured in 'M' for payment purpose. The construction of masonry boundary wall shall be done as per detailed construction drawings to be issued to the successful tenderer.

## **2.12. SOAK PIT AND SEPTIC TANK**

Complete works for the making and proper functioning of soak pit and septic tank is included in the scope:

Brief description of major items shall be as follows:

- a. Earth work in excavation, back filling, and disposal of surplus earth. b. P.C.C. M-15 (1:2:4).
- c. Brick work of M-5 grade in 1:5 cement mortar.

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- d. Plaster 12 mm thick 1:3 in coarse sand, finished with floating coat of neat cement inside and rough plaster outside.
  - e. Brick bat filling in soak pit.
  - f. Honey comb brick work in soak pit.
  - g. RCC M-25 including reinforcement, shuttering etc in top slab.
  - h. Making all types of connections for sewerage collection and disposal.
  - i. Providing and fixing cast iron vent pipe up to required height as per drawing.

Note:

Soak pit and septic tank shall be provided inclusive of all related works, as per approved detailed drawings to be issued to the successful tenderer. Offer to be prepared by the tenderer based on the enclosed drawings and on lump sum unit rate (per installation).

### **2.13. PAVER BLOCK (80 mm THK) PAVEMENTS IN SPECIFIED AREAS**

Brief description of major works to be considered in this item is as follows:

- a. Earthwork in excavation including back filling upto required level (including using borrow earth and disposal of surplus earth).
- b. Filling in layers of 150 mm thickness in controlled way.
- c. Watering and compaction up to 95% of modified dry proctor density of soil with Mechanical means.
- d. Providing and laying / fixing 80 mm thick M-30 Paver Blocks over 75 mm thk. sand cushion over well compacted sub grade / PCC as specified.
- e. Filling joints between the blocks with fine River sand.
- f. Making slopes, finishing edges, leaving pockets for pedestals & sleepers.
- g. Actual work shall be carried out as per certified construction drawings to be issued to successful tenderer.

Note:

- i. Complete civil works for Paver Block Pavement including, earth work in excavation, preparation of base i.e., compacted sub grade, 100mm thk. sand filling and compaction, etc. are included in the works & payment shall be made under Paver Block Pavement item. Only net laid quantity shall be considered for payment purpose.
- ii. PCC under the Paver Block Pavement wherever specified shall be paid under separate PCC item.

### **2.14. RCC KERB STONE IN SPECIFIED AREAS**

Brief description of major works to be considered in this item is as follows:

- a. Earth Work in excavation including back filling up to required level (including using borrow earth and disposal of surplus earth).
- b. Supplying and fixing M-25 Kerb Stone Blocks 125 mm x 300 mm over 75 mm thk. PCC - M 10 grade.

- c. Filling joints between the blocks with cement mortar (1:3) (in coarse sand).
- d. Actual work shall be carried out as per certified construction drawings to be issued to successful tenderer.

Note:

Complete civil works for Kerb Stone including, earth work in excavation, preparation of base i.e., compacted sub grade, 75 mm thk. PCC, etc. are included in the works & payment shall be made in RM. under Kerb Stone item.

## 2.15. BUILDING WORKS

Complete civil and architectural works for the buildings is included in the scope:

### **Utility/Office building - Control room, Office room, Store Room, UPS and Battery Room, Electrical Room etc**

Brief description of major civil and architectural under the item is as follows:

- i. Site grading of the plot by removing 150 mm top soil stacking it properly and reusing it for planting purpose, including plot development by filling good quality earth as required in the new areas to be developed.
- ii. The building shall be RCC framed structure with cladding and partitions of masonry walls.
- iii. Construction of all sub-structures and superstructures.
- iv. Anti-termite treatment to be applied to the building foundations, plinth and under flooring inside the building and under Apron.
- v. DPC 40 mm with cement concrete 1:2:4 as per requirement with water proofing compound of CICO/ PIDILITE/ SIKA and application of bituminous paint.
- vi. All underground concrete/ masonry structure in contact with earth shall be given two coats of hot bitumen application.
- vii. All structural concrete for RCC elements shall have a minimum strength of 25 MPa at 28 days. Grade of concrete in R.C.C. works shall be M-25.
- viii. Masonry shall be in cement mortar 1:4 (in coarse sand) and with CC blocks of strength not less than 7.5 MPa.
- ix. Plastering on masonry structures shall be of thickness 15 mm on either faces, and 6 mm on concrete faces. The cement mortar shall not be leaner than 1:4 in coarse sand.
- x. All chhajja/ canopy projections shall have drip mould grooves underneath all along periphery.
- xi. Entrance door/door for office/officer, control room of the building shall be anodized aluminium

/powder coated of approved shade fully / partially glazed , 6 mm thick float glass(ASAHI/MODI/TUFF) panes fixed with necessary gaskets and aluminium beading strip or panelled (double sided) with pre laminated board, double leaf / single leaf doors with floor springs. All windows/ ventilators shall be aluminum glazed min. 6mm thick glass (ASAHI/MODI/TUFF) with anodized aluminum/powder coated hardware with aluminum grill. The windows / ventilators shall be partially/ fully fixed or openable, casement or sliding windows as per requirement and drawing. The fixtures like handles, stoppers ,stays, etc., shall also be anodized aluminium/powder coated and shall be of approved make. All aluminium sections shall be of standard make like Jindal, Hindalco or approved equivalent. Aluminium alloy used in the manufacture of extruded sections shall correspond to IS Designation H E 9 WP of IS 733. Hollow aluminium alloy sections used shall conform to IS Designation HV9 WP of IS 1285. The sections shall be polished and anodized with approved colour. The average thickness of anodic coating shall not be less than 20 microns as per IS: 1868-1982. All work shall be fitted and shop assembled to a first job, and ready for erection. EDPM performed profiles shall be used for inserting into extruded pockets of sections. Glazing beads shall also be of EDPM performed profiles to hold the glass in frame under pressure. Non metallic setting blocks shall be used to centralize the glass in frame. All work shall be adequately braced and reinforced as necessary for strength and rigidity. Stainless steel ball bearings, housed in nylon type nylon rollers, shall be used. All Mechanical connections shall be sealed with silicon sealant. Around all windows, approved quality sealants shall be run down to make sure of total weather/water sealing.

- xii. Windows shall have aluminium grills (Diamond Window Grill from Decogrill or approved equivalent).
- xiii. Toilet doors shall be of high grade PVC (Sintex or approved equivalent) with suitable frames.
- xiv. Flush doors, wherever required, shall have shutters conforming to IS:2202 (Part I) decorative type, core of block board construction with frame of 1<sup>st</sup> classhard wood and well matched teak 3 ply veneering with vertical grains or cross bands and face veneers on both faces of shutters, 35mm thick including IS marked stainless steel butt hinges with necessary screws. Frames shall be pressed steel single/double rebate door frames conforming to IS: 4351 manufactured from commercial mild steel sheet of 1.25 mm thickness including hinges jamb, lock jamb, bead, etc.
- xv. Inside walls and ceilings of rooms/ buildings shall be finished with acrylic washable distemper on Birla Putty or JK Putty and outside with weather resistant paint “Weather shield” of ICI or “Apex Ultima” of Asian Paints of approved color on Birla Putty or JK Putty.

Rain water pipes of pvc shall be provided. Only approved make shall be used. RCC channels for cables, pipe trenches etc. shall have provision of MS chequered plate / PVC coated MS Chequered cover plate/ electrical room (as per requirement) and payment for chequered plates shall be paid as per SOR item of Structural works.

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- xvi. Inserts shall be provided to suit the technological requirements.
- xvii. All exposed flat roofs shall be treated with “Aquashield APP” of STP or “Davco Armour shield” of Chryso over a layer of screed concrete as per suppliers specification.
- xviii. If sloping roof is provided as per design drawing, the same shall be finished with decorative plaster.
- xix. Grade slab in flooring shall be of 150mm thick RCC of M-25 grade, 100 thick P.C.C. (M-10) over a compacted sand layer of 250mm on well-prepared sub base.
- xx. Flooring & skirting in SCADA room, Office/ Control room, Verandah shall be provided with 10mm to 12 mm thick vitrified ceramic tiles (600 x 600) mm of make Asian/Kajaria/Johnson / Somany etc.) on a bed of 20mm thick cement mortar of 1:4 proportion be provided. Skirting height shall be 150mm. Flooring and skirting in Electrical room shall be heavy duty vitrified tiles (600X600) mm.
- Flooring and Dado in UPS / Battery room shall be provided with Acid proof tiles Pavigres of Kajaria (size 300X300mm).  
The height of dado in UPS/Battery room shall be 2400 mm with respect to finished floor level. Eye/Face wash, model no.7001 pedestal mounted from Tobit Engineers shall be provided in UPS/Battery room.
- xxi. Flooring & dado of Fire Protection room, store shall be of polished Kota stone.
- xxii. All M.S. doors/window & louvered door for electrical room etc., wooden doors & leafs shall be painted with 3 coats of synthetic enamel paint on pink/zinc chromate primer.
- xxiii. All finishes, painting, locking arrangement, etc. any other works not specifically mentioned but required for completion and handing over of premises, complete in all respects.
- xxiv. Apron 0.90M/1.0 m wide (as per drawing) of PCC M-10 grade and peripheral Storm water drains in Brick around building (as per requirements).
- xxv. Electrical work including lighting inside the building and outside shall be under the scope of this contract. The quantity of fixture etc. shall be covered under Electrical SOR for the terminal.
- xxvi. Mineral fibre false ceiling of “Armstrong” or equivalent make of approved pattern shall be provided in Scada, Telecom and Electrical Rooms, office room, engineers room, discussion room etc. as mentioned in working drawings. The tiles shall be beveled/ tegular tiles of size (600 x 600 x19) mm with 95% humidity resistance, light reflectance >80%, 0.7 NRC, thermal conductivity  $k=0.052- 0.057$  w/m0c, class O/class1(BS 476 classification) fire performance or equivalent .Tiles to be laid on 24XL-hot dipped galvanised steel suspension system having rotary stitching on the main runner, 1200mm & 600mm cross tees making regular cut out for light fittings, fire sprinklers, etc., fixing & finishing. Ceiling to be



finished neat and complete so that no irregularities are visible after finish, including providing caps to the cut outs after fitting the fire sprinkler nozzles.

- xxvii. One or more 1000 liter overhead Sintex tank with necessary GI incoming and outgoing pipes and fittings along with 0.5 HP pump for pumping water shall be provided for supplying water in toilets / other areas.
- xxviii. Toilets and pantry fixtures shall be provided as follows: EWC no. 20024 of Hindware, Flat back urinal no. 60002 of Hindware, Pedestal type Wash Basin no. 10010 of Hindware, Stainless steel Sink of size 410X410 of Nirali, unless mentioned otherwise in architectural drawings.
- xxix. Toilets to have first quality chromium plated fittings - taps, faucets, stopcocks, etc. of Jagaur/ Parryware/ Cera, liquid soap dispenser, towel rail, deodorant holder, coat hook, china recessed toilet paper holder, anti cockroach chilly trap, etc.
- xxx. Toilets and pantry shall have anti-skid ceramic tiles flooring and ceramic tiles dado upto +1500 mm height from FFL.
- xxxi. Cutouts for exhaust fans to be made at beam bottom in Battery Room and Electrical Room in required numbers.
- xxxii. M.S. Cat ladder to be provided for roof approach.
- xxxiii. M.S. railing, wherever required, shall consist of handrail of 63X32X3.2 mm M.S. hollow section, 16X16 mm M.S. sq. bar balusters @ 250mm c/c and 2 nos. 25X6 mm M.S. plate running horizontally at equal distances.
- xxxiv. Water supply piping with GI pipe complete with all fittings and jointing, pipe work, bronze valves with overhead tanks with high pressure ball cock, level indicator, level control and all its connections and platform, anti-mosquito over flow grating etc.
- xxxv.** A backlit signage hoarding in approved design including GODAVARI GAS logo of 5.0m x 1.0m prepared in aluminum framework with flexible sub strata and approved colored translucent vinyl to be provided on rooftop.(refer point no.- 2.25) (for payment refer separate SOR item).
- xxxvi. G.I. conduit to be fixed in concrete as per detail drawing shall be supplied and fixed in position.
- xxxvii. Clearing all construction debris and handing over completed work site .
- xxxviii. Making as-built details on one set of construction drawings and return to Owner.
- xxxix. Any other item not covered above but required for proper functioning of the building.

**Note:**

1. The construction of the building shall be done as per detailed construction drawings to be issued to the successful tenderer. Offer can be prepared by the tenderers based on the enclosed architectural and standard drawings and on lump sum unit rate (per sqm) for complete building work.
2. The payment for completed works shall be made as follows:
  - a. For superstructure all items (above Plinth Beam Level) as listed above shall be payable as per enclosed drawing No.PMC/05/11/STD/CNG/001.
  - b. Centerline measurement for building shall be considered for payment purpose.
  - c. For substructure e.g. foundations, plinth beam etc. and other items such as apron, peripheral drains, steps etc. respective SOR items shall be payable.
3. For electrical wiring, illumination and fixtures refer relevant parts of specification for Electrical Works. All Electrical works shall be paid under respective Electrical Items. However, all required civil works for electrical, instrumentation/ are in contractor's civil scope of work.

**2.16. RCC GRADE SLAB IN FORECOURT**

Complete civil works and other finishes in the fore court are included in the scope. Brief description of major civil items shall be as follows:

- a. Stone soling (150 mm thick) compacted with road roller and river sand filling in voids.
- b. 100 mm thick PCC M-10 (1:3:6).
- c. Laying of all required conduit, cables, pipes etc. and fixing them securely to the reinforcement bars (payable under separate item).
- d. RCC M25 (to be procured from batching plant/site prepared mix) 150 mm thick laid to slope including reinforcement and inserts, PVC sleeves, expansion joints and brush finish.
- e. Providing & laying 50 mm thick M25 screed over RCC floor with 4 mm dia and 75 X75 mm wire mesh (payable under separate item).
- f. Applications of non-metallic compounds, as per manufacturer's specifications to make the surface hard enough to bear abrasion, improve impermeability & resist weathering. The compound to be used shall be non-metallic hardener of Roff/ Fosroc/ STP/ CICO or equivalent (payable under separate item).

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- g. Providing non-deteriorating board in expansion joints with polysulphide sealant (payable under separate item).
  - h. Making of cable and steel tube trench with precast covers with lifting arrangement (payable under separate item but area of trench will be deducted from forecourt).
  - i. Making dispenser islands including Granite/Vitrified tile top fixing and all its finishes (payable under separate item).
  - j. Concrete paver blocks laid over PCC (payable under separate item).
  - k. Fixing of concrete kerb stone blocks. Kerb stone blocks shall have niche with reflective material fixed in it (payable under separate item).
  - l. Manhole, gully trap including precast covers.

Note:

- a. Only area of completed forecourt shall be measured for payment.
- b. The construction of fore court shall be done as per approved detailed construction drawings to be issued to the successful tenderer. Offer to be prepared by the tenderer based on the enclosed architectural drawings and on lump sum unit rate (per Sq.M) for complete work.

## **2.17. CULVERT**

Complete works for the construction of culvert is included in the scope. Brief description of major civil work items shall be as follows:-

- a. Excavation of earth and back filling/disposal of the same.
- b. 350 mm thick PCC M-10 (1:3:6).
- c. CC Block of M-7.5 grade in 1:4 cement mortars as per design.
- d. 12 mm thick plaster in 1:3 on exposed brick surface.
- e. Laying of RCC pipe, joining the pipe lengths and encasing the same with 350 thick PCC M-15 (1:2:4).
- f. Diversion of existing drainage (if any) during construction and its restoration to original position after smooth joining of existing with new construction.  
Culvert shall be made as per approved detailed construction drawings to be issued to the successful tenderer. Offers can be prepared by the tenderers based on the enclosed drawings and on lump sum unit rate (per RM) of pipe dia. basis.

Note:

In case a R.C.C. box culvert is provided - the payment shall be made under R.C.C. composite rate.

## **2.18. EXTERNAL SEWERAGE & STORM WATER PIPING**

Complete works for the installation and proper functioning of external sewerage and drainage is included in the scope.

Brief description of major items shall be as follows:

- a. Earth work in excavation and back filling.
- b. PCC M-15 (1:2:4).
- c. Laying pipes (SW, RCC pipe 150 / 300 mm dia).
- d. Connection to Municipal manhole.
- e. Restoration of site and clearing the debris.

External sewerage shall be provided inclusive of all related works, as per approved detailed drawings to be issued to the successful tenderer. Offer to be prepared by the tenderer based on the enclosed drawings and on lump sum unit rate (per RM) pipe laid.

## **2.19. ROADWORK**

Complete works in making of road over well-compacted sub grade (CBR 4.0 - 5.0 in soaked condition) is included in the scope.

Brief description of major items shall be as follows:

- a. Preparation of sub grade including dressing to camber, making good all undulations, re-rolling with power road roller of 8 to 12 tons capacity etc.
- b. Supply, stacking, and laying two layers of 115 mm thick WBM with 90 mm to 45 mm graded stone aggregate stone screening and blending material including screening, sorting, spreading to template and consolidation with power roller of 8 to 10 tons capacity etc. using kankar, murum and red bajri etc.
- c. Supply, stacking and laying one layer of 75 mm thick base course WBM with 63 mm to 45 mm graded stone in the same fashion as above.
- d. Supply, stacking and laying one layer of 75 mm thick base course WBM with 53mm to

22.4 mm graded stone in the same fashion as above.

- e. Providing and applying 75 mm thick Bitumen macadam with tack coat.
- f. Providing and applying tack coat using hot straight run bitumen of grade 80/100 by spraying with Mechanically operated spray unit fitted with boiler, after cleaning and preparing the WBM surface @ 0.75 Kg/Sqmt.
- g. Providing two layers of 25 mm thick premix carpet surfacing with 2.25 cum. and 1.12 cum. of stone chipping of 13.2 mm and 11.2 mm size respectively per 100 sqmt and 52 kg and 56 kg of hot bitumen per cum of stone chipping of 13.2 mm and 11.2 m size respectively including a tack coat with hot straight run bitumen including consolidation with road roller of 6 to 9 tons capacity etc. complete with paving asphalt 60/70 with no solvent.

Road making shall be done as per approved detailed construction drawings to be issued to the successful tenderer. Offer to be prepared by the tenderer based on the enclosed drawings and on lump sum unit rate (per SqM) of premix carpet surface laid.

#### **2.20. PRE-CAST SLAB**

Brief description of main items shall be as follows:

Heavy duty 600mmx550mmx70mm thick precast Slab in trenches shall be provided and fixed as per instruction of Engineer-in-charge.

#### **2.21. PROVIDING AND LAYING FLOOR HARDENER**

Heavy duty non- metallic hardener compound of STP, Roff, Fosroc, CICO of approved manufacture or equivalent laid in panels at all locations over well compacted concrete bed complete with all works, with minimum coverage as per manufacturers' specifications, drawings and as directed by EIC shall be provided and laid. All preparation and laying to be done under specialist supervision and a performance guarantee be furnished for a long term service life.

#### **2.22. GROUTING WITH NON-SHRINKABLE COMPOUND**

Brief description of major items shall be as follows:

Ready mix non-shrink cementitious grout of compressive strength 30N/mm<sup>2</sup> / 45 N/mm<sup>2</sup> as per SOR shall be provided and laid manually or by pumping at all positions. This shall include shuttering, compacting, edging, repairing, sealing and curing for shutdown repairs, base grouting of rotating equipment and other installation complete. This shall be as per specifications, site sketches/ drawings and direction of the EIC.

Minimum coverage as per manufacturers' recommendations shall be applied in absence of

actual field consumption data.

### 2.23. PROVIDING AND LAYING CAPCELL BOARD

CAPCELL board sealing in expansion joints of 12 mm/25 mm thickness and required depth shall be

provided and laid. All preparation, protection, sealing and sand bed separation will be part of the work.

### 2.24. SPECIFICATION-PRECAST PANELLED COMPOUND WALL FOR DE-COMPRESSION UNITS

The compound wall shall consist of RCC precast concrete posts of minimum cross sections 140mmX125mm at 1.8 M c/c having two grooves of required size so as to receive precast RCC panels of minimum 50 mm thick. The post shall be reinforced with 4 nos of 10mm dia TMT bars with stirrups. Panels shall be reinforced with minimum 03 nos of longitudinal 8 mm dia TMT steel for panel width 300 mm and distribution 8mm dia bars at 250mm c/c. The RCC for precast posts and panels shall be of M30 grade. The post shall be encased with PCC 1:3:6 in ground for minimum dimensions 600x600x750mm depth.

Note:

Complete civil works for precast panelled compound wall including, earth work in excavation, backfilling, shuttering, RCC, PCC, reinforcement, transportation and erection of posts, panels, etc. are included in the works & payment shall be made in sqm for the laid area above floor level.

### **LIST OF RECOMMENDED MAKES & MANUFACTURERS**

Sl.No	Description	Manufacturers
1	Glazed tiles / Ceramic tiles / Vitrified ceramic tiles	M/s. HR Johnson; M/s. Kajaria Tiles, M/s. Somany Floor & Wall Tiles, Bell-Ceramics, M/s.NITCO, M/s. Murudeshwar Ceramics Ltd.
2	FLOOR HARDENR	CICO, Fosroc,Sika
3	STEEL DOORS, ROLLING SHUTTERS & PRESS STEEL DOOR FRAMES	M/s Shakthi Met-Door, M/s. Madhu Industries, M/s. Deccan Structural Systems Pvt. Ltd., M/s. NCL Seccolor Ltd.,
4	ALUMINIUM DOORS, WINDOWS, CURTAIN WALLS / STRUCTURAL GLAZING USING INDAL / JINDAL / HINDALCO SECTIONS	Indal , Bhoruka, Hindalco, Jindal M/s. ALFAB Products.

5	GLASS : (Plain/Frosted clear / tinted float glass)	M/s Modigaurd, M/s Saint-Gobain, M/s Asahi, M/s. Hindusthan Safety Glass Works Ltd
6	HARDWARE FITTINGS & FIXTURES:	M/s Shalimar Hardware. M/s Everite, M/s Hardwyn, M/s Earl Bihari, M/s Godrej & Boyce, Secur Industries. M/s EBCO: M/s Godrej & Boyce mfg. Ltd. M/s CROWN
7	EXPANSION JOINT AND TARFELT WATERPROOFING	M/s Shalitek; M/s Tiki Tar industries; M/s STP Ltd. (Ms Shalimar Tar Products); M/s Lloyd Insulation (I) M/s Pidilite M/s IWL
8	INTEGRAL WATER: PROOFING COMPOUND	Accoproof, Cico; Impermo Lafarge, Fosroc, Roffe,Sika,
9	WATERPROOFING TREATMENT	Sika, Fosroc, Roffe, Overseas water proofing corporation, Chowgule Texsa, Pidilite,
10	CEMENT PAINTS, EXTERIOR EMULSION PAINTS, DISTEMPER, ACRYLIC EMULSION PAINTS, ENAMEL PAINTS & FLAT OIL PAINTS	M/s Asian Paints; M/s Berger Paints; M/s Goodlass Nerolac; M/s Jenson Nicholson;
11	FALSE CEILING / PARTITION	India gypsum, Armstrong, Lafarge boral gypsum limited, Luxalon
12	DECORATIVE LAMINATES	Decolam,National, Formica, Greenlam, Century (merino)
13	DOOR CLOSERS, FLOOR SPRING	Everite, Garnish, HARDWYN, DORMA
14	SEALANTS	Ge Silicon, Dow corning, Bostik, Pidlite Industries
15	CONCRETE PAVER BLOCKS	Basant Beton, Cobble stones, Abideep Interlock Pavers, pvt. Ltd., Pave Stone Marketing (P) Ltd., Designers Pavings& Tiles Pvt. Ltd., Bessers Concrete Paver Blocks.
16	SANITARY APPLIANCES	Parryware,Hindustan Sanitary Ware & Industries ltd., Neycer.
17	CP BRASS FITTINGS, WASTE COUPLINGS, BOTTLE TRAPS	Jaquar, Essco, Nova, Gem, Marc, Essess, Jupiter aqua , Grohe.

18	PVC flushing cisterns	Parry ware, Hindware, Neycer
19	Mirror	Saint Gobain, Modigaurd, Atul glass works,
20	Plastic seat and cover	Commander,
21	Stainless Sink	Nirali, Diamond, Jaquar Dayana,Amc, etc.
22	GI Pipes	Tata, Jindal
23	GI Malleable fittings	Unik, Zoloto pec,MJM, Bimal
24	GM gate/ Globe valves	Neta, Sant, New, Leader
25	SW Pipes & Gulley traps	Perfect Kashmiria, South India Corporation, TACEL, INDO PIPES
26	HDPE/UPVC Pipes & fittings	Prince, Finolex, Supreme, Kitec, Oriplast, Polyfab,
27	CPVC pipes & fittings	Flowgaurd (ASTRAL), Finolex
28	CI manhole covers	Neco
29	PVC storage tanks	Sintex, Infra, ICP (India) Pvt. Ltd. Century, Polycon
30	CEMENT	ACC, Ambuja Cement. Ultra Tech, Birla super
31	REINFORCEMENT STEEL	SAIL, TATA STEEL, RINL
32	ADMIXTURES	FOSROC,SIKA,ROFF
33	PVC PIPES	SUPREME, INFRA, PRINCE, FINOLEX
34	ANTI TERMITE TREATMENT	PEST CONTROL INDIA LTD, MYSODET LTD., ASHOK PEST CONTROL – HUBLI, PEST CONTROL – PUNE, CHRISLINE MARKETING AGENTS- Bangalore
35	APP modified bitumen water proofing membrane	STP, BITUMAT, SIKA, IWL, PIDILITE TEXSA
36	Wall care putty for base preparation	Birla Wallcare putty, Berger, Johnson and Nicholson, JK white
37	Polysulphide Sealant	Cico, Fosroc, Pidilite, Sika
38	Chain link fencing	Tata



39	PRELAMINATED PARTICLE BOARD	Archidply
40	PRECAST RCC COVER SLAB	NUTEK, Bangalore, For any other make, contractor has to obtain prior approval from /GGPL based on their credentials.
41	CANOPY FALSE CEILING	INTERARCH For any other make, contractor has to obtain prior approval from /GGPL based on their credentials.
42	CANOPY ROOF SHEETING	
43	ACM SHEETING FOR FACIA, SIGNAGES	ALSTONE, For any other make, contractor has to obtain prior approval from /GGPL based on their credentials.
44	RMC CONCRETE PLANT	RMX (Magadi road), SCC READYMIX (Kumblagod, Kengeri Hobli), NEXGEN CONCRETE (Hennur)
45	STRUCTURAL STEEL	SAIL, TATA STEEL, RINL
46	PRECAST CONCRETE PANELS FOR COMPOUND WALL IN DE-COMPRESSION  UNI  T INSTALLATION	M/S SASICON For any other make, contractor has to obtain prior approval from /GGPL based on their credentials.

TENDER NO: GGPL/KKD/C&P/CW/2545/VS

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**QUALITY ASSURANCE &  
QUALITY CONTROL**

**SITE QUALITY PLAN**

**CIVIL ENGINEERING DIVISION**

SL. No	Component/ Operation and Description of test	Sampling plan with basis	Type of check	Instrument	Reference document	Acceptance Norm	Format of Record	Testing agency	Remarks
<b>A: MATERIALS</b>									
<b>1.0</b>	<b>COARSE AGGREGATE</b>								
1.1	Specific Gravity, Density, Voids	Once in 12 weeks or change of source whichever is earlier	Laboratory Test	Weigh balance, Oven, Jar	IS:2386 Part III, IS:456, IS:383			Package Contractor	These test will be carried out while establishing design mix.
1.2	Sieve Analysis	<u>For Industrial Projects:</u> One sample per 200 M <sup>3</sup> (or part thereof) or change of source whichever is earlier. <u>For Building Projects:</u> One sample per 45M <sup>3</sup> (or part thereof)	Field Laboratory Test	Sieve set & weigh balance	IS:383	As per requirement of design mix within the limits specified in relevant IS Codes.	L-04	-do-	Mandatory Site Test
1.3	Petrography examination including visual inspection	To be done once per source	Visual/ Checking	-	IS:2386 Part IV, IS:383 (for acceptance limits)		-	-do-	Test will be carried out while establishing mix design

TENDER NO: GGPL/KKD/C&P/CW/2545/VS



SL. No	Component/ Operation and Description of test	Sampling plan with basis	Type of check	Instrument	Reference document	Acceptance Norm	Format of Record	Testing agency	Remarks
1.4	Deleterious Chemicals	To be done once per source	Lab Test	Balance Sieve & Container	IS:2386 Part III, IS:383 (for acceptance limits)			-do-	Test will be carried out while establishing mix design
1.5	Soundness	To be done once per Source	-do-	Sieve Scales & Drying Oven	IS:2386 Part V, IS:383 (for acceptance limits)			-do-	Test will be carried out while establishing mix design
1.6	Acid & Alkali Reactivity	To be done once per source	Lab Test	Weigh balance	IS:2386 Part VII, IS:383			-do-	Test will be carried out while establishing mix design
1.7	Flakiness	To be done once per Source	-do-	-	IS:2386 Part-I, IS:2386 Part VII, IS : 383			-do-	-do-

TENDER NO: GGPL/KKD/C&amp;P/CW/2545/VS

SL. No	Component/ Operation and Description of test	Sampling plan with basis	Type of check	Instrument	Reference document	Acceptance Norm	Format of Record	Testing agency	Remarks
1.8	Bulk Density	One Sample per 200 m <sup>3</sup> or part thereof		Oven, Jar & Weigh balance	IS:2386			-do-	-do-
<b>2.0</b>	<b>FINE AGGREGATE</b>								
2.1	Bulka ge Moisture	One sample per 20M <sup>3</sup> (or part thereof)	Routine Measurement	Oven, Jar and weigh balance	IS : 2386 Part-III, IS : 383			-do-	Mandatory Site Test. Volume of sand and weight of water shall be adjusted as bulkage & moisture contents.
2.2	Sieve Analysis	<u>For Industrial Projects.</u> One sample per 200 m <sup>3</sup> (or part thereof) or change of source whichever is earlier. <u>For Building Project.</u> One sample per 40 M <sup>3</sup> (or part thereof)	Routine	Sieve Set, Weigh balance	IS : 2386 Part-I, IS : 383	As per requirement of design mix within the limits specified in relevant IS Codes	L - 03	-do-	Mandatory Site Test.
2.3	Particle Size and Shape	To be done once per source and to be repeated if source is changed	Routine	-do-	IS : 2386 Part-I, IS : 383	Particle size shall be maximum 4.75		-do-	To be carried out during mix design.

TENDER NO: GGPL/KKD/C&P/CW/2545/VS



SL. No	Component/ Operation and Description of test	Sampling plan with basis	Type of check	Instrument	Reference document	Acceptance Norm	Format of Record	Testing agency	Remarks
						mm. Grading shall be within the limits of grading zone - III for concrete work and for mortar and grout within the limits of grading zone III & IV.			
2.4	Delete-rious Chemicals	- do-	-do-	Bal-ance, sieve & Container	IS : 2386 Part-III, IS : 383			-do-	To be carried out during mix design.
2.5	Soundness	- do-	-do-	Sieve, Scales & Drying Oven	IS : 2386 Part-V, IS : 383 ( for acceptance limit)		-	-do-	To be carried out during mix design.

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**ANNEXURE - 1 MATERIAL TESTS FOR SITES**

SL. No	Component/ Operation and Description of test	Sampling plan with basis	Type of check	Instrument	Reference document	Acceptance Norm	Format of Record	Testing agency	Remarks
2.6	Acid and Alkali Re-activity	To be done once per source and to be repeated if source is changed	-do-	Weigh Balance	IS : 2386 Part-VII, IS : 383		-	-do-	To be carried out during mix design.
2.7	Mortar Making Properties	-do-		Compression testing machine, 7.06 cm cube moulds	IS : 2386 Part-VI, IS : 383		-	-do-	To be carried out during mix design.
2.8	Petrographic Examination including visual inspection	-do-	Visual/ Physical	-	IS : 2386 Part-VI, IS : 383 ( for acceptance limit)		-		
2.9	Specific Gravity, Density, Voids	Once in 12 weeks, change of source whichever is earlier	Measurement	Weigh Balance	IS : 2386 Part-III				These tests will be carried out while establishing design mix.
2.10	Check Silt and Clay Content	Every 20M <sup>3</sup> (or part thereof)	Measurement	Jar & Oven	IS : 2386 Part-II, IS : 383	Deleterious material not to exceed 5%	-		Mandatory Site Test

TENDER NO: GGPL/KKD/C&P/CW/2545/VS



SL. No	Component/ Operation and Description of test	Sampling plan with basis	Type of check	Instrument	Reference document	Acceptance Norm	Format of Record	Testing agency	Remarks
<b>3.0</b>	<b>LIME</b>								
3.1	Chemical and Physical Properties	Every 10 MT (or part thereof)	Laboratory Test		IS: 6932 (Part I to X)			- do-	Optional Test if required.
<b>4.0</b>	<b>CEMENT</b>								
4.1	Fineness	For each consignment of 100T (or part thereof).	Laboratory Test		IS : 4031, IS : 269, IS : 1489, IS : 455			Manufacturer/ Package Contractor	Manufacturer's certificate to be furnished.
4.2	Normal consistency	-do-	Laboratory Test	Vicat needle	IS : 4031, IS : 269, IS : 1489, IS : 456			Manufacturer/ Package Contractor	- do-



SL. No	Component/ Operation and Description of test	Sampling plan with basis	Type of check	Instrument	Reference document	Acceptance Norm	Format of Record	Testing agency	Remarks
4.3	Initial and Final setting	-do-	Laboratory Test	Vicat needle	IS : 4031, IS : 269, IS : 1489, IS : 457	Depending on the type of cement and as per relevant IS		Manufacturer/ Package Contractor	- do-
4.4	Soundness, Specific Gravity	-do-	Laboratory Test		IS : 4031, IS : 269, IS : 1489, IS : 458			Manufacturer/ Package Contractor	- do-
4.5	Compressive Strength	Every fortnight for each consignment.	Measurement	Compression Testing Machine	IS : 4031, IS : 269, IS : 1489, IS : 459	Depending on the type of cement and as per relevant IS		Package Contractor	Mandatory Site Test
<b>5.0</b>	<b>CONCRETE</b>								
5.1	Workability, Slump test and compaction factor test	Once a day for each batching/ mixing plant	Measurement		IS : 456, IS : 1199, Client's specification	Degree of workability adopted depending on the type of structure and type of		Package Contractor	Mandatory Site Test

SL. No	Component/ Operation and Description of test	Sampling plan with basis	Type of check	Instrument	Reference document	Acceptance Norm	Format of Record	Testing agency	Remarks
						compaction equipment.			
5.2	Crushing Strength	One set of 6 cubes of 150 cm. Size per 35 Cum. of concrete or part thereof for each grade of concrete per 8 hours of work or portion thereof.	Measurement	Compression Test Machine	IS : 516, IS : 1199, IS : 416 and Client's specification	Shall be as per IS: 456		Package Contractor	Three specimens shall be tested at 7 days and remaining at 28 days. Mandatory Site Test.
5.3	Water Cement Ratio	At random at the time of Batching	Measurement	Visual observation	As per approved design mix			Package Contractor	
5.4	Check cement content	-do-	Measurement / by weight batcher		IS : 3025, IS : 456 and approved design mix.			Package Contractor	
<b>6.0</b>	<b>WATER</b>								

SL. No	Component/ Operation and Description of test	Sampling plan with basis	Type of check	Instrument	Reference document	Acceptance Norm	Format of Record	Testing agency	Remarks
6.1	Tests for ascertaining limits of solid	Once for each source of supply	-do-	Lab Test	IS : 3026 and Soil investigation record.			Package Contractor	During mix design stage
6.2	Test of pH value	-do-	-do-	PH meter	IS : 456	PH value shall be less than 6.	Site log book		-do-
<b>7.0</b>	<b>BRICK</b>								
7.1	Compressive Strength	<u>For designation 100,</u> Every 50,000 or part thereof. <u>For designation up to 75,</u> Every 100,000 or part thereof.	Compressive strength	Compression Testing Machine	IS: 1077	As per brick designation.			Mandatory Site Test
7.2	Shape, Size, Colour	-do-	Visual & measurement for size		IS: 3495				Mandatory Site Test

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SL. No	Component/ Operation and Description of test	Sampling plan with basis	Type of check	Instrument	Reference document	Acceptance Norm	Format of Record	Testing agency	Remarks
7.3	Water absorption and efflorescence	One test for each source of manufacturer and every lot of 200,000.	Routine		IS: 3495	Water absorption: a) after 24 hours not less than 20% by weight b) after 6 hours not less than 10% by weight. c) moderate degree of efflorescence			Mandatory Site Test
<b>8.0</b>	<b>REINFORCEMENT STEEL</b>								
8.1	Tensile Strength	Every 20T or every consignment purchased by Package Contractor	Measurement	Universal Testing Machine	IS: 1599			Manufacturer/ Package Contractor	Manufacturer's test certificate must be submitted
8.2	Bend Strength	-do-	-do-		-do-			-do-	-do-

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SL. No	Component/ Operation and Description of test	Sampling plan with basis	Type of check	Instrument	Reference document	Acceptance Norm	Format of Record	Testing agency	Remarks
8.3	Surface cracks, Rrusts etc.	Random	Visual	Visual					
<b>9.0</b>	<b>TIMBER</b>								
9.1	Moisture Content	Every 1M <sup>3</sup> or part thereof	Measurement	Moisture meter				Package Contractor	Mandatory Test
<b>10.0</b>	<b>FLUSH DOOR SHUTTER</b>								
10.1	End Immersion	N = Total No of Shutters 1 Shutter for N<=65 2 Shutters for 65<N<=180 3 Shutters for 180<N<=300 4 Shutters for 300< N<=500 5 Shutters for N>=501	Destructive Test	At approved test house	IS: 2202			Package Contractor	Mandatory Test
10.2	Knife Test								
10.3	Adhesion Test								
<b>11.0</b>	<b>ALUMINIUM DOORS/ WINDOW FITTINGS</b>								
11.1	Thickness of Anodic Coating	Cost of fittings of every Rs.20,000/- or part Thereof	Measurement	At approved test house	IS: 5523			Package Contractor	Mandatory Test



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SL. No	Component/ Operation and Description of test	Sampling plan with basis	Type of check	In-stru-ment	Re-fer-ence docu-ment	Ac-ceptance Norm	Format of Rec-ord	Test-ing agency	Remarks
14.2	Impact Test	-do-	-do-	-do-	-do-	-do-	-do-	-do-	Optional Test
<b>15.0</b>	<b>MORTICE LOCK</b>								
15.1	Testing of springs	Every 100 locks or part thereof	Measu-ment	Approved Test House				Package Contractor	Mandatory Test
<b>16.0</b>	<b>BITUMEN</b>								
					IS: 73				
<b>17.0</b>	<b>STORAGE OF MATERIALS</b>								

TENDER NO: GGPL/KKD/C&P/CW/2545/VS



SL. No	Component/ Operation and Description of test	Sampling plan with basis	Type of check	Instrument	Reference document	Acceptance Norm	Format of Record	Testing agency	Remarks
17.1	Cement	100%	Visual		IS: 4082	Covered storage. <input type="checkbox"/> Clear gap of min. 15cm from the floor. <input type="checkbox"/> Space of min. 45cm around the exterior wall. <input type="checkbox"/> Stacking not more than 15 bags high arranged alternately length-length-wise and crosswise.			



TENDER NO: GGPL/KKD/C&P/CW/2545/VS



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SL. No	Component/ Operation and Description of test	Sampling plan with basis	Type of check	Instrument	Reference document	Acceptance Norm	Format of Record	Testing agency	Remarks
						<input type="checkbox"/> Width of the stack shall not be more than 3 meters			
17.2	Reinforcement	100%	Visual		IS: 4082	Open storage. <input type="checkbox"/> Bars of different classification, sizes and length will be stacked separately.			

TENDER NO: GGPL/KKD/C&P/CW/2545/VS



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SL. No	Component/ Operation and Description of test	Sampling plan with basis	Type of check	Instrument	Reference document	Acceptance Norm	Format of Record	Testing agency	Remarks
17.3	Brick	100%	Visual		IS: 4082	Open storage. <input type="checkbox"/> Bricks shall be stacked on dry firm ground. <input type="checkbox"/> Stacks shall be 50 bricks long and 10 bricks high. <input type="checkbox"/> Bricks shall be placed on edge. <input type="checkbox"/> Width of each stack shall be two bricks.			

TENDER NO: GGPL/KKD/C&P/CW/2545/VS



SL. No	Component/ Operation and Description of test	Sampling plan with basis	Type of check	In-stru-ment	Re-fer-ence docu-ment	Ac-ceptance Norm	Format of Rec-ord	Test-ing agency	Remarks
17.4	Aggregates	100%	Visual		IS: 4082	<ul style="list-style-type: none"><li><input type="checkbox"/> Shall be stored at site on a dry ground/ platform of planks/ old corru-gated iron sheets/ floor of bricks/ thin layer of lean concrete.</li><li><input type="checkbox"/> Stacks of fine ag-gregate and coarse aggregate shall kept in sepa-rate stockpiles.</li></ul>			

TENDER NO: GGPL/KKD/C&P/CW/2545/VS



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SL. No	Component/ Operation and Description of test	Sampling plan with basis	Type of check	Instrument	Reference document	Acceptance Norm	Format of Record	Testing agency	Remarks
17.5	Other Bought Out Items	100%	Visual		IS: 4082	Covered storage. Materials shall be stored as per manufacturer's specification.			
<b>18.0</b>	<b>PILING</b>								
<b>18.1</b>	<b>PLANT &amp; MACHINERY</b>								

TENDER NO: GGPL/KKD/C&P/CW/2545/VS



SL. No	Component/ Operation and Description of test	Sampling plan with basis	Type of check	In-stru-ment	Re-fer-ence docu-ment	Ac-ceptance Norm	Format of Rec-ord	Test-ing agency	Remarks
	<input type="checkbox"/> Concrete mixer <input type="checkbox"/> Vibrators of adequate capacity <input type="checkbox"/> Power driven rigs of adequate capacity <input type="checkbox"/> Weigh Batches <input type="checkbox"/> Lighting <input type="checkbox"/> Mobile Cranes		Visual/ Physical						
<b>19.0</b>	<b>CONSTRUCTION OF PILE</b>								
19.1	SPT values during boring operation	100%							

TENDER NO: GGPL/KKD/C&P/CW/2545/VS



SL. No	Component/ Operation and Description of test	Sampling plan with basis	Type of check	Instrument	Reference document	Acceptance Norm	Format of Record	Testing agency	Remarks
19.2	Tolerances in position	100%	Measurement	Measuring Tape	IS: 2911 (Part I/ Sec2)	Piles <600mm: 75mm or D/4 whichever is less. Piles >600mm: 75mm or D/10 whichever is more. For single pile: <600mm: 50mm or D/4 whichever is less. >600mm: 100mm.		Piling Contractor	
19.3	Control of alignment	100%	Measurement	Measuring Tape	IS: 2911 (Part I/ Sec2)	Vertical pile: 1.5 % deviation maximum. Raker pile: 4%			

TENDER NO: GGPL/KKD/C&P/CW/2545/VS



SL. No	Component/ Operation and Description of test	Sampling plan with basis	Type of check	Instrument	Reference document	Acceptance Norm	Format of Record	Testing agency	Remarks
19.4	Chipping of pile top	100%				Manual chipping after 3 days of casting. Pneumatic tools after 7 days of casting.			
<b>20.0</b>	<b>BENTONITE SUSPENSION:</b>								
20.1	Liquid limit		Measurement			>300% <400%		Piling Contractor	
20.2	Sand content of Bentonite powder		-do-			Not more than 7%		-do-	
20.3	Density of freshly prepared Bentonite suspension		-do-	Hydrometer	IS:9556	Between 1.034 and 1.10gm/ ml.		-do-	Shall be recorded for initial 10 piles and subsequently at every 10 <sup>th</sup> pile.
20.4	Marsh viscosity		-do-	Marsh cone		Between 30 and 60 sec		-do-	

TENDER NO: GGPL/KKD/C&P/CW/2545/VS



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SL. No	Component/ Operation and Description of test	Sampling plan with basis	Type of check	Instrument	Reference document	Acceptance Norm	Format of Record	Testing agency	Remarks
20.5	PH value of Bentonite suspension		-do-	PH indicator paper strip		Between 9 and 11.5		-do-	
20.6	Density after mixing with deleterious material		-do-	Hydrometer		Maximum. 1.25gm/ ml.		-do-	Shall be recorded for initial 10 piles and subsequently at every 10 <sup>th</sup> pile.
<b>21.0</b>	<b>PILE TESTING</b>								



TENDER NO: GGPL/KKD/C&P/CW/2545/VS



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SL. No	Component/ Operation and Description of test	Sampling plan with basis	Type of check	Instrument	Reference document	Acceptance Norm	Format of Record	Testing agency	Remarks
21.1	Vertical Load Test ( for both test & job piles )	Test pile. No of pile to be tested shall be minimum one.	Testing	Dial Gauge (Sensitivity of dial gauge : 0.01 mm )	IS:2911, Part-IV	Safe load shall be minimum of the following: (a)2/3 <sup>rd</sup> of final load against total displacement of 12 mm. (b) 50% of final load against total displacement of 10% of pile diameter.		Piling contractor	

TENDER NO: GGPL/KKD/C&P/CW/2545/VS



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SL. No	Component/ Operation and Description of test	Sampling plan with basis	Type of check	Instrument	Reference document	Acceptance Norm	Format of Record	Testing agency	Remarks
		Working pile. No of piles to be tested shall be minimum 1/2 % of total no of piles.	-do-	-do-	-do-	Maximum settlement shall not exceed 12 mm against test load 150% of working load.		-do-	
21.2	Lateral load test	Optional	Testing	-do-	IS:2911, Part-IV	Safe load shall be minimum of the following: (a) 50% of the final load against total displacement of 12 mm. (b) Final load against total displacement of 5 mm		-do-	

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**ANNEXURE - 1 MATERIAL TESTS FOR SITES**

SL. No	Component/ Operation and Description of test	Sampling plan with basis	Type of check	In-stru-ment	Re-fer-ence docu-ment	Ac-ceptance Norm	Format of Rec-ord	Test-ing agency	Remarks
21.3	Pull out Test	Optional	Tes-tin g	-do-	IS:2911, Part-IV	Safe load shall be least of the following: (a) 2/3rd of total load against displacement of 12mm. (b) Half of the load at which load displacement curve breaks		-do-	Initial test shall be carried out up to twice the estimated safe load.  Routine test shall be carried out to 150% of the estimated safe load or 12mm total displacement.

## ANNEXURE - 2 TESTING EQUIPMENT FOR SITES

S L N O	BROAD CLASS	NOMENCLATURE DESCRIPTION	UTILITY	TEST PROCE- DURE	REFER- ENCE DOCU- MENT	TO BE AVAIL- ABLE AT SITE
1.0	ROUTINE TEST LAB. EQUIPMENT	1.1 Vicat Apparatus	Cement con- sistency & Pene- tration	Penetration of Std. Needle	IS : 5513	Yes
		1.2 Lechatelier's test Apparatus	Cement shrinkage	Size variation after curing of sample	IS : 5514	Yes
		1.3 Mould ( Cement) (70.7x70.7x70.7 mm)	Cement cubes	Cubes made of 1:3 cement : Sand	IS : 10086	Yes
		1.4 Cement Mortar Mould Vibrator	Cube compaction	Vibration for fixed duration	IS : 10078	Yes
		1.5 Concrete Cube mould ( 150x150x150) mm	Concrete Cubes	-	IS : 10086	Yes
		1.6 Compressive strength Test- ing machine	Concrete Cube Test	Crushing strength of cube	IS : 2505	Yes
		1.7 Concrete slump cone	Workability Check	Drop in cone height of concrete	IS : 7320	Yes
		1.8 Coarse aggregate sieves	Sieve analysis	Sieving	IS : 383	Yes
		1.9 (a) Soil Core cutter (b) Proctor Compac- tion	To test compaction of soil	Core cut out of soil and density measured	IS : 2720	Yes
		1.10 Fine aggregate sieves	Sieve analysis	Sieving	IS : 383	Yes
		1.11 Sieve shaker	Mechanical sieving	-	-	Yes
		1.12 Aggregate impact Test Machine	Impact value of aggre- gate	-	IS : 9377	Yes

TENDER NO: GGPL/KKD/C&P/CW/2545/VS



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<b>2.0</b>	<b>DIMENSION- AL &amp; ALLIED MEASUR- ING EQUIP- MENT</b>	2.1 Theodolite & levelling staff	Levelling and centre line marking and ver- ticality measure- ment	Measurement and recording	-	Yes
		2.2 Measuring Tape	Dimension	-	-	Yes

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**ANNEXURE - 2 TESTING EQUIPMENT FOR SITES**

<b>S L N O</b>	<b>BROAD CLASS</b>	<b>NOMENCLATURE DESCRIPTION</b>	<b>UTILITY</b>	<b>TEST PROCE- DURE</b>	<b>REFER- ENCE DOCU- MENT</b>	<b>TO BE AVAIL- ABLE AT SITE</b>
		2.3 Laser Beam apparatus	Verticality of structures	Centre line alignment	-	Yes
<b>3.0</b>	<b>PROCESS CONTROL ACCESSORIES</b>	3.1 Oven	Material Drying for moisture control	Material to be kept for specific duration	-	Yes
		3.2 Physical balance	Weighing	-	-	Yes
		3.3 Air entrainment meter	To determine % of air in fresh concrete mix	Samples of fresh concrete to be taken and tested in the equipment	IS : 1199	Yes
<b>4.0</b>	<b>SPECIAL TEST EQUIP- MENT</b>	NDT 4.1 Rebound hammer	Strength test of concrete	Rebound of the ball is proportional to the strength of concrete	-	Yes
		4.2 Ultrasonic test for concrete	Test for porosity for concrete	Speed of the ray transmitted through the concrete indicates the extend of porosity	-	Yes
		4.3 Profometer/Micro covermeter	Location & diameter of reinforcement	Variation in density used to detect steel location	-	Yes
		D.T. 4.4 Portable electrically operated concrete core cutter	Strength of In-situ concrete	Core cut out of concrete tested for strength	-	Yes

TENDER NO: GGPL/KKD/C&P/CW/2545/VS



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SL. No	Description of Site Activity	Workmanship Checks to be undertaken	Remarks
1	Earth work	<ul style="list-style-type: none"><li>(a) Classification of Soil, for payments, if required.</li><li>(b) Line &amp; level.</li><li>(c) Disposal lead.</li><li>(d) Levelling at Disposal Yard.</li><li>(e) Initial &amp; Final level in Level Book.</li><li>(f) Rolling/Tamping/Compaction of Fills, as per IS : 2720</li><li>(g) Arrangement for de-watering.</li><li>(h) Shoring &amp; Strutting.</li><li>(i) Safety (side slopes, ramps, working space around foundation, dumping at safe distance beyond top edge).</li><li>(j) Excess excavation depth properly filled for foundation works.</li><li>(k) Foundation bed level, bearing capacity conformance.</li></ul>	

TENDER NO: GGPL/KKD/C&P/CW/2545/VS



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SL. No	Description of Site Activity	Workmanship Checks to be undertaken	Remarks
2	Piling Work	<ul style="list-style-type: none"><li>a) Diameter of Pile.</li><li>b) Depth Driver.</li><li>c) Sequence of driving in a pile group.</li><li>d) Set for last 10 blows or as specified.</li><li>e) Type and size of hammer and its stroke, in case of double acting hammer, No. of blows per minute &amp; stroke.</li><li>f) Type and condition of packing on the pile head and or dolly in the hammer.</li><li>g) Driving resistance record through variable strata in case of driven cast-in-situ pile.</li><li>h) Bore log in case of Bored pile.</li><li>i) Density of slurry in case of Bentonite slurry pile.</li><li>j) Date &amp; time of driving.</li><li>k) Date of concreting &amp; time gap between end of driving &amp; concreting.</li></ul>	



TENDER NO: GGPL/KKD/C&P/CW/2545/VS



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SL. No	Description of Site Activity	Workmanship Checks to be undertaken	Remarks
		l) Standing ground water level. m) Ground level at the commencement. n) Length of Pile. o) Length of Permanent casing. p) Set at intervals during last 3 Meters. q) Concrete Mix. r) Details of Reinforcement. s) Volume of Concrete supplied to pile against theoretical volume. t) Water tightness of pile before concreting. u) Eccentricity v) Deviation for Verticality. w) Condition of pile head at cut-off. x) Routine load test results. y) Initial load test results. z) Integrity test results of each pile.	

TENDER NO: GGPL/KKD/C&P/CW/2545/VS



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SL. No	Description of Site Activity	Workmanship Checks to be undertaken	Remarks
3	Concret-ing Works	<ul style="list-style-type: none"><li>(a) Check quality and size of coarse aggregate with special reference to undersize/oversize materials, disintegrated/self materials, earth and other foreign materials beyond limit, organic impurities.</li><li>(b) Fineness modulus of sand, silt content, bulkage, foreign materials in sand.</li><li>(c) Check formwork.</li><li>(d) Line, level of concrete.</li><li>(e) Honeycombed surface in concrete.</li><li>(f) Strength of Concrete.</li><li>(g) Check Mix Boxes.</li><li>(h) Mixing of concrete by hand/machine.</li><li>(i) Use of Vibrator.</li><li>(j) Slump of concrete.</li></ul>	

TENDER NO: GGPL/KKD/C&P/CW/2545/VS



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SL. No	Description of Site Activity	Workmanship Checks to be undertaken	Remarks
4	Formwork	<ul style="list-style-type: none"><li>a) Line, level and dimensions as per drawing.</li><li>b) Cross bracing of supporting framework.</li><li>c) Diagonal bracings.</li><li>d) Ground support rigidity to avoid settlement.</li><li>e) Plumbness of shores.</li><li>f) Wedge tightening of shores.</li><li>g) Thickness of shutter to withstand pressure of wet concrete.</li><li>h) Leakproofness of shutter ( IS : 457 )</li><li>i) Demoulding agent/Oiling of shutter.</li><li>j) Facility for removal of formwork in proper sequence.</li><li>k) Avoid premature removal.</li></ul>	

TENDER NO: GGPL/KKD/C&P/CW/2545/VS

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SL. No	Description of Site Activity	Workmanship Checks to be undertaken	Remarks
5	Reinforced Concrete Works	<ul style="list-style-type: none"> <li>a) Sieve analysis of coarse aggregate to check oversize, undersize, im-properly graded aggregate.</li> <li>b) Check presence of disintegrated/soft or foreign materials in aggregates.</li> <li>c) Quality of sand, Silt content, Bulkage test.</li> <li>d) Quality of Cement and age of Cement ( 1<sup>st</sup> in 1<sup>st</sup> OUT system )</li> <li>e) Quality of water for mixing and curing.</li> <li>f) Slump test.</li> <li>g) Cube Tests.</li> <li>h) Cover Block thickness and integrity (cover not reduced more than 2mm or increased by more than 10mm).</li> <li>i) Whether reinforcement exposed on removal of forms.</li> <li>j) Tensile testing of steel reinforcement, as required.</li> <li>k) Gauge of binding wire and its use at all joints.</li> <li>l) Reinforcement placement as per drawing and top reinforcement to be supported by chairs etc.</li> </ul>	

TENDER NO: GGPL/KKD/C&P/CW/2545/VS



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SL. No	Description of Site Activity	Workmanship Checks to be undertaken	Remarks
		<ul style="list-style-type: none"><li>m) Spacing of laps and staggering and length of lap.</li><li>n) Mix design record/requirements.</li><li>o) Rigidity and evenness of centring &amp; shuttering.</li><li>p) Finish requirement of surface.</li><li>q) Throating and moulding requirements as per drawings.</li><li>r) Line and level requirements as per drawing.</li><li>s) Expansion joint contraction, joint provisions.</li><li>t) Fixing of inserts, conduits, bolts to proper alignment.</li><li>u) Hacking of green concrete for future plastering.</li><li>v) Adequate curing.</li><li>w) Corrosion protection requirements of reinforcement.</li><li>x) Drainage provisions on roof surface ( slope &amp; spout )</li><li>y) Gangway placement for concreting to be independent of reinforcement.</li><li>z) Rigidity of reinforcement cage to avoid distortion during concreting</li></ul>	

TENDER NO: GGPL/KKD/C&P/CW/2545/VS



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SL. No	Description of Site Activity	Workmanship Checks to be undertaken	Remarks
		<p>aa) Compaction requirements of concrete by needle vibrators/Form vibrator etc.</p> <p>bb) Provisions at construction joint - Waterbar - Nozzles etc.</p> <p>cc) Provision of dowel bars 12mm <input type="checkbox"/> 300 long ( 400mm either side ) at <math>\perp</math> C/C on construction joint surface.</p>	

TENDER NO: GGPL/KKD/C&P/CW/2545/VS



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SL. No	Description of Site Activity	Workmanship Checks to be undertaken	Remarks
6	Brickwork	<ul style="list-style-type: none"><li>(a) Quality of bricks for strength, dimensional accuracy, efflorescence water absorption and evenness of backing.</li><li>(b) Sand quality for fineness modulus and Silt content.</li><li>(c) Cement quality.</li><li>(d) Mixing of Mortar to structural space.</li><li>(e) Thickness of joint not exceeding 10mm.</li><li>(f) Raking of joints in green stage by raking tool ( 15mm deep )</li><li>(g) Filling of vertical joints properly.</li><li>(h) Soaking of bricks.</li><li>(i) Line and level of brickwork.</li><li>(j) Plumbness.</li><li>(k) Brick corners are provided with proper brick closer not by brick bat.</li><li>(l) Top coarse in plinth, windowsill, below RC slab and parapets are with brick on edge.</li></ul>	

TENDER NO: GGPL/KKD/C&P/CW/2545/VS



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SL. No	Description of Site Activity	Workmanship Checks to be undertaken	Remarks
		<ul style="list-style-type: none"><li>(m) Type of scaffolding.</li><li>(n) Filling of scaffolding potholes.</li><li>(o) Brick coarses are in level.</li><li>(p) Proper bonding of main wall with cross wall ( No tothing joints )</li><li>(q) Brickwork taken-up in layers not exceeding 1 Metre.</li><li>(r) Proper provision of reinforcement in brick-wall.</li><li>(s) Lateral bonding of brick-wall to steel/concrete columns.</li><li>(t) Filling-up voids between brick -wall and door/windows shutter.</li><li>(u) Adequate curing of brickwork.</li></ul>	



TENDER NO: GGPL/KKD/C&P/CW/2545/VS



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SL. No	Description of Site Activity	Workmanship Checks to be undertaken	Remarks
7	Stone Masonary Work	(a) Quality of stone. (b) Strength of Mortar. (c) Mix of Mortar. (d) Quality of Sand - Silt content & fineness modulus. (e) Whether joints fully filled with Mortar. (f) Whether required number of bond stones provided (Marking of bond stone during construction needed for easy identification ). (g) Extent of spalls in hearting. (h) Line, Level, Thickness. (i) Joint thickness ( whether excessive thick )	

TENDER NO: GGPL/KKD/C&P/CW/2545/VS



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SL. No	Description of Site Activity	Workmanship Checks to be undertaken	Remarks
8	Flooring Work		
8.1	Cement Concrete Floor	(a) Aggregates, Sand - refer PCC Works. (b) Strength. (c) Thickness. (d) Hardener type and mix. (e) Panel size. (f) Curing arrangement. (g) Polishing requirement.	

TENDER NO: GGPL/KKD/C&P/CW/2545/VS



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SL. No	Description of Site Activity	Workmanship Checks to be undertaken	Remarks
8.2	Cast in situ Mosaic Floor	a) Aggregates, Sand - refer PCC Works. b) Strength. c) Thickness. d) Hardener type and mix. e) Panel size. f) Curing arrangement. g) Polishing requirement.	

TENDER NO: GGPL/KKD/C&P/CW/2545/VS



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SL. No	Description of Site Activity	Workmanship Checks to be undertaken	Remarks
8.3	Terrazzo Tile Floor	(a) Quality of Lime. (b) Strength test of tile. (c) Abrasion test of tile. (d) Thickness of Joint & Colour matching. (e) Polishing by 80, 120, 320 Grade Carborandum. (f) Any hollow sound when tapped. (g) Curing arrangement.	
8.4	Glazed Tile Floor	(a) Size of Tile (b) Thickness of Tile ( $\square$ 0.5 mm ) (c) No glazed surface at edges. (d) Free from crazing.	

TENDER NO: GGPL/KKD/C&P/CW/2545/VS



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SL. No	Description of Site Activity	Workmanship Checks to be undertaken	Remarks
9	Woodwork	<ul style="list-style-type: none"><li>a) Specified timber is used.</li><li>b) Grade of Wood.</li><li>c) Free from cracks, dead knots etc. as per grade specification.</li><li>d) Seasoning done or not.</li><li>e) Moisture content by moisture meter.</li><li>f) Lines, level and smoothness of finish &amp; planning.</li><li>g) Glue utilised in joints or not and whether bamboo pin (min. 10mm dia.) used in joint.</li><li>h) Tolerance of finished size.</li><li>i) Use of preservative against masonry surface.</li><li>j) Size of Holdfasts as per Specification.</li><li>k) Thickness and dimension of shutter in door panels.</li><li>l) Thickness of glass panels and quality of glass.</li><li>m) Whether Putty provided between glass-pane and sash bar &amp; glass pane and beading (No rattling sound when tapped).</li></ul>	

TENDER NO: GGPL/KKD/C&P/CW/2545/VS



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SL. No	Description of Site Activity	Workmanship Checks to be undertaken	Remarks
		<ul style="list-style-type: none"><li>n) Whether healing in flush door is of specified type solid core, hollow, particle board etc.</li><li>o) Quality of Ply and Glue in flush door (Not Urea formaldehyde).</li><li>p) Destruction test of flush door (End emersion, Knife test etc.)</li><li>q) Fitting quality and number as per Specification.</li><li>r) Surfacing of steel fittings as per specification (bright, black Japan, black enamelled, oxidised) and plate thickness.</li><li>s) Anodising thickness of aluminium fittings.</li><li>t) Type of brass fittings (Extruded/Cast) with plate thickness.</li><li>u) Check whether top &amp; bottom surface of shutter properly painted or note.</li><li>v) Painting of shutter to be done after checking of Knots etc.</li><li>w) Provision of Chits and Sand blocks.</li><li>x) Quality of Mesh in meshed shutter (No. of mesh/Sq.inch. ) and folding of mesh at the edges before fixing.</li></ul>	

SL. No	Description of Site Activity	Workmanship Checks to be undertaken	Remarks
10.	Steel doors /Windows /grills	a) Size of frame and corner welding of frames ( Flush butt welded as per specification ) b) Proper fixing of Hinge. c) Primer Coating. d) Provision of Tie Rod at bottom of Door frame for proper size maintenance during fixing. e) Line, Level & Plumb. f) Quality of friction hinges. g) Quantity of Putty ( □185 Gm. Per Meter length ) and painting of Putty within 2 weeks. h) Number of glazing Clips ( 4 to 6 ). i) Provision of metal beadings as per specification. j) Material of striking plate in windows (brass or not as per specification ) k) Welding of grill before fixing glazing without deformation of frame. l) Length of screws for fixing grills to windows frames.	

TENDER NO: GGPL/KKD/C&P/CW/2545/VS



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SL. No	Description of Site Activity	Workmanship Checks to be undertaken	Remarks
11.	Painting work	<ul style="list-style-type: none"><li>(a) Name of Manufacturer, Specification, Batch Number, Colour, Date of Manufacture, ISI Marking on Paint Contai</li><li>(b) Cracks, voids, pores on masonry surface properly filled.</li><li>(c) Nail-holes, cracks on wood surface properly filled.</li><li>(d) Steel surface preparation, sand blasting, derusting etc. as per Specification.</li><li>(e) Soundness and adherence of Old Paint.</li><li>(f) Paint quality ( No. adulteration by thinner ) and quality of Primer.</li><li>(g) Application of each coat of Paint for uniformity, paint drop, dabs, brush-marks, waves and variation of colour.</li><li>(h) Difficult to reach areas like edges, corners, nuts, bolts etc. are properly painted.</li><li>(i) Spilled Paints on floors &amp; walls properly cleaned.</li><li>(j) Painting of fan hooks and exposed surfaces of inserts as per Specification.</li></ul>	



TENDER NO: GGPL/KKD/C&P/CW/2545/VS

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SL. No	Description of Site Activity	Workmanship Checks to be undertaken	Remarks
12	Roofing Works	(a) Slope of roof. (b) Quality of Lime, Waterproofing materials etc. as per Specification. (c) Size & quality of brick ballast. (d) Weight & quality of bitumen felt. (e) Over-lapping of bitumen felts. (f) Test by ponding with water. (g) Formation of ridges & valleys. (h) Drip course provision. (i) Embedding of felt at vertical wall. (j) Hollering at the vertical turning point below felt. (k) Grouting of rainwater pipe. (l) Proper termination of Tarfelt near RWP.	

TENDER NO: GGPL/KKD/C&P/CW/2545/VS



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SL. No	Description of Site Activity	Workmanship Checks to be undertaken	Remarks
13	Water Supply & Sanitary works	<ul style="list-style-type: none"><li>(a) Quality of G.I. Pipe with original colour paint for class of pipe and IS Mark on surface of pipe.</li><li>(b) Joining of pipe with white lead and jute yarn on threads.</li><li>(c) Pipes are approachable for future maintenance.</li><li>(d) Provision of union at each Stop Cock.</li><li>(e) Supporting pipes with clamps suitably embedded &amp; jammed in wall</li><li>(f) Quality/Weight of water-tap, Stop Cocks, Ball Valves and Water Supply fittings as per Specification and ISI Mark.</li><li>(g) Provision of Vent. Pipe above Overhead Tank to avoid Airlock.</li><li>(h) Leading over-flow pipe from Tank upto roof drain spout.</li><li>(i) Mosquitoproof cemplings at over flow pipe of Tank &amp; Cisterns.</li><li>(j) Quantity of lead provided at Spigot &amp; Socket joints of pipes.</li><li>(k) Internal surface of HCI Pipes to have painting with Dr. Angus Smith Solution.</li><li>(l) Hydraulic testing of Water Supply system.</li></ul>	

TENDER NO: GGPL/KKD/C&P/CW/2545/VS



SL. No	Description of Site Activity	Workmanship Checks to be undertaken	Remarks
		<p>(m) Proper quality HCI Pipes used (Dimension, Weight, Finish, ISI Marks etc.) in Sewage System ( C.I. Rain-water pipes ) are not used in Sewage System.</p> <p>(n) Flushing test of flushing Cistern.</p> <p>(o) Hume Pipe Class, makes, dimension and test certificate.</p> <p>(p) Stone ware pipe make, dimension, finish, glazing and conforming to Class AA/Class A as per Specification.</p> <p>(q) Quality of Line and level of system.</p> <p>(r) Floor tap water-seal to be minimum as per Specification.</p> <p>(s) Manhole covers, road gully groutings weight, sizes, make &amp; finish.</p> <p>(t) Commercial quality ceramic fittings are not used.</p> <p>(u) Brand name, quality, dimension, colour, ISI marking for sanitary fixtures as per Specification.</p> <p>(v) Static head water test for HCI Pipe in section ( 4.5 Metres )</p> <p>(w) Test Performance for Water closets ( six pieces of toilet papers 150 x 115mm flushed completely 3 times out of 4 trials ) Water supply network tested to a pressure of 10 Kg/Cm<sup>2</sup> before taking over the system.</p>	

TENDER NO: GGPL/KKD/C&P/CW/2545/VS

FORMAT NO.L -01

DETERMINING THE GRADING OF SAND (FINAL AGGREGATE)

Date of Testing:	Wt. Of samples:	gms.	RETAINED ON IS SEIVE NO.	WT.RETAINED	PERCENTAGE WT. RETAINED	CUMULATIVE % WT. RETAINED	Type of aggregate	PERCENT-AGE PASS-ING	REMARKS (GRADING ZONE)
			1	10 mm					
			2	4.74 mm					
			3	2.36 mm					
			4	1.18 mm					
			5	600 microns					
			6	300 microns					
			7	150 microns					
			8	75 microns					

REFERENCE GRADING ZONES OF FINAL AGGREGATE (IS 383)

IS SEIVE DESIGNA-TION	GRADING ZONE I	GRADING ZONE II	GRADING ZONE III	GRADING ZONE IV
10mm	100	100	100	100
4.75 mm	90-100	90-100	90-100	95-100
2.36 mm	60-95	75-100	85-100	95-100
1.18 mm	30-70	55-90	75-100	90-100
600 microns	15-34	35-59	60-79	80-100
300 microns	5-20	8-30	12-40	15-50
150 microns	0-10	0-10	0-10	0-15

TENDER NO: GGPL/KKD/C&P/CW/2545/VS



FORMAT NO.L-02

METHODS OF DETERMINING THE GRADE OF COARSE AGGREGATE

Date of Testing:					Type of aggregate	PERCENT-AGE PASS-ING	REMARKS (GRADING ZONE)
Wt. Of samples:							
gms.	RETAINED ON IS SEIVE NO.	WT.RETAINED	PERCENTAGE WT. RETAINED	CUMULATIVE % WT. RETAINED			
SI.N O.							
1	40 mm						
2	20 mm						
3	16 mm						
4	12.5 mm						
5	10 mm						
6	4.75 mm						
7	2.36 mm						

GRADING ZONES OF COARSE AGGREGATE (IS 383)

IS SEIVE DESIGNATION	40 mm	20 mm	16 mm	12.5 mm
40 mm	95-100	100	-	-
20 mm	30-70	95-100	100	100
16 mm	-	-	90-100	-
12.5 mm	-	-	-	90-100
10 mm	10-35	25-55	30-70	40-85
4.75 mm	0-5	0-10	0-10	0-10
2.36 mm	-	-	-	-



TENDER NO: GGPL/KKD/C&P/CW/2545/VS

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FORMAT NO.L-03

<b>DATE :</b>							
<b><u>COMPRESSIVE STRENGTH OF CEMENT</u></b>							
<b>CONCRETE AGENCY :</b>							
<b>LOCATIONS :</b>							
<b>CUBE SIZE :</b>							
<b>DATE OF CAST :</b>							
<b>TYPE OF CEMENT :</b>							
<b>GRADE OF CONCRETE :</b>							
<b>WATER/ CEMENT RATIO :</b>							
<b>ADDITION OF PLASTICIS- ER :</b>							
<b>WEIGHT OF CUBE :</b>							
CUBE TEST				7 DAYS STRENGTH		28 DAYS STRENGTH	
SL. NO	MARK	DATE	SLUMP	FAILURE LOAD (KN)	STRENGTH (Kg/Cm <sup>2</sup> )	FAILURE LOAD (KN)	STRENGTH (Kg/Cm <sup>2</sup> )
1							
2							
3							
4							
5							
6							
PERIOD	SPECIFICATION			ACTUAL (AVERAGE)			
7 DAYS	Kg/Cm <sup>2</sup>			Kg/Cm <sup>2</sup>			
28 DAYS	Kg/Cm <sup>2</sup>			Kg/Cm <sup>2</sup>			

**TECHNICAL SPECIFICATION**

**FOR**

**STEEL STRUCTURAL WORKS SPECIFICATION**

**FOR FABRICATION, ERECTION AND PAINTING**

**OF**

**STEEL STRUCTURES**

**Contents**

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ANNEXURE –B.....

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ANNEXURE – E .....

ANNEXURE - F .....



## **1.0 GENERAL**

**1.1** This specification shall apply to steelwork in Canopy Structures and general structural works for the following Units :

A ) Structural unloading platforms , gates and pipe supports in 6 nos. of De-compression unit installations

B ) Canopy, Loading platform , gates and pipe supports in 3 nos. of CNG mother stations.

## **SECTION-1 FABRICATION OF STEEL STRUCTURES**

### **2.0 SCOPE OF WORK**

**2.1** The scope of work under fabrication includes, but not limited to, the following:

- a) Preparation and submission of material indents, bolt lists and bought-out items list.
- b) Procurement and Supply of Colour coated sheets for structures including packing, loading, transportation, unloading, stacking & storing on skids or supports at site.
- d) Procurement and supply of all consumables like bolts nuts, hooks, Polycoated hook bolts, washers, electrodes, paints, shims, packs, etc., taking into consideration allowance for spares and wastage.
- e) Preparation and submission of fabrication drawings ( based on Design drawings ) assembly drawings for sheeting, modification / rectification sketches, erection drawings, as-built drawings, bill of materials, bolts lists and shipping documents for approval of purchaser.
- f) Submission of design calculation for non-standard connections, temporary bracings etc. for approval of purchaser.
- g) Cold straightening of section and plates, whenever they are bent and kinked.
- h) Fabrication of all steel structural components covered under design drawings including M S, G I Gratings are generally described under the scope of the project.
- i) Making arrangements for and conducting tests, such as chemical analysis, physical and Mechanical tests on raw materials where specified/as directed by the Purchaser/Consultant. The scope of testing includes conducting tests at shop as well as at site in line with the instruction of Purchaser/Consultant.
- j) Making arrangements for providing all facilities for conducting ultrasonic, X-ray or gamma ray tests of welds, getting the tests conducted by reputed testing laboratories

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- making available test films / graphs, reports and interpretation. The scope of testing includes conducting tests at shop as well as at site in line with the instruction of Purchaser/Consultant.
- k) Controlled Assembly of steel structural components at shop, wherever required.
  - l) Preparation of steel structural surfaces for painting as provided in the specifications / drawings.
  - m) Application for one primer coat of painting at shop, as specified in the design drawing/specifications.
  - n) Loading, transportation from fabrication workshop to site of erection and unloading of all steel structural components / units / assemblies, Colour coated sheets, FRP sheets and their erection complete with all fittings and fixtures.
  - o) Receipt of free issue items if any from Purchaser's place, handling and unloading at site and fabrication/erection.
  - p) Dismantling wherever required and disposal of debris at a place designated by Purchaser or re-erection of the same as instructed by Purchaser.
  - q) Rectification of damaged structures including fixing, aligning, levelling, bolting and welding etc.
  - r) Preparation of "As-built" drawings.

**3.0 PREPARATION OF FABRICATION AND ERECTION DRAWINGS**

**3.1** Fabrication drawings shall be prepared based on design drawings of steel structures.

**3.2** Drawing shall be prepared in metric system as per IS:696-1972 and IS:813-1986. The fabrication drawings shall specify the following details:-

- (a) Type, size and length of welds in case of welded connections,(specifying clearly shop or site weld). Length of weld specified shall be effective length (excluding end crates).
- (b) In case of bolted joints, arrangement of bolts and specification of bolts, nuts etc.(specifying clearly shop and site bolts).
- (c) Specification of electrode/wire flux.
- (d) If required special provision to be mentioned in the drawings for handling of structures during and after fabrication.
- (e) Specification of paint and corresponding surface preparation for painting.
- (f) General arrangement/marketing plan.

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- (g) Reference to design drawings.
- (h) Material list indicating mark number-wise material requirement giving size, weight, material specification, identification number of each items, number of pieces required etc.
- (i) Layout with all connecting members with blown up joint details wherever required, in order to specify clearly various fabrication and erection requirements as per design drawings.
- (j) Specification of preparation of mating surfaces in case of connection by HSFG bolts.
- (k) Appropriate edge preparation in case of butt/groove welds in accordance with IS:9595-1996, for all plates and sections having thickness greater than 8 mm.
- (l) Erection clearances in order to facilitate smooth erection at site (ref clause no.17.2.2.of IS: 800- 2007).
- (m) Each erection piece shall be clearly identified by an erection mark in these drawings. All loose members shall be given part mark, which shall be 'wired on' the main erection piece for despatch.

**3.3** Fabrication drawings shall be prepared in such a manner that structures can be dispatched from fabrication shop to erection site with maximum economic transportable size, so as to reduce work involved at site to a minimum.

**3.4** Bracings shall be connected for 50% of the capacity of the member or the force specified in the design drawing, whichever is more.(for single angle bracing member, consider full area as effective for this purpose).

**3.5** Standard simple beam connections, unless otherwise stated in the drawings, shall be designed and detailed for 60% beam shear / moment carrying capacity.

**3.6** Wherever there is risk of nuts becoming loose due to vibration, lock nuts shall be provided, or nuts shall be welded after alignment and tightening.

**3.7** For all connections by permanent bolts, two nos. of washers shall be used. One washer bearing against the head and the other bearing against the nut.

**3.8** Detailing of structural steel members subject to dynamic loading shall be such as to ensure smooth transition of load, as well as best behaviour under stress due to fatigue. Welding across tension flange of crane girders is not permitted.

**3.9** For detailing connection, the allowable stress for materials, welds, bolts etc, shall be as per IS:800- 2007 and IS:816-2007, or as specified in the drawing.

**3.10** The contractor shall be responsible for design and detailing all connections. The design of connection shall provide adequate strength for transfer of force in the structural elements, as indicated on design drawings. Detailing shall be such that erection shall be convenient and free from all interfaces, drilling and cutting at site.

#### **4.0 MATERIALS**

##### **4.1 Structural Steel**

Structural steel and other related materials for construction shall conform to **ANNEXURE-F**.

4.1.2 Due to non-availability of specified materials, suitable substitutions may be provided with the consent of the purchaser. Such substitution shall be incorporated in the "As-built" drawings.

4.1.3 All the items are to be cut as per requirements of the drawing. If joints are to be provided in any item, in order to meet requirements of size and shape, cutting plan showing locations of joints shall be prepared for consideration of purchaser. Joints provided shall be incorporated in "As-built" drawings.

4.1.4 Rolling and cutting tolerances shall be as per IS: 1852:1985.

4.1.5 Only tested materials shall be used unless use of untested materials for certain secondary structural members is permitted by purchaser. If test certificate for the material is not available from the main producer, the following tests shall be carried out at the discretion of the purchaser.

- (a) Chemical Composition
- (b) Mechanical Properties
- (c) Weld ability test

4.1.6 Where steel castings are to be used the same shall conform to IS: 1030:1998

##### **4.2 Bolts and Nuts**

4.2.1 Black hexagonal bolts, nuts and lock-nuts shall conform to IS:1363(Part 1 to 3):2002

4.2.2 Precision and semi-precision hexagonal bolts, screws, nuts and lock-nuts shall conform to IS:1364(Part 1 to 6):2002.

4.2.3 High tensile friction grip bolts shall conform to IS:3757:1985 and high strength structural nuts shall conform to IS:6623:2004, and hardened steel washers to IS: 6649:1985.

##### **4.3 Electrodes**

4.3.1 Mild steel electrodes and high tensile steel electrodes shall conform to IS:814:2004. Electrode to be used for submerged arc welding shall conform to specification IS:7280:1974.

## **5.0 STORING OF MATERIALS**

5.1 Materials shall be stored and stacked properly ensuring that place is properly drained and is free from dirt. It shall be ensured that no damage is caused due to improper stacking.

## **6.0 MATERIAL PREPARATION**

6.1 Cut edges shall be finished smooth by grinding or machining wherever necessary. Sufficient allowance (3 mm to 5 mm ) should be kept in the items in case machining is necessary.

6.2 Cutting may be effected by gas cutting, shearing, cropping or sawing. In gas cutting of high tensile steel, special care is to be taken to leave sufficient metal to be removed by machining so that all metal that has been hardened by flame is removed.

6.3 Sufficient shrinkage allowance (@ 1mm/M) shall be kept wherever heavy welding is involved.

6.4 Straightening and bending shall be done in cold condition as far as practicable.

6.5 If required, straightening and bending may be done by application of heat between 900°C and 1100°C. Cooling down of the heated item shall be done slowly.

## **7.0 DRILLING AND PUNCHING OF HOLES**

7.1 Drilling and punching of holes for bolts shall be done as per IS:800:2007, unless otherwise specified by the purchaser.

7.2 Drifting of holes for bolts during assembly shall not cause enlargement of holes beyond permissible limit or damage the metal.

7.3 Holes for bolted connection should match well to permit easy entry of bolts. Gross mismatch of holes shall be avoided.

7.4 Permissible deviation in holes for mild steel bolts of normal accuracy and high strength bolts are given in the **ANNEXURE-A**.

## **8.0 ASSEMBLY FOR FABRICATION**

8.1 Fabrication of all structural steelwork shall be in accordance with IS:800-2007 and in

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- conformity with various clauses of this specification, unless otherwise specified in the drawings.
- 8.2** Fabrication of structures shall preferably be taken up as per the sequence of erection.
- 8.3** All erection units shall bear erection mark no. and reference drg no. at a prominent location on the structures for easy identification at site.
- 8.4** Fabricated structures shall conform to tolerance as specified in this standard and in IS:7215-1974. In case of contradiction, tolerances specified in this standard shall prevail.
- 8.5** All the components of structures shall be free from twist, bend, damage etc,
- 8.6** Assembly of structures shall be carried out by using suitable jigs and fixtures in order to obviate distortion during welding.
- 8.7** Cutting of items specially for truss, bracing, bunker, hopper, galleries surge girder, portal etc, shall be done only after checking of sizes as per Layout.
- 8.8** Surface, wherever machining is specified , shall be either planed or milled or ground to ensure maximum contact.
- 8.9** If end-milling or machining is planned after the assembly is over, sufficient allowance (5 mm to 15 mm) shall be kept in the items where milling/machining is to be done.
- 8.10** If pre-bending of the plate is required to avoid welding distortion, it shall be done in cold condition.
- 8.11** If extra joints are required to be provided in column, crane girder etc, approval should be obtained from the purchaser. However, as general guidance following is suggested. Splice joints of column and crane girder shall of full strength butt weld and wherever possible shall be located at zones of minimum or substantially lesser stress.
- 8.12** Splice joints of flange and web should be staggered.
- 8.13** Sufficient trial assembly of fabricated components (despatch elements) shall be carried out in the fabrication works to control the accuracy of workmanship.
- 8.14** Where necessary, washers shall be tapered or otherwise suitably shaped to give the heads of nuts and bolts satisfactory bearing.
- 8.15** The threaded portion of each bolt shall project through the nut at least by two thread.
- 8.16** Tolerance of assembled components of structures is given in **ANNEXURE-B**.
- 8.17** Permissible deviations from designed (true) geometrical form of the despatch elements shall be in accordance with IS: 7215-1974

**9.0 WELDING**

**9.1** The Contractor shall work out welding procedure for Purchaser's approval, considering the following factors :-

- (i) Specification and thickness of steel.
- (ii) Specification of electrode or/and base wire.
- (iii) Welding process (manual arc welding, submerged arc welding).
- (iv) Type of structures to be welded (thickness of components meeting at a joint).
- (v) Pre and post heating requirement.
- (vi) Preparation of fusion faces.
- (vii) Sequence of welding.
- (viii) Weather condition.
- (ix) Use of jigs and fixtures etc.
- (x) Type of non-destructive testing to be carried out.
- (xi) Inspection procedure to be followed
- (xii) Design requirements of the joints.

**9.2** Welding of any load bearing structure shall be carried out only by the person who has passed welder's qualification as per IS:7318 (Part-I)-1974.

**9.3** All metal arc welding shall be carried out as per IS:9595-1996.

**9.4** Submerged arc welding of mild steel and low alloy steel shall be as per IS:4353-1995.

**9.5** Electrode shall conform to IS 814: 2004

**9.6** Electrodes shall be stored in a dry place. Electrodes whose coatings are damaged due to absorption of moisture or due any other reason shall not be used.

**9.7** Low Hydrogen electrodes and flux for submerged welding shall be dried as per manufacturer's recommendation at 250-300 Degree C for one hour in drying oven before use.

**9.8** For suitability of wire flux combination, procedure test shall be carried out as per IS:3613-1974 if so required.

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- 9.9** Welding shall be done by electric arc process. Generally submerged arc, automatic & Semi-automatic welding shall be employed. Only where it is not practicable, manual arc welding may be resorted to. In case of manual arc welding, recommendations of electrode manufacturer is to be strictly followed.
- 9.10** Welding surface shall be smooth, uniform, free from fins, tears notches or any other defect which may adversely affect welding.
- 9.11** For multi-run weld deposit, the next run should be done only after thorough removal of slag and proper cleaning of surface.
- 9.12** Fillet weld shall have the correct profile with smooth transition into parent metal. Dressing of welds, if specified, shall be done by such method which does not cause grooving and other surface defects on the weld or on the parent metal.
- 9.13** All butt welds shall start and end with run-on and run-off plates. All such plates shall be carefully trimmed off by gas cutting after welding is over.
- 9.14** Fillet welds shall not be stopped at corners but shall be returned round them.
- 9.15** If butt weld is to be ground flush with the surface of the member as per drawing. adequate reinforcement shall be built up and then the same shall be chipped off and ground flush. The grinding is to be done in the direction of stress flow till the transverse marks are eliminated.
- 9.16** Welding shall not be done under such weather conditions which might adversely affect the efficiency of the welding.
- 9.17** Manipulators shall be used wherever necessary and shall be designed to facilitate welding and ensure that all welds are easily accessible to the operators.
- 9.18** Stress relieving after welding shall be done if especially called for in the drawing or specification. Ends of structural members and portions of gussets receiving welding at site shall be left unpainted.
- 9.19** Permissible deviation in assembly of weld joints shall be in accordance with **ANNEXURE - C**.
- 10.0** **INSPECTION & TESTING**
- 10.1** The purchaser/Inspector shall have free access at all times to those parts of Contractor's or his Sub- Contractor's works which are concerned with the fabrication of steel works and shall be afforded all reasonable facilities at all stages of preparation, fabrication and trial assemblies for satisfying himself that the fabrication is being undertaken in accordance with the provisions of relevant specification.



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- 10.2** All gauges and templates, tools, apparatus, labour and assistance for checking shall be supplied by the contractor free of charge. The purchaser /Inspector may at his discretion, check the test results obtained at the Contractor's works, by independent test at the Government Test House or elsewhere, and should the material so tested be found to be unsatisfactory, the cost of such test shall be borne by the Contractor.
- 10.3** Contractor shall make all necessary arrangements for stage inspection by purchaser/Inspector during the fabrication at shop and incorporate all on-the-spot instructions / changes conveyed in writing to the Contractor.
- 10.4** Material improperly detailed or wrongly fabricated shall be reported to the Purchaser/Inspector and shall be made good as directed. Minor misfits which can be remedied by moderate use of drift pins, and moderate amount of reaming and slight chipping may be corrected in that manner, if in the opinion of the Purchaser/Inspector the strength or appearance of the structure will not be adversely affected. In the event the Purchaser/Inspector directs otherwise, the items will be rejected and a completely new piece shall be fabricated. The cost of correcting errors shall be to the account of the Contractor.
- 10.5**
- i) The Purchaser/Engineer shall have the power:
    - a) To certify, before any structure is submitted for inspection, that the same is not in accordance with the contract, owing to the adoption of any unsatisfactory method of fabrication.
    - b) To reject any structure as not being in accordance with specifications & drawings.
    - c) To insist that no structure or parts of the structure once rejected is resubmitted for inspection/test, except in cases where the Purchaser / Inspector authorised representative considers the defects as rectifiable.
  - ii) If, on rejection of structure by the Purchaser/Inspector the Contractor fails to make satisfactory progress within the stipulated period, the Purchaser/Inspector shall be at liberty to cancel the contract and fabricate or authorize the fabrication of the structures at any other place he chooses, at the risk and cost of the Contractor, without prejudice to any action being taken in addition to terms of General Conditions of Contract.
  - iii) The Purchaser / Inspector's decision regarding rejection shall be final and binding on the Contractor.
  - iv) The specifications prescribe various tests at specified intervals for ascertaining the quality of the work done. If the tests prove unsatisfactory, Purchaser/Inspector shall have liberty to order the Contractor to re-do the work, done in that period and/ or to

order such alterations and strengthening that may be necessary at the cost of the Contractor and the contractor shall be bound to carry out such orders failing which the rectification/redoing will be done by the Purchaser through other agencies and the cost recovered from the Contractor.

- v) Notwithstanding any inspection at the workshop the Purchaser/Inspector shall have the liberty to reject, without being liable for compensation any fabricated members or materials brought to site that do not conform to specifications / drawings.
- vi) All rejected materials shall be removed from the site of fabrication by the Contractor at his own cost and within the time stipulated by the Purchaser/Inspector.

## **11.0 CONTROL IN WELDING**

Before inspection, the surface of weld metal shall be cleaned of all slag, spatter matter, scales etc. by using wire brush or chisel.

### **b) Dye Penetration Test (DPT)**

This shall be carried out for all important fillet welds and groove welds as desired by purchaser for both statically and dynamically loaded structures to check the following :

- i) Surface cracks
- ii) Surface porosities

Dye Penetration Test shall be carried out in accordance with American National Standard ASTM E165.

### **c) Ultrasonic testing**

Ultrasonic test shall be conducted for all butt/groove welds and heat affected zone in dynamically loaded structures and for other important load bearing butt welds in statically loaded structures as desired by purchaser, to detect the following :

- i) Cracks
- ii) Lack of fusion
- iii) Slag inclusions
- iv) Gas porosity

Ultrasonic testing shall be carried out in accordance with American National Standard ANSI/AWS D1.1.

Before ultrasonic test is carried out, any surface irregularity like undercuts, sharp ridges etc. shall be rectified. Material surface to be used for scanning by probes must allow free movement of probes. For this purpose, surface shall be prepared to make it suitable for carrying out ultrasonic examination.

**d) Radiographic Testing**

(X-ray and Gamma-Ray Examination) :- This test shall be limited to 2% of length of butt/groove welds for welds made by manual or semi- automatic welding and 1 % of length of weld if made by automatic welding machines . The location and extent of weld to be tested by this method shall be decided by purchaser to detect the following defects:

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**11.1** The extent of quality control in respect of welds for structural elements for both statically and dynamically loaded structures shall be as follows and shall be conducted by the contractor at his own cost:-

**a) Visual Examination** - All welds shall be 100% visually inspected to check the following:

- i) Presence of undercuts
- ii) Visually identifiable surface cracks in both welds and base metals.
- iii) Unfilled craters
- iv) Improper weld profile and size
- v) Excessive reinforcement in weld
- vi) Surface porosity

Before inspection, the surface of weld metal shall be cleaned of all slag, spatter matter, scales etc. by using wire brush or chisel.

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- i) Gas porosity
- ii) Slag inclusions
- iii) Lack of penetration
- iv) Lack of fusion
- v) Cracks

Radiographic testing shall be conducted in accordance with American National Standard ANSI/AWS D1.1

Any surface irregularity like undercuts, craters, pits etc. shall be removed before conducting radiographic test. The width of the radiographic film shall be width of the welded joint plus 20 mm on either side of the weld.

**12.0 ACCEPTABLE LIMITS OF DEFECTS IN WELD**

**12.1** Limits of Acceptability of welding defects shall be as follows: -

- a) Visual inspection & Dye Penetration Test - The limits of acceptability of defects detected during visual inspection and Dye Penetration Test shall be in accordance with American National Standard ANSI/AWS D1.1 for statically as well as dynamically loaded structures.
- b) Ultrasonic Testing - The limits of acceptability of defects detected during ultrasonic testing shall be in accordance with American National Standard ANSI/AWS D1.1 for statically and dynamically loaded structures.
- c) Radiographic testing - The limits of acceptability of defects detected during Radiographic testing shall be in accordance with American National Standard ANSI/AWS D1.1 for statically and dynamically loaded structures

**13.0 RECTIFICATION OF DEFECTS IN WELDS**

**13.1** In case of detection of defects in welds, the rectification of the same shall be done as follows :

- i) Al2I craters in the weld and breaks in the weld run shall be thoroughly filled with weld.
- ii) Undercuts, beyond acceptable limits, shall be repaired with dressing so as to provide smooth transition of weld to parent metal.
- iii) Welds with cracks and also welds with incomplete penetration, porosity, slag inclusion etc. exceeding permissible limits shall be rectified by removing the length of weld at the location of such defects plus 10 mm from both ends of defective weld, and shall be re-welded. Defective weld shall be removed by chipping hammer, gouging torch or grinding wheel. Care shall be taken not to damage the adjacent material.

**14.0 COMPLETION DOCUMENTS**

**14.1** On completion of work, the Contractor shall submit to the Purchaser the following documents: -

- a) The technical documents according to which the work was carried out.
- b) Copies of the "As built" drawings showing thereon all additions and alterations made during the fabrication.
- c) Manufacturers test certificates

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- d) Certificates/documents on control checking
- e) Test of welds
- f) Inspection Certificates issued by Purchaser/Consultant for the material/structures.

**15.0** In addition to provision of erection and transport equipments, the scope of work includes supply of tools and tackles, consumables, materials, labour and supervision and shall cover the following:

- a) Storing and stacking of all fabricated structural components/units/assemblies at site storage yards till the time of erection.
- b) Transportation of structures from storage yard to site of erection, including multiple handling, if required.
- c) All minor rectification / modifications such as :-
  - i) Removal of bends, kinks, twists etc. for parts damaged during transportation and handling.
  - ii) Reaming of holes which do not register or which are damaged, for use of next higher size bolt.
  - iii) Plug-welding and re-drilling of holes which do not register and which cannot be reamed for use of next higher size bolt.

Drilling of holes which are either not drilled at all or are drilled in incorrect position during fabrication.

- d) Fabrication of minor missing items as directed by the purchaser.
- e) Verification of the position of embedded anchor bolts and inserts w.r.t. line find levels, installed by others based on Geodetic Scheme / Bench mark / Reference co-ordinates to be furnished by the Purchaser.
- f) Assembly at site of steel Structural components wherever required, including temporary supports and staging.
- g) Marking arrangements for providing all facilities for
  - i) Conducting ultrasonic x-ray or gamma ray tests by reputed testing laboratories

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- ii) Making available test films / graphs, with reports / interpretation.
- h) Site Rectification of damaged portions of shop primer by cleaning and application touch-up paint.
- i) Erection of structures including making connections by bolts / High strength Friction Grip bolts/welding as per drawing.
- j) Alignment of all structures true to line, level plumbs and dimensions within specified limits of tolerance.
- k) Application at site after erection, required number of coats of primer and finishing paint as per specification and drawing.
- l) Rectification of structures as per Preliminary acceptance report and Final acceptance report.

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**SECTION 2                      ERECTION OF STEEL STRUCTURE**

**16.0            ERECTION**

**16.1            General**

16.1.1          Erection shall be carried out in accordance with IS:800:2007 and other relevant standards referred to therein.

16.1.2          For safe and accurate erection of structural steelwork, staging, temporary support, false-work etc. shall be erected as required.

16.1.3          The fabricated materials received at erection site shall be verified with respect of marking on the key plan/marketing plan or shipping list.

16.1.4          Any material found damaged or defective shall be stacked separately and the damaged or defective portions shall be painted in distinct colour for identification and the same shall be brought to the notice of the Purchaser.

**16.2            Erection of Structures**

16.2.1          Erection work shall be taken up after receipt of clearance from the purchaser.

16.2.2          For safety requirements during erection, provisions in IS:7205:1974, IS:7969:1975 and other relevant Indian standards shall be followed.

16.2.3          Erection shall be carried out with the help of maximum PMChanization possible.

16.2.4          Prior to commencement of erection, all the erection equipment ,tools, tackles, ropes etc. shall be tested for their load carrying capacity. Such tests may be repeated at intermediate stages also if considered necessary and frequent visual inspection shall be done of all vulnerable areas and components to detect damages or distress in the erection equipment, if any.

16.2.5          Following shall be taken care of during erection, whenever necessary:-

16.2.5.1        Temporary bracing, whenever required, shall be provided to sustain forces due to erection loads and equipment etc. Erected parts of the structures shall remain stable during all stages of erection when subjected to the action of wind, dead weight and erection forces etc. Specified sequence of erection of vertical and horizontal structural members shall be followed.

16.2.5.2        Erected members shall be held securely in place by bolts to take care of dead load, wind load and erection load.



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- 16.2.5.3 All connections shall achieve free expansion and contraction of structures wherever provided.
- 16.2.5.4 No final bolting or welding of joints shall be done until the structure has been properly aligned.
- 16.2.5.5 For positioning beams, columns and other steel members, the use of steel sledges is not permitted.
- 16.2.5.6 Instrumental checking of correctness of initial setting out of structures and adjustment of alignment shall be carried out in sequence and at different stages as required. The final leveling and alignment shall be carried out immediately after completion of each section of a building .
- 16.2.5.7 All structural members shall be erected with erection marks in the same relative position as shown in the appropriate erection and shop drawings.
- 16.2.5.8 The contractor shall design, manufacture, erect and provide false-work, staging temporary support etc. required for safe and accurate erection of structural steelwork and shall be fully responsible for the adequacy of the same.
- 16.2.5.9 The Contractor shall also provide facilities such as adequate temporary access ladders, gangways, tools & tackles, instruments etc.to purchaser for his inspection at any stage during erection.

**17.0 ROOF AND SIDE CLADDING WITH PRE-COLOUR COATED GALVALUME TROUGHED STEEL SHEETS**

- 17.1.1 The scope of work shall cover:
- a) Preparation of drawings showing layout and size of sheets used details of connections and flashings, bill of materials.
  - b) Roof & Side Pre- color coated galvalume troughed steel sheets ,flashings and like corner pieces, apron pieces, ridges etc, loading, transportation and supply at site, unloading, stacking & storing on skids, cutting and bending of sheets wherever required; drilling of holes all as per specification and drawings.
  - c) Supply , Loading, transportation, unloading and delivery of sheeting material to erection site.
  - d) Provision of all tools, tackles, equipment, labour supervision and services required for the satisfactory completion of the work specified herein and on the drawings.
  - f) Erection in position sheets for roofing, sides, erection of all flashings, fit-

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tings like ridges, valleys, gutters, corners, apron etc. at all locations all work as per drawings and specifications.

- g) Gutters with Down comers work shall be carried out in line with the drawings.

17.1.2 The roof sheet shall be of Galvalume/zincalume BHP steel sheet made of cold rolled steel of 550 MPA minimum yield strength conforming to ASTM A366 or AS 1595. Base metal thickness shall be 0.5mm and total thickness of colour coated profiled sheet shall be 0.58mm.

**17.1.3 Linear Metal False Ceiling :**

- a) Providing, cutting, fabrication and installation of canopy false ceiling with TRAC 150 F of Interarch (or equivalent) coil coated (Pre-painted) steel false ceiling system comprising of 150 mm wide x 17 mm deep roll formed out of 0.50 mm thick polyester coated galvanized steel panels, fixed on steel runner of 34.5 mm width x 48 mm deep manufactured out of 0.60 mm thick pre-coated galvanized steel with rigid suspension of 20x20x0.5 mm fixed with steel brackets/clips etc. The suspension system should be meant of exterior use. The carrier shall be suspended at 1mtr c/c supported from purlin and suspension angle at 500 mm c/c. panel shall be factory cut to provide minimum joints. The longitudinal joints shall have additional special G.I. Splice in between two panels. The carrier joint shall have a carrier splice maintaining a module of 150 mm. The ceiling shall be clipped on to the suspended carriers after they are aligned and leveled. Cutting for fixing of light fittings shall be done as per the cutout required to fit the fixture. The work shall

be carried out under a specialized and experienced supervisor. shall be humidity resistance, Fireproof, Moisture-Proof, Mould-Proof, Smoke-Proof, Sound-Absorbing product Metal ceiling panels shall be coil coated steel or Aluminum alloy of thickness 0.5 to 0.7MM

- b) Providing cut out in the false ceiling for the under lights as required. The under lights and wiring for the canopy, sinages shall be payable as per electrical SOR and Technical specifications.

**Technical details**

Size –150F

Thickness: 0.5 to 0.9MM

Sound Absorption (NRC): 0.60-0.70 Sound attenuation (dB): 28-34 Humidity

Resistance (%RH): 100 Fire Reaction: Class A (ASTM E84) Fire proof

Light Reflectance (%): 83-85

Panels are coil coated steel or Aluminum alloy

**18.0 RULES & REGULATIONS OF SAFETY, ELECTRICITY BOARDS, FACTORY ETC.**

**18.1** The Contractor shall at all times comply with all relevant factory acts, electricity rules, safety regulations etc. as per statutory regulations of Central / State Government.

**19.0 DEVIATIONS**

**19.1** Should the Contractor wish to deviate from any specification or details shown on the purchaser's approved drawings and / or Technical Specifications, he shall obtain the purchaser's written authority before proceeding with the deviations.

**20.0 MEASUREMENTS**

**20.1 Structural Steel**

Structural steelwork will be measured by the metric tonne and as per IS: 1200 (part-8) - 1993 and IS: 1200 (part-9) -1973 subject to provisions outlined below:-

- a) The calculation of quantities shall be based on unit weights for structural sections as given in IS: 808-1989 . The payments will be made on the basis of weights of members given in the approved fabrication drawings. However, any changes on the above weights during fabrication erection, payment shall be based on sketches Approved by the purchaser.
- b) In the event the I.S. does not specify any mode of measurement for a particular item of work, the same shall be measured as per any other relevant international standard or as directed by the Purchaser.
- c) The weight of all plates and sections shall be calculated from the approved drawing using the minimum overall square or rectangular dimensions and theoretical weight, no deduction being made for skew cuts, holes etc. In the case of plates, other than gussets, the actual dimensions shown on approved drawings will apply unless approved otherwise by the purchaser based on cutting diagram of mother plates.
- d) The weight of all welding runs, bolt, stanchion base packing, cuttings to waste and rolling margins, and coatings of paint, will be excluded from the measured weight and shall be deemed to have been allowed for in the rates for structural steelworks quoted by the Contractor.
- e) Temporary works and all other materials not included in the permanent works shall be excluded from any measurement for payment.

**21.0 SIGNAGE WORKS**

**21.1 Monolith tower(or Pylon)**

- 21.1.1 4mm thick ACM (Aluminium Composite Material) panel router cut cladding on M.S. framework (hollow steel sections as per design requirement) with Product Panels of Retro Reflective Sheeting Type XI DG3 Microprismetice as per ASTM D 4956-09 in required colour & Size on both sides. Retro Reflective shall be of appropriate approved colour and cutouts for product names, logos, etc. duly CNC Plotted. The body of the monolith shall be in ACM having Total Thickness of 4mm : Top Coil 0.5mm ( 3003/3105 Grade as per IS - 737 1986 with minimum 25 microns PVdF Coating on top coil and Polyester / Epoxy coating on Back Coil ( 4 -7 microns PVDF ACM in colour and shape as per approved design.

The company logo should be prepared in polycarbonate sheets (GE/ LEXAN make) in corporate colours and thermoformed to form the design which shall be in turn fixed in cutouts made in monolith body of ACM. The portions of the monolith to be backlit to make the acrylic/ polycarbonate portions/ logos visible at night. Special spot lights (2 nos.- 400 watts with metal halide lights of Philips make) to be incorporated in design to light up the entire tower with throw from base. The backlit portion of the monolith to be lit with sufficient numbers T5 (28 W) tube lights (Philips make) with electronic choke, mounted on MS tube frames with plastic holders. Multi-strand copper conductors with PVC insulation to be used. Steel structural frame to be installed on RCC foundations. Top and exposed sides of the foundation to be cladded in 18 mm thick black polished granite. All work to be done in line, level and plumb, all complete with by works, as approved.

## **21.2 Canopy Fascia (1000mm wide) on canopy vertical faces**

- 21.2.1 4mm thick ACM (of approved make) cladding in a combination of corporate colours with the use of Retro Reflective Sheeting Type XI DG3 Microprismetice duly pasted on ACM in required size & shape (colour scheme and design to be approved) on mild steel framework with part backlit for company logo and name. The letters shall be in 30 mm thick Acrylic/ PC duly CNC Routed in require shape & Size as per direction of concerned engineer. Structural frame to be welded rigidly/ Bolted to the structural member of existing canopy structures. Canopy fascia to be made in 12 m. (min.) long straight panels factory plan/processed at converters factory and assembled/installed at site. Corner piece (1 metre both sides) on both sides (as required), also to be factory plan/processed/assembled and installed at site. Only bottom trim and top flashing is to be Plan/processed and installed at site. All work to be done in line, level and plumb.

Backlit section of the fascia shall be of 4 meters length and one/ two logos (depending on design) and shall have sufficient number of LED/T5 (28 W) tube light with electronic chokes mounted with plastic holders to structural frame. The top of the fascia shall have 4 mm thick ACM with hinged GI service door in backlit part. The back of the fascia to have 18 gauge GI sheets. Multi-strand copper conductors with PVC insulation to be used. The bottom and top of the fascia shall have a white ACM trim to cover the gap between the canopy and fascia. The backside will be non-lit. the contractor should

make suitable fixing arrangement, which should be duly vetted by a certified structural engineer as per the actual dimensions of the canopy structure. The canopy fascia shall have a combination of approximately 200 wide ACM on the top and 700 wide below in proper approved design and colour scheme, complete with all by works

**21.3 Building Fascia, 700mm wide on top of building faces in Elevation**

- 21.3.1 4mm thick ACM (of approved make) cladding in a combination of corporate colours with the use of Retro Reflective Sheeting Type XI DG3 Microprismetice as per ASTM D 4956-09 duly pasted on ACM in required size & shape (colour scheme to be approved) on mild steel framework.

Structural frame to be fasteners/ Nut Bolted to the building walls with dash fasteners and leveling 'arrangement. Building fascia to be made in maximum length of straight panels (with minimum no. of joints) straight panels factory plan/processed at converters factory and assembled/installed at site. Corner piece (1 metre both sides) on both sides, also to be factory plan/processed/assembled and installed at site. Only bottom trim and top flashing is to be Plan/processed and installed at site. All work to be done in line, level and plumb, all complete with by works, as approved.

**21.4 Spreader, 1200X450X150mm**

- 21.4.1 4mm thick ACM (Aluminium Composite Material) cladding with the use of Retro Reflective Sheeting Type XI DG3 Microprismetice as per ASTM D 4956-09 duly pasted on ACM in required size & shape on structural framework with back-lit panels in 10 mm thick Acrylic/ PC duly CNC Routed in require shape & Size as per direction of concerned engineer. Front face of panels to have appropriate colour with cutout for text as indicated in drawings as approved and the sides to be white. Spreader frame to be fixed securely to canopy columns with box & cap arrangement. The spreader to be made in two sections as per design with 'L' lock. The smaller section to be mounted on sliding channel with sufficient no. of LED/ CFL lights and electronic chokes fixed with plastic holders. Multi-strand copper conductors with PVC insulation to be used. All work to be done in line, level and plumb, all complete with by works, as approved.

**21.5 Mandatory sign, 300X750mm(on column), 300X450(on toilets)&300X600 (in compressor & LCV area)**

- 21.5.1 4mm thick. ACM (Aluminum Composite Material) sheets cladded on structural framework. Matter/Logo in Retro Reflective Sheeting Type XI DG3 Microprismetice as per ASTM D 4956-09 duly pasted on ACM in required size & shape, all complete with by works, as approved.

300mm X 750mm 300mm X 450mm 300mm X 600mm

**21.6 Direction sign**

21.6.1 4mm thick. ACM (Aluminum Composite Material) cladding on steel framework with the use of 3M (or approved equivalent make) Retro Reflective Sheeting Type XI DG3 Microprismatic as per ASTM D 4956-09 duly pasted on ACM in require size & shap & back-lit panels in 10 mm thick Acrylic/ PC duly CNC Routed in require shape & Size as per direction of concerned engineer or 3 mm thick, thermoformed PET-G (Spectra Copolymer/ Relstar) on both sides. Front face of PET-G panels to have acrylic of appropriate colour with cutout for arrow sign as indicated in drawings and the sides to be white. The sign frame to be fixed securely to CC foundation as shown in drawings. The CC foundation shall have 8mm thick polished black granite tiles cladding on top and all exposed side surfaces. Sufficient no. of LED/ T5 (14 W) tube lights with electronic chokes fixed with plastic holders and electric connections. Multi-strand copper conductors with PVC insulation to be used. All work to be done in line, level and plumb, all complete with by works, as approved.

**21.7 Canopy column cladding**

21.7.1 Cladding in white 4mm thick ACM (Aluminum Composite Material) on structural with suspension pin, fixed securely to existing canopy column by welding at site. ACM panel fixing to ensure consistent joint gaps and panel size. All grooves shall be sealed with sealant material of approved colour, all complete with by works, as approved.

250mm X 500 mm 200mm X 400mm

a) Hoarding

Printed Flex sheet (make LG or 3M) with approved Art work (suitable for front lit) to be Fitted to the steel sheet of existing Hoarding structure in aluminium frame using Klick Rail System & as per direction of concerned Engineer/client.

b) Spot halogen lights

Supplying and fixing Spot halogen lights (150 watts of Philips make) at an interval of 2 m center to center on top of existing hoarding including supply with steel bracket and laying of cable upto electrical panel of Electrical room (in Utility building) complete in all respect.

**SECTION-3 PAINTING OF STEEL STRUCTURES**

**22.0 SURFACE PREPARATION FOR PAINTING**

**22.1 General**

The steel surface which is to be prepared shall be cleaned of dirt and grease and the heavier layers of rust by grinding prior to actual surface preparation to a specified grade.

## **22.2 Mechanical Cleaning**

### **22.2.1 Manual/power tool cleaning.**

Manual/power tool cleaning shall be done as per grade St-2 or St-3, of Swedish Standard Institution SIS 055900.

- i) Grade St-2: Thorough scraping and wire brushing, machine brushing, grinding etc. This grade of preparation shall remove loose mill scale, rust and foreign matter. Finally the surface is to be cleaned with a vacuum cleaner or with clean compressed air or with clean brush. After preparation, the surface should have a faint metallic sheen. The appearance shall correspond to the prints designated St-2.
- ii) Grade St-3: very thorough scraping and wire brushing, machine brushing, grinding etc. The surface preparation is same as for grade St-2 but to be done much more thoroughly. After preparing the surface, it should have a pronounced metallic sheen and correspond to the prints designated St-3.

## **23.0 PAINTS AND PAINTING**

**23.1** For use of specific painting system, the paint manufacturer's specification shall prevail.

**23.2** General compatibility between primer and finishing paints shall be established through the paint manufacturer supplying the paints.

**23.3** Before buying the paint in bulk, it is recommended to obtain sample of paint and establish "Control Area of Painting". On control area surface preparation and painting shall be carried out in the presence of manufacturer of paint.

**23.4** In order to ensure that the supplied paint meets the stipulation in design drawing/ specification, if required, samples of paint shall be tested in laboratories to establish quality of paint with respect to (i) Viscosity (ii) adhesion/ bond of paint in steel surfaces (iii) adhesion/simulated salt spray test (iv) chemical analysis (percentage of solids by weight) (v) normal wear resistance as encountered during handling & erection (vi) resistance against exposure to acid fumes etc.

**23.5** Whole quantity of paint for a particular system of paint shall be obtained from the same manufacturer.

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- 23.6** Thinners, wherever used, shall be as per recommendation of the paint manufacturer.
- 23.7** Areas which become inaccessible after assembly of structures shall be painted before assembly, after cleaning the surfaces as specified.
- 23.8** Wherever shop primer painting is scratched, abraded or damaged, the surfaces shall be thoroughly cleaned using emery paper and power driven wire brush wherever warranted, and touched up with corresponding primer. Touching up paint shall be matched and blended to eliminate conspicuous marks.
- 23.9** If more than 50% of the painted surface of an item requires repair, the entire item shall be Mechanically cleaned and new primer coats shall be applied followed by finishing coats as per painting specification.
- All field welded areas on shop painted item shall be Mechanically cleaned (including the weld area proper, adjacent areas contaminated by weld spatter or fumes and areas where existing primer. intermediate / finishing paint is burnt). Subsequently, new primer and finishing coats of paint shall be applied as per painting specification.
- 23.10** Application of paint shall be by spraying or brushing as per IS:487-1985 and in uniform layers of 50% overlapping strokes. Painting shall not be done when the temperature is less than 5°C or relative humidity more than 85%, unless manufacturer's recommendations permit. Also painting shall not be done in frosty or foggy weather. During application, paint agitation must be provided wherever such agitation is recommended by the manufacturer.
- 23.11** Paint shall be applied at manufacturer's recommended rates. The number of coats shall be such that the minimum dry film thickness (DFT) specified is achieved. The dry film thickness of painted surfaces shall be checked with ELCOMETER or measuring gauges to ensure application of specified DFT.
- 23.12** All structures shall receive appropriate number of primer and finishing coats in order to achieve overall DFT as per design drawings/ specifications. First coat of primer paint shall be applied not later than 2-3 hours after preparation of surface, unless specified otherwise.
- 23.13** The finishing paint as specified shall be of approved colour and quality. The under coat shall have different tint to distinguish the same from the finishing coat.
- 23.14** Edges, corners, crevices, depressions, joints and welds shall receive special attention to ensure that they receive painting coats of the required thickness.
- 23.15** Machine-finished surface shall be coated with white lead and tallow before shipment or before being put into the open air.
- 23.16** Parts of surfaces embedded in concrete shall be thoroughly cleaned of grease, rust, mill scale etc. and shall be given a protective coat of portland cement slurry immediately af-



ter fabrication. No paint shall be applied on this part.

**23.17** Zinc-rich primer paints, which have been exposed several months before finishing coat is applied, shall be washed down thoroughly to remove soluble zinc salt deposits. In similar circumstances, the surfaces of paint based on epoxy resin should be abraded or lightly blast cleaned to ensure adhesion of next coat.

**23.18** Surfaces which cannot be painted but require protection shall be given a coat of rust inhibitive grease according to IS:958-2000 or equivalent international standard.

**24.0 PAINTING SYSTEM**

The recommended painting system for general service requirement of steel structures Refer **ANNEXURE-E**.

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**ANNEXURE-A**

Permissible deviations in pitch and gauge of holes for bolts of normal accuracy (high strength bolts included)

Description	Hole diameter (mm)	Permissible Deviations in Spacing (mm)	Permissible deviations in each group of holes	
			Carbon Steel 4	Low Al-loyed Steel 5
1	2	3		
a) Deviation in the hole diameter.	Upto 17.0 Above 17.0	+1 +1.5	No limits	
b) Ovality (difference between the biggest and the smallest diameter)	Upto 17.0; Above 17.0;	+1 +1.5	No limits	
c) Curves, exceeding 1mm and cracks on the hole edges	–	–	Not Permissible	
d) (i) Non-coincidence of holes in separate details of the assembled unit, upto 1mm	–	–	Upto 50%	Upto 50%
(ii) Above 1 mm upto 1.5 mm	–	–	Upto 10%	Upto 10%
e) Slope of axis	–	Upto 30% of the thickness of unit	No limits	No limits

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**ANNEXURE –B**

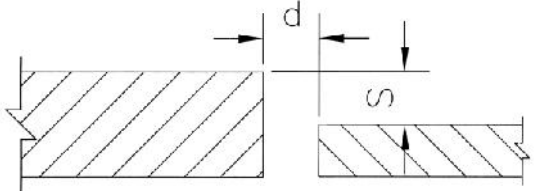
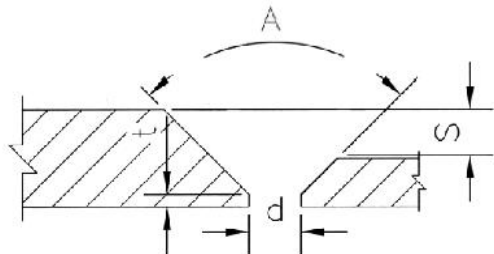
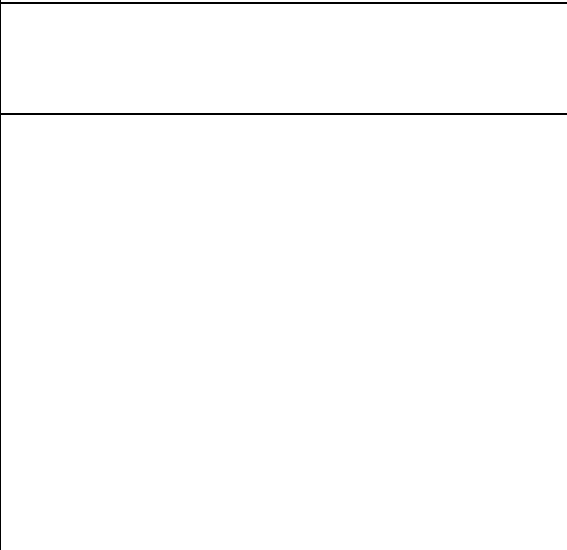
**TOLERANCE OF ASSEMBLED COMPONENTS OF STRUCTURES**

Description of Deviation ( $\pm$ ) in mm for the Elements of Structures Components of Length in Metres

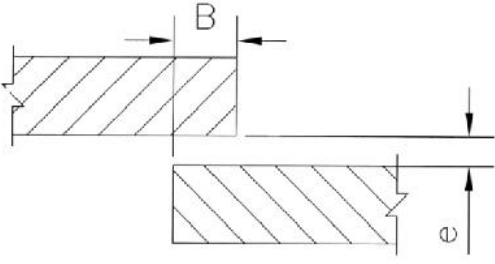
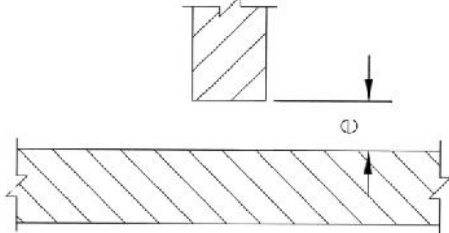
Structures	Up to 1	1 to 5	5 to 10	10 to 15	15 to 20	20 to 25	Over 25
1	2	3	4	5	6	7	8
I.i) Deviations from the dimensions assembled. Length & width of the Details Cut :							
a) Manual gas Cutting as per marking	3	3.5	4	4.5	5	-	-
b) With shears or with a saw as per marking	2	2.5	3	3.5	4	-	-
c) With shears or with a saw with a stop	1.5	2	2.5	3	3.5	-	-
d) Machine Gas Cutting	2	2.5	3	3.5	4	-	-
ii)Length and width of planed ends processed on Edge Planing Machine	1	1.5	2	2.5	3	-	-
II i) Distance between the Centres of the End holes.							
a) Drilled according to marking	2	2.5	3	3.5	4	-	-
b) Drilled according to a gauge with bushing	1	1.5	2	2.5	3	-	-
ii)Distance between the centres of adjacent holes							
a) Drilled according to marking or to a gauge	1.5	-	-	-	-	-	-
b) Drilled according to a gauge with bushings	0.5	-	-	-	-	-	-
III. Deviation in the dimensions of despatch elements after completion of fabrication, Assembled in positioners or in other Devices with clamps in fixed positioners and also							
a) According to guide blocks with pins.	2	3	5	7	8	9	10
b) Assembled with bolts	3	5	8	11	12	14	15
c) Size (length & width) between Milled surface (for all cases of assembly)	1	1.5	2	2.5	3	3.5	4
d) The same made in separate details during machining & fixed during the assembling work with clamps	2	3	5	7	8	9	10
e) The same drilled according to positioners in finished structures	1	1.5	2	2.5	3	3.5	4

**ANNEXURE – C**

**PERMISSIBLE DEVIATION IN ASSEMBLY OF WELDED JOINTS:**

Description	Permissible deviation	Sketch
<p>A. Square-butt Joints:</p> <p>a) Gap between the ends of plates (d)</p> <p>b) Stepping of one plate over the other (s)</p>	<p><math>\pm 1</math> mm</p> <p>1 mm</p>	
<p>B. Single Vee-groove Joints (without backing strip)</p> <p>a) Bevel angle (<math>A^\circ</math>)</p> <p>b) Gap between two Plates (d)</p> <p>c) Stepping of one plate over the other (s)</p> <p>d) Root thickness (t)</p>	<p><math>\pm 5^\circ</math></p> <p><math>\pm 1</math> mm</p> <p>2 mm</p> <p>1 mm</p>	
<p>C. Double V-groove Joint</p> <p>a) Stepping of one plate over the others (s)</p> <p>b) Deviation in the value of Root thickness (t)</p> <p>c) Deviation in Bevel angle (<math>A^\circ</math>)</p> <p>d) Deviation in value of Gap (d)</p>	<p>2 mm</p> <p>1 mm</p> <p><math>\pm 5^\circ</math></p> <p><math>\pm 1</math> mm</p>	
<p>D. Lap Joints:</p>		

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	<p>a) Overlap (B)</p> <p>b) Gap between the surfaces (e)</p>	<p>5 mm</p> <p>1 mm</p>	
<p>E.</p>	<p>Tee fillet Joints:</p> <p>a) gap between the edge of the web and the surface of the flange(e)</p>		

**ANNEXURE – D**
**TOLERANCES IN ERECTED STEEL STRUCTURES**

SI No.	Description	Tolerance (mm)
<b>A. COLUMNS</b>		
1.	Deviation of column axes at foundation top level with respect to true axes.	
	i) In Longitudinal direction	± 5
	ii) In Lateral direction	± 5
2.	Deviation in the level of bearing surface of columns at foundation top with respect to true level	± 5
3.	Out of plumbness (verticality) of column axis from true vertical axis and measured at column top :	
	a) For columns without any special requirements :	
	i) Upto and including 30m	±H/1000 or ± 25mm height whichever is less
	ii) Over 30 m height	± H/1200 Or ± 35mm maximum
	b) For column with special requirements like cranes or such similar requirements :	
	i) Upto and including 30m	±H/1000 or ± 20mm height whichever is less
	ii) Over 30 m height	± H/1500 or ± 25mm maximum
4.	Deviation in straightness in longitudinal & transverse planes of columns, at any point along the height	± H/1000or ± 10mm whichever is less.
5.	Difference in the erected position of adjacent pairs of columns along length or across width of building, prior to connecting trusses / beams, with respect to true distance.	± 5
6.	Deviation in any bearing or seating level with respect to true level.	± 5
7.	Difference in bearing levels of a member on adjacent pair of columns both across and along the building, from the true difference.	± 5

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NOTE :i) Tolerance specified under 3(a) and 3(b) should be read in conjunction with 4 and 5.

ii) "H" above is the column height in mm

**B. TRUSSES**

1.	Shift, at the centre of top chord member of truss with respect to the centre of span or vertical plane passing through the centre of bottom chord.	$\pm 1/250$ of height span in mm or $\pm 15$ mm whichever is less
2.	Lateral shift of top chord at the centre of of truss span from the vertical plane passing through the centre of supports of the truss.	$\pm 1/1500$ of span of truss in mm or $\pm 10$ mm whichever is less
3.	Lateral shift in location of truss from its true vertical position.	$\pm 10$
4.	Lateral shift in location of purlins from true position.	$\pm 5$
5.	Deviation in difference of bearing levels of trusses or beam from the true  (L =span) difference.	L/1200 or 20 mm whichever is less
6.	Relative shift in the track location of crane stops (end buffers) along the crane tracks, along track	1/1000 of gauge S in mm  subject to maximum of 20 mm gauge.

## **PAINTING SYSTEM**

Enamel System :

- i) Primer Paint : Two coats of Zinc Phosphate in phenolic alkyd medium (DFT=40 microns/coat)
- ii) Intermediate Paint : One coat of Synthetic MIO( ie: micaceous iron oxide) (DFT=75 microns/coat)
- iii) Finishing paint : Two coats of Synthetic enamel (DFT=25 microns/coat) conforming to IS: 2932-2003

## **ANNEXURE - F**

### **MATERIAL OF CONSTRUCTION (AS APPLICABLE)**

1. Unless otherwise specified in the drawing:
  - a) All rolled sections and plates shall conform to Grade-A as per IS:2062-1999.
  - b) Plated structures subjected to dynamic loading shall conform to Grade-B as per IS: 2062-1999.
2. Steel sheets shall conform to IS:1079-1994.
3. Steel tubes for structural purposes shall conform to IS:1161 1998(Grade YST-240).
4. Collectors and down comers shall conform to IS:3589-2001.
5. All black hexagonal bolts, nuts and locknuts shall conform to IS:1363(Part 1 to 3 -2002 and IS:1364(Part 1 to 6)-2002(for precision and semi- precision hexagonal bolts). Washers shall conform to IS:5369-1975.
6. All HSEFG bolts shall conform to IS:3757-1985.
7. Covered electrodes for arc welding shall conform to IS:814- 1991. Coding of electrodes shall be as follows :-
  - a) ER 421 'C' x for mild steel of Grade A and Grade-B as per IS:2062-1999.
  - b) EB 542 'C' x H3X  
for
    - i) Mild Steel of Grade B as per IS:2062-1999 for dynamically loaded structures (arising out of crane, vibratory screen, equipment etc.)
    - ii) For SAIL-MA micro alloyed steel 350 HYA/HYB.



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- iii) When combined thickness (CT) for steel conforming to IS:2062-1999 exceeds 40mm as per Fig.1  
"C" is the value of current as recommended by the electrode manufacturer.

**STRUCTURAL AND CIVIL DRAWINGS**

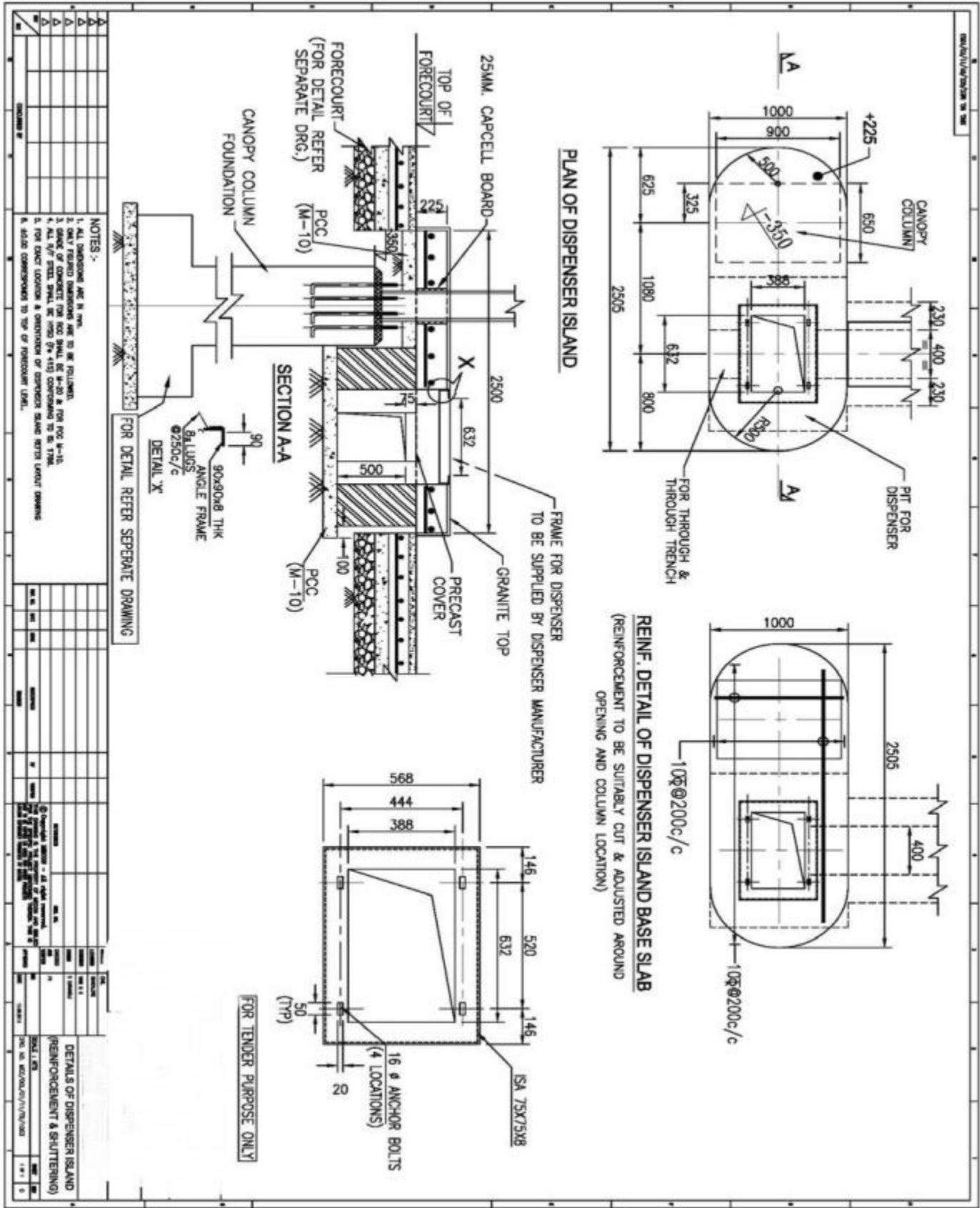
**LIST OF STANDARD DRAWINGS (CIVIL AND STRUICUTURAL)**

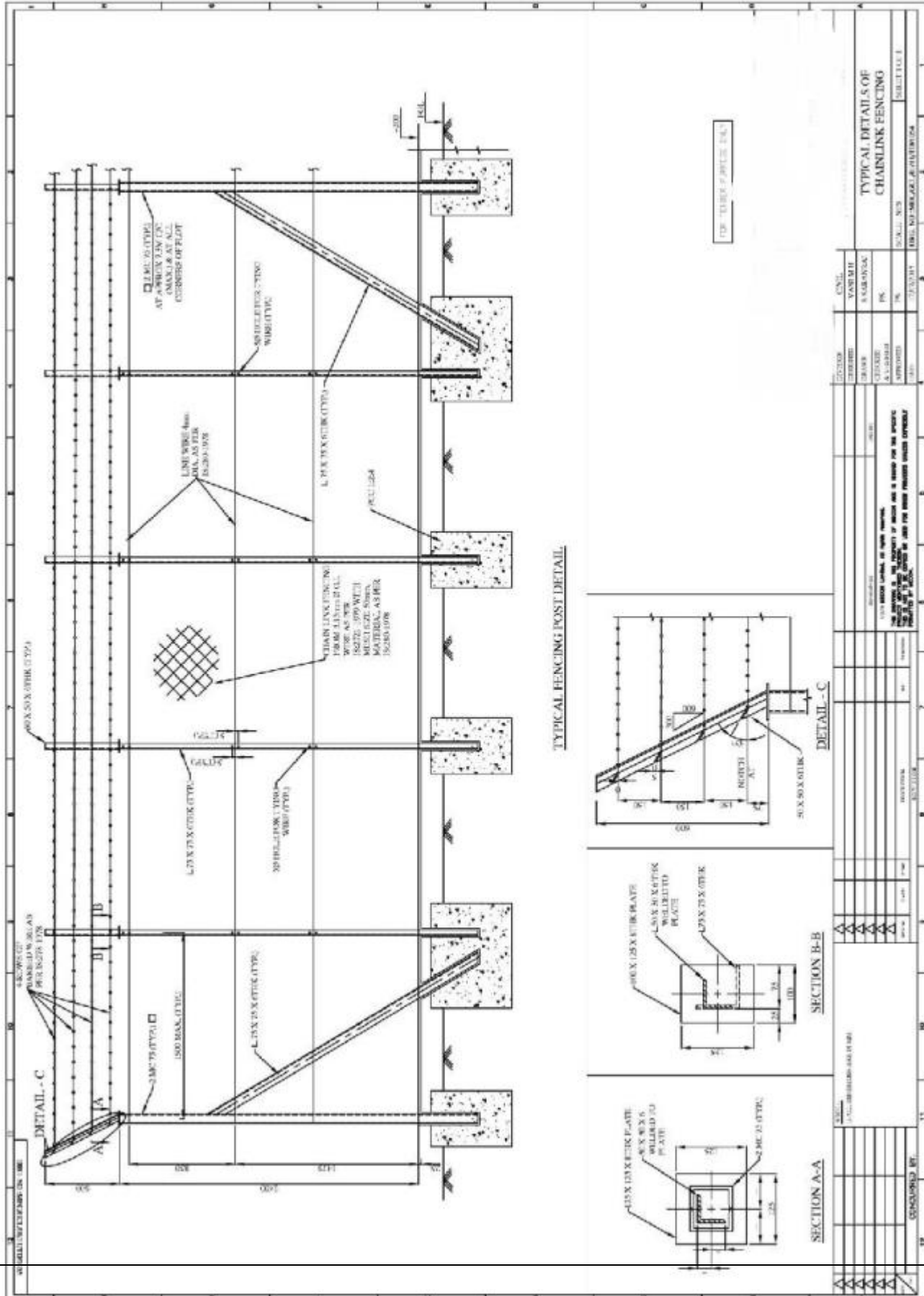
SI No.	Description	Document No./ Drawing No.	Rev. No.
1	TYPICAL DETAILS OF SS TUBE TRENCH	PMC/GGPL/G1/01/TD/1051	Rev. 0
2	TYPICAL DETAILS OF SOAK PIT & SEPTIC TANK	PMC/GGPL/G1/01/TD/1052	Rev. 0
3	TYPICAL DETAILS OF DISPENSER ISLAND	PMC/GGPL/G1/01/TD/1053	Rev. 0
4	DETAILS OF CHAIN LINK FENCING	PMC/GGPL/G1/01/TD/1054	Rev. 0
5	DETAILS OF BOUNDARY WALL	PMC/GGPL/G1/01/TD/1055	Rev. 0
6	TYPICAL DETAILS OF CANOPY –A (TWO LEGGED)	PMC/23QQ/01/12/D2/CN/ST/0301	Rev. 0
7	TYPICAL DETAILS OF CANOPY –A (FOUR LEGGED)	PMC/23QQ/01/12/D2/CN/ST/0302 3	Rev. 0





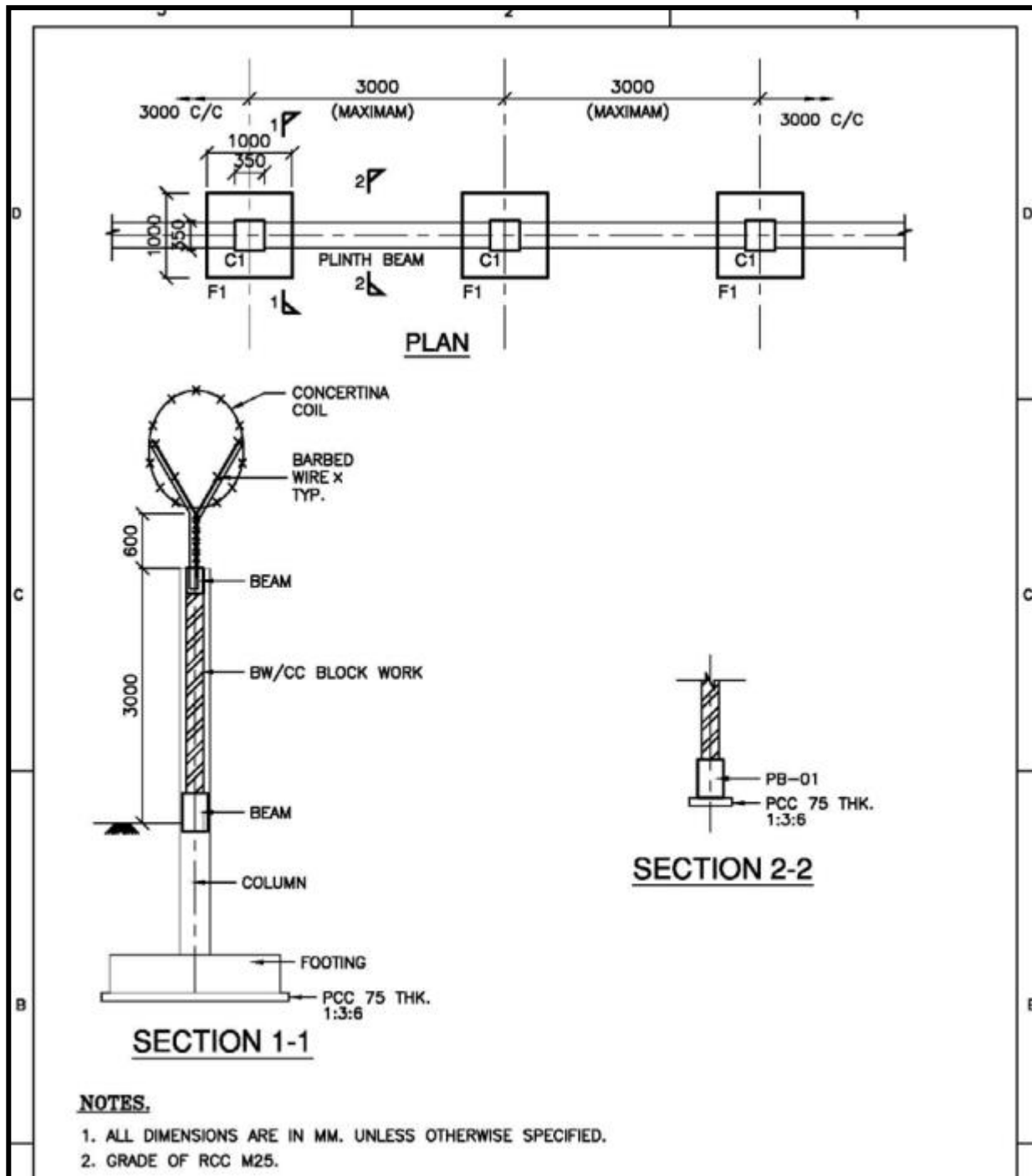
TENDER NO: GGPL/KKD/C&P/CW/2545/VS



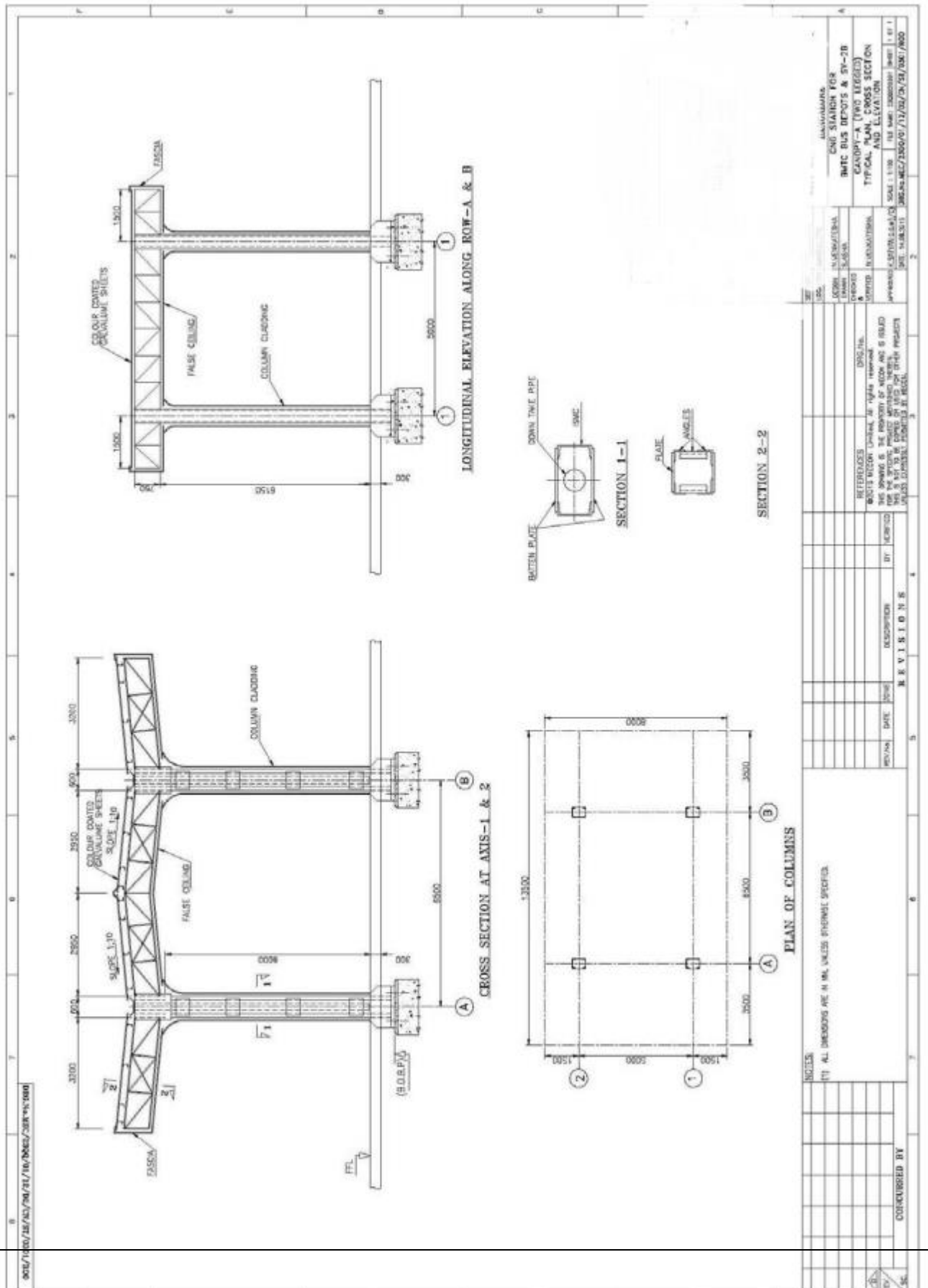


NO.	DESCRIPTION	UNIT	QTY	REMARKS
1	POST	NO.	1	
2	RAIL	M	10	
3	WIRE MESH	SQ. M	100	
4	CONCRETE	CUM	10	
5	PAINT	LITRE	100	
6	SPRINT	LITRE	100	
7	WIRE	M	100	
8	WIRE	M	100	
9	WIRE	M	100	
10	WIRE	M	100	
11	WIRE	M	100	
12	WIRE	M	100	
13	WIRE	M	100	
14	WIRE	M	100	
15	WIRE	M	100	
16	WIRE	M	100	
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C&P created with AutoCAD/Revit/MS Project/MS Word/MS Excel/MS PowerPoint



NO.	REV.	DATE	BY	DESCRIPTION

NO.	REV.	DATE	BY	DESCRIPTION

NO.	REV.	DATE	BY	DESCRIPTION

CONCURRED BY

GGPL/KKD/C&P/CW/2545/VS





**PART-II**

**ELECTRICAL & ILLUMINATION WORKS**

## **PART – A – GENERAL ISTRUCTIONS**

### **1.01 Introduction**

The intent of this specification is to define the requirements for the supply of equipment and materials (as required), erection, testing and commissioning of the electrics and illumination power distribution system.

The work shall be carried out in the best workmanship - like manner, in conformity with these specifications, approved drawings and the instructions of the Engineer-in-charge from time to time.

The contract shall include clearing of temporary construction, waste materials and loose earth, which might get collected in and nearby the work site consequent of the execution of work under this contract.

### **1.02 Standards**

The equipment to be supplied as well as the work being executed shall conform to applicable Indian Standards ( BIS)/ recognized International Standards viz IEC/IEEE/VDE where corresponding Indian Standards do not exist , code of practices of the Bureau of India Standards, technical specifications and installation standards enclosed herewith In case of any conflict, the most stringent specification shall govern.

In addition, the work shall also conform to the requirements of the following: The Indian Electricity Act, and the Rules framed there under The fire Insurance Regulations

The regulations laid down by the Chief Electrical Inspector of the state government / Central Electricity Authority (CEA).

The regulations laid down by the Factory Inspector.

The regulations laid down by the Chief Inspector of Explosives.

Any other regulations laid down by the Central, State or Local Authorities from time to time during the pendency of this contract.

### **1.03 Site Condition**

The equipment offered and the installation shall be suitable for continuous operation under the following site conditions.

Max. / Min temperature	:	46 <sup>0</sup> C/5 <sup>0</sup> C
Max. relative humidity	:	90 %
Altitude	:	Less than 500 m above MSL

### **1.04 Power Supply Parameters**

NORMAL POWER	415V AC, 3 Phase & Neutral
LIGHTING DISTRIBUTION (Normal)	230 V AC, 1 Phase
INSTRUMENTATION (UPS)	230 V AC, 1 Phase

### 1.05 SCOPE OF WORK

Scope of work shall cover procurement, supply, loading, transportation, delivery, transit insurance, unloading, storage and handling at site, erection, insurance during erection till handing over, testing and commissioning of various equipment/systems/sub-systems of FRLS, 1.1kV Grade Copper LT Power cables, FLP Outdoor Illumination consisting of Street light poles, light fixtures, switches/sockets, FLP type Isolating switch, 63kVA 11/0.433kV, Distribution transformer, Earthing & lightning protection system including civil and structural works, conducting site Tests and trial runs of the above System, Watch and ward of the site till handing over to Owner, preliminary acceptance test (PAT), final acceptance test (FAT) and handing over the system in 'Ready to switch on' condition to the Owner, as described in the specification. The package shall be executed on **ITEM RATE BASIS** as per enclosed BOQ.

All equipments / materials supplied by the contractor shall be as per the list of approved makes enclosed with this document subject to submission of Certification and approvals.

Special Instructions to the Tenderer :

1. The scope of work shall include minor civil works related to the placement of panels/equipment being supplied by tenderer in electrical premises viz, chipping, grouting, making/closing, providing chequered plates for unused openings etc.
2. Tenderer shall coordinate and co-operate with Owner/ Owner's Consultant, other agencies engaged by the Owner for any data/information exchange, installation / erection, testing and commissioning of plant. The scope includes attending various co-ordination meetings/ progress review meetings, design review meetings etc.
3. The successful tenderer shall carefully go through the clause of Invitation to Tender, specification, Bill of Quantities and drawings and shall include in his rates any sum he may consider necessary to cover fulfillment of the various clauses contained therein. Unit prices stated in the Bill of Quantities against the item of work shall be inclusive of all installation accessories and consumables necessary to complete the said work within the contemplation of the contract. Beyond the unit prices no extra amount will be paid for incidental contingent work or materials.
4. For installation work at site, the successful tenderer shall be fully responsible for arranging the required handling equipment, winches, pulley, drilling machines, tools and tackles, welding sets, pipe bending machine, cable crimping tools, gauges, scaffoldings, ladders, temporary water and power connections, testing instruments etc as required for smooth execution of work.

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5. On completion of the installation but before energisation of the system, all installations shall be physically checked and properly tested. These checks and tests shall be conducted by the tenderer under the supervision of Owner/Consultant  
.The tenderer shall furnish the final status and test results. Any defect observed during such check and tests shall be rectified by the tenderer free of cost within contract completion period.
6. The wastage limits for cables shall not be more than 2.5 % of total quantity of cables. Before cutting of cables from drums, the tenderer shall carry out measurement of cable required to be laid and the cable shall be cut from the drum as per drum cutting schedule to be prepared by him so that wastage is minimized.
7. The quantities given in Schedule of Quantities are probable quantities of work involved. These are furnished for the tenderer's conveniences and it must be clearly understood that the contract is not a lump sum contract, that the probable quantities and the aggregate value of the entire tender are only indicative and the OWNER does not in any way assure the tenderer or guarantee that the actual quantity of work would correspond to the probable quantities in the tender.
8. Cables shall be supplied in wooden cable drums and the minimum cable length in a drum shall generally not be less than 1000M. Tenderer shall note that variation of cable length in each cable drum shall not be more than + / - 5 % of total cable length for the cable drum. However, there shall not be any "negative" (-ve) tolerance in the quantity of cables for each size of cable.
9. Tender shall note that the cable jointing shall be avoided as far as possible, however if the requirement of cable joints is inevitable the same shall be done only after the approval from Owner / consultant at site.
10. The installation price for equipment and fittings shall include supply, fabrication and erection of painted supporting brackets made of steel angles, flats etc including bolts, nuts, washers etc., minor civil work and all consumable materials required for the installation. Suitable identification tags shall be provided without any extra cost to the OWNER.
11. Generally all floor mounted panels shall be tack welded to embedded channels and inserts provided in the floor. Where foundation pockets are not provided, and are required for fixing of equipment the tenderer shall provide adequate size of expansion type fasteners which shall be installed in the floor slab or brick wall by drilling as recommended. No additional rates shall be admissible on this account, whatsoever.
12. The tenderer shall include in his quoted installation price the supply of all necessary miscellaneous erection materials such as cable clamps, bolts, nuts, washers, shims, tapes etc as required to complete the installation of individual equipment and cables in all respect.
13. Installation price of cables/wires shall include supply and installation of all accesso-

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ries like glands, lock nuts, cable lugs and ferrules, bolts, nuts, screws, washers, identification tags etc and all other consumable materials as required. Also cost for transporting of cable drums, laying of cable, cutting of cables as per required length, returning surplus/cut length, sealing of pipes and holes including spare ones are included. Installation price of cables shall include laying of cables through pipes and pipe sleeves wherever required. Installation price for laying of cables in air shall include required consumables, clamps, providing aluminium cable tags at both ends at specified lengths including supply and punching of tags.

14. Installation price of pipes to be laid in ground required for cable laying, road / rail crossings shall include necessary cutting of road, excavation of required depth as per the drawings, Back filling, Laying, concrete embedment and subsequent repair and finishing the road as before.
15. Installation price of cables/wires shall include all the labour along with the rate for the services of joiner and labour, supervision, testing and cost of installation material such as identification tags, consumable material etc as required for completing the termination work in all respects. The rate for pulling of cables through conduits / pipes, laying inside covered cable trenches, laying on walls on saddles / Clamps, measurement at site prior to cutting of cable, cable ties, cable clamps, dressing of cables, providing cable tags at intervals and at exit / entry points of buildings, sealing of the conduit/pipes with cable putty, Cable markers shall be provided at every 10 meters for cable directly buried in ground. shall be included in the rates quoted for installation of cables. Installation price for cable trays shall also include the rates for coupler plates, Zinc passivated fasteners, clamps for fixing on cable tray supports etc in the rate quoted for the supply and installation of cable trays.
16. Installation price of directly buried underground cables shall include excavation of cable trench to a depth of 1000mm from finished ground level, providing at least 75mm sand cushion in the trench, laying of cable over the sand cushion, again providing 75mm sand cushion on the cable laid, placing burnt red bricks suitably over top layer of sand cushion and back filling of excavated trench with good soil. The installation charges of underground cabling shall include labour, supply & installation of above said materials viz., sand, burnt red bricks, good earth for back filling, cable route markers, joint markers etc.
17. The installation price of equipment like LDB, MCBDBs, MCB box, earthing, cables, wiring, lighting etc covered in the scope shall include floor openings/drilling/cuttings, provision of sleeves / inserts/ mounting channels wherever required, foundation bolts along with all civil materials for completion of installation in all respects for smooth and reliable operation. The installation rates shall also include supply and fabrication of steel materials including all miscellaneous accessories. Tenderer shall include the rates for minor civil works such as chipping/grouting, providing shim plates, tack welding to floor / wall embedded inserts, providing bolts/nuts for fastening to embedded bolts, welding of supports to column etc., in cost for the installation of switchboards along with the cost for embedment in concrete / supply of fabricated supports.
18. Installation prices of fan/exhaust fans, PVC conduits etc shall include supply and

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erection of supporting brackets, clamps, saddles, brackets, hooks, cleats including bolts, nuts, washers identification tags etc and other consumables as well as minor civil work involved for the installation.

19. Installation price of light fittings viz., FLP light fixtures, well glass/Road light fittings / low bay fluorescent / CFL / HPSV/LED light fittings shall include mounting of lighting fittings on structure/wall including mounting of control gear box by means of conduits of required length, MS angle / pipe, brackets, suspension hooks, straps, clamps, ball and socket, nuts, bolts and terminal boxes wherever required, cutting and making of required threads and supply steel materials, fabrication of brackets, interconnection between control gear box, bushing, locknuts etc. as required. Flexible cables as required for tapping to individual lighting fittings as well as 14 SWG GS wire for earthing and flexible conduits shall be included in the prices quoted for installation of lighting fittings. Supply of all materials and accessories shall be included in the installation price, Installation rates for road lighting fittings shall also include supply of steel materials, fabrication of brackets, interconnection between Control Gear box and fittings with supply of suitable clamps, lugs etc. Flexible conduits wherever required same shall be included in the installation rate of light fittings.
20. Installation price of point wiring includes cabling /wiring, installation of switchboards, modular type switches & universal socket outlet, junction boxes, ceiling roses along with 19mm dia Rigid PVC conduits. The point wiring shall also includes circular/rectangular thermoplastic material junction boxes, bends, tees, sockets, adapters, reducers etc and accessories such as saddles, distance pieces etc as per requirement for installation on walls / structure / ceiling.
21. Installation prices of earthing conductors along floor, wall, structures, etc shall include clamps, cleats and other fixing devices, jointing as well as termination including chipping of floors where required and making good the same after erection. The installation price of earthing strips laid buried in ground shall include excavation up to 800mm depth, laying, backfilling including clamps, cleats and other fixing devices , jointing as well as termination, bitumen paint at the joints of the earth strip . Also the installation price of earth station shall include excavation, dewatering, laying of pipes, providing supports, drilling, welding, hot boring, jointing with jointing materials, , fabrication, fixing of all fittings and accessories, wrapping and coating, construction of concrete enclosure with top cover and filling with salt and good earth complete with testing, painting the tested value together with station No. on aluminium marker plates and commissioning to ensure satisfactory earth resistance results.
22. The rates for fixing of supports by means of tack welding, grouting, anchor bolts etc as required as per site conditions shall be included in the rates quoted for installation of prefabricated galvanized cable tray support structures.
23. Submission of manufacturer's test reports of all equipment is in the scope of work of the tenderer.
24. Submission of documentation on safety and statutory measures.

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25. Any rework required to be done due to inadequacies in the work of tenderer and any reasons not attributable to Owner shall be done by the tenderer at no extra cost.

26. During site installation, testing and commissioning if any damages are caused by incorrect procedures of the successful tenderer such items to be repaired / replaced by tenderer free of cost within the time schedule for completion of work at no extra cost.

**1.06 DRAWINGS, STANDARD SPECIFICATIONS AND INSTALLATION STANDARDS**

- 1) The drawings accompanying the tender documents when read with specification shall depict the electrical system of the Terminal. These are indicative of the nature of work and issued for tendering purposes only. Purpose of these drawings is to enable the tenderer to make an offer in line with the requirements of the Owner. Construction shall be as per drawings / specifications issued / approved by the Engineer-in-charge during the course of execution of work.
- 2) Conduit layout drawing in ceiling, wherever required, to be prepared by the contractor and shall be submitted for approval.
- 3) After the job completion, contractor shall submit catalogues/manuals (O&M) of major brought out items. Final certified as built drawings, documents and manuals etc shall be submitted by the contractor to Owner in bound volume with one set in soft copy (CD) plus five sets of prints.

**PART – B - EQUIPMENT SPECIFICATIONS (To be read always in conjunction with Design Basis as stated in Part – A above)**

**1. TRANSFORMERS**

**1.1. General**

- 1.1.1. The distribution transformer will be connected to supply system to step down the supply voltage to feed 415V substations.

**1.2. Transformer rating and over loading**

Transformers shall be capable of delivering the rated current at a voltage equal to 112.5 percent of the rated voltage without exceeding the temperature limits specified for liquid, winding and hot spot

Transformers shall operate satisfactorily without injurious heating at rated kVA, at any voltage within  $\pm 12.5\%$  of the rated voltage of the particular tap.

Transformers shall be designed for 50Hz  $+2\%$  &  $-5\%$ , unless specified otherwise in design criteria.

Transformers for two or more limits of voltage or frequency or both shall operate satisfactorily at its rated kVA without injurious heating under all the rated conditions of voltage or frequency or both: provided increase in voltage is not accompanied by decrease in frequency.

Transformers shall be suitable for over loading as per IS 6600, unless specified otherwise. Off circuit tap switch, terminal bushings, other auxiliary components/ equipment shall be designed for maximum permissible over loading. Short time over loading to the

extent of 50% shall be considered for this purpose unless specified otherwise.

**1.3. Short circuit withstand capability**

Transformers shall be capable of withstanding thermal and Mechanical stresses during 3 phase, line to line, double line to earth and line to ground dead short circuits at the transformer terminals, for 2 sec, without any injury. Temperature of the winding prior to the short circuit to be considered for this shall be that corresponding to the maximum permissible value applicable to the overloading cycle specified.

For this purpose, fault and type of system earthing shall be considered as indicated in Design Criteria.

**1.4. Vibration and noise level**

Design and manufacture of transformer shall be such as to reduce noise and vibration level. The noise level shall be as per NEMA TR-1.

**1.5. Harmonics**

The transformer shall be designed with particular attention to the suppression of harmonics, especially the third and fifth.

**1.6. Flux density**

The rated flux density in any part of the core and yoke at rated voltage and frequency shall be such that the flux density shall be 1.7 Tesla.

The maximum flux density in any part of the core and yoke at rated voltage and frequency shall be such that the flux density with + 12.5 percent combined voltage and frequency variation from rated voltage and frequency shall not exceed 1.9 Tesla.

**1.7. CONSTRUCTIONAL FEATURES:**

**Magnetic Circuit**

1.7.1. Transformers shall be of core type construction. The cores shall be constructed from high grade, low loss, high permeability cold rolled non-aging grain oriented silicon steel laminations of grade M4 or superior.

Thickness of laminations shall not be more than 0.3 mm. Surface insulation of laminations shall be rust resistant and have high inter laminar resistance. Insulation shall withstand annealing temperature as high as 850 deg.C. The insulation shall be resistant to the action of hot cooling medium.

The insulation structure for the core to bolts and core to clamp plates shall be such as to withstand a voltage of 2000V AC for one minute.

M.S Channel of size indicated in design criteria shall be used for clamping the core and the same shall be painted by Varnish and corrosion oil resistant paint before use. Whenever the CRGO sheets are punched or sheared into laminations, laminations shall be annealed in a non-oxidizing atmosphere to relieve stresses and restore the original magnetic properties of CRGO sheets. The laminations shall be free of all burrs and sharp projections.

The design of magnetic circuit shall be such as to avoid static discharges, development of short circuit paths within itself or to the earthed clamping structure and production of flux components at right angles to the plane of the laminations which may cause local heating.



All steel sections used for supporting the core shall be shot or sand blasted after fabrication.

The finally assembled core and coil assembly shall be rigidly fixed to the tank to avoid shifting during transport, handling and short circuits. Adequate provision shall be made for lifting the complete core and coil assembly.

The supporting frame work of the cores shall be so designed as to avoid the presence of pockets which would prevent complete emptying of the tank through the drain valve, or cause trapping of air during filling.

### **1.8. Windings**

Transformers shall be suitable for earthing system as specified in Design Criteria. The windings shall be fully insulated.

Temperature of winding shall be limited to Maximum 90°C for transformers rated upto 200kVA and shall be 95°C for transformers rated above 200kVA when measured by resistance method.

Hot spot temperature shall be as per IS 2026.

The coil clamping arrangement shall be such as to not impede the free circulation of cooling media.

The windings/ and connection of transformer shall be braced to withstand shocks which may occur during transport or due to short circuits, repeated peak loads and other transient conditions during service.

Windings shall be subjected to a shrinkage treatment before final assembly, so that no further shrinkage occurs during service. Adjustable device shall be provided for taking up any possible shrinkage of coils in service if required.

The conductors shall be transposed at sufficient intervals in order to minimize eddy currents and equalize the distribution of currents and temperature along the windings.

Coil clamping rings shall be of steel or of a suitable insulating material. Axially laminated material other than bakelised paper shall not be used.

Completed core and winding assembly shall be dried in full vacuum to eliminate presence of moisture. After drying process, the full assembly shall be impregnated immediately.

No strip conductors wound on edge shall have a width exceeding six times its thickness.

The winding material shall be aluminium.

All insulating materials used shall be compatible with cooling medium and other materials that come into contact with the insulation system, under all operating conditions.

Windings shall not have sharp bends which might damage insulation and/ or produce high dielectric stresses.

Coils shall be supported using dried and high pressure compressed wedge type insulation spacers at frequent intervals.

All threaded connections shall be locked. Leads from the winding to the terminal board and bushings shall be rigidly supported to prevent injury during short circuits / vibration.

Permanent current carrying joints in the windings and leads shall be welded or brazed.

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Clamping bolts for current carrying parts inside the transformer shall be compatible with liquid under all service conditions.

### 1.9. Taps

No taps are required for transformers rated up to 100kVA .

Taps shall be provided on the higher voltage winding of the transformer and shall be arranged so as to maintain as far as possible the electromagnetic balance of the windings.

It shall be possible to vary the voltage in 4 positions by 3 equal steps of 2.5% each for a variation of +2.5% to -5 % for transformers rated above 100kVA upto 200kVA.

It shall be possible to vary the voltage in 6 positions by 5 equal steps of 2.5% each for a variation of +5% to -10 % for transformers rated above 200kVA upto 500kVA.

### 1.10. Off-circuit tap switch

Tap-changing shall be carried out with the transformer off-circuit by means of links or by means of an externally-operated switch with Mechanical locking device and a position indicator. Arrangement for pad-locking shall be provided.

### 1.11. Transformer Liquid

Naptha based mineral oil shall be used as transformer liquid and shall conform to IS – 335. All transformers shall be supplied along with first filling of liquid with top up oil being supplied loose in drums. **When the oil is topped up, the oil level as seen at the conservator shall be at “Maximum” level.** All components, insulating materials used in the transformer construction shall be compatible with the liquid under all operating conditions.

Temperature rise of top oil shall be limited to 35°C for transformers rated upto 100kVA and 40 °C for transformers rated above 100kVA up to 500kVA when measured by thermometer method.

### 1.12. Transformer Cooling

The transformer shall be Oil Natural Air Natural ( ONAN ) cooled type.

### 1.13. Radiators

Radiators shall have fixed connection to tank.

### 1.14. Tank

Tank shall be made from high quality low carbon steel and shall have oil tight welded construction. The transformer tank covers shall be bolted/clamped alternatively welded with tank rim so as to make a leak proof joint. The curb design in case of welded construction shall be such that it is possible to remove the weld and reweld the tank at least two times.

The tanks of all transformers shall be complete with all accessories and shall be designed so as to allow the complete transformer filled with liquid to be lifted by cranes or jacks, transported by road, rail or water without over straining any joints and without causing subsequent leakage of liquid.

In case of transformers up to 200 kVA, plain tank shall be capable of withstanding a pressure of 80 kPa and a vacuum of 250 mm of mercury. Limiting values of the deflections are specified in Cl. 21.7.1 of IS 1180.

For transformers above 200 kVA and up to 2500 kVA, plain tank shall be capable of withstanding a pressure of 80 kPa and a vacuum of 500 mm of mercury. Limiting values

of the deflections are specified in Cl. 21.7.2 of IS 1180.

For three phase transformers up to 2500 kVA, transformer tanks with corrugations shall be designed for a pressure of 15 kPa measured at the top of the tank with no leakage. The base of each tank shall be so designed that it shall be possible to move the complete transformer unit by skidding in any direction without injury when using plates or rails.

Tank cover shall be of adequate strength and shall not distort when lifted.

Tank covers shall have pockets for bulbs of liquid temperature indicators. Thermometer pockets shall have captive screwed top to prevent ingress of water. The pockets shall be located in the position of maximum liquid temperature and it shall be possible to remove the instrument bulbs without lowering the liquid in the tank.

**1.15. Lifting and Pulling Lugs**

Lifting Lug -Minimum 4 nos. of welded heavy duty lifting lugs of M/S Plate 8mm thick suitable reinforced by vertical supporting flat welded edgewise below the lug on the side wall shall be provided. Lifting lugs shall be suitable for lifting the transformer with liquid.

Pulling Lug – 4 Nos. of welded heavy duty pulling lugs of M/S plate 8 mm thick shall be provided to pull the transformer horizontally.

**1.16. Top Cover Fixing Bolts**

GI bolts and nuts of size 12mm x 40mm with one plan and one spring washer suitably apart (100mm ) shall be used to press the cover.

**1.17. HV/LV Terminations**

Bare Bushing shall be considered for terminations on both HV and LV side. Further, the HV and LV terminations shall be oriented at 180°.

**1.18. Bushings**

The transformers shall be fitted on high voltage and low voltage sides with outdoor type-bushings of appropriate voltage and current ratings. The high voltage bushings (3 Nos.) shall conform to IS 2099. The low voltage bushings (4 Nos.) shall conform to IS 7421. Alternatively, the low voltage side may be made suitable for adoption of PVC / XLPE cables of suitable size.

Minimum rated current of the line end bushing shall be 1.5 times the rated current of the corresponding winding ; where repeated peak loads are specified, bushing rating shall be selected accordingly. Rating of LV Neutral bushing shall be same as that of LV line side bushing. Porcelain bushings shall be provided for HV and LV terminations; however for LV terminations epoxy bushings are also acceptable.

Bushings shall be suitable for atmosphere present in the place of installation. Total creepage distance shall not be less than 25 mm/kV of highest system voltage.

The bushing shall be made in two parts. The outer bushing shall be of porcelain. The dimensions of the outer bushing shall conform to relevant part /Section No. of IS 3347 depending on the Voltage Class. The internal bushing shall be of either porcelain or tough insulating material, like epoxy and shall have embedded stem. Metal portion of the internal HV and LV bushing inside the tank shall remain dipped in oil in all operating condi-

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tions.

Short time rating and insulation level of bushing shall be same as that for transformer.

The minimum phase to phase and phase to earth external clearances for HV & LV bushings shall be as follows:-

	Minimum Clearances	
	Phase to Phase (in mm)	Phase to Earth (in mm)
HV Bushing	255	140
LV Bushing	75	40

**1.19. Conservator**

Conservator shall be located in such a position as not to obstruct the electrical connections to the transformer. The conservator volume shall be sufficient to maintain the oil seal from ambient temperature to maximum oil temperature allowed specified elsewhere in the specification, with oil level varying within minimum and maximum levels.

The conservator shall be provided with dial type magnetic oil level gauge with pointer and potential free contacts for alarm/trip. In addition , prismatic type oil level gauge with minimum and maximum levels marked shall also be provided. Taps or valves shall not be fitted to the oil gauge.

Drain plug shall drain the conservator oil completely. One end of conservator shall be bolted into position so that it can be removed for cleaning purposes. If the sump is formed by extending the feed pipe into the conservator vessel, the extension shall be for at least 20 mm. The minimum oil level (corresponding to - 5°C) should be above sump level. Oil filling hole(1 ¼ nominal size thread) with cap shall be provided.

A silica gel breather with inspection window and oil seal shall be mounted at 1.4m above transformer base and connected to the conservator.

**1.20. Breathers**

Breather joints shall be of bolted type. It shall have die cast Aluminium body and inside container for Silica gel shall be of tin.

**1.21. Losses and Impedance**

The losses and impedance for various ratings of transformers of 11kV class shall be within the permissible limits. These losses are the maximum permissible.

Rating (kVA)	Max. Losses at 50 % loading (Watts)	Max. Losses at 100 % loading (Watts)	Impedance % (subject to tolerance as per IS : 2026)

63	380	1250	4.5
100	520	1800	4.5
160	770	2200	4.5
200	890	2700	4.5
250	1050	3150	4.5

No positive tolerance shall be allowed on the maximum losses displayed on the label for both 50 % and 100 % loading values.

**1.22. Valves and connections**

All valves shall be of gun metal/ cast steel, full way type with internal screwed ends and will be opened by turning counter clockwise when facing the hand wheel. There will be no oil leakage when the valves are in closed position. All valves opening to atmosphere shall be fitted with blank flanges. Means shall be provided for padlocking the bottom valves in open and closed position. All valves shall be provided with an indicator to show clearly the position of the valve. Means shall be provided for top and bottom oil sampling. All transformers shall have residual drain plug, bottom drain valve, top and bottom filter valves suitable for connecting to oil filtration unit. The filter valves shall be arranged on opposite sides of the transformer.

**1.23. Joints and gaskets**

All gaskets used for making oil tight joints shall be of proven material such as granulated cork-bonded with synthetic rubber ( SRBC ) or synthetic rubber ( nitrile ) gaskets for oil filled transformers confirming to IS 11149/Type C as per IS – 4253 Part- II .

**1.24. Explosion vent/ pressure relief device**

Means provided for release of excess pressure generated inside the tank shall be either double diaphragm type explosion vent or pressure relief device. In case pressure relief device is provided, same shall be of sufficient size for rapid release of any pressure that may be generated within the tank and which might result in damage to the equipment. The device shall operate at static pressure of less than the hydraulic test pressure for transformer tank. Means shall be provided to prevent the ingress of rain water. The device shall be provided with potential free contact wired up to Marshalling Box.

The PRD shall be mounted on the main tank and if on the cover, shall be fitted with skirt projecting 25 mm inside the tank and of such a design to prevent gas accumulation.

If diaphragm type explosion vent is used, the diaphragm shall be of suitable design and material and situated above maximum oil level. An equalizer pipe connecting the explosion vent and conservator shall be provided for relieving or equalizing the pressure in the device depending upon design consideration.

**1.25. Internal earthing arrangements**

All metal parts of the transformer with the exception of individual core laminations, core bolts and associated individual clamping plates shall be maintained at fixed potential by earthing.

**1.26. Core clamping structure earthing**

The top main core clamping structure shall be connected to the tank body by a copper strip of adequate cross section. The bottom clamp structure shall also be connected to the tank by one or more of the following methods.  
By connection through vertical tie rods of the top structure.

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- a By direct metal to metal contact with tank base maintained by the weight of the core and winding.
- b By connection to the top structure on the same side of the core as the main earth connection to the tank.

**1.27. Earthing of coil clamping rings**

Where coil clamping rings are metal, at earth potential, each ring shall be connected to the adjacent core clamping structure on the same side of the transformer as main earth connections.

**1.28. Earthing of magnetic circuit**

Magnetic circuit shall be earthed to the clamping structure at one point only.

**1.29. Size of earth connection**

All earth connections, except those from the individual coil clamping rings shall be done by copper conductor with min. cross section of  $80 \text{ mm}^2$ . Copper connections inserted between laminations of different sections of core shall not be less than  $20 \text{ mm}^2$ .

**1.30. Fitting and accessories**

Transformer shall be provided with fittings and accessories as specified in Annexure-II

**ANNEXURE- I**  
**DESIGN CRITERIA**

1	Rating of transformer	63 kVA	
2	Percentage impedance of transformer	4.5% upto 250kVA	
3	3 Phase power supply system in which transformer is to be used		
a)	Primary side (HV) max. voltage	┘ 7.2 kV	┘ 12 kV
b)	System earthing Primary side (HV)	Effectively grounded	
	Secondary side (LV)	Effectively grounded	
4	Max. 3 phase fault levels Primary side (HV)	40 kA	
	Secondary side (LV)	10 kA	
5	Insulation level		
a)	PF withstand in kV (RMS)		
	HV winding	20 kV	28 kV
	LV winding	3 kV	
b)	Impulse withstand KVP		
	HV winding	60 kV	75 kV
	LV winding	NA	
6	Core		

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	i) Core Clamping	a) ISMC 125 X 65 mm for 500kVA b) ISMC 100 X 50 mm for 250kVA c) ISMC 75 X 40 mm for <= 100kVA
	ii) Core fixing bolt – 2Nos.	a) 20 mm High Tensile bolt for 500kVA b) 16 mm High Tensile bolt for 250kVA c) 12 mm High Tensile bolt for <= 100kVA
	iii) Tie rod insulating medium	Kraft paper tube of thickness 1.5 mm
	iv)	

**Annexure-II**

**Fitting and accessories**

1. 1 No. of Rating and Terminal marking Plate.
2. 2 Nos. of Earthing terminals minimum M12 with nuts should be provided on the tank.
3. 4 Nos. of Lifting lugs for the complete transformer as well as for core & winding assembly.
4. 1 no. of Cap for oil filling (on conservator).
5. Drain cum Sampling valve (3/4" normal thread size) with cover preferably steel with plug.
6. 1 No. of Conservator with drain plug .
7. 1 No. Thermometer pocket.
8. Air Release plug on main tank.
9. Platform mounting channels.
10. Uni directional Flat rollers.
11. Inspection hole.
12. Pressure relief device or Explosion vent.
13. Dehydrating breather : Silicagel breather of 500 gms capacity.
14. Oil Level guage shall be provided indicating 3 position of oil marked as below: Minimum (-) – 5 degree C



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Maximum (+)- 30 degree C to 90 degree C.

15. Off circuit tap switch handle shall be provided with locking arrangement.
16. HT & LT bushings- 3Nos. of HT bushings and 4 Nos. of LT bushings shall be provided with terminal connectors .Each bushing of HV and LV shall be provided with 3 Nos. of brass nuts and 2 Nos. plain brass washers for connecting terminal.LT terminal connectors for 250kVA transformers shall be supplied in separate packing.
17. Radiators: Elliptical/fin/tubular type radiators shall be provided as per design.
18. Arching horns for HT hushing with adjustable type on the ground side.
19. Filter Valve – 20mm dia. shall be provided on the upper side of the tank.

**2. 415V Switchboard**

**2.1. General**

- i) The 415V Switchboard Panel shall be designed to carry continuously without overheating, the rated current specified in the schedule of quantities.
- ii) The busbars shall be rated to limit the temperature rise within 40 deg.c over the specified ambient temperature of 45 deg.c (total temperature: 85 deg.c)
- iii) The 415V Switchboard Panel shall comply with IS 8623 Part I&II,IEC 439 and other relevant Indian/International Standards.
- iv) The ratings of incomer and feeders shall be as indicated in schedule of items/ single line diagrams enclosed.

**2.2. Construction**

- i) The 415V Switchboard Panel shall have sheet steel enclosure cubicle type and shall be
  - a) Floor mounted, self standing/supporting type
  - b) Totally enclosed, dust, damp and vermin proof
  - c) Single front and preferably without rear access.
  - d) With IP 42 enclosure as per IS 2147
  - e) Fully compartmentalized, fixed type, in tier formation with Alumi-

um busbars

f) Easily extensible on both sides at site

The 415V Switchboard Panel shall have MCCB acting as incomer while the outgoing feeders shall be with MCCBs as indicated in the enclosed single line diagram.

- ii) The 415V Switchboard Panel shall be of indoor, factory assembled, continuous boards suitable for cable entry from bottom.
- iii) The boards shall be provided with lifting eye bolts for each shipping section.
- iv) The cubicles shall be manufactured using high quality CRCA sheet steel of at least 2 mm thick.
- v) Suitable neoprene gaskets shall be adequately provided on all doors and covers for making the boards dust proof.
- vi) All operating handles shall be accessible from the front side of the cubicle. The operating handles shall be suitably interlocked Mechanically with the door such that the door can be opened or closed only with the switch in OFF position. Provision for defeating the door interlock also shall be provided.
- vii) The number of accepted tier formation shall be subject to the condition that the operating handles shall be above 400 mm from floor level and shall not exceed 1800 mm from floor level for convenience of the operating personnel.
- viii) Each unit compartment shall have full metal barrier on all sides except front, which shall be a hinged door. All hinges shall be concealed.
- ix) Each vertical section shall have a busbar alley on one side for tap off to feeders and cable alley on the other side and shall be provided with door/removable covers at the front.
- x) The clearances required at the back and front side, shall be indicated.
- xi) There shall not be more than 6 compartments in a vertical section.
- xii) A base channel/frame of minimum 50 mm height and 2.5 mm thickness shall be provided.
- xiii) All inscriptions shall be on traffolite/anodised aluminium sheets with white letters on black background.

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- i) 415V Switchboard Panel shall have MCCBs as incomer and outgoing feeders conforming to the detailed specifications given below :
- ii) All incomer feeders shall have 3 indicating lamps, red ,yellow, blue in colour, to announce power supply 'ON'.
- iii) All incomer feeders shall have voltmeters and ammeters with selector switches with off position. All outgoing feeders shall be provided with ammeters with selector switches.
- iv) Incomers of 415V Switchboard Panel shall have specially designed termination arrangements to accommodate multiple cables (as indicated in schedule of items).
- v) Number and ratings/details of feeders are given in schedule of items/SLD

**2.3. Busbars, busbar supports, connections**

- i) 415V Switchboard Panel shall have metal enclosed chamber for main busbars at the top running throughout the length of the board. The busbar chamber shall have removable covers for easy maintenance.
- ii) Outgoing feeders shall be connected to the main busbars through vertical busbars provided in the busbar alley. Vertical bus bars shall be easily accessible for maintenance. Vertical bus bars for TP&N shall be arranged to run full height of the vertical section irrespective of whether the bottom most section is used or left as empty feeder.
- iii) Busbars (triple pole and neutral) shall be
  - a) Aluminium conductor
  - b) Uniform in cross section through out the length of the bus and identified by colour code throughout.
  - c) Selected giving due consideration to proximity effect.
- iv) All the busbars shall have dynamic stability for the peak current and thermal stability for the specified symmetrical short circuit current for 1 second without any deformation, deterioration or damage.
- v) Busbars shall be provided with heat shrunk insulation.
- vi) An earth bar of adequate cross section for terminating fourth core of outgoing cable shall be provided running throughout the length of the power distribution board at the bottom with provision to connect to shop earth grid at either end of the board. Size of earth bar shall however be not less than neutral bus size. Removable bus link shall be provided between neutral and earth bus bars.

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vii) Bus bar support shall

- a) Have high dielectric strength and high impact strength capable of withstanding dynamic stability currents.
- b) Be of non-hygroscopic type
- c) be with anti-tracking barriers
- d) be self extinguishing and fire retardant insulators with ribbed construction to prevent tracking due to dust accumulation and to have larger creepage distance.

viii) Size of the neutral bus shall not be less than half of the size of main busbar.

ix) The busbars shall be rated to limit the temperature rise within 40 deg. C over the specified ambient temperature as indicated in the design criteria.

x) Allowance shall be made for reduction in section by bolt holes.

xi) Busbar, connecting fishplates, zinc bichromated bolts, nuts and washers shall be provided at each end of a shipping section to facilitate connection at site.

xii) The clearance between bare phase power busbars and between phase and earth in air shall not be less than 25 mm and 19 mm respectively.

xiii) All busbar joints shall be of bolted type. Belleville/ spring washers shall be used for joints to prevent loosening.

xiv) Busbars shall be phase identified by colour code.

**2.4. Cable alley**

i) Each vertical section shall have a cable alley along side

ii) Cable alley shall have adequate space for terminating copper power cables.

iii) Barriers running complete height of the board shall effectively isolate the cable alley from horizontal and vertical busbars.

iv) Bottom cable chamber shall be left free completely for accommodating power cables and shall be completely isolated from vertical busbars.

v) Removable, undrilled gland plates shall be provided for each cubicle/vertical.

vi) There shall be no horizontal cross bracings within 250 mm of gland plates where the cables enter.

- vii) All power outgoing terminals shall be brought out to a separate terminal block/strip through solid links with bellows and located in the cable alley.

**2.5. Interchangeability**

- i) All identical equipment and corresponding parts, accessories shall be fully interchangeable without any modification.
- ii) Components and equipment that are not fully interchangeable are liable for rejection and the supplier shall replace all such items by fully interchangeable ones free of cost.

**2.6. Make up of Modules**

**i) Incoming feeder:**

- Shall be MCCB unit of adequate rating in fixed module. MCCB shall be with microprocessor based direct acting self powered adjustable O/C, E/F, S/C release.
- Provided with voltmeter and ammeter with selector switches. Multifunction meter & energy meter shall be provided at the incomer. Meters to have accuracy class 1.0 and size 144 x 144 sq. mm.
- Provided with microprocessor based metering system, MFM with RS 485 communication port and pulse energy output.
- Provided with R, Y, B phase indication lamps and ON, OFF & TRIP lamps
- MCCB shall have 1 NO + 1 NC contacts rated for 6A, AC 11 duty. ACB shall have minimum 4 NO = 4 NC auxiliary contacts rated for 6A, AC 11 duty.

**ii) Outgoing MCCB feeders:**

- With microprocessor based adjustable, self powered release for O/C, S/C and E/F. In case, E/F release is not possible then ELR with CBCT shall be provided.
- With 1 NO + 1 NC auxiliary contacts rated for 6A at AC11 duty.
- Provided with ON, OFF and Trip lamps, ammeter for all feeders rated 100 A and above

**Moulded Case Circuit Breakers (MCCBs):**

MCCBs shall be of triple pole construction suitable for panel mounting, Operating Mechanism shall be trip free, quick make, quick break type.

The MCCBs shall be provided with front operating handles and Mechanical ON/OFF indicators. In case of trip, the handles shall rest in an intermediate position.

MCCBs shall be provided with microprocessor-based release for O/C, S/C, and E/F, which shall be fully adjustable.

Where MCCBs are used in the motor starter modules in conjunction with contactor and thermal overload relay, type 2 coordination shall be provided.

MCCBs shall have following accessories and features:

- a) Shunt trip release
- b) Auxiliary contact set of 1 NO + 1 NC contacts
- c) Fault signaling contact set of 1 NO + 1 NC contacts
- d) Insulation shields to isolate the connections between each pole
- e) Finger protection plate to prevent accidental contact

The compartment door shall be interlocked with the handle of the MCCB

## **2.7. Indicating instruments and current transformers**

- i) All indicating instruments (voltmeters and ammeters) shall conform to IS 1248.
- ii) All indicating instruments shall be of taut band flush mounting type size 96 mm x 96 mm and shall conform to 1.5 accuracy class.
- iii) All instruments shall be provided with zero adjusting device for external operation.
- iv) Ammeters shall be suitable for operation on CT and scaled to read actual currents flowing in the circuits.
- v) All measuring current transformers shall conform to IS 2705. The current transformers shall be of cast resin/bakelite housing type, with bar primary, 5A secondary current and class 1 accuracy. The burden of CTs shall be as required by the associated measuring instruments and connecting leads.

## **2.8. Indicating lamps**

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All indicating lamps shall be of low wattage cluster LED type. Red, Yellow and Blue colour lenses shall be provided for the lamps of the incomer.

**2.9. Wiring and terminations**

- i) The Emergency Panel shall be completely factory assembled and wired.
- ii) Power connections shall be done by 1100 V grade single core pvc insulated copper conductor or by aluminium strips of sizes adequate for the respective ratings. Control / Aux. wiring shall be by 650 V/1100V grade PVC single core copper conductor of min. cross-section 2.5sq.mm.
- iii) Each wire shall be identified by ferrules at each end in accordance with schematics.
- iv) Wiring to the door shall be done by flexible cable and the cables shall be bunched, sleeved and cleared so that no Mechanical damage can occur to the cables during door movements. All terminations shall be of adequate current rating and size to suit individual feeder rating.
- v) Outgoing power terminals shall be designed for connecting PVC Aluminium/copper cables of sizes indicated in schedule of items/SLDs.
- vi) Not more than 2 wires shall be connected at one control terminal.
- vii) Required number of heavy duty double compression type brass cable glands suitable for the outgoing cables, projected nipple type complete with two locknuts and earthing washer (provided with earth studs) shall be supplied.
- viii) Edge of cable glands shall have threaded projection to enable the locknut to fit from inside of the equipment.
- ix) Terminals, crimping type cable lugs and glands shall be suitable for the cable sizes to be indicated by the Owner during the execution of order.

**3. Lighting distribution board (LDB)**

<b>A. General :-</b>		
1.0	Type	<ul style="list-style-type: none"> <li>- Metal clad</li> <li>- Shall be suitable for 415/240V, 3 phase and neutral.</li> </ul>
2.0	Construction	<ul style="list-style-type: none"> <li>- Totally enclosed.</li> <li>- Dust &amp; vermin proof.</li> <li>- Welded back and sides .</li> </ul>

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3.0	Enclosure class	IP54 . IP 55 (with canopy) for outdoor installation .
4.0	Type of execution	Single front.
5.0	Mounting	Wall mounting .
6.0	Installation	Indoor / Outdoor (with canopy).
<b>B. Constructional Features :-</b>		
1.0	Sheet steel CRCA	
	Thickness	2 mm .
2.0	Cable entry	- Incomer :- Bottom cable entry. - Outgoing :- Top / Bottom cable entry.
3.0	Design	- One Incomer and outgoings .  - All the components shall be accessible from front  - Access to the operating handle of the incoming isolating switch shall be from the front of the cubicle without opening the front door.  - Operating knobs of outgoing MCBs shall be accessible from outside without opening the door. The outgoing MCB shall be provided with a glass door.  - Protective insulated cover plate (3 mm thick bakelite sheet ) shall be provided inside the cubicle to shroud all the live parts .
4.0	Gland plate	Undrilled detachable gland plates (3 mm thick) shall be provided at the top and bottom with suitable gaskets for cable entry.
5.0	Miscellaneous	- Neoprene rubber gasket shall be provided for all the doors , removable covers & between adjacent covers .  - Suitable locking devices.  - Doors shall have concealed hinges .



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6.0	Labelling	Clear legible identification labels (anodized aluminium with white letters engraved on black background ) with letter sizes of :-  - 5 mm for components and module name plates. - Danger board on front and rear sides in English , Hindi and local language .
7.0	Earthing	Two separate earthing terminals shall be provided.
8.0	Limiting dimensions	- Width of SLDB :- 800 mm - Depth of SLDB :- 300 mm - Height of SLDB :- 400 mm (min)
<b>C. Busbars</b>		
1.0	Arrangement	Three phase & neutral.
2.0	Material	High conductivity electrolytic aluminium alloy confirming to grade E91E as per IS-5082 –1981.
3.0	Phase Busbar Rating	- Shall be able to carry continuously the connected load (considering all derating factors) plus a 25% margin . - Max. current density shall be - 1.0 A/sq.mm for Aluminium - 1.5 A/sq.mm for Copper .
4.0	Neutral Busbar Rating	50 % of phase busbar rating
5.0	Short circuit rating	25 kA for 1 sec (or higher as per system requirement).
6.0	Busbar configuration	Red-yellow-blue , black for neutral .
7.0	Busbar insulation	Heat shrinkable PVC  - R,Y,B coloured sleeves for phases - Black for neutral.

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8.0	Busbar supporting insulators	<ul style="list-style-type: none"> <li>- Non-hygroscopic</li> <li>- Flame retarded</li> <li>- Track resistant</li> <li>- High strength</li> <li>- Sheet moulded compound or equivalent polyester fibre glass moulded type .</li> </ul>
9.0	Air clearance for bare busbar	Phase to phase     :- 25.4 mm (minimum) Phase to earth     :- 19.0 mm (minimum)
<b>D. Feeder arrangement</b>		
<b>Incomers</b>		
1.0	Isolating Equipment	4 pole ELCB/RCCB with MCCB . ELCB/RCCB shall be of AC 23 duty category conforming to IS: 13947-1993 having fully shrouded contacts.
2.0	Quantity	One
3.0	Indication Lamps	LED type indicating lamps for :- - Power ON R / Y / B .
<b>Outgoing feeder arrangements</b>		

1.0	Circuit breaker	DP MCB
<b>E. Panel wiring</b>		
1.0	Power / current transformer circuit	1.1Kv grade single core , black colour PVC insulated , stranded copper conductor of minimum size 2.5 sq.mm.
2.0	Ferrules	- Numbered plastic/ceramic ferrules. - Self locking type.
3.0	Marking	- Wiring shall be properly marked as per relevant IS.
4.0	Terminals	- Power & control terminals shall be segregated by insulating material like hylam / bakelite sheet. - Terminals shall be ELMEX type suitable for connecting two cores of 2.5 sq.mm wires. - Minimum 20 % spare terminals shall be provided. - The minimum rating of control terminal shall be 10 Amps.
5.0	Cable glands	Double compression cable glands for receiving cables .

#### 4. SPECIFICATIONS OF MAJOR COMPONENTS

Specification of major components are listed as below and shall be followed unless specified specifically in equipment specification. In case of contradiction between parameter of a specific component in equipment specification and here below then parameters indicated in equipment specification shall prevail.

##### 4.1. MOULDED CASE CIRCUIT BREAKER (MCCB)

1.0	Reference standard	IS : 13947 (Part-2) : 1993
2.0	Rated Current	Minimum 100A (frame rating). I rated shall be as per load current with 150% margin with adjustable setting.
3.0	Type	Complete with continuous electronic / microprocessor based adjustable releases.

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5.0	Short circuit rating	10 kA (Minimum) ( $I_{cs} = I_{cu}$ ). ( $I_{cs}$ ) = Service Short circuit breaking capacity ( $I_{cu}$ ) = Rated ultimate short circuit breaking capacity.
6.0	Operating handle	Yes
7.0	Safety Door interlock	Door interlock, Padlocking in ON/OFF position
8.0	Withstand capability	Rated short time with-stand current ( $I_{cw}$ ) shall be 12 times maximum rated operational current for 1 sec.
9.0	Utilisation category	AC23B
10.0	Electrical features	- S/C , O/C, E/F protection for power supply feeders MCCB's. - Features to minimise the let-through energy ( $I^2t$ ) in the event of short circuit on load side.
11.0	Auxiliary contacts	1 NO + 1 NC, Alarm contacts.
12.0	Miscellaneous	Can be used in load side or line side vice versa. Shunt trip coil .

**4.2. AC CONTACTORS**

1.0	Service	Indoor within steel cubicle for maximum system voltage, starting of motors and miscellaneous loads
2.0	Standard	Shall conform to IS / IPSS
3.0	No. poles	3 pole air break .
4.0	Operating type	Magnetic coil operated at 240 V AC. No economy resistors. Insulation for coils shall be class 'E' or better
5.0	Rating	25A (Minimum) , Rated generally for 150% of full load motor rated current. However, contactor ratings with respect to motor ratings are standardized and shall be followed as per Table-1A.
6.0	Interrupting capacity	Ten times the rated current for rated size upto 100A and eight times the rated current for larger sizes.

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7.0	Duty	According to IEC 158-1 - AC 1 duty :- Non inductive or slightly inductive loads - AC 3 duty :- Squirrel cage motors : starting , switching off motors during running
8.0	Utilisation category	AC23A for unidirectional motors
9.0	Aux. contact requirement	- Minimum 4 NO +4 NC contacts with minimum rating of - 10A , 415 V for rated duty AC-11. - 2A , 220 V for rated duty DC-11. - Shall have the facility of adding add-on contact blocks.
10.0	Closing (pick-up)	85% to 110%
11.0	Dropout	65% to 45%

**4.3. CURRENT TRANSFORMERS:**

1.0	Type	Bar type primaries and 5A (max) secondary with thermal and dynamic ratings corresponding to the units with which they are used.
2.0	Accuracy class	- Measuring CT accuracy class 1.0. - Protective CT accuracy class 5 P 10.

**4.4. CONTROL TRANSFORMERS**

1.0	Type	Dry type , cast resin
2.0	Voltage	415V/240V
3.0	Primary taps	+2.5 % , +5 %

#### 4.5. INDICATING INSTRUMENTS

1.0	Basic details	<ul style="list-style-type: none"> <li>- Shall not damage by passage of fault current or existence of over voltage for the maximum permitted duration of fault conditions.</li> <li>- Voltmeters protected by fuses placed as close to the bus-bar as possible.</li> </ul>
2.0	Mounting	Flush mounting, square dial with zero adjusting device for external operation .
3.0	Accuracy class	1.5
4.0	Size	<ul style="list-style-type: none"> <li>- Size of voltmeter and ammeter for incomer 144 x 144 mm for incoming feeders.</li> <li>- Size of ammeter for motor feeders 96 x 96 mm.</li> </ul>

#### 4.6. THERMAL OVERLOAD RELAYS

1.0	Standard	IEC:292-1
2.0	Basic details	<ul style="list-style-type: none"> <li>- Triple pole</li> <li>- Ambient temperature compensated .</li> <li>- Inverse time lag.</li> <li>- Hand reset type.</li> <li>- Bimetallic with adjustable setting and builtin single phase protection .</li> <li>- Reset PB shall be operable from outside .</li> <li>- Shall be able to withstand prospective short circuit current without damage or injurious heating till the motor protection MCCB clears the fault .</li> <li>- Auto tripping shall be indicated on MCC .</li> </ul>
3.0	Contacts	1 NO + 1 NC contacts with minimum rating of <ul style="list-style-type: none"> <li>- 10A , 415 V for rated duty AC-11.</li> <li>- 2A , 220 V for rated duty DC-11.</li> </ul>

#### 4.7. PUSH BUTTONS

**TENDER NO: GGPL/KKD/C&P/CW/2545/VS**

1.0	Basic details	<ul style="list-style-type: none"> <li>- All push button switches including illuminated push buttons shall be of sturdy design</li> <li>- Shrouded actuator for "START" application, and "STOP" application shall be provided.</li> <li>- Mushroom Head actuator for "EMERGENCY STOP" shall be latched type with turn to release.</li> <li>- Press to latch in operated position and turn-to- release in unactuated position.</li> <li>- Double break parallel contact design or other suitable design feature enhancing contact reliability required in circuits with electronic interfaces involving low voltages and small currents shall be adopted.</li> </ul>
2.0	Size	- 22.4 mm diameter
3.0	Contact rating	<ul style="list-style-type: none"> <li>- Minimum 2 NO + 2NC contacts (or 4 NC for Em Stop PB) with following current ratings . <ul style="list-style-type: none"> <li>• Continuous - 10 A</li> <li>• AC 11 - 1.5 amps at 240V</li> <li>• DC 11 - 0.5 amps at 110 V DC, L / R - 40 ms</li> </ul> </li> <li>- All contact faces of contacts shall be of silver or silver alloy.</li> <li>- Facility of adding addon contact blocks to be provided</li> </ul>
4.0	Colour	<ul style="list-style-type: none"> <li>• Accept - Blue</li> <li>• Test - Yellow</li> <li>• Reset - Black</li> </ul>

**4.8. INDICATING LAMPS**

1.0	Type	- LED Cluster type
2.0	Basic details	- Sufficient number of lamp grips shall be provided for easy replacement of lamps.
2.0	Size	- 22.4 mm diameter

3.0	Colour	<ul style="list-style-type: none"> <li>- For motor `ON`, valve/damper/gate `OPEN`, supply `ON`, breaker `CLOSE` : Red</li> <li>- For motor `OFF`, valve/damper/gate `CLOSE`, supply `OFF`, breaker `OPEN` : Green</li> <li>- Fault indication, over load, alarm : Amber condition, `SERVICE &amp; TEST POSITION` indication.</li> <li>- General purpose indication, : White mo- tor `AUTO TRIP`.</li> </ul> <p>Other colours may be adopted depending upon particular application as approved by the Owner.</p>
4.0	Layout of indication lamps on boards / panels	<p>Indicating lamps shall be located just above the associated push-button / control switches.</p> <p>Red lamps shall invariably be located to the right of green lamps.</p> <p>In case a white lamp is also provided, it shall be placed between red and green lamps along the centre line of control switch/ push button pair.</p> <p>Blue and Amber should normally be located above the Red and Green lamps.</p> <p>When associated with push buttons, red lamps shall be directly above the green push button and green lamp shall be directly above the red push button.</p>

**4.9. MINIATURE CIRCUIT BREAKERS (MCB)**

1.0	Type	Heat resistant plastic moulded type,
2.0	Number of Poles	Double Pole (DP)
3.0	Ref . Standard	IS: 8828 –1978
4.0	Protections	MCBs shall be provided with quick break trip-free PMChanism and direct acting thermal overload and short circuit trip elements.
5.0	Short circuit capacity	Not less than 9kA at 0.8pf



6.0	Mounting	DIN Channel mounting . Single phase MCBs mounted adjacent to each other and connected to different phases shall be provided with adequate insulated phase barriers.
7	Current Rating	The MCBs shall be selected from standard current ratings.(As per SLD) MCB characteristics curve shall be as per application .

#### **4.10. SELECTOR SWITCHES**

1.0	Basic details	<ul style="list-style-type: none"> <li>- Shall have modular construction with number of switching contacts for each position operated by a single shaft.</li> <li>- Inscription for each position shall be provided.</li> <li>- Stay-put or spring return arrangement shall be provided as per the circuit and control/operational requirement.</li> <li>- The contacts shall be designed for higher contact reliability and electronics compatibility involving low voltage and small value of currents.</li> <li>- The operating handle shall be robust and strong.</li> <li>- One number of potential free switching contact for each position shall be provided as spare.</li> <li>- Control switches for circuit breaker ON/OFF control 3 position spring return to neutral with lost motion device and pistol grip handle.</li> <li>- Other control and selector switches - stay put type with wing type knobs.</li> </ul>
2.0	Contacts	<p>2 NO + 2 NC contacts with minimum rating of</p> <ul style="list-style-type: none"> <li>- All the selector switches shall be of 10 A rating</li> <li>- 25A for sturdy applications .</li> <li>- 1 NO &amp; 1 NC contact / poles shall be potential free for PLC inputs .</li> </ul>

#### **5. CABLES**

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**5.1. HT XLPE CABLES 11 kV / 6.6 kV (E) ,**

Sl.No.	Parameter	Description
1.0	Voltage Grade	11 kV (E)/ 6.6 kV (E) as applicable
2.0	Duty type	Heavy duty
3.0	No. of cores	3 cores
4.0	Reference standard	IS:8130 – 1984 IS:5831 – 1984 IS:3975 -1988 IS:1554, part - 1, 1988 IS:3961 (Part-II) - 1967. IS:7098 Part-I & II IEC-60502
5.0	Conductor type	Compact circular stranded (rm/V) aluminum conductor, with extruded conductor shielding of semi conducting material .  Conductor construction as per IS 8130-1984.
6.0	Insulation type	XLPE insulated, with insulation shielding over individual cores, consisting of extruded semi conducting compound, followed by lapped semi conducting material and copper tape (non magnetic) metallic screen, cores stranded together with a holding tape provided with a common covering of extruded inner sheath of type ST2 compound .  The cable shall conform to IS:7098(Part-2)-1985.
7.0	Armour	Galvanized steel wire armoured .  For multi core cables , armouring shall be applied over the inner sheath of flat steel wires (strips) .  Round steel wire armouring can also be offered.  For single core armoured cables non-magnetic armour consisting of hard drawn flat or round aluminium wires shall be provided.

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8.0	Outer sheath	PVC outer sheathed of type ST2 compound . Black in colour . Suitable chemicals shall be added into the PVC compound of the outer sheath to protect the cable against rodent and termite attack.
9.0	Miscellaneous	Copper screen shall be suitable to carry 1 KA E/F current for one second.
10.0	Temp. rise on continuous load	90 deg.C
11.0	Oxygen index of outer sheath material for XLPE Cable	Shall not be less than 29 at 27. 2 deg. C.
12.0	Temperature index	Not below 250degC.
13.0	Max. conductor withstand temperature during short circuit.	250degC

**5.2. FLAME RETARDANT LOW SMOKE (FRLS) CABLES**

Sl.No.	Parameter	Description
1.0	Voltage Grade	1.1 kV grade
2.0	Reference standard	Category AF as per IS : 10810 ASTM-D 2863 (Critical Oxygen Index) ASTM-D 2863 (Temperature Index) ASTM-D 2843 (Smoke density) IEC 754-1 (Acid gas generation)
		IEEE-383 (Flammability test on group of cables) Swedish chimney test SS 424175, class F3. (Flammability test) IEC 332-1 (Flammability test) IEC 332-3 (Flammability test) IS 5831 (Fire resistant test)
3.0	Duty type	Heavy duty
4.0	No. of cores	Single or multicore as per requirement
5.0	Cross sectional area	As per requirement .
6.0	Conductor type	Annealed tinned copper conductor
8.0	Insulation type	XLPE insulation
11.0	Sheath	Specially designed with thermoplastic or thermosetting materials , superior resistance to ignition and flame propagation with smoke emission and toxicity or corrosive characteristics  Flame retarded  Oil resistant
12.0	Armouring	GI wire / strip armoured as per requirement and size (as specified in respective TS)

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13.0	Test values	Critical Oxygen Index : Minimum 29 Temperature Index : Minimum 250 deg. C Smoke density : Minimum average light transmission of 40% Acid gas generation : HCl gas released 20% maximum Flammability test on group of cables: As per standards mentioned Flammability test : As per standards mentioned Fire resistant test : As per standards mentioned
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**6. ILLUMINATION**
**6.1. GENERAL**

The lighting system inside and outside the station are designed based on the desired minimum illumination levels recommended by IS.

The illumination system shall be designed as per IS:3646-1992. The minimum level of illumination, type of fittings, maintenance factor to be considered is as given below:

<b>Area</b>	<b>Type of Light Fittings&amp; Lamps</b>	<b>Lux level (min)</b>	<b>MF</b>
Control rooms	Surface mounted / Suspended luminaires with energy efficient LED tube. (CGL type LCTLR-36-CDL).	300	0.75
Electrical rooms having PCC, PDB	Surface mounted / Suspended luminaires with energy efficient LED tube. (CGL type LCTLR-36-CDL).	200	0.7
Offices without false ceiling	Surface mounted / Suspended luminaires with energy efficient LED tube. (CGL type LCTLR-36-CDL).	300	0.75
Battery Room	Industrial vapour proof IP55 luminaire with 2 x 36 W TFL diecase aluminium control gear boxes at the ends with synthetic rubber gasket	100	0.6
Compressor room	Surface mounted / Suspended luminaires with energy efficient LED tube. (CGL type LCTLR-36-CDL).	200	0.6
Flood lighting	Weather proof Flood light luminaire with 120W	70	0.5

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	LED lamp, IP 65 or better, integral type with aluminium die cast housing. The luminaire shall be complete with control gear, driver & surge protector, heat resistant cover, prewired up to terminal block.		
Toilets	Bulk head luminaire (led) similar to CGL CAT.NO. LBH-10-CDL.	100	0.6
Street light Fittings	4 x 24 W Flame proof street light Ex-d type fixture with T5 lamp, control gear in cast aluminium alloy LM6 enclosure and toughened glass cover. The enclosure shall be of IP: 65 suitable for Zone 1 & 2 gas group IIA & IIB with all accessories.	As per IS	0.6
Canopy Light Fittings	Explosion cum weather proof 72 W LED light fitting similar to Baliga Catalogue no. ECRF-236	As per IS	0.6

MF : Maintenance factor

The light fittings shall be complete with all accessories like electronic ballast, reflector etc.

**6.2. HIGH MAST SPECIFICATIONS**

**6.2.1. DESIGN CRITERIA :**

The equipment shall be suitable for operation at Hazardous area. The ambient conditions for design of equipments shall be taken as below:-

- |                               |   |                                 |
|-------------------------------|---|---------------------------------|
| a) Design Ambient temperature | : | 50°C                            |
| b) Maximum humidity           | : | 100%                            |
| c) Altitude                   | : | Less than 500 mtr. at sea level |
| d) Site condition             | : | ----                            |
| e) Wind speed                 | : | 180 km/hr                       |

**6.2.2. STRUCTURE :**

The High mast shall be of continuously tapered, polygonal cross section, at least 20 sided, presenting a good and pleasing appearance and shall be based on proven In-Tension design conforming to the standards referred to above, to give an assured performance, and reliable service. The structure shall be suitable for wind loadings as per IS 875 Part 3 1987.

**6.2.3. CONSTRUCTION :**

The mast shall be fabricated from special steel plates, cut and folded to form a polygonal section and shall be telescopically jointed and welded. The procedural weld geometry and

the workmanship shall be exhaustively tested on the completed welds. Mast can be fabricated in multiple sections of length approximately 10 metres. Thus a 30 M can be delivered in three sections. No site welding or bolted joint shall be done on the mast. The minimum overlap distance shall be 1.5 times the diameter at penetration. The dimensions of the mast shall be decided based on proper design and design calculations shall be submitted for verification.

The mast shall be provided with fully penetrated flange, which shall be free from any lamination or incursion. The welded connection of the base flange shall be fully developed to the strength of the entire section. The base flange shall be provided with supplementary gussets between the bolt-holes to ensure elimination of helical stress concentration. For the environmental protection of the mast, the entire fabricated mast shall be hot dip galvanized, internally and externally, having a uniform thickness of 85 microns for the bottom section and 65 micron for the middle and top sections.

**6.2.4. DOOR OPENING:**

An adequate door opening shall be provided at the base of the mast and the opening shall be such that it permits clear access to equipment like winches, cables, plug and socket, etc. and also facilitate easy removal of the winch. The door opening shall be complete with a close fitting, vandal resistant, weatherproof door, provided with a heavy-duty double internal lock with special paddle key.

The door opening shall be carefully designed and reinforced with welded steel section, so that the mast section at the base shall be unaffected and undue buckling of the cut portion is prevented. Size of door opening shall be around 1100 x 280 mm and shall be strengthened if required to avoid buckling of the mast section under heavy wind conditions.

**6.2.5. DYNAMIC LOADING FOR THE MAST:**

The mast structure shall be suitable to sustain an assumed maximum reaction arising from a wind speed as per IS 875 (three second gust), and shall be measured at a height of 10 meters above ground level. The design life of the mast shall be a minimum of 25 years.

**6.2.6. LANTERN CARRIAGE:**

Fabrication:

A fabricated Lantern Carriage shall be provided for fixing and holding the flood light fittings and control gear boxes. The Lantern Carriage shall be of special design and shall be of steel tube construction, the tubes acting as conduits for wires, with holes fully protected by grommets. The Lantern Carriage shall be so designed and fabricated to hold the required number of flood light fittings and the control gear boxes, and also have a perfect self balance.



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The Lantern Carriage can be fabricated in two halves and joined by bolted flanges with stainless steel bolts and nylon type stainless steel nuts to enable easy installation or removal from the erected mast. The inner lining of the carriage shall be provided with suitable protective arrangement, so that no damage is caused to the surface of the mast during the raising and lowering operation of the carriage. The entire Lantern Carriage shall be hot dip galvanized after fabrication. The design shall provide a perfect balance for the lantern carriage during raising and to lowering also.

**Junction Box:**

Weather proof junction box, made of Cast Aluminium shall be provided on the Carriage Assembly as required, from which the inter-connections to the designed number of the flood light luminaries and associated control gears fixed on the carriage shall be made.

**Raising and lowering Mechanism:**

For installation and maintenance of the luminaries and lamps, it will be necessary to lower and raise the Lantern Carriage Assembly. To enable this, a suitable Winch Arrangement shall be provided, with the winch fixed at the base of the mast and the specially designed head frame assembly at the top. Suitable limit switches shall be provided to trip the winch motor at both top & bottom ends of the designed travel.

**Winch:**

The winch shall be of completely self sustaining type, without the need for brake shoe, springs or clutches. Each driving spindle of the winch shall be positively locked when not in use, gravity activated PAWLS. Individual drum also should be operated for fine adjustment of lantern carriage. The capacity, operating speed, safe working load, recommended lubrication and serial number of the winch shall be clearly marked on each winch.

The winch shall be self-lubricating type by means of an oil bath and the oil shall be readily available grades of reputed producers.

The winch drums shall be grooved to ensure perfect seat for stable and tidy rope lay, with no chances of rope slippage. The rope termination in the winch shall be such that distortion or twisting is eliminated and at least 5 to 6 turns of rope remains on the drum even when the lantern carriage is fully lowered and rested on the rest pads. It should be possible to operate the winch manually by a suitable handle and by an external power tool. It shall be possible to remove the double drum after dismantling, through the door opening provided at the base of the mast. Also, a winch gear box for simultaneous and reversible operation of the double drum winch shall be provided as part of the contract.

The winch shall be type tested in presence of a reputed Institution and the test certificates

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shall be furnished before supply of materials. A test certificate shall be furnished by the Contractor from the original equipment manufacturer, for each winch in support of the maximum load operated by the winch.

### Head Frame:

The head frame which is to be designed as a capping unit of the mast, shall be of welded steel construction, galvanized both internally and externally. The top pulley shall be of appropriate diameter, large enough to accommodate the stainless steel wire ropes and the multi-core electric cable. The pulley block shall be made of non-corrodible material, like die cast Aluminium Alloy (LM-6). Self-lubricating bearings and stainless steel shaft shall be provided to facilitate smooth and maintenance free operation for a long period. The pulley assembly shall be fully protected by a canopy galvanized internally and externally.

Close fitting guides and sleeves shall be provided to ensure that the ropes and cables do not dislodge from their respective positions in the grooves. The head frame shall be provided with guides and stops with PVC buffer for docking the lantern carriage.

### Stainless Steel Wire Ropes:

The suspension system shall essentially be without any intermediate joint and shall consist of only non-corrodible stainless steel of AISI 316 or better grade.

The stainless steel wire ropes shall be of multi strand construction, the central core being of the same material. The overall diameter of the rope shall not be less than 6 mm. The breaking load of each rope shall have factor of safety of over 5 for the system at full load. The end constructions of ropes to the winch drum shall be fitted with talurit.

The thimbles shall be secured on ropes by compression splices. Two continuous lengths of stainless steel wire ropes shall be used in the system and no intermediate joints are acceptable in view of the required safety. **No intermediate joints / terminations, either bolted or else, shall be provided on the wire ropes between winch and lantern carriage.**

### 6.2.7. ELECTRICAL SYSTEM, CABLE AND CABLE CONNECTION:

A suitable Flame proof terminal box shall be provided as part of the contract at the base compartment of the high mast for terminating the incoming cable. The electrical connections from the bottom to the top shall be made by special trailing cable. The cable shall be EPR insulated and PCP sheathed to get flexibility and endurance, and have copper conductors. The cable shall be of reputed make. At the top there shall be weather proof junction box to terminate the trailing cable. Connections from the top junction box to the individual luminaries shall be made by using 3 core flexible PVC cables of adequate size. **The system shall have in-built facilities for testing the luminaries while in lowered**

**position. 2 No's Trailing cable shall be considered for making 2 lighting circuits.**

Also, suitable provision shall be made at the base compartment of the mast to facilitate the operation of externally mounted, electrically operated power tool for raising and lowering of the lantern carriage assembly. The trailing cables of the lantern carriage rings shall be terminated by means of specially designed, metal clad, multi-pin plug and socket provided in the base compartment to enable easy disconnection when required.

A **FLAME PROOF TYPE** distribution board with suitably rated 3-phase incomer MCB and separate MCB's controlled feeders for lighting and power tool shall also be supplied. The board shall incorporate timer for control of lighting (**2 circuits**) and control circuit for winch operation with all necessary contactors etc. The board shall have IP 65 protection with rainwater protections canopy and epoxy powder coated suitable for outdoor mounting in coastal area. The work shall also include necessary foundation cable glands etc. complete as required.

#### **6.2.8. POWER TOOL FOR THE WINCH:**

A suitable, high-powered, electrically driven, internally mounted power tool, with manual over ride shall be supplied for the raising and lowering of the lantern carriage for maintenance purposes. The speed of the power tool shall be to suit the system. The power tool shall be single speed, provided with a motor of the required rating. The power tool shall be supplied complete with push button type remote control switch, together with 6 (six) meters of power cable, so that the operations can be carried out from a safe distance of 5 (five) meters. The capacity and speed of the electric motor used in the power tool shall be suitable for the lifting of the design load installed on the lantern carriage.

The power tool mounting shall be so designed that it will be not only self supporting but also aligns the power tool perfectly with respect to the winch spindle during the operations. Also, a handle for the manual operation of the winches in case of problems with the electricity operated tool, shall be provided and shall incorporate a torque limiting device.

There shall be a separate torque-limiting device to protect the wire ropes from over stretching. It shall be Mechanical with suitable load adjusting device. The torque limiter shall trip the load when it exceeds the adjusted limits. There shall be suitable provision for warning the operator once the load is tripped off. The torque limiter is a requirement as per the relevant standards in view of the over all safety of the system. Each mast shall have its own power tool motor.

#### **6.2.9. LIGHTNING FINIAL:**

One number heavy duty hot dip galvanized lightning finial shall be provided for each mast. The lightning finial shall be minimum 1.2 M in length or as required so that the lantern carriage also comes within the safety zone and shall be provided at the centre of the

head frame. It shall be bolted solidly to the head frame to get a direct conducting path to the earth through the mast. **The lightning finial shall not be provided on the lantern carriage under any circumstances in view of safety of the system. 2 NO'S Copper jumpers shall be provided from lightning final to the mast body.**

**6.2.10. AVIATION OBSTRUCTION LIGHTS:**

2 No's Neon type Aviation Obstruction Lights of reliable design shall be provided on top of each mast.

**6.2.11. EARTHING TERMINALS:**

Suitable earth terminal using 12 mm diameter stainless steel bolts shall be provided at a convenient location on the base of the Mast, for lightning and electrical earthing of the mast. The mast shall be provided with duplicate earthing including necessary earth pits as per IS.

**6.2.12. FOUNDATION FOR HIGH MAST:**

The scope also includes supplying all materials and casting of RCC pedestal foundation along with necessary Anchor bolts etc.,

The detailed drawing considering wind speed for the pedestal foundation shall be submitted and got approved by consultant/Owner before starting of the work.

**6.2.13. DATA SHEET:**

A technical data sheet covering all the main parts / components shall be SUBMITTED ALONG WITH THE OFFER. (As per standards BSEN-10025, IS-875 & IS-2062).

**6.2.14. LUMINAIRES:**

Luminaries shall be specially designed with suitable lamp housing and control gears. The luminaries shall be tested as per Indian standards and test reports shall be submitted for approval. The luminaries shall be suitable for installation on high masts. The number and type of light fitting shall be as per SOR. **The Required lux level for each Mast shall be between 20 to 30 lux.**

**6.3. LIGHT FIXTURES, LAMPS AND ACCESSORIES:**

**6.3.1. GENERAL**

- i. All the luminaries shall be designed, manufactured and tested in accordance with relevant IS specifications so far as they are applicable.
- ii. All types of light fittings shall be supplied with lamps.
- iii. All the luminaries shall be industrial type with LED with minimum burning time

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of 50,000 hours with no toxic content with a colour temperature (CCT) $\geq$ 4000K&CRI above 80 . Power factor shall be more than 0.9 and driver efficiency more than 86%. Junction Temperature shall be kept as low as possible so as to increase performance and life time of LED and ensure that the luminaries are as heat efficient as possible. LED Light fittings shall be suitable for operation at an ambient temperature of 50Deg.C. Heatsink temperature rise above ambient shall be limited as per relevant available IS/IEC . For all outdoor fittings , surge arrestors shall be provided.

- iv. All the light fixtures shall be complete with all parts along with LED lamps/tubes, drivers and accessories for installation and efficient performance whether specifically mentioned in the specification or not. LED fittings shall be selected so as to provide correct colour appearance and rendering to enable workers to see & judge quickly and accurately, details of their work such as colour, brightness, shape form etc.
- v. Individual light fittings shall be provided with suitable arrangements for GI threaded conduit entry of 19 mm dia unless otherwise specified. Terminals of all fittings shall be suitable for taking 2.5 sq. mm flexible, copper conductor PVC insulated, FRLS-PVC sheathed cable.
- vi. Fittings shall be supplied with all inter – connections made and fully wired up to the terminal block and shall be suitable for mounting on wall / column / ceiling / suspension (from the ceiling including suitable bracket).
- vii. All the luminaries shall be commercial / industrial type as per specific requirement. Specification for the various types of LED mentioned in the schedule of quantities shall be followed. All the lighting fixtures shall be complete with all parts, including Earthing arrangement and accessories for efficient performance whether specifically asked in the specification or in the schedule of items or not.
- viii. All live parts shall be provided with suitable sleeves to prevent accidental contacts. The Earthing terminal in the fitting shall effectively earth the body of the entire luminaries
- ix. The luminaries shall be suitably designed to provide economically the required level of illumination on the working plane when mounted at normal standard height in accordance with the type of fixtures.
- x. The luminaries shall be suitable for operating at normal supply voltage of 240 V, single phase, 50 Hz with voltage variation of +/- 10% or at voltages as specified. Electronic Ballast's/drivers shall be used for all fittings. P.F correction capacitor to improve P.F up to 0.95, electronic igniter, necessary connectors etc., shall also be provided where required.
- xi. The clearance between the live parts and the enclosures earthing and other safety factors shall be governed by the latest revisions of the IS specification and IE rules.
- xii. Mounting accessories like chain, for fittings mounted in false ceilings anchor bolt

and all erection accessories required for complete installation is in the scope of the contractor. The price for same shall be included in the fitting cost.

- xiii. Down rods / chains for mounting light fittings and fans and GI conduits, brackets, flats, hooks, channels, etc., also to be supplied and installed as required. The price for same shall be included in the fitting cost.
- xiv. All luminaries are to be supplied with required lamps as indicated in the drawings / specifications.
- xv. All discharge lamp fittings shall be supplied with suitable ballast, power factor improvement capacitor, igniter, etc. The ballast terminals shall be made for various tapings for use on a wide range of mains voltage making it versatile in application.

### 6.3.2. NON HAZARDOUS AREA LIGHT FIXTURES

#### A. DECORATIVE LED LIGHTFITTING SIMILAR TO CGL CAT.NO. LCTLS-36- CDL :

Decorative type light fitting suitable for energy efficient LED lamps with high efficiency diffuser and CRCA powder coated body, IP20 or better for surface / recessed mounting accommodating all electrical accessories pre-wired up to a terminal block. It shall have optimum glare control and shall be aesthetically appealing with distinguished looks. Fitting type shall be similar to the type mentioned in the price schedule.

#### B. FLOOD LIGHT LUMINAIRE (LED) SIMILAR TO CGL CAT. No. LSFO-120-CDL:

Weather proof Flood light luminaire with 120W LED lamp, IP 65 or better, integral type with aluminium die cast housing. The luminaire shall be complete with control gear, driver & surge protector, heat resistant cover, prewired up to terminal block.

#### C. AVIATION OBSTRUCTION LUMINAIRE (SUITABLE FOR NEON

LAMP) : Aviation obstruction lights shall consist of yellow painted cast aluminium body housing, with led LAMP and heat resistant, clear, toughened, thick glass dome mounted on hinged die cast aluminium ring secured to the body. The luminaire shall be provided with Neon spiral plugged into spring loaded high tension nylon socket and wired up to the terminal block. The luminaire shall be suitable for mounting on a pipe bracket.

#### D. BULK HEAD LUMINAIRE (LED) SIMILAR TO CGL CAT.NO. LBH-10-

CDL : The body of the fitting shall be made of epoxy powder coated die cast aluminium fitted with acrylic diffuser and frame. Proper sealing of inside against outside influences like water vapour etc., is to be achieved. The fitting shall be provided with electronic driver. The housing shall have suitable conduit threaded entry and fixing lugs shall be provided for mounting on wall / ceiling. All MS

hardware parts shall be cadmium plated and passivated to withstand corrosion. The fitting shall be weather proof IP:65.

**E. STREET LIGHT POLE:**

The Octagonal Poles shall be designed to withstand the maximum wind speed as per IS 875. The top loading i.e area and the weight of Fixtures are to be calculate maximum deflection of the poles and the same shall meet the requirement of BS: 5649Part VI 1982. Each pole shall comprise of FLP looping/terminal box (IP:66-polycarbonate type) clamped with top level 1200mm above ground level along with a suitable earth terminal. A base plate 300 x 300 x 10mm welded to the bottom of the pole. The looping box shall be provided with a suitable bus bar arrangement to loop 3 to 4 cables (type and size shall be as per schedule of items/drawings). 2A DP MCB and an earthing terminal shall be provided.

The pole shaft shall have octagonal cross section and shall be continuously tapered with single longitudinal welding. There shall not be any circumferential welding. The welding of pole shaft shall be done by Submerged Arc welding (SAW)process.

The welding shall be carried out conforming to approved procedures and duly qualified by third party inspection agency. The welders shall also be qualified for welding the octagonal shafts.

Octagonal Poles : HT Steel Conforming to grade S355JO Foundation Bolts : EN.8grade.

Base Plate : Fe410 conforming to IS226 / IS2062

The octagonal poles shall be in single section (upto11mtr).There shall not be any circumferential weld joint.

The pole shall be provided with a cap having 3 nos. fixing bolts at 120 degrees apart, pipe arm with suitable stiffeners shall be provided to mount the street light fitting. The dia of the pipe shall be suitable to carry the weight of fitting etc and suitable for mounting the fitting.

The pole shall be provided with necessary cross arms as per schedule of items for mounting one or more numbers of street light fittings where required. Both underground cable and earth cable shall be terminated at the terminal/looping box. Further wiring to the light fixture shall be done by three core flexible copper wire (2 core for power supply and third core for earthing). The earth terminal at the terminal box shall be further connected to the earth terminal on the pole by aluminium cable.

Steel octagonal pole cap and all other MS material shall be epoxy painted hot dip galvanized to 80 micron thickness. All hardwares like nuts, bolts, etc shall be of stainless steel or zinc passivated.

The octagonal poles shall be bolted on a precast foundation with a set off our foundation bolts for greater rigidity. The civil work for street light pole foundation forms a part of erection.

The poles shall be hot dip galvanized as per IS2629/ IS2633 /IS 4759 standards with average coating thickness of 70 micron. The galvanizing shall be done in single dipping.

The scope also includes supplying all materials and casting of RCC pedestal foundation along with necessary Anchor bolts etc.,

The detailed drawing considering wind speed for the pedestal foundation shall be submitted and got approved by consultant/Owner before starting of the work.

Steel tubular poles shall conform to IS 2713 Part II – 1980 with designation as specified in the BOQ.

**F. TIMER**

Timer (Time switch) shall be accurate & quartz driven. The timer shall have an built in chargeable Ni-Cd cells for 150 hours continuous operation in the event of power failure. The timer shall be suitable for switching ON / OFF street lights, open area lights, boundary wall lights etc., at predetermined time.

**6.3.3. SOCKETS, SWITCHES, FANS AND OTHER INSTALLTION ACCESSORIES:**

**A. SOCKET OUTLETS:**

i. FLUSH/SURFACE MOUNTING SOCKET OUTLETS (DECORATIVE TYPE)

6A / 16A, 6A, 240V, single phase, 3 pin (two pole and one earth) socket outlet shall be flush / surface mounting type along with decorative type switch. The socket shall be 6A / 16A combined (universal type) having 6 pin, or 16A, 3 pin with suitable piano type switch.

ii. INDUSTRIAL TYPE PLUG SOCKET OUTLET

10A/20A, 240V, single phase, 3 pin (two pole and one earth) industrial type socket outlet with interlocked switch. The outer casing shall be made of non-corroding die cast aluminium alloy, moulded of superior grade phenolic /polyester compound.

**B. JUNCTION AND OUTLET BOXES :**

Junction and outlet boxes fabricated with sheet steel shall have a minimum thickness of 1.6 mm / polycarbonate unless otherwise specified in schedule of items. All these items shall be painted whether indicated specifically in the BOQ or not. The JB shall have earthing terminals & terminal block, required no. of knockouts for cable entry etc.,

The exact size and number of knockouts & cable glands shall be decided by the Contractor as per actual requirement.

**C. CONTROL SWITCHES :**

i. DECORATIVE TYPE



Single pole decorative type, 6A or 16A switches shall be used for light point wiring in control rooms, office premises/non plant buildings.

All branch switches shall be placed in line conductor of the circuit and no single switch or fuse shall be inserted in the neutral conductor of the circuit.

ii. **SWITCH BOARDS (FOR DECORATIVE SWITCHES AND SOCKETS)**

: The switch board shall be made of 1.6 mm thick sheet steel and painted / polycarbonate including supports for switches, sockets, fan regulator etc., but excluding front cover in case of decorative switches & sockets which will be of FRP sheet of approved quality, design and colour. Clear depth of the box shall not be less than 60 mm, but adequate for easy mounting of fan regulators. All fittings shall be in flush pattern in case of concealed wiring. The FRP cover sheet thickness shall not be less than 4 mm. No separate payment will be made for switch boards as the cost of this has to be included along with the rate quoted for socket, point wiring, switches and fans. In case of more numbers of sockets / switches / regulators are to mounted in one location, these can be mounted in a bigger size switch board with necessary clearance etc., between switches instead of individual switch board for each switch. Sheet steel enclosure shall be painted with two coats of epoxy paint above two coats of epoxy based primer.

iii. **BOLTS & NUTS / BRACKETS / DOWNRODS / CHAIN:**

All screws, bolts nuts and washers used for Illumination work shall be of brass or cadmium passivated MS to resist corrossions. All brackets, down rods, chains used for suspension of light fittings shall be made of MS Conduits / channels / angles / strips as approved by site engineer. Two coats of epoxy spray painting shall be applied over two coat of epoxy based primer for all accessories.

iv. **CEILING ROSES / LAMP HOLDERS FOR POINT WIRING :**

- a. Ceiling rose may be used in the wiring, as required.
- b. Normally only one flexible cord shall be attached to a ceiling rose. Specially designed ceiling roses shall be used for multiple pendants.
- c. All ceiling roses shall be of three plate pattern.
- d. All lamp holders shall be of brass and batten or angle type as required with shrouding.

v. **CEILING FAN FANS AND REGULATORS :**

- a. All ceiling fans supplied shall be conforming to relevant IS and with capacitor starting, 5 star rated suitable for voltage range of not

less than 220 V to 240 V AC single phase supply.

- b. Fans shall be supplied complete with fan motor, fan blade, insulated hangers canopy and regulator along-with a down rod of suitable length as required. The speed regulators shall be of electronic type for steeples variation from zero to 100%. All ceiling fans supplied shall have double ball bearings.
- c. All ceiling fans shall be wired to a junction box and suspended from a hook in shackle and insulated from the same. All joints in the suspended rod shall be screwed and all joints or bolts in connection there with shall in addition be secured by means of split pin.
- d. The canopy at the top of the suspension rod shall effectively hide the suspension.
- e. The lead-in wires shall not be smaller than 0.75 Sq.mm (24/0.2 mm) PVC insulated flexible copper conductor cable and shall be protected from abrasion.
- f. Unless otherwise stated, all ceiling fans shall be hung at 150mm above the light fitting level or as directed by the Engineer in-charge. The length of the down rod supplied shall be suitable for this purpose.
- g. Generally the ceiling fans shall be mounted 2500/3000, above FFL. The down rod length shall be considered based on roof profile (slope or flat).

vi. **EXHAUST FAN :**

Exhaust fan shall have totally enclosed with highly efficient heavy duty motor mounted on ball bearing, precisely and dynamically balanced blades/impeller to ensure smooth and trouble free operation, rigid frame with rubber pads for silent operation finished with epoxy based painting for better chemical, Mechanical and corrosion resistant. The exhaust fan shall be supplied with wire guard/bird mesh screen as required.

The exhaust fan shall be provided with earthing terminal. Battery rooms shall be provided with minimum two exhaust fans. All toilet blocks / Pantry shall be provided with Exhaust fans.

**6.3.4. CABLES & WIRES:**

**A. CABLES:**

Cables shall be used for power supply to lighting boards and all outdoor installations.

**B. WIRES :**

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1100V grade PVC insulated FRLS, PVC sheathed round wire armoured PVC overall sheathed cable with stranded copper conductors (YRY) not less than 2.5 sq mm cross-section shall be used for wiring for connecting from distribution board to outdoor light fittings and not less than 4 sq mm cross-section for power circuits. Where the number of cables is less it is permitted to directly fix the cables on GI saddles and a common clamp for the the cables. Cables shall be cleated at intervals not exceeding 1000mm. Generally, cables shall be laid in such a manner to avoid crossing / jumping of cables over each other and shall provide a neat and tidy appearance. Suitable size compression brass glands shall be provided for cable entry / exit.

**C. POINT WIRING:**

Supply and wiring of 1100V grade, FRLS, PVC insulated single core Copper conductor wire (without joint) drawn into the 19 mm dia concealed PVC Conduit for Light points and 25mm dia. PVC conduit for power points (including supply of conduit). The scope covers pulling the wire from switch box to lighting / exhaust fan point through the conduit and connecting both the ends with all accessories like bends, junction boxes and couplers, factory made covers for all the pull JB's, including breaking of wall etc.

The wiring for lighting, fans and socket outlets shall be carried out on point wiring basis. Point wiring shall be done in conduits using 3 runs of single core 1100V grade , FRLS,PVC insulated stranded copper wire as per IS:694 as specified in BOM.

The 6A sockets shall be of universal type. The sockets shall be flush mounting type. Every switchbox shall consist of 6A socket outlet controlled by a 6A switch.

The switchbox shall be suitable for concealed flush mounting in walls. Necessary chipping of walls for installing the switchbox and making the wall good after installation of the switch box shall be included in the scope. The switchbox shall be made from galvanized sheet steel and shall have a provision for earthing from inside. The boards shall be covered with poly carbonate front cover having good aesthetic look suitable for mounting modular switches and sockets.

Point wiring shall include supply and installation of 1.5 sq.mm,2.5 sq.mm, 4 sq.mm & 6 sq.mm Cu wires, 19mm rigid PVC conduits and wiring accessories like pull box, ceiling roses, fittings including circular/rectangular sheet steel/thermoplastic bends, tees, sockets, adopters, reducers, saddles, distance pieces etc for concealed wiring as per requirements to complete the lighting/fan/exhaust fan wiring of rooms. PVC insulated multi stranded copper wires of 1.1 KV grade with ISI certification shall be used. The following colour code shall be adopted for wiring:

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Phase : Red/Yellow/Blue Single phase wiring : Black Neutral : Green

Primary point is the light/fan point wiring from the switch box to one light fitting / fan via the switch. Secondary points are light points looped from the primary light point or from the nearest secondary light point in the same lighting circuit.

All electronic ballasts for light fittings shall be low loss type with total harmonic distortion not more than 30% and power factor greater than 0.9.

**D. TESTS :**

All tests conducted shall be as per IS amended up to date. Type test certificates shall be submitted at the time of approval of specific makes.

**E. CONDUITS :**

i. PVC CONDUIT

Rigid heavy duty PVC conduit as per IS : suitable for electrical wiring may also be used wherever indicated in the approved drawings or specifically approved by Engineer. It shall be of approved make.

ii. PVC CASING, CAPPING & ACCESSORIES

PVC casing, capping & accessories like Tees, elbows, JB's shall be of heavy duty fire retardant self extinguishing, Acid & Alkali resistant, PVC toughness that will not dent, snap-fit covering, desired colour.

iii. GI PIPES

All the pipes supplied shall be suitable for cable drawing, without any internal burrs, smooth internal surface and threaded at both ends with coupling at one end

Class 'B' type GI pipes as per IS shall be used for the following cable routes:

- a. Cables running on floor shall be laid in buried pipes.
- b. All cables laid upto a level +200mm from floor level shall be in GI pipes.
- c. Cables crossing road, entering building from outside through wall/foundations etc. shall be laid in GI pipes.
- d. All GI pipes shall have a suitable fish wire for drawing cable.

**6.3.5. EARTHING:**

Earthing shall confirm to IS 3043 – 1987 and relevant OISD.

**A. EARTHING OF LIGHTING DISTRIBUTION BOARDS :**

The lighting board shall be provided with two separate earth terminals. An earth bus bar of appropriate cross section shall be provided inside the lighting board and connected to the earth terminals provided on either side of the board.

Adequate number of holes / terminals shall be provided on earth bus with suitable provision for terminating the earth wire.

GI strip / GI wire insulated single core cable of suitable size shall be used for earthing the lighting board, by connecting the two earth terminals separately to the earthing main in the shop / earth pit.

**B. EARTHING OF LIGHT FIXTURES AND SOCKET OUTLETS :**

The single core PVC insulated / bare copper wire or 14 SWG GI wire and the third core of the flexible wiring cable shall be used for earthing the light fixtures and single phase socket outlets etc.,

**C. EARTHING OF METAL BOXES AND BRACKETS :**

Not less than 14 SWG GI wire or suitable size PVC insulated copper wire shall be used for earthing all metal boxes and brackets.

**D. EARTHING OF STREET LIGHT POLES/SOLAR LIGHTING POLES/  
FLOOD LIGHTING POLES :**

At every 5<sup>th</sup> pole including end poles a separate earth station shall be provided. The poles will be earthed by connecting its earth terminal to the junction box through 8 SWG GI wire. Apart from the above, continuous earthing connection from pole to pole shall be carried out using single core PVC insulated PVC sheathed armoured cable with aluminium conductor.

The earth terminal at the junction box shall be connected to the main earthing ring through GI 25 x 5 mm flat.

**6.4. HAZARDOUS AREA ILLUMINATION:**

**6.4.1. GENERAL :**

All the equipment's installed and accessories used shall conform to the requirements stipulated under relevant OISD / IEC / Indian Standards for the type / category of installation. All the equipments and accessories installed in these areas shall be certified by CMRS, Dhandbad for using in that particular types of hazardous atmosphere like flammable gas / Vapour or hazardous dust. All the equipments installed shall not attain more than the maximum permissible surface temperature specified for that area elsewhere in the specification, if not the maximum permissible temperature may be assumed as 100 degree C. It shall be ensured that overheating / sparking whether in normal use or under fault condition is confined within the approved housing of wiring system and electrical

item concurred. If any equipment is likely to produce more than the prescribed maximum permissible surface temperature due to abnormal conditions of operation or during fault conditions, all such fittings shall be fitted with a thermal device to disconnect the appropriate circuit before the maximum safe temperature is exceeded.

This bimetal thermally operated cutout device shall preferably be included in the enclosure containing choke and other control gears liable to be over heated. THIS THERMAL DEVICE SHALL NOT BE AUTOMATIC SELF-RESETTING TYPE. If control gears are not integral with the fitting the enclosure for the control gears also shall be suitable for use in that particular type of hazardous atmosphere and certified by CMRS, Dhandbad. For all the equipments where cast iron body is specified, cast Aluminium alloy (LM-06) is also acceptable. All the equipments if constructed out of Aluminium alloy, its external surfaces shall be smooth finished to be free from frictional sparking hazard. All the equipments shall have markings, warning inscriptions and interlocks, specified as per relevant I.S, inscribed either by raised lettering or cast integrally with or by a plate permanently attached to the body of the fitting. Copy of CMRS, Dhandbad, and certificate for each type of fitting should be submitted.

#### **6.4.2. LIGHT FITTINGS :**

- i. FLAME PROOF STREET LIGHT FITTING SIMILAR TO CGL CAT. NO. FSL 424**  
4 x 24 W Flame proof street light Ex-d type fixture with T5 lamp, control gear in cast aluminium alloy LM6 enclosure and toughened glass cover. The enclosure shall be of IP: 65 suitable for Zone 1 & 2 gas group IIA & IIB with all accessories.
- ii. FLAME PROOF SIMILAR TO Baliga CAT. NO. ECRF-236**  
The fitting shall have a Aluminium alloy LM 6 enclosure , toughened Glass Window and Surface mounting arrangement with control gear housing the terminal box. The enclosure shall be IP 66 suitable for Zone 1 with all accessories.
- iii. INDUSTRIAL VAPOUR PROOF LIGHT FITTING**  
Industrial vapour proof IP55 luminaire with 2 x 36 W TFL diecast aluminium control gear boxes at the ends with synthetic rubber gasket connected by MS pipe finished in hammer tone grey.

#### **6.4.3. SWITCHES, SOCKETS AND OTHER ACCESSORIES :**

The enclosures shall be of cast iron construction having an integral terminal chamber. The front cover shall be secured to the body either by a threaded joint or by special type screws. The box shall have minimum two earthing provision outside and preferably one more inside. The switches and sockets shall be supplied with suitable double compression FLP type cable gland and cable entry / exit provisions shall be as per specific requirements. The enclosure shall have suitable provision for mounting on wall / column. The

contact of the switches shall be suitable for heavy duty and shall be able to make and break the specified rated current effectively. The enclosure shall be suitable to contain the spark / arc created during the operation of the switch effectively from the outside atmosphere. The entire equipment shall conform to the relevant standards and certified by the appropriate authorities for use in hazardous areas having flammable gases or Vapour and explosive dust.

All the accessories such as Pull/anchor/ceiling/junction/outlet boxes specified for use in hazardous areas should conform to the relevant standards and certified by CMRS, Dhandbad. The body of all the above boxes shall be made of cast iron or cast Aluminium alloy and shall have a removable cover plate. The cover plate shall have either a threaded joint or a screwed joint with the body. The number of cable entries shall be as per the requirement.

**6.4.4. FLAME PROOF EXHAUST FAN :**

Exhaust fans shall have flame proof, highly efficient heavy duty motor mounted on ball bearing, precisely dynamically balanced blades / impeller to ensure smooth to trouble free operation, rigid frame with rubber pads for mounting to reduce vibrations for silent operation, finished with stove enameled epoxy powder coated for better chemical, Mechanical and corrosion resistant. The exhaust fan shall be supplied with wire guard / bird mesh screen as required.

**6.4.5. FLAME PROOF MCB DISTRIBUTION BOARDS :**

All equipments shall be designed suitable for operation in hazardous areas having flammable gases or Vapour and explosive dust. The distribution board shall be wall / floor mounted type made of cast iron / cast Aluminium LM6 with anti corrosive and light grey epoxy coated finish. The incoming cable terminals, outgoing cable terminals and the switch are all housed in separate chambers. The operating handle of the incomer shall be suitably inter locked Mechanically with the door of the incomer. The boards are provided with neoprene gasket. Suitable cable entries shall be provided for incomer and outgoing. The boards are provided with 2 Nos. external and 1 no internal earth terminals. The entire equipment shall conform to the relevant standards and certified by the appropriate authorities for use in hazardous areas.

**6.4.6. WIRING :**

**A. GENNERAL:**

For general requirements for wiring refer to the details stipulated under specifications for wiring for Ordinary (non-hazardous) area elsewhere in this specification. Additional requirement for carrying out wiring in the hazardous areas are as specified below.

**B. USING ARMOURED CABLES :**

- i. 1100V grade XLPE insulated FRLS PVC sheathed round wire armoured PVC overall sheathed cable with copper conductors shall be used for wiring wherever surface laid cables are specified for connecting from distri-

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- bution board to light fittings and other equipment.
- ii. While carrying out surface wiring using armoured cables, cable shall be supported 500mm apart to avoid sag. The cables shall be neatly clamped and should not create a shoddy appearance.
  - iii. The rate quoted shall include the cost of accessories required like FLP junction boxes, saddles, consumables, etc., for supply and installation of complete wiring system.
  - iv. Cables shall be laid in such a manner to avoid crossing / jumping of cables and shall provide a very neat and tidy appearance.
  - v. Suitable size double compression brass glands (Approved by CMRS as suitable for flameproof area) shall be provided for cable entry / exit to any of the flameproof apparatus.
  - vi. The cables used shall have multi-strand copper conductor.
  - vii. Nylon/rawl plugs shall be used for fixing cables to ordinary wall / ceiling. The plugs shall be fixed using the correct size of drills and screws as specified by the manufacturer. Using of wooden plugs is not permitted.

**C. WIRING USING PIPES :**

- i. Wiring in the hazardous areas can be carried out using 1100V grade PVC insulated FRLS PVC sheathed cable with copper conductor in surface laid solid drawn or ERW welded pipe, if specified, for connecting from distribution board to other equipments in flame proof areas.
- ii. Conduits shall be supported at a minimum distance of 1000mm horizontally and 500mm vertically, Nylon / rawl plugs shall be used for fixing conduits on wall / ceiling. The plugs shall be fixed using correct size of drills and screws as specified by the suppliers. Using of wooden plugs is not permitted.
- iii. Conduits shall be laid in such a manner to avoid crossing of conduits.
- iv. Metal conduits are to be screwed tight to the apparatus. Conduit unions only are to be used for jointing and couplers are not allowed.
- v. Flexible conduits are NOT allowed for use in hazardous areas.
- vi. Cables with multi-strand conductors only are permitted for use in conduit wiring system for hazardous areas.
- vii. The rates quoted for the conduit system shall include the cost of accessories required for supply and installation of a complete conduit system e.g., saddles, consumables etc.,

**D. CONTROL OF ELECTRICAL SUPPLY CIRCUITS :**

- i. The supply of electricity to a building or underground site containing explosives is to be controlled by one or more master switches outside the building or underground sites. Master switches should be in close proximity



ty to each other, identified and capable of isolating every conductor entering the building including the neutral of switches, starters, etc., If installed inside the building, these should confirm to the category of installations.

- ii. All circuits are to be provided with protection against over load and earth leakage. Over current protection may be given by automatic circuit breakers complying with IS : 3842 (Part-I) 1967.

**6.5. CONTROL ROOM SWITCH BOARD;**

1.0	Location	Control room for controlling the lighting fixtures
2.0	Type	Flush mounted type
3.0	Construction	Fabricated from 14 SWG MS sheet with 6mm thick bakelite cover  Shall have conduct knockouts on the sides.
4.0	Switch Mechanism	Modular switches shall be provided
5.0	Power source	The switchboards shall be fed from SLDB of respective area.

**6.6. 240V SWITCH SOCKET OUTLET;**

1.0	Type	1 pole, 3 pin with third pin earthed industrial type receptacles .  non-reversible, metal-clad, dust proof, industrial type suitable for horizontal insertion.
2.0	Rating	240 V AC , 15A,
3.0	Construction	Metal clad gasketed construction, weatherproof  All socket outlets shall be supplied with heavy- duty type plug and cap with chain.
4.0	Isolation Switch	rotary type switch mounted flush in the socket outlet box.  The isolating switches shall be manually operated industrial type of category AC 22.

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5.0	Protection	Operating handle of the rotary switch shall be fixed in such a manner that it shall not be possible either to insert or withdraw the plug without switching off the supply.
6.0	Cable entry	Suitable for cable entry through 20mm dia. conduit.
7.0	Mounting	Wall / column mounting
8.0	Inscription	Inscription plate shall be provided indicating the voltage and current rating of the switch socket outlet.
9.0	Miscellaneous	In hazardous area, flame proof switch socket outlet shall be provided.

**6.7. 240 V SINGLE / DOUBLE POLE SWITCHES:**

1.0	Application	The switches are intended for controlling lighting circuits
2.0	Type	Weather and dustproof and industrial type
3.0	Design	The rotary or toGGPL switches provided shall be of sturdy design
4.0	Standard	As per IS : 6875 (Part-3) - 1980
5.0	Housing	The unit shall be housed in cast iron or cast aluminium box having gasketed, screwed front cover plate, fixing lugs and suitable provision for terminating conduit/cable at the top, bottom or sides as specified.
6.0	Mounting	DIN Channel mounting . Single phase MCBs mounted adjacent to each other and connected to different phases shall be provided with adequate insulated phase barriers.
7.0	Terminal suitability	Terminals suitable for aluminium conductor cables.

**7. ERECTION SPECIFICATION:**

**7.1. GUIDELINES FOR DESIGN OF SYSTEM AND ENGINEERING THE LAYOUT OF ELECTRICAL EQUIPMENT.**

**7.1.1. General**

The tenderer shall execute the work at site based on layout drawings furnished by consultant/client.

**7.1.2. DESIGN REQUIREMENT FOR ELECTRICAL & CONTROL ROOM BUILDINGS**

- All electrical room shall have adequate space to accommodate the electrical equipment from the point of view of operation and maintenance, and conform to IE Rules & Regulations.
- All electrical rooms shall be constructed with heatproof material at the roof if it is exposed to sunlight.
- All Electrical buildings/MCC rooms shall be of Civil construction, with suitable drainage for rain water.
- Suitable exhaust ventilation system shall be provided for rooms housing PDBs, Emergency panel, Capacitor bank etc.
- Ceiling fans shall be provided in office rooms.
- Exhaust ventilation system for toilets, store rooms, etc.
- Entry/Exit for the electrical room shall be provide minimum 2500x2000 with MS doors. All doors shall open outside.
- The height of rooms housing LT Panels, PDB, Capacitor bank etc shall be decided considering minimum 5.0mtr clear height shall be provided.
- The wiring of light fittings in the buildings shall be concealed type. Modular switches shall be used in the control rooms, office rooms, etc. (which are not required to glow continuously) for switching ON/OFF the lights/fans.
- Electrical rooms, control rooms shall be considered fire hazardous.
- Roofs of the electrical premises shall be fully watertight and moisture proof.

**7.1.3. GUIDE-LINE FOR ERECTION OF ELECTRICAL EQUIPMENT AND ACCESSORIES**

**7.1.3.1. General**

All the electrical equipment shall be installed with proper care and as per layout drawings. Minor modifications required at site shall be made by the contractor with approval of Owner representative/Consultant for installation of the equipment. Care shall be taken for proper handling of equipment and undue vibrations shall be avoided particularly in case of sensitive equipment.

The contractor shall have valid electrical contractor's license valid for State Govt. and as well supervisory licence. He shall have in his employment sufficient number of electricians and supervisors holding valid licenses for HV and LV installations.

#### **7.1.3.2. Rotating machines**

The erection work of motors shall include checking of all motors before installation including thorough cleaning and checking of bearings, replacement / rectification of defective items, greasing of bearing, if required, making minor modifications in its mounting arrangement, wherever required, assembling and its mounting on the motor base plate or on Mechanical equipment, as the case may be, including levelling and alignment, checking insulation resistance and improving the same, if necessary, checking of internal connections etc.

All work associated with revisioning of motor shall also be included such as uncoupling and removing of motor from Mechanical equipment, disassembling, cleaning, checking of insulation resistance and improving the same, if necessary, regreasing and replacing defective items/bearings on foundation, wherever required, reassembling, placing, levelling, aligning and fixing of coupling of the revisioned motor with Mechanical equipment.

The height of the shaft of the motors shall correspond to the machine to be driven, if discrepancies are encountered these shall be compensated by inserting machined metal sim plates under the supports of the motor.

The motors mounted on the movable base frames / base plates shall be connected via intermediate terminal boxes with flexible cables.

After the complete installation of the motors, all bolts and bolted joints of the Mechanical and electrical equipment shall be checked to ensure that they are done up tightly by torque wrench. A further check shall be made to ensure that the armature can be easily rotated.

The insulation resistances of the coils and connecting leads within the machine shall be checked against earth by a suitable megger. Insulation resistance if found less, the machine shall be dried to achieve the desired value.

Space heaters of main drive motor required to be installed in motor foundation pits shall be suitably and firmly mounted.

For handling the machine with the crane, the slings, lifting cables etc. shall not be secured around the shaft. However, the armature of disassembled machines may be lifted or supported by the shaft.

The machine shall be lifted or lowered without shocks or quick jerks to avoid any damage.

#### **7.1.3.3. Sheet metal enclosed panels**

The base frames of all panels, shall be welded to structures or to the civil inserts provided on the floor/walls. Fabrication of supports/frames, wherever required, shall be done by the contractor.

The shipping section shall be placed in position before removing the protective covering to eliminate scratch/damage. The shipping section shall be moved by using rollers under the shipping skids wherever lifting cranes are not available. The contractor shall do the assembly at site as per manufacturer's general arrangement drawings and installation instruction. While assembling a complete board comprising several unit type cubicles, the board as a whole shall be aligned. The panels shall be properly leveled prior to grouting the holding down bolts or welding the panels to the inserts. All interconnection of bus-bars and wiring between the panels shall be done as per manufacturer's instructions and drawings. Welding work on the panels shall only be carried out after consultation with the Owner. Damage to the paint due to welding shall be rectified by the contractor.

After Mechanical installation of the board is completed, loose instruments shall be installed, wherever required, and wires shall be connected to the instrument. The wiring of intermediate terminal strips between two panels, wherever disconnected for transport, shall also be connected.

#### **7.1.3.4. Transformers**

The transformer and its accessories and mountings like conservator, thermometers, sili-cagel breathers, etc., delivered at site in separate packages, shall be assembled at site after cleaning by the contractor in proper sequence as per manufacturer's drawings. The oil conservator and the pipes shall be erected as shown in the manufacturer's drawings.

Before the transformer is filled/topped with oil, oil samples shall be checked by the contractor from each container. The oil shall possess the dielectric strength as per relevant IS/CEA. Oil shall be filled upto the mark shown.

The contractor shall also test the oil from each transformer to determine its suitability for use. If required, the contractor shall carry out drying and filtering operations as per IS code of practice to ensure that moisture is completely removed and the oil is free from impurities. This may be carried out by using oil filtering equipment to be provided by the contractor having vacuum as well as heating arrangement. Only after the dielectric strength of oil and other parameters are checked and approved, the external connections shall be made to the transformers.

Any modifications to HT and LT terminal box to accommodate the number of cables to be

terminated shall be carried out by the contractor.

Naked light and flame shall never be used near the transformer.

#### **7.1.3.5. Cable Installations**

Concrete cable channels can be considered in case of lesser number of cables.

Laying of cables directly in underground or in trenches shall be considered where number of cables is less. In such case, cable shall be laid in one layer only, more than one layer is not permissible.

Cables in trenches shall be laid on 8 cm of riddled sand and covered with 8 cm of riddled sand. Red Bricks shall be provided for covering these trenches. The maximum trench depth shall normally be 1.5 m and thickness of top cover of 75 mm.

Installation of cables directly buried in ground shall generally conform to the requirements given in IS: 1255 –1983.

#### **7.1.3.6. HT cable termination accessories**

The cable accessories shall include end termination kits and also any special tool and tackles and accessories required for making the terminations.

The termination arrangement shall be complete with all fittings and consumables. For all cables, a minimum extra length of 2 metres shall be left before termination.

The termination kit shall be of heat shrinkable type. The termination kits shall have the following features:

- Electrical stress control to be provided at the cable insulation shield terminus.
- An external leakage insulation to be provided between the cable conductors and ground.
- Adequate protection to be provided at the end of the cables against the entrance of the moisture and, provision to maintain the constant pressure in the cable.

#### **7.1.3.7. Exposed & Concrete conduits**

Exposed conduits shall be laid along walls, floors, ceilings, on steel supports etc. as per working drawings/site requirements in consultation with the supervisory personnel. The conduits shall be neatly run and evenly spaced.

Fixing of conduits to the supports on wall, column, structure shall not be done by welding. Exposed conduits shall be adequately supported by racks, clamps, straps etc. Jointing of conduits shall be done only in straight portion and not in bend portion.

The contractor shall have arrangements at site for bending facilities for conduits as well as dies for threading conduits of diameters and threads corresponding to the standards. The threaded ends of conduits shall be painted with anticorrosive paint. The

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outer ends shall be smoothened free of burrs and sharp edges. Bushings shall be fitted at both ends of conduits.

Flexible metallic conduits shall be used for termination of connections to motors and other electrical equipment like pressure switches etc. which need to be disconnected at periodic intervals.

All conduits shall be effectively connected to the earth terminal of the equipment where it terminates.

Both ends of conduits shall be suitably earthed. Earthing continuity to be maintained by means of flexible wire wherever two conduits are joined with sockets.

Approved conduit bending machines to be arranged by the contractor shall be used for bending conduits at site. The radius of any conduit bend shall be as per standards for cabling. Bends shall be free from cracks, crimps or other damage to the pipe or its coating.

Annular space of used & un-used conduits should be sealed at both ends.

**7.1.4. EARTHING AND LIGHTING PROTECTION**

**7.1.4.1. EARTHING**

Entire system shall be earthed in accordance with the provisions of the relevant IEC recommendations/ IS code of practice IS 3043-1987 and Indian Electricity Rules, so that the values of the step and contact potentials in case of faults are kept within safe permissible limits.

Parts of all electrical equipment and machinery not intended to be alive shall have two separate and distinct earth connections each to conform to the stipulation of the Indian Electricity Rules.

All buildings as well as the electrical sub-stations and electrical rooms shall be provided with a ring main earthing system each. Individual ring main earthing systems shall again be interconnected as a network. The earthing system shall be provided to have overall network earthing resistance shall be less than one ohm.

The ring earthing system around each building shall be laid at a distance of approximately 1.5 m from the building and at a depth of approximately 0.8m. The ring shall be bonded at intervals to the building steel structures, reinforcement of building columns and also to pipes, wherever they are crossing. The earth ring shall further be connected at intervals to deep earthing electrodes to achieve a combined earth resistance of less than one ohm.

For the purpose of dimensioning the earthing lines/conductors, the duration of the earth fault current shall be taken as 1 seconds.

For protective earthing separate conductor shall be used for flow of earth fault current as

elaborated below.

The LV side neutrals of the Distribution transformers & Gas Gen Set shall each be connected to two separate isolated earthing electrodes. They shall also be connected with the neutral bus of the corresponding switchgear and the switchgear neutral bus shall be connected to the earthing ring at two different and distinct points. The fourth core of cables for cables shall also be connected to the earthing mains. A continuous earth strip shall be run in each side of cable trenches.

The power supply cables (LT) from the sub-station and the distribution cables to individual motors shall have 4/3.5 cores.

LT power supply cables shall have four cores and the fourth core shall have cross-sectional area of 50% of the other cores generally. The fourth core of the main supply lines shall be connected to the solidly earthed neutral bar as well as at the earth bars in MCC/distribution boards.

#### 7.1.4.2. CONDUCTOR SIZE FOR GROUND CONECTIONS

For equipment ground connections, the minimum conductor sizes used should be as follows:

**i. LT System:-**

75 x 10 mm GI flat :

- Main earthing rings
- Main LT switch-boards
- Transformers
- Gas Gen Set
- Earthing leads to earth electrodes

**ii. LT system where the voltage does not exceed 650V normally :**

6 Sq.mm Stranded wire :

- Motors and starters upto and including 2.2kW, Light fitting, JB's, etc.
- Instruments and miscellaneous small items protected by fuses of ratings not exceeding 15A.

16 Sq.mm Stranded wire :

- Motors and starters above 3.7 kW and upto including 15 kW.

25 x 3 mm GI Flat :



- Motors and starters above 15 kW and upto including 45 kW.
- LCB, Welding socket outlet, isolators, LDBs.

50 x 6 mm GI Flat :

- Motors and starters over 45 kW and HT maotors.
- MCC, PDB, MLDB.
- Main earthing ring for MCC room, in shop units / plant buildings.
- Cable tryas all around.
- Aux. LT switch board and other equipment protected by circuit breakers.

**7.1.4.3. EARTHING ELECTRODES:**

The earthing electrodes shall be of GI pipes 50 mm dia and about 4 mm thickness in one piece provided with water holes and other filling devices. Earthing system for computers and microprocessor based equipment/ PCs shall be distinct and separate from the power and lighting equipment earthing system.

Every electrical equipment shall have double earthing.

The earthing grid and the lightning grid shall be interconnected.

**7.1.4.4. LIGHTNING PROTECTIN:**

All buildings and plant structures vulnerable to lightning strokes owing to their height or exposed situation shall be protected against atmospheric flash-overs and lightning strokes in such a manner as to eliminate any danger to the personnel employed therein. Stipulations of IS : 2309 - 1969 shall be followed.

A 'Faraday Cage' made of hot galvanised strip steel connected to all buried pipes and steel structures crossing this cage ring shall be laid around each main building or plant unit as earthing device. This shall be separate from the electrical equipment earthing ring main.

All lightning arrestor earth leads of the buildings and plant units shall be connected to this cage ring.

Air termination network should cover all salient points of the structure. All metallic chimneys, ducts and the like above the roof of the structure shall be bonded to and form part of the air termination network. Vertical air termination points shall project at least 30 cm above the object on which it is fixed.

Down conductors shall follow the most direct path possible between air termination and earth termination avoiding sharp bends. Down conductor shall have a testing point adjacent to the earth electrode. Each conductor shall have an independent earth termination.

All earth terminations shall be interconnected.

Earthing electrodes and grid for lightning protection shall be distinct separate from the earthing system for earthing of electrical equipment and at no place shall be connected to other earthing system.

Earthing connection to equipment subject to movement, vibration and shocks, shall be through flexible stranded conductors.

The termination of strips to the equipment shall be done by bolting and the wires shall be terminated by compression lugs. Jointing of strips shall be done by welding for proper continuity. All contact surfaces shall be thoroughly cleaned of dust and oil and after jointing, the joints shall be given bitumen paint.

#### **7.1.4.5. GUIDELINES FOR INSTALLTION OF EARTHING CONDUCTOR:**

Earthing conductors laid directly in ground for **Lightning protection**, shall be coated with one coat of bituminised paints, be wrapped with one layer of bitumaetic tape laid on half lapped and shall have a final coat of bituminised paint to prevent corrosion.

Earthing conductors run on walls/floors/cable and equipment structures etc. shall be supported at suitable intervals and painted with black oxide paint.

All joints in all kind of Earthing conductors except at earthing electrode shall be welded and painted black with bitumen paint.

At road crossings earthing strips shall be laid through conduits /concrete ducts.

Special earthing shall be provided for all electronic equipment as per manufacturer's recommendations / practice.

#### **8. TESTING:**

Test of all equipment shall be conducted as per latest IS applicable. Tests shall also confirm to International Standards IEC/VDE/DIN/BS (in case corresponding test are not mentioned in IS).

All routine test shall be carried out at manufacturer's works in the presence of Owner or his representative.

The tenderer shall submit type test certificates for similar equipment supplied by him elsewhere. In case type test certificates for similar equipment are not available, the same shall be conducted in the presence of Owner or his representative if Owner so desires, without any financial implications to the Owner.

All the equipment shall be tested at site to know its condition and to prove suitability for required performance. The Factory tests, site tests and acceptance tests to be performed by Contractor are detailed below.

The Contractor shall be responsible for satisfactory working of the complete system in an

integrated manner and its guaranteed performance

**8.1. TRANSFORMERS:**

**A. Routine tests**

- i. Assembly inspection / painting check.
- ii. Measurement of winding resistance.
- iii. Measurement of voltage ratio and check of voltage vector relationship.
- iv. Measurement of impedance voltage (Principal tapping), short circuit impedance and load loss.
- v. Measurement of no-load and current.
- vi. Measurement of insulation resistance index.
- vii. Dielectric test:
  - a) Induced over voltage withstand test
  - b) Applied voltage withstand test (H.V. power frequency test)
- viii. Certification for off-load tap changer.
- ix. Final documentation check.

**B. Type tests**

- i. Temperature rise test
- ii. Measurement of acoustic sound level
- iii. Lightning impulse withstand test (if test certificates are not available)
- iv. Short circuit test
- v. Measurement of commutating reactance and determination of inductive voltage drops (for thyristor converter transformer only).

**8.2. LT switch gear:**

**A. Routine tests**

- i. Assembly inspection / painting check.
- ii. Measurement of insulation resistance.
- iii. Functional test including automatic bus transfer scheme.
- iv. Polarity tests for CTs
- v. Final documentation check.

**B. Type tests**

- i. Temperature rise test for main and vertical bus bars.
- ii. Short circuit test for main and vertical bus bars.

- iii. Enclosure class, degree of protection.
- iv. Dielectric test including protective circuit.

**8.3. Final Test of Materials of Grounding and lightning system**

- i) Visual check
- ii) Dimensional check
- iii) Accessories fitting check
- iv) Mechanical and electrical test (where applicable)
- v) Final documentation check

**8.4. CABLES**

**A. Shop Tests**

- a) The cables shall be subject to shop tests in accordance with relevant standards to prove the design and general qualities of the cables as below:-
- b) Routine test on each drum of cables.
- c) Acceptance tests on drum chosen at random for acceptance of the lot.
- d) High Voltage withstand test for HT cable (Hi Pot test).
- e) Type tests certificates on each type of cable, inclusive of measurement of armour D.C. resistance of power cables shall be furnished by Contractor

**B. PACKING**

- i. Cables shall suit barrel diameter and securely clamped/ fixed. The barrels must be sufficiently strong to withstand Mechanical shocks and shall effectively protect against transit.
- ii. Both ends of cable shall be metal capped to prevent moisture ingress. Ends shall be kept inside the cable drum in a manner so that these are accessible for testing.
- iii. Cable drum identification/ marking shall be as follows:
  - a) Makers name
  - b) Consignee's full address
  - c) Type size and length of cables
  - d) Net and gross weights
  - e) Any other marking for shipping

f) Drum Markings

**C. Drum Lengths**

- i. LT Cables shall be delivered at site preferably on standard drums each containing 500 m or 1000 m cables, Where total quantity of a particular cable is less than 500 m, the entire length shall be supplied in one drum.
- ii. For 90% cable drum of each item of cable permissible tolerance is in length + 5% For 10% balance cable drums, Contractor shall ensure that each 500 m capacity drum contains at least 250m and each 1000m capacity drum contains at least 500m cable lengths. Overall tolerance for each item of cable is + 1% of total length.

**8.5. Motors:**

**A. Routine Tests**

The following are the routine tests carried out on each and every motor :

- i. Measurement of resistance.
- ii. Insulation resistance test .
- iii. Motors are tested at 1/3 times the rated voltage for checking the ability of the motor to run upto full speed , when switched in either direction .
- iv. No load test .
- v. High voltage test .

**B. Type Tests**

- i. Measurement of rotor resistance
- ii. No load test
- iii. Locked rotor test .
- iv. Full load reading of voltage, current , power input and slip.
- v. Temperature rise test.
- vi. Momentary overload test .
- vii. Insulation resistance test .
- viii. High voltage test .
- ix. Polarisation index test (for HT motors)

**8.6. SITE TESTS AND CHECKS**

**8.6.1. General**

All the equipment shall be tested at site to know their condition and to prove suitability for required performance.

The test indicated in following pages shall be conducted after installation. All tools, accessories and required instruments shall have to be arranged by contractor. Any other test that is considered necessary by the manufacturer of the equipment, Contractor or mentioned in commissioning manual has to be conducted at site.

## **TENDER NO: GGPL/KKD/C&P/CW/2545/VS**

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In addition to tests on individual equipment some tests / checks are to be conducted / observed from overall system point of view. Such checks are highlighted under miscellaneous tests but these shall not be limited to as indicated and shall be finalised with consultation of Owner before charging of the system.

The Contractor shall be responsible for satisfactory working of complete integrated system and guaranteed performance.

All checks and tests shall be conducted in the presence of Owner's representative and test results shall be submitted in six copies to Owner and one copy to Electrical Inspector. Test results shall be filled in proper proforma.

After clearance from Electrical Inspector, system / equipment shall be charged in step by step method.

Based on the test results clear cut observation shall be indicated by testing engineer with regard to suitability for charging of the equipment or reasons for not charging are to be brought by the Contractor.

### **8.6.2. Trial Run Test**

After the successful test of each equipment as per standard test procedure, the entire control system shall be put on trial run test on actual site conditions and operation of the system.

### **8.6.3. Acceptance Test**

The acceptance test on the system shall be carried out by the contractor as per mutually agreed test procedures to establish satisfactorily functioning of the system as a whole and each equipment as part of the system.

### **8.6.4. Site tests**

The tests to be carried out on the equipment at pre-commissioning stage shall include following but not limited to the following:

#### **Transformer:**

- i. IR test on each winding to ground and between winding.
- ii. HV test with 2.5 KV megger for HV side and 500V for LV side.
- iii. BDV test on oil samples.

#### **LT switch board**

- i. IR test.
- ii. HV test with 2.5 KV megger.
- iii. Functional test for all feeders.
- iv. Check operation of contactors from local points.

#### **CABLES**

- i. Visual check.
- ii. Checking of continuity and IR values for all the cables before and after HV test.
- iii. HV test and measurement of leakage current after termination of cable kits.
- iv. Check for identification (tag number system) distance placement of cable marker, cable joint etc. as per the cable layout drawing.
- v. Check tightness of all connections.

### **EARTHING**

- i. Check tightness of all earth connections.
- ii. Check earthing of all metallic equipment, cable trays, busbar supporting structures, building column (if steel) all elect equipment, pipe lines etc. as per the drawing / specification.
- iii. Measurement of earth resistance for each electrode
- iv. Measurement of total earth resistance.

### **MISCELLANEOUS**

- i. Checking of continuity of the system.
- ii. Checking safe accessibility of all operating points.
- iii. Check availability of emergency lighting.
- iv. Check availability of control aux. supply.
- v. Ensure availability of first aid box, fire fighting equipment, rubber mats, rubber glove.
- vi. Check for safe movement of operators control room / switchgear etc., wrt proper illumination, escape light uncovered openings provision of hand railings in stairs etc.
- vii. Check proper covering of cable channels.
- viii. Placement of shock treatment chart, danger boards provision of boards indicating 'Man on work' 'Do not switch ON' 'Do not switch OFF'. 'EARTHED' etc.
- ix. Check proper dressing of cables, Mechanical protection of cables, placement of cable markers.
- x. Check sealing of all cable openings including conduits opening with fire resistance material.
- xi. Check sealing of all openings at bottom of electrical panels.

**PREFERRED MAKE LIST**

S.No	ITEM DESCRIPTION	PREFERRED MAKES
1	11/0.433kV Distribution transformer	Viji Power Transformers Pvt. Limited/Flow Line transformers Pvt. Ltd/Diamond Power Transformer/Mahalakshmi transformers / Kavika transformer/Techno Fabs/Voltech Manufacturing Company Limited/Perfect Electricals
2	11kV Termination Kit	3M/RAYCHEM/CCI
3	HT XLPE Cables	Universal/Polycab/KEI/KEC
4	LT Power Cable (FRLS)	Universal/Polycab/KEI/KEC/Special CABLES
5	LT Switchgear	ABB/C&S/BCH/Risha Control Engineering Pvt. Limited/Siemens/Lotus Power Gear
6	Flame proof light fixtures	Baliga/ Sudhir Switchgears Pvt. Ltd./ Flexpro Electricals Pvt. Ltd./ FCG./ Bajaj Electricals Ltd./ Crompton Greaves Ltd.
7	Non Flame proof Light Fixtures	Bajaj/Crompton/Wipro/Philips/Osram/Sigma
8	High Mast/Street Light Poles	Philips/Bajaj/CGL/Wipro/Transrail/Tulip
9	Air Conditioner	O General/ Daikin/ Hitachi
10	FLP Cable glands	Baliga/ Flexpro/ Flameproof/ FCG/Dowells
11	Cable - Lugs	Dowells/ Jainson



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12	Cable tray	Advance power product/Ercon Composite /India Electricals Syndicate/Mahavir Engineering
13	Ceiling/Exhaust Fans	Khaitan Electricals Ltd./ Havell's/ Crompton Greaves Limited/Bajaj Electricals/USHA
14	Contactors - AC Power	ABB/Siemens/Schneider/L&T/Control and switchgear
15	Control Transformer	Intravidyut/Indcoil/Kappa/Kalpa/Indushree
16	Earthing Materials	Rukmani Electrical & Components Pvt Ltd./ Indiana Grating Pvt Ltd./Any reputed make with ISI certification
17	Flame proof LDB's/ JB,s/Control Station/ switches	FCG/Flame proof/Flexpro Electricals/Sudhir/ Baliga Lighting Equipments Pvt. Ltd.
18	Indicating Lamps	Vaishno Electricals/Osram/TelePMChanique/ABB/Esbee/Essen
19	Indicating Meters	Conzerv(Schneider)/ Rishabh Instruments Pvt. Ltd./ AE/PMCO/Secure meters/ABB/Siemens
20	Miniature Circuit Breakers (MCBs) and Lighting DB	Siemens/L&T/Schneider/Indoasian/Havells/MDS(Legrand)/ABB/HPL India
21	MCCB	Siemens/L&T/Schneider/ABB
22	Protection Relays - Thermal	BCH/L&T/Schneider/Siemens/ABB/Control & Switchgear
23	Push Buttons	Salzer/BCH/L&T/Essen/Technic/Vaishno/ABB/Control & Switchgear
24	Selector switches	ABB/BCH/Kaycee/Siemens/Teknik/L&T/Control & Switchgear/Vaishno/Salzer/Siemens
25	Switches - 5/15A Piano/ Plate, Switch Socket	Anchor/MDS Legrand/Precision/Cona
26	Switch Socket Outlet	Anchor/BCH/Essen/Best & Crompton

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27	Switch Socket Outlets (Industrial)	Essen Engineering Company Pvt. Ltd./ Crompton Greaves Ltd./ BCH
28	GI Pipes	Tata Pipe/Jindal/GSI/Indus Tube/Swatik/Zenith
29	PVC pipes	Finolex/Premier/Sudhakar/Kissan/Supreme
30	Safety Items – Shock treatment chart etc	Reputed make with ISI certification
31	Terminal Blocks	Phoenix Contact/ Connect Well/Lapp/ S&S/ Wago /Elmex
32	Timer & Time delay relays	ABB/BCH/L&T/Siemens / Essen/TelePMCanique/Omron
33	ELCB/RCCB	ABB/Siemens/Schneider/MDS (Legrand)/L&T/Indoasian/HPL India

**TENDER NO: GGPL/KKD/C&P/CW/2545/VS**

**LIST OF STANDARD DRAWINGS**

Sl No.	Description	Document No./ Drawing No.	Rev.
1	SLD for PDB Panel for CNG station	PMC/23RT /01/E1/D2/CN/ST/0413	Rev. 0
2	SLD for Emergency Panel	PMC/23RT /01/E1/D2/CN/ST/0414	Rev. 0
3	SLD of LDB-1	PMC/23RT /01/E1/D2/CN/ST/0415	Rev. 0
4	SLD of LDB-2	PMC/23RT /01/E1/D2/CN/ST/0416	Rev. 0
5	SLD of LDB-3	PMC/23RT /01/E1/D2/CN/ST/0417	Rev. 0
6	Marking of trenches for electric cables	PMC/23RT /01/E1/D2/CN/ST/0418	Rev. 0
7	Typical Installation of Street Lighting Fixtures (Bracket Mounted) on pole for safe area	PMC/23RT/01/E1/D2/CN/ST/0419	Rev. 0
8	Typical section of cable trench in unpaved areas	PMC/23RT/01/E1/D2/CN/ST/0420 (2 Sheets)	Rev. 0
9	Typical installation of lighting fixture on octagonal pole	PMC/23RT/01/E1/D2/CN/ST/0421 (Sheet 1 to 3)	Rev. 0
10	Flame proof lighting fixture mounting details	PMC/23RT/01/E1/D2/CN/ST/0424	Rev. 0
11	Typical installation of flood lighting pole(with rungs)	PMC/23RT/01/E1/D2/CN/ST/0425	Rev. 0
12	Earthing of tanks and vessels	PMC/23RT/01/E1/D2/CN/ST/0427	Rev. 0
13	Typical earth connection for street light pole	PMC/23RT/01/E1/D2/CN/ST/0428	Rev. 0
14	Typical installation of lighting fixture on octagonal pole	PMC/23RT/01/E1/D2/CN/ST/0429	Rev. 0
15	Earth electrode in test pit	PMC/23RT/01/E1/D2/CN/ST/0430	Rev. 0
16	Typical Electrical Earth pit	PMC/23RT/01/E1/D2/CN/ST/431	Rev. 0
17	Typical Electronic Earth pit	PMC/23RT/01/E5/D2/CN/ST/001	Rev. 0

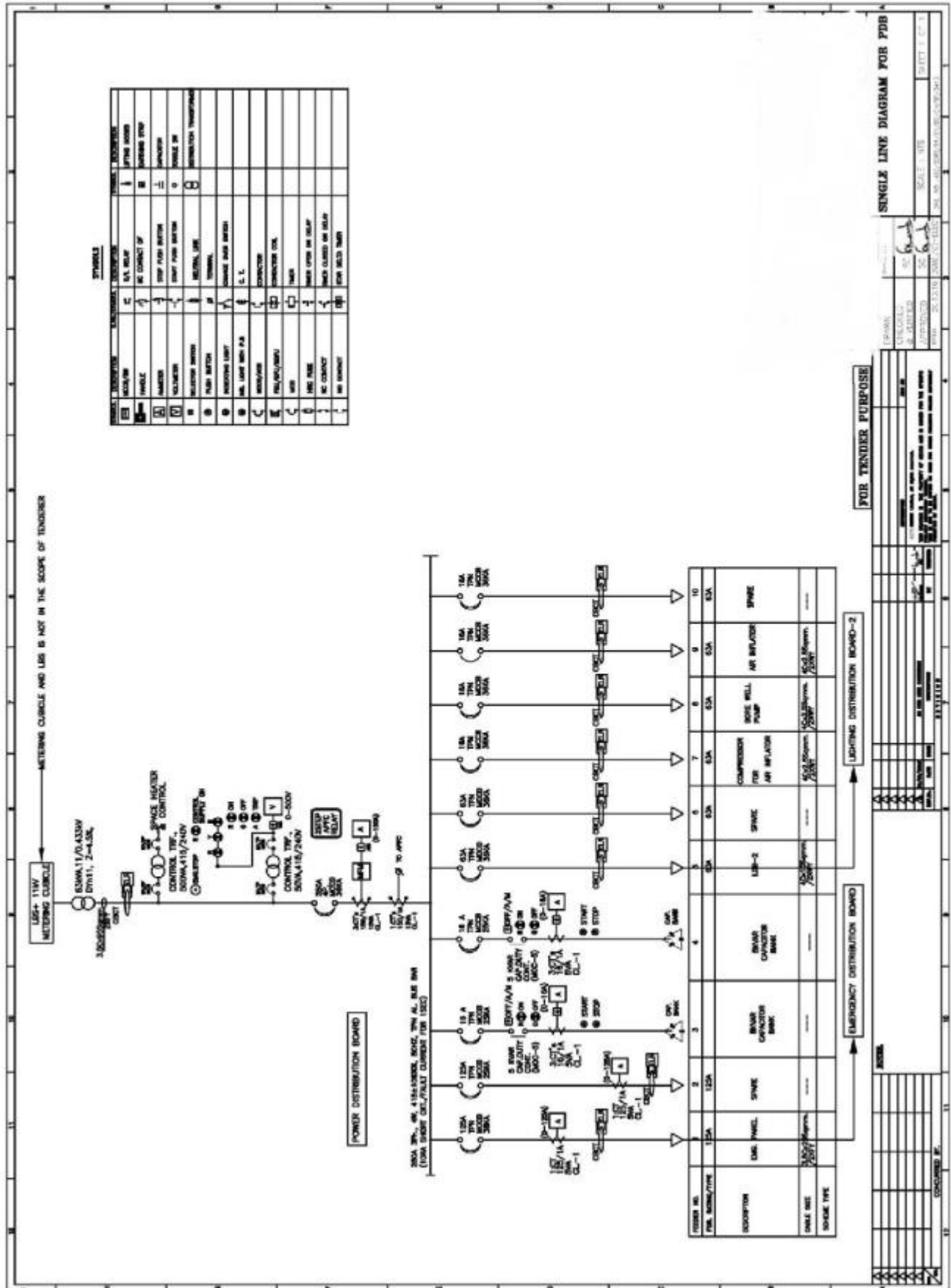
**TENDER NO: GGPL/KKD/C&P/CW/2545/VS**

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**CHECK LIST**

**TO BE FILLED-UP BY TENDERER**

Sl. No.	Description	Remarks
1.	No deviation from the Electrical Specification/SOR	
2.	Confirmation for Inspection of all electrical equipments as per Specification/QAP.	
3.	Unpriced SOR enclosed with offer	
4.	List of similar electrical job undertaken during last three years has been enclosed with the offer.	
5.	List of electrical personnel employed, with their qualification & experience, has been enclosed with the offer.	
6.	Credential of electrical sub-contractor, enclosed with the offer.	
7.	Photocopy of Electrical Contractor's license - grade A has been enclosed with the offer.	



**SYMBOLS**

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
(C)	V.A. RELAY	(M)	OFFICE ACCESS
(K)	DC CONTACT OF	(S)	STARTING STOP
(A)	STOP PUSH BUTTON	(L)	LOCKER
(V)	START PUSH BUTTON	(O)	TRIPBLE DR
(B)	RELAY COIL	(R)	RESISTANCE THERMISTOR
(N)	NEUTRAL LINE		
(P)	PHAS MOTOR		
(L)	INDUCING LIGHT		
(M)	RELAY WITH P.A.B.		
(K)	CONTRACTOR		
(C)	CONTRACTOR		
(M)	RELAY/CONTACTOR		
(K)	CONTACTOR		
(M)	RELAY		
(K)	DC CONTACT		
(M)	DC CONTACT		
(M)	DC CONTACT		

**SINGLE LINE DIAGRAM FOR PDB**

NO.	REVISION	DATE	BY	CHKD.	SCALE	DATE
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12						

CONFORMED BY: \_\_\_\_\_

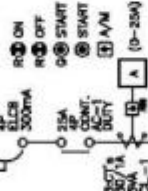
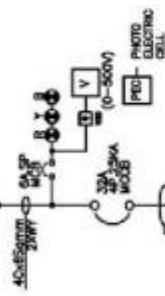






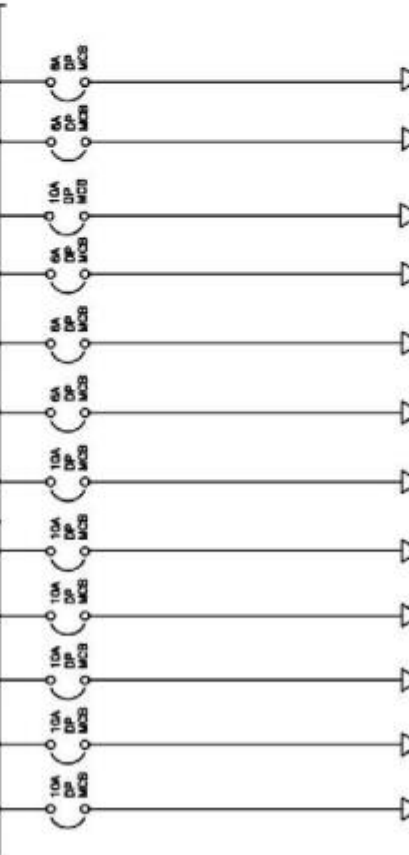


FROM EMERGENCY DISTRIBUTION BOARD



LIGHTING DISTRIBUTION BOARD-3

60A 3PH, 4W, 415±10%, 50HZ, 3PH CU, SUB MAF (100KA SHORT C.T., FAULT CURRENT FOR 1 SEC)



1	10A	10A	OFFICE BUILDING LIGHTING		
2	10A	10A	OFFICE BUILDING LIGHTING		
3	10A	10A	OFFICE BUILDING LIGHTING		
4	10A	10A	OFFICE BUILDING LIGHTING		
5	10A	10A	OFFICE BUILDING LIGHTING		
6	10A	10A	OFFICE BUILDING LIGHTING		
7	6A	6A	SPARE		
8	6A	6A	SPARE		
9	6A	6A	BACK UP TOWER LIGHTING		
10	10A	10A	SPARE		
11	10A	10A	SPARE		

SYMBOLS

SYMBOL	DESCRIPTION	SYM. SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
⊞	WOUND/TO	⊞	O/A RELAY	⊞	LIFTING HOODS
⊞	HANDLE	⊞	NO CONTACT OF	⊞	STARTING STOP
⊞	AMMETER	⊞	STOP PUSH BUTTON	⊞	CONTACTOR
⊞	VOLTMETER	⊞	START PUSH BUTTON	⊞	TOGGLE SW
⊞	SELECTOR SWITCH	⊞	MECHANICAL LINK	⊞	DISTRIBUTION TRANSFORMER
⊞	PUSH BUTTON	⊞	TERMINAL		
⊞	WARNING LIGHT	⊞	CHANGE OVER SWITCH		
⊞	IND. LIGHT WITH F.B.	⊞	C. T.		
⊞	MOTOR/ACB	⊞	CONTACTOR		
⊞	PLUG/PLUG/PLUG	⊞	CONTACTOR COIL		
⊞	MCB	⊞	TIMER		
⊞	INC. FUSE	⊞	TIMER SPON ON DELAY		
⊞	NO CONTACT	⊞	TIMER CLOSED ON DELAY		
⊞	NO CONTACT	⊞	STOP WITH TIMER		

FOR TENDER PURPOSE

SINGLE LINE DIAGRAM  
LDB-3

DESIGNED BY: [Signature]  
CHECKED BY: [Signature]  
DATE: [Date]

SCALE: 1:100  
SHEET NO. 1 OF 1

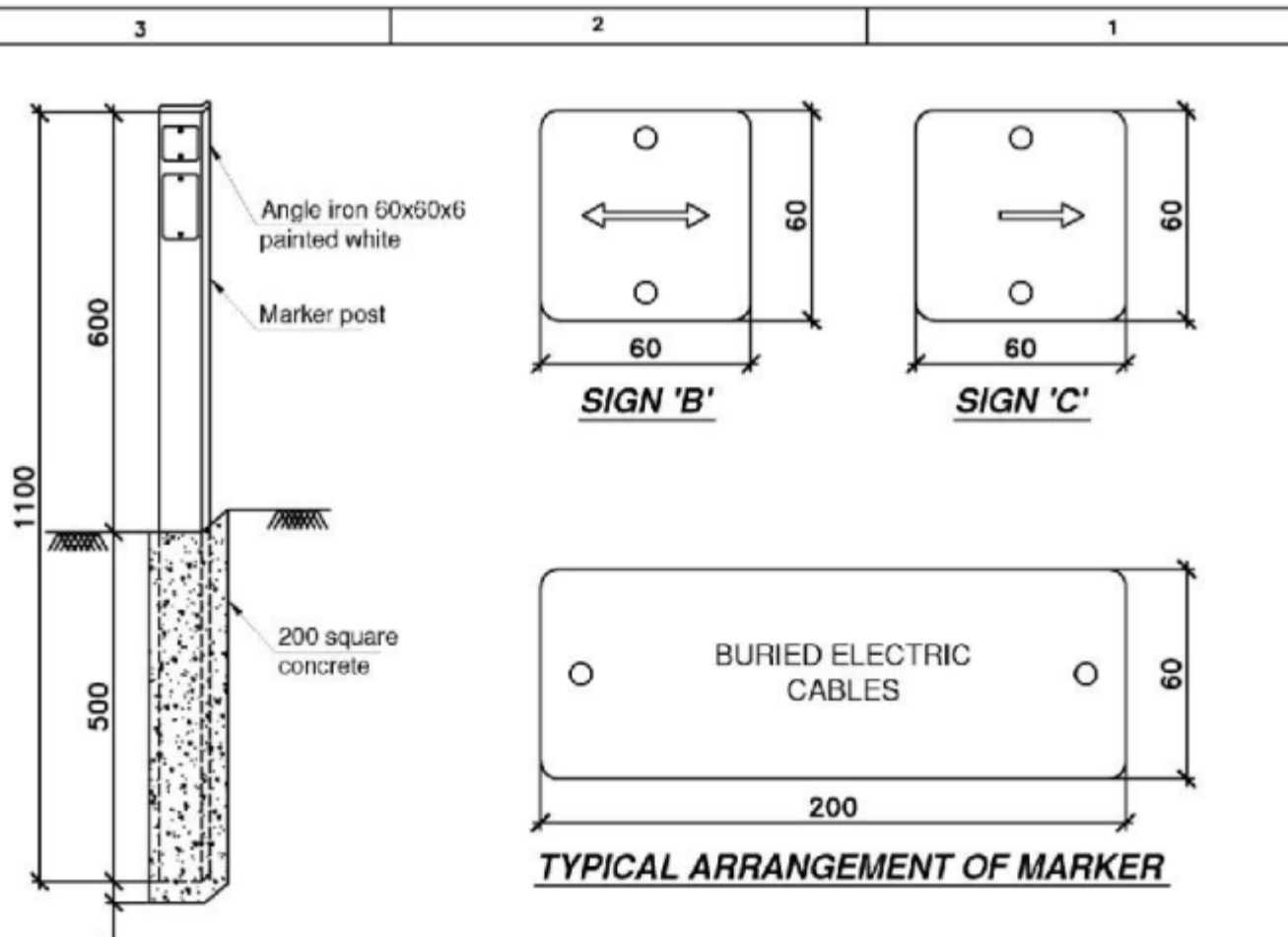
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REVISIONS:

NO. 1

DATE: [Date]

SCALE: 1:100



**TYPICAL ARRANGEMENT OF MARKER**

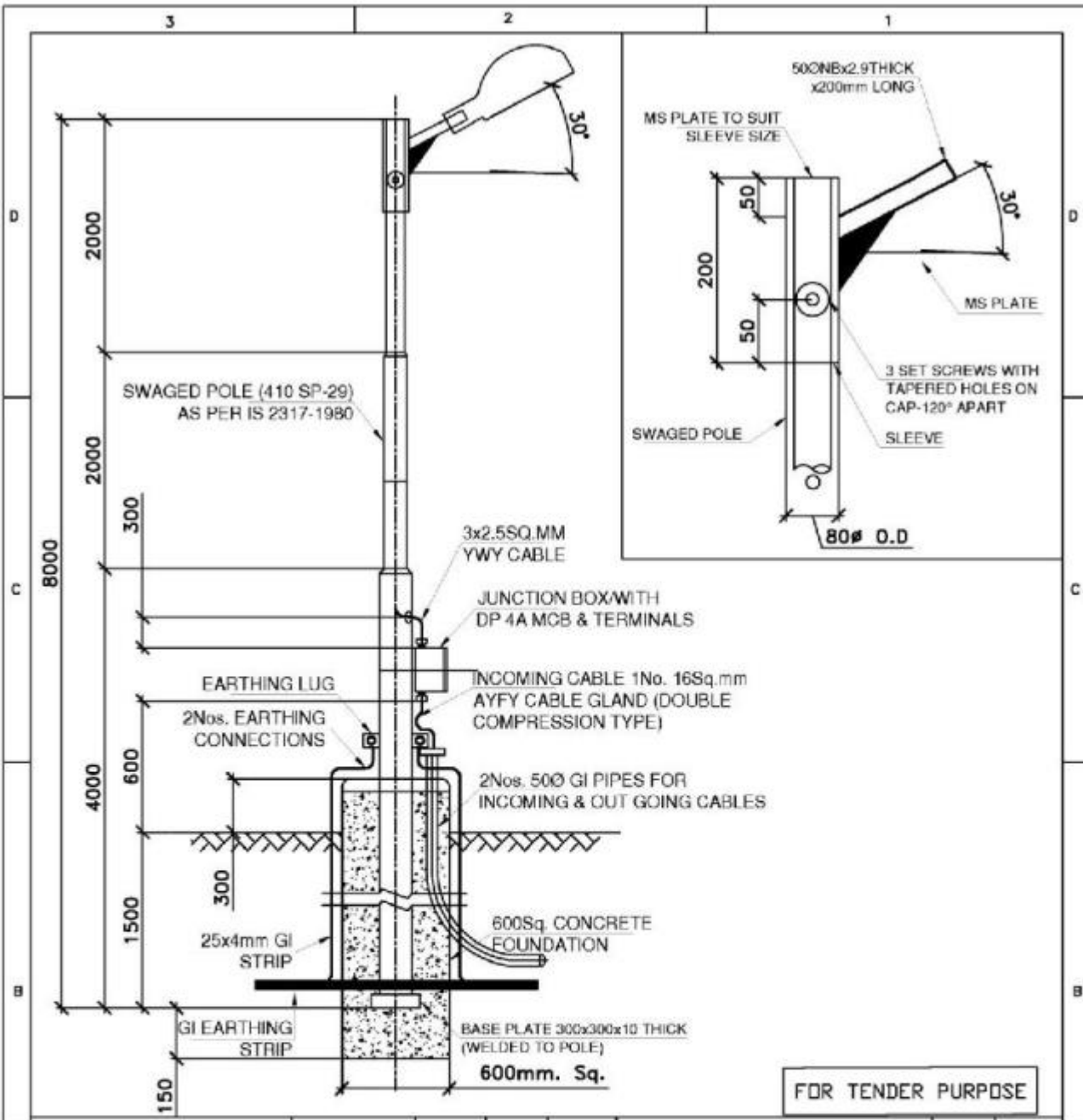
	Electric cable trench			
Assembly consisting	L 60x60x6-11.10m long SIGN-A-1 No. SIGN-C-2 Nos.	L 60x60x6-11.10m long SIGN-A-1 No. SIGN-B-1 No.	L 60x60x6-11.10m long SIGN-A-1 No. SIGN-B-1 No. SIGN-C-1 No.	L 60x60x6-11.10m long SIGN-A-1 No. SIGN-B-2 Nos.

**NOTE:-**

1. TRENCHES SHALL BE MARKED AT ALL DIRECTION CHANGES, INTERSECTIONS AND STRAIGHT RUNS
2. SIGN MADE OF 14 ENAMELLED SHEET PLATE WHITE LETTERING MADE ON GREEN BACKGROUND.

FOR TENDER PURPOSE

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FOR TENDER PURPOSE

REFERENCES	DRG.No.	REV.No.	ZONE	DATE	DESCRIPTION OF REVISIONS	BY	APPRD.
NOTE:							

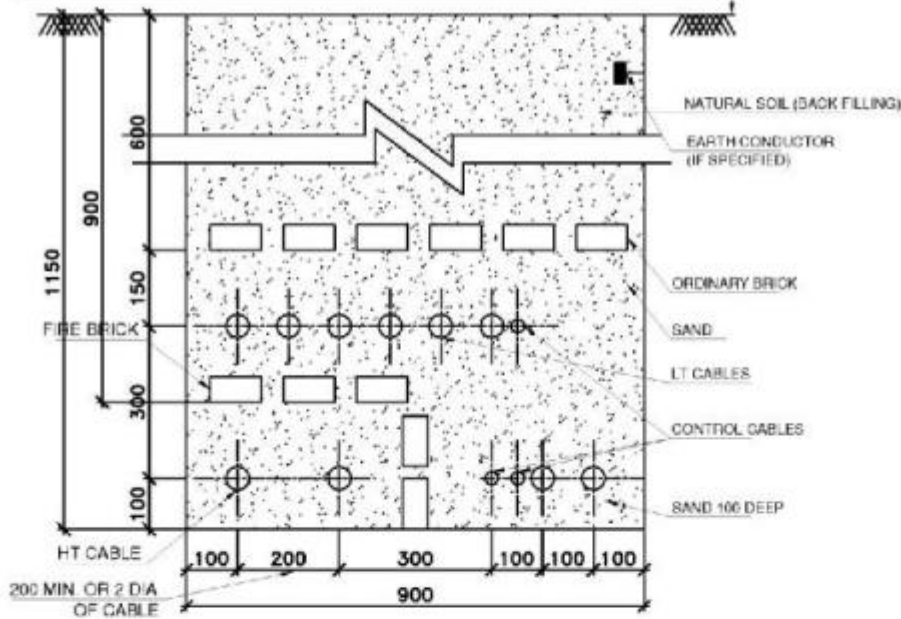
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NAME	SIGN. & DATE	SECTION :
DESIGNED	MADHU	ELECTRICAL
CAD	RAGHU	SCALE : NTS
REVIEWED	S.C	SH.No. 1 of 1
APPROVED	S.C	

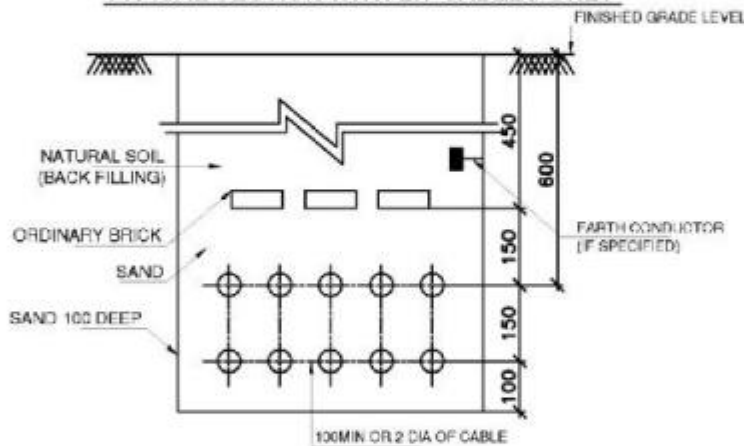
**TYPICAL INSTALLATION OF STREET LIGHTING FIXTURES (BRACKET MOUNTED) ON POLE FOR SAFE AREA**

DRG.No. : MEC/23RT/01/E1/D2/CN/ST/0419

**TYPICAL SECTION WITH H.T CABLES AND L.T CABLES** FINISHED GRADE LEVEL



**TYPICAL SECTION WITH L.T CABLES ONLY** FINISHED GRADE LEVEL



**NOTE:**

1. LEAVE SPACE FOR LATER ADDITION OF AT LEAST 2 CABLES OR 15% AVERAGE SPARE SPACE REGARDLESS OF FUTURE EXPANSION.
2. IF TELEPHONE CABLES ARE LAID IN THE SAME TRENCH A CLARENCE OF 300mm SHALL BE PROVIDED BETWEEN POWER AND TELEPHONE CABLES.

FOR TENDER PURPOSE

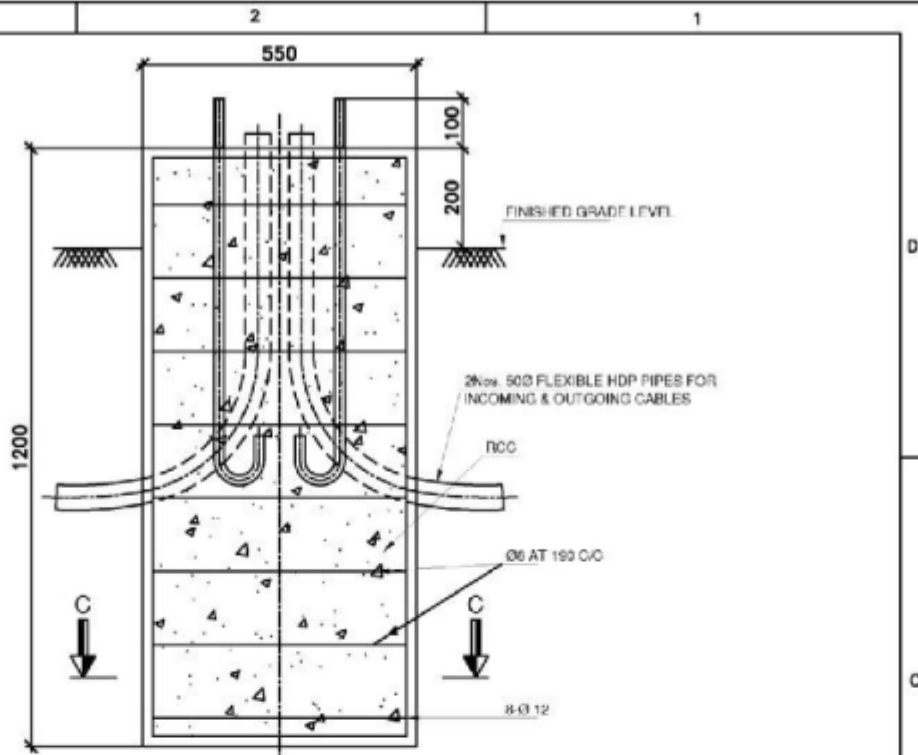
REFERENCES	DRG.No.	REV.No.	ZONE	DATE	DESCRIPTION OF REVISIONS	BY	APPRD.
NOTE:							

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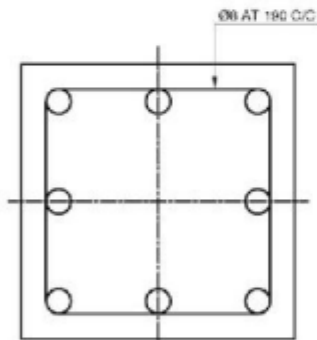
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DESIGNED	MADHU	<i>[Signature]</i>	ELECTRICAL
CAD	RAGHU	<i>[Signature]</i>	SCALE : NTS
REVIEWED	S.C	<i>[Signature]</i>	SH.No. 1 of 1
APPROVED	S.C	<i>[Signature]</i>	

**TYPICAL SECTION OF CABLE TRENCH IN UNPAVED AREAS**

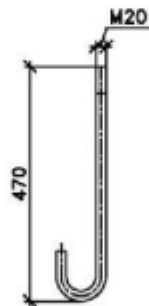
DRG.No. : MEC/23RT/01/E1/D2/CN/ST/0420



**DETAIL OF CIVIL FOUNDATION**



**SECTION C-C**



**ANCHOR BOLT DETAILS**

(TOTAL LENGTH 800mm)

**NOTE:-**

1. GRADE OF STEEL REINFORCEMENT (FOR R.C.C)-FE 415
2. CLEAR COVER TO REINFORCEMENT-50mm
3. ASSUMED S.B.C-10T/Sq.m. (MINIMUM)

FOR TENDER PURPOSE

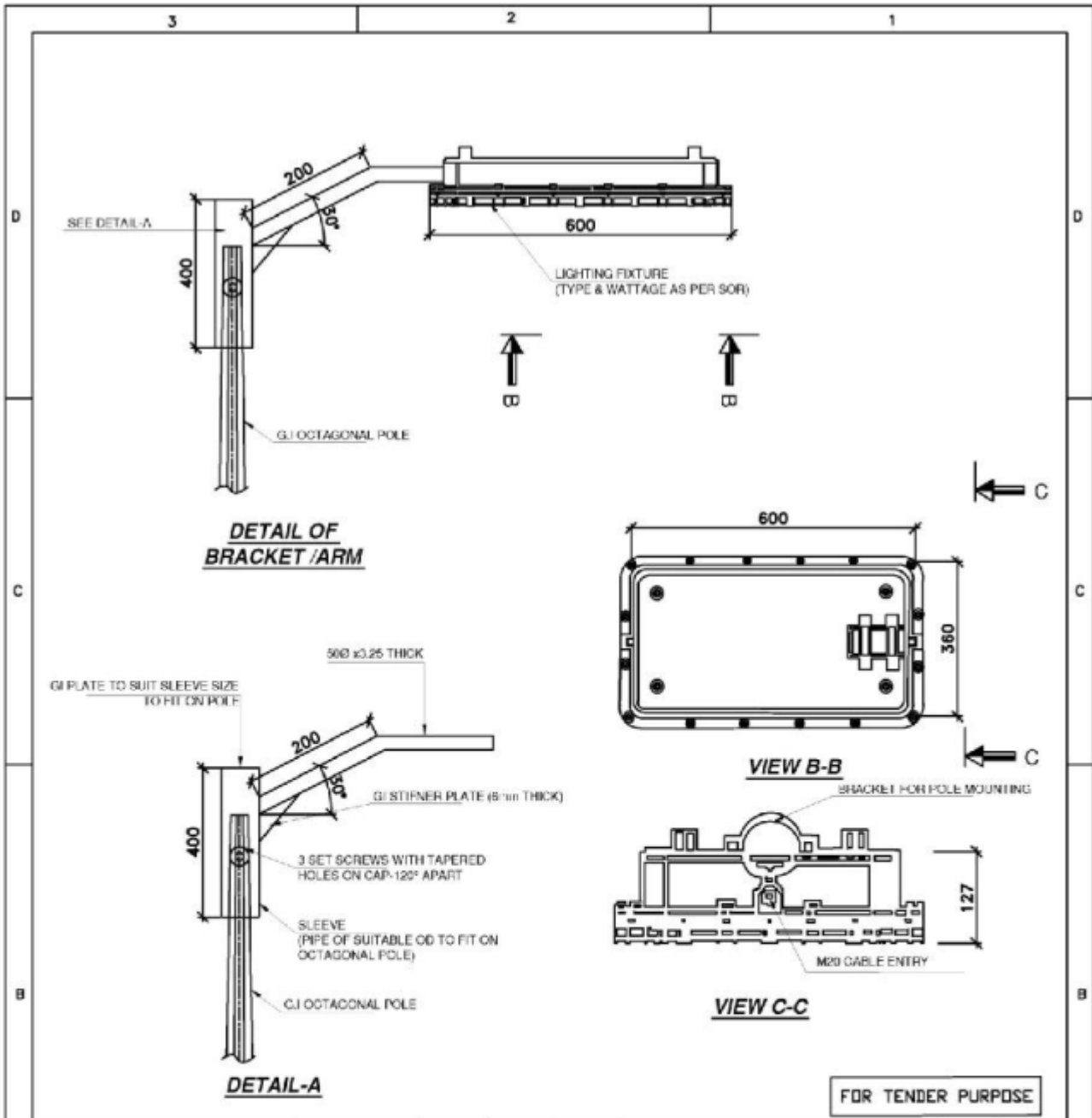
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	NAME	SIGN. & DATE	SECTION :
DESIGNED	MADHU	<i>[Signature]</i>	ELECTRICAL
CAD	RAGHU	<i>[Signature]</i>	SCALE : NTS
REVIEWED	S.C	<i>[Signature]</i>	SH.No. 1 of 3
APPROVED	S.C	<i>[Signature]</i>	

**TYPICAL INSTALLATION OF LIGHTING FIXTURE ON OCTAGONAL POLE**

DRG.No. : MEC/23RT/01/E1/D2/CN/ST/0421



FOR TENDER PURPOSE

REFERENCES	DRG.No.	REV.No.	ZONE	DATE	DESCRIPTION OF REVISIONS	BY	APPRD.
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APPROVED	S.C	<i>[Signature]</i>	

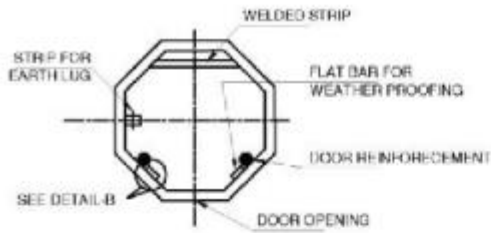
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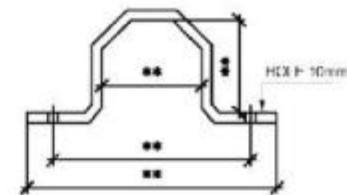
3

2

1



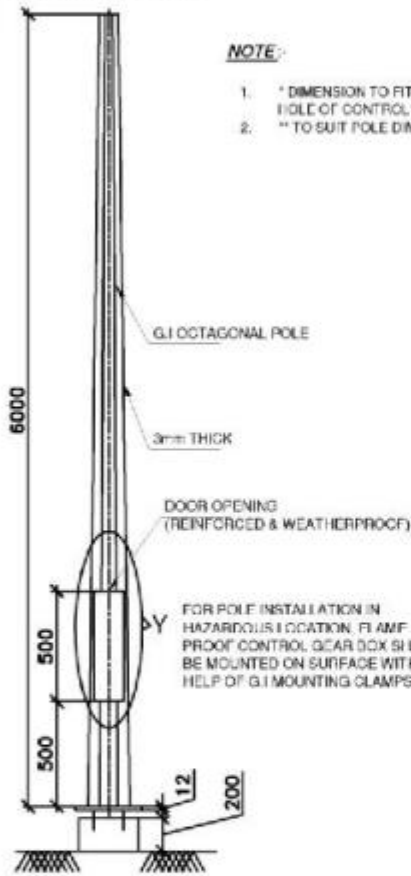
**SECTION A-A  
(FOR SAFE AREA)**



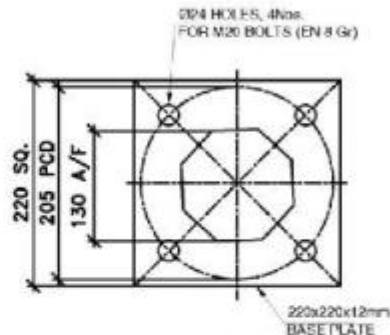
**G.I MOUNTING CLAMPS FOR  
CONTROL GEAR BOX**

**NOTE:-**

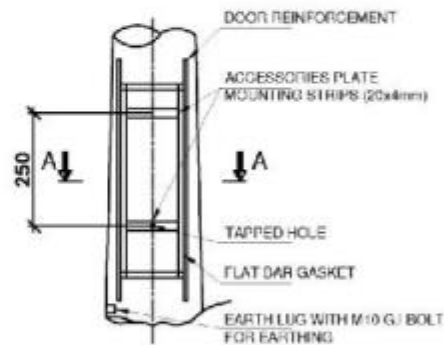
1. \* DIMENSION TO FIT THE MOUNTING HOLE OF CONTROL GEAR BOX.
2. \*\* TO SUIT POLE DIMENSION



**ELEVATION**



**BASE PLATE**



**DETAIL - Y**

FOR TENDER PURPOSE

REFERENCES	DRG.No.	REV.No.	ZONE	DATE	DESCRIPTION OF REVISIONS	BY	APPRD.
NOTE:							

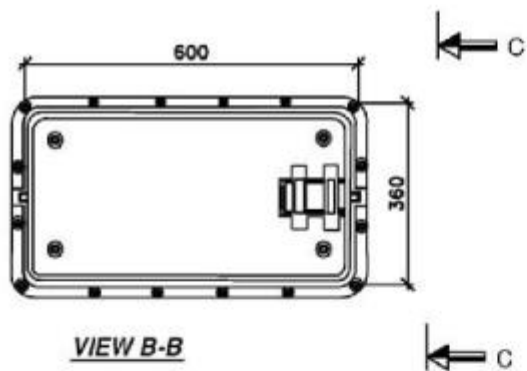
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CAD	RAGHU		SCALE : NTS
REVIEWED	S.C	<i>[Signature]</i>	SH.No. 3 of 3
APPROVED	S.C	<i>[Signature]</i>	

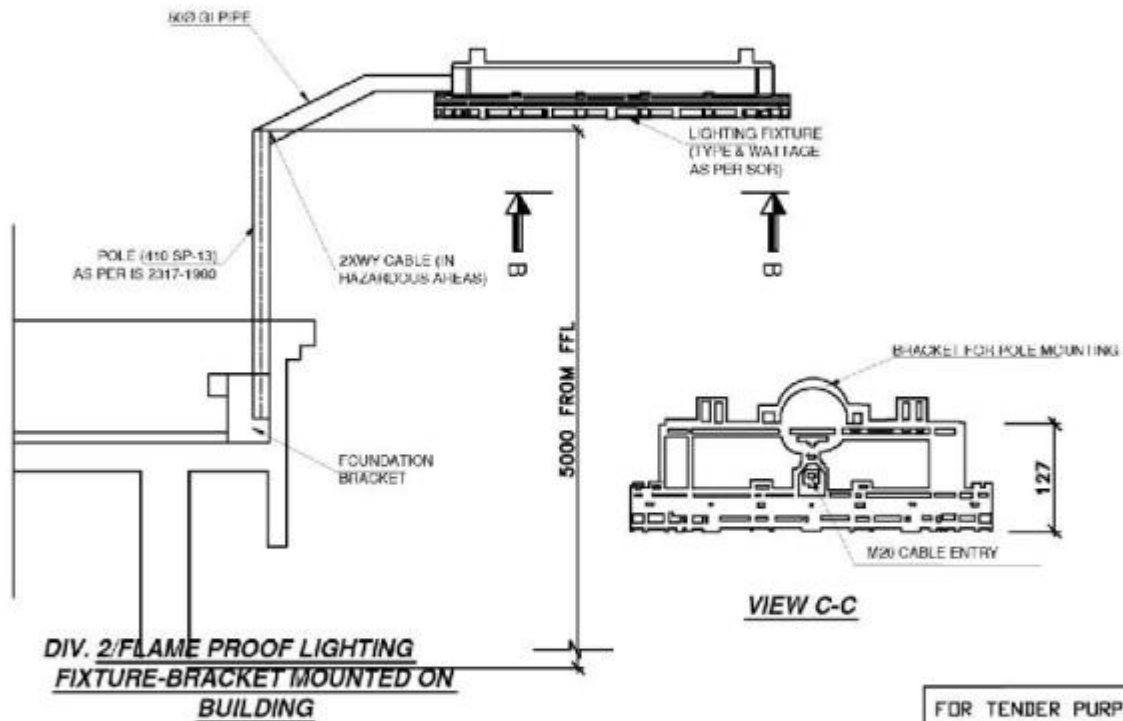
**TYPICAL INSTALLATION OF LIGHTING FIXTURE  
ON OCTAGONAL POLE**

DRG.No. : MEC/23RT/01/E1/D2/CN/ST/0421



**DETAIL-1  
(ADAPTOR)**

DESCRIPTION	DIMENSIONS	
	X	Y
PLATFORM MOUNTED POLE	TO SUIT 190 B.S PIPE	TO SUIT 380 B.S PIPE
FLOOR MOUNTED POLE	TO SUIT 190 B.S PIPE	TO SUIT 500 B.S PIPE



FOR TENDER PURPOSE

REFERENCES	DRG.No.	REV.No.	ZONE	DATE	DESCRIPTION OF REVISIONS	BY	APPRD.
NOTE:							

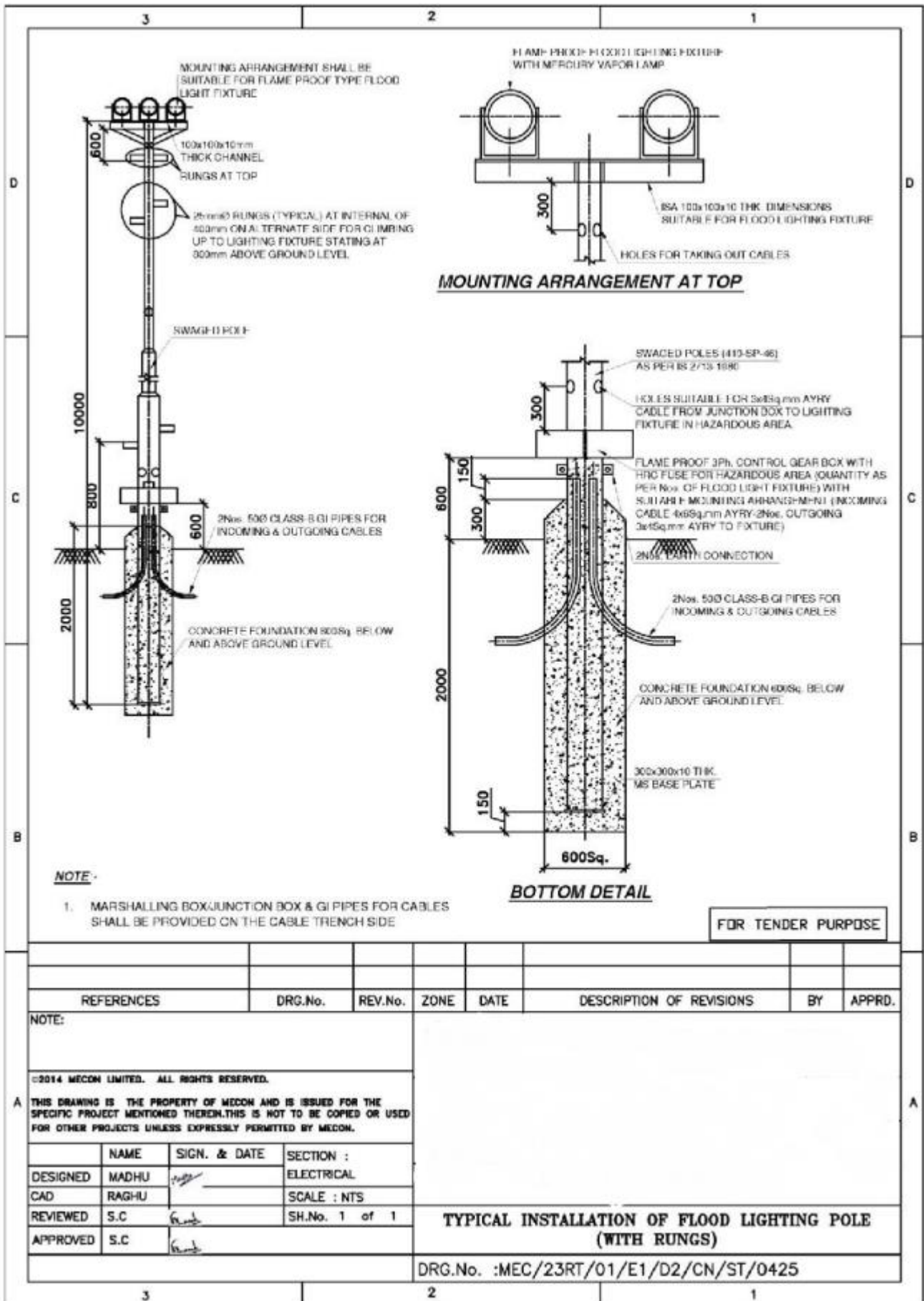
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NAME	SIGN. & DATE	SECTION :
DESIGNED	MADHU	ELECTRICAL
CAD	RAGHU	SCALE : NTS
REVIEWED	S.C	SH.No. 1 of 1
APPROVED	S.C	

**FLAME PROOF LIGHTING FIXTURE MOUNTING DETAILS  
(TYPICAL)**

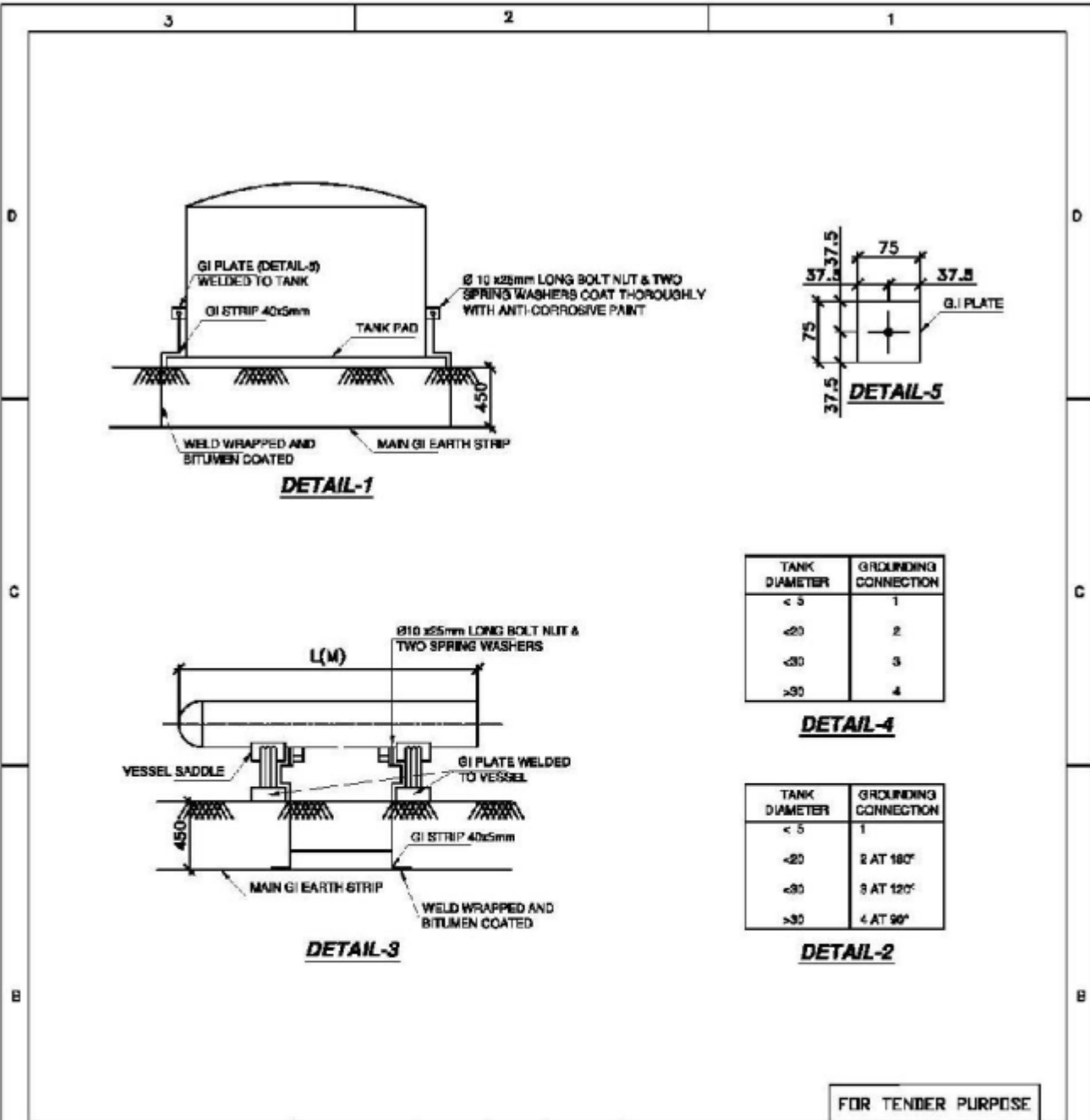
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FOR TENDER PURPOSE

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CAD	RAGHU	<i>[Signature]</i>	SCALE :		NTS		
REVIEWED	S.C	<i>[Signature]</i>	SH.No. 1 of 1		<b>TYPICAL INSTALLATION OF FLOOD LIGHTING POLE (WITH RUNGS)</b> DRG.No. :MEC/23RT/01/E1/D2/CN/ST/0425		
APPROVED	S.C	<i>[Signature]</i>					



FOR TENDER PURPOSE

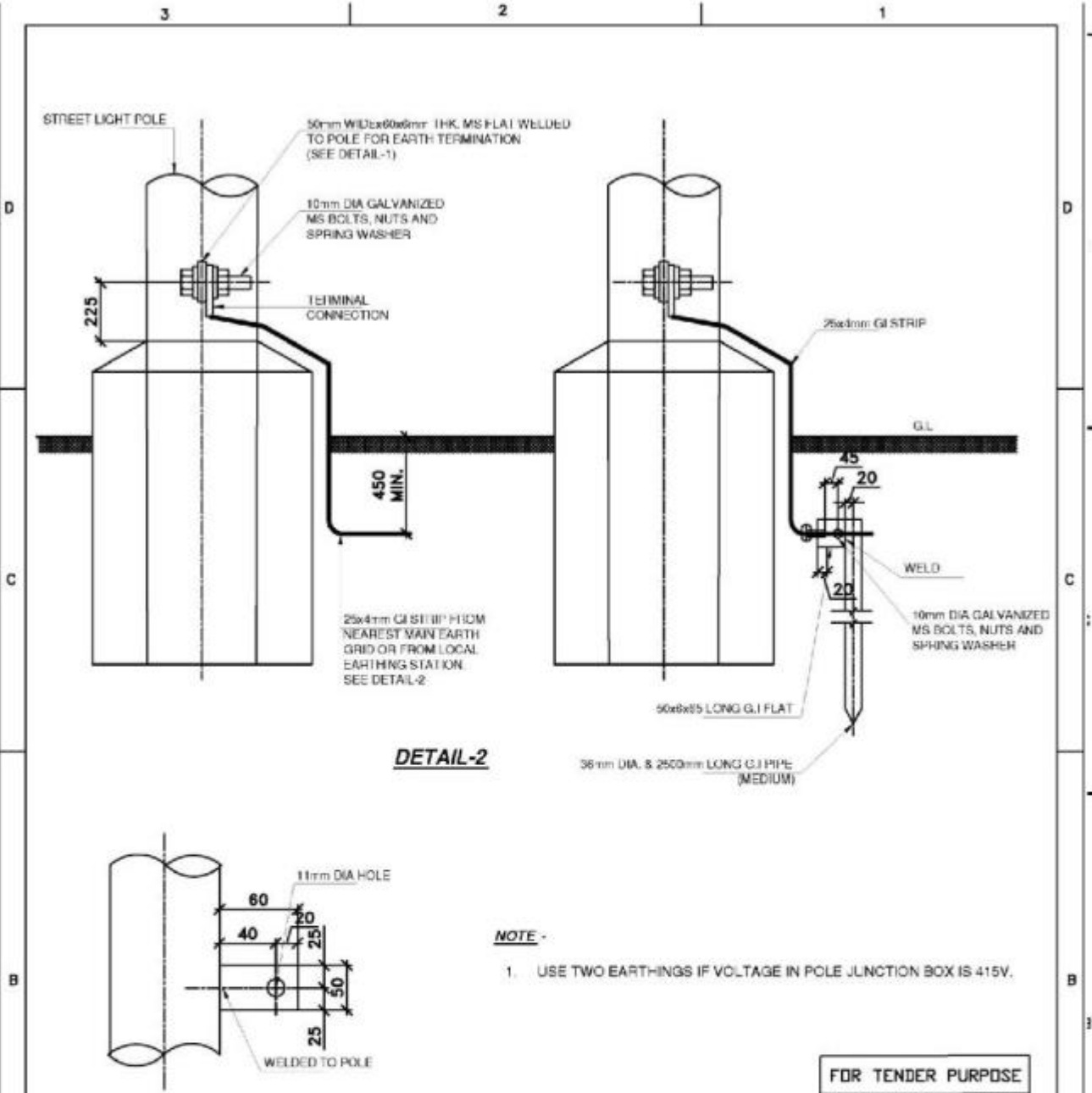
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NOTE:

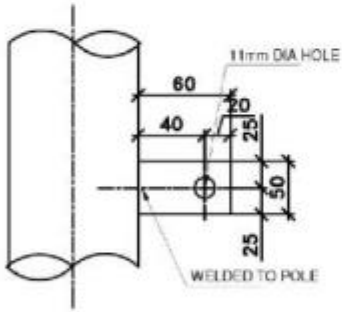
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NAME	S/GN. & DATE	SECTION :
DESIGNED	MADHU	ELECTRICAL
CAD	RAGHU	SCALE : NTS
REVIEWED	S.C	SH.No. 1 of 1
APPROVED	S.C	

**EARTHING OF TANKS AND VESSELS**  
 DRG.No. : MEC/23RT/01/E1/D2/CN/ST/0427



**DETAIL-2**



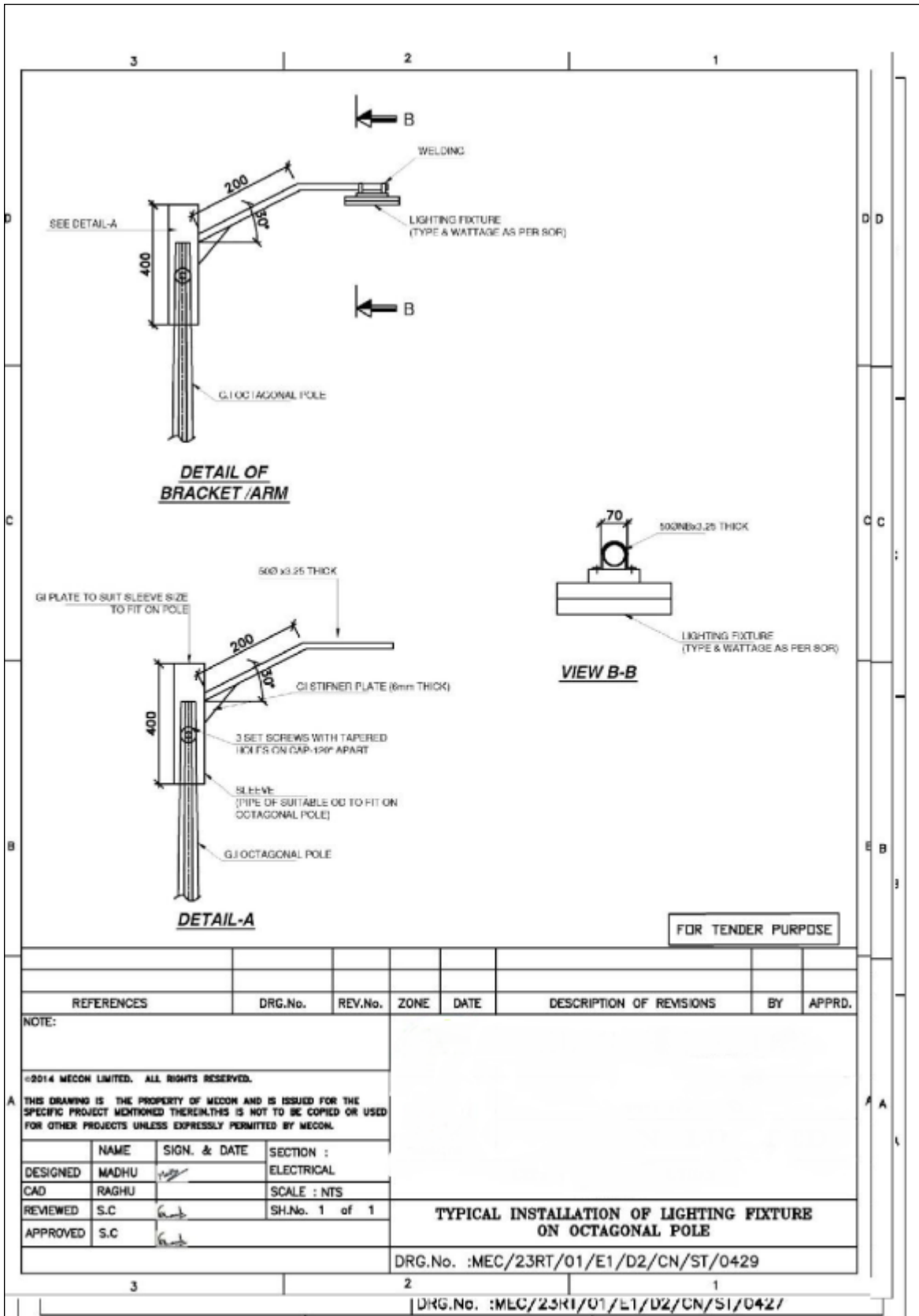
**DETAIL-1**

**NOTE -**

- 1. USE TWO EARTHING'S IF VOLTAGE IN POLE JUNCTION BOX IS 415V.

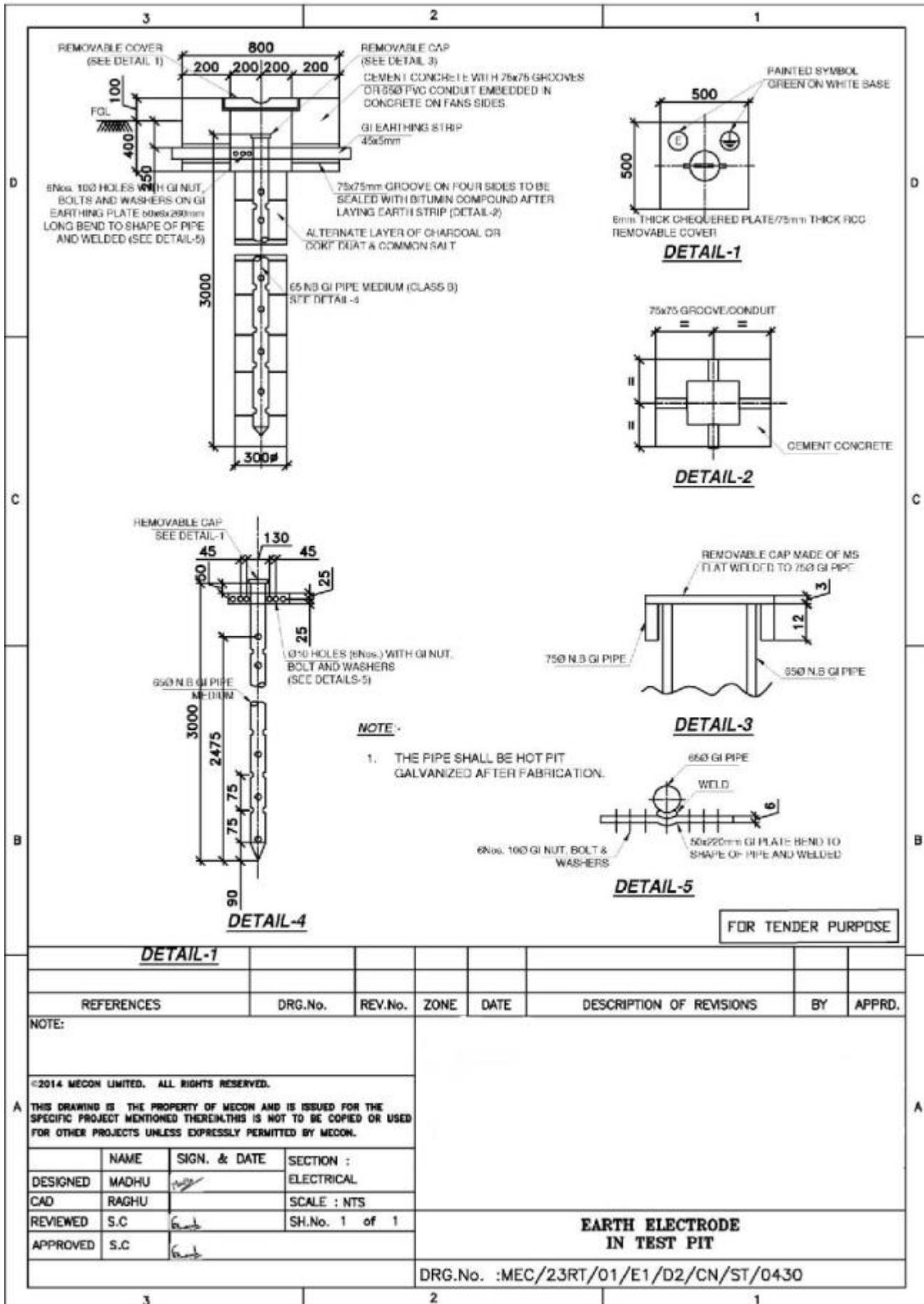
FOR TENDER PURPOSE

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DESIGNED	MADHU	<i>[Signature]</i>	SECTION :		ELECTRICAL		
CAD	RAGHU	<i>[Signature]</i>	SCALE :		NTS		
REVIEWED	S.C	<i>[Signature]</i>	SH.No. 1 of 1				
APPROVED	S.C	<i>[Signature]</i>	<b>TYPICAL EARTH CONNECTION FOR STREET LIGHT POLE</b>				
DRG.No. :MEC/23RT/01/E1/D2/CN/ST/0428							
DRG.No. :MEC/23RT/01/E1/D2/CN/ST/0427							



REFERENCES	DRG.No.	REV.No.	ZONE	DATE	DESCRIPTION OF REVISIONS	BY	APPRD.
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CAD	RAGHU	<i>[Signature]</i>	SCALE :		NTS		
REVIEWED	S.C	<i>[Signature]</i>	SH.No. 1 of 1		<b>TYPICAL INSTALLATION OF LIGHTING FIXTURE ON OCTAGONAL POLE</b> DRG.No. : MEC/23RT/01/E1/D2/CN/ST/0429		
APPROVED	S.C	<i>[Signature]</i>					

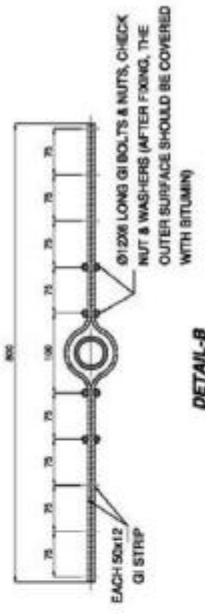
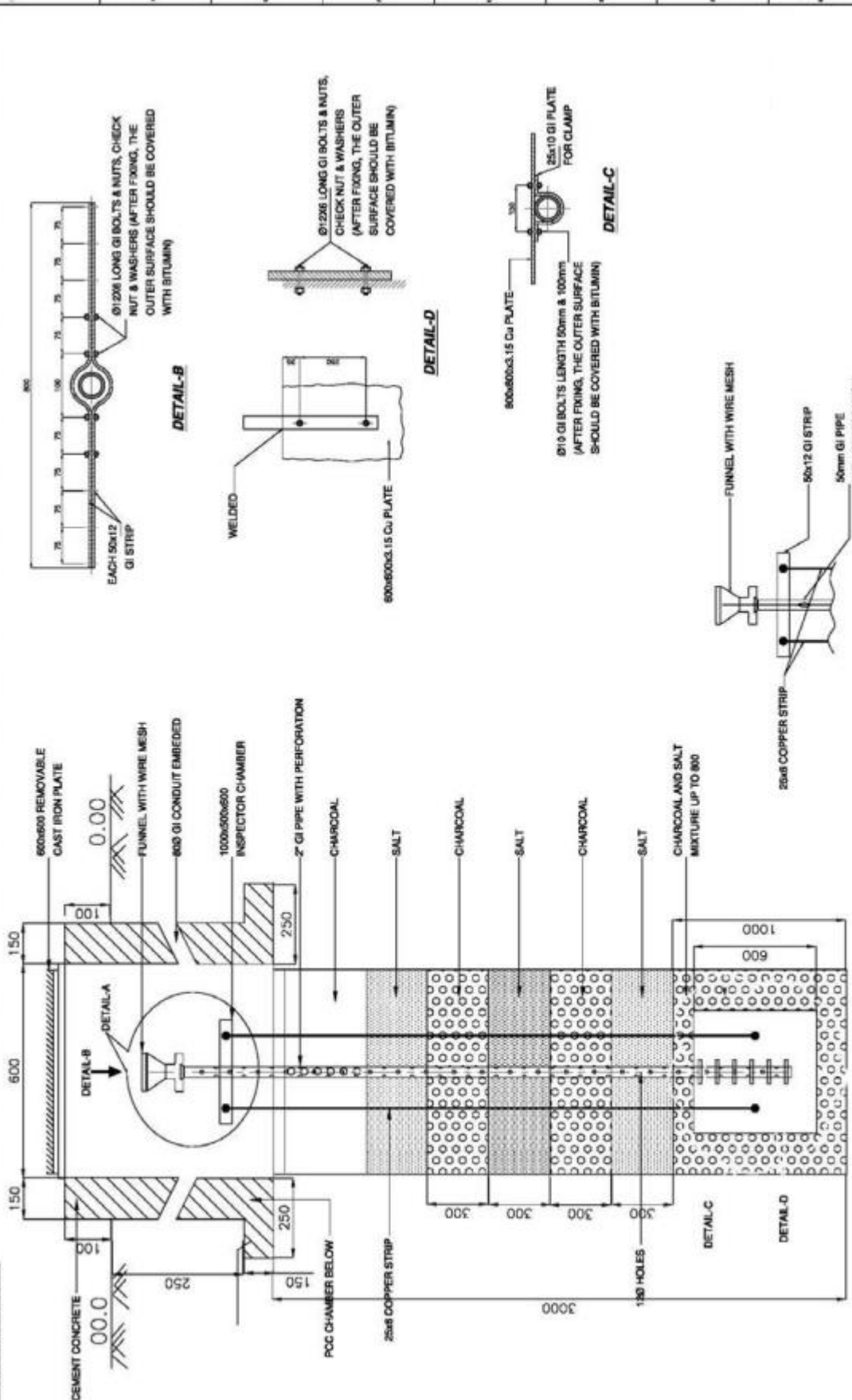
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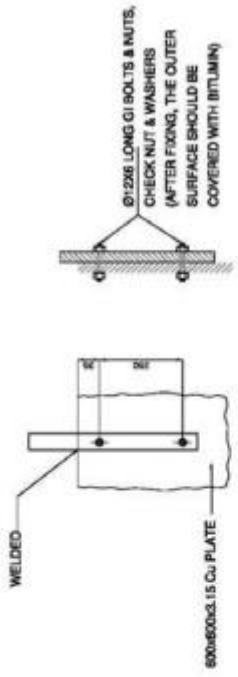
DETAIL-1							
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NOTE:							
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DESIGNED	MADHU		SECTION : ELECTRICAL				
CAD	RAGHU		SCALE : NTS				
REVIEWED	S.C		SH.No. 1 of 1		<b>EARTH ELECTRODE IN TEST PIT</b>		
APPROVED	S.C						
DRG.No. : MEC/23RT/01/E1/D2/CN/ST/0430							



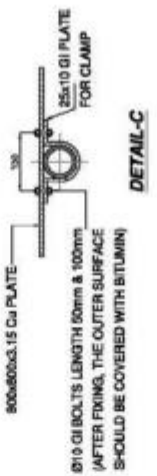
100/13/10/76/75/19/100/75/100/300



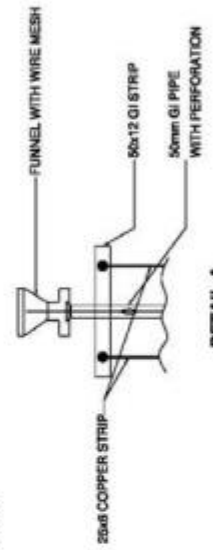
DETAIL-B



DETAIL-D



DETAIL-C



DETAIL-A

EARTH PIT

- NOTES:-
1. ALL DIMENSIONS ARE IN MM OR OTHERWISE MENTIONED.
  2. TO SUIT SOIL CONDITION AT SITE.
  3. RESISTANCE OF THE EARTH PIT SHOULD BE LESS THAN 1 OHM.
  4. THE ENTIRE EARTH PIT SHALL BE COVERED WITH BITUMEN COMPOUND.
  5. THE COMPLETE EARTHING SYSTEM SHALL CONFORM TO IS:2042(1987)

NO.	DATE	BY	CHKD	DESCRIPTION	REVISION
1	08.01.17	SK	SK	ISSUED FOR TENDER	1
2	08.01.17	SK	SK	REVISED AS PER COMMENTS	2
3	08.01.17	SK	SK	REVISED AS PER COMMENTS	3
4	08.01.17	SK	SK	REVISED AS PER COMMENTS	4
5	08.01.17	SK	SK	REVISED AS PER COMMENTS	5

TYPICAL ELECTRONIC EARTH PIT

SCALE: AS SHOWN  
 DATE: 08.01.17  
 DRAWN BY: SK  
 CHECKED BY: SK  
 PROJECT NO: 100/13/10/76/75/19/100/75/100/300

**TENDER NO: GGPL/KKD/C&P/CW/2545/VS**

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## **PART-III**

# **TECHNICAL SPECIFICATION FOR MECHANICAL WORKS**





**TENDER NO: GGPL/KKD/C&P/CW/2545/VS**

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**Contents**

- 1. INTRODUCTION.....
- 2. SCOPE OF WORK. ....
- 3. DETAILED SCOPE OF WORK UNDER THE PRESENT TENDER: .....
- 4. Completion Time Schedule .....
- 5. General Instructions to the Contractor.....
- 6. REFERENCE SPECIFICATION, CODES AND STANDARDS.....
- 7. APPROVALS .....
- 8. STRUCTURES, SERVICES AND OTHER PROPERTY.....
- 9. SAFETY .....
- 10. PROGRESS OF WORK.....

## **1. INTRODUCTION**

- 1.1. M/s Godavari Gas Private Limited, a joint venture company of APGDC and HPCL is engaged in development of CNG (Compressed Natural Gas) as fuel to commercial & private vehicles through filling stations in the automobile sector & PNG (piped Natural Gas) to Industrial, household, commercial sector through City Gas Distribution Networks (CGDN) at different Geographical Areas in East and West Godavari districts of Andhra Pradesh. PNGRB has awarded to Godavari Gas the work of development of City Gas Distribution Network for East and West Godavari district Geographical Areas (GA's) for distribution of CNG and PNG to various consumer segments. Presently, GGPL is planning to implement CNG & City Gas Distribution Network (CGDN) to supply Natural Gas to domestic, commercial, industrial and automobile consumers distributed over the Geographical Areas (GA's) of East and West Godavari Districts.
- 1.2. GGPL planning to provide compressed natural gas (an eco-friendly fuel) & related services in Automobile, Domestic, Commercial and Industrial sectors in the state of Andhra Pradesh.
- 1.3. GGPL is creating infrastructure & services for Automobile Sector and provide compressed natural gas (an eco-friendly fuel) in the East and West Godavari Dists of Andhra Pradesh state.
- 1.4. **GENERAL INFORMATION:**  
This tender deals with various Mechanical works involved in 8 nos. of CNG Mother / Daughter booster stations proposed in BPCL /IOCL /HPCL retail outlets land procured through EOI with car dispensers., 3 nos. of CNG Mother/Online stations proposed on GGPL's land, 6 nos. of De-compression unit installations for City Gas Distribution . All are located in East and West Godavari Geographical areas in the state of Andhra Pradesh. The brief scope of work is presented in Table-I.  
Further, the contract will be valid for 2 years from the date of FOA (Fax of Acceptance) and job will be intimated after award of contract for one or more than one. of CNG stations in a phased manner depending upon the availability of Plots/ ROs by the Client within a time period of 24 months from the date of FOA (Fax of acceptance), which shall be considered as the validity of the subject works contract and the contractor will be provided with the site details along with the intimation. The contractor shall have to deploy his manpower within seven days from the time of intimation for execution of work by EIC/Client.

## **2. SCOPE OF WORK.**

The broad scope of work under "Mechanical Works" is essentially but not limited to the following.

**TENDER NO: GGPL/KKD/C&P/CW/2545/VS**

- i) Supply and Laying of SS (SS316) tubes and SS compression ferrule fittings, valves, mass flow meter, Conductive core thermoplastic hose with break away coupling within trenches/ above ground and pneumatic testing for CNG application.
- ii) Erection of Mechanical equipment. Handling (including lifting and transportation from Client's store within city to respective CNG stations) and erecting in position, either on the foundation or on roof of office building at ~ 3 to 4 m above ground level. Contractor's scope includes supply of all material and accessories including but not limited to any fixtures, clamps, gasket, nut bolts, etc.. Scope also includes supply of all lifting tools / necessary accessories and hiring of cranes for same.
- iii) Supply, erection & commissioning of miscellaneous items as explained in SOR and specification (like Air Compressor for tyre inflating, Gas genset-Fire fighting equipment like DCP, Sand bucket, CO<sub>2</sub> extinguisher etc.)

2.1. The scope of work (activity-wise) at CNG stations in BPCL/IOCL/HPCL retail outlets, CNG stations in land procured through EOI and at Mother station are as given below.

**FACILITIES ENVISAGED IN VARIOUS STATIONS : TABLE-I**

Part No.	Type of CNG station / decompression unit installation	Supply , Laying & Pneumatic testing of SS 316 tubes for CNG line	Transportation and Erection of cascades	Supply, erection & commissioning of miscellaneous items.
Part-A	Online CNG station in BPCL /IOCL/HPCL Retail outlet (RO)/land procured through EOI with car dispensers.	SS tubing from 1(ONE) no. of CNG Compressor to 1(ONE) no. of CNG Cascade of 4500WL/ 3000 WL and 2(TWO) nos. of Car Dispensers.	1(ONE) no. of 4500 WL/3000 WL CNG storage Cascade for car dispensers.	1(ONE) no. of DCP75 kg, 1(ONE) no. of DCP 9 kg, 1(ONE) no. of CO <sub>2</sub> - 4.5 kg fire extinguisher and 1 (ONE) no. of Sand Bucket Stand with 4 Nos. Buckets
Part-B	Decompression unit installation	SS tubing from 1(ONE) no. of CNG De-compression unit to CNG storage cascade to LCV unloading point	1(ONE) no. of 4500 WL/3000 WL CNG storage Cascade.	1(ONE) no. of DCP 9 kg, 1(ONE) no. of CO <sub>2</sub> - 4.5 kg fire extinguisher and 1 (ONE) no. of Sand Bucket Stand with 4 Nos. Buckets.

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Part-C	Mother / Online CNG station on land of Godavari Gas Pvt. Ltd. with Car and Bus Dispensers and LCV loading facility.	SS tubing from 2(TWO) nos. of CNG Compressors to 3(THREE) nos. of CNG Cascades, 2(TWO) nos. of Car Dispensers, 1(ONE) no. of Bus dispenser and 1(ONE) LCV loading facility.	2(TWO) nos. of 4500 WL/3000 WL CNG storage Cascade for car dispensers and 1(ONE) no. of 4500 WL/3000WL CNG storage Cascade for bus dispensers	1(ONE) no. of air compressor with tyre inflator, 2(TWO) nos. of DCP75 kg, 7(SEVEN) nos. of DCP 9 kg, 3(THREE) nos. of CO <sub>2</sub> - 4.5 kg fire extinguisher and 5 (FIVE) nos. of Sand Bucket Stand with 4 Nos. Buckets., 1(ONE) no. of 30 KVA gas genset
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**3. DETAILED SCOPE OF WORK UNDER THE PRESENT TENDER:**

Detailed scope of work is divided under different sub-heads. List of sub-heads along with different activities (with brief specification) is evolved and estimated quantities are given. The tenderer has to quote on sub-head wise per unit rate as mentioned.

Generally the following shall constitute the Contractor's scope of work but not limited to as given herein:

**3.1. SCOPE OF WORKS FOR SUPPLY, LAYING, TESTING & COMMISSIONING OF SS TUBING**

- 3.1.1. Supply of SS 316 tubes with SS ferrule fittings and SS ball valves, mass flow meter, conductive core thermoplastic hose with breakaway coupling (above ground / within trenches) for CNG application.
- 3.1.2. Receiving and upkeeping the materials procured by contractor in a good condition.
- 3.1.3. Laying of SS 316 tubes with SS ferrule fittings and SS ball valves, mass flow meter, conductive core thermoplastic hose with breakaway coupling (above ground / within trenches) for CNG application.
- 3.1.4. SS tubes shall be clamped to the MS Angle (within trench)/ rails on above ground at every 1000mm using of PVC heavy duty clamp of Swagelok/Parker/Dk-Lok/Vaishnavi hydraulics pvt Ltd./Vardhaman bearings/ AK industries make. **U-Clamping with rubber sheet is not acceptable.** It is not permitted to flatten Tubes for clamping purpose.
- 3.1.5. Carrying out pneumatic testing with Nitrogen at 280 bar(g) and purging with Nitrogen as per the provided procedures elsewhere in the document; providing all tools, tackles, instruments, manpower and other related accessories for carrying out the testing of tubes.

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- 3.1.6. Deputing of person during commissioning of CNG station (Actual gas charging in SS tubing) and checking of gas leakage in SS tube/fitting.
- 3.1.7. Final clean up and restoration of site, facilities etc. as per the requirement of Owner/ Engineer-in charge.
- 3.1.8. Submission of final material appropriation statements for all the materials procured by contractor, returning surplus material to GGPL stores, reconciliation of material / consumables and obtaining 'No Objection Certificate' from GGPL/ .
- 3.1.9. Any other works not specifically listed herein but required for satisfactory Completion / operation Safety/statutory maintenance of the works in all respects within specified schedule at no extra cost to OWNER.
- 3.1.10. Preparation and submission of “As Built Drawings”.

**3.2. LOADING, UNLOADING, TRANSPORTATION &ERECTION OF MECHANICAL EQUIPMENT**

- 3.2.1. Receiving of material from stores.
- 3.2.2. Loading of material / equipment on a trailer / truck from GGPL stores and Safe transportation to various sites.
- 3.2.3. Unloading, placement and alignment on foundation -either on ground or aboveground (+ 3.5 m) on roof top / top of structural platform (cascades only)/ on top of CNG compressor.
- 3.2.4. Making Transit Insurance of equipment from stores to site.
- 3.2.5. All equipment transported shall be securely boarded and transported without causing any damage to equipment. Any damage caused during loading, transportation& unloading shall be recovered from the contractor.
- 3.2.6. Leak testing of all equipment after erection as per standard practice and instruction of engineering in charge.

**3.3. SUPPLY, ERECTION & COMMISSIONING OF MISCELLANEOUS ITEMS**

- 3.3.1. **Air compressor (Pump) :** Supply, erection (at location indicated by EIC), testing and commissioning of Air Compressor-cum-Pump with accessories such as dispensing stand, hose, nozzle, valves, connectors etc complete with Automatic Intelligent Tyre Inflating M/C [AITIM] to supply compressed air for all types of vehicles that visit

**TENDER NO: GGPL/KKD/C&P/CW/2545/VS**

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the station for refuelling of CNG or other purposes.

**3.3.2. Fire Fighting Equipment:** Supply and installation of (at location indicated by EIC) the following fire fighting equipment in various CNG stations.

- i. 4.5 kg capacity CO<sub>2</sub> type fire extinguishers with steel cylinder with discharge valve conforming to IS:2878-2004. Extinguisher shall be painted with red enamel paint and hardware/ bracket required for fixing to wall.
- ii. 9 kg capacity dry chemical powder (DCP) type fire extinguisher (Manufacturing code IS: 13849) with extinguishers cabinet suitable for inverted operation and fabricated from MS sheet internally protected with anticorrosive treatment and hydraulically tested. Extinguishers shall be externally painted with red enamel paint.
- iii. 75 kg capacity trolley mounted dry chemical powder (DCP) type fire extinguisher (Manufacturing code IS: 10658) suitable for inverted operation fabricated from MS sheet internally protected with anticorrosive treatment and hydraulically tested extinguishers externally painted with red enamel.
- iv. Fire buckets, 9 ltrs. capacity, made of galvanised mild steel (as per IS: 2546) including supplying & fixing of MS angle iron stand to accommodate 4 nos. offire buckets and first fill with sand/water all complete as per direction of Engineer In charge. (Note: One set of Fire bucket consists of 4 buckets with stand).

**3.3.3. Gas genset:**Supply, erection (at location indicated by EIC), testing and commissioning of 30 KVA gas genset with accessories such as regulators, ball valves and pipe

3.4. Survey, making arrangement of safety, security, temporary water &electrical connections, traffic detour etc. setting out the piping GAD by laying out the plans at site.

3.5. Preparing QAP and taking approval from including Welder's qualification Test, Internal Test Plan, Hydrostatic Test Procedures, SS Tube &Yard Pipe testing & procedures.

3.6. Taking all measures to provide safety to traffic, public, workmen operating staff, equipment, and operation/ maintenance activities, underground/ above Ground services and providing FIRE PROTECTION measures during construction and any other activity to make the station functional in all respect.

3.7. To carry out all tests at worksite, approved laboratory and place of manufacture/ fabrication; provide all test certificates from manufacturers &supplier and offer inspection at all stages of procurement/ construction.

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- 3.8. To maintain and observe all statutory requirement with regards to labour laws, taxation laws, local statutory rules and insurance requirements.
- 3.9. To hand over clear site to GGPL/ after removing all debris subsequent to completed works as per scope.
- 3.10. To submit daily, weekly and monthly progress reports and to attend review meetings both at site and at project office and other discussions with GGPL/ /Statutory Authorities.
- 3.11. To transfer all Test Certificates, warranties / guarantees including maintenance / performance guarantees of various fittings / fixtures, equipment / material and indemnify / GGPL of any liabilities of payments / dues to it's suppliers, manufacturers, agents etc.
- 3.12. Marking all as-built details on construction/ fabrication drawings/ data sheets issued by GGPL / and submission of as-built details and drawings in six Sets.

**4. Completion Time Schedule**

- i. For CNG Station Covered Under Part A -06 (FOUR) months from date of intimation for individual CNG station.
  - ii. For Installations Covered Under Part B -06 (FOUR) months from the date of intimation for individual unit.
  - iii. For CNG Station Covered Under Part C -10 (TEN) months from date of intimation for each CNG station
  - iv. In case of issuance for intimation for more than one unit simultaneously for Part-A & Part-B, completion schedule will get extended by additional one month for each additional unit.
- 4.1. The transportation and erection of cascades in each location shall be completed within 7 (seven) working days from the date of intimation by the EIC / Client.
  - 4.2. The supply and erection of Misc. items EXCLUDING Gas Genset in each location shall be completed within 7 (seven) working days from the date of intimation by the EIC / Client.

**5. General Instructions to the Contractor**

- 5.1. Plan and prepare a schedule for execution and work implementation as per QA/QC plans to be approved by /GGPL. Proper man power set up at site by carrying out a pre-construction survey, establishing the site deviations, requirement of site modifications in construction drawings, earth filling/ cutting requirement etc.

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- 5.2. Receiving the latest revision of all documents/ drawings from GGPL/ at the commencement of work / during the course of construction and execution of work at site.
- 5.3. In case any discrepancy is found between drawings & documents, the same shall be brought to the notice of the Engineer-in-charge before execution of work and decision of the Engineer-in-charge shall be final and binding to the contractor without any extra cost implication to GGPL.
- 5.4. The contractor has to make all shop drawings wherever necessary, at his owncost, and get it approved by / GGPL before commencement of that work at site.
- 5.5. Specification and descriptions of various items are for identification of material and works to be carried out under them. No cost shall be quoted against these unless mentioned.
- 5.6. Quantities as mentioned are indicative and can have a variation from the quantities actually executed. The contractor is advised to work out the breakup of individual work items and quantities at his own before quoting any rates. GGPL is not liable for any discrepancies in the quantities and no extra time or cost shall be granted on this pretext.
- 5.7. The contractor has to obtain all types of statutory approvals including completion certificate, approval from electrical inspector for electrical work ,electrical Connection, water connection, fire department etc. and all other approvals that might be required to commission the station, from various relevant authorities during the course of work and after completion of works in co-ordination with GGPL/ without any cost implication to GGPL.
- 5.8. The contractor has to arrange all tools and plants, site fencing material, lighting arrangements, store, electricity and water at his own cost.
- 5.9. The contractor should quote keeping this in mind that no request for escalation inthe cost shall be entertained under any circumstances by Owner after placement of order.
- 5.10. The contractor is bound to carry out all on any number of sites simultaneously that may be allotted to him.
- 5.11. The tender contains a set of key tender purpose drawings/ data. These information/ details are for “Tender Purpose only”. The tenderer should visit each location and acquaint himself with site conditions of each site. No deviations and/or claims whatsoever of any kind and nature would be admissible.
- 5.12. The work shall be carried out in city conditions and generally close to the roads and public services conveying a considerable volume of vehicular traffic and human activity. It is deemed necessary that the tenderer considers the “SAFETY” as



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the MOST IMPORTANT aspect of working conditions and is required to include in his offer all costs (direct and indirect) towards observance, compliance and provision of all safety appurtenances and norms.

- 5.13. Supplying SS tubes, fittings and other free issue items from GGPL's stores and bringing it to site, keeping proper care of, storing the same till they are used for construction and returning the unused material to the store.
- 5.14. Installing site markers, warning signs, fencing etc. and cleaning all unserviceable materials, debris to designated disposal areas and obtain a No Dues Certificate from the concerned authorities.
- 5.15. Handing over the completed works to GGPL for their operation/ use purposes.
- 5.16. The Contractor has to prepare As-Built drawings, shop drawings, fabrication drawings and submit them along with test certificates, guarantee cards/ warranty cards/ service schedule any other purchase documents/ literature for all equipment / fixtures / fittings installed at the time of completion of work.
- 5.17. Any other activity(ies) not mentioned/ covered explicitly above, but otherwise required for satisfactory completion/ operation/ safety/ statutory/ maintenance of the works shall also be covered under the Scope of Work and has to be completed by the Contractor within specified Schedule of Items of Works at no extra cost to GGPL.
- 5.18. The contractor has to return all the drawings issued to him from time-to-time along with the final bill to / GGPL after marking As-built dimensions and details. The contractor is not permitted to make copies of any drawing/ document provided to him.

**6. REFERENCE SPECIFICATION, CODES AND STANDARDS**

The contractor shall carry out the work in accordance with this Specification, approved construction drawings issued by GGPL, 's Engineering Standards or relevant BIS code as might be required.

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

**7. APPROVALS**

Approval in principle for all work should be obtained from EIC prior to execution. To ensure smooth execution of the work on a day-to-day basis, it will be the Contractors responsibility to liaison with EIC / concerned engineer and obtain necessary approvals.

**8. STRUCTURES, SERVICES AND OTHER PROPERTY**

**8.1. Protection of Structures and Utilities**

The Contractor shall at his own cost, support and protect all buildings, walls, fences or other structures and all utilities and property which may, unless so protected, be damaged as a result of the execution of the works. He shall also comply with the requirements in the specification relating to protective measures applicable to particular operations or kind of work

**8.2. Interference with Traffic, Street Drainage and General Public**

The Work shall be executed in such a manner as to cause a minimum of inconvenience to persons requiring to use public or private roads, lanes, thoroughfares, walkways, rights of use or passages through which the works are to be executed. Closure of roads, etc., shall not be permitted without the approval of the EIC.

The contractor shall conduct his operations at all times, with a view to minimizing as far as practicable noise from construction and other objectionable nuisances (eg. oil leakage, smoke, fumes.)

**9. SAFETY**

The Contractor shall conform to the requirements outlined in Preamble for safety requirements. In addition, the Contractor shall observe safe working practices in the storage and handling of pipes, SS tubes, flammable fluids, etc. and ensure that smoking or naked flames are not permitted in the vicinity when these works are being executed.

The Contractor shall also protect all work sites with warning signs, barricades and night lighting.

The contractor should ensure that the workers wear safety shoes and helmets while carrying out any work under the present scope.

Where the EIC determines that the Contractor is performing the work in an unsafe manner, he may suspend the work until the Contractor takes corrective action.

Since the work shall be carried out in city conditions and generally close to the highways/roads and public services conveying a considerable volume of vehicular traffic and human activity, it is deemed necessary that the tenderer considers the "SAFETY" as the MOST IMPORTANT aspect of working conditions and is required to include in his offer all costs (direct and indirect) towards observance, compliance and provision of all safety appurtenances and norms.

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**10. PROGRESS OF WORK**

The Contractor shall proceed with the Work under the Contract with due expedition and without delay.

The EIC may direct in what order and at what time the various stages or parts of the work under the Contract shall be performed.

If the Contractor can reasonably comply with this direction, the Contractor shall do so. If the Contractor cannot reasonably comply, the Contractor shall notify the EIC in writing giving reasons.

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**PART-III : Mechanical Work**

**JOB SPECIFICATIONS FOR MECHANICAL WORKS IN CNG STATIONS**

**CONTENTS**

SECTION A	Specifications for Supply of SS Tubes, SS Fittings ,SS Valves& Conductive core thermo plastic hose with breakaway coupling
SECTION B	Specifications for SS Tube Laying and Testing
SECTION C	Specifications for Erection of Mechanical Equipment
SECTION D	Specifications for Supply, Erection & Commissioning of Miscellaneous items

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**MECHANICAL WORKS**

**SECTION A. Specifications for Supply of SS Tubes, SS Fittings , SS Valves & Conductive core thermo plastic hose with breakaway coupling**

**CONTENTS**

- 1.0 SCOPE OF SUPPLY OF SS TUBES, VALVE & FITTING
- 2.0 TECHNICAL SPECIFICATION FOR SS  
TUBES (TS No. PMC/TS/05/62/035)
- 3.0 TECHNICAL SPECIFICATION FOR SS BALL  
VALVES (TS No. PMC/TS/05/62/048)
- 4.0 TECHNICAL SPECIFICATION FOR SS FERRULE FIT-  
TINGS (TS No. PMC/TS/05/62/047)
- 5.0 TECHNICAL SPECIFICATION FOR THERMO PLASTIC HOSE  
WITH BREAKAWAY COUPLING  
(TS No. PMC/TS/05/62/049)

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**1. Scope of supply of SS Tubes, SS Valves & SS Fittings**

The contractor has to supply SS Tubes, SS Valves & SS Fittings strictly as per technical specification no. PMC/TS/05/62/035, PMC/TS/05/62/047 & PMC/TS/05/62/048 attached.

The SS Tubes, valves and fittings are to be laid, tested and commissioned as detailed in SECTION - B. The balance items are to be re-conciled and submitted to Godavari Gas stores in good condition. The uncountable material beyond the permissible limits as specified in clause no. 6.0 of Section B would not be paid.

The contractor is required to purchase SS Tubes, SS fittings & SS Valves as per the quantities given in Schedule of Rates (SOR) from the approved vendor list enclosed. The contractor shall take prior approval before placement of order and get the QAP approved by / Godavari Gas . The inspection of materials and / or scrutiny of documents would be carried by / Godavari Gas / Third Party Inspection Agency appointed by contractor at his own cost.

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**TECHNICAL SPECIFICATION FOR SS TUBES FOR CNG REFILLING STATIONS**

**Contents of TS No. PMC/TS/05/25/035**

<u>Sl.No.</u>	<u>Description</u>
1.0	SCOPE OF WORK
2.0	CODE & STANDARD
3.0	PRECEDENCE
4.0	DEVIATION
5.0	SAFETY
6.0	SPECIFICATION
7.0	DOCUMENTATION
8.0	PACKING & SHIPMENT
9.0	GUARANTEE

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**1. SCOPE OF WORK**

- 1.1. The scope of the tenderer will include manufacture/ supply, inspection/testing/ marking/ packaging/ handling and despatch of SS tubes, as indicated in the Bill of Quantities meeting all the requirements as per ASTM A269.
- 1.2. All codes and standards for manufacture, testing, inspection etc. shall be of latest edition.
- 1.3. Purchaser reserves the right to delete or order additional quantities during execution of order, based on unit rates and other terms & conditions in the original order.

**2. CODES & STANDARD**

Items	Applicable Codes and Standards
Tubes	ASTM A269, ANSI B31.3

**3. PRECEDENCE**

In case of any conflict between this job specification and other document, the following order of precedence shall apply :-

- i. Job Specification
- ii. International Standards/ Codes Applicable

**4. DEVIATION**

Deviations if any required by Tenderer shall be separately furnished against each clause giving reasoning for each deviation. Tenderer to note that except the deviations furnished by them, Tenderer's offer shall be deemed to be in total conformity with the enquiry specifications.

**5. SAFETY**

- 5.1. All tubes shall be designed as per applicable code & standards.
- 5.2. All part/ component shall meet the requirement for the specified area's Classification.
- 5.3. Area classification shall be Class-I, Division-I ; Group-D as per NEC or Zone-I Group IIA/ IIB as per IS/ IEC Specification or equivalent specifications.

**6. SPECIFICATION**



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All the items shall be suitable for compressed natural gas service and meet following specifications.

- 6.1. Tube material shall be stainless steel as per ASTM A269 (Grade TP 316).
- 6.2. Tubing material shall have minimum molybdenum content 2.5%, carbon content of max. 0.030%.
- 6.3. Tube shall be bright annealed.
- 6.4. Tube shall be seamless.
- 6.5. Tube hardness shall be less than Rb 80. Tubes shall be NACE MR 0175 certified for hardness. Hardness test shall be carried out on each tube.
- 6.6. All S.S.tubes shall be online 100% eddy current Tested as per ASTM A1016. In lieu of eddy current Test / non-destructive electric examination, each tube shall be hydrotested as per requirement of ASTM A1016 clause no.26, at a hydrotest pressure of 350 kg/cm<sup>2</sup>(g). However, it shall be ensured that the test pressure does not result in stresses exceeding the yield strength at test pressure.
- 6.7. Tolerance on outer diameter shall be  $\pm 0.08$  mm.
- 6.8. Tube shall be of minimum 5 to 6 meter in length.
- 6.9. Minimum thickness shall be as per following table.

Tube OD	Minimum Wall Thickness	Maximum Allowable Working Pressure psig
1"	0.120"	4700
3/4"	0.095"	4700
1/2"	0.083"	4700
3/8"	0.065"	4800
1/4"	0.035"	4800

Note: Bidder to reconfirm maximum allowable working pressure for each tube size.

- 6.10. Following documents/ certificates to be submitted.
  - i. Chemical composition for heat
  - ii. Chemical composition for products

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- iii. Tensile test
- iv. Hardness test
- v. Flaring test
- vi. Leak test
- vii. Visual inspection and dimensional check

6.11. Tubing should be clearly marked with the specifications given in the inspection certificate with heat code, lot code, outer diameter and wall thickness with inspection certificate no.,

6.12. Tubes should be supplied with both ends plugged.

**7. DOCUMENTATION**

Following test certificates shall be furnished along with shipment.

7.1. Test certificate of visual, chemical, Mechanical testing (incl. tensile, hardness, flaring and leak test).

7.2. Manufacturer's standard shop inspection & test report for all items.

7.3. The test report for specified tests.

7.4. Third party inspection report as applicable to meet the requirements of specified codes & standards as applicable.

**8. PACKING & SHIPMENT**

8.1. All the items shall be suitably wrapped and packaged to withstand rough handling during ocean shipment and inland journey. Tubes should be supplied with both ends plugged.

8.2. The item shall be properly tagged and packaged separately to facilitate easy identification.

8.3. Items shall be wrapped and packaged in such-a-way that they can be preserved in original as new condition.

**9. GUARANTEE**

9.1. Manufacturer shall guarantee that the design, materials, manufacturing and testing of tubes conform to the requirement of this specification. Manufacturer shall replace all tubes free of costs which fail during field pressure testing or do not perform satisfactorily due to inadequate engineering, substandard material and poor workmanship.

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- 9.2. The manufacturer shall guarantee against any defect, failure normal functioning occurring during 12 months from the date of commissioning or 24 months from the date of supply whichever is earlier.

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**TECHNICAL SPECIFICATION FOR SS FERRULE FITTINGS FOR  
CNG REFILLING STATIONS**

**Contents of TS No. PMC/TS/05/25/047A**

<b><u>Sl.No.</u></b>	<b><u>Description</u></b>
1.0	SCOPE OF WORK
2.0	CODE & STANDARD
3.0	PRECEDENCE
4.0	DEVIATION
5.0	SPECIFICATION
6.0	MARKING, PACKING & SHIPMENT
7.0	DOCUMENTATION
8.0	GUARANTEE

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**1. SCOPE OF WORK**

- 1.1. The scope of this specification covers the requirement of design, manufacture/ inspection/ testing at works/ marking/ packaging/ and supply of high pressure SS Ferrule Fittings.

**2. CODES & STANDARD**

The latest edition of the following standards are referred to in this specification

<b>Items</b>	<b>Applicable Codes and Standards</b>
Bar Stock	ASME SA-479-316 or DIN 4401 or BS:970-316-S31
Forging	ASME SA-182-316 or DIN 4401 or BS:970-316-S31
Thread	NPT ANSI B 1.20.1

**3. PRECEDENCE**

- 3.1. In case of any conflict between this job specification and other document, the following order of precedence shall apply:
- i. Job Specification.
  - ii. International Standards/ Codes Applicable.

**4. DEVIATION**

Deviations if any required by Tenderer shall be separately furnished against each clause giving reasoning for each deviation. Tenderer to note that except the deviations furnished by them, Tenderer's offer shall be deemed to be in total conformity with the enquiry specifications.

**5. SPECIFICATION**

All the items shall be suitable for compressed Natural Gas service and meet following specifications.

**5.1. Materials**

5.1.1. Fittings shall be manufactured from the following materials :-

- i. Bar stock shall be as per BS:970-316-S31, DIN 4401 or ASME 479-316 but with carbon content less than 0.05% to provide increased resistance to corrosion.
- ii. Forgings shall be as per BS:970-316-S31, DIN 4401 or ASME SA-182-316.

5.1.2. The fittings end connections shall be compatible to tube of hardness  $\leq$  Rb80.

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- 5.1.3. All component parts of the fittings shall be of the same material.
- 5.1.4. The ferrule material shall be able to withstand an atmosphere of Natural Gas, oil and moisture without rusting.

**5.2. Design & Manufacture**

- 5.2.1. All fittings shall be designed in conformance with the requirements of ASME B 31.3 and applicable standards. Area classification applicable for all items shall be Class-1, Division-1, Group-D as per NEC or Zone-1 Group IIA/ IIB as per IS/ IEC specification or equivalent specification. All fittings shall be designed so that all parts/ components meet the requirements for the specified area classification.
- 5.2.2. The SS fittings shall be of flare less design and four piece construction, consisting of front and rear ferrules, nut and body suitable for use on SS tubes conforming to ASTM A269 TP316.
- 5.2.3. Fittings shall be rated for at least the design pressure as stipulated in the material requisition. The design of fittings shall ensure that they shall be capable of holding full tube burst pressure after only one and a quarter turn pull up of the nut.
- 5.2.4. The threaded ends of fittings shall be NPT as per ANSI B1.20.1.
- 5.2.5. The fittings shall hold the tube with collecting action producing a firm grip on the tube without substantially reducing the tube wall thickness.
- 5.2.6. Fittings shall not torque the tubing during original or subsequent make-up of the connection and should use geometry for inspection before and after makeup. The fittings shall not require disassembly for inspection before or after makeup.
- 5.2.7. All tube fittings shall be gaugeable for sufficient pull up after one and a quarter turn. All tube fittings shall have a gaugeable shoulder and there will be no radius at the point where the shoulder meets the neck of the fitting body.
- 5.2.8. The gap inspection gauge shall be easily insertable at finger tight position of nut. The gap inspection gauge shall not be insertable between the nut and shoulder of the fitting after completing only one and a quarter turn pull up of the nut.
- 5.2.9. The tube seat counter bore in the body shall be faced flat 90° to the axis of the tubing to minimize tube expansion and subsequent galling.
- 5.2.10. The sealing and gripping power of the fitting shall be controlled such that the action be-

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tween ferrules will overcome commercial variations in tubing wall thickness, hardness, diameter and installer skill.

5.2.11. The seal contact areas of the fittings body shall have a machined finish of 32 Ra or better.

5.2.12. The fittings body shall have no machined stop or shoulder to preclude additional tightening in subsequent make-up.

5.2.13. Front Ferrule

- i. The front ferrule shall effect a long, smooth repeatable seal by contact with body and a grip hold on the tube surface.
- ii. The front ferrule shall always remain in a sprung condition to compensate for thermal stresses and to accomplish repeated make and break.

5.2.14. Rear Ferrule

- i) The rear ferrule shall collect the tubing surface, improving the performance of the tubing in systems of high impulse or vibration.
- ii) The rear ferrule shall have a machine recess on the inside diameter and shall have complete surface hardening so as to substantially reduce the required pull up torque. Both the requirements i.e. complete surface hardness and machined recess shall be met for all rear ferrules.

5.2.15. Nuts shall have silver plated threads to act as a lubricating agent to avoid galling and to reduce tightening torque.

5.3. Inspection and Testing

5.3.1. The fitting shall have type approval to either of ASTM F1387/ECER110 test protocols witnessed by any one of following auditing/inspection agencies.

- i. ASME
- ii. British Standard institute
- iii. Det Norske Veritas (DNV)
- iv. Lloyd's Register
- v. TUV

5.4. Test Reports and Certificates

5.4.1. The manufacturer shall furnish test procedure and typical test reports of all tests conducted on fittings as per the requirements of clause 5.3.

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**6. MARKING, PACKING & SHIPMENT**

- 6.1. Heat code traceability number shall be stamped or etched on both body and nut of each fitting.
- 6.2. Replacement nuts and ferrules shall be packaged in a manner so as to allow safe and simple replacement.
- 6.3. All the items shall be suitably wrapped and packaged to withstand rough handling during ocean shipment and inland journey.
- 6.4. Item shall be properly tagged and packaged separately to facilitate easy identification.
- 6.5. Items shall be wrapped and packaged in such-a-way that they can be preserved in original as new condition.

**7. DOCUMENTATION**

- 7.1. All documents shall be furnished in English language only.
- 7.2. Following test certificates shall be furnished along with shipment.
  - i. Test certificate of chemical, Mechanical testing.
  - ii. Manufacturer's standard shop inspection & test report.
  - iii. The procedure and certificates to be submitted as per the requirements of clause 5.4 of this specification.

**8. GUARANTEE**

- 8.1. Manufacturer shall guarantee that the design, materials, manufacturing and testing of fittings comply with the requirement of this specification and applicable codes and standards. Manufacturer shall replace all fittings which should result defective or fail during field pressure testing or fail to perform satisfactorily due to inadequate engineering, sub-standard material and workmanship.
- 8.2. The manufacturer shall guarantee against any defect, failure or malfunctioning occurring during 12 months from the date of commissioning or 24 months from the date of supply whichever is earlier.



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**TECHNICAL SPECIFICATION FOR SS BALL VALVES FOR CNG REFILLING STATIONS**

**Contents of TS No. PMC/TS/05/25/048**

<u>Sl.No.</u>	<u>Description</u>
1.0	SCOPE OF WORK
2.0	CODE & STANDARD
3.0	PRECEDENCE
4.0	DEVIATION
5.0	MATERIALS
6.0	DESIGN & MANUFACTURER
7.0	INSPECTION & TESTING
8.0	OTHER REQUIREMENTS
9.0	TEST REPORTS & CERTIFICATES
10.0	MARKING, PACKING & SHIPMENT
11.0	DOCUMENTATION
12.0	GUARANTEE

**1. SCOPE OF WORK**

- 1.1. The scope of this specification include design, manufacture/ supply ,inspection/ testing/ marking/ packaging/ handling and despatch of SS Ball Valves as per relevant codes.
- 1.2. Purchaser reserves the right to delete or order additional quantities during execution of order, based on unit rates and other terms & conditions in the original order.

**2. CODES & STANDARD**

Items Applicable Codes and Standards  
Valves MSS-SP-99

**3. PRECEDENCE**

- 3.1. In case of any conflict between this job specification and other document ,the following order of precedence shall apply :
  - 3.1.1. Job Specification.
  - 3.1.2. International Standards/ Codes Applicable.

**4. DEVIATION**

Deviations if any required by Vendor shall be separately furnished against each clause giving reasoning for each deviation. Vendor to note that except the deviations furnished by them, Vendor's offer shall be deemed to be in total conformity with the enquiry specifications.

**5. MATERIALS**

- 5.1. The valve body shall be made out of material conforming to ASTM A479Type 316
- 5.2. Material of construction of ball shall conform to ASTM A276 Type 316.
- 5.3. Material of construction of seat shall be PEEK.

**6. DESIGN & MANUFACTURE**

- 6.1. All ball valves shall be designed in conformance with the requirements of ASME B31.3, MSS-SP-99 and other applicable code and standards. Area classification applicable for all items shall be Class-1, Division-1, Group-Das per NEC or Zone-1 Group-IIA/ IIB as per IS/ IEC specification or equivalent specification. All fittings shall be designed so that all parts/ components meet the requirements for the specified area classification.
- 6.2. Valves shall be rated for a maximum working pressure of 5000 psig and shall be capa-

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ble of operation between a temperature range of (-40)° to 250°F.

- 6.3. Valves shall have spring loaded PEEK seats allowing seal-ability over the full pressure range at any port and low operating torque over the full range of pressures and temperatures.
- 6.4. Elastomeric seals, which require no packing adjustment, shall be used.
- 6.5. Valves stem shall be of bottom loaded and blow out proof design.
- 6.6. Ball shall be blow out proof and trunnion mounted when it is specified in SOR.
- 6.7. Valves shall have positive wrench/ handle stops, Phenolic black wrench/handle shall be provided. Wrench/ handle shall indicate the direction to flow. IN the case of three way valves the stem shall also provided a visual indication of flow direction if the handle is removed.

**7. INSPECTION AND TESTING**

- 7.1. The valve manufacturer shall submit typical type test reports for the following test carrier out on similar valves :-
  - i. Hydrostatic seat leak test shall be carried out with de-ionised water. There shall be no detectable set leakage at 1.1 times the rated pressure of the valve.
  - ii. Gas pressure test for seat and shell shall be carried out with nitrogen at 1000 psig. There shall be no detectable external leakage. Maximum allowable seat leakage shall be 0.1 atm-cc/min.

**8. TEST REPORTS & CERTIFICATES**

- 8.1. The manufacturer shall supply material compliance certificates.
- 8.2. The valve manufacturer shall provide test procedure and valve inspection and test report for type tests carried out on similar valves as per the requirements of clause 7.

**9. MARKING, PACKING & SHIPMENT**

- 9.1. Heat code shall be marked on valve body to facilitate tractability.
- 9.2. All the items shall be suitably wrapped and packaged to with stand rough handling during ocean shipment and inland journey.
- 9.3. Each item shall be properly tagged and package separately to facilitate easy identification.
- 9.4. All Items shall be wrapped and packaged in such-a-way that they can be preserved in original as new condition.

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**10. DOCUMENTATION**

- 10.1. All document shall be furnished in English language only.
- 10.2. Prior to shipment, manufacturer shall submit following test certificates and documents.
- i. Test certificate of chemical, Mechanical testing.
  - ii. Manufacturers standard shop inspection and test reports.
  - iii. The procedure and certificates to be submitted as per the requirements of clause 8.0 of this specification.
  - iv. Manual for installation, erection, maintenance and operating instructions including a list of recommended spares for valves.

**11. GUARANTEE**

- 11.1. Manufacturer shall guarantee that the design, materials, manufacturing and testing of fittings comply with the requirement of this specification and applicable codes and standards. Manufacturer shall replace all fittings which should result defective or fail during field pressure testing or fail to perform satisfactorily due to inadequate engineering, sub-standard material and workmanship.
- 11.2. The manufacturer shall guarantee against any defect, failure or malfunctioning occurring during 12 months from the date of commissioning or 24 months from the date of supply whichever is earlier.



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**TECHNICAL SPECIFICATION FOR CONDUCTIVE CORE THERMOPLASTIC HOSE WITH  
BREAKAWAY COUPLING FOR CNG REFILLING STATIONS**

CONTENTS

1.0 SCOPE

2.0 CODES AND STANDARDS

3.0 SPECIFICATIONS

4.0 TEST REPORTS & CERTIFICATES

5.0 MARKING, PACKING & SHIPMENT

6.0 WARRANTY

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**1. SCOPE**

- 1.1. The scope of this specification covers the requirements of design, manufacture / inspection / testing at the works / marking / packaging / and supply of flexible fill hose with breakaway coupling for loading and unloading of mobile cascades with all auxiliaries and features required for efficient and safe operation.

**2. CODES AND STANDARDS**

Unless otherwise specified elsewhere in this specification Flexible fill hose with breakaway coupling and their installation shall conform to the latest revisions of codes and standards listed below.

ITEM	APPLICABLE CODES & STANDARDS
HOSE(For CNG Application)	NFPA-52, AGA1-93, ANSI-4.2112.52
END CONNECTIONS	ASTM A 276, ASTM A479, ASTM A262, Practice-A to E and or EN ISO 3651-2
THREAD	NPT ANSI B 1.20.1

**3. SPECIFICATIONS**

The specification described herewith are intended to give vendor the technical and operating conditions of the flexible fill hose. Vendor may indicate in his offer, the additional features, which his flexible fill hose has in terms of better design, enhance reliability etc.,.However such feature may be accepted subject to client's review and approval.

Each flexible fill hose should have the following specifications:-

- i) The core material shall be non-metallic, electrically conductive, thermoplastic flexible hose of min.3m length with both ends of ½"OD SS 316 tube in complete conformity with the relevant codes & standards as mentioned above.
- ii) Two or more layers of fibre reinforcement.
- iii) Thick layer of abrasion resistant Polyurethane black cover to prevent abrasion and display better wear resistance shall be provided on the hose.
- iv) Electrical conductivity shall comply with AGA1-93.
- v) End connections shall be SS 316 material confirming to relevant design standards as specified above.
- vi) The whole assembly shall be rated for a working pressure of 5000 psig and shall be rated for temperature range of -40 to 250°F.
- vii) Vendor shall also include supply of Breakaway coupling suitable for NGV industry in each hose.

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- viii) Specific conductivity of filling hose shall be 0.512 Mega ohms for lengths upto 180” (approx. 4.5 mtr.) and 3.5 Mega ohms for length over 180” and up to 1200”( approx. 30 mtr.)
- ix) Minimum Burst Pressure of Flexible Fill Hose shall be four times the working pressure.

**4. TEST REPORTS AND CERTIFICATES**

- i) The manufacturer shall supply material compliance certificate.
- ii) The manufacturer must submit product type test reports for the following tests conducted on CNg hoses.
  - a. Hydraulic Burst pressure test.
  - b. Hydraulic proof pressure test.
  - c. Hydraulic leakage test.
  - d. Change in length test.

**5. MARKING, PACKING AND SHIPMENT**

- i) All hoses shall be duly marked with the manufacturer's name, series, material, hose size and all relevant standards applicable.
- ii) All the items shall be suitably wrapped and packaged to withstand rough handling during ocean shipment and inland journey.
- iii) Each item shall be properly tagged and packaged separately to facilitate easy identification.
- iv) All items shall be wrapped and packaged in such a way that they can be preserved in original as new condition.

**6. WARRANTY**

- i) Manufacturer shall guarantee that the design, materials, manufacturing and testing of CNG hoses comply with the requirement of this specification and applicable codes and standards. Manufacturer shall replace if resulted defective or fail during field pressure testing or fail to perform satisfactorily due to inadequate engineering, substandard material, and workmanship.
- ii) The manufacturer shall guarantee against any defect, failure or malfunctioning occurring during 12 months from the date of commissioning or 24 months from the date of supply whichever is earlier.

**MECHANICAL WORKS**

**SECTION - B**  
**SS TUBE LAYING AND TESTING**

**CONTENTS**

- 1.0 SCOPE OF WORK AND TECHNICAL SPECIFICATION**
- 2.0 INSTALLATION PROCEDURE**
- 3.0 REMAKE OF FITTINGS**
- 4.0 REFERENCE SPECIFICATION, CODES AND STANDARDS**
- 5.0 SCOPE OF SUPPLY**
- 6.0 SCRAP AND EXCESS MATERIAL**
- 7.0 HIGH PRESSURE GAS LEAK TESTING PROCEDURE**



## **1. SCOPE OF WORK AND TECHNICAL SPECIFICATION**

### **1.1. LAYING OF SS TUBE**

Laying, testing and commissioning of SS tubes and fittings complete with all supports. The SS tube fixing clamps from approved vendors shall be procured and installed by the contractor. Payment shall be at the rate for the work set out in the agreed Schedule of Rates.

Contractor shall engage GODAVARI GAS LTD./ approved sub-contractor for this specialised work. The list of parties are enclosed in Annexure-I.

### **1.2. SCOPE OF WORKS: FOR LAYING, TESTING & COMMISSIONING OF SSTUBING**

Generally the following shall constitute the Contractor's scope of work but not limited to as given herein:

- 1.2.1. SS tubes shall be clamped at every 1000 mm by the heavy duty PVC tube clamps of approved make. The practice of flattening tubes for clamping purposes shall not be permitted.
- 1.2.2. Tubes shall be bent using tube benders only and any hot bending will be totally rejected. Tubes shall be cut using pipe cutting device. Hot cutting is not allowed.
- 1.2.3. Carrying out pneumatic testing at 280 bar and purging with nitrogen at 2 bar as per approved procedures; providing all tools, tackles, instruments, manpower and other related Accessories for carrying out the testing of tubes. Leakages, if any, observed during testing shall be rectified without any additional cost to owner.
- 1.2.4. Start-up and commissioning assistance.
- 1.2.5. Handing over the completed works to GODAVARI GAS LTD. for their operation/ use purposes.
- 1.2.6. Final clean up and restoration of site, facilities etc. as per the requirement of owner / Engineer-in charge.
- 1.2.7. Preparation and submission of "As Built Drawings".
- 1.2.8. Co-ordination as required with other agencies/Contractor(s) till the time the commissioning operations are complete.
- 1.2.9. Any other work not specifically mentioned herein, but required for the satisfactory completion/ operation/ safety/ statutory/ maintenance of the works shall also be covered under the scope of work and has to be completed by the Contractor within specified schedule at no extra cost to GODAVARI GAS LTD.

## **2. INSTALLATION PROCEDURE**

## **2.1. TUBE END PREPARATION**

- 2.1.1. Cut the ends square with a hacksaw and a suitable guide tube cutters are satisfactory for most tube materials but tend to work harden stainless steel. As such proper care shall be exercised while cutting the SS tubes to avoid the hardening.
- 2.1.2. Burrs must be removed inside and outside for proper entry into fitting to prevent contamination and/ or restricted flow. 'Swagelok' / 'Parker' debarring tool shall be used.
- 2.1.3. Remove all fittings, chips, and grit before attachment of fittings.

## **2.2. ASSEMBLY**

- 2.2.1. Tube line fabrication must be accurate so that the tube end easily enters the fitting in proper alignment. Do not force an improperly fitted tube line into the fittings
- 2.2.2. Ensure that the tube end is bottomed against the shoulder in the fitting body. This is necessary to prevent movement of the tube while the nut forces the ferrule to grip the tube and to seal through any imperfections that may exist on the outside tube surface.
- 2.2.3. Never permit the fitting body to rotate during tube end make-up, use two wrenches. Assemble port connectors to components first and hold with a wrench while making up the tube joint. All types of union bodies must be held while each of the tube ends is made up.
- 2.2.4. Never attempt to make up by torque.
- 2.2.5. Always turn the nut the prescribed amount regardless of torque required. Fitting end plugs required only 1- ¼ turn from finger tight make up in all sizes.

## **3. REMAKE OF FITTINGS**

A disassembled joint can be remade, simply by retightening the nut to the position of the original make up. For maximum number of remakes, mark the fitting and nut before disassembly. Before retightening, make sure the assembly has been inserted into the fitting until the ferrule(s) seats in the fitting. Retighten the nut by hand. Rotate the nut with a wrench of the original position as indicated by the previous marks lining up. (A noticeable increase in Mechanical resistance will be felt indicating the ferrule is being re-sprung into sealing position.) Then snug the nut 1/12 turn (1/2 hex flat) past the original position.

## **4. REFERENCE SPECIFICATION, CODES AND STANDARDS**

The Contractor shall carry out the work in accordance with this specification, 's Engineering Standards, ASME B 31.8 - Gas Transmission and Distribution Piping Systems, Oil Industry Safety Directorate (OISD) norms.

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

**5. SCOPE OF SUPPLY**

**5.1. SUPPLIED BY THE CONTRACTOR AT HIS OWN COST AS PART OF THIS SPECIFICATION:**

The procurement and supply of SS tube clamps at the appropriate time of all the materials and consumables except for the materials specifically enlisted under Owner's scope of supply, shall be entirely the Contractor's responsibility and its rates of execution shall be inclusive for all these items, as follows but not limited to these:

- i. Heavy duty PVC clamps for tubes, anchor bolts of various sizes for fixing to concrete structure.
- ii. Primer and finishing paints.
- iii. All material for minor civil works like grouting etc.,
- iv. Minor structural steel for fabrication of tube/ tray supports like MS plates, GI plates, flats, pipe etc.,
- v. Nitrogen for Pneumatic testing and for purging.
- vi. All items not expressly mentioned in the Contract but which are necessary for the satisfactory completion and performance of the Work under this Contract.

Note: Samples of all the consumables items / test certificates required to be approved by EIC.

**6. SCRAP AND EXCESS MATERIAL**

Every month the Contractor shall submit an account for all the materials issued to him by the owner in the standard proforma prescribed for this purpose by the Engineer-in-charge.

On completion of the work, the Contractor shall submit material appropriation statements for all the materials issued by the Owner in the standard proforma. The following scrap allowances are permissible.

ITEM	UNACCOUNTABLE	SCRAP
Tube	1 %	1% (Less than 0.3 m)
Valves	0 %	0%
Ferrule Fittings	0 %	0 %

All excess materials and scrap shall be returned after duly accounting for, to the GODAVARI GAS LTD. stores. Where materials are to be weighed before return, the Contractor shall be responsible for making necessary arrangements for weighing etc.

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The contractor shall not use scrap sections obtained during the course of construction for fabrication of temporary supports or other items without prior written permission of Engineer-in-Charge.

If the Contractor fails to return the surplus material aforesaid, the Owner will charge the Contractor for such unreturned material at penal rates, which will be deducted from whatever amount is due to the Contractor. In case any material issued by the Owner deteriorates during storage by the Contractor, new material will be issued to him if available at penal rates, but delay in procuring such materials will be at the Contractor's account only. *Any damaged valve and ferrule fittings should not be used and shall be returned to GODAVARI GAS LTD. stores.*

**7. HIGH PRESSURE GAS LEAK TESTING PROCEDURE WITH NITROGEN.**

- Pressure testing of Gas line to be started after completion of installation.
- All gas piping connections, valves, and appliance connections and valves are inspected visually for tightness and good condition.
- A gas pressure gauge is connected in the line. The calibration certificate of the gauge shall be submitted to / Godavari Gas Pvt. Ltd. for review before start of the testing.
- The gas service valve is opened to permit gas to flow into the gas piping distribution system, and then the valve is closed again, securely.
- The gas pressure gauge should read gradual increase in pressure.
- The tube shall be pressurised to 60 bar gradually and hold for 30 minutes. Leak testing shall be carried out with soap solution at all joints of Valves, Regulators & Fittings.
- If any leak is found, tube shall be depressurised and leak arrest shall be done. **Leak arrest by using Teflon tape is not acceptable.** Ensure Leak arrest is done at 60bar at all the joints.
- The tube shall be pressurised to 100 bar gradually and hold for 30 minutes. Leak testing shall be carried out with soap solution at all joints of Valves, Regulators & Fittings.
- If any leak is found, tube shall be depressurised and leak arrest shall be done. **Leak arrest by using Teflon tape is not acceptable.** Ensure Leak arrest is done at 100bar at all the joints.
- The tube shall be pressurised to 200 bar gradually and hold for 30 minutes. Leak testing shall be carried out with soap solution at all joints of Valves, Regulators & Fittings.
- If any leak is found, tube shall be depressurised and leak arrest shall be done. **Leak arrest by using Teflon tape is not acceptable.** Ensure Leak arrest is done at 200bar at all the joints.
- The tube shall be pressurised to 280 bar gradually and hold for 240 minutes.

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Leak testing shall be carried out with soap solution at all joints of Valves, Regulators & Fittings. Pressure reading shall be noted down every 30 minutes.

- If any leak is found, tube shall be depressurised and leak arrest shall be done. **Leak arrest by using Teflon tape is not acceptable.** Tube shall be pressurised again and Ensure Leak arrest is done at 280bar at all the joints.
- Final leak testing at 280 bar shall be witnessed by /Godavari Gas Pvt. Ltd..

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**SECTION - C**

**ERECTION OF MECHANICAL EQUIPMENT**

**CONTENTS:**

- 1. SCOPE OF WORK FOR LOADING, UNLOADING, TRANSPORTATION &ERECTIONOF EQUIPMENT.**
- 2. EQUIPMENT WEIGHTS & SIZES.**

SECTION-C

**LOADING, UNLOADING, TRANSPORTATION & ERECTION OF MECHANICAL EQUIPMENT**

**1. SCOPE OF WORK:**

1.1. Generally the following shall constitute the Contractor's scope of work but not limited to as given herein:

- i. Receiving of material from stores.
- ii. Loading of material/ equipment on a trailer / truck from stores. Safe transportation to various sites.
- iii. Unloading, placement and alignment on foundation -on ground or on above compressor at +3.5m or above ground at +3.5 m at roof top of office building (cascade only).
- iv. Transit Insurance of equipment from stores to site.
- v. All equipment transported shall be securely boarded and transported without causing any damage to equipment. Any damage caused during loading, transportation & unloading shall be recoverable from the contractor.
- vi. All the equipment shall be leak tested after erection as per instruction of engineering in charge and standard practice.

**2. Equipment weight & sizes**

Sl. No.	Equipment	Size	Weight / Unit Appx.
1.	Cascade 4500 L (water capacity)	5.5 m X 2.0m X 2.0m (H) Approx.	9.0 T
2	Cascade 3000 L (water capacity)	4.0m X 2.0m X 2.0m (H) Approx.	6.0 T

All excess, unutilized or defective materials and scrap shall be returned after duly accounting for, to the GODAVARI GAS LTD. stores. Where materials are to be weighed before return, the Contractor shall be responsible for making necessary arrangements for weighing etc.

The contractor shall not use scrapped or defective materials obtained during the course of construction for fabrication of temporary supports or other items without prior written permission of Engineer-in-Charge.

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If the Contractor fails to return the surplus material aforesaid, the Owner will charge the Contractor for such un-returned material at penal rates, which will be deducted from whatever amount is due to the Contractor. In case any material issued by the Owner deteriorates during storage by the Contractor, new material will be issued to him if available at penal rates, but delay in procuring such materials will be at the Contractor's account only.

Contractor to arrange all equipment & tools such as cranes, winch, lifting hook etc and skilled & semiskilled manpower and consumables for erection of all the Mechanical equipment.



**SECTION - D**

**SUPPLY, ERECTION & COMMISSIONING OF MISCELLANEOUS ITEMS**

**CONTENTS:**

1. AIR COMPRESSOR-CUM-PUMP
2. FIRE FIGHTING EQUIPMENT
3. 30 KVA SOUND-PROOF ACOUSTIC GAS GEN SET

**SUPPLY, ERECTION & COMMISSIONING OF MISCELLANEOUS ITEMS**

1. **Air compressor (Pump)with Automatic Intelligent Tyre Inflating M/C (AITIM):**  
Contractor will supply, erect at prepared location, test and commission an Air Compressor-cum-Pump with Accessories such as dispensing stand, hose, nozzle, valves, connectors etc complete with Automatic Intelligent Tyre Inflating M/C [AITIM].

Air compressor - cum- pump shall supply compressed air for all types of vehicles that visit the station for refuelling of CNG or other purposes.

Details of air compressor along with inflator:

Type Drive	- V belt drive
Electrical Supply	- 415V/3ph/50Hz
Discharge pressure	- 12 kg/cm <sup>2</sup>
Motor	- As per manufacturer
Make	- Ingersoll Rand/Elgi/KPCL/CP
Display	- Digital in both system [MKS & CGS]
Alarm	- Digital & Sound
Control	- To stop filling of air on alarm/set point.
Housing	- Steel/ Fibre glass- coated/painted in approved colours with GODAVARI GAS LTD. Logo.
Dispensing Hose	- Non -conductive.
AITIM	- Precision Testing Machines Pvt Ltd, NewDelhi/Instrument Research Association Pvt. Ltd,Bangalore/or any other approved make.

**Note-** One-year spares shall be supplied along with those for accessories.

**2. Fire Fighting Equipment:**

Contractor will supply and erect at designated locations the fire fighting equipment.

The details of the fire fighting equipment are given below.

- i. Supply and installation of 4.5 kg capacity CO<sub>2</sub> type fire extinguishers with steel cylinder with discharge valve and conforming to IS: 2878-1975. Extinguisher shall be painted with red enamel paint and hardware/ bracket required for fixing to wall.
- ii. Supply and installation of 9 kg capacity dry chemical powder (DCP) type fire extinguisher with extinguishers cabinet suitable for inverted operation and fabricated from MS sheet internally protected with anticorrosive treatment and hydraulically tested. Extinguishers shall be externally painted with red enamel paint. Manufacturing code IS: 13849.
- iii. Supply and installation of 75 kg capacity trolley mounted dry chemical powder (DCP) type fire extinguisher suitable for inverted operation fabricated from MS sheet internally protected with anticorrosive treatment and hydraulically tested extinguishers externally painted with red enamel. Manufacturing code IS: 10658.
- iv. Providing & installation of galvanised mild steel fire buckets of 9 ltrs. capacity, made as per IS: 2546 including supplying & fixing of MS angle iron stand to accommodate 4 nos. of fire buckets and first fill with sand/water all complete as per direction of Engineer In charge (One set consisting of 4 buckets with stand).

Note: The equipment are to be purchased from the vendor list enclosed.

**3. SPECIFICATION FOR GAS GENERATOR SET (30KVA)**

**1. SCOPE**

This specification covers the design, engineering, shop testing, supply, erection, testing and commissioning of 415V, 3 phase, 30 KVA gas generator set for CNG station along with all required accessories including integral AVM pads, AMF Panel and weather and sound proof acoustic enclosure.

The rating applies for supplying continuous power at variable load for unlimited annual hours. A 10% over load is allowed for up to 1 hour in every 12 hours.

## **2. CODES AND STANDARDS**

The Gas generator set with all its components shall comply with Environmental (Protection) 3<sup>rd</sup> Amendment Rules 2016 and all other latest applicable standards, regulations and safety codes in the locality where the equipment shall be installed. The equipment shall comply with following British standards, Indian standards or equivalent British or International Standards with latest revisions.

- o ISO 3046/1
- o BS 5514
- o AS 2789
- o DIN 6271
- o ISO 8528/1
- o ISO 8528-5

## **3. GENERAL**

- 3.1. The Gas Generator set shall be outdoor type complete with suitable acoustic enclosure, to limit noise level to 75 db at 1 metre from the enclosure surface. Gensets should be provided with integral acoustic enclosure at the manufacturing stage itself. The set shall consist of Gas Engine coupled to suitable alternator having self, brush less/ static excitation system with PMG and include all necessary accessories and control panel as specified and as required.
- 3.2. The engine and generator shall be mounted on an integral robust fabricated steel frame with anti vibration mounting pads. No separate foundation will be provided. Required set of foundation bolts, nuts and washer etc. And set of spanner and tools shall be supplied by the bidder.
- 3.3. The gas genset should meet CSA,UL, NFPA or other comparable safety standards.
- 3.4. The generator set shall be factory built and production tested.
- 3.5. The generator set shall be capable of taking the block loading in single step.
- 3.6. The generator shall have integral vibration isolation.
- 3.7. The generator shall have advanced Digital Controller for the engine and alternator combine with LED display unit for display of system parameters and fault indication of both the engine/ alternator.
- 3.8. The generator set shall have cooling system rated for 50°C ambient temperature.

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- 3.9. The generator shall have a test certificate confirming the generator load parameters.
- 3.10. The generator shall have auto start feature with programmed cranking cycles.
- 3.11. The generator shall have package mounted line circuit breaker for protection.
- 3.12. All the electrical/instrumentation fittings / equipment, junction box shall be flame proof and shall bear valid certification.
- 3.13. The generator set shall have a spark arrestor and a catalytic converter fitted on it.
- 3.14. Lifting lugs must be provided for safe handling and the gas generator shall be mounted on the iron base frame which shall be grouted on the concrete foundation.
- 3.15. The material used for station piping shall be carbon steel for connection between GO-DAVARI GAS 's tap-off point and gas genset inlet / metering device.

**4. GAS ENGINE**

- 4.1. The generator set shall be powered by proven field tested 4 stroke, min. 4 cylinder, water cooled gas engine suitable for operating on natural gas with a power output of at least 5% more than the maximum power required by the alternator along with all standard engine components and shall have following features:
  - a. Internal Exhaust system with approved spark arrestor and catalytic converter.
  - b. The gas engine shall be suitable for block loading in one step and supplied with electronic isochronous governor for optimum fuel, spark performance and frequency regulation of  $\pm 1\%$ .
  - c. Residential grade silencer.
  - d. 70A / 12V battery Charging Alternator.
  - e. 12V starter motor.
  - f. High engine temperature safety & shutdown.
  - g. Low lube oil pressure safety & shutdown.
  - h. Dry type air filter.
  - i. Cartridge type lubrication oil filter.
  - j. The generator set engine should be fitted with 3-way catalytic converter capable of reducing NOx, CO and HC by over 70%.
  - k. The catalyst supplier should have its product validated by ARAI.
  - l. The generator set shall have a gas train to operate at an inlet gas pressure of 14 to 49 kg/cm<sup>2</sup>(g). Any facility required for reduction in the pressure from the gas inlet pressure for the operation of gas generator shall be to the bidder scope.
  - m. The generator set shall be able to operate on the following gas configuration;

<b>Component</b>	<b>Average Gas Composition (Mol%)</b>
Methane (mol%)	94

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Ethane (mol%)	4.2
Propane (mol%)	1.3
i-Butane (mol%)	0.2
n-Butane (mol%)	0.2
i-Pentane (mol%)	0.02
n-Pentane (mol%)	0.02
Nitrogen (mol%)	0.06

**NOTES:**

- O2 not more than 0.5% mole. Total non hydrocarbon not more than 2.0%
- Total S including H2S not more than 10 ppm by weight
- H2S not more than 4 ppm by volume.
- Moisture content in the range 112 to 114 kg/MMSCM

**5. LUBE OIL SYSTEM**

Automatic pressure lubrication system shall be provided. Bidder shall also indicate the specific lube oil consumption and capacity of the lube oil tank.

**6. ENGINE STARTING SYSTEM**

Starting of gas engine shall be by electrical starting system. Electrical starting system shall comprise of a starter motor, batteries, battery charger and all the necessary instruments and accessories. Batteries and battery charger shall be supplied by the bidder.

**7. AIR INTAKE AND EXHAUST SYSTEM**

Air intake filter and silencer shall be provided. The exhaust system shall consist of an exhaust gas driven turbo charger, exhaust gas silencer, necessary piping, adapters, accessories etc.

**8. GOVERNING SYSTEM**

The gas engine should have electronic isochronous governing. Governor shall be provided for keeping constant speed within permissible limits with variable load. The governor shall be electronic type..it shall be capable of operating on isochronus mode i.e. the speed of the engine (frequency of the generator set) shall remain constant irrespective of the load on the gas generator set upto 100% capacity. RPM indicator and tacho generator to trip the gas generator set during over speed shall also be provided.

**9. DIGITAL CONTROLLER**

The digital controller shall be integrally mounted on generator set and shall have auto-

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matic start function with provision for manual start / stop / reset and auto options as per technical specs / features listed below:

- a. The digital controller shall have self diagnostics and test function.
- b. Digital controller shall have LED to display Engine parameters like running hours, crank cycle status, Diagnostics.
- c. LED shall also display communication faults like
  - i. High engine Temperature.
  - ii. Low oil Pressure.
  - iii. Fail to start (Over crank safety)
  - iv. Over speed
  - v. Over frequency
  - vi. Over voltage
  - vii. Under frequency
  - viii. Under voltage
  - ix. High battery voltage
  - x. Low battery voltage
  - xi. Auxiliary fault.
- d. Digital Controller shall preferably have a MMI membrane keypad for configuration and adjustment of features like
  - i. Password protection for Menu access
  - ii. System configurations like system voltage, Phase and
  - iii. Frequency settings etc.

**10. ALTERNATOR (Power output @ 0.8 power factor)**

The alternator shall be designed for the specified rating voltage etc. and shall be single bearing with class 'H' insulation with 13 deg. temp. rise as per NEMA MG1-1.66, IEEE & ANSI standards.

The alternator shall be suitable for continuous operation at 415V, 3 phase, 4 wire system, 50 Hz, 0.8 pf(lag).

The Alternator should be able to take the 100% load in single step.

The alternator shall have following features:

- Brush type, screen protected, revolving field, self excited, self regulated through an AVR /AVR.
- It should have PMG (Permanent Magnet) excitation incorporated for block and motor loads.
- Sustained short circuit current of upto 150% of the rated current upto 5 seconds.
- It should have vacuum impregnated windings with fungus resistant varnish for use in humid areas.
- It should have self ventilated and drip proof construction.
- It should have Superior voltage wave form from a two-thirds pitch stator and skewed rotor.
- + / - 1% voltage regulation (max.)
- IP:23 enclosure
- Two nos. body earthing terminals which shall be separate from the neutral terminal.

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- Permissible overload 10% for one hour in 12 hours of duration.

**11. AMF Panel with Mains By pass**

Control Panel shall be suitable for 415V, 3 Phase, 4 Wire, 50Hz, 0.8PF, fabricated out of 2.0mm CRCA MS Sheets, free standing, floor mounting (inside- side acoustic), front hinged, indoor use, cubicle type, bottom gland plates for Cable connections, dust & vermin proof with Powder Coated painting complete with internal wiring, ferrules, inscription plates etc. The push button, lamps will be finalized during detail engineering .

Fuse less design shall be considered.

**12. PERFORMANCE REQUIREMENTS**

The unit shall be capable of starting from cold condition.

The unit shall be capable of a peak output of 10% in excess of the rated output for a period of one hour out of a total 12 consecutive hours of operation, without exceeding permissible temperature limits and with a fairly clear visible exhaust.

The unit shall operate upto 110% of the rated speed over the entire range of output without undue vibration and noise.

Slam shut off valve or an alternate arrangement should be provided to shut off the supply of gas in case gas pressure exceeds the specified limits.

Proper filter shall be provided before gas regulating unit to ensure protection against any foreign material.

2 nos. ball valve shall be provided for isolating the gas supply from gas genset as and when required.

Any item not mentioned and required for proper functioning of the gas genset / gas train shall be provided free of cost by bidder.

The bidder would be required to submit test certificate of all the equipments in gas gensets / gas train.

The filter should be hydro tested up to 1.5 times of the line pressure at its installation point.

The bidder would be required to submit calibration certificates of pressure gauges and other installed instruments as applicable and submit the detailed P&ID & GAD.

Bidders shall submit the TPI report for inspection of all items of gas gensets and the gas gensets as a whole equipment under operating conditions.



**13. WIRING**

All control wiring inside the controller shall be carried out with 2.5 sq.mm 1100/650 V grade PVC insulated copper wires.

**14. CONTROL SYSTEM**

The gas generator set will be normally at rest when the station A.C. supply is available from normal power source. In case of main AC power supply failure, the Gas Generator shall be stated as follows.

On failure of normal station A.C. power supply, Gas Generator set shall start automatically.

When gas Generator set is running & grid power restores, the load shall be transferred to grid automatically and the Gas Generator set will stop after a preset time.

Three attempt starting facility shall be provided for the Gas generator set. In case, the gas engine fails to start and reach rated speed within 30 seconds, it shall be disconnected and locked out automatically.

**15. BASE FRAME**

Skid mounted type base frame, fabricated from suitable size MS channel, of heavy side members and cross members, providing common bed for engine and alternator, directly coupled together. The base frame shall have provision for grouting the set on grouting bolts as well as fixing on Anti-Vibration Mounts. Provision shall also be made in the base frame for lifting the set.

**16. AVM PADS**

Vibration Mounting Pads, as recommended by the set manufacturer shall be supplied with the GC set.

**17. ACOUSTIC ENCLOSURE**

The generator set comprising of engine coupled with alternator for each set should be placed inside an acoustic enclosure having the following salient features :

- i. The enclosure shall be of modular construction with provision to assemble and dismantle easily at site. There should also be adequate provision for taking out the equipment for maintenance / repairing jobs and reinstalling the same after necessary corrective action.
- ii. The engine generator shall be factory enclosed in not less than a 12 guage cold rolled steel enclosure constructed with corner posts, uprights and headers. The roof shall aid in the runoff of water and include a drip edge. The weatherproof and corrosion resistant acoustic enclosure should be duly surface treated, phosphate and finally powder coated for long lasting finish. The sheet metal components should preferably be hot dip, seven tank pre-treated before powder coating with

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special pure polyester based powder.

- iii. The sound proofing of the enclosure should be done with self extinguishing high quality rock wool / mineral wool confirming to IS 8183. The rock wool should be further covered with fibre glass tissue and perforated sheet. The silencer must be such that sound level is 75 dbAat 1 meter from the enclosure surface.
- iv. Exhaust silencer shall be provided of the size as recommended by the manufacturer and shall attenuate the sound to the level noted above. It shall be supplied with a flexible, seamless, stainless steel exhaust connection as well as with all internal pipe work. A rain cap will be supplied to terminate the exhaust pipe. These components must be properly sized to assure operation with minimum back pressure and high sound when installed. The canopy should be finished in synthetic enamel paint incorporating rust inhibitors and aluminium sprayed silencers and spark arrestors to guarantee a superior and long lasting finish.
- v. The temperature inside the enclosure should be suitable for human comfort. The temperature of exhaust line should not exceed the self ignition temperature of the fuel gas. A high temperature trip system (to shut down the engine by cutting off fuel supply to the engine through the solenoid valve) with variable setting connected to a thermostatically controlled blower must be provided for eliminating excessive heat dissipated by the engine within the acoustic enclosure. Suitable continuous on line temperature monitoring and control system with alarm and shut down mechanism should be provided.
- vi. There should be a provision of emergency shutdown of the generating set (Prime mover) from outside the enclosure.
- vii. The enclosure should be complete with power and control wiring between control panel and alternator and other components like blowers etc. with proper size copper cable. The cables should be terminated using gland and tinned copper sweating sockets and run through guard pipe.
- viii. The enclosure should have sufficient space in and around the generating set to facilitate maintenance and operation of the set.
- ix. The control panel for the Generating set should be installed separately on the same skid in a different enclosure (which need not be acoustic). The connection from the alternator and control panel should be carried out with 3.5 core 120 sq.mm PVC insulated, PVC sheathed armoured copper cable and cable should be terminated with proper size of tinned copper sweating socket and cable glands at alternator and panel end.
- x. All the terminal boxes / junction boxes etc, the battery and self starter connection terminals and its components should be housed inside DGMS approved intrinsically safe enclosure.

**18. PACKING AND DESPATCH**

The unit shall be packed suitably to facilitate installation and transportation. During transport, care shall be taken to avoid damage to paint or accessories of the equipment if any damage is caused during transport, the vendor shall repair the same , free of cost.

**19. TOOL KIT**

Special tool kit, if any, for the Gas generator set shall be supplied.

**20. TESTS & INSPECTIONS**

Following tests shall be carried out in GAS Generator:

Routine tests for engine like fuel consumption test at 100% & 50% load for 12 hrs each, 24 hrs running test at 75% load , etc. as per relevant Indian / International standards / manufacturer's standards.

Routine tests for alternator, as per latest IS-4722 or other applicable Indian standards like insulation resistance and high voltage test etc.

8 hour run test with the set completely assembled at works / site with full load and 10% overload. All parameters will be recorded in presence of the customer's representative.

Bidder shall submit copies of routine and type test certificates for approval in required sets before dispatch.

Following inspections shall be carried out in gas generator:

Bidder shall arrange for below mentioned inspection at factory

- a. Visual
- b. Dimensional
- c. Fitment & alignment
- d. Guaranteed parameters.
- e. Painting thickness
- f. Vibration
- g. Sound level

Bidder shall submit the following documents before dispatch:

- a. Outline dimensional drawings with general arrangement
- b. Piping flow sheets and piping layout.
- c. Electrical wiring and schematic diagram along with cable schedule and general arrangement drawing for control panel.
- d. Foundation drawings.
- e. Fuel oil system with instrumentation and control with write-up.
- f. Lube oil system with instrumentation and control with write-up
- g. Governor system and voltage regulator write-up.
- h. Gas Gen set instrumentation and control system with write-up.

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**21. CERTIFICATION**

- 21.1. Bidder shall be responsible for obtaining all statutory approvals, as applicable for all electrical, instruments and control systems.
- 21.2. Bidder shall supply type test certificate in compliance to Environmental (Protection) 3<sup>rd</sup> Amendment Rules 2016
- 21.3. In general, the following verification shall be provided by the bidder.
  - a. For all flame proof equipments manufactured within India, the testing shall be carried out by any of the approved testing houses –central Mining Research institute (CMRI) / ERTL etc.,
  - b. For all intrinsically safe equipment manufactured within India, the testing shall be carried out by any of the approved testing houses –central Mining Research institute (CMRI) / ERTL etc.,

## ANNEXURE - I

**LIST OF SUPPLIERS OF MAJOR BOUGHT-OUT ITEMS**

Sl.No.	Item Description	Preferred make
1.	Fire fighting equipment	a. Nitin Fire Protection Pvt. Ltd., Mumbai b. Safex Fire Services, Bombay c. Cross fire (India), Gurgaon d. Zenith fire services, Bombay e. Steelage industries Ltd., Chennai. f. Atlas Firetech Pvt. Ltd, Delhi
2.	List of parties for laying SS tubing	a. <b>M/s TechsolEngg Services (I) Pvt Ltd</b> , 210, CB-202A, Guru Harkishan Plaza, Ring Road, Narayana, New Delhi 110028 b. <b>M/s Equipment fabricators</b> , Kannamangala post, Whitefield-Hoskote road, Bangalore-560067 - <a href="http://www.ef-india.com">http://www.ef-india.com</a> / (Contact :Mr.Ravi, Mobile no.9845125348/ Mr.Porus Shroff (Director), Mobile no.9845031272). c. <b>M/s CCD Technical solutions Private limited</b> , No.10, PKM road, Athipet, Chennai-600058 - <a href="http://www.ccdtechnical.com">http://www.ccdtechnical.com</a> / (Contact :Mr.Gurumoorthy, Mobile no.950007659/ N.G.Kumar, Mobile no.9840999270). d. <b>Nichepro Technologies &amp; Consultancy</b> ,# 3, 6th Cross, Gupta Layout, Halasuru, Bangalore - 60008, karthik@nichepro.in, Karthik :- +91 9900087357 e. <b>Shree Manjunatha Engineering Works</b> ,#301, 1st floor, 1st Cross, Vidya Nagar, OPP: SKF Bearings, Bommasandra, Director :- Mr.Veerabhadrapa, <a href="mailto:veerabhadrapa.v@gmail.com">veerabhadrapa.v@gmail.com</a> , <a href="mailto:vennu@smesolutions.co.in">vennu@smesolutions.co.in</a> , <a href="mailto:smesvennu@gmail.com">smesvennu@gmail.com</a> , +91-9845590232, +91- 8884600170. f. <b>Sri Lakshmi Engineering Contractors</b> , No. 116, J.B. Link Road IVth Phase, Bommasandra Industrial Area, <a href="mailto:srilakshmiengcon@gmail.com">srilakshmiengcon@gmail.com</a> , Proprietor :- Mr. Sasi.D, Mob:- +919036009595.  Note: If a bidder wishes to do the job by themselves or any other sub-contractor, they need to get prior approval from GGPL / after submitting credentials for the same

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<p>3.</p>	<p>SS fittings &amp; Valves</p>	<p>a. <b>M/s Parker Hannifin India Pvt. Ltd.</b>,Plot EL-26, MIDC, TTC, Industrial Area, Mahape,Navi Mumbai - 400 701 ,Tel. No. : 022- 5907081/82 Fax No. : 022-55901080 ,E-mail : parker@vsnl.com / aoke@parker.com <u>Thru representative</u> M/s Super Technical (India) Pvt. Ltd., 501, Samarpan Complex, New Link Road,Chakala, Andheri (E), Mumbai -400099 Ph: 022 - 2832 3760 / 61, Fax: 2832 3759 ,Email Id :sales@supertechnical.in</p> <p>b. <b>M/s Swagelok,</b> <u>Thru Bangalore Representative:</u> <b>M/s Bangalore Fluid System components Pvt. Ltd.,</b> #1,Doddanakkundi Industrial area, MahadevapuraPost, Bangalore – 560048  Tel No.080-42669100 Mobile: 91 9686700138  Email: bangalore@swagelok.com</p> <p>c. <b>M/s SSP. U.S.A</b> <u>Thru Indian representative</u> <b>M/s Oiltech Consultancy Services,</b> 11, VeenaBeena, Guru Nanak road, Bandra (W), Mumbai - 400 050 (India) Tel.No.:022-56936500,56964146(D) ,Fax No. : 022-26514429/26405644  E-mail : ashisn@oiltechconsultancy.com ; oiltech@vsnl.com</p>
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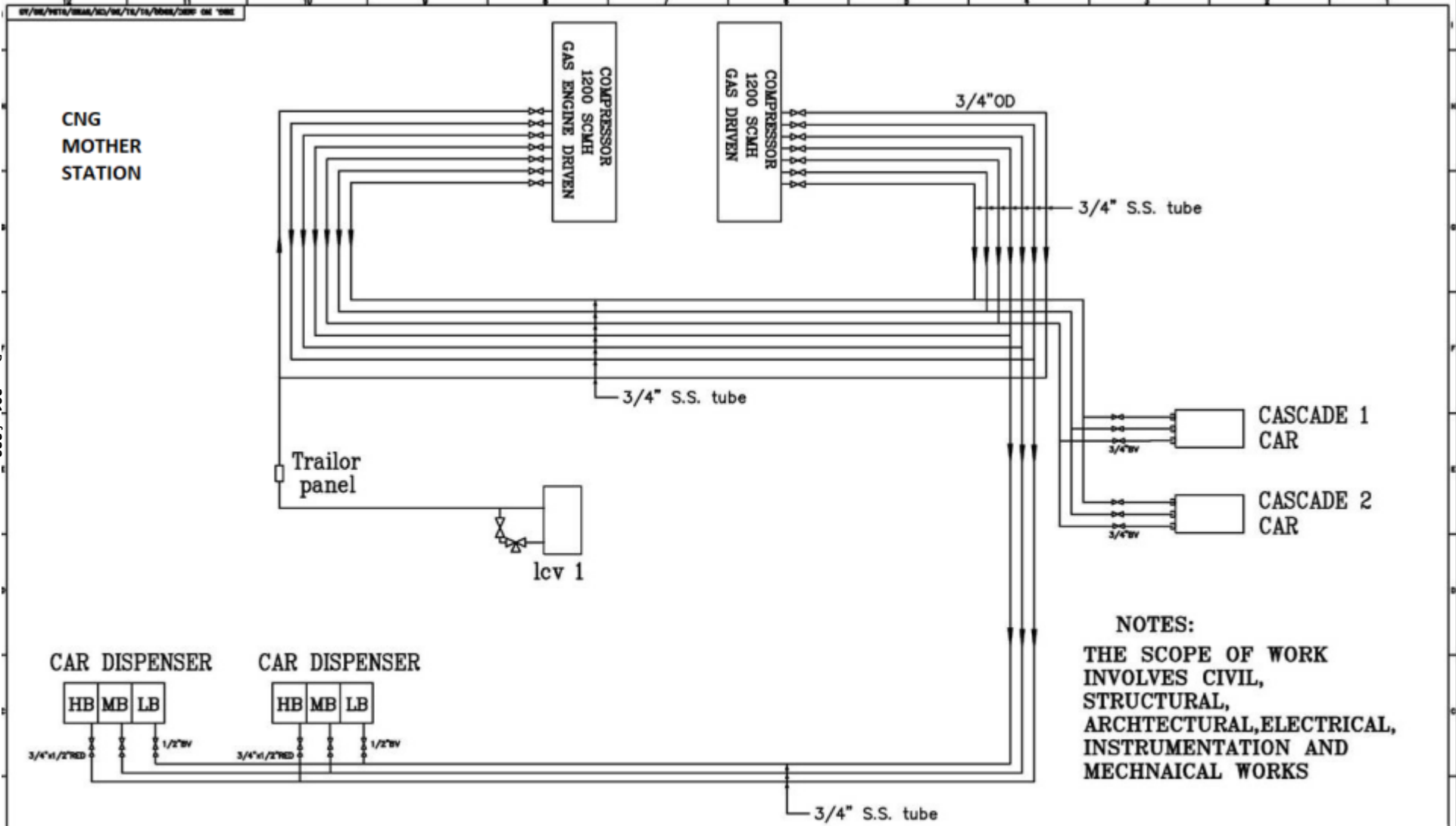
		<p><b>d. M/s Dk-lokCorp.,South Korea only for SS fittings</b>  <u>Thru Indian representative</u>  <b>METCO MARKETING (INDIA) PVT LTD</b>          104,Niraj Industrial Estate, Off Mahakali Caves Road, Andheri(East), Mumbai-400093, INDIA  <b>Tel : +91 22 4073 8484 Fax : +91 22 66938485</b>  <b>E-mail : dipen@metcoindia.com Homepage</b>  <b>: www.metcoindia.com</b></p> <p><b>Techsol Engineers</b>          No. 94, 4th Floor, 2nd Cross, MLA Layout, R.T. Nagar, Bangalore, Karnataka 560032  <b>Tel : +91 8861200084 87 Fax : +91 80 23535285</b>  <b>E-mail : <a href="mailto:contact@techsolengineers.com">contact@techsolengineers.com</a></b></p> <p><b>e. M/s Hylok, South Korea only for SS fittings</b>  <u>Thru Indian representative</u>  <b>M/s SSSP Technologies ( Hy-Lok)</b>          130 Sahid Dinesh Gupta Road,(29,Sahid Dinesh Gupta Road), Behala ,Jadu Colony, Kolkata -700 034,India, m- 91 98306 88788          e-mailid:- <a href="mailto:spban1958@gmail.com">spban1958@gmail.com</a>, phalguni-banerjee943@yahoo.in</p>
4.	SS Tube	<p><b>a. M/s Sandvik Steel Asia Pvt. Ltd.</b>          Steel Division, Mumbai-Pune Road, Dapodi, Pune- 4110212,India          Tel. No. : 020-27104562, 27104568 Fax No.: 020-27145022, 27145339          E-mail : <a href="mailto:genny.dcruze@sandvik.com">genny.dcruze@sandvik.com</a> ; <a href="mailto:siddarth.mittal@sandvik.com">siddarth.mittal@sandvik.com</a>.</p> <p><b>b. M/s Tubacex India,</b>          402-A, Platina-G block ,Bandra-Kurla complex, Bandra (E),</p>

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		<p>Mumbai-400 051, Ph No.022-40015 300, 022-40015 350</p> <p>Email: <a href="mailto:sales@tubacexindia.com">sales@tubacexindia.com</a></p> <p><b>c. Ratnamani metals &amp; tubes ltd.</b></p> <p>Address : 17, Rajmugat Society, Naranpura Cross Roads, Ahmedabad - 380013 Gujarat (India).</p> <p>Telephone : +91-79-2741 5501/2/3/4</p> <p>Fax : +91-79-27480999</p> <p>E-mail : info@ratnamani.com</p>
5.	SS Tube clamps	Swagelok/ Parker/ Dk-Lok/ Vaishnavi hydraulics Pvt. Ltd./ Vardhaman bearings / AK industries
6.	Air compressors	KPCL/Elgi/Ingersoll Rand/ Chicago Pneumatic
7.	Automatic Intelligent tyre inflator (AITIM)	Precision testing machines Pvt. Ltd./ Instrument Research Association Pvt. Ltd
8.	CNG high pressure hose	Swagelok/ Parker/Eaton Synflex / OPW
9.	Gas generator	Shiva Gen Set(Green Power) / Kohler generators/M/s Enerzea power solutions Pvt.Ltd./ Cyra Engines Pvt. Ltd./Perfect gas generators/Prakash diesels Pvt.ltd/Cooper Corporation



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**NOTES:**  
THE SCOPE OF WORK INVOLVES CIVIL, STRUCTURAL, ARCHITECTURAL, ELECTRICAL, INSTRUMENTATION AND MECHNAICAL WORKS

**SCHEMATIC LAYOUT OF SS 316 TUBES WITHIN TRENCHES FOR CNG SUPPLY**

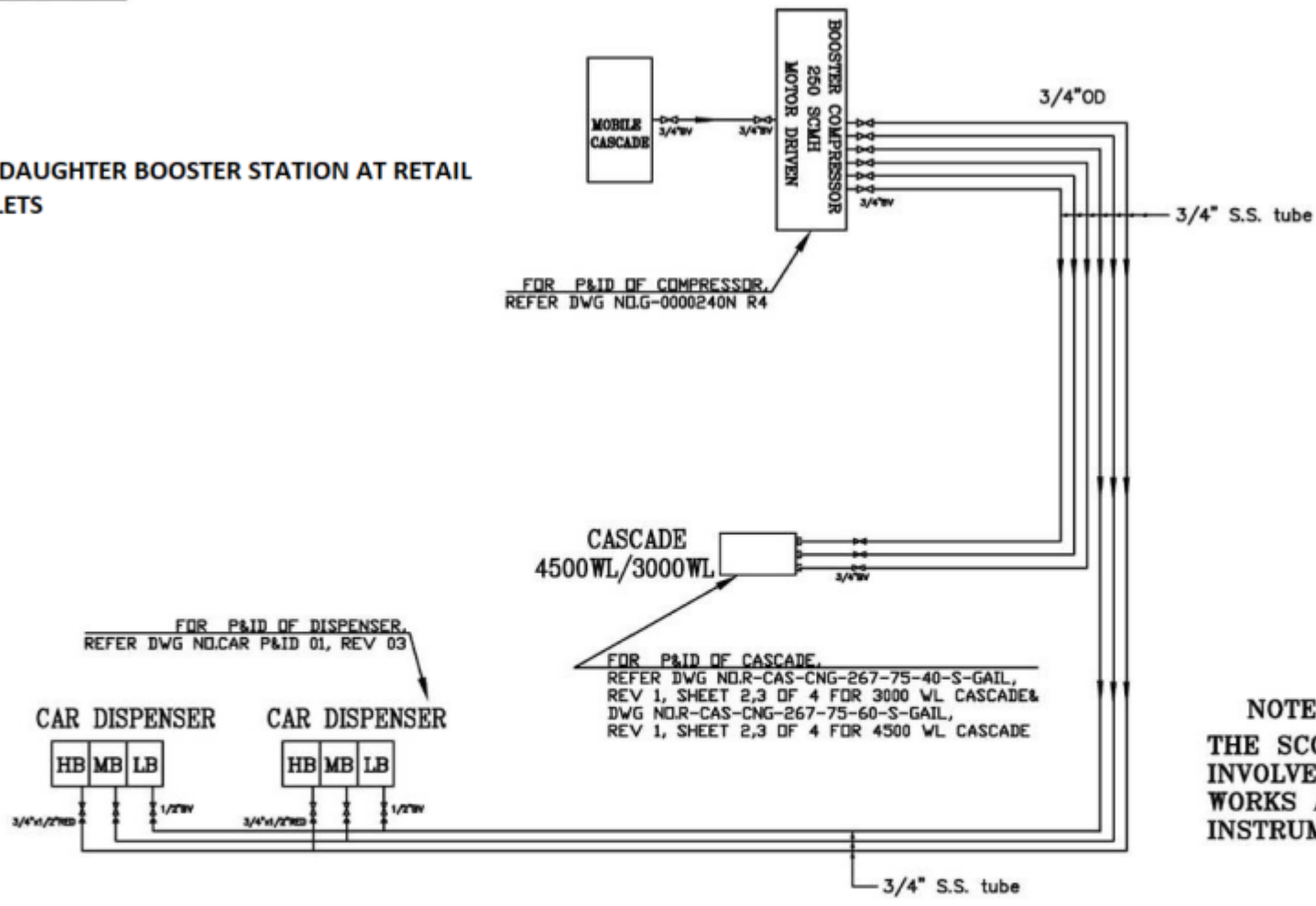
Page 301 of 333

CONCURRED BY:	DATE:	DESIGNED BY:	DESIGNED:	DRAWN BY:	DRAWN:	APPROVED BY:	APPROVED:	DATE:	SCALE:	SHEET:
								01/02/2018	1:1	1 OF 1



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CNG DAUGHTER BOOSTER STATION AT RETAIL OUTLETS



FOR P&ID OF COMPRESSOR, REFER DWG NO.G-0000240N R4

FOR P&ID OF DISPENSER, REFER DWG NO.CAR P&ID 01, REV 03

FOR P&ID OF CASCADE, REFER DWG NO.R-CAS-CNG-267-75-40-S-GAIL, REV 1, SHEET 2,3 OF 4 FOR 3000 WL CASCADE & DWG NO.R-CAS-CNG-267-75-60-S-GAIL, REV 1, SHEET 2,3 OF 4 FOR 4500 WL CASCADE

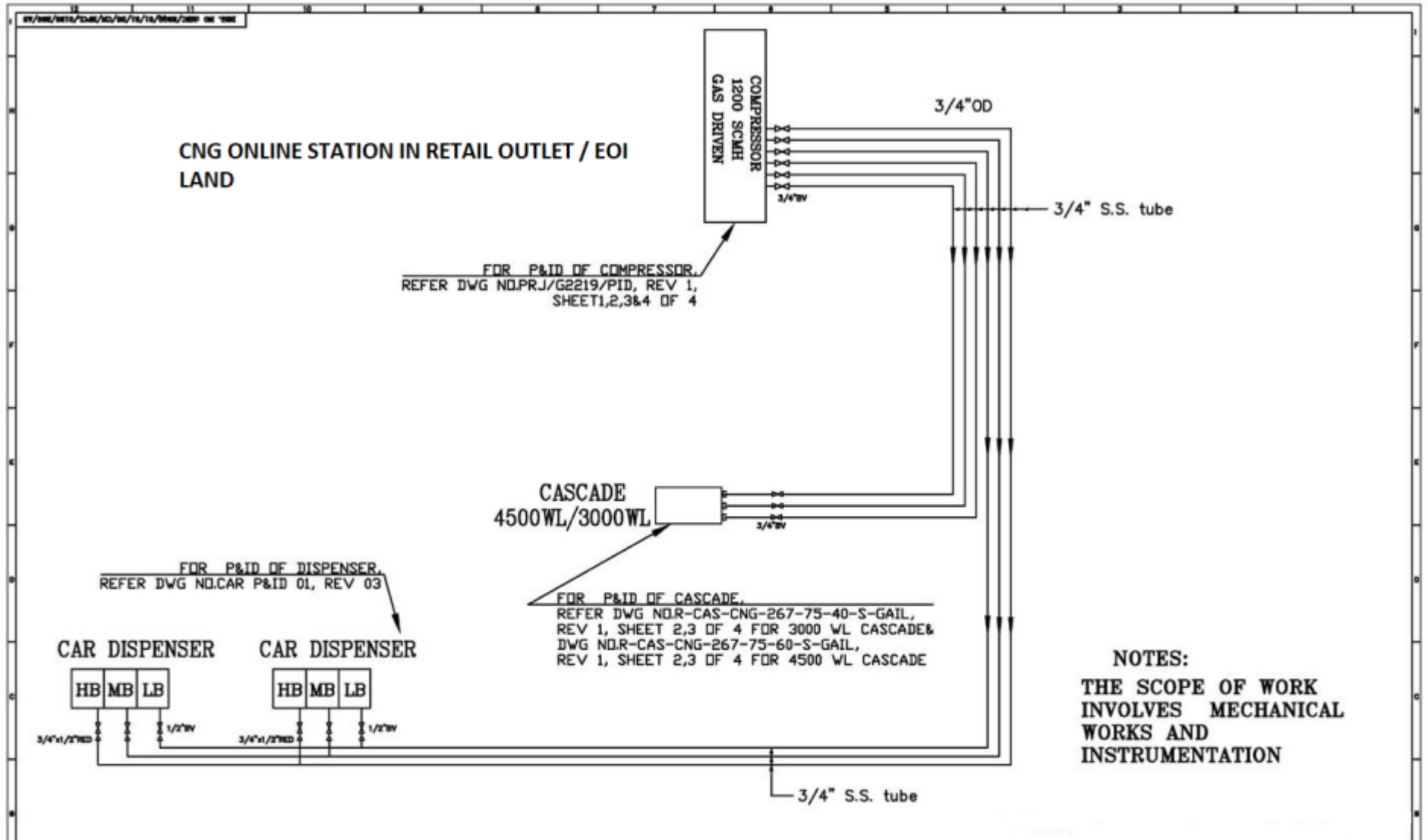
NOTES:  
THE SCOPE OF WORK INVOLVES MECHANICAL WORKS AND INSTRUMENTATION WORKS

SCHEMATIC LAYOUT OF SS 316 TUBES WITHIN TRENCHES FOR CNG SUPPLY

CONCLUDED BY:		DESIGNED: M & C		DRAWN: ANN		CHECKED & VERIFIED: MK		APPROVED: R.K.HERA		DATE: 09/05/2018	
REVISIONS:		NO.		DESCRIPTION		BY		DATE		SCALE: NTD	
REVISIONS:		NO.		DESCRIPTION		BY		DATE		SHEET 1 OF 1	
REVISIONS:		NO.		DESCRIPTION		BY		DATE		DWG. NO GGC/0001/01/01/06/CR/SPCL/0100A/000/AS	



**TENDER NO: GGPL/KKD/C&P/CW/2545/VS**



**NOTES:**  
 THE SCOPE OF WORK  
 INVOLVES MECHANICAL  
 WORKS AND  
 INSTRUMENTATION

**SCHEMATIC LAYOUT OF SS 316 TUBES WITHIN TRENCHES FOR CNG SUPPLY**

DESIGNED	M & C	REVISION	NO
ENGINEERED	ANN	DATE	
DRAWN	ANN	PROJECT	CNG ONLINE STATION AT RETAIL OUTLETS
CHECKED & VERIFIED	MEK	DESCRIPTION	P&ID OF CNG ONLINE STATION IN RETAIL OUTLET
APPROVED	R.E.HERRA	SCALE	1:1
DATE	31/05/2018	DWG. NO	GGPL/2018/01/21/24/C&P/CW/2545/VS/AS



**TENDER NO: GGPL/KKD/C&P/CW/2545/VS**

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## **PART-IV**

# **TECHNICAL SPECIFICATION FOR INSTRUMENT WORKS**

**TENDER NO: GGPL/KKD/C&P/CW/2545/VS**

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## **SPECIFICATION FOR 3KVA UPS**

## **1.0 SCOPE**

The intent of this specification is to define the requirements of uninterrupted power supply system and the associated battery bank sets. Tenderer's scope of work includes design, manufacture, testing, packing and delivery to site and installation, testing & commissioning of the complete UPS system with battery banks etc. as per this specification & data sheet.

## **2.0 STANDARDS**

**2.1** In general the equipment covered by this specification shall, unless otherwise specified, be in line with the requirement of any of the latest applicable standards of

- a) Bureau of Indian Standards
- b) British Standard Institution
- c) American Standard Institution
- d) International Electro Technical Commission
- e) IEEE

**2.2** Wherever the requirements in this specification are in conflict with any of the above Standards, the requirements under this specification shall be binding.

## **3.0 GENERAL REQUIREMENTS**

### **3.1 Basic Particulars for Design**

- a) Suitable for commercial application.
- b) Single-phase voltage and frequency controlled output.
- c) Suitable protection shall be provided in the control circuit to guard against instability of phase controlled rectifier due to electrical oscillation, which may be present in input supply as caused by emergency Gas Genset.
- d) The load shall normally be fed from the inverter.
- e) Battery shall be suitable to maintain the power supply in the event of mains failure or battery charger failure for the time periods specified
- f) Static by pass switch to connect the load to the mains supply through static voltage stabilizer or hot standby UPS, as per the configuration, without interruption to the load in the event of inverter failure.

### **3.2 Rectifier/ Battery Charger**

- 1. Transient and surge protection circuit in input circuit to protect UPS from surges and voltage spikes.
- 2. Automatic boost and float charging control
- 3. Charger shall simultaneously supply entire power necessary for inverter and to keep the battery of required capacity in fully charged condition. Provision for

automatic charging in both float and boost shall be made.

### 3.3 Constructional Features

1. Free standing, floor mounted indoor type and complete with all interconnection
2. Dust and vermin proof
3. Units shall be self contained and serviceable
4. Suitable for non air conditioned room.

### 3.4 Battery unit

Ampere-hour capacity of the battery shall be selected on the following basis:

- a) Load power factor of 0.8
- b) Aging factor of 0.8
- c) Battery state of charge factor of 0.88
- d) Temperature correction factor shall be taken as specified in data sheet
- e) Minimum end cell voltage shall be 1.1V per cell for Ni-Cd battery & 1.85 V per cell for SMF LA/VRLA battery.
- g)

$$\text{Battery Current} = \frac{\text{Inverter Efficiency} \times \text{End cell voltage} \times \text{No of cells}}{\text{Inverter rated KVA} \times \text{Rated load p.f}}$$

- i) Battery stands in multi row/ single tier formation. Stand Material shall be as per battery manufacturer's standard.

### 4.0 DRAWINGS AND DOCUMENTS

4.1 The following documents shall be submitted along with the offer:

- a) List of two years operation and maintenance spare.
- b) Technical data sheet and check list duly filled.
- c) Space requirement for UPS & auxiliary panels and battery bank

4.2 The following drawings shall be submitted for approval on award of contract.

- a) G.A. of panel, battery stand,
- b) Bill of Material.
- c) Schematic & Wiring diagram for reference.
- d) Charger sizing calculation.

4.3 Final drawings, operation & maintenance manual and erection Instructions shall be submitted along with dispatch of equipments in three sets in hard copy & two sets in soft copy (CD/DVD).



**5.0 INSPECTION**

- 5.1** The contractor shall submit Quality Assurance Plan (QAP) for respective equipments within 3 weeks of award of contract. QAP shall be prepared and furnished by the contractor in Form No. 11.20(4.4) F-10 along with their internal in process quality checks.
- 5.2** Batteries shall be tested for type and 'Acceptance Test'/ Routine Test at battery manufacturer's works and test reports shall be submitted for review and approval.
- 5.3** Final acceptance testing along with the batteries shall be done at site. Site acceptance test procedure shall be submitted by the Contractor along with QAP.

**6.0 PACKING AND DESPATCH**

The equipment shall be properly packed for transportation by ship / rail or trailer. The equipment shall be wrapped in polythene sheets before being placed in crates / cases to prevent damage. Crates / cases shall have skid bottoms for handling. Special notations such as "Fragile", "This side up" "Centre of gravity", "Weight", "Owner's particulars", 'PO nos.'" etc, shall be clearly marked on the package together with other details as per purchase order. Contractor shall supply above packed material at required place as specified elsewhere.

**DATASHEET FOR 3 KVA UPS**

<b>UNINTERRUPTED POWER SUPPLY</b>		
<b>1.0 INPUT POWER SUPPLY</b>		
1.1	Voltage/ Phase / Frequency	230 V AC (+)10% & (-)15% 1Ph., 50 Hz $\pm$ 6%
1.2	System fault level	50 kA for 1 Sec
<b>2.0 SITE CONDITION</b>		
2.1	Design Maximum	50°C
2.2	Max. Relative humidity	95% RH ( max. humidity and temperature do not occur at same time)
<b>3.0 OUT PUT REQUIREMENT</b>		
3.1	Voltage / Phase / Frequency	230V $\pm$ 1% AC, Single phase, 50 Hz $\pm$ 0.1%
3.2	Output waveform	Pure Sinusoidal Wave
		Voltage distortion (THD): Less than 3% for linear loads& Less than 5% for non linear loads.
3.3	Transfer time between AC and Battery modes	0 ms (bumpless)

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4.0 SYSTEM REQUIREMENTS		
4.1	Rating (KVA at 0.8 pf.)	As per SOR
4.2	Type of inverter	The inverter circuit should be IGBT based, fully microprocessor controlled with latest proven technology
4.3	Overload capacity	125% of the rated output for 10 minutes & 150% for 1 minute.
4.4	Inverter efficiency	>90% for normal load and not below 85% for 25% of load
4.5	Type of enclosure	Unitized, Floor mounted
4.6	Internal protection	All live parts shrouded
4.7	Earthing	Doubly Earthed (Two distinct terminals to be made available)
4.8	Crest Factor	$\geq 3:1$
4.9	Input Power Factor	0.8 to 0.85
4.10	Load Power Factor	0.8 (with variation between 0.7 to 1.0)
4.11	Overall efficiency	>80%
4.12	Connectivity	Serial port RS232/ 485.
5.0 Battery Bank		
5.1	Type of Battery	As per SOR
6.0 Distribution boxes		
6.1	Distribution Board Details	<u>(1) ACDB 230 V, Single Phase (1 No.)</u> : Incomer : DP MCB Outgoing : 4nos, 6A and 2 nos. 10A MCBs

**TENDER NO: GGPL/KKD/C&P/CW/2545/VS**

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**SPECIFICATION FOR 2x 5 kVA HOT  
REDUNDANT UPS**

## **1.0 SCOPE**

The intent of this specification is to define the requirements of uninterrupted power supply system and the associated battery bank sets. Tenderer's scope of work includes design, manufacture, testing, packing and delivery to site and installation, testing & commissioning of the complete UPS system with distribution boards and battery banks etc. as per this specification & data sheet.

## **2.0 STANDARDS**

**2.1** In general the equipment covered by this specification shall, unless otherwise specified, be in line with the requirement of any of the latest applicable standards of

- a) Bureau of Indian Standards
- b) British Standard Institution
- c) American Standard Institution
- d) International Electro Technical Commission
- e) IEEE
- f) NEMA

**2.2** Wherever the requirements in this specification are in conflict with any of the above Standards, the requirements under this specification shall be binding.

## **3.0 GENERAL REQUIREMENTS**

### **3.1 Basic Particulars for Design**

- a) Suitable for industrial application.
- b) Automatic selection of available phase (out of three phases) in case of outage of power supply of the phase in use for feeding incoming power supply to the UPS.
- c) Single-phase voltage and frequency controlled output.
- d) Suitable protection shall be provided in the control circuit to guard against instability of phase controlled rectifier due to electrical oscillation, which may be present in input supply as caused by emergency Gas Genset.
- e) Parallel hot redundant system with automatic static bypass, common DC battery and solid-state voltage stabilizer as per data sheet and drawing.
- f) The load shall normally be fed from the inverter.
- g) Battery shall be suitable to maintain the power supply in the event of mains failure or battery charger failure for the time period specified
- h) Static by pass switch to connect the load to the mains supply through static voltage stabilizer or hot standby UPS, as per the configuration, without interruption to the load in the event of inverter failure.
- i) AC Distribution board as per data sheet.
- j) Noise level at a distance of 1 m. from UPS panels shall not exceed 65dB.

### 3.2 Rectifier/ Battery Charger

1. Switched ON through a MCCB.
2. With transient and surge protection circuit in input circuit to protect UPS from surges and voltage spikes.
3. Automatic boost and float charging control
4. Protective features:
  - Maximum current limiting
  - Over temp. trip.
  - Boost charging and float charging current limiting with back up protection against overcharging.
5. Charger shall simultaneously supply entire power necessary for inverter and to keep the battery of required capacity in fully charged condition. Provision for automatic charging in both float and boost shall be made.

### 3.3 Inverter

1. DC/DC converter for voltage control
2. Control electronics
3. Series reactor and parallel filter
4. Output transformer
5. Protection against the following:
  - Abnormal output voltage
  - Over load trip
  - Low battery voltage
6. Meters
  - For output voltage
  - For output frequency
  - Ammeter
  - Battery current and voltage with indication of status - "in charge" or "discharge".
7. Static by-pass switch
  - Static switch automatically switches the load to the reserve power supply or the mains whenever there is failure in inverter supply to the load.
  - Retransfer of load from stabilized bypass supply to the inverter in auto as well as in manual mode.
  - High-speed fuses shall be provided for protecting the thyristors against accidental overload.

**3.4 Constructional Features**

1. Free standing, floor mounted indoor type and complete with all interconnection with lifting hooks
2. Dust and vermin proof
3. Sheet steel clad mounted on 100 mm base frame
  - Minimum 2 mm thick for panels
  - Minimum 1.6 mm thick for doors and side covers
4. Units shall be self contained and serviceable
5. The arrangement and layout shall facilitate easy and convenient supervision of the unit while running as well as quick detection of disturbances and troubleshooting.
6. Copper earth bus bar shall run throughout the length of Panels. All doors & non- current carrying parts shall be suitably earthed.
7. The maximum and minimum operating height of the switches shall be 1800mm and 300mm respectively.
8. Enclosure conforming to minimum IP-31 class.
9. Units shall be provided with cooling fans and louvers.
10. Suitable for non air conditioned room.
11. Interior and exterior colour shall be RAL 7035.

**3.5 Battery unit**

3.5.1 Ampere-hour capacity of the battery shall be selected on the following basis:

- a) Load power factor of 0.8
- b) Aging factor of 0.8
- c) Battery state of charge factor of 0.88
- d) Temperature correction factor shall be taken as specified in data sheet
- e) Backup time 30 minutes at full load
- f) Minimum end cell voltage shall be 1.1V per cell for Ni-Cd battery & 1.85 V per cell for SMF LA/VRLA battery.

g)

$$\text{Battery Current} = \frac{\text{Inverter Efficiency} \times \text{End cell voltage} \times \text{No of cells}}{\text{Inverter rated KVA} \times \text{Rated load p.f}}$$

- h) Load break switch fuse unit in sheet steel enclosure shall be provided near the battery bank for isolation.
- j) Battery stands in multi row/ single tier formation. Stand Material shall be as per battery manufacturer's standard.

**4.0 DRAWINGS AND DOCUMENTS**

**TENDER NO: GGPL/KKD/C&P/CW/2545/VS**

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- 4.1** The following documents shall be submitted along with the offer:
- List of two years operation and maintenance spare.
  - Technical data sheet and check list duly filled.
  - Space requirement for UPS & auxiliary panels and battery bank
- 4.2** The following drawings shall be submitted for approval on award of contract.
- G.A. of panel, battery stand, ACDB
  - Bill of Material.
  - Schematic & Wiring diagram for reference.
  - Charger sizing calculation.
- 4.4** Final drawings, operation & maintenance manual and erection Instructions shall be submitted along with dispatch of equipments in three sets in hard copy & two sets in soft copy (CD/DVD).
- 5.0 INSPECTION**
- 5.1** Inspection and testing of equipment shall be carried out by the owner/ consultant at the works of the contractor on final product to ensure conformity of the same with the acceptable criteria of technical specification, approved drawings and national/ international standards.
- 5.2** The contractor shall submit Quality Assurance Plan (QAP) for respective equipments within 3 weeks of award of contract. QAP shall be prepared and furnished by the contractor in Form No. 11.20(4.4) F-10 along with their internal in process quality checks.
- 5.3** 'Type test' including 12 hr. heat run test shall be conducted on one UPS System of each rating and 'Routine test' on the remaining.
- 5.4** Batteries shall be tested for type and 'Acceptance Test'/ Routine Test at battery manufacturer's works and test reports shall be submitted for review and approval.
- 5.5** Final acceptance testing along with the batteries shall be done at site. Site acceptance test procedure shall be submitted by the Contractor along with QAP.
- 6.0 PACKING AND DESPATCH**

The equipment shall be properly packed for transportation by ship / rail or trailer. The equipment shall be wrapped in polythene sheets before being placed in crates / cases to prevent damage. Crates / cases shall have skid bottoms for handling.

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Special notations such as “Fragile”, “This side up” “Centre of gravity”, “Weight”, “Owner’s particulars”, ‘PO nos.’” etc, shall be clearly marked on the package together with other details as per purchase order. Contractor shall supply above packed material at required place as specified elsewhere.



**DATASHEET FOR 2X5 KVA UPS**

<b>UNINTERRUPTED POWER SUPPLY</b>		
<b>1.0 INPUT POWER SUPPLY</b>		
1.1	Voltage/ Phase / Frequency	415 V AC (+)10% & (-)15% 3Ph., 50 Hz $\pm$ 6%
1.2	System fault level	50 kA for 1 Sec
<b>2.0 SITE CONDITION</b>		
2.1	Design Maximum	50°C
2.2	Max. Relative humidity	95% RH ( max. humidity and temperature do not occur at same time)
<b>3.0 OUT PUT REQUIREMENT</b>		
3.1	Voltage / Phase / Frequency	230V $\pm$ 1% AC, Single phase, 50 Hz $\pm$ 0.1%
3.2	Output waveform	Pure Sinusoidal Wave
		Voltage distortion (THD): Less than 3% for linear loads & Less than 5% for non linear loads.
3.3	Redundancy Switching between both UPS	Bumpless
3.4	Transfer time between AC and Battery modes	0 ms (bumpless)
<b>4.0 SYSTEM REQUIREMENTS</b>		
4.1	Rating (KVA at 0.8 pf.)	As per SOR
4.2	Type of inverter	The inverter circuit should be IGBT based, fully microprocessor controlled with latest proven technology
4.3	Overload capacity	125% of the rated output for 10 minutes & 150% for 1 minute.
4.4	Mode of operation	Parallel Redundant with static bypass & Dual Redundant rectifier
4.5	Inverter efficiency	>90% for normal load and not below 85% for 25% of load
4.6	Type of enclosure	Minimum IP-31
4.7	External Cable Connection	Bottom entry only
4.8	Internal protection	All live parts shrouded
4.9	Earthing	Doubly Earthed (Two distinct terminals to be made available)

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4.10	Cooling	Forced ventilation with fans
4.11	Noise Level	<65 dB at full Load from 1 mtr distance
4.12	Crest Factor	$\geq 3:1$
4.13	Input Power Factor	0.8 to 0.85
4.14	Load Power Factor	0.8 (with variation between 0.7 to 1.0)
4.15	Overall efficiency	>80%
4.16	Connectivity	Serial port RS232/ 485.
<b>5.0 Rectifier/Charger</b>		
5.1	Automatic phase selection device	Yes
5.2	Input Power factor	>0.8 (minimum) at rated load
5.3	Input current THD (Total Harmonic Distortion) at nominal load	$\leq 25\%$
5.4	Overload Capability	125% minimum for 10 min. 150% minimum for 1 min.
5.5	Inrush current	Limited by soft-start circuit
5.6	Output voltage tolerance	+/- 1%
5.7	DC voltage ripple	<1% with battery connected <2 % Without battery connected
<b>6.0 Bypass</b>		
6.1	Automatic Bypass	Static bypass to provide an un interruptible transfer of load in case of failure of any system component or malfunctioning or overload & the load shall return on the UPS when the malfunctioning or overload is cleared.
6.2	Input connection	Separate for each UPS
6.3	The switching time from inverter to bypass & vice versa	No break type
6.4	Manual/Maintenance Bypass	Shall be provided
6.5	Overload on bypass	150% (minimum) for 1 minutes, 125% (minimum) for 10 min.
<b>7.0 Battery Bank</b>		
7.1	Type of Battery	As per SOR
<b>8.0 Alarms, Indications and LCD Display</b>		

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8.1	Digital panel Meter with LCD display shall be provided for monitoring	a) Input AC Voltage, current, frequency b) Output AC Voltage, current, frequency. c) Mains ON/OFF, d) Inverter ON/ OFF e) Battery voltage low
8.2	Audible Alarms With LCD Display-	a) Mains Failure b) Battery Low c) UPS fault (Continuous)
9.0 Protective Features		
9.1	Input	Mains Over voltage, under voltage, phase failure
9.2	Inverter	Over voltage, short circuit, overload, over temperature
9.3	Battery	Under voltage at battery terminal, Battery over charge, Battery Over current
9.4	Rectifier & Battery charger	Maximum current limiting Over temp. Trip Boost charging and float charging current limiting with back up protection against over charging.
10.0 Distribution boxes		
10.1	Distribution Board Details	(1) ACDB 230 V, Single Phase (1 No.) : Incomer : DP MCB Outgoing : 4 nos, 6A and 4 nos. 10A MCBs

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**TECHNICAL SPECIFICATION FOR  
MASS FLOW METER**

**1. SCOPE**

- 1.1. This Specification covers Design, Manufacture, testing, Supply & Transportation, Unloading at project site of Mass flow meter (Model CNG 50 with integral local display) based on Coriolis principle of Micro motion, USA with F-series 2700 transmitter to be used in CNG mother stations of City Gas Distribution project for Bengaluru.

**2. GENERAL**

- 2.1. Mass flow meter shall be based on Coriolis principle. Installation and manufacturing of Mass Flow meter shall be as per AGA-11. While installing special care shall be taken to isolate the mass flow meter from piping vibration.
- 2.2. Each Mass flow meter shall include a sensor with integral transmitter i.e meter electronics certified intrinsically safe / explosion proof by statutory authority suitable for the required hazardous area as per IS-2148 / IEC-79. Also the offered sensor and the transmitter shall be weather proof to IP65 or better as per IS-2147/IEC-529. Statutory authority for local installation is CCOE.
- 2.3. Offered mass flow meter shall be necessary for Custody Transfer application but not exceeding 0.5% of span.
- 2.4. Calibration for the offered mass flow meter shall be in Kg/hr, cumulative flow. MFM with head mounted integral local display to indicate flow rate (Kg/hr), cumulative gas (in Kgs) etc.; inbuilt totalizer non-volatile & non-resettable type; suitable for hazardous area classification.
- 2.5. Flying lead type electrical termination is not acceptable. All electrical connections shall be ½” NPTF. Cable glands shall be provided for electrical power, signal and control connections. Cable glands shall be double compression type and certified weather proof and explosion proof for the required area classification as per IS-2147 and IS-2148.
- 2.6. Offered mass flow meter shall be completely free from corrosion of measuring tube due to alternating stresses continuously occurring in the tube. Also measuring tube shall be completely free from erosion, which may result due to fluid velocity.
- 2.7. The design of meter electronics shall be in compliance with the electromagnetic compatibility requirements as per IEC-801.
- 2.8. Meter electronics shall include all the associated pre-amplifiers, converters, line riser etc. and shall have enough diagnostic facility to correct live zero, variation, meter factor etc with the help of Laptop. Output of the mass flow meter RS485 type to PLC

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shall be utilized.

2.9. Installation details like straight run requirements, recommendation for horizontal/ vertical installation, minimum distance between upstream and downstream pipe bends from mass flow meter to be provided.

2.10. Vendor shall calibrate each Mass flow meter at his shop or any recognized test house with the fluid (Use design process conditions) for which it is to be used as per Clause no.9 of MPMS (Draft standard Nov.2000) or as per ISO 4185 STD. In case it is not possible to calibrate the Mass Flow Meter with actual fluid. Vendor must indicate

- a) Fluid used for calibration
- b) Correction factor / Adjustment required for actual process fluid. In any case, in accuracy when extended to actual process shall not exceed the specified limits (as per manufacturer's standard).

2.11. Vendor shall submit the following test certificates and test reports for purchaser's review:-

- a) Material test certificate with detailed chemical analysis from foundry (MIL certificate)
- b) Certificate of radiography / x-ray from any welded joint.
- c) Hydrostatic test report with pressure of 1.5 times the design pressure.
- d) Calibration report including calibration factors for each mass flow meter
- e) Certificate from statutory body for offered sensor and transmitter for required area classification.

2.12. **CERTIFICATION:**

The requirement of statutory approvals for usage of equipment / instruments / system in electrically hazardous area shall be as follows:

- a) The vendor shall be responsible for obtaining all statutory approvals, as applicable for all instruments and control systems.
- b) Equipment's / instruments / systems located in electronically hazardous area shall be certified for use by statutory authorities for their use in the area of their installation. In general, the following verification shall be provided by the vendor.
  - Bidder shall provide certificates (from BSEEFA FM, UL, PTB, LCIE etc.) from country of origin for all intrinsically safe / flameproof protected by other methods .Equipment / instrument / systems, which are manufactured outside India, if required, bidder shall provide necessary certification / approvals / authentication, for all such intrinsically safe / flame proof equipment / instrument / systems, by the Indian authority-Chief controller of Explosive (CCOE), Nagpur, India.
  - For all flame proof equipment manufactured within India, the testing

shall be carried out by any of the testing houses- central Mining Research Institute (CMRI) / ERTL etc. The items shall in addition bear the valid certification from CCOE.

**3. Specification for MFM:**

- 3.1. Specifications of MFM sensor (Coriolis CNG series sensor: 1/2-inch (15mm); 316L stainless steel):
- a) Coriolis CNG series sensor: 1/2-inch (15mm).
  - b) 316L stainless steel.
  - c) Process connections: 3/4-inch NPT female adapter ; or 3/4" OD X 3/4" OD . If MFM comes with 3/4" NPT Female adapter, then 2 nos. of male connectors of 3/4" NPTM X 3/4" OD SS fittings of required pressure rating are to be supplied by the vendor along with MFM.
  - d) Compatible size 12VCO union fittings.
  - e) Case options: Standard case.
  - f) Electronic Interface; For integrally mounted 2700 transmitter
  - g) Approvals: ATEX equipment category 2 (zone 1 ) / PED compliant.
  - h) Language: English installation manual.
  - i) Factory options: Standard product
- 3.2. Specifications of MFM transmitter (Coriolis Flow & density transmitter):
- a) Coriolis Flow & density transmitter
  - b) Mounting / housing material: Integral mount transmitter.
  - c) Power: 18 to 100V DC and 85 to 265V AC; self switching.
  - d) Display: Backlit dual line display for process variables and totalizer reset.
  - e) Output: One mA; One frequency; RS485.
  - f) Conduit connections: 1/2-inch NPT.
  - g) Approvals: ATEX-Equipment category 2 (Zone 1- Flame proof terminal compartment).
  - h) Language: English installation manual and English configuration manual.
  - i) Software options : Weights & Measures custody transfer and meter verification, hardware locking & software locking arrangement required.
  - j) Standard product.

For applications requiring simultaneous monitoring of multiple flow variables

- a) Selected combinations of outputs including milliamp, frequency, and discrete I/O.

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- b) Modbus, HART, wireless HART, FOUNDATION field bus and PROFIBUS-PA digital communications.
  - c) Simultaneously outputs multiple variables, including mass flow rate, volume flow rate, Gas standard volume flow rate, density, temperature and drive gain.
  - d) Compact, integral mounting to sensor with 360 degrees of rotation.
  - e) Class I, Division 1/ Zone 1 local operator interface.
  - f) View process variables, handle alarms, control totalizers, meter configuration and more.
  - g) Interface functions shall be customized and password protected.
  - h) Shall support English language.
  - i) 20 Hz / 100 Hz selectable response time.
4. Coriolis true Mass Flow Meter with integral display unit should be provided to ensure accuracy and direct Mass Flow measurement shall confirm to AGA 11 standard. Mass flow meter (Indicating Type) should be designed for custody transfer metering of CNG and meet the following requirements:

Principle of metering – Coriolis Flow rate : 1 to 100 kg/min.

Accuracy :  $\pm 0.5\%$  (inclusive of linearity, hysteresis & repeatability error) Repeatability :  $\pm 0.3\%$  or better

Zero stability: 0.01 kg/min or better

Pressure rating:

Flow tube rating : Max: 345 bar, Normal: 255 bar. Process fluid temperature : -40 to +125°C. Ambient temperature limits: -20- to +60°C.

Materials of construction: Wetted parts : SS 316L

Sensor housing : 304L stainless steel

Totaliser – Non resettable type

Enclosure – IP65 or better, NEMA 4 & Ex. Proof for transmitter and sensor. Pressure & temp influence – Nil.

Calibration traceability – NIST/NMI/PTB/ISO/IEC 17025



Pressure rating of wetted parts – 5200 psi at 25°C as per ANSI B 31.3/ASME

EMI effect on sensor and Transmitter – To the requirement of EMC to latest IEC/EN standard

Vibration effect –As per IEC 68.2.6 / SAMA PMC 31.1 (1980) or latest standard. Approval – ATEX/CSA/FM/CENLEC/SEV

W&M- Statutory authority of country of origin and from ministry of consumer affairs, Govt. of India.

Output – RS 485 / frequency.

Output to be available –RS 485 / frequency / Analog duly programmed.

Each flow meter should be provided with a liquid crystal display (LCD) for ongoing flow monitoring and totaliser.

Mass flow meter shall have diagnostic facility to check live / dynamic zero, configurable parameter, constants etc through laptop.

Provision for sealing /locking of mass flow meter / transmitter shall be provided to avoid possibility of tempering during use of MFM.

#### **CALIBRATION & CERTIFICATION:**

Mass Flow Meter shall be calibrated at minimum six points (Flow range 0 to 100 Kg/min) and calibration certificate shall be valid at the time of Supply. If any of the calibration certificates is not in order, the supplier should replace the affected equipment with valid certificate at supplier cost. The calibration certificates should be presented upon at the time of delivery to site.

A documentation and obtaining statutory approval from the country of origin is in vendor's scope. The offered Mass flow meter must be approved and certified for specified flow and accuracy by recognized and/or other statutory authorities (of the Country of Origin).

The meters shall be type approved by Weights and Measures department (Ministry of Consumer affairs, India). Supplier shall furnish certificate of stamping & sealing of individual meters by Local Weights & Measures department, India along with certified calibration curve of individual meters.

#### **5. DATASHEETS**

Vendor shall furnish all the filled data sheets for the approval of /GGPL. Vendor shall

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clearly indicate deviation if any in the respective data sheet.

GENERAL	1.	Tag no.		*
	2.	Service		CNG
	3.	Line size & Schedule		*
HAZ LOC	4	Electrical Area Classification		IEC Zone 2 Gr. IIA/IIB
SENSOR	5.	Type		Coriolis
	6.	Function		Mass flow
	7.	Connection size / rating		¾" tube OD, 5200 psig
	8.	Body material		316 SS
	9.	Sensor housing material leads		SS Hermetical- ly sealed
	10.	Sensor / Wetted parts ma- terial		316 SS
	11.	Enclosure		WP to IP 65 of bet- ter ingress protec- tion.
	12.	Intrinsic safety		Required
	13.	Range Min. Max.	Kg/h	* *
	14.	Accuracy		±0.5% flow rate
	15.	Conduit connection		½" NPTF
	16.	Jacketing		Required.
	TRANSMIT- TER	17	Function	
18.		Load driving capability in Ohms		600
19		Output signal/protocol type		*
20		Enclosure		Flameproof + WP (IP 65 or better)
21		Intrinsic safety		Required
22		Power supply		*
	23	Conduit connection		½" NPTF

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	24	Mounting location		*
	25	Max. Distance Allowable - sensor to transmitter		*
	26	Tx to control room receiver		*
	27	Power consumption in Watts		*
FLUID	28.	Fluid - State		CNG-gas
	29	Flow: Min./Nor./Max.	Kg/h	As per TS
	30	Pressure: Operating: Maximum	Kg/cm <sup>2</sup> (g)	As per TS
	31	Temperature: Operating: Maximum	°C	As per TS
	32	Operating relative density		
	33.	Relative molecular mass		
	34.	Operating Viscosity	cP	
	35	Maximum allowable pressure	Kg/cm <sup>2</sup> (g)	
OPTIONS	36	Filter / Mesh size		
	37	Mounting brackets		Required
	38	Inter Connecting cables		Required
	39	Cable glands/size		Required
	40	Switch /type		
		Contact rating		
	41.	Accessories for hot tap		
OTHERS	42.	Manufacturer		*
	43.	Model No. Meter		*
	44.	Converter		*

‘\*’ Vendor to indicate

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**Vendor list of Bought out items:**

UPS System and Inverter	M/s Emerson / M/s DB Power/ M/s APlab / M/s Hi-rel
Batteries (Lead acid)	Amco batteries Ltd./ Exide Industries Ltd./ HBLNIFE power system Pvt. Ltd./ Amara Raja Batteries Ltd.
Batteries (Nick-el Cadmium)	Amco batteries Ltd../ HBLNIFE power system Pvt. Ltd
Mass flow meter	Micro motion (CNG 50with 2700 transmitter)

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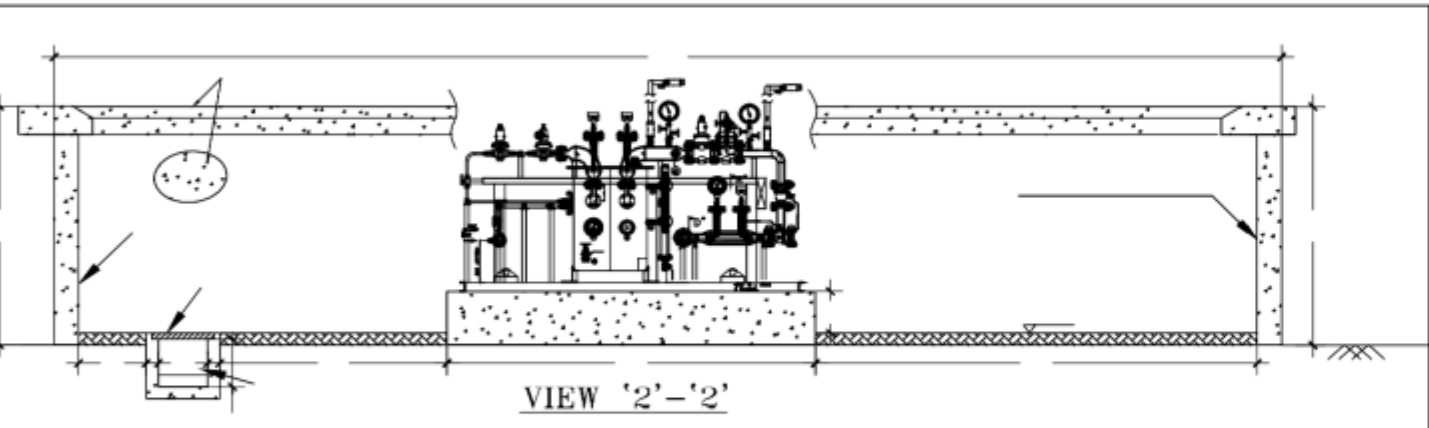
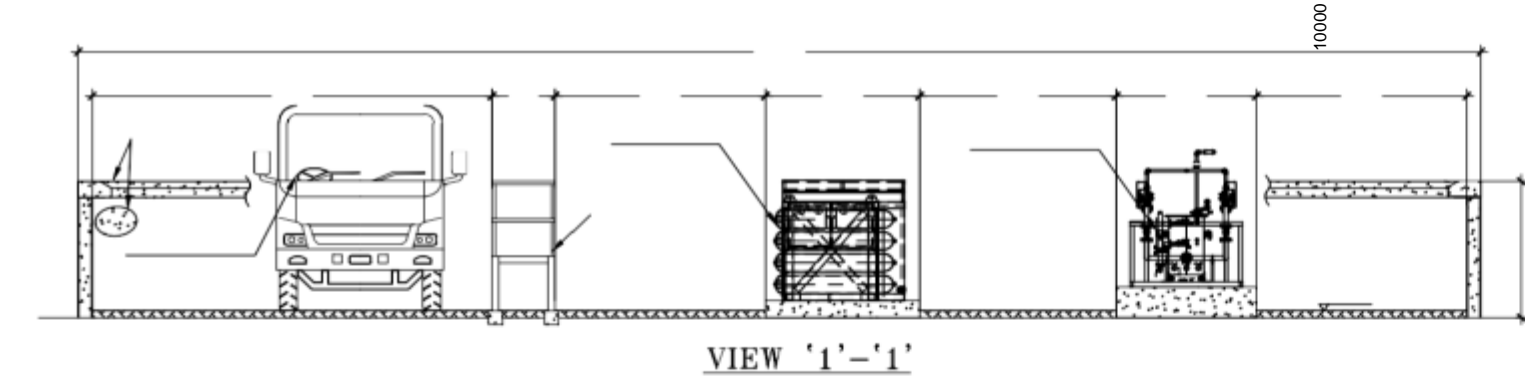
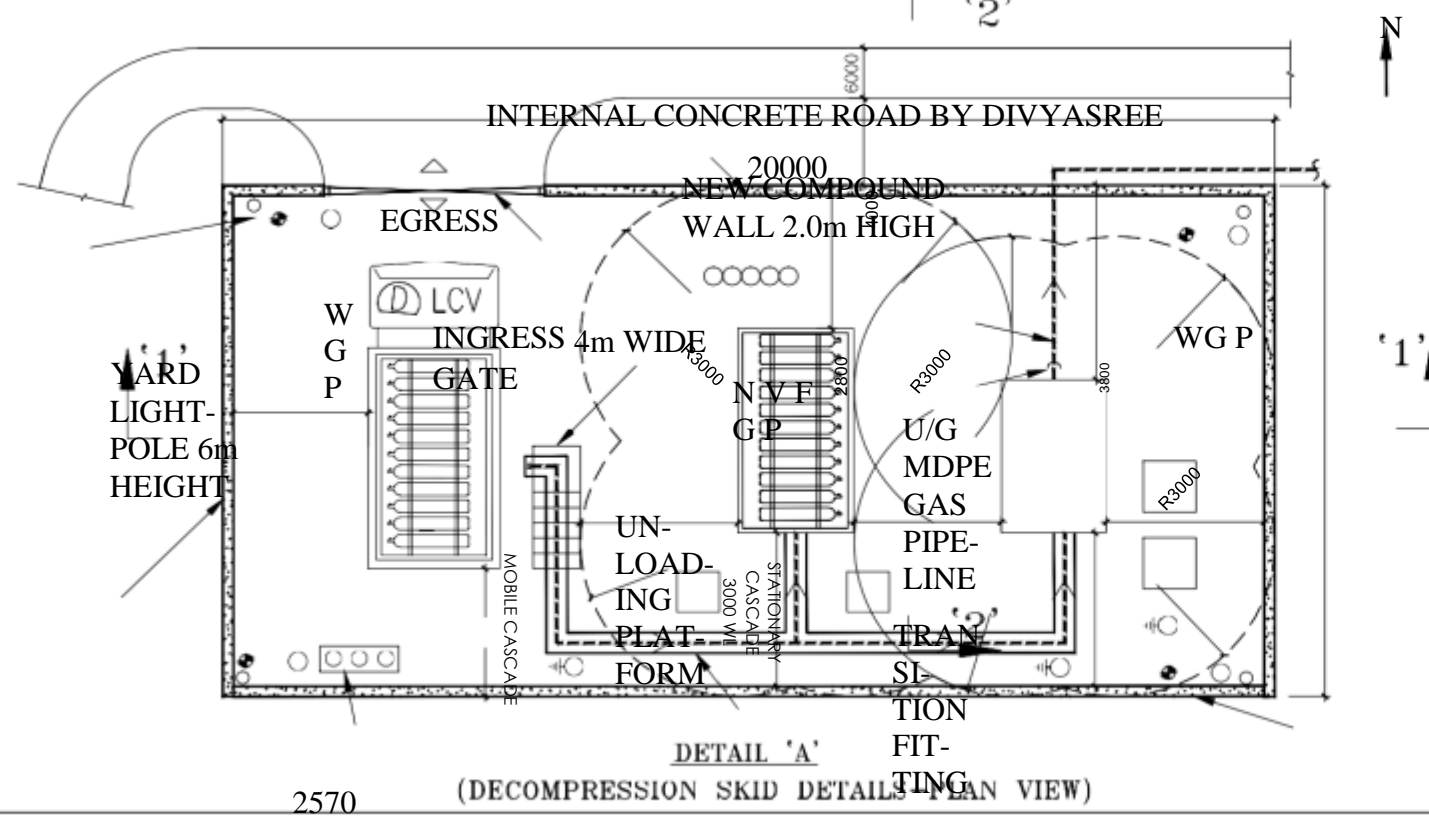


**PART-V**

**TYPICAL CNG STATIONS AND  
DE-COMPRESSOR UNIT LAYOUT DRAWINGS**

**LIST OF LAYOUT DRAWINGS**

<b>SI NO.</b>	<b>DESCRIPTION</b>
1.	Typical layout of CNG online station
2.	Typical layout of CNG Daughter booster station
3.	Typical layout of CNG mother station
4.	Typical layout of CNG De-compression station



REV	DATE	BY	CHKD	DESCRIPTION
01	21.09.2023	TS	A.T.R	ISSUED FOR PLANNING
02				
03				
04				
05				
06				
07				
08				
09				
10				
11				
12				

NOTES:

1. SEE DRAWING DETAILS PRECAUTIONS & PROCEDURE OF INSTALLATION
2. BCP
3. BCP
4. BCP
5. BCP
6. BCP
7. BCP
8. BCP
9. BCP
10. BCP
11. BCP
12. BCP

EQUIPMENT DETAILS:

NO.	DESCRIPTION	QTY	UNIT
A.			
B. SAFETY FEATURES:			

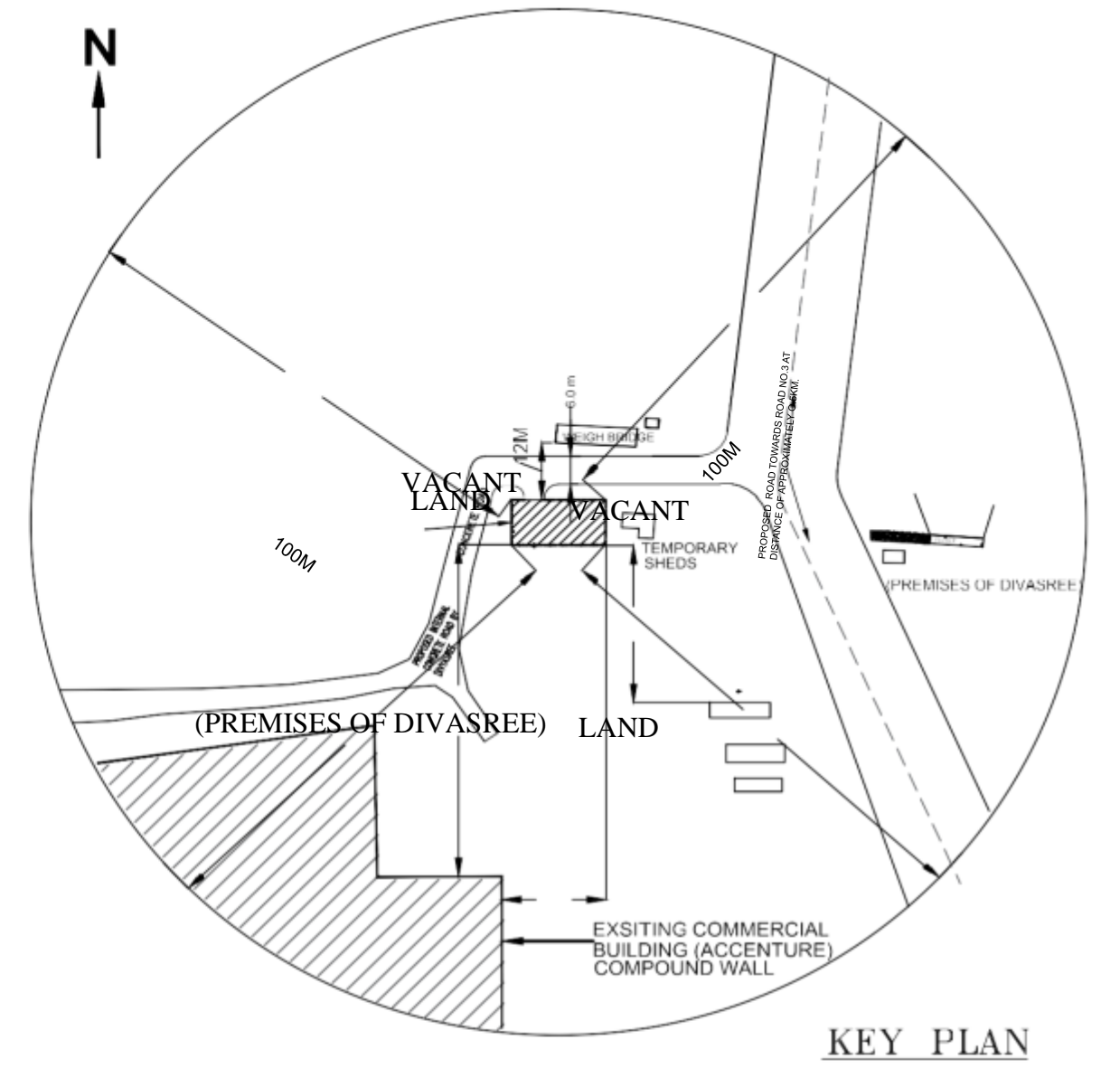
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01	21.09.2023	TS	A.T.R	ISSUED FOR PLANNING
02				
03				
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05				
06				
07				
08				
09				
10				
11				
12				

REFERENCES:

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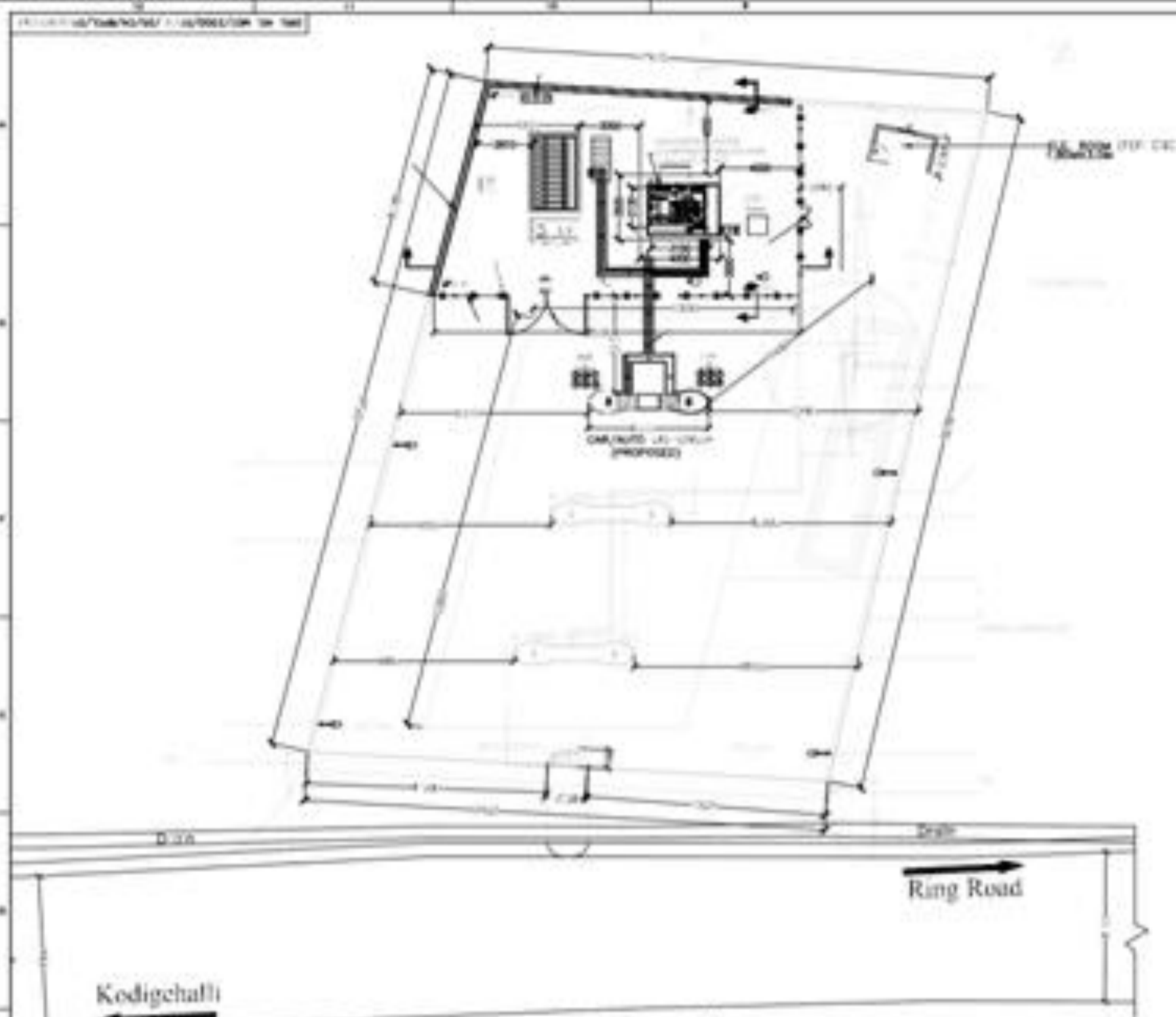
DATED: \_\_\_\_\_



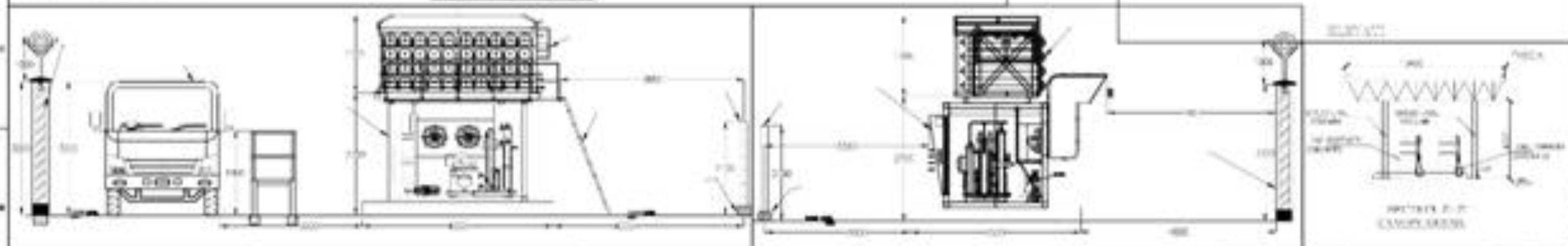
TYPICAL LAYOUT OF 450SCMH DECOMPRESSION SKID INSTALLATION







LOCATION PLAN WITH 100 M. RADIUS



NO.	DESCRIPTION	QTY	UNIT
1	COMPRESSOR UNIT	1	NO.
2	CASHIER COUNTER	1	NO.
3	PUMP	1	NO.
4	TANKS	2	NO.
5	PIPEWORK	1	NO.
6	VALVES	1	NO.
7	WELDS	1	NO.
8	CONCRETE	1	NO.
9	PAVING	1	NO.
10	ELECTRICAL SUPPLY	1	NO.
11	MECHANICAL SUPPLY	1	NO.
12	WATER SUPPLY	1	NO.
13	SEWER SUPPLY	1	NO.

NO.	DESCRIPTION	QTY	UNIT
1	COMPRESSOR UNIT	1	NO.
2	CASHIER COUNTER	1	NO.
3	PUMP	1	NO.
4	TANKS	2	NO.
5	PIPEWORK	1	NO.
6	VALVES	1	NO.
7	WELDS	1	NO.
8	CONCRETE	1	NO.
9	PAVING	1	NO.
10	ELECTRICAL SUPPLY	1	NO.
11	MECHANICAL SUPPLY	1	NO.
12	WATER SUPPLY	1	NO.
13	SEWER SUPPLY	1	NO.

NO.	DESCRIPTION	QTY	UNIT
1	COMPRESSOR UNIT	1	NO.
2	CASHIER COUNTER	1	NO.
3	PUMP	1	NO.
4	TANKS	2	NO.
5	PIPEWORK	1	NO.
6	VALVES	1	NO.
7	WELDS	1	NO.
8	CONCRETE	1	NO.
9	PAVING	1	NO.
10	ELECTRICAL SUPPLY	1	NO.
11	MECHANICAL SUPPLY	1	NO.
12	WATER SUPPLY	1	NO.
13	SEWER SUPPLY	1	NO.

**NOTES:**

1. THE STATION SHALL BE DESIGNED AND CONSTRUCTED IN ACCORDANCE WITH THE PROVISIONS OF THE GAS ACT, 1954 AND THE REGULATIONS THEREUNDER.
2. THE STATION SHALL BE DESIGNED AND CONSTRUCTED IN ACCORDANCE WITH THE PROVISIONS OF THE GAS ACT, 1954 AND THE REGULATIONS THEREUNDER.
3. THE STATION SHALL BE DESIGNED AND CONSTRUCTED IN ACCORDANCE WITH THE PROVISIONS OF THE GAS ACT, 1954 AND THE REGULATIONS THEREUNDER.
4. THE STATION SHALL BE DESIGNED AND CONSTRUCTED IN ACCORDANCE WITH THE PROVISIONS OF THE GAS ACT, 1954 AND THE REGULATIONS THEREUNDER.

**GENERAL:**

1. THE STATION SHALL BE DESIGNED AND CONSTRUCTED IN ACCORDANCE WITH THE PROVISIONS OF THE GAS ACT, 1954 AND THE REGULATIONS THEREUNDER.
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4. THE STATION SHALL BE DESIGNED AND CONSTRUCTED IN ACCORDANCE WITH THE PROVISIONS OF THE GAS ACT, 1954 AND THE REGULATIONS THEREUNDER.

**GENERAL INFORMATION:**

LOCATION: [ ]

NAME OF CITY: [ ]

NEAREST POLICE STATION: [ ]

NEAREST BUS STATION: [ ]

DISTANCE FROM BUS STATION: [ ]

STATE PIN CODE: [ ]

CNG STATION PLAT AREA: [ ]

OFFICE BUILDING AREA: [ ]

PROPOSED STATION AREA: [ ]

**APPROVAL:**

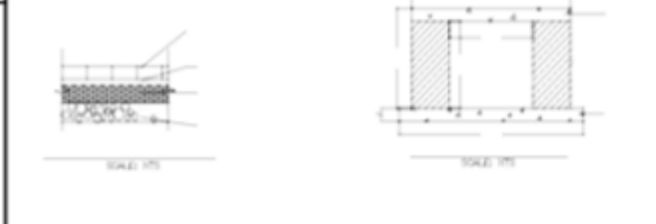
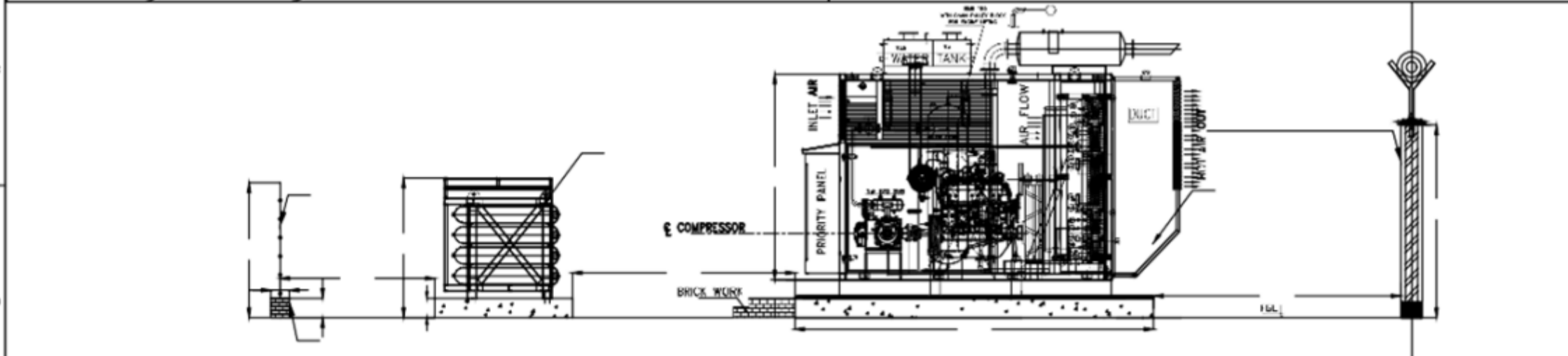
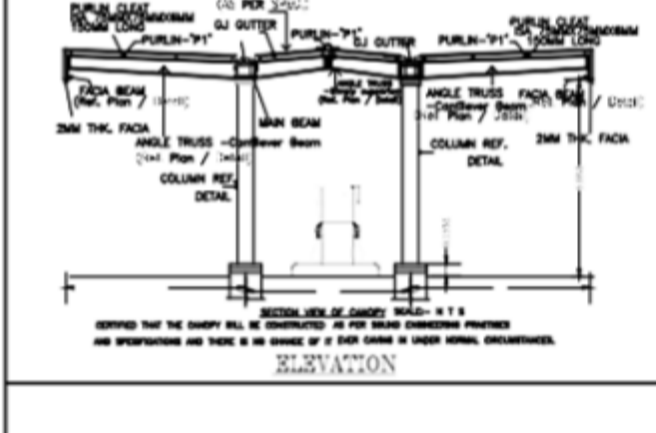
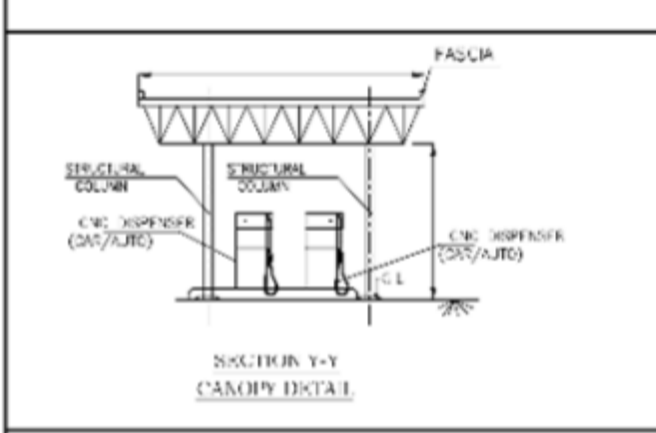
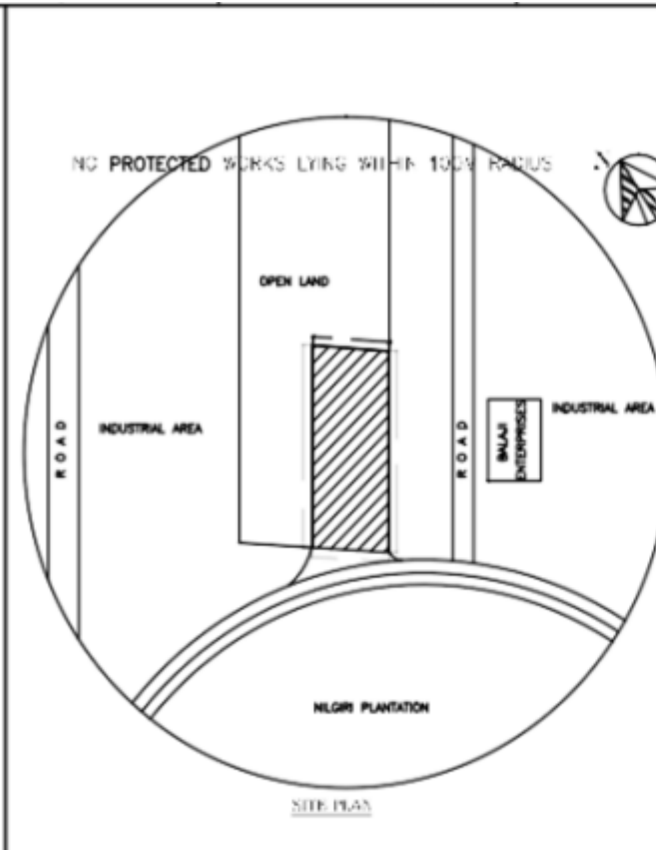
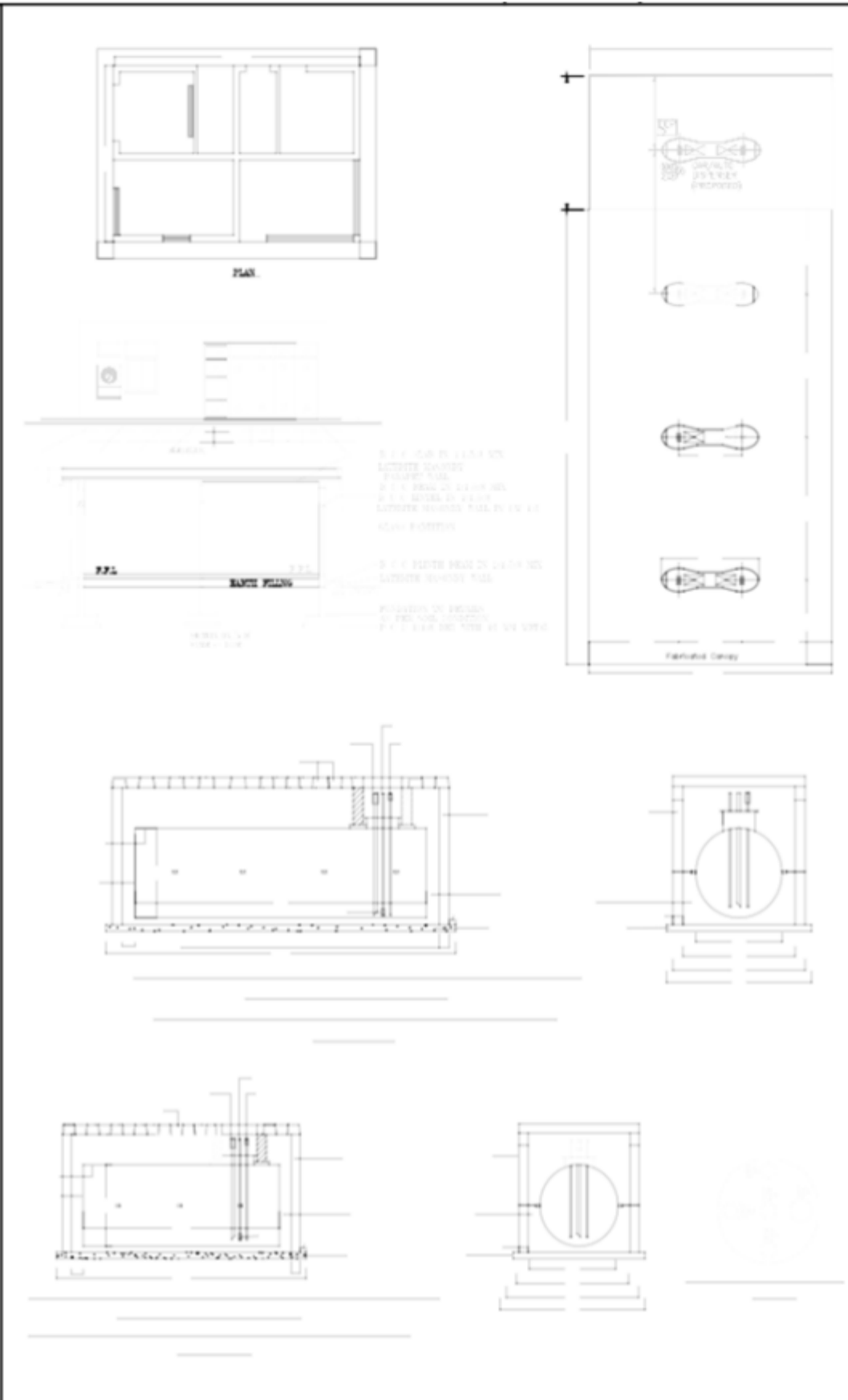
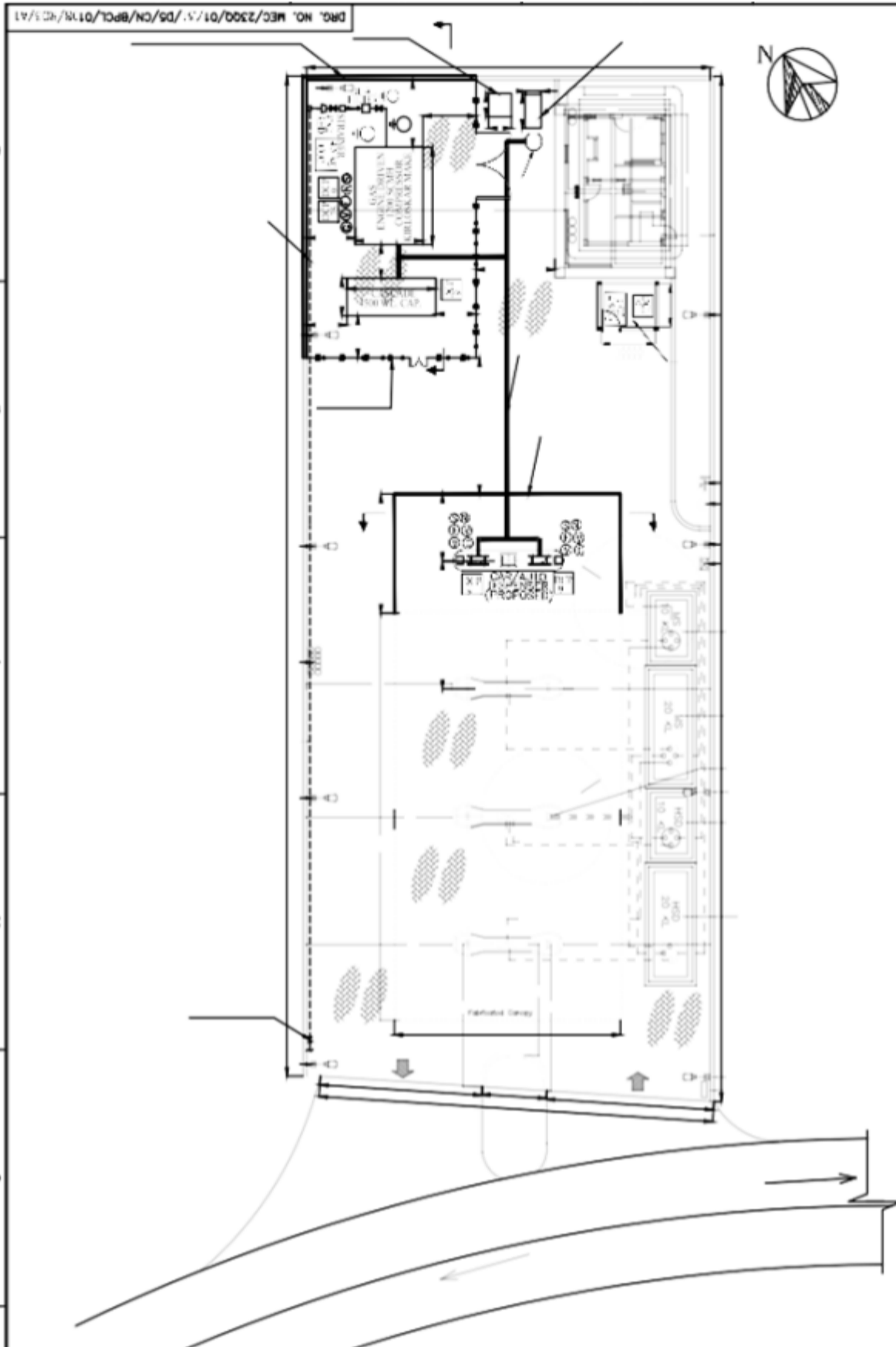
[Signature]

[Name]

[Title]

**DHS FOR COE APPROVAL**

NO.	DESCRIPTION	QTY	UNIT
1	COMPRESSOR UNIT	1	NO.
2	CASHIER COUNTER	1	NO.
3	PUMP	1	NO.
4	TANKS	2	NO.
5	PIPEWORK	1	NO.
6	VALVES	1	NO.
7	WELDS	1	NO.
8	CONCRETE	1	NO.
9	PAVING	1	NO.
10	ELECTRICAL SUPPLY	1	NO.
11	MECHANICAL SUPPLY	1	NO.
12	WATER SUPPLY	1	NO.
13	SEWER SUPPLY	1	NO.



- NOTES:-
1. ALL DIMENSIONS ARE IN MILLI METRE, UNLESS OTHERWISE STATED.
  2. NUMBER OF ALUMINIUM ROLES ARE INDICATED.
  3. CNG GAS TUBES SHALL BE Laid IN TRENCH.

- CONFIRMATION**
1. THE LICENSED PREMISES SHALL BE USED ONLY FOR THE PURPOSE AND FACILITIES IT IS LICENSED FOR.
  2. CNG SHALL BE DISPENSED ONLY INTO THOSE CYLINDERS OF MOTOR VEHICLES WHICH ARE APPROVED BY THE CHIEF CONTROLLER AND HAVE PASSED THE PERIODIC STATUTORY TESTS UNDER THESE RULES CONDUCTED BY A TESTING STATION RECOGNISED BY THE CHIEF CONTROLLER.
  3. THE CNG GAS TUBES, DISPENSERS, COMPRESSOR, PIPING AND OTHER FITTINGS SHALL BE OF A DESIGN SUITABLE FOR CNG IN CONFORMANCE TO OGD STD. 179.
  4. THE STORAGE OF THE CASCADE OF CYLINDERS SHOULD BE MADE IN A WELL-VENTILATED SHED HAVING A LIGHT ROOF OR CANOPY WITH ATLEAST ONE SIDE OPEN, AN AREA OF ATLEAST 1 METER AROUND THE CASCADE SHALL BE PROVIDED WITHIN THE SHED AND THE SAME SHALL BE DEMARCATED EITHER BY RAISED PLATFORM OR BY CURB WALL.
  5. NO CYLINDER SHALL BE FILLED WITH CNG IN EXCESS OF THE DESIGN WORKING PRESSURE.
  6. INTER-DISTANCE BETWEEN VARIOUS EQUIPMENTS, STORAGE CASCADES, DISPENSERS, ETC. INSTALLED IN CNG DISPENSING STATION SHALL BE PROVIDED WITH SAFETY DISTANCES AS PER TABLE I & II OF FORM G OF GAS CYLINDER RULES, 2004.
  7. THE DISPENSER FOR DISPENSING CNG SHALL BE OF A TYPE APPROVED BY THE CHIEF CONTROLLER.
  8. THE VEHICLE SHALL HAVE APPROVED TYPE OF CNG KIT FITTED IN ACCORDANCE WITH GUIDELINES OF MINISTRY OF ROAD TRANSPORT AND HIGHWAYS, GOVT. OF INDIA.
  9. NO MOTOR VEHICLE SHALL BE FUELED WHILE THE ENGINE IS RUNNING AND WHERE THE VEHICLE IS LICENSED FOR THE CONVEYANCE OF MORE THAN SIX PASSENGERS OR MORE THAN TWO WHILE ANY PASSENGER REMAINS IN THE VEHICLE.
  10. WARNING SIGNS WITH THE WORDS 'STOP' AND 'NO SMOKING' AND 'NO OPEN FLAME PERMITTED', 'FLAMMABLE GAS' SHALL BE DISPLAYED AT DISPENSING STATION AND COMPRESSOR AREA PROMINENTLY.
  11. ALL ELECTRICAL FITTINGS AND EQUIPMENTS SUCH AS COMPRESSORS, DISPENSERS, SWITCHES, STARTERS, ETC. INSTALLED IN THE PREMISES USED FOR COMPRESSING AND FILLING OF CNG SHALL BE FLAMEPROOF CONSTRUCTION CONFORMING TO IS:2148 OR SUCH OTHER SPECIFICATION AS APPROVED BY THE CODE.
  12. NO ALTERATIONS OR ADDITIONS SHALL BE CARRIED OUT TO THE PREMISES WITHOUT PRIOR APPROVAL OF THE CODE.
  13. SMOKING, NAKED FLAMES, SOURCE OF FIRE, MOBILE PHONES OR ANY OTHER IMPLEMENTS CAPABLE OF IGNITING FLAMMABLE VAPOUR OR GAS SHALL NOT BE ALLOWED INSIDE THE PREMISES.
  14. EVERY PERSON MANAGING OR EMPLOYED ON OR IN CONNECTION WITH THE LICENSED PREMISES WILL ABSTAIN FROM ALL ACTS WHICH TEND TO CAUSE FIRE OR EXPLOSION AND WHICH IS NOT REASONABLY NECESSARY AND TO THE BEST OF HIS ABILITY SHALL PREVENT OTHER PERSONS FROM DOING SUCH ACT.
  15. THE LICENSEE SHALL PROVIDE AT THE FOLLOWING SCALE AT DIFFERENT LOCATIONS, FACILITIES AT LEAST AS PER THE FOLLOWING TABLE:
- | LOCATION             | TYPE OF EXTINGUISHERS |
|----------------------|-----------------------|
| DISPENSING UNIT      | 1X9 Kg DCP            |
| COMPRESSOR (ON LINE) | 1X75 Kg DCP           |
| CNG STORAGE          | 1X9 Kg DCP            |
16. THE OPERATORS AND ATTENDANTS SHALL BE FULLY CONVERSANT AND TRAINED WITH ALL THE FACETS OF THE DISPENSING ACTIVITIES INCLUDING OPERATIONAL PROCEDURES, MAINTENANCE AND HAZARDS OF CNG AND THE RISK ASSOCIATED WITH THE HANDLING OF THE PRODUCT.
  17. THE EMERGENCY TELEPHONE NUMBERS OF LOCAL FIRE SERVICE, POLICE AND THE PRINCIPAL MARKETING COMPANY AND EMERGENCY INSTRUCTIONS SHALL BE CONSPICUOUSLY DISPLAYED IN THE LICENSED PREMISES.
  18. IF THE LICENSING AUTHORITY CALLS UPON THE HOLDER OF A LICENSE BY A NOTICE IN WRITING TO EXECUTE ANY REPAIRS IN THE LICENSED PREMISES WHICH ARE IN THE OPINION OF SUCH AUTHORITY NECESSARY FOR THE SAFETY OF THE PREMISES, THE HOLDER OF THE LICENSE SHALL EXECUTE THE REPAIRS WITHIN SUCH PERIOD AS MAY BE SPECIFIED IN THE NOTICE.
  19. FREE ACCESS TO THE LICENSED PREMISES SHALL BE GIVEN AT ALL REASONABLE TIME TO ANY OF THE OFFICERS LISTED IN RULE 71 AND EVERY FACILITY SHALL BE AFFORDED TO SUCH OFFICER FOR ASCERTAINING THAT THE RULES AND THE CONDITIONS OF THIS LICENSE ARE DULY OBSERVED.
  20. ANY ACCIDENT, FIRE, EXPLOSION OR UNLAWFUL INCIDENT OCCURRED WITHIN THE LICENSED PREMISES SHALL BE IMMEDIATELY REPORTED TO THE CHIEF CONTROLLER, CONTROLLER, DISTRICT MAGISTRATE AND THE OFFICER - IN-CHARGE OF THE NEAREST POLICE STATION BY THE FASTEST MODE OF COMMUNICATION.

- CERTIFICATE**
1. CERTIFIED THAT ALL THE CLEARANCE / APPROVALS FROM MOP & OTHER RELEVANT GOVT. DEPARTMENTS HAVE ALREADY BEEN OBTAINED.
  2. IT IS CERTIFIED THAT ALL THE IRC GUIDELINES ARE MET.
  3. IT IS CERTIFIED THAT TO BEST OF OUR KNOWLEDGE THERE IS NO COURT CASE PENDING IN ANY COURT OF LAW AGAINST THESE PREMISES AND DEPARTMENT.
  4. IT IS CERTIFIED THAT THIS IS NEW CNG STATION IN EXISTING RETAIL OUTLET.
  5. IT IS CERTIFIED THAT ALL THESE FACILITIES HAVE BEEN PROVIDED ARE EXACTLY AS PER THE DRAWINGS.
  6. IT IS CERTIFIED THAT NO HIGH TENSION LINE / ELECTRIC LINE ARE PASSING OVER THE PREMISES.

**PLOT INFORMATION:-**

LOCATION : SRIGANDHADA KAWALI, SUNKADAKATTE, BANGALORE.

NAME OF CITY : BANGALORE.

NEAREST POLICE STATION : KAMAKSHIPALYA

NEAREST RLY. STATION : BANGALORE JN.

DISTANCE FROM RLY. STATION : 8.0 Km (APPROX.)

STATE PIN CODE : KARNATAKA 560091

CNG STATION PLOT AREA : 1672.83 Sq.M

OFFICE BUILDING AREA : 56.64 Sq.M

PROPOSED GARAGE AREA : 95.5 Sq.M

- REFERENCES:-**
1. FOR DETAILS OF COMPRESSOR, REFER DWG NO. P/0219/02219/GAS
  2. FOR PIPING OF COMPRESSOR, REFER DWG NO. P/0219/02219/PIPE, SHEET 1, 2, 3, 4.
  3. FOR DETAILS OF CASCADE, REFER DWG NO. R GAS GAS 207 75 AG 3 GAS
  4. FOR PIPING OF CASCADE, REFER DWG NO. R-GAS-CND-267-75-40-3-GAS

**ONLINE CNG STATION FOR COOE APPROVAL**

**NOTES**

1. ALL DIMENSIONS ARE IN mm.
2. CNG DISPENSER IS CONTROLLED BY 3 SMALL GASOLINE VIA CNG COMPRESSOR CASCADE VIA CNG COMPRESSOR BY SS TUBES.
3. THE PROPOSED CNG FACILITIES ARE DESIGNED IN ACCORDANCE WITH THE FOLLOWING CODE AND GUIDELINES:
  - A. IS: 5425 - 1990/IND-79
  - B. PETROLEUM RULES - 2002.
  - C. GAS CYLINDER RULES - 2004. (GOVT. OF INDIA).
  - D. GUIDELINES OF CHIEF CONTROLLER OF EXPLOSIVES MANGALURU.
4. FIRE SAFETY EQUIPMENT FOR CNG FACILITIES SHALL BE PROVIDED.
5. FIRE SAFETY AND TRAFFIC SIGNS SHALL BE INSTALLED.

**EQUIPMENT TABLE**

S.NO.	EQUIPMENT	NO.	SERVICE	BLOCK SIZE (L X W X H IN MM)	CAPACITY
1.	COMPRESSOR-GAS ENGINE DRIVEN	1	C.N.G.	5.8x4.2x3.8	1200 SCMH
2.	STATIONARY CASCADE	1	C.N.G.	5.5x2.3x1.8	4500 LTR. WATER
3.	C/A/R/D DISPENSER	2	C.N.G.	1.15x0.56x1.90	15.0 C/W/ FLW

**SAFETY FEATURES:-**

- a) 9 KG DOP TYPE FIRE EXTINGUISHER NEAR STATIONARY CASCADE ON LINE COMPRESSOR & CNG DISPENSER.
- b) 75 KG DOP TYPE FIRE EXTINGUISHER NEAR ON-LINE COMPRESSOR.
- c) CO2 FLOODING SYSTEM OUTSIDE COMPRESSOR ENCLOSURE.

**GAL GAS LIMITED**

BHARATI PROJECTS & CONSULTANCY PVT. LTD. (P) LTD. BANGALORE CITY

LC NO: P/SC/KA/14/2866(2162115)

NO.	DATE	BY	REVISION	DATE	BY
3	08.06.2016	AS PER CODE COMMENTS DTD 17.05.2016	AVP	CS	
2	08.02.2016	AS PER CODE COMMENTS	AVP	MF	
1	27.02.2016	ISSUE FOR CODE APPROVAL	AVP	MF	
0	30.11.2015	ISSUE FOR PLANNING	AVP	MF	

REVISIONS

DATE: 08.06.2016

BY: (Signature)

DATE: 08.06.2016

BY: (Signature)

DATE: 08.06.2016

BY: (Signature)

SECTION	NO.	DATE	BY	REVISION	DATE	BY
SECTION	NO.	DATE	BY	REVISION	DATE	BY

**CITY GAS DISTRIBUTION NETWORK**

DATE: 08.06.2016

BY: (Signature)

DATE: 08.06.2016

BY: (Signature)

DATE: 08.06.2016

BY: (Signature)

<b>SECTION I : SUMMARY OF PRICES (To be submitted with priced part of the offer)</b>			
<b>COMPOSITE WORKS IN VARIOUS CNG STATIONS AT EAST &amp; WEST GODAVARI DISTRICTS OF ANDHRA PRADESH</b>			
<b>BID DOCUMENT NO.: GGPL/KKD/C&amp;P/CW/2545/VS</b>			
Sl. No.		Price Currency IN INR	
		(In Figures)	(In Words)
1	Total amount of quoted price for CNG Works		
i)	Civil Works		
ii)	Electrical Works		
iii)	Instrumentation works		
iv)	Mechanical Works		
v)	Steel Structural Works		
vi)	Architectural Works		
2	Gross Total Amount (inclusive of all applicable taxes & duties excluding GST)		
	1 +2+3		
3	GST @ ___ net Total Amount mentioned at Sl. No. 4 above.		
4	Total Amount (Sl. No. 4 + 5)		
Place	:		Signature of Authorised Signatory
Date	:		Name :
			Designation :
			Seal :
Tender No.:			
Offer No. & Date :			

Tender No. GGPL/KKD/C&P/CW/2545/VS		SCHEDULE OF RATES FOR CNG MOTHER STATIONS				
Item No.	Description	Unit	Quantity for 1(one) no. of CNG mother station	Total Quantity for 8 (EIGHT) nos. of CNG mother station	Unit Rate	Total Amount for 8 (Eight) nos. of CNG mother station exclusive of GST (in Rs.)
<b>PART - I : CIVIL WORKS</b>						
<b>1.00</b>	<b>Site clearance and earth Work</b>	-				
	Earth work in surface excavation not exceeding 30 cm in depth but exceeding 1.5 m in width as well as 10 sqm on plan including disposal of excavated earth for all leads and lifts, Excavated portion to be neatly rammed, leveled, dressed & compacted to receive bed concrete. Carting away excess excavated earth / debris as directed by the project manager outside the premises to any place designated by the local authority from site by mechanical transport. Item also include cutting and removing of bushes / trees with 30m girth (to be measured at 1.0m above ground) etc. (Approval of location of disposal from local authority is in scope of contractor.)	-				
<b>1.10</b>	All kinds of soil	Sqm	1035	8280		
<b>2.00</b>	Felling of trees of the girth (measured at a height 1 m above ground level ) including cutting of trunks and branches , removing the roots and stacking of serviceable materials and disposal unserviceable material.	-		0		
<b>2.10</b>	a) beyond 30 cm Girth upto and including 60 cm girth	Each	6	48		
<b>3.00</b>	Earth work in excavation by mechanical means (Hydraulic excavator) / manual means over areas (exceeding 30 cm in depth, 1.5 m in width as well as 10 sqm on plan but upto depth of 3.0m) including dewatering of both ground and surface water in all season, removal of slurry generated while excavation and keeping the area free of water with necessary shoring, strutting required for keeping earth in position etc. and packing cavities (wherever required) including disposal of excess excavated earth and stacking of required excavated earth, for all leads and lifts, Excavated portion to be neatly rammed, leveled, dressed & compacted to receive bed concrete. Carting away excess excavated earth / debris as directed by the project manager outside the premises to any place designated by the local authority from site by mechanical transport. ( Approval of location of disposal from local authority to be in scope of contractor.)	-		0		
<b>3.10</b>	All kinds of soil	Cum	1955	15640		
<b>3.20</b>	same as above but beyond 3.0m in depth	Cum	90	720		
<b>4.00</b>	Earth work in excavation by mechanical means (Hydraulic excavator) / manual means over areas (exceeding 30 cm in depth, 1.5 m in width as well as 10 sqm on plan but upto depth of 3.0M) including dewatering of both ground and surface water in all season, removal of slurry generated while excavation and keeping the area free of water with necessary shoring, strutting required for keeping earth in position etc. packing cavities (wherever required) including disposal of excess excavated earth and stacking of required excavated earth, for all leads and lifts, Excavated portion to be neatly rammed, leveled, dressed & compacted to receive bed concrete. Carting away excess excavated earth / debris as directed by the project manager outside the premises to any place designated by the local authority from site by mechanical transport. ( Approval of location of disposal from local authority to be in scope of contractor.)	-		0		
<b>4.10</b>	Ordinary Rock	Cum	40	320		
<b>4.20</b>	same as above but beyond 3.0m in depth	Cum	23	184		
<b>4.30</b>	Hard Rock (Blasting Prohibited)	Cum	23	184		
<b>4.40</b>	same as above but beyond 3.0m in depth	Cum	12	96		
<b>5.00</b>	Earth filling from available earth (excluding rock) under floors and other places with special compaction to achieve dry density of 95% standard proctor density with excavated surplus earth including cost of excavation reclaiming from spoil heaps within plant site as per instruction of the Consultant at all heights/depths, transporting, depositing, compacting and dressing, trimming complete as desired in layers not exceeding 15 cms including watering, consolidating by mechanical means as per specifications and instructions of the Consultant.	Cum	805	6440		
<b>6.00</b>	Earth work in filling with good quality imported earth from approved source in the layers of 150 mm and compacted up to 95% to its MDD and any plan dimension including all testing, watering, rolling each layer with 1/2 tonne roller or wooden or steel rammers, and every 3rd and top-most layer with power roller of minimum 8 tonnes and dressing / filling up ground depressions etc. complete in all respect as per scope of work, detailed construction drawings , as per technical specifications and directions of the Engineer-in-charge.	Cum	290	2320		
<b>7.00</b>	Supplying and filling in foundation and plinth with river sand under floors for all leads and lifts, including watering, ramming, consolidating and dressing complete.	Cum	23	184		
<b>8.00</b>	Providing and injecting chemical emulsions for pre-construction anti-termite treatment and creating continuous chemical barrier under and all round the column pits, wall trenches, excavation top surface of plinth filling, junction, external perimeter of buildings, expansion joints surrounding of pipes and conduit etc. complete. (plinth area of the building at ground level shall only be measured) with chlorpyrifos/Lindane E.C. 20% with 1% concentration. Work to be executed by approved agency and specified guarantee for 07 years shall be furnished by the tenderer.	Sqm	90	720		
				0		
<b>9.00</b>	<b>CEMENT CONCRETE</b>	-		0		
	Providing and laying in position ready mixed plain cement concrete below foundation, & flooring, trenching and mass concrete, coping etc including shuttering , curing with all leads and lifts as per direction of the Engineer - in - charge.	-		0		
<b>9.10</b>	PCC 1:2:4 (1 Cement: 2 Coarse sand: 4 Stone aggregate 20mm nominal size)	Cum	20	160		
<b>9.20</b>	PCC 1:3:6 (1 Cement: 3 Coarse sand: 6 Stone aggregate 20mm nominal size)	Cum	100	800		
<b>9.30</b>	PCC 1:4:8 (1 Cement: 4 Coarse sand: 8 Stone aggregate 20mm nominal size)	Cum	12	96		
	<b>DAMP-PROOF COURSE (DPC)</b>	-		0		

10.00	Providing and laying damp proof course 40mm thick with cement concrete 1:2:4 (1 cement : 2 coarse sand : 4 graded stone aggregate 20mm nominal size) including providing and mixing of water proofing compound @ 2% of cement content and providing and applying two layers of bitumen of grade 80/100 of approved quality using 1.7 kg/ sqm on damp proof course after cleaning the surface with brushes and finally with a piece of cloth likely soaked in kerosene oil complete and as directed by the Project Manager.	Sqm	18	144		
				0		
	<b>REINFORCED CEMENT CONCRETE</b>	-		0		
	<b>FORMWORK</b>	-		0		
11.00	Providing Centering and shuttering including strutting, propping etc. and removal of form work for all level.	-		0		
11.10	For Foundations, footings, base of columns, plinth Beam etc	Sqm	920	7360		
11.20	Walls (any thickness) including attached pilasters, buttresses, plinth and string courses etc.	Sqm	465	3720		
11.30	Suspended floors, roofs, landings, balconies and access platform ,lintels etc.	Sqm	270	2160		
11.40	Columns, Pillars, Piers, Abutments, Posts and Struts	Sqm	230	1840		
				0		
	<b>STEEL REINFORCEMENT</b>	-		0		
12.00	Supply and placing in position Steel reinforcement TMT grade Fe415/Fe500 for R.C.C. work including straightening, cutting, bending, placing in position and binding all complete at all levels. Item also include the provision of necessary chairs and spacer and cost of binding wire etc complete. The chairs and spacer bars provided will not be measured for payment.	-		0		
12.10	Thermo-Mechanically Treated bars	MT	44	352		
				0		
13.00	Providing and laying in position ready mixed M-25 grade concrete for reinforced cement concrete work in super structure such as columns, beams, walls, etc cement content as per approved design mix, manufactured in fully automatic batching plant and transported to site of work in transit mixer for all leads and at all levels, having continuous agitated mixer, manufactured as per mix design of specified grade for reinforced cement concrete work, including pumping of R.M.C. from transit mixer to site of laying, excluding the cost of centering, shuttering finishing and reinforcement, including cost of admixtures in recommended proportions as per IS : 9103 to accelerate/ retard setting of concrete, improve workability without impairing strength and durability as per direction of the Engineer - in - charge. Cement content considered in this item is 330 kg/cum. Excess/ less cement used as per design mix is payable/ recoverable separately.	-		0		
13.10	For all works upto plinth level	Cum	315	2520		
13.20	For all works above plinth level upto floor v level	Cum	75	600		
				0		
14.00	Add/deduct for using extra /less cement in the items of design mix over and above the specified cement content therein.	Kgs	2300	18400		
				0		
	<b>CC BLOCK work</b>	-		0		
15.00	Providing and laying cement blocks (solid blocks) masonry Grade M 7.5 with 200 mm thick blocks upto plinth level and super structure above plinth level up to top level of building in cement mortar 1:4 (1 cement : 4 coarse sand ).	-		0		
15.10	Upto Plinth level	Cum	105	840		
15.20	Upto floor V level	Cum	90	720		
16.0	Brick work with bricks of class designation 5.0 with Mortar 1:6 (1Cement: 6 Coarse sand) in all levels.	Cum	25	200		
17.0	Providing and fixing 75 mm thick M-25 factory made RCC drain/trench cover including cost of shuttering and minimum reinforcement@ 8mm dia TMT Fe-500 bars @100mm c/c bothway. The RCC cover shall be encased with 100mm wide 1.6mm thick MS sheet alongwith 2 nos 12mm dia bar for hook etc complete including painting of MS sheet .	Sqm	90	720		
17.10	Providing and fixing 100mm thick M-25 factory made RCC drain/trench cover including cost of shuttering and minimum reinforcement@ 8mm dia TMT Fe-500 bars @100mm c/c bothway in two layers. The RCC cover shall be encased with 100mm wide 1.6mm thick MS sheet alongwith 2 nos 12mm dia bar for hook etc complete including painting of MS sheet .	Sqm	160	1280		
	<b>STONE CLADDING WORKS</b>	-		0		
18.00	Providing and fixing Granite Stone gang saw cut (mirror polished and machine cut) of thickness 18 mm for wall lining, dispenser pedestal, platform, counter, staircase etc including nosing etc., backing filled with a grout of average 12-15 mm thick in cement mortar 1:3 (1 cement : 3 coarse sand), including pointing with white cement mortar 1:2 (1 white cement : 2 marble dust) with an admixture of pigment to match the granite shade .(Basic rate of Granite : Rs1500/sqm).	Sqm	18	144		
	<b>STEEL WORK</b>	-				
19.00	Supplying and fixing rolling shutters of approved make, made of required size M.S. laths, interlocked together through their entire length and jointed together at the end by end locks, mounted on specially designed pipe shaft with brackets, side guides and arrangements for inside and outside locking with push and pull operation complete, including the cost of providing and fixing necessary 27.5 cm long wire springs manufactured from high tensile steel wire of adequate strength conforming to IS: 4454 - part 1 and M.S. top cover of required thickness for rolling shutters.	-				
	80 x125 mm M.S. laths with 1.25 mm thick top cover including Providing and fixing ball bearing for rolling shutters and providing mechanical device chain and crank operation for operating rolling shutters for all sizes and at all levels including two coats of approved quality synthetic enamel paint over a coat of primer.	Sqm	12	96		
20.00	Steel work welded in built up sections/ framed work, including cutting, hoisting, fixing in position and applying two coats of approved quality Synthetic enamel paint over a primer coat using structural steel etc. as required.	-				
20.10	In gratings, frames, guard bar, ladder, railings, brackets, gates, insert plates, angle insets including Y angles and similar works including two coats of approved quality Synthetic enamel paint over a primer coat.	Kgs	7245	57960		

20.20	Providing and fixing MS tube hand rail of approved size by welding etc to steel ladder railing, balcony railing, staircase railing and similar works, including two coats of approved quality Synthetic enamel paint over a primer coat.	Kgs	345	2760		
21.00	<b>FLOORING</b>	-				
	Providing and laying R.C.C. vacuum dewatering concrete flooring with floor hardener of approved make to be sprinkled at the rate of 5 kg/sqm before mechanical troweling as per manufacturer's specifications including mixing, tamping mechanically, consolidating, leveling cement concrete of grade M25 in grade slab, 200/150 thick including suction drying, mechanical trowelling (power float) and finishing, curing, cutting expansion grooves and filling expansion grooves with polysulphide joint fillers complete as specified and directed including shuttering but excluding reinforcement, including doweled construction joints as per drawings.	Cum	105	840		
22.00	52 mm thick cement concrete flooring with concrete hardener topping, under layer 40 mm thick cement concrete 1:2:4 (1 cement : 2 coarse sand : 4 graded stone aggregate 20 mm nominal size) and top layer 12 mm thick cement hardener consisting of mix 1:2 (1 cement hardener mix : 2 graded stone aggregate 6 mm nominal size) by volume, hardening compound mixed @ 2 litre per 50 kg of cement or as per manufacturer's specifications. This includes cost of cement slurry, but excluding the cost of nosing of steps etc. complete.	Sqm	14	112		
				0		
23.0	Providing and fixing 1st quality ceramic glazed wall tiles conforming to IS:15622 (thickness to be specified by the manufacturer), of approved make, in all colours, shades except burgundy, bottle green, black of any size as approved by Engineer-in-Charge, in skirting, risers of steps and dados, over 12 mm thick bed of cement mortar 1:3 (1 cement : 3 coarse sand) and jointing with grey cement slurry @ 3.3kg per sqm, including pointing in white cement mixed with pigment of matching shade complete.	sqm	30	240		
				0		
24.0	Providing and laying rectified Glazed Ceramic floor tiles of size 300x300 mm or more (thickness to be specified by the manufacturer), of 1st quality conforming to IS : 15622, of approved make, in approved colours, laid on 20 mm thick cement mortar 1:4 (1 Cement: 4 Coarse sand), including grouting the joints with white cement and matching pigments etc., complete.	sqm	10	80		
25.0	Providing and laying vitrified floor tiles in different sizes (thickness to be specified by the manufacturer) with water absorption less than 0.08% and conforming to IS : 15622, of approved make, in all colours and shades, laid on 20mm thick cement mortar 1:4 (1 cement : 4 coarse sand), including grouting the joints with white cement and matching pigments etc., complete. Size of Tile 600 x 600 mm	Sqm	35	280		
	<b>ROOFING</b>	-		0		
26.0	Making khurras 45x45 cm with average minimum thickness of 5 cm cement concrete 1:2:4 (1 cement : 2 coarse sand : 4 graded stone aggregate of 20 mm nominal size) over P.V.C. sheet 1 m x 1 m x 400 micron, finished with 12 mm cement plaster 1:3 (1 cement : 3 coarse sand) and a coat of neat cement, rounding the edges and making and finishing the outlet complete.	Each	4	32		
27.0	Providing and laying integral cement based water proofing treatment including preparation of surface as required for treatment of roofs, balconies, terraces etc consisting of following operations: a) Applying a slurry coat of neat cement using 2.75 kg/sqm of cement admixed with water proofing compound conforming to IS. 2645 and approved by Engineer-in-charge over the RCC slab including adjoining walls upto 300 mm height including cleaning the surface before treatment. b) Laying brick bats with mortar using broken bricks/brick bats 25 mm to 115 mm size with 50% of cement mortar 1:5 (1 cement : 5 coarse sand) admixed with water proofing compound conforming to IS : 2645 and approved by Engineer-in-charge over 20 mm thick layer of cement mortar of mix 1:5 (1 cement :5 coarse sand ) admixed with water proofing compound conforming to IS : 2645 and approved by Engineer-in-charge to required slope and treating similarly the adjoining walls upto 300 mm height including rounding of junctions of walls and slabs c) After two days of proper curing applying a second coat of cement slurry using 2.75 kg/ sqm of cement admixed jointless cement mortar of mix 1:4 (1 cement :4 coarse sand) admixed with water proofing compound conforming to IS : 2645 and approved by Engineer-in-charge including laying glass fibre cloth of and approved by Engineer-in-charge including laying glass fibre cloth of approved quality in top layer of plaster and finally finishing the surface with trowel with neat cement slurry and making pattern of 300x300 mm square 3 mm deep. e) The whole terrace so finished shall be flooded with water for a minimum period of two weeks for curing and for final test. All above operations to be done in order and as directed and specified by the Engineer-in-Charge. Work to be executed by approved agency and specified guarantee for 07 years shall be furnished by the tenderer.	-		0		
27.1	With average thickness of 120 mm and minimum thickness at khurra as 65 mm.	Sqm	100	800		
28.0	Providing and fixing on wall face unplasticised Rigid PVC rain water pipes conforming to IS : 13592 Type A, including jointing with seal ring conforming to IS : 5382, leaving 10 mm gap for thermal expansion complete with PVC moulded fittings and accessories like Couplers, Tees, Bends, Shoes, PVC pipe clamps & fastner complete in all respects and as directed by Engineer-in-Charge	-		0		
	110 mm diameter	Rm	12	96		
				0		
29.00	<b>FINISHING</b>	-		0		
29.10	12 mm cement internal plaster on walls of all heights at all levels in perfect line and level	Sqm	275	2200		
29.20	18 mm external cement plaster in two coats under layer 12 mm thick cement plaster 1:5 (1 cement : 5 coarse sand) and a top layer 6 mm thick cement plaster 1:5 (1 cement : 5 fine sand) for all heights and levels in perfect line and level	Sqm	1035	8280		
29.30	6 mm cement plaster of mix : 1:3 (1 cement : 3 fine sand) in ceiling in perfect line and level at all levels	-		0		
		Sqm	95	760		
29.40	15mm thick Cement plaster 1:6 (1Cement : 6 coarse Sand) outer walls	Sqm	870	6960		
29.50	Wall painting with premium acrylic emulsion paint, having VOC (Volatile Organic Compound ) content less than 50 grams/ litre, of approved brand and manufacture, including applying two or more coats wherever required, to achieve even shade and colour for all heights and levels. Item includes applying pop putty and one coat of primer.	Sqm	290	2320		
29.6	Painting with synthetic enamel paint, having VOC (Volatile Organic Compound) content less than 150 grams/ litre, of approved brand and manufacture, including applying two or more coats over a coat of primer wherever required to achieve even shade and colour for all heights and levels	Sqm	175	1400		
29.70	Painting with APEX/Wheathershield make exterior paint with one coat of primer and two or more coat of approved paint on new work wherever required to achieve even shade and colour for all heights and levels	Sqm	1150	9200		
30.00	<b>ALUMINIUM WORK</b>	-				

	Providing and fixing aluminium work for doors, windows, ventilators and partitions with extruded built up standard tubular sections/ appropriate Z sections and other sections of approved make conforming to IS: 733 and IS: 1285, fixing with dash fasteners of required dia and size, including necessary filling up the gaps at junctions, i.e. at top, bottom and sides with required EPDM rubber/ neoprene gasket etc. Aluminium sections shall be smooth, rust free, straight, mitred and jointed mechanically wherever required including cleat angle, Aluminium snap beading for glazing / paneling, C.P. brass / stainless steel screws, all complete as per architectural drawings and the directions of Engineer-in-charge.	-				
	Anodised aluminium (anodised as per IS:1868 of required shade and coating as per AC-15)	-				
<b>30.1</b>	For fixed portion such as frame etc	Kgs	230	1840		
<b>30.2</b>	For shutter of door window etc	Kgs	175	1400		
<b>31.0</b>	Providing and fixing 12 mm thick prelaminated particle board flat pressed three layer or graded wood particle board conforming to IS: 12823 Grade I Type II, in panelling fixed in aluminium doors, windows shutters and partition frames with C.P. brass / stainless steel screws etc. complete as per architectural drawings and directions of engineer-in-charge.	-				
<b>31.1</b>	Pre-laminated particle board with decorative lamination on one side and balancing lamination on other side	Sqm	12	96		
<b>32.0</b>	Providing and fixing double action hydraulic floor spring of approved brand and manufacture conforming to IS : 6315, having brand logo embossed on the body / plate with double spring mechanism and door weight upto 125 kg, for doors, including cost of cutting floors, embedding in floors as required and making good the same matching to the existing floor finishing and cover plates with brass pivot and single piece M.S. sheet outer box with slide plate etc. complete as per the direction of Engineer-in-charge	-				
<b>32.1</b>	With stainless steel cover plate minimum 1.25 mm thickness	Each	6	48		
<b>33.0</b>	Providing and fixing glazing in aluminium door, window, ventilator shutters and partitions etc. with EPDM rubber / neoprene gasket etc. complete as per the architectural drawings and the directions of engineer-in-charge. (Cost of aluminium snap beading shall be paid in basic item):	-		0		
<b>33.1</b>	With float glass panes of 5.50 mm thickness	Sqm	12	96		
<b>34.00</b>	Providing & fixing colour coated aluminium hardware fittings with approved quality and shade as per IS specifications/as approved by Consultant to woodwork with cadmium plated MS screws, suitable sockets in masonry/concrete surface if required including all bye-works complete as per specification, drawing and instruction of Consultants (fittings shall not be paid separately in composite items which specify inclusions of fittings)					
	a) Butt hinges (extruded section 125 mm x 75 mm x 4 mm)	Nos	25	200		
	b) Tower bolts (with barrel & bolts of extruded section -					
	(i) 200 mm x 10 mm	Nos	10	80		
	c) Sliding door bolts including locking arrangement (aldrop)					
	(i) 250 mm long x 16 mm dia rod	Nos	8	64		
	d) Grip handle without back plate of approved IS brand			0		
	(i) 125 mm long	Nos	20	160		
<b>34.00</b>	e) floor stopper of double type for door shutters up to 40 mm thick			0		
	(i) rubber - double type	Nos	10	80		
	f) Providing & fixing approved quality hydraulic door closer conforming to IS:3564 (Everite or equivalent) as directed by Consultant	Nos	2	16		
<b>35.00</b>	<b>ROAD WORK &amp; External development</b>	-				
<b>35.10</b>	Providing and laying at or near ground level factory made kerb stone of M-25 grade cement concrete in position to the required line, level and curvature, jointed with cement mortar 1:3 (1 cement: 3 coarse sand), including making joints with or without grooves (thickness of joints except at sharp curve shall not be more than 5mm), including making drainage opening wherever required complete etc. as per direction of Engineer-in-charge (length of finished kerb edging shall be measured for payment). (Precast C.C. kerb stone shall be approved by Engineer-in-charge).SIZE : (150MMX600MM)	Cum	12	96		
<b>35.20</b>	Preparation and consolidation of sub grade with power road roller of 8 to 12 tonne capacity after excavating earth to an average of 22.5 cm depth, dressing to camber and consolidating with road roller including making good the undulations etc. and re-rolling the sub grade and disposal of surplus earth with lead upto 50 metres.	Sqm	1380	11040		
<b>35.30</b>	Extra for compaction of earth work in embankment under optimum moisture conditions to give at least 98% of the maximum dry density (proctor density).	Cum	175	1400		
<b>35.40</b>	Providing and laying 10-40mm well graded granular stone aggregate for wet mix macadam as base course compacted thickness 135mm done in two layers (each layer compacted from 200 mm to 135 mm) including all materials, labours, plant and machinery including all lead and lift, loading, unloading, transporting, stacking, spreading to line, level gade and camber, compacting, watering etc., complete with vibratory roller compactor 8 to 10 tonne to attain 98% of max. dry density	Cum	90	720		

35.50	Construction of dry lean cement concrete sub base over a prepared sub-grade with coarse and fine aggregate conforming to IS:383, the size of coarse aggregate not exceeding 25 mm, aggregate cement ratio not to exceed 15:1, aggregate gradation after blending to be as per specifications, cement content not to be less than 150kg/cum optimum moisture content to be determined during trial length construction, concrete strength not to be less than 10 Mpa at 7 days, mixed in a batching plant, transported to site, for all leads & lifts, laid with a mechanical paver, compacting with 8-10 tonne vibratory roller, finishing and curing etc. complete as per direction of Engineer-in-charge.	Cum	130	1040		
35.60	Providing and laying paving of pre cast concrete interlocking pavers made of M30 grade concrete of 80mm thickness of approved pattern make, size, of compressive strength 300KG/sq cm. Paver blocks should be laid on 150mm thk DLC and sand cushion as required with a gap of 1.5mm between the blocks filled with sand including paving and curb gap to be filled with concrete of same grade of concrete pavers	Sqm	370	2960		
36.00	<b>WATER SUPPLY &amp; SANITARY</b>	-		0		
	Providing and fixing PVC water tank of approved make with ISI mark and conforming to IS 12701 and with GI fittings for inlet, outlet, Over flow, scour float valve, connections of required size and dia. Including connections and hoisting/fixing the same tank on roof and other places at all heights with all bye-works complete at all leads and lifts as per drawings, specifications and instructions of the Engineer Incharge. (Support of tank on brick/RCC/PCC will be paid under relevant items)	-		0		
36.10	a) 1000 litres capacity	Nos	2	16		
37.00	Providing and fixing white glazed vitreous china European water closet with ISI mark - Studio type with cistern (EWC) of superior quality 81cm high, double trap syphonic pattern, 'P' or 'S' trap, with low level cistern with cover with siphon and standard flush fittings, plastic seat cover & lid of superior approved quality, CP brass bar hinges, screws, bolts, rubber, buffers 15mm dia PVC inlet pipe connection and CP brass angle stopcock, fixing EWC to floor with floor trap for waste water and necessary brass screws, all complete at all leads and lifts as per manufacturer's specifications and instructions of the Engineer-In-charge.	Nos	2	16		
38.00	Supplying, fitting and fixing white glazed vitreous china wash basin of superior quality - HSW No. 10032 model or equivalent with ISI mark and size 550mm x 430mm, having single or double holes with 15 mm CP brass pillar tap - JAQUAR Continental series No. 011, CP brass chain and plugs, 32mm CP brass waste coupling, PVC flexible waste pipe, 15mm PVC inlet water pipe connection, CI cantilever brackets embedded in 1:2:4 concrete, 15 mm CP brass angle stopcock - JAQUAR Continental series No. 053, etc. filling the gaps between basin and wall with white cement etc. all complete at all leads and lifts as per drawings, specifications and instructions of the Engineer-In-charge.	Nos	2	16		
39.00	Supplying, fabricating and laying UPVC pipes BS 5255 including collars, bends and specials, taking out waste water and soil waste from toilets to the nearest gully trap or inspection chamber including the cost of all material, labour, leads & lifts, transportation, taxes, duties, all as per specifications, drawings and directions of the Engineer-In-charge.	-		0		
39.10	a) 75 mm dia	RM	65	520		
39.20	b) 110 mm dia	RM	12	96		
39.30	c) 160 mm dia	RM	25	200		
39.40	Supply and fixing of Floor trap with SS grating to waste water pipe connection.	-				
	1) 75mm dia of weight not less than 4.8 Kgs.	Nos	3	24		
40.00	Providing and fixing white glazed vitreous china large flat back, channel flushing, front lipped standing urinal size 590x375x390mm of superior quality from approved make (similar to HSW No. 60002 model with ISI mark, with push valve, 15 mm PVC flexible inlet connection, 15mm CP brass angle cock, 15mm dia CP brass spreaders connected to matching connecting pipe from cistern and 32mm dia PVC waste pipe upto floor all as per directions of the Engineer-in-charge (partitions excluded).	Nos	2	16		
41.00	Providing and fixing 15mm CP brass long body bib cock with wall flange - JAQUAR Continental series No. CON-047KN or equivalent at all leads and lifts as per drawings, specifications and instructions of the Engineer-In-charge.	Nos	2	16		
42.00	Providing and fixing 15mm CP brass concealed stop cock (extra heavy body) with adjustable wall flange - JAQUAR Continental series No. CON-087KN or equivalent at all leads and lifts as per drawings, specifications and instructions of the Engineer-In-charge.	Nos	2	16		
43.00	Providing and fixing 15mm CP brass angular stop cock - JAQUAR Continental series No. CON-059KN or equivalent at all leads and lifts as per drawings, specifications and instructions of the Engineer-In-charge.	Nos	2	16		
44.00	Providing and fixing CP brass health faucet with 8mm dia, 1m long flexible tube and wall hook with NRV- JAQUAR Allied series No. ALD-CHR-577 or equivalent at all leads and lifts as per drawings, specifications and instructions of the Engineer-In-charge.	Nos	2	16		
45.00	Supplying, fitting and laying upvc solvent weld plumbing pipe conforming ASTM D-1785 with all necessary fittings such as bends, tees, elbows, reducers, unions, nipples, plugs, clamps, fixtures, etc., in masonry / concrete works etc., complete at all leads and lifts as per drawings, specifications and instructions of the Engineer-In-charge.	-		0		
45.10	a) 50 mm nominal bore	RM	15	120		
45.20	b) 40 mm nominal bore	RM	15	120		
45.30	c) 32 mm nominal bore	RM	100	800		
45.40	d) 25 mm nominal bore	RM	20	160		
45.50	e) 20 mm nominal bore	RM	15	120		
45.60	f) 15 mm nominal bore	RM	15	120		



46.00	Providing minimum 6mm thick <b>polished float glass mirror</b> , bevelled edge, of approved make fixed to with 6mm thick marine plywood sheet backing with teakwood beading, fixing arrangements all complete at all leads and lifts as per drawings, specifications and instructions of the Engineer-In-charge.	-		0		
	Mirror size- 750x450mm	Nos	2	16		
47.00	Providing and fixing recessed toilet paper roll holder including roller white glazed vitreous china, HSW No. 40.025 or approved equivalent make	Nos	2	16		
48.00	Providing and fixing CP brass towel rail 600mm long, 20 mm dia with CP brackets fixed to wall with SS screws and TW guttas.	Nos	2	16		
49.00	Construction of brick masonry inspection chamber with full bricks, in CM 1:5, provided with a light duty CI covers conforming to IS:1726, 610 x 455 mm, weight not less than 52 kg, embedding the CI frame in 100 mm thick RCC top slab, neatly finished including 12mm thick plastering on both faces in CM 1:6, rounding, float coat of neat cement finish on the inner side, PCC bedding etc., all complete including excavation and backfilling, shuttering, painting the frame and cover with two coats of approved anti corrosive paint etc., as per specifications and direction of Consultant.					
	c) Internal size 450x450	Nos	3	24		
50.00	Providing yard gully trap 150x100mm with CI grating 150 x 150mm and water tight light weight CI covers conforming to IS:1726 of size 300x300mm including half-brick masonry in CM (1:4) plastered neatly with CM (1:4) on both faces, 100mm thick PCC bed of mark M-10C, necessary excavation, complete as per direction of the Consultant.	Nos	2	16		
51.00	Supplying, fitting and fixing superior quality gun metal gate valve (full way) of "LEADER" make or equivalent with ISI mark			0		
	a) 32mm dia	Nos	2	16		
				0		
	<b>MISCELLANEOUS WORK</b>	-		0		
52.00	Providing and laying manually or by pumping at all positions a ready mix non-shrink cementitious grout of compressive strength specified below for specified works e.g. base grouting of rotating equipment and other installation complete in all respects as per scope of work, detailed construction drawings, technical specifications and directions of the Engineer-In-Charge.	-		0		
52.10	a) Having compressive strength of 30 N/mm2	Per bag of 25 Kg	120	960		
	[1] Approved makes are ACC, FOSROC, ROFF, SEIKA QUALCRETE.	-				
	2] Minimum coverage as per manufacturers recommendations shall be applied in absence of actual field consumption data.]	-				
	3. To be read in conjunction with relevent clause of PJS.	-				
53.00	Providing and fixing in concrete at all levels and positions, bolts with nuts and washers, pipe sleeves etc. including painting the exposed surfaces with two coats of approved paint, providing grease to exposed area of bolts, welding wherever necessary, complete as per drawing, specifications and instruction of engineer in charge (PCC blocks, jigs and fixtures will not be paid extra) and protecting the same till final erection.	Kgs	450	3600		
54.00	Providing and fixing concertina coil fencing with punched tape concertina coil 600mm dia 10metre openable length(total length 90m) having 50 nos. rounds per 6 metre length, upto 3 m height of wall with existing angle iron "Y" shaped placed 2.4 m or 3.00 m apart and with 9 horizontal R.B.T. reinforced barbed wire, stud tied with G.I. staples and G.I. clips to retain horizontal including necessary bolts or G.I. barbed wire tied to angle iron all complete as per direction of Engineer-in-charge with reinforced barbed tape (RBT) Spring core (2.5mm thick) wire of high tensile strength of 165 kg/sq.mm with tape (0.52 mm thick) and weight 43.478 gm/metre. (cost of M.S. angle, C.C.blocks shall be paid separately)	RM	175	1400		
55.00	supply and installation of high grade rubber and PVC made Speed Breakers at ingress and egress. Make, size and type shall be as per directions of Engineer-In-Charge	Nos.	2	16		
56.00	Providing and mixing approved water proofing admixture as per the manufacturer's specification including cost of material complete with all byworks as per drawing, manufacturer's specifications and instruction of the Engineer-In-charge.	per bag of 50kg cement used	230	1840		
	a) Liquid water proofing compound of approved make (similar to Prolapin 421 IC/Plastocrete - N)	-				
57.0	Providing and laying stone ballast 40 to 115 mm size in layers upto 200mm thickness (wherever not covered in respective SOR items) with spreading & blinding material like sand, stone grit and compaction with mechanical means, watering etc. <b>under floors/foundations, plinth protection &amp; as per drawings</b> including cost of material complete in all respect as per scope of work, detailed construction drawings as per technical specifications and directions of the Engineer-in-charge.	Cum	14	112		
58.0	Providing and fixing G.I. chain link fabric fencing of required width in mesh size 50x50 mm including strengthening with 2 mm dia wire or nuts, bolts and washers as required complete as per the direction of Engineer-In-charge. The cost of structural steel and PCC shall be paid separately.	-		0		
58.1	Made of G.I. wire of dia 4 mm	Sqm	120	960		
59.0	Supplying & Spreading of trap / granite /quartzite/gniss crusher broken stone metal of following size for the sub all lead & lift e.t.c. complete	-		0		
	a) 40 mm metal	Cum	4	32		
				0		
	<b>DISMANTLING/DEMOLISHING</b>	-		0		

60.00	Demolishing of Cement Concrete (PCC) of all grades manually/mechanical means including disposal of debris as directed by the Engineer. Debris shall be disposed outside the site and this shall be entirely Contractor's responsibility irrespective of any Lead.	Cum	5	40		
61.00	Demolishing of RCC of all grades manually/ mechanical means including disposal of debris as directed by the Engineer. Debris shall be disposed outside the site and this shall be entirely Contractor's responsibility irrespective of any Lead.	Cum	15	120		
62.00	Demolishing of CC block work/brick work / stone masonry of all grades manually/ mechanical means including disposal of debris as directed by the Engineer. Debris shall be disposed outside the site and this shall be entirely Contractor's responsibility irrespective of any Lead.	Cum	20	160		
63.00	Demolishing barbed wire or flexible wire rope in fencing including making rolls and staking as directed by the Engineer.	Kgs	35	280		
64.00	<b>SOAK PIT AND SEPTIC TANK</b>	-		0		
64.1	Providing and construction of septic tank in brick masonry and base and top slab in RCC M25 complete in all respect as per scope of work, detailed construction drawings, technical specifications and directions of the Engineer-in-charge.	Nos.	1	8		
64.2	Making soak pit with 2.5 m diameter 3.0 metre deep with 45 x 45 cm dry brick honey comb shaft with bricks and S.W. drain pipe 100 mm diameter, 1.8 m long complete as per standard design. With class7.5 bricks	Nos.	1	8		
64.3	Supply and placing NP2 class R.C.C. pipes with collars jointed with stiff mixture of cement mortar in the proportion of (1:2): With 150mm dia	RM	60	480		
65.00	<b>BORE WELL</b>			0		
	Boring, drilling the borewell of 6.5 inch dia with casing/strainer pipe of approved make by suitable method prescribed in IS:2800 (P-I) with 300 mm dia PVC outer casing pipe till required depth including labour, hire and running charges of all equipment, tools, plants, machineries & fittings required for the job, supply and fixing required capacity submersible pump of approved make with electrical cabling & accessories, flushing & development of borewell, providing borewell water and yield test reports etc all complete as per direction of the Engineer.			0		
65.1	a) Drilling in all type of strata upto 100 Mtr depth.	RM	100	800		
	b) Drilling in all type of strata beyond 100 Mtr and upto 200 Mtr depth.	RM	100	800		
	c) Supplying and fixing in position in borewell UPVC casing pipe 7inch dia as per IS:12818 at all depths including fittings, accessories etc.	RM	50	400		
	d) Supplying and fixing in position Submersible pump of required capacity with electrical cables, fittings, fixtures etc.-3HP , 30 Stage Motor 259 to 702 feet : Head Ra... 1440 to 4320 ltrs/hrs : F... 4" OD, 1.25" Delivery Single Phase	Nos.	1	8		
	<b>TOTAL FOR CIVIL WORKS</b>					

Tender No. GGPL/KKD/C&P/CW/2545/VS		SCHEDULE OF RATES FOR CNG MOTHER STATIONS				
Item No.	Description	Unit	Quantity for 1 (one) no. of CNG mother station	Total Quantity for 8 (EIGHT) nos. of CNG mother station	Unit Rate	Total Amount for 8 (eight) nos. of CNG mother stations exclusive of GST (in Rs.)
<b>PART II-ELECTRICAL WORKS</b>						
<b>ELECTRICAL WORKS -SUPPLY</b>						
1	Supply of lighting fixtures complete with mounting bracket, flame proof/non flame proof type Light fixture,glands, lugs etc. including civil works with pipe inserts for cables and all associated works as per specifications, drawings and instruction of Engineer-in-charge. Work to be completed in all respects.Make of all equipments shall be as per approved make list	-	-			
a)	Street lighting pole 6mtr high GI octagonal pole complete with bracket, GI clamps for fixing flame proof Junction Box, and other accessories as required as per standard drawing & tender specification.	Set	12	96		
b)	FLP Junction box for terminating Loop in & Loop Out cable.	Set	12	96		
c)	4 x 24 W Flame proof street light Ex-d type fixture with T5 lamps, control gear in cast aluminium alloy LM6 enclosure and toughened glass cover with all accessories. The enclosure shall be of IP: 65 suitable for Zone 1 & 2 gas group IIA & IIB . Similar to CGL model FSL 424 .	Set	16	128		
d)	Surface mounted LED type lighting fixture including 36 W LED Lamp,driver and other accessories Similar to CGL cat.No. LCTLR-36-CDL.	Set	9	72		
e)	Surface mounted Industrial vapour proof IP65 luminaire including 39 W LED,driver ,with polycarbonate housing and other accessories similar to Wipro model LE20-491-XXX-67-XX.	Set	1	8		
f)	Energy saving surface mounted 6 W LED decorative Luminaire with LED lamp, driver,thermally conductive housing and PMMA diffuser.Similar to CG Catl No. LCSR-06-CDL.	Set	3	24		
g)	7 W LED Light fitting,Linear mirror light provided with high output PMMA diffuser, LED lamp ,driver and other accessories .Similar to CG cat. No. LCL-07-CDL.	Set	1	8		
2	Supply of the underlight for the canopy as specified including FLP lighting fixture, 72W LED lamp , driver ,similar to Baliga Cat.No. ECRF-236, FLP junction box etc. as required.	No.	6	48		
3	1200mm sweep Ceiling fan including suitable down rod.Energy star rating for the equipment shall be considered 5 star rated.	Nos.	1	8		
4	380mm Sweep Exhaust fan, single phase propeller type having bird screen mesh /louvers complete with mounting bracket, rubber pads of suitable thickness to absorb vibrations, etc.Energy star rating for the equipemnt shall be considered as 5 star rated.	Nos.	2	16		
5	380mm Sweep FLP Exhaust fan, single phase propeller type having bird screen mesh /louvers complete with mounting bracket, rubber pads of suitable thickness to absorb vibrations, etc.Energy star rating for the equipemnt shall be considered as 5 star rated.	Nos.	1	8		
6	Supplying and fixing suitable size GI box with modular plate and cover in front on surface or in recess, including providing and fixing modular socket along with modular switch of required rating as specified below, connections etc. as required.outlet and			0		
a)	16A/6A , 5 in 1 socket outlet with safety shutter along with 16A Piano switch in modular type boxes	Nos.	16	128		
b)	16A ,Socket outlet with safety shutter along with C Curve,16A TP MCB in modular type boxes .	Nos.	3	24		
c)	6A , 5 in 1 socket outlet along with 6A Piano switch in modular type boxes	Nos.	15	120		
				0		
7	16A Rotary Switch in FLP LM6 Aluminium alloy , IP 65 enclosure for controlling canopy light fittings.	Nos.	2	16		
8	Supply of Switchboards :	-	-	0.00		
a)	Floor mounted PDB consisting of Bus bar chamber, Capacitor panel, Incoming and Outgoing feeders as per Tender Drg.No.MEC/23RT/01/E1/D2/CN/ST/0413 & tender specification.	No.	1	8		
b)	Floor mounted Emergency panel consisting of bus bar chamber, cable alley, incoming & outgoing MCCB feeders as specified in tender drg. no. MEC/23RT/01/E1/D2/CN/ST/0414 & as per tender specification.	No.	1	8		
c)	Wall/Column mounted LDB-1 (For Building Lighting Points) as specified in tender drg. no. MEC/23RT/01/E1/D2/CN/ST/0415 & as per tender specification.	No.	1	8		
d)	Wall/Column mounted LDB-2 (For Building Power Points) as specified in tender drg. no. MEC/23RT/01/E1/D2/CN/ST/0416 & as per tender specification	No.	1	8		
e)	Wall/Column LDB-3 (For Outdoor Lighting) consisting of PB, indication Lamp etc. as specified in tender drg. no. MEC/23RT/01/E1/D2/CN/ST/0417 & as per tender specification	No.	1	8		
f)	LT Distribution box (2 mm thk. SMC sheet) 160 AMPS ,TPN,MCCB 415 V, 50kA for 1 sec., IP 55, cable entry side and bottom as per tender specification along with mounting arrangement and other accessories-BESCOM APPROVED MAKE.	No.	1	8		

9	Earthing pits comprising, 3.5 meter long 50 mm dia. GI pipe electrode, charcoal, salt, GI earthing conductor for interconnecting the electrodes, 6mm thick CI checked plate for cover, CI earth pit marker, erection accessories conforming to IS- 3043 and as per technical specification. It shall also include brick masonry chamber and all other civil works	Nos.	12	96	
10	Galvanised (GI) earth conductor .			0	
a)	GI Strip (50X6) mm	Mtr.	200	1600	
b)	GI Strip (25X3) mm	Mtr.	350	2800	
c)	8 SWG GI wire	Mtr.	100	800	
d)	16 sq.mm braided copper wire	Mtr.	5	40	
11	Crocodile Clamp of Brass	No.	1	8	
12	Supply of 1.1kV grade XLPE insulated, PVC sheathed ST2 , FRLS armoured Cables (conforming to IS:7098 and specification) of following sizes:	-	-	0.00	
a)	3.5 x 95 mm <sup>2</sup> A2XFY	Mtr.	100	800	
b)	3.5 X 50 mm <sup>2</sup> A2XFY	Mtr.	20	160	
c)	3.5 X 25 mm <sup>2</sup> A2XFY	Mtr.	20	160	
d)	4x16 mm <sup>2</sup> A2XFY	Mtr.	50	400	
e)	4x10 mm <sup>2</sup> 2XWY	Mtr.	50	400	
f)	4x6 mm <sup>2</sup> 2XWY	Mtr.	50	400	
g)	4x2.5 mm <sup>2</sup> 2XWY	Mtr.	1150	9200	
h)	2x2.5 mm <sup>2</sup> 2XWY	Mtr.	250	2000	
				0	
13	Supply of 1.1 Kv grade cable FLP, double compression type Brass cable glands as per Tender Specification for the following sizes of cables:			0	
a)	3.5 x 95 mm <sup>2</sup> A2XFY	Nos.	2	16	
b)	3.5 X 50 mm <sup>2</sup> A2XFY	Nos.	2	16	
c)	3.5 X 25 mm <sup>2</sup> A2XFY	Nos.	4	32	
d)	4x16 mm <sup>2</sup> A2XFY	Nos.	4	32	
e)	4x10 mm <sup>2</sup> 2XWY	Nos.	2	16	
f)	4x6 mm <sup>2</sup> 2XWY	Nos.	2	16	
g)	4x2.5 mm <sup>2</sup> 2XWY	Nos.	52	416	
h)	2x2.5 mm <sup>2</sup> 2XWY	Nos.	4	32	
				0	
14	Supply of 1.1 Kv grade cable with heavy duty crimping type Copper lugs etc as per Tender Specification for the following sizes of cables:			0	
a)	3.5 x 95 mm <sup>2</sup> A2XFY	Nos.	8	64	
b)	3.5 X 50 mm <sup>2</sup> A2XFY	Nos.	8	64	
c)	3.5 X 25 mm <sup>2</sup> A2XFY	Nos.	16	128	
d)	4x16 mm <sup>2</sup> A2XFY	Nos.	16	128	
e)	4x10 mm <sup>2</sup> 2XWY	Nos.	8	64	
f)	4x6 mm <sup>2</sup> 2XWY	Nos.	8	64	
g)	4x2.5 mm <sup>2</sup> 2XWY	Nos.	208	1664	
h)	2x2.5 mm <sup>2</sup> 2XWY	Nos.	8	64	
				0	
15	Supply of 3CX 95 sq.mm, 11kV(E) grade XLPE insulated, PVC sheathed ST2 ,Semi conductor screen , aluminium conductor , armoured Cables (conforming to IS:7098 and specification).	Mtr.	25	200	
16	Indoor Cable end termination kits suitable for 11 kV, 3x95 sq.mm XLPE cable (Heat shrinkable type).	Set	2	16	
17	Supply and Wiring with 2X4 sq. mm FRLS PVC insulated copper conductor single core cable in surface/ recessed medium class 25mm PVC conduit alongwith 1 No. 4 sq. mm FRLS PVC insulated copper conductor single core cable for loop earthing as required.	No.	31	248	
18	<b>Point wiring for primary &amp; secondary points of light/Fans point/ exhaust fan point/ socket point with FRLS PVC insulated copper conductor single core cable of size indicated below in surface / recessed medium class 19 mm PVC conduit, with piano type switch, phenolic laminated sheet, suitable size G.I. box and earthing the point with FRLS PVC insulated copper conductor single core cable of size indicated below etc. as required. The scope also covers supply and laying of PVC conduit, the pulling of wire from switchbox to lighting/fan point through the conduit and connecting both the ends with all accessories, like switch box, junction boxes &amp; couples, pull boxes etc including breaking of walls /floors, earthing etc.)</b>			0.00	
a)	<b>Primary point (For Lighting point)</b>			0.00	
	Supply & wiring of light point including 1 no. 6 Amp 240 V snap on grid system modular type switch with mounted front plate to match with the interior made with shielded contact (polycarbonate) and along with recess mounting G.I box of adequate size with two no. of 2.5 sq.mm + one (earth green ) runs of 1.5 sq.mm wire etc. as indicated in SI. No. 14.	Nos.	12.00	96	
b)	<b>Secondary points ( For lighting upto 3 points in a group)</b>			0.00	
	Supply and wiring of subsequent light points controlled by primary points described as above, with two no. of 2.5 sq.mm + one (earth-green) runs of 1.5 sq.mm wire etc as indicated in SI. No. 18.	Nos.	10.00	80	
c)	<b>Ceiling fan &amp; Exhaust fan points</b>			0.00	
	Supply and wiring for ceiling/ wall mounted fan point / exhaust fan point with 1 no. 10Amp 240V modular switch and electronic regulator (only for ceiling fans) mounted snap on grid system type front plate to match with the interior made with shielded contact (polycarbonate) and along with recess mounting G.I box of adequate size with two + one (earth green ) runs of 2.5 sq.mm as indicated in SI. No. 18.	Nos.	3.00	24	
d)	<b>Primary Point (For 6A Socket Outlet with Switch)</b>			0	
	Supply and wiring of socket outlet with switch with two no. of 2.5 sq.mm + one (earth-green) runs of 1.5 sq.mm wire etc as indicated in SI. No. 18.	Nos.	5.00	40	
e)	<b>Primary Point (For 6A Socket Outlet with Switch)</b>			0	
	Supply and wiring of subsequent socket outlet with switch controlled by Primary point with two no. of 2.5 sq.mm + one (earth-green) runs of 1.5 sq.mm wire etc as indicated in SI. No. 18.	Nos.	5.00	40	
19	Supply of following sizes of class 'B' G.I.Pipe including all material and labour as per specification and drawings approved			0	
a)	40mm NB	Mtr.	20	160	
b)	50 mm NB	Mtr.	500	4000	
c)	80 mm NB	Mtr.	300	2400	
d)	100 mm NB	Mtr.	20	160	
				0	
20	Supply of following sizes of PVC Pipe			0	
a)	19 mm NB	Mtr.	20	160	
b)	25 mm NB	Mtr.	20	160	
c)	40 mm NB	Mtr.	20	160	
d)	60 mm NB	Mtr.	20	160	
e)	100 mm NB	Mtr.	20	160	
				0	

21	Supply of following including necessary clamp, bolts, rawl plugs etc.	-	-	0.00		
a)	Shock hazard charts	Nos.	1	8		
b)	First Aid Boxes	Nos.	1	8		
c)	Carbon-di-oxide(CO2) type fire extinguisher 4.5 Kg capacity Complete with gunmetal valve conforming to IS : 3224 With ISI mark, Discharge horn with bend & wall fixing Bracket With Mfg. Test certificate.	Nos.	3	24		
d)	Caution boards	Nos.	3	24		
e)	Single Line Diagram in teak wood wall cabinet with glass door	No.	1	8		
f)	Wooden key box with glass cover	No.	1	8		
				0		
22	Supply of 1.1kV grade insulated mats required for maintenance of electrical equipment in substation as required including cutting to required shape in running length and including all labour and materials etc. complete and as per directions of Engineer-In-Charge as per IS 15652 and Indian Electricity Rules.	Sq.Mtr.	8	64		
				0		
23	Supply of latest model( 5 stars BEE certified) 1.5 T split AC complete with remote control unit, 5 KVA stabilizer, MS painted Stand for outdoor unit etc.	Nos.	1	8		
				0		
24	Supply of 63kVA ,11/0.433kV Outdoor type, 3 Ph, 50Hz, Aluminium wound,Dyn11, ONAN Distribution Transformer complete with all accessories and first oil filled. Termination arrangement for HV side & LV side and all miscellaneous civil materials required to complete HT & LT installation as indicated in the tender specification no. .	No	1	8		
25	Supply of 150mm GI ladder type cable tray along with all accessories etc.	Mtrs	4	32		
26	Supply of 2 Coats of Primer Painted & Fabricated support structure.	Kg	200	1600		
	<b>TOTAL FOR ELECTRICAL (SUPPLY) WORKS</b>					
	<b>ELECTRICAL WORKS - ERECTION</b>					
1	Installation, testing, commissioning of lighting fixtures complete with mounting bracket, flame proof/non flame proof fixture, glands, lugs etc. including minor civil works with pipe inserts for cables and all associated work as per specifications, drawings and instruction of Engineer-in-charge. Work to be completed in all respects.	-	-	#VALUE!		
a)	Street lighting pole 6mtr high GI octagonal pole complete with bracket, GI clamps for fixing flame proof Junction Box, and other accessories as required as per standard drawing & tender specification.	Set	12	96		
b)	FLP Junction box for terminating Loop in & Loop Out cable.	Set	12	96		
c)	4 x 24 W Flame proof street light Ex-d type fixture with T5 lamps, control gear in cast aluminium alloy LM6 enclosure and toughened glass cover with all accessories. The enclosure shall be of IP: 65 suitable for Zone 1 & 2 gas group IIA & IIB . Similar to CGL model FSL 424 .	Set	16	128		
d)	Surface mounted LED type lighting fixture including 36 W LED Lamp,driver and other accessories Similar to CGL cat.No. LCTLR-36-CDL.	Set	9	72		
e)	Surface mounted Industrial vapour proof IP65 luminaire including 39 W LED,driver ,with polycarbonate housing and other accessories similar to Wipro model LE20-491-XXX-67-XX.	Set	1	8		
f)	Energy saving surface mounted 6 W LED decorative Luminaire with LED lamp, driver,thermally conductive housing and PMMA diffuser. Similar to CG Catl No. LCSR-06-CDL.	Set	3	24		
g)	7 W LED Light fitting,Linear mirror light provided with high output PMMA diffuser, LED lamp ,driver and other accessories . Similar to CG cat. No. LCL-07-CDL.	Set	1	8		
2	Erection , testing and commissioning of the underlight for the canopy as specified including FLP lighting fixture, 72W LED lamp , driver ,similar to Baliga Cat.No. ECRF-236, FLP junction box etc. as required.	No.	6	48		
3	1200mm sweep Ceiling fan including suitable down rod.Energy star rating for the equipment shall be considered 5 star rated.	Nos.	1	8		
4	380mm Sweep Exhaust fan, single phase propeller type having bird screen mesh /louvers complete with mounting bracket, rubber pads of suitable thickness to absorb vibrations, etc.Energy star rating for the equipemnt shall be considered as 5 star rated.	Nos.	2	16		
5	380mm Sweep FLP Exhaust fan, single phase propeller type having bird screen mesh /louvers complete with mounting bracket, rubber pads of suitable thickness to absorb vibrations, etc.Energy star rating for the equipemnt shall be considered as 5 star rated.	Nos.	1	8		
6	16A Rotary Switch in FLP LM6 Aluminium alloy , IP 65 enclosure for controlling canopy light fittings.	Nos.	2	16		
7	Installation, testing, commissioning of Switchboards :	-	-	0.00		
a)	Floor mounted PDB consisting of Bus bar chamber, Capacitor panel, Incoming and Outgoing feeders as per Tender Drg.No.MEC/23RT/01/E1/D2/CN/ST/0413 & tender specification.	No.	1	8		
b)	Floor mounted Emergency panel consisting of bus bar chamber, cable alley, incoming & outgoing MCCB feeders as specified in tender drg. no. MEC/23RT/01/E1/D2/CN/ST/0414 & as per tender specification.	No.	1	8		
c)	Wall/Column mounted LDB-1 (For Building Lighting Points) as specified in tender drg. no. MEC/23RT/01/E1/D2/CN/ST/0415 & as per tender specification.	No.	1	8		
d)	Wall/Column mounted LDB-2 (For Building Power Points) as specified in tender drg. no. MEC/23RT/01/E1/D2/CN/ST/0416 & as per tender specification	No.	1	8		
e)	Wall/Column LDB-3 (For Outdoor Lighting) consisting of PB, indication Lamp etc. as specified in tender drg. no. MEC/23RT/01/E1/D2/CN/ST/0417 & as per tender specification	No.	1	8		
f)	LT Distribution box (2 mm thk. SMC sheet) 160 AMPS ,TPN,MCCB 415 V, 50kA for 1 sec., IP 55, cable entry side and bottom as per tender specification along with mounting arrangement and other accessories-BESCOM APPROVED MAKE.	No.	1	8		

8	Erection , testing and commissioning of Earthing pits comprising, 3.5 meter long 50 mm dia. GI pipe electrode, charcoal, salt, GI earthing conductor for interconnecting the electrodes,6mm thick CI checked plate for cover ,CI earth pit marker, erection accessories conforming to IS- 3043 and as per technical specification.It shall also include brick masonry chamber and all other civil works	Nos.	12	96.00		
9	Galvanised (GI) earth conductor .			0.00		
a)	GI Strip (50X6) mm	Mtr.	200	1600		
b)	GI Strip (25X3) mm	Mtr.	350	2800		
c)	8 SWG GI wire	Mtr.	100	800		
d)	16 sq.mm braided copper wire	Mtr.	5	40		
10	Crocodile Clamp of Brass	No.	1	8		
11	Installation, testing, commissioning of 1.1kV grade XLPE insulated, PVC sheathed ST2 , FRLS Electrical Power and Control Cables (conforming to IS:7098 and specification) of following sizes:	-	-	0.00		
a)	3.5 x 95 mm <sup>2</sup> A2XFY	Mtr.	100	800		
b)	3.5 X 50 mm <sup>2</sup> A2XFY	Mtr.	20	160		
c)	3.5 X 25 mm <sup>2</sup> A2XFY	Mtr.	20	160		
d)	4x16 mm <sup>2</sup> A2XFY	Mtr.	50	400		
e)	4x10 mm <sup>2</sup> 2XWY	Mtr.	50	400		
f)	4x6 mm <sup>2</sup> 2XWY	Mtr.	50	400		
g)	4x2.5 mm <sup>2</sup> 2XWY	Mtr.	1150	9200		
h)	2x2.5 mm <sup>2</sup> 2XWY	Mtr.	250	2000		
12	Installation, Commissioning of 1.1 Kv grade cable double compression type Brass cable glands as per Tender Specification for the following sizes of cables:			0		
	3.5 x 95 mm <sup>2</sup> A2XFY	Nos.	2	16		
	3.5 X 50 mm <sup>2</sup> A2XFY	Nos.	2	16		
	3.5 X 25 mm <sup>2</sup> A2XFY	Nos.	4	32		
	4x16 mm <sup>2</sup> A2XFY	Nos.	4	32		
	4x10 mm <sup>2</sup> 2XWY	Nos.	2	16		
	4x6 mm <sup>2</sup> 2XWY	Nos.	2	16		
	4x2.5 mm <sup>2</sup> 2XWY	Nos.	52	416		
	2x2.5 mm <sup>2</sup> 2XWY	Nos.	4	32		
13	Installation, Commissioning of 1.1 Kv grade cable with heavy duty crimping type Copper lugs etc as per Tender Specification for the following sizes of cables:			0		
	3.5 x 95 mm <sup>2</sup> A2XFY	Nos.	8	64		
	3.5 X 50 mm <sup>2</sup> A2XFY	Nos.	8	64		
	3.5 X 25 mm <sup>2</sup> A2XFY	Nos.	16	128		
	4x16 mm <sup>2</sup> A2XFY	Nos.	16	128		
	4x10 mm <sup>2</sup> 2XWY	Nos.	8	64		
	4x6 mm <sup>2</sup> 2XWY	Nos.	8	64		
	4x2.5 mm <sup>2</sup> 2XWY	Nos.	208	1664		
	2x2.5 mm <sup>2</sup> 2XWY	Nos.	8	64		
14	Installation , Testing and Commissioning of 3CX 95 sq.mm, 11kV(E) grade XLPE insulated, PVC sheathed ST2 ,Semi conductor screen , aluminium conductor , armoured Cables (conforming to IS:7098 and specification)	Mtr.	25	200		
15	Installation of Indoor Cable end termination kits suitable for 11 kV, 3x95 sq.mm XLPE cable (Heat shrinkable type).	Set	2	16		
16	Installation of following sizes of class 'B' G.I.Pipe including all associated civil work with all material and labour as per specification and drawings	-	-	0.00		
a)	40 mm NB	Mtr.	20	160		
b)	50 mm NB	Mtr.	500	4000		
c)	80 mm NB	Mtr.	300	2400		
d)	100 mm NB	Mtr.	20	160		
17	Erection, Commissioning of following sizes of PVC Pipe	-	-	0.00		
a)	19 mm NB	Mtr.	20	160		
b)	25 mm NB	Mtr.	20	160		
c)	40 mm NB	Mtr.	20	160		
d)	60 mm NB	Mtr.	20	160		
e)	100 mm NB	Mtr.	20	160		
18	Installation of following including necessary clamp, bolts, rawl plugs etc.	-	-	0.00		
a)	Shock hazard charts	Nos.	1	8		
b)	First Aid Boxes	Nos.	1	8		
c)	Carbon-di-oxide(CO2) type fire extinguisher 4.5 Kg capacity Complete with gunmetal valve conforming to IS : 3224 With ISI mark, Discharge horn with bend & wall fixing Bracket With Mfg. Test certificate.	Nos.	3	24		
d)	Caution boards	Nos.	3	24		
e)	Single Line Diagram in teak wood wall cabinet with glass door	No.	1	8		
f)	Wooden key box with glass cover	No.	1	8		
19	Installation, testing, commissioning of 1.1kV grade insulated mats required for maintenance of electrical equipment in substation as required including cutting to required shape in running length and including all labour and materials etc. complete and as per directions of Engineer-In-Charge as per IS 15652 and Indian Electricity Rules.	Sq.Mtr.	8	64		
20	Installation of latest model( 5 stars BEE certified) 1.5 T split AC complete with remote, 5 KVA stabilizer, MS Stand for outdoor unit etc.	Nos.	1	8		
21	Installation, testing, commissioning of 63 KVA , 11 kV/433 V outdoor type,3Ph,50Hz, copper wound,Dyn11,ONAN distribution transformer complete with all accessories and first oil filled. Termination arrangement for HV side & LV side .	No	1	8		
22	Installation testing and commissioning of 150mm,GI Cable trays along with all accessories, labour , civil works etc.	Mtrs	4	32		
23	Erection,testing and commissioning of 2 Coats of Primer Painted & Fabricated support structure.	Kg	200	1600		
<b>TOTAL FOR ELECTRICAL (Erection) WORKS</b>						
<b>TOTAL FOR ELECTRICAL (SUPPLY+ERECTION) WORKS</b>						

	Note for Electrical :
	Above quantities are estimated quantities and may change during detail engineering as per site condition. Contractor shall supply the equipments, at the same rate ,as per these change quantities. Payment shall be made as per quantities erected.
	The cable size mentioned in SLD are indicative.The final size shall be based on the actual requirement and the size shall be selected from SOR .
	Makes of all equipemnts shall be as per preferred make list.Items for which preferred makes are not indicated shall be provided only after approval of the make by owner / consultant.

Tender No. GGPL/KKD/C&P/CW/2545/VS			SCHEDULE OF RATES FOR CNG MOTHER STATIONS			
Item No.	Description	Unit	Quantity for 1(one) no. of CNG mother station	Total Quantity for 8 (eight) nos. of CNG mother station	Unit Rate	Total Amount for 8 (eight) nos. of CNG mother stations exclusive of GST (in Rs.)
<b>PART - IV : Mechanical &amp; Piping Works</b>						
<b>SECTION-A : SS TUBE LAYING &amp; TESTING</b>						
1.0 (a)	Laying with PVC heavy duty tube clamp of Swagelok/Parker/DK-Lok/Vaishnavi Hydraulics/Vardhaman bearings/AK Industries, Pneumatic testing with Nitrogen at 280 bar and commissioning of SS tubes along with fittings, mass flow meter and valves as given below and as per Technical Specification and scope of work including handling, lifting, transportation from stores to location of CNG stations.	-	-	-	-	-
1.1	1"OD X 0.120" min Wall thk. SS Tube	RM	150	1200		
1.2	¾"OD X 0.095" min Wall thk. SS Tube	RM	500	4000		
1.3	½"OD X 0.083" min Wall thk. SS Tube	RM	25	200		
1.0 (b)	<b>SUPPLY OF SS TUBES as per Technical Specification (Make:Sandvik/Tubacex/Ratnamani)</b>	-	-	0.00		
1.1	1"OD X 0.120" min Wall thk. ,Material SS316 SS Tube	M	150	1200		
1.2	¾"OD X 0.095" min Wall thk.,Material SS316SS Tube	M	500	4000		
1.3	½"OD X 0.083" min Wall thk.,Material SS316 SS Tube	M	25	200		
	Note: Quantities beyond mentioned quantities may be provided as free issue.	-	-	0.00		
2	<b>Supply of SS Fittings (Make:Swagelok/Parker/SSP/Dk-lok/Hylok)</b>	-	-	0.00		
	<b>Quick Connect Body &amp; Stem</b>	-	-	0.00		
2.1	End connection:½" Tube OD, for stem & ½"NPT (F) for body Material : SS316; Rated pressure : 5000 PSI @ 70°F Temperature: 0°F to 400°F	Nos.	6	48		
	<b>Union</b>	-	-	0.00		
2.2	Size : ¾" OD, Material : SS316 (Rated pressure : 5000 PSI @ 70°F Temperature : 0°F to 400°F)	Nos.	100	800		
2.3	Size : ½" OD, Material : SS316 (Rated pressure : 5000 PSI @ 70°F Temperature : 0°F to 400°F)	Nos.	5	40		
2.4	Size : 1" OD, Material : SS316 (Rated pressure : 5000 PSI @ 70°F Temperature : 0°F to 400°F)	Nos.	30	240		
	<b>Reducing Union</b>	-	-	0.00		
2.5	Tube OD ¾" x Tube OD ½", Material : SS316 (Rated pressure : 5000 PSI @ 70°F Temperature : 0°F to 400°F)	Nos.	6	48		
2.6	Tube OD 1" x Tube OD ¾", Material : SS316 (Rated pressure : 5000 PSI @ 70°F Temperature : 0°F to 400°F)	Nos.	6	48		
	<b>Equal Tee</b>	-	-	0.00		



2.7	Size:½" OD x ½" OD x ½" OD, Material:SS316 (Rated pressure : 5000 PSI @ 70°F Temperature : 0°F to 400°F)	Nos.	5	40		
2.8	Size:¾" OD x ¾" OD x ¾" OD, Material : SS316 ( Rated pressure : 5000 PSI @ 70°F Temperature : 0°F to 400°F)	Nos.	20	160		
2.9	Size:1" OD x 1" OD x 1" OD, Material : SS316(Rated pressure : 5000 PSI @ 70°F Temperature : 0°F to 400°F)	Nos.	8	64		
	<b>Nut</b>	-	-	0.00		
2.10	¾" OD, Material : SS316(Rated pressure : 5000 PSI @ 70°F Temperature : 0°F to 400°F)	Nos.	20	160		
2.11	½" OD, Material : SS316(Rated pressure : 6000 PSI @ 70°F Temperature : 0°F to 400°F)	Nos.	10	80		
2.12	1" OD, Material : SS316(Rated pressure : 5000 PSI @ 70°F Temperature : 0°F to 400°F)	Nos.	10	80		
	<b>Front Ferrule</b>	-	-	0.00		
2.13	¾" OD, Material : SS316(Rated pressure : 5000 PSI @ 70°F Temperature : 0°F to 400°F)	Nos.	20	160		
2.14	½" OD, Material : SS316(Rated pressure : 5000 PSI @ 70°F Temperature : 0°F to 400°F)	Nos.	10	80		
2.15	1" OD, Material : SS316(Rated pressure : 5000 PSI @ 70°F Temperature : 0°F to 400°F)	Nos.	10	80		
	<b>Back Ferrule</b>	-	-	0.00		
2.16	¾" OD, Material : SS316(Rated pressure : 5000 PSI @ 70°F Temperature : 0°F to 400°F)	Nos.	20	160		
2.17	½" OD, Material : SS316(Rated pressure : 5000 PSI @ 70°F Temperature : 0°F to 400°F)	Nos.	10	80		
2.18	1" OD, Material : SS316(Rated pressure : 5000 PSI @ 70°F Temperature : 0°F to 400°F)	Nos.	10	80		
	<b>Male Connector</b>	-	-	0.00		
2.19	Size ¼" NPT (M) x 3/8" OD, SS316(Rated pressure : 5000 PSI @ 70°F Temperature : 0°F to 400°F)	Nos.	6	48		
2.20	Size 1/2" NPT (M) x 3/8" OD, SS316(Rated pressure : 5000 PSI @ 70°F Temperature : 0°F to 400°F)	Nos.	6	48		
2.21	Tube Fitting, Male Connector, 3/4 in. Tube OD x 1/2 in. Male NPT(Rated pressure : 5000 PSI @ 70°F Temperature : 0°F to 400°F)	Nos.	3	24		
<b>3</b>	<b>Supply of SS Ball Valves of Make:Swagelok/Parker/SSP conforming to MECON's Technical Specification No. MEC/TS/05/62/048 for SS Ball Valves of following sizes, specifications as indicated below :</b>	-	-	0.00		
3.1	2-Way Floating Normal Bore Ball Valve ¾"	Nos.	24	192		
3.2	2-Way Floating Normal Bore Ball Valve ½"	Nos.	12	96		
3.3	3-Way Trunnion Mounted, Reducer Bore Ball Valve ½" OD end Connection and ¼" NPT (F) bottom end connection	Nos.	6	48		
3.4	2-Way Floating Normal Bore Ball Valve ¾" with 1" expander union on both sides	Nos.	2	16		
<b>4</b>	<b>Conductive Core Thermoplastic hose (Make: SWAGELOK /PARKER SYNFLEX/ OPW)</b>	-	-	0.00		

4.1	3/8" ID Conductive Core Thermoplastic Hose for CNG Service with break away coupling min. 3.0m length	Nos.	6	48		
	<b>SECTION-B : ERECTION OF MECH. EQUIPMENT</b>	-	-	0.00		
1.0	Handling (including lifting and transportation from Client's store within city to CNG stations) and erecting in position, the following equipment either on the foundation or on roof at ~ 3 to 4 m above ground level. Contractor's scope includes supply of all material and accessories including but not limited to any fixtures, clamps, gasket, nut bolts, etc.. Scope also includes supply of all lifting tools / necessary accessories and hiring of cranes for same.	-	-	0.00		
1.1	Cascade 4500/3000 water capacity. Erection at + 3 to 4.0 M level	Nos.	3	24		
	<b>Note:</b> The quantities given above against individual items are indicative and shall not be considered to be binding. The quantities may increase or decrease at site at the time of actual execution and as per the discretion of Owner/ Engineer-in-charge. The unit rate shall be operated to work out the final payment due to Contractor.	-	-			
	<b>SECTION-C : SUPPLY, ERECTION &amp; COMMISSIONING OF MISCELLANEOUS ITEM</b>	-	-			
1.0	Supply, erection & commissioning of following miscellaneous items as per technical specification and at locations (within the stations) as directed by EIC	-	-			
1.1	Air compressor pump (Tyre Inflator)	No.	1	8		
1.2	Fire fighting Equipments	-	-	0.00		
1.2.1	DCP -9 Kg	Nos.	7	56		
1.2.2	DCP -75 Kg	Nos.	2	16		
1.2.3	CO2 – 4.5 Kg	Nos.	3	24		
1.2.4	Sand Bucket Stand with 4 Nos. Bucket	Nos.	5	40		
1.3	Design, manufacture, assembly & supply in well packed condition at site of 30 KVA gas generator set complete with acoustic enclosure,Control panel &AMF panel including 30mtrs length of sch.80 inlet pipe,4 nos. of socket welded elbows,2 (TWO) nos. of isolation ball valve of 800# with socket welded ends and Pressure regulators suitable to reduce the incoming gas pressure from 14 to 49 kg/cm2(g) to the required generator pressure for connecting to Gen set, flanges, nut, bolts, gasket, pipe etc all required accessories and control equipment to supply continuous electrical power as per the specification.	Nos.	1	8		
1.3.1	Installation, Testing and Commissioning of 30 KVA gas generator set complete with Control panel & AMF Panel including hook-up from existing steel pipe line (approx 30mtrs length) to Gen set, flanges, nut bolts, gasket, pipe etc all required accessories and control equipment to supply continuous electrical power as per the specification and all associated civil works.	Nos.	1	8		
	<b>SECTION-D : STRUCTURAL WORKS &amp; PRESSURE GUAGES</b>	-	-			
1.0	<b>Pipe Supports &amp; Other Structures</b>	-	-			

	Supply, fabrication and erection of all types of pipe supports like clamps, saddle, guide stops, cradles, turn buckles, anchors, T-posts; stockade/ trestle and pipe bridge for overhead piping; frames for canopy, approach ladders and platforms, crossover, cable tray supports, etc. including painting as per specification labour and supervision & complete work as per drawings, specifications and instruction of Engineer-in-charge. (Bolts, nuts, washers, U-clamps etc. for supporting shall be supplied by the Contractor within the rates quoted. These items will not be measured and paid seperately). HDPE/ rubber sheet is to be provided between support & pipe wherever required., The work is to be completed in all respect as per scope of work and specification.	M.Ton.	1	8		
	<b>Notes:</b>					
	i) The quantities indicated above are tentative estimated values and hence are approximate. Final payment will be made based on actual quantities to be certified by the Owner/Owner representative.					
	ii) The cost of MS bolts (permanent and service), washers, electrodes, putty, gases, cost of straightening the raw materials, cutting of flats from plates and providing splices, paints, tools, plants etc., as required for the work shall be deemed to be included in the quoted rates.	-	-	0.00		
	iii) All handling and transport charges of raw materials and fabricated structures including double handling, as required, for completion of work in accordance with time schedule, are deemed to be included in the quoted rates.					
1.1	<b>PRESSURE GAUGES</b>					
	Supply, installation and calibration of pressure Gauges and their accessories inclusive of supply of necessary piping materials/tubings alongwith all necessary valves & fittings, fabrication and installation of impulse lines/manifolds as per D. S. No. MEC/23H7/05/E5/1/001/DS-PG of WIKA / AN instruments etc.	No.	3	24		
	<b>TOTAL FOR MECHANICAL WORKS</b>					

Tender No. GGPL/KKD/C&P/CW/2545/VS		SCHEDULE OF RATES FOR CNG MOTHER STATIONS				
Item No.	Description	Unit	Quantity for 1(one) no. of CNG mother station	Total Quantity for 8 (eight) nos. of CNG mother station	Unit Rate	Total Amount for 8 (eight) nos. of CNG mother stations exclusive of GST (in Rs.)
<b>PART III-INSTRUMENTATION WORKS</b>						
<b>SUPPLY</b>						
1	5.0 KVA ,hot reduntant, 3 phase input(415V+ 10%) and single phase output (230 V+1%) industrial type UPS with battery bank ( Sealed Maintenance Free VRLA) etc. for 4.0 hours backup for critical load installations including interconnecting cables, battery stand, ACDB and all other accessories, complete in all respect including commissioning spares as per technical write up, drawing & datasheet attached.	Set	1	8		
2	Supply of complete Electronic earthing system with necessary accessories like copper stranded conductor, Cu plates, Cu strips, GI strips, Funnel with wire Mesh, GI pipe, PVC conduit, bolts,nuts, concrete chamber with CI cover, coke/charcoal, salt & sand etc., as per technical write up, drawings, etc.	Nos.	2	16		
3	Design, Manufacture, testing, Loading at contractor's works, Supply& Transportation, Unloading at Project site of Coriolis CNG-Series Mass flow meter (Model CNG 50 with integral local display) based on Coriolis principle of Micro motion, USA with F-series 2700 transmitter as per the technical specification and data sheet.Mass Flow Meter model shall be certified by statutory authorities W & M India for CNG applications and it is suitable for custody transfer application.	Nos.	2	16		
<b>TOTAL FOR SUPPLY WORKS</b>						
<b>ERECTION</b>						
1	5.0 KVA , hot reduntant,3 phase input(415V+ 10%) and single phase output (230 V+1%) industrial type UPS with battery bank ( Sealed Maintenance Free VRLA) etc. for 4.0 hours backup for critical load installations including interconnecting cables, battery stand, ACDB and all other accessories, complete in all respect including commissioning spares as per technical write up, drawing & datasheet attached.	No.	1	8		
				0		
2	Intallation, testing and commissioning of complete Electronic earthing system with necessary accessories like copper stranded conductor, Copper Plates, GI strips, Funnel with wire Mesh,GI pipe, PVC conduit,bolts,nuts, concrete chamber with CI cover,coke/charcoal, salt & sand etc.,	No	2	16		
<b>TOTAL FOR ERECTION WORKS</b>						
<b>TOTAL FOR SUPPLY + ERECTION WORKS</b>						
<b>0</b>						
<b>Notes :</b>						
(i)	Above quantities are estimated quantities and may change during detail engineering as per site condition. Successful Tenderer shall supply the equipments, at the same rate, as per these change quantities. Payment shall be made as per quantities erected.					
(ii)	Makes of all equipemnts shall be as per preferred make list.Items for which preferred makes are not indicated shall be provided only after approval of the make by owner / consultant.					

Tender No. GGPL/KKD/C&P/CW/2545/V5		SCHEDULE OF RATES FOR CNG MOTHER STATIONS				
Item No.	Description	Unit	Quantity for 1(one) no. of CNG mother station	Total Quantity for 8 (eight) nos. of CNG mother station	Unit Rate	Total Amount for 8 (eight) nos. of CNG mother stations exclusive of GST (in Rs.)
<b>PART V : STEEL STRUCTURAL WORKS</b>						
<b>ST-1</b>	<b>Structural Steel Works for Canopy &amp; Other Allied Structures</b>					
	Supply of steel consisting of Plates, Rolled steel joists, Channels, Angles, Tubes, Rectangular / Square Hollow Steel sections, Fascia, Flashings, Rain water pipe & Gutter etc, straightening of raw steel if required. Preparation of all necessary Fabrication drawings ( Based on MECON Design drawings ) including bill of materials. Fabrication of Steel structures as per Fabrication drawings (including preparation of supplementary sketches and detailed bill of materials ) supply of bolts, nuts, washers, shims, packs, putty, gas, welding electrodes and all other consumables, as required. Cleaning and preparation of all steel surfaces by Mechanical Cleaning to St 3 of Swedish Standard for painting, Supply and application of One Coat of Primer Paint of Zinc Phosphate in Phenolic Alkyd medium 40 microns DFT, Intermediate Primer Coat of Zinc Phosphate in Phenolic Alkyd medium 40 microns DFT, One Coat of Intermediate Paint of Synthetic MIO (ie: Micaceous Iron Oxide) 75 microns DFT, supply and application of 2 coats of Finishing paint Synthetic Enamel 25 microns DFT / coat. Finishing Coat shall be applied one Coat before erection and one coat after erection. The total thickness of paint shall be 205 Microns. Loading, Transportation and Unloading and Delivery at erection site of all fabricated structures up to height of about 12 M, erection, alignment and welding of all structures true to line, level, plumb and dimension, including rectification if any, splicing, site assembly all as per technical specifications and drawings, touch up painting, including supply of paint, where paint is damaged.	Tons	20	160		
<b>ST-2</b>	<b>Structure Steel Works for Miscellaneous Structures like Grating, Handrails, Hoardings etc</b>			0		
	Supplying, Fabricating & Erecting in position steel structures fabricated out of MS Girders, channels, Tees, angle, flats, plate, square hollow sections pipes etc. conforming to IS:2062 and/or from pipes conforming to IS:1161 for structural purpose for cascade supporting structure, loading/unloading platform, Gratings for platform, catladder, handrails, hoardings for sinages, Lcv stand, etc. of any size/dia for required design including cutting, welding, bolting, hoisting, fixing in position, including application of one coat of primer at shop and second coat of primer at site after erection and two coats of finishing paint at site. The work is to be completed in all respect as per specification, scope of work, detailed construction drawings and directions of the Engineer-in-charge.	KG	500	4000		
	[ Rate to include cost of all labour, nut, bolts, tools, tackles, hire charges royalties, levies, transportation, scrap value, gas cutting, welding, other consumables, paints, compressed air, water, electric power etc. all complete.]			0		
<b>ST-3</b>	<b>Providing and fixing Fencing Gates</b>			0		
	Supplying, fabricating & fixing fencing gates fabricated from pipes conforming to IS:1161 and plates conforming to IS:2062 & fixing of GI weldmesh made from 3mm GI wire @ 75 mm bothways to structural steel frame by means of welding/bolting, painting with enamel paint in approved shade including supply of all raw materials, bolts, electrodes, transportation etc complete as per enclosed sketch, technical specifications and directions of the Engineer-In-Charge.			0		
a)	4m Wide x 2.1m High	Nos.	1	8		
c)	1m Wide x 2.1m High	Nos.	1	8		
<b>ST-4</b>	<b>Providing and Fixing 6 O/P Chequered Plate Covers</b>			0		
	Providing and fixing chequered plate in approved panel or over steel structure including cutting, welding, hoisting, fixing in position, and applying two or more coats of approved quality synthetic enamel over a priming coat of approved steel primer etc complete as per scope detailed drawings, technical specifications and directions of the Engineer-In-Charge.	KG	500	4000		
	[ Rate to include cost of all labour, nut, bolts, stiffening sections, bars tools, tackles, hire charges, royalties, levies, transportation, scrap value, gas cutting, welding, other consumables, paints, compressed air, water, electric power etc. all complete.]			0		
<b>ST-5</b>	<b>Providing and fixing safety guard</b>			0		
	Providing and fixing safety guard with 80 mm heavy duty G.I. Pipe ( size 450 deep and 300 width inside) grouted with ready mix high strength grout mortar of approved manufacturer and painted with approved quality paint as per scope of work, detailed construction drawings, technical specifications and directions of Engineer-In-Charge. [Rate to include cost of all labour, tools, tackles etc. complete].	Nos.	20	160		
<b>ST-6</b>	<b>Providing and fixing Colour Coated Sheets</b>			0		
	Preparation of sheeting drawings, procurement, transportation and delivery at erection site of colour coated steel sheets for roof & side cladding shall be of Galvalume/zincalume BHP steel sheet made of cold rolled steel of 300 MPA minimum yield strength conforming to ASTM A366 or AS 1595. Base metal thickness shall be 0.5mm and total thickness of colour coated profiled sheet shall be 0.58mm. Fixing of sheets with all flashings, corners, ridges, cutting, bending of sheets to a required shape & size and erecting them in roof & sides with all fixing arrangement as per manufactures instructions and complete in all respect as per drawings and specifications. (Net laid area to be measured.)	Sq.Mt	150	1200		

ST-7	<b>Providing and fixing Trac ( 150 F ) Pre-Coated False Ceiling System</b>			0		
	Preparation of sheeting drawings, procurement, transportation and delivery at erection site Trac ( 150 F ) Pre-Coated Steel False Ceiling System with powder coated finishes as per Manufacturers Instructions and Specifications.	Sq.Mt	140	1120		
	<b>Notes:</b>					
1	Rate to include cost of all labour, tools, tackles, equipment, hire charges, supply of all materials such as structural steel, purlins, nuts, bolts, washers, screws, seals, wire ropes, flashing, fitting and fixtures, gutter, rain water pipes and bends, electrodes, edge colour coated sheets for signage works, primer, paint and all consumables etc. with all bye works and sundry works complete in all respect.					
2	The quantities indicated are estimated values and hence are approximate. Final payment will be made based on actual quantities to be certified by the Purchaser.					
3	The cost of MS bolts (permanent and service), washers, electrodes, putty, gases, cost of straightening the raw materials, cutting of flats from plates and providing splices, paints, tools, plants, etc., as required for the work shall be deemed to be included in the quoted rates.					
4	All handling and transport charges of raw materials and fabricated structures including double handling, as required, for completion of work in accordance with Time schedule, are deemed to be included in the quoted rates.					
5	All accessories like MS tower bolts, MS Pivot, MS Wheels, MS Tee section, locking arrangement etc. shall be measured by weight only.					
6	Contractor shall ensure proper alignment and smooth operation of Gate.					
	<b>TOTAL FOR STRUCTURAL WORKS</b>					

Tender No. GGPL/KKD/C&P/CW/2545/VS		SCHEDULE OF RATES FOR CNG MOTHER STATIONS				
S.NO.	Description of Item	Unit	Quantity for 1(one) no. of CNG mother station	Total Quantity for 8 (EIGHT) nos. of CNG mother station	Unit Rate	Total Amount for 8 (Eight) nos. of CNG mother stations exclusive of GST (in Rs.)
1.0	Supply & installation of 4mm thick ACM of approved make alongwith required frame of MS section cladding in a combination of corporate colours in approved pattern and shade of GODAVARI GAS PVT LTD with the use of Retro Reflective Sheeting along with all fixtures, scaffolding etc complete. for CANOPY FASCIA.					
1.1	4mm thick ACM	SQM	60.0	480.0		
1.2	Retro Reflective sheet	SQM	21	168		
1.3	GODAVARI GAS PVT LTD Letters on acrylic with LED lightning inside including all cabling works	1 set	1	8		
1.4	LOGO on acrylic with LED lightning inside including all cabling works	Each	1	8		
				0.0		
2.0	Supply & installation of 4mm thick ACM of approved make alongwith required frame of MS section cladding in a combination of corporate colours in approved pattern and shade of GODAVARI GAS PVT LTD with the use of Retro Reflective Sheeting along with all fixtures, scaffolding etc complete. for BUILDING FASCIA.			0		
2.1	4mm thick ACM	SQM	10.0	80.0		
2.2	Retro Reflective sheet	SQM	2.0	16.0		
3.0	Supply & installation of all materials for SPREADER (1200 X450X150mm thick rectangular and 100mm away from column face) including 4mm thick ACM (Aluminium Composite Material) cladding along with required MS frame etc., with the use of Retro Reflective Sheeting in required size & shape along with all fixtures, scaffolding etc., on structural framework of canopy in 10 mm thick Acrylic duly CNC Routed in require shape & Size as per direction of Engineer In Charge.	Each	2	16		
				0.0		
4.0	Supply & installation of all materials for MANDATORY SIGNS at various facilities of CNG Station and of various sizes with 4mm thick. ACM (Aluminum Composite Material) sheets along with all fixtures . Item include Matter/Logo (as approved) in Retro Reflective Sheeting duly pasted on ACM in required size & shape. all complete as per direction of Engineer In Charge..	Sqm	2.0	16.0		
				0.0		
5.0	Supply & installation of DIRECTION SIGN of size 1000mm X 500mm X 250mm as per drawing standing 325 mm above finished footing level with 4mm thick. ACM (Aluminum Composite Material) of approved make / colour & Shade cladded to MS framework with the use of approved Retro Reflective Sheeting of approved make duly pasted on ACM in require size & shape duly CNC Routed as per direction of Engineer Incharge.	Each	2	16		
				0.0		
6.0	Supply & installation of CANOPY COLUMN CLADDING over the structural column with 4mm thick ACM (Aluminum Composite Material) of approved colour with all necessary fittings and fixtures. The item includes required MS Frame if any and scaffolding and fixtures etc as per direction of Engineer Incharge.	Sqm	40.0	320.0		
				0		
7.0	Supply and installation of Signage/Monolith as per enclosed drawing of monolith structure. The item is lump sum and shall includes all relevent costs associated with putting up such facility incl supply, fabrication, erection, assembly, commissioning the GODAVARI GAS PVT LTD LTD. MONOLITH including electrical cabling and lighting etc for the same.					
7.1	Cladding: Providing and fixing 4mm ACM to be used for cladding duly by cold forming, CNC machine routed and fold as per drawing including MS framework.					

7.2	Company Logo: On top of aluminium cladding as per drawing with Acrylic / PETG thermoformed shape & letters(as per art work) covered with vinyl of approved make with the provisions of illuminations during night with LED of approved make with necessary electrical fittings.	Each	1	8		
7.3	Letters: Acrylic / PETG thermoformed shape & letters(as per art work) letters of lit during night through LED lights and also having provisions of price change unit of products.					
7.4	Signs: Retro reflective vinyls pasting on front face of monolith for signages as per the artwork.					
<b>TOTAL FOR ARCHTECTURAL WORKS</b>						